



## Turning

Turning Introduction .....	A2-A7
Turning ISO Inserts .....	B1-B218
Tools for External Turning and Internal Boring .....	C1-C129
Tools for Small Hole Boring.....	D1-D91
Grooving and Cut-Off.....	E1-E133
Threading .....	F1-F101

# Turning Product Highlights

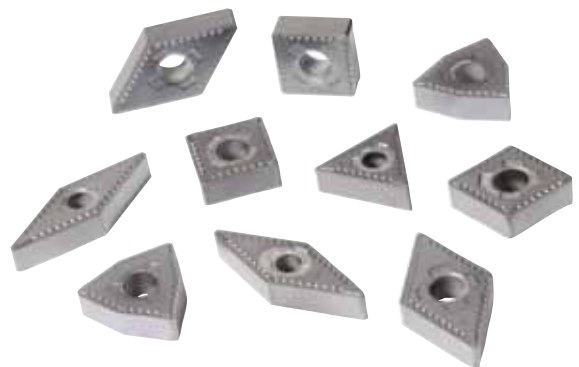
## WIDIA™ Victory™ High-Temp Turning

With three geometries and three grades, WIDIA Victory has a complete portfolio for high-temp turning applications in nickel-based (INCONEL® , Udimet®, Rene), cobalt-based (Haynes®), and Fe-based (Airmet 100) materials, as well as difficult-to-machine stainless (460SS, duplex, high-alloy stainless), cobalt-chrome, and stainless-based powdered metals. These materials are commonly found in rings, housings, hubs, compressors, fans, rotors, and medical devices.

### -FS Geometry

The -FS Geometry is a ground, highly-positive design best used in finishing cuts where size control, finish, and minimisation of part deflection are considerations.

- Excellent chip control versus similar competitive geometries. This chip control adds process stability and reduces machine stoppages to remove stringers.
- Increased cutting speed and/or feed rate for better chip control to reduce cycle time, gain productivity, and reduce machining cost.
- Reduced cutting forces provide longer tool life and/or better surface finish.
- Improved depth-of-cut (DOC) notching resistance for longer tool life.
- Advanced PVD grades provide more wear resistance and longer tool life.





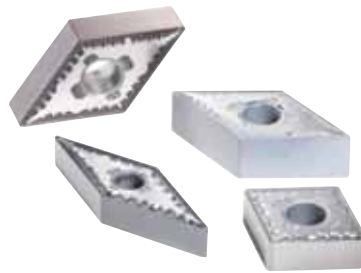
## -MS Geometry

-MS geometry is a moulded geometry with increased edge toughness that is best used in medium machining.

- The -MS geometry offers excellent chip control versus similar competitive geometries. This chip control adds process stability and reduces machine stoppages to remove stringers.
- Available in two PVD grades, -MS is a high-performance geometry. Compete with confidence against any competitor. The -MS is also available in an uncoated grade.
- The WIDIA™ Victory™ grades offer better depth-of-cut (DOC) notching resistance and improved edge toughness. This offers customers an improved solution from other competitors.

## -UR Geometry

- -UR geometry offers a roughing solution for high-temp materials. Available in WS10PT™ and WS25PT™, the -UR geometry provides smooth chip forming and improved coolant flow for increased tool life. This positive geometry, with its unique chipbreaker without inflection points, reduces cutting forces and improves depth-of-cut (DOC) notching resistance.



# Turning Product Highlights

## WIDIA™ VariTurn™

Formerly known as WIDIA Value, the WIDIA VariTurn platform offers high-performance inserts with versatility. With eight grades and eight geometries, VariTurn covers 80% of all turning applications.

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

## WMT™ System

The WMT platform is the economical and reliable option for all grooving, face grooving, cut-off, turning, and profiling applications. The WMT system ensures precise insert positioning and provides only the most accurate machining, with exceptionally fast cycle times and superior performance.

### The WMT portfolio offers:

- Proven higher stability.
  - WMT insert design has the best clamping system for stability.
- Platform flexibility, with multiple geometries in single holder for multiple application types.
- Victory™ grades:
  - WU10HT™ — Uncoated
  - WU10PT, WU25PT — PVD
  - WP10CT, WP25CT — CVD
- Greater depth-of-cut (DOC) capability.

### Versatile and Well Constructed

- Specifically designed to increase speeds and feeds.
- Excellent geometry for even the most demanding deep grooving applications.
- The WMT system enables heavy stock removal in turning applications.
- Ensures finer surface finishes and a long, reliable tool life.





## WIDIA™ Tools for Small Hole Boring

When the application calls for boring at a D min of less than 3,5mm, WIDIA offers comprehensive and easy solutions to choose from. Our portfolio of tools for small hole boring offer solutions in either indexable inserts or solid carbide inserts, and inserts are available for boring, profiling, threading, and grooving.

### I.D. Indexable Tooling

- Steel and solid carbide shanks with through coolant in inch and metric sizes.
- Ground-in and pressed-type chipbreaker inserts.
- Coated and uncoated carbide grades and cubic boron nitride/polycrystalline diamond-tipped inserts to support all machining applications.

### Quadralock™ System

- Versatile and engineered to give exceptional performance for I.D. machining applications. Quick, accurate insert indexing.
- Internal coolant can be used with all tool bodies. Cutting inserts have special slots that direct coolant to the cutting edge.
- Carbide grades for steels, stainless steels, non-ferrous materials, super alloys, titanium, and hard materials.

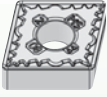
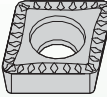
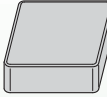
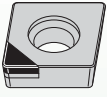
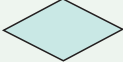





### A/B Series Tooling

- Inserts repeat within  $\pm 0,013\text{mm}$ , allowing quick and accurate setups.
- Elliptical, ground insert shanks allow for maximum strength and rigidity.
- Available in boring, grooving, threading, and profiling insert styles.
- Coated and uncoated carbide grades and cubic boron nitride/polycrystalline diamond-tipped inserts to support all machining applications.

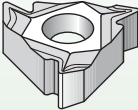
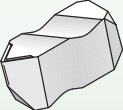
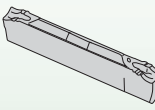
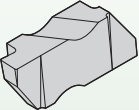
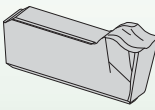



■ ISO Turning Inserts

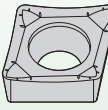
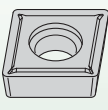

Step 1 • Select Insert Style

						
			Carbide Inserts, Negative	Carbide Inserts, Positive	Ceramic Inserts	PcBN/PCD Inserts
<b>C</b>	Rhomboid 80°		B35-B45	B30-B34 B45-B46	B179-B181	B197-B203
<b>D</b>	Rhomboid 55°		B51-B63	B47-B50 B63-B64	B182-B183	B206-B210
<b>R</b>	Round		B67	B65-B66	B184-B186	B210
<b>S</b>	Square 90°		B70-B77	B68-B70 B78-B80	B187-B192	B210-B212
<b>T</b>	Triangular 60°		B83-B91	B91-B93	B193-B195	B212-B215
<b>V</b>	Rhomboid 35°		B95-B99	B94-B95	B196	B216-B218
<b>W</b>	Trigon 80° with enlarged corner angles		B99-B105	B105	B196	B218

■ Threading, Grooving, and Cut-Off

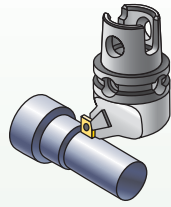
						
	LT	TopThread™	WMT™	TopGroove™	Separator™	ProGroove™
inserts	F42-F68	F8-F22	E12-E26	E48-E72	E112-E121	E94-E101
toolholders	F69-F77	F23-F35	E28-E39	E73-E79	E122-E128	E102-E104

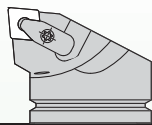
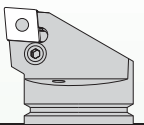
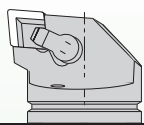
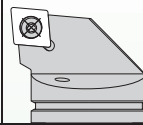
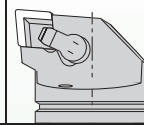
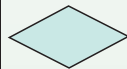





■ WIDIA™ Turning Solutions

			
	Inserts to Machine Aluminium	VariTurn™	Tools for Small Hole Boring
inserts	B150-B157	B106-B149	D2-D91

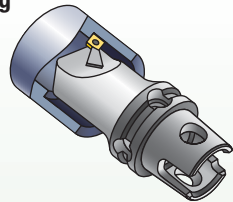
**Step 2 • Select Application and Clamping System**

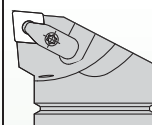
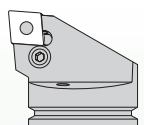
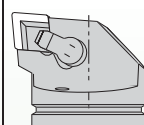
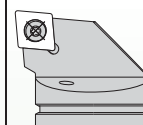
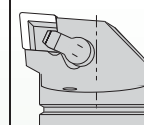




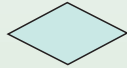

**External Machining**



								
			<b>D-Style Clamping</b>	<b>P-Style Clamping</b>	<b>Negative C-Style Clamping</b>	<b>S-Style Clamping</b>	<b>Positive C-Style Clamping</b>	
<b>C</b>	Rhomboid 80°		conventional	C8–C10	C20–C22	C31–C32	C42–C43	–
<b>D</b>	Rhomboid 55°			C11	C23–C24	C32–C33	C43–C42	–
<b>R</b>	Round		conventional	C12	–	C35	–	C40–C41
<b>S</b>	Square 90°		conventional	C12–C14	C25–C27	C36–C37	C45	–
<b>T</b>	Triangular 60°		conventional	C15	C28–C29	C37–C39	C46–C47	–
<b>V</b>	Rhomboid 35°		conventional	C16–C17	–	–	C48	–
<b>W</b>	Trigon 80° with enlarged corner angles		conventional	C19	C30	–	C48–C49	–

**Internal Machining**



								
			<b>D-Style Clamping</b>	<b>P-Style Clamping</b>	<b>Negative C-Style Clamping</b>	<b>S-Style Clamping</b>	<b>Positive C-Style Clamping</b>	
<b>C</b>	Rhomboid 80°		conventional	C56	C60	C62	C66–C70	–
<b>D</b>	Rhomboid 55°			C56–C57	–	C63	C71–C76	–
<b>R</b>	Round		conventional	–	–	–	–	–
<b>S</b>	Square 90°		conventional	–	–	C63–C64	–	–
<b>T</b>	Triangular 60°		conventional	C58	C60	–	C77–C80	C65
<b>V</b>	Rhomboid 35°		conventional	C58	–	–	C80–C81	–
<b>W</b>	Trigon 80° with enlarged corner angles		conventional	C59	C61	C64	–	–





## Turning • ISO Inserts

WIDIA Victory High-Performance Inserts .....	B2–B105
WIDIA VariTurn .....	B106–B149
Inserts for Machining Aluminium.....	B150–B157
Ceramic, PcBN, and PCD Inserts.....	B158–B218

## A Complete High-Performance Turning Portfolio •

### WIDIA™ Victory™

Specifically engineered multilayer coating provides high-speed capability for finishing to roughing operations. New geometries enhance chip control for better tool life and superior surface finishes.



# Victory

- Market-leading technology.
- Longer tool life.
- Higher productivity through increased speed capability.

## Steel and Stainless Steel Grades

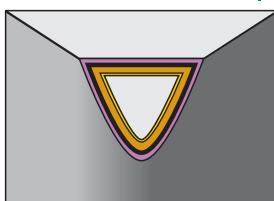
- Reduced cycle times — high speed and feed capability.
- Long tool life — new multilayer coating provides better wear resistance.
- Proven seating — smooth and secure seating surface.
- Outer layer is bronze-colored for easier wear detection.

### Post-coat treatment

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

New geometry identification system.

MT-CVD/CVD-TiN-TiCN-  
Al<sub>2</sub>O<sub>3</sub>-ZrCN



### Improved edge toughness

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

### Post-coat grinding

- Provides secure seating surface.

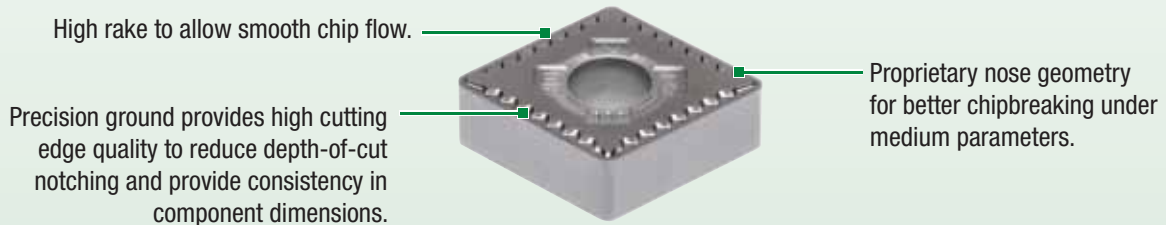
### Alpha alumina layer

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

New WIDIA™ Victory™ grades and geometries are designed to offer better tool life and surface finishes.

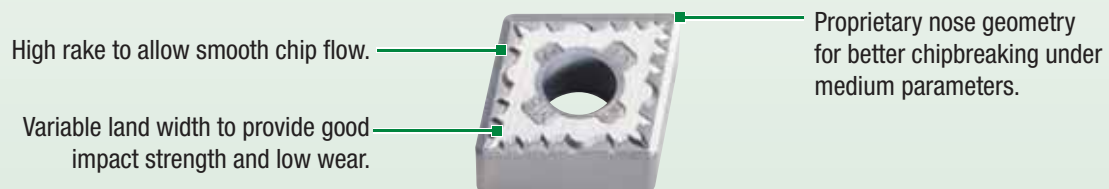
**..GG-FS Geometry**

- All ..GG-FS inserts are G tolerance inserts. This is a critical feature in some applications, especially the aerospace industry.
- Reduced cycle times — high speed and feed capability.
- Reduced cutting forces — improved dimensional control and reduced deflections.
- New chip forming elements — better chip control.
- Long tool life — new multilayer coating provides better wear resistance.
- Proven seating — smooth and secure seating surface.



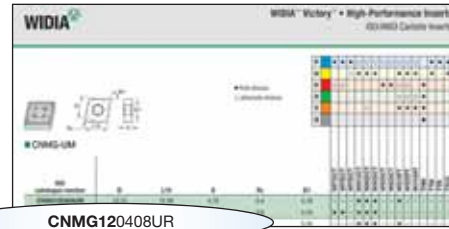
**..MG-MS Geometry**

- High positive rake angle delivers improved tool life by reducing cutting forces and built-up edge when machining high-temp alloys.
- Improved chip control and reduced crater wear due to proprietary chipbreakers with varying shapes and distances.
- Reduced thermal wear and cracking due to near sharp cutting edge with optimised edge treatment.
- Improved chipbreaking at various depths of cut due to variable land width, which improves impact strength.
- All MG-MS inserts are moulded, which supports increased tool life due to the elimination of grinding stress.



## How Do Catalogue Numbers Work?

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

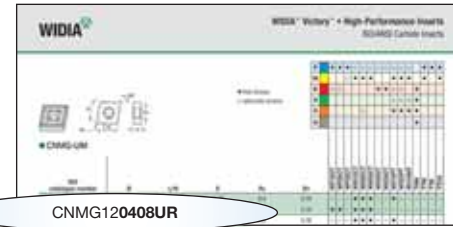


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Insert Shape		Insert Clearance Angle		Tolerance Class		Insert Features		Size																																																																																																																																																																																																
<b>H</b>	Hexagon 120°		<b>A</b> 3°	<p>Tolerances apply prior to edge prep and coating</p> <p><b>D</b> = Theoretical diameter of the insert inscribed circle <b>S</b> = Thickness <b>B</b> = See figures below</p>	<b>N</b>	<p>Code for mm cutting edge length "L10"</p> <table border="1"> <thead> <tr> <th>"D"</th> <th>C</th> <th>D</th> <th>R</th> <th>S</th> <th>T</th> <th>V</th> <th>W</th> </tr> </thead> <tbody> <tr><td>3,97</td><td>S4</td><td>04</td><td>03</td><td>03</td><td>06</td><td>—</td><td>—</td></tr> <tr><td>4,76</td><td>04</td><td>05</td><td>04</td><td>04</td><td>08</td><td>08</td><td>S3</td></tr> <tr><td>5,56</td><td>05</td><td>06</td><td>05</td><td>05</td><td>09</td><td>09</td><td>03</td></tr> <tr><td>6,00</td><td>—</td><td>—</td><td>06</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>6,35</td><td>06</td><td>07</td><td>06</td><td>06</td><td>11</td><td>11</td><td>04</td></tr> <tr><td>7,94</td><td>08</td><td>09</td><td>07</td><td>07</td><td>13</td><td>13</td><td>05</td></tr> <tr><td>8,00</td><td>—</td><td>—</td><td>08</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>9,52</td><td>09</td><td>11</td><td>09</td><td>09</td><td>16</td><td>16</td><td>06</td></tr> <tr><td>10,00</td><td>—</td><td>—</td><td>10</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>11,11</td><td>11</td><td>13</td><td>11</td><td>11</td><td>19</td><td>19</td><td>07</td></tr> <tr><td>12,00</td><td>—</td><td>—</td><td>12</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>12,70</td><td>12</td><td>15</td><td>12</td><td>12</td><td>22</td><td>22</td><td>08</td></tr> <tr><td>14,29</td><td>14</td><td>17</td><td>14</td><td>14</td><td>24</td><td>24</td><td>09</td></tr> <tr><td>15,88</td><td>16</td><td>19</td><td>15</td><td>15</td><td>27</td><td>27</td><td>10</td></tr> <tr><td>16,00</td><td>—</td><td>—</td><td>16</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>17,46</td><td>17</td><td>21</td><td>17</td><td>17</td><td>30</td><td>30</td><td>11</td></tr> <tr><td>19,05</td><td>19</td><td>23</td><td>19</td><td>19</td><td>33</td><td>33</td><td>13</td></tr> <tr><td>20,00</td><td>—</td><td>—</td><td>20</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>22,22</td><td>22</td><td>27</td><td>22</td><td>22</td><td>38</td><td>38</td><td>15</td></tr> <tr><td>25,00</td><td>—</td><td>—</td><td>25</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>25,40</td><td>25</td><td>31</td><td>25</td><td>25</td><td>44</td><td>44</td><td>17</td></tr> <tr><td>31,75</td><td>32</td><td>38</td><td>31</td><td>31</td><td>54</td><td>54</td><td>21</td></tr> <tr><td>32,00</td><td>—</td><td>—</td><td>32</td><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>	"D"	C	D	R	S	T	V	W	3,97	S4	04	03	03	06	—	—	4,76	04	05	04	04	08	08	S3	5,56	05	06	05	05	09	09	03	6,00	—	—	06	—	—	—	—	6,35	06	07	06	06	11	11	04	7,94	08	09	07	07	13	13	05	8,00	—	—	08	—	—	—	—	9,52	09	11	09	09	16	16	06	10,00	—	—	10	—	—	—	—	11,11	11	13	11	11	19	19	07	12,00	—	—	12	—	—	—	—	12,70	12	15	12	12	22	22	08	14,29	14	17	14	14	24	24	09	15,88	16	19	15	15	27	27	10	16,00	—	—	16	—	—	—	—	17,46	17	21	17	17	30	30	11	19,05	19	23	19	19	33	33	13	20,00	—	—	20	—	—	—	—	22,22	22	27	22	22	38	38	15	25,00	—	—	25	—	—	—	—	25,40	25	31	25	25	44	44	17	31,75	32	38	31	31	54	54	21	32,00	—	—	32	—	—	—	—	<b>R</b>	<b>R</b>
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32,00	—	—	32	—	—	—	—																																																																																																																																																																																																	
<b>O</b>	Octagon 135°		<b>B</b> 5°	<b>F</b>	<b>F</b>																																																																																																																																																																																																			
<b>P</b>	Pentagon 108°		<b>C</b> 7°	<b>A</b>	<b>A</b>																																																																																																																																																																																																			
<b>R</b>	Round —		<b>D</b> 15°	<b>M</b>	<b>M</b>																																																																																																																																																																																																			
<b>S</b>	Square 90°		<b>E</b> 20°	<b>G</b>	<b>G</b>																																																																																																																																																																																																			
<b>T</b>	Triangular 60°		<b>F</b> 25°	<b>W</b>	<b>W</b>																																																																																																																																																																																																			
<b>C</b>	Rhomboid 80° 55° 75° 86° 35°		<b>G</b> 30°	<b>T</b>	<b>T</b>																																																																																																																																																																																																			
<b>D</b>			<b>N</b> 0°	<b>Q</b>	<b>Q</b>																																																																																																																																																																																																			
<b>E</b>			<b>P</b> 11°	<b>U</b>	<b>U</b>																																																																																																																																																																																																			
<b>M</b>				<b>B</b>	<b>B</b>																																																																																																																																																																																																			
<b>V</b>				<b>H</b>	<b>H</b>																																																																																																																																																																																																			
<b>W</b>	Trigon 80° with enlarged corner angles			<b>C</b>	<b>C</b>																																																																																																																																																																																																			
<b>L</b>	Rectangular 90°			<b>J</b>	<b>J</b>																																																																																																																																																																																																			
<b>A</b>	Parallelogram 85°			<b>X</b>	<b>Special Design</b>																																																																																																																																																																																																			
<b>B</b>	82°			<b>V</b>																																																																																																																																																																																																				
<b>N/K</b>	55°																																																																																																																																																																																																							

tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±0,025	±0,013	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,013
M	See tables on next page		±0,013
U	See tables on next page		±0,013

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



CNMG120408UR

04		08						UR	
Thickness S		Corner Radius "Rε"		Hand of Insert (optional)		Cutting Edge (optional)		Chipbreaker (optional)	
<b>symbol</b>	<b>thickness</b>	<b>symbol</b>	<b>corner radius</b>	<b>R</b> = Right hand	<b>F</b>		Sharp	<b>13</b>	= Railroad Light
<b>mm</b>	<b>mm</b>	<b>mm</b>	<b>mm</b>	<b>L</b> = Left hand	<b>E</b>		Rounded	<b>CT</b>	= Copy Turning
—	0,79	X0	0,04	<b>N</b> = Neutral	<b>T</b>		Chamfered	<b>FF</b>	= Fine Finishing
T0	1,00	01	0,1		<b>S</b>		Chamfered and Rounded	<b>FP</b>	= Finish Positive
01	1,59	02	0,2		<b>K</b>		Double-Chamfered	<b>FW</b>	= Finish Wiper
T1	1,98	04	0,4		<b>P</b>		Double-Chamfered and Rounded	<b>ML</b>	= Medium Light
02	2,38	08	0,8					<b>MR</b>	= Medium Roughing
03	3,18	12	1,2					<b>MW</b>	= Medium Wiper
T3	3,97	16	1,6					<b>RH</b>	= Roughing Heavy
04	4,76	20	2,0					<b>T</b>	= Negative Land
05	5,56	24	2,4					<b>UF</b>	= Universal Finishing
06	6,35	28	2,8					<b>UM</b>	= Universal Medium
07	7,94	32	3,2					<b>UR</b>	= Universal Roughing
9	9,52	00	—					<b>.NMP</b>	= Sharp Medium
11	11,11	M0	round insert					<b>MP</b>	= Medium Positive
12	12,70	—	—					<b>FS</b>	= Finishing High-Temp(S)

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

<b>MS</b>	= Medium High-Temp(S)
<b>MU</b>	= Medium Universal
<b>SR</b>	= Super Roughing
<b>65</b>	= Heavy Roughing

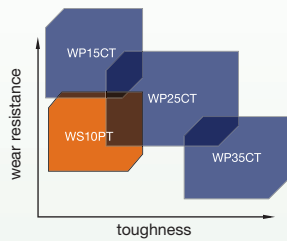
A system of grades, geometries, and application guidelines to provide optimal solutions for your metalcutting needs. It's easy to determine which WIDIA™ chip-control cutting tool will work best in your specific workpiece materials and applications!



W	P	15	C	T														
Brand	Primary Workpiece Material	Application Range*	Insert Material	Application														
<table border="1"> <tr><td>P</td><td>Steel</td></tr> <tr><td>M</td><td>Stainless Steel</td></tr> <tr><td>K</td><td>Cast Iron</td></tr> <tr><td>N</td><td>Non-Ferrous</td></tr> <tr><td>S</td><td>High-Temp Alloys</td></tr> <tr><td>H</td><td>Hardened Materials</td></tr> <tr><td>U</td><td>Universal Machining</td></tr> </table>	P	Steel	M	Stainless Steel	K	Cast Iron	N	Non-Ferrous	S	High-Temp Alloys	H	Hardened Materials	U	Universal Machining		<p>05 = fine finishing                      10 = finishing                      15 = } medium to roughing                      20 = }                      25 = }                      30 = } roughing                      35 = }                      40 = }                      45 = } heaviest roughing                      50 = }</p> <p>*Samples shown are based on turning and will differ within applications</p>	<p>H = Uncoated Carbide                      C = Carbide + CVD                      P = Carbide + PVD                      T = Cermet                      Y = Ceramics                      D = Diamond                      B = PcBN                      S = HSS                      E = HSS-E                      M = HSS-E-PM</p>	<p>T = Turning                      M = Milling                      H = Holemaking                      D = Solid Drills                      E = Solid End Mills                      G = Taps                      R = Reamer                      V = Thread Mills</p>
P	Steel																	
M	Stainless Steel																	
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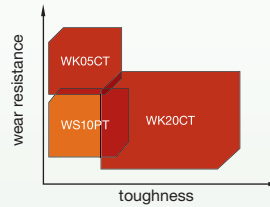


## Victory Toughness/Wear Resistance



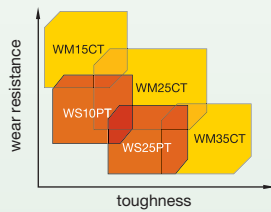
### WP Grades for Steel

- Three grades and seven primary geometries for use in roughing to finishing operations.
- Increase cutting speed and/or feed rate to gain productivity.



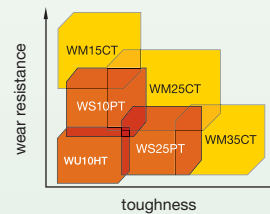
### WK Grades for Cast Iron

- Two grades to cover all of your cast iron turning operations.
- Very good balance of wear resistance and toughness for long predictable tool life. Flat top geometry for machining cast iron. For finishing to roughing applications.



### WM Grades for Stainless Steel

- Three grades across 12 geometries for use in roughing to finishing operations.
- Increase cutting speed and/or feed rate by up to 30% over similar competitive grades.



### WS Grades for High-Temp Alloys

- Two grades for use in roughing to finishing operations.
- Very good wear resistance for longer tool life.
- One uncoated grade for use in titanium.

## Positive and Negative Inserts

### Positive Inserts



- Screw-on inserts are the first choice for I.D. turning of all materials and O.D. turning on small to medium lathes.
- Suitable for all workpiece materials.

### Negative Inserts



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

### Ceramic Inserts



- Ceramic inserts are a great choice for productive machining of high-temp alloys.
- Negative rake inserts are also recommended for the machining of hardened materials and cast irons.
- Available in flat-top geometries with moulded and ground peripheries.

### PcBN and PCD Inserts



- PcBN can be used for machining steels with a hardness higher than 48 HRC.
- PcBN inserts can also be used for productivity improvements in machining cast irons and high-temp alloys.
- PCD inserts are used for machining non-ferrous materials.



## Insert Selection System

### How to Use

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

### Example:


#### Six workpiece material groups

##### ■ Step 1 • Select the insert geometry

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




##### ■ Step 2 • Select the grade

Given: cutting conditions:  
lightly interrupted cut   
Geometry: -RH  
Unknown: grade  
Solution: WP25CT™



##### ■ Step 3 • Select the cutting speed

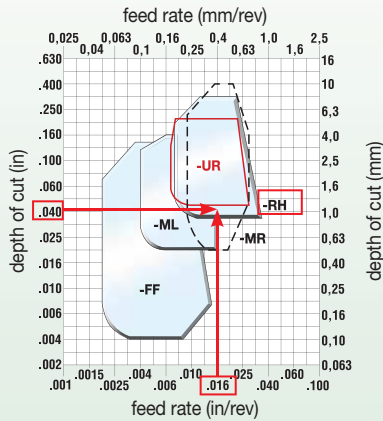
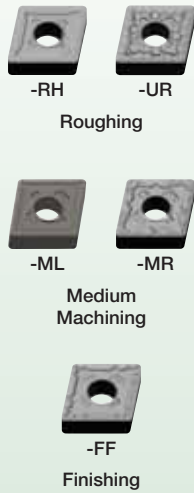
Given: grade WP35CT™   
cutting conditions  
material CK15  
Unknown: cutting speed  
Solution: 210 m/min

#### Need help in selecting a product?

Additional information can be obtained by contacting the WIDIA Customer Application Support Team. Go to [widia.com](http://widia.com) for your country's phone number.

**Step 1 • Select the insert geometry**

**Negative Inserts**



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

**Step 2 • Select the grade**

cutting condition	Negative Insert Geometry					Positive Insert Geometry		
	-FF	-ML	-MR	-UR	-RH	-FP	-MU	-MP
heavily interrupted cut	WP15CT	WP25CT	WP35CT/ WP25CT	WP35CT	WP35CT	WP25CT/ WS25PT	WP35CT	WM35CT
lightly interrupted cut	WP15CT	WP25CT	WP25CT	WP35CT	WP35CT	WP25CT	WP25CT	WP25CT
varying depth of cut, casting, or forging skin	WP15CT	WP15CT	WP15CT	WP25CT	WP25CT	WP15CT	WP15CT	WP15CT
smooth cut, pre-turned surface	WP15CT	WP15CT	WP15CT	WP25CT	WP25CT	WP15CT	WP15CT	WP15CT

**Step 3 • Selecting the cutting speed**

Low-Carbon (<0.3% C) and Free-Machining Steel		speed – m/min									Starting Conditions
material group	grade	135	180	225	275	320	360	410	455	495	m/min
P0/P1	WP15CT	◇									395
	WP25CT	◇									275
	WP35CT	◇									210
	WS10PT	◇									280

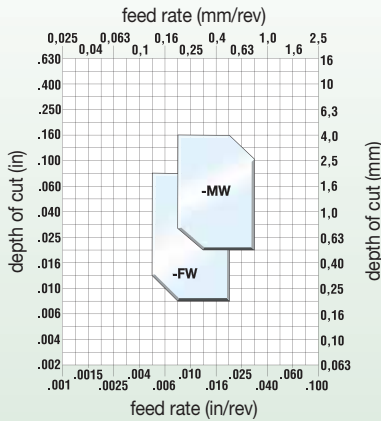
**WIDIA Material Group Selection Guide:**

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

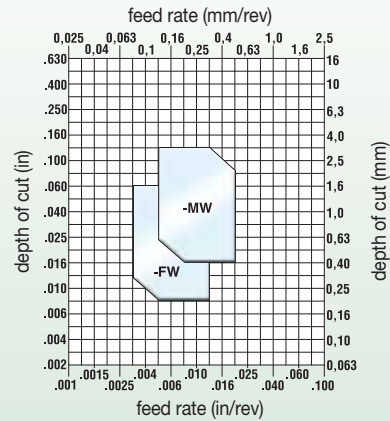
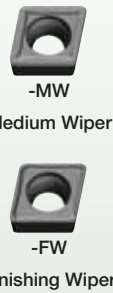
material	material group ISO code	number of material subgroups
steel	P	1–6
stainless steel	M	1–3
cast iron	K	1–3
non-ferrous materials	N	1–8
high-temp alloys	S	1–4
hardened materials	H	1

■ Step 1 • Select the insert geometry

Negative Wiper Inserts



Positive Wiper Inserts

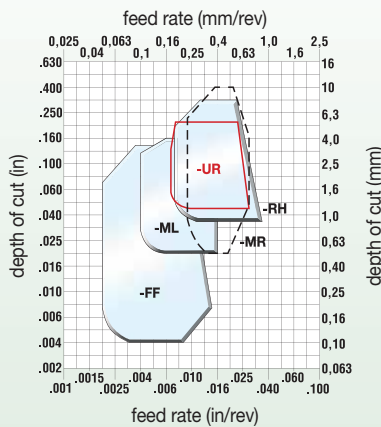
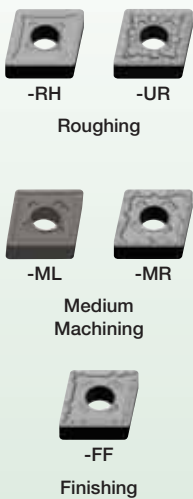


■ Step 2 • Select the grade

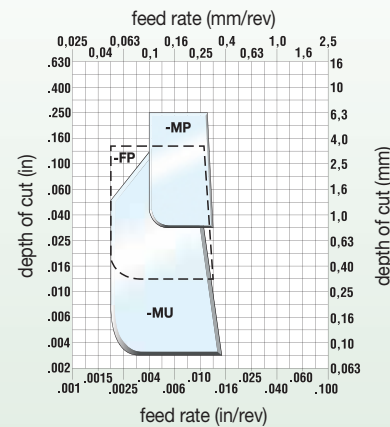
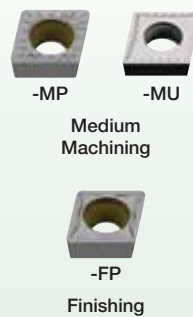
cutting condition	Negative Insert Geometry		Positive Insert Geometry	
	-FW	-MW	-FW	-MW
heavily interrupted cut	WP15CT	WP25CT	-	WP25CT
lightly interrupted cut	WP15CT	WP25CT	WP15CT	WP25CT
varying depth of cut, casting, or forging skin	WP15CT	WP15CT	WP15CT	WP15CT
smooth cut, pre-turned surface	WP15CT	WP15CT	WP15CT	WP15CT

■ Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



■ Step 2 • Select the grade

cutting condition	Negative Insert Geometry					Positive Insert Geometry		
	-FF	-ML	-MR	-UR	-RH	-FP	-MU	-MP
heavily interrupted cut	WP15CT	WP25CT	WP35CT/ WP25CT	WP35CT	WP35CT	WP25CT/ WS25PT	WP35CT	WM35CT
lightly interrupted cut	WP15CT	WP25CT	WP25CT	WP35CT	WP35CT	WP25CT	WP25CT	WP25CT
varying depth of cut, casting, or forging skin	WP15CT	WP15CT	WP15CT	WP25CT/ WP15CT	WP25CT	WP15CT	WP25CT/ WP15CT	WP15CT
smooth cut, pre-turned surface	WP15CT	WP15CT	WP15CT	WP25CT/ WP15CT	WP25CT	WP15CT	WP25CT/ WP15CT	WP15CT

(continued)

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

speed – m/min

Starting Conditions

material group	grade	135	180	225	275	320	360	410	455	495	m/min
P0/P1	WP15CT										395
	WP25CT										275
	WP35CT										210
	WS10PT										280
	WM35CT										280

**Medium- and High-Carbon Steels (<0.3% C)**

speed – m/min

Starting Conditions

material group	grade	135	180	225	275	320	360	410	455	495	m/min
P2	WP15CT										265
	WP25CT										195
	WP35CT										150
	WS10PT										200
	WM35CT										200

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

speed – m/min

Starting Conditions

material group	grade	135	180	225	275	320	360	410	455	495	m/min
P3	WP15CT										190
	WP25CT										155
	WP35CT										120
	WS10PT										155
	WM35CT										155

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

speed – m/min

Starting Conditions

material group	grade	60	90	120	150	180	210	240	270	300	m/min
P4	WP15CT										145
	WP25CT										105
	WP35CT										95
	WS10PT										110
	WM35CT										110

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

speed – m/min

Starting Conditions

material group	grade	120	150	180	210	240	270	300	330	360	m/min
P5	WP15CT										215
	WP25CT										195
	WP35CT										135
	WS10PT										200

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

speed – m/min

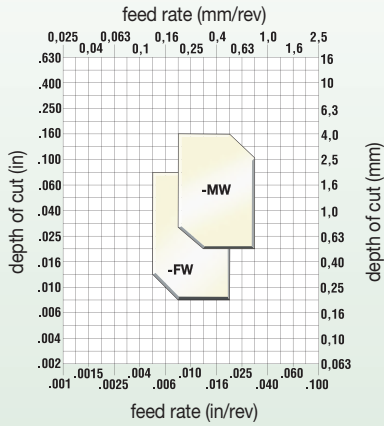
Starting Conditions

material group	grade	105	135	165	195	225	255	285	315	345	m/min
P6	WP15CT										180
	WP25CT										150
	WP35CT										105
	WS10PT										150

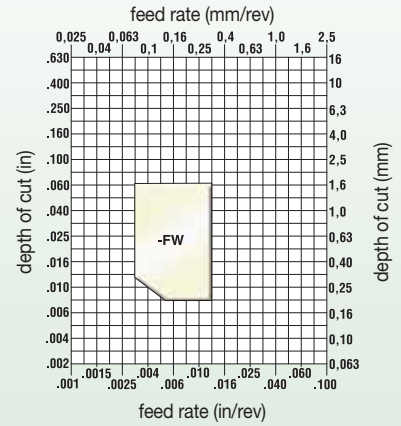
■ Step 1 • Select the insert geometry



**Negative Wiper Inserts**



**Positive Wiper Inserts**

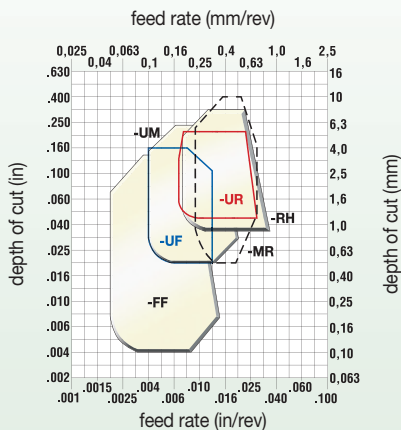
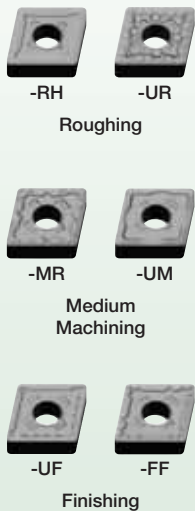


■ Step 2 • Select the grade

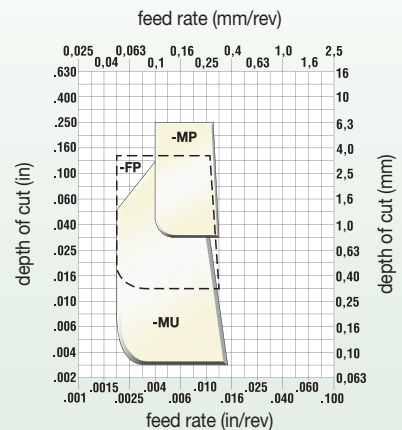
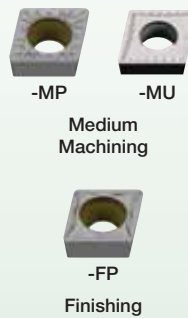
cutting condition	Negative Insert Geometry		Positive Insert Geometry
	-FW	-MW	-FW
heavily interrupted cut	WM15CT	WM15CT	WM15CT
lightly interrupted cut	WM15CT	WM25CT	WM15CT
varying depth of cut, casting, or forging skin	WM15CT	WM25CT	WM15CT
smooth cut, pre-turned surface	WM15CT	WM25CT	WM15CT

■ Step 1 • Select the insert geometry

**Negative Inserts**



**Positive Inserts**



(continued)

**Step 2 • Select the grade** *(continued)*

cutting condition	Negative Insert Geometry						
	-FF	-UF	-MR	-UM	-RH	-UR	
heavily interrupted cut		WS10PT	WM15CT	WM35CT	WM35CT	-	WM35CT
lightly interrupted cut		WS10PT	WM15CT	WM25CT	WM25CT	WM35CT	WM35CT/ WM25CT
varying depth of cut, casting, or forging skin		WM15CT	WM15CT/ WS10PT	WM15CT	WM15CT	WM35CT	WM25CT
smooth cut, pre-turned surface		WM15CT	WM15CT	WM15CT	WM15CT	-	WM15CT

cutting condition	Positive Insert Geometry			
	-FP	-MU	-MP	
heavily interrupted cut		WM25CT	WM35CT/ WS25PT	WM25CT
lightly interrupted cut		WM25CT	WM25CT/ WS10PT	WM25CT
varying depth of cut, casting, or forging skin		WM25CT/ WM15CT	WM25CT	WM25CT/ WM15CT
smooth cut, pre-turned surface		WM15CT	WM25CT	WM15CT

**Step 3 • Select the cutting speed**

**Austenitic Stainless Steel** speed – m/min Starting Conditions

material group	grade	90	135	180	225	270	315	200	360	405	450	m/min
M1	WM15CT											180
	WM25CT											150
	WM35CT											120
	WS10PT											215
	WS25PT											

**Austenitic Stainless Steel** speed – m/min Starting Conditions

material group	grade	90	135	180	225	270	315	200	360	405	450	m/min
M2	WM15CT											165
	WM25CT											140
	WM35CT											105
	WS10PT											200
	WS25PT											

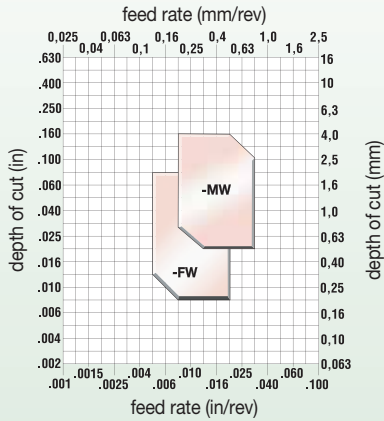
**Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture)** speed – m/min Starting Conditions

material group	grade	90	135	180	225	270	315	200	360	405	450	m/min
M3	WM15CT											150
	WM25CT											120
	WM35CT											90
	WS10PT											185
	WS25PT											

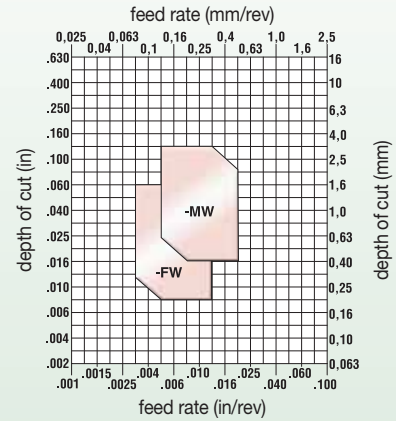
■ Step 1 • Select the insert geometry



**Negative Wiper Inserts**



**Positive Wiper Inserts**

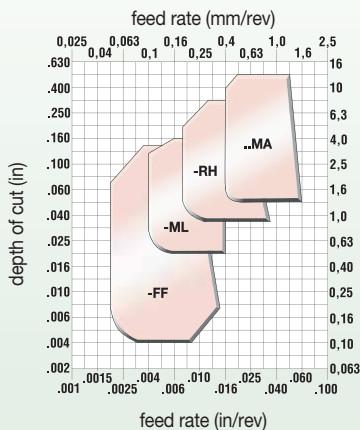


■ Step 2 • Select the grade

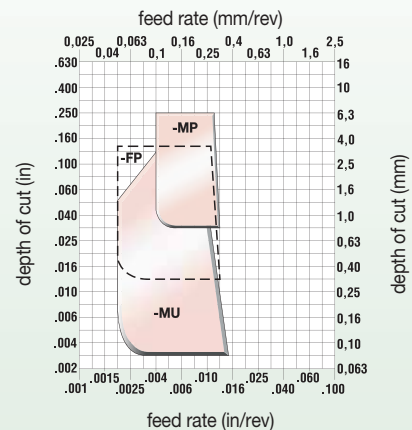
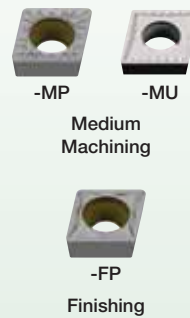
cutting condition		Negative Insert Geometry		Positive Insert Geometry	
		-FW	-MW	-FW	-MW
heavily interrupted cut		-	-	-	-
lightly interrupted cut		WK05CT	WK05CT	WK05CT	WK05CT
varying depth of cut, casting, or forging skin		WK05CT	WK05CT	WK05CT	WK05CT
smooth cut, pre-turned surface		WK05CT	WK05CT	WK05CT	WK05CT

■ Step 1 • Select the insert geometry

**Negative Inserts**



**Positive Inserts**



(continued)

**Step 2 • Select the grade** *(continued)*

cutting condition	Negative Insert Geometry				Positive Insert Geometry			
	-FF	-ML	-UR	..MA	-FP	-MU	-MP	
heavily interrupted cut		WK20CT	WK20CT	WK20CT	WK20CT	WK20CT	WK20CT	WK20CT
lightly interrupted cut		WK20CT	WK20CT	WK20CT	WK20CT	WK20CT	WK20CT	WK20CT
varying depth of cut, casting, or forging skin		WK20CT	WK05CT	WK20CT	WK05CT	WK20CT	WK20CT	WK20CT
smooth cut, pre-turned surface		WK20CT	WK05CT	WS10PT	WK05CT	WK20CT	WK20CT/ WK05CT/ WS10PT	WK20CT

**Step 3 • Select the cutting speed**

**Grey Cast Iron** speed – m/min Starting Conditions

material group	grade	60	180	305	430	550	675	800	920	1040	1160	m/min
<b>K1</b>	WK05CT											450
	WK20CT											300

**Ductile, Compacted Graphite, and Malleable Cast Irons (<600 MPa tensile strength)** speed – m/min Starting Conditions

material group	grade	90	135	180	225	275	320	360	410	460	500	m/min
<b>K2</b>	WS10PT											200
	WK05CT											360
	WK20CT											240

**Ductile, Malleable, and Austempered Cast Irons (>600 MPa tensile strength)** speed – m/min Starting Conditions

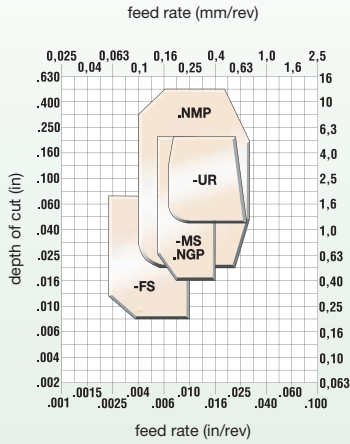
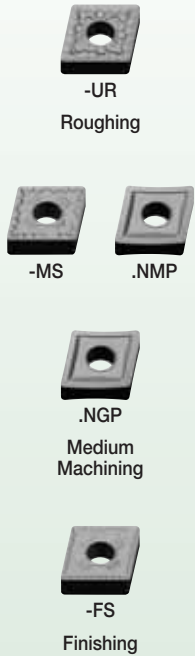
material group	grade	90	135	180	225	275	320	360	410	460	500	m/min
<b>K3</b>	WS10PT											150
	WK05CT											240
	WK20CT											210



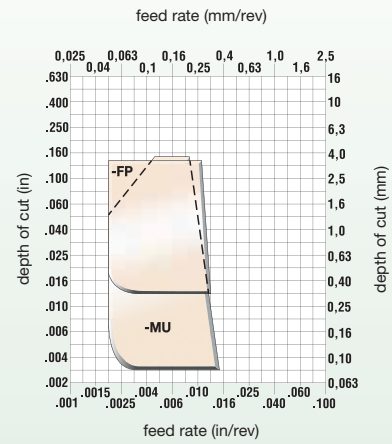
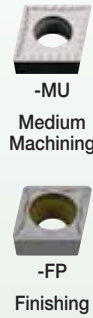
■ Step 1 • Select the insert geometry



**Negative Inserts**



**Positive Inserts**



■ Step 2 • Select the grade

cutting condition	Image	Negative Insert Geometry				Positive Insert Geometry	
		-FS	-NGP/-NMP	-MS	-UR	-FP	-MU
heavily interrupted cut		WS25PT	WS25PT	WS25PT	WS25PT/ WM35CT	WS25PT/ WM15CT	WS25PT
lightly interrupted cut		WS10PT	WS10PT	WS25PT	WS25PT/ WM25CT	WS25PT	WS25PT
varying depth of cut, casting, or forging skin		WS10PT	WS10PT	WS10PT	WS25PT	WS10PT	WS10PT
smooth cut, pre-turned surface		WS10PT/ WU10HT	WS10PT/ WU10HT	WS10PT	WS10PT	WS10PT	WS10PT

(continued)

■ Step 3 • Select the cutting speed (continued)

**Iron-Based, Heat-Resistant Alloys**  
 (135–320 HB) (≤34 HRC)

material group	grade	speed – m/min										Starting Conditions
		15	45	75	105	140	170	200	230	290	310	m/min
S1	WU10HT	◊										30
	WS10PT	◊										55
	WS25PT	◊										40
	WM15CT	◊										55
	WM25CT/WM35CT	◊										40

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

material group	grade	speed – m/min										Starting Conditions
		15	45	75	105	140	170	200	230	290	310	m/min
S2	WU10HT	◊										35
	WS10PT	◊										60
	WS25PT	◊										30
	WM15CT	◊										60
	WM25CT/WM35CT	◊										30

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

material group	grade	speed – m/min										Starting Conditions
		15	45	75	105	140	170	200	230	290	310	m/min
S3	WU10HT	◊										40
	WS10PT	◊										70
	WS25PT	◊										40
	WM15CT	◊										70
	WM25CT/WM35CT	◊										40

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

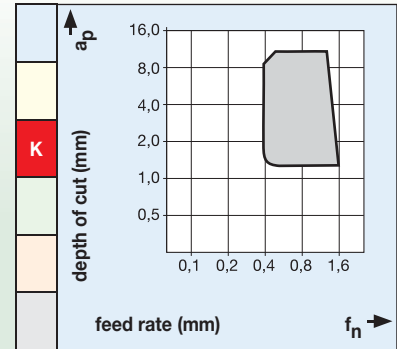
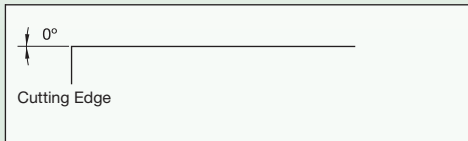
material group	grade	speed – m/min										Starting Conditions
		15	45	75	105	140	170	200	230	290	310	m/min
S4	WU10HT	◊										45
	WM15CT	◊										70
	WM25CT/WM35CT	◊										55

■ Negative Inserts

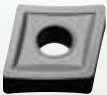
**..MA**



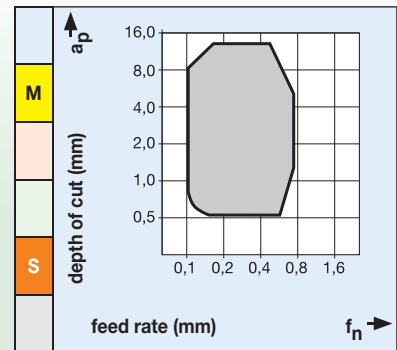
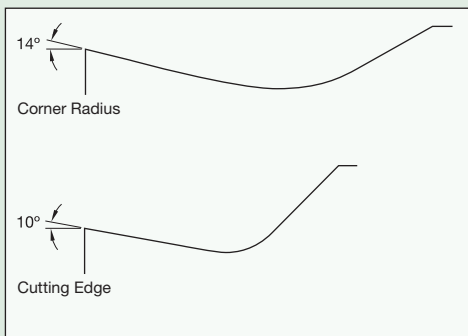
Flat top geometry for machining cast iron. For finishing to roughing applications.



**.NMP**



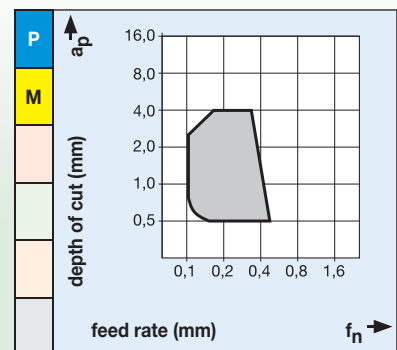
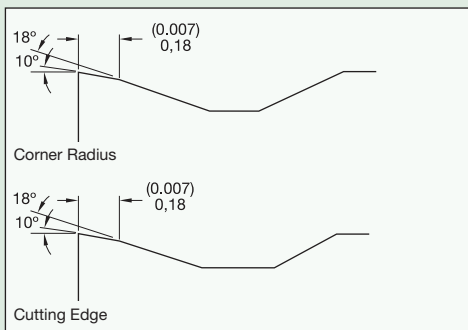
For medium-duty machining of tough work materials, such as chrome- and nickel-based alloys. Minimises tendency for materials to adhere to insert.



**4**



Semi-finishing geometry for light- to medium-duty steel machining. Reduced back forces result from adjusted inclination angle. Well-suited for positive, vibration-prone parts.



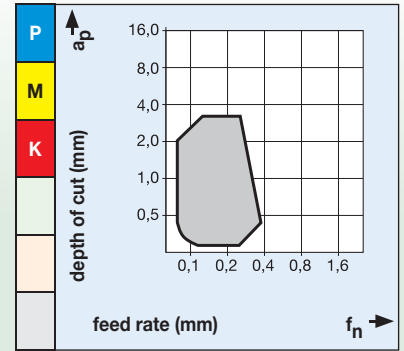
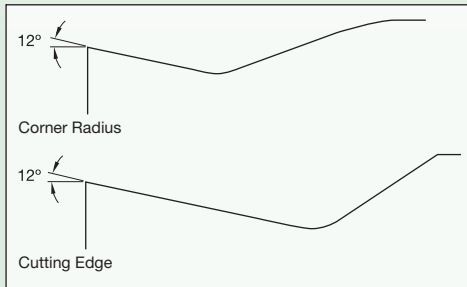
(continued)

■ **Negative Inserts** *(continued)*

**22**



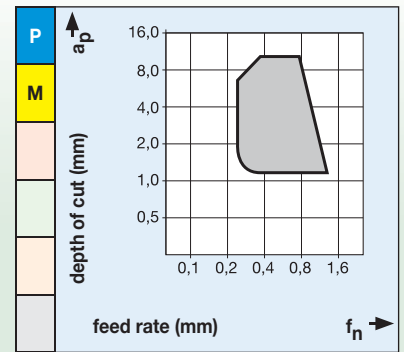
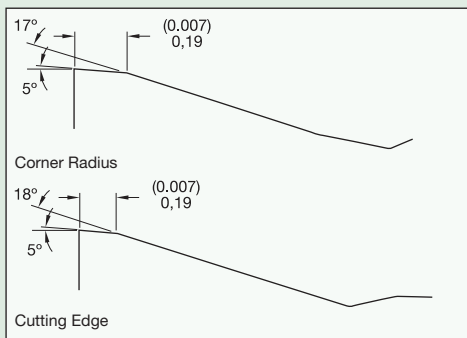
For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.



**65**



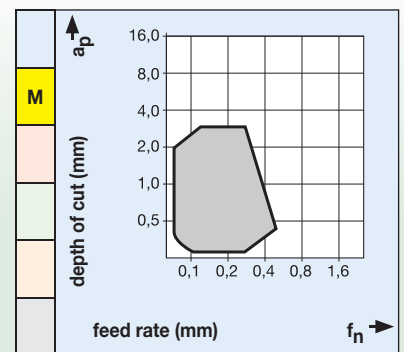
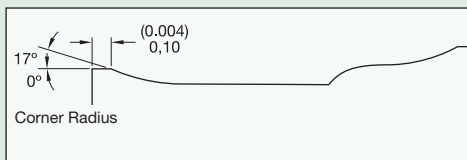
Rough-turning geometry with chip control extending to the medium-duty range. Positive rake angle lowers cutting forces, reducing power requirements. Used on low-tensile and stainless steels.



**CT**



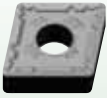
Designed for outward copy turning. Where other geometries produce long chips, the unique distribution of the cut results in good chip control.



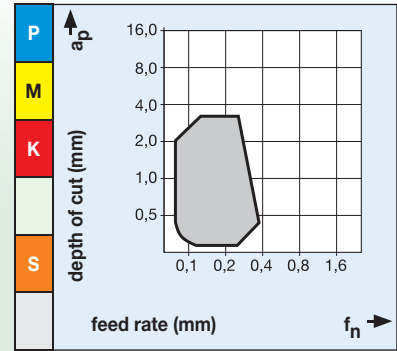
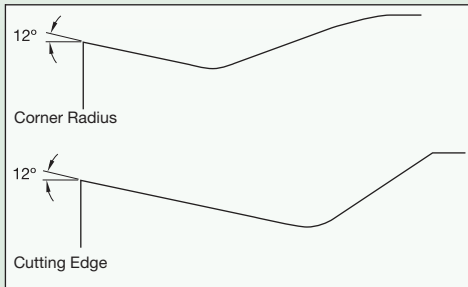
*(continued)*

■ **Negative Inserts** *(continued)*

**FF**



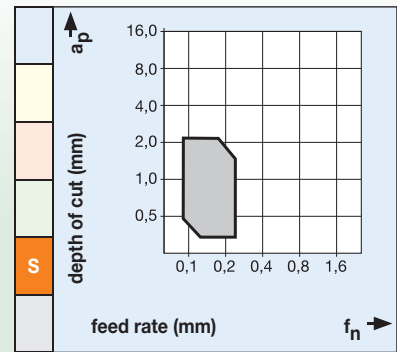
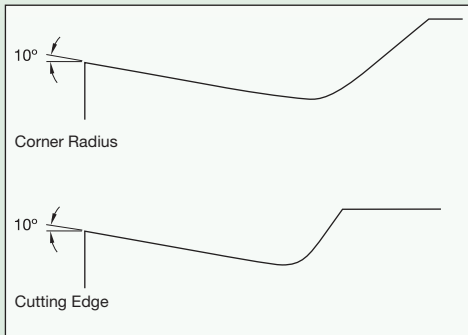
For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.



**FS**



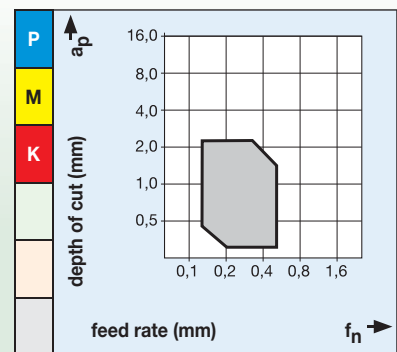
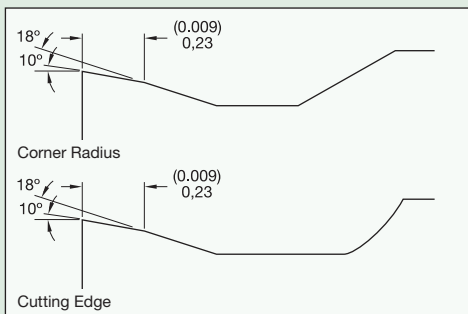
For finishing applications. Ground periphery with positive cutting edge ideally suited for high-temp alloys. Micro finished edge on the ground periphery adds just a slight hone for improved edge integrity and reliability.



**FW**



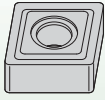
Wiper geometry for finishing when good surface finish is needed using high feed rates. First choice for high-performance finishing.



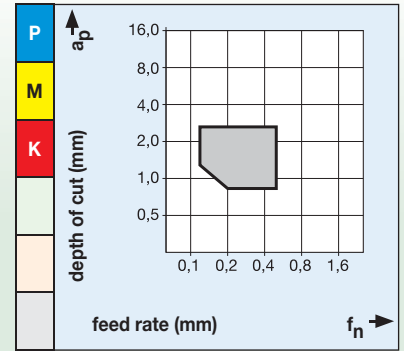
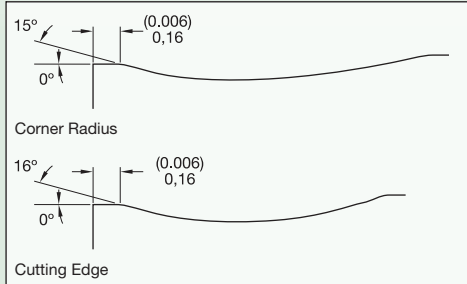
*(continued)*

■ **Negative Inserts** *(continued)*

**MG**



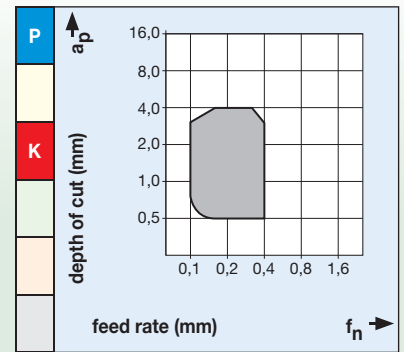
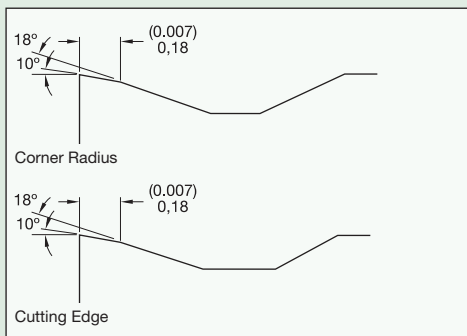
For light machining to light roughing.



**ML**



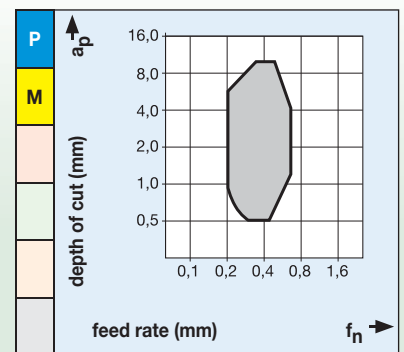
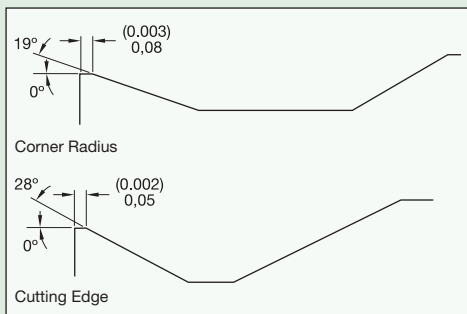
For finishing to medium machining with a negative, stable cutting edge.



**MR**



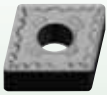
For medium to light roughing of steels, difficult-to-machine high-alloy titanium, and aluminium materials. High strength to deal with heavy chip deformation.



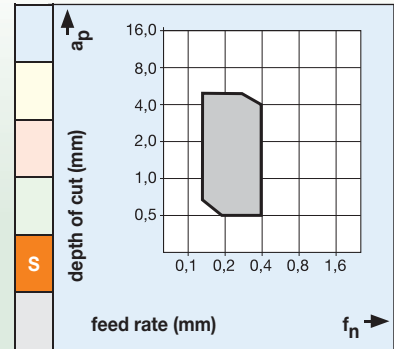
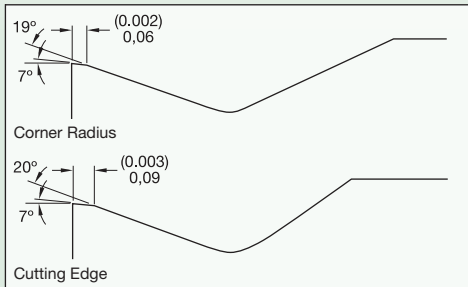
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**■ Negative Inserts** *(continued)*

**MS**



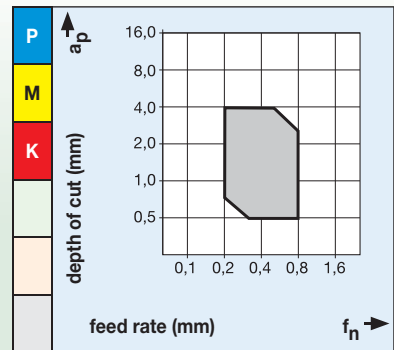
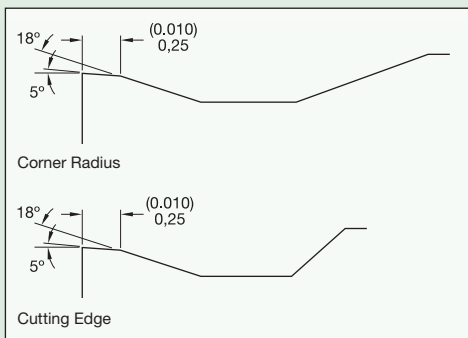
For medium machining in high-temp materials. Utilises a micro-finished edge preparation to increase edge toughness.



**MW**



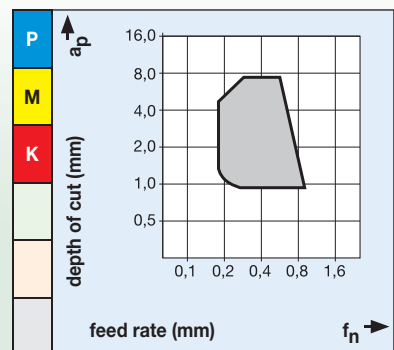
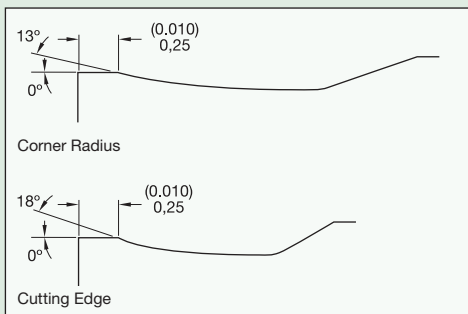
Wiper geometry for light to medium turning with high feed rates. Feed twice as high as with edges with full corner radii to produce same surface finish.



**RH**



For medium-duty to roughing. Outstanding chip control. High edge strength for interrupted cuts, forging skin, or scale. Preferred for all cast iron, such as grey, malleable, and nodular.



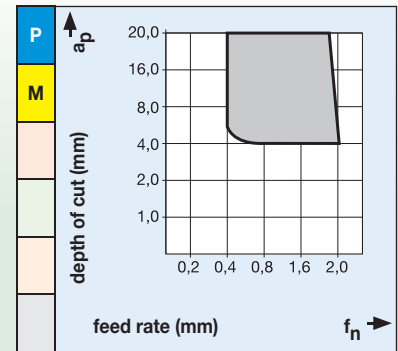
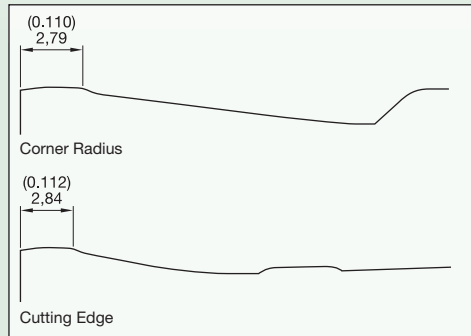
*(continued)*

■ **Negative Inserts** *(continued)*

**SR**



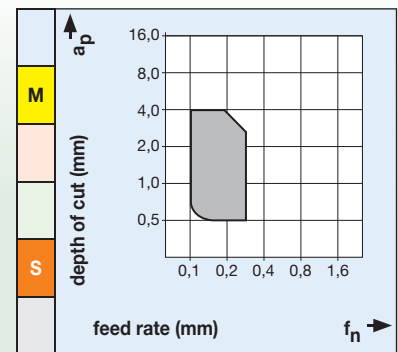
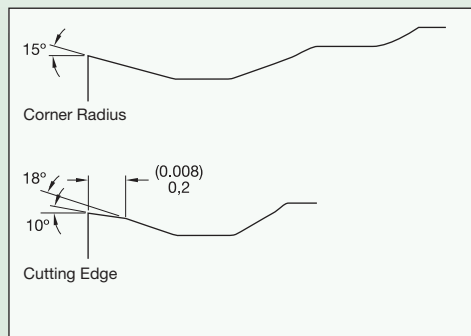
A super roughing geometry. The SR has a strong cutting edge to support high cutting loads in roughing applications. Can produce high metal removal rates.



**UF**



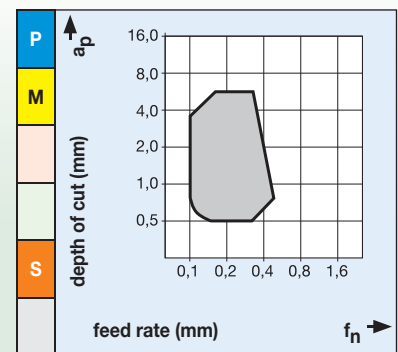
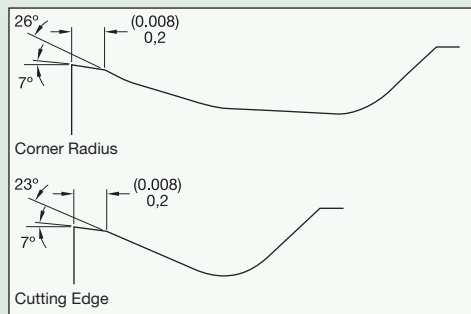
For finishing with a positive cutting edge for reduced cutting forces and superior surface quality.



**UM**



For medium-duty turning operations. Soft-cutting chipbreaker. Used in applications producing varying chip sections, such as profile or copy turning. Good dimensional accuracy. For soft steel materials and stainless steels.



*(continued)*

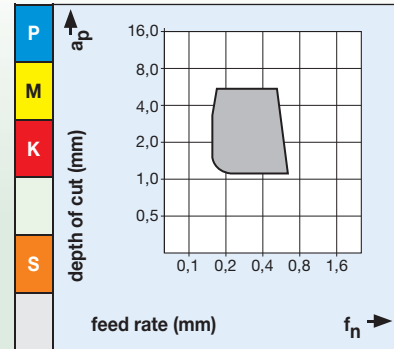
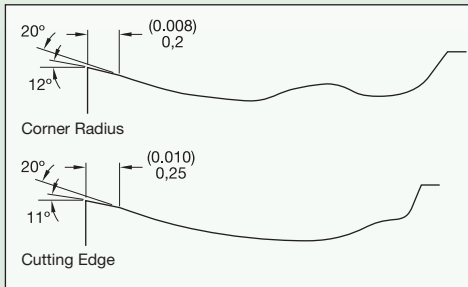


■ **Negative Inserts** *(continued)*

**UR**

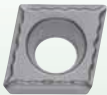


Roughing geometry with smooth chip forming and improved coolant flow for increased tool life. Positive geometry reduces cutting forces and improves depth-of-cut notching resistance. Ideally suitable for stainless steel applications and for smooth machining of steel.

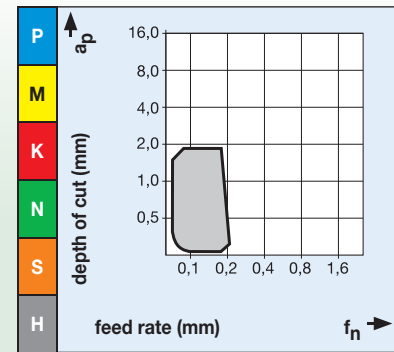
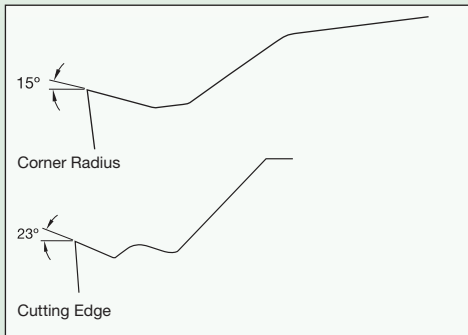


■ **Positive Inserts**

**2**



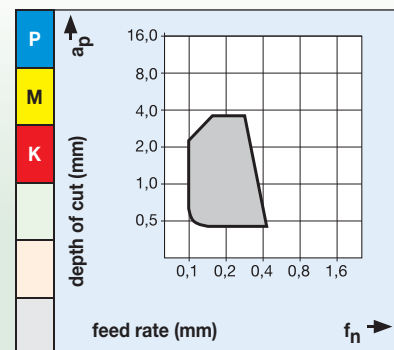
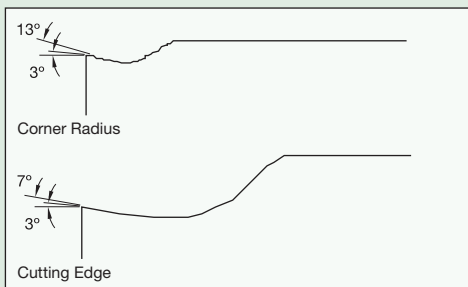
Sharp edge for finish machining. Good chip control with very small chip sections. High dimensional accuracy and smooth surface finishes. Inserts with .008" corner radius precision-ground on all sides.



**41**



Preferred for light- to medium-duty machining. Low cutting forces and reduced power requirements due to positive rake angle. Good chip control over a wide range. Also used on short-chipping cast iron.



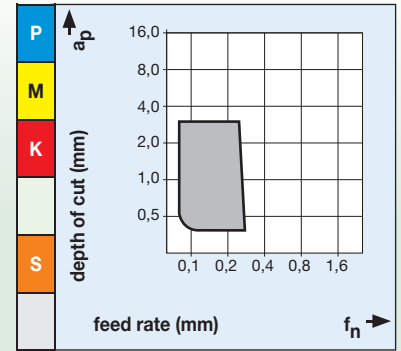
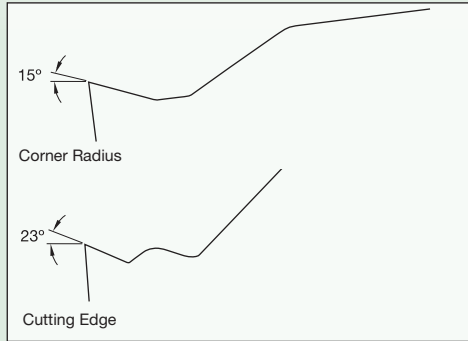
*(continued)*

■ Positive Inserts (continued)

**FP**



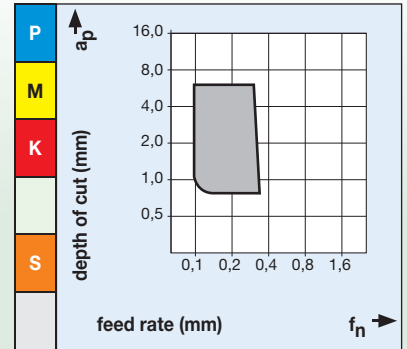
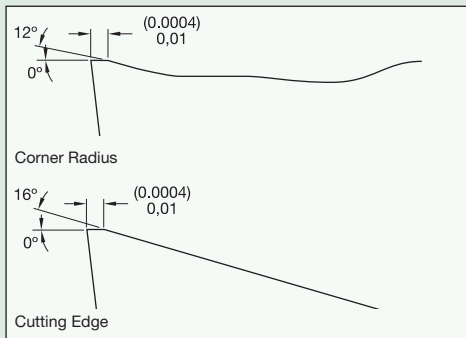
For finishing to medium turning operations with optimal chip control over a wide range of cutting conditions and workpiece materials.



**MP**



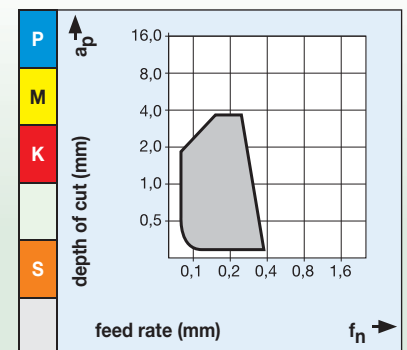
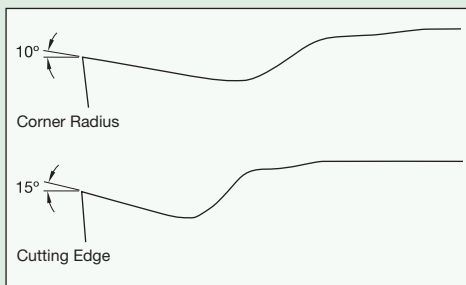
For medium to rough turning with reduced cutting forces and improved chip control for high feed rates. Suitable for high metal removal rates and spindling applications.

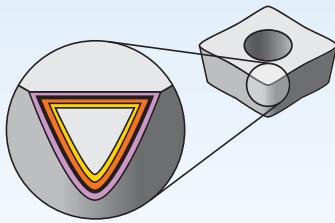


**MU**



A medium universal geometry with a soft cutting action due to its positive geometry. Has a versatile application range and is suited for turning unstable components and for boring applications.



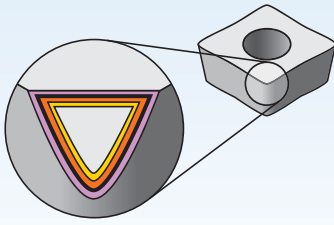


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

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

Grade	Coating	Grade Description	wear resistance ← → toughness																		
			05	10	15	20	25	30	35	40	45										
WP15CT		Coated carbide. MT-CVD/CVD – TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -ZrCN. Good balance of wear resistance and toughness properties. High productivity machining on smooth to lightly interrupted cuts. For steels.	P																		
	HC-P15																				
WP25CT		Coated carbide. MT-CVD/CVD – TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -ZrCN. Good toughness properties. Excellent first choice for steel machining, high productivity metal removal for all but the harshest interrupted cuts.	P																		
	HC-P25																				
WP35CT		Coated carbide. MT-CVD/CVD – TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -ZrCN. Proven on all roughing and heavy roughing operations, wet or dry, on interrupted and uninterrupted cuts.	P																		
	HC-P35																				
WM15CT		Coated carbide. MT-CVD/CVD – TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -ZrCN. High degree of wear resistance and good resistance to depth-of-cut notching for long tool life in finishing to medium turning applications.	P																		
	HC-M15																				
WM25CT		Coated carbide. MT-CVD/CVD – TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -ZrCN. Good balance of wear resistance and toughness properties. Light and medium machining. For austenitic stainless steel AISI series.	P																		
	HC-M25																				
WM35CT		Coated carbide. MT-CVD/CVD – TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -ZrCN. Good toughness and wear resistance balance. For medium to roughing operations with light and heavily interrupted cuts.	P																		
	HC-M35																				





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

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

wear resistance ← → toughness

Grade	Coating	Grade Description	Performance Matrix																					
			05	10	15	20	25	30	35	40	45													
<b>THM</b> HW-K15		Uncoated carbide. Extraordinarily good balance of hardness, wear resistance, edge stability, and toughness. Light and medium machining. For cast iron, all non-ferrous metals, and non-metals. Useful in unfavourable conditions.																						
			<b>K</b>																					
			<b>N</b>																					
			<b>S</b>																					
<b>TTM</b> HW-P25		Uncoated carbide. Medium machining. For steel.																						
			<b>P</b>																					
			<b>M</b>																					
<b>TTR</b> HW-P35		Uncoated carbide. Light and medium machining. For steel. To be used at low cutting speeds. Effective in unfavourable conditions.																						
			<b>P</b>																					
<b>TT15</b> HT-P15		Cermets. Light machining. Extremely good wear resistance at higher cutting speeds. For steels and nodular cast iron. Recommended for high cutting speeds under favourable conditions.																						
			<b>P</b>																					
			<b>M</b>																					
			<b>K</b>																					

## NOVO KNOWS CAD/CAM

With the addition of NOVO™ 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 outdated method of finding a tool in a catalogue, and then manually inputting the tooling information from the catalogue into the CAD/CAM software.

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

**With NOVO:** The powerful digital intelligence of NOVO not only helps 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 can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. [widia.com/novo](http://widia.com/novo)



























































































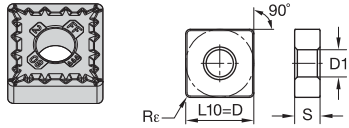








Inserts

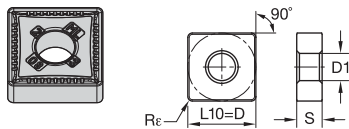


● first choice  
○ alternate choice

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

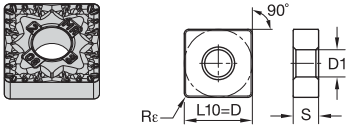
**■ SNMG-FF**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SNMG090304FF	9,53	9,53	3,18	0,4	3,81	4171045	4171046	4171047	4171048	4171049	4171071	4171072	4171073	4171074	4170488	4170489	4170490	4170491	4170492	4170493	4170494
SNMG090308FF	9,53	9,53	3,18	0,8	3,81	4171046	4171047	4171048	4171049	4171072	4171073	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083
SNMG120404FF	12,70	12,70	4,76	0,4	5,16	4171047	4171048	4171049	4171072	4171073	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084
SNMG120408FF	12,70	12,70	4,76	0,8	5,16	4171048	4171049	4171072	4171073	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085
SNMG120412FF	12,70	12,70	4,76	1,2	5,16	4171049	4171072	4171073	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085	4171086
SNMG120416FF	12,70	12,70	4,76	1,6	5,16	4171049	4171072	4171073	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085	4171086



**■ SNMG-ML**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SNMG090304ML	9,53	9,53	3,18	0,4	3,81	4171071	4171072	4171073	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085	4171086
SNMG090308ML	9,53	9,53	3,18	0,8	3,81	4171072	4171073	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085	4171086	4171087
SNMG120404ML	12,70	12,70	4,76	0,4	5,16	4171073	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085	4171086	4171087	4171088
SNMG120408ML	12,70	12,70	4,76	0,8	5,16	4171074	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085	4171086	4171087	4171088	4171089
SNMG120412ML	12,70	12,70	4,76	1,2	5,16	4171075	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085	4171086	4171087	4171088	4171089	4171090
SNMG120416ML	12,70	12,70	4,76	1,6	5,16	4171076	4171077	4171078	4171079	4171080	4171081	4171082	4171083	4171084	4171085	4171086	4171087	4171088	4171089	4171090	4171091

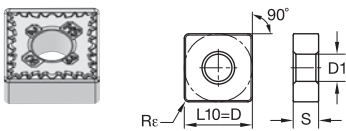


● first choice  
○ alternate choice

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

■ SNMG-MR

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115	
SNMG120408MR	12,70	12,70	4,76	0,8	5,16	4171146	4170571	4170057	4173025	4173140											
SNMG120412MR	12,70	12,70	4,76	1,2	5,16	5684354	5684355		4173026	4173141											
SNMG120416MR	12,70	12,70	4,76	1,6	5,16				4173027	4173142											
SNMG150608MR	15,88	15,88	6,35	0,8	6,35				4173028	4173143											
SNMG150612MR	15,88	15,88	6,35	1,2	6,35	4171147			4173029	4173144											
SNMG150616MR	15,88	15,88	6,35	1,6	6,35				4173030	4173145											
SNMG190612MR	19,05	19,05	6,35	1,2	7,93	4171148	4170572	4170058	4173031	4173146											
SNMG190616MR	19,05	19,05	6,35	1,6	7,93	4171149			4173032	4173147											

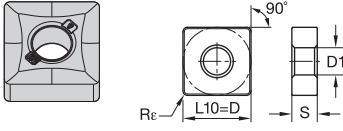


■ SNMG-MS

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
SNMG120408MS	12,70	12,70	4,76	0,8	5,16									5908847	5908848	5908849				
SNMG120412MS	12,70	12,70	4,76	1,2	5,16									5908850	5908921	5908922				
SNMG150612MS	15,88	15,88	6,35	1,2	6,35									5908923	5908924					
SNMG190612MS	19,05	19,05	6,35	1,2	7,94									5908925	5908926					



Inserts

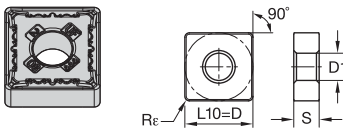


● first choice  
○ alternate choice

P	M	K	N	S	H													
●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
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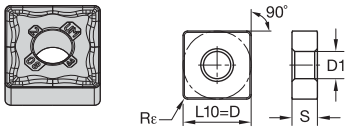
**SNMG-RH**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SNMG120408RH	12,70	12,70	4,76	0,8	5,16	4170998	4170999	4171533	4171715	4173049			4171918								
SNMG120412RH	12,70	12,70	4,76	1,2	5,16	4170999	4171534	4171716	4173050	4173049			4171919								
SNMG120416RH	12,70	12,70	4,76	1,6	5,16	4171000	4171535	4171717	4173051				4171920								
SNMG150608RH	15,88	15,88	6,35	0,8	6,35	4171001	4171536	4171718	4173052				4171921								
SNMG150612RH	15,88	15,88	6,35	1,2	6,35	4171002	4171537	4171719	4173053				4171922								
SNMG150616RH	15,88	15,88	6,35	1,6	6,35	4171003	4171538	4171720	4173054				4171923								
SNMG190608RH	19,05	19,05	6,35	0,8	7,93	4171004	4171539	4171721	4173055				4171924								
SNMG190612RH	19,05	19,05	6,35	1,2	7,93	4171005	4171540	4171722	4173056				4171925								
SNMG190616RH	19,05	19,05	6,35	1,6	7,93	4171006	4171541	4171723	4173057				4171926								



**SNMG-UF**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SNMG120404UF	12,70	12,70	4,76	0,4	5,16				4169364	4169390				5645610							
SNMG120408UF	12,70	12,70	4,76	0,8	5,16				4169365	4169391				5645611							
SNMG120412UF	12,70	12,70	4,76	1,2	5,16				4169366	4169392											



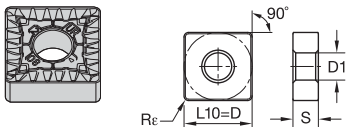
- first choice
- alternate choice

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



### ■ SNMG-UM

ISO catalogue number	D	L10	S	R <sub>ε</sub>	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS29PT	WU10HT	THM	TTM	TTR	TTI15	
SNMG120404UM	12,70	12,70	4,76	0,4	5,16	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG120408UM	12,70	12,70	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG120412UM	12,70	12,70	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

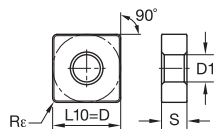
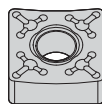


### ■ SNMG-UR

ISO catalogue number	D	L10	S	R <sub>ε</sub>	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS29PT	WU10HT	THM	TTM	TTR	TTI15	
SNMG120408UR	12,70	12,70	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG120412UR	12,70	12,70	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG120416UR	12,70	12,70	4,76	1,6	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG150612UR	15,88	15,88	6,35	1,2	6,35	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG150616UR	15,88	15,88	6,35	1,6	6,35	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG190612UR	19,05	19,05	6,35	1,2	7,93	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG190616UR	19,05	19,05	6,35	1,6	7,93	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SNMG190616UR	19,05	19,05	6,35	1,2	7,93	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



Inserts

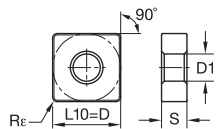
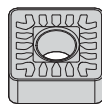


• first choice  
○ alternate choice

P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
M	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
K	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
N	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

■ **SNMM-65**

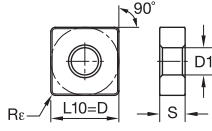
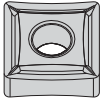
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS29PT	WU10HT	THM	TTM	TTR	TT115	
SNMM12040865	12,70	12,70	4,76	0,8	5,16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMM12041265	12,70	12,70	4,76	1,2	5,16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMM15061665	15,88	15,88	6,35	1,6	6,35	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMM19061265	19,05	19,05	6,35	1,2	7,93	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMM19061665	19,05	19,05	6,35	1,6	7,93	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMM19062465	19,05	19,05	6,35	2,4	7,93	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•



■ **SNMM-SR**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS29PT	WU10HT	THM	TTM	TTR	TT115	
SNMM190616SR	19,05	19,05	6,35	1,6	7,93	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMM190624SR	19,05	19,05	6,35	2,4	7,93	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Inserts

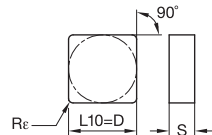


● first choice  
○ alternate choice

P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
M	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
K	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
N	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

■ SNMP

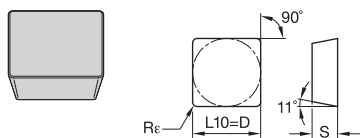
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SNMP120408	12,70	12,70	4,76	0,8	5,16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMP120412	12,70	12,70	4,76	1,2	5,16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMP150608	15,88	15,88	6,35	0,8	6,35	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMP150612	15,88	15,88	6,35	1,2	6,35	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMP150616	15,88	15,88	6,35	1,6	6,35	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMP190616	19,05	19,05	6,35	1,6	7,93	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•



■ SNU

ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SNUN120408	12,70	12,70	4,76	0,8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNUN120412	12,70	12,70	4,76	1,2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•



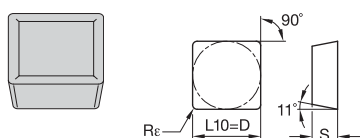


● first choice  
○ alternate choice

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

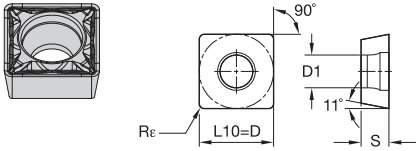
■ SPG

ISO catalogue number	D	L10	S	Rr	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SPGN090308	9,53	9,53	3,18	0,8								4170943								
SPGN120308	12,70	12,70	3,18	0,8								4170944								
SPGN120312	12,70	12,70	3,18	1,2								4170945								



■ SPMR

ISO catalogue number	D	L10	S	Rr	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SPMR090308	9,53	9,53	3,18	0,8			4170650					4170946								
SPMR120304	12,70	12,70	3,18	0,4	4170853		4170651					4170947								
SPMR120308	12,70	12,70	3,18	0,8	4170854		4170652					4170948								
SPMR120312	12,70	12,70	3,18	1,2			4170783					4170949								

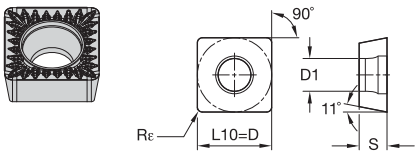


● first choice  
○ alternate choice

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

■ SPMT-FP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SPMT09T304FP	9,53	9,53	3,97	0,4	4,40	4170023	4170033	-	-	4168831	-	-	4170110	-	-	-	-	-	-	-	-
SPMT09T308FP	9,53	9,53	3,97	0,8	4,40	4170024	4170334	-	-	4168832	-	-	4170111	-	-	-	-	-	-	-	-



■ SPMT-MP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
SPMT09T308MP	9,53	9,53	3,97	0,8	4,40	-	4170261	-	4168925	-	-	-	4170269	-	-	-	-	-	-	-	-
SPMT120408MP	12,70	12,70	4,76	0,8	5,50	-	4170262	-	-	-	-	-	4170270	-	-	-	-	-	-	-	-















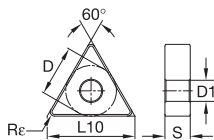








Inserts

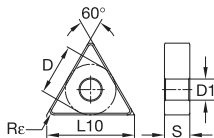


- first choice
- alternate choice

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

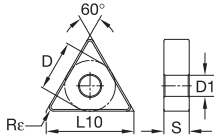
■ TNMG-UF

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
TNMG160404UF	9,53	16,50	4,76	0,4	3,81	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG160408UF	9,53	16,50	4,76	0,8	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG160412UF	9,53	16,50	4,76	1,2	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG220404UF	12,70	22,00	4,76	0,4	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG220408UF	12,70	22,00	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



■ TNMG-UM

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
TNMG160404UM	9,53	16,50	4,76	0,4	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG160408UM	9,53	16,50	4,76	0,8	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG160412UM	9,53	16,50	4,76	1,2	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG160416UM	9,53	16,50	4,76	1,6	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG220404UM	12,70	22,00	4,76	0,4	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG220408UM	12,70	22,00	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMG220412UM	12,70	22,00	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

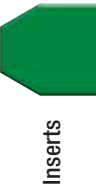


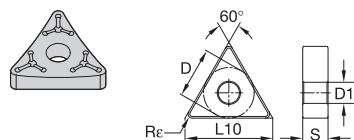
● first choice  
○ alternate choice

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

**TNMG-UR**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
TNMG160408UR	9,53	16,50	4,76	0,8	3,81	4171115	4170522	4170035	4169434	4169465	-	-	4171441	-	5579395	-	-	-	-	-
TNMG160412UR	9,53	16,50	4,76	1,2	3,81	4171116	4170523	-	4169466	4169502	-	-	4171442	-	5680175	-	-	-	-	-
TNMG160416UR	9,53	16,50	4,76	1,6	3,81	4171117	-	-	4169467	-	-	-	4171443	-	-	-	-	-	-	-
TNMG220408UR	12,70	22,00	4,76	0,8	5,16	4171118	4170524	4170036	4169435	4169468	4169503	-	4171444	-	5579397	-	-	-	-	-
TNMG220412UR	12,70	22,00	4,76	1,2	5,16	4171119	4170525	4170037	4169436	4169469	4169504	-	4171445	-	5473198	-	-	-	-	-
TNMG220416UR	12,70	22,00	4,76	1,6	5,16	4171120	4170526	-	4169470	4169505	-	-	4171446	-	-	-	-	-	-	-
TNMG270612UR	15,88	27,50	6,35	1,2	6,35	4171121	4170527	-	4169437	4169471	4169506	-	4171447	-	5579405	-	-	-	-	-
TNMG270616UR	15,88	27,50	6,35	1,6	6,35	4171122	-	4169438	4169472	4169507	-	-	4171448	-	-	-	-	-	-	-



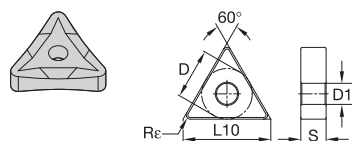


● first choice  
○ alternate choice

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

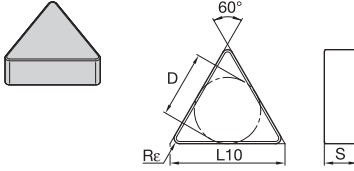
**TNMM-65**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS28PT	WU10HT	THM	TTM	TTR	TTI15	
TNMM16040865	9,53	16,50	4,76	0,8	3,81	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMM16041265	9,53	16,50	4,76	1,2	3,81	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMM22040865	12,70	22,00	4,76	0,8	5,16	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMM22041265	12,70	22,00	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMM22041665	12,70	22,00	4,76	1,6	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



**TNMP**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS28PT	WU10HT	THM	TTM	TTR	TTI15	
TNMP160404	9,53	16,50	4,76	0,4	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMP160408	9,53	16,50	4,76	0,8	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMP160412	9,53	16,50	4,76	1,2	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMP220404	12,70	22,00	4,76	0,4	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMP220408	12,70	22,00	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TNMP220412	12,70	22,00	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

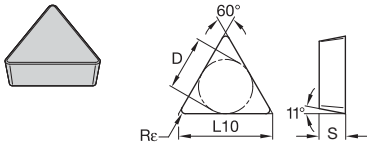


- first choice
- alternate choice

P	M	K	N	S	H
●	●	○			
○	○				

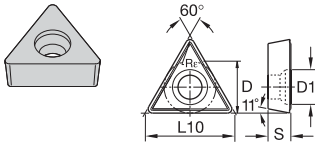
■ TNU

ISO catalogue number	D	L10	S	Rε
<b>TNUN160408</b>	9,53	16,50	4,76	0,8



■ TPG

ISO catalogue number	D	L10	S	Rε
<b>TPGN110308</b>	6,35	11,00	3,18	0,8
<b>TPGN160308</b>	9,53	16,50	3,18	0,8



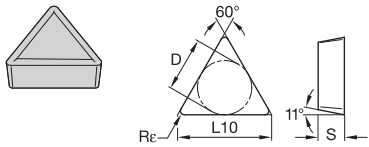
■ TPGA

ISO catalogue number	D	L10	S	Rε	D1
<b>TPGA110204</b>	6,35	11,00	2,38	0,4	2,80
<b>TPGA110208</b>	6,35	11,00	2,38	0,8	2,80

WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
							4170964							
							4170952	4170952						
							4170953	4170953						
										2031786	2015081			



Inserts

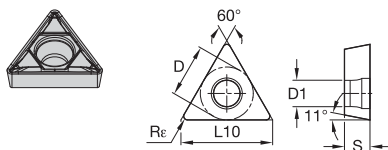


● first choice  
○ alternate choice

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

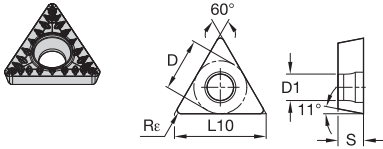
### TPMR

ISO catalogue number	D	L10	S	Re	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
TPMR110304	6,35	11,00	3,18	0,4	●														
TPMR110308	6,35	11,00	3,18	0,8	○	○													
TPMR160304	9,53	16,50	3,18	0,4	○														
TPMR160308	9,53	16,50	3,18	0,8	○	○													
TPMR160312	9,53	16,50	3,18	1,2	○	○													



### TPMT-FP

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
TPMT090208FP	5,56	9,63	2,38	0,8	2,50	○	○													
TPMT110204FP	6,35	11,00	2,38	0,4	2,80	○	○													
TPMT110208FP	6,35	11,00	2,38	0,8	2,80	○	○													
TPMT16T304FP	9,53	16,50	3,97	0,4	4,40	○	○													
TPMT16T308FP	9,53	16,50	3,97	0,8	4,40	○	○													
TPMT16T312FP	9,53	16,50	3,97	1,2	4,40	○	○													
TPMT220408FP	12,70	22,00	4,76	0,8	5,50	○	○													

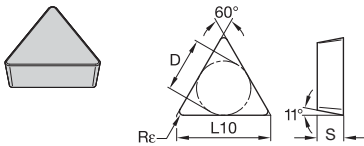


● first choice  
○ alternate choice

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

### TPMT-MP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
TPMT110208MP	6,35	11,00	2,38	0,8	2,80	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TPMT16T308MP	9,53	16,50	3,97	0,8	4,40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TPMT16T312MP	9,53	16,50	3,97	1,2	4,40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

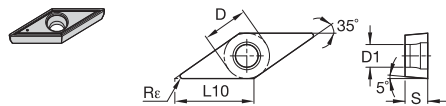


### TPU

ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
TPUN110304	6,35	11,00	3,18	0,4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TPUN110308	6,35	11,00	3,18	0,8	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TPUN160304	9,53	16,50	3,18	0,4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TPUN160308	9,53	16,50	3,18	0,8	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TPUN160312	9,53	16,50	3,18	1,2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TPUN220408	12,70	22,00	4,76	0,8	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TPUN220412	12,70	22,00	4,76	1,2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



Inserts

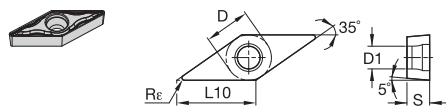


● first choice  
○ alternate choice

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

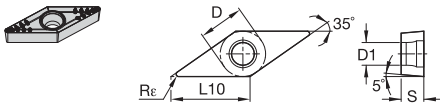
**VBMT**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TMM	TTR	TTI15
<b>VBMT160404</b>	9,53	16,61	4,76	0,4	4,40	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>VBMT160408</b>	9,53	16,61	4,76	0,8	4,40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>VBMT160412</b>	9,53	16,61	4,76	1,2	4,40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



**VBMT-FP**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TMM	TTR	TTI15
<b>VBMT110302FP</b>	6,35	11,07	3,18	0,2	2,80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>VBMT110304FP</b>	6,35	11,07	3,18	0,4	2,80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>VBMT110308FP</b>	6,35	11,07	3,18	0,8	2,80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>VBMT160402FP</b>	9,53	16,61	4,76	0,2	4,40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>VBMT160404FP</b>	9,53	16,61	4,76	0,4	4,40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>VBMT160408FP</b>	9,53	16,61	4,76	0,8	4,40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>VBMT160412FP</b>	9,53	16,61	4,76	1,2	4,40	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

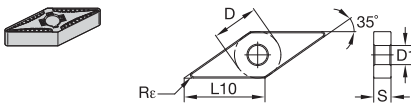


● first choice  
○ alternate choice

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

### ■ VBMT-MP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
VBMT160404MP	9,53	16,61	4,76	0,4	4,40	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VBMT160408MP	9,53	16,61	4,76	0,8	4,40	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○

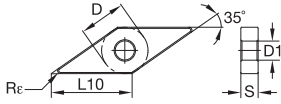
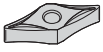


### ■ VNGG-FS

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
VNGG160401FS	9,53	16,61	4,76	0,1	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VNGG160402FS	9,53	16,61	4,76	0,2	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VNGG160404FS	9,53	16,61	4,76	0,4	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VNGG160408FS	9,53	16,61	4,76	0,8	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





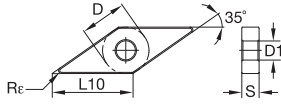
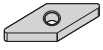


● first choice  
○ alternate choice

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

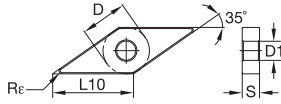
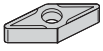
■ VNGP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115	
VNGP160401	9,53	16,61	4,76	0,1	3,81	■	■	■	■	■	■	■	■	■	○	○	○	○	○	○	○
VNGP160402	9,53	16,61	4,76	0,2	3,81	■	■	■	■	■	■	■	■	○	○	○	○	○	○	○	○
VNGP220404	12,70	22,14	4,76	0,4	5,16	■	■	■	■	■	■	■	■	○	○	○	○	○	○	○	○
VNGP220408	12,70	22,14	4,76	0,8	5,16	■	■	■	■	■	■	■	■	○	○	○	○	○	○	○	○



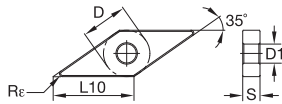
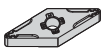
■ VNMA

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115	
VNMA160408	9,53	16,61	4,76	0,8	3,81	■	■	■	■	■	■	■	■	○	○	○	○	○	○	○	○



■ VNMG

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115	
VNMG12T304	7,14	12,45	3,97	0,4	3,60	■	■	■	■	■	■	■	■	○	○	○	○	○	○	○	○
VNMG12T308	7,14	12,45	3,97	0,8	3,65	■	■	■	■	■	■	■	■	○	○	○	○	○	○	○	○



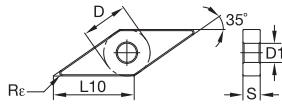
• first choice  
○ alternate choice

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



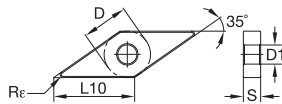
### VNMG-FF

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
VNMG160404FF	9,53	16,61	4,76	0,4	3,81	4171053	4171054	4171053	4172694					5684334	5684333						
VNMG160408FF	9,53	16,61	4,76	0,8	3,81				4172695												



### VNMG-ML

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
VNMG160404ML	9,53	16,61	4,76	0,4	3,81	4171079	4170495						4171674	4171413							
VNMG160408ML	9,53	16,61	4,76	0,8	3,81	4171080	4170496					4171675	4171414								

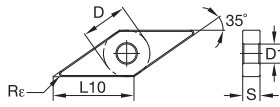


### VNMG-MR

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
VNMG160408MR	9,53	16,61	4,76	0,8	3,81	4171157	4170580	4170066													







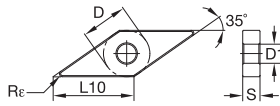
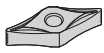
● first choice  
○ alternate choice

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



### VNMG-UR

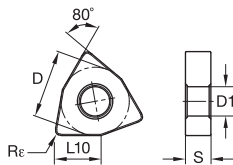
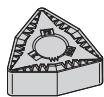
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
VNMG160408UR	9,53	16,61	4,76	0,8	3,81	4171123	4170529	4170038	4169439	4169473	4169508	-	4171449	-	5579416	-	-	-	-	-	-
VNMG160412UR	9,53	16,61	4,76	1,2	3,81	4171124	4170530	-	4169440	4169474	-	-	4171450	5680176	-	-	-	-	-	-	-



### VNMP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
VNMP160404	9,53	16,61	4,76	0,4	3,81	-	-	-	-	-	-	-	-	4172497	-	-	-	-	-	-	-
VNMP160408	9,52	16,61	4,76	0,8	3,81	-	-	-	-	-	-	-	-	4172498	-	-	-	-	-	-	-

NOTE: DNMP-style inserts are single-sided.

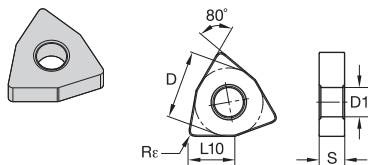


### WNGG-FS

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
WNGG080404FS	12,70	8,69	4,76	0,4	5,16	-	-	-	-	-	-	-	-	5548688	5538234	5550003	-	-	-	-
WNGG080408FS	12,70	8,69	4,76	0,8	5,16	-	-	-	-	-	-	-	-	5538235	5550004	-	-	-	-	-



Inserts

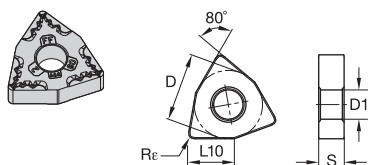


● first choice  
○ alternate choice

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

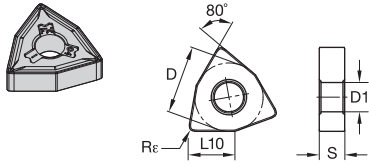
■ WNMA

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
WNMA060408	9,53	6,52	4,76	0,8	3,81	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMA060412	9,53	6,52	4,76	1,2	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMA080408	12,70	8,69	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMA080412	12,70	8,69	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMA080416	12,70	8,69	4,76	1,6	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



■ WNMG-FF

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
WNMG060404FF	9,53	6,52	4,76	0,4	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMG060408FF	9,53	6,52	4,76	0,8	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMG080404FF	12,70	8,69	4,76	0,4	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMG080408FF	12,70	8,69	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



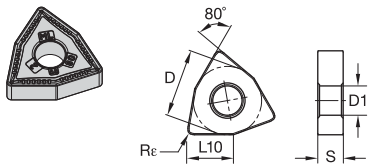
● first choice  
○ alternate choice

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

Inserts

#### WNUMG-FW

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
WNUMG060404FW	9,53	6,52	4,76	0,4	3,81	5623510	5623511	5623514	5623515	4171676	4171762	4171693									
WNUMG060408FW	9,53	6,52	4,76	0,8	3,81	5623511	5623514	5623515	4171676	4171762	4171693										
WNUMG080404FW	12,70	8,69	4,76	0,4	5,16	5623514	5623515	4171676	4171762	4173109	4171693										
WNUMG080408FW	12,70	8,69	4,76	0,8	5,16	5623515	4171676	4171763	4173110	4173109	4171694	4171693									
WNUMG080412FW	12,70	8,69	4,76	1,2	5,16							4171696									

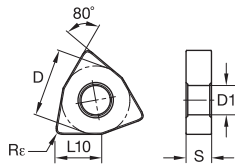


#### WNUMG-ML

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
WNUMG060404ML	9,53	6,52	4,76	0,4	3,81	4171081	4171082	4171083	4171084	4171088	4171089	4171090	4171091	4171092	4171093	4171094	4171095	4171096	4171097	4171098	4171099
WNUMG060408ML	9,53	6,52	4,76	0,8	3,81	4171082	4170497	4171083	4171084	4171088	4171089	4171090	4171091	4171092	4171093	4171094	4171095	4171096	4171097	4171098	4171099
WNUMG080404ML	12,70	8,69	4,76	0,4	5,16	4171083	4170498	4171084	4171089	4171090	4171091	4171092	4171093	4171094	4171095	4171096	4171097	4171098	4171099		
WNUMG080408ML	12,70	8,69	4,76	0,8	5,16	4171084	4170499	4171089	4171090	4171091	4171092	4171093	4171094	4171095	4171096	4171097	4171098	4171099			



Inserts

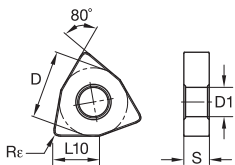
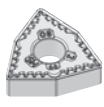


● first choice  
○ alternate choice

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

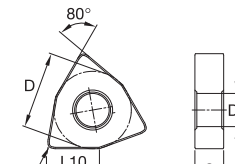
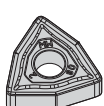
**■ WNMG-MR**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
<b>WNMG080408MR</b>	12,70	8,69	4,76	0,8	5,16	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>WNMG080412MR</b>	12,70	8,69	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>WNMG080416MR</b>	12,70	8,69	4,76	1,6	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



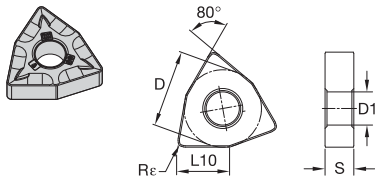
**■ WNMG-MS**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
<b>WNMG060408MS</b>	9,53	6,52	4,76	0,8	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>WNMG080404MS</b>	12,70	8,69	4,76	0,4	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>WNMG080408MS</b>	12,70	8,69	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



**■ WNMG-MW**

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
<b>WNMG060408MW</b>	9,53	6,52	4,76	0,8	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>WNMG080408MW</b>	12,70	8,69	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>WNMG080412MW</b>	12,70	8,69	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

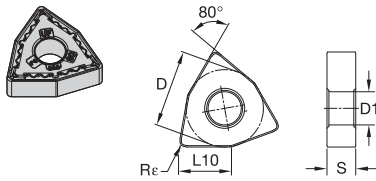


● first choice  
○ alternate choice

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

■ **WNUMG-RH**

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115	
WNUMG060408RH	9,53	6,52	4,76	0,8	3,81	4171018	4171553	4171735		4173063											
WNUMG080408RH	12,70	8,69	4,76	0,8	5,16	4171019	4171554	4171736		4173064			4171932								
WNUMG080412RH	12,70	8,69	4,76	1,2	5,16	4171020	4171555	4171737		4173065			4171933								
WNUMG080416RH	12,70	8,69	4,76	1,6	5,16	4171021	4171556	4171738		4173066			4171934								



■ **WNUMG-UF**

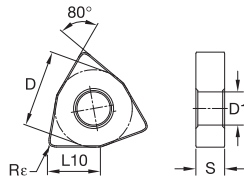
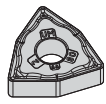
ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115	
WNUMG060404UF	9,53	6,52	4,76	0,4	3,81				4169374	4169400					5645621						
WNUMG060408UF	9,53	6,52	4,76	0,8	3,81				4169375	4169401				5645622							
WNUMG080404UF	12,70	8,69	4,76	0,4	5,16				4169376	4169402				5645619							
WNUMG080408UF	12,70	8,69	4,76	0,8	5,16				4169377	4169403				5645623							
WNUMG080412UF	12,70	8,69	4,76	1,2	5,16				4169378	4169404				5645624							



Inserts



Inserts

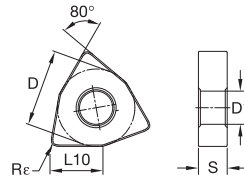
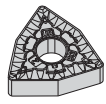


- first choice
- alternate choice

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

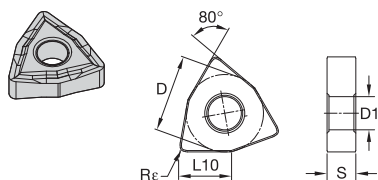
■ WNMG-UM

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS29PT	WU10HT	THM	TTM	TTR	TTI15	
WNMG060404UM	9,53	6,52	4,76	0,4	3,81	○	○	○	●	●	●	○	○	○	○	○	○	○	○	○	○
WNMG060408UM	9,53	6,52	4,76	0,8	3,81	○	○	○	●	●	●	○	○	○	○	○	○	○	○	○	○
WNMG060412UM	9,53	6,52	4,76	1,2	3,81	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMG080404UM	12,70	8,69	4,76	0,4	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMG080408UM	12,70	8,69	4,76	0,8	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMG080412UM	12,70	8,69	4,76	1,2	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
WNMG080416UM	12,70	8,69	4,76	1,6	5,16	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



■ WNMG-UR

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS29PT	WU10HT	THM	TTM	TTR	TTI15	
WNMG060408UR	9,53	6,52	4,76	0,8	3,81	4171125	4170531	4170039	4169441	4169475	-	-	4171451	5680178	5680177	-	-	-	-	-	-
WNMG060412UR	9,53	6,52	4,76	1,2	3,81	4171126	4170532	-	-	-	-	-	4171452	-	-	-	-	-	-	-	-
WNMG080408UR	12,70	8,69	4,76	0,8	5,16	4171127	4170533	4170040	4169442	4169476	4169509	5680179	-	-	-	-	-	-	-	-	-
WNMG080412UR	12,70	8,69	4,76	1,2	5,16	4171128	4170534	4170041	4169443	4169477	4169510	-	4171453	5579420	-	-	-	-	-	-	-
WNMG080416UR	12,70	8,69	4,76	1,6	5,16	4171129	4170535	4170042	4169478	4169511	-	-	4171455	-	-	-	-	-	-	-	-

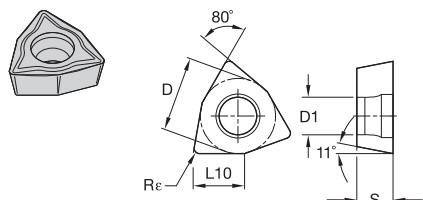


● first choice  
○ alternate choice

P																					
M			○	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
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S						○				○	○	○	○	○	○	○	○	○	○	○	○
H																					

### ■ WNMP

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
<b>WNMP080408</b>	12,70	8,69	4,76	0,8	5,16									4172499							
<b>WNMP080412</b>	12,70	8,69	4,76	1,2	5,16									4172500							



### ■ WPMT-FP

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15	
<b>WPMT040204FP</b>	6,35	4,34	2,38	0,4	2,80		4170341														
<b>WPMT06T304FP</b>	9,53	6,52	3,97	0,4	4,40	4170030			4168821	4168839											
<b>WPMT06T308FP</b>	9,53	6,52	3,97	0,8	4,40	4170031	4170342			4168840											
<b>WPMTS3T104FP</b>	4,76	3,25	1,98	0,4	2,15		4170343			4168841											

Inserts

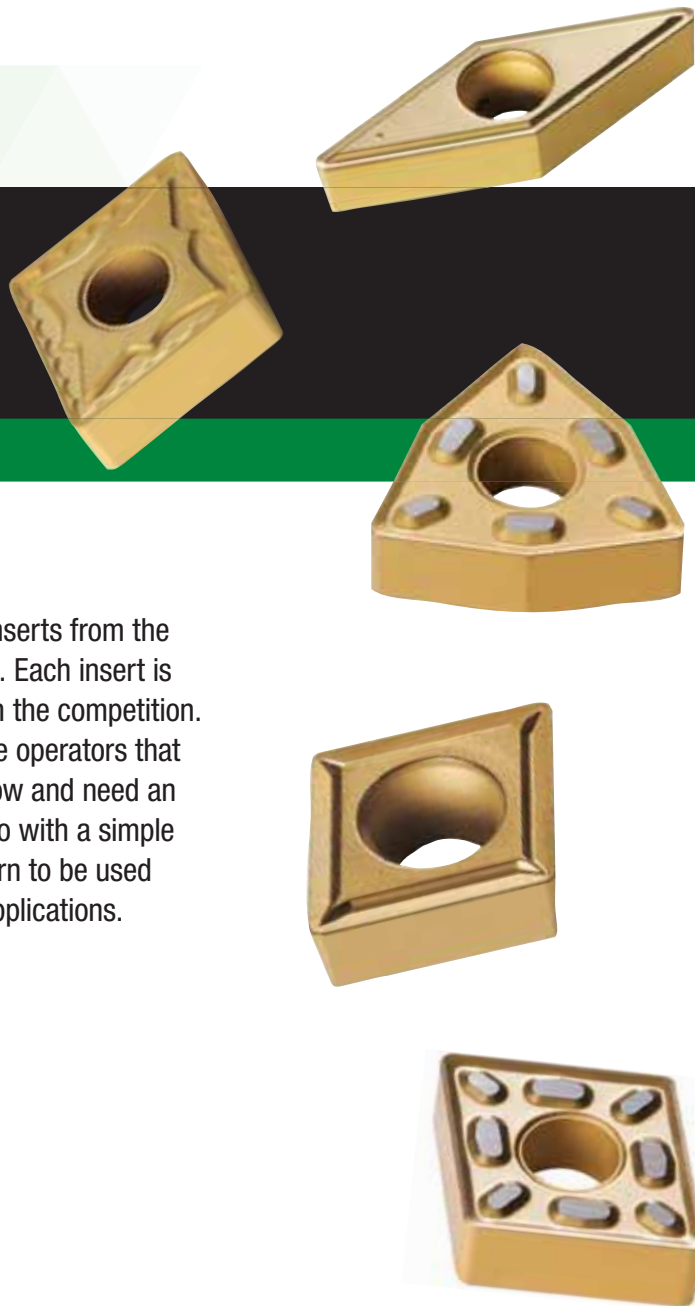


The Gold Standard for Value •  
**WIDIA™ VariTurn™**

# VariTurn

WIDIA VariTurn is the cost-effective line of inserts from the brand you already know and trust for quality. Each insert is 100% manufactured by WIDIA to outperform the competition. WIDIA VariTurn offers the versatility for those operators that are cutting steel today and cast iron tomorrow and need an insert to get the job done. A focused portfolio with a simple grade selection method allows WIDIA VariTurn to be used for up to approximately 80% of all turning applications.

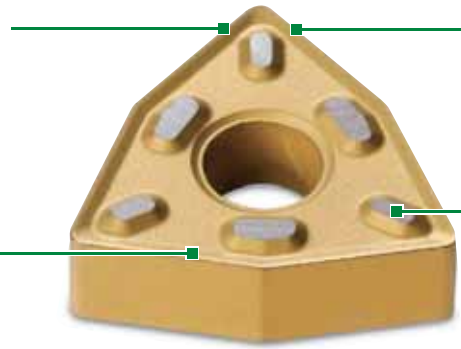
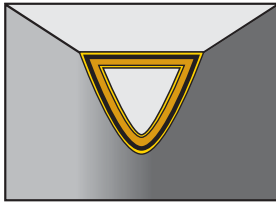
- Engineered to optimise performance.
- Gold coating on every insert.
- Proven grade technologies.



**Post-coat treatment**

- Improves edge toughness.
- Wide range of applications.

MT-CVD/CVD-  
TiN-TiCN-Al2O3-TiN



**Improved edge toughness**

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

**Post-coat grinding**

- Provides secure seating surface.

## Getting the Most from Every Insert

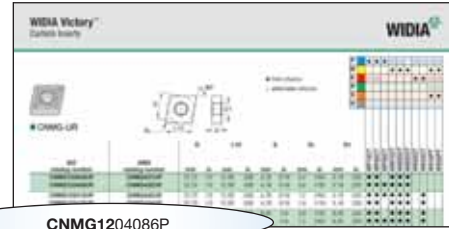
WIDIA™ VariTurn™ products make it simple to get the most out of your inserts, and your money. Every insert is gold, which exposes wear as the tool continues to be used. This makes it easy to detect when an insert is ready to be changed — maximising the product's value and protecting the workpiece. Also,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

## WIDIA VariTurn Options

This versatile line offers a simple geometry selection system, eight grades, and eight geometries, including negative rake and screw-on. With these options, WIDIA VariTurn inserts cover 80% of all general turning applications.

## How Do Catalogue Numbers Work?

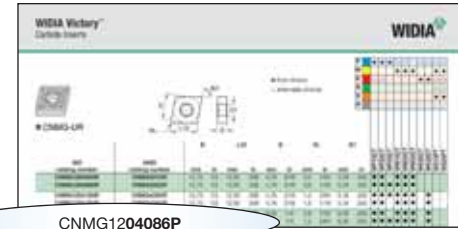
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



CNMG1204086P

<b>C</b>		<b>N</b>		<b>M</b>		<b>G</b>		<b>12</b>																																																																																																																																																																																																	
Insert Shape		Insert Clearance Angle		Tolerance Class		Insert Features		Size																																																																																																																																																																																																	
<b>H</b>	Hexagon 120°	<b>A</b>	3°	<p>Tolerances apply prior to edge prep and coating</p> <p><b>D</b> = Theoretical diameter of the insert inscribed circle <b>S</b> = Thickness <b>B</b> = See figures below</p>	<b>N</b>		<p>"Code for mm cutting edge length "L10"</p> <table border="1"> <thead> <tr> <th>"D"</th> <th>C</th> <th>D</th> <th>R</th> <th>S</th> <th>T</th> <th>V</th> <th>W</th> </tr> </thead> <tbody> <tr><td>3,97</td><td>S4</td><td>04</td><td>03</td><td>03</td><td>06</td><td>-</td><td>-</td></tr> <tr><td>4,76</td><td>04</td><td>05</td><td>04</td><td>04</td><td>08</td><td>08</td><td>S3</td></tr> <tr><td>5,56</td><td>05</td><td>06</td><td>05</td><td>05</td><td>09</td><td>09</td><td>03</td></tr> <tr><td>6,00</td><td>-</td><td>-</td><td>06</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>6,35</td><td>06</td><td>07</td><td>06</td><td>06</td><td>11</td><td>11</td><td>04</td></tr> <tr><td>7,94</td><td>08</td><td>09</td><td>07</td><td>07</td><td>13</td><td>13</td><td>05</td></tr> <tr><td>8,00</td><td>-</td><td>-</td><td>08</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>9,52</td><td>09</td><td>11</td><td>09</td><td>09</td><td>16</td><td>16</td><td>06</td></tr> <tr><td>10,00</td><td>-</td><td>-</td><td>10</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>11,11</td><td>11</td><td>13</td><td>11</td><td>11</td><td>19</td><td>19</td><td>07</td></tr> <tr><td>12,00</td><td>-</td><td>-</td><td>12</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>12,70</td><td>12</td><td>15</td><td>12</td><td>12</td><td>22</td><td>22</td><td>08</td></tr> <tr><td>14,29</td><td>14</td><td>17</td><td>14</td><td>14</td><td>24</td><td>24</td><td>09</td></tr> <tr><td>15,88</td><td>16</td><td>19</td><td>15</td><td>15</td><td>27</td><td>27</td><td>10</td></tr> <tr><td>16,00</td><td>-</td><td>-</td><td>16</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>17,46</td><td>17</td><td>21</td><td>17</td><td>17</td><td>30</td><td>30</td><td>11</td></tr> <tr><td>19,05</td><td>19</td><td>23</td><td>19</td><td>19</td><td>33</td><td>33</td><td>13</td></tr> <tr><td>20,00</td><td>-</td><td>-</td><td>20</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>22,22</td><td>22</td><td>27</td><td>22</td><td>22</td><td>38</td><td>38</td><td>15</td></tr> <tr><td>25,00</td><td>-</td><td>-</td><td>25</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>25,40</td><td>25</td><td>31</td><td>25</td><td>25</td><td>44</td><td>44</td><td>17</td></tr> <tr><td>31,75</td><td>32</td><td>38</td><td>31</td><td>31</td><td>54</td><td>54</td><td>21</td></tr> <tr><td>32,00</td><td>-</td><td>-</td><td>32</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	"D"	C	D	R	S	T	V	W	3,97	S4	04	03	03	06	-	-	4,76	04	05	04	04	08	08	S3	5,56	05	06	05	05	09	09	03	6,00	-	-	06	-	-	-	-	6,35	06	07	06	06	11	11	04	7,94	08	09	07	07	13	13	05	8,00	-	-	08	-	-	-	-	9,52	09	11	09	09	16	16	06	10,00	-	-	10	-	-	-	-	11,11	11	13	11	11	19	19	07	12,00	-	-	12	-	-	-	-	12,70	12	15	12	12	22	22	08	14,29	14	17	14	14	24	24	09	15,88	16	19	15	15	27	27	10	16,00	-	-	16	-	-	-	-	17,46	17	21	17	17	30	30	11	19,05	19	23	19	19	33	33	13	20,00	-	-	20	-	-	-	-	22,22	22	27	22	22	38	38	15	25,00	-	-	25	-	-	-	-	25,40	25	31	25	25	44	44	17	31,75	32	38	31	31	54	54	21	32,00	-	-	32	-	-	-	-	<b>R</b>	
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8,00	-	-	08		-	-		-	-																																																																																																																																																																																																
9,52	09	11	09		09	16		16	06																																																																																																																																																																																																
10,00	-	-	10	-	-	-		-																																																																																																																																																																																																	
11,11	11	13	11	11	19	19		07																																																																																																																																																																																																	
12,00	-	-	12	-	-	-	-																																																																																																																																																																																																		
12,70	12	15	12	12	22	22	08																																																																																																																																																																																																		
14,29	14	17	14	14	24	24	09																																																																																																																																																																																																		
15,88	16	19	15	15	27	27	10																																																																																																																																																																																																		
16,00	-	-	16	-	-	-	-																																																																																																																																																																																																		
17,46	17	21	17	17	30	30	11																																																																																																																																																																																																		
19,05	19	23	19	19	33	33	13																																																																																																																																																																																																		
20,00	-	-	20	-	-	-	-																																																																																																																																																																																																		
22,22	22	27	22	22	38	38	15																																																																																																																																																																																																		
25,00	-	-	25	-	-	-	-																																																																																																																																																																																																		
25,40	25	31	25	25	44	44	17																																																																																																																																																																																																		
31,75	32	38	31	31	54	54	21																																																																																																																																																																																																		
32,00	-	-	32	-	-	-	-																																																																																																																																																																																																		
<b>O</b>	Octagon 135°	<b>B</b>	5°	<b>F</b>																																																																																																																																																																																																					
<b>P</b>	Pentagon 108°	<b>C</b>	7°	<b>A</b>																																																																																																																																																																																																					
<b>R</b>	Round	<b>D</b>	15°	<b>M</b>																																																																																																																																																																																																					
<b>S</b>	Square 90°	<b>E</b>	20°	<b>G</b>																																																																																																																																																																																																					
<b>T</b>	Triangular 60°	<b>F</b>	25°	<b>W</b>																																																																																																																																																																																																					
<b>C</b> <b>D</b> <b>E</b> <b>M</b> <b>V</b>	Rhomboid 80° 55° 75° 86° 35°	<b>G</b>	30°	<b>T</b>																																																																																																																																																																																																					
<b>W</b>	Trigon 80° with enlarged corner angles	<b>N</b>	0°	<b>Q</b>																																																																																																																																																																																																					
<b>L</b>	Rectangular 90°	<b>P</b>	11°	<b>U</b>																																																																																																																																																																																																					
<b>A</b> <b>B</b> <b>N/K</b>	Parallelogram 85° 82° 55°	Indicated for other clearance angles requiring descriptions.		<b>B</b>																																																																																																																																																																																																					
						<b>H</b>																																																																																																																																																																																																			
						<b>C</b>																																																																																																																																																																																																			
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						<b>X</b>	Special Design																																																																																																																																																																																																		
						<b>V</b>	Special Design																																																																																																																																																																																																		

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



CNMG1204086P

**04**

Thickness  
S

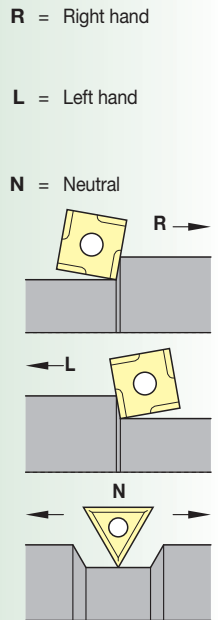
symbol	thickness
mm	mm
—	0,79
T0	1,00
01	1,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94
9	9,52
11	11,11
12	12,70

**08**

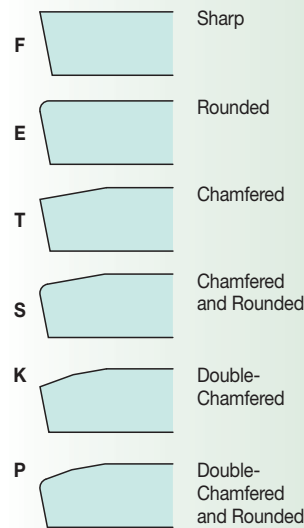
Corner  
Radius "Re"

symbol	corner radius
mm	mm
X0	0,04
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
28	2,8
32	3,2
00	round insert
M0	
—	

Hand of Insert  
(optional)



Cutting Edge  
(optional)



**6P**

Chipbreaker  
(optional)

- 1P = Finishing
- 2P = Finishing
- ..GP = Medium Machining
- 4P = Medium Machining
- 6P = Medium Roughing
- ..MA = Roughing
- 7N = Heavy Roughing

± Tolerance on "D"

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

± Tolerance on "B"

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

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

TN	15	M														
Brand	Relative Hardness (ISO 513)	Primary Workpiece Material (ISO 513)														
TN = WIDIA	<p>01 = Hardest</p> <p>10</p> <p>20</p> <p>30</p> <p>40</p> <p>50 = Toughest</p>	<table border="1"> <tr><td>P</td><td>Steel</td></tr> <tr><td>M</td><td>Stainless Steel</td></tr> <tr><td>K</td><td>Cast Iron</td></tr> <tr><td>N</td><td>Non-Ferrous</td></tr> <tr><td>S</td><td>High-Temp Alloys</td></tr> <tr><td>H</td><td>Hardened Materials</td></tr> <tr><td>U</td><td>Universal Machining</td></tr> </table>	P	Steel	M	Stainless Steel	K	Cast Iron	N	Non-Ferrous	S	High-Temp Alloys	H	Hardened Materials	U	Universal Machining
P	Steel															
M	Stainless Steel															
K	Cast Iron															
N	Non-Ferrous															
S	High-Temp Alloys															
H	Hardened Materials															
U	Universal Machining															



# WIDIA™ Tunable Tooling



EXTREME **CHALLENGES.**  
EXTREME **RESULTS.**

Internal dampening package eliminates chatter, vibration, and harmonics in all your deep-hole boring applications!

- Proprietary features provide superior surface finish and increased productivity.
- Wide product offering — from boring bars, extensions, and holders to rotating adaptors and modular sections.
- Reduce setup time with KM™ Quick Change Tooling — now an ISO Standard!
- Customise WIDIA pre-tuned boring bars — after they're on the machine — to optimise performance in your specific machining operations.

For tighter tolerances, reduced scrap rates, and improved tool life, you can rely on WIDIA Tunable Tooling!

To learn more, contact your local Authorised Distributor or visit [widia.com](http://widia.com)

**WIDIA** 



■ Step 1 • Select the insert geometry

Negative Inserts



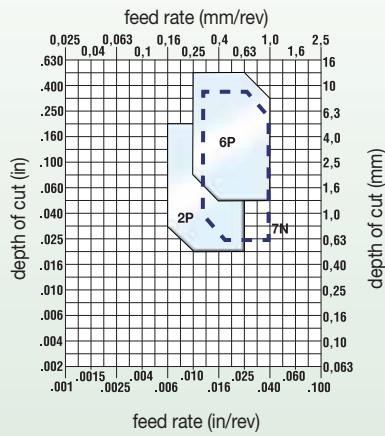
2P  
Finishing



6P  
Roughing



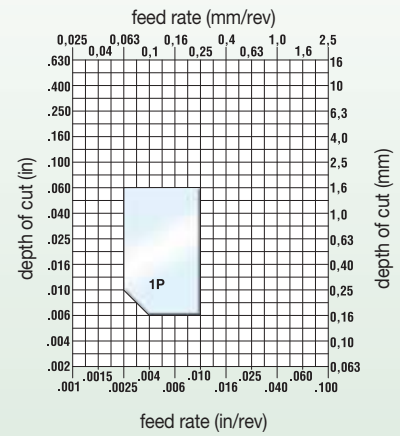
7N  
Heavy Roughing



Positive Inserts



1P  
Finishing



■ Step 2 • Select the grade

cutting condition	Negative Insert Geometry			Positive Insert Geometry
	2P	6P	7N	1P
heavily interrupted cut	TN30P	TN30P	TN30P	TN30P
lightly interrupted cut	TN20P/TN30P	TN20P/TN30P	TN20P/TN30P	TN20P
varying depth of cut, casting, or forging skin	TN20P/TN30P	TN20P/TN30P	TN20P/TN30P	TN10P
smooth cut, pre-turned surface	TN10P	TN10P	TN10P	TN10P

(continued)

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

Material Group	grade	speed – m/min									Starting Conditions
		135	180	225	275	320	360	410	455	495	m/min
P0/P1	TN10P	◊									316
	TN20P	◊									248
	TN30P	◊									189

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

Material Group	grade	speed – m/min									Starting Conditions
		135	180	225	275	320	360	410	455	495	m/min
P2	TN10P	◊									212
	TN20P	◊									176
	TN30P	◊									135

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

Material Group	grade	speed – m/min									Starting Conditions
		135	180	225	275	320	360	410	455	495	m/min
P3	TN10P	◊									152
	TN20P	◊									140
	TN30P	◊									108

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

Material Group	grade	speed – m/min									Starting Conditions
		60	90	120	150	180	210	240	270	300	m/min
P4	TN10P	◊									116
	TN20P	◊									95
	TN30P	◊									86

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

Material Group	grade	speed – m/min									Starting Conditions
		120	150	180	210	240	270	300	330	360	m/min
P5	TN10P	◊									172
	TN20P	◊									176
	TN30P	◊									122

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

Material Group	grade	speed – m/min									Starting Conditions
		105	135	165	195	225	255	285	315	345	m/min
P6	TN10P	◊									144
	TN20P	◊									135
	TN30P	◊									95

**Step 1 • Select the insert geometry**

**Negative Inserts**



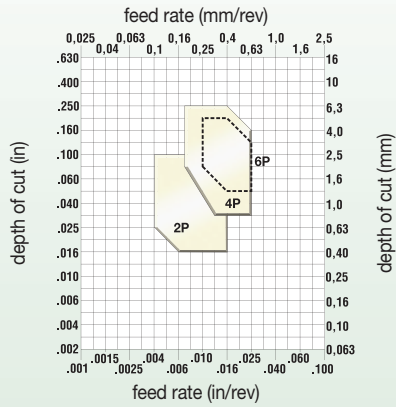
2P  
Finishing



4P  
Medium



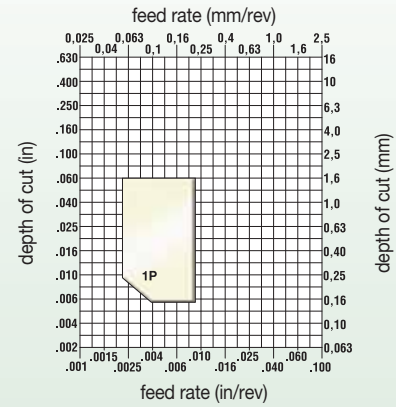
6P  
Roughing



**Positive Inserts**



1P  
Finishing



**Step 2 • Select the grade**

cutting condition	Negative Insert Geometry			Positive Insert Geometry
	2P	4P	6P	1P
heavily interrupted cut	TN15M/TN10	TN30M	TN30M	TN30M/TN10
lightly interrupted cut	TN15M/TN10	TN30M	TN30M	TN30M
varying depth of cut, casting, or forging skin	TN15M	TN15M/TN30M	TN15M/TN30M	TN15M/TN30M
smooth cut, pre-turned surface	TN15M	TN15M	TN15M	TN15M

**Step 3 • Selecting the cutting speed**

Austenitic Stainless Steel		speed – m/min									Starting Conditions
Material Group	grade	90	135	180	225	270	315	360	405	450	m/min
M1	TN15M		◊								162
	TN30M		◊								135
	TN10U			◊							194
	TN15U		◊								129

Austenitic Stainless Steel		speed – m/min									Starting Conditions
Material Group	grade	90	135	180	225	270	315	360	405	450	m/min
M2	TN15M		◊								149
	TN30M		◊								135
	TN10U			◊							180
	TN15U		◊								120

Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture)		speed – m/min									Starting Conditions
Material Group	grade	90	135	180	225	270	315	360	405	450	m/min
M3	TN15M		◊								135
	TN30M		◊								108
	TN10U			◊							167
	TN15U		◊								111

**Step 1 • Select the insert geometry**

**Negative Inserts**



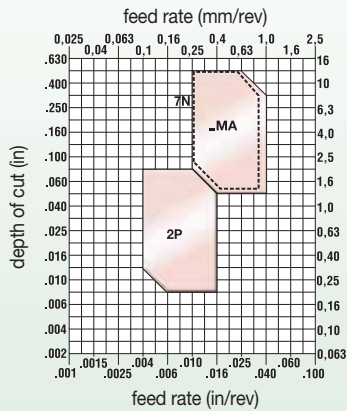
**2P**  
Finishing



**..MA**  
Heavy Roughing



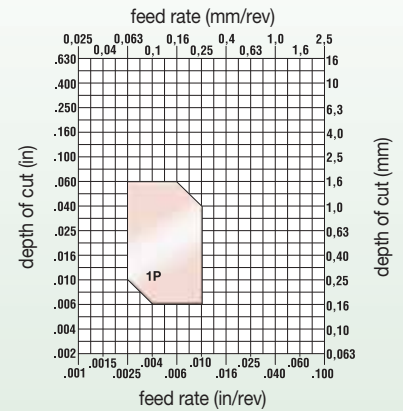
**7N**  
Heavy Roughing



**Positive Inserts**



**1P**  
Finishing



**Step 2 • Select the grade**

cutting condition	Negative Insert Geometry			Positive Insert Geometry
	2P	..MA	7N	1P
heavily interrupted cut	TN20K	TN20K	TN20K	TN20K
lightly interrupted cut	TN20K	TN20K	TN20K	TN20K
varying depth of cut, casting, or forging skin	TN20K	TN20K	TN20K	TN20K
smooth cut, pre-turned surface	TN20K	TN20K	TN20K	TN20K

**Step 3 • Selecting the cutting speed**

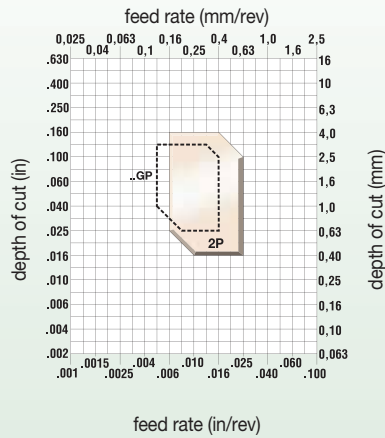
Grey Cast Iron		speed – m/min									Starting Conditions
Material Group	grade	60	150	240	330	420	510	600	690	780	m/min
<b>K1</b>	TN20K										270

Ductile, Compacted Graphite, and Malleable Cast Irons (<80 KSI tensile strength)		speed – m/min									Starting Conditions
Material Group	grade	60	150	240	330	420	510	600	690	780	m/min
<b>K2</b>	TN20K										216

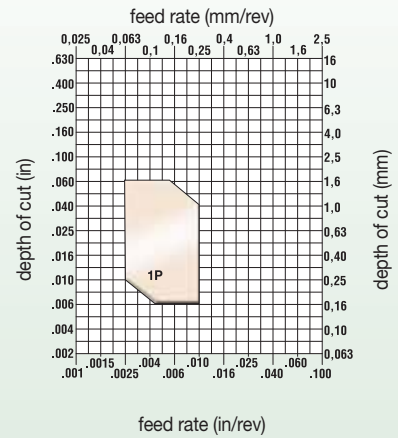
Ductile, Compacted Graphite, and Malleable Cast Irons (>80 KSI tensile strength)		speed – m/min									Starting Conditions
Material Group	grade	60	150	240	330	420	510	600	690	780	m/min
<b>K3</b>	TN20K										189

■ Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



■ Step 2 • Select the grade

cutting condition	Negative Insert Geometry		Positive Insert Geometry
	2P	..GP	1P
heavily interrupted cut	TN15U	-	TN15U
lightly interrupted cut	TN10U	TN10U	TN15U
varying depth of cut, casting, or forging skin	TN10U	TN10U	TN10U
smooth cut, pre-turned surface	TN10U	TN10U	TN10U

■ Step 3 • Select the cutting speed

Iron-Based, Heat-Resistant Alloys  
(135–320 HB) (≤34 HRC)

Material Group	grade	speed – m/min									Starting Conditions
		15	45	75	105	140	170	200	230	260	m/min
S1	TN10U										50
	TN15U										33

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

Material Group	grade	speed – m/min									Starting Conditions
		15	45	75	105	140	170	200	230	260	m/min
S2	TN10U										54
	TN15U										36

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

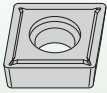
Material Group	grade	speed – m/min									Starting Conditions
		15	45	75	105	140	170	200	230	260	m/min
S3	TN10U										63
	TN15U										42

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

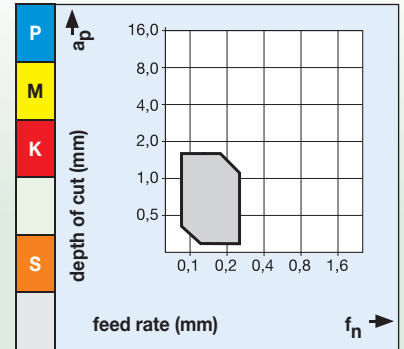
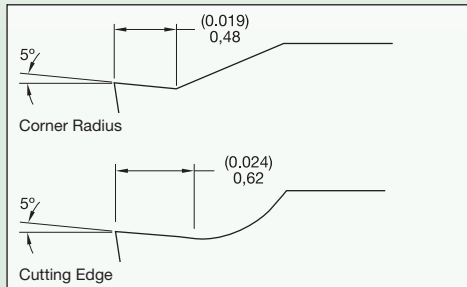
Material Group	grade	speed – m/min									Starting Conditions
		15	45	75	105	140	170	200	230	260	m/min
S4	TN10U										63
	TN15U										42

■ Positive and Negative Inserts

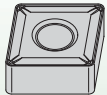
**1P**



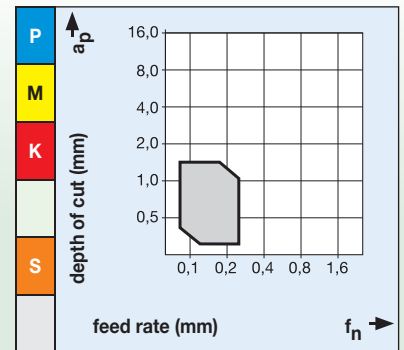
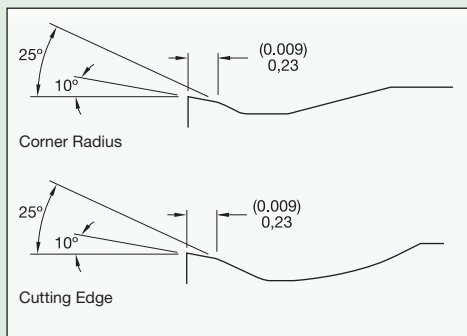
Preferred for light finishing. Low cutting forces and reduced power requirements due to positive rake angle. Good chip control over a wide range.



**2P**



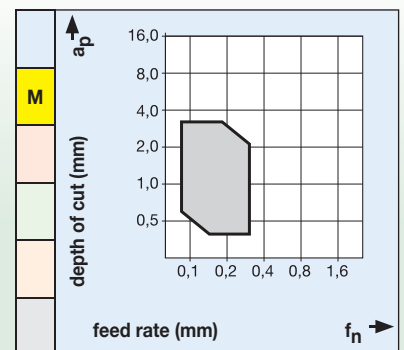
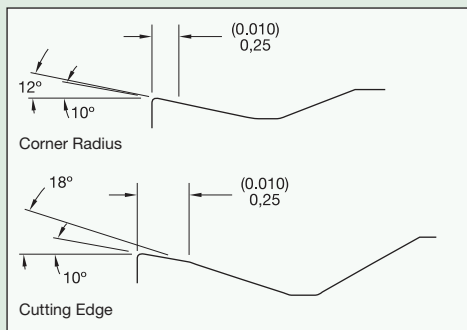
For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.



**4P**



For medium-duty turning operations. Soft-cutting chipbreaker. Used in applications producing varying chip sections, such as profile or copy turning. Good dimensional accuracy. For soft steel materials and stainless steels.



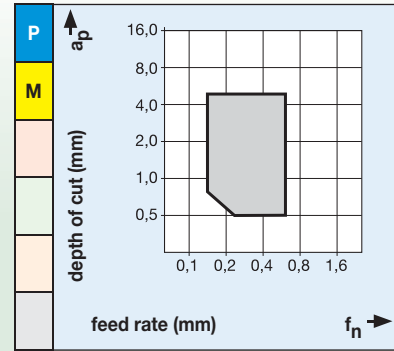
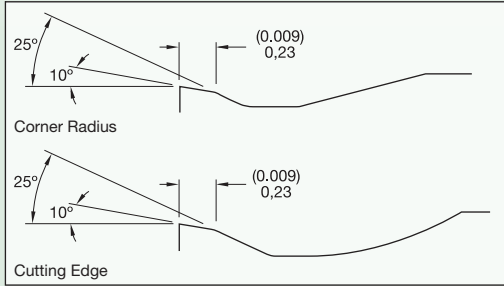
(continued)

■ Positive and Negative Inserts (continued)

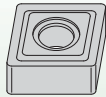
**6P**



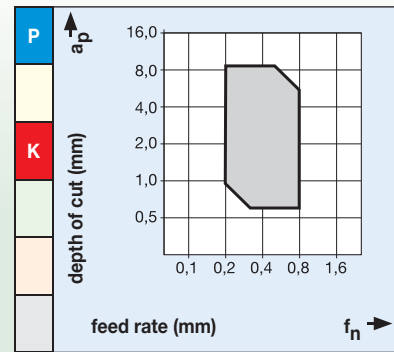
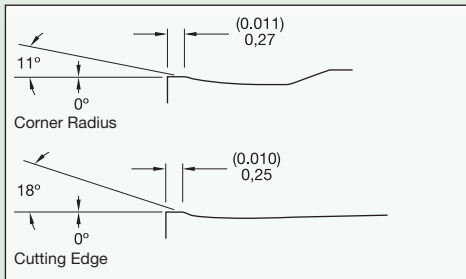
For medium to rough turning. Outstanding chip control due to specially configured chipbreaker element in corner area. Good chip forming with low depths of cut.



**7N**



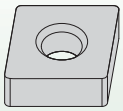
For medium-duty to roughing. Outstanding chip control. High edge strength for interrupted cuts, forging skin, or scale. Preferred for all cast iron such as grey, malleable, and nodular.



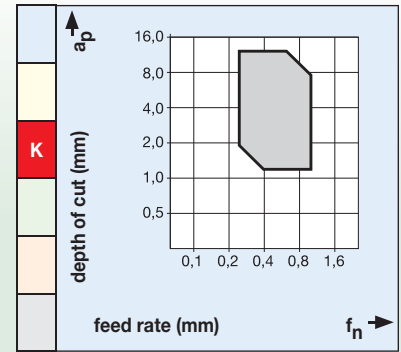
(continued)

■ Positive and Negative Inserts *(continued)*

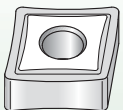
**..MA**



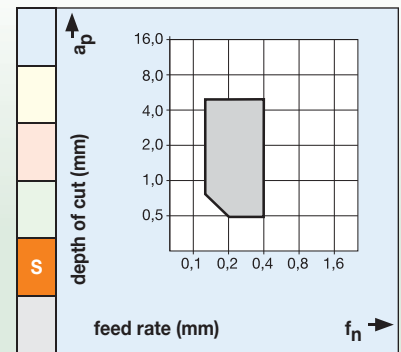
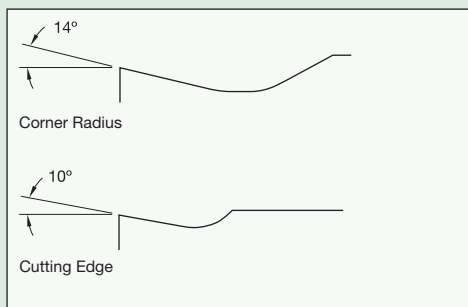
Flat top geometry for machining cast iron. For finishing to roughing applications.



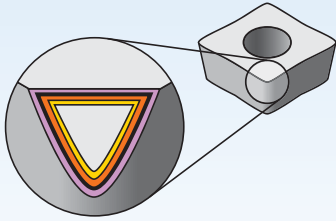
**..GP**



For light machining to light roughing.





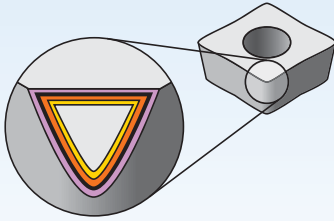


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

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

wear resistance ← → toughness


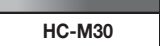



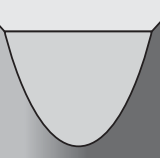
Grade	Coating	Grade Description	Performance Chart																				
				05	10	15	20	25	30	35	40	45											
TN10P		Coated carbide. MTCVD-TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN. Ideal for light finishing to medium machining applications. Superior wear resistance.	<b>P</b>																				
	<b>HC-P10</b>		<b>K</b>																				
TN20P		Coated carbide. MTCVD-TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN. Great general-purpose turning grade for steels. Ideal for semi-finishing to moderately heavy roughing.	<b>P</b>																				
	<b>HC-P20</b>		<b>K</b>																				
TN30P		Coated carbide. MTCVD-TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN. Tough carbide grade. Ideal for roughing and heavy roughing applications.	<b>P</b>																				
	<b>HC-P30</b>																						
TN15M		Coated carbide. MTCVD-TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN. Ideal for general-purpose machining of stainless steels.	<b>P</b>																				
			<b>M</b>																				
			<b>S</b>																				



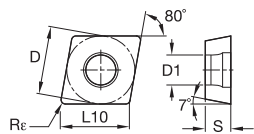
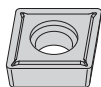
Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

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

wear resistance ← → toughness

Grade	Coating	Grade Description		wear resistance ← → toughness																		
				05	10	15	20	25	30	35	40	45										
TN30M		Coated carbide. MTCVD-TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN. Ideal for general-purpose machining of stainless steels.	<b>P</b>																			
	<b>M</b>																					
HC-M30																						
	<b>S</b>																					
TN20K		Coated carbide. MTCVD-TiN-TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN. Great when used for straight or lightly interrupted cut applications of ductile and cast irons.	<b>P</b>																			
	<b>K</b>																					
HC-K20																						
TN10U		Coated carbide. PVD-TiAlN-TiN. Ideal for finishing of difficult to machine alloys and stainless steels.	<b>P</b>																			
			<b>M</b>																			
			<b>K</b>																			
			<b>N</b>																			
			<b>S</b>																			
TN15U		Uncoated carbide. Excellent abarasion resistance for machining cast irons, austentic stainless steels, and most high-temperature alloys.	<b>P</b>																			
			<b>M</b>																			
			<b>K</b>																			
			<b>N</b>																			
			<b>S</b>																			
HW-P15																						

Inserts

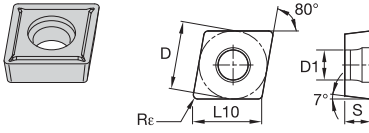


● first choice  
○ alternate choice

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

■ CCGT-1P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
CCGT0602021P	6,35	6,45	2,38	0,2	2,80							4163978	4163979
CCGT0602041P	6,35	6,45	2,38	0,4	2,80							4163980	4163981
CCGT0602081P	6,35	6,45	2,38	0,8	2,80							4163982	
CCGT09T3011P	9,53	9,67	3,97	0,1	4,40							4164495	4164496
CCGT09T3021P	9,53	9,67	3,97	0,2	4,40							4164493	4164494
CCGT09T3041P	9,53	9,67	3,97	0,4	4,40							4164497	4164498
CCGT09T3081P	9,53	9,67	3,97	0,8	4,40							4164499	4164500



● first choice  
○ alternate choice

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

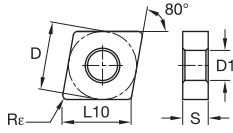
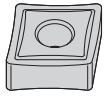


■ **CCMT-1P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
CCMT0602021P	6,35	6,45	2,38	0,2	2,80	4166244	-	-	4166242	4166323	4166245	4166324	4166325
CCMT0602041P	6,35	6,45	2,38	0,4	2,80	4166326	4166327	-	4166329	4166330	4166328	4166331	4166332
CCMT0602081P	6,35	6,45	2,38	0,8	2,80	4166333	4166334	-	4166336	4166337	4166335	4166338	-
CCMT09T3021P	9,53	9,67	3,97	0,2	4,40	-	-	-	-	-	-	4166339	4166340
CCMT09T3041P	9,53	9,67	3,97	0,4	4,40	4166341	4166342	-	4166344	4166345	4166343	4166346	4166347
CCMT09T3081P	9,53	9,67	3,97	0,8	4,40	4166348	4166349	-	4166351	4166352	4166350	4166353	4166354
CCMT1204041P	12,70	12,90	4,76	0,4	5,50	4166355	4166356	-	4166358	4166359	4166357	4166358	-
CCMT1204081P	12,70	12,90	4,76	0,8	5,50	4166559	4166560	-	4166562	4166563	4166561	4166562	-



Inserts

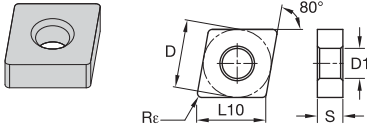


● first choice  
○ alternate choice

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

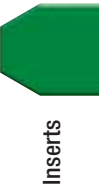
■ CNGP

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
CNGP120401	12,70	12,90	4,76	0,1	5,16							4164564	4164565
CNGP120402	12,70	12,90	4,76	0,2	5,16							4164564	4164565
CNGP120404	12,70	12,90	4,76	0,4	5,16							4164566	4164567
CNGP120408	12,70	12,90	4,76	0,8	5,16							4164568	4164569
CNGP120412	12,70	12,90	4,76	1,2	5,16							4164570	4164571



● first choice  
○ alternate choice

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

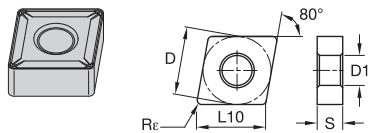


**■ CNMA**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
CNMA120404	12,70	12,90	4,76	0,4	5,16	●	●	●	○	○	○	○	○
CNMA120408	12,70	12,90	4,76	0,8	5,16	●	●	●	○	○	○	○	○
CNMA120412	12,70	12,90	4,76	1,2	5,16	●	●	●	○	○	○	○	○
CNMA120416	12,70	12,90	4,76	1,6	5,16	●	●	●	○	○	○	○	○
CNMA160612	15,88	16,12	6,35	1,2	6,35	●	●	●	○	○	○	○	○
CNMA160616	15,88	16,12	6,35	1,6	6,35	●	●	●	○	○	○	○	○
CNMA190612	19,05	19,34	6,35	1,2	7,93	●	●	●	○	○	○	○	○
CNMA190616	19,05	19,34	6,35	1,6	7,93	●	●	●	○	○	○	○	○



Inserts

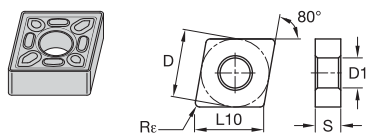


● first choice  
○ alternate choice

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

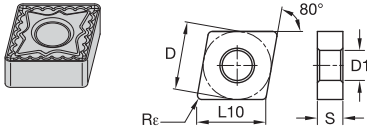
■ CNMG-2P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
CNMG1204042P	12,70	12,90	4,76	0,4	5,16	4166171	4166172	-	4166244	4166245	4166243	4166246	4166247
CNMG1204082P	12,70	12,90	4,76	0,8	5,16	4166248	4166249	-	4166251	4166252	4166250	4166253	4166254
CNMG1204122P	12,70	12,90	4,76	1,2	5,16	4166255	4166256	-	4166258	-	4166257	4166259	-



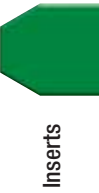
■ CNMG-4P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
CNMG1204044P	12,70	12,90	4,76	0,4	5,16	-	5359116	-	4165830	4165831	-	5359117	-
CNMG1204084P	12,70	12,90	4,76	0,8	5,16	-	5359118	-	4165832	4165853	-	5359119	-
CNMG1204124P	12,70	12,90	4,76	1,2	5,16	-	5359240	-	4165854	4165855	-	5359241	-
CNMG1606124P	15,88	16,12	6,35	1,2	6,35	-	-	-	4165856	4165857	-	-	-
CNMG1906124P	19,05	19,34	6,35	1,2	7,93	-	-	-	4165858	4165859	-	-	-



● first choice  
○ alternate choice

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



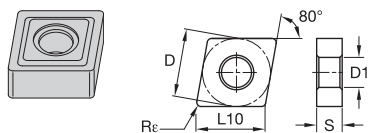
■ CNMG-6P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
CNMG0903086P	9,53	9,67	3,18	0,8	3,81	4165948	4165949	-	4165950	4165951	■	■	■
CNMG1204046P	12,70	12,90	4,76	0,4	5,16	4165952	4165963	-	4165964	4165965	■	■	■
CNMG1204086P	12,70	12,90	4,76	0,8	5,16	4165966	4165967	4165968	4165969	4165970	■	■	■
CNMG1204126P	12,70	12,90	4,76	1,2	5,16	4165971	4165972	4165973	4165974	4165975	■	■	■
CNMG1606126P	15,88	16,12	6,35	1,2	6,35	-	4165976	4165977	4165978	4165979	■	■	■
CNMG1906126P	19,05	19,34	6,35	1,2	7,93	-	4165980	4165981	4165982	4165983	■	■	■





Inserts

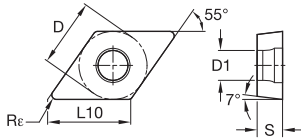
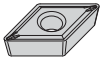


● first choice  
○ alternate choice

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

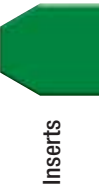
■ CNMG-7N

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
CNMG1204047N	12,70	12,90	4,76	0,4	5,16	4166386	4166387	—	—	—	4166388	—	—
CNMG1204087N	12,70	12,90	4,76	0,8	5,16	4166389	4166390	4166391	—	—	4166392	—	—
CNMG1204127N	12,70	12,90	4,76	1,2	5,16	4166433	4166434	4166435	—	—	4166436	—	—
CNMG1204167N	12,70	12,90	4,76	1,6	5,16	4166437	4166438	—	—	—	4166439	—	—
CNMG1606127N	15,88	16,12	6,35	1,2	6,35	4166440	4166441	4166442	—	—	4166443	—	—
CNMG1606167N	15,88	16,12	6,35	1,6	6,35	4166444	4166445	—	—	—	4166446	—	—
CNMG1906087N	19,05	19,34	6,35	0,8	7,93	4166447	—	—	—	—	4166448	—	—
CNMG1906127N	19,05	19,34	6,35	1,2	7,93	4166449	4166450	4166451	—	—	4166452	—	—
CNMG1906167N	19,05	19,34	6,35	1,6	7,93	4166453	4166454	4166455	—	—	4166456	—	—
CNMG2509247N	25,40	25,79	9,53	2,4	9,12	—	—	—	—	—	—	—	—



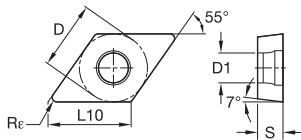
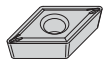
● first choice  
○ alternate choice

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



**DCGT-1P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DCGT0702011P	6,35	7,75	2,38	0,1	2,80	●	●	○	○	○	○	○	○
DCGT11T3011P	9,53	11,63	3,97	0,1	4,40	○	○	○	○	○	○	○	○
DCGT1504081P	12,70	15,50	4,76	0,8	5,50	○	○	○	○	○	○	○	○

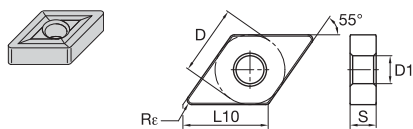


**DCMT-1P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DCMT0702021P	6,35	7,75	2,38	0,2	2,80	○	○	○	○	○	○	○	○
DCMT0702041P	6,35	7,75	2,38	0,4	2,80	4166627	4166628	○	4166630	4166631	4166629	4166632	4166633
DCMT11T3021P	9,53	11,63	3,97	0,2	4,40	○	○	○	○	○	○	○	○
DCMT11T3041P	9,53	11,63	3,97	0,4	4,40	4166636	4166637	○	4166639	4166640	4166638	4166641	4166642
DCMT11T3081P	9,53	11,63	3,97	0,8	4,40	4166643	4166644	○	4166646	4166647	4166645	4166648	○
DCMT11T3121P	9,53	11,63	3,97	1,2	4,40	4166649	○	○	4166651	4166650	4166655	○	○
DCMT1504041P	12,70	15,50	4,76	0,4	5,50	4166653	4166654	○	○	○	○	○	○
DCMT1504081P	12,70	15,50	4,76	0,8	5,50	4166656	○	○	○	○	○	○	○



Inserts

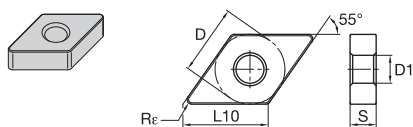


● first choice  
○ alternate choice

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

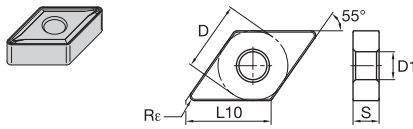
■ DNGP

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DNGP150401	12,70	15,50	4,76	0,1	5,16	■	■	■	■	■	■	4164784	■
DNGP150402	12,70	15,50	4,76	0,2	5,16	■	■	■	■	■	■	4164572	4164783
DNGP150404	12,70	15,50	4,76	0,4	5,16	■	■	■	■	■	■	4164785	4164786
DNGP150408	12,70	15,50	4,76	0,8	5,16	■	■	■	■	■	■	4164787	4164788



■ DNMA

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DNMA150408	12,70	15,50	4,76	0,8	5,16	■	■	■	■	■	4165838	■	■
DNMA150608	12,70	15,50	6,35	0,8	5,16	■	■	■	■	■	4165840	■	■
DNMA150412	12,70	15,50	4,76	1,2	5,16	■	■	■	■	■	4165839	■	■
DNMA150612	12,70	15,50	6,35	1,2	5,16	■	■	■	■	■	4165841	■	■



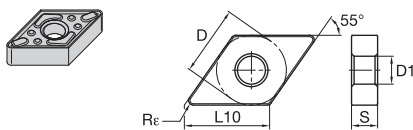
● first choice  
○ alternate choice

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



■ DNMG-2P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DNMG1504042P	12,70	15,50	4,76	0,4	5,16	4166260	4166261	-	4166263	4166264	4166262	4166265	4166266
DNMG1506042P	12,70	15,50	6,35	0,4	5,16	4166825	4166826	-	4166828	-	4166827	4166829	4166830
DNMG1504082P	12,70	15,50	4,76	0,8	5,16	4166267	4166269	-	4166273	4166275	4166271	4166277	4166279
DNMG1506082P	12,70	15,50	6,35	0,8	5,16	4166831	4166832	-	4166844	-	4166843	4166845	4166846
DNMG1506122P	12,70	15,50	6,35	1,2	5,16	4166847	4166848	-	4166850	4166851	4166849	4166852	-

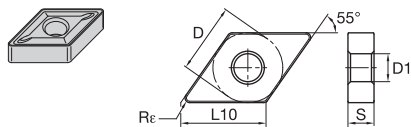


■ DNMG-4P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DNMG1504044P	12,70	15,50	4,76	0,4	5,16	-	-	-	4165860	4165861	-	-	-
DNMG1506044P	12,70	15,50	6,35	0,4	5,16	-	5359244	-	4165864	4165865	-	-	-
DNMG1504084P	12,70	15,50	4,76	0,8	5,16	-	5359242	-	4165862	4165863	-	5359243	-
DNMG1506084P	12,70	15,50	6,35	0,8	5,16	-	5359245	-	4165866	4165867	-	-	-
DNMG1506124P	12,70	15,50	6,35	1,2	5,16	-	-	-	4165868	4165869	-	-	-



Inserts

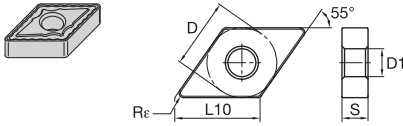


● first choice  
○ alternate choice

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

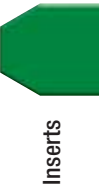
■ DNMG-6P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DNMG1104086P	9,53	11,63	4,76	0,8	3,81	4165984	4165985	-	-	-	-	-	-
DNMG1504046P	12,70	15,50	4,76	0,4	5,16	4165987	4165988	-	4165989	4165990	-	-	-
DNMG1506046P	12,70	15,50	6,35	0,4	5,16	4166767	4166768	-	4166769	4166770	-	-	-
DNMG1504086P	12,70	15,50	4,76	0,8	5,16	4165991	4165992	4165993	4165994	4165995	-	-	-
DNMG1506086P	12,70	15,50	6,35	0,8	5,16	4166771	4166772	4166793	4166794	4166795	-	-	-
DNMG1504126P	12,70	15,50	4,76	1,2	5,16	4165996	4165997	-	4166765	4166766	-	-	-
DNMG1506126P	12,70	15,50	6,35	1,2	5,16	4166796	4166797	4166798	4166799	4166800	-	-	-
DNMG1906126P	15,88	19,38	6,35	1,2	6,35	-	-	4166801	-	-	-	-	-



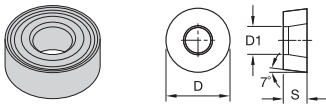
● first choice  
○ alternate choice

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



■ **DNMG-7N**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DNMG1504047N	12,70	15,50	4,76	0,4	5,16	4166458	4166459	-	-	-	-	-	-
DNMG1504087N	12,70	15,50	4,76	0,8	5,16	4166460	4166461	4166462	-	-	4166463	-	-
DNMG1506087N	12,70	15,50	6,35	0,8	5,16	4166484	4166485	4166486	-	-	4166487	-	-
DNMG1504127N	12,70	15,50	4,76	1,2	5,16	4166464	4166465	4166432	-	-	4166483	-	-
DNMG1506127N	12,70	15,50	6,35	1,2	5,16	4166488	4166489	4166490	-	-	4166491	-	-
DNMG1906127N	15,88	19,38	6,35	1,2	6,35	-	4166492	4166493	-	-	-	-	-

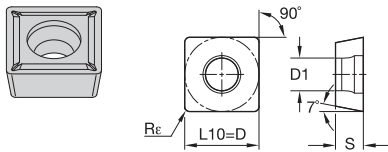


■ **RNMG-7N**

ISO catalogue number	D	S	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
RNMG12047N	12,70	4,76	5,16	-	4166494	-	-	-	4166495	-	-
RNMG19067N	19,05	6,35	7,93	4166496	4166497	-	-	-	-	-	-



Inserts

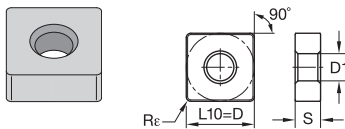


● first choice  
○ alternate choice

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

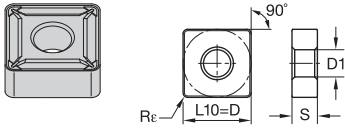
■ SCMT-1P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
SCMT09T3041P	9,53	9,53	3,97	0,4	4,40	4166362	4166393	-	4166395	4166396	4166394	4166397	-
SCMT09T3081P	9,53	9,53	3,97	0,8	4,40	4166398	4166399	-	4166401	4166402	4166400	4166403	-
SCMT1204041P	12,70	12,70	4,76	0,4	5,50	-	-	-	-	-	-	4166404	-
SCMT1204081P	12,70	12,70	4,76	0,8	5,50	4166405	4166406	-	4166408	4166409	4166407	4166410	-



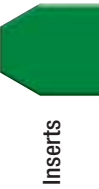
■ SNMA

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
SNMA120408	12,70	12,70	4,76	0,8	5,16	-	-	-	-	-	4165842	-	-
SNMA120412	12,70	12,70	4,76	1,2	5,16	-	-	-	-	-	4165843	-	-
SNMA150612	15,88	15,88	6,35	1,2	6,35	-	-	-	-	-	4165844	-	-
SNMA190612	19,05	19,05	6,35	1,2	7,93	-	-	-	-	-	4165845	-	-



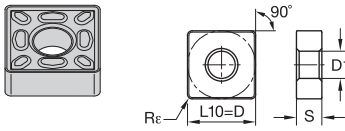
● first choice  
○ alternate choice

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



■ **SNMG-2P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
SNMG0903082P	9,53	9,53	3,18	0,8	3,81	4166853	4166854	-	-	-	4166855	4166856	-
SNMG1204082P	12,70	12,70	4,76	0,8	5,16	4166857	4166858	-	4166860	-	4166859	4166861	4166862



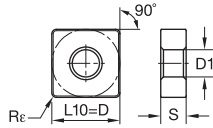
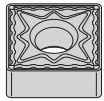
■ **SNMG-4P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
SNMG1204084P	12,70	12,70	4,76	0,8	5,16	-	-	-	4165870	4165871	-	-	-
SNMG1204124P	12,70	12,70	4,76	1,2	5,16	-	-	-	4165872	4165873	-	-	-





Inserts

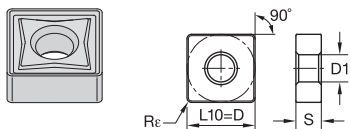


● first choice  
○ alternate choice

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

■ SNMG-6P

ISO catalogue number	D	L10	S	R <sub>ε</sub>	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
SNMG0903086P	9,53	9,53	3,18	0,8	3,81	4166802	4166803	-	-	-	-	-	-
SNMG1204046P	12,70	12,70	4,76	0,4	5,16	4166804	4166805	-	4166806	4166807	-	-	-
SNMG1204086P	12,70	12,70	4,76	0,8	5,16	4166808	4166809	4166810	-	-	-	-	-
SNMG1204126P	12,70	12,70	4,76	1,2	5,16	4166813	4166814	4166815	4166811	4166812	-	-	-
SNMG1906166P	19,05	19,05	6,35	1,6	7,92	-	-	5308173	-	-	-	-	-
SNMG1906126P	19,05	19,05	6,35	1,2	7,93	4166818	4166819	4166820	4166821	-	-	-	-



● first choice  
○ alternate choice

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

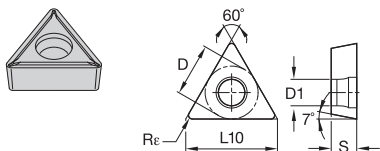
■ **SNMG-7N**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
SNMG1204087N	12,70	12,70	4,76	0,8	5,16	4166498	4166499	-	-	4166500	-	-	-
SNMG1204127N	12,70	12,70	4,76	1,2	5,16	4166501	4166502	4166503	-	4166504	-	-	-
SNMG1204167N	12,70	12,70	4,76	1,6	5,16	4166505	4166506	4166507	-	4166508	-	-	-
SNMG1506127N	15,88	15,88	6,35	1,2	6,35	-	4166509	4166510	-	4166511	-	-	-
SNMG1506167N	15,88	15,88	6,35	1,6	6,35	-	4166512	4166513	-	4166514	-	-	-
SNMG1906127N	19,05	19,05	6,35	1,2	7,93	-	4166515	4166516	-	4166517	-	-	-
SNMG1906167N	19,05	19,05	6,35	1,6	7,93	-	4166518	4166519	-	4166520	-	-	-

Inserts



Inserts

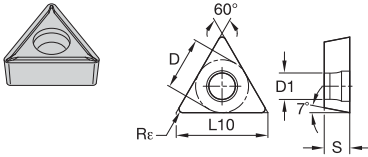


● first choice  
○ alternate choice

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

■ TCGT-1P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TCGT1102011P	6,35	11,00	2,38	0,1	2,80							4164526	4164527
TCGT1102041P	6,35	11,00	2,38	0,4	2,80							4164528	4164529
TCGT16T3021P	9,53	16,50	3,97	0,2	4,40							4164530	-
TCGT16T3041P	9,53	16,50	3,97	0,4	4,40							4164531	4164532
TCGT16T3081P	9,53	16,50	3,97	0,8	4,40							4164543	-



● first choice  
○ alternate choice

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

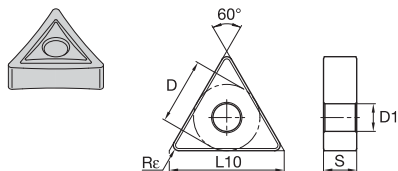


■ **TCMT-1P**

ISO catalogue number	D	L10	S	Re	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TCMT1102041P	6,35	11,00	2,38	0,4	2,80	4166414	4166415	-	4166417	4166418	4166416	4166419	-
TCMT1102081P	6,35	11,00	2,38	0,8	2,80	4166420	4166421	-	-	-	4166422	4166423	-
TCMT1102021P	6,35	11,00	2,38	0,2	2,90	4166411	-	-	-	-	4166412	4166413	-
TCMT16T3021P	9,53	16,50	3,97	0,2	4,40	-	-	-	-	-	-	4166424	-
TCMT16T3041P	9,53	16,50	3,97	0,4	4,40	4166425	4166426	-	4166428	4166429	4166427	4166430	-
TCMT16T3081P	9,53	16,50	3,97	0,8	4,40	4166469	4166471	-	4166563	4166564	4166472	4166565	-
TCMT16T3121P	9,53	16,50	3,97	1,2	4,40	-	-	-	-	-	-	4166566	-
TCMT2204081P	12,70	22,00	4,76	0,8	5,50	4166567	4166568	-	4166570	4166571	4166569	4166572	-



Inserts

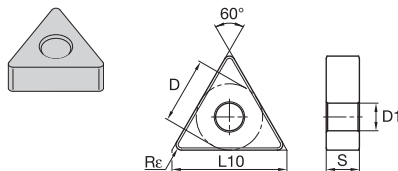


● first choice  
○ alternate choice

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

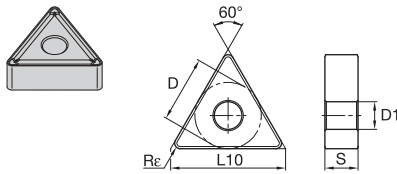
■ TNGP

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TNGP160402	9,53	16,50	4,76	0,2	3,81	●	●	●	○	○	○	○	○
TNGP160404	9,53	16,50	4,76	0,4	3,81	○	○	○	○	○	○	○	○
TNGP160408	9,53	16,50	4,76	0,8	3,81	○	○	○	○	○	○	○	○



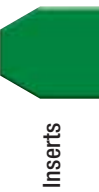
■ TNMA

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TNMA160408	9,53	16,50	4,76	0,8	3,81	○	○	○	○	○	○	○	○
TNMA160412	9,53	16,50	4,76	1,2	3,81	○	○	○	○	○	○	○	○
TNMA220408	12,70	22,00	4,76	0,8	5,16	○	○	○	○	○	○	○	○



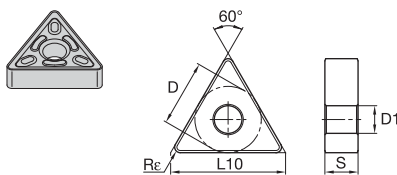
● first choice  
○ alternate choice

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



■ **TNMG-2P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TNMG1604042P	9,53	16,50	4,76	0,4	3,81	4166863	4166864	-	4166866	4166867	-	4166868	4166869
TNMG1604082P	9,53	16,50	4,76	0,8	3,81	4166870	4166871	-	4166873	-	4166872	4166874	4166875
TNMG1604122P	9,53	16,50	4,76	1,2	3,81	4166876	4166877	-	4166879	4166880	4166878	4166881	-
TNMG2204082P	12,70	22,00	4,76	0,8	5,16	4166882	4166883	-	4166885	-	4166884	4166886	4166887

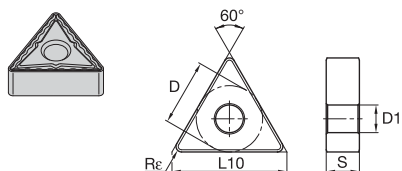


■ **TNMG-4P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TNMG1604044P	9,53	16,50	4,76	0,4	3,81	-	5359246	-	4165874	4165875	-	-	-
TNMG1604084P	9,53	16,50	4,76	0,8	3,81	-	5359247	-	4165876	4165877	-	-	-
TNMG1604124P	9,53	16,50	4,76	1,2	3,81	-	-	-	4165878	4165879	-	-	-
TNMG2204044P	12,70	22,00	4,76	0,4	5,16	-	5359248	-	4165880	4165881	-	-	-
TNMG2204084P	12,70	22,00	4,76	0,8	5,16	-	5359249	-	4165882	4165883	-	-	-
TNMG2204124P	12,70	22,00	4,76	1,2	5,16	-	-	-	-	-	-	-	-



Inserts

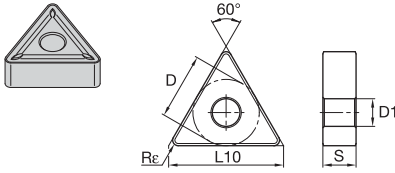


● first choice  
○ alternate choice

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

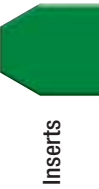
■ TNMG-6P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TNMG1604046P	9,53	16,50	4,76	0,4	3,81	4166822	4166823	-	4166824	4167086	-	-	-
TNMG1604086P	9,53	16,50	4,76	0,8	3,81	4167087	4167088	4167089	4167090	4167091	-	-	-
TNMG1604126P	9,53	16,50	4,76	1,2	3,81	4167092	4167113	-	4167114	4167115	-	-	-
TNMG2204046P	12,70	22,00	4,76	0,4	5,16	4167116	4167117	-	4167118	4167119	-	-	-
TNMG2204086P	12,70	22,00	4,76	0,8	5,16	4167120	4167121	4167122	4167123	4167124	-	-	-



● first choice  
○ alternate choice

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



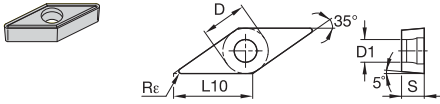
■ **TNMG-7N**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TNMG1604047N	9,53	16,50	4,76	0,4	3,81	-	4166521	-	-	-	-	-	-
TNMG1604087N	9,53	16,50	4,76	0,8	3,81	4166522	4166523	4166524	-	-	4166525	-	-
TNMG1604127N	9,53	16,50	4,76	1,2	3,81	4166526	4166527	4166528	-	-	4166529	-	-
TNMG2204047N	12,70	22,00	4,76	0,4	5,16	4166530	4166531	-	-	-	-	-	-
TNMG2204087N	12,70	22,00	4,76	0,8	5,16	4166532	4166533	4166534	-	-	4166535	-	-
TNMG2204127N	12,70	22,00	4,76	1,2	5,16	-	4166536	4166537	-	-	4166538	-	-
TNMG2706127N	15,88	27,50	6,35	1,2	6,35	4166539	4166540	4166541	-	-	4166542	-	-
TNMG3309247N	19,05	33,00	9,53	2,4	7,93	4166543	4166544	4166545	-	-	4166546	-	-





Inserts

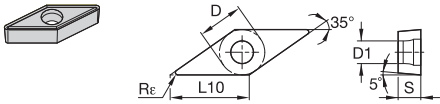


● first choice  
○ alternate choice

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

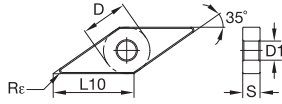
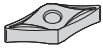
■ VBGT-1P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
VBGT1103011P	6,35	11,07	3,18	0,1	2,80	●	●	●	○	○	○	○	○
VBGT1103021P	6,35	11,07	3,18	0,2	2,80	●	●	●	○	○	○	○	○
VBGT1103041P	6,35	11,07	3,18	0,4	2,80	●	●	●	○	○	○	○	○
VBGT1604011P	9,53	16,61	4,76	0,1	4,40	●	●	●	○	○	○	○	○
VBGT1604021P	9,53	16,61	4,76	0,2	4,40	●	●	●	○	○	○	○	○
VBGT1604041P	9,53	16,61	4,76	0,4	4,40	●	●	●	○	○	○	○	○



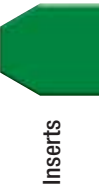
■ VBMT-1P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
VBMT1103021P	6,35	11,07	3,18	0,2	2,80	●	●	●	○	○	○	○	○
VBMT1103041P	6,35	11,07	3,18	0,4	2,80	●	●	●	○	○	○	○	○
VBMT1103081P	6,35	11,07	3,18	0,8	2,80	●	●	●	○	○	○	○	○
VBMT1604021P	9,53	16,61	4,76	0,2	4,40	●	●	●	○	○	○	○	○
VBMT1604041P	9,53	16,61	4,76	0,4	4,40	●	●	●	○	○	○	○	○
VBMT1604081P	9,53	16,61	4,76	0,8	4,40	●	●	●	○	○	○	○	○



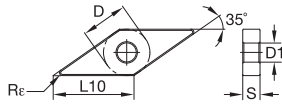
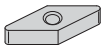
● first choice  
○ alternate choice

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



■ VNGP

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
VNGP160401	9,53	16,61	4,76	0,1	3,81	●	●	○	○	○	○	○	○
VNGP160402	9,53	16,61	4,76	0,2	3,81	○	○	○	○	○	○	○	○
VNGP220404	12,70	22,14	4,76	0,4	5,16	○	○	○	○	○	○	○	○
VNGP220408	12,70	22,14	4,76	0,8	5,16	○	○	○	○	○	○	○	○

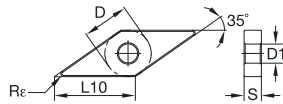
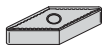


■ VNMA

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
VNMA160408	9,53	16,61	4,76	0,8	3,81	○	○	○	○	○	○	○	○



Inserts

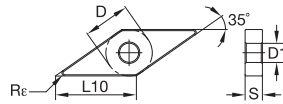
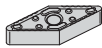


● first choice  
○ alternate choice

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

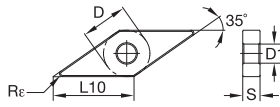
■ VNMG-2P

ISO catalogue number	D	L10	S	Re	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
VNMG1604042P	9,53	16,61	4,76	0,4	3,81	4166281	4166282	-	4166284	4166285	4166283	4166286	4166287
VNMG1604082P	9,53	16,61	4,76	0,8	3,81	4166288	4166289	-	4166291	-	4166290	4166292	4166293



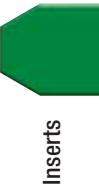
■ VNMG-4P

ISO catalogue number	D	L10	S	Re	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
VNMG1604044P	9,53	16,61	4,76	0,4	3,81	-	5359251	-	4165884	4165885	-	5359252	-
VNMG1604084P	9,53	16,61	4,76	0,8	3,81	-	5359253	-	4165886	4165887	-	5359254	-



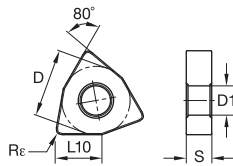
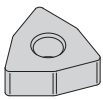
● first choice  
○ alternate choice

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



■ **VNMG-6P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
VNMG1604086P	9,53	16,61	4,76	0,8	3,81	4167125	4167126	-	4167127	4167128	-	-	-

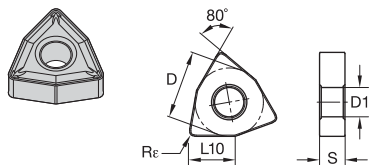


■ **WNMA**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
WNMA060408	9,53	6,52	4,76	0,8	3,81	-	-	-	-	-	4165850	-	-
WNMA080408	12,70	8,69	4,76	0,8	5,16	-	-	-	-	-	4165851	-	-
WNMA080412	12,70	8,69	4,76	1,2	5,16	-	-	-	-	-	4165852	-	-



Inserts

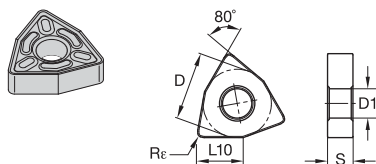


● first choice  
○ alternate choice

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

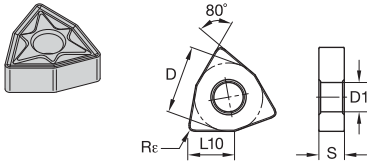
■ WNMG-2P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
WNMG0804042P	12,70	8,69	4,76	0,4	5,16	4166294	4166295	-	4166297	4166298	4166296	4166299	4166300
WNMG0804082P	12,70	8,69	4,76	0,8	5,16	4166301	4166302	-	4166304	-	4166303	4166305	4166306



■ WNMG-4P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
WNMG0804044P	12,70	8,69	4,76	0,4	5,16	-	-	-	4165888	4165889	-	-	-
WNMG0804084P	12,70	8,69	4,76	0,8	5,16	-	5359255	-	4165890	4165891	-	5359256	-
WNMG0804124P	12,70	8,69	4,76	1,2	5,16	-	-	-	4165892	-	-	-	-



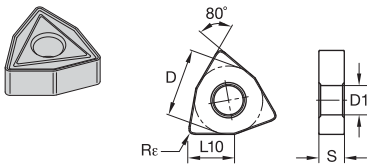
● first choice  
○ alternate choice

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



■ **WNMG-6P**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
WNMG0604086P	9,53	6,52	4,76	0,8	3,81	●	●	○	○	○	○	○	○
WNMG0804086P	12,70	8,69	4,76	0,8	5,16	●	●	○	○	○	○	○	○
WNMG0804126P	12,70	8,69	4,76	1,2	5,16	○	○	○	○	○	○	○	○



■ **WNMG-7N**

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
WNMG0804087N	12,70	8,69	4,76	0,8	5,16	○	○	○	○	○	○	○	○
WNMG0804127N	12,70	8,69	4,76	1,2	5,16	○	○	○	○	○	○	○	○
WNMG0804167N	12,70	8,69	4,76	1,6	5,16	○	○	○	○	○	○	○	○



## WIDIA™ Inserts for Machining Aluminium

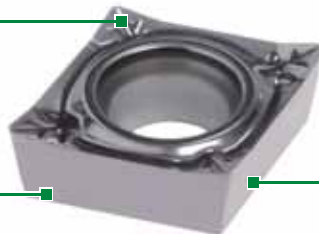
WIDIA offers a series of inserts specifically designed for machining aluminium materials. These inserts are available in both an uncoated and a PVD grade for better performance and better tool life.

# Inserts for Aluminium

- Easy-to-choose platform — two geometry and three grades.
- Longer tool life.

High positive rake for smooth chip flow.

G tolerance inserts for better precision.



High polish inserts to prevent built-up edge and for longer tool life.

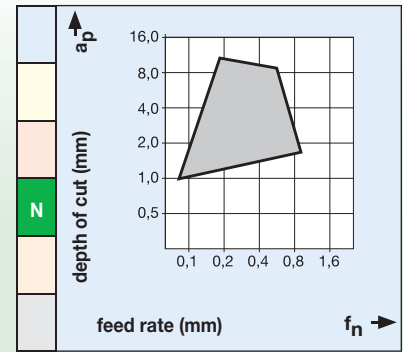


■ Positive Inserts

**AL1**



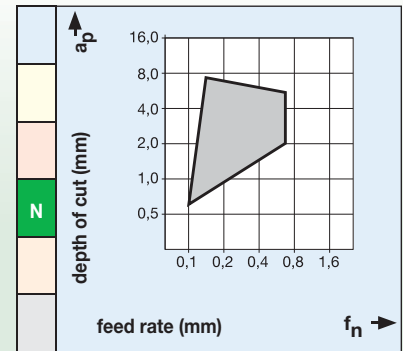
For turning cast aluminium, light alloys, non-ferrous metals, high-melting metals, plastics, glass fibre, reinforced plastics, laminated board, carbon, and fine ceramics.



**AL3**



For cost-effective machining of aluminium, non-ferrous metals, and plastics. Extremely sharp cutting edges result in optimum part finishes with low cutting forces and short chips. Finishing of steel, stainless steel, and grey iron is possible with the coated grade HCK10™.





**Step 1 • Select the insert geometry**

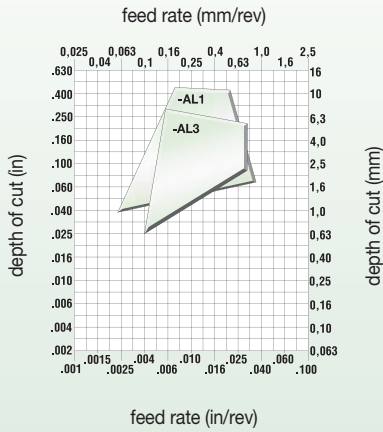
**Positive Inserts**



AL1



AL3



**Step 2 • Select the grade**

**Positive Insert Geometry**

cutting condition		-AL1	-AL3
heavily interrupted cut		HCK10/HWK10	HCK10/HWK15
lightly interrupted cut		HCK10/HWK10	HCK10/HWK15
varying depth of cut, casting, or forging skin		HCK10/HWK10	HCK10/HWK15
smooth cut, pre-turned surface		HCK10/HWK10	HCK10/HWK15

**Step 3 • Selecting the cutting speed**

**Low-Silicon Aluminium Alloys**

(hypoeutectic <12,2% Si) and Magnesium Alloys

speed – m/min

Starting Conditions



Material Group	grade	250	500	750	1000	1250	1500	1750	2000	2250	2500	m/min
N2	HCK10	◀▶										550

**High-Silicon Aluminium Alloys**

(hypereutectic >12,2% Si) and Magnesium Alloys

speed – m/min

Starting Conditions



Material Group	grade	250	500	750	1000	1250	1500	1750	2000	2250	2500	m/min
N3	HCK10	◀▶										550

■ Additional cutting speed recommendations for miscellaneous workpiece materials

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

Material Group	grade	speed – m/min				Starting Conditions
		250	500	750	1000	m/min
N4	HCK10	◊				275
	HWK10/HWK15	◊				260

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

Material Group	grade	speed – m/min				Starting Conditions
		250	500	750	1000	m/min
N5	HCK10	◊				275

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

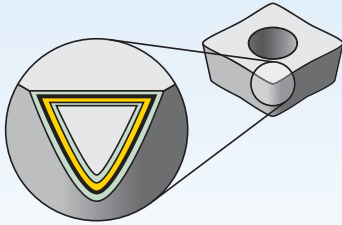
Material Group	grade	speed – m/min				Starting Conditions
		250	500	750	1000	m/min
N6	HCK10	◊				200

MMCs (Aluminium-Based Metal Matrix Composites)

Material Group	grade	speed – m/min				Starting Conditions
		250	500	750	1000	m/min
N7	HCK10	◊				170

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

Material Group	grade	speed – m/min				Starting Conditions
		250	500	750	1000	m/min
N8	HCK10	◊				215
	HWK10/HWK15	◊				180

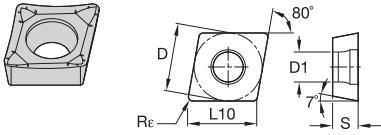


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

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

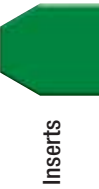
wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45
<b>HCK10</b>		Coated carbide. PVD — TIALN-Al <sub>2</sub> O <sub>3</sub> on micro-grain carbide. Light and medium machining. For aluminium alloys.										
	<b>HC-N10</b>											
<b>HWK10</b>		Uncoated carbide. Micro-grain carbide with high cutting edge stability. Light machining. For non-ferrous metals and non-metals.										
	<b>HF-N10</b>											
<b>HWK15</b>		Uncoated carbide. Micro-grain carbide with high cutting edge stability. Light and medium machining. For non-ferrous metals and non-metals.										
	<b>HF-N15</b>											



● first choice  
○ alternate choice

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

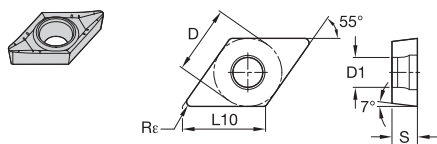


■ **CCGT-AL3**

ISO catalogue number	D	L10	S	Rε	D1	HCK10	HWK10	HWK15
CCGT060202AL3	6,35	6,45	2,38	0,2	2,80	2022257	2022258	2022256
CCGT060204AL3	6,35	6,45	2,38	0,4	2,80	2022259	2022260	2022258
CCGT09T302AL3	9,53	9,67	3,97	0,2	4,40	2022261	2022262	2022854
CCGT09T304AL3	9,53	9,67	3,97	0,4	4,40	2022261	2022262	2022854
CCGT09T308AL3	9,53	9,67	3,97	0,8	4,40	2022859	2022858	2022856
CCGT120402AL3	12,70	12,90	4,76	0,2	5,50	2022859	2022858	2022856
CCGT120404AL3	12,70	12,90	4,76	0,4	5,50	2022323	2022324	2022325
CCGT120408AL3	12,70	12,90	4,76	0,8	5,50	2022325	2022326	2022324



Inserts

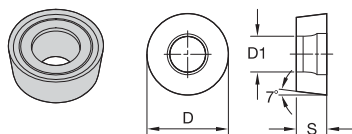


● first choice  
○ alternate choice

P			
M			
K			
N	●	●	●
S			
H			

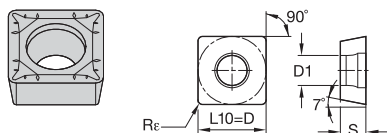
■ DCGT-AL3

ISO catalogue number	D	L10	S	Re	D1	HCK10	HWK10	HWK15
DCGT070202AL3	6,35	7,75	2,38	0,2	2,80	2022327	2022328	2022328
DCGT070204AL3	6,35	7,75	2,38	0,4	2,80	2022329	2022330	2022330
DCGT11T302AL3	9,53	11,63	3,97	0,2	4,40	2014890	2022861	2022861
DCGT11T304AL3	9,53	11,63	3,97	0,4	4,40	2014890	2022331	2022331
DCGT11T308AL3	9,53	11,63	3,97	0,8	4,40	2022332	2022483	2022483



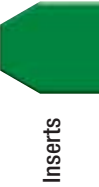
■ RCGT-AL1

ISO catalogue number	D	S	D1	HCK10	HWK10	HWK15
RCGT0803M0AL1	8,00	3,18	3,40	2002473	2002474	2002474



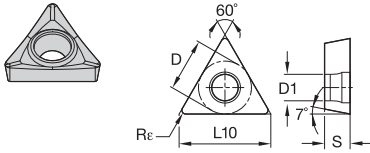
■ SCGT-AL3

ISO catalogue number	D	L10	S	Re	D1	HCK10	HWK10	HWK15
SCGT120408AL3	12,70	12,70	4,76	0,8	5,50	2023638	2023638	2023638



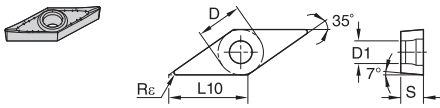
P			
M			
K			
N	●	●	●
S			
H			

● first choice  
○ alternate choice



■ **TCGT-AL1**

ISO catalogue number	D	L10	S	Re	D1	HCK10	HWK10	HWK15
TCGT110204AL1	6,35	11,00	2,38	0,4	2,80		2006991	
TCGT16T308AL1	9,53	16,50	3,97	0,8	4,40		2007004	



■ **VCGT-AL3**

ISO catalogue number	D	L10	S	Re	D1	HCK10	HWK10	HWK15
VCGT110302AL3	6,35	11,07	3,18	0,2	2,80			2024559
VCGT110304AL3	6,35	11,07	3,18	0,4	2,80			2024561
VCGT160404AL3	9,53	16,61	4,76	0,4	4,40	2022484		2022485
VCGT160408AL3	9,53	16,61	4,76	0,8	4,40	2022487		2022488
VCGT160412AL3	9,53	16,61	4,76	1,2	4,40	2002503		2022489
VCGT220530AL3	12,70	22,14	5,56	3,0	5,50	2002505		2002506



# Ceramic, PcBN, and PCD Inserts

## Advanced Material Inserts

Hard part turning, along with the machining of cast irons, high-temp alloys, and non-ferrous materials, can be accomplished through the use of inserts made from advanced materials. These advanced materials include ceramics, PcBN (polycrystalline cubic boron nitride), and PCD (polycrystalline diamond). WIDIA™ offers:

- Improved performance.
- Greater wear resistance.
- Longer tool life.

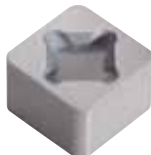
### Ceramic Inserts

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

**CW2015 —  
Mixed Ceramic**



**CW5025 —  
Silicon-Nitride  
Ceramic**

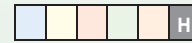


**PcBN**

**Solid Inserts**

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

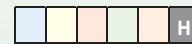
**WBH25P**



**Tipped Inserts**

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

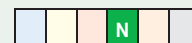
**WBH25P**



**PCD**

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

**WDN25U**





## How Do Catalogue Numbers Work?

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

ISO catalogue number	D	L10	S	R <sub>a</sub>	D1
CCGW21505EC	6,35	6,40	2,38	0,2	2,80
CCGW21505EC	6,35	6,40	2,38	0,2	2,80

CCGW21505EC

C	C	G	W	2																																																																																																																																																																																																																								
Insert Shape	Insert Clearance Angle	Tolerance Class	Insert Features	Size																																																																																																																																																																																																																								
<p><b>H</b> Hexagon 120°</p> <p><b>O</b> Octagon 135°</p> <p><b>P</b> Pentagon 108°</p> <p><b>R</b> Round</p> <p><b>S</b> Square 90°</p> <p><b>T</b> Triangular 60°</p> <p><b>C</b> Rhomboid 80°</p> <p><b>D</b> 55°</p> <p><b>E</b> 75°</p> <p><b>M</b> 86°</p> <p><b>V</b> 35°</p> <p><b>W</b> Trigon 80° with enlarged corner angles</p> <p><b>L</b> Rectangular 90°</p> <p><b>A</b> Parallelogram 85°</p> <p><b>B</b> 82°</p> <p><b>N/K</b> 55°</p>	<p><b>A</b> 3°</p> <p><b>B</b> 5°</p> <p><b>C</b> 7°</p> <p><b>D</b> 15°</p> <p><b>E</b> 20°</p> <p><b>F</b> 25°</p> <p><b>G</b> 30°</p> <p><b>N</b> 0°</p> <p><b>P</b> 11°</p> <p><b>O</b> For other clearance angles requiring descriptions.</p>	<p>Tolerances apply prior to edge prep and coating</p> <p><b>D</b> = Theoretical diameter of the insert inscribed circle  <b>S</b> = Thickness  <b>B</b> = See figures below</p>	<p><b>N</b></p> <p><b>R</b></p> <p><b>F</b></p> <p><b>A</b></p> <p><b>M</b></p> <p><b>G</b></p> <p><b>W</b></p> <p><b>T</b></p> <p><b>Q</b></p> <p><b>U</b></p> <p><b>B</b></p> <p><b>H</b></p> <p><b>C</b></p> <p><b>J</b></p> <p><b>X</b> Special Design  <b>V</b></p>	<p>Code for metric cutting edge length "L10"</p> <table border="1"> <thead> <tr> <th>"D"</th> <th>mm</th> <th>C</th> <th>D</th> <th>R</th> <th>S</th> <th>T</th> <th>V</th> <th>W</th> </tr> </thead> <tbody> <tr> <td>3,97</td> <td>S4</td> <td>04</td> <td>03</td> <td>03</td> <td>06</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>4,76</td> <td>04</td> <td>05</td> <td>04</td> <td>04</td> <td>08</td> <td>08</td> <td>S3</td> <td>—</td> </tr> <tr> <td>5,56</td> <td>05</td> <td>06</td> <td>05</td> <td>05</td> <td>09</td> <td>09</td> <td>03</td> <td>—</td> </tr> <tr> <td>6,00</td> <td>—</td> <td>—</td> <td>06</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>6,35</td> <td>06</td> <td>07</td> <td>06</td> <td>06</td> <td>11</td> <td>11</td> <td>04</td> <td>—</td> </tr> <tr> <td>7,94</td> <td>08</td> <td>09</td> <td>07</td> <td>07</td> <td>13</td> <td>13</td> <td>05</td> <td>—</td> </tr> <tr> <td>8,00</td> <td>—</td> <td>—</td> <td>08</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>9,52</td> <td>09</td> <td>11</td> <td>09</td> <td>09</td> <td>16</td> <td>16</td> <td>06</td> <td>—</td> </tr> <tr> <td>10,00</td> <td>—</td> <td>—</td> <td>10</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>11,11</td> <td>11</td> <td>13</td> <td>11</td> <td>11</td> <td>19</td> <td>19</td> <td>07</td> <td>—</td> </tr> <tr> <td>12,00</td> <td>—</td> <td>—</td> <td>12</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>12,70</td> <td>12</td> <td>15</td> <td>12</td> <td>12</td> <td>22</td> <td>22</td> <td>08</td> <td>—</td> </tr> <tr> <td>14,29</td> <td>14</td> <td>17</td> <td>14</td> <td>14</td> <td>24</td> <td>24</td> <td>09</td> <td>—</td> </tr> <tr> <td>15,88</td> <td>16</td> <td>19</td> <td>15</td> <td>15</td> <td>27</td> <td>27</td> <td>10</td> <td>—</td> </tr> <tr> <td>16,00</td> <td>—</td> <td>—</td> <td>16</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>17,46</td> <td>17</td> <td>21</td> <td>17</td> <td>17</td> <td>30</td> <td>30</td> <td>11</td> <td>—</td> </tr> <tr> <td>19,05</td> <td>19</td> <td>23</td> <td>19</td> <td>19</td> <td>33</td> <td>33</td> <td>13</td> <td>—</td> </tr> <tr> <td>20,00</td> <td>—</td> <td>—</td> <td>20</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>22,22</td> <td>22</td> <td>27</td> <td>22</td> <td>22</td> <td>38</td> <td>38</td> <td>15</td> <td>—</td> </tr> <tr> <td>25,00</td> <td>—</td> <td>—</td> <td>25</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>25,40</td> <td>25</td> <td>31</td> <td>25</td> <td>25</td> <td>44</td> <td>44</td> <td>17</td> <td>—</td> </tr> <tr> <td>31,75</td> <td>32</td> <td>38</td> <td>31</td> <td>31</td> <td>54</td> <td>54</td> <td>21</td> <td>—</td> </tr> <tr> <td>32,00</td> <td>—</td> <td>—</td> <td>32</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	"D"	mm	C	D	R	S	T	V	W	3,97	S4	04	03	03	06	—	—	—	4,76	04	05	04	04	08	08	S3	—	5,56	05	06	05	05	09	09	03	—	6,00	—	—	06	—	—	—	—	—	6,35	06	07	06	06	11	11	04	—	7,94	08	09	07	07	13	13	05	—	8,00	—	—	08	—	—	—	—	—	9,52	09	11	09	09	16	16	06	—	10,00	—	—	10	—	—	—	—	—	11,11	11	13	11	11	19	19	07	—	12,00	—	—	12	—	—	—	—	—	12,70	12	15	12	12	22	22	08	—	14,29	14	17	14	14	24	24	09	—	15,88	16	19	15	15	27	27	10	—	16,00	—	—	16	—	—	—	—	—	17,46	17	21	17	17	30	30	11	—	19,05	19	23	19	19	33	33	13	—	20,00	—	—	20	—	—	—	—	—	22,22	22	27	22	22	38	38	15	—	25,00	—	—	25	—	—	—	—	—	25,40	25	31	25	25	44	44	17	—	31,75	32	38	31	31	54	54	21	—	32,00	—	—	32	—	—	—	—	—
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By referencing this easy-to-use guide, you can identify the correct product to meet your needs.

WIDIA Cubic Boron Nitride and Polycrystalline Diamond Inserts ISO Inserts									
ISO catalogue number	D	L10	S	R <sub>e</sub>	D1	ISO	ISO	ISO	ISO
CCGW21505EC	6,35	6,40	2,38	0,2	2,80				
CCGW21505EC	6,35	6,40	2,38	0,2	2,80				
CCGW21505EC	6,35	6,40	2,38	0,2	2,80				

CCGW21505EC

<b>15</b>	<b>05</b>		<b>E</b>			<b>C</b>																																																																																													
Thickness "S"	Corner Radius "R <sub>e</sub> "	Hand of Insert (optional)	Cutting Edge (optional)	T-Land Width (optional)	T-Land Angle (optional)	Tip Style (optional)	Chipbreaker (optional)																																																																																												
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	Class M Tolerance			Class U Tolerance		Class M Tolerance			Class U Tolerance
	Shapes S, T, C, R, & W	Shape D	Shape V	Shapes S, T, & C		Shapes S, T, C, R, & W	Shape D	Shape V	Shapes S, T, & C
mm	mm	mm	mm	mm	mm	mm	mm	mm	
3,97	0,05	—	—	—	3,97	0,08	—	—	—
4,76	0,05	—	—	0,08	4,76	0,08	—	—	0,13
5,56	0,05	0,05	0,05	0,08	5,56	0,08	0,11	—	0,13
6,35	0,05	0,05	0,05	0,08	6,35	0,08	0,11	—	0,13
7,94	0,05	0,05	0,05	0,08	7,94	0,08	0,11	—	0,13
9,52	0,05	0,05	0,05	0,08	9,52	0,08	0,11	0,18	0,13
11,11	0,08	0,08	0,08	0,13	11,11	0,13	0,15	—	—
12,70	0,08	0,08	0,08	0,13	12,70	0,13	0,15	0,25	0,20
14,29	0,08	0,08	0,08	0,13	14,29	0,13	0,15	—	—
15,88	0,10	0,10	0,10	0,18	15,88	0,15	0,18	—	0,27
17,46	0,10	0,10	0,10	0,18	17,46	0,15	0,18	—	0,27
19,05	0,10	0,10	0,10	0,18	19,05	0,15	0,18	—	0,27
22,22	0,13	—	—	0,25	22,22	0,15	—	—	0,38
25,40	0,13	—	—	0,25	25,40	0,18	—	—	0,38
31,75	0,15	—	—	0,25	31,75	0,20	—	—	0,38

## WBH25P for Enhanced Performance – Five Unique Features

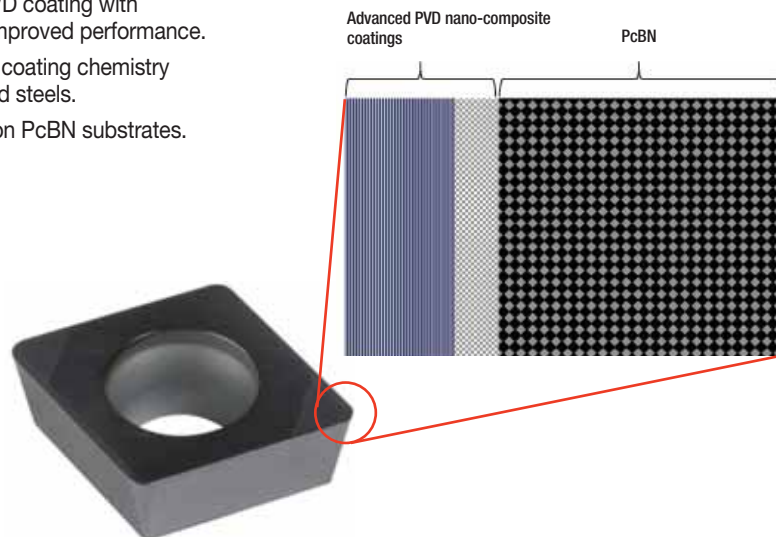
### 1 Newly developed substrate enables application in a wide variety of demanding situations.

The substrate contains superhard grains with a uniquely formulated size distribution and nano-structured binder phase. This unique combination provides an unparalleled balance of wear resistance and toughness. The net result is a robust hard turning tooling solution for a wide range of applications, including continuous to interrupted cutting.



### 2 Nano-composite coating that enhances speed capabilities and tool life.

- Specially developed, advanced PVD coating with nano-composite architecture for improved performance.
- Improved wear resistance by PVD coating chemistry technology for machining hardened steels.
- Enhanced PVD coating adhesion on PcBN substrates.



### 3 Improved edge preparation technology for longer tool life, reliable performance, better surface finish, and tighter workpiece tolerances.

A critical performance factor is the edge preparation itself. The grind direction, surface roughness, hone sizes, and tolerances have great impact on performance and process reliability. WIDIA™ has performed significant research work and optimised edge preparation to improve your overall machining effectiveness.



**Grade Numbering System – Ceramics**

<b>CW</b>	<b>2</b>	<b>0</b>	<b>15</b>
Brand	Cutting Material Group		Application Range
CW = WIDIA™	<p><b>2</b> = CM Mixed (black) ceramic</p> <p><b>3</b> = CR Whisker reinforced ceramic</p> <p><b>5</b> = CN Silicon nitride ceramic</p>	<p><b>0</b> = Stationary cutting edges (turning, parting, threading)</p> <p><b>1</b> = First successor</p> <p><b>2</b> = Semi-standard rotating cutting edges</p> <p><b>3</b> = Semi-standard general applications</p> <p><b>5</b> = Rotating cutting edges (milling, drilling, reaming)</p>	<p><b>05</b> = fine finishing</p> <p><b>10</b> = finishing</p> <p><b>15</b> = } medium to roughing</p> <p><b>20</b> = }</p> <p><b>25</b> = }</p> <p><b>30</b> = } roughing</p> <p><b>35</b> = }</p> <p><b>40</b> = }</p> <p><b>45</b> = } heaviest roughing</p> <p><b>50</b> = }</p>



Grade Numbering System – PcBN and PCD

<b>W</b>	<b>B</b>	<b>H</b>	<b>30</b>	<b>P</b>
Brand	Cutting Material Group	Material Range	Application Range	Coating
WIDIA™	<p><b>B</b> = CBN</p> <p><b>D</b> = PCD</p>		<p>05 = fine finishing</p> <p>10 = finishing</p> <p>15 = } medium to roughing</p> <p>20 = }</p> <p>25 = }</p> <p>30 = } roughing</p> <p>35 = }</p> <p>40 = }</p> <p>45 = } heaviest roughing</p> <p>50 = }</p>	<p><b>U</b> = Uncoated</p> <p><b>C</b> = CVD Coated</p> <p><b>P</b> = PVD Coated</p>

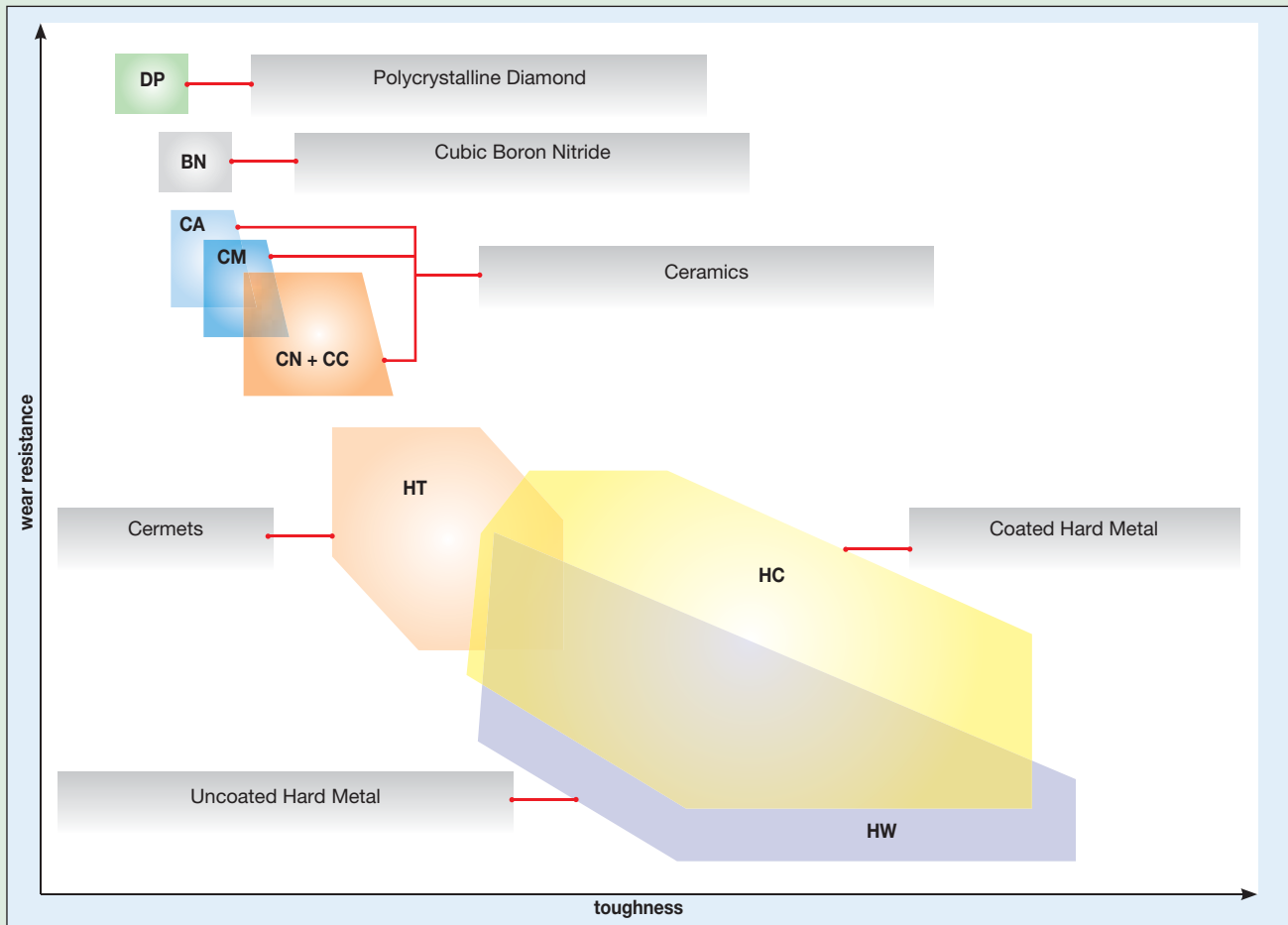
  

<b>P</b>	Steel
<b>M</b>	Stainless Steel
<b>K</b>	Cast Iron
<b>N</b>	Non-Ferrous
<b>S</b>	High-Temp Alloys
<b>H</b>	Hardened Materials
<b>U</b>	Universal Machining



The cutting tool materials are classified by the combination of their hardness and wear resistance characteristics.

The extended standard DIN ISO 513 also includes ceramic cutting materials and the superhard polycrystalline materials, boron nitride and diamond, resulting in additional identification symbols for these cutting material groups.



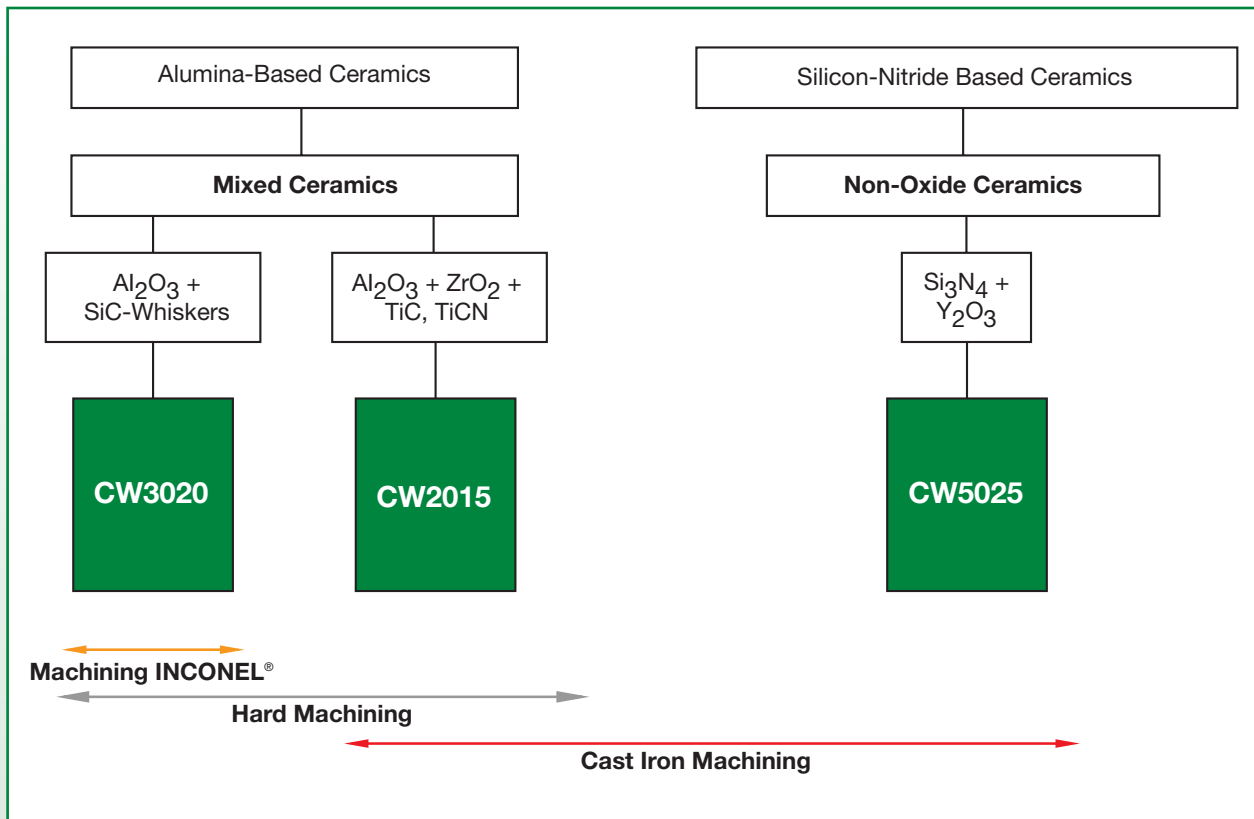
main group	sub-group (symbol)	feature
hard metal	HW	Uncoated WC-base hard metal
	HT	Uncoated TIC/TIN-base hard metal (cermets)
	HC	Coated hard metal
ceramics	CA	Al <sub>2</sub> O <sub>3</sub> -base oxide ceramics
	CM	Composite ceramics Al <sub>2</sub> O <sub>3</sub> + metal carbide
	CN	Si <sub>3</sub> N <sub>4</sub> -base nitride ceramics
	CC	Coated ceramics
cubic boron nitride	BL	Cubic boron nitride (CBN) with low CBN content
	BH	Cubic boron nitride (CBN) with high CBN content
diamond	DP	Polycrystalline diamond (PCD)

**Ceramic Inserts for Hard Turning, Turning in Cast Iron Materials, and Turning in High-Temp Alloys**



- Ceramics offer greater wear resistance and toughness.
- Ceramics can be used in high-speed, continuous, and lightly interrupted turning applications in cast iron materials.
- Ceramics can be used for high-speed applications in high-temp alloys.

**Ceramic Turning Grades**



**CW2015™**

- Alumina and titanium carbo-nitride.
- High hardness and wear resistance.
- TiCN increases strength and hardness.
- Black in colour.

**CW3020™**

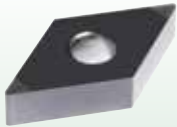
- Alumina + SiC whisker.
- High hardness and wear resistance.
- Whisker ceramic with elongated crystals and very high strength.
- Grey-green colour.

**CW5025™**

- Pure silicon-nitride composition.
- Used in high-speed turning applications.
- Designed for use in grey cast iron and lower tensile ductile irons.

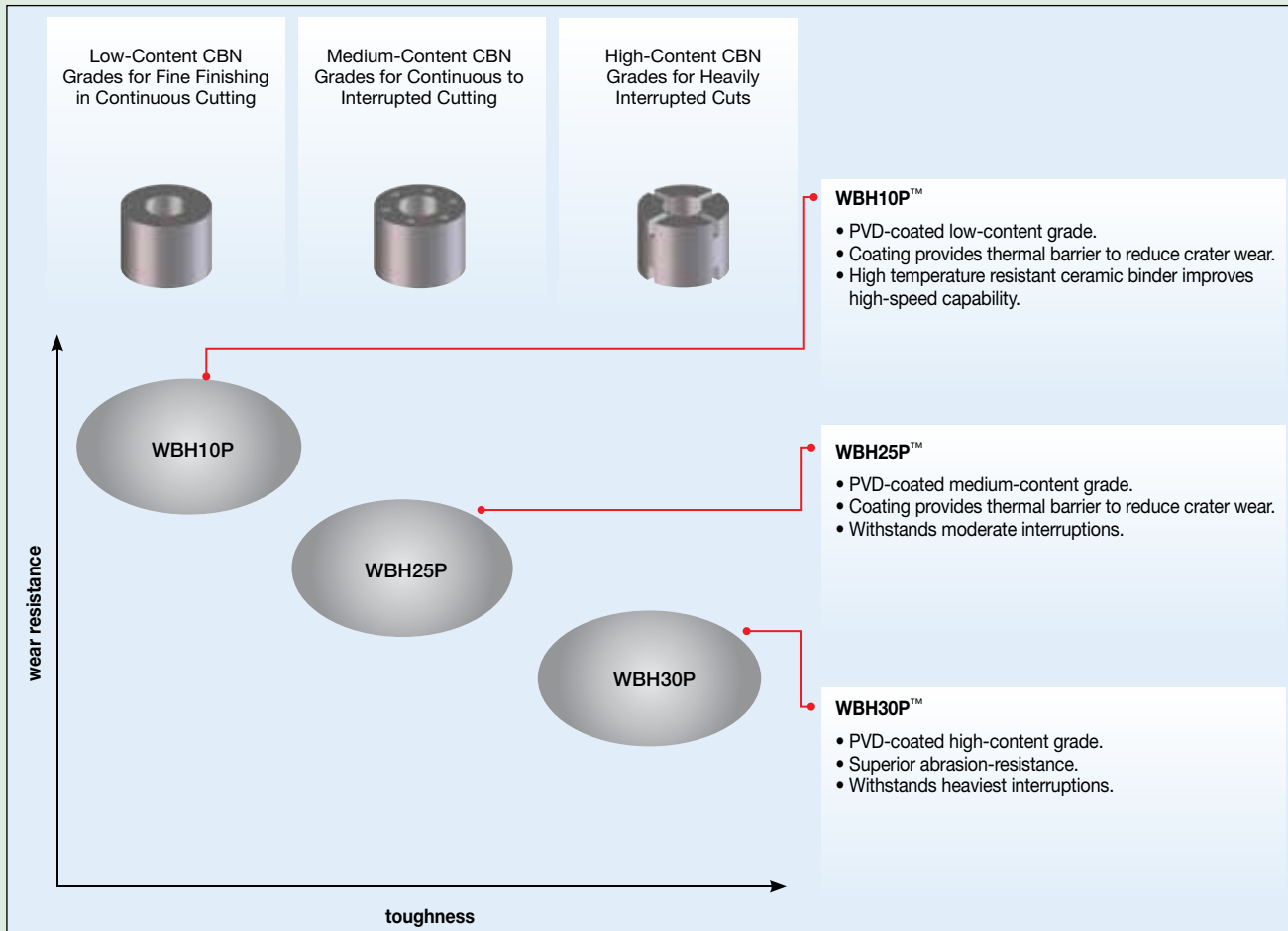


### PcBN Grades for Hard Turning, Powder Metal, and Grey Cast Iron Machining

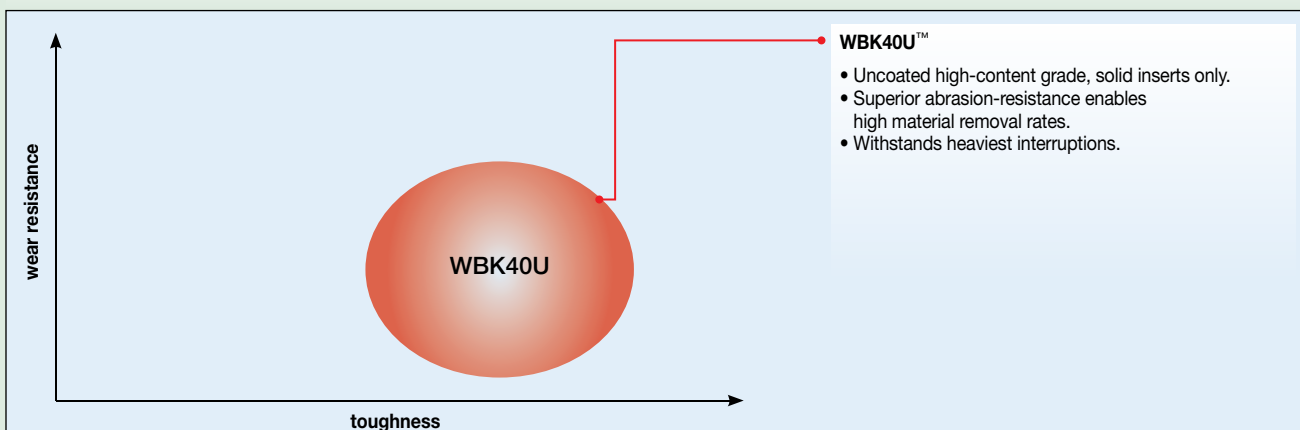


- PVD-coated grades available.
- Complete range of CBN grades for continuous to heavily interrupted turning.
- Industry-leading grades for grey cast iron machining.
- Full line of grades for hard turning.
- For best performance: solid, full-top, and tipped inserts are available.

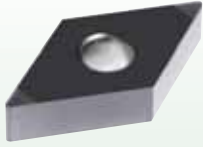
#### Hard Turning Grades



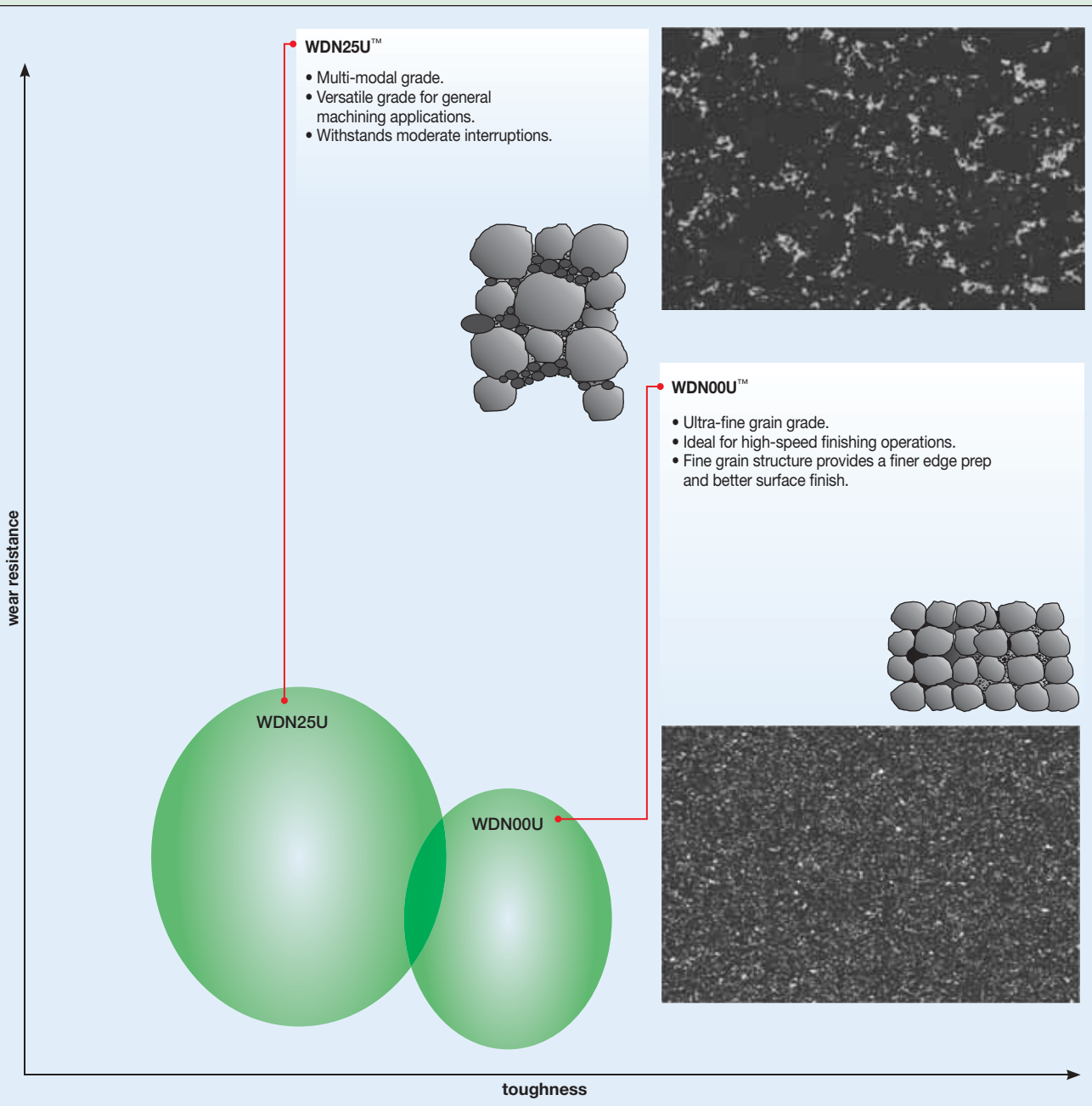
#### Grey Cast Iron Grades



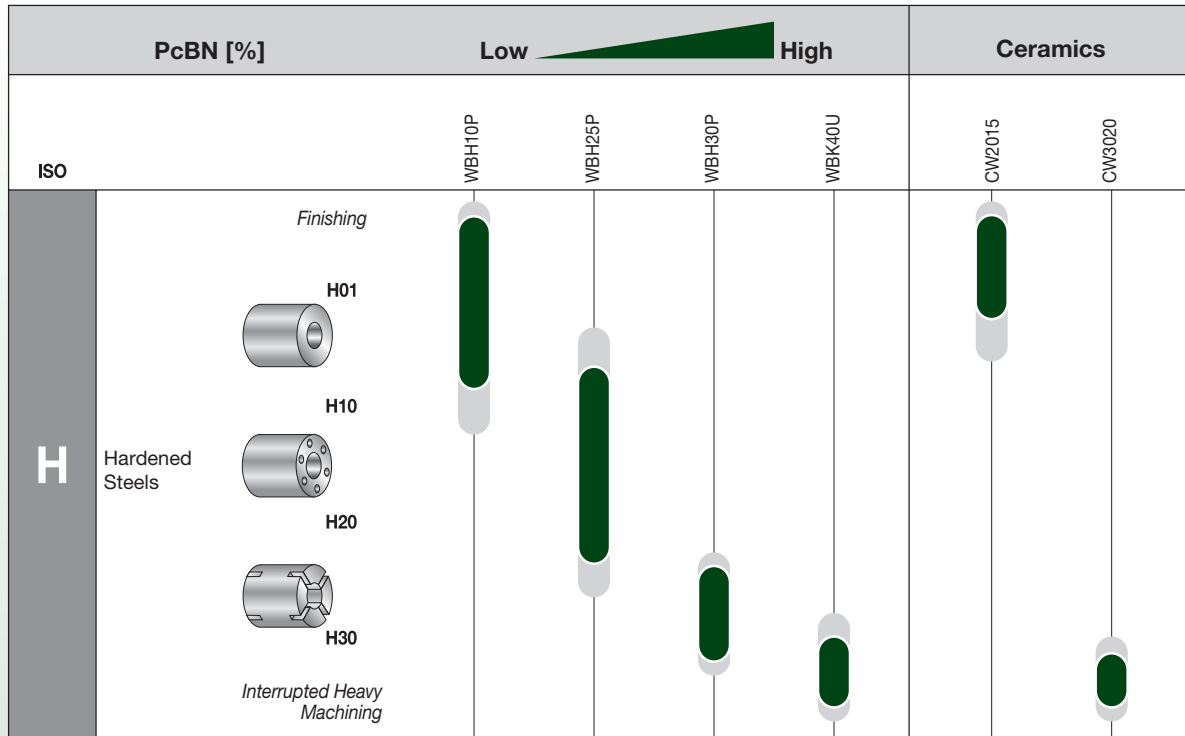
**PCD Grades for Turning Non-Ferrous Materials**



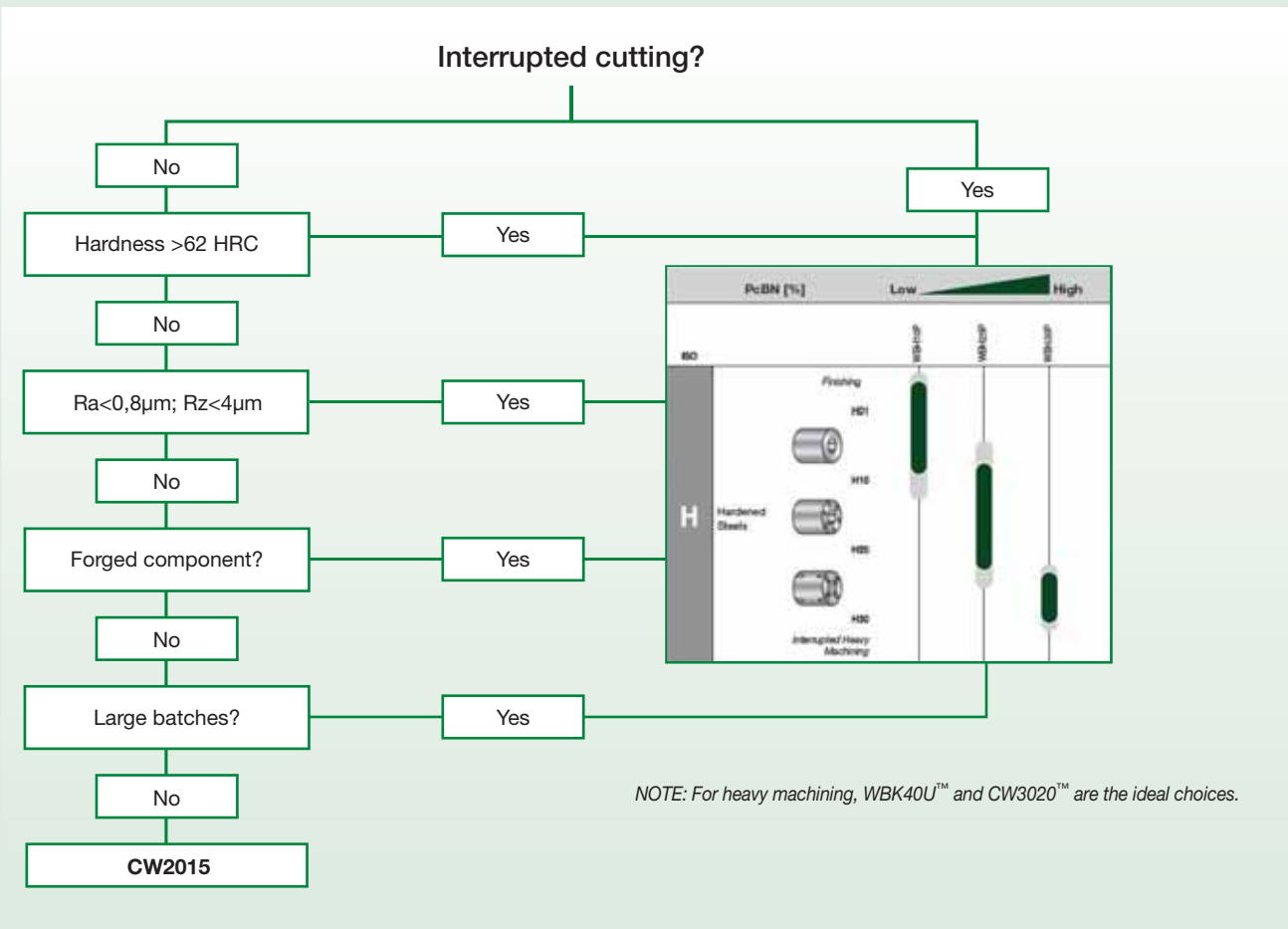
- Two PCD grades — WDN25U and WDN00U — cover a wide range of applications.
- New grades provide outstanding performance to increase productivity and cut manufacturing costs.
- High abrasion and chipping resistance.
- Used in machining aluminium alloys with low- and high-silicon content, copper alloys, ceramics, and plastics.
- Suitable for machining highly abrasive materials such as titanium and Metal Matrix Composites (MMC).



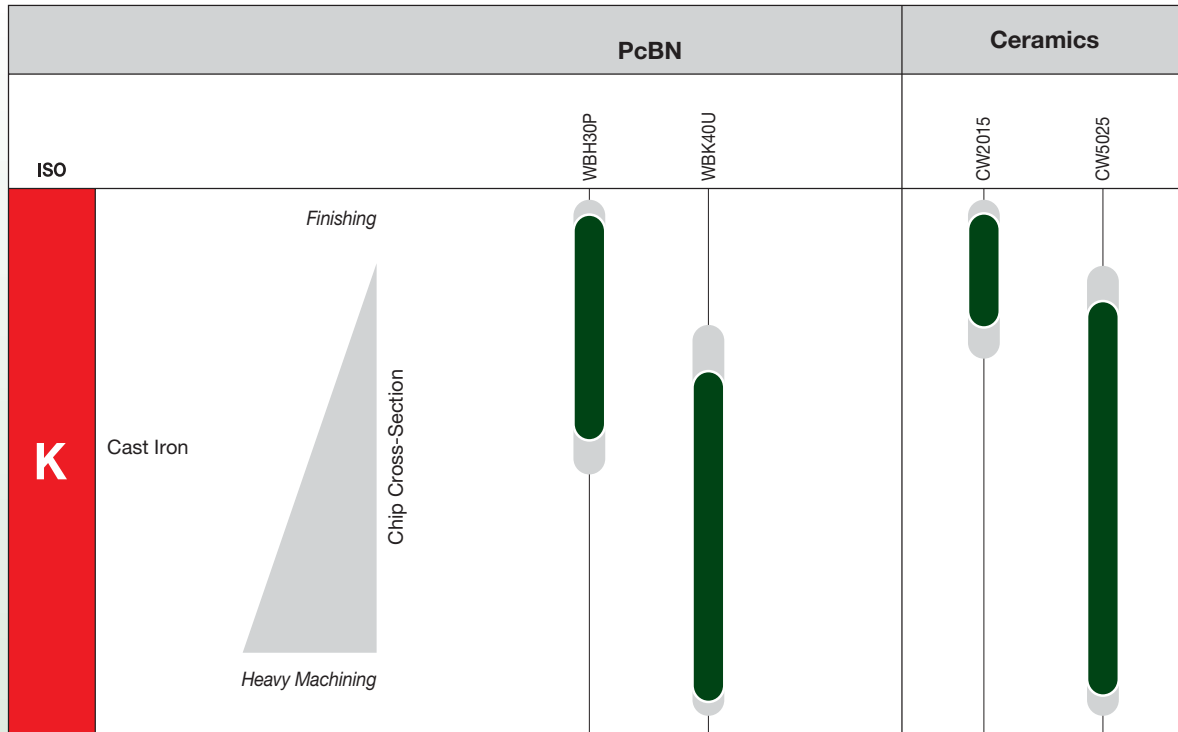
Advanced Materials for Hard Turning



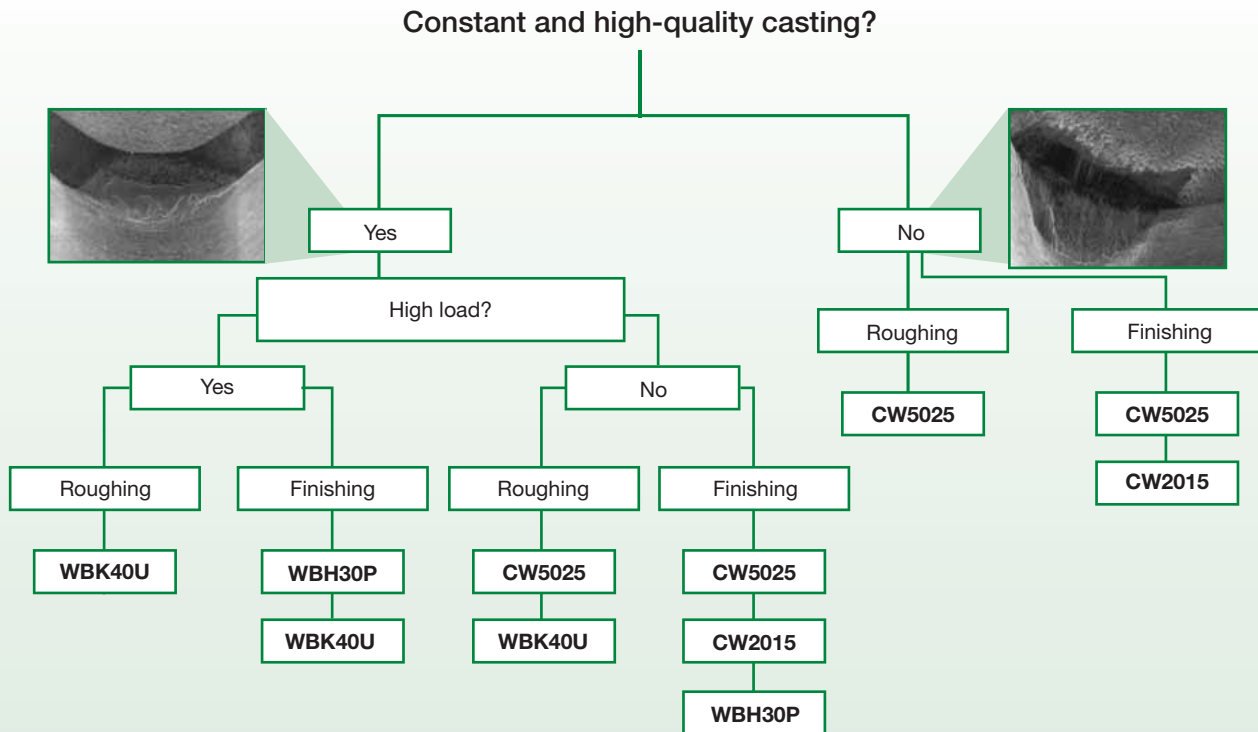
Hard Turning Grade Selection



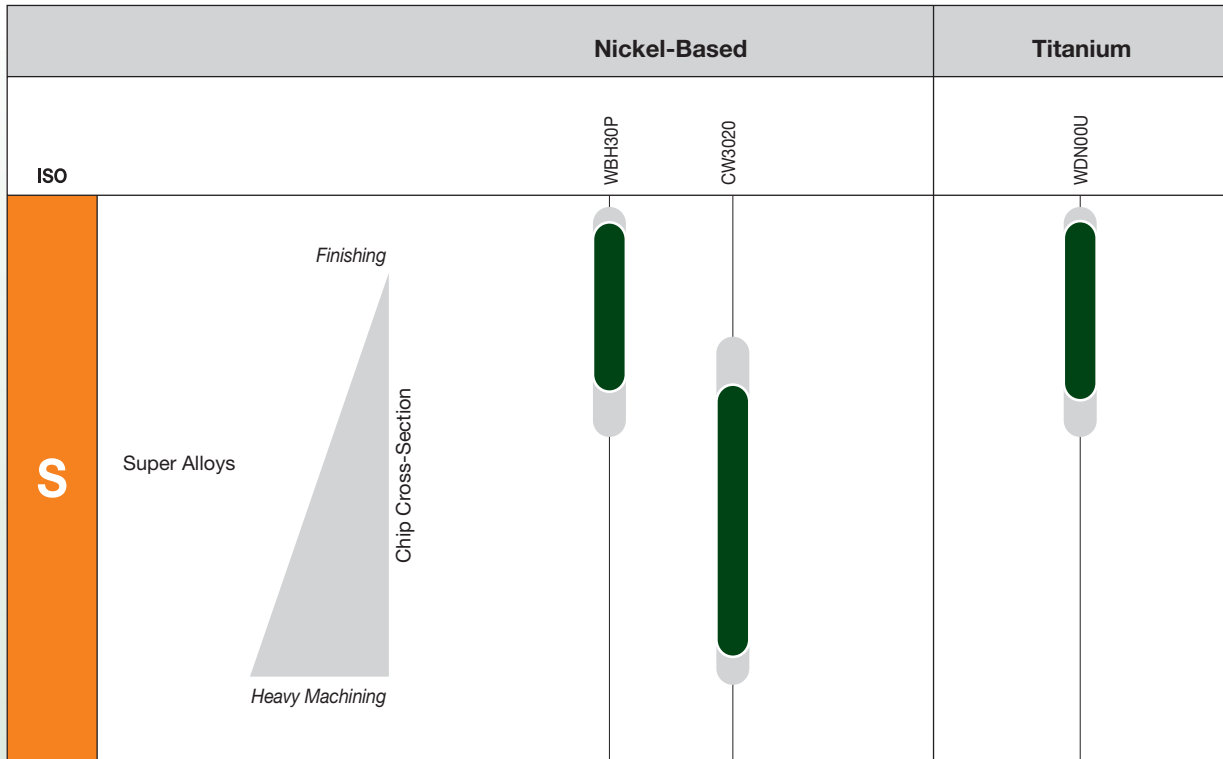
Advanced Materials for Cast Iron Machining



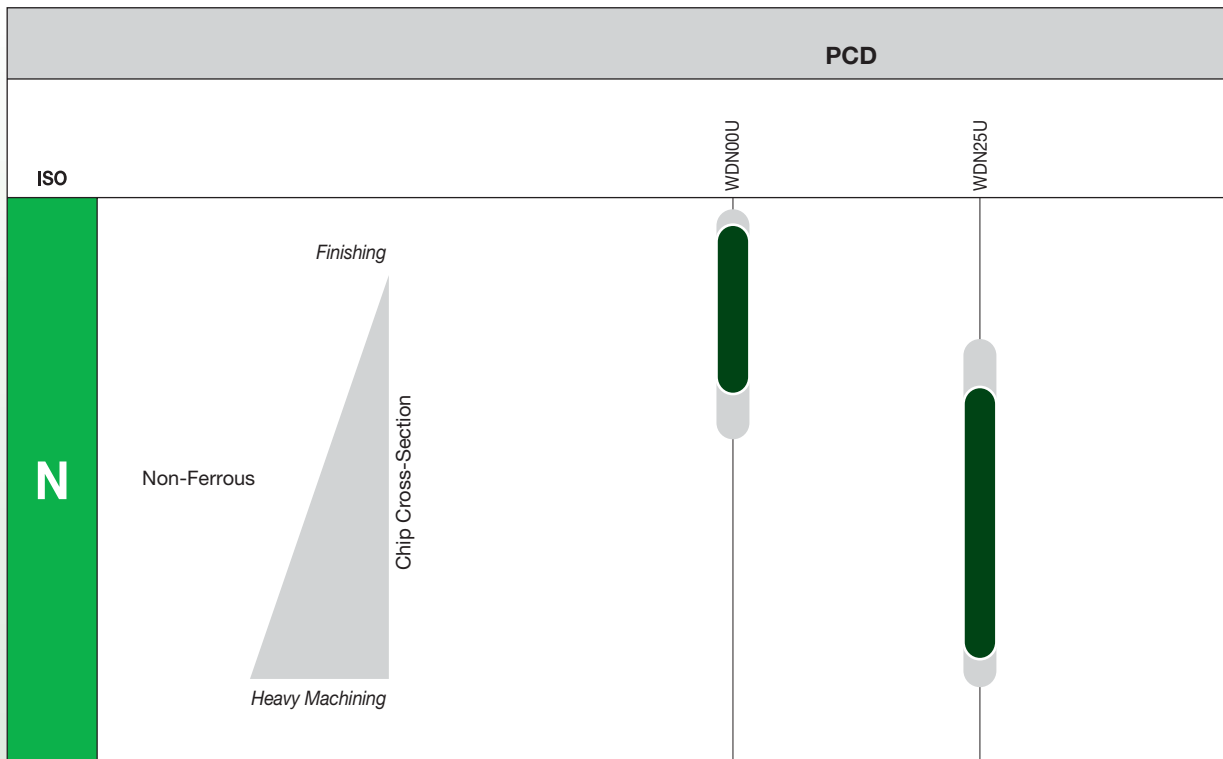
Cast Iron Machining Grade Selection

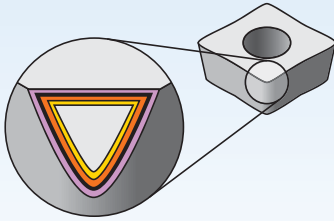


Advanced Materials for High-Temperature Machining



Advanced Materials for Non-Ferrous Machining

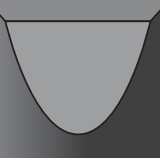
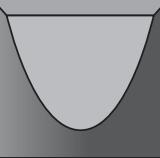
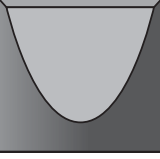
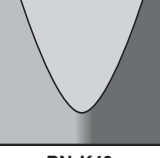
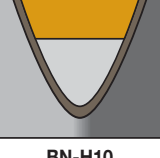


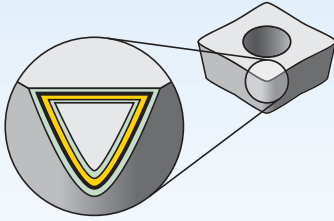


Reduce cycle times. High speed and feed capability. Long tool life. New multi-layer coating provides better wear resistance.

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

wear resistance ← → toughness

Grade	Coating	Grade Description	Material																		
			05	10	15	20	25	30	35	40	45										
CW2015		Mixed (black) ceramic. Matrix Al <sub>2</sub> O <sub>3</sub> and TiCN. Good toughness properties combined with good wear resistance. Semi-finishing and finishing. For hardened iron base materials and grey cast iron (finishing).																			
	<b>CM-H10</b>																				
CW5025		Silicon-nitride ceramic. Extraordinary toughness properties. Roughing, also in heavily interrupted cuts. Capable of high-performance turning. To be used with or without coolant. For grey cast iron.																			
	<b>CN-K15</b>																				
CW3020		Whisker ceramic with a matrix of Al <sub>2</sub> O <sub>3</sub> + SiCw. The SiC whiskers embedded in the micro-structure give this ceramic excellent toughness for cutting high-temp alloys and cast materials with high Brinell hardness.																			
	<b>C4</b>																				
WBK40U		A high CBN content, solid CBN insert with multiple cutting edges. Applied in roughing to finishing of fully pearlitic grey cast iron, chilled irons, high-chrome alloyed steels, sintered powdered metals, and heavy cuts in hardened steels (>45 HRC). Use for finishing chilled and fully pearlitic cast iron. Solid inserts offer better security and shock-resistance than tipped inserts, while also enabling deeper depth-of-cut capability.																			
	<b>BN-K40</b>																				
WBH10P		A low content CBN grade with a PVD-TiAlN coating for added wear resistance. Designed for precision machining of hardened steels (>45 HRC); the harder the steel the better. PVD coating offers improved wear resistance and excellent surface finish capability. Effectively applied on bearing steels, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburised and nitrided irons, and some hard coatings.																			
	<b>BN-H10</b>																				



Reduce cycle times. High speed and feed capability. Long tool life. New multi-layer coating provides better wear resistance.

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

wear resistance ← → toughness

Grade	Coating		Grade Description	Material Group																
	Coating	Substrate		05	10	15	20	25	30	35	40	45								
WBH25P		BN-H25	A PVD-TiAlN coating over a low content, CBN tip brazed onto a carbide insert. Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburised and nitrided irons, and some hard coatings.																	
WBH30P		BN-H30	A PVD-TiAlN coating over a low content, CBN tip brazed onto a carbide insert. Designed for roughing to finishing in interrupted cuts on hardened steels (>45 HRC). Applied on grey cast iron, chilled irons, high-chrome alloyed steels, high-temp alloys, and sintered powdered metals.																	
WDN00U*		DP-N10	An ultra-fine grained polycrystalline diamond (PCD) tip brazed onto a carbide substrate. Designed for general purpose turning of primarily non-ferrous materials. Applied over a wide range of continuous to interrupted cuts where superior surface finish is needed. Use on low- to medium-silicon content aluminium alloys, non-metallics, copper, brass, and zinc-based alloys. The ultra-fine grained diamond particle size enables superior surface finishes while ensuring the best mechanical shock resistance of any PCD cutting tool.																	
WDN25U		DP-N25	A multi-modal PCD grade with a range of grain sizes brazed onto a carbide substrate. Engineered for extreme abrasion resistance and good edge strength for demanding applications. An ideal choice for high-silicon aluminium alloys, bi-metallic (AL/GCI) materials, MMC, carbon-fibre reinforced plastics, and other abrasive non-metallic materials.																	

\*Grade available as Custom Solution only.

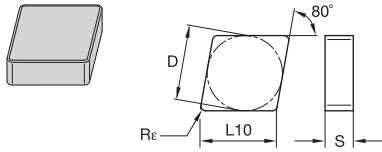
Material Group		Cutting Speed – vc m/min								
		CW2015			CW3020			CW5025		
		min	Start	max	min	Start	max	min	Start	max
ap [mm]		0,5		4,0	0,5		4,0	1,0		8,0
f [mm/rev]		0,2		0,4	0,1		5,0	0,2		0,6
P	0	-	-	-	-	-	-	-	-	-
	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-
M	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
K	1	250	<b>475</b>	725	-	-	-	250	<b>760</b>	1000
	2	300	<b>550</b>	800	-	-	-	275	<b>365</b>	490
	3	250	<b>400</b>	600	-	-	-	275	<b>335</b>	440
N	1	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-
S	1	-	-	-	170	<b>200</b>	375	-	-	-
	2	-	-	-	170	<b>200</b>	375	-	-	-
	3	-	-	-	190	<b>250</b>	375	-	-	-
	4	-	-	-	-	-	-	-	-	-
H	1	60	<b>100</b>	140	45	<b>85</b>	125	-	-	-
	2	60	<b>100</b>	140	45	<b>85</b>	125	-	-	-
	3	60	<b>100</b>	140	45	<b>85</b>	125	-	-	-
	4	60	<b>100</b>	140	45	<b>85</b>	125	-	-	-

Inserts



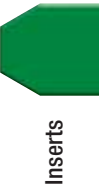
Inserts

Material Group		Cutting Speed – vc m/min																	
		WBH10P			WBH25P			WBH30P			WBK40U			WDN00U			WDN25U		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
ap [mm]		0,10	0,50		0,10	0,50		0,08	0,40		0,10	1,50		0,20	2,00		0,20	2,00	
f [mm/rev]		0,06	0,25		0,05	0,20		0,05	0,20		0,08	0,20		0,10	0,30		0,10	0,25	
P	0/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K	1	-	-	-	-	-	-	400	600	800	650	800	1200	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	1	-	-	-	-	-	-	-	-	-	-	-	-	500	765	2500	500	765	2500
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	350	580	1000
	3	-	-	-	-	-	-	-	-	-	-	-	-	250	520	1000	250	520	1000
	4	-	-	-	-	-	-	-	-	-	-	-	-	250	400	750	250	400	750
	5	-	-	-	-	-	-	-	-	-	-	-	-	550	760	1000	550	760	1000
	6	-	-	-	-	-	-	-	-	-	-	-	-	400	460	850	400	365	750
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	120	160	200	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	120	160	200	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	120	160	200	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	100	180	320	-	-	-
H	1	80	170	260	80	160	230	60	120	220	60	120	220	-	-	-	-	-	-
	2	80	170	260	80	160	230	60	120	220	60	120	220	-	-	-	-	-	-
	3	80	170	260	80	160	230	60	120	220	60	120	220	-	-	-	-	-	-
	4	80	170	260	80	160	230	60	120	220	60	120	220	-	-	-	-	-	-



● first choice  
○ alternate choice

P			
M			
K		●	●
N			
S		●	
H		●	

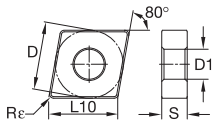
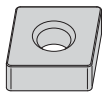


■ CNGN/CNG

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGN120404T02020	12,70	12,90	4,76	0,4	—	2952551	—	—
CNGN120408T01020	12,70	12,90	4,76	0,8	—	—	3869578	—
CNGN120408T02020	12,70	12,90	4,76	0,8	—	2952552	—	2952082
CNGN120412T01020	12,70	12,90	4,76	1,2	—	—	3869579	—
CNGN120412T02020	12,70	12,90	4,76	1,2	—	2952603	—	2952113
CNGN120416T01020	12,70	12,90	4,76	1,6	—	—	3869580	—
CNGN120416T02020	12,70	12,90	4,76	1,6	—	2952604	—	2952114
CNGN120712T01020	12,70	12,90	7,94	1,2	—	—	3869581	—
CNGN120712T02020	12,70	12,90	7,94	1,2	—	2952605	—	2952115
CNGN120716T01020	12,70	12,90	7,94	1,6	—	—	3869582	—



Inserts

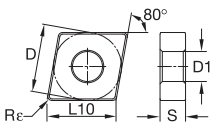
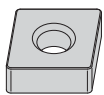


- first choice
- alternate choice

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

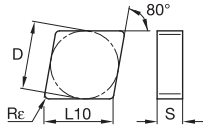
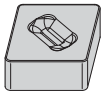
■ CNGA

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGA120404T02020	12,70	12,90	4,76	0,4	5,16	2952526		
CNGA120408T02020	12,70	12,90	4,76	0,8	5,16	2952527		2952159
CNGA120412T02020	12,70	12,90	4,76	1,2	5,16	2952528		2952161
CNGA120416T02020	12,70	12,90	4,76	1,6	5,16			2952173
CNGA160612T02020	15,88	16,12	6,35	1,2	6,35	2952529		2952174
CNGA160616T02020	15,88	16,12	6,35	1,6	6,35			2952175
CNGA190612T02020	19,05	19,34	6,35	1,2	7,93	2952530		2952176
CNGA190616T02020	19,05	19,34	6,35	1,6	7,93	2952531		



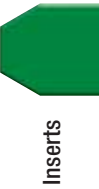
■ CNGA-FW

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGA120408T01020FW	12,70	12,90	4,76	0,8	5,16			2952158
CNGA120412T01020FW	12,70	12,90	4,76	1,2	5,16			2952160
CNGA120416T01020FW	12,70	12,90	4,76	1,6	5,16			2952162



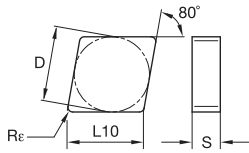
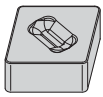
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■ **CNGX**

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGX120708T02020	12,70	12,90	7,94	0,8	—			2952117
CNGX120712T02020	12,70	12,90	7,94	1,2	—			2952119
CNGX160716T02020	15,88	16,12	7,94	1,6	—			2952121

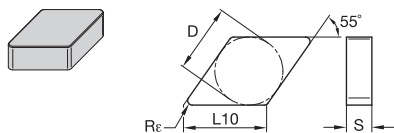


■ **CNGX-FW**

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGX120712T01020FW	12,70	12,90	7,94	1,2	—			2952118



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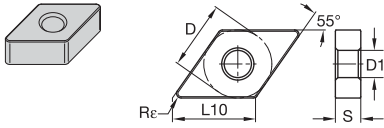


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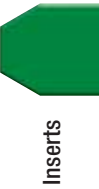
■ DNGN/DNG

ISO catalogue number	D	L10	S	Re	D1	CW2015	CW3020	CW5025
DNGN150704T02020	12,70	15,50	7,94	0,4	—	2952607	—	—
DNGN150708T01020	12,70	15,50	7,94	0,8	—	—	3869743	—
DNGN150708T02020	12,70	15,50	7,94	0,8	—	2952608	—	—
DNGN150712T02020	12,70	15,50	7,94	1,2	—	2952609	—	—
DNGN150716T01020	12,70	15,50	7,94	1,6	—	—	3869745	—



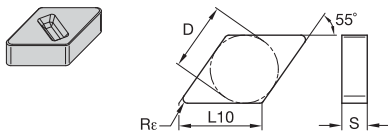
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■ **DNGA**

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
DNGA150404T02020	12,70	15,50	4,76	0,4	5,16	2952532	●	●
DNGA150408T02020	12,70	15,50	4,76	0,8	5,16	2952533	●	●
DNGA150412T02020	12,70	15,50	4,76	1,2	5,16	2952534	●	2952184
DNGA150604T02020	12,70	15,50	6,35	0,4	5,16	2952535	●	●
DNGA150608T02020	12,70	15,50	6,35	0,8	5,16	2952536	●	●
DNGA150612T02020	12,70	15,50	6,35	1,2	5,16	2952537	●	2952185

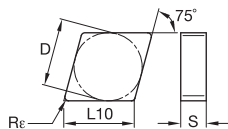


■ **DNGX**

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
DNGX120712T02020	10,00	12,21	7,94	1,2	—	●	●	2952124
DNGX120716T02020	10,00	12,21	7,94	1,6	—	●	●	2952125
DNGX150708T02020	12,70	15,50	7,94	0,8	—	●	●	2952126
DNGX150712T02020	12,70	15,50	7,94	1,2	—	●	●	2952127
DNGX150716T02020	12,70	15,50	7,94	1,6	—	●	●	2952128



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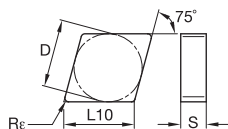
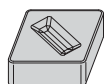


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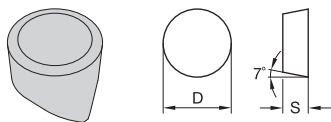
■ ENGN/ENG

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
ENGN130704T02020	12,70	13,15	7,94	0,4	—	2952611		
ENGN130708T02020	12,70	13,15	7,94	0,8	—	2952612		
ENGN130712T02020	12,70	13,15	7,94	1,2	—	2952613		
ENGN130716T02020	12,70	13,15	7,94	1,6	—	2952614		



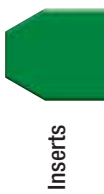
■ ENGX

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
ENGX130716T02020	12,70	13,15	7,94	1,6	—			2952130



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■ RCGX/RCGV

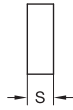
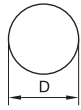
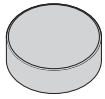
ISO catalogue number	D	S	CW2015	CW3020	CW5025
RCGX060400T01020	6,35	4,76	-	3869746	-
RCGX090700T02020	9,53	7,92	2952694	-	-
RCGX090700T07015	9,53	7,92	2952695	-	-
RCGX090700T01020	9,53	7,94	2952693	3869747	-
RCGX120700T01020	12,70	7,92	-	3869748	-
RCGX120700T02020	12,70	7,92	2952697	-	-
RCGX120700T20015	12,70	7,92	2952698	-	-







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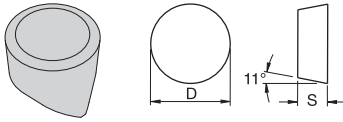


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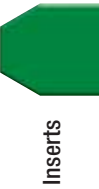
■ RNGN/RNG

ISO catalogue number	D	S	CW2015	CW3020	CW5025
RNGN090300T01020	9,53	3,18	-	3869749	-
RNGN090400T02020	9,53	4,76	2952615	-	-
RNGN120400T01020	12,70	4,76	-	3869750	-
RNGN120400T02020	12,70	4,76	2952616	-	2952131
RNGN120700T01020	12,70	7,94	-	3869751	-
RNGN120700T02020	12,70	7,94	2952617	-	-
RNGN120700T10015	12,70	7,94	2952618	-	-
RNGN120700T20015	12,70	7,94	2952619	-	-
RNGN150700T02020	15,88	7,94	2952620	-	2952133



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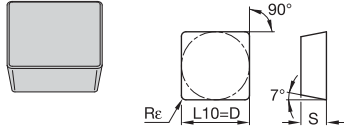


■ **RPGV**

ISO catalogue number	D	S	CW2015	CW3020	CW5025
RPGX060400T01020	6,35	4,78	-	3869753	-
RPGX090700T01020	9,53	7,92	-	3869754	-
RPGX120700T01020	12,70	7,94	-	3869755	-



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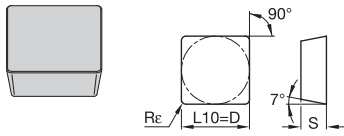


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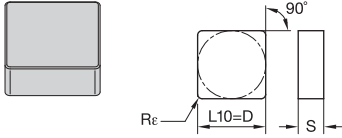
■ SCGN/SCG

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SCGN090412T00520	9,53	9,53	4,76	1,2	—	I	I	2952147



■ SCUN/SCU

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SCUN120412T00520	12,70	12,70	4,76	1,2	—	2952699	I	I



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■ SNGN/SNG

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SNGN090308T02020	9,53	9,53	3,18	0,8	—	2952748	2952748	2952748
SNGN090412T00515	9,53	9,53	4,76	1,2	—	2952749	2952749	2952749
SNGN120408T00520	12,70	12,70	4,76	0,8	—	2952750	2952750	2952750
SNGN120408T02020	12,70	12,70	4,76	0,8	—	2952751	2952751	2952135
SNGN120412T01020	12,70	12,70	4,76	1,2	—	—	3869756	—
SNGN120412T02020	12,70	12,70	4,76	1,2	—	2952752	2952752	2952136
SNGN120416T01020	12,70	12,70	4,76	1,6	—	—	3869757	—
SNGN120416T02020	12,70	12,70	4,76	1,6	—	—	—	2952137
SNGN120704T02020	12,70	12,70	7,94	0,4	—	2952824	2952824	2952824
SNGN120708T02020	12,70	12,70	7,94	0,8	—	2952825	2952825	2952825
SNGN120712T00520	12,70	12,70	7,94	1,2	—	2953339	2953339	2953339
SNGN120712T01020	12,70	12,70	7,94	1,2	—	—	3869758	—

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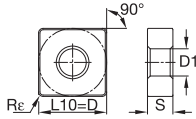
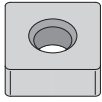
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ISO catalogue number	D	L10	S	R <sub>e</sub>	D1	CW2015	CW3020	CW5025
SNGN120712T02020	12,70	12,70	7,94	1,2	—	2952826	—	2952138
SNGN120716T00520	12,70	12,70	7,94	1,6	—	2953340	—	—
SNGN120716T01020	12,70	12,70	7,94	1,6	—	—	3869759	—
SNGN120716T02020	12,70	12,70	7,94	1,6	—	—	—	2952139
SNGN120720T02020	12,70	12,70	7,94	2,0	—	2952828	—	—
SNGN120720T10015	12,70	12,70	7,94	2,0	—	2952829	—	—
SNGN150712T02020	15,88	15,88	7,94	1,2	—	2952830	—	—
SNGN150716T02020	15,88	15,88	7,94	1,6	—	2952831	—	—
SNGN190720K20015	19,05	19,05	7,94	2,0	—	2952832	—	—
SNGN190720T20015	19,05	19,05	7,94	2,0	—	2952833	—	—



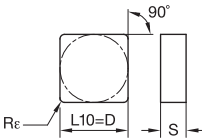
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■ SNGA

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SNGA120408T02020	12,70	12,70	4,76	0,8	5,16	2952538	2952538	2952187
SNGA120412T02020	12,70	12,70	4,76	1,2	5,16	2952539	2952188	2952188
SNGA120416T02020	12,70	12,70	4,76	1,6	5,16	2952540	2952189	2952189
SNGA150612T02020	15,88	15,88	6,35	1,2	6,35	2952190	2952190	2952190
SNGA150616T02020	15,88	15,88	6,35	1,6	6,35	2952191	2952191	2952191

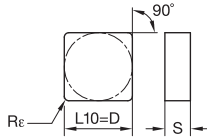


■ SNGX

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SNGX120708T02020	12,70	12,70	7,94	0,8	—	2952140	2952140	2952140
SNGX150716T02020	15,88	15,88	7,94	1,6	—	2952144	2952144	2952144



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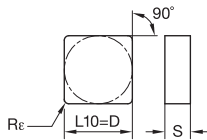
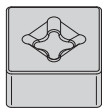


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■ SNGX-FW

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SNGX120712T01020FW	12,70	12,70	7,94	1,2	—			2952141



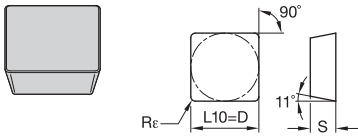
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ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SNMX120712T02020	12,70	12,70	7,94	1,2	—			2952069
SNMX120716T02020	12,70	12,70	7,94	1,6	—			2952070
SNMX150716T02020	15,88	15,88	7,94	1,6	—			2952071



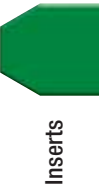
■ SPGN-T/SPG-T

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SPGN090308T01020	9,53	9,53	3,18	0,8	—	2952700		
SPGN120304T01020	12,70	12,70	3,18	0,4	—	2952701		
SPGN120308T01020	12,70	12,70	3,18	0,8	—	2952702		



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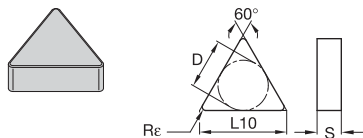
■ SPUN-T

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
SPUN120304T00520	12,70	12,70	3,18	0,4	—	2952703		
SPUN120308T00520	12,70	12,70	3,18	0,8	—	2952704		
SPUN120312T00520	12,70	12,70	3,18	1,2	—	2952705		





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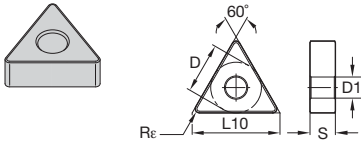


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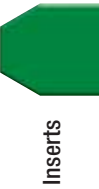
■ TNGN/TNG

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
TNGN160404T02020	9,53	16,50	4,76	0,4	—	2952835		
TNGN160408T01020	9,53	16,50	4,76	0,8	—		3869761	
TNGN160408T02020	9,53	16,50	4,76	0,8	—	2952836		2952072
TNGN160412T02020	9,53	16,50	4,76	1,2	—	2952837		2952153
TNGN160416T02020	9,53	16,50	4,76	1,6	—	2952838		
TNGN160708T02020	9,53	16,50	7,94	0,8	—	2952839		
TNGN160712T02020	9,53	16,50	7,94	1,2	—	2952840		
TNGN220408T02020	12,70	22,00	4,76	0,8	—	2952841		
TNGN220416T02020	12,70	22,00	4,76	1,6	—			2952154



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N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

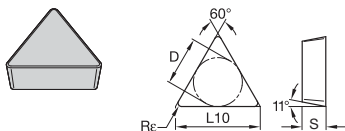


■ **TNGA**

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
TNGA160408T02020	9,53	16,50	4,76	0,8	3,81	2952541	2952542	2952195
TNGA160412T02020	9,53	16,50	4,76	1,2	3,81	2952542	2952196	2952197
TNGA160416T02020	9,53	16,50	4,76	1,6	3,81	2952543	2952197	
TNGA220408T02020	12,70	22,00	4,76	0,8	5,16	2952544		



Inserts

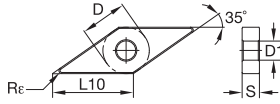
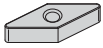


● first choice  
○ alternate choice

P			
M			
K	●		●
N			
S		●	
H	●		

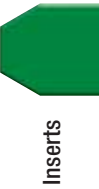
■ TPG

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
TPGN110304T01020	6,35	11,00	3,18	0,4	—	2952706		
TPGN110308T01020	6,35	11,00	3,18	0,8	—	2952707		
TPGN110312T01020	6,35	11,00	3,18	1,2	—	2952708		
TPGN160304T00520	9,53	16,50	3,18	0,4	—	2952709		
TPGN160304T01020	9,53	16,50	3,18	0,4	—	2952710		
TPGN160308T00520	9,53	16,50	3,18	0,8	—	2952711		
TPGN160308T01020	9,53	16,50	3,18	0,8	—	2952712		
TPGN160308T02020	9,53	16,50	3,18	0,8	—	-		2952155
TPGN160312T01020	9,53	16,50	3,18	1,2	—	2952713		
TPGN160312T02020	9,53	16,50	3,18	1,2	—	-		2952156



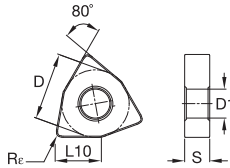
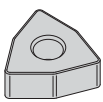
● first choice  
○ alternate choice

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



■ **VNGA**

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
VNGA160404T02020	9,53	16,61	4,76	0,4	3,81	2952545	■	■
VNGA160408T02020	9,53	16,61	4,76	0,8	3,81	2952546	■	2952198
VNGA160412T02020	9,53	16,61	4,76	1,2	3,81	2952547	■	■
VNGA220408T02020	12,70	22,14	4,76	0,8	5,16	2952548	■	■

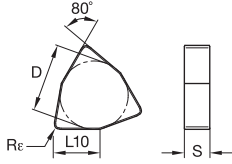


■ **WNGA**

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
WNGA080408T02020	12,70	8,69	4,76	0,8	5,16	■	■	2952199
WNGA080412T02020	12,70	8,69	4,76	1,2	5,16	■	■	2952200
WNGA080416T02020	12,70	8,69	4,76	1,6	5,16	■	■	2952201



Inserts

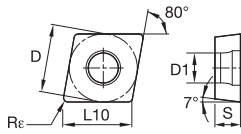
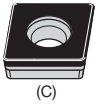


- first choice
- alternate choice

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K	●		●
N			
S		●	
H	●		

■ WNGX

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
WNGX080712T02020	12,70	8,69	7,94	1,2	—	—	—	2962157

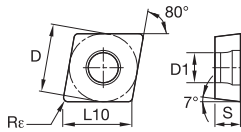
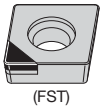


● first choice  
○ alternate choice

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K	■			●	●				
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### ■ CCGW-C

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CCGW060202EC	6,35	6,45	2,38	0,2	2,80	○	3883561	○	○	○	○
CCGW060202S01015C	6,35	6,45	2,38	0,2	2,80	3883505	○	○	○	○	○
CCGW060204S01015C	6,35	6,45	2,38	0,4	2,80	3883506	3883573	○	○	○	○
CCGW09T304S01015C	9,53	9,67	3,97	0,4	4,40	○	3883575	○	○	○	○
CCGW09T308S01015C	9,53	9,67	3,97	0,8	4,40	○	3883577	○	○	○	○

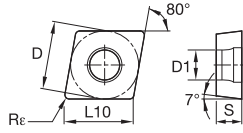


### ■ CCGW-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CCGW060204FST	6,35	6,45	2,38	0,4	2,80	○	○	○	○	5885722	3898746
CCGW09T304FST	9,53	9,67	3,97	0,4	4,40	○	○	○	○	5885723	3898749
CCGW09T308FST	9,53	9,67	3,97	0,8	4,40	○	○	○	○	5885724	3898750



Inserts

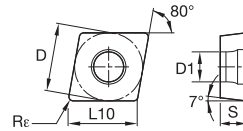
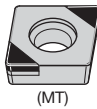


● first choice  
○ alternate choice

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

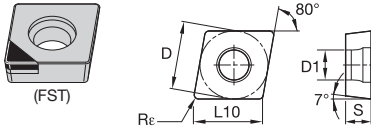
■ CCGW-FWC

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CCGW060202EFWC	6,35	6,45	2,38	0,2	2,80	■	■	■	■	■	■
CCGW060204EFWC	6,35	6,45	2,38	0,4	2,80	■	■	■	■	■	■
CCGW09T304EFWC	9,53	9,67	3,97	0,4	4,40	■	■	■	■	■	■
CCGW09T308EFWC	9,53	9,67	3,97	0,8	4,40	■	■	■	■	■	■



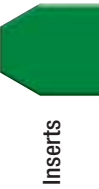
■ CCGW-MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CCGW09T304S01015MT	9,52	9,67	3,99	0,4	4,40	■	■	■	■	■	■
CCGW09T308S01015MT	9,52	9,67	3,99	0,8	4,40	■	■	■	■	■	■



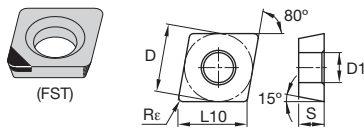
● first choice  
○ alternate choice

P	■								
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K	■			●	●				
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S	■					●	●		
H	■	●	●	●	●				



■ **CCMW-FST**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CCMW060204FST	6,35	6,45	2,38	0,4	2,80	■	■	■	■	■	3883135
CCMW060208FST	6,35	6,45	2,38	0,8	2,80	■	■	■	■	■	3883133
CCMW09T304FST	9,53	9,67	3,97	0,4	4,40	■	■	■	■	■	3883134
CCMW09T308FST	9,53	9,67	3,97	0,8	4,40	■	■	■	■	■	3883136



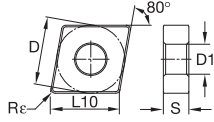
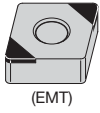
■ **CDHB-FST**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CDHBS4T002FST	3,97	4,03	1,02	0,1	2,13	■	■	■	■	■	3898745
CDHBS4T004FST	3,97	4,03	1,02	0,2	2,13	■	■	■	■	■	3898744





Inserts

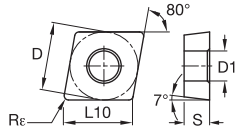
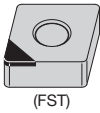


● first choice  
○ alternate choice

P	■						
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K	■		●	●			
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S	■				●		
H	■	●	●	●	●		

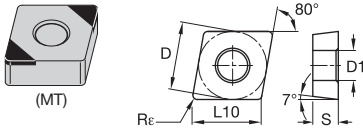
■ CNGA-EMT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CNGA120408EMT	12,70	12,90	4,76	0,8	5,16	■	3883363	■	■	■	■
CNGA120412EMT	12,70	12,90	4,76	1,2	5,16	■	3883364	■	■	■	■



■ CNGA-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CNGA120404FST	12,70	12,90	4,76	0,4	5,16	■	■	■	■	5885725	3898726
CNGA120408FST	12,70	12,90	4,76	0,8	5,16	■	■	■	■	5885726	3898727



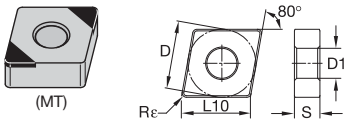
● first choice  
○ alternate choice

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



### ■ CNGA-FW/MW MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CNGA120404EFWMT	12,70	12,90	4,76	0,4	5,15	-	3883356	-	-	-	-
CNGA120408EFWMT	12,70	12,90	4,76	0,8	5,16	-	3883912	-	-	-	-
CNGA120408S01025FWMT	12,70	12,90	4,78	0,8	5,16	3883523	-	-	-	-	-

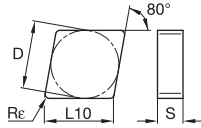
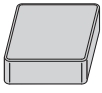


### ■ CNGA-MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CNGA120404S01025MT	12,70	12,90	4,78	0,4	5,16	3883509	3883885	6018006	-	-	-
CNGA120408S01025MT	12,70	12,90	4,78	0,8	5,16	3883510	3883886	6018008	-	-	-
CNGA120412S01020MT	12,70	12,90	4,78	1,2	5,16	-	-	6018009	-	-	-
CNGA120412S01025MT	12,70	12,90	4,78	1,2	5,16	3883511	3883887	6018010	-	-	-



Inserts

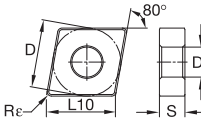
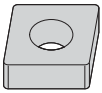


● first choice  
○ alternate choice

P	■							
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N	■				●	●		
S	■						●	
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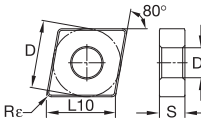
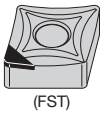
■ CNMN

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CNMN090312S02020	9,53	9,67	3,18	1,2	—	■	■	■	3883278	■	■
CNMN120408S02020	12,70	12,90	4,76	0,8	—	■	■	■	3883279	■	■
CNMN120412S02020	12,70	12,90	4,76	1,2	—	■	■	■	3883280	■	■



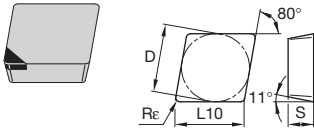
■ CNMA

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CNMA120408S02020	12,70	12,90	4,76	0,8	5,16	■	■	■	3883281	■	■
CNMA120412S02020	12,70	12,90	4,76	1,2	5,16	■	■	■	3883282	■	■



■ CNMS-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CNMS120408FST	12,70	12,90	4,76	0,8	5,16	■	■	■	■	■	3898729



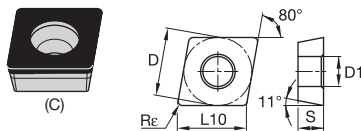
● first choice  
○ alternate choice

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



**CPGN**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CPGN120304F	12,70	12,90	3,18	0,4	—	○	○	○	○	○	○
CPGN120308F	12,70	12,90	3,18	0,8	—	○	○	○	○	○	○



**CPGW-C**

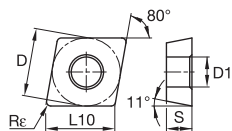
ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CPGW060202EC	6,35	6,45	2,38	0,2	2,80	○	○	○	○	○	○
CPGW060202S01015C	6,35	6,45	2,38	0,2	2,80	○	○	○	○	○	○
CPGW060204S01015C	6,35	6,45	2,38	0,4	2,80	○	○	○	○	○	○
CPGW060208S01015C	6,35	6,45	2,38	0,8	2,80	○	○	○	○	○	○
CPGW09T304S01015C	9,53	9,67	3,97	0,4	4,40	○	○	○	○	○	○
CPGW09T308S01015C	9,53	9,67	3,97	0,8	4,40	○	○	○	○	○	○



Inserts



(FST)



● first choice  
○ alternate choice

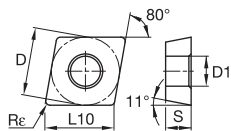
P	■								
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K	■			●	●				
N	■					●	●		
S	■						●	●	
H	■	●	●	●	●				

■ CPGW-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CPGW060202FST	6,35	6,45	2,38	0,2	2,80	■	■	■	■	■	■
CPGW060204FST	6,35	6,45	2,38	0,4	2,80	■	■	■	■	■	■
CPGW060208FST	6,35	6,45	2,38	0,8	2,80	■	■	■	■	■	■
CPGW09T304FST	9,53	9,67	3,97	0,4	4,40	■	■	■	■	■	■
CPGW09T308FST	9,53	9,67	3,97	0,8	4,40	■	■	■	■	■	■
CPGW120404FST	12,70	12,90	4,76	0,4	5,50	■	■	■	■	■	■
CPGW120408FST	12,70	12,90	4,76	0,8	5,50	■	■	■	■	■	■

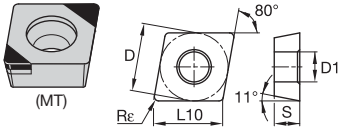


(FWST)



■ CPGW-FWST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CPGW060204FWST	6,35	6,45	2,38	0,4	2,80	■	■	■	■	■	■
CPGW09T308FWST	9,53	9,67	3,97	0,8	4,40	■	■	■	■	■	■
CPGW120408FWST	12,70	12,90	4,76	0,8	5,50	■	■	■	■	■	■



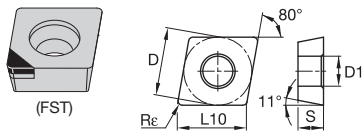
● first choice  
○ alternate choice

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

Inserts

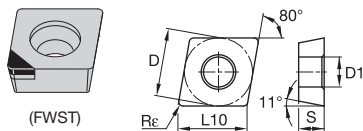
**■ CPGW-MT**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CPGW09T304S01015MT	9,53	9,67	3,99	0,4	4,40	3883526	○	6018084	○	○	○
CPGW09T308S01015MT	9,53	9,67	3,99	0,8	4,40	3883527	○	6018085	○	○	○



**■ CPMW-FST**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CPMW050204FST	5,56	5,65	2,38	0,4	2,50	○	○	○	○	○	3883139
CPMW060204FST	6,35	6,45	2,38	0,4	2,80	○	○	○	○	○	3883137

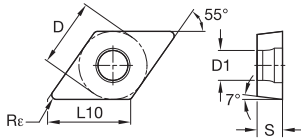
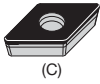


**■ CPMW-FWST**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CPMW09T304FWST	9,53	9,67	3,97	0,4	4,40	○	○	○	○	○	3883138



Inserts

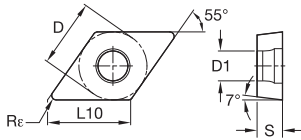
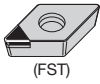


● first choice  
○ alternate choice

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

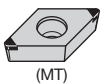
■ DCGW-C

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DCGW070202EC	6,35	7,75	2,38	0,2	2,80	○	3883585	○	○	○	○
DCGW070202S01015C	6,35	7,75	2,38	0,2	2,80	3883528	○	○	○	○	○
DCGW070204S01015C	6,35	7,75	2,38	0,4	2,80	3883529	3883586	○	○	○	○



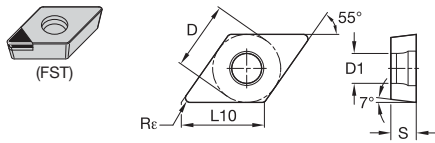
■ DCGW-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DCGW070204FST	6,35	7,75	2,38	0,4	2,80	○	○	○	○	○	3898761
DCGW11T304FST	9,53	11,63	3,97	0,4	4,40	○	○	○	○	○	3898762



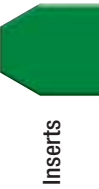
■ DCGW-MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DCGW11T304S01015MT	9,52	11,63	3,99	0,4	4,40	3883530	○	○	○	○	○
DCGW11T308S01015MT	9,52	11,63	3,99	0,8	4,40	3883531	○	○	○	○	○



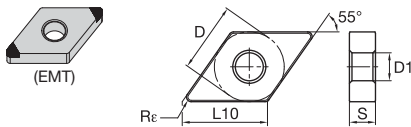
● first choice  
○ alternate choice

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



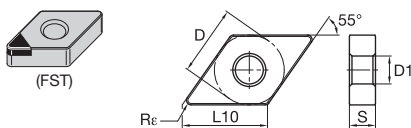
### ■ DCMW-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DCMW070204FST	6,35	7,75	2,38	0,4	2,80	■	■	■	■	■	3883142
DCMW11T304FST	9,53	11,63	3,97	0,4	4,40	■	■	■	■	■	3883122
DCMW11T308FST	9,53	11,63	3,97	0,8	4,40	■	■	■	■	■	3883143



### ■ DNGA-EMT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DNGA150408EMT	12,70	15,50	4,76	0,8	5,16	■	3883365	■	■	■	■
DNGA150412EMT	12,70	15,50	4,76	1,2	5,16	■	3883327	■	■	■	■



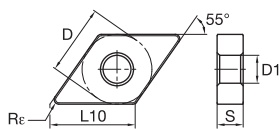
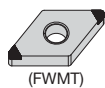
### ■ DNGA-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DNGA150404FST	12,70	15,50	4,76	0,4	5,16	■	■	■	■	5885774	3898730
DNGA150408FST	12,70	15,50	4,76	0,8	5,16	■	■	■	■	5885775	3898731





Inserts

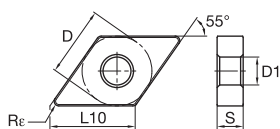
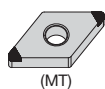


● first choice  
○ alternate choice

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

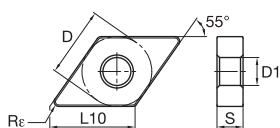
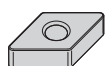
■ DNGA-FWMT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DNGA150404EFWMT	12,70	15,50	4,76	0,4	5,16	■	3883358	■	■	■	■
DNGA150408EFWMT	12,70	15,50	4,76	0,8	5,16	■	3883359	■	■	■	■
DNGA150412EFWMT	12,70	15,50	4,76	1,2	5,16	■	3883360	■	■	■	■



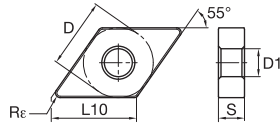
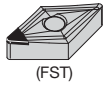
■ DNGA-MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DNGA150404S01025MT	12,70	15,50	4,78	0,4	5,16	3883532	3883888	6018090	■	■	■
DNGA150408S01025MT	12,70	15,50	4,78	0,8	5,16	3883533	3883889	■	■	■	■



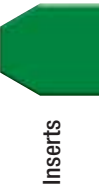
■ DNMA

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DNMA110408S02020	9,53	11,63	4,76	0,8	3,81	■	■	■	3883313	■	■



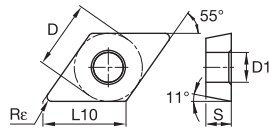
● first choice  
○ alternate choice

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



### ■ DNMS-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DNMS150404FST	12,70	15,50	4,76	0,4	5,16	■	■	■	■	5885776	3898732
DNMS150408FST	12,70	15,50	4,76	0,8	5,16	■	■	■	■	5885777	3898733

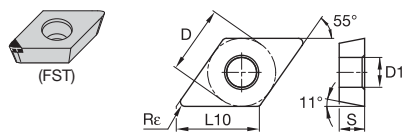


### ■ DPGW-C

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DPGW070202EC	6,35	7,75	2,38	0,2	2,80	■	3883582	■	■	■	■
DPGW070204S01015C	6,35	7,75	2,38	0,4	2,80	■	3883583	■	■	■	■
DPGW070208S01015C	6,35	7,75	2,38	0,8	2,80	■	3883587	■	■	■	■



Inserts

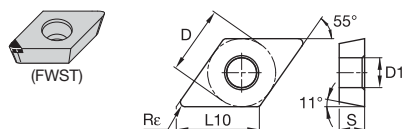


● first choice  
○ alternate choice

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

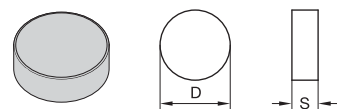
■ DPGW-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DPGW070202FST	6,35	7,75	2,38	0,2	2,80	■	■	■		5885778	3898763
DPGW070204FST	6,35	7,75	2,38	0,4	2,80	■	■	■		5885779	3898764
DPGW11T304FST	9,53	11,63	3,97	0,4	4,40	■	■	■		5885780	3898765



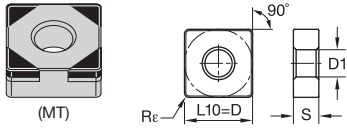
■ DPGW-FWST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DPGW070204FWST	6,35	7,75	2,38	0,2	2,80	■	■	■		5885792	3898766
DPGW11T304FWST	9,53	11,63	3,97	0,2	4,40	■	■	■		5885791	3898767



■ RNM

ISO catalogue number	D	S	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
RNMN090300S02020	9,53	3,18	■	■	■	3883315	■	■
RNMN120300S02020	12,70	3,18	■	■	■	3883316	■	■
RNMN120400S02020	12,70	4,76	■	■	■	3883317	■	■



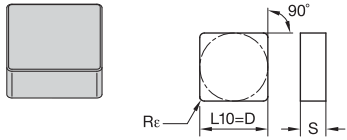
● first choice  
○ alternate choice

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



■ SNGA-MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
SNGA120404S01025MT	12,70	12,70	4,78	0,4	5,16	■	3883915	■	■	■	■
SNGA120408S01025MT	12,70	12,70	4,78	0,8	5,16	■	3883328	■	■	■	■
SNGA120412S01025MT	12,70	12,70	4,78	1,2	5,16	■	3883691	■	■	■	■

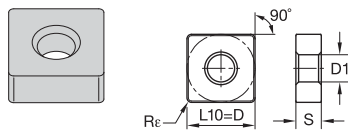


■ SNM

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
SNMN090316S02020	9,53	9,53	3,18	1,6	—	■	■	■	3883320	■	■
SNMN120416T02020	12,70	12,70	4,76	1,6	—	■	■	■	3883324	■	■



Inserts

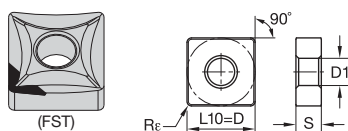


● first choice  
○ alternate choice

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

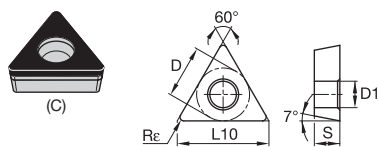
■ SNMA

ISO catalogue number	D	L10	S	Re	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
SNMA120408S02020	12,70	12,70	4,76	0,8	5,16	○	○	○	●	○	○
SNMA120412S02020	12,70	12,70	4,76	1,2	5,16	○	○	○	●	○	○



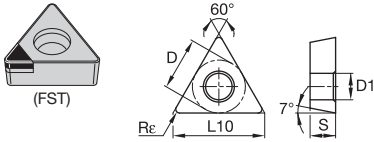
■ SNMS-FST

ISO catalogue number	D	L10	S	Re	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
SNMS120408FST	12,70	12,70	4,76	0,8	5,16	○	○	○	○	○	●
SNMS120412FST	12,70	12,70	4,76	1,2	5,16	○	○	○	○	○	●



■ TCGW-C

ISO catalogue number	D	L10	S	Re	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TCGW110202EC	6,35	11,00	2,38	0,2	2,80	○	●	○	○	○	○
TCGW110204S01015C	6,35	11,00	2,38	0,4	2,80	○	●	○	○	○	○

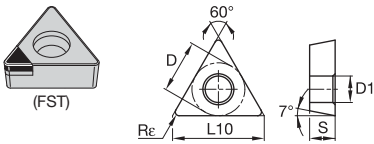


● first choice  
○ alternate choice

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

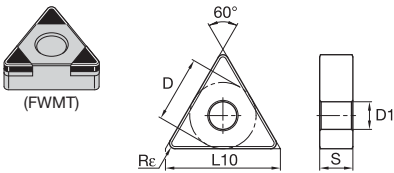
**TCGW-FST**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TCGW110204FST	6,35	11,00	2,38	0,4	2,80	■	■	■	■	■	3898768
TCGW16T304FST	9,53	16,50	3,97	0,4	4,40	■	■	■	■	■	3898769



**TCMW-FST**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TCMW110204FST	6,35	11,00	2,38	0,4	2,80	■	■	■	■	■	3883144

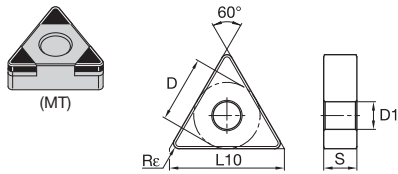


**TNGA-FWMT**

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TNGA160408EFWMT	9,53	16,50	4,76	0,8	3,81	■	3883361	■	■	■	■
TNGA160412EFWMT	9,53	16,50	4,76	1,2	3,81	■	3883362	■	■	■	■



Inserts

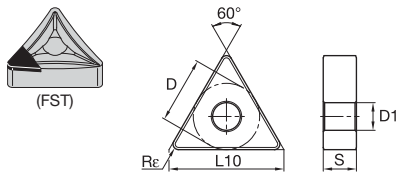


● first choice  
○ alternate choice

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

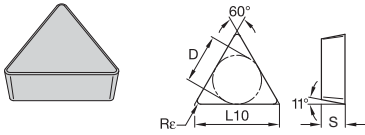
■ TNGA-MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TNGA160404S01025MT	9,53	16,50	4,78	0,4	3,81	■	■	■	■	■	■
TNGA160408S01025MT	9,53	16,50	4,78	0,8	3,81	■	■	■	■	■	■
TNGA160412S01025MT	9,53	16,50	4,78	1,2	3,81	■	■	■	■	■	■



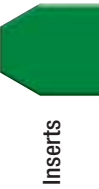
■ TNMS-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TNMS160404FST	9,53	16,50	4,76	0,4	3,81	■	■	■	■	■	■
TNMS160408FST	9,53	16,50	4,76	0,8	3,81	■	■	■	■	■	■



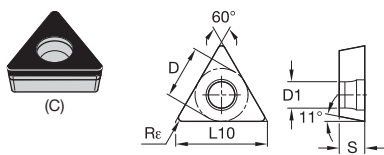
● first choice  
○ alternate choice

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



■ TPGN

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TPGN110304F	6,35	11,00	3,18	0,4	—	■	■	■	■	■	■
TPGN110308F	6,35	11,00	3,18	0,8	—	■	■	■	■	■	■
TPGN160304F	9,53	16,50	3,18	0,4	—	■	■	■	■	■	■
TPGN160308F	9,53	16,50	3,18	0,8	—	■	■	■	■	■	■
TPGN220408F	12,70	22,00	4,76	0,8	—	■	■	■	■	■	■



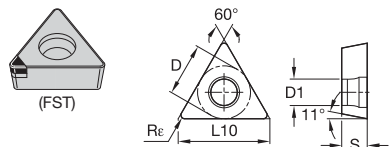
■ TPGW-C

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TPGW110202EC	6,35	11,00	2,38	0,2	2,80	■	■	■	■	■	■
TPGW110204S01015C	6,35	11,00	2,38	0,4	2,80	■	■	■	■	■	■
TPGW110208S01015C	6,35	11,00	2,38	0,8	2,80	■	■	■	■	■	■





Inserts

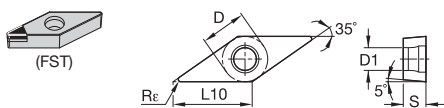


● first choice  
○ alternate choice

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

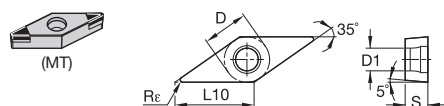
■ TPGW-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
TPGW110204FST	6,35	11,00	2,38	0,4	2,80	■	■	■	■	■	3898770
TPGW110208FST	6,35	11,00	2,38	0,8	2,80	■	■	■	■	■	3898771
TPGW16T304FST	9,53	16,50	3,97	0,4	4,40	■	■	■	■	■	3898772
TPGW16T308FST	9,53	16,50	3,97	0,8	4,40	■	■	■	■	■	3898773



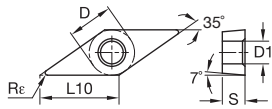
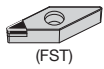
■ VBGW-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
VBGW110304FST	6,35	11,07	3,18	0,4	2,80	■	■	■	■	■	3898774
VBGW160404FST	9,53	16,61	4,76	0,4	4,40	■	■	■	■	■	3898775



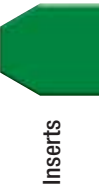
■ VBGW-MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
VBGW160408S01015MT	9,52	16,61	4,78	0,8	4,40	3883537	■	6018095	■	■	■
VBGW160404S01015MT	9,53	16,61	4,78	0,4	4,40	3883536	■	6018094	■	■	■



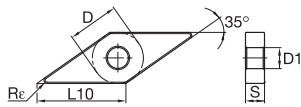
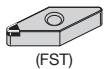
● first choice  
○ alternate choice

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



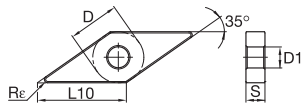
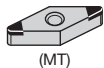
### VCMW-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
VCMW110304FST	6,35	11,07	3,18	0,4	2,80	■	■	■	■	■	3883147



### VNGA-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
VNGA160404FST	9,53	16,61	4,76	0,4	3,81	■	■	■	■	■	3898736
VNGA160408FST	9,53	16,61	4,76	0,8	3,81	■	■	■	■	■	3898737

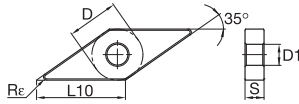
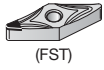


### VNGA-MT

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
VNGA160404S01025MT	9,53	16,61	4,78	0,4	3,81	3883538	3883894	6018096	■	■	■
VNGA160408S01025MT	9,53	16,61	4,78	0,8	3,81	3883539	3883896	6018097	■	■	■



Inserts

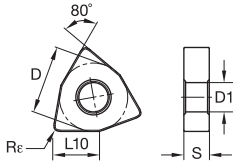


● first choice  
○ alternate choice

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

■ VNMS-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
VNMS160404FST	9,53	16,61	4,76	0,4	3,81						3898738
VNMS160408FST	9,53	16,61	4,76	0,8	3,81						3898739



■ WNGA-FST

ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
WNGA080404FST	12,70	8,69	4,76	0,4	5,16						3898740
WNGA080408FST	12,70	8,69	4,76	0,8	5,16						3898741



# Victory™ -UR Geometry

EXTREME **CHALLENGES.**  
EXTREME **RESULTS.**

-UR geometry offers a roughing solution for high-temp materials.

Available in WS10PT™ and WS25PT™, the -UR geometry provides smooth chip forming and improved coolant flow for increased tool life. This positive geometry, with its unique chipbreaker without inflection points, reduces cutting forces and improves depth-of-cut (DOC) notching resistance, while still providing superior edge stability.

To learn more, contact your local Authorised Distributor or visit [widia.com](http://widia.com).

**WIDIA**  
**VICTORY**



## Turning • Tools for External Turning and Internal Boring

Tools for External Turning .....	C2–C49
Tools for Internal Boring .....	C50–C81
Tunable Boring Bars .....	C82–C84
Cartridges .....	C86–C129

Modern machining operations performed on CNC machine tools and flexible production facilities require high-performance tools that provide straightforward design and application versatility. WIDIA™ offers an extensive range of toolholders for external turning to meet even the most exacting production demands across a broad spectrum of workpiece shapes and sizes.

# Tools for External Turning



Whatever your operation requirements — from light finishing cuts at very high cutting speeds to heavy roughing applications — there is a WIDIA solution to meet your needs. The complete programme includes toolholders for pin-, screw-, or clamp-type holding.

## D-Style Clamping

- Used for negative style inserts.
- Clamp assembly contains clamp, screw, and retaining ring.
- Quick insert indexing.
- Ensures insert repeatability and seating.
- Reduced chatter and extended tool life.

## P-Style Clamping

- Lever-type clamping system for negative indexable inserts.
- No interference to chip flow.
- Fast insert changes.

*P-style available in metric sizes only.*



## S-Style Clamping

- Screw clamping system for positive indexable inserts.
- Compact design for high reliability and cost efficiency.
- Carbide shim for additional tool protection.

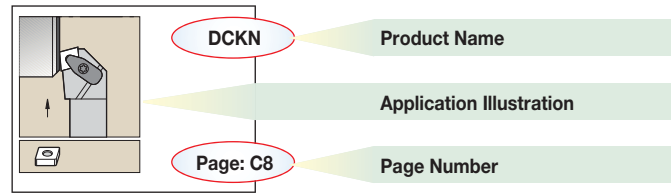
## C-Style Clamping

- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.



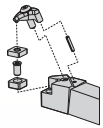


Each unique clamping system offers product options to fill your specific toolholder needs. Find the illustration that fits your application and navigate to the corresponding page to get the correct solution.



### D-Style Clamping

**D**

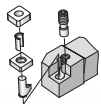


One-piece clamp assembly holder for use with negative style inserts. An extremely rigid clamping system. The tool is protected by a carbide shim.

	<b>DCKN</b> 75° Page: <b>C8</b>		<b>DCLN</b> 95° Page: <b>C9</b>		<b>DCRN</b> 75° Page: <b>C10</b>		<b>DCSN</b> 45° Page: <b>C10</b>
	<b>DDJN</b> 93° Page: <b>C11</b>		<b>DDNN</b> 63° Page: <b>C11</b>		<b>DRGN</b> Page: <b>C12</b>		<b>DSDN</b> 45° Page: <b>C12</b>
	<b>DSKN</b> 75° Page: <b>C13</b>		<b>DSRN</b> 75° Page: <b>C14</b>		<b>DSSN</b> 45° Page: <b>C15</b>		<b>DTFN</b> 90° Page: <b>C16</b>
	<b>DTGN</b> 90° Page: <b>C16</b>		<b>DVJN</b> 93° Page: <b>C17</b>		<b>DVON</b> 117,5° Page: <b>C18</b>		<b>DVVN</b> 72,5° Page: <b>C18</b>
	<b>DWLN</b> 95° Page: <b>C19</b>						

### P-Style Clamping

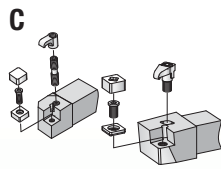
**P**



Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter. Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°. Advantages of this system are fast insert changes and no interference with chip flow.

	<b>PCBN</b> 75° Page: <b>C20</b>		<b>PCKN</b> 75° Page: <b>C21</b>		<b>PCLN</b> 95° Page: <b>C22</b>		<b>PDJN</b> 93° Page: <b>C23</b>
	<b>PDNN</b> 62,5° Page: <b>C24</b>		<b>PSBN</b> 75° Page: <b>C25</b>		<b>PSDN</b> 45° Page: <b>C26</b>		<b>PSKN</b> 75° Page: <b>C26</b>
	<b>PSSN</b> 45° Page: <b>C27</b>		<b>PTFN</b> 90° Page: <b>C28</b>		<b>PTGN</b> 90° Page: <b>C29</b>		<b>PWLN</b> 95° Page: <b>C30</b>

**C-Style Clamping**

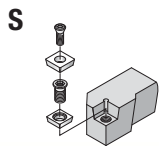


Top clamping system for negative and positive indexable inserts to DIN 4968. This universal clamping system is robust and easy to handle. Some height-adjustable clamps enable the use of additional chipbreakers. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of 16mm and insert iCs greater than 6,35mm.

	<b>CCLN-MX</b> 95° Page: C31		<b>CCLN-MN</b> 95° Page: C31		<b>CCLN-MF</b> 95° Page: C32		<b>CDJN-MX</b> 93° Page: C32
	<b>CDJN-MN</b> 93° Page: C33		<b>CELN-MF</b> 97,5° Page: C33		<b>CELN-MN</b> 97,5° Page: C34		<b>CKJN</b> Page: C34
	<b>CRDN-MN</b> Page: C35		<b>CRSN-MN</b> Page: C35		<b>CSBP</b> 75° Page: C36		<b>CSDP</b> 45° Page: C36
	<b>CSSP</b> 45° Page: C37		<b>CTCP</b> 90° Page: C37		<b>CTDP</b> 45° Page: C38		<b>CTFP</b> 90° Page: C38
	<b>CTGP</b> 90° Page: C39		<b>CRDP*</b> Page: C40		<b>CRGP*</b> Page: C41		

\*Exact Clamping System not shown.

**S-Style Clamping**

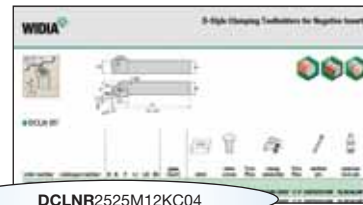


Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967. Compact design using a minimum of spare parts for high reliability and cost efficiency. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of 16mm and insert iCs from 9,52mm are secured by means of a threaded bushing.

	<b>SCLC</b> 95° Page: C42		<b>SCDP</b> 45° Page: C42		<b>SCLP</b> 95° Page: C43		<b>SDHC</b> 107,5° Page: C43
	<b>SDJC</b> 93° Page: C44		<b>SDNC</b> 62,5° Page: C45		<b>SRDC</b> Page: C45		<b>SSBC</b> 75° Page: C46
	<b>SSSC</b> 45° Page: C47		<b>STFC</b> 90° Page: C48		<b>SVHB</b> 107,5° Page: C48		<b>SVJB</b> 93° Page: C49
	<b>SVVB</b> 72,5° Page: C49						

## How Do Catalogue Numbers Work?

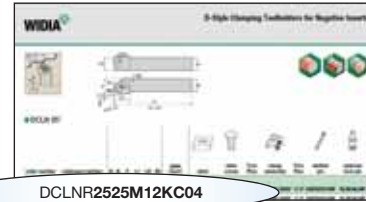
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



DCLNR2525M12KC04

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

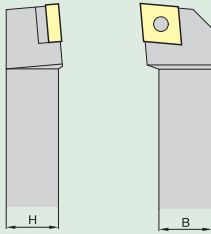
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



DCLNR2525M12KC04

**25**

Shank Dimensions



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

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

Example: 8,0mm = 08

**25**

**M**

Tool Length

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

**12**

Insert Size

**KC**

Additional Information

**KC** =  
D-Style Clamping

**04**

Insert Thickness (optional)

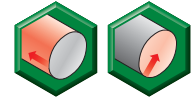
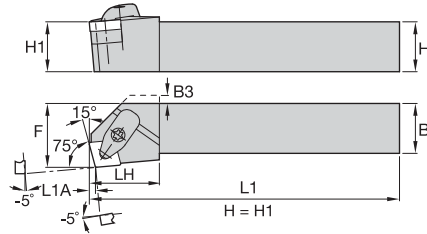
**04** = 4,76mm  
**06** = 6,35mm

**Cutting Edge Length L10**

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



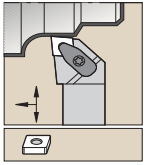
See pages B30–B46 for inserts.



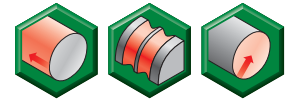
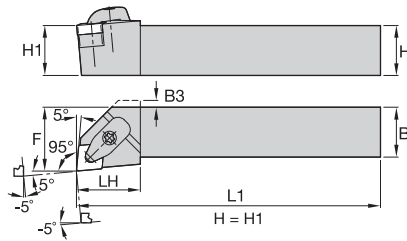
Tools for External Turning and Internal Boring

■ DCKN 75°

order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>																
5697856	DCKNR2020K12KC04	20	20	25,0	125	32,0	3,1	6,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5697857	DCKNR2525M12KC04	25	25	32,0	150	32,0	3,1	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697858	DCKNR3225P12KC04	32	25	32,0	170	32,0	3,1	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697859	DCKNR3232P16KC06	32	32	40,0	170	32,0	3,8	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5697880	DCKNR3232P19KC06	32	32	40,0	170	38,0	4,6	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
<b>left hand</b>																
5697853	DCKNL2020K12KC04	20	20	25,0	125	32,0	3,1	6,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5697854	DCKNL2525M12KC04	25	25	32,0	150	32,0	3,1	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697855	DCKNL3225P12KC04	32	25	32,0	170	32,0	3,1	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP

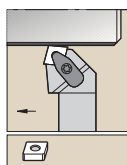


See pages B30–B46 for inserts.

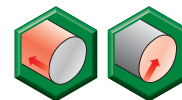
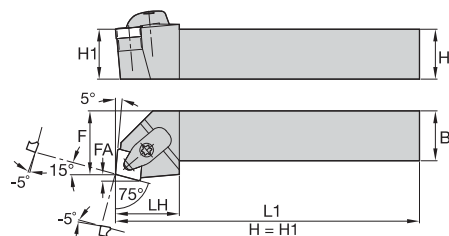


## ■ DCLN 95°

order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>															
5697890	DCLNR1616H09KC03	16	16	20,0	100	30,0	6,0	CN..090308	ICSN332	KMSP39IP	9 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5697891	DCLNR2020K09KC03	20	20	25,0	125	30,0	2,0	CN..090308	ICSN332	KMSP39IP	9 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5697892	DCLNR2020K12KC04	20	20	25,0	125	32,0	4,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5697893	DCLNR2525M12KC04	25	25	32,0	150	32,0	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697894	DCLNR2525M16KC06	25	25	32,0	150	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5697895	DCLNR3232P16KC06	32	32	40,0	170	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5697896	DCLNR3232P19KC06	32	32	40,0	170	40,0	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
5697897	DCLNR4040S19KC06	40	40	50,0	250	40,0	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
5697898	DCLNR4040S25KC09	40	40	50,0	250	51,0	—	CN..250924	ICSN846	KMSP825IP	25 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP
<b>left hand</b>															
5697881	DCLNL1616H09KC03	16	16	20,0	100	30,0	6,0	CN..090308	ICSN332	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5697882	DCLNL2020K09KC03	20	20	25,0	125	30,0	2,0	CN..090308	ICSN332	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5697883	DCLNL2020K12KC04	20	20	25,0	125	32,0	4,0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5697884	DCLNL2525M12KC04	25	25	32,0	150	32,0	—	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697885	DCLNL2525M16KC06	25	25	32,0	150	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5697886	DCLNL3232P16KC06	32	32	40,0	170	33,0	—	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5697887	DCLNL3232P19KC06	32	32	40,0	170	40,0	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
5697888	DCLNL4040S19KC06	40	40	50,0	250	40,0	—	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
5697889	DCLNL4040S25KC09	40	40	50,0	250	51,0	—	CN..250924	ICSN846	KMSP825IP	25 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP

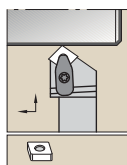


See pages B30–B46 for inserts.

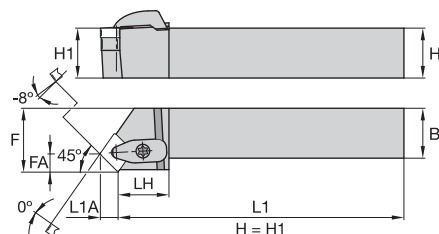


## DCRN 75°

order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>															
5697903	DCRNR2020K12KC04	20	20	25,0	125	32,0	3,3	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5697904	DCRNR2525M12KC04	25	25	32,0	150	32,0	3,3	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697905	DCRNR3225P12KC04	32	25	32,0	170	32,0	3,3	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697906	DCRNR3232P16KC06	32	32	40,0	170	38,0	4,1	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5697907	DCRNR3232P19KC06	32	32	40,0	170	38,0	4,9	CN..190612	ICSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
<b>left hand</b>															
5697899	DCRNL2020K12KC04	20	20	25,0	125	32,0	3,3	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5697900	DCRNL2525M12KC04	25	25	32,0	150	32,0	3,3	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697901	DCRNL3225P12KC04	32	25	32,0	170	32,0	3,3	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697902	DCRNL3232P16KC06	32	32	40,0	170	38,0	4,1	CN..160612	ICSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP

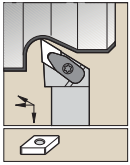


See pages B30–B46 for inserts.

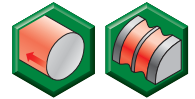
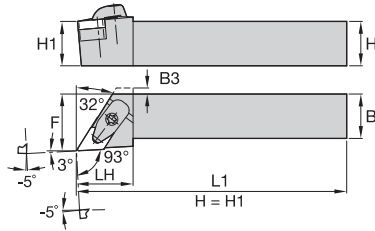


## DCSN 45°

order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>																
5697911	DCSNR2020K12KC04	20	20	25,0	125	35,0	8,2	8,5	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5697913	DCSNR2525M12KC04	25	25	32,0	150	35,0	8,2	8,5	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
<b>left hand</b>																
5697908	DCSNL2020K12KC04	20	20	25,0	125	35,0	8,2	8,5	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5697909	DCSNL2525M12KC04	25	25	32,0	150	35,0	8,2	8,5	CN..120408	ICSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP

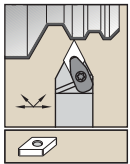


See pages B47–B64 for inserts.

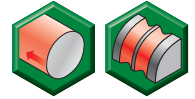
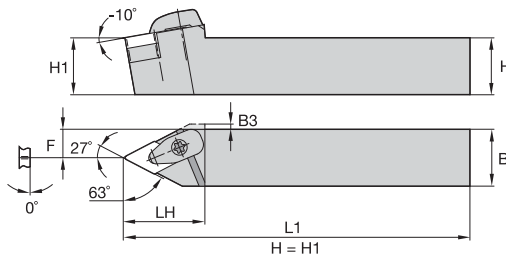


■ **DDJN 93°**

order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>															
5697924	DDJNR2020K11KC04	20	20	25,0	125	30,0	2,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5697926	DDJNR2020K15KC06	20	20	25,0	125	32,0	4,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697928	DDJNR2525M11KC04	25	25	32,0	150	30,0	—	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5697930	DDJNR2525M15KC06	25	25	32,0	150	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697932	DDJNR3225P15KC06	32	25	32,0	170	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5564336	DDJNR3232P15KC06	32	32	40,0	170	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
<b>left hand</b>															
5697915	DDJNL2020K11KC04	20	20	25,0	125	30,0	2,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5697916	DDJNL2020K15KC06	20	20	25,0	125	32,0	4,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697918	DDJNL2525M11KC04	25	25	32,0	150	30,0	—	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5697920	DDJNL2525M15KC06	25	25	32,0	150	32,0	—	DN..150608	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697922	DDJNL3225P15KC06	32	25	32,0	170	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5564335	DDJNL3232P15KC06	32	32	40,0	171	32,0	—	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP



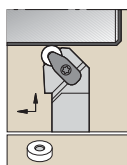
See pages B47–B64 for inserts.



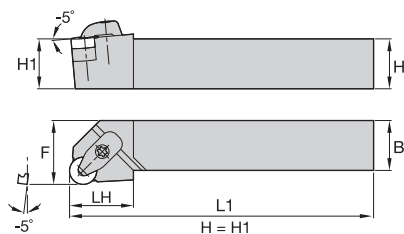
■ **DDNN 63°**

order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>															
5697940	DDNNR2020K15KC06	20	20	10,0	125	40,0	2,5	DN..150608	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697942	DDNNR2525M15KC06	25	25	13,0	150	40,0	—	DN..150608	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
<b>left hand</b>															
5697934	DDNNL2020K15KC06	20	20	10,0	125	40,0	2,5	DN..150608	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697936	DDNNL2525M15KC06	25	25	13,0	150	40,0	—	DN..150608	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697938	DDNNL3225P15KC06	32	25	13,0	170	40,0	—	DN..150608	IDSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP



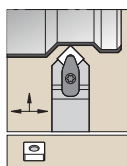


See pages B65–B67 for inserts.

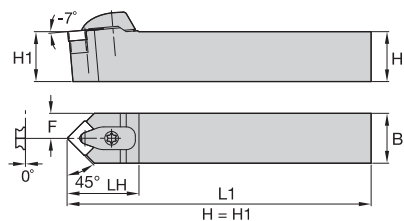


■ DRGN

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin	
<b>right hand</b>															
5697948	DRGNR2525M12KC04	25	25	32,0	150	32,0	RN..120400	IRSN44	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
5697950	DRGNR3225P12KC04	32	25	32,0	170	32,0	RN..120400	IRSN44	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
5697952	DRGNR4040S25KC09	40	40	50,0	250	48,0	RN..250900	IRSN84	KMSP825IP	25 IP	—	25 IP	SSP025018M	KLM81025IP	
<b>left hand</b>															
5697944	DRGNL3225P12KC04	32	25	32,0	170	32,0	RN..120400	IRSN44	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
5697946	DRGNL4040S25KC09	40	40	50,0	250	48,0	RN..250900	IRSN84	KMSP825IP	25 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP	

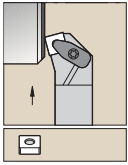


See pages B68–B80 for inserts.

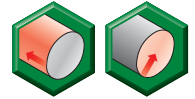
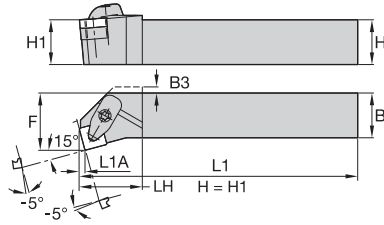


■ DSDN 45°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
5697954	DSDNN2020K12KC04	20	20	10,0	125	36,0	SN..120408	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697955	DSDNN2525M12KC04	25	25	12,0	150	36,0	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697957	DSDNN2525M15KC06	25	25	12,0	150	42,0	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5697959	DSDNN3225P12KC04	32	25	12,0	170	36,0	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5697961	DSDNN3232P19KC06	32	32	15,5	170	44,0	SN..190612	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
5697963	DSDNN4040S25KC09	40	40	19,5	250	59,0	SN..250924	ISSN846	KMSP825IP	40 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP

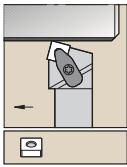


See pages B68–B80 for inserts.

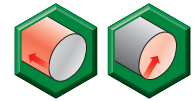
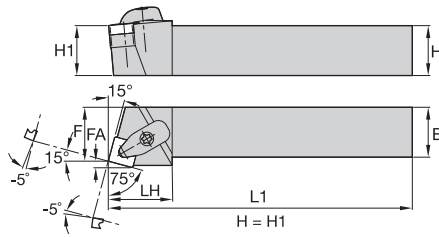


## ■ DSKN 75°

order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>																
5696685	DSKNR2020K12KC04	20	20	25,0	125	32,0	3,1	8,0	SN..120408	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696686	DSKNR2525M12KC04	25	25	32,0	150	32,0	3,1	4,0	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696687	DSKNR3225P12KC04	32	25	32,0	170	32,0	3,1	—	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696688	DSKNR3232P15KC06	32	32	40,0	170	32,0	3,8	—	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5696689	DSKNR3232P19KC06	32	32	40,0	170	38,0	4,6	—	SN..190612	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
<b>left hand</b>																
5696682	DSKNL2525M12KC04	25	25	32,0	150	32,0	3,1	4,0	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696683	DSKNL3225P12KC04	32	25	32,0	170	32,0	3,1	—	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696684	DSKNL3232P15KC06	32	32	40,0	170	32,0	3,8	—	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP



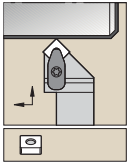
See pages B68–B80 for inserts.



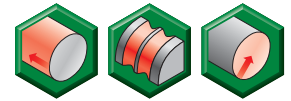
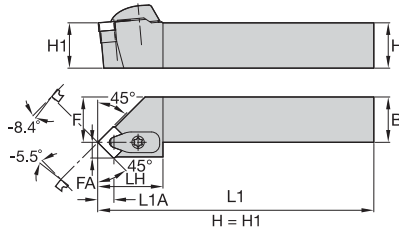
Tools for External Turning and Internal Boring

■ DSRN 75°

order number	catalogue number	H	B	F	L1	LH	FA	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>															
5696703	DSRNR2020K12KC04	20	20	22,0	125	32,0	3,3	SN..120408	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696704	DSRNR2525M12KC04	25	25	27,0	150	32,0	3,3	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696705	DSRNR3232P15KC06	32	32	35,0	170	38,0	4,0	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5696706	DSRNR3232P19KC06	32	32	35,0	170	42,0	4,8	SN..190612	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
5696707	DSRNR4040S25KC09	40	40	43,0	250	52,0	6,1	SN..250924	ISSN846	KMSP825IP	25 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP
<b>left hand</b>															
5696700	DSRNL2525M12KC04	25	25	27,0	150	32,0	3,3	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696701	DSRNL3232P15KC06	32	32	35,0	170	38,0	4,0	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5696702	DSRNL4040S25KC09	40	40	43,0	250	52,0	6,1	SN..250924	ISSN846	KMSP825IP	25 IP	CM236R ASSY	25 IP	SSP025018M	KLM81025IP

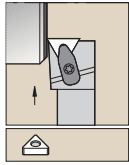


See pages B68–B80 for inserts.

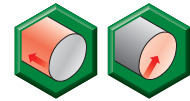
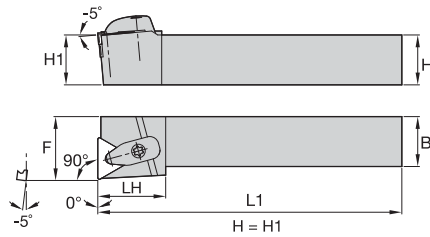


## ■ DSSN 45°

order number	catalogue number	H	B	F	L1	LH	FA	L1A	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>																
5696713	DSSNR2020K12KC04	20	20	25,0	125	36,0	8,4	8,7	SN..120408	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696714	DSSNR2525M12KC04	25	25	32,0	150	36,0	8,4	8,7	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696715	DSSNR2525M15KC06	25	25	32,0	150	42,0	10,5	10,7	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5696716	DSSNR3225P12KC04	32	25	32,0	170	35,4	8,4	8,7	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696717	DSSNR3232P15KC06	32	32	40,0	170	40,3	10,5	10,7	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5696718	DSSNR3232P19KC06	32	32	40,0	170	44,0	12,7	10,7	SN..190612	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP
<b>left hand</b>																
5696708	DSSNL2020K12KC04	20	20	25,0	125	36,0	8,4	8,7	SN..120408	ISSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696709	DSSNL2525M12KC04	25	25	32,0	150	36,0	8,4	8,7	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696710	DSSNL3225P12KC04	32	25	32,0	170	35,4	8,4	8,7	SN..120408	ISSN443	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
5696711	DSSNL3232P15KC06	32	32	40,0	170	40,3	10,5	10,7	SN..150612	ISSN543	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM58L15IP
5696712	DSSNL3232P19KC06	32	32	40,0	170	44,0	12,7	10,7	SN..190612	ISSN643	KMSP625IP	25 IP	CM210R ASSY	25 IP	SSP025016M	KLM68L25IP

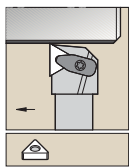


See pages B81–B93 for inserts.

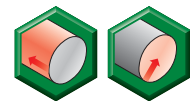
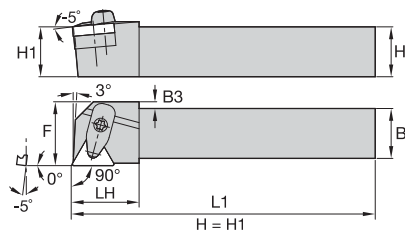


DTFN 90°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin	
<b>right hand</b>															
5696724	DTFNR2020K16KC04	20	20	25,0	125	32,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696725	DTFNR2525M16KC04	25	25	32,0	150	32,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696726	DTFNR3232P27KC06	32	32	40,0	170	38,0	TN..270612	ITSN534	KMSP515IP	15 IP	CM209R ASSY	15 IP	SSP025016M	KLM5815IP	
<b>left hand</b>															
5696719	DTFNL2020K16KC04	20	20	25,0	125	32,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696720	DTFNL2525M16KC04	25	25	32,0	150	32,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696721	DTFNL2525M22KC04	25	25	32,0	150	34,0	TN..220408	ITSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	
5696722	DTFNL3225P16KC04	32	25	32,0	170	32,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696723	DTFNL3225P22KC04	32	25	32,0	170	34,0	TN..220408	ITSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP	

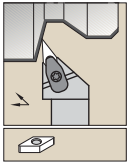


See pages B81–B93 for inserts.

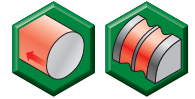
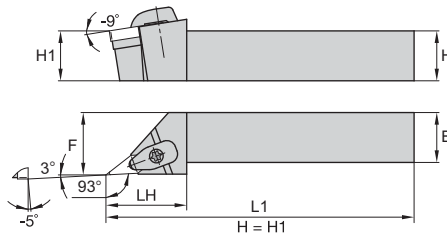


DTGN 90°

order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>															
5696729	DTGNR2020K16KC04	20	20	25,0	125	25,0	6,5	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5696730	DTGNR2525M16KC04	25	25	32,0	150	25,0	—	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5696731	DTGNR2525M22KC04	25	25	32,0	150	32,0	3,0	TN..220408	ITSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM46L15IP
<b>left hand</b>															
5696727	DTGNL2020K16KC04	20	20	25,0	125	25,0	6,5	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5696728	DTGNL2525M16KC04	25	25	32,0	150	25,0	—	TN..160408	ITSN323	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP

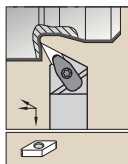


See pages B94–B99 for inserts.

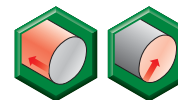
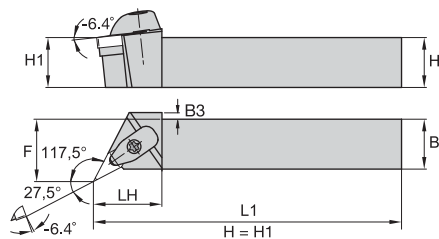


## ■ DVJN 93°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin	
<b>right hand</b>															
5696737	DVJNR2020K16KC04	20	20	25,0	125	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696738	DVJNR2525M16KC04	25	25	32,0	150	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696739	DVJNR2525M22KC04	25	25	32,0	150	55,0	VN..220408	IVSN432	KMSP415IP	15 IP	CM235R ASSY	15 IP	SSP025016M	KLM4615IP	
5696740	DVJNR3225P16KC04	32	25	32,0	170	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696741	DVJNR3225P22KC04	32	25	32,0	170	55,0	VN..220408	IVSN432	KMSP415IP	15 IP	CM235R ASSY	15 IP	SSP025016M	KLM4615IP	
<b>left hand</b>															
5696732	DVJNL2020K16KC04	20	20	25,0	125	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696733	DVJNL2525M16KC04	25	25	32,0	150	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696734	DVJNL2525M22KC04	25	25	32,0	150	55,0	VN..220408	IVSN432	KMSP415IP	15 IP	CM235R ASSY	15 IP	SSP025016M	KLM4615IP	
5696735	DVJNL3225P16KC04	32	25	32,0	170	46,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP	
5696736	DVJNL3225P22KC04	32	25	32,0	170	55,0	VN..220408	IVSN432	KMSP415IP	15 IP	CM235R ASSY	15 IP	SSP025016M	KLM4615IP	

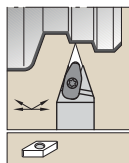


See pages B94–B99 for inserts.

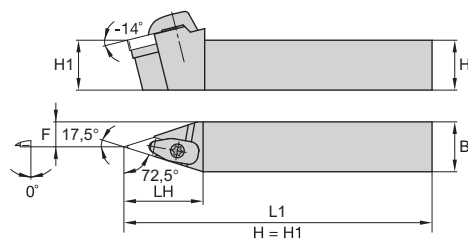


■ DVON 117,5°

order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>															
5696745	DVONR2020K16KC04	20	20	27,0	125	38,0	5,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
5696746	DVONR2525M16KC04	25	25	32,0	150	38,0	—	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
5696747	DVONR3225P16KC04	32	25	32,0	170	38,0	—	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
<b>left hand</b>															
5696742	DVONL2020K16KC04	20	20	27,0	125	38,0	5,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
5696743	DVONL2525M16KC04	25	25	32,0	150	38,0	—	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
5696744	DVONL3225P16KC04	32	25	32,0	170	38,0	—	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP

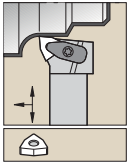


See pages B94–B99 for inserts.

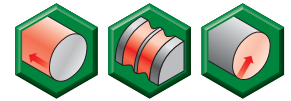
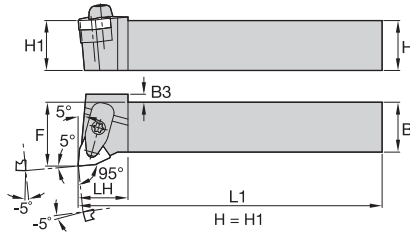


■ DVVN 72,5°

order number	catalogue number	H	B	F	L1	LH	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
5696748	DVVNN2020K16KC04	20	20	9,5	125	48,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
5696749	DVVNN2525M16KC04	25	25	12,0	150	48,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP
5696750	DVVNN3225P16KC04	32	25	12,0	170	48,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	15 IP	SSP025016M	KLM34L9IP



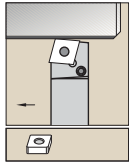
See pages B99–B105 for inserts.



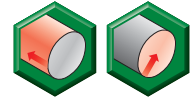
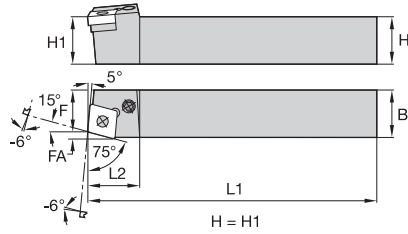
## ■ DWLN 95°

order number	catalogue number	H	B	F	L1	LH	B3	gage insert	shim	shim screw	Torx Plus	clamp assembly	Torx Plus	slotted pin	optional lock pin
<b>right hand</b>															
5696757	DWLN2020K06KC04	20	20	25,0	125	31,0	—	WN..060408	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5696758	DWLN2020K08KC04	20	20	25,0	125	33,0	—	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696759	DWLN2525M06KC04	25	25	32,0	150	25,0	—	WN..060408	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5696760	DWLN2525M08KC04	25	25	32,0	150	25,0	4,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696761	DWLN3225P08KC04	32	25	32,0	170	25,0	4,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696762	DWLN3232P08KC04	32	32	40,0	170	25,0	—	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
<b>left hand</b>															
5696751	DWLN2020K06KC04	20	20	25,0	125	31,0	—	WN..060408	IWSN322	KMSP39IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5696752	DWLN2020K08KC04	20	20	25,0	125	33,0	—	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696753	DWLN2525M06KC04	25	25	32,0	150	25,0	—	WN..060408	IWSN322	KMSP315IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM34L9IP
5696754	DWLN2525M08KC04	25	25	32,0	150	25,0	4,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696755	DWLN3225P08KC04	32	25	32,0	170	25,0	4,0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP
5696756	DWLN3232P08KC04	32	32	40,0	170	25,0	—	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	15 IP	SSP025016M	KLM4615IP





See pages B30–B46 for inserts.

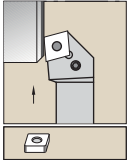


Tools for External Turning and Internal Boring

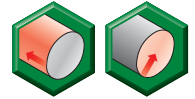
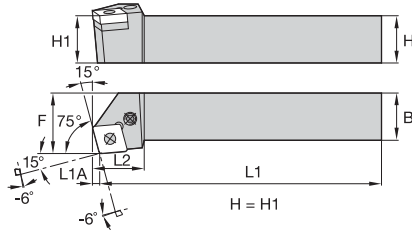
■ PCBN 75°



order number	catalogue number	H	B	F	L1	L2	FA	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus	
<b>right hand</b>															
3878361	PCBNR2020K12	20	20	17,0	125	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP	
3878356	PCBNR2525M12	25	25	22,0	150	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP	
3878366	PCBNR2525M16	25	25	22,0	150	26,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP	
3878367	PCBNR3225P16	32	25	22,0	170	28,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP	
3878363	PCBNR3232P16	32	32	27,0	170	38,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP	
3878358	PCBNR3232P19	32	32	27,0	170	40,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP	
3878364	PCBNR4040S19	40	40	35,0	250	38,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP	
<b>left hand</b>															
3878360	PCBNL2020K12	20	20	17,0	125	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP	
3878354	PCBNL2525M12	25	25	22,0	150	26,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP	
3878365	PCBNL2525M16	25	25	22,0	150	26,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP	
3878359	PCBNL3225P16	32	25	22,0	170	28,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP	
3878355	PCBNL3232P16	32	32	27,0	170	38,0	4,2	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP	
3878357	PCBNL3232P19	32	32	27,0	170	40,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP	
3878362	PCBNL4040S19	40	40	35,0	250	38,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP	

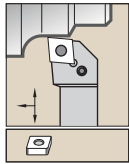


See pages B30–B46 for inserts.

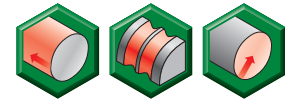
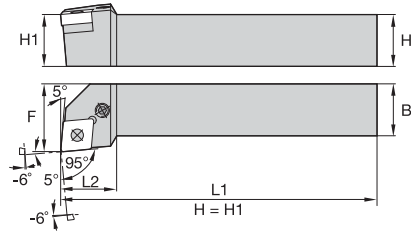


## ■ PCKN 75°

order number	catalogue number	H	B	F	L1	L2	L1A	gage insert						
									shim	shim pin	punch pin	lever	lever screw	Torx Plus
<b>right hand</b>														
3878372	PCKNR2020K12	20	20	25,0	125	23,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878370	PCKNR2525M12	25	25	32,0	150	23,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878374	PCKNR2525M16	25	25	32,0	150	30,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3878375	PCKNR3225P16	32	25	32,0	170	30,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3899889	PCKNR3232P16	32	32	40,0	170	38,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	—
3878371	PCKNR3232P19	32	32	40,0	170	40,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
3879707	PCKNR4040S19	40	40	50,0	250	36,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
<b>left hand</b>														
3878373	PCKNL2020K12	20	20	25,0	125	23,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878369	PCKNL2525M12	25	25	32,0	150	23,0	3,1	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878377	PCKNL2525M16	25	25	32,0	150	30,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3878376	PCKNL3225P16	32	25	32,0	170	30,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3899888	PCKNL3232P16	32	32	40,0	170	38,0	3,8	CN..160612	512.117	513.025	515.022	511.025	514.125	—
3878368	PCKNL3232P19	32	32	40,0	170	40,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
3878378	PCKNL4040S19	40	40	50,0	250	36,0	4,6	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP



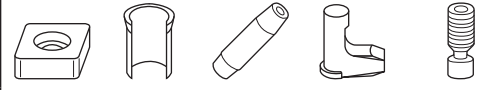
See pages B30–B46 for inserts.

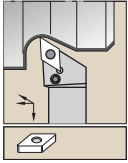


Tools for External Turning and Internal Boring

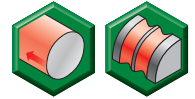
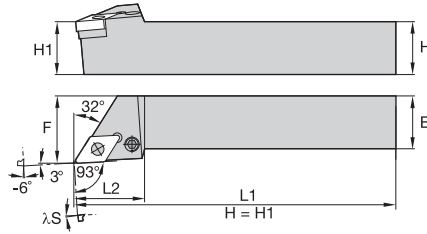
■ PCLN 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	lever screw wrench size
<b>right hand</b>													
3900154	PCLNR1616H09	16	16	20,0	100	23,0	CN..090308	512.111	513.019	515.018	511.018	514.018	2.5 mm
3878400	PCLNR1616H12	16	16	20,0	100	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878422	PCLNR2020K12	20	20	25,0	125	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878419	PCLNR2525M12	25	25	32,0	150	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878401	PCLNR2525M16	25	25	32,0	150	28,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3878402	PCLNR3225P12	32	25	32,0	170	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878421	PCLNR3225P16	32	25	32,0	170	38,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3878413	PCLNR3225P19	32	25	32,0	170	38,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
3878396	PCLNR3232P16	32	32	40,0	170	36,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3878414	PCLNR3232P19	32	32	40,0	170	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
3878417	PCLNR4040S19	40	40	50,0	250	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
<b>left hand</b>													
3900153	PCLNL1616H09	16	16	20,0	100	23,0	CN..090308	512.111	513.019	515.018	511.018	514.018	2.5 mm
3878379	PCLNL1616H12	16	16	20,0	100	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878418	PCLNL2020K12	20	20	25,0	125	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878398	PCLNL2525M12	25	25	32,0	150	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878380	PCLNL2525M16	25	25	32,0	150	28,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3878397	PCLNL3225P12	32	25	32,0	170	26,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3878381	PCLNL3225P19	32	25	32,0	170	38,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
3878415	PCLNL3232P16	32	32	40,0	170	36,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
3878393	PCLNL3232P19	32	32	40,0	170	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP
3878416	PCLNL4040S19	40	40	50,0	250	36,0	CN..190612	512.123	513.033	515.022	511.033	514.133	25 IP





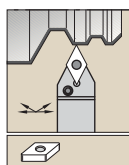
See pages B47–B64 for inserts.



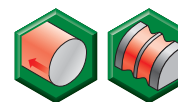
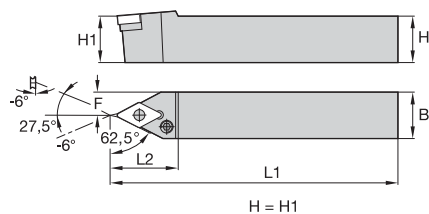
## ■ PDJN 93°

order number	catalogue number	H	B	F	L1	L2	λS°	gage insert						
									shim	shim pin	punch pin	lever	lever screw	Torx Plus
<b>right hand</b>														
3878424	PDJNR1616H11	16	16	20,0	100	22,0	-6,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
3878429	PDJNR2020K11	20	20	25,0	125	30,0	-7,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
3879318	PDJNR2020K15	20	20	25,0	125	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3879151	PDJNR2525M11	25	25	32,0	150	30,0	-7,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
3878425	PDJNR3225P15	32	25	32,0	170	38,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3879152	PDJNR3232P15	32	32	40,0	170	38,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3878426	PDJNR4025R15	40	25	32,0	200	38,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
<b>left hand</b>														
3879313	PDJNL1616H11	16	16	20,0	100	22,0	-6,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
3878427	PDJNL2020K11	20	20	25,0	125	30,0	-7,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
3879317	PDJNL2020K15	20	20	25,0	125	36,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3878428	PDJNL2525M11	25	25	32,0	150	30,0	-7,0	DN..110408	512.060	513.060	515.018	511.060	514.118	10 IP
3879314	PDJNL2525M15	25	25	32,0	150	—	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15IP
3878423	PDJNL3225P15	32	25	32,0	170	38,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3879315	PDJNL3232P15	32	32	40,0	170	38,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3879316	PDJNL4025R15	40	25	32,0	200	38,0	-7,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP

Tools for External Turning and Internal Boring



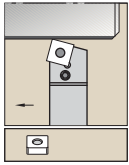
See pages B47–B64 for inserts.



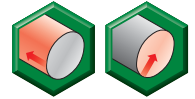
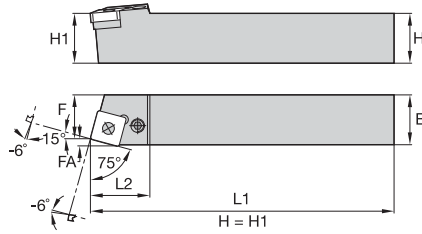
Tools for External Turning and Internal Boring

■ PDNN 62,5°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
<b>right hand</b>													
3879319	PDNNR2525M15	25	25	12,5	150	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3900156	PDNNR3225P15	32	25	12,5	170	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3879322	PDNNR4025M15	40	25	12,5	150	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
<b>left hand</b>													
3879320	PDNNL2525M15	25	25	12,5	150	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP
3900155	PDNNL3225P15	32	25	12,5	170	36,0	DN..150608	512.153	513.023	515.018	511.024	514.128	15 IP



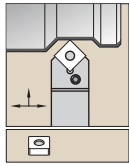
See pages B68–B80 for inserts.



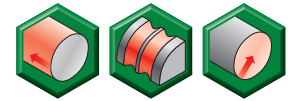
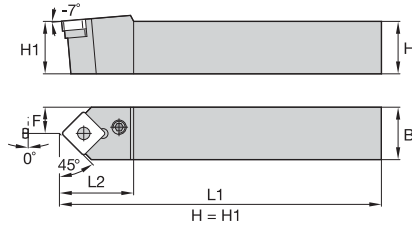
## ■ PSBN 75°

order number	catalogue number	H	B	F	L1	L2	FA	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus	
<b>right hand</b>															
3879324	PSBNR2020K12	20	20	17,0	125	26,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
3900158	PSBNR2525M12	25	25	22,0	150	26,0	—	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
3879333	PSBNR2525M15	25	25	22,0	150	36,0	3,8	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP	
3879330	PSBNR3232P15	32	32	27,0	170	33,0	3,8	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP	
3879327	PSBNR3232P19	32	32	27,0	170	40,0	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP	
3879334	PSBNR4040S19	40	40	35,0	250	38,0	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP	
3879331	PSBNR4040S25	40	40	35,0	250	47,0	5,9	SN..250724	512.092	513.038	515.028	511.038	514.138	30 IP	
<b>left hand</b>															
3879325	PSBNL2020K12	20	20	17,0	125	26,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
3900157	PSBNL2525M12	25	25	22,0	150	26,0	—	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP	
3879329	PSBNL2525M15	25	25	22,0	150	36,0	3,8	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP	
3879332	PSBNL3232P15	32	32	27,0	170	33,0	3,8	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP	
3879328	PSBNL3232P19	32	32	27,0	170	40,0	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP	
3879323	PSBNL4040S19	40	40	35,0	250	38,0	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP	
3879326	PSBNL4040S25	40	40	35,0	250	47,0	5,9	SN..250724	512.092	513.038	515.028	511.038	514.138	30 IP	
3900159	PSBNL5050T25	50	50	43,0	300	50,0	—	SN..250724	512.092	513.038	515.028	511.038	514.138	30 IP	

Tools for External Turning and Internal Boring

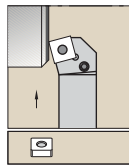


See pages B68–B80 for inserts.

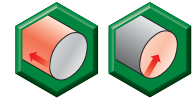
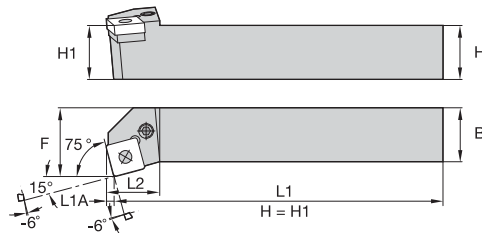


■ PSDN 45°

order number	catalogue number	H	B	F	L1	L2	gage insert						
								shim	shim pin	punch pin	lever	lever screw	Torx Plus
3879336	PSDNN1616H09	16	16	8,0	100	20,0	SN..090308	512.053	513.019	515.018	511.018	514.118	10 IP
3879335	PSDNN2020K12	20	20	10,0	125	26,0	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879337	PSDNN2525M12	25	25	12,5	150	26,0	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3900160	PSDNN3225P15	32	25	12,5	170	33,0	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3900161	PSDNN3232P15	32	32	16,0	170	33,0	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3879338	PSDNN4040S25	40	40	20,0	250	47,0	SN..250724	512.092	513.038	515.028	511.038	514.138	30 IP

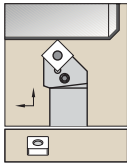


See pages B68–B80 for inserts.

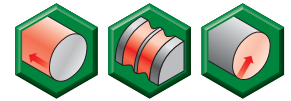
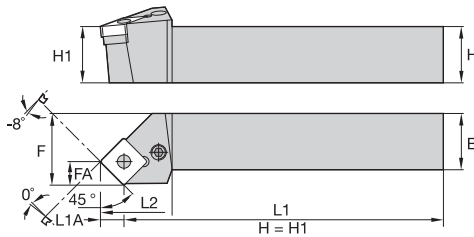


■ PSKN 75°

order number	catalogue number	H	B	F	L1	L2	L1A	gage insert						
									shim	shim pin	punch pin	lever	lever screw	Torx Plus
<b>right hand</b>														
3879340	PSKNR2020K12	20	20	25,0	125	23,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879341	PSKNR2525M12	25	25	32,0	150	23,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879708	PSKNR2525M15	25	25	32,0	150	32,0	3,8	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3879342	PSKNR3232P19	32	32	40,0	170	37,5	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
3879710	PSKNR4040S19	40	40	50,0	250	37,5	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
<b>left hand</b>														
3879709	PSKNL1616H09	16	16	20,0	100	20,0	2,2	SN..090308	512.053	513.019	515.018	511.018	514.118	10 IP
3879343	PSKNL2020K12	20	20	25,0	125	23,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879339	PSKNL2525M12	25	25	32,0	150	23,0	3,1	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879344	PSKNL3232P19	32	32	40,0	170	37,5	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
3879345	PSKNL4040S19	40	40	50,0	250	37,5	4,6	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP



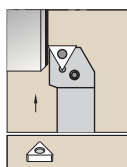
See pages B68–B80 for inserts.



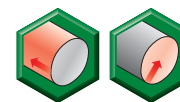
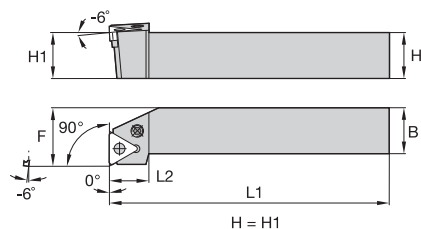
## ■ PSSN 45°

order number	catalogue number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
<b>right hand</b>															
3879351	PSSNR1616H09	16	16	20,0	100	23,0	6,1	6,1	SN..090308	512.053	513.019	515.018	511.018	514.118	10 IP
3879359	PSSNR2020K09	20	20	25,0	125	26,0	6,1	6,1	SN..090308	512.053	513.019	515.018	511.018	514.118	10 IP
3879348	PSSNR2020K12	20	20	25,0	125	28,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879352	PSSNR2525M12	25	25	32,0	150	28,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879349	PSSNR2525M15	25	25	32,0	150	32,0	10,2	10,2	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3879360	PSSNR3225P12	32	25	32,0	170	29,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879362	PSSNR3225P15	32	25	32,0	170	32,0	10,2	10,2	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3879354	PSSNR3232P15	32	32	40,0	170	32,0	10,0	11,5	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3879350	PSSNR3232P19	32	32	40,0	170	37,5	12,5	12,5	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
3879361	PSSNR4040S19	40	40	50,0	250	37,5	12,5	12,5	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
<b>left hand</b>															
3879363	PSSNL1616H09	16	16	20,0	100	23,0	6,1	6,1	SN..090308	512.053	513.019	515.018	511.018	514.118	10 IP
3879844	PSSNL2020K09	20	20	25,0	125	26,0	6,1	6,1	SN..090308	512.053	513.019	515.018	511.018	514.118	10 IP
3879347	PSSNL2020K12	20	20	25,0	125	28,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879353	PSSNL2525M12	25	25	32,0	150	28,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	514.123	15 IP
3879355	PSSNL2525M15	25	25	32,0	150	32,0	10,2	10,2	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3879358	PSSNL3225P12	32	25	32,0	170	29,0	8,3	8,3	SN..120408	512.063	513.023	515.018	511.023	—	15 IP
3879843	PSSNL3225P15	32	25	32,0	170	32,0	10,2	10,2	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3879712	PSSNL3232P15	32	32	40,0	170	32,0	10,2	10,2	SN..150612	512.025	513.025	515.022	511.025	514.125	15 IP
3879356	PSSNL3232P19	32	32	40,0	170	37,5	12,5	12,5	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
3879357	PSSNL4040S19	40	40	50,0	250	37,5	12,5	12,5	SN..190612	512.083	513.033	515.022	511.033	514.133	25 IP
3879711	PSSNL4040S25	40	40	50,0	250	50,0	16,0	16,0	SN..250724	512.092	513.038	515.028	511.038	514.138	30 IP





See pages B81–B93 for inserts.

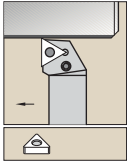


Tools for External Turning and Internal Boring

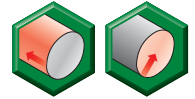
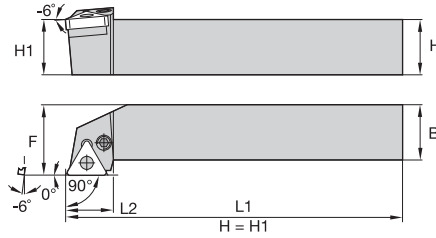
■ PTFN 90°



order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
<b>right hand</b>													
3879369	PTFNR1616H16	16	16	20,0	100	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879367	PTFNR2020K16	20	20	25,0	125	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879364	PTFNR2525M16	25	25	32,0	150	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879372	PTFNR2525M22	25	25	32,0	150	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
3879370	PTFNR3225P22	32	25	32,0	170	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
3879845	PTFNR3232P22	32	32	40,0	170	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
<b>left hand</b>													
3879365	PTFNL1616H16	16	16	20,0	100	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879366	PTFNL2020K16	20	20	25,0	125	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879368	PTFNL2525M16	25	25	32,0	150	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP

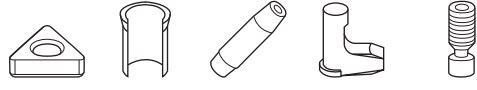


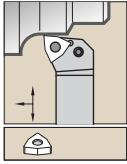
See pages B81–B93 for inserts.



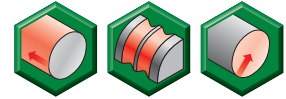
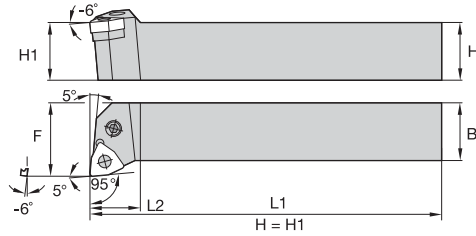
■ **PTGN 90°**

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
<b>right hand</b>													
3879385	PTGNR1616H16	16	16	20,0	100	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879389	PTGNR2020K16	20	20	25,0	125	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879390	PTGNR2525M16	25	25	32,0	150	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879387	PTGNR2525M22	25	25	32,0	150	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
3879846	PTGNR3225P22	32	25	32,0	170	28,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
3879391	PTGNR3232P22	32	32	40,0	170	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
3900163	PTGNR4040T27	40	40	50,0	300	31,0	TN..270612	512.031	513.025	515.022	511.028	514.128	15 IP
<b>left hand</b>													
3879383	PTGNL1616H16	16	16	20,0	100	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879384	PTGNL2020K16	20	20	25,0	125	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879388	PTGNL2525M16	25	25	32,0	150	20,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3879386	PTGNL2525M22	25	25	32,0	150	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
3879392	PTGNL3232P22	32	32	40,0	170	26,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
3900162	PTGNL4040T27	40	40	50,0	300	31,0	TN..270612	512.031	513.025	515.022	511.028	514.128	15 IP





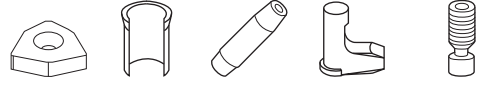
See pages B99–B105 for inserts.

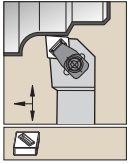


Tools for External Turning and Internal Boring

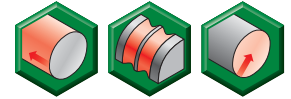
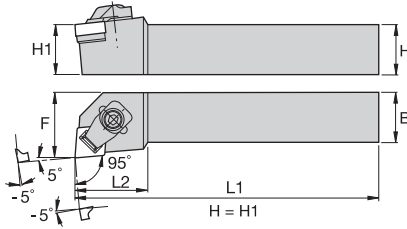
■ PWLN 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
<b>right hand</b>													
3879405	PWLN1616H06	16	16	20,0	100	14,0	WN..060408	512.134	513.018	515.018	511.018	514.118	10 IP
3879407	PWLN2020K06	20	20	25,0	125	14,0	WN..060408	512.134	513.018	515.018	511.018	514.118	10 IP
3879408	PWLN2020K08	20	20	25,0	125	20,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
3900167	PWLN2525M06	25	25	32,0	150	20,0	WN..060408	512.134	513.018	515.018	511.018	514.118	10 IP
3879409	PWLN2525M08	25	25	32,0	150	26,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
3900164	PWLN3232P08	32	32	40,0	170	26,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
<b>left hand</b>													
3879410	PWLN1616H06	16	16	20,0	100	14,0	WN..060408	512.134	513.018	515.018	511.018	514.118	10 IP
3879406	PWLN2020K06	20	20	25,0	125	14,0	WN..060408	512.134	513.018	515.018	511.018	514.118	10 IP
3879403	PWLN2020K08	20	20	25,0	125	20,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
3900166	PWLN2525M06	25	25	32,0	150	20,0	WN..060408	512.134	513.018	515.018	511.018	514.118	10 IP
3879404	PWLN2525M08	25	25	32,0	150	26,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
3900165	PWLN3232P08	32	32	40,0	170	26,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP





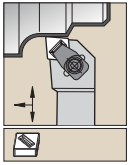
See pages B177–B179 and B197–B205 for inserts.



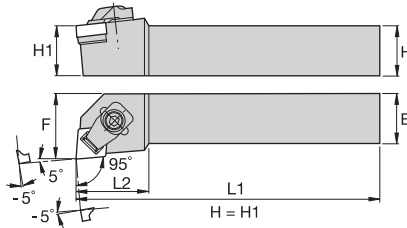
## ■ CCLN-MX 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp assembly	hex
<b>right hand</b>												
3032691	CCLNR2525M12MX7	25	25	32,0	150	32,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm
3032713	CCLNR3225P12MX7	32	25	32,0	170	32,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm
<b>left hand</b>												
3032692	CCLNL2525M12MX7	25	25	32,0	150	32,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm

NOTE: MX — clamping version is shown.



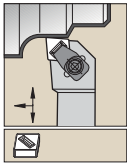
See pages B177–B179 and B197–B205 for inserts.



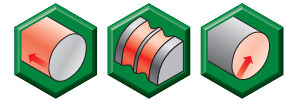
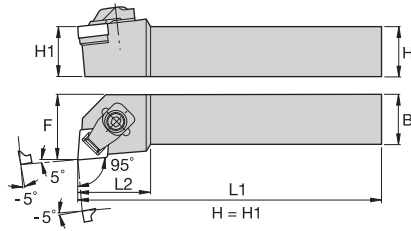
## ■ CCLN-MN 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
<b>right hand</b>													
3032715	CCLNR2525M12MN4	25	25	32,0	150	32,0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm
3032717	CCLNR2525M12MN7	25	25	32,0	150	32,0	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm
3032719	CCLNR3225P12MN7	32	25	32,0	170	32,0	CN.N120708	552.221	554.252	2.5 mm	—	551.317	4 mm
<b>left hand</b>													
3032716	CCLNL2525M12MN4	25	25	32,0	150	32,0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm

NOTE: MX — clamping version is shown.



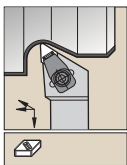
See pages B177–B179 and B197–B205 for inserts.



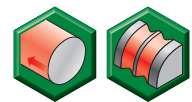
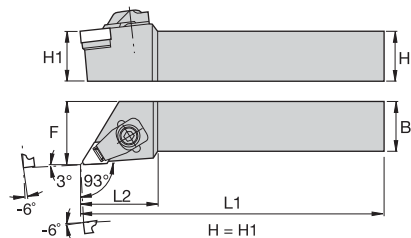
■ CCLN-MF 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	chipbreaker	clamp assembly	hex
<b>right hand</b>													
3032723	CCLNR2525M12MF7	25	25	32,0	150	32,0	CN.N120708	552.221	554.252	2.5 mm	557.125	551.317	4 mm

NOTE: MX — clamping version is shown.



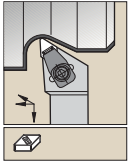
See pages B180–B181 and B206–B216 for inserts.



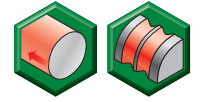
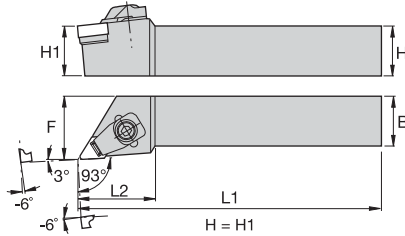
■ CDJN-MX 93°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp assembly	hex
<b>right hand</b>												
3032726	CDJNR2525M15MX7	25	25	32,0	150	38,0	DN.X150708	552.228	554.252	2.5 mm	551.332	4 mm
<b>left hand</b>												
3032727	CDJNL2525M15MX7	25	25	32,0	150	38,0	DN.X150708	552.228	554.252	2.5 mm	551.332	4 mm

NOTE: MX — clamping version is shown.



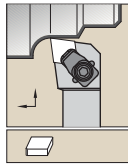
See pages B180–B181 and B206–B216 for inserts.



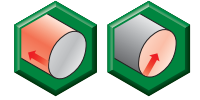
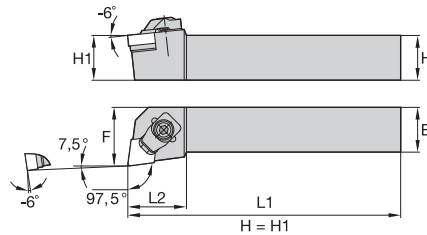
## ■ CDJN-MN 93°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
<b>right hand</b>													
3032728	CDJNR2525M15MN7	25	25	32,0	150	38,0	DN.N150708	552.228	554.252	2.5 mm	557.111	551.317	4 mm
3032545	CDJNR3225P15MN7	32	25	32,0	170	38,0	DN.N150708	552.228	554.252	2.5 mm	557.111	551.317	4 mm
<b>left hand</b>													
3032544	CDJNL2525M15MN7	25	25	32,0	150	38,0	DN.N150708	552.228	554.252	2.5 mm	557.111	551.317	4 mm
3032546	CDJNL3225P15MN7	32	25	32,0	170	38,0	DN.N150708	552.228	554.252	2.5 mm	557.111	551.317	4 mm

NOTE: MX — clamping version is shown.



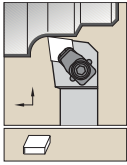
See page B182 for inserts.



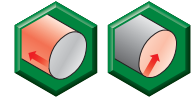
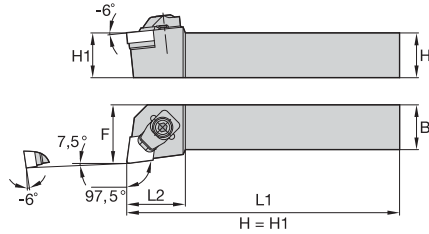
## ■ CELN-MF 97,5°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	chipbreaker	clamp assembly	hex
<b>right hand</b>													
3879700	CELNR2525M13MF7	25	25	32,5	153	32,0	EN.N130708	552.240	554.252	2.5 mm	557.125	551.317	4 mm
<b>left hand</b>													
3879698	CELNL2525M13MF7	25	25	32,5	153	32,0	EN.N130708	552.240	554.252	2.5 mm	557.125	551.317	4 mm

NOTE: MN — clamping version is shown.



See page B182 for inserts.

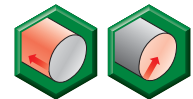
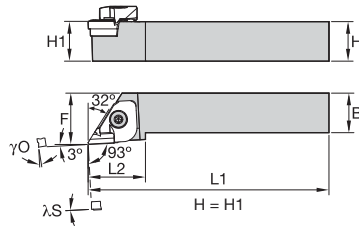
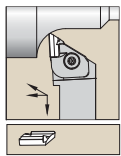


Tools for External Turning and Internal Boring

■ CELN-MN 97,5°

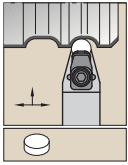
order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
<b>right hand</b>													
3879701	CELNR2525M13MN7	25	25	32,5	153	32,0	EN.N130708	552.240	554.252	2.5 mm	557.111	551.317	4 mm
<b>left hand</b>													
3879699	CELNL2525M13MN7	25	25	32,5	153	32,0	EN.N130708	552.240	554.252	2.5 mm	557.111	551.317	4 mm

NOTE: MN – clamping version is shown.

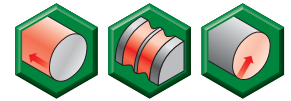
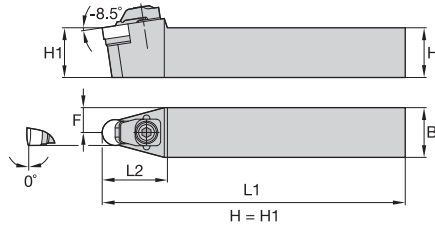


■ CKJN

order number	catalogue number	H	B	F	L1	L2	λS°	γ0°	gage insert	shim	shim pin	clamp	clamp assembly	hex	hex wrench	pin
<b>right hand</b>																
3870064	CKJNR2525M16	25	25	32,0	150	36,0	0.0	-6.0	KN..160410R	512.100	513.020	551.129	—	4 mm	170.004	513.123
3870065	CKJNR3225P16	32	25	32,0	170	33,0	0.0	-6.0	KN..160410R	512.100	513.020	551.129	—	4 mm	170.004	513.123
<b>left hand</b>																
3870042	CKJNL2525M16	25	25	32,0	150	36,0	0.0	-6.0	KN..160410L	512.101	513.020	—	551.130	4 mm	170.004	513.123
3870063	CKJNL3225P16	32	25	32,0	170	33,0	0.0	-6.0	KN..160410L	512.101	513.020	—	551.130	4 mm	170.004	513.123



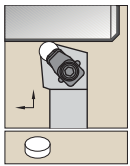
See pages B183–B185 and B210 for inserts.



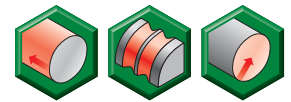
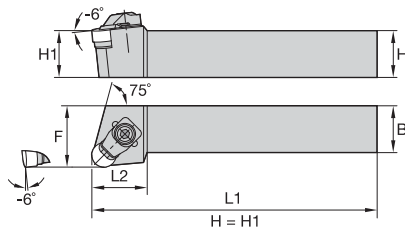
## ■ CRDN-MN

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
3032549	CRDNN2525M12MN4	25	25	12,5	150	30,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
3032551	CRDNN2525M12MN7	25	25	12,5	150	30,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm
3032550	CRDNN3225P12MN4	32	25	12,5	170	30,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
3032552	CRDNN3225P12MN7	32	25	12,5	170	30,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm

NOTE: MN — clamping version is shown.



See pages B183–B185 and B210 for inserts.

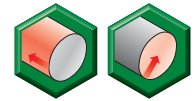
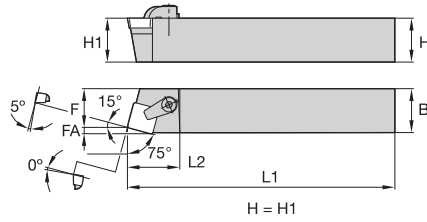
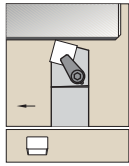


## ■ CRSN-MN

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
<b>right hand</b>													
3032677	CRSNR2525M12MN7	25	25	32,0	150	26,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm
3032675	CRSNR3225P12MN4	32	25	32,0	170	26,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
3032679	CRSNR3225P12MN7	32	25	32,0	170	26,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm
<b>left hand</b>													
3032678	CRSNL2525M12MN7	25	25	32,0	150	26,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm
3032676	CRSNL3225P12MN4	32	25	32,0	170	26,0	RN.N120400	552.229	554.252	2.5 mm	557.111	551.333	4 mm
3032680	CRSNL3225P12MN7	32	25	32,0	170	26,0	RN.N120700	552.230	554.252	2.5 mm	557.111	551.333	4 mm

NOTE: MN — clamping version is shown.

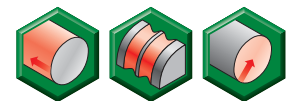
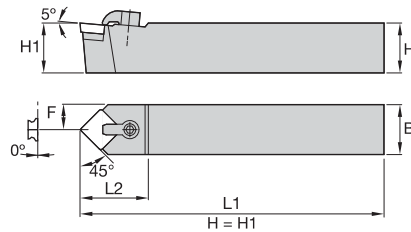
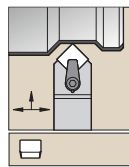




See pages B186–B191 and B211–B212 for inserts.

■ CSBP 75°

order number	catalogue number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	hex	clamp	clamp screw	hex	
<b>right hand</b>															
3870068	CSBPR2020K12	20	20	17,0	125	30,0	3,1	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm	
3870069	CSBPR2525M12	25	25	22,0	150	30,0	3,1	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm	
<b>left hand</b>															
3870066	CSBPL2020K12	20	20	17,0	125	30,0	3,1	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm	

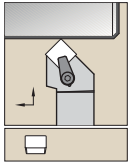


See pages B186–B191 and B211–B212 for inserts.

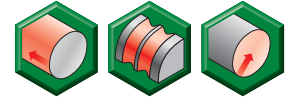
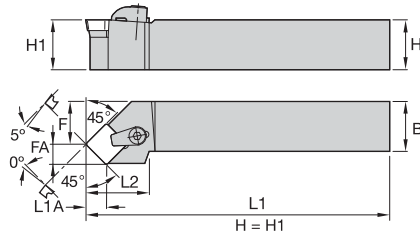
■ CSDP 45°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
3870070	CSDPN1616H09	16	16	8,0	100	25,0	SP..090308	SM820	MS959	—	CKM7	STCM9	2.5 mm
3870071	CSDPN2020K12	20	20	10,0	125	32,0	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm
3870072	CSDPN2525M12	25	25	12,5	150	32,0	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm

Tools for External Turning and Internal Boring

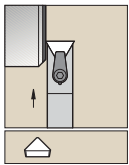


See pages B186–B191 and B211–B212 for inserts.

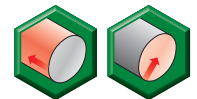
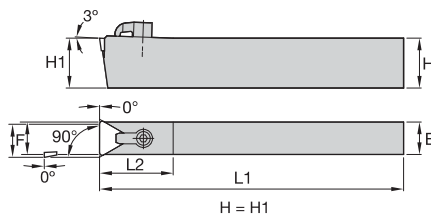


■ **CSSP 45°**

order number	catalogue number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
<b>right hand</b>															
3870074	CSSPR2020K12	20	20	25,0	125	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm
3870075	CSSPR2525M12	25	25	32,0	150	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm
<b>left hand</b>															
3870073	CSSPL2525M12	25	25	32,0	150	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm

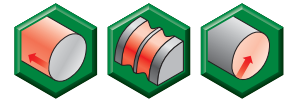
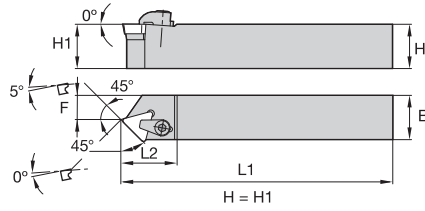
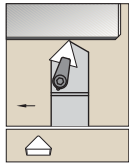


See pages B192–B194 and B212–B216 for inserts.



■ **CTCP 90°**

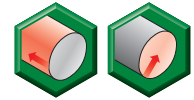
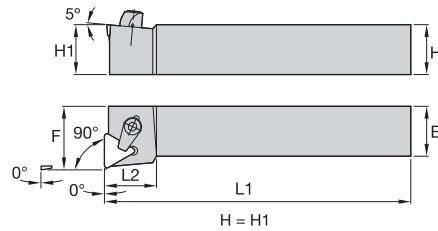
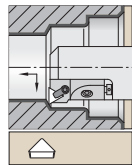
order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
3870080	CTCPN4018R22	40	18	19,2	200	41,0	TP..220408	SM837	MS125	2.5 mm	CKM13	STCM4	4 mm
3870076	CTCPN2510M11	25	10	10,0	150	26,0	TP..110304	SM819	MS960	—	CKM7	STCM5	2.5 mm
3870077	CTCPN2514M16	25	14	14,4	150	28,0	TP..160308	SM841	MS111	2 mm	CKM13	STCM4	4 mm
3870078	CTCPN2518M22	25	18	19,2	150	41,0	TP..220408	SM837	MS125	2.5 mm	CKM13	STCM4	4 mm
3870079	CTCPN2520M22	25	20	20,2	150	41,0	TP..220408	SM837	MS125	2.5 mm	CKM13	STCM4	4 mm



See pages B192–B194 and B212–B216 for inserts.

■ CTDP 45°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	clamp	clamp screw	hex
<b>right hand</b>												
3870083	CTDPR1212F11	12	12	6,0	80	22,0	TP..110304	SM819	MS960	CKM19	STCM9	2.5 mm
<b>left hand</b>												
3870082	CTDPL1212F11	12	12	6,0	80	22,0	TP..110304	SM819	MS960	CKM19	STCM9	2.5 mm

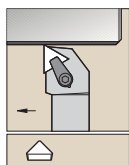


See pages B192–B194 and B212–B216 for inserts.

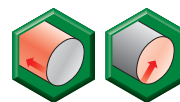
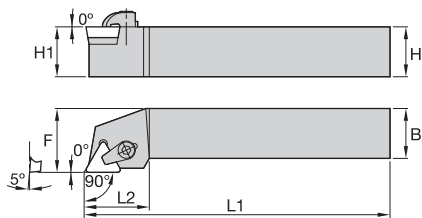
■ CTFP 90°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
<b>right hand</b>													
3870087	CTFPR2020K16	20	20	25,0	125	29,0	TP..160308	SM841	MS111	2 mm	CKM10	STCM8	4 mm
3870088	CTFPR2525M16	25	25	32,0	150	29,0	TP..160308	SM841	MS111	2 mm	CKM9	STCM4	4 mm
<b>left hand</b>													
3870086	CTFPL2525M16	25	25	32,0	150	29,0	TP..160308	SM841	MS111	2 mm	CKM9	STCM4	4 mm





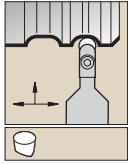
See pages B192–B194 and B212–B216 for inserts.



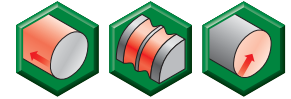
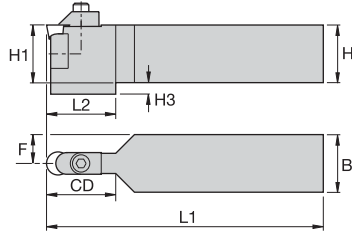
## ■ CTGP 90°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
<b>right hand</b>													
3870092	CTGPR1212F11	12	12	16,0	80	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
3870103	CTGPR1616H11	16	16	20,0	100	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
3870104	CTGPR2020K11	20	20	25,0	125	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
3870105	CTGPR2020K16	20	20	25,0	125	26,0	TP..160308	SM841	MS111	2 mm	CKM10	STCM8	4 mm
3870106	CTGPR2525M16	25	25	32,0	150	26,0	TP..160308	SM841	MS111	2 mm	CKM9	STCM4	4 mm
3870107	CTGPR2525M22	25	25	32,0	150	30,0	TP..220408	SM837	MS125	2.5 mm	CKM9	STCM4	4 mm
<b>left hand</b>													
3870089	CTGPL1212F11	12	12	16,0	80	20,0	TP..110304	SM819	MS960	—	CKM19	STCM9	2.5 mm
3870090	CTGPL2020K16	20	20	25,0	125	26,0	TP..160308	SM841	MS111	2 mm	CKM10	STCM8	4 mm
3870091	CTGPL2525M16	25	25	32,0	150	26,0	TP..160308	SM841	MS111	2 mm	CKM9	STCM4	4 mm





See page B184 for inserts.

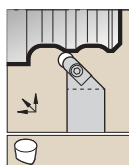


Tools for External Turning and Internal Boring

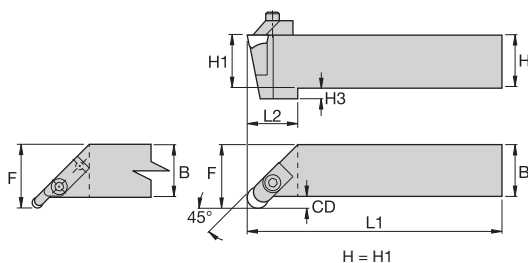
■ CRDP

order number	catalogue number	H	B	F	L1	L2	H3	CD	gage insert	nest	clamp	clamp screw	hex
3871510	CRDPN2525M06V	25	25	12,5	151	—	—	19,0	R..X060400E	NST1	CM214	MS1321	2.5 mm
3871512	CRDPN3232P09V	32	32	16,0	171	—	—	29,0	R..X090700E	NST2	CM219	CS412	9/64
3871511	CRDPN2525M09V	25	25	12,5	151	—	—	29,0	R..X090700E	NST2	CM219	CS412	9/64
3871514	CRDPN3232P12V	32	32	16,0	171	—	—	38,0	R..X120700E	NST3	CM216	CS412	9/64
3871513	CRDPN2525M12V	25	25	12,5	151	38,1	6,4	38,0	R..X120700E	NST3	CM216	CS412	9/64

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



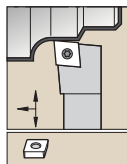
See page B184 for inserts.



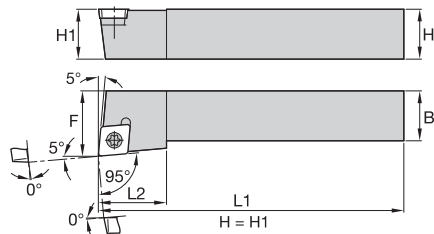
## ■ CRGP

order number	catalogue number	H	B	F	L1	L2	H3	CD	gage insert	nest	clamp	clamp screw	hex
<b>right hand</b>													
3871515	CRGPR2525M06V	25	25	32,0	151	—	—	7,3	R..X060400E	NST1	CM214	MS1321	2.5 mm
3871519	CRGPR3232P09V	32	32	40,0	171	—	—	8,3	R..X090700E	NST2	CM219	CS412	9/64
3871517	CRGPR2525M09V	25	25	32,0	151	—	—	7,3	R..X090700E	NST2	CM219	CS412	9/64
3871521	CRGPR2525M12V	25	25	32,0	151	27,1	6,4	7,3	R..X120700E	NST3	CM216	CS412	9/64
<b>left hand</b>													
3871516	CRGPL2525M06V	25	25	32,0	151	—	—	7,3	R..X060400E	NST1	CM214	MS1321	2.5 mm
3871520	CRGPL3232P09V	32	32	40,0	171	—	—	8,3	R..X090700E	NST2	CM219	CS412	9/64
3871518	CRGPL2525M09V	25	25	32,0	151	—	—	7,3	R..X090700E	NST2	CM219	CS412	9/64
3871524	CRGPL3232P12V	32	32	40,0	171	37,1	—	8,3	R..X120700E	NST3	CM216	CS412	9/64
3871522	CRGPL2525M12V	25	25	32,0	151	27,1	6,4	7,3	R..X120700E	NST3	CM216	CS412	9/64

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

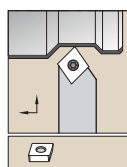


See pages B30–B46 for inserts.

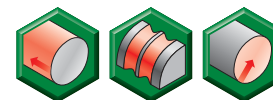
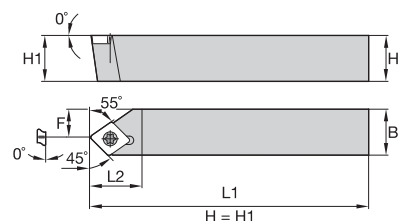


■ SCLC 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>												
3900169	SCLCR1010E06	10	10	12,0	70	12,0	CC..060204	—	—	—	MS1153	T7
3900172	SCLCR1212F06	12	12	16,0	80	12,0	CC..060204	—	—	—	MS1153	T7
3900170	SCLCR1212F09	12	12	16,0	80	16,0	CC..09T308	—	—	—	MS1155	T15
3879416	SCLCR1616H09	16	16	20,0	100	16,0	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
3879417	SCLCR2020K09	20	20	25,0	125	16,0	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
3879414	SCLCR2020K12	20	20	25,0	125	20,0	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15
3879418	SCLCR2525M12	25	25	32,0	150	19,8	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15
<b>left hand</b>												
3900171	SCLCL1010E06	10	10	12,0	70	12,0	CC..060204	—	—	—	MS1153	T7
3900173	SCLCL1212F06	12	12	16,0	80	12,0	CC..060204	—	—	—	MS1153	T7
3900168	SCLCL1212F09	12	12	16,0	80	16,0	CC..09T308	—	—	—	MS1155	T15
3879411	SCLCL1616H09	16	16	20,0	100	16,0	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
3879412	SCLCL2020K09	20	20	25,0	125	16,0	CC..09T308	SKCP343	SRS3	3.5 mm	MS1156	T15
3879415	SCLCL2020K12	20	20	25,0	125	20,0	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15
3879413	SCLCL2525M12	25	25	32,0	150	19,8	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15

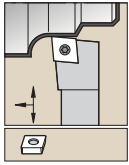


See pages B30–B46 for inserts.

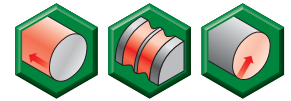
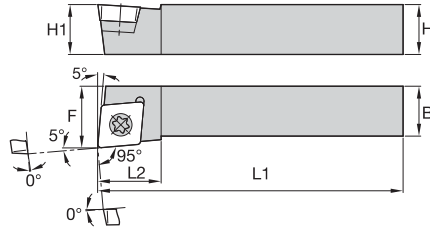


■ SCDP 45°

order number	catalogue number	H	B	F	L1	L2	gage insert	insert screw	Torx
<b>right hand</b>									
5094163	SCDPR1212H06	12	12	7,0	100	14,0	CP..060203	MS1153	T7
<b>left hand</b>									
5094162	SCDPL1212H06	12	12	7,0	100	14,0	CP..060203	MS1153	T7

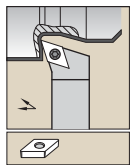


See pages B30–B46 for inserts.

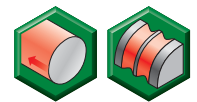
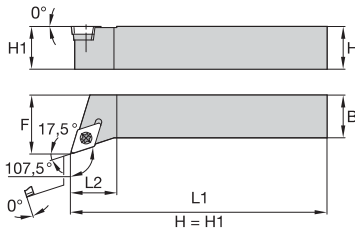


■ **SCLP 95°**

order number	catalogue number	H	B	F	L1	L2	gage insert	insert screw	Torx
<b>right hand</b>									
5094217	SCLPR1010M06	10	10	11,0	150	11,4	CP..060203	MS1153	T7
5094218	SCLPR1212M06	12	12	13,0	150	11,4	CP..060203	MS1153	T7
<b>left hand</b>									
5094212	SCLPL1212M06	12	12	13,0	150	11,4	CP..060203	MS1153	T7



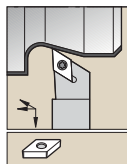
See pages B47–B64 for inserts.



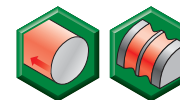
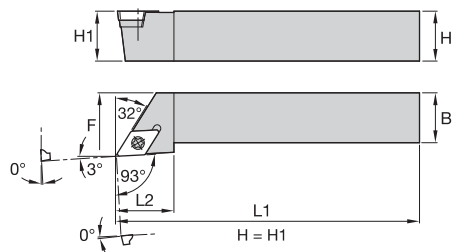
■ **SDHC 107,5°**

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>												
3879435	SDHCR1616H11	16	16	20,0	100	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879437	SDHCR2020K11	20	20	25,0	125	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879440	SDHCR2525M11	25	25	32,0	150	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879436	SDHCR2525M15	25	25	32,0	150	25,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
<b>left hand</b>												
3879433	SDHCL1616H11	16	16	20,0	100	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879439	SDHCL2020K11	20	20	25,0	125	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879438	SDHCL2525M11	25	25	32,0	150	20,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879434	SDHCL2525M15	25	25	32,0	150	25,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15





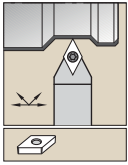
See pages B47–B64 for inserts.



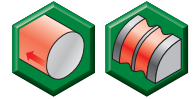
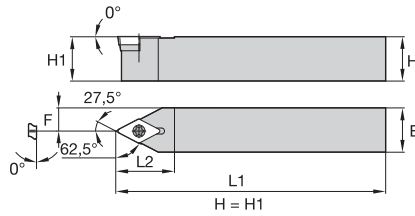
Tools for External Turning and Internal Boring

■ SDJC 93°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>												
3879464	SDJCR1010M07	10	10	12,0	150	16,0	DC..070204	—	—	—	MS1153	T7
3899890	SDJCR1212F07	12	12	16,0	80	16,0	DC..070204	—	—	—	MS1153	T7
3900177	SDJCR1212F11	12	12	16,0	80	22,0	DC..11T308	—	—	—	MS1155	T15
3879456	SDJCR1616H07	16	16	20,0	100	16,0	DC..070204	—	—	—	MS1153	T7
3879459	SDJCR1616H11	16	16	20,0	100	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879458	SDJCR2020K07	20	20	25,0	125	16,0	DC..070204	—	—	—	MS1153	T7
3879460	SDJCR2020K11	20	20	25,0	125	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879457	SDJCR2020K15	20	20	25,0	125	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
3879461	SDJCR2525M11	25	25	32,0	150	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879463	SDJCR2525M15	25	25	32,0	150	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
3900175	SDJCR3225P15	32	25	32,0	170	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
<b>left hand</b>												
3899892	SDJCL1010E07	10	10	12,0	70	16,0	DC..070204	—	—	—	MS1153	T7
3899891	SDJCL1212F07	12	12	16,0	80	16,0	DC..070204	—	—	—	MS1153	T7
3900176	SDJCL1212F11	12	12	16,0	80	22,0	DC..11T308	—	—	—	MS1155	T15
3879441	SDJCL1616H07	16	16	20,0	100	16,0	DC..070204	—	—	—	MS1153	T7
2024450	SDJCL1616H11	16	16	20,0	100	21,0	DC..11T3..	—	—	—	12148038800	T15
3879454	SDJCL1616H11	16	16	20,0	100	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879442	SDJCL2020K07	20	20	25,0	125	16,0	DC..070204	—	—	—	MS1153	T7
3879462	SDJCL2020K11	20	20	25,0	125	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879848	SDJCL2020K15	20	20	25,0	125	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
3879453	SDJCL2525M11	25	25	32,0	150	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879455	SDJCL2525M15	25	25	32,0	150	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
3900174	SDJCL3225P15	32	25	32,0	170	32,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15

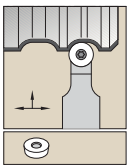


See pages B47–B64 for inserts.

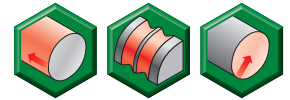
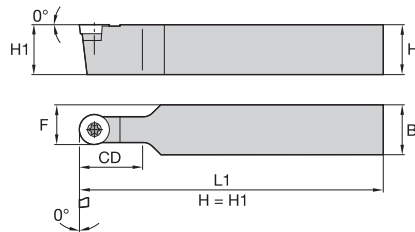


■ **SDNC 62,5°**

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
<b>left hand</b>												
3879468	SDNCN0808L07	8	8	4,0	140	16,0	DC..070204	—	—	—	MS1153	T7
3879469	SDNCN1010M07	10	10	5,0	150	16,0	DC..070204	—	—	—	MS1153	T7
3900178	SDNCN1212F11	12	12	6,0	80	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879465	SDNCN1616H11	16	16	8,0	100	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879467	SDNCN2020K11	20	20	10,0	125	22,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879849	SDNCN2525M11	25	25	12,5	150	25,0	DC..11T308	SKDP343	SRS3	3.5 mm	MS1156	T15
3879466	SDNCN2525M15	25	25	12,5	150	28,0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
3900179	SDNCN3225P15	32	25	12,5	170	32,5	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15

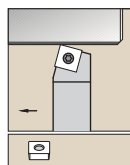


See pages B65–B67 for inserts.

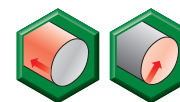
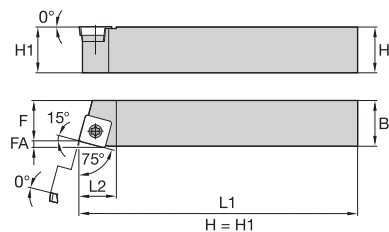


■ **SRDC**

order number	catalogue number	H	B	F	L1	CD	gage insert	shim	shim screw	hex	insert screw	Torx
3879735	SRDCN1616H06	16	16	11,0	100	16,0	RC..0602M0	—	—	—	MS1153	T7
3879702	SRDCN1616H08	16	16	12,0	100	16,0	RC..0803M0	—	—	—	MS1154	T9
3900182	SRDCN2020K06	20	20	12,5	125	19,7	RC..0602M0	—	—	—	MS1153	T7
3879733	SRDCN2020K08	20	20	14,0	125	20,0	RC..0803M0	—	—	—	MS1154	T9
3879736	SRDCN2020K10	20	20	15,0	125	20,0	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
3900183	SRDCN2525M06	25	25	15,0	150	19,7	RC..0602M0	—	—	—	MS1153	T7
3879737	SRDCN2525M08	25	25	16,5	150	25,0	RC..0803M0	—	—	—	MS1154	T9
3879734	SRDCN2525M10	25	25	17,5	150	25,0	RC..10T3M0	SKRN100300	SRS3	3.5 mm	MS1156	T15
3879738	SRDCN2525M12	25	25	18,5	150	25,0	RC..1204M0	SKRN1203M0	SRS3	3.5 mm	MS1156	T15
3900181	SRDCN3225P12	32	25	8,0	170	28,0	RC..1204M0	SKRN1203M0	SRS3	3.5 mm	MS1156	T15
3900180	SRDCN3225P16	32	25	20,0	170	35,0	RC..1605M0	SKRN160400	SRS5	5 mm	MS1160	T20



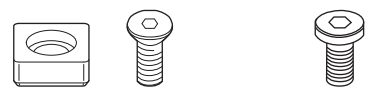
See pages B68–B80 for inserts.

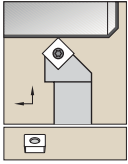


Tools for External Turning and Internal Boring

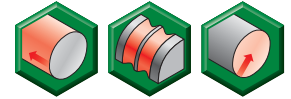
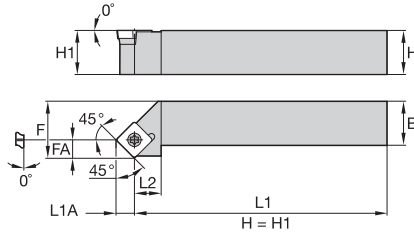
## SSBC 75°

order number	catalogue number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>													
3879850	SSBCR1616H09	16	16	13,0	100	16,0	2,2	SC..096308	SKSP343	SRS3	3.5 mm	MS1156	T15
3879741	SSBCR2020K12	20	20	17,0	125	21,0	3,1	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
3879740	SSBCR2525M12	25	25	22,0	150	21,0	3,1	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
<b>left hand</b>													
3879739	SSBCL1616H09	16	16	13,0	100	16,0	2,2	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15
3879852	SSBCL2020K12	20	20	17,0	125	21,0	3,1	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
3879851	SSBCL2525M12	25	25	22,0	150	21,0	3,1	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15





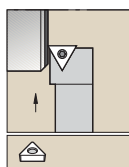
See pages B68–B80 for inserts.



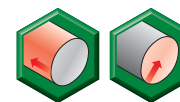
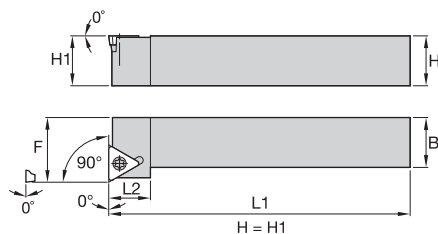
■ **SSSC 45°**

order number	catalogue number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>														
3879747	SSSCR1616H09	16	16	20,0	100	18,0	6,1	6,1	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15
3879746	SSSCR2020K12	20	20	25,0	125	25,0	8,3	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
3879744	SSSCR2525M12	25	25	32,0	150	25,0	8,3	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
<b>left hand</b>														
3879745	SSSCL1616H09	16	16	20,0	100	18,0	6,1	6,1	SC..09T308	SKSP343	SRS3	3.5 mm	MS1156	T15
3879743	SSSCL2020K12	20	20	25,0	125	25,0	8,3	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15
3879742	SSSCL2525M12	25	25	32,0	150	25,0	8,3	8,3	SC..120408	SKSP453	SRS4	4 mm	MS1158	T15

Tools for External Turning and Internal Boring

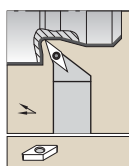


See pages B81–B93 for inserts.

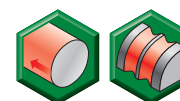
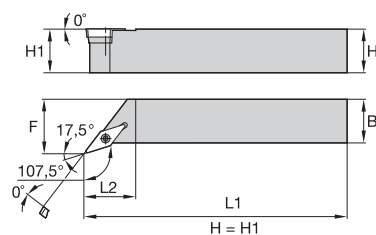


■ STFC 90°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>												
3900184	STFCR1212F11	12	12	16,0	80	13,0	TC..110204	—	—	—	MS1153	T7
3879763	STFCR2020K16	20	20	25,0	125	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
3879750	STFCR2525M16	25	25	32,0	150	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
<b>left hand</b>												
3879751	STFCL1616H16	16	16	20,0	100	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
3879748	STFCL2020K16	20	20	25,0	125	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15
3879752	STFCL2525M16	25	25	32,0	150	20,0	TC..16T308	SKTP343	SRS3	3.5 mm	MS1156	T15

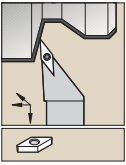


See pages B94–B99 for inserts.

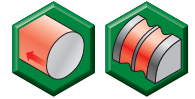
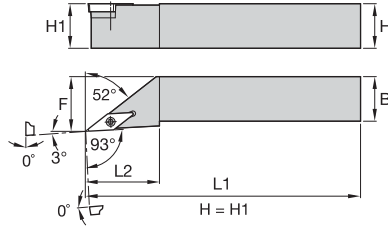


■ SVHB 107,5°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>												
3879767	SVHBR2020K16	20	20	25,0	125	28,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879765	SVHBR2525M16	25	25	32,0	150	28,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879853	SVHBR3225P16	32	25	32,0	170	25,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
<b>left hand</b>												
3879764	SVHBL2020K16	20	20	25,0	125	28,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879766	SVHBL2525M16	25	25	32,0	150	28,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879768	SVHBL3225P16	32	25	32,0	170	25,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15

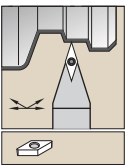


See pages B94–B99 for inserts.

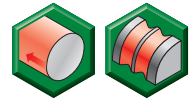
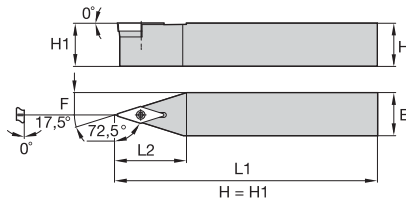


■ **SVJB 93°**

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>												
3879769	SVJBR1616H16	16	16	20,0	100	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879776	SVJBR2020K16	20	20	25,0	125	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879775	SVJBR2525M16	25	25	32,0	150	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879773	SVJBR3225P16	32	25	32,0	170	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
<b>left hand</b>												
3879772	SVJBL1616H16	16	16	20,0	100	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879770	SVJBL2020K16	20	20	25,0	125	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879774	SVJBL2525M16	25	25	32,0	150	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879771	SVJBL3225P16	32	25	32,0	170	35,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15



See pages B94–B99 for inserts.



■ **SVVB 72,5°**

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
3879777	SVVBN2020K16	20	20	10,0	125	33,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879778	SVVBN2525M16	25	25	12,5	150	33,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15
3879779	SVVBN3225P16	32	25	12,5	170	33,0	VB..160408	SKVN343	SRS3	3.5 mm	MS1156	T15

Today's modern boring operations require the most reliable, high-performance tools. WIDIA™ offers an extensive range of toolholders for internal boring to meet even the most precise production demands across a broad spectrum of workpiece shapes and sizes.

# Tools for Internal Boring



WIDIA boring bars, available with both a conventional steel shank or a vibration-resistant carbide shank and coolant hole, guarantee consistent results and enhanced production reliability.

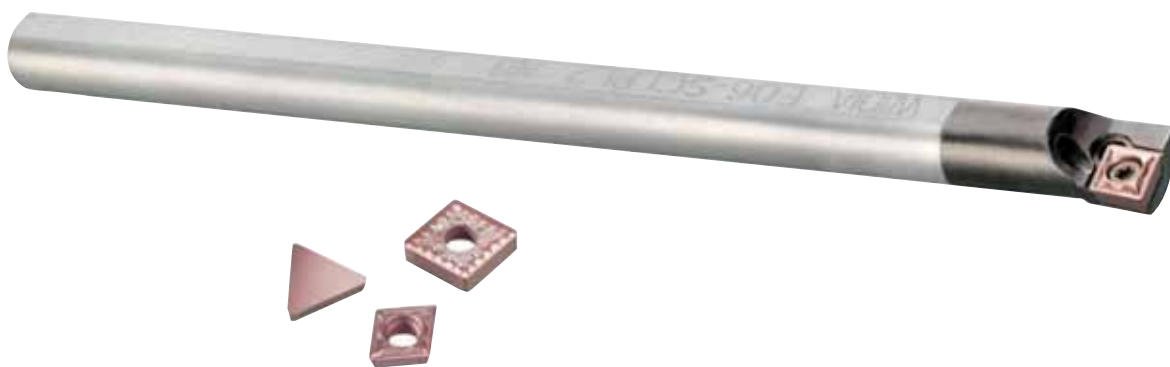
## D-Style Clamping

- Used for negative style inserts.
- Clamp assembly contains clamp, screw, and retaining ring.
- Quick insert indexing.
- Ensures insert repeatability and seating.
- Reduced chatter and extended tool life.

## P-Style Clamping

- Lever-type clamping system for negative indexable inserts.
- No interference to chip flow.
- Fast insert changes.

*P-style available in metric sizes only.*



## S-Style Clamping

- Screw clamping system for positive indexable inserts.
- Compact design for high reliability and cost efficiency.
- Carbide shim for additional tool protection.

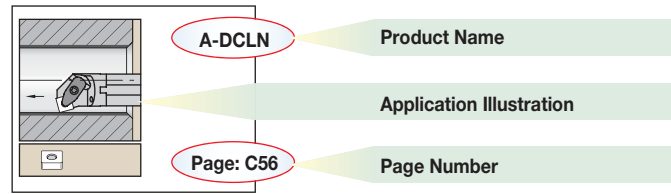
## C-Style Clamping

- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.



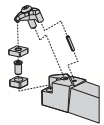


Each unique clamping system offers product options to fill your specific toolholder needs. Find the illustration that fits your application and navigate to the corresponding page to get the correct solution.

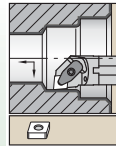


## D-Style Clamping

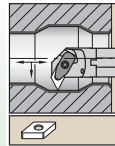
**D**



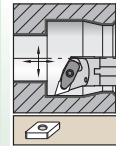
One-piece clamp assembly holder for use with negative style inserts. An extremely rigid clamping system. The tool is protected by a carbide shim.



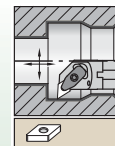
**A-DCLN**  
95°  
Page:  
**C56**



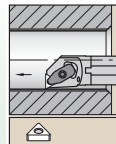
**A-DDPN**  
117,5°  
Page:  
**C56**



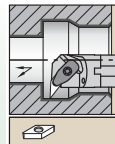
**A-DDQN**  
107,5°  
Page:  
**C57**



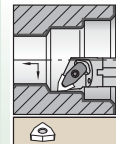
**A-DDUN**  
93°  
Page:  
**C57**



**A-DTFN**  
90°  
Page:  
**C58**



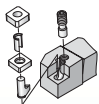
**DVUN**  
93°  
Page:  
**C58**



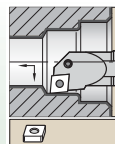
**A-DWLN**  
95°  
Page:  
**C59**

## P-Style Clamping

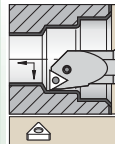
**P**



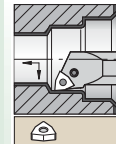
Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter. Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°. Advantages of this system are fast insert changes and no interference with chip flow.



**A-PCLN**  
95°  
Page:  
**C60**

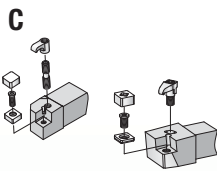


**A-PTFN**  
90°  
Page:  
**C60**

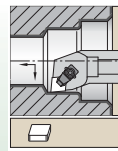


**A-PWLN**  
95°  
Page:  
**C61**

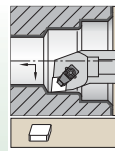
**C-Style Clamping**



Top clamping system for negative and positive indexable inserts to DIN 4968. This universal clamping system is robust and easy to handle. Some height-adjustable clamps enable the use of additional chipbreakers. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of 16mm and insert iCs greater than 6,35mm.



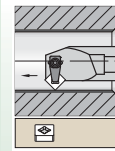
**S-CCLN-MX**  
95°  
Page: C62



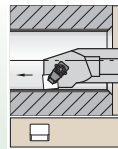
**S-CCLN-MN**  
95°  
Page: C62



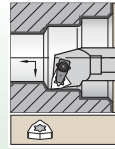
**S-CDQN-MX**  
Page: C63



**S-CSSN-MX**  
45°  
Page: C63



**S-CSYN-MN**  
85°  
Page: C64

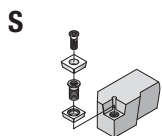


**S-CWLN-MX**  
95°  
Page: C64

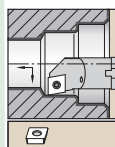


**A-CTFP**  
90°  
Page: C65

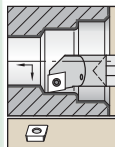
**S-Style Clamping**



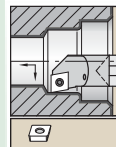
Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967. Compact design using a minimum of spare parts for high reliability and cost efficiency. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of .625" and insert iCs from .375" are secured by means of a threaded bushing.



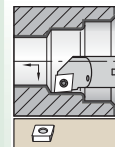
**A-SCFP**  
90°  
Page: C66



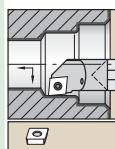
**E-SCFC**  
90°  
Page: C66



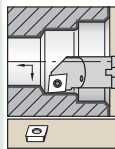
**E-SCFP**  
90°  
Page: C67



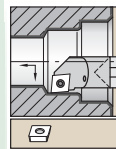
**A-SCLC**  
95°  
Page: C67



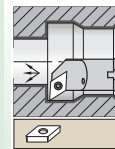
**E-SCLC**  
95°  
Page: C68



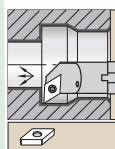
**A-SCLP**  
95°  
Page: C69



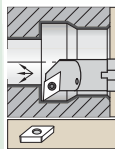
**E-SCLP**  
95°  
Page: C70



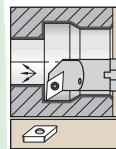
**A-SDQC**  
107,5°  
Page: C71



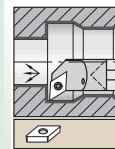
**E-SDQC**  
107,5°  
Page: C72



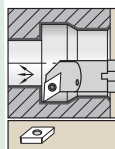
**A-SDQP**  
Page: C72



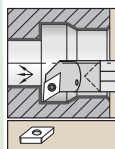
**A-SDUC**  
93°  
Page: C73



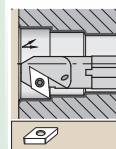
**E-SDUC**  
93°  
Page: C74



**A-SDUP**  
93°  
Page: C75



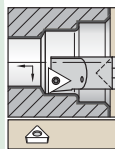
**E-SDUP**  
93°  
Page: C75



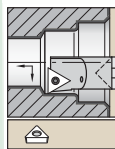
**A-SDXP**  
95°  
Page: C76



**A-STFC**  
90°  
Page: C76



**E-STFC**  
90°  
Page: C77



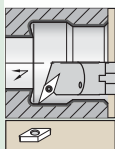
**A-STFP**  
90°  
Page: C78



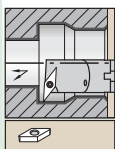
**E-STFP**  
90°  
Page: C79



**A-STWP**  
60°  
Page: C80



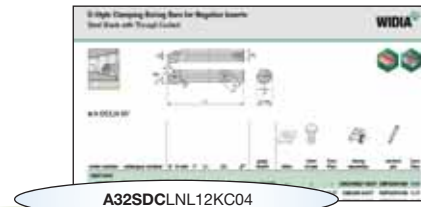
**A-SVQB**  
107,5°  
Page: C80


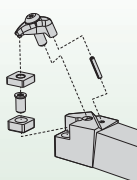
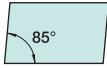

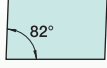

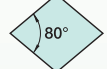

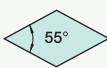
















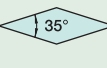


**A-SVUB**  
93°  
Page: C81

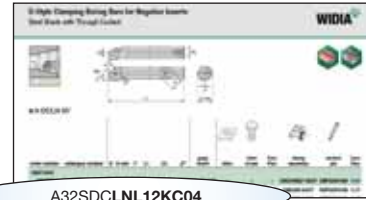
## How Do Catalogue Numbers Work?

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



A	32	S	D	C
Bar Type	Bar Diameter	Bar Length**	Insert Holding Method	Insert Shape
<p><b>A</b> </p> <p>Steel bar with coolant</p>	<p><b>Metric:</b> A two-digit number indicates the bar diameter in mm. If the diameter is represented by a one digit number, a 0 (zero) will be used in front of it. Example: 8mm = 08</p>	<p>3 = F 3.5 = G 4 = H 4.5 = J 5 = K 5.5 = L 6 = M 6.5 = N 7 = Q 8 = R 10 = S 12 = T 14 = U 16 = V 18 = W 20 = Y</p> <p>**Used only when more than one length is available or a special length is required.</p>	<p><b>D</b> </p>	<p><b>A</b> </p>
<p><b>S</b> </p> <p>Steel bar without coolant</p>			<p><b>B</b> </p>	
<p><b>C</b> </p> <p>Carbide bar</p>			<p><b>C</b> </p>	
<p><b>D</b> </p> <p>DeVibrator bar with coolant</p>			<p><b>D</b> </p>	
<p><b>D</b> </p> <p>Tunable bar with coolant</p>			<p><b>E</b> </p>	
<p><b>E</b> </p> <p>Carbide bar with coolant</p>			<p><b>H</b> </p>	
<p><b>B</b> </p> <p>DeVibrator</p>			<p><b>K</b> </p>	
<p><b>H</b> </p> <p>Interchangeable head</p>			<p><b>L</b> </p>	
<p><b>L</b> </p> <p>Heavy metal bar with coolant</p>			<p><b>M</b> </p>	
			<p><b>O</b> </p>	
	<p><b>P</b> </p>			
	<p><b>R</b> </p>			
	<p><b>S</b> </p>			
	<p><b>T</b> </p>			
	<p><b>V</b> </p>			
	<p><b>W</b> </p>			

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

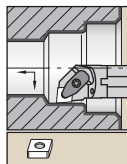


A32SDCLNL12KC04

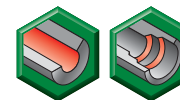
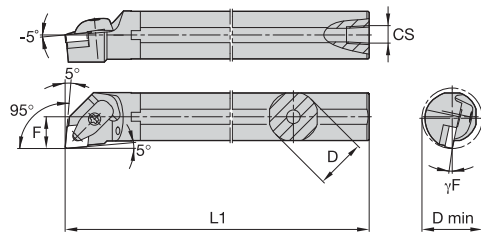
L	N	L	12	KC04
Bar Style or Lead Angle	Insert Clearance Angle	Hand of Tool	Insert Size Cutting Edge Length L10	Additional Information
<p><b>E</b> </p> <p><b>F</b> </p> <p><b>K</b> </p> <p><b>L</b> </p> <p>(E-style inserts)</p> <p><b>L</b> </p> <p><b>P</b> </p> <p><b>Q</b> </p> <p><b>S</b> </p> <p><b>U</b> </p> <p><b>X</b> </p>	<p><b>N</b> 0° </p> <p><b>B</b> 5° </p> <p><b>C</b> 7° </p> <p><b>P</b> 11° </p> <p><b>D</b> 15° </p> <p><b>E</b> 20° </p> <p><b>F</b> 25° </p>	<p><b>R =</b> Right-hand boring bar</p> <p><b>R</b> </p> <p><b>L =</b> Left-hand boring bar</p> <p><b>L</b> </p>	<p><b>H</b> </p> <p><b>O</b> </p> <p><b>P</b> </p> <p><b>S</b> </p> <p><b>T</b> </p> <p><b>CDE</b> </p> <p><b>M</b> </p> <p><b>V</b> </p> <p><b>W</b> </p> <p><b>L</b> </p> <p><b>A</b> </p> <p><b>B</b> </p> <p><b>K</b> </p> <p><b>R</b> </p>	<p><b>M... =</b> M.. MF, MN, MX, for ceramic and PcBN inserts</p> <p><b>KC =</b> D-Style Clamping</p> <p><b>+ =</b> Insert thickness</p>

# D-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant

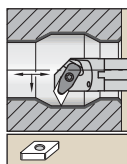


Steel shank with through coolant.  
See pages B30–B46 for inserts.

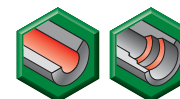
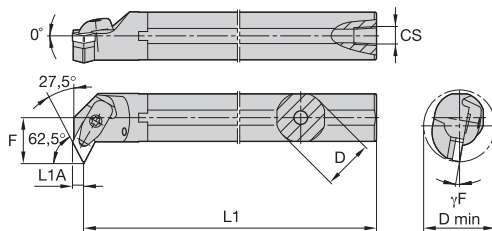


## ■ A-DCLN 95°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
<b>right hand</b>														
5696071	A25RDCLNR12KC04	25	32,0	17,0	200	1/4-18 NPT	-12.0	CN..120408	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
5696073	A32SDCLNR12KC04	32	40,0	22,0	250	1/4-18 NPT	-12.0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
5696075	A40TDCLNR12KC04	40	50,0	27,0	300	1/4-18 NPT	-9.0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
5696077	A40TDCLNR16KC06	32	45,0	27,0	250	1/4-18 NPT	-12.0	CN..160612	ICSN533	KMSP515IP	15 IP	CM209R ASSY	SSP025018M	15 IP
<b>left hand</b>														
5696072	A25RDCLNL12KC04	25	32,0	17,0	200	1/4-18 NPT	-12.0	CN..120408	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
5696074	A32SDCLNL12KC04	40	50,0	27,0	300	1/4-18 NPT	-9.0	CN..120408	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
5696076	A40TDCLNL12KC04	32	45,0	27,0	250	1/4-18 NPT	-12.0	DN..150608	ICSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
5696078	A40TDCLNL16KC06	32	45,0	27,0	250	1/4-18 NPT	-12.0	CN..160612	ICSN533	KMSP515IP	15 IP	CM209R ASSY	SSP025018M	15 IP



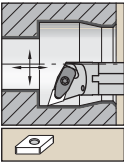
Steel shank with through coolant.  
See pages B47–B64 for inserts.



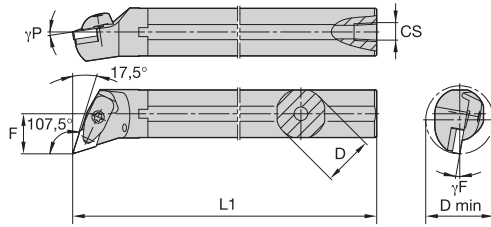
## ■ A-DDPN 117,5°

order number	catalogue number	D	D min	F	L1	L1A	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
<b>right hand</b>															
5696079	A25RDDPNR11KC04	32	45,0	27,0	250	6,5	1/4-18 NPT	-12.0	DN..150608	IDSN322	KMSP315IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP
5696080	A32SDDPNR15KC06	40	52,0	30,0	300	6,6	1/4-18 NPT	-10.0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
5696082	A40TDDPNR15KC06	40	52,0	30,0	300	6,6	1/4-18 NPT	-10.0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
<b>left hand</b>															
5696081	A32SDDPNL15KC06	40	52,0	30,0	300	6,6	1/4-18 NPT	-10.0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
5696083	A40TDDPNL15KC06	40	52,0	30,0	300	6,6	1/4-18 NPT	-10.0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP



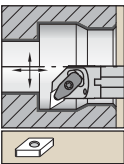


Steel shank with through coolant.  
See pages B47–B64 for inserts.

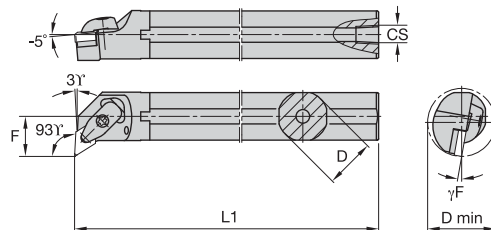


■ **A-DDQN 107,5°**

order number	catalogue number	D	D min	F	L1	CS	γF°	γP°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
<b>right hand</b>															
5696085	A32SDDQNR15KC06	32	40,0	22,0	250	1/4-18 NPT	-12,0	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP
5696087	A40TDDQNR15KC06	40	50,0	27,0	300	1/4-18 NPT	-10,0	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
<b>left hand</b>															
5696086	A32SDDQNL15KC06	32	40,0	22,0	250	1/4-18 NPT	-12,0	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP
5696088	A40TDDQNL15KC06	40	50,0	27,0	300	1/4-18 NPT	-10,0	-10,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP



Steel shank with through coolant.  
See pages B47–B64 for inserts.

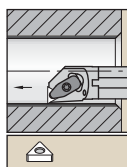


■ **A-DDUN 93°**

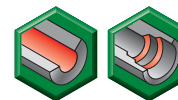
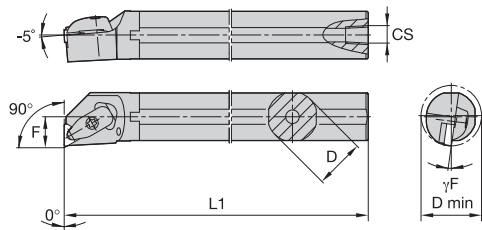
order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus	
<b>right hand</b>															
5696089	A25RDDUNR11KC04	25	32,0	17,0	200	1/4-18 NPT	-12,0	DN..110408	—	—	—	CM234RLP ASSY	SSP025016M	15 IP	
5696211	A32SDDUNR11KC04	32	40,0	22,0	250	1/4-18 NPT	-12,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
5696213	A32SDDUNR15KC06	32	40,0	22,0	250	1/4-18 NPT	-12,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
5696215	A40TDDUNR15KC06	40	50,0	27,0	300	1/4-18 NPT	-9,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
5696217	A50UDDUNR15KC06	50	63,0	35,0	350	1/4-18 NPT	-7,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
<b>left hand</b>															
5696210	A25RDDUNL11KC04	25	32,0	17,0	200	1/4-18 NPT	-12,0	DN..110408	—	—	—	CM234RLP ASSY	SSP025016M	15 IP	
5696212	A32SDDUNL11KC04	32	40,0	22,0	250	1/4-18 NPT	-12,0	DN..110408	IDSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
5696214	A32SDDUNL15KC06	32	40,0	22,0	250	1/4-18 NPT	-12,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
5696216	A40TDDUNL15KC06	40	50,0	27,0	300	1/4-18 NPT	-9,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	
5696218	A50UDDUNL15KC06	50	63,0	35,0	350	1/4-18 NPT	-7,0	DN..150608	IDSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP	

# D-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant

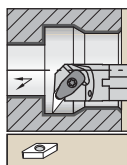


Steel shank with through coolant.  
See pages B81–B93 for inserts.

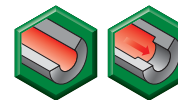
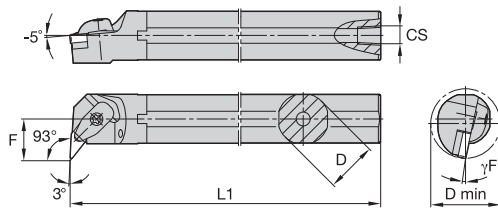


## ■ A-DTFN 90°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
<b>right hand</b>														
5696219	A25RDTFNR16KC04	25	32,0	17,0	200	1/4-18 NPT	-14,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP
5696261	A32SDTFNR16KC04	32	40,0	22,0	250	1/4-18 NPT	-12,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP
<b>left hand</b>														
5696260	A25RDTFNL16KC04	25	32,0	17,0	200	1/4-18 NPT	-14,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP
5696262	A32SDTFNL16KC04	32	40,0	22,0	250	1/4-18 NPT	-12,0	TN..160408	ITSN323	KMSP315IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP



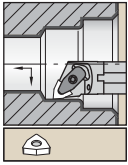
Steel shank with through coolant.  
See pages B94–B99 for inserts.



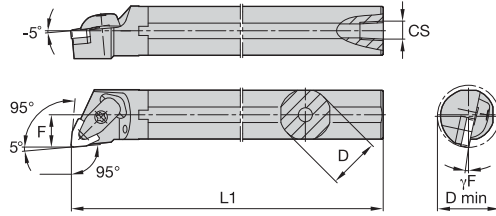
## ■ A-DVUN 93°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
<b>right hand</b>														
5696263	A32SDVUNR16KC04	32	40,0	22,0	250	1/4-18 NPT	-9,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
5696265	A40TDVUNR16KC04	40	50,0	27,0	300	1/4-18 NPT	-8,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	SSP025016M	15 IP
<b>left hand</b>														
5696264	A32SDVUNL16KC04	32	40,0	22,0	250	1/4-18 NPT	-9,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM234R ASSY	SSP025016M	15 IP
5696266	A40TDVUNL16KC04	40	50,0	27,0	300	1/4-18 NPT	-8,0	VN..160408	IVSN322	KMSP315IP	15 IP	CM215R ASSY	SSP025016M	15 IP





Steel shank with through coolant.  
See pages B99-B105 for inserts.



## ■ A-DWLN 95°

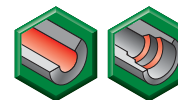
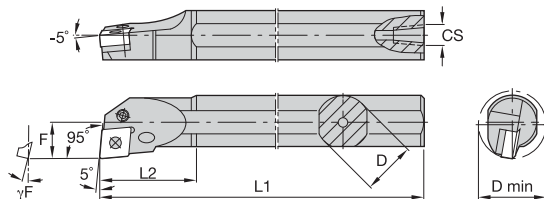
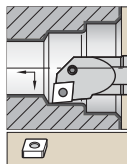
order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
<b>right hand</b>														
5696267	A25RDWLN06KC04	25	32,0	17,0	200	1/4-18 NPT	-14.0	WN..060408	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
5696269	A25RDWLN08KC04	25	32,0	17,0	200	1/4-18 NPT	-12.0	WN..080408	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
5696281	A32SDWLN08KC04	32	40,0	22,0	250	1/4-18 NPT	-14.0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP
5696283	A40TDWLN08KC04	40	50,0	27,0	300	1/4-18 NPT	-14.0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP
<b>left hand</b>														
5696268	A25RDWLN06KC04	25	32,0	17,0	200	1/4-18 NPT	-14.0	WN..060408	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
5696280	A25RDWLN08KC04	25	32,0	17,0	200	1/4-18 NPT	-12.0	WN..080408	—	—	—	CM234RLP ASSY	SSP025016M	15 IP
5696282	A32SDWLN08KC04	32	40,0	22,0	250	1/4-18 NPT	-14.0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234RLP ASSY	SSP025016M	15 IP
5696284	A40TDWLN08KC04	40	50,0	27,0	300	1/4-18 NPT	-14.0	WN..080408	IWSN433	KMSP415IP	15 IP	CM234R ASSY	SSP025016M	15 IP





# P-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant



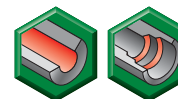
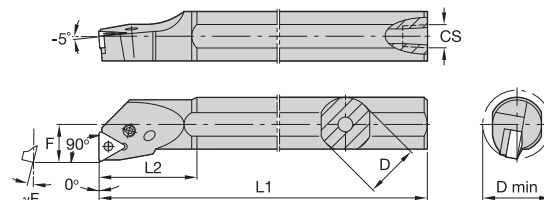
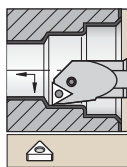
Steel shank with through coolant.

See pages B30–B46 for inserts.

## ■ A-PCLN 95°



order number	catalogue number	D	D min	F	L1	L2	CS	$\gamma F^\circ$	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
<b>right hand</b>															
3883468	A25TPCLNR12	25	32,0	17,0	300	40	1/4-18 NPT	-12,0	CN..120408	—	—	—	511.022	514.122	10 IP
3883466	A32UPCLNR12	32	40,0	22,0	350	50	1/4-18 NPT	-10,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3883463	A40VPCLNR12	40	50,0	27,0	400	55	1/4-18 NPT	-10,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3883442	A40VPCLNR16	40	50,0	27,0	400	55	1/4-18 NPT	-11,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP
<b>left hand</b>															
3883469	A25TPCLNL12	25	32,0	17,0	300	40	1/4-18 NPT	-12,0	CN..120408	—	—	—	511.022	514.122	10 IP
3883467	A32UPCLNL12	32	40,0	22,0	350	50	1/4-18 NPT	-10,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3883465	A40VPCLNL12	40	50,0	27,0	400	55	1/4-18 NPT	-10,0	CN..120408	512.112	513.023	515.018	511.023	514.123	15 IP
3883464	A40VPCLNL16	40	50,0	27,0	400	55	1/4-18 NPT	-11,0	CN..160612	512.117	513.025	515.022	511.025	514.125	15 IP



Steel shank with through coolant.

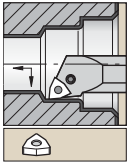
See pages B81–B93 for inserts.

## ■ A-PTFN 90°



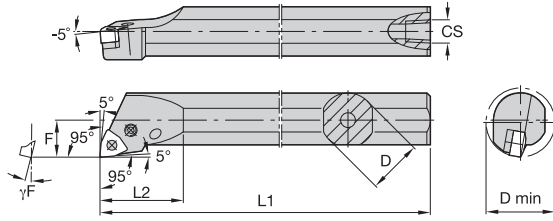
order number	catalogue number	D	D min	F	L1	L2	CS	$\gamma F^\circ$	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
<b>right hand</b>															
3883263	A25TPTFNR16	25	32,0	17,0	300	40	1/4-18 NPT	-12,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3883151	A32UPTFNR16	32	40,0	22,0	350	50	1/4-18 NPT	-10,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3883149	A40VPTFNR22	40	48,0	27,0	400	55	1/4-18 NPT	-10,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP
<b>left hand</b>															
3883264	A25TPTFNL16	25	32,0	17,0	300	40	1/4-18 NPT	-12,0	TN..160408	512.013	513.018	515.018	511.018	514.118	10 IP
3883150	A40VPTFNL22	40	48,0	27,0	400	55	1/4-18 NPT	-10,0	TN..220408	512.023	513.023	515.018	511.023	514.123	15 IP





Steel shank with through coolant.

See pages B99-B105 for inserts.



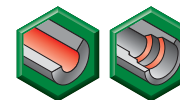
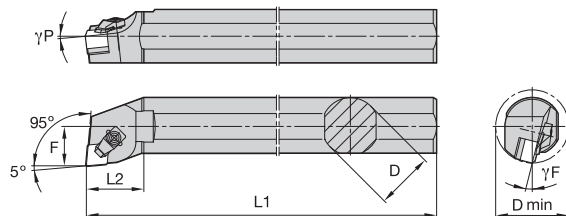
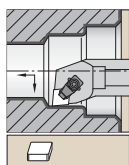
■ **A-PWLN 95°**



order number	catalogue number	D	D min	F	L1	L2	CS	$\gamma F^\circ$	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
<b>right hand</b>															
3883459	A16RPWLN06	16	27,0	11,0	200	32	1/8-27 NPT	-12,0	WN..060408	—	—	—	511.030	514.112	—
3883455	A20SPWLN06	20	25,0	13,0	250	—	1/8-27 NPT	-14,0	WN..060408	—	—	—	511.030	514.112	8 IP
3883458	A25RPWLN08	25	32,0	17,0	200	—	1/4-18 NPT	-12,0	WN..080408	512.135	513.023	515.018	511.023	514.123	15 IP
3883454	A32SPWLN08	32	40,0	22,0	250	50	1/4-18 NPT	-10,0	WN..080408	512.135	513.023	515.018	511.023	514.123	—
<b>left hand</b>															
3883461	A16RPWLN06	16	27,0	11,0	200	32	1/8-27 NPT	-12,0	WN..060408	—	—	—	511.030	514.112	—
3883457	A20SPWLN06	20	25,0	13,0	250	—	1/8-27 NPT	-14,0	WN..060408	—	—	—	511.030	514.112	8 IP
3883456	A32SPWLN08	32	40,0	22,0	250	50	1/4-18 NPT	-10,0	WN..080408	512.135	513.023	515.018	511.023	514.123	—

# C-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant



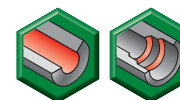
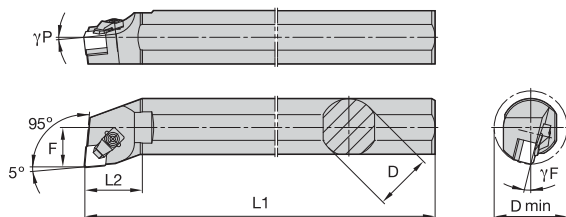
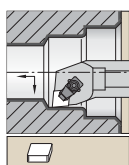
See pages B177–B179 and B197–B205 for inserts.

Steel shank with through coolant.

## ■ S-CCLN-MX 95°

order number	catalogue number	D	D min	F	L1	L2	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	shim	shim screw	hex	clamp assembly	hex
<b>right hand</b>														
3883565	S32SCCLNR12MX7	32	40,0	22,0	251	43	-14,0	-5,0	CN.X120708	—	—	—	551.316	4 mm
3029009	S40TCCLNR12MX7	40	55,0	27,0	300	40	-14,0	-6,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm
<b>left hand</b>														
3883564	S32SCCLNL12MX7	32	40,0	22,0	251	43	-14,0	-5,0	CN.X120708	—	—	—	551.316	4 mm
3029010	S40TCCLNL12MX7	40	55,0	27,0	300	40	-14,0	-6,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm

NOTE: MN — clamping version is shown.



See pages B177–B179 and B197–B205 for inserts.

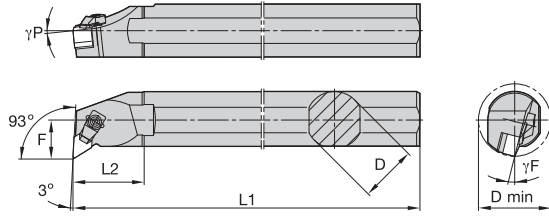
Steel shank with through coolant.

## ■ S-CCLN-MN 95°

order number	catalogue number	D	D min	F	L1	L2	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
<b>right hand</b>															
3029011	S40TCCLNR12MN4	40	55,0	27,0	300	40	-14,0	-6,0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm
3029143	S40TCCLNR12MN7	40	55,0	27,0	300	40	-14,0	-6,0	CN.N120708	552.221	554.253	2.5 mm	557.111	551.317	4 mm
<b>left hand</b>															
3029012	S40TCCLNL12MN4	40	55,0	27,0	300	40	-14,0	-6,0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm
3029144	S40TCCLNL12MN7	40	55,0	27,0	300	40	-14,0	-6,0	CN.N120708	552.221	554.252	2.5 mm	557.111	551.317	4 mm

NOTE: MN — clamping version is shown.





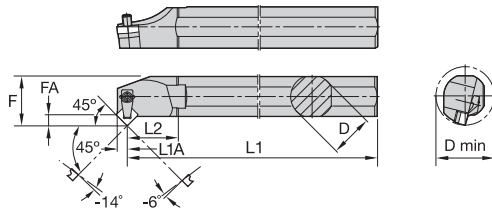
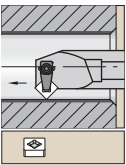
See pages B180–B181 and B206–B216 for inserts.

Steel shank with through coolant.

**■ S-CDQN-MX**

order number	catalogue number	D	D min	F	L1	L2	γF°	γP°	gage insert	shim	shim screw	hex	clamp assembly	hex
<b>right hand</b>														
3883567	S40TCDQNR12MX7	40	50,0	27,0	302	45,0	-14,0	-5,0	DN.X120708	552.225	554.254	2.5 mm	551.316	4 mm
<b>left hand</b>														
3883566	S40TCDQNL12MX7	40	50,0	27,0	302	45,0	-14,0	-5,0	DN.X120708	552.225	554.254	2.5 mm	551.316	4 mm

NOTE: MN – clamping version is shown.



See pages B186–B191 and B211–B212 for inserts.

Steel shank with through coolant.

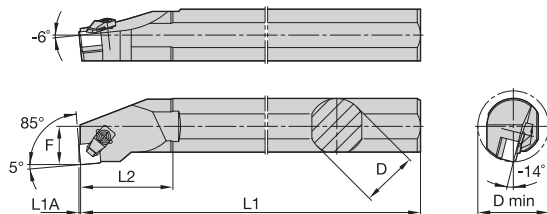
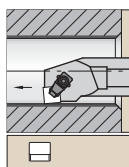
**■ S-CSSN-MX 45°**

order number	catalogue number	D	D min	F	L1	L2	L1A	FA	gage insert	shim	shim screw	hex	clamp assembly	hex
<b>right hand</b>														
3029151	S40TCSSNR12MX7	40	55,0	27,0	300	67,0	8,5	8,2	SN.X120708	552.232	554.252	2.5 mm	551.316	4 mm
<b>left hand</b>														
3029152	S40TCSSNL12MX7	40	55,0	27,0	300	67,0	8,5	8,2	SN.X120708	552.232	554.252	2.5 mm	551.316	4 mm

NOTE: MX – clamping version is shown.

# C-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant



See pages B186–B191 and B211–B212 for inserts.

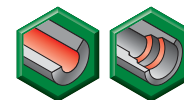
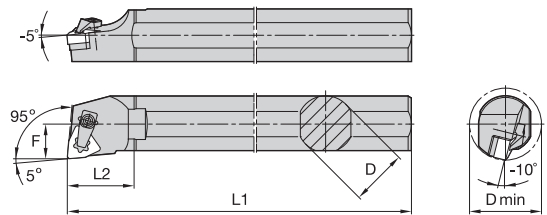
Steel shank with through coolant.

## ■ S-CSYN-MN 85°



order number	catalogue number	D	D min	F	L1	L2	L1A	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex	
<b>right hand</b>															
3883569	S40TCSYNR12MN7	40	55,0	27,0	300	67,0	1,0	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm	
<b>left hand</b>															
3883568	S40TCSYNL12MN7	40	55,0	27,0	300	67,0	1,0	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm	

NOTE: MN – clamping version is shown.



See pages B195–B198 and B218 for inserts.

Steel shank with through coolant.

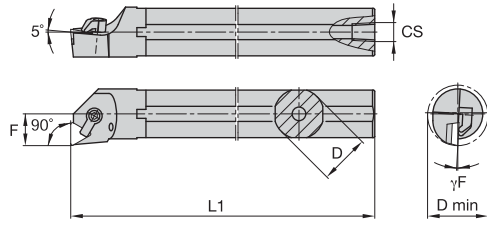
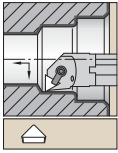
## ■ S-CWLN-MX 95°



order number	catalogue number	D	D min	F	L1	L2	gage insert	shim	shim screw	hex	clamp assembly	hex
<b>right hand</b>												
3029153	S40TCWLNRO8MX7	40	80,0	27,0	300	55,0	WN.X080708	552.210	554.252	2.5 mm	551.316	4 mm
<b>left hand</b>												
3029154	S40TCWLNLO8MX7	40	80,0	27,0	300	55,0	WN.X080708	552.210	554.252	2.5 mm	551.316	4 mm

NOTE: MX – clamping version is shown.





See pages B192–B194 and B212–B216 for inserts.

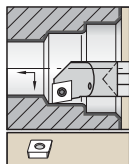
Steel shank with through coolant.

## ■ A-CTFP 90°

order number	catalogue number	D	D min	F	L1	CS	$\gamma_F^\circ$	gage insert	shim	shim screw	hex	clamp	clamp screw	hex	
<b>right hand</b>															
3883451	A16RCTFPR11	16	20,0	11,0	200	1/8-27 NPT	-4.0	TP..110304	—	—	—	CKM19	STCM9	2.5 mm	
3883450	A25RCTFPR16	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm	
<b>left hand</b>															
3883453	A16RCTFPL11	16	20,0	11,0	200	1/8-27 NPT	-4.0	TP..110304	—	—	—	CKM19	STCM9	2.5 mm	
3883452	A25RCTFPL16	25	32,0	17,0	200	1/4-18 NPT	-3.0	TP..160308	SM841	MS110	2 mm	CKM10	STCM8	4 mm	

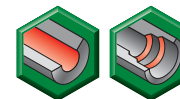
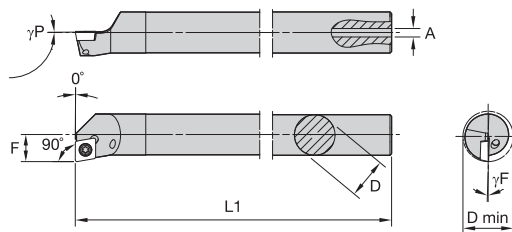
# S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.

See pages B30-B46 for inserts.

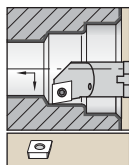


## ■ E-SCFC 90°

order number	catalogue number	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>											
2023600	E08KSCFCR06	8	11,0	6,0	125	3,0	-12,0	0,0	CC..060204	12148036300	T8
<b>left hand</b>											
2031019	E08KSCFCL06	8	11,0	6,0	125	3,0	-12,0	0,0	CC..060204	12148036300	T8

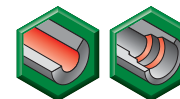
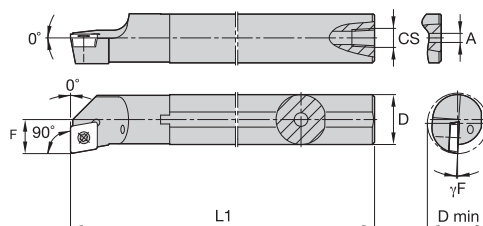


## Steel Shank with Through Coolant



Steel shank with through coolant.

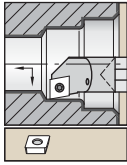
See pages B30-B46 for inserts.



## ■ A-SCFP 90°

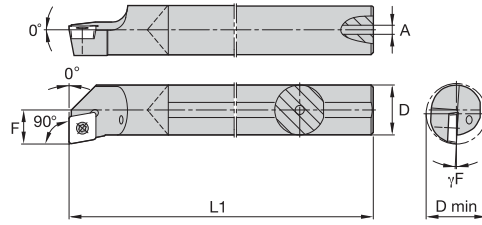
order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
<b>right hand</b>											
5077442	A08JSCFP06	8	11,0	6,0	110	2,4	—	-8,0	CP..0602..	MS1153	T7
5077449	A10KSCFP06	10	13,0	7,0	125	3,2	—	-6,0	CP..0602..	MS1153	T7
5077497	A12MSCFP06	12	16,0	9,0	150	—	1/16 - 27 NPT	-4,0	CP..0602..	MS1153	T7
5077552	A16RSCFP06	16	20,0	11,0	200	—	1/8 - 27 NPT	-5,0	CC..0602..	MS1153	T7
5077553	A16RSCFP09	16	20,0	11,0	200	—	1/8 - 27 NPT	-4,0	CP..09T3..	MS1155	T15
5077614	A20SSCF06	20	25,0	13,0	250	—	1/8 - 27 NPT	-3,0	CC..0602..	MS1153	T7
5077615	A20SSCF09	20	25,0	13,0	250	—	1/8 - 27 NPT	-2,0	CP..09T3..	MS1155	T15
<b>left hand</b>											
5077441	A08JSCFPL06	8	11,0	6,0	110	2,4	—	-8,0	CP..0602..	MS1153	T15
5077447	A10KSCFPL06	10	13,0	7,0	125	3,2	—	-6,0	CP..0602..	MS1153	T7
5077496	A12MSCFPL06	12	16,0	9,0	150	—	1/16 - 27 NPT	-4,0	CP..0602..	MS1153	T7
5077550	A16RSCFPL06	16	20,0	11,0	200	—	1/8 - 27 NPT	-5,0	CC..0602..	MS1153	T7
5077551	A16RSCFPL09	16	20,0	11,0	200	—	1/8 - 27 NPT	-4,0	CP..09T3..	MS1155	T15
5077556	A20SSCFPL06	20	25,0	13,0	250	—	1/8 - 27 NPT	-3,0	CC..0602..	MS1153	T7
5077557	A20SSCFPL09	20	25,0	13,0	250	—	1/8 - 27 NPT	-2,0	CP..09T3..	MS1155	T7





Carbide shank with through coolant.

See pages B30–B46 for inserts.

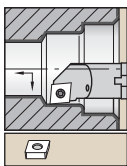


■ **E-SCFP 90°**



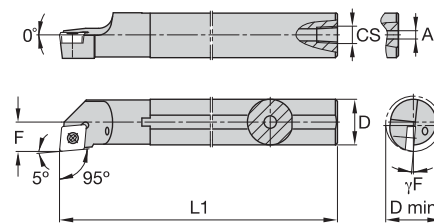
order number	catalogue number	D	D min	F	L1	A	A1	γF°	gage insert	insert screw	Torx
<b>right hand</b>											
2010047	E06JSCFPR04	6	8,0	4,5	110,0	2,0	1,4	-10.0	CP..04T104	12148005800	T6
5092759	E08KSCFPR06A	8	11,0	6,0	123,0	2,4	—	-8.0	CP..060204	MS1939	T7
5092921	E10MSCFPR06A	10	13,0	7,0	148,0	3,2	—	-4.0	CP..060204	MS1939	T7
5092923	E12QSCFPR06	12	16,0	9,0	177,5	4,8	—	-3.0	CP..060204	MS1153	T7
<b>left hand</b>											
2031018	E06JSCFPL04	6	8,0	4,5	110,0	2,0	1,4	-10.0	CP..04T104	12148005800	T6
5092757	E08KSCFPL06A	8	11,0	6,0	123,0	2,4	—	-8.0	CP..060204	MS1939	T7
5092920	E10MSCFPL06A	10	13,0	7,0	148,0	3,2	—	-4.0	CP..060204	MS1939	T7
5092922	E12QSCFPL06	12	16,0	9,0	177,5	4,8	—	-3.0	CP..060204	MS1153	T7

**Steel Shank with Through Coolant**



Steel shank with through coolant.

See pages B30–B46 for inserts.



■ **A-SCLC 95°**

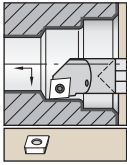


order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>														
3883285	A08JSCLCR06	8	11,0	6,0	110	2,4	—	-8.0	CC..060204	—	—	—	MS1939	T7
3883283	A10KSCLCR06	10	13,0	7,0	125	3,2	—	-7.0	CC..060204	—	—	—	MS1153	T7
3883271	A16RSCLCR09	16	20,0	11,0	200	—	1/8-27 NPT	-7.0	CC..09T308	—	—	—	MS1155	T15
3883269	A20SSCLCR09	20	25,0	13,0	250	4,0	1/8-27 NPT	-5.0	CC..09T308	—	—	—	MS1155	T15
3883265	A25TSCLCR12	25	32,0	17,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	—	—	—	MS1157	T15
3883266	A32TSCLCR12	32	40,0	22,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15
<b>left hand</b>														
3883286	A08JSCLCL06	8	11,0	6,0	110	2,4	—	-8.0	CC..060204	—	—	—	MS1939	T7
3883284	A10KSCLCL06	10	13,0	7,0	125	3,2	—	-7.0	CC..060204	—	—	—	MS1153	T7
3883272	A16RSCLCL09	16	20,0	11,0	200	4,0	1/8-27 NPT	-7.0	CC..09T308	—	—	—	MS1155	T15
3883270	A20SSCLCL09	20	25,0	13,0	250	—	1/8-27 NPT	-5.0	CC..09T308	—	—	—	MS1155	T15
3883267	A25TSCLCL12	25	32,0	17,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	—	—	—	MS1157	T15
3883268	A32TSCLCL12	32	40,0	22,0	300	6,4	1/4-18 NPT	-7.0	CC..120408	SKCP453	SRS4	4 mm	MS1158	T15



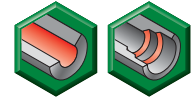
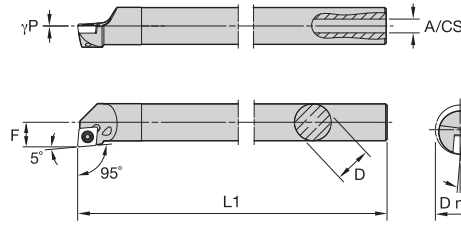
# S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.

See pages B30–B46 for inserts.

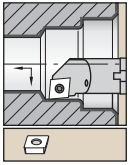


Tools for External Turning and Internal Boring

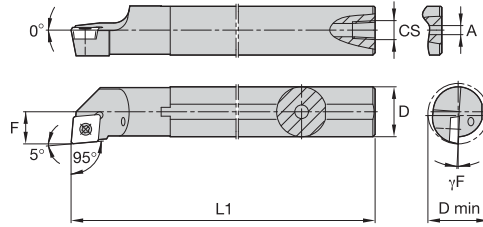
## ■ E-SCLC 95°



order number	catalogue number	D	D min	F	L1	A	CS	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>												
2010068	E08KSCLCR06	8	11,0	6,0	125	3,0	—	-12.0	0.0	CC..060204	12148036300	T8
2023603	E08KSCLCR065	8	10,0	5,0	125	3,0	—	-15.0	0.0	CC..060204	12148036300	T8
2031021	E10MSCLCR06	10	13,0	7,0	150	3,5	—	-10.0	0.0	CC..060204	12148068700	T8
2023608	E12QSCLCR06	12	16,0	9,0	180	4,5	—	-8.0	0.0	CC..060204	12148068700	T8
2010139	E16RSCLCR09	16	20,0	11,0	200	4,5	—	-7.0	0.0	CC..090308	12148038800	T15
2023614	E16RSCLCR09T3	16	20,0	11,0	200	4,5	—	-7.0	0.0	CC..09T308	12148038800	T15
2023621	E20SSCLCR09	20	25,0	13,0	250	—	G 1/8	-5.0	0.0	CC..090308	12148038800	T15
2010184	E20SSCLCR09T3	20	25,0	13,0	250	—	G 1/8	-5.0	0.0	CC..09T308	12148038800	T15
2031029	E25TSCCLCR09	25	32,0	17,0	300	—	G 1/4	-3.0	0.0	CC..090308	12148038800	T15
2010224	E25TSCCLCR09T3	25	32,0	17,0	300	—	G 1/4	-3.0	0.0	CC..09T308	12148038800	T15
2023632	E32USCLCR12	32	40,0	22,0	350	—	G 1/4	-10.0	0.0	CC..120408	MS2260	T20
<b>left hand</b>												
2023601	E08KSCLCL06	8	11,0	6,0	125	3,0	—	-12.0	0.0	CC..060204	12148036300	T8
2031020	E08KSCLCL065	8	10,0	5,0	125	3,0	—	-15.0	0.0	CC..060204	12148036300	T8
2031022	E10MSCLCL06	10	13,0	7,0	150	3,5	—	-10.0	0.0	CC..060204	12148036300	T8
2023607	E12QSCLCL06	12	16,0	9,0	180	4,5	—	-8.0	0.0	CC..060204	12148068700	T8
2023613	E16RSCLCL09	16	20,0	11,0	200	4,5	—	-7.0	0.0	CC..090308	12148038800	T15
2023615	E16RSCLCL09T3	16	20,0	11,0	200	4,5	—	-7.0	0.0	CC..09T308	12148038800	T15
2031026	E20SSCLCL09	20	25,0	13,0	250	—	G 1/8	-5.0	0.0	CC..090308	12148038800	T15
2031027	E20SSCLCL09T3	20	25,0	13,0	250	—	G 1/8	-5.0	0.0	CC..09T308	12148038800	T15
2010215	E25TSCCLCL09	25	32,0	17,0	300	—	G 1/4	-3.0	0.0	CC..090308	12148038800	T15
2031028	E25TSCCLCL09T3	25	32,0	17,0	300	—	G 1/4	-3.0	0.0	CC..09T308	12148038800	T15



Steel shank with through coolant.  
See pages B30–B46 for inserts.



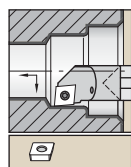
## ■ A-SCLP 95°

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
<b>right hand</b>											
5077640	A08JSCLPR06	8	11,0	6,0	110	2,4	—	-6.0	CP..0602..	MS1939	T7
5077645	A10KSCLPR06	10	13,0	7,0	125	3,2	—	-4.0	CP..0602..	MS1939	T7
5077681	A12MSCLPR06	12	16,0	9,0	150	4,0	—	-3.0	CP..0602..	MS1153	T7
5077694	A16RSCLPR06	16	20,0	11,0	200	—	1/8 - 27 NPT	-5.0	CC..0602..	MS1153	T7
5077695	A16RSCLPR09	16	20,0	11,0	200	4,0	1/8 - 27 NPT	-4.0	CP..09T308	MS1155	T15
5077722	A20SSCLPR09	20	25,0	13,0	250	—	1/8 - 27 NPT	-2.0	CP..09T3..	MS1155	T15
<b>left hand</b>											
5077619	A08JSCLPL06	8	11,0	6,0	110	2,4	—	-6.0	CP..0602..	MS1939	T7
5077644	A10KSCLPL06	10	13,0	7,0	125	3,2	—	-4.0	CP..0602..	MS1939	T7
5077680	A12MSCLPL06	12	16,0	9,0	150	4,0	—	-3.0	CP..0602..	MS1153	T7
5077688	A16RSCLPL06	16	20,0	11,0	200	—	1/8 - 27 NPT	-5.0	CC..0602..	MS1153	T7
5077692	A16RSCLPL09	16	20,0	11,0	200	—	1/8 - 27 NPT	-4.0	CP..09T3..	MS1155	T15
5077721	A20SSCLPL09	20	25,0	13,0	250	—	1/8 - 27 NPT	-2.0	CP..09T3..	MS1155	T15

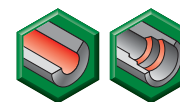
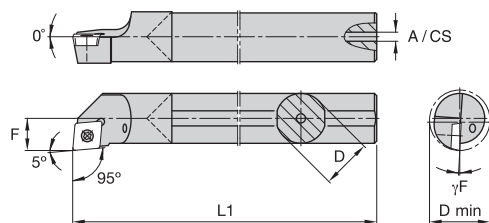


# S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant




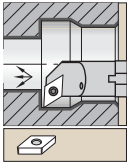
Carbide shank with through coolant.  
See pages B30–B46 for inserts.



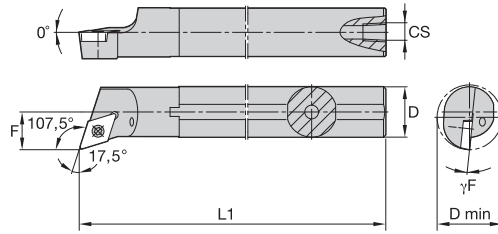
Tools for External Turning and Internal Boring

## ■ E-SCLP 95°

order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
										
<b>right hand</b>										
2023598	E06JSCLPR04	6	8,0	4,5	110	2,0	-10.0	CP..04T104	12148005800	T6
5093094	E08KSCLPR06A	8	11,0	6,0	122	2,4	-6.0	CP..060204	MS1939	T7
5093098	E10MSCLPR06A	10	13,0	7,0	149	3,2	-4.0	CP..060204	MS1939	T7
5093144	E12QSCLPR06	12	16,0	9,0	178	4,8	-3.0	CP..060204	MS1153	T7
5093181	E16RSCLPR09	16	20,0	11,0	201	5,5	-4.0	CP..09T308	MS1155	T15
5093185	E20SSCLPR09	20	25,0	13,0	250	7,1	-2.0	CP..09T308	MS1155	T15
<b>left hand</b>										
2023597	E06JSCLPL04	6	8,0	4,5	110	2,0	-10.0	CP..04T104	12148005800	T6
5093093	E08KSCLPL06A	8	11,0	6,0	122	2,4	-6.0	CP..060204	MS1939	T7
5093097	E10MSCLPL06A	10	13,0	7,0	149	3,2	-4.0	CP..060204	MS1939	T7
5093143	E12QSCLPL06	12	16,0	9,0	178	4,8	-3.0	CP..060204	MS1153	T7
5093149	E16RSCLPL09	16	20,0	11,0	201	5,5	-4.0	CP..09T308	MS1155	T15
5093184	E20SSCLPL09	20	25,0	13,0	250	7,1	-2.0	CP..09T308	MS1155	T15



Steel shank with through coolant.  
See pages B47–B64 for inserts.



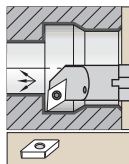
## ■ A-SDQC 107,5°

order number	catalogue number	D	D min	F	L1	CS	$\gamma F^\circ$	gage insert	insert screw	Torx
<b>right hand</b>										
3883476	A16RSDQCR07	16	20,0	11,0	200	1/8-27 NPT	-5.0	DC..070204	MS1153	T7
3883474	A20SSDQCR11	20	25,0	13,0	250	1/8-27 NPT	-5.0	DC..11T308	MS1155	T15
3883462	A25TSDQCR11	25	32,0	17,0	300	1/4-18 NPT	-4.0	DC..11T308	MS1155	T15
<b>left hand</b>										
3883477	A16RSDQCL07	16	20,0	11,0	200	1/8-27 NPT	-5.0	DC..070204	MS1153	T7
3883475	A20SSDQCL11	20	25,0	13,0	250	1/8-27 NPT	-5.0	DC..11T308	MS1155	T15
3883473	A25TSDQCL11	25	32,0	17,0	300	1/4-18 NPT	-4.0	DC..11T308	MS1155	T15



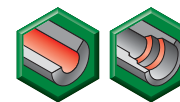
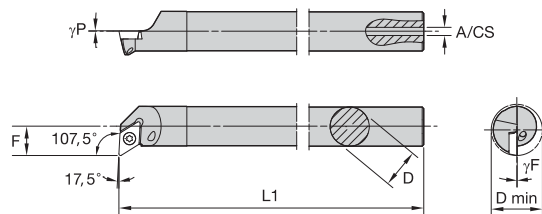
# S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.

See pages B47–B64 for inserts.

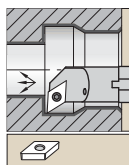


## ■ E-SDQC 107,5°

order number	catalogue number	D	D min	F	L1	A	CS	$\gamma F^\circ$	$\gamma P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>												
2010111	E12QSDQCR07	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204	12148080000	T8
2031025	E16RSDQCR07	16	20,0	11,0	200	5,5	—	-5.0	0.0	DC..070204	12148080000	T8
2023623	E20SSDQCR11	20	25,0	13,0	250	—	G 1/8	-7.0	0.0	DC..11T308	12148038800	T15
<b>left hand</b>												
2031023	E12QSDQCL07	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204	12148080000	T8
2010148	E16RSDQCL07	16	20,0	11,0	200	5,5	—	-5.0	0.0	DC..070204	12148080000	T8
2023622	E20SSDQCL11	20	25,0	13,0	250	—	G 1/8	-7.0	0.0	DC..11T308	12148038800	T15

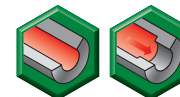
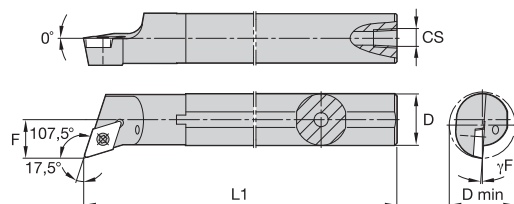


## Steel Shank with Through Coolant



Steel shank with through coolant.

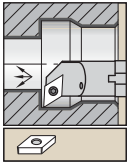
See pages B47–B64 for inserts.



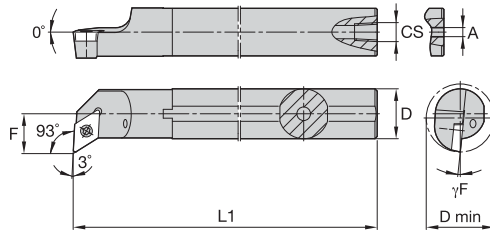
## ■ A-SDQP

order number	catalogue number	D	D min	F	L1	CS	$\gamma F^\circ$	gage insert	insert screw	Torx
<b>right hand</b>										
5078292	A12MSDQPR07	12	16,0	9,0	150	1/16-27 NPT	2.0	DP..0702..	MS1153	T7
5078295	A16RSDQPR07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..0702..	MS1153	T7
5078298	A20SSDQPR11	20	25,0	13,0	250	1/8-27 NPT	2.0	DP..11T3..	MS1155	T15
5078320	A25TSDQPR11	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T3..	MS1155	T15
<b>left hand</b>										
5078291	A12MSDQPL07	12	16,0	9,0	150	1/16-27 NPT	2.0	DP..0702..	MS1153	T7
5078293	A16RSDQPL07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..0702..	MS1153	T7
5078296	A20SSDQPL11	20	25,0	13,0	250	1/8-27 NPT	2.0	DP..11T3..	MS1155	T15
5078299	A25TSDQPL11	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T3..	MS1155	T15



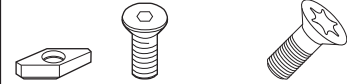


Steel shank with through coolant.  
See pages B47–B64 for inserts.



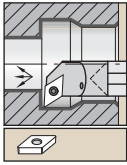
## ■ A-SDUC 93°

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex	insert screw	Torx
<b>right hand</b>														
3883297	A10KSDUCR07	10	13,0	7,0	125	3,2	—	-7.0	DC..070204	—	—	—	MS1153	T7
3883294	A16RSDUCR07	16	20,0	11,0	200	—	1/8-27 NPT	-4.0	DC..070204	—	—	—	MS1153	T7
3883293	A16RSDUCR11	16	20,0	11,0	200	—	1/8-27 NPT	-6.0	DC..11T308	—	—	—	MS1155	T15
3883291	A20SSDUCR11	20	25,0	13,0	250	—	1/8-27 NPT	-5.0	DC..11T308	—	—	—	MS1155	T15
3883288	A25TSDUCR11	25	32,0	17,0	300	—	1/8-27 NPT	-4.0	DC..11T308	—	—	—	MS1155	T15
3883287	A32TSDUCR15	32	40,0	22,0	300	—	1/8-27 NPT	-7.0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15
<b>left hand</b>														
3883298	A10KSDUCL07	10	13,0	7,0	125	3,2	—	-7.0	DC..070204	—	—	—	MS1153	T7
3883296	A16RSDUCL07	16	20,0	11,0	200	—	1/8-27 NPT	-4.0	DC..070204	—	—	—	MS1153	T7
3883295	A16RSDUCL11	16	20,0	11,0	200	—	1/8-27 NPT	-6.0	DC..11T308	—	—	—	MS1155	T15
3883292	A20SSDUCL11	20	25,0	13,0	250	—	1/8-27 NPT	-5.0	DC..11T308	—	—	—	MS1155	T15
3883290	A25TSDUCL11	25	32,0	17,0	300	—	1/8-27 NPT	-4.0	DC..11T308	—	—	—	MS1155	T15
3883289	A32TSDUCL15	32	40,0	22,0	300	—	1/8-27 NPT	-7.0	DC..150408	SKDP453	SRS4	4 mm	MS1158	T15

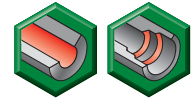
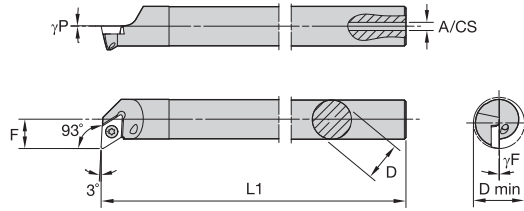


# S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.



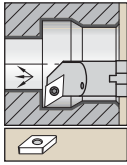
See pages B47–B64 for inserts.

## ■ E-SDUC 93°



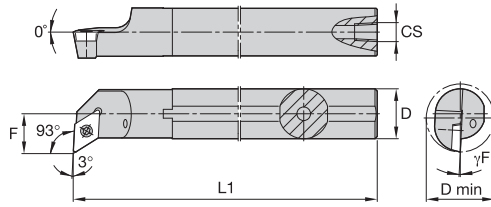
order number	catalogue number	D	D min	F	L1	A	CS	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>												
2023611	E12QSDUCR07	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204	12148068700	T8
2010157	E16RSDUCR07	16	20,0	11,0	200	4,5	—	-5.0	0.0	DC..070204	12148080000	T8
2023624	E20SSDUCR11	20	25,0	13,0	250	—	G 1/8	-7.0	0.0	DC..11T308	12148038800	T15
2023630	E25TSDUCR11	25	32,0	17,0	300	—	G 1/4	-5.0	0.0	DC..11T308	12148038800	T15
<b>left hand</b>												
2023610	E12QSDUCL07	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204	12148068700	T8
2023617	E16RSDUCL07	16	20,0	11,0	200	4,5	—	-5.0	0.0	DC..070204	12148080000	T8
2010193	E20SSDUCL11	20	25,0	13,0	250	—	G 1/8	-7.0	0.0	DC..11T308	12148038800	T15
2023629	E25TSDUCL11	25	32,0	17,0	300	—	G 1/4	-5.0	0.0	DC..11T308	12148038800	T15

Tools for External Turning and Internal Boring



Steel shank with through coolant.

See pages B47–B64 for inserts.

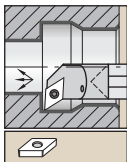


■ **A-SDUP 93°**

order number	catalogue number	D	D min	F	L1	CS	$\gamma_F^\circ$	gage insert	insert screw	Torx
<b>right hand</b>										
5078360	A12MSDUPR07	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	MS1153	T7
5078364	A16RSDUPR07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	MS1153	T7
5078368	A20SSDUPR11	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	MS1155	T15
5078376	A25TSDUPR11	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T308	MS1155	T15
<b>left hand</b>										
5078329	A12MSDUPL07	12	16,0	9,0	150	1/16-27 NPT	-2.0	DP..070204	MS1153	T7
5078363	A16RSDUPL07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..070204	MS1153	T7
5078367	A20SSDUPL11	20	25,0	13,0	250	1/8-27 NPT	-2.0	DP..11T308	MS1155	T15
5078375	A25TSDUPL11	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T308	MS1155	T15

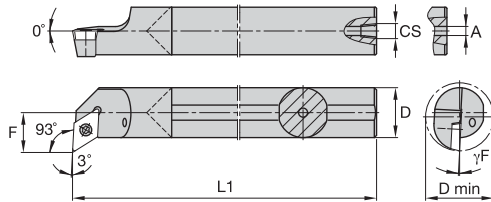


**Carbide Shank with Through Coolant**



Carbide shank with through coolant.

See pages B47–B64 for inserts.



■ **E-SDUP 93°**

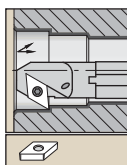
order number	catalogue number	D	D min	F	L1	A	$\gamma_F^\circ$	gage insert	insert screw	Torx
<b>right hand</b>										
5093591	E12QSDUPR07	12	16,0	9,0	179	4,8	-2.0	DP..070204	MS1153	T7
5093634	E16RSDUPR07	16	20,0	11,0	199	5,5	0.0	DP..070204	MS1153	T7
5093639	E20SSDUPR11	20	25,0	13,0	253	7,1	-2.0	DP..11T308	MS1155	T15
<b>left hand</b>										
5093429	E12QSDUPL07	12	16,0	9,0	179	4,8	-2.0	DP..070204	MS1153	T7
5093633	E16RSDUPL07	16	20,0	11,0	199	5,5	0.0	DP..070204	MS1153	T7
5093638	E20SSDUPL11	20	25,0	13,0	253	7,1	-2.0	DP..11T308	MS1155	T15





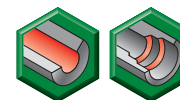
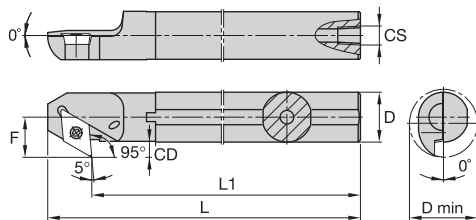
# S-Style Clamping Boring Bars for Positive Inserts

Steel Shank with Through Coolant



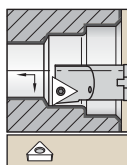
Steel shank with through coolant.

See pages B47–B64 for inserts.



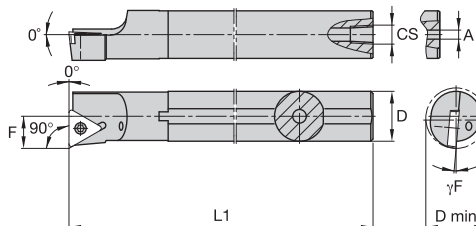
## ■ A-SDXP 95°

order number	catalogue number	D	D min	F	L1	L	CD	CS	gage insert	insert screw	Torx
<b>right hand</b>											
5078401	A12MSDXPR07	12	16,0	9,0	150	162,0	3,09	1/16-27 NPT	DP..070204	MS1153	T7
5078405	A16RSDXPR07	16	20,0	11,0	200	212,0	3,20	1/8-27 NPT	DP..070204	MS1153	T7
5078430	A20SSDXPR11	20	25,0	13,0	250	270,0	4,31	1/8-27 NPT	DP..11T308	MS1155	T15
<b>left hand</b>											
5078400	A12MSDXPL07	12	16,0	9,0	150	162,0	3,09	1/16-27 NPT	DP..070204	MS1153	T7
5078404	A16RSDXPL07	16	20,0	11,0	200	212,0	3,20	1/8-27 NPT	DP..070204	MS1153	T7
5078409	A20SSDXPL11	20	25,0	13,0	250	270,0	4,31	1/8-27 NPT	DP..11T308	MS1155	T15



Steel shank with through coolant.

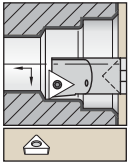
See pages B81–B93 for inserts.



## ■ A-STFC 90°

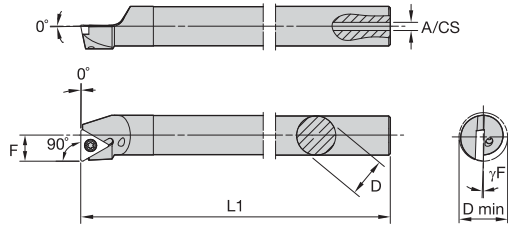
order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx	
<b>right hand</b>											
3883382	A10KSTFCR11	10	13,0	7,0	125	3,2	-7.0	TC..110204	MS1153	T7	
<b>left hand</b>											
3883443	A10KSTFCL11	10	13,0	7,0	125	3,2	-7.0	TC..110204	MS1153	T7	





Carbide shank with through coolant.

See pages B81–B93 for inserts.



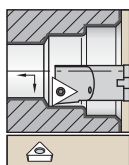
■ **E-STFC 90°**



order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
<b>right hand</b>											
2031888	E10MSTFCR11	10	13,0	7,0	150	3,5	—	-10,0	TC..110204	12148068700	T8
2031024	E12QSTFCR11	12	16,0	9,0	180	4,5	—	-8,0	TC..110204	12148068700	T8
2010174	E16RSTFCR16	16	20,0	11,0	200	4,5	—	-9,0	TC..16T308	12148038800	T15
2023626	E20SSTFCR16	20	25,0	13,0	250	—	G 1/8	-7,0	TC..16T308	12148038800	T15
2023631	E25TSTFCR16	25	32,0	17,0	300	—	G 1/4	-5,0	TC..16T308	12148038800	T15
<b>left hand</b>											
2010090	E10MSTFCL11	10	13,0	7,0	150	3,5	—	-10,0	TC..110204	12148068700	T8
2010120	E12QSTFCL11	12	16,0	9,0	180	4,5	—	-8,0	TC..110204	12148068700	T8
2023618	E16RSTFCL16	16	20,0	11,0	200	4,5	—	-9,0	TC..16T308	12148038800	T15
2023625	E20SSTFCL16	20	25,0	13,0	250	—	G 1/8	-7,0	TC..16T308	12148038800	T15
2010233	E25TSTFCL16	25	32,0	17,0	300	—	G 1/4	-5,0	TC..16T308	12148038800	T15

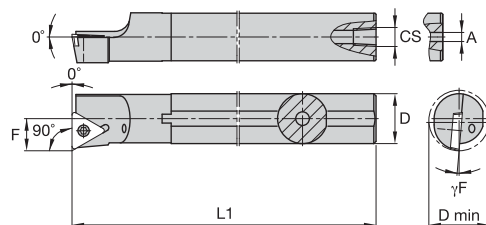
# S-Style Clamping Boring Bars for Positive Inserts

Steel Shank with Through Coolant



Steel shank with through coolant.

See pages B81–B93 for inserts.

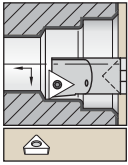


## ■ A-STFP 90°

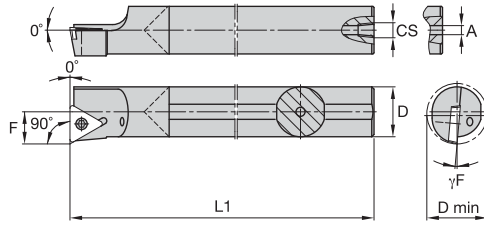


order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
<b>right hand</b>											
5086726	A08JSTFPR09	8	11,0	6,0	110	—	—	-8.0	TP..090204	MS1933	T7
3883446	A10KSTFPR11	10	13,0	7,0	125	3,2	—	-4.0	TP..110204	MS1153	T7
5086802	A12MSTFPR11	12	16,0	9,0	150	4,0	—	-2.0	TP..110204	MS1153	T7
3883444	A16RSTFPR11	16	20,0	11,0	200	—	1/16-27 NPT	0.0	TP..110204	MS1153	T7
5086807	A20SSTFPR16	20	25,0	13,0	250	—	—	-2.0	TP..16T308	MS1155	T15
5086809	A25STFPR16	25	32,0	17,0	300	6,4	1/4-18 NPT	0.0	TP..16T308	MS1155	T15
<b>left hand</b>											
5086724	A08JSTFPL09	8	11,0	6,0	110	—	—	-8.0	TP..090204	MS1933	T7
3883447	A10KSTFPL11	10	13,0	7,0	125	3,2	—	-4.0	TP..110204	MS1153	T7
5086800	A12MSTFPL11	12	16,0	9,0	150	4,0	—	-2.0	TP..110204	MS1153	T7
3883445	A16RSTFPL11	16	20,0	11,0	200	—	1/16-27 NPT	0.0	TP..110204	MS1153	T7
5086806	A20SSTFPL16	20	25,0	13,0	250	—	—	-2.0	TP..16T308	MS1155	T15
5086808	A25STFPL16	25	32,0	17,0	300	6,4	1/4-18 NPT	0.0	TP..16T308	MS1155	T15

Tools for External Turning and Internal Boring



Carbide shank with through coolant.  
See pages B81–B93 for inserts.



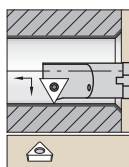
■ **E-STFP 90°**

order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
<b>right hand</b>										
5093696	E08KSTFPR09A	8	11,0	6,0	124	2,4	-6.0	TP..090204	<b>MS1933</b>	T7
5093750	E10MSTFPR11A	10	13,0	7,0	152	3,2	-4.0	TP..110204	<b>MS1153</b>	T7
5093755	E12QSTFPR11	12	16,0	9,0	181	4,8	-2.0	TP..110204	<b>MS1153</b>	T7
5093759	E16RSTFPR11	16	20,0	11,0	201	5,5	0.0	TP..110204	<b>MS1153</b>	T7
5093773	E20SSTFPR16	20	25,0	13,0	251	7,1	-2.0	TP..16T308	<b>MS1155</b>	T15
<b>left hand</b>										
5093694	E08KSTFPL09A	8	11,0	6,0	124	2,4	-6.0	TP..090204	<b>MS1933</b>	T7
5093699	E10MSTFPL11A	10	13,0	7,0	152	3,2	-4.0	TP..110204	<b>MS1153</b>	T7
5093754	E12QSTFPL11	12	16,0	9,0	181	4,8	-2.0	TP..110204	<b>MS1153</b>	T7
5093758	E16RSTFPL11	16	20,0	11,0	201	5,5	0.0	TP..110204	<b>MS1153</b>	T7
5093772	E20SSTFPL16	20	25,0	13,0	251	7,1	-2.0	TP..16T308	<b>MS1155</b>	T15

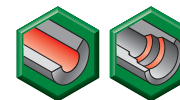
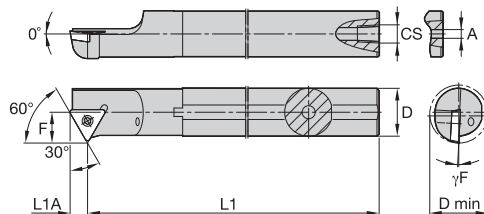


# S-Style Clamping Boring Bars for Positive Inserts

Steel Shank with Through Coolant



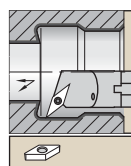
Steel shank with through coolant.



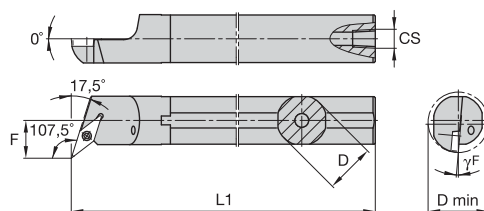
See pages B81–B93 for inserts.

## ■ A-STWP 60°

order number	catalogue number	D	D min	F	L1	L1A	A	γF°	gage insert	insert screw	Torx
<b>right hand</b>											
5086811	A12MSTWPR11	12	16,0	9,0	150	—	—	-2.0	TP..110204	MS1153	T7
5086813	A16RSTWPR11	16	20,0	11,0	200	—	—	-2.0	TP..110204	MS1153	T7
<b>left hand</b>											
3883449	A10KSTWPL11	10	13,0	7,0	125	5,0	3,2	-4.0	TP..110204	MS1153	T7
5086810	A12MSTWPL11	12	16,0	9,0	150	—	—	-2.0	TP..110204	MS1153	T7
5086812	A16RSTWPL11	16	20,0	11,0	200	—	—	-2.0	TP..110204	MS1153	T7



Steel shank with through coolant.

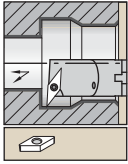


See pages B94–B99 for inserts.

## ■ A-SVQB 107,5°

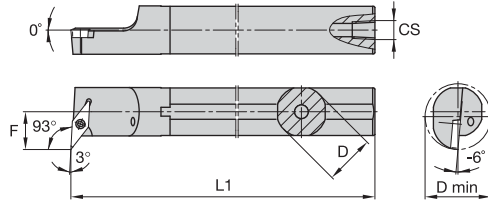
order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx	
<b>right hand</b>											
3883436	A16RSVQBR11	16	20,0	11,0	200	1/8-27 NPT	-7.0	VB..110304	MS1153	T7	
3883434	A25TSVQBR16	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408	MS1155	T15	
<b>left hand</b>											
3883435	A25TSVQBL16	25	32,0	17,0	300	1/4-18 NPT	-6.0	VB..160408	MS1155	T15	





Steel shank with through coolant.

See pages B94–B99 for inserts.



■ **A-SVUB 93°**

order number	catalogue number	D	D min	F	L1	CS	gage insert	insert screw	Torx
<b>right hand</b>									
3883440	A20SSVUBR11	20	25,0	13,0	250	1/8-27 NPT	VB..110304	MS1153	T7
3883438	A25TSVUBR16	25	32,0	17,0	300	1/4-18 NPT	VB..160408	MS1155	T15
<b>left hand</b>									
3883439	A25TSVUBL16	25	32,0	17,0	300	1/4-18 NPT	VB..160408	MS1155	T15



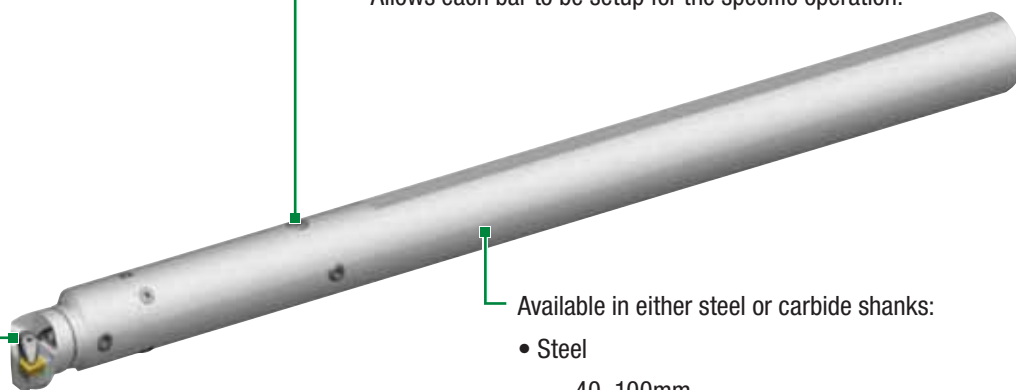
## Tunable Boring Bars with Front End KM™ Quick Change Adaptor

Reduce vibrations and enhance productivity in deep boring applications with KM Quick Change heads and tunable boring bars.

# Tunable Boring Bars



Adjustment screw to allow for on-machine tuning.  
Allows each bar to be setup for the specific operation.



Available in either steel or carbide shanks:

- Steel  
— 40–100mm
- Carbide  
— 50–100mm

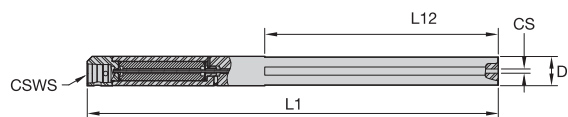
Comprehensive offering of KM Quick Change cutting units. See WIDIA™ Tooling Systems Catalogue (A-09-02122) for KM adaptors.

Features	Function	Benefit
Robust internal clamping package	<ul style="list-style-type: none"> <li>• Eliminates chatter and vibration.</li> <li>• Higher metal removal rate.</li> <li>• Larger depths of cut.</li> </ul>	<ul style="list-style-type: none"> <li>• High surface quality.</li> <li>• Low scrap rate.</li> <li>• Increased productivity.</li> <li>• Reduced noise exposure.</li> </ul>
Tunable clamping mechanism	Bar can be tuned on the machine with just turning a screw.	Optimised damping characteristics for all kinds of machining conditions.
KM™ Quick Change front end adaptor	<ul style="list-style-type: none"> <li>• Ridged clamping system.</li> <li>• Wide selection of KM Quick Change cutting units.</li> </ul>	Flexible system reduces tooling inventory and setup times.

### ■ Tuning Procedure

1. Loosen the two locking screws on the bar.
2. Turn the adjusting screw in the positive direction until it becomes snug. The adjusting screw becomes snug when it locks the tuner mass.
3. Turn the screw one complete turn in the negative direction and take a test cut.
4. Repeat Step 3 until chatter is eliminated.
5. Once chatter is eliminated, note that chatter starts between the current screw setting and one turn in the positive direction. Make 1/4 turn adjustments within this range, taking test cuts for each setting, until you can identify the adjusting screw setting that causes chatter to start.
6. Once the adjusting screw setting that causes chatter is determined, back the adjusting screw off a 1/2 turn in the negative direction.
7. Tighten both clamping screws and take a test cut to confirm desired results.





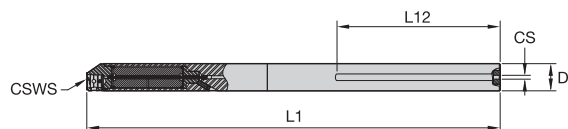
Tunable steel shank with through coolant and front end KM™ clamping unit.



■ D...TTB-KM • Metric

order number	catalogue number	D	L1	CS	L12	L1 min	CSWS system size
3637636	D40MTTB560KM40	40	520	RP 3/8-19	305	330	KM40
3637637	D50MTTB737KM40	50	697	RP 3/8-19	470	337	KM40
3637638	D60MTTB1000KM40	60	976	RP 3/8-19	686	396	KM40
3642134	D80MTTB1120KM63	80	1060	RP 3/8-19	610	560	KM63
3642135	D100MTTB1330KM63	100	1384	RP 3/8-19	622	695	KM63

NOTE: KM adaptors can be found in the WIDIA™ Tooling Systems Catalogue (A-09-02122EN).



Carbide tunable boring bar with KM™ Quick Change connection.



■ G-KM-TTB • Metric

order number	catalogue number	D	L1	CS	L12	CSWS system size
3954298	G50MTTB1026KM40	50	986	RP 3/8-19	300	KM40
3954299	G60MTTB1226KM40	60	1186	RP 3/8-19	381	KM40
3954300	G80MTTB1564KM63	80	1504	RP 3/8-19	480	KM63
3954301	G100MTTB2066KM63	100	1975	RP 3/8-19	600	KM63

NOTE: KM adaptors can be found in the WIDIA™ Tooling Systems Catalogue (A-09-02122EN).

# Separator™ Toolholders and Inserts



EXTREME **CHALLENGES.**  
EXTREME **RESULTS.**



Specifically engineered to deliver toolholder flexibility with integral, component, universal, and blade-style designs.

- Insert widths 2–4mm.
- Toolholder shank sizes 10–31,75mm.
- Cut-off up to 76mm bar capacity.
- Quick, reliable insert indexing.
- Positive mechanical clamping.
- CNC square shank, screw machine, and PL blade-style toolholders.

To learn more, contact your local Authorised Distributor or visit [widia.com](http://widia.com).

**WIDIA** 

Modern machining operations demand high-quality, high-performance toolholders that provide straightforward design and application versatility.

Standard WIDIA™ cartridges are ideal for turning tools with one, or several, cutting edges. A wide range of cartridge sizes and styles provide numerous combinations and application possibilities.

# Cartridges



## Clamping System M

- Combined pin/wedge clamp for negative inserts.
- An extremely sturdy clamping system, specially designed for interrupted cuts.
- The tool is protected by a carbide shim.

## Clamping System P

- Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter.
- Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°.
- Advantages of this system are fast insert changes and no interference with chip flow.

*P-style available in metric sizes only.*



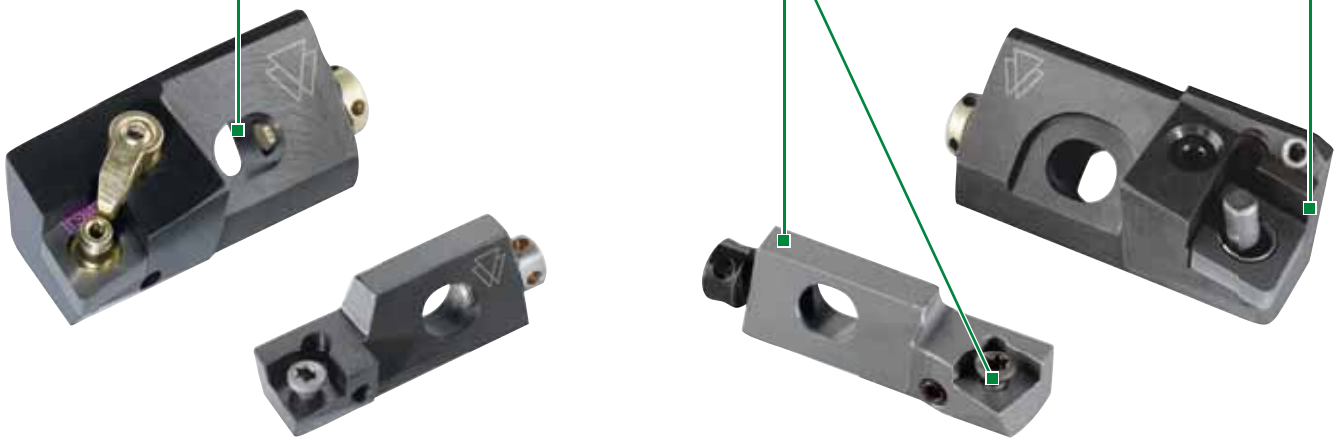
Simple and secure mounting to the tool by a single cartridge clamping screw.

High accuracy on "F" dimension ensures proper application to minimum bore dimensions.

Same clamping systems as standard turning toolholders.

Overall sizes to DIN and ISO are ideal for single- and multi-tooth turning, boring, and spotting tools.

Precise axial and radial positioning by adjustment screws.



## Clamping System C

- Top clamping system for negative and positive indexable inserts to DIN 4968.
- This universal clamping system is robust and easy to handle.
- Some height-adjustable clamps enable the use of additional chipbreakers.
- A carbide shim provides additional tool protection.

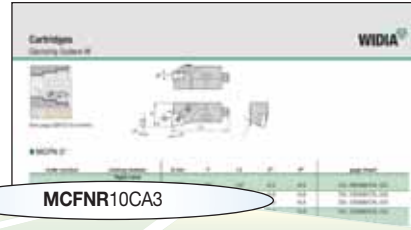


## Clamping System S

- Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967.
- Compact design using a minimum of spare parts for high reliability and cost efficiency.
- A carbide shim provides additional tool protection.
- Toolholders with cutting edge heights upwards of 16mm (.625") and insert iCs from 9,52mm (.375") are secured by means of a threaded bushing.

## How Do Catalogue Numbers Work?

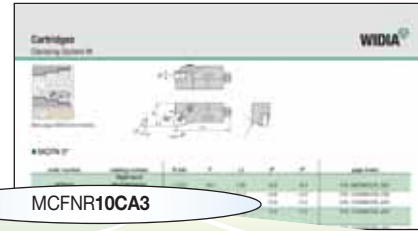
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



MCFNR10CA3

M	C	F	N	R
<p><b>Insert Clamping System</b></p> <div> <p><b>C</b></p> <p>Top clamping by clamping finger for inserts without hole.</p> </div> <div> <p><b>M</b></p> <p>Top and hole clamping for inserts with hole.</p> </div> <div> <p><b>P</b></p> <p>Insert clamping by toggle lever for insert hole.</p> </div> <div> <p><b>S</b></p> <p>Centre clamping by screw for inserts with hole.</p> </div>	<p><b>Insert Shape</b></p> <div> <p><b>C</b> </p> </div> <div> <p><b>D</b> </p> </div> <div> <p><b>R</b> </p> </div> <div> <p><b>S</b> </p> </div> <div> <p><b>T</b> </p> </div> <div> <p><b>W</b> </p> </div>	<p><b>Cartridge Style</b></p> <div> <p><b>F</b> <b>K</b> </p> </div> <div> <p><b>L</b> <b>J</b> </p> </div> <div> <p><b>Q</b> <b>R</b> </p> </div> <div> <p><b>S</b> <b>G</b> </p> </div>	<p><b>Insert Clearance Angle</b></p> <div> <p><b>C</b> </p> </div> <div> <p><b>N</b> </p> </div> <div> <p><b>P</b> </p> </div>	<p><b>Hand of Tool</b></p> <div> <p><b>Right-hand cartridge</b></p> <p><b>R</b> </p> </div> <div> <p><b>Left-hand cartridge</b></p> <p><b>L</b> </p> </div>

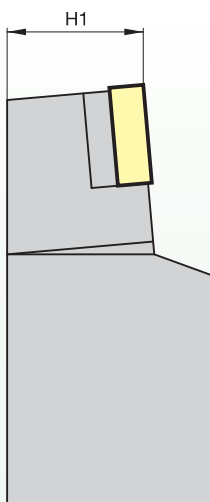
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



MCFNR10CA3

**10**

Cartridge Size



**H1** = Cutting edge height of cartridge, in inches

**C**

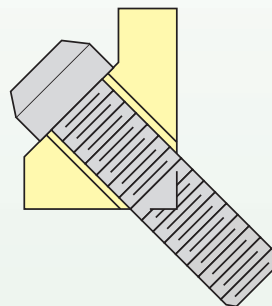
Identifying Code of Cartridge

**C** = Cartridge

**A**

Mounting Design of Cartridge

A-design conforming to ISO 5611



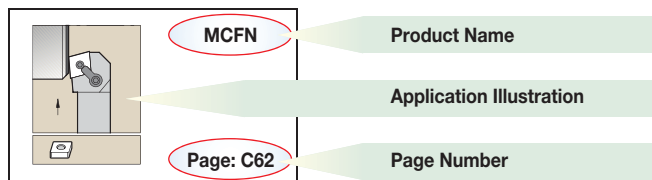
**3**

Insert Size



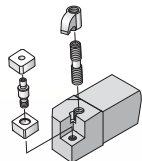
**Insert iC**  
Number of 1/8ths of "D"

Each unique clamping system offers product options to fill your specific toolholder needs. Find the illustration that fits your application and navigate to the corresponding page to get the correct solution.



### Clamping System M

**M**

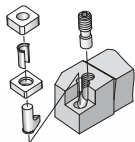


Combined pin/wedge clamp for negative inserts. An extremely sturdy clamping system, specially designed for interrupted cuts. The tool is protected by a carbide shim.

	<b>MCFN</b> 90° Page: <b>C92</b>		<b>MCKN</b> 75° Page: <b>C93</b>		<b>MCLN</b> 95° Page: <b>C94</b>		<b>MDJN</b> 93° Page: <b>C95</b>
	<b>MDQN</b> 107,5° Page: <b>C96</b>		<b>MSKN</b> 75° Page: <b>C97</b>		<b>MSRN</b> 75° Page: <b>C98</b>		<b>MSSN</b> 45° Page: <b>C99</b>
	<b>MSTN</b> 60° Page: <b>C100</b>		<b>MSYN</b> 85° Page: <b>C101</b>		<b>MTFN</b> 90° Page: <b>C102</b>		<b>MTGN</b> 90° Page: <b>C103</b>

### P-Style Clamping

**P**

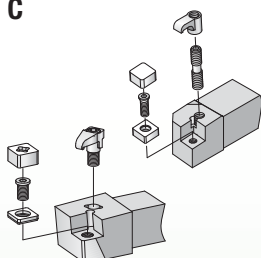


Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter. Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°. Advantages of this system are fast insert changes and no interference with chip flow.

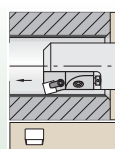
	<b>PCLN</b> 95° Page: <b>C104</b>		<b>PSKN</b> 75° Page: <b>C105</b>
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### Clamping System C

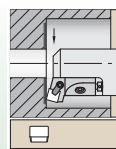
**C**



Top clamping system for negative and positive indexable inserts to DIN 4968. This universal clamping system is robust and easy to handle. Some height-adjustable clamps enable the use of additional chipbreakers. A carbide shim provides additional tool protection.



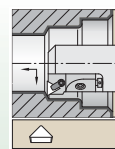
**CSKP**  
75°  
Page:  
**C106**



**CSRSP**  
75°  
Page:  
**C107**



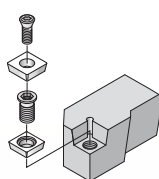
**CSSP**  
45°  
Page:  
**C108**



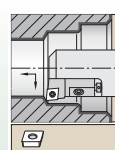
**CTFP**  
90°  
Page:  
**C109**

### Clamping System S

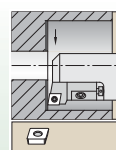
**S**



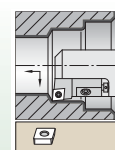
Combined pin/wedge clamp for negative inserts. An extremely sturdy clamping system, specially designed for interrupted cuts. The tool is protected by a carbide shim.



**SCFP**  
90°  
Page:  
**C110**



**SCGP**  
90°  
Page:  
**C111**



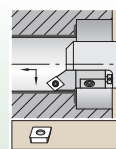
**SCLC**  
95°  
Page:  
**C112**



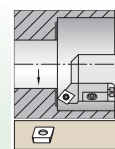
**SCLP**  
95°  
Page:  
**C113**



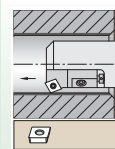
**SCRSP**  
75°  
Page:  
**C114**



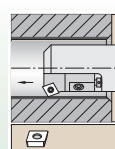
**SCSP**  
45°  
Page:  
**C115**



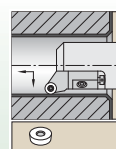
**SCTP**  
60°  
Page:  
**C116**



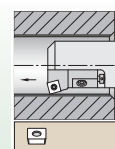
**SCWP**  
60°  
Page:  
**C117**



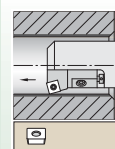
**SDJP**  
93°  
Page:  
**C118**



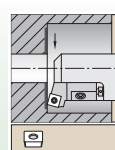
**SRGC**  
Page:  
**C119**



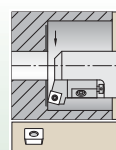
**SSKC**  
75°  
Page:  
**C120**



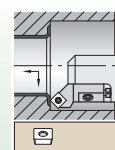
**SSKP**  
75°  
Page:  
**C121**



**SSRC**  
75°  
Page:  
**C122**



**SSRP**  
75°  
Page:  
**C123**



**SSSC**  
45°  
Page:  
**C124**



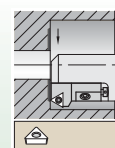
**SSSP**  
45°  
Page:  
**C125**



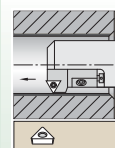
**STFP**  
90°  
Page:  
**C126**



**STGP**  
90°  
Page:  
**C127**

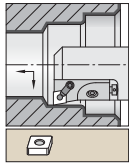


**STTP**  
60°  
Page:  
**C128**

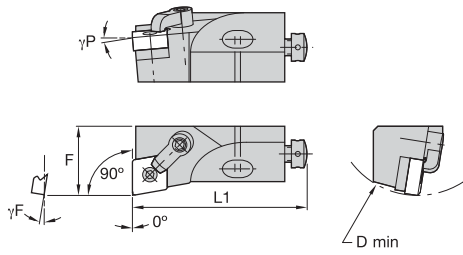


**STWP**  
60°  
Page:  
**C129**





See pages B30–B46 for inserts.



Tools for External Turning and Internal Boring

■ MCFN 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
<b>right hand</b>							
3870421	MCFNR10CA09	40	14,0	50	-9.0	-9.0	CN..090308/CN..322
3870420	MCFNR12CA12	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
3870419	MCFNR16CA12	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3870418	MCFNR20CA12	70	25,0	70	-9.0	-5.0	CN..120408/CN..432
<b>left hand</b>							
3870423	MCFNL12CA12	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
3870422	MCFNL16CA12	60	25,0	63	-9.0	-5.0	CN..120408/CN..432

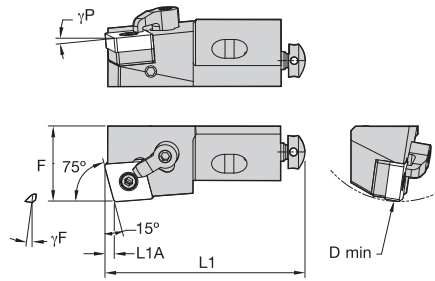
■ Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	—	4 mm	CSWM 060 050
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	ICSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	ICSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B30–B46 for inserts.



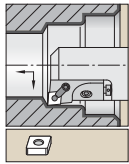
## ■ MCKN 75°

order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
<b>right hand</b>								
3870416	MCKNR12CA12	50	20,0	55	3	-9.0	-5.0	CN..120408/CN..432
3870415	MCKNR16CA12	60	25,0	63	3	-9.0	-5.0	CN..120408/CN..432
<b>left hand</b>								
3870417	MCKNL12CA12	50	20,0	55	3	-9.0	-5.0	CN..120408/CN..432

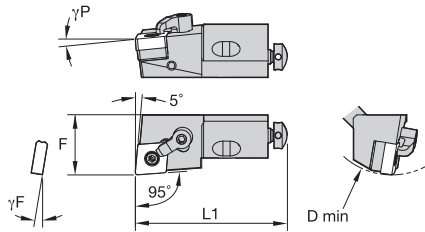
## ■ Spare Parts



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



See pages B30–B46 for inserts.

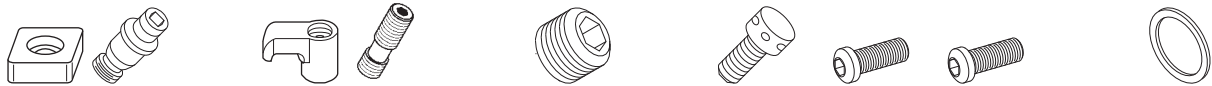


Tools for External Turning and Internal Boring

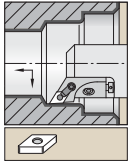
■ MCLN 95°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
<b>right hand</b>							
3870410	MCLNR12CA12	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
3870409	MCLNR16CA12	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3870408	MCLNR20CA12	70	25,0	70	-9.0	-5.0	CN..120408/CN..432
3870407	MCLNR25CA19	100	32,0	100	-9.0	-5.0	CN..190612/CN..643
<b>left hand</b>							
3870414	MCLNL12CA12	50	20,0	55	-9.0	-5.0	CN..120408/CN..432
3870413	MCLNL16CA12	60	25,0	63	-9.0	-5.0	CN..120408/CN..432
3870412	MCLNL20CA12	70	25,0	70	-9.0	-5.0	CN..120408/CN..432
3870411	MCLNL25CA19	100	32,0	100	-9.0	-5.0	CN..190612/CN..643

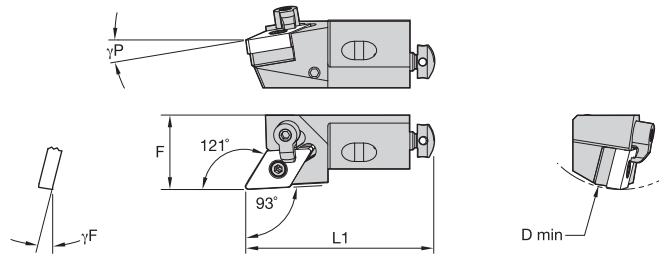
■ Spare Parts



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



See pages B47–B64 for inserts.



## ■ MDJN 93°

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3870405	MDJNR16CA15	60	25,0	63	-9.0	-9.0	DN..150408/DN..3.532
3870404	MDJNR20CA15	70	25,0	70	-8.5	-8.5	DN..150408/DN..3.532
<b>left hand</b>							
3870406	MDJNL16CA15	60	25,0	63	-9.0	-9.0	DN..150408/DN..3.532

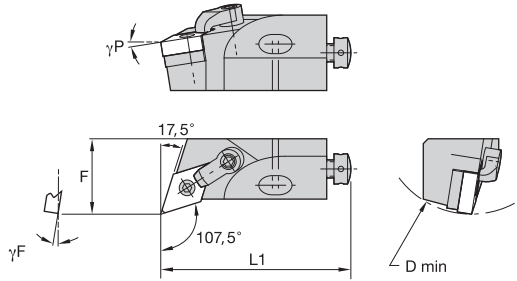
## ■ Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
60	IDSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	IDSN432	KLM46	2.5 mm	CKM41	STCM40	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B47–B64 for inserts.



■ MDQN 107,5°

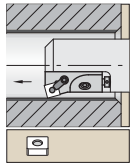
order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
<b>right hand</b>							
3870361	MDQNR16CA15	60	25,0	63	-9.0	-6.0	DN..150408/DN..3.532
3870360	MDQNR20CA15	70	25,0	70	-9.0	-8.0	DN..150408/DN..3.532
<b>left hand</b>							
3870403	MDQNL16CA15	60	25,0	63	-9.0	-6.0	DN..150408/DN..3.532
3870362	MDQNL20CA15	70	25,0	70	-9.0	-8.0	DN..150408/DN..3.532

■ Spare Parts

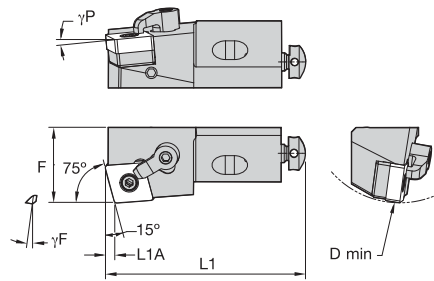


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
60	IDSN432	KLM46S	2.5 mm	CKM36	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	IDSN432	KLM46	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050

Tools for External Turning and Internal Boring



See pages B68–B80 for inserts.



## ■ MSKN 75°

order number	catalogue number	D min	F	L1	L1A	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>								
3870352	MSKNR10CA09	40,0	14,0	50	2,2	-9,0	-5,0	SN..090308/SN..322
3870351	MSKNR12CA12	50,0	20,0	55	3,0	-9,0	-5,0	SN..120408/SN..432
3870350	MSKNR16CA12	60,0	25,0	63	3,0	-9,0	-5,0	SN..120408/SN..432
3870349	MSKNR20CA15	70,0	25,0	70	3,7	-9,0	-5,0	SN..150612/SN..543
3870348	MSKNR25CA19	100,0	32,0	100	4,6	-9,0	-5,0	SN..190612/SN..543
<b>left hand</b>								
3870356	MSKNL10CA09	40,0	14,0	50	2,2	-9,0	-5,0	SN..090308/SN..322
3870354	MSKNL16CA12	60,0	25,0	63	3,0	-9,0	-5,0	SN..120408/SN..432
3870353	MSKNL20CA15	70,0	25,0	70	3,7	-9,0	-5,0	SN..150612/SN..543

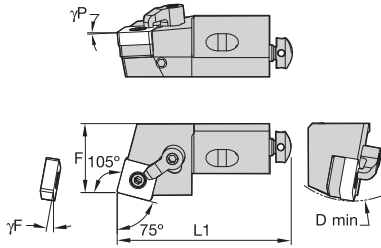
## ■ Spare Parts



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



See pages B68–B80 for inserts.

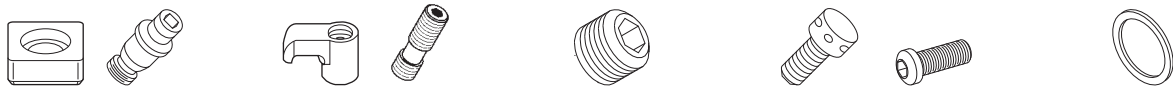


Tools for External Turning and Internal Boring

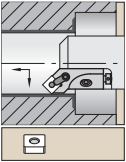
■ MSRN 75°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
<b>right hand</b>							
3870344	MSRNR10CA09	40,0	14,0	50	-9.0	-5.0	SN..090308/SN..322
3870343	MSRNR12CA12	50,0	20,0	55	-9.0	-5.0	SN..120408/SN..432
3870341	MSRNR20CA15	70,0	25,0	70	-9.0	-5.0	SN..150612/SN..543
<b>left hand</b>							
3870347	MSRNL12CA12	50,0	20,0	55	-9.0	-5.0	SN..120408/SN..432
3870346	MSRNL16CA12	60,0	25,0	63	-9.0	-5.0	SN..120408/SN..432
3870345	MSRNL20CA15	70,0	25,0	70	-9.0	-5.0	SN..150612/SN..543

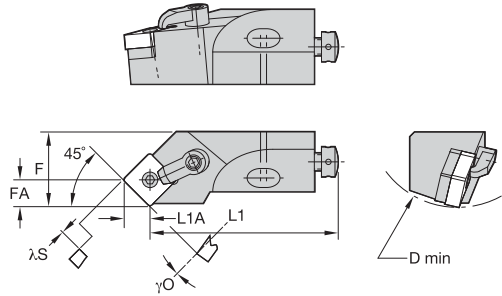
■ Spare Parts



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



See pages B68–B80 for inserts.



## ■ MSSN 45°

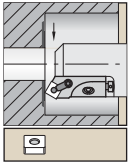
order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
<b>right hand</b>								
3870336	MSSNR10CA09	40,0	14,0	44	6,1	-13.0	0.0	SN..090308/SN..322
3870335	MSSNR12CA12	50,0	20,0	47	8,3	-13.0	0.0	SN..120408/SN..432
3870334	MSSNR16CA12	60,0	25,0	53	8,3	-13.0	0.0	SN..120408/SN..432
3870333	MSSNR20CA15	70,0	25,0	60	10,3	-13.0	0.0	SN..150612/SN..543
<b>left hand</b>								
3870340	MSSNL10CA09	40,0	14,0	44	6,1	-13.0	0.0	SN..090308/SN..322
3870339	MSSNL12CA12	50,0	20,0	47	8,3	-13.0	0.0	SN..120408/SN..432
3870338	MSSNL16CA12	60,0	25,0	53	8,3	-13.0	0.0	SN..120408/SN..432

## ■ Spare Parts

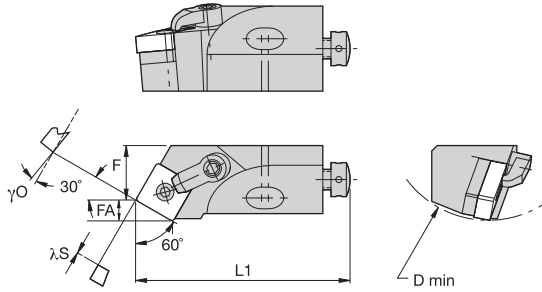


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	–	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	–	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	ISSN432	KLM46S	2.5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





See pages B68–B80 for inserts.



■ MSTN 60°

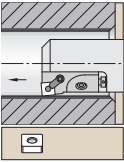
order number	catalogue number	D min	F	L1	FA	λS°	γO°	gage insert
<b>right hand</b>								
3870312	MSTNR10CA09	40,0	9,0	50	13,3	-11.0	0.0	SN..090308/SN..322
3870311	MSTNR12CA12	50,0	13,0	55	5,9	-11.0	0.0	SN..120408/SN..432
3870310	MSTNR16CA12	60,0	15,0	63	5,9	0.0	-11.0	SN..120408/SN..432

■ Spare Parts

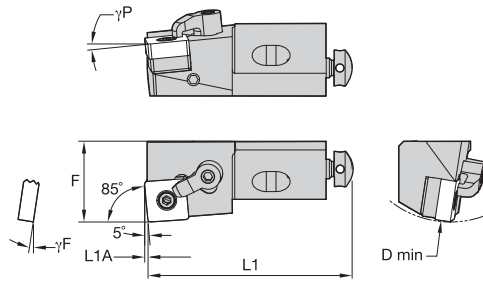


D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	ISSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050

Tools for External Turning and Internal Boring



See pages B68–B80 for inserts.



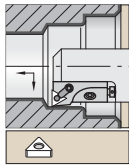
## MSYN 85°

order number	catalogue number	D min	F	L1	L1A	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>								
3870308	MSYNR10CA09	40,0	14,0	50	0,8	-9,0	-5,0	SN..090308/SN..322
3870307	MSYNR12CA12	50,0	20,0	55	1,0	-9,0	-5,0	SN..120408 / SN..432
3870306	MSYNR16CA12	60,0	25,0	63	1,0	-9,0	-5,0	SN..120408 / SN..432
3870305	MSYNR25CA19	100,0	32,0	100	1,5	-9,0	-5,0	SN..190612/SN..643
<b>left hand</b>								
3870309	MSYNL10CA09	40,0	14,0	50	0,8	-9,0	-5,0	SN..090308/SN..322

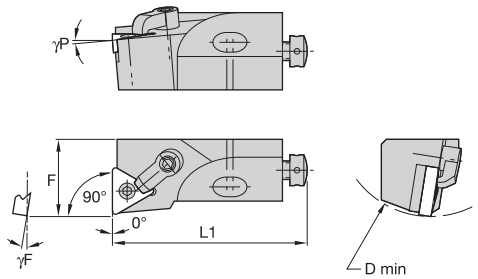
## Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	holding screw	hex	washer
40	—	KLM33	2 mm	CKM36	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	—	KLM43	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	—	4 mm	CSWM 060 050
60	ISSN432	KLM46S	2.5 mm	CKM34	STCM9	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	—	5 mm	CSWM 080 050
100	ISSN633	KLM68	4 mm	CKM35	STCM8	4 mm	KUAM27	4 mm	KUAM33	—	MS364	8 mm	CSWM 100 080



See pages B81–B93 for inserts.

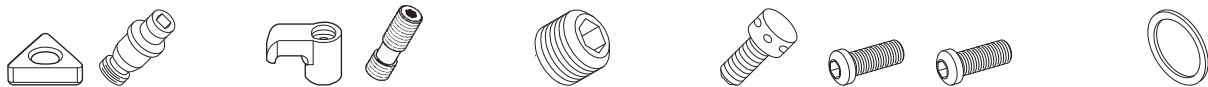


Tools for External Turning and Internal Boring

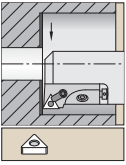
■ MTFN 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
<b>right hand</b>							
3871303	MTFNR12CA16	50,0	20,0	55	-9.0	-5.0	TN..160408/TN..332
3871302	MTFNR16CA16	60,0	25,0	63	-9.0	-5.0	TN..160408/TN..332
3871301	MTFNR20CA22	70,0	25,0	70	-9.0	-5.0	TN..220408/TN..432
3871300	MTFNR25CA27	100,0	32,0	100	-9.0	-5.0	TN..270612/TN..443
<b>left hand</b>							
3871306	MTFNL12CA16	50,0	20,0	55	-9.0	-5.0	TN..160408/TN..332
3871305	MTFNL16CA16	60,0	25,0	63	-9.0	-5.0	TN..160408/TN..332

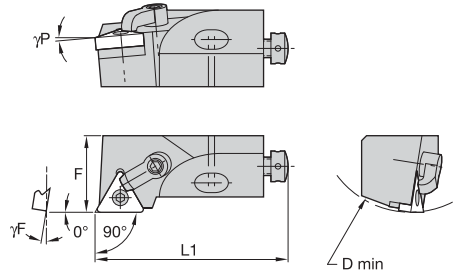
■ Spare Parts



D min	shim	lock pin	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	holding screw	hex	washer
50	—	KLM33L	2 mm	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	—	4 mm	CSWM 060 050
60	ITSN322	KLM34L	2 mm	CKM34	STCM9	2 mm	KUAM25	2 mm	KUAM32	191.407	—	5 mm	CSWM 080 050
70	ITSN433	KLM46	2.5 mm	CKM35	STCM37	2.5 mm	KUAM25	2.5 mm	KUAM32	191.407	—	5 mm	CSWM 080 050
100	ITSN534	KLM58	3 mm	CKM38	STCM39	3 mm	KUAM26	3 mm	KUAM32	—	MS364	8 mm	CSWM 100 080



See pages B81–B93 for inserts.



## ■ MTGN 90°

order number	catalogue number	D min	F	L1	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert
<b>right hand</b>							
3871296	MTGNR12CA16	50,0	20,0	55	-9.0	-5.0	TN..160408/TN..332
3871295	MTGNR16CA16	60,0	25,0	63	-9.0	-5.0	TN..160408/TN..332
3871294	MTGNR20CA22	70,0	25,0	70	-9.0	-5.0	TN..220408/TN..432
<b>left hand</b>							
3871299	MTGNL12CA16	50,0	20,0	55	-9.0	-5.0	TN..160408/TN..332
3871298	MTGNL16CA16	60,0	25,0	63	-9.0	-5.0	TN..160408/TN..332
3871297	MTGNL20CA22	70,0	25,0	70	-9.0	-5.0	TN..220408/TN..432

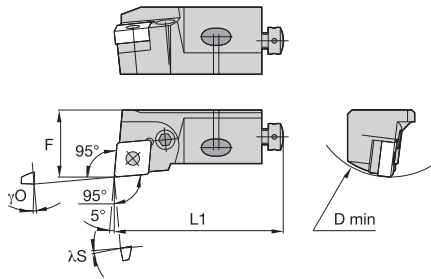
## ■ Spare Parts



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



See pages B30–B46 for inserts.



Tools for External Turning and Internal Boring

■ PCLN 95°

order number	catalogue number	D min	F	L1	λS°	γ0°	gage insert
<b>right hand</b>							
3871291	PCLNR12CA12	50	20,0	55	-6.0	-9.0	CN..120408/CN..432
3871290	PCLNR16CA12	60	25,0	63	-6.0	-7.0	CN..120408/CN..432
<b>left hand</b>							
3871293	PCLNL16CA12	60	25,0	63	-6.0	-7.0	CN..120408/CN..432
3871292	PCLNL20CA16	70	25,0	70	—	—	CN..160612/CN..543

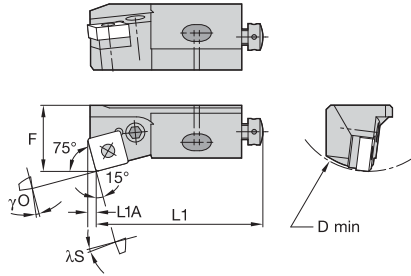
■ Spare Parts



D min	shim	shim pin	toggle lever	lever screw	wrench size lever screw	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	—	—	511.022	514.122	10 IP	KUAM28	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	512.112	513.023	511.023	514.123	15 IP	KUAM23	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	512.117	513.025	511.025	514.125	15 IP	KUAM23	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B68-B80 for inserts.



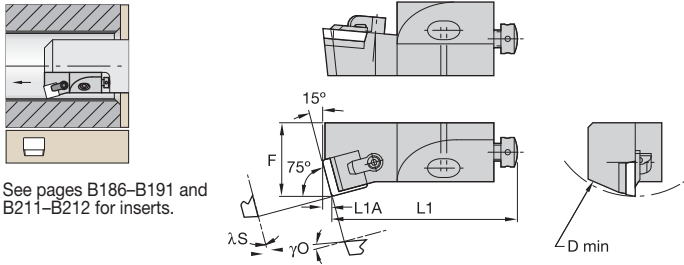
## PSKN 75°

order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
<b>right hand</b>								
3871287	PSKNR12CA12	50,0	20,0	55	3,1	-8.0	-6.0	SN..120408/SN..432
3871286	PSKNR16CA12	60,0	25,0	63	3,1	-6.0	-6.0	SN..120408/SN..432
3871289	PSKNR20CA15	70,0	25,0	70	3,8	—	—	SN..150612/SN..543
<b>left hand</b>								
3871288	PSKNL16CA12	60,0	25,0	63	3,1	-6.0	-6.0	SN..120408/SN..432

## Spare Parts



D min	shim	shim pin	toggle lever	lever screw	wrench size lever screw	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	—	—	511.022	514.122	10 IP	KUAM28	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	512.063	513.023	511.023	514.123	15 IP	KUAM23	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050
70	512.025	513.025	511.025	514.125	15 IP	KUAM23	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B186–B191 and B211–B212 for inserts.

Tools for External Turning and Internal Boring

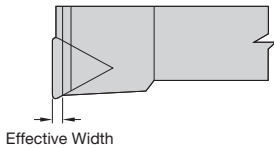
■ CSKP 75°

order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
<b>right hand</b>								
3870437	CSKPR10CA09	40,0	14,0	50	2,2	0.0	5.0	SP..090308/SP..322
3870436	CSKPR12CA12	50,0	20,0	55	3,1	0.0	5.0	SP..120308/SP..422

■ Spare Parts



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

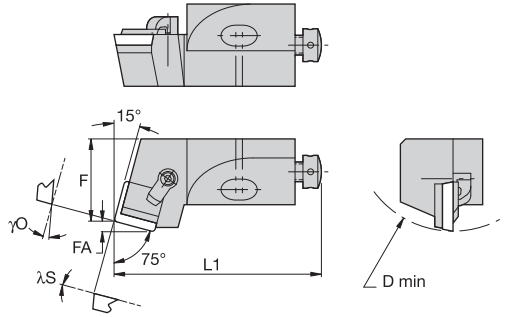


■ Chipbreakers for C-Style Cartridges

Chipbreakers			note
insert	chipbreaker	effective width	
SP..090308/SP..322	CBS-12	2.1	**For chipbreaking on both primary and secondary cutting edges
	CBS-12D**	2.1	
SP..120308/SP..422	CBS16	4.4	**For chipbreaking on both primary and secondary cutting edges
	CBS-16D**	2.8	
	CBS-16N	3.0	
	CBS16F	2.1	



See pages B186–B191 and B211–B212 for inserts.



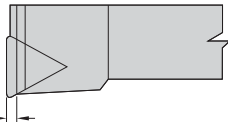
■ **CSRP 75°**

order number	catalogue number	D min	F	L1	FA	λS°	γO°	gage insert
<b>right hand</b>								
3870435	CSRPR10CA09	40,0	14,0	50	2,2	0.0	0.0	SP..090308/SP..322
3870434	CSRPR12CA12	50,0	20,0	55	3,0	3.0	0.0	SP..120308/SP..422

■ **Spare Parts**



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

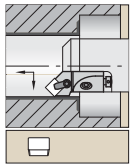


Effective Width

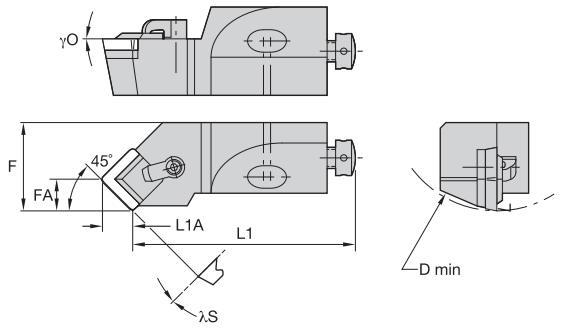
■ **Chipbreakers for C-Style Cartridges**

Chipbreakers			note
insert	chipbreaker	effective width	
SP..090308/SP..322	CBS-12	2.1	**For chipbreaking on both primary and secondary cutting edges
	CBS-12D**	2.1	
SP..120308/SP..422	CBS16	4.4	**For chipbreaking on both primary and secondary cutting edges
	CBS-16D**	2.8	
	CBS-16N	3.0	
	CBS16F	2.1	





See pages B186–B191 and B211–B212 for inserts.



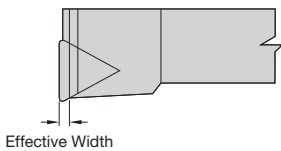
■ CSSP 45°

order number	catalogue number	D min	F	L1	FA	L1A	λS°	γO°	gage insert
<b>right hand</b>									
3870430	CSSPR10CA09	40,0	14,0	44	6,5	6,1	0.0	0.0	SP..090308/SP..322
3870429	CSSPR12CA12	50,0	20,0	47	8,7	8,3	0.0	0.0	SP..120308/SP..422
<b>left hand</b>									
3870433	CSSPL10CA09	40,0	14,0	44	6,5	6,1	0.0	0.0	SP..090308/SP..322
3870432	CSSPL12CA12	50,0	20,0	47	8,7	8,3	0.0	0.0	SP..120308/SP..422
3870431	CSSPL20CA12	70,0	25,0	60	—	8,3	0.0	0.0	SP..120308/SP..422

■ Spare Parts

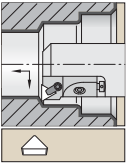


D min	shim	shim screw	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	—	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	—	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
70	SM840	MS111	2 mm	CKM20	STCM11	3 mm	KUAM26	3 mm	KUAM32	191.407	5 mm	CSWM 080 050

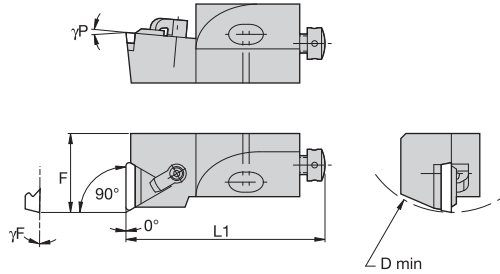


■ Chipbreakers for C-Style Cartridges

Chipbreakers		effective width	note
insert	chipbreaker		
SP..090308/SP..322	CBS-12	2.1	**For chipbreaking on both primary and secondary cutting edges
	CBS-12D**	2.1	
SP..120308/SP..422	CBS16	4.4	**For chipbreaking on both primary and secondary cutting edges
	CBS-16D**	2.8	
	CBS-16N	3.0	
	CBS16F	2.1	



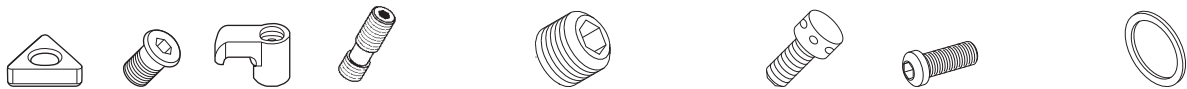
See pages B192–B194 and B212–B216 for inserts.



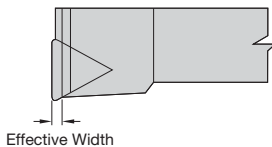
## CTFP 90°

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3870427	CTFPR10CA11	40,0	14,0	50	0.0	5.0	TP..110304/TP..421
3870426	CTFPR12CA16	50,0	20,0	55	0.0	5.0	TP..160308/TP..322
3870424	CTFPR20CA22	70,0	25,0	70	0.0	5.0	TP..220408/TP..432
<b>left hand</b>							
3870428	CTFPL12CA16	50,0	20,0	55	0.0	5.0	TP..160308/TP..322

## Spare Parts

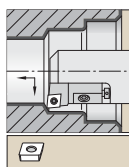


D min	shim	shim screw	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
70	SM837	MS125	CKM35	STCM8	4 mm	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050

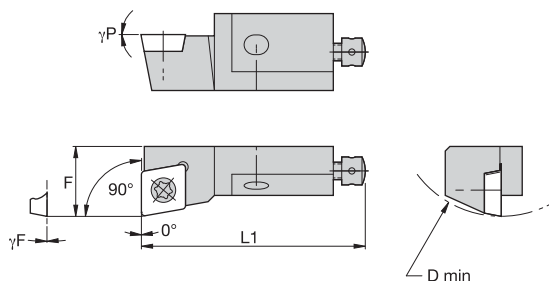


## Chipbreakers for C-Style Cartridges

insert	chipbreaker	effective width	note
TP..110304/TP..421	CBT-8	2.2	
TP..160308/TP..322	CBT-12*	4.0	*Use with CTC-style holder only
	CBT-12*	2.7	*Use with CTC-style holder only
	CBT-12*	2.2	*Use with CTC-style holder only
TP..220408/TP..432	CBT-16	5.5	
	CBT-16N	3.2	
	CBT-16F	2.1	



See pages B30–B46 for inserts.



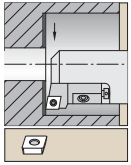
■ SCFP 90°

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3871284	SCFPR06CA05	20	8,0	25	0.0	0.0	CP..050204/CP..18151
3871283	SCFPR08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
3871272	SCFPR10CA09	40	14,0	50	0.0	0.0	CP..09T308/CP..3252
<b>left hand</b>							
3871285	SCFPL08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151

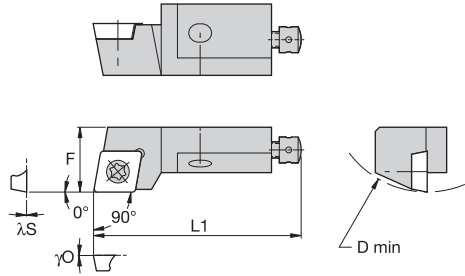
■ Spare Parts



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



See pages B30–B46 for inserts.



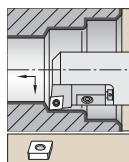
## ■ SCGP 90°

order number	catalogue number	D min	F	L1	$\lambda S^\circ$	$\gamma 0^\circ$	gage insert
<b>right hand</b>							
3871270	SCGPR08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
<b>left hand</b>							
3871271	SCGPL08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151

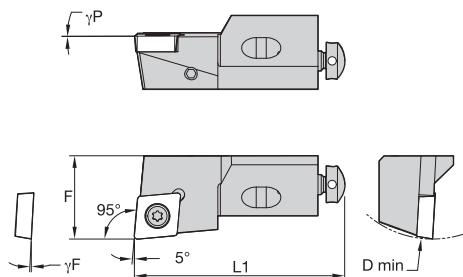
## ■ Spare Parts



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



See pages B30–B46 for inserts.



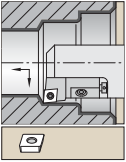
■ SCLC 95°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
<b>right hand</b>							
3871268	SCLCR10CA09	40	14,0	50	-3.0	0.0	CC..09T308/CC..3252
3871265	SCLCR12CA12	50	20,0	55	-3.0	0.0	CC..120408/CC..432
<b>left hand</b>							
3871267	SCLCL12CA12	50	20,0	55	-3.0	0.0	CC..120408/CC..432
3871266	SCLCL16CA12	60	25,0	63	-3.0	0.0	CC..120408/CC..432

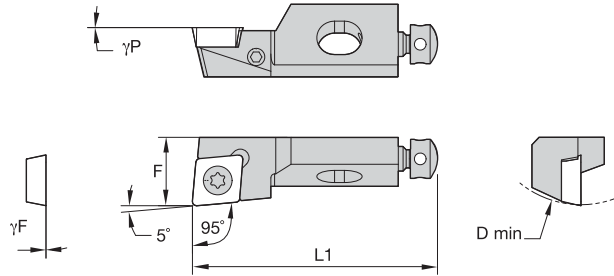
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	MS1157	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B30–B46 for inserts.



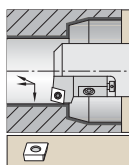
## ■ SCLP 95°

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3871261	SCLPR06CA05	20	8,0	25	0.0	0.0	CP..050204/CP..18151
3871260	SCLPR08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
3871259	SCLPR10CA09	40	14,0	50	0.0	0.0	CP..09T308/CP..3252
<b>left hand</b>							
3871264	SCLPL06CA05	20	8,0	25	0.0	0.0	CP..050204/CP..18151
3871263	SCLPL08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
3871262	SCLPL10CA09	40	14,0	50	0.0	0.0	CP..09T308/CP..3252

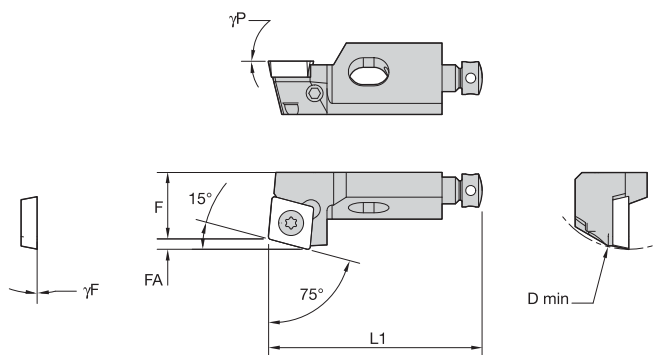
## ■ Spare Parts



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



See pages B30–B46 for inserts.



■ **SCR P 75°**

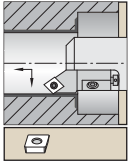
order number	catalogue number	D min	F	FA	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>								
3871257	SCRPR08CA06	25	10,0	1,5	32	0.0	0.0	CP..060204/CP..2151
<b>left hand</b>								
3871258	SCRPL08CA06	25	10,0	1,5	32	0.0	0.0	CP..060204/CP..2151

■ **Spare Parts**

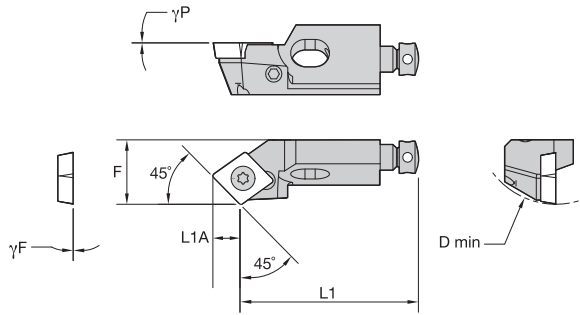


D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	holding screw	hex	washer
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

Tools for External Turning and Internal Boring



See pages B30–B46 for inserts.



■ **SCSP 45°**

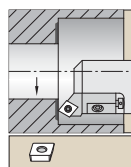
order number	catalogue number	D min	F	L1	L1A	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>								
3871255	SCSPR06CA05	20	8,0	21	4	0.0	0.0	CP..050204/CP..18151
3871254	SCSPR08CA06	25	10,0	28	4	0.0	0.0	CP..060204/CP..2151

■ **Spare Parts**

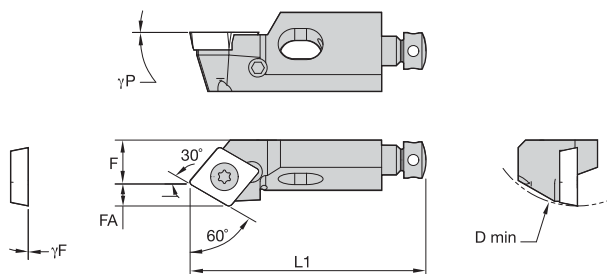


D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	holding screw	hex	washer
20	MS1933	T7	—	—	KUAM35	MS2173	2 mm	CSWM 035 040
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050





See pages B30–B46 for inserts.



■ SCTP 60°

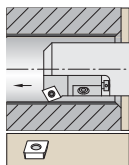
order number	catalogue number	D min	F	FA	L1	γF°	γP°	gage insert
<b>right hand</b>								
3871252	SCTPR06CA05	20	5,5	2,6	25	0.0	0.0	CP..050204/CP..18151
3871251	SCTPR08CA06	25	6,0	3,0	32	0.0	0.0	CP..060204/CP..2151
<b>left hand</b>								
3871253	SCTPL08CA06	25	6,0	3,0	32	0.0	0.0	CP..060204/CP..2151

■ Spare Parts

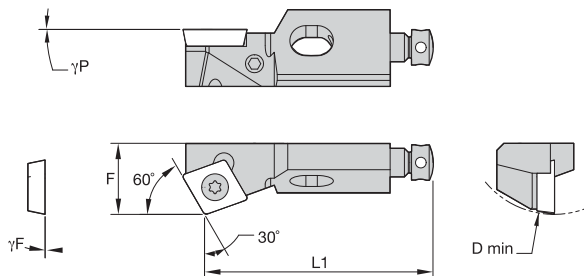


D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	holding screw	hex	washer
20	MS1933	T7	—	—	KUAM35	MS2173	2 mm	CSWM 035 040
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	MS2175	2.5 mm	CSWM 040 050

Tools for External Turning and Internal Boring



See pages B30–B46 for inserts.



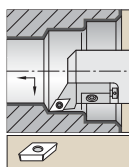
## ■ SCWP 60°

order number	catalogue number	D min	F	L1	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert
<b>right hand</b>							
3871249	SCWPR08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
<b>left hand</b>							
3871250	SCWPL08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151

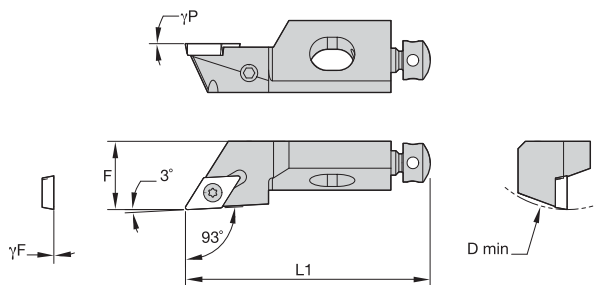
## ■ Spare Parts



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



See pages B47–B64 for inserts.



■ SDJP 93°

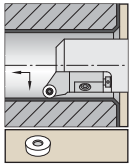
order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3871247	SDJPR10CA07	40	14,0	50	0.0	0.0	DP..070204/DP..2151
<b>left hand</b>							
3871248	SDJPL10CA07	40	14,0	50	0.0	0.0	DP..070204/DP..2151

■ Spare Parts

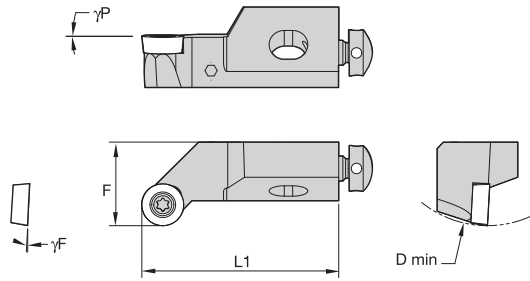


D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	MS1153	T7	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050

Tools for External Turning and Internal Boring



See pages B65–B67 for inserts.



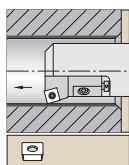
## ■ SRGC

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3871245	SRGCR08CA06	25	10,0	32	-4.0	0.0	RC..0602M0/RC..215
3871244	SRGCR10CA08	40	14,0	50	-3.0	0.0	RC..0803M0/RC..0803M0
<b>left hand</b>							
3871246	SRGCL12CA10	50	20,0	55	-3.0	0.0	RC..10T3M0/RC..10T3M0

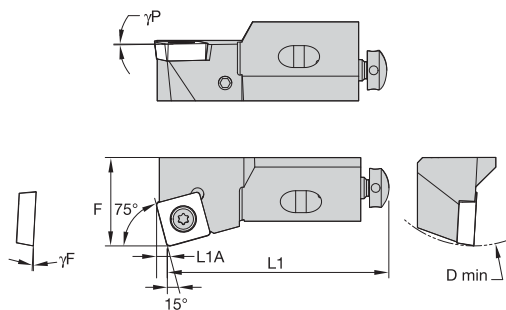
## ■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	holding screw	hex	washer
25	MS1153	T7	KUAM34	1.5 mm	KUAM20	—	MS2175	2.5 mm	CSWM 040 050
40	MS1154	T9	KUAM28	2 mm	KUAM30	191.405	—	4 mm	CSWM 060 050
50	MS1155	T15	KUAM23	2.5 mm	KUAM31	191.406	—	4 mm	CSWM 060 050



See pages B68–B80 for inserts.



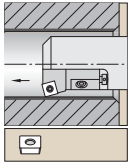
■ SSKC 75°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
<b>right hand</b>							
3871192	SSKCR10CA09	40	14,0	50	-4.3	-2.5	SC..09T308/SC..3252
3871191	SSKCR12CA12	50	20,0	55	-3.0	0.0	SC..120408/SC..432
3871190	SSKCR16CA12	60	25,0	63	-3.0	0.0	SC..120408/SC..432
<b>left hand</b>							
3871243	SSKCL12CA12	50	20,0	55	-3.0	0.0	SC..120408/SC..432

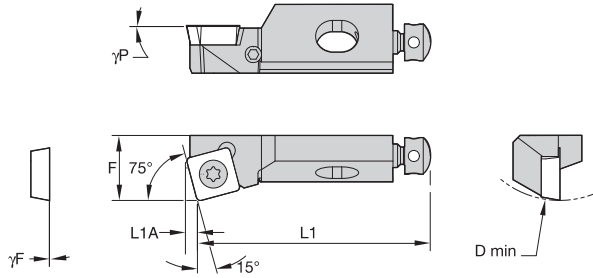
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	MS1157	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B68-B80 for inserts.



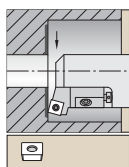
## SSKP 75°

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3870393	SSKPR10CA09	40	14,0	50	0.0	0.0	SP..09T308/SP..3252
3870392	SSKPR12CA09	50	20,0	55	0.0	0.0	SP..09T308/SP..3252
<b>left hand</b>							
3870394	SSKPL10CA09	40	14,0	50	0.0	0.0	SP..09T308/SP..3252

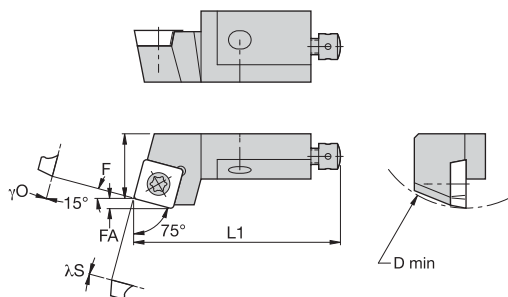
## Spare Parts



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



See pages B68–B80 for inserts.



■ SSRC 75°

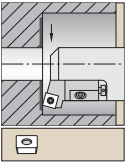
order number	catalogue number	D min	F	FA	L1	λS°	γO°	gage insert
<b>right hand</b>								
3870390	SSRCR12CA12	50	20,0	3,1	55	-3.0	0.0	SC..120408/SC..432
<b>left hand</b>								
3870391	SSRCL12CA12	50	20,0	3,1	55	-3.0	0.0	SC..120408/SC..432

■ Spare Parts

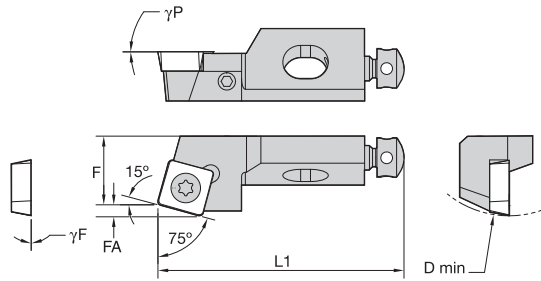


D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
50	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050

Tools for External Turning and Internal Boring



See pages B68–B80 for inserts.



## SSRP 75°

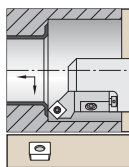
order number	catalogue number	D min	F	FA	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>								
3870388	SSRPR10CA09	40	14,0	2,2	50	0.0	0.0	SP..09T308/SP..3252
<b>left hand</b>								
3870389	SSRPL10CA09	40	14,0	2,2	50	0.0	0.0	SP..09T308/SP..3252

## Spare Parts

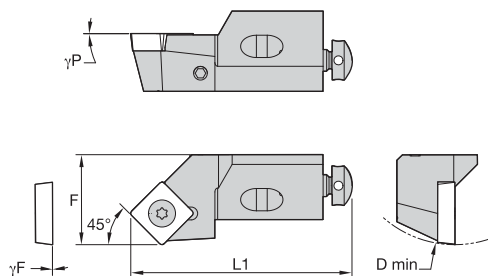


D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050





See pages B68–B80 for inserts.



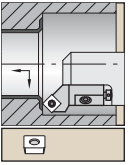
■ SSSC 45°

order number	catalogue number	D min	F	L1	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert
<b>right hand</b>							
3870386	SSSCR10CA09	40	14,0	44	-3.0	0.0	SC..09T308/SC..3252
3870385	SSSCR12CA12	50	20,0	47	-3.0	0.0	SC..120408/SC..432
3870384	SSSCR16CA12	60	25,0	53	0.0	0.0	SC..120408/SC..432
<b>left hand</b>							
3870387	SSSCL12CA12	50	20,0	47	-3.0	0.0	SC..120408/SC..432

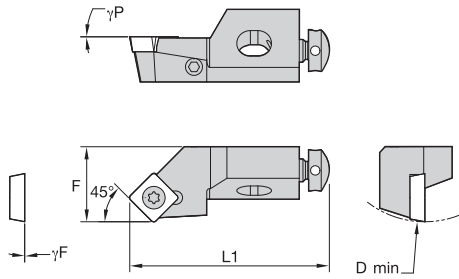
■ Spare Parts



D min	insert screw	Torx	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	MS1155	T15	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	MS1157	T15	KUAM23	2.5 mm	KUAM31	191.406	4 mm	CSWM 060 050
60	MS1157	T15	KUAM25	2.5 mm	KUAM32	191.407	5 mm	CSWM 080 050



See pages B68–B80 for inserts.



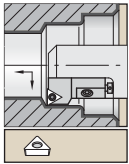
## SSSP 45°

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3870382	SSSPR10CA09	40	14,0	44	0.0	0.0	SP..09T308/SP..3252
<b>left hand</b>							
3870383	SSSPL10CA09	40	14,0	44	0.0	0.0	SP..09T308/SP..3252

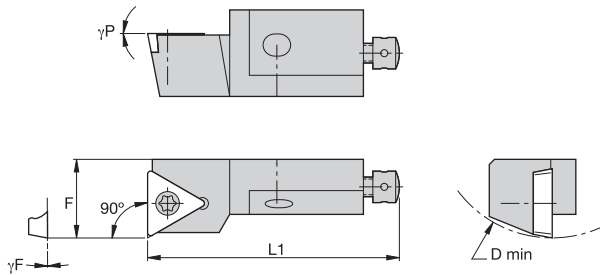
## Spare Parts



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



See pages B81–B93 for inserts.



Tools for External Turning and Internal Boring

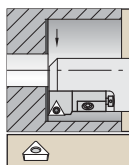
■ STFP 90°

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3870378	STFPR08CA09	25	10,0	32	0.0	0.0	TP..090204/TP..18151
3870377	STFPR10CA11	40	14,0	50	0.0	0.0	TP..110204/TP..2151
3870376	STFPR12CA16	50	20,0	55	0.0	0.0	TP..16T308/TP..3252
<b>left hand</b>							
3870381	STFPL08CA09	25	10,0	32	0.0	0.0	TP..090204/TP..18151
3870380	STFPL10CA11	40	14,0	50	0.0	0.0	TP..110204/TP..2151
3870379	STFPL12CA16	50	20,0	55	0.0	0.0	TP..16T308/TP..3252

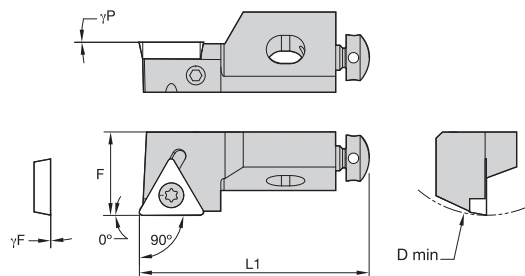
■ Spare Parts



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



See pages B81–B93 for inserts.



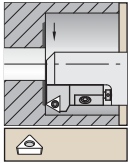
## ■ STGP 90°

order number	catalogue number	D min	F	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>							
3870372	STGPR08CA09	25	10,0	32	0.0	0.0	TP..090204/TP..18151
3870371	STGPR10CA11	40	14,0	50	0.0	0.0	TP..110204/TP..2151
3870370	STGPR12CA16	50	20,0	55	0.0	0.0	TP..16T308/TP..3252
<b>left hand</b>							
3870374	STGPL08CA09	25	10,0	32	0.0	0.0	TP..090204/TP..18151
3870373	STGPL10CA11	40	14,0	50	0.0	0.0	TP..110204/TP..2151

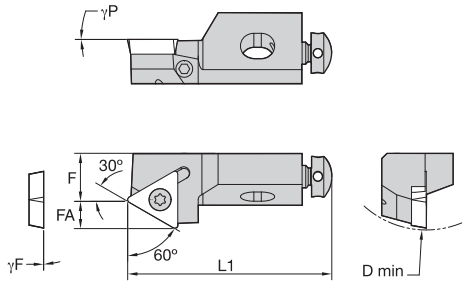
## ■ Spare Parts



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



See pages B81–B93 for inserts.



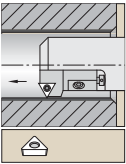
■ STTP 60°

order number	catalogue number	D min	F	FA	L1	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>								
3870369	STTPR08CA09	25	6,0	4,3	32	0.0	0.0	TP..090204/TP..18151
3870368	STTPR10CA11	40	9,0	4,9	50	0.0	0.0	TP..110204/TP..2151
3870367	STTPR12CA16	50	13,0	7,2	55	0.0	0.0	TP..16T308/TP..3252

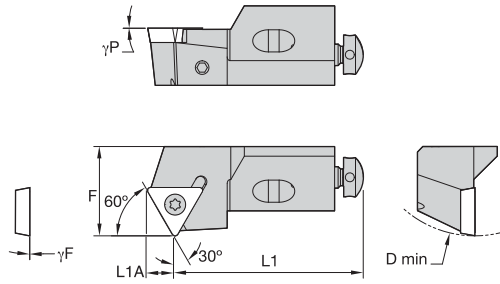
■ Spare Parts



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



See pages B99–B105 for inserts.



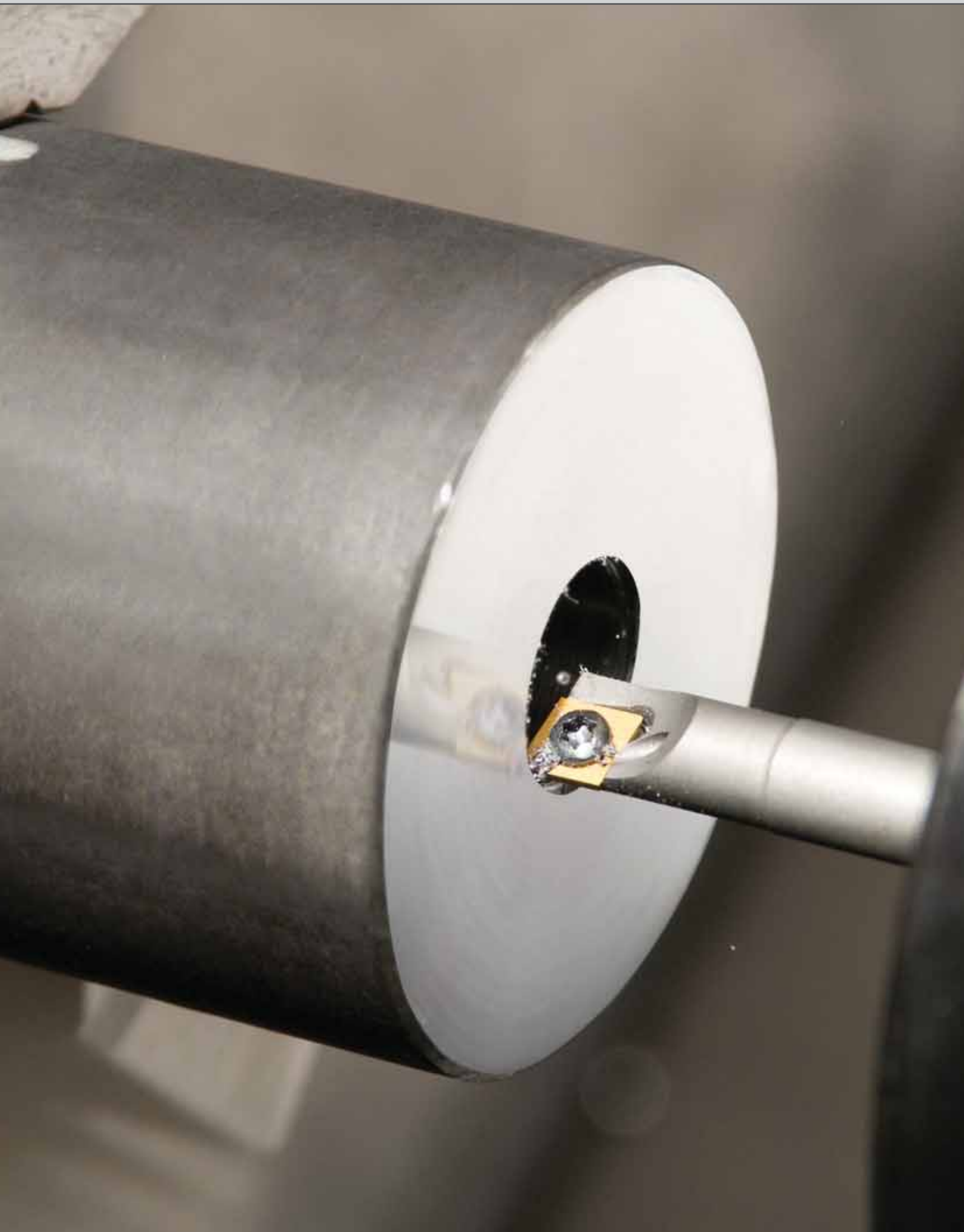
## STWP 60°

order number	catalogue number	D min	F	L1	L1A	$\gamma F^\circ$	$\gamma P^\circ$	gage insert
<b>right hand</b>								
3870364	STWPR08CA09	25	10,0	28	4,3	0.0	0.0	TP..090204/TP..18151
3870363	STWPR10CA11	40	14,0	44	5,0	0.0	0.0	TP..110204/TP..2151
3870252	STWPR12CA16	50	20,0	47	7,2	0.0	0.0	TP..16T308/TP..3252
<b>left hand</b>								
3870366	STWPL10CA11	40	14,0	44	5,0	0.0	0.0	TP..110204/TP..2151
3870365	STWPL12CA16	50	20,0	47	7,2	0.0	0.0	TP..16T308/TP..3252

## Spare Parts



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



## Turning • Tools for Small Hole Boring

Small Hole Boring I.D. Indexable Insert Tooling.....	D2–D59
A/B Series .....	D60–D71
Quadralock.....	D72–D84
Technical Information .....	D86–D89
Custom Solution Worksheet .....	D90–D91



The WIDIA™ line of micro boring bars provide accurate holemaking tooling in diameters as small as 1,57mm. These economical, indexable inserts are available in both steel and carbide shanks and are stocked in both metric and inch sizes. Ideal for a wide range of applications, including precision micro boring.

## Small Hole Boring • I.D. Indexable Insert Tooling



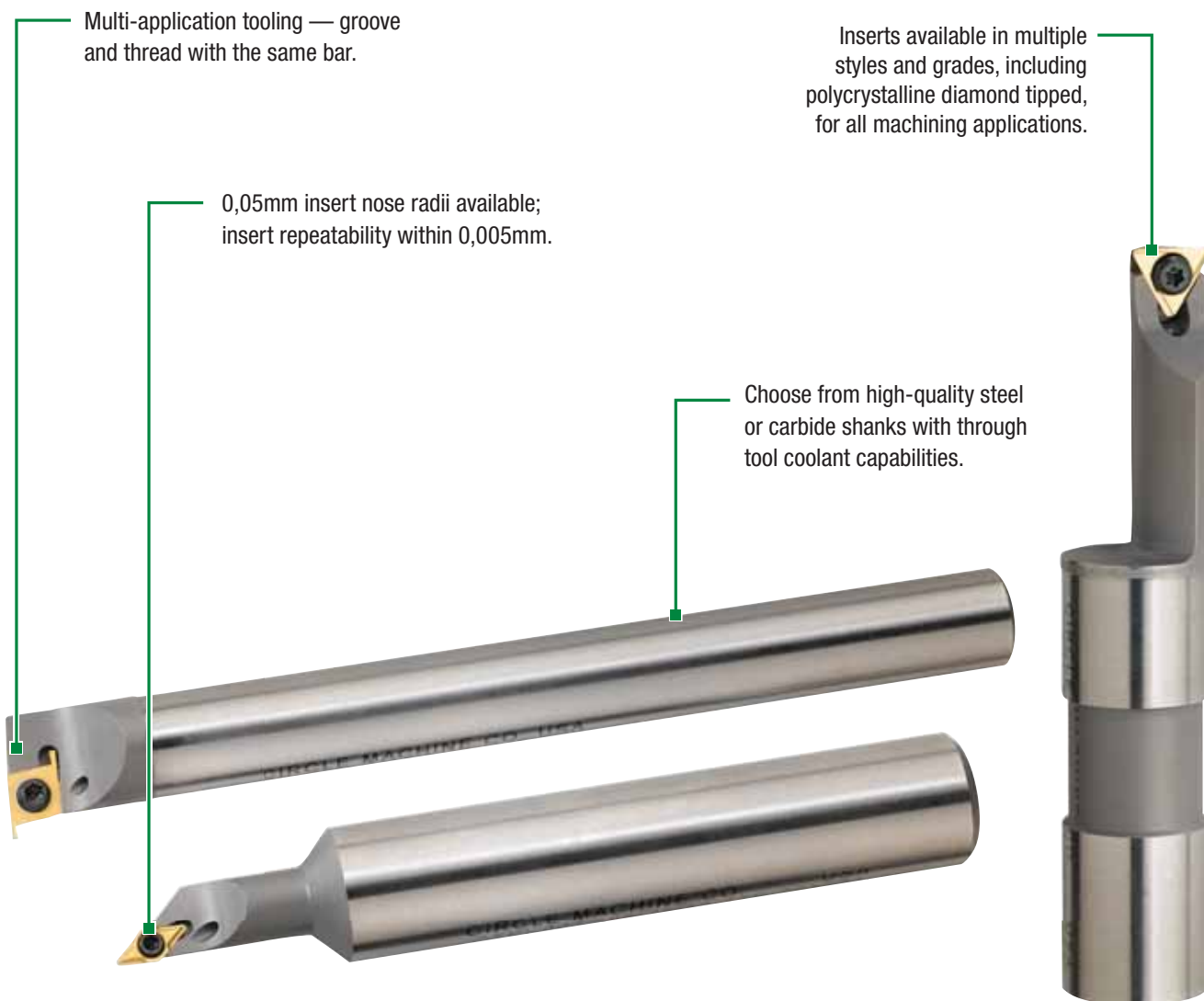
### 80° Diamond Insert Boring Bars

- Available in shanks as small as 4mm to bore >4,57mm diameter.
- Positive rake geometry for free cutting action and better surface finishes.
- Superior, unobstructed chip evacuation.
- Stocked in multiple grades to bore a wide range of materials.

### Threading and Grooving Boring Bars

- Easy insert changes for threading and grooving.
- Thread down to a 48 TPI, 1,3mm TP (pitch).
- Thread and groove capabilities to an inside bore diameter of 6,91mm.





Multi-application tooling — groove and thread with the same bar.

0,05mm insert nose radii available; insert repeatability within 0,005mm.

Inserts available in multiple styles and grades, including polycrystalline diamond tipped, for all machining applications.

Choose from high-quality steel or carbide shanks with through tool coolant capabilities.

## Triangle Insert Boring Bars

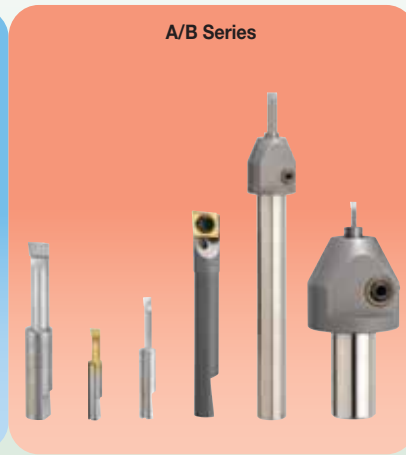
- Designed for less obstruction and greater chip evacuation.
- Positive rake geometry to bore holes >6,98mm diameter.
- Stocked in all grades, including diamond-tipped and borazon-tipped styles.
- Stocked in shanks as small as 6mm for 7,06mm minimum bore diameter.



**The World's Most Comprehensive Boring Solutions**

Trust the WIDIA™ full line of boring tools to meet all of your demanding job requirements. Whatever the work at hand, you are sure to find the most appropriate solution in this comprehensive, easy-to-use guide.

We engineer only the BEST boring tools, guaranteed to reduce your machining time, provide superior results, and outperform the competition.



**Select the Correct Small Hole Boring Product Platform for Your Application**

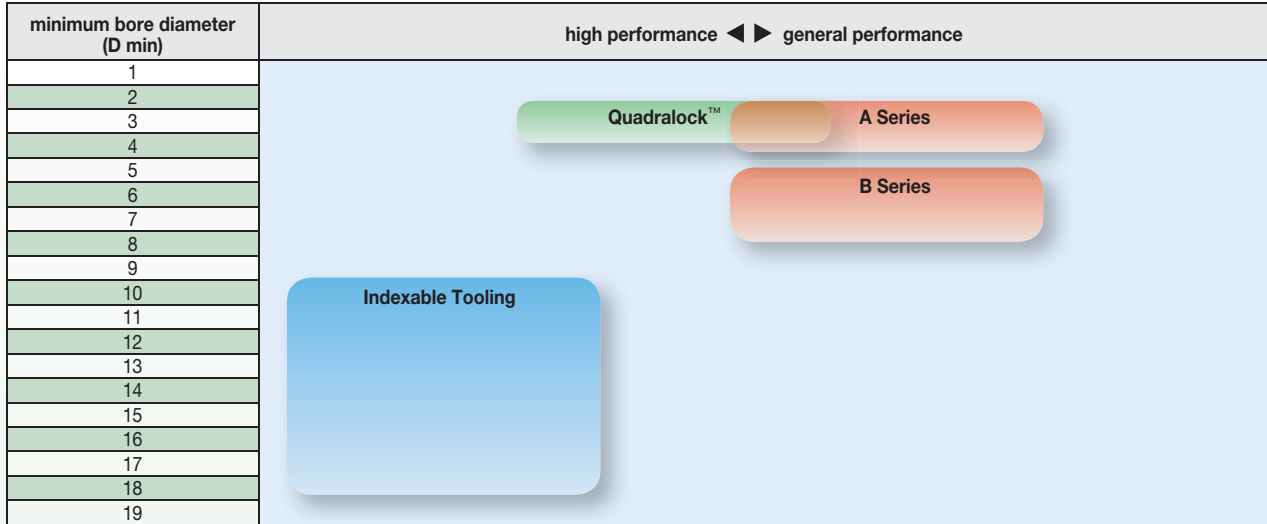
1 Determine tooling system to be used based on hole size to be bored (D min).

NOTE: Proper bar selection will have largest minimum bore dimension under hole size to be bored.

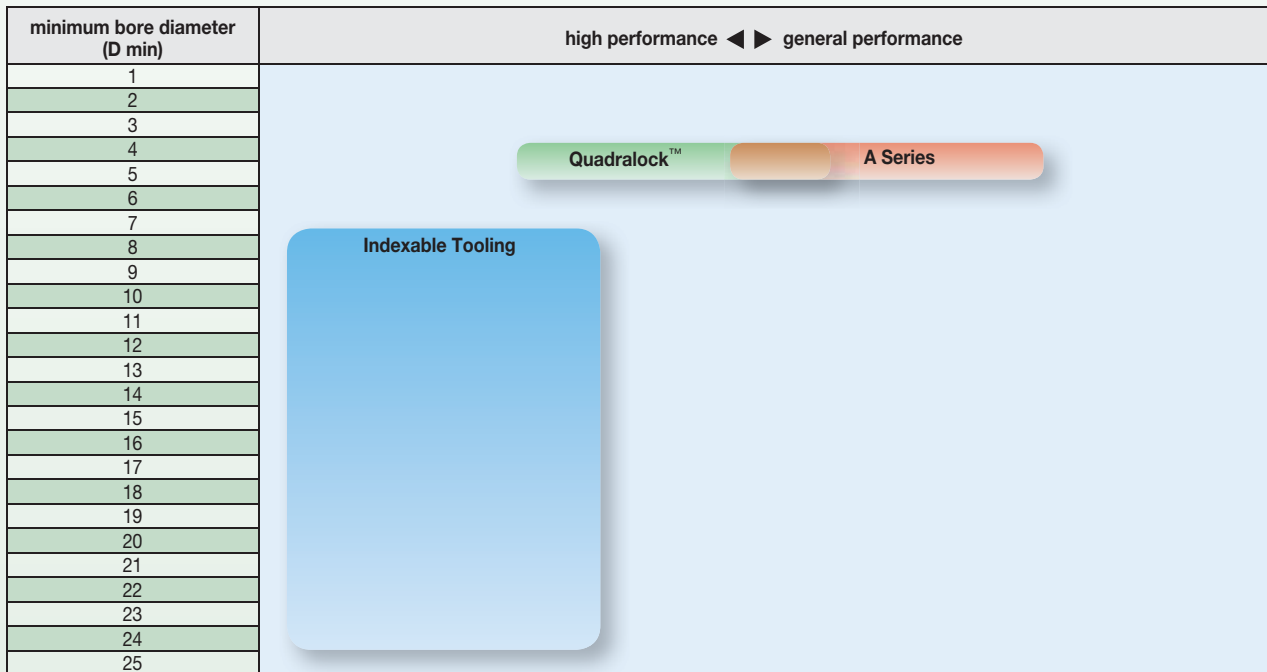
- Indexable Tooling
- A/B Series
- Quadralock

Boring	
minimum bore diameter (D min)	high performance ◀ ▶ general performance
1	
2	
3	
4	
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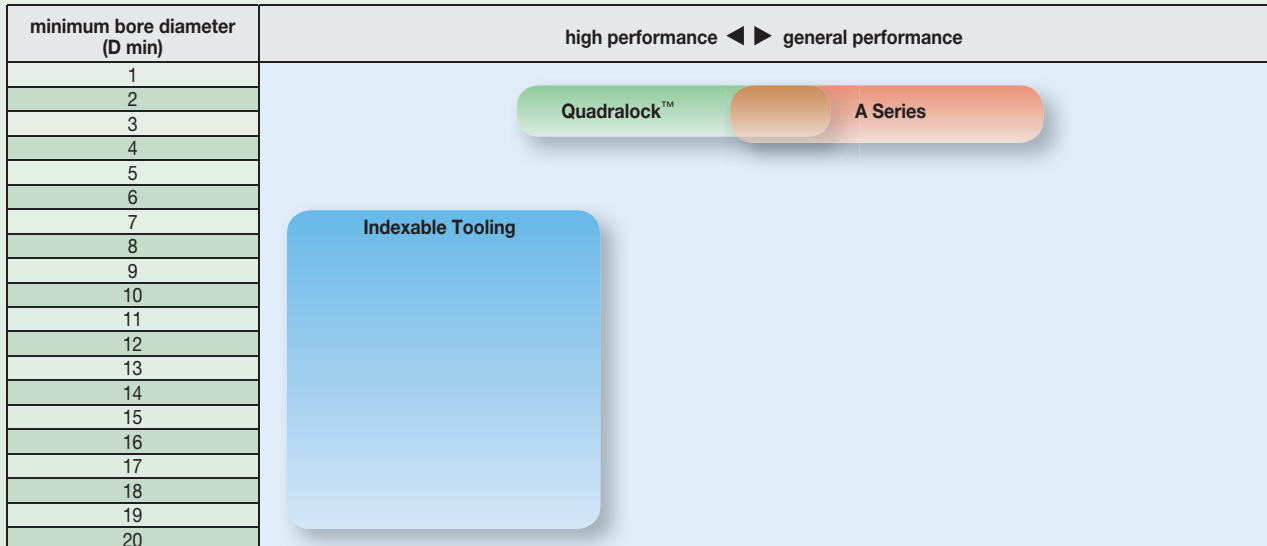
**Profiling**



**Threading**



**Grooving**



NOTE: Proper bar selection will have largest minimum bore dimension under hole size to be bored.

**2 Determine boring bar (D).**

**A Select shank size (D) based on your machine's requirements.**

**B Determine bore depth (how far the boring bar extends from the holder).**

Multiply bar diameter by 4. If bore depth is less, use a steel bar. If bore depth exceeds 4:1 ratio, use a carbide bar. Use L1 or L4 depending on bar selected. (See recommended maximum overhang chart on page D86.) For indexable tooling, go to step 3. For all other tooling systems, go directly to step 4.

**C Determine lead angle (KRA).** Zero degree lead angle is used when maximum stability is required. Lead angle may vary based on changing conditions, such as boring in a blind hole.

**Small Hole Boring Bars for Turning**  
Clamping System S • Carbide

■ CCBM

order number	catalogue number	KRA	D	D min	F	L1	A	γ°	γP°	grade insert	insert screw	Tors
2831801	CCBM51000R	90	5,00	5,94	3,18	100,56	1,02	0,0°	5,0°	CD_547002	CC11	T8
2896025	CCBM61000R	90	6,00	7,08	3,73	100,33	1,19	0,0°	5,0°	CD_547002	CC11	T8
2831277	CCBM81520R	90	8,00	9,04	4,70	152,15	2,36	0,0°	5,0°	CD_547002	CC11	T8
2831826	CCBM51005R	95	5,00	5,94	3,02	100,56	1,02	0,0°	5,0°	CD_547002	CC11	T8
2831311	CCBM61525R	95	6,00	7,08	3,73	152,15	1,19	0,0°	5,0°	CD_547002	CC11	T8
2831821	CCBM61005R	95	6,00	7,08	3,73	100,33	1,19	0,0°	5,0°	CD_547002	CC11	T8
2831289	CCBM81525R	95	8,00	9,04	4,70	152,15	2,36	0,0°	5,0°	CD_547002	CC11	T8

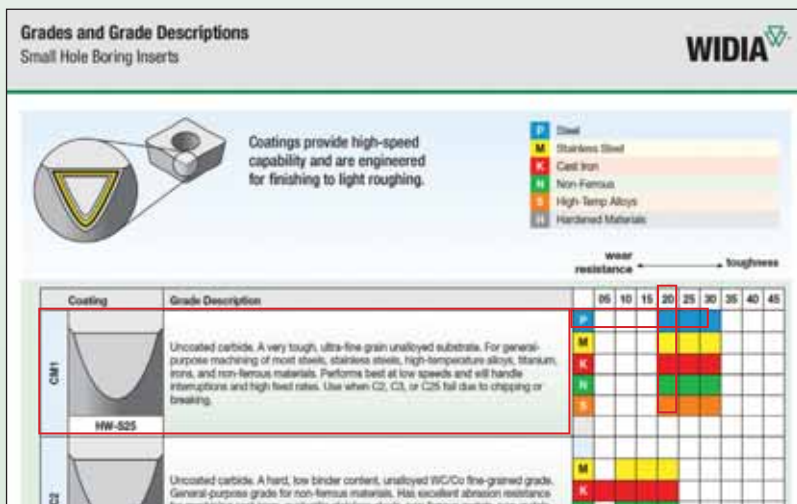
**3 Determine which chipbreaker is best for the material to be machined.**

Consult the Small Hole Boring Chipbreaker Geometry charts on pages D34–D37.



**4 Determine which grade is best for the material to be machined.**

Consult the Grades and Grade Descriptions charts on pages D38–D39.



**5 Select the appropriate insert based on style, grade, and geometry.**

**Small Hole Boring Positive Inserts**

first choice  
 alternate choice

ISO catalogue number	D	L10	S	R0	D1	max	C2	C25	C3	CG5	CG55
CDHS4T0X0	3.97	4.03	1.02	0.05	2.13	-	2830087	2830087	2830087	2830087	2830087
CDHS4T0X5M	3.97	4.03	1.02	0.05	2.13	1.30					
CDHS4T002	3.97	4.03	1.02	0.18	2.13	-	2830064	2830064	2830064	2830064	2830064
CDHS4T002M	3.97	4.03	1.02	0.18	2.13	0.96					
CDHS4T004M	3.97	4.03	1.02	0.38	2.13	0.96					
CDHS4T004	3.97	4.03	1.02	0.38	2.13	-	2830030	2830030	2830030	2830030	2830030

NOTE: Min DOC only applies to tipped inserts, which are designated with an "M" at the end of the catalogue number.

**6 Determine the Speed and Feed Chart with the appropriate cutting data.**

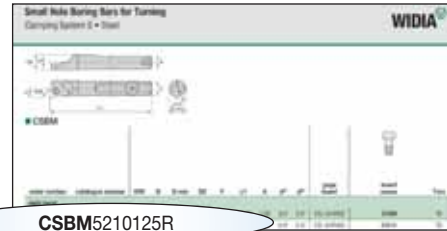
- A Based on grade and edge geometry, identify starting speed (vc) and feed (fz). The first choice starting feed is in bold.
- B Use the corresponding speed located in the same column below the feed information.

**Speed and Feed Chart**  
Positive Inserts • Metric

Material Group	ap [mm] f [mm/rev]	Cutting Speed – vc m/min													
		C2			C25			C3			CG5		CG55		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max		
P	0/1	-	-	-	-	-	-	-	-	-	95	115	140	105	130
	2	-	-	-	-	-	-	-	-	-	60	75	90	65	85
	3	-	-	-	-	-	-	-	-	-	60	75	90	65	85
	4	-	-	-	-	-	-	-	-	-	45	60	70	50	65
	5	-	-	-	-	-	-	-	-	-	60	75	90	65	85
	6	-	-	-	-	-	-	-	-	-	40	50	60	45	55
M	ap [mm]	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-
	f [mm/rev]	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-
	1	55	70	80	60	80	95	60	80	95	75	90	110	80	100
K	ap [mm]	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-
	f [mm/rev]	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-
	1	50	65	80	60	70	85	60	70	85	60	75	90	65	80
N	ap [mm]	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-
	f [mm/rev]	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-
	1	400	505	605	400	505	605	400	505	605	400	505	605	445	555
N	ap [mm]	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-
	f [mm/rev]	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-
	2	295	370	440	295	370	445	295	370	445	295	370	445	325	405
N	ap [mm]	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-
	f [mm/rev]	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-
	3	70	85	105	70	85	105	70	85	105	65	105	125	90	115
N	ap [mm]	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-	0.300	0.051	-
	f [mm/rev]	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-	0.300	0.025	-
	4	310	380	465	310	385	465	310	385	465	140	175	210	155	190

## How Do Catalogue Numbers Work?

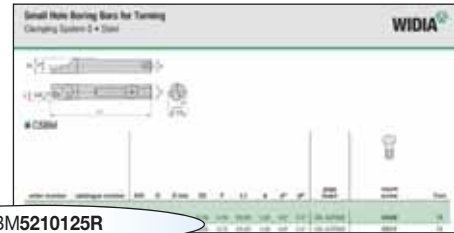
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



CSBM5210125R

<b>C</b>	<b>S</b>	<b>B</b>	<b>M</b>	
Series Type	Bar Type	Bar Style Designation	Units	Insert Shape (optional)
<p><b>C</b></p> <p><b>F</b></p> <p><b>G</b></p>	<p><b>S</b> = Steel (with coolant)</p> <p><b>C</b> = Carbide (with coolant)</p>		<p><b>M</b> = Metric</p>	<p><b>C</b></p> <p><b>W</b></p>
<p><b>L</b></p>	<p><b>B</b> Boring Bar</p>	<p><b>O</b> Offset Boring Bar</p>		
<p><b>Q</b></p>	<p><b>C</b> External Chamfering Bar</p>	<p><b>P</b> Profiling Bar</p>		
<p><b>S</b></p>	<p><b>I</b> Internal Threading Bar</p>	<p><b>R</b> Reverse Chamfer or Back Chamfer Bar</p>		
	<p><b>M</b> Offset Internal Grooving Bar</p>			

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



CSBM5210125R

**52**

Head Diameter shown as "D2"

**Metric**

- 7 = 6,60mm
- 8 = 8,18mm/8,20mm
- 10 = 9,78mm
- 13 = 12,70mm/  
12,95mm
- 45 = 4,57mm
- 48 = 4,80mm
- 52 = 5,16mm
- 53 = 5,30mm
- 64 = 6,60mm
- 66 = 6,55mm/6,60mm
- 82 = 8,15mm
- 95 = 9,50mm
- 99 = 9,91mm
- 159 = 15,88mm

**10**

Shank Diameter shown as "D"

**Metric**

- 4 = 4,00mm
- 5 = 5,00mm
- 6 = 6,00mm
- 8 = 8,00mm
- 10 = 10,00mm
- 12 = 12,00mm
- 16 = 16,00mm

**12**

Length/Depth shown as "L1/L4"

Bore Length for Step Bars  
Thread Depth for Threading Bars  
Overall Length for Straight Shank Bars

**Metric**

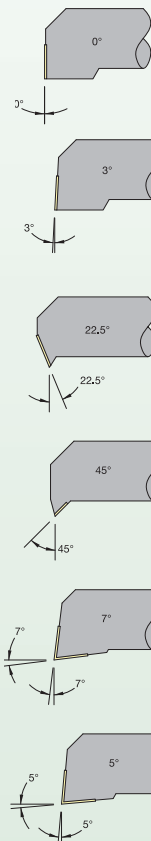
- 12 = 12,70mm
- 19 = 19,05mm
- 22 = 22,23mm
- 25 = 25,40mm
- 32 = 31,75mm
- 38 = 38,10mm
- 48 = 47,63mm
- 51 = 50,80mm
- 63 = 63,50mm
- 64 = 64,00mm
- 76 = 76,00mm
- 79 = 79,38mm
- 100 = 100,58mm/  
101,50mm/  
101,60mm
- 102 = 101,60mm
- 127 = 127,00mm
- 152 = 152,00mm  
152,40mm
- 178 = 177,80mm  
179,90mm
- 203 = 203,20mm
- 254 = 254,00mm

**5**

Lead Angle\*

0 = 90°  
Used for Threading/  
Grooving Bars

- 3 = 3°
- 5 = 5°
- 7 = 7°
- 225 = 22.5°
- 30 = 30°
- 45 = 45°
- 60 = 60°



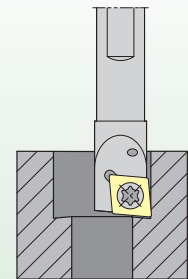
**R**

Hand of Tool

R = Right hand  
L = Left hand

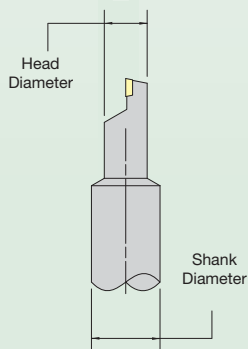
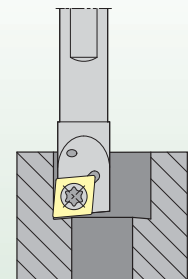
Right-hand boring bar

R



Left-hand boring bar

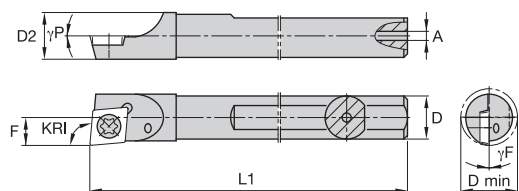
L




NOTE: Only shown on stepped-style bars.

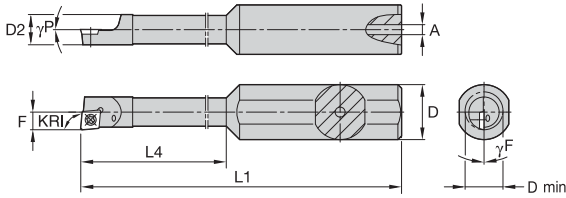
\*NOTE: Shown as "KRI" for metric bars.





### CSBM

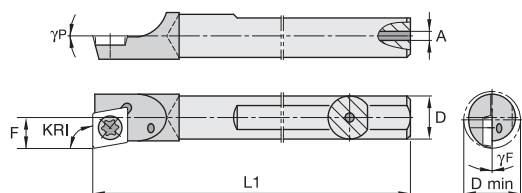
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
													
<b>right hand</b>													
3896205	CSBM5650R	90	5,00	5,94	5,16	3,10	63,50	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831676	CSBM6650R	90	6,00	7,09	6,20	3,73	63,50	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831441	CSBM5655R	95	5,00	5,79	5,16	2,95	63,50	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831687	CSBM6655R	95	6,00	7,09	6,21	3,73	63,50	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831666	CSBM8765R	95	8,00	9,04	8,18	4,70	76,20	1,52	0.0°	5.0°	CD..S4T002	CC11	T6
2831701	CSBM4657R	97	4,00	4,57	4,22	2,41	63,50	1,02	0.0°	0.0°	CD..S4T002	CC09	T6
<b>left hand</b>													
3896204	CSBM5650L	90	5,00	5,94	5,16	3,10	63,50	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
3896207	CSBM6650L	90	6,00	7,09	6,20	3,73	63,50	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
3896209	CSBM8760L	90	8,00	9,05	8,18	4,70	76,00	2,40	0.0°	5.0°	CD..S4T002	CC11	T6
3896206	CSBM5655L	95	5,00	5,78	5,16	2,95	63,50	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
3896208	CSBM6655L	95	6,00	7,09	6,20	3,73	63,50	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
3517652	CSBM8765L	95	8,00	9,04	8,18	9,04	76,20	1,52	0.0°	5.0°	CD..S4T002	CC11	T6
2831695	CSBM4657L	97	4,00	4,57	4,22	2,41	63,50	1,02	0.0°	0.0°	CD..S4T002	CC09	T6




■ CSBM • STEPPED

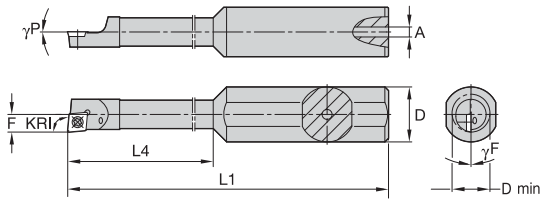
order number	catalogue number	KRI	D	D min	D2	F	L1	L4	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>														
2831606	CSBM5210250R	90	10,00	5,94	5,16	3,10	70,00	25,72	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831499	CSBM5212250R	90	12,00	5,94	5,16	3,10	70,00	25,40	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831477	CSBM6412190R	90	12,00	7,42	6,60	3,86	70,00	19,05	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831462	CSBM6412320R	90	12,00	7,42	6,60	3,86	70,00	31,75	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831661	CSBM4510125R	95	10,00	5,18	4,57	5,18	69,85	12,70	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831639	CSBM5210125R	95	10,00	5,78	5,16	2,95	70,00	12,30	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831615	CSBM5210255R	95	10,00	5,78	5,16	5,78	69,85	24,96	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831595	CSBM6410195R	95	10,00	7,24	6,60	3,68	70,00	19,05	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831548	CSBM4512125R	95	12,00	5,18	4,57	2,64	69,85	12,70	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831512	CSBM5212255R	95	12,00	5,78	5,16	2,95	70,00	25,40	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831490	CSBM6412195R	95	12,00	7,24	6,60	3,68	70,00	19,05	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831468	CSBM6412325R	95	12,00	7,24	6,60	3,68	70,00	31,75	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
<b>left hand</b>														
2831656	CSBM4510125L	95	10,00	5,18	4,57	2,64	70,00	12,70	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831588	CSBM6410195L	95	10,00	7,24	6,60	3,68	70,00	19,05	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
3890853	CSBM4512125L	95	12,00	5,18	4,57	2,64	69,85	12,70	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
3890854	CSBM4512255L	95	12,00	5,18	4,57	2,64	69,85	25,40	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831528	CSBM5212125L	95	12,00	5,78	5,16	2,95	70,00	12,70	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831483	CSBM6412195L	95	12,00	7,24	6,60	3,68	70,00	19,05	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
3890855	CSBM6412325L	95	12,00	7,24	6,60	3,68	70,00	31,75	1,02	0.0°	5.0°	CD..S4T002	CC11	T6





### ■ CCBM

order number	catalogue number	KRI	D	D min	F	L1	A	$\gamma^F$	$\gamma^P$	gage insert	insert screw	Torx
												
<b>right hand</b>												
2831801	CCBM51000R	90	5,00	5,94	3,18	100,58	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
3896025	CCBM61000R	90	6,00	7,08	3,73	100,33	1,19	0.0°	5.0°	CD..S4T002	CC11	T6
2831277	CCBM81520R	90	8,00	9,04	4,70	152,15	2,36	0.0°	5.0°	CD..S4T002	CC11	T6
2831826	CCBM51005R	95	5,00	5,94	3,02	100,58	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831311	CCBM61525R	95	6,00	7,08	3,73	152,15	1,19	0.0°	5.0°	CD..S4T002	CC11	T6
2831821	CCBM61005R	95	6,00	7,09	3,73	100,33	1,19	0.0°	5.0°	CD..S4T002	CC11	T6
2831289	CCBM81525R	95	8,00	9,04	4,70	152,15	2,36	0.0°	5.0°	CD..S4T002	CC11	T6
2831832	CCBM41007R	97	3,96	4,57	2,41	100,33	1,02	0.0°	0.0°	CD..S4T002	CC09	T6
2831324	CCBM41527R	97	4,00	4,57	2,41	152,40	1,02	0.0°	0.0°	CD..S4T002	CC09	T6
<b>left hand</b>												
3896023	CCBM51000L	90	5,00	5,94	3,18	100,58	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
3896024	CCBM61000L	90	6,00	7,08	3,73	100,33	1,19	0.0°	5.0°	CD..S4T002	CC11	T6
3896026	CCBM61520L	90	6,00	7,09	3,73	152,15	1,19	0.0°	5.0°	CD..S4T002	CC11	T6
3896028	CCBM81520L	90	8,00	9,04	4,70	152,15	2,36	0.0°	5.0°	CD..S4T002	CC11	T6
2831807	CCBM51005L	95	5,00	5,94	3,02	100,58	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831025	CCBM51525L	95	5,00	5,94	3,02	152,40	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831307	CCBM61525L	95	6,00	7,08	3,73	152,15	1,19	0.0°	5.0°	CD..S4T002	CC11	T6
2831791	CCBM61005L	95	6,00	7,09	3,73	100,33	1,19	0.0°	5.0°	CD..S4T002	CC11	T6
3896027	CCBM81005L	95	8,00	9,04	4,70	101,60	2,36	0.0°	5.0°	CD..S4T002	CC11	T6
2831283	CCBM81525L	95	8,00	9,04	4,70	152,40	2,36	0.0°	5.0°	CD..S4T002	CC11	T6
2831813	CCBM41007L	97	3,96	4,57	2,41	100,33	1,02	0.0°	0.0°	CD..S4T002	CC09	T6
3896002	CCBM41527L	97	4,00	4,57	2,41	152,40	1,02	0.0°	0.0°	CD..S4T002	CC09	T6

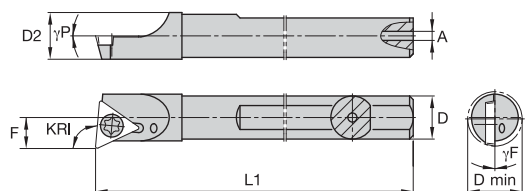


■ CCBM • STEPPED

order number	catalogue number	KRI	D	D min	F	L1	L4	A	$\gamma F^\circ$	$\gamma P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>													
2831211	CCBM5312510R	90	12,00	5,94	3,18	88,90	50,80	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831188	CCBM6612320R	90	12,00	7,42	3,85	69,85	31,75	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831175	CCBM6612630R	90	12,00	7,42	3,86	101,60	63,50	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831127	CCBM5316510R	90	16,00	6,10	3,18	114,30	50,80	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831110	CCBM6516320R	90	16,00	7,42	3,86	95,25	31,75	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831265	CCBM4812225R	95	12,00	5,28	2,64	60,32	22,22	3,18	0.0°	5.0°	CD..S4T002	CC09	T6
2831255	CCBM4812485R	95	12,00	5,28	2,64	85,73	47,63	3,18	0.0°	5.0°	CD..S4T002	CC09	T6
2831244	CCBM5312255R	95	12,00	5,94	3,02	63,50	25,40	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831201	CCBM6612325R	95	12,00	7,24	3,68	69,85	31,75	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
3896019	CCBM6612635R	95	12,00	7,24	3,68	101,60	63,50	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
3896015	CCBM4816225R	95	16,00	5,28	2,64	85,72	22,23	3,18	0.0°	5.0°	CD..S4T002	CC09	T6
3896017	CCBM4816485R	95	16,00	5,28	2,64	111,12	47,62	3,18	0.0°	5.0°	CD..S4T002	CC09	T6
2831162	CCBM5316255R	95	16,00	5,94	3,02	88,90	25,40	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831139	CCBM5316515R	95	16,00	5,94	3,02	114,30	50,80	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
3896018	CCBM6516325R	95	16,00	7,24	3,68	95,25	31,75	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
<b>left hand</b>													
2831194	CCBM6612325L	95	12,00	7,24	3,68	69,85	31,75	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
3896093	CCBM6612635L	95	12,00	7,24	3,68	101,60	63,50	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831157	CCBM5316255L	95	16,00	5,94	3,02	88,90	25,40	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831132	CCBM5316515L	95	16,00	5,94	3,02	114,30	50,80	3,18	0.0°	5.0°	CD..S4T002	CC11	T6
2831117	CCBM6516325L	95	16,00	7,24	3,68	95,25	31,75	3,18	0.0°	5.0°	CD..S4T002	CC11	T6




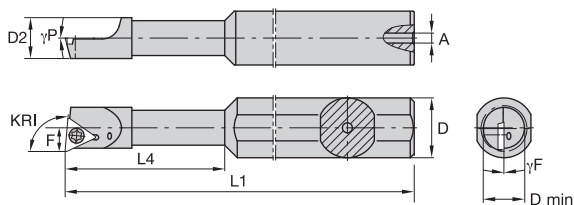
Tools for Small Hole Boring



Tools for Small Hole Boring

### ■ FSBM

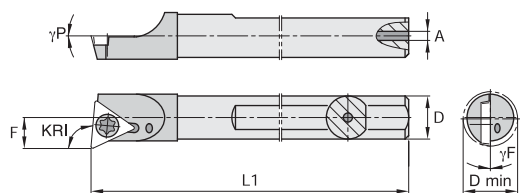
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
													
<b>right hand</b>													
2829554	FSBM61000R	90	6,00	7,06	6,20	3,71	101,60	1,02	0.0°	5.0°	TD..07S102	FC11	T7
2829566	FSBM61005R	95	6,00	7,06	6,20	3,71	101,60	1,02	0.0°	5.0°	TD..07S102	FC11	T7
<b>left hand</b>													
3896211	FSBM61000L	90	6,00	7,06	6,20	3,71	101,60	1,02	0.0°	5.0°	TD..07S102	FC11	T7
3896213	FSBM81000L	90	8,00	9,14	8,20	4,80	101,60	1,52	0.0°	5.0°	TD..07S102	FC11	T7
2829545	FSBM81005L	95	8,00	9,14	8,20	4,80	101,60	1,52	0.0°	5.0°	TD..07S102	FC11	T7



■ FSBM • STEPPED

order number	catalogue number	KRI	D	D min	D2	F	L1	L4	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>														
3890858	FSBM6612320R	90	12,00	7,52	6,58	3,96	76,20	31,75	1,02	0.0°	5.0°	TD..07S102	FC14	T7
2829472	FSBM8212250R	90	12,00	9,09	8,15	4,75	76,00	25,40	1,52	0.0°	5.0°	TD..07S102	FC14	T7
2829448	FSBM8212380R	90	12,00	9,09	8,15	4,75	76,20	38,10	1,52	0.0°	5.0°	TD..07S102	FC14	T7
3890860	FSBM6616190R	90	16,00	7,52	6,58	3,96	101,60	19,05	1,02	0.0°	5.0°	TD..07S102	FC14	T7
2829533	FSBM5212125R	95	12,00	6,99	5,16	3,20	76,20	12,70	1,02	0.0°	5.0°	TD..07S102	FC11	T7
3890857	FSBM5212255R	95	12,00	6,99	5,16	3,20	76,20	25,40	1,02	0.0°	5.0°	TD..07S102	FC11	T7
2829508	FSBM6612195R	95	12,00	7,52	6,58	3,96	76,00	19,05	1,02	0.0°	5.0°	TD..07S102	FC14	T7
2829459	FSBM8212385R	95	12,00	9,09	8,15	4,75	76,00	38,10	1,52	0.0°	5.0°	TD..07S102	FC14	T7
3897011	FSBM5216125R	95	16,00	6,99	5,16	3,20	101,60	12,70	1,02	0.0°	5.0°	TD..07S102	FC11	T7
3890862	FSBM6616325R	95	16,00	7,52	6,58	3,96	101,60	31,75	1,02	0.0°	5.0°	TD..07S102	FC14	T7
2829429	FSBM6616195R	95	16,00	7,52	6,60	3,96	102,00	19,05	1,02	0.0°	5.0°	TD..07S102	FC14	T7
<b>left hand</b>														
2829442	FSBM8212380L	90	12,00	9,09	8,15	4,75	76,00	38,10	1,52	0.0°	5.0°	TD..07S102	FC14	T7
3890861	FSBM6616320L	90	16,00	7,52	6,58	3,96	101,60	31,75	1,02	0.0°	5.0°	TD..07S102	FC14	T7
3890856	FSBM5212125L	95	12,00	6,99	5,16	3,20	76,20	12,70	1,02	0.0°	5.0°	TD..07S102	FC11	T7

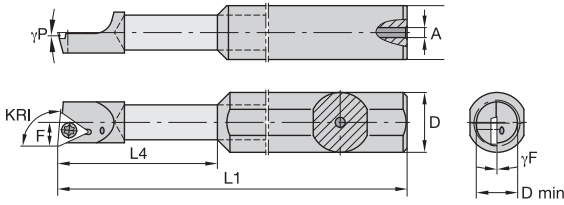




■ FCBM

order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>												
3896036	FCBM51000R	90	5,00	6,98	3,40	100,58	1,02	0.0°	5.0°	TD..07S102	FC11	T7
3896031	FCBM61520R	90	6,00	7,06	3,70	152,40	1,19	0.0°	5.0°	TD..07S102	FC11	T7
2829356	FCBM81520R	90	8,00	9,16	4,80	152,40	2,36	0.0°	5.0°	TD..07S102	FC14	T7
2829390	FCBM61525R	95	6,00	7,06	3,71	152,40	1,19	0.0°	5.0°	TD..07S102	FC11	T7
2829368	FCBM81525R	95	8,00	9,16	4,80	152,40	2,36	0.0°	5.0°	TD..07S102	FC14	T7
<b>left hand</b>												
3896035	FCBM51000L	90	5,00	6,98	3,40	100,58	1,02	0.0°	5.0°	TD..07S102	FC11	T7
3896030	FCBM61520L	90	6,00	7,06	3,71	152,40	1,19	0.0°	5.0°	TD..130805	FC11	T7
3896032	FCBM81520L	90	8,00	9,16	4,80	152,40	2,36	0.0°	5.0°	TD..130805	FC11	T7
3896037	FCBM51005L	95	5,00	6,98	3,20	100,58	1,02	0.0°	5.0°	TD..07S102	FC11	T7
2829385	FCBM61525L	95	6,00	7,06	3,71	152,40	1,19	0.0°	5.0°	TD..07S102	FC11	T7





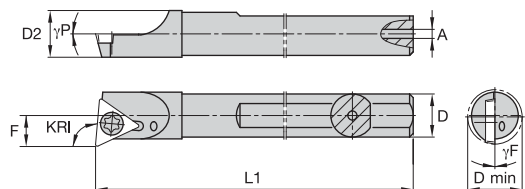
FCBM • STEPPED



order number	catalogue number	KRI	D	D min	F	L1	L4	A	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>													
3896072	FCBM6612630R	90	12,00	7,52	3,96	101,60	63,50	1,19	0.0°	5.0°	TD..07S102	FC14	T7
2829268	FCBM8212790R	90	12,00	9,09	4,75	117,48	79,38	3,18	0.0°	5.0°	TD..07S102	FC14	T7
3896069	FCBM5316250R	90	16,00	6,98	3,40	88,90	25,40	3,18	0.0°	5.0°	TD..07S102	FC11	T7
3896084	FCBM6616320R	90	16,00	7,52	3,96	95,25	31,75	3,18	0.0°	5.0°	TD..07S102	FC11	T7
3896086	FCBM8216380R	90	16,00	9,09	4,75	101,60	38,10	3,18	0.0°	5.0°	TD..07S102	FC14	T7
3896095	FCBM8216790R	90	16,00	9,09	4,75	142,87	79,37	3,18	0.0°	5.0°	TD..07S102	FC14	T7
2829350	FCBM5312255R	95	12,00	6,98	3,20	63,50	25,40	3,18	0.0°	5.0°	TD..07S102	FC11	T7
2829323	FCBM6612325R	95	12,00	7,52	3,96	69,85	31,75	3,18	0.0°	5.0°	TD..07S102	FC14	T7
3896083	FCBM6612635R	95	12,00	7,52	3,96	101,60	63,50	3,18	0.0°	5.0°	TD..07S102	FC11	T7
2829301	FCBM8212385R	95	12,00	9,09	4,75	76,20	38,10	3,18	0.0°	5.0°	TD..07S102	FC14	T7
2829279	FCBM8212795R	95	12,00	9,09	4,75	117,48	79,38	3,18	0.0°	5.0°	TD..07S102	FC14	T7
3897085	FCBM5316255R	95	16,00	6,98	3,20	88,90	25,40	3,18	0.0°	5.0°	TD..07S102	FC11	T7
3790247	FCBM6616325R	95	16,00	7,52	3,96	95,25	31,75	3,18	0.0°	5.0°	TD..07S102	FC14	T7
3786518	FCBM6616635R	95	16,00	7,52	3,96	127,00	63,50	3,18	0.0°	5.0°	TD..07S102	FC14	T7
3786519	FCBM8216795R	95	16,00	9,09	4,75	117,48	79,38	3,18	0.0°	5.0°	TD..07S102	FC14	T7
<b>left hand</b>													
3896067	FCBM5312510L	90	12,00	6,98	3,40	88,90	50,80	3,18	0.0°	5.0°	TD..07S102	FC11	T7
2829344	FCBM5312255L	95	12,00	6,98	3,20	63,50	25,40	3,18	0.0°	5.0°	TD..07S102	FC11	T7
3896068	FCBM5312515L	95	12,00	6,98	3,20	88,90	50,80	3,18	0.0°	5.0°	TD..07S102	FC11	T7
2829319	FCBM6612325L	95	12,00	7,52	3,96	69,85	31,75	3,18	0.0°	5.0°	TD..07S102	FC14	T7
2829295	FCBM8212385L	95	12,00	9,09	4,75	76,20	38,10	3,18	0.0°	5.0°	TD..07S102	FC14	T7
3896070	FCBM5316255L	95	16,00	6,98	3,20	88,90	25,40	3,18	0.0°	5.0°	TD..07S102	FC11	T7
3896085	FCBM6616325L	95	16,00	7,52	3,96	95,25	31,75	3,18	0.0°	5.0°	TD..07S102	FC11	T7
3896087	FCBM8216385L	95	16,00	9,09	4,75	101,60	38,10	3,18	0.0°	5.0°	TD..07S102	FC14	T7


Tools for Small Hole Boring

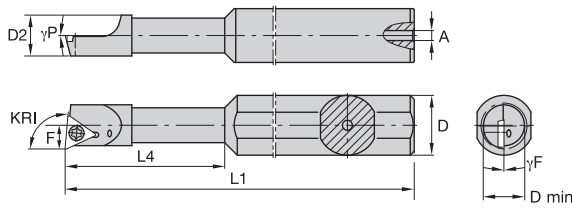




Tools for Small Hole Boring

### ■ QSBM

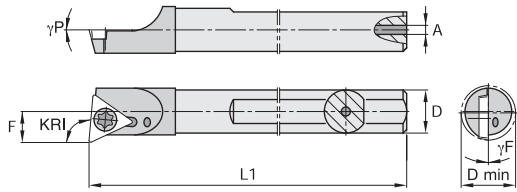
order number	catalogue number	KRI	D	D min	D2	F	L1	A	$\gamma F^\circ$	$\gamma P^\circ$	gage insert	insert screw	Torx
													
<b>right hand</b>													
3886552	QSBM101275R	95	10,00	11,15	10,21	5,79	127,00	3,20	0.0°	5.0°	TP..110202	QC21	T9
<b>left hand</b>													
3886550	QSBM101270L	90	10,00	11,15	10,21	5,79	127,00	3,20	0.0°	5.0°	TP..110202	QC21	T9
3886943	QSBM121520L	90	12,00	13,16	12,19	6,81	152,40	4,00	0.0°	5.0°	TP..110202	QC26	T9
3886551	QSBM101275L	95	10,00	11,15	10,21	5,79	127,00	3,20	0.0°	5.0°	TP..110202	QC21	T9



■ QSBM • STEPPED


order number	catalogue number	KRI	D	D min	D2	F	L1	L4	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>														
2825013	QSBM9912480R	90	12,00	11,12	9,91	5,61	95,25	47,63	2,03	0.0°	5.0°	TP..110202	QC21	T9
3890865	QSBM9916480R	90	16,00	11,12	9,91	5,61	107,95	47,63	2,03	0.0°	5.0°	TP..110202	QC21	T9
3886949	QSBM15920630R	90	20,00	17,47	15,88	8,97	114,30	63,50	2,49	0.0°	5.0°	TP..110202	QC26	T9
2825052	QSBM9912295R	95	12,00	11,12	9,91	5,61	95,25	28,58	2,03	0.0°	5.0°	TP..110202	QC21	T9
2825024	QSBM9912485R	95	12,00	11,12	9,91	5,61	95,25	47,63	2,03	0.0°	5.0°	TP..110202	QC21	T9
3890864	QSBM9916295R	95	16,00	11,12	9,91	5,61	107,95	28,58	2,03	0.0°	5.0°	TP..110202	QC21	T9
2824993	QSBM9916485R	95	16,00	11,12	9,91	5,61	107,95	47,63	2,03	0.0°	5.0°	TP..110202	QC21	T9
3886945	QSBM1316385R	95	16,00	14,30	12,95	7,52	107,95	38,10	2,03	0.0°	5.0°	TP..110202	QC26	T9
3886948	QSBM1316635R	95	16,00	14,30	12,95	7,52	107,95	63,50	2,03	0.0°	5.0°	TP..110202	QC26	T9
2824950	QSBM9920385R	95	20,00	11,12	9,91	5,61	101,60	38,10	2,03	0.0°	5.0°	TP..110202	QC21	T9
3886950	QSBM15920635R	95	20,00	17,47	15,88	8,97	114,30	63,50	2,49	0.0°	5.0°	TP..110202	QC26	T9
<b>left hand</b>														
2825019	QSBM9912485L	95	12,00	11,12	9,91	5,61	95,25	47,63	2,03	0.0°	5.0°	TP..110202	QC21	T9
3896089	QSBM9916295L	95	16,00	11,12	9,91	5,61	107,95	28,58	2,03	0.0°	5.0°	TP..110202	QC21	T9
3886944	QSBM1316385L	95	16,00	14,30	12,95	7,52	107,95	38,10	2,03	0.0°	5.0°	TP..110202	QC26	T9
3886947	QSBM1316635L	95	16,00	14,30	12,95	7,52	107,95	63,50	2,03	0.0°	5.0°	TP..110202	QC26	T9
2824945	QSBM9920385L	95	20,00	11,12	9,91	5,61	101,60	38,10	2,03	0.0°	5.0°	TP..110202	QC21	T9



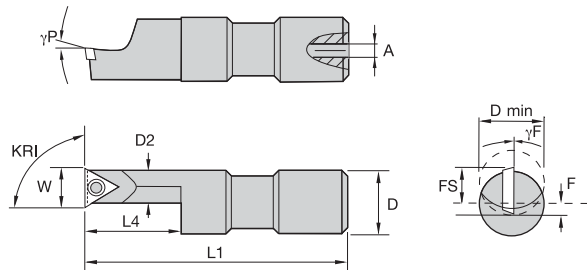


Tools for Small Hole Boring


### ■ QCBM

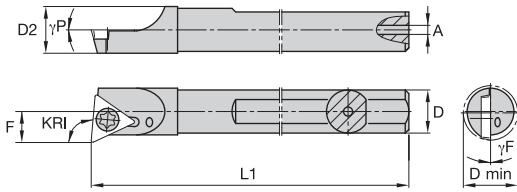
order number	catalogue number	KRI	D	D min	F	L1	A	$\gamma F^\circ$	$\gamma P^\circ$	gage insert	insert screw	Torx
												
<b>right hand</b>												
3854445	QCBM102540R	90	10,00	11,15	5,79	254,00	3,20	0.0°	5.0°	TP..110202	QC21	T9
2824776	QCBM102545R	95	10,00	11,15	5,79	254,00	3,20	0.0°	5.0°	TP..110202	QC21	T9
2824747	QCBM122545R	95	12,00	13,16	6,81	254,00	4,70	0.0°	5.0°	TP..110202	QC21	T9
<b>left hand</b>												
3896043	QCBM122540L	90	12,00	13,16	6,81	254,00	4,70	0.0°	5.0°	TP..110202	QC26	T9
3896044	QCBM122545L	95	12,00	13,16	6,81	254,00	4,70	0.0°	5.0°	TP..110202	QC26	T9

## Clamping System S • Steel



### ■ QSOM

order number	catalogue number	KRI	D	D min	D2	F	L1	L4	FS	W	A	$\gamma F^\circ$	$\gamma P^\circ$	gage insert	insert screw	Torx
																
<b>right hand</b>																
2824819	QSOM9516385R	95	16,00	16,51	9,50	0,64	95,25	38,10	10,63	10,70	2,03	0.0°	5.0°	TP..110202	QC26	T9



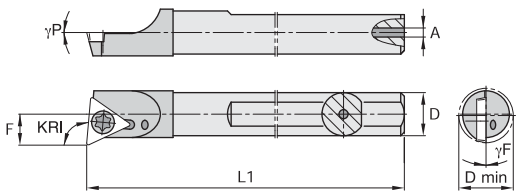
■ **SSBM**

order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>													
3886968	SSBM202030R	90	20,00	21,23	20,19	10,90	203,20	4,00	0.0°	5.0°	TP..160302	SC30	T10
<b>left hand</b>													
3886967	SSBM202030L	90	20,00	21,23	20,19	10,90	203,20	4,00	0.0°	5.0°	TP..160302	SC30	T10
3886969	SSBM202035L	95	20,00	21,23	20,19	10,90	203,20	4,00	0.0°	5.0°	TP..160302	SC30	T10



Tools for Small Hole Boring

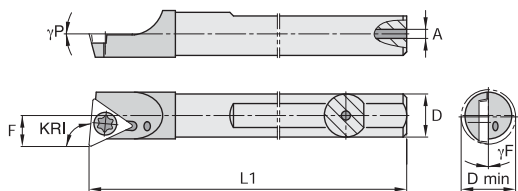
Clamping System S • Carbide



■ **SCBM**

order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>												
3895892	SCBM162540R	90	16,00	17,25	8,89	254,00	5,51	0.0°	5.0°	TP..160302	SC30	T10
3896004	SCBM162545R	95	16,00	17,25	8,89	254,00	5,51	0.0°	5.0°	TP..160302	SC30	T10
3896006	SCBM202545R	95	20,00	21,25	10,90	254,00	7,11	0.0°	5.0°	TP..160302	SC30	T10
<b>left hand</b>												
3895891	SCBM162540L	90	16,00	17,25	8,89	254,00	5,51	0.0°	5.0°	TP..160302	SC30	T10
3896005	SCBM202540L	90	20,00	21,25	10,90	254,00	7,11	0.0°	5.0°	TP..160302	SC30	T10
3896003	SCBM162545L	95	16,00	17,25	8,89	254,00	5,51	0.0°	5.0°	TP..160302	SC30	T10
3896091	SCBM202545L	95	20,00	21,25	10,90	254,00	7,11	0.0°	5.0°	TP..160302	SC30	T10





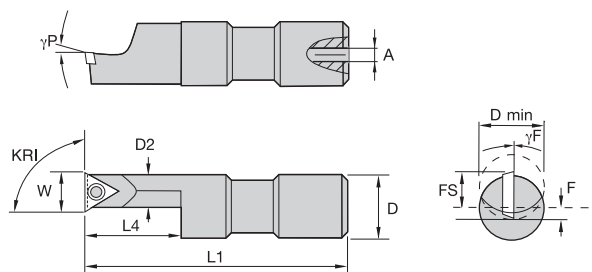
Tools for Small Hole Boring

■ SDBM

order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>													
3896011	SDBM162540R	90	16,00	17,25	—	8,89	254,00	5,51	0.0°	5.0°	TP..160302	SC30	T10
3896014	SDBM202540R	90	20,00	21,25	—	10,90	254,00	7,11	0.0°	5.0°	TP..160302	SC30	T10
2822085	SDBM162545R	95	16,00	17,25	16,13	8,89	254,00	5,54	0.0°	5.0°	TP..160302	SC30	T10
3896092	SDBM202545R	95	20,00	21,25	—	10,90	254,00	7,11	0.0°	5.0°	TP..160302	SC30	T10
<b>left hand</b>													
3896010	SDBM162540L	90	16,00	17,25	—	8,89	254,00	5,51	0.0°	5.0°	TP..160302	SC30	T10
3896013	SDBM202540L	90	20,00	21,25	—	10,90	254,00	7,11	0.0°	5.0°	TP..160302	SC30	T10
3896012	SDBM162545L	95	16,00	17,25	—	8,89	254,00	5,51	0.0°	5.0°	TP..160302	SC30	T10
3897084	SDBM202545L	95	20,00	21,25	—	10,90	254,00	7,11	0.0°	5.0°	TP..160302	SC30	T10



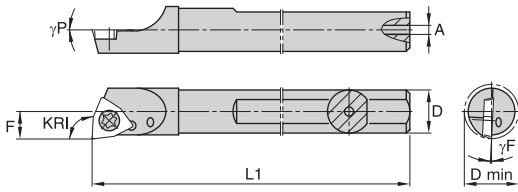
Clamping System S • Steel



■ SSOM

order number	catalogue number	KRI	D	D min	D2	F	L1	L4	FS	W	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>																
3896090	SSOM1325380R	90	24,99	24,61	12,70	1,78	95,25	38,10	14,46	16,24	3,00	0.0°	5.0°	TPHB160302	SC30	T10
3890867	SSOM1325630R	90	24,99	24,61	12,70	1,78	120,65	63,50	14,46	16,24	3,00	0.0°	5.0°	TPHB160302	SC30	T10
3890866	SSOM1325385R	95	24,99	24,61	12,70	1,78	95,25	38,10	14,40	16,18	3,00	0.0°	5.0°	TPHB160302	SC30	T10
3890868	SSOM1325635R	95	24,99	24,61	12,70	1,78	120,65	63,50	14,40	16,18	3,00	0.0°	5.0°	TPHB160302	SC30	T10

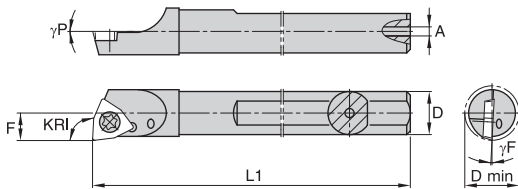




**GSBMW**

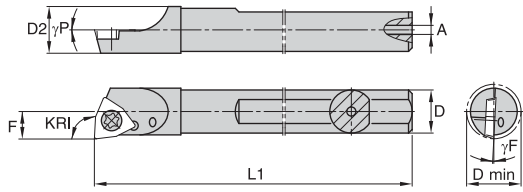
order number	catalogue number	KRI	D	D min	D2	F	L1	A	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>													
2828122	GSBMW61003R	93	6,00	6,78	6,21	3,43	101,60	1,02	-3.0°	0.0°	WP..S30104	CT11	T6
3886549	GSBMW81003R	93	8,00	8,10	8,18	4,42	101,60	2,40	-3.0°	0.0°	WP..S30104	CT11	T6
<b>left hand</b>													
2828116	GSBMW61003L	93	6,00	6,78	6,21	3,43	101,60	1,02	-3.0°	0.0°	WP..S30104	CT11	T6
3886548	GSBMW81003L	93	8,00	8,10	8,18	4,42	101,60	2,40	-3.0°	0.0°	WP..S30104	CT11	T6

**Clamping System S • Carbide**



**GCBMW**

order number	catalogue number	KRI	D	D min	F	L1	A	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>												
3896040	GCBMW51523R	93	5,00	6,60	3,20	152,40	1,02	-3.0°	0.0°	WP..S30104	CT11	T6
2827711	GCBMW61523R	93	6,00	6,78	3,43	152,40	1,19	-3.0°	0.0°	WP..S30104	CT11	T6
<b>left hand</b>												
3896039	GCBMW51523L	93	5,00	6,60	3,20	152,40	1,02	-3.0°	0.0°	WP..S30104	CT11	T6
2827705	GCBMW61523L	93	6,00	6,78	3,43	152,40	1,19	-3.0°	0.0°	WP..S30104	CT11	T6
3897012	GCBMW81523L	93	8,00	8,80	4,42	152,40	2,36	-3.0°	0.0°	WP..S30104	CT11	T6



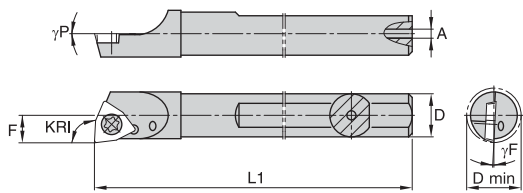
Tools for Small Hole Boring

■ QSBMW

order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>													
3393828	QSBMW121523R	93	12,00	12,90	12,19	6,55	152,40	4,00	-3.0°	0.0°	WP..040204	QTM20	T7
<b>left hand</b>													
3886952	QSBMW101273L	93	10,00	10,94	10,70	5,59	127,00	3,20	-3.0°	0.0°	WP..040204	QTM20	T7



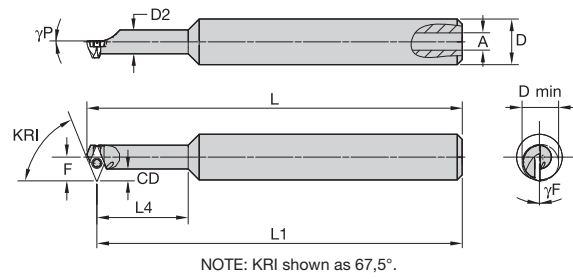
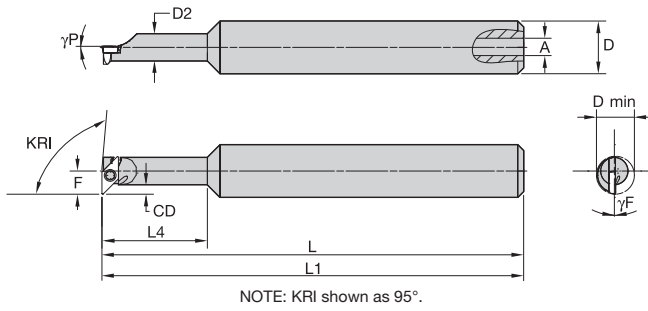
Clamping System S • Carbide



■ QCBMW

order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
<b>right hand</b>												
3782378	QCBMW102543R	93	10,00	10,95	5,59	254,00	3,20	-3.0°	0.0°	WP..040204	QTM20	T7
<b>left hand</b>												
3896045	QCBMW102543L	93	10,00	10,95	5,59	254,00	3,20	-3.0°	0.0°	WP..040204	QTM20	T7
3896046	QCBMW122543L	93	12,00	12,90	6,55	254,00	4,70	-3.0°	0.0°	WP..040204	QTM20	T7





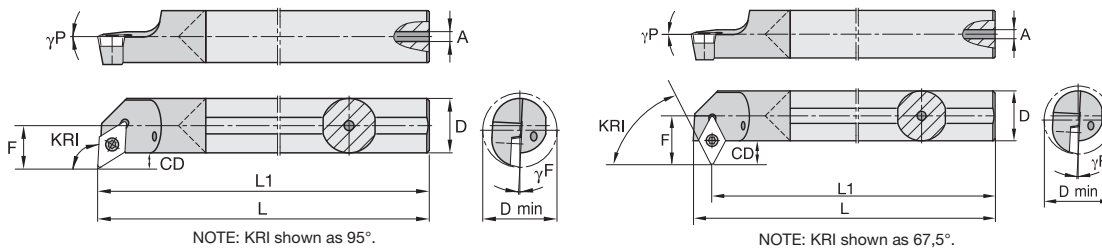
■ **CSPM**

order number	catalogue number	KRI	D	D min	D2	F	CD	L	L1	L4	A	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>																
2831399	CSPM71225225R	67.5	12,00	10,16	6,60	6,60	3,30	104,00	101,60	25,40	1,02	0.0°	0.0°	GC..050102	CT15	T6
3758942	CSPM81232225R	67.5	12,00	11,37	8,18	7,01	2,92	105,16	101,60	31,75	1,02	0.0°	0.0°	GC..050102	CT15	T6
2831411	CSPM712255R	95.0	12,00	9,14	6,60	5,59	2,29	101,60	101,60	25,40	1,02	0.0°	0.0°	GC..050102	CT15	T6
<b>left hand</b>																
2831394	CSPM71225225L	67.5	12,00	10,16	6,60	6,60	3,30	104,00	101,60	25,40	1,02	0.0°	0.0°	GPHW050102	CT15	T6
2831378	CSPM81232225L	67.5	12,00	11,38	8,18	7,01	2,92	104,10	101,60	31,75	1,02	0.0°	0.0°	GC..050102	CT15	T6
2831405	CSPM712255L	95.0	12,00	9,14	6,60	5,59	2,29	101,60	101,60	25,40	1,02	0.0°	0.0°	GP..050102	CT15	T6
2831383	CSPM812325L	95.0	12,00	10,74	8,20	6,38	2,27	101,60	101,60	31,75	1,02	0.0°	0.0°	GP..050102	CT15	T6



Tools for Small Hole Boring

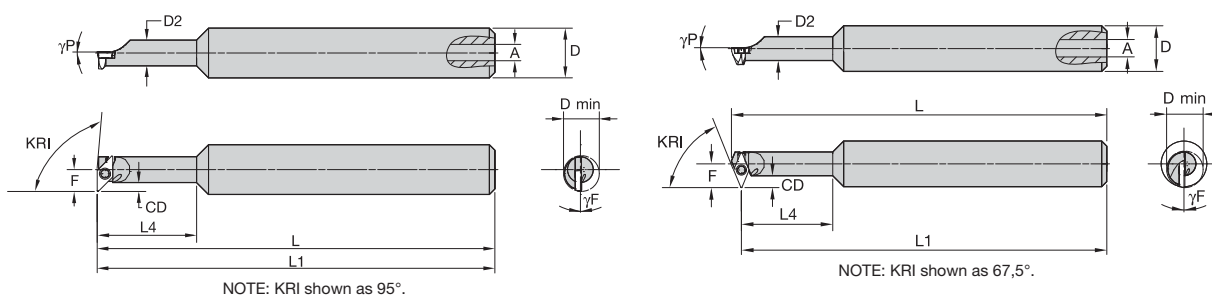




### CCPM

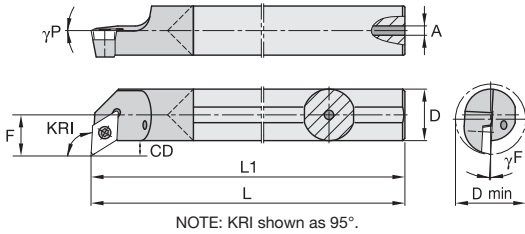
order number	catalogue number	KRI	D	D min	F	CD	L	L1	A	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>														
2831010	CCPM6152225R	67.5	6,00	10,16	6,60	3,51	154,61	152,40	1,19	0.0°	0.0°	GP..050102	CT15	T6
2831020	CCPM61525R	95.0	6,00	9,14	5,59	2,49	152,40	152,40	1,19	0.0°	0.0°	GP..050102	CT15	T6
<b>left hand</b>														
2831004	CCPM6152225L	67.5	6,00	10,15	6,60	3,51	152,61	152,40	1,19	0.0°	0.0°	GP..050102	CT15	T6
2830980	CCPM8152225L	67.5	8,00	11,38	7,01	2,92	155,96	152,40	2,36	0.0°	0.0°	GP..050102	CT15	T6
3897899	CCPM61525L	95.0	6,00	9,14	5,59	2,49	152,40	152,40	1,19	0.0°	0.0°	GP..050102	CT15	T6
3896022	CCPM81525L	95.0	8,00	10,74	6,38	2,28	152,40	152,40	2,23	0.0°	0.0°	GP..050102	CT15	T6

### Clamping System S • Steel

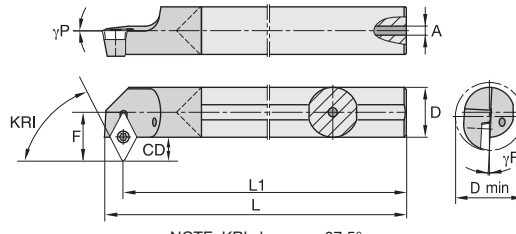


### GSPM

order number	catalogue number	KRI	D	D min	D2	F	CD	L	L1	L4	A	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>																
3518694	GSPM1316515R	95.0	16,00	16,00	12,95	9,50	3,02	127,00	127,00	50,80	2,49	0.0°	0.0°	GC..060202	GT21	T7
<b>left hand</b>																
3897894	GSPM101638225L	67.5	16,00	13,72	9,78	8,59	3,70	105,01	101,60	38,10	2,49	0.0°	0.0°	GC..060202	GT21	T7
3897896	GSPM131651225L	67.5	16,00	16,89	12,95	10,16	3,68	130,90	127,00	50,80	2,49	0.0°	0.0°	GC..060202	GT21	T7
3897895	GSPM1016385L	95.0	16,00	13,08	9,78	7,93	3,04	114,30	114,30	38,10	2,49	0.0°	0.0°	GC..060202	GT21	T7
3896052	GSPM1316515L	95.0	16,00	16,00	12,95	9,50	3,02	127,00	127,00	50,80	2,49	0.0°	0.0°	GC..060202	GT21	T7



NOTE: KRI shown as 95°.

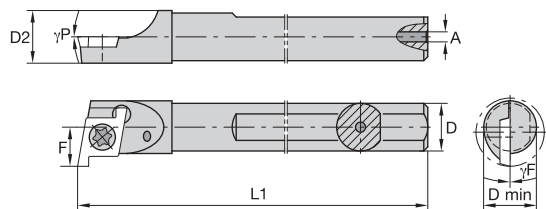


NOTE: KRI shown as 67,5°.

■ GCPM

order number	catalogue number	KRI	D	D min	F	CD	L	L1	A	$\gamma_F^\circ$	$\gamma_P^\circ$	gage insert	insert screw	Torx
<b>right hand</b>														
2827656	GCPM10254225R	67.5	10,00	14,20	8,81	3,68	258,47	254,00	3,20	0.0°	0.0°	GC..060202	GT21	T7
3897906	GCPM12254225R	67.5	12,00	16,18	9,80	3,71	257,86	254,00	4,70	0.0°	0.0°	GC..060202	GT21	T7
3896073	GCPM16254225R	67.5	16,00	20,09	11,76	3,67	258,01	254,00	5,51	0.0°	0.0°	GC..060202	GT21	T7
3897904	GCPM102545R	95.0	10,00	13,54	8,15	3,06	254,00	254,00	3,20	0.0°	0.0°	GC..060202	GT21	T7
3759184	GCPM122545R	95.0	12,00	15,52	9,14	3,05	254,00	254,00	4,70	0.0°	0.0°	GC..060202	GT21	T7
3897909	GCPM162545R	95.0	16,00	19,43	11,10	3,01	254,00	254,00	5,51	0.0°	0.0°	GC..060202	GT21	T7
<b>left hand</b>														
3897903	GCPM10254225L	67.5	10,00	14,20	8,81	3,72	257,49	254,00	3,20	0.0°	0.0°	GC..060202	GT21	T7
3897905	GCPM12254225L	67.5	12,00	16,18	9,80	3,71	257,86	254,00	4,70	0.0°	0.0°	GC..060202	GT21	T7
3897908	GCPM16254225L	67.5	16,00	20,07	11,76	3,67	258,02	254,00	5,51	0.0°	0.0°	GC..060202	GT21	T7
3782377	GCPM102545L	95.0	10,00	13,54	8,15	3,02	254,00	254,00	3,20	0.0°	0.0°	GC..060202	GT21	T7
3897907	GCPM122545L	95.0	12,00	15,52	9,14	3,05	254,00	254,00	4,70	0.0°	0.0°	GC..060202	GT21	T7
2827644	GCPM162545L	95.0	16,00	19,43	11,10	3,01	254,00	254,00	5,51	0.0°	0.0°	GC..060202	GT21	T7



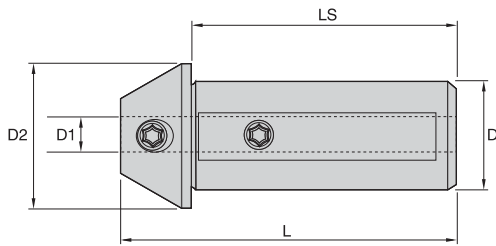


Tools for Small Hole Boring

### ■ CSMM

order number	catalogue number	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand												
2831048	CSMM6760R	6,00	7,92	6,60	4,44	76,20	1,02	0.0°	0.0°	CD.50302R	CC11	T6

NOTE: Refer to insert design for cutting depth, cutting width, and blind hole limitations.

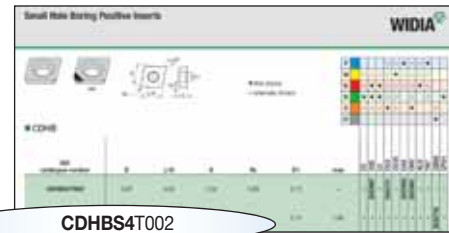


■ CSM

order number	catalogue number	D1	D	D2	LS	L
2832838	CSM22156	3,96	22,00	27,94	50,80	63,50
2832832	CSM22187	4,75	22,00	27,94	50,80	63,50
2832827	CSM22250	6,36	22,00	27,94	50,80	63,50
2832820	CSM22312	7,93	22,00	27,94	50,80	63,50
2832813	CSM22375	9,53	22,00	27,94	50,80	63,50
2832809	CSM22500	12,70	22,00	27,94	50,80	63,50

## How Do Catalogue Numbers Work?

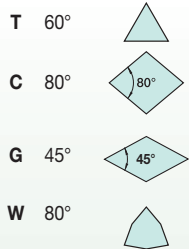
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



CDHBS4T002

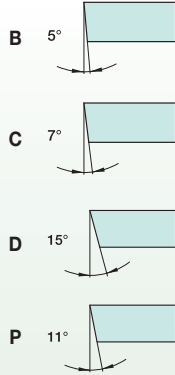
**C**

Insert Shape



**D**

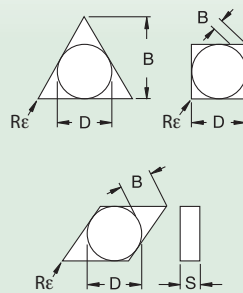
Insert Clearance Angle



**H**

Tolerance Class

Tolerances apply prior to edge prep and coating.



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

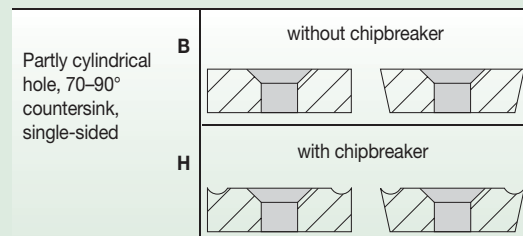
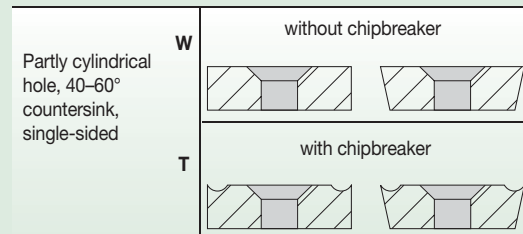
**B**

Insert Features

**S4**

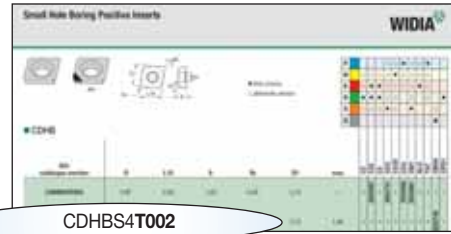
Size

"D" mm	Code for metric cutting edge length "L10"			
	C	G	T	W
3,97	S4	05	06	—
4,06	—	—	07	—
4,76	04	06	08	S3
6,35	06	—	11	04
9,53	09	—	16	06
9,80	—	—	17	—



tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±0,025	±0,013	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,013
M	See tables on next page		±0,013
U	See tables on next page		±0,013

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



CDHBS4T002

<b>T0</b>	<b>02</b>																																							
Thickness	Corner Radius "Re"	Hand of Insert <i>(optional)</i>	Cutting Edge Condition or Chip Control Features <i>(optional)</i>	Tip Style <i>(optional)</i>																																				
<table border="1"> <thead> <tr> <th>symbol mm</th> <th>thickness mm</th> </tr> </thead> <tbody> <tr><td>T0</td><td>1,00; 1,02</td></tr> <tr><td>01</td><td>1,59; 1,58</td></tr> <tr><td>T1</td><td>1,98; 1,91</td></tr> <tr><td>02</td><td>2,38; 2,36</td></tr> <tr><td>03</td><td>3,18</td></tr> <tr><td>T3</td><td>3,97</td></tr> <tr><td>S1</td><td>1,19</td></tr> </tbody> </table>	symbol mm	thickness mm	T0	1,00; 1,02	01	1,59; 1,58	T1	1,98; 1,91	02	2,38; 2,36	03	3,18	T3	3,97	S1	1,19	<table border="1"> <thead> <tr> <th>symbol mm</th> <th>corner radius mm</th> </tr> </thead> <tbody> <tr><td>X0</td><td>0,04; 0,05</td></tr> <tr><td>01</td><td>0,1</td></tr> <tr><td>02</td><td>0,2; 0,18</td></tr> <tr><td>04</td><td>0,4; 0,38</td></tr> <tr><td>05</td><td>0,5</td></tr> <tr><td>08</td><td>0,8</td></tr> <tr><td>09</td><td>0,9</td></tr> <tr><td>12</td><td>1,2</td></tr> <tr><td>16</td><td>1,6</td></tr> </tbody> </table>	symbol mm	corner radius mm	X0	0,04; 0,05	01	0,1	02	0,2; 0,18	04	0,4; 0,38	05	0,5	08	0,8	09	0,9	12	1,2	16	1,6	<p>R = Right hand L = Left hand</p>	<p>HP = High positive LF = Light finishing</p>	<p><b>Symbol</b> M <b>Usage</b> Mini tip</p>
symbol mm	thickness mm																																							
T0	1,00; 1,02																																							
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"D" mm	± Tolerance on "D"				"D" mm	± Tolerance on "B"			
	Class M Tolerance			Class U Tolerance		Class M Tolerance			Class U Tolerance
	Shapes S, T, C, R, & W mm	Shape D mm	Shape V mm	Shapes S, T, & C mm		Shapes S, T, C, R, & W mm	Shape D mm	Shape V mm	Shapes S, T, & C mm
3,97	0,05	-	-	-	3,97	0,08	-	-	-
4,76	0,05	-	-	0,08	4,76	0,08	-	-	0,13
5,56	0,05	0,05	0,05	0,08	5,56	0,08	0,11	-	0,13
6,35	0,05	0,05	0,05	0,08	6,35	0,08	0,11	-	0,13
7,94	0,05	0,05	0,05	0,08	7,94	0,08	0,11	-	0,13
9,52	0,05	0,05	0,05	0,08	9,52	0,08	0,11	0,18	0,13
11,11	0,08	0,08	0,08	0,13	11,11	0,13	0,15	-	-
12,70	0,08	0,08	0,08	0,13	12,70	0,13	0,15	0,25	0,20
14,29	0,08	0,08	0,08	0,13	14,29	0,13	0,15	-	-
15,88	0,10	0,10	0,10	0,18	15,88	0,15	0,18	-	0,27
17,46	0,10	0,10	0,10	0,18	17,46	0,15	0,18	-	0,27
19,05	0,10	0,10	0,10	0,18	19,05	0,15	0,18	-	0,27
22,22	0,13	-	-	0,25	22,22	0,15	-	-	0,38
25,40	0,13	-	-	0,25	25,40	0,18	-	-	0,38
31,75	0,15	-	-	0,25	31,75	0,20	-	-	0,38

The WIDIA™ three-step insert selection system makes choosing and applying the most productive tool easy. Tool recommendations are based on six workpiece material groups.

- 1 **Select the Insert Geometry:**  
Based on the needed depth of cut and feed rate, choose the geometry that best matches your needs.
- 2 **Select the Grade:**  
Determine your cutting conditions, and choose the proper grade.

### TN7–CM1 for Steel

ISO 513	P				
	01	10	20	30	40
Hard Metal Coated					
		TN7			
		ALO			
		CG6			
		CG55			
			CG5		
			CM1		

wear resistance = harder

- TN7** — High edge strength and wear-resistant cermet. Finishing to semi-finishing of carbon, alloy, and stainless steels at medium to high speeds.
- ALO** — Can withstand light interruptions. Alumina coating enables higher cutting speeds.
- CG6** — High-speed, general-purpose grade for all kinds of steel and cast iron.
- CG55** — High edge strength and wear resistance. Reduces problems with built-up edge. Superior thermal deformation resistance and depth-of-cut notch resistance.
- CG5** — Best at low speeds. Will handle interruptions and high feed rates.
- CM1** — For heavy turning and heavily interrupted cuts.

toughness = softer

### ALO–CM1 for Stainless Steel

ISO 513	M				
	01	10	20	30	40
Hard Metal Coated					
		ALO			
		C3 and C25			
		C2			
		CG6			
		CG55			
			CG5		
		CM1			

wear resistance = harder

- ALO** — Can withstand light interruptions. Alumina coating enables higher cutting speeds.
- C3 and C25** — Good wear resistance with some toughness.
- C2** — Excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys.
- CG6** — High-speed, general-purpose grade for all kinds of steel and cast iron.
- CG55** — High edge strength and wear resistance. Reduces problems with built-up edge. Superior thermal deformation resistance and depth-of-cut notch resistance.
- CG5** — Best at low speeds. Will handle interruptions and high feed rates.
- CM1** — For heavy turning and heavily interrupted cuts.

toughness = softer

**3 Select the Cutting Speed:**  
In the foldout speed and feed chart, establish your cutting speed and obtain your optimal starting conditions and range.

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

**TN7–CM1 for Cast Iron**

ISO 513	K				
	01	10	20	30	40
Hard Metal Coated	TN7				
	ALO				
	CG6				
	CG55				
	C3 and C25				
	C2				
			CG5		
			CM1		

wear resistance = harder

- TN7** — High edge strength and wear-resistant cermet.
- ALO** — Can withstand light interruptions. Alumina coating enables higher cutting speeds.
- CG6** — High-speed, general-purpose grade for all kinds of steel and cast iron.
- CG55** — High edge strength and wear resistance. Reduces problems with built-up edge. Superior thermal deformation resistance and depth-of-cut notch resistance.
- C3 and C25** — Good wear resistance with some toughness.
- C2** — Excellent abrasion-resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys.
- CG5** — Best at low speeds. Will handle interruptions and high feed rates.
- CM1** — For heavy turning and heavily interrupted cuts.

toughness = softer

**C3–CM1 for High-Temperature Alloys**

ISO 513	S				
	01	10	20	30	40
Hard Metal Coated	C3 and C25				
	C2				
			CG5		
			CM1		

wear resistance = harder

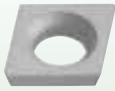
- C3 and C25** — Good wear resistance with some toughness.
- C2** — Excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys.
- CG5** — Best at low speeds. Will handle interruptions and high feed rates.
- CM1** — For heavy turning and heavily interrupted cuts.

toughness = softer

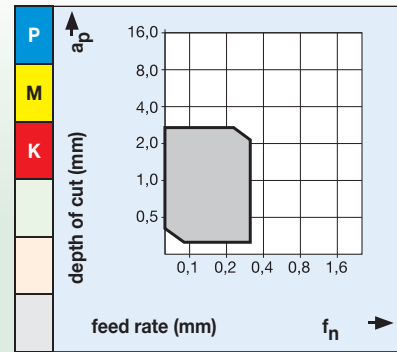


■ Single-Sided, Positive Inserts

..HB



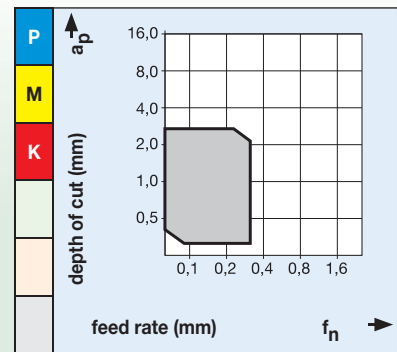
Flat inserts. Peripheral ground for best surface quality and reduced cutting pressure. Very stable cutting edge offers maximum rigidity.



..HT



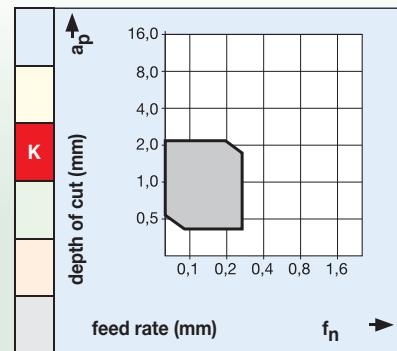
Peripheral ground insert chipbreaker. Good chip control. Geometry for general-purpose applications.



..HB-M



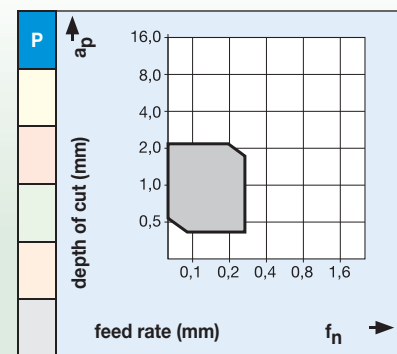
Cubic Boron Nitride (CBN) or Polycrystalline Diamond (PCD) tip for high-temp alloys and non-ferrous machining. Very stable cutting edge offers maximum rigidity.



..LF



Geometry for general-purpose applications. Very good chip control. Recommended for general finish machining.



**Geometry Selection Criteria**

**Flat Top-Type Inserts**

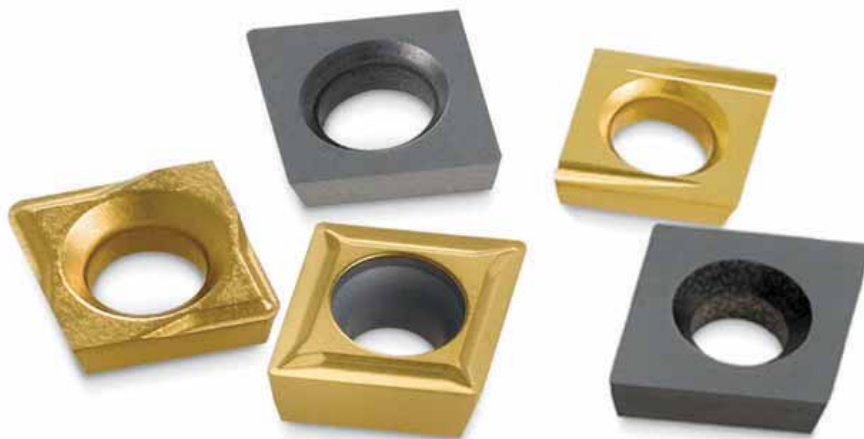
Chipbreaker Geometry ..HB, ..HB-M, ..HW

- Suitable for interrupted cuts.
- Use when chip control is not critical.

**Pressed Chipbreaker-Type Inserts**

Chipbreaker Geometry ..LF

- Suitable for moderate interruption of cuts.
- Use when chip control is a concern.

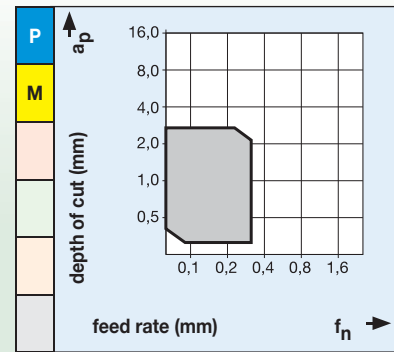


■ Single-Sided, Positive Inserts

..HH



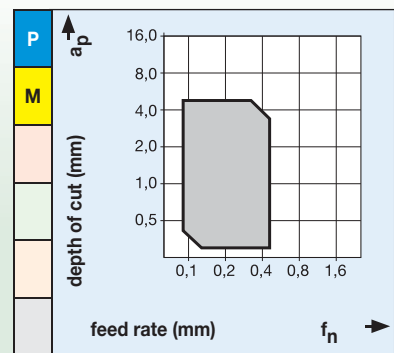
Peripheral ground for best surface quality and reduced cutting pressure. For fine to medium finishes.



HP



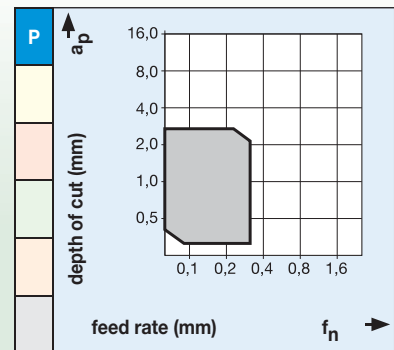
High positive-type chipbreaker. Peripheral ground for best surface quality and reduced cutting pressure. Recommended for high-temp alloys and non-ferrous machining.



..HH-R/L



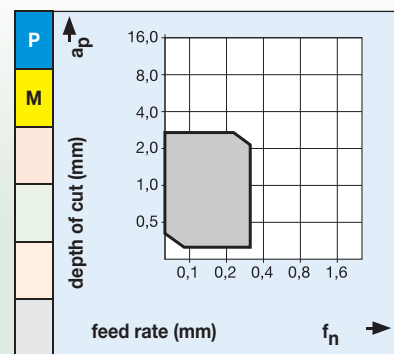
Ground-in chipbreaker. Peripheral ground for best surface quality and reduced cutting pressure.  
\*Right-hand inserts used in left-hand bars ONLY. Left-hand inserts used in right-hand bars ONLY.



..HW



Flat insert for profiling. Very stable cutting edge offers maximum rigidity.



**Geometry Selection Criteria**

**Pressed Chipbreaker-Type Inserts with Ground Periphery**

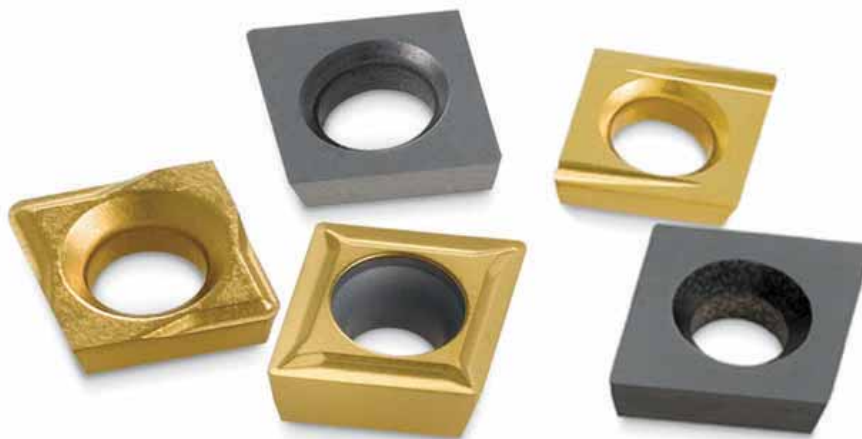
Chipbreaker Geometry ..HH, ..HT, HP

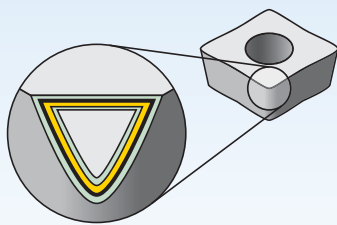
- Suitable for light to moderate interruption of cuts.
- Use when chip control is a concern.
- Superior surface finish and closer tolerance on workpiece.

**Ground-In Chipbreaker-Type Inserts**

Chipbreaker Geometry ..HH-R/L

- Suitable for smooth cuts.
- Use when chip control is a concern.
- Superior surface finish and closer tolerance on workpiece.

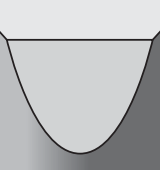
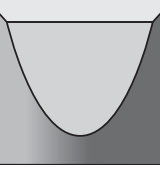
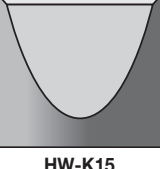
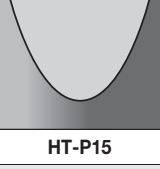
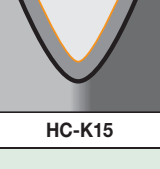




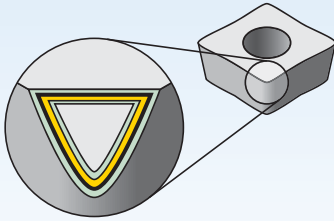
Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Grade	Coating	Grade Description	Material Group																				
			P	M	K	N	S	H	05	10	15	20	25	30	35	40	45						
CM1	 HW-S25	Uncoated carbide. A very tough, ultra-fine grain unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates. Use when C2, C3, or C25 fail due to chipping or breaking.	P																				
			M																				
			K																				
			N																				
			S																				
C2	 HW-N15	Uncoated carbide. A hard, low binder content, unalloyed WC/Co fine-grained grade. General-purpose grade for non-ferrous materials. Has excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys.	M																				
			K																				
			N																				
			S																				
C3 and C25	 HW-K15	Uncoated carbide. Has excellent abrasion resistance for machining cast irons, aluminium, and non-ferrous metals. Good wear resistance with some toughness. Harder than C2, resulting in greater edge wear resistance. Suitable for finishing operations.	M																				
			K																				
			N																				
			S																				
TN7	 HT-P15	A highly wear-resistant (TiC/TiN-based) cermet grade. High edge strength and wear-resistant cermet offers improved tool life over uncoated/coated carbides and resists material build-up on cutting edge. Finishing to semi-finishing of carbon, alloy, and stainless steels at medium to high speeds. Can also be used on non-ferrous materials.	P																				
			M																				
			K																				
ALO	 HC-K15	Coated carbide. CVD – TiCN-TiC-Al <sub>2</sub> O <sub>3</sub> . A thin alumina coating over a hard, deformation-resistant substrate. High-speed finishing of grey cast irons and medium-speed finishing of alloy steels that are in a hardness range of 35–50 HRC. Can withstand light interruptions. Alumina coating enables higher cutting speeds.	P																				
			M																				
			K																				



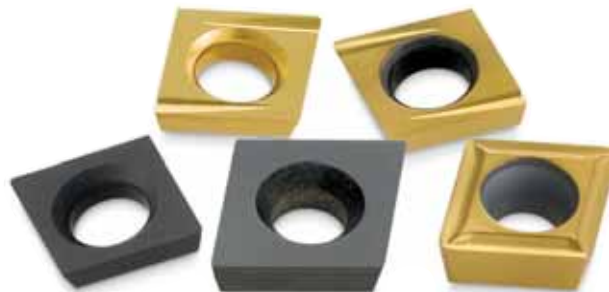


Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45
<b>CG6</b>		Coated carbide. CVD — TiC-TiCN-TiN. Tri-phase coating on a hard, low binder content, fine-grained grade. High-speed, general-purpose grade for all kinds of steel. Gold in colour.	<b>P</b>									
	<b>HC-P10</b>		<b>M</b>									
<b>CG5</b>		A PVD-TiN-coated grade. Straight 9.5% Co substrate. Submicron grain. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates.	<b>P</b>									
			<b>M</b>									
			<b>K</b>									
			<b>N</b>									
			<b>S</b>									
<b>CG55</b>		A PVD-TiN coating over a very wear-resistant, unalloyed carbide substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Grade provides combination of high edge strength and wear resistance. Coating increases wear resistance and reduces problems with built-up edge. The substrate offers superior thermal deformation resistance and depth-of-cut notch resistance.	<b>P</b>									
			<b>M</b>									
			<b>K</b>									
			<b>S</b>									
<b>CBN6</b>		PcBN tip brazed onto a carbide insert. Recommended for machining hardened steel (45–65 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburised and nitrided irons, and some hard coatings. Can be run both dry and wet.										
			<b>H</b>									
<b>CPD1</b>		Polycrystalline diamond (PCD) compact grade provides exceptional hardness and abrasion resistance. CPD1 is a superior finish boring grade that will significantly improve workpiece tolerances, surface finishes, and insert tool life in high-silicon aluminium, copper, aluminium carbon graphite, hard rubber, plastics, and/or wood.										
			<b>N</b>									
<b>DP-N10</b>												



Material Group		Cutting Speed – vc m/min																	
		C2			C25			C3			CG5			CG55			CG6		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	ap [mm]	-	-	-	-	-	-	-	-	-	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300
	f [mm/rev]	-	-	-	-	-	-	-	-	-	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300
	0/1	-	-	-	-	-	-	-	-	-	95	<b>115</b>	140	105	<b>130</b>	155	125	<b>155</b>	190
	2	-	-	-	-	-	-	-	-	-	60	<b>75</b>	90	65	<b>85</b>	100	80	<b>100</b>	125
	3	-	-	-	-	-	-	-	-	-	60	<b>75</b>	90	65	<b>85</b>	100	80	<b>100</b>	125
	4	-	-	-	-	-	-	-	-	-	45	<b>60</b>	70	50	<b>65</b>	80	65	<b>80</b>	95
	5	-	-	-	-	-	-	-	-	-	60	<b>75</b>	90	65	<b>85</b>	100	80	<b>100</b>	125
6	-	-	-	-	-	-	-	-	-	40	<b>50</b>	60	45	<b>55</b>	70	55	<b>65</b>	80	
M	ap [mm]	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300
	f [mm/rev]	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300
	1	55	<b>70</b>	80	60	<b>80</b>	95	60	<b>80</b>	95	75	<b>90</b>	110	80	<b>100</b>	120	95	<b>115</b>	140
	2	50	<b>60</b>	75	55	<b>70</b>	85	55	<b>70</b>	85	65	<b>80</b>	100	75	<b>90</b>	110	85	<b>105</b>	125
3	35	<b>45</b>	55	45	<b>50</b>	65	45	<b>50</b>	65	50	<b>60</b>	75	55	<b>65</b>	80	60	<b>80</b>	95	
K	ap [mm]	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300
	f [mm/rev]	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300
	1	50	<b>65</b>	80	60	<b>70</b>	85	60	<b>70</b>	85	60	<b>75</b>	90	65	<b>80</b>	100	75	<b>90</b>	110
	2	65	<b>80</b>	100	75	<b>90</b>	110	75	<b>90</b>	110	75	<b>95</b>	115	85	<b>105</b>	125	95	<b>115</b>	140
3	50	<b>60</b>	75	55	<b>65</b>	80	55	<b>65</b>	80	55	<b>70</b>	80	60	<b>75</b>	90	65	<b>85</b>	100	
N	ap [mm]	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	0,051	-	0,300	-	-	-
	f [mm/rev]	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	0,025	-	0,300	-	-	-
	1	400	<b>505</b>	605	400	<b>505</b>	605	400	<b>505</b>	605	400	<b>505</b>	605	445	<b>555</b>	665	-	-	-
	2	295	<b>370</b>	440	295	<b>370</b>	445	295	<b>370</b>	445	295	<b>370</b>	445	325	<b>405</b>	490	-	-	-
	3	70	<b>85</b>	105	70	<b>85</b>	105	70	<b>85</b>	105	85	<b>105</b>	125	90	<b>115</b>	135	-	-	-
	4	310	<b>380</b>	465	310	<b>385</b>	465	310	<b>385</b>	465	140	<b>175</b>	210	155	<b>190</b>	230	-	-	-
	5	145	<b>185</b>	220	145	<b>185</b>	220	145	<b>185</b>	220	175	<b>220</b>	265	195	<b>240</b>	290	-	-	-
6	140	<b>175</b>	210	140	<b>175</b>	210	140	<b>175</b>	210	170	<b>210</b>	255	185	<b>235</b>	280	-	-	-	
7	240	<b>295</b>	355	240	<b>300</b>	360	240	<b>300</b>	360	245	<b>305</b>	365	265	<b>335</b>	400	-	-	-	
S	ap [mm]	0,025	-	0,200	0,025	-	0,200	0,025	-	0,200	0,025	-	0,200	0,025	-	0,200	-	-	-
	f [mm/rev]	0,025	-	0,127	0,025	-	0,127	0,025	-	0,127	0,025	-	0,127	0,025	-	0,127	-	-	-
	1	30	<b>35</b>	45	30	<b>35</b>	45	30	<b>35</b>	45	30	<b>35</b>	45	35	<b>40</b>	50	-	-	-
	2	25	<b>30</b>	35	25	<b>30</b>	35	25	<b>30</b>	35	25	<b>30</b>	35	25	<b>35</b>	40	-	-	-
	3	25	<b>30</b>	35	25	<b>30</b>	35	25	<b>30</b>	35	30	<b>40</b>	50	35	<b>45</b>	55	-	-	-
4	25	<b>30</b>	35	25	<b>30</b>	35	25	<b>30</b>	35	-	-	-	-	-	-	-	-	-	
H	ap [mm]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	f [mm/rev]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

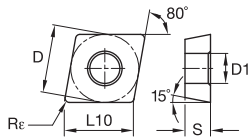
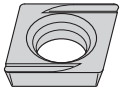
NOTE: Speed and feed rates and depth of cut may vary depending on materials and machining conditions including, but not limited to, tool overhang, tool size, and finished surface requirements.

Material Group		Cutting Speed – vc m/min														
		CM1			ALO			TN7			CBN6			CPD1		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	–	–	–	–	–	–
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	–	–	–	–	–	–
	0/1	55	<b>65</b>	80	165	<b>205</b>	245	200	<b>245</b>	295	–	–	–	–	–	–
	2	35	<b>45</b>	55	105	<b>135</b>	160	130	<b>160</b>	190	–	–	–	–	–	–
	3	35	<b>45</b>	55	105	<b>135</b>	160	130	<b>160</b>	190	–	–	–	–	–	–
	4	25	<b>35</b>	40	85	<b>105</b>	125	100	<b>125</b>	150	–	–	–	–	–	–
	5	35	<b>45</b>	55	105	<b>135</b>	160	130	<b>160</b>	190	–	–	–	–	–	–
6	25	<b>30</b>	35	70	<b>90</b>	105	85	<b>105</b>	130	–	–	–	–	–	–	
M	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	–	–	–	–	–	–
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	–	–	–	–	–	–
	1	55	<b>65</b>	80	105	<b>130</b>	160	105	<b>130</b>	155	–	–	–	–	–	–
	2	50	<b>60</b>	75	95	<b>120</b>	145	95	<b>115</b>	140	–	–	–	–	–	–
3	35	<b>45</b>	55	70	<b>90</b>	110	70	<b>85</b>	105	–	–	–	–	–	–	
K	ap [mm]	0,051	–	0,300	0,051	–	0,300	0,051	–	0,300	–	–	–	–	–	–
	f [mm/rev]	0,025	–	0,300	0,025	–	0,300	0,025	–	0,300	–	–	–	–	–	–
	1	45	<b>60</b>	70	125	<b>155</b>	185	80	<b>105</b>	125	–	–	–	–	–	–
	2	60	<b>75</b>	90	160	<b>200</b>	240	105	<b>130</b>	160	–	–	–	–	–	–
3	45	<b>55</b>	65	115	<b>145</b>	170	80	<b>95</b>	115	–	–	–	–	–	–	
N	ap [mm]	0,051	–	0,300	–	–	–	0,051	–	0,300	–	–	–	0,051	–	0,300
	f [mm/rev]	0,025	–	0,300	–	–	–	0,025	–	0,300	–	–	–	0,025	–	0,300
	1	400	<b>505</b>	605	–	–	–	400	<b>505</b>	605	–	–	–	855	<b>1065</b>	1280
	2	295	<b>370</b>	445	–	–	–	295	<b>370</b>	445	–	–	–	650	<b>810</b>	975
	3	70	<b>85</b>	105	–	–	–	80	<b>100</b>	120	–	–	–	365	<b>455</b>	550
	4	100	<b>125</b>	150	–	–	–	195	<b>240</b>	290	–	–	–	325	<b>405</b>	490
	5	145	<b>185</b>	220	–	–	–	195	<b>245</b>	295	–	–	–	340	<b>425</b>	510
	6	140	<b>175</b>	210	–	–	–	175	<b>220</b>	265	–	–	–	335	<b>420</b>	505
7	240	<b>295</b>	360	–	–	–	240	<b>300</b>	365	–	–	–	525	<b>660</b>	790	
S	ap [mm]	0,025	–	0,200	–	–	–	–	–	–	0,025	–	0,200	–	–	–
	f [mm/rev]	0,025	–	0,127	–	–	–	–	–	–	0,025	–	0,127	–	–	–
	1	25	<b>30</b>	40	–	–	–	–	–	–	90	<b>110</b>	135	–	–	–
	2	20	<b>25</b>	30	–	–	–	–	–	–	70	<b>85</b>	105	–	–	–
	3	25	<b>35</b>	40	–	–	–	–	–	–	100	<b>120</b>	145	–	–	–
4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
H	ap [mm]	–	–	–	–	–	–	–	–	–	0,025	–	0,200	–	–	–
	f [mm/rev]	–	–	–	–	–	–	–	–	–	0,025	–	0,127	–	–	–
	1	–	–	–	–	–	–	–	–	–	110	<b>135</b>	165	–	–	–
	2	–	–	–	–	–	–	–	–	–	105	<b>130</b>	155	–	–	–
	3	–	–	–	–	–	–	–	–	–	100	<b>120</b>	145	–	–	–
4	–	–	–	–	–	–	–	–	–	90	<b>110</b>	135	–	–	–	

NOTE: Speed and feed rates and depth of cut may vary depending on materials and machining conditions including, but not limited to, tool overhang, tool size, and finished surface requirements.







● first choice  
○ alternate choice

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

■ CDHH-R/L

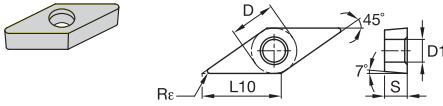
ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1	
<b>right hand</b>																	
CDHHS4T002R	3,97	4,03	1,02	0,18	2,13	-	-	-	2830731	-	-	-	2830706	-	-	-	-
CDHHS4T004R	3,97	4,03	1,02	0,38	2,13	-	-	-	2830682	-	-	-	-	-	-	-	-
<b>left hand</b>																	
CDHHS4T002L	3,97	4,03	1,02	0,18	2,13	-	-	-	2830724	-	-	2830712	2830700	-	-	-	-
CDHHS4T004L	3,97	4,03	1,02	0,38	2,13	-	-	-	2830678	-	-	-	-	-	-	-	-

NOTE: Right-hand inserts used in left-hand bars only.

Tools for Small Hole Boring







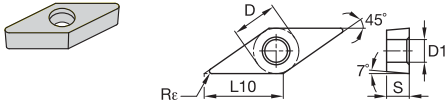
● first choice  
○ alternate choice

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

Tools for Small Hole Boring

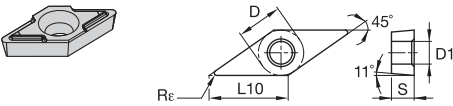
## GCHW

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
GCHW060202	4,76	6,73	2,36	0,18	2,39	○	○	○	●	○	○	○	○	○	○	○
GCHW060204	4,76	6,73	2,36	0,38	2,39	○	○	○	●	○	○	○	○	○	○	○



## GCHT

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
GCHT060202	4,83	6,83	2,36	0,18	2,39	○	○	○	○	○	○	○	○	○	○	○
GCHT060204	4,76	6,83	2,36	0,38	2,39	○	○	○	○	○	○	○	○	○	○	○

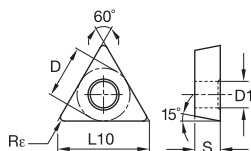
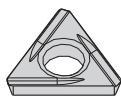


## GPHW

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
GPHW050102	3,97	5,61	1,59	0,18	2,13	○	○	○	○	○	○	○	○	○	○	○
GPHW050104	3,97	5,61	1,59	0,38	2,13	○	○	○	○	○	○	○	○	○	○	○







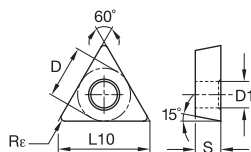
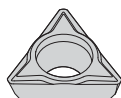
● first choice  
○ alternate choice

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

### TDHH-R/L

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1	
<b>right hand</b>																	
TDHH07S102R	4,06	7,04	1,19	0,18	2,41	●	○	○	○	○	○	○	○	○	○	○	○
TDHH07S104R	4,06	7,04	1,19	0,38	2,41	○	○	○	○	○	○	○	○	○	○	○	○
<b>left hand</b>																	
TDHH07S102L	4,06	7,04	1,19	0,18	2,41	○	○	○	○	○	○	○	○	○	○	○	○
TDHH07S104L	4,06	7,04	1,19	0,38	2,41	○	○	○	○	○	○	○	○	○	○	○	○

NOTE: Right-hand inserts used in left-hand bars only.



### TDHH

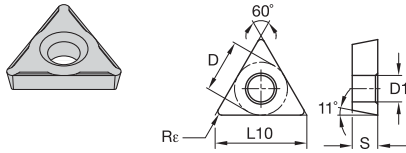
ISO catalogue number	D	L10	S	Rε	D1	max	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TDHH07S102	4,06	7,04	1,19	0,18	2,41	—	○	○	○	○	○	○	○	○	○	○	○
TDHH07S102L	4,06	7,04	1,19	0,18	2,41	4,52	○	○	○	○	○	○	○	○	○	○	○
TDHH07S102R	4,06	7,04	1,19	0,18	2,41	4,52	○	○	○	○	○	○	○	○	○	○	○
TDHH07S104L	4,06	7,04	1,19	0,38	2,41	4,36	○	○	○	○	○	○	○	○	○	○	○
TDHH07S104R	4,06	7,04	1,19	0,38	2,41	4,36	○	○	○	○	○	○	○	○	○	○	○
TDHH07S104	4,06	7,18	1,19	0,38	2,41	—	○	○	○	○	○	○	○	○	○	○	○

NOTE: Max DOC only applies to tipped inserts, which are designated with an "M" at the end of the catalogue number.







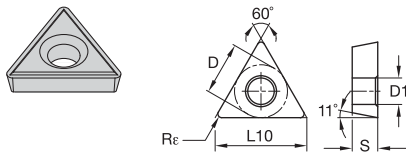


● first choice  
○ alternate choice

P	M	K	N	S	H	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

## TPHH

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPHH110202	6,35	11,00	2,38	0,18	3,30				2823914							
TPHH110204	6,35	11,00	2,38	0,38	3,30				2823858							
TPCH110204	6,50	11,26	2,38	0,38	3,30						2823851					



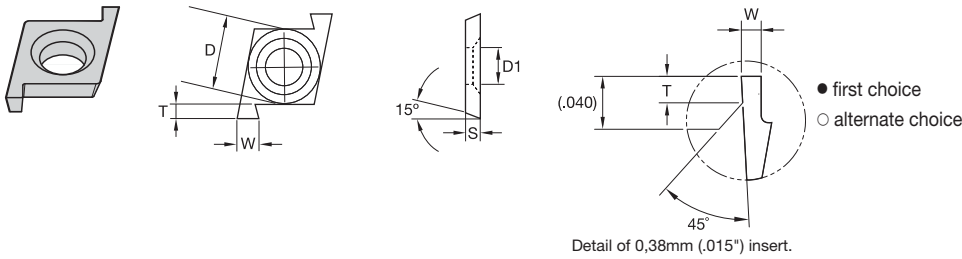
## TPHH-LF

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPHH160304	9,53	16,50	3,18	0,40	3,33				2821070							
TPHH160304LF	9,53	16,50	3,18	0,40	3,33		2821718									
TPHH160308	9,53	16,50	3,18	0,79	3,33						2821670		2821688			
TPHH160308	9,53	16,50	3,18	0,79	3,33				2821067							
TPHH17T309LF	9,80	16,98	3,97	0,94	3,33				2821319							

Tools for Small Hole Boring

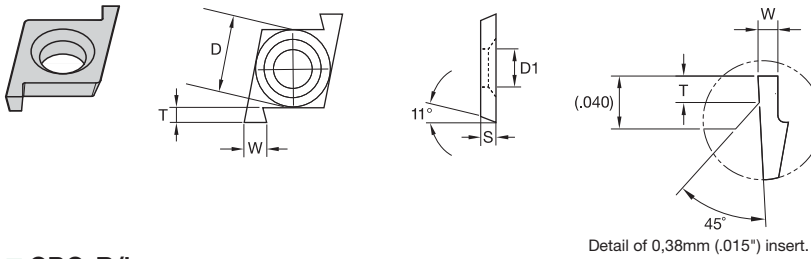






**CDG-R/L**

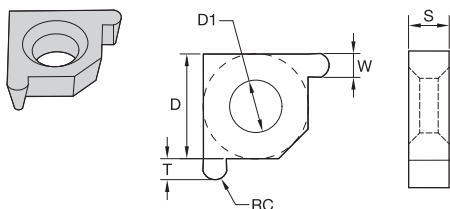
ISO catalogue number	D	S	T	W	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
<b>right hand</b>																
CDG50252R	3,97	1,27	1,02	0,64	2,13				2830541							
CDG50302R	3,97	1,27	1,02	0,76	2,13				2830529			2830535				



**CPG-R/L**

ISO catalogue number	D	S	T	W	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
<b>right hand</b>																
CPG2032R	6,35	1,91	1,65	0,76	2,79				2824546							
CPG2062R	6,35	1,91	1,65	1,52	2,79				2824531							

Tools for Small Hole Boring

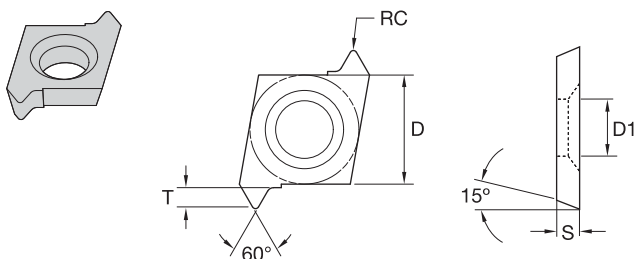


● first choice  
○ alternate choice

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

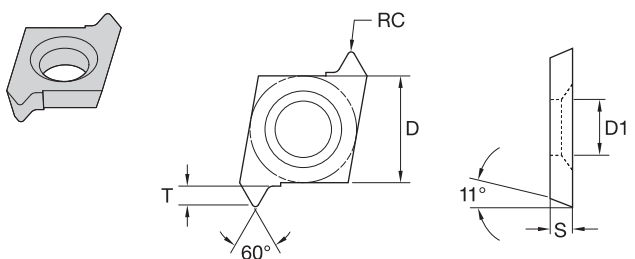
**FNR-R/L**

ISO catalogue number	D	S	T	W	RC	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																	
FNR150472R	5,00	1,85	1,00	1,20	0,60	2,50	○	○	○	●	○	○	○	○	○	○	○



**CDT-R/L**

ISO catalogue number	D	S	T	RC	D1	TPI min	TPI max	TP min	TP max	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																				
CDT50022R	3,97	1,27	0,76	0,05	2,11	24	48	0,5	1,0	○	○	○	●	○	○	○	○	○	○	○



**CPT-R/L**

ISO catalogue number	D	S	T	RC	D1	TPI min	TPI max	TP min	TP max	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																				
CPT20052R	6,35	1,91	1,65	0,13	2,79	10	24	1,0	2,5	○	○	○	○	○	○	○	○	○	○	○

Tools for Small Hole Boring





WIDIA-CIRCLE™ catalogue number	New ISO catalogue number
CDCD	CDHB
CDCG	CDHH
CDCT	CDHH
CPCA	CPHB
CPCM	CPHH
GCCD	GCHW
GCCT	GCHT
GPCD	GPHW
GPCT	GPHT
TD6P	TPHB
TDAB	TDHB
TDAT	TDHH
TDCG	TDHH
TPCB	TPHB
TPCG	TPHH
TPCH	TPHH
TPGH	TPHH
TPMT	TPMT
WPGT	WPHT



**■ Insert Screws**

order number	ISO catalogue number	Torx/hex	internal thread
2840098	MSM46	2 mm	M4X0.7
2840186	AS832/AS-8-32	5/64	#8-32
2892513	BS832	5/64	—
2820981	LTM16	T5	M2X0.4
2832647	CC11	T6	#1-72
2832635	CT11	T6	#1-72
2830477	FC11	T7	—
2828337	GT21	T7	#2-56
2825941	QTM20	T7	M2.5X0.45
2825948	QTM26	T7	M2.5X0.45
2826005	QC15	T8	#3-48
2826038	QC21	T9	#4-40
2823227	SC30	T10	#4-40
2823203	STM31	T15	M3.5 X 0.6
2832641	CT15	T16	#1-72

**■ Wrenches**

order number	ISO catalogue number	Torx/hex
2840094	MKEY	2.0 mm
2840174	AKEY	5/64
2828318	GTKEY	T5
2832628	CKEY	T6
2830492	FKEY	T7
2825973	Q8KEY	T8
2825982	QKEY	T9
2823182	SKEY	T10

**■ Drive Bits**

order number	ISO catalogue number	Torx/hex
2840089	MBIT	2 mm
2832661	CBIT	T6
2830497	FBIT	T7
2825963	QTBIT	T7
2825964	Q8BIT	T8
2826045	QBIT	T9
2823236	SBIT	T10
2823196	STBIT	T15

**■ Wedges**

order number	ISO catalogue number
2840192	AW250/AW-250
2836024	BW312

## A/B Series Small Hole Tooling

Available in steel and carbide shanks, the WIDIA™ line of micro boring bars is an excellent, economical choice for a wide range of applications — from creating small holes in small parts to precision micro boring typically found in large workpieces — manufactured in the aerospace, heavy equipment, and automotive industries.

# A/B Series



### A/B Series Micro Boring Bar

#### Features

- 1,56–3,96mm diameter boring range.
- Unique locking system enables quick, accurate insert changes.
- Insert repeatability guaranteed within  $\pm 0,013$ mm.

#### Benefits

- Quick, accurate insert setups.
- Available in multiple styles for machining a wide range of materials.
- Elliptical, ground insert shanks for maximum strength and rigidity.

#### ABD Type

Replaceable boring insert with coolant slot.



#### ABD Type

Replaceable boring insert available in coated and uncoated carbide, CBN, and PCD tip. A series has a coolant slot.



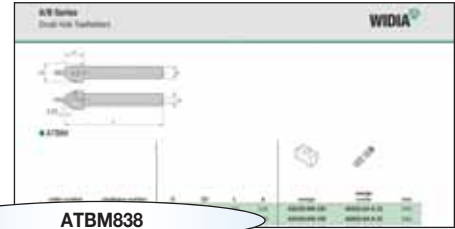
#### BB Type

Replaceable boring insert.



## A/B Series Boring Bar Identification System

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



ATBM838

**AT**

Series Style and Bar Type  
*Construction Features  
of the Boring Bar*

**AT** = Through Coolant

**BS** = No Coolant

**B**

Boring  
Bar

**M**

Type

**M** = Metric

**8**

Shank Diameter  
*shown as "D"*

**Metric**

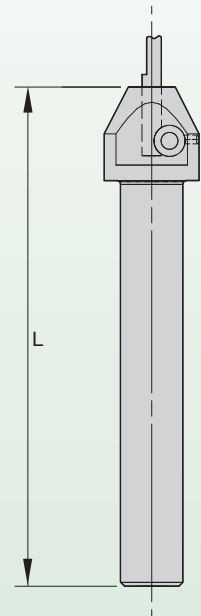
- 8** = 8,00mm
- 10** = 10,00mm
- 12** = 12,00mm
- 16** = 16,00mm
- 20** = 20,00mm

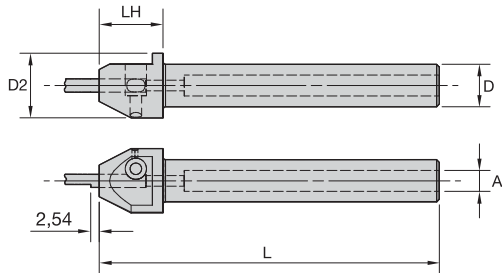
**38**

Length  
*shown as "L"*

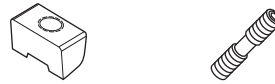
**Metric**

- 38** = 38,0mm
- 100** = 100,0mm
- 102** = 102,0mm
- 152** = 152,0mm



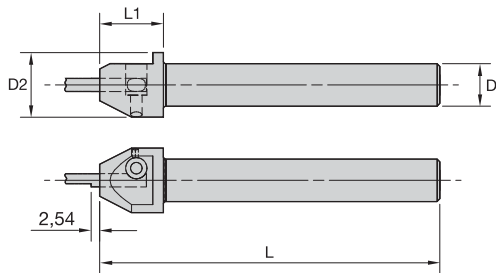


■ **ATBM**



order number	catalogue number	D	D2	L	A	wedge	wedge screw	hex
3896121	ATBM12100	12,00	19,30	102	6,35	AW250/AW-250	AS832/AS-8-32	5/64
2839192	ATBM1638	16,00	19,30	38	6,35	AW250/AW-250	AS832/AS-8-32	5/64
3896193	ATBM16100	16,00	19,30	102	6,35	AW250/AW-250	AS832/AS-8-32	5/64
3896194	ATBM20102	20,00	19,30	102	6,35	AW250/AW-250	AS832/AS-8-32	5/64
3896195	ATBM25102	25,00	19,30	102	6,35	AW250/AW-250	AS832/AS-8-32	5/64

NOTE: These tools will accept any A-Series solid carbide insert (ABD, ABD-M, AGD, APD, and ATD).

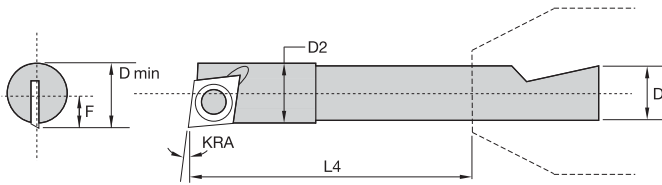


■ **BSBM**



order number	catalogue number	D	D2	L	L1	wedge	wedge screw	hex
3896196	BSBM20152	20,00	25,65	152	29	BW312	BS832	5/64

NOTE: These tools will accept any B-Series solid carbide insert (BB and BP).



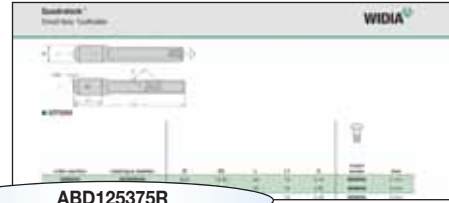
■ ABC



order number	catalogue number	KRA	D	D min	D2	F	L4	gage insert	insert screw	Torx
<b>right hand</b>										
2836656	ABC1000R	-7	3,96	4,57	4,16	2,41	25,40	CD..120605	CC09	T6
2836651	ABC1250R	-7	3,96	4,57	4,16	2,41	31,75	CD..120605	CC09	T6
2836645	ABC1500R	-7	3,96	4,57	4,16	2,41	38,10	CD..120605	CC09	T6
2836667	ABC500R	-7	3,96	4,57	4,16	2,41	12,70	CD..120605	CC09	T6
2836660	ABC750R	-7	3,96	4,57	4,16	2,41	19,05	CD..120605	CC09	T6

Tools for Small Hole Boring

## A/B Series Boring Bar Identification System



ABD125375R

### ABD

Insert Style

**A Series = Through Coolant**

- ABC** = Indexable Boring
- ABD** = Boring
- AGD** = Grooving
- APD** = Profiling
- ATD** = Threading

**B Series = Without Coolant**

- BB** = Boring
- BP** = Profiling

### 125

Minimum Bore  
*shown as "D min"*

**A Series**

- 06** = 1,58mm
- 09** = 2,39mm
- 125** = 3,18mm
- 156** = 3,96mm

**(AGD style only)**

- 095** = 2,79mm
- 125** = 3,56mm
- 156** = 4,45mm

**(ATD style only)**

- 095** = 2,79mm
- 125** = 3,56mm
- 156** = 4,45mm

**B Series**

- 187** = 4,75mm
- 250** = 6,35mm
- 312** = 7,93mm

### 375

Bore Depth, Groove Width,  
Flat on Thread  
*shown as "L4, W"*

**Bore Depth**

- 187** = 4,75mm
- 281** = 7,14mm
- 312** = 7,93mm
- 375** = 9,53mm
- 500** = 12,70mm
- 600** = 15,24mm
- 625** = 15,88mm
- 750** = 19,05mm
- 825** = 20,96mm
- 875** = 22,23mm
- 1000** = 25,40mm
- 1250** = 31,75mm
- 1500** = 38,10mm
- 1750** = 44,45mm
- 2125** = 53,98mm

**A Series**

**Groove Width  
(AGD style only)**

- 03** = 0,76mm
- 04** = 1,02mm
- 05** = 1,27mm

**Thread  
(ATD style only)**

- F2** = 0,05mm  
Flat on thread

### R

Hand  
of Tool

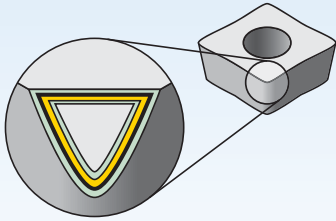
**R** =  
Right hand

**L** =  
Left hand

Tip Style  
*(optional)*

**Symbol  
M**

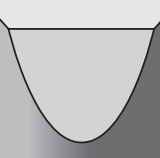
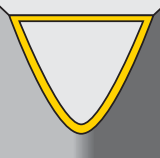
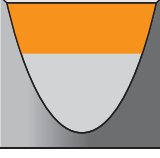
**Usage  
Mini tip**



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

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

wear resistance ← → toughness

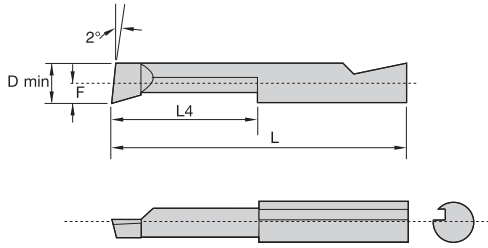
Coating		Grade Description		05	10	15	20	25	30	35	40	45		
<b>CM1</b>		Uncoated carbide. A very tough, ultra-fine grain unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates. Use when C2, C3, or C25 fail due to chipping or breaking.	<b>P</b>											
			<b>M</b>											
			<b>K</b>											
			<b>N</b>											
			<b>S</b>											
<b>CG5</b>		A PVD-TiN-coated grade. Straight 9.5% Co substrate. Submicron grain. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates.	<b>P</b>											
			<b>M</b>											
			<b>K</b>											
			<b>N</b>											
			<b>S</b>											
<b>CBN6</b>		PcBN tip brazed onto a carbide insert. Recommended for machining hardened steel (45–65 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburised and nitrided irons, and some hard coatings. Can be run both dry and wet.												
			<b>H</b>											





Material Group		Cutting Speed – vc m/min								
		CG5			CM1			CBN6		
		min	Start	max	min	Start	max	min	Start	max
P	ap [mm]	0,025	-	0,200	0,025	-	0,203	-	-	-
	f [mm/rev]	0,013	-	0,178	0,013	-	0,178	-	-	-
	0/1	95	<b>120</b>	145	55	<b>70</b>	85	-	-	-
	2	65	<b>80</b>	90	40	<b>45</b>	55	-	-	-
	3	65	<b>80</b>	90	40	<b>45</b>	55	-	-	-
	4	50	<b>60</b>	75	30	<b>35</b>	45	-	-	-
	5	65	<b>80</b>	95	40	<b>45</b>	55	-	-	-
6	45	<b>55</b>	65	25	<b>30</b>	40	-	-	-	
M	ap [mm]	0,025	-	0,200	0,025	-	0,200	-	-	-
	f [mm/rev]	0,013	-	0,178	0,013	-	0,178	-	-	-
	1	75	<b>95</b>	110	55	<b>70</b>	85	-	-	-
	2	70	<b>85</b>	100	50	<b>65</b>	75	-	-	-
K	ap [mm]	0,001	-	0,010	0,001	-	0,010	-	-	-
	f [mm/rev]	0,0005	-	0,007	0,0005	-	0,007	-	-	-
	1	65	<b>80</b>	95	50	<b>60</b>	75	-	-	-
	2	80	<b>95</b>	115	60	<b>75</b>	90	-	-	-
N	ap [mm]	0,025	-	0,640	0,025	-	0,640	-	-	-
	f [mm/rev]	0,013	-	0,178	0,013	-	0,178	-	-	-
	1	405	<b>505</b>	605	405	<b>505</b>	605	-	-	-
	2	300	<b>370</b>	445	300	<b>370</b>	445	-	-	-
	3	75	<b>95</b>	110	70	<b>90</b>	105	-	-	-
	4	140	<b>175</b>	210	105	<b>125</b>	155	-	-	-
	5	100	<b>125</b>	150	80	<b>100</b>	120	-	-	-
	6	100	<b>125</b>	150	80	<b>100</b>	120	-	-	-
S	ap [mm]	0,025	-	0,200	0,025	-	0,200	-	-	-
	f [mm/rev]	0,013	-	0,178	0,013	-	0,178	-	-	-
	1	30	<b>35</b>	40	55	<b>70</b>	85	-	-	-
	2	20	<b>30</b>	35	45	<b>55</b>	65	-	-	-
	3	35	<b>40</b>	50	30	<b>35</b>	45	-	-	-
H	ap [mm]	-	-	-	-	-	-	0,025	-	0,200
	f [mm/rev]	-	-	-	-	-	-	0,0005	-	0,004
	1	-	-	-	-	-	-	110	<b>140</b>	165
	2	-	-	-	-	-	-	105	<b>130</b>	155
	3	-	-	-	-	-	-	100	<b>125</b>	150
4	-	-	-	-	-	-	100	<b>125</b>	150	

NOTE: Speed and feed rates and depth of cut may vary depending on materials and machining conditions including, but not limited to, tool overhang, tool size, and finished surface requirements.

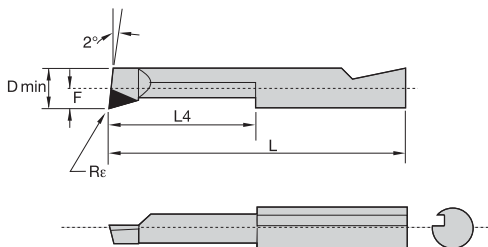


● first choice  
○ alternate choice

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M	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

■ **ABD**

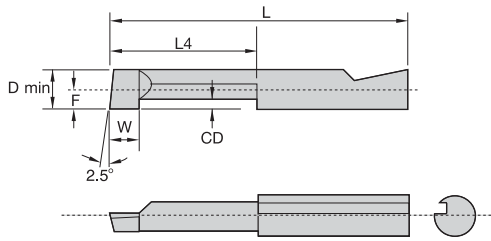
ISO catalogue number	D min	L4	L	F	CG5	CM1	CBN6
<b>right hand</b>							
ABD06187R	1,58	5,41	21,92	0,66	2836639	2836632	
ABD06312R	1,58	7,93	24,44	0,66	2836627	2836621	
ABD09281R	2,39	7,14	23,65	1,04	2836614	2836608	
ABD09500R	2,39	12,70	29,21	1,04	2836604	2836599	
ABD125375R	3,18	9,53	26,04	1,45	2836593	2836588	
ABD125625R	3,18	15,88	32,39	1,45	2836582	2836579	
ABD156500R	3,96	12,70	29,21	1,85	2836573		
ABD156875R	3,96	22,23	38,74	1,85	2836561		



■ **ABD-M**

ISO catalogue number	D min	L4	L	F	Rε	CG5	CM1	CBN6
<b>right hand</b>								
ABD156875RM	3,96	22,23	38,74	1W,85	0,18			2836679

Tools for Small Hole Boring

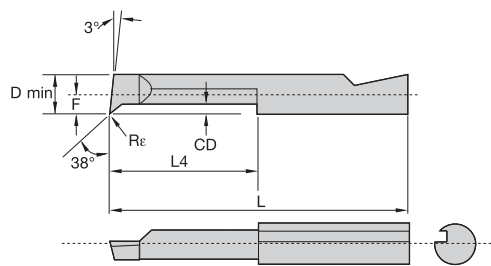


● first choice  
○ alternate choice

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M	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

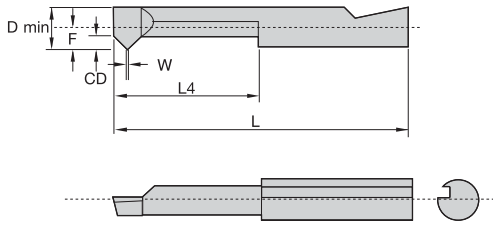
■ AGD

ISO catalogue number	D min	L4	L	F	CD	W	CG5	CM1	CBN6
right hand									
AGD09503	2,79	7,93	24,44	1,17	0,76	0,76	2836550	2836545	-
AGD12504	3,56	9,53	26,04	1,55	0,89	1,02	2836537	-	-
AGD15605	4,45	12,70	29,21	1,93	1,27	1,27	2836524	-	-



■ APD

ISO catalogue number	D min	L4	L	F	CD	Rε	CG5	CM1	CBN6
right hand									
APD06187R	1,58	4,75	21,26	0,66	0,43	0,18	2836511	-	-
APD09281R	2,39	7,14	23,65	1,07	0,71	0,18	-	2836495	-
APD125375R	3,18	9,53	26,04	1,45	1,02	0,18	2836489	-	-
APD156500R	3,96	12,70	29,21	1,85	1,27	0,18	-	2836473	-

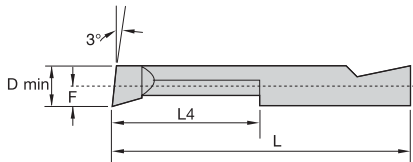


● first choice  
○ alternate choice

P	●	○
M	●	○
K	○	●
N	○	●
S	●	○
H	●	○

■ **ATD**

ISO catalogue number	D min	L4	L	F	CD	W	TP min	TP max	TPI min	TPI max	CG5	CM1	CBN6
right hand													
ATD12560F2	3,56	9,53	26,04	1,55	0,69	0,05	1,06	0,53	24	48	-	2836450	-
ATD15660F2	4,45	12,70	29,21	1,93	0,81	0,05	1,27	0,53	20	48	2836443	2836436	-

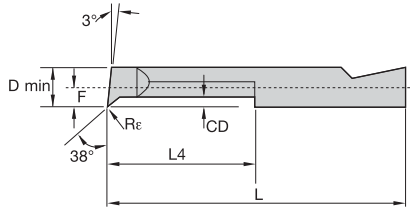


■ **BB**

ISO catalogue number	D min	L4	L	F	CG5	CM1	CBN6
right hand							
BB187750R	4,75	19,05	45,72	2,24	2832769	-	-
BB1871250R	4,75	31,75	58,42	2,24	2832758	-	-
BB2501000R	6,35	25,40	52,07	3,05	2832747	2832742	-
BB3121250R	7,93	53,98	80,65	3,84	2832724	2832719	-



Tools for Small Hole Boring



● first choice  
○ alternate choice

P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

■ BP

Tools for Small Hole Boring

ISO catalogue number	D min	L4	L	F	CD	Rε	CG5	CM1	CBN6
right hand									
BP187600R	4,75	15,24	41,91	2,24	1,58	0,18	2832702		
BP250825R	6,35	20,96	47,63	3,05	1,98	0,18	2832689		

**■ Insert Screws**

order number	ISO catalogue number	Torx/hex	internal thread
2840098	MSM46	2 mm	M4X0.7
2840186	AS832/AS-8-32	5/64	#8-32
2892513	BS832	5/64	—
2820981	LTM16	T5	M2X0.4
2832647	CC11	T6	#1-72
2832635	CT11	T6	#1-72
2830477	FC11	T7	—
2828337	GT21	T7	#2-56
2825941	QTM20	T7	M2.5X0.45
2825948	QTM26	T7	M2.5X0.45
2826005	QC15	T8	#3-48
2826038	QC21	T9	#4-40
2823227	SC30	T10	#4-40
2823203	STM31	T15	M3.5 X 0.6
2832641	CT15	T16	#1-72

**■ Wrenches**

order number	ISO catalogue number	Torx/hex
2840094	MKEY	2.0 mm
2840174	AKEY	5/64
2828318	GTKEY	T5
2832628	CKEY	T6
2830492	FKEY	T7
2825973	Q8KEY	T8
2825982	QKEY	T9
2823182	SKEY	T10

**■ Drive Bits**

order number	ISO catalogue number	Torx/hex
2840089	MBIT	2 mm
2832661	CBIT	T6
2830497	FBIT	T7
2825963	QTBIT	T7
2825964	Q8BIT	T8
2826045	QBIT	T9
2823236	SBIT	T10
2823196	STBIT	T15

**■ Wedges**

order number	ISO catalogue number
2840192	AW250/AW-250
2836024	BW312

## Quadralock™ •

High-Precision Products for I.D. Applications

Easy access, quick-change toolholders and inserts perform multiple I.D. applications for maximum productivity with one toolholder.

The unique cutting tip of the Quadralock™ I.D. Quick-Change Tooling System can be locked in four different positions, enabling operation in both Swiss-style and conventional machines. Four quick, easy setup steps and guaranteed insert repeatability within  $\pm 0,013\text{mm}$  ensures superior performance.



# Quadralock

## Quadralock Ultra-Precision Tooling

### Features

- Fixed-limit stop for precise and repeatable cutting edge positioning.
- Tight insert seat pocket ensures secure hold.
- V-slots and limit-stop bolts for increased indexability.

### Benefits

- Internal coolant supply directly lubricates cutting edge.
- Ability to rotate tool at 90° increments.
- For all boring, grooving, profiling, and threading applications.

### Boring

Bore holes as small as 0,25mm.



### Grooving

Groove in a 2,79mm diameter hole.



### Profiling

Profile in diameters as small as 1,57mm.

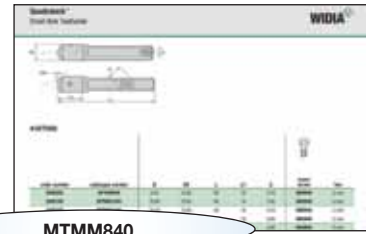


### Threading

Thread down to a No. 5; 2,54mm.



# Quadralock Boring Bar Identification System



## MTM

Quadralock Boring System

## M

Type

**M** = Metric

## 8

Shank Diameter  
*shown as "D"*

**Metric**

- 8** = 8,00mm
- 10** = 10,00mm
- 12** = 12,00mm
- 16** = 16,00mm
- 22** = 22,00mm

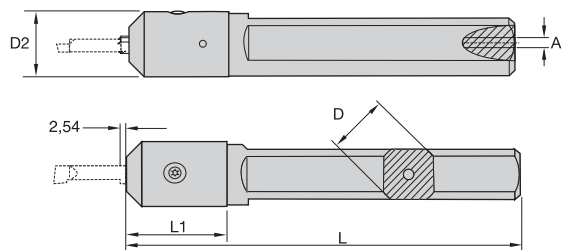
## 40

Length  
*shown as "L"*

**Metric**






- 40** = 38,10mm
- 100** = 101,60mm
- 127** = 127,00mm





■ **MTMM**

Tools for Small Hole Boring

order number	catalogue number	D	D2	L	L1	A	insert screw	hex
3896202	MTMM840	8,00	12,95	38	19	3,18		2 mm
3896198	MTMM1040	10,00	12,95	38	19	3,00		2 mm
3896200	MTMM1240	12,00	12,95	38	19	3,18		2 mm
3896199	MTMM12100	12,00	12,95	102	19	3,00		2 mm
3896201	MTMM22127	22,00	12,95	127	19	3,00		2 mm

## Easy Access to Proven Metalworking Expertise!

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

# Customer Application Support (CAS)

EXTREME **CHALLENGES.**  
EXTREME **RESULTS.**

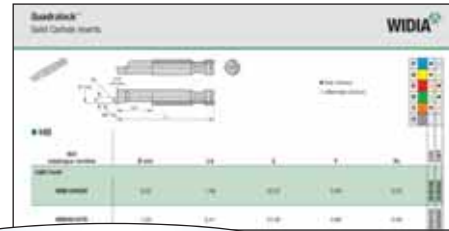
ORIGINATING COUNTRY	LANGUAGE	TEL	FAX	EMAIL
Australia	English	+61 001 724 539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
Austria	German	0800 291630	0049 911 9735 429*	eu.techsupport@widia.com
Belgium	English / French	0800 80410	0049 911 9735 429*	eu.techsupport@widia.com
China	Chinese	+86 400 889 2237	+86 21 58999985 *	w-cn.techsupport@widia.com
Denmark	English	+45 808 89295	001 724 539 6830 *	na.techsupport@widia.com
Finland	English	0800 919413	001 724 539 6830 *	na.techsupport@widia.com
France	French	+33 080 5540 379	0049 911 9735 429*	eu.techsupport@widia.com
Germany	German	0800 1015774	0911 9735 429*	eu.techsupport@widia.com
India	English	+91 001 724539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
Israel	English	+972 1809 449907	001 724 539 6830 *	na.techsupport@widia.com
Italy	Italian	800 916568	02 89512146 *	eu.techsupport@widia.com
Japan	English	+81 001 724539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
Korea (South)	English	+82 001 724539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
Malaysia	English	+60 001 724539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
Netherlands	English	0800 0201131	001 724 539 6830 *	na.techsupport@widia.com
New Zealand	English	+64 001 724539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
Norway	English	800 10081	001 724 539 6830 *	na.techsupport@widia.com
Poland	Polish	00800 4411943	06166 56504*	eu.techsupport@widia.com
Russia (landline)	Russian	+7 8800 5556395	0048 6166 56504*	eu.techsupport@widia.com
Russia (cell phone)	Russian	+7 8005556395	0048 6166 56504*	eu.techsupport@widia.com
Singapore	English	+65 001 724539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
South Africa	English	+27 0800 981644	001 724 539 6830 *	na.techsupport@widia.com
Sweden	English	+46 020798794	001 724 539 6830 *	na.techsupport@widia.com
Taiwan	English	+886 001 724539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
Thailand	English	+66 001 724539 6921 *	001 724 539 6830 *	ap.techsupport@widia.com
United Kingdom	English	+44 0800 028 2996	001 724 539 6830 *	na.techsupport@widia.com
Ukraine	Russian	+380 0800502665	0048 6166 56504*	eu.techsupport@widia.com
USA	English	888 539 5145	001 724 539 6830 *	na.techsupport@widia.com

Phone and fax numbers marked with \* are not toll free.

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Authorised Distributor or visit [widia.com/services](http://widia.com/services).

**WIDIA** 

## Quadralock Boring Bar Insert Identification System

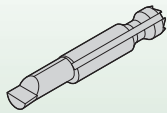


MB125625R

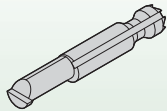
### MB

Insert Style

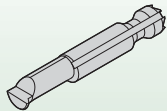
**MB** = Boring



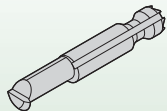
**MG** = Grooving



**MP** = Profiling



**MT** = Threading



### 125

Minimum Bore  
shown as "D min"

**Metric**

010	=	0,25mm
030	=	0,76mm
062	=	1,58mm
094	=	2,39mm
125	=	3,18mm
156	=	3,96mm

(for MG and MT style only)

095	=	2,79mm
125	=	3,56mm
156	=	4,45mm

### 625

Bore Depth, Groove Width,  
Flat on Thread  
shown as "L4, W"

**Metric**

**Bore Depth**

062	=	1,58mm
187	=	4,75mm
281	=	7,14mm
312	=	7,93mm
375	=	9,53mm
500	=	12,70mm
625	=	15,88mm
875	=	22,23mm

**Groove Width  
(for MG style only)**

030	=	0,76mm
040	=	1,02mm
050	=	1,27mm

**Thread  
(for MT style only)**

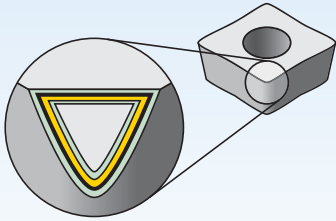
60F2	=	0,05mm
------	---	--------

Flat on 60° thread

### R

Hand  
of Tool

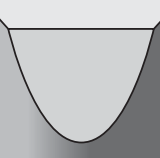
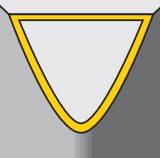
**R** =  
Right hand  
  
**L** =  
Left hand



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

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

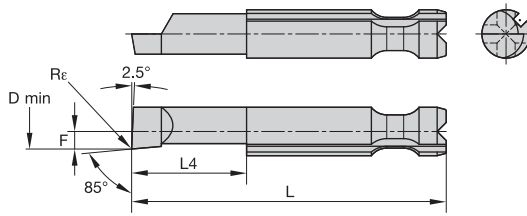
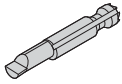
wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45		
Grade	 <b>CM1</b> <b>HW-S25</b>	Uncoated carbide. A very tough, ultra-fine grain unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates. Use when C2, C3, or C25 fail due to chipping or breaking.	<b>P</b>											
			<b>M</b>											
			<b>K</b>											
			<b>N</b>											
			<b>S</b>											
			<b>H</b>											
Grade	 <b>CG5</b> <b>HC-S25</b>	A PVD-TiN-coated grade. Straight 9.5% Co substrate. Submicron grain. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Performs best at low speeds and will handle interruptions and high feed rates.	<b>P</b>											
			<b>M</b>											
			<b>K</b>											
			<b>N</b>											
			<b>S</b>											
			<b>H</b>											



Material Group		Cutting Speed – vc m/min					
		CG5			CM1		
		min	Start	max	min	Start	max
P	ap [mm]	.001	-	.008	.001	-	.008
	f [mm/rev]	.0005	-	.007	.0005	-	.007
	0/1	105	130	155	65	80	100
	2	70	90	105	45	55	65
	3	70	90	105	45	55	65
	4	55	70	85	40	45	55
	5	70	90	105	45	55	70
M	6	50	60	70	35	40	45
	ap [mm]	.001	-	.008	.001	-	.008
	f [mm/rev]	.0005	-	.007	.0005	-	.007
	1	75	95	110	55	70	85
K	2	70	85	100	50	65	75
	3	55	65	80	40	50	55
	ap [mm]	.001	-	.010	.001	-	.010
	f [mm/rev]	.0005	-	.007	.0005	-	.007
N	1	65	80	95	50	60	75
	2	80	95	115	60	75	90
	3	55	70	85	45	55	65
	ap [mm]	.001	-	.025	.001	-	.025
	f [mm/rev]	.0005	-	.007	.0005	-	.007
	1	405	505	605	405	505	605
	2	300	370	445	300	370	445
	3	75	95	110	70	90	105
S	4	140	175	210	105	125	155
	5	100	125	150	80	100	120
	6	100	125	150	80	100	120
	7	240	300	360	240	300	360
	ap [mm]	.001	-	.008	.001	-	.008
H	f [mm/rev]	.001	-	.007	.001	-	.007
	1	30	35	40	55	70	85
	2	20	30	35	45	55	65
	3	35	40	50	30	35	45
	4	-	-	-	-	-	-
H	ap [mm]	-	-	-	-	-	-
	f [mm/rev]	-	-	-	-	-	-
	1	-	-	-	-	-	-
	2	-	-	-	-	-	-
	3	-	-	-	-	-	-
4	-	-	-	-	-	-	

NOTE: Speed and feed rates and depth of cut may vary depending on materials and machining conditions including, but not limited to, tool overhang, tool size, and finished surface requirements.



● first choice  
○ alternate choice

P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
N	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

■ MB

ISO catalogue number	D min	L4	L	F	Re	CG5	CM1
<b>right hand</b>							
MB010062R	0,25	1,58	20,57	0,09	0,03	2836098	2836085
MB062187R	1,58	5,41	21,92	0,66	0,05	2836423	3885985
MB062312R	1,58	7,93	24,44	0,66	0,05	2836418	2836263
MB094281R	2,39	7,14	23,65	1,04	0,05	2836405	3657732
MB094500R	2,39	12,70	29,21	1,04	0,05	2836251	2836240
MB125625R	3,18	15,88	32,39	1,45	0,10	2836388	2836240
MB156500R	3,96	12,70	29,21	1,85	0,10	3885997	2836229
MB156875R	3,96	22,23	38,74	1,85	0,10	2836229	

(continued)



(MB – continued)

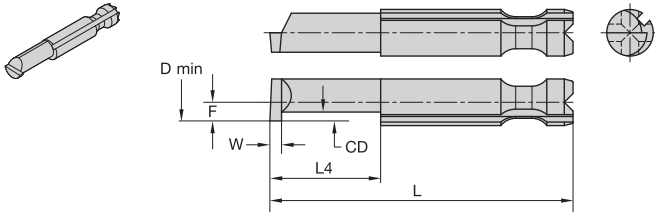
● first choice  
○ alternate choice

P	●	○
M	●	○
K	○	●
N	○	●
S	●	○
H		

Tools for Small Hole Boring

ISO catalogue number	D min	L4	L	F	R <sub>ε</sub>	CG5	CM1
MB010062L	0,25	1,58	20,57	0,09	0,03	3885960	3885959
MB030187L	0,76	4,75	21,26	0,34	0,03	3885961	3885962
MB062187L	1,58	5,41	21,92	0,66	0,05	3885983	3885984
MB062312L	1,58	7,93	24,44	0,66	0,05	3885986	3885987
MB094281L	2,39	7,14	23,65	1,04	0,05	3885989	3885990
MB094500L	2,39	12,70	29,21	1,04	0,05	3885992	3885991
MB125375L	3,18	9,53	26,04	1,45	0,10	3885993	3885994
MB125625L	3,18	15,88	32,39	1,45	0,10	3885994	3885995
MB156500L	3,96	12,70	29,21	1,85	0,10	3027643	3885996
MB156875L	3,96	22,23	38,74	1,85	0,10	3885996	3885999

NOTE: Actual bore depth for MB062187R and MB062187L equals 5,41mm.  
ANSI Catalogue Number MB062187R and ANSI Catalogue Number MB062187L have an actual bore depth of .213".



● first choice  
○ alternate choice

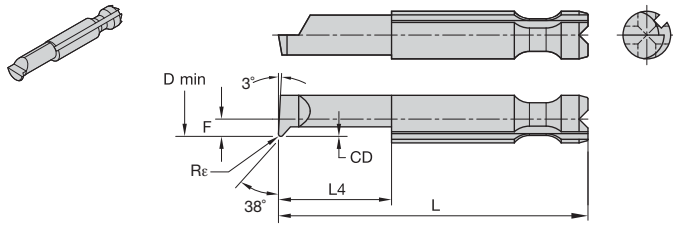
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N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>

■ MG

ISO catalogue number	D min	L4	L	F	CD	W	CG5	CM1
<b>right hand</b>								
MG095030R	2,79	7,93	24,44	1,17	0,76	0,76	-	2836223
MG125040R	3,56	9,53	26,04	1,55	0,89	1,02	3897442	-
MG156050R	4,45	12,70	29,21	1,93	1,27	1,27	-	2836210
<b>left hand</b>								
MG095030L	2,79	7,93	24,44	1,17	0,76	0,76	3886000	3886001
MG125040L	3,56	9,53	26,04	1,55	0,89	1,02	3886002	3886003
MG156050L	4,45	12,70	29,21	1,93	1,27	1,27	3897483	3897484







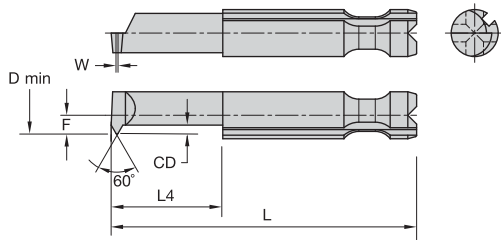
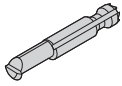
● first choice  
○ alternate choice

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M	<input checked="" type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input checked="" type="checkbox"/>
N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>

■ MP

Tools for Small Hole Boring

ISO catalogue number	D min	L4	L	F	CD	Re	CG5	CM1
<b>right hand</b>								
MP062187R	1,58	4,75	21,26	0,66	0,43	0,10	2836357	-
MP094281R	2,39	7,14	23,65	1,07	0,71	0,10	2836351 2836345	3897488 3897488
MP125375R	3,18	9,53	26,04	1,45	1,02	0,20	2836345 2836190	2836184 2836184
MP156500R	3,96	12,70	29,21	1,85	1,27	0,20	2836339 2836184	2836184 2836184
<b>left hand</b>								
MP062187L	1,58	4,75	21,26	0,66	0,43	0,10	-	3897486 3897486
MP094281L	2,39	7,14	23,65	1,07	0,71	0,10	3644074 3897487	3897487 3897487
MP125375L	3,18	9,53	26,04	1,45	1,02	0,20	-	3897490 3897490
MP156500L	3,96	12,70	29,21	1,85	1,27	0,20	3897491 3897492	3897492 3897492



■ MT

● first choice  
○ alternate choice

P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
N	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ISO catalogue number	D min	L4	L	F	CD	W	CG5	CM1
<b>right hand</b>								
MT09560F2R	2,79	7,93	24,44	1,17	0,56	0,05	I	2836180
MT12560F2R	3,56	9,53	26,04	1,55	0,69	0,05	2836328	3897497
MT15660F2R	4,45	12,70	29,21	1,93	0,81	0,05	I	2836168
<b>left hand</b>								
MT09560F2L	2,79	7,93	24,44	1,17	0,56	0,05	3897493	3897494
MT12560F2L	3,56	9,53	26,04	1,55	0,69	0,05	3897496	3897495
MT15660F2L	4,45	12,70	29,21	1,93	0,81	0,05	3897498	3897499

Tools for Small Hole Boring

### ■ Insert Screws

order number	ISO catalogue number	Torx/hex	internal thread
2840098	MSM46	2 mm	M4X0.7
2840186	AS832/AS-8-32	5/64	#8-32
2892513	BS832	5/64	—
2820981	LTM16	T5	M2X0.4
2832647	CC11	T6	#1-72
2832635	CT11	T6	#1-72
2830477	FC11	T7	—
2828337	GT21	T7	#2-56
2825941	QTM20	T7	M2.5X0.45
2825948	QTM26	T7	M2.5X0.45
2826005	QC15	T8	#3-48
2826038	QC21	T9	#4-40
2823227	SC30	T10	#4-40
2823203	STM31	T15	M3.5 X 0.6
2832641	CT15	T16	#1-72

### ■ Wrenches

order number	ISO catalogue number	Torx/hex
2840094	MKEY	2.0 mm
2840174	AKEY	5/64
2828318	GTKEY	T5
2832628	CKEY	T6
2830492	FKEY	T7
2825973	Q8KEY	T8
2825982	QKEY	T9
2823182	SKEY	T10

### ■ Drive Bits

order number	ISO catalogue number	Torx/hex
2840089	MBIT	2 mm
2832661	CBIT	T6
2830497	FBIT	T7
2825963	QTBIT	T7
2825964	Q8BIT	T8
2826045	QBIT	T9
2823236	SBIT	T10
2823196	STBIT	T15

### ■ Wedges

order number	ISO catalogue number
2840192	AW250/AW-250
2836024	BW312

# WMT™ System



EXTREME **CHALLENGES.**  
EXTREME **RESULTS.**

The WMT platform is the economical and reliable option for all your grooving, cut-off, turning, and profiling applications. Trust the WMT system to ensure precise insert positioning and provide only the most accurate machining with exceptionally fast cycle times and superior performance.

## **Versatile and Well-Constructed**

- Specifically designed to increase speeds and feeds.
- Excellent geometry for even your most demanding deep grooving applications.
- The WMT system enables heavy stock removal in turning applications.
- Ensures finer surface finishes and a long, reliable tool life.

## **WMT Toolholders**

- Outstanding system rigidity and clamping capabilities.
- Guarantees fast cycle times and limited turret indexes.
- Precise insert positioning for accurate machining.
- Double-V shape means operator-friendly insert indexing and optimum insert positioning.
- Choice of integral or modular holders.

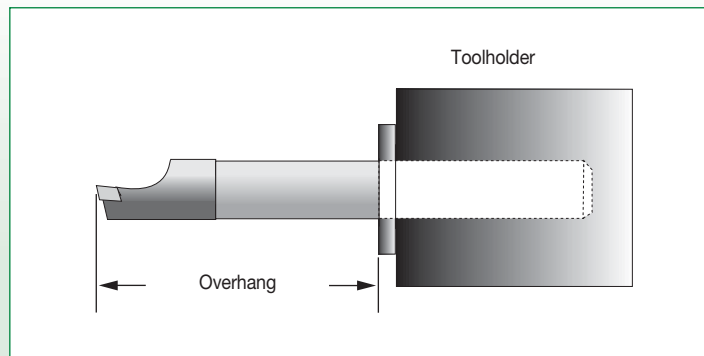
To learn more, contact your local Authorised Distributor or visit [widia.com](http://widia.com).

**WIDIA** 

## Setup Recommendations for Bar Overhang

WIDIA-CIRCLE™ cutting tools are the finest quality boring, grooving, profiling, and threading tools available. For more than 50 years, WIDIA-CIRCLE has been the industry leader in solving small-diameter hole machining problems in major manufacturing plants worldwide.

A common problem associated with any cutting tool is extending the tool beyond its support point. This condition of excessive overhang can cause chatter, poor finishes, or inadequate tool life.



We recommend a 4:1 ratio (4 times bar diameter) overhang when using steel shank bars and up to a 10:1 (10 times bar diameter) overhang when using carbide shank bars. The overhang ratios are affected by many factors:

- Type(s) of material(s) being machined.
- Depth of cut(s).
- Feed rate(s).

Recommended conditions may still be unsatisfactory because of chatter. Chatter can be induced by non-rigid setups or harmonics from the machine or machining conditions. In many cases, changing the RPM of the machine can reduce chatter.

shank diameter (mm)	steel shank ratio 4:1 (mm)	carbide shank ratio 10:1 (mm)
4,00mm	16,00mm	40,00mm
5,00mm	20,00mm	50,00mm
6,00mm	24,00mm	60,00mm
8,00mm	32,00mm	80,00mm
10,00mm	40,00mm	100,00mm
12,00mm	48,00mm	120,00mm
16,00mm	64,00mm	160,00mm
20,00mm	80,00mm	200,00mm
25,00mm	100,00mm	250,00mm
32,00mm	128,00mm	320,00mm

### Setup Information and Recommendations

**Tool “D” (above centreline)**

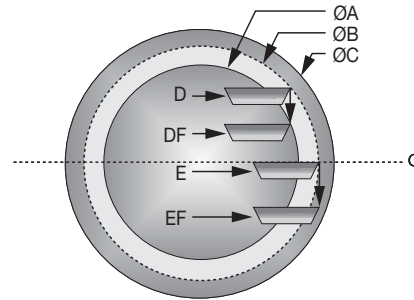
Set  $\varnothing B$  is deflected to position “DF,” relieving the load by deflecting to a smaller bore,  $\varnothing A$ . Tool “D” cannot “dig in” because the cut (load) becomes lighter as it deflects.

**Tool “E” (on centreline or below)**

Set  $\varnothing B$  “digs in” and is deflected toward position “EF” and bore  $\varnothing C$ . The larger the load, the larger the deflection.

**Tip of the Insert**

This enables the end user to hold closer tolerances, produce a better finish, and avoid chatter.

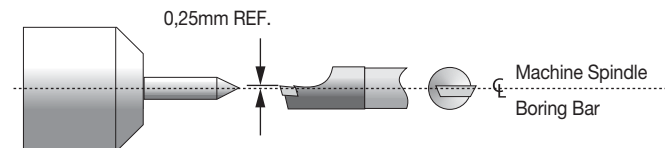


Built-in geometries of WIDIA-CIRCLE™ precision boring bars are based on the concept that the boring bar shank will always be positioned on the machine spindle centreline. The cutting point will be slightly high (against direction of rotation) except when facing centreline or cutting on outside diameters.

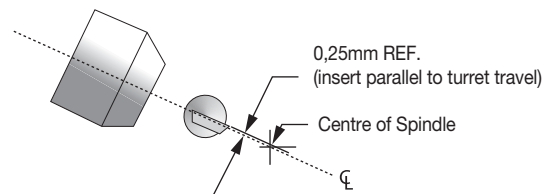
Use WIDIA-CIRCLE precision setup level or:

1. Use centre height gage and position insert as shown in illustration.
2. If centre point is unavailable, mark the centre of the bar stock with a centring punch or square. Position the insert as shown in illustration.
3. Lay a straight edge on the insert to help position the insert parallel to the travel or centreline.

*NOTE: In some cases, to help reduce chatter or taper, the insert may need to be rotated less than 0,25mm but more than 0,05mm above centre.*

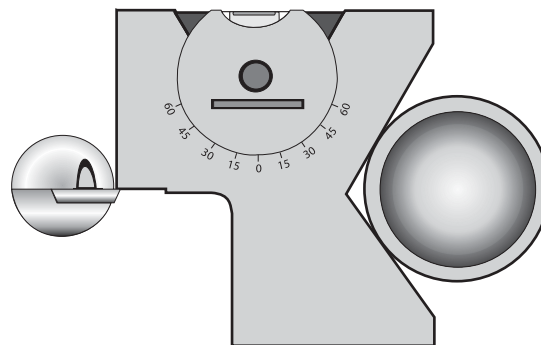


Slant Bed Machines

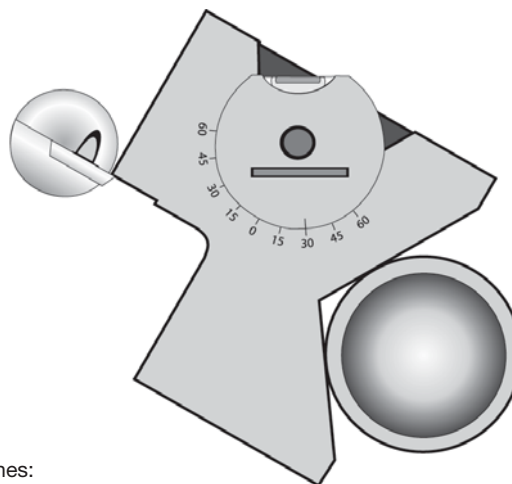




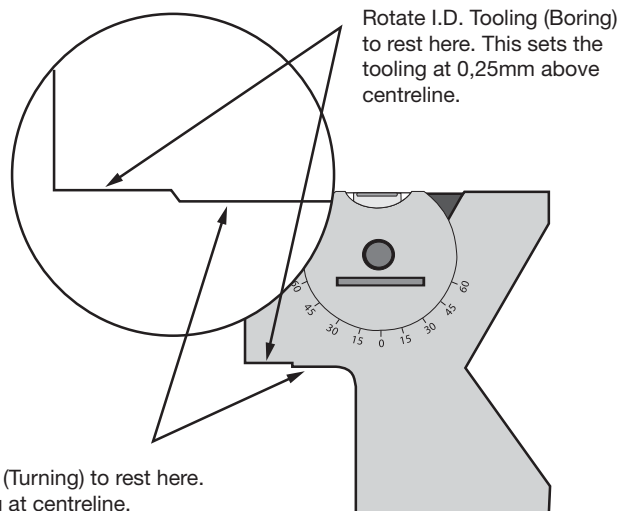
Uni-Level Precision Setup Level



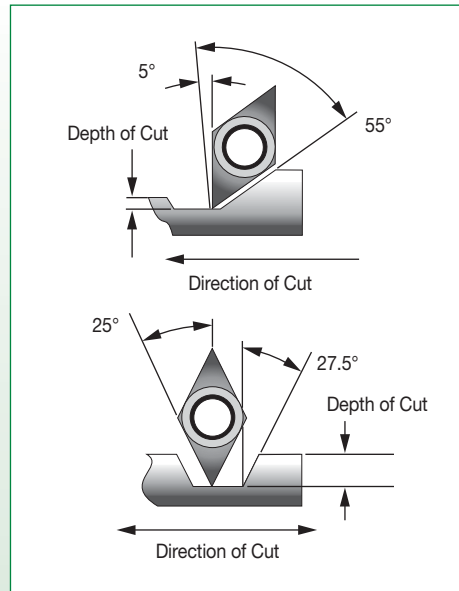
For most machines:  
Set the dial to the 0° mark.



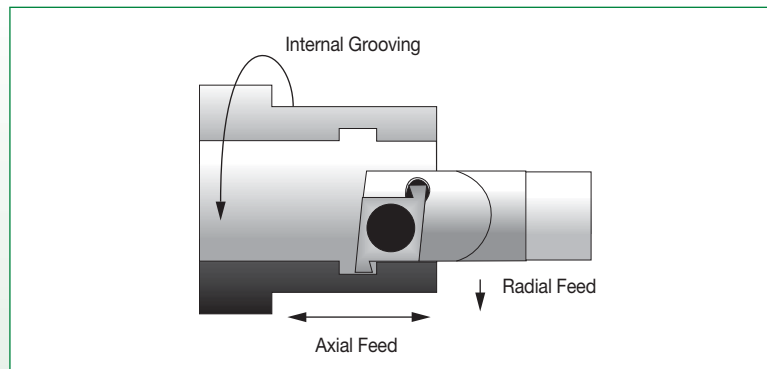
For slant bed-type machines:  
Set the dial to the degree of the bed.



**Setup Information and Recommendations for Boring and Profiling**



**Setup Information and Recommendations for Grooving**

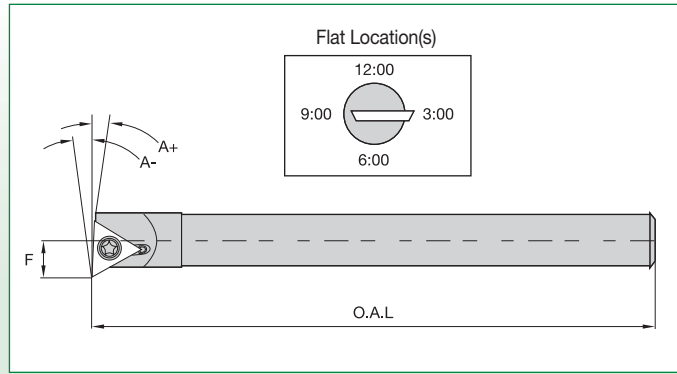


**■ CDG Indexable-Type Grooving Inserts**

safe overhang conditions:	steel ratio 4:1 (mm)	carbide ratio 10:1 (mm)
surface footage(s):	see pages D40–D41	
radial feeds:	C-Series = 0,008–0,025mm Q-Series = 0,008–0,051mm	
axial feeds:	C-Series = 0,013–0,051mm Q-Series = 0,013–0,127mm	



For more than 50 years, WIDIA-CIRCLE™ has offered the most reliable, highest-quality small hole boring bars available. Although our extensive product line covers most machining applications, we understand that a custom solution tool may be required.



### Straight Shank-Type Boring Bars

Steel or Carbide

Date

#### Customer-Specified Dimensions

- = **O.A.L. (Overall Length)** From 3x bar diameter to catalogue length.
- = **"F" Dimension** 0,254mm from basic dimension shown in catalogue triangle insert bars only.
- = **"A" Dimension** +10° to -10° triangle insert bars only.
- = **Flat Location(s)** 1 Flat — no charge (see illustration above).

**Special Instructions**  
(please make any necessary notes or sketches in the box at right)

**Closest Catalogue Standard**

**Customer**

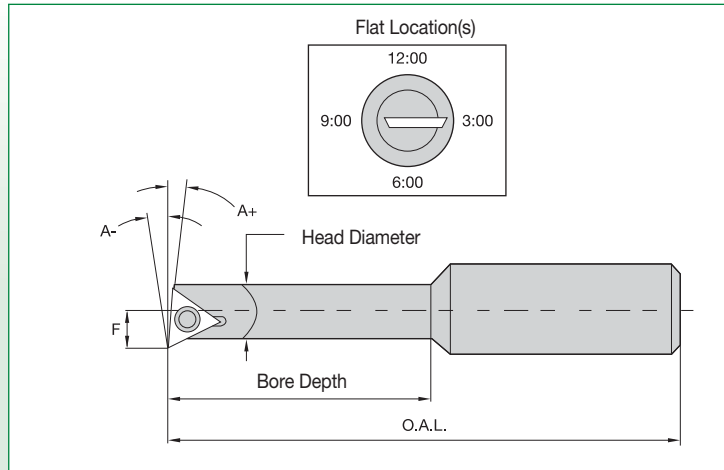
**Distributor**

**Shipping Requirements**

Ground       Next Day Air       2nd Day Air       3rd Day Air

*Attention Distributors: Use this worksheet to collect information for your customer.*

Use this worksheet to modify any of our existing products to meet your own specifications. If your special requirements do not fit any of these categories, contact us directly.



### Step-Down Shank-Type Boring Bars

Steel or Carbide

Date

#### Customer-Specified Dimensions

- = **Bore Depth** 19,05mm to 6x diameter steel; 19,05mm to 10x diameter carbide.
- = **O.A.L. (Overall Length)** Steel; smaller than O.A.L. listed in catalogue carbide, bore depth, and standard sleeve length.
- = **"F" Dimension** 0,254mm from basic dimension shown in catalogue triangle insert bars only.
- = **"A" Dimension** +10° to -10° triangle insert bars only.
- = **Flat Location(s)** 1 Flat — no charge (see illustration above).

**Special Instructions**  
(please make any necessary notes or sketches in the box at right)

**Closest Catalogue Standard**

**Customer**

**Distributor**


**Shipping Requirements**

Ground
  Next Day Air
  2nd Day Air
  3rd Day Air

*Attention Distributors: Use this worksheet to collect information for your customer.*

# NOVO KNOWS

## ART TO PART TO PROFIT



Being as productive and profitable as possible is your fundamental goal. With the addition of NOVO™ to your team, your goal can be achieved. NOVO possesses powerful digital tools that link together process planning, inventory availability and purchase, cost-per-part management, and productivity improvements.

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

[widia.com/novo](http://widia.com/novo)



**01**

THE DIGITAL SOURCE FOR DELIVERING  
SMART MACHINING SOLUTIONS

[widia.com/novo](http://widia.com/novo)

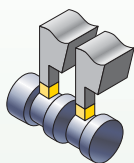
**NOVO**  <sup>TM</sup>



## Turning • Grooving and Cut-Off

Grooving and Cut-Off Platforms .....	E2-E3
WMT Grooving, Face Grooving, Cut-Off, and Profiling.....	E4-E39
TopGroove Shallow Grooving and Face Grooving .....	E40-E91
ProGroove Grooving and Cut-Off .....	E92-E107
Separator for Cut-Off .....	E108-E133

**Grooving**



**WMT™**

- Insert cutting widths: 2–8mm.
- O.D. cutting depths: 16,5–25,4mm.
- I.D. boring bar minimum bore diameter: 57,15mm.
- Screw-clamping integral shank/cartridge toolholders available.
- Geometry for deep grooving.

Pages:  
E4–E39



**TopGroove™**

- Insert cutting widths: 0,5–6,35mm.
- Insert cutting depths: 0,64–12,7mm.
- I.D. boring bar minimum bore diameter: 11,2mm.
- Integral shank toolholders available.

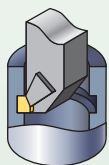
Pages:  
E40–E91



**ProGroove™**

- Insert cutting depths: 10–40mm.
- Inserts enable precision sintered execution, good tolerances, and repeatability.
- Screw-clamping integral shank toolholders available.
- Grooving and O.D. turning.

Pages:  
E92–E104



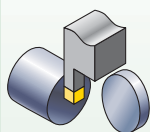
**LG**

- Insert cutting widths: 8–16mm.
- O.D. cutting depths: 20–32mm.
- Wedge-clamping integral shank tooling available.

Pages:  
E105–E107



**Cut-Off**



**WMT**

- Cut-off widths: 1,5–4mm.
- Maximum cutting depth: 22,2mm.
- Screw-clamping integral shank/cartridge toolholders available.
- Economical double-sided inserts for rigidity and dimensional accuracy.
- Right-/left-hand styles: 5° and 12° lead angles.

Pages:  
E4–E39



**Separator™**

- Cut-off widths: 2–4mm.
- Positive mechanical, self-clamping blades.
- Right-/left-hand style toolholders available.
- Single-edge inserts for maximum depth capacity.

Pages:  
E108–E133



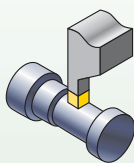
**ProGroove**

- Cut-off widths: 2–8mm.
- Single-edge inserts for maximum depth capacity.
- Right-/left-hand styles with 6° lead angles.
- Self-clamping blades/screw-clamping integral shank toolholders available.

Pages:  
E92–E104



**Plunge and Turn**



**WMT**

**Heavy Stock Removal in Turning Applications**

- Double-sided inserts, cutting widths: 2–8mm.
- O.D. cutting depths: 16,5–25,4mm.
- I.D. boring bar minimum bore diameter: 57,15mm.
- Screw-clamping integral shank/cartridge toolholders available.

Pages:  
E4–E39



**ProGroove**

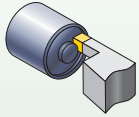
**For Light-Cutting Inserts**

- Cutting widths: 2–8mm.
- O.D. cutting depths: 10–40mm.
- Single-edge inserts for maximum depth capacity.
- Screw-clamping integral shank toolholders available.

Pages:  
E92–E104



**Face Grooving**



**WMT™**

- Cutting widths: 3–6,35mm.
- Cutting depths: 13–25,4mm.
- Minimum face groove diameter: 38–205mm.

Pages:  
E4–E39



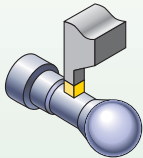
**TopGroove™**

- NF/NFD face groove insert range: 24–57mm.
- Cutting width range for standard inserts: 0,8–9,5mm.
- Cutting depth range for standard inserts: 1,27–12,70mm.
- Cutting width range for NF/NFD face grooving inserts: 2–6,35mm.
- Standard insert minimum face groove diameter range: 54–330mm.
- Cutting depth range for NF/NFD face grooving inserts: 1,52–12,70mm.
- Cutting depth range for NF: 1,52–3,81mm.
- Cutting depth range for NFD: 6,35–12,7mm.

Pages:  
E40–E91



**Profiling**



**WMT**

**For Heavy Stock Removal**

- Full-radius insert cutting widths: 3–8mm.
- O.D. cutting depths: 16,5–25,4mm.
- Screw-clamping integral shank/cartridge toolholders available.

Pages:  
E4–E39



**TopGroove**

**Moderate/Heavy Stock Removal at Shallow Profile Depths**

- Full-radius insert cutting widths: 1,57–6,35mm.
- Insert cutting depths: 2,39–6,35mm.
- Integral shank toolholders and ERICKSON™ heads available.

Pages:  
E40–E91



**ProGroove™**

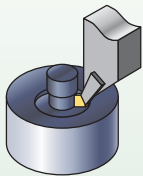
**For Light Cutting**

- Full-radius insert cutting widths: 3–6mm.
- O.D. cutting depths: 10–32mm.
- Screw-clamping integral shank/cartridge toolholders available.

Pages:  
E92–E104



**Undercutting**



**TopGroove**

- Undercutting insert widths: 2,4–4mm.
- Economical double-ended inserts.

Pages:  
E40–E91





## WMT™ System •

One Platform for Grooving, Face Grooving,  
Cut-Off, and Profiling

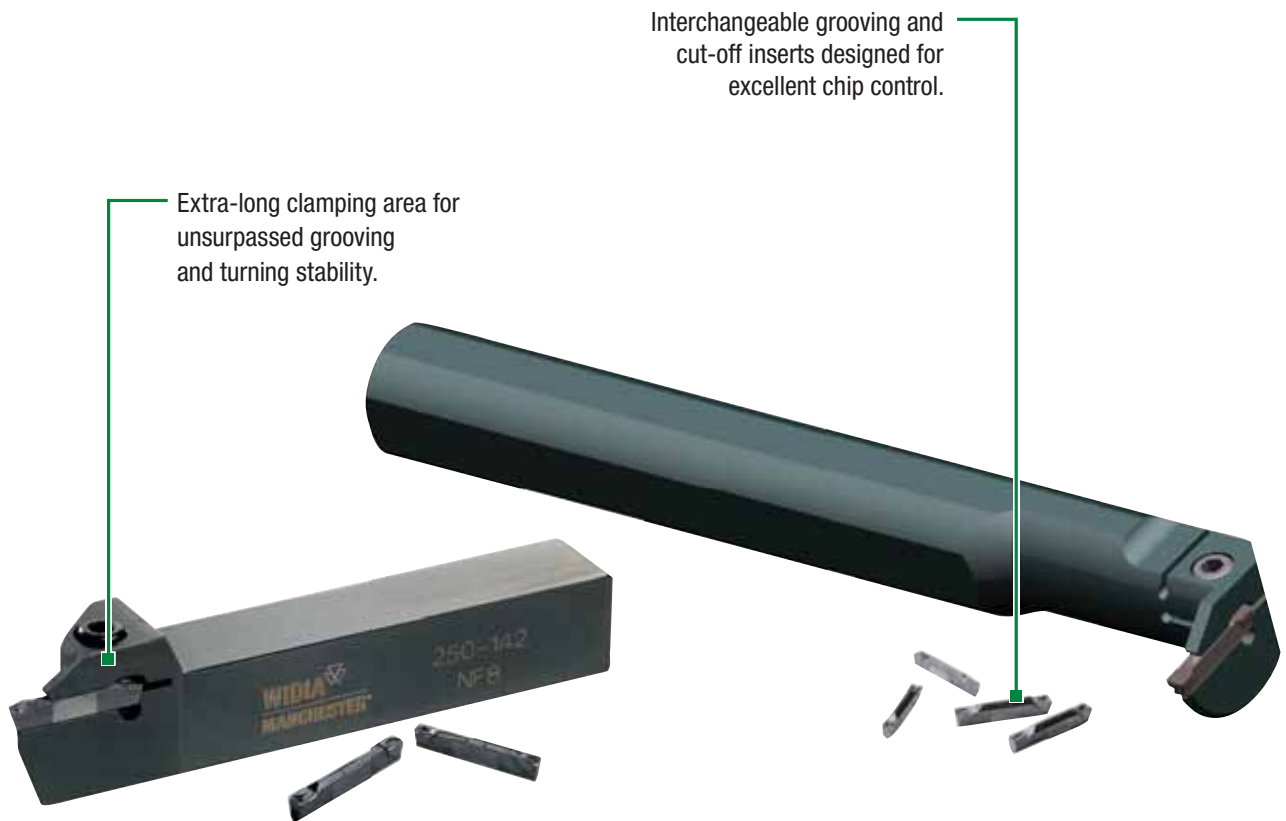


# WMT

The WMT platform is the economical and reliable option for all your grooving, cut-off, turning, and profiling applications. Trust the WMT system to ensure precise insert positioning and provide only the most accurate machining with exceptionally fast cycle times and superior performance.

### Versatile and Well-Constructed

- Specifically designed to increase speeds and feeds.
- Excellent geometry for even your most demanding deep grooving applications.
- The WMT system enables heavy stock removal in turning applications.
- Ensures finer surface finishes and a long, reliable tool life.



Extra-long clamping area for unsurpassed grooving and turning stability.

Interchangeable grooving and cut-off inserts designed for excellent chip control.

## WMT™ Toolholders

- Outstanding system rigidity and clamping capabilities.
- Guarantees fast cycle times and limited turret indexes.
- Precise insert positioning for accurate machining.
- Double-V shape means operator-friendly insert indexing and optimum insert positioning.
- Choice of integral or modular holders.



## The Most Advanced Turning Solutions in the Industry

For unsurpassed quality, value, and performance, look no further than the WIDIA™ comprehensive line of specially engineered and dependable grooving and cut-off solutions. All the tools you need from the reliable name you can trust!

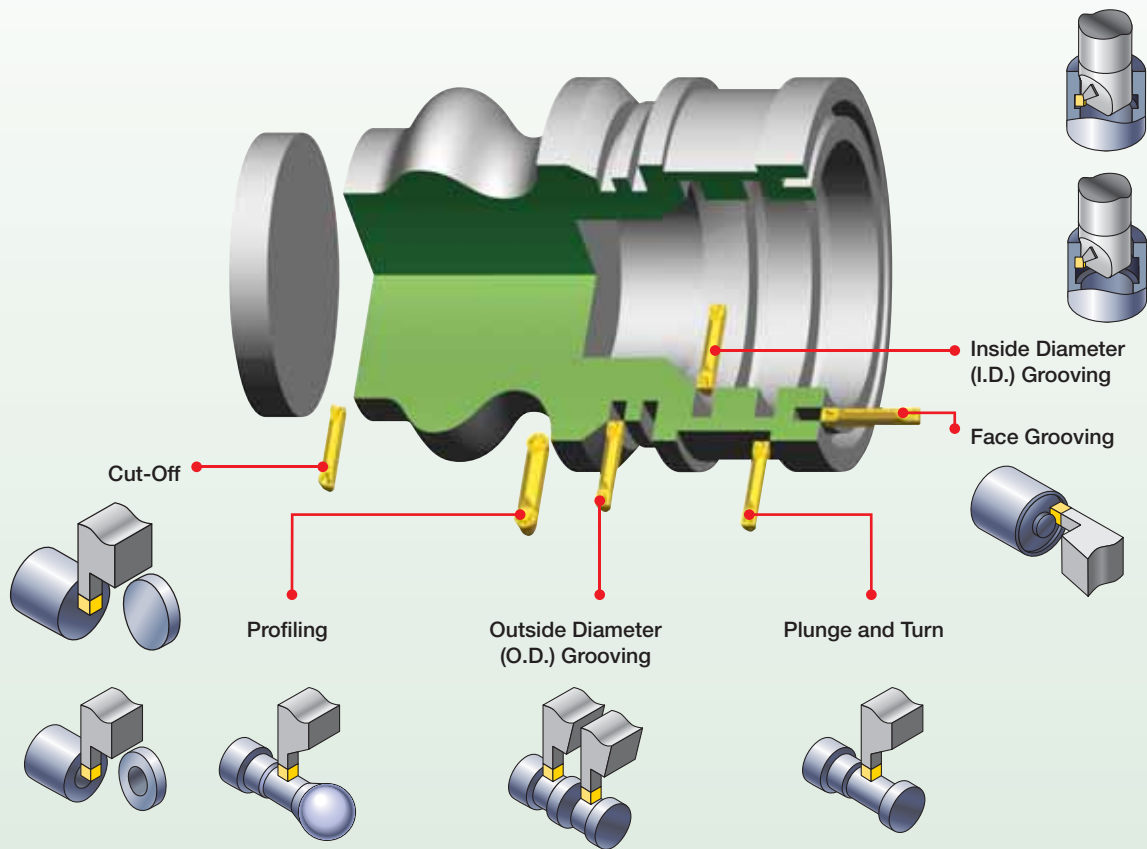
The WMT system, with its extra-long clamping area and precise insert positioning, ensures exceptionally fast and accurate machining, all-in-one tool, for your most demanding grooving, cut-off, turning, and profiling applications.

It is perfect for all general-purpose operations, including both shallow and deep grooving.

Utilise this handy, easy-to-use guide to identify and select the appropriate grooving and cut-off tools for your specific needs.

### 1 Choose the application to be performed:

Groove depth, width, and profile.



### 2 Identify the material to be machined:

Each tool has a material grid marked with a letter indicating the materials that can be machined.

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

**3 Select your toolholder based on the application:**

- A** Choose the appropriate width “W” required for the application.
- B** Choose the shortest cutting depth “CD” dimension for increased tool rigidity.
- C** Select the largest toolholder shank “H” and “B” dimensions for maximum rigidity.

WMT™ Turning, Grooving, and Cut-Off  
Integral Toolholders

■ O.D. Cut-Off and Grooving

Order number	catalogue number	Insert size	H	A	B	CD	F	C	HS	L1	L2	clamp screw	clamp screw
right hand													
3000216	WMTSR222SM116	1	25.0	5.00	11	25.0	24.5	—	130	116	—	00K249	—
3000468	WMTSR116K216	2	16.0	3.00	11	16.0	15.5	8	125	101	—	00K249	—
3000469	WMTSR222K216	2	20.0	3.00	11	20.0	19.5	—	125	92	—	00K249	—
3000506	WMTSR222SM216	2	25.0	3.00	11	25.0	24.5	—	130	116	—	00K249	—
3000490	WMTSR116K211	2	16.0	3.00	11	16.0	15.5	—	125	92	—	—	01K206
3000482	WMTSR116K222	2	16.0	3.00	22	16.0	15.5	8	125	92	—	—	01K206
3000488	WMTSR222K211	2	20.0	3.00	11	20.0	19.5	—	125	92	—	—	01K206
3000476	WMTSR222K222	2	25.0	3.00	22	25.0	24.5	—	130	116	—	—	01K206
3000478	WMTSR222SM211	2	25.0	3.00	11	25.0	24.5	—	130	116	—	—	01K206
3000481	WMTSR222SM222	2	25.0	3.00	22	25.0	24.5	—	130	116	—	—	01K206
3000392	WMTSR116K111	4	16.0	4.00	11	16.0	15.5	—	125	92	—	—	01K206
3000484	WMTSR116K222	4	16.0	4.00	22	16.0	15.5	8	125	92	—	—	01K206
3003751	WMTSR222K226	4	20.0	4.00	22	20.0	20.0	8	125	92	—	—	01K206
3000504	WMTSR222K411	4	20.0	4.00	11	20.0	19.5	—	125	92	—	—	01K206
3003752	WMTSR222SM111	4	20.0	4.00	11	20.0	24.7	—	130	117	—	—	01K206
3000483	WMTSR222SM422	4	25.0	4.00	22	25.0	24.5	—	130	116	—	—	01K206
3000486	WMTSR116K314	5	16.0	3.00	14	16.0	15.2	—	125	88	—	—	01K169
3000473	WMTSR222K314	5	20.0	3.00	14	20.0	19.2	—	125	88	—	—	01K169
3000475	WMTSR222K326	5	20.0	3.00	22	20.0	19.2	8	140	92	—	—	01K169

	application	conventional toolholders	modular blades
	O.D. Grooving and Cut-Off	pages E30–E32	page E38
	Face Grooving	pages E33–E34	page E39
	I.D. Grooving	page E35	—
	Plunge and Turn	pages E30–E32	page E38

**4 Select chipbreaker style for the application:**

- CM** Cut-Off Medium
- CM-W** Cut-Off Medium with Wiper
- PT** Groove, Plunge, and Turn
- PC** Plunge and Contour
- PH** Groove, Plunge, and Turn

NOTE: Chart shows recommended starting feed rates.

**WMT™ Turning, Grooving, Cut-off, and Profiling**  
 Feed Values for Grooving Inserts

**CM Cut-Off Medium**

- Double-ended, V-bottom, and top, mechanically clamped.
- Neutral, right-, and left-hand lead angles up to 12°.
- Designed to increase speed and feed.
- Chip geometry designed for excellent chip control and minimized cutting pressure on various materials.
- Ideal for 300 Series stainless steel, tool steel, titanium, INCOINEL®, and other nickel-based alloys at moderate speeds and feeds.

**CM-W Cut-Off Medium with Wiper**

- Wiper flats where surface finish is critical.
- Double-ended, V-bottom, and top, mechanically clamped.
- Neutral, right-, and left-hand lead angles up to 12°.
- Designed to increase speed and feed.
- Chip geometry designed for excellent chip control and minimized cutting pressure on various materials.

**PT Grooving Inserts**

- High positive rake geometry for low cutting force, especially in soft materials.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Delivers chip control over full range of DOC when turning.
- Cuts in both axial and radial directions.

**PC Grooving and Profiling Inserts**

- Superior chip control.
- Full nose radius geometry for plunge and contour operations.
- Effective cutting edge geometry exceeds 180° for increased versatility.

**PH Plunging and Turning Inserts**

- Excellent performance in greater than 35 HRC.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Delivers chip control over full range of DOC when turning.
- Delivers superior chip control in interrupted cuts.

Width of cut (mm)	CM Feed Rate (mm/min)	CM-W Feed Rate (mm/min)
1.5 and 2.0	0.15	0.20
2.5	0.20	0.25
3.0	0.25	0.30
4.0	0.30	0.35

Insert Size	Turn/profile feed (mm/min)	Plunge groove feed (mm/min)
size 2	0.1	0.05
size 3	0.15	0.1
size 4	0.25	0.15
size 5	0.4	0.30

Insert Size	Turn/profile feed (mm/min)	Plunge groove feed (mm/min)
size 2	0.1	0.05
size 3	0.15	0.1
size 4	0.25	0.15
size 5	0.4	0.30

- A** Choose the appropriate insert width “W” for your specific application.
- B** Select the required corner radius value “RR”.

**WMT™ Turning, Grooving, and Cut-Off**  
 Cut-Off Inserts

• first choice  
 ○ alternate choice

WMT-CM	catalogue number	insert size	A W	B RR	LJ	hand	WP190T	WP250T	WU190T	WU250T	WU15HT
	WMTCO15A00CM06	1	1.50	0.08	16.30	N - Neutral	•	•	•	•	•
	WMTCO20A00CM06	2	2.00	0.08	16.21	N - Neutral	•	•	•	•	•

**5 Select grade:**

Grooving cutting condition		Recommended Grades					
		steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
heavily interrupted cut		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	-
lightly interrupted cut		WP25CT/ WU25PT	WU25PT	WP25CT/ WU25PT	WU25PT	WU25PT	-
varying depth of cut, casting, or forging skin		WU10PT	WU10PT	WP10CT/ WU10PT	WU10PT	WU10HT/ WU10PT	WU10PT
smooth cut, pre-turned surface		WP10CT/ WU10PT	WU10PT	WP10CT/ WU10PT	WU10PT	WU10HT/ WU10PT	WU10PT

Cut-Off cutting condition		Recommended Grades					
		steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
heavily interrupted cut		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	-
lightly interrupted cut		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	-
varying depth of cut, casting, or forging skin		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	WU25PT
smooth cut, pre-turned surface		WU25PT	WU25PT	WU25PT	WU25PT	WU25PT	WU25PT

NOTE: See page E11 for Grades and Grade Descriptions.

**6 Determine cutting data:**

- A** Based on material group and grade, identify starting speed (vc).
- B** First choice starting speed is in **bold**.

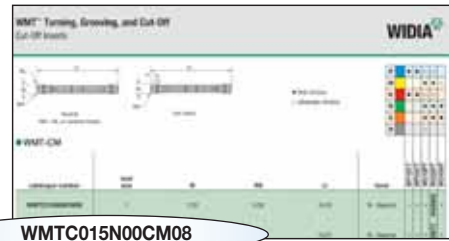
NOTE: See page E13 for cutting data.

**WMT™ Turning, Grooving, and Cut-Off**  
Recommended Cutting Speeds • Metric

Material Group	Cutting Speed — vc m/min																	
	WU15HT			WU15PT			WU25PT			WP10CT			WP25CT					
	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max			
P	9/1	100	<b>100</b>	110	100	200	210	170	<b>175</b>	B	180	210	225	240	170	175	180	
	2	95	95	105	180	185	190	150	160	170	210	220	230	185	195	205		
	3	95	95	105	160	165	170	150	160	170	210	220	230	185	195	205		
	4	70	70	75	165	170	175	135	140	155	140	145	155	125	125	135		
	5	85	90	95	170	175	180	140	150	160	180	190	195	155	165	170		
	6	50	50	50	140	150	160	120	125	130	70	75	80	70	75	80		
M	1	70	75	80	120	125	130	120	125	130	--	--	--	--	--	--		
	2	50	50	50	100	100	110	70	75	80	--	--	--	--	--	--		
	3	50	50	50	95	100	105	65	70	75	--	--	--	--	--	--		
K	1	85	90	95	190	200	210	155	165	170	215	225	235	180	190	195		
	2	75	75	80	185	190	200	155	165	175	205	215	225	175	185	195		
	3	70	75	80	170	175	180	140	150	160	210	225	240	190	200	210		
N	1	70	75	80	140	150	160	110	120	130	--	--	--	--	--	--		
	2	70	75	80	140	150	160	110	120	130	--	--	--	--	--	--		
	3	70	75	80	140	150	160	110	120	130	--	--	--	--	--	--		
	4	70	75	80	140	150	160	110	120	130	--	--	--	--	--	--		
	5	70	75	80	140	150	160	110	120	130	--	--	--	--	--	--		
	6	70	75	80	140	150	160	110	120	130	--	--	--	--	--	--		
	7	70	75	80	140	150	160	110	120	130	--	--	--	--	--	--		
S	1	30	25	30	70	75	80	60	65	65	--	--	--	--	--	--		
	2	30	25	30	65	65	70	50	50	50	--	--	--	--	--	--		
	3	30	30	30	100	100	110	70	75	80	--	--	--	--	--	--		
	4	--	--	--	70	75	80	50	50	50	--	--	--	--	--	--		
1	--	--	--	15	30	60	15	30	60	--	--	--	--	--	--	--		

## WMT Identification System

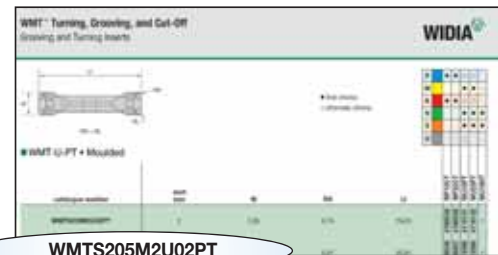
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



WMTC015N00CM08

**Cut-Off**

<b>WMT</b> Tooling System	<b>C</b> Cut-Off	<b>015</b> W in mm* 10	<b>N</b> Hand of Insert	<b>00</b> Main Cutting Edge Lead Angle	<b>CM</b> Chipbreaker Geometry <b>CM</b> = Cut-Off Medium <b>CM-W</b> = Cut-Off Medium with Wiper	<b>08</b> Corner Radius in mm* 10
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WMTS205M2U02PT

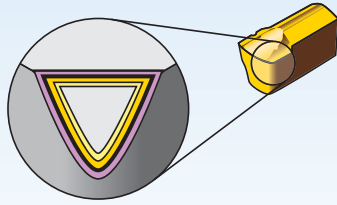
**Groove, Plunge, Turn, and Contour Inserts**

<b>WMT</b> Tooling System	<b>S</b> Square	<b>205</b> mm* 10 inch* 1000	<b>M</b> Unit of Measurement for Width <b>M</b> = mm <b>I</b> = inch	<b>2</b> Seat Size	<b>U</b> Insert Tolerance	<b>02</b> Corner Radius in mm* 10	<b>PT</b> Chipbreaker Geometry <b>PT</b> = Groove, Plunge, and Turn <b>PH</b> = Groove, Plunge, and Turn <b>PC</b> = Plunge and Contour
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**P** = Precision ground grooving width tolerance:  
± .001" (0,025mm)

**U** = Utility moulded grooving width tolerance:

3,05–4,05:	$\frac{+.006"}{-0}$	$\frac{(+0,15\text{mm})}{-0}$
5,05–10,05:	$\frac{+.010"}{-0}$	$\frac{(+0,25\text{mm})}{-0}$



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

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

wear resistance ← → toughness

Grade	Coating	Grade Description	Material																						
				05	10	15	20	25	30	35	40	45													
WU10PT	HC-P15	An advanced PVD-TiAlN coating over a very deformation-resistant unalloyed carbide substrate. The WU10PT™ grade's new and improved coating enables speeds to be increased by 50–100%. The WU10PT grade is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys under stable conditions. It also performs well machining hardened and short chipping materials.	P																						
			M																						
			K																						
			N																						
			S																						
			H																						
WU25PT	HC-P30	An advanced PVD-TiAlN-coated grade with a tough, ultra-fine-grain, unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.	P																						
			M																						
			K																						
			N																						
			S																						
			H																						
WU10HT	HC-P15	A hard, low binder content, unalloyed WC/Co fine-grained uncoated grade. 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-temperature 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																						
			H																						
WP10CT	HC-P10	A specially engineered, proprietary, cobalt-enriched carbide grade with thick K-MTCVD-TiCN coating layer, an Al <sub>2</sub> O <sub>3</sub> layer of controlled grain size, and outer layers of TiCN and TiN for maximum wear resistance. An excellent finishing to medium machining grade for a variety of workpiece materials including most steels, ferritic and martensitic stainless steels, and cast irons. The specially engineered 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. The smooth coating provides good resistance to edge build-up and microchipping and produces excellent surface finishes.	P																						
			M																						
			K																						
			H																						
WP25CT	HC-P25	A tough cobalt-enriched carbide grade with a newly designed multilayer K-MTCVD TiCN-Al <sub>2</sub> O <sub>3</sub> -TiCN/TiN coating with superior interlayer adhesion. This is the industry's best general-purpose turning grade for most steels and ferritic and martensitic stainless steels. The substrate design, with cobalt-enrichment, ensures adequate deformation resistance along with excellent bulk toughness and insert edge strength. The coating layers offer good wear resistance over a wide range of machining conditions. The smoothness of the coating leads to reduced frictional heat, minimises microchipping, and improves workpiece surface finishes.	P																						
			M																						
			K																						
			H																						



**CM Cut-Off Medium**

- Double-ended, V-bottom, and top, mechanically clamped.
- Neutral, right-, and left-hand lead angles up to 12°.
- Designed to increase speed and feed.
- Chip geometry designed for excellent chip control and minimised cutting pressure on various materials.



**CM-W Cut-Off Medium with Wiper**

- Wiper flats where surface finish is critical.
- Double-ended, V-bottom, and top, mechanically clamped.
- Neutral, right-, and left-hand lead angles up to 12°.
- Designed to increase speed and feed.
- Chip geometry designed for excellent chip control and minimised cutting pressure on various materials.
- Ideal for 300 Series stainless steel, tool steel, titanium, INCONEL®, and other nickel-based alloys at moderate speeds and feeds.



**PT Plunge, Groove, and Turn Inserts**

- High positive rake geometry for low cutting force, especially in soft materials.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Delivers chip control over full range of DOC when turning.
- Cuts in both axial and radial directions.



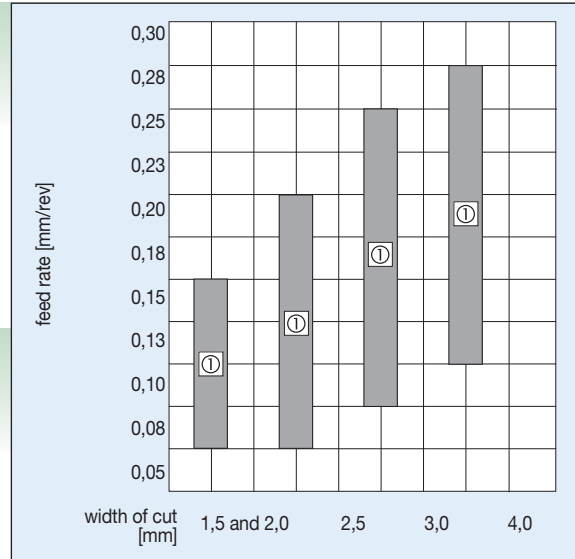
**PC Grooving and Profiling Inserts**

- Superior chip control.
- Full nose radius geometry for plunge and contour operations.
- Effective cutting edge geometry exceeds 180° for increased versatility.

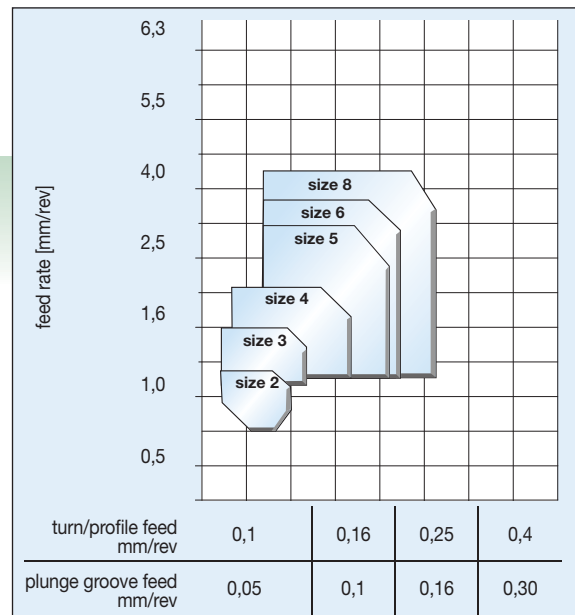
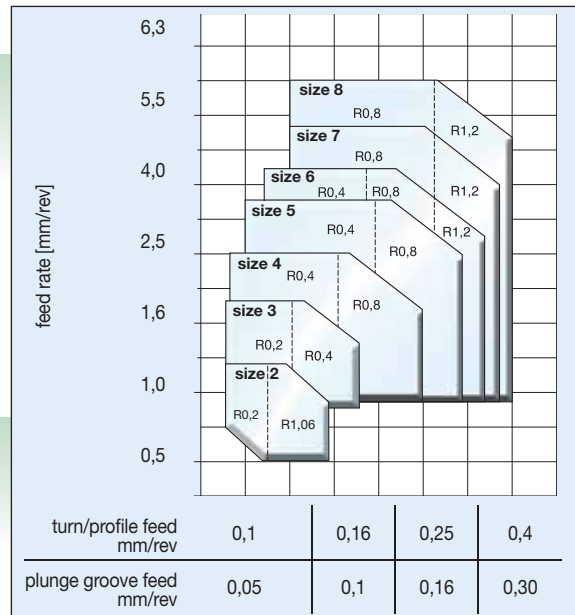


**PH Plunge, Groove, and Turn Inserts**

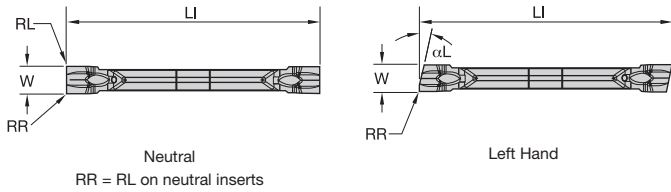
- Excellent performance in greater than 35 HRC.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Delivers chip control over full range of DOC when turning.
- Delivers superior chip control in interrupted cuts.



① Recommended Starting Feed



Material Group		Cutting Speed – vc m/min														
		WU10HT			WU10PT			WU25PT			WP10CT			WP25CT		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0/1	100	<b>100</b>	110	190	<b>200</b>	210	170	<b>175</b>	180	210	<b>225</b>	240	170	<b>175</b>	180
	2	95	<b>95</b>	105	180	<b>185</b>	190	150	<b>160</b>	170	210	<b>220</b>	230	185	<b>195</b>	205
	3	95	<b>95</b>	105	180	<b>185</b>	190	150	<b>160</b>	170	210	<b>220</b>	230	185	<b>195</b>	205
	4	70	<b>70</b>	75	165	<b>170</b>	175	135	<b>145</b>	155	140	<b>145</b>	155	125	<b>125</b>	135
	5	85	<b>90</b>	95	170	<b>175</b>	180	140	<b>150</b>	160	180	<b>190</b>	195	155	<b>165</b>	170
	6	50	<b>50</b>	50	140	<b>150</b>	160	120	<b>125</b>	130	70	<b>75</b>	80	70	<b>75</b>	80
M	1	70	<b>75</b>	80	120	<b>125</b>	130	120	<b>125</b>	130	-	-	-	-	-	-
	2	50	<b>50</b>	50	100	<b>100</b>	110	70	<b>75</b>	80	-	-	-	-	-	-
	3	50	<b>50</b>	50	95	<b>100</b>	105	85	<b>90</b>	95	-	-	-	-	-	-
K	1	85	<b>90</b>	95	190	<b>200</b>	210	155	<b>165</b>	170	215	<b>225</b>	235	180	<b>190</b>	195
	2	75	<b>75</b>	80	185	<b>190</b>	200	155	<b>165</b>	175	205	<b>215</b>	225	175	<b>185</b>	195
	3	70	<b>75</b>	80	170	<b>175</b>	180	140	<b>150</b>	160	210	<b>225</b>	240	190	<b>200</b>	210
N	1	70	<b>75</b>	80	140	<b>150</b>	160	110	<b>120</b>	130	-	-	-	-	-	-
	2	70	<b>75</b>	80	140	<b>150</b>	80	110	<b>120</b>	80	-	-	-	-	-	-
	3	70	<b>75</b>	80	140	<b>150</b>	80	110	<b>120</b>	80	-	-	-	-	-	-
	4	70	<b>75</b>	80	140	<b>150</b>	80	110	<b>120</b>	80	-	-	-	-	-	-
	5	70	<b>75</b>	80	140	<b>150</b>	80	110	<b>120</b>	80	-	-	-	-	-	-
	6	70	<b>75</b>	80	140	<b>150</b>	80	110	<b>120</b>	80	-	-	-	-	-	-
	7	70	<b>75</b>	80	140	<b>150</b>	120	110	<b>120</b>	105	-	-	-	-	-	-
S	1	20	<b>25</b>	30	70	<b>75</b>	80	60	<b>65</b>	65	-	-	-	-	-	-
	2	20	<b>25</b>	30	65	<b>65</b>	70	50	<b>50</b>	50	-	-	-	-	-	-
	3	50	<b>50</b>	50	100	<b>100</b>	110	70	<b>75</b>	80	-	-	-	-	-	-
	4	-	-	-	70	<b>75</b>	80	50	<b>50</b>	50	-	-	-	-	-	-
H	1	-	-	-	15	<b>30</b>	60	15	<b>30</b>	60	-	-	-	-	-	-
	2	-	-	-	15	<b>30</b>	60	15	<b>30</b>	60	-	-	-	-	-	-
	3	-	-	-	15	<b>30</b>	60	15	<b>30</b>	60	-	-	-	-	-	-
	4	-	-	-	15	<b>30</b>	60	15	<b>30</b>	60	-	-	-	-	-	-



● first choice  
○ alternate choice

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

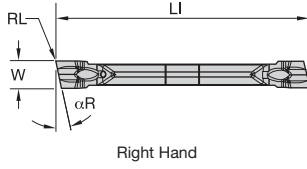
■ WMT-CM

Grooving and Cut-Off

catalogue number	seat size	W	RR	LI	hand	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTC015N00CM08	1	1,50	0,08	19,30	N - Neutral	●	●	○	○	○
WMTC020N00CM08	2	2,00	0,08	19,21	N - Neutral	●	●	○	○	○
WMTC094N00CM13	2B	2,39	0,13	22,32	N - Neutral	●	●	○	○	○
WMTC030N00CM17	3	3,00	0,17	25,40	N - Neutral	●	●	○	○	○
WMTC125N00CM17	3	3,17	0,17	25,41	N - Neutral	●	●	○	○	○
WMTC040N00CM17	4	4,00	0,17	25,40	N - Neutral	●	●	○	○	○
WMTC015L05CM08	1	1,50	0,08	19,31	L - Left	●	●	○	○	○
WMTC020L05CM08	2	1,99	0,08	19,21	L - Left	●	●	○	○	○
WMTC020L12CM08	2	2,00	0,08	19,25	L - Left	●	●	○	○	○
WMTC030L12CM17	3	3,00	0,17	25,40	L - Left	●	●	○	○	○
WMTC030L05CM17	3	3,00	0,17	25,40	L - Left	●	●	○	○	○
WMTC040L12CM17	4	4,00	0,17	25,40	L - Left	●	●	○	○	○
WMTC040L05CM17	4	4,00	0,17	25,40	L - Left	●	●	○	○	○

(continued)

(WMT-CM – continued)



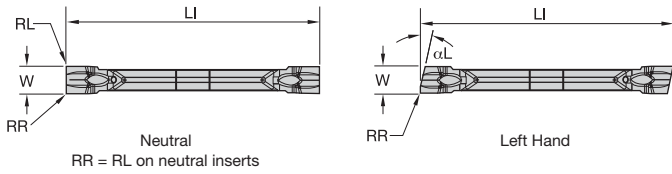
● first choice  
○ alternate choice

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

catalogue number	seat size	W	RL	LI	αR	hand	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTC015R12CM08	1	1,50	0,08	19,28	12	R - Right	●	●	○	○	○
WMTC015R05CM08	1	1,50	0,08	19,31	5	R - Right	●	●	○	○	○
WMTC020R05CM08	2	2,00	0,08	19,26	5	R - Right	●	●	○	○	○
WMTC020R12CM08	2	2,00	0,08	19,26	12	R - Right	●	●	○	○	○
WMTC094R12CM13	2B	2,39	0,13	22,28	12	R - Right	●	●	○	○	○
WMTC094R05CM13	2B	2,39	0,13	22,32	5	R - Right	●	●	○	○	○
WMTC030R05CM17	3	3,00	0,17	25,40	5	R - Right	●	●	○	○	○
WMTC030R12CM17	3	3,00	0,17	25,40	12	R - Right	●	●	○	○	○
WMTC125R05CM17	3	3,17	0,17	25,40	5	R - Right	●	●	○	○	○
WMTC125R12CM17	3	3,18	0,17	25,40	12	R - Right	●	●	○	○	○
WMTC040R12CM17	4	4,00	0,17	25,40	12	R - Right	●	●	○	○	○
WMTC040R05CM17	4	4,00	0,17	25,40	5	R - Right	●	●	○	○	○



Grooving and Cut-Off



● first choice  
○ alternate choice

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

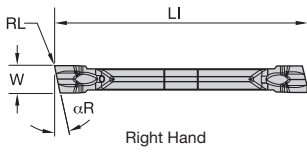
**WMT-CM-W**

catalogue number	seat size	W	RR	LI	hand	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTC015N00CMW08	1	1,50	0,08	19,30	N - Neutral	●	●	○	○	○
WMTC020N00CMW08	2	2,00	0,08	19,21	N - Neutral	●	●	○	○	○
WMTC094N00CMW13	2B	2,39	0,13	22,32	N - Neutral	●	●	○	○	○
WMTC030N00CMW17	3	3,00	0,17	25,40	N - Neutral	●	●	○	○	○
WMTC125N00CMW17	3	3,18	0,17	25,41	N - Neutral	●	●	○	○	○
WMTC040N00CMW17	4	4,00	0,17	25,40	N - Neutral	●	●	○	○	○
WMTC020L12CMW08	2	2,00	0,08	19,27	L - Left	●	●	○	○	○
WMTC030L12CMW17	3	3,00	0,17	25,40	L - Left	●	●	○	○	○
WMTC030L05CMW17	3	3,00	0,17	25,40	L - Left	●	●	○	○	○

(continued)

Grooving and Cut-Off

(WMT-CM-W – continued)



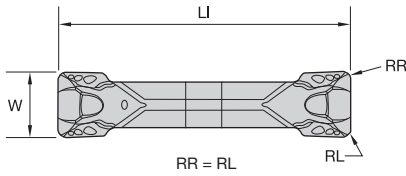
● first choice  
○ alternate choice

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

catalogue number	seat size	W	RL	LI	αR	hand	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTC020R05CMW08	2	2,00	0,08	19,20	5	R - Right	●	●	○	○	
WMTC020R12CMW08	2	2,00	0,08	19,27	12	R - Right	●	●	○	○	
WMTC094R12CMW13	2B	2,39	0,13	22,29	12	R - Right	●	●	○	○	
WMTC094R05CMW13	2B	2,39	0,13	22,32	5	R - Right	●	●	○	○	
WMTC030R05CMW17	3	3,00	0,17	25,40	5	R - Right	●	●	○	○	
WMTC030R12CMW17	3	3,00	0,17	25,40	12	R - Right	●	●	○	○	
WMTC125R05CMW17	3	3,17	0,17	25,41	5	R - Right	●	●	○	○	
WMTC125R12CMW17	3	3,17	0,17	25,41	12	R - Right	●	●	○	○	



Grooving and Cut-Off



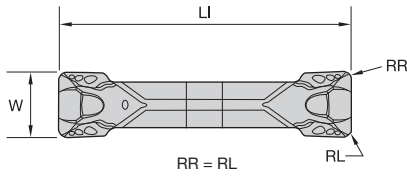
● first choice  
○ alternate choice

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

■ **WMT-U-PT • Moulded**

Grooving and Cut-Off

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS205M2U02PT	2	2,05	0,15	19,23	4169554	4169555	4116131	4116132	—
WMTS305M3U03PT	3	3,05	0,31	25,81	4169556	4169557	4113568	4113569	—
WMTS305M3U06PT	3	3,05	0,61	25,78	4169558	4169559	4113570	4113571	—
WMTS405M4U03PT	4	4,05	0,31	25,53	4169560	4169561	4113577	4113578	—
WMTS405M4U06PT	4	4,05	0,61	25,53	4169562	4169563	4113579	4113580	—
WMTS505M5U03PT	5	5,05	0,30	28,76	4169564	4169565	4116148	4116149	—
WMTS505M5U06PT	5	5,05	0,61	28,76	4169566	4169567	4116150	4116151	—
WMTS605M6U03PT	6	6,05	0,30	28,76	4169568	4169569	4117253	4117254	—
WMTS605M6U06PT	6	6,05	0,59	28,76	4169570	4169571	4117255	4117256	—
WMTS805M8U06PT	8	8,05	0,61	28,70	4169572	4169573	4117261	4117262	—
WMTS805M8U15PT	8	8,05	1,50	28,71	4169574	4169575	4117263	4117264	—



● first choice  
○ alternate choice

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

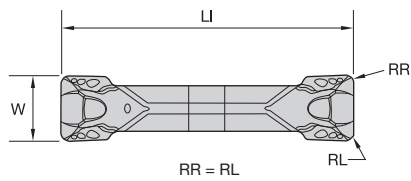
■ **WMT-P-PT • Precision**

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS200M2P02PT	2	2,00	0,15	19,10	●	●	○	○	○
WMTS094I2BP02PT	2B	2,38	0,15	22,15	●	●	○	○	○
WMTS094I2BP04PT	2B	2,38	0,38	22,14	●	●	○	○	○
WMTS300M3P03PH	3	3,00	0,30	25,65	●	●	○	○	○
WMTS300M3P03PT	3	3,00	0,31	25,65	●	●	○	○	○
WMTS300M3P06PH	3	3,00	0,60	25,65	●	●	○	○	○
WMTS300M3P06PT	3	3,00	0,61	25,65	●	●	○	○	○
WMTS125I3P03PT	3	3,17	0,23	25,40	●	●	○	○	○
WMTS125I3P08PT	3	3,17	0,76	25,40	●	●	○	○	○
WMTS125I3P03PH	3	3,18	0,25	25,40	●	●	○	○	○
WMTS125I3P08PH	3	3,18	0,75	25,40	●	●	○	○	○
WMTS156I4P03PH	4	3,95	0,30	25,40	●	●	○	○	○
WMTS156I4P08PH	4	3,96	0,75	25,40	●	●	○	○	○
WMTS400M4P03PH	4	4,00	0,30	25,40	●	●	○	○	○
WMTS400M4P03PT	4	4,00	0,31	25,40	●	●	○	○	○
WMTS400M4P06PH	4	4,00	0,60	25,40	●	●	○	○	○





(WMT-P-PT • Precision — continued)



● first choice  
○ alternate choice

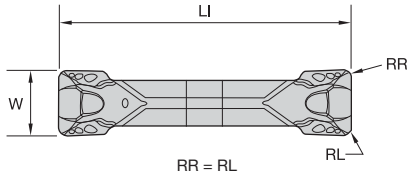
P	●	●	○	○
M	●	●	○	○
K	●	●	○	○
N	●	●	○	○
S	●	●	○	○
H	○	○	○	○

Grooving and Cut-Off

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS400M4P06PT	4	4,00	0,60	25,40	●	●	○	○	○
WMTS188I5P03PT	5	4,76	0,26	28,63	●	●	○	○	○
WMTS188I5P03PH	5	4,77	0,25	28,63	●	●	○	○	○
WMTS188I5P08PH	5	4,77	0,75	28,63	●	●	○	○	○
WMTS188I5P08PT	5	4,77	0,76	28,63	●	●	○	○	○
WMTS500M5P03PH	5	5,00	0,30	28,63	●	●	○	○	○
WMTS500M5P03PT	5	5,00	0,30	28,63	●	●	○	○	○
WMTS500M5P06PH	5	5,00	0,60	28,63	●	●	○	○	○
WMTS500M5P06PT	5	5,00	0,61	28,63	●	●	○	○	○
WMTS600M6P03PH	6	6,00	0,30	28,63	●	●	○	○	○
WMTS600M6P03PT	6	6,00	0,30	28,63	●	●	○	○	○
WMTS600M6P06PT	6	6,00	0,58	28,63	●	●	○	○	○
WMTS600M6P06PH	6	6,00	0,60	28,63	●	●	○	○	○
WMTS250I6P08PH	6	6,32	0,75	28,63	●	●	○	○	○

(continued)

(WMT-P-PT • Precision — continued)

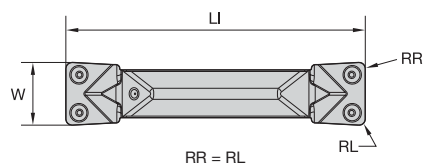


● first choice  
○ alternate choice

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

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS250I6P08PT	6	6,34	0,76	28,63	●	●	○	○	○
WMTS250I6P03PH	6	6,35	0,25	28,63	●	●	○	○	○
WMTS250I6P03PT	6	6,35	0,25	28,63	●	●	○	○	○
WMTS312I8P03PH	8	7,92	0,25	28,57	●	●	○	○	○
WMTS312I8P08PH	8	7,92	0,75	28,57	●	●	○	○	○
WMTS800M8P03PH	8	8,00	0,30	28,57	●	●	○	○	○
WMTS800M8P06PH	8	8,00	0,60	28,57	●	●	○	○	○
WMTS800M8P06PT	8	8,00	0,61	28,57	●	●	○	○	○
WMTS800M8P15PT	8	8,00	1,50	28,57	●	●	○	○	○





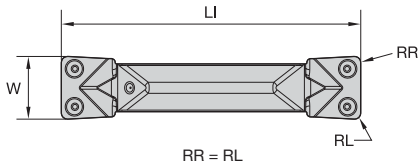
● first choice  
○ alternate choice

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

■ **WMT-U-PH • Moulded**

Grooving and Cut-Off

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS305M3U03PH	3	3,05	0,30	25,81			5346392	5346393	
WMTS305M3U06PH	3	3,05	0,60	25,81			5346394	5346395	
WMTS405M4U03PH	4	4,05	0,30	25,53			5346396	5346397	
WMTS405M4U06PH	4	4,05	0,60	25,53			5346398	5346399	
WMTS505M5U03PH	5	5,05	0,30	28,76			5346400	5346401	
WMTS505M5U06PH	5	5,05	0,60	28,76			5346402	5346403	
WMTS605M6U03PH	6	6,05	0,30	28,76			5346404	5346405	
WMTS605M6U06PH	6	6,05	0,60	28,76			5346406	5346407	
WMTS805M8U03PH	8	8,05	0,30	28,70			5346410	5346411	
WMTS805M8U06PH	8	8,05	0,60	28,70			5346408	5346409	



● first choice  
○ alternate choice

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

■ WMT-P-PH • Precision

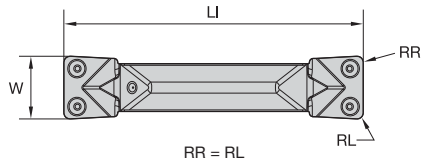
catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS300M3P03PH	3	3,00	0,30	25,65	●	●	○	○	
WMTS300M3P06PH	3	3,00	0,60	25,65	●	●	○	○	
WMTS125I3P03PH	3	3,18	0,25	25,40	●	●	○	○	
WMTS125I3P08PH	3	3,18	0,75	25,40	●	●	○	○	
WMTS156I4P03PH	4	3,95	0,30	25,40	●	●	○	○	
WMTS156I4P08PH	4	3,96	0,75	25,40	●	●	○	○	
WMTS400M4P03PH	4	4,00	0,30	25,40	●	●	○	○	
WMTS400M4P06PH	4	4,00	0,60	25,40	●	●	○	○	
WMTS188I5P03PH	5	4,77	0,25	28,63	●	●	○	○	
WMTS188I5P08PH	5	4,77	0,75	28,63	●	●	○	○	

(continued)



Grooving and Cut-Off

(WMT-P-PH • Precision — continued)

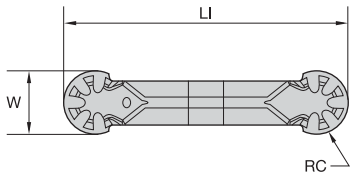


● first choice  
○ alternate choice

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

Grooving and Cut-Off

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS500M5P03PH	5	5,00	0,30	28,63	●	●	○	○	○
WMTS500M5P06PH	5	5,00	0,60	28,63	●	●	○	○	○
WMTS600M6P03PH	6	6,00	0,30	28,63	●	●	○	○	○
WMTS600M6P06PH	6	6,00	0,60	28,63	●	●	○	○	○
WMTS250I6P08PH	6	6,32	0,75	28,63	●	●	○	○	○
WMTS250I6P03PH	6	6,35	0,25	28,63	●	●	○	○	○
WMTS312I8P03PH	8	7,92	0,25	28,57	●	●	○	○	○
WMTS312I8P08PH	8	7,92	0,75	28,57	●	●	○	○	○
WMTS800M8P03PH	8	8,00	0,30	28,57	●	●	○	○	○
WMTS800M8P06PH	8	8,00	0,60	28,57	●	●	○	○	○



● first choice  
○ alternate choice

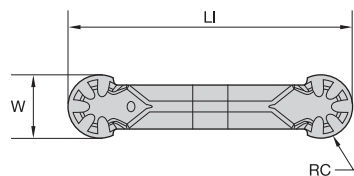
P	●	●	○	○	
M	●	●	○	○	
K	●	●	○	○	
N	●	●	○	○	
S	●	●	○	○	
H	○	○	○	○	

■ **WMT-U-PC • Moulded**

catalogue number	seat size	W	RC	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTR305M3UPC	3	3,05	1,53	25,53	4170174		4170172	4170173	
WMTR405M4UPC	4	4,05	2,03	25,58	4170179		4170177	4170178	
WMTR505M5UPC	5	5,05	2,53	29,01	4170184		4170182	4170183	
WMTR605M6UPC	6	6,05	3,03	28,77	4170189		4170187	4170188	
WMTR805M8UPC	8	8,05	4,03	29,22	4170194		4170192	4170193	



Grooving and Cut-Off



● first choice  
○ alternate choice

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

■ WMT-P-PC • Precision

Grooving and Cut-Off

catalogue number	seat size	W	RC	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTR300M3PPC	3	3,00	1,50	25,40			4170170	4170171	4170195
WMTR400M4PPC	4	4,00	2,00	25,45			4170175	4170176	4170196
WMTR188I5PPC	5	4,78	2,39	28,65			4170119	4170120	
WMTR500M5PPC	5	5,00	2,50	28,88			4170180	4170181	
WMTR600M6PPC	6	6,00	3,00	28,65			4170185	4170186	
WMTR250I6PPC	6	6,36	3,18	29,01			4170121	4170122	
WMTR312I8PPC	8	7,94	3,96	29,00			4170163	4170164	
WMTR800M8PPC	8	8,00	4,00	29,08			4170190	4170191	

## NOVO KNOWS SEARCH

Searching for a tool by using the outdated method of a catalogue has been replaced with the Advise and Select functions from NOVO™ — saving you time and money.

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### ADVISE

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

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

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### SELECT

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

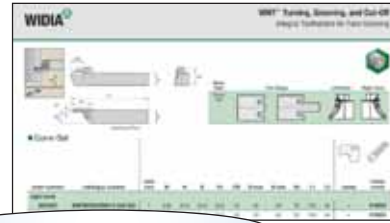
- If you know which product you are looking for, a quick search can be performed by just the catalogue number or product description.
- Smart filters significantly reduce the amount of potential tooling solutions.
- After the tool is selected, NOVO also provides cutting and adaptive item options that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

NOVO can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. [widia.com/novo](http://widia.com/novo)



## WMT System

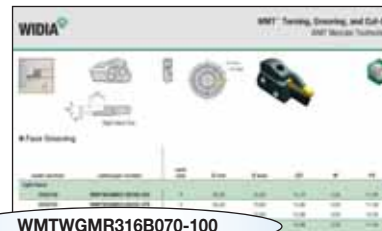
Our WMT toolholders now have a smart new naming system. Here are some examples of the improved nomenclature for our WMT Toolholders.



**WMTBR2525M313038-052**

### Integral Toolholders

<b>WMT</b>	<b>B</b>	<b>R</b>	<b>2525</b>	<b>M</b>	<b>3</b>	<b>13</b>	<b>—</b>	<b>038-052</b>
Tooling System	Tool Style	Hand	Shank Size	Tool Length	Seat Size	Max Grooving Depth		Face Grooving Diameter
<b>WMT</b> = Groove and Turn (WMT Insert)	<b>S</b> = Straight <b>C</b> = Straight with circular support <b>E</b> = End mount <b>A</b> = Straight, face grooving, curve in <b>B</b> = Straight, face grooving, curve out	<b>R</b> = Right hand <b>L</b> = Left hand	Height x Width in mm	<b>H</b> = 100 <b>J</b> = 110 <b>K</b> = 125 <b>L</b> = 140 <b>M</b> = 150 <b>P</b> = 170	<b>1</b> <b>2</b> <b>2B</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>8</b>	CD max in mm  D min – D max in mm (e.g., 70–100 = 70mm D min 100 mm D max)	Diameters are min and max for outer face groove diameter 999 = unlimited D max	



**WMTWGM316B070-100**

### Modular Blades

<b>WMT</b>	<b>WGM</b>	<b>R</b>	<b>3</b>	<b>16</b>	<b>B</b>	<b>070-100</b>
Tooling System	Connection Type	Hand	Seat Size	Max Grooving Depth	Tool Style	Face Grooving Diameter
		<b>R</b> = Right hand <b>L</b> = Left hand			<b>A</b> = Curve In <b>B</b> = Curve Out	



WGMSR2525

**Modular Toolholders**

**WGM**

Tooling System

**MDG** = Modular Deep Grooving

**WGM** = Modular Serrated Locking System

**S**

Tool Style

**S** = Straight

**E** = End mount

**R**

Hand

**R** = Right hand

**L** = Left hand

**2525**

Shank Size

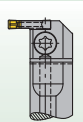


A25RWMTER0316M

**Integral Boring Bars**

**A**

Steel Bar with Coolant



**25**

Bar Diameter

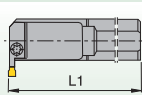


**metric bars:**  
Bar diameter in millimetres

**inch bars:**  
A two-digit number which indicates the bar diameter in 1/16" increments.

**R**

Bar Length



metric bars:	inch bars:
R = 200mm	R = 8"
S = 250mm	S = 10"
T = 300mm	T = 12"

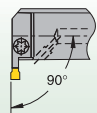
**WMT**

WMT™ Groove and Turn System

**E**

Tool Style

**E** = End mounted (90°)



**R**

Hand

**R** = Right hand  
**L** = Left hand

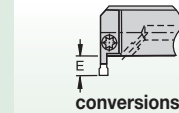
**03**

Seat Size

pocket seat size	cutting width (mm)
02	2,00–2,62
2B	2,39–2,62
03	3,0–3,05
04	4,0–4,05
05	5,0–5,05
06	6,0–6,05
08	8,0–8,05
10	10,0–10,05

**16**

Max Grooving Depth



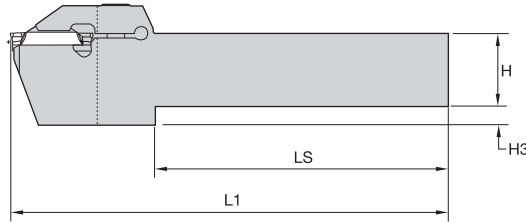
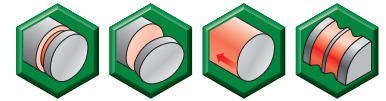
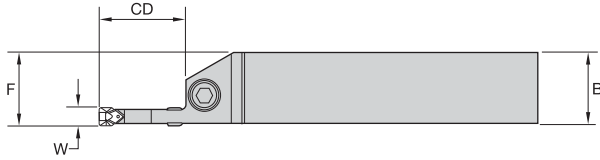
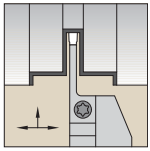
**conversions:**

mm	inch
7mm	.28"
10mm	.39"
12mm	.47"
16mm	.63"

**M**

Tool Units

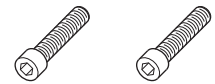
**N** = Inch  
**M** = Metric



Right Hand Tool

Grooving and Cut-Off

■ O.D. Grooving and Cut-Off

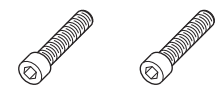


order number	catalogue number	seat size	W	H	B	CD	F	H3	L1	LS	clamp screw	clamp screw
right hand												
3650516	WMTSR2525M116	1	1,50	25,0	25,0	17	25,0	—	150	116	606249	—
3650456	WMTSR1616K216	2	2,00	16,0	16,0	17	16,0	6	125	101	606249	—
3650458	WMTSR2020K216	2	2,00	20,0	20,0	17	20,0	—	125	92	606249	—
3650506	WMTSR2525M216	2	2,00	25,0	25,0	17	25,0	—	150	116	606249	—
3539172	WMTSR1616K2B19	2B	2,38	16,0	16,0	24	15,9	5	125	88	—	MS326
3539174	WMTSR2020K2B19	2B	2,38	20,0	20,0	24	19,9	5	125	88	—	MS326
3539221	WMTSR2525M2B19	2B	2,38	25,0	25,0	24	24,9	—	150	113	—	MS326
3650460	WMTSR1616K311	3	3,00	16,0	16,0	11	16,0	—	125	93	—	619205
3650462	WMTSR1616K322	3	3,00	16,0	16,0	22	16,0	5	125	85	—	619205
3650468	WMTSR2020K311	3	3,00	20,0	20,0	11	20,0	—	125	93	—	619205
3650470	WMTSR2020K322	3	3,00	20,0	20,0	22	20,0	5	125	85	—	619205
3650479	WMTSR2525M311	3	3,00	25,0	25,0	11	25,0	—	150	118	—	619205
3650481	WMTSR2525M322	3	3,00	25,0	25,0	22	25,0	—	150	110	—	619205
3650502	WMTSR1616K411	4	4,00	16,0	16,0	11	16,0	—	125	92	—	619205
3650464	WMTSR1616K422	4	4,00	16,0	16,0	22	16,0	5	125	83	—	619205
3653751	WMTSR2020K20	4	4,00	20,0	20,0	22	20,0	5	125	83	—	619205
3650504	WMTSR2020K411	4	4,00	20,0	20,0	11	20,0	—	125	92	—	619205
3653752	WMTSR2525M11	4	4,00	25,0	25,0	11	25,0	—	150	117	—	619205
3650483	WMTSR2525M422	4	4,00	25,0	25,0	22	25,0	—	150	109	—	619205
3650466	WMTSR1616K514	5	5,00	16,0	16,0	14	16,0	—	125	88	—	619168
3650473	WMTSR2020K514	5	5,00	20,0	20,0	14	20,0	—	125	88	—	619168
3650475	WMTSR2020L525	5	5,00	20,0	20,0	15	20,0	5	140	93	—	619168
3650485	WMTSR2525M514	5	5,00	25,0	25,0	14	25,0	—	150	115	—	619168
3650487	WMTSR2525M525	5	5,00	25,0	25,0	25	25,0	—	150	104	—	619168
3650477	WMTSR2020L614	6	6,00	20,0	20,0	14	20,0	—	140	103	—	619168
3650489	WMTSR2525M614	6	6,00	25,0	25,0	14	25,0	—	150	114	—	619168
3650491	WMTSR2525M625	6	6,00	25,0	25,0	25	25,0	—	150	104	—	619168
3650494	WMTSR2525M814	8	8,00	25,0	25,0	14	25,0	—	150	113	—	619168
3650496	WMTSR2525M825	8	8,00	25,0	25,0	25	25,0	—	150	104	—	619168
3650498	WMTSR3232M814	8	8,00	32,0	32,0	14	32,0	—	150	113	—	619168
3650500	WMTSR3232M825	8	8,00	32,0	32,0	25	32,0	—	150	104	—	619168

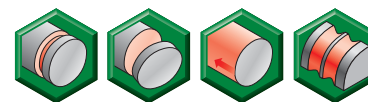
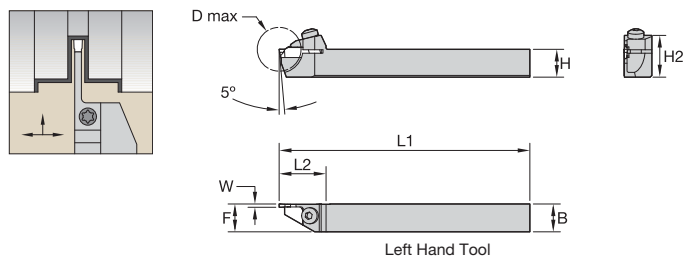
(continued)

(O.D. Grooving and Cut-Off – continued)

order number	catalogue number	seat size	W	H	B	CD	F	H3	L1	LS	clamp screw	clamp screw
<b>left hand</b>												
3653332	WMTSL2525M116	1	1,50	25,0	25,0	16	25,0	—	150	116	606249	—
3650457	WMTSL1616K216	2	2,00	16,0	16,0	17	16,0	6	125	101	606249	—
3650459	WMTSL2020K216	2	2,00	20,0	20,0	17	20,0	—	125	92	606249	—
3650507	WMTSL2525M216	2	2,00	25,0	25,0	17	25,0	—	150	116	606249	—
3539173	WMTSL1616K2B19	2B	2,38	16,0	16,0	24	15,9	5	125	88	—	MS326
3539175	WMTSL2020K2B19	2B	2,38	20,0	20,0	24	19,9	5	125	88	—	MS326
3650461	WMTSL1616K311	3	3,00	16,0	16,0	11	16,0	—	125	93	—	619205
3650463	WMTSL1616K322	3	3,00	16,0	16,0	22	16,0	5	125	85	—	619205
3650469	WMTSL2020K311	3	3,00	20,0	20,0	11	20,0	—	125	93	—	619205
3650471	WMTSL2020K322	3	3,00	20,0	20,0	22	20,0	5	125	85	—	619205
3650480	WMTSL2525M311	3	3,00	25,0	25,0	11	25,0	—	150	118	—	619205
3650482	WMTSL2525M322	3	3,00	25,0	25,0	22	25,0	—	150	110	—	619205
3650465	WMTSL1616K422	4	4,00	16,0	16,0	22	16,0	5	125	83	—	619205
3650472	WMTSL2020K22	4	4,00	20,0	20,0	22	20,0	5	125	83	—	619205
3650505	WMTSL2020K411	4	4,00	20,0	20,0	11	20,0	—	125	92	—	619205
3653763	WMTSL2525M11	4	4,00	25,0	25,0	11	25,0	—	150	117	—	619205
3650484	WMTSL2525M422	4	4,00	25,0	25,0	22	25,0	—	150	109	—	619205
3650467	WMTSL1616K514	5	5,00	16,0	16,0	14	16,0	—	125	88	—	619168
3650474	WMTSL2020K514	5	5,00	20,0	20,0	14	20,0	—	125	88	—	619168
3650486	WMTSL2525M514	5	5,00	25,0	25,0	14	25,0	—	150	113	—	619168
3650488	WMTSL2525M525	5	5,00	25,0	25,0	25	25,0	—	150	104	—	619168
3650478	WMTSL2020L614	6	6,00	20,0	20,0	14	20,0	—	140	103	—	619168
3650490	WMTSL2525M614	6	6,00	25,0	25,0	14	25,0	—	150	114	—	619168
3650493	WMTSL2525M625	6	6,00	25,0	25,0	25	25,0	—	150	104	—	619168
3650495	WMTSL2525M814	8	8,00	25,0	25,0	14	25,0	—	150	113	—	619168
3650497	WMTSL2525M825	8	8,00	25,0	25,0	25	25,0	—	150	104	—	619168
3650499	WMTSL3232M814	8	8,00	32,0	32,0	14	32,0	—	150	113	—	619168
3650501	WMTSL3232M825	8	8,00	32,0	32,0	25	32,0	—	150	104	—	619168



Grooving and Cut-Off



■ **Swiss Grooving and Cut-Off • Metric**

Grooving and Cut-Off

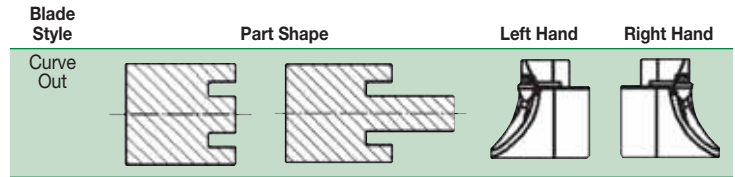
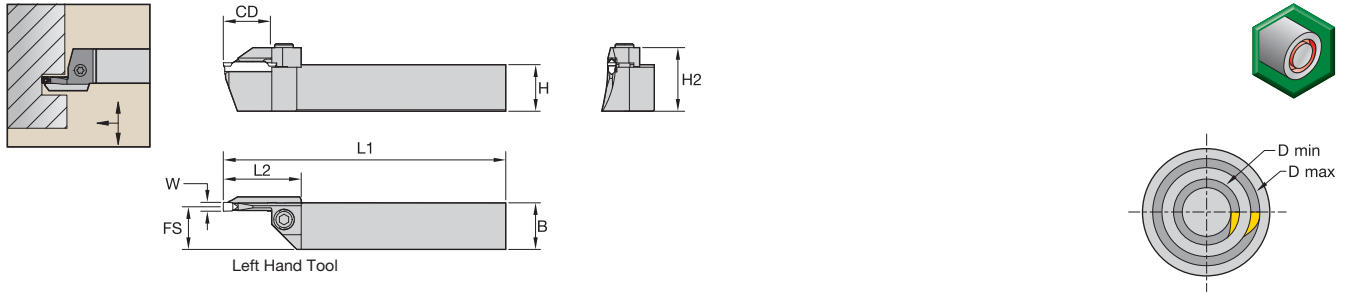
order number	catalogue number	seat size	W	H	B	F	D max	H2	L1	L2	clamp screw
<b>right hand</b>											
3650508	WMTCR1010H110	1	1,50	10,0	10,0	10,0	20	16	100	21	606249
3650510	WMTCR1212H110	1	1,50	12,0	12,0	12,0	20	18	100	21	606249
3650512	WMTCR1616K113	1	1,50	16,0	15,9	16,0	26	24	125	24	606266
3650514	WMTCR2020K113	1	1,50	20,0	19,9	20,0	26	28	125	24	606266
3653413	WMTCR1010H210	2	2,00	10,0	10,0	10,0	20	16	100	21	606249
3653415	WMTCR1212H210	2	2,00	12,0	12,0	12,0	20	18	100	21	606249
3653417	WMTCR1616K213	2	2,00	16,0	15,8	16,0	26	24	125	24	606266
3653419	WMTCR2020K213	2	2,00	20,0	19,8	20,0	26	28	125	24	606266
3539170	WMTCR1212H2B16	2B	2,38	12,0	11,7	11,9	32	23	100	30	606249
<b>left hand</b>											
3650509	WMTCL1010H110	1	1,50	10,0	10,0	10,0	20	16	100	21	606249
3650511	WMTCL1212H110	1	1,50	12,0	12,0	12,0	20	18	100	21	606249
3650513	WMTCL1616K113	1	1,50	16,0	15,9	16,0	26	24	125	24	606266
3650515	WMTCL2020K113	1	1,50	20,0	19,9	20,0	26	28	125	24	606266
3653414	WMTCL1010H210	2	2,00	10,0	10,0	10,0	20	16	100	21	606249
3653416	WMTCL1212H210	2	2,00	12,0	12,0	12,0	20	18	100	21	606249
3653418	WMTCL1616K213	2	2,00	16,0	15,8	16,0	26	24	125	24	606266
3653420	WMTCL2020K213	2	2,00	20,0	19,8	20,0	26	28	125	24	606266
3539171	WMTCL1212H2B16	2B	2,38	12,0	11,7	11,9	32	23	100	30	606249

NOTE: Insert exterior edge in line with toolholder edge for 10mm and 12mm shank toolholders.

Update to our latest style cut-off inserts for use in the above style toolholders.

These holders can be used in many machines including Stars, Citizens, Tsugami, and Tonos/DECO.

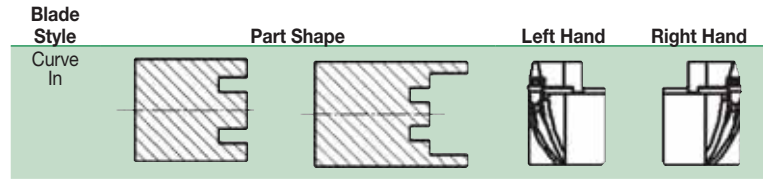
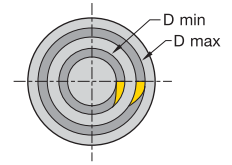
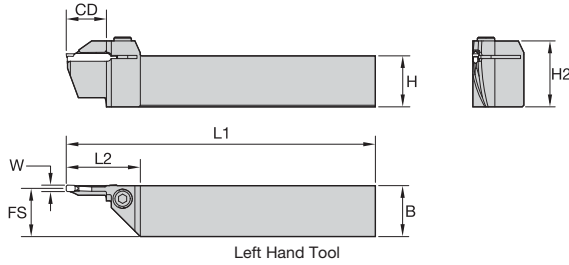
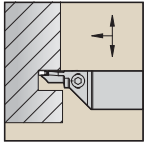
Insert Width	Lead Angle	Old Manchester Catalogue Number	Old Manchester Grade	WMT Cut-Off Insert	WMT Insert Grade	WIDIA™ Order Number
1,5mm	Neutral	583-165	M443B	WMTC015N00CM08	WU25PT	4169668
1,5mm	Right - 5°	583-166	M443B	WMTC015R05CM08	WU25PT	4169670
1,5mm	Right - 12°	583-168	M443B	WMTC015R12CM08	WU25PT	4169672
1,5mm	Left - 5°	583-167	M443B	WMTC015L05CM08	WU25PT	4169671
2,0mm	Neutral	583-170	M443B	WMTC020N00CM08	WU25PT	4169673
2,0mm	Right - 5°	583-170	M443B	WMTC020R05CM08	WU25PT	4169675
2,0mm	Right - 12°	583-173	M443B	WMTC020R12CM08	WU25PT	4169678
2,0mm	Left - 5°	583-172	M443B	WMTC020L05CM08	WU25PT	4169677
2,0mm	Left - 12°	583-174	M443B	WMTC020L12CM08	WU25PT	4169680
2,0mm	Neutral - Groove	583-129	M45 / M43	WMTC020M2P02PT	WU25PT	4116130
2,0mm	Neutral	583-125	M45 / M43	WMTC020N00CMW08	WU25PT	4169674
2,0mm	Right - 5°	583-126	M45 / M43	WMTC020R05CMW08	WU25PT	4169676
2,0mm	Right - 12°	583-128	M45 / M43	WMTC020R12CMW08	WU25PT	4169679
2,0mm	Left - 12°	583-129	M45 / M43	WMTC020L12CMW08	WU25PT	4169681



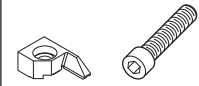
**Curve Out**

order number	catalogue number	seat size	W	H	B	FS	CD	D max	D min	H2	L1	L2	clamp	clamp screw
<b>right hand</b>														
3653421	WMTBR2525M313-038-052	3	3,00	24,8	24,8	23,5	13	52	38	32	150	34	—	619205
3653423	WMTBR2525M316-052-070	3	3,00	24,8	24,8	23,5	16	70	52	32	150	34	—	619205
3653425	WMTBR2525M316-070-100	3	3,00	24,8	24,8	23,5	16	100	70	32	150	34	—	619205
3653427	WMTBR2525M319-100-205	3	3,00	25,0	24,8	23,5	19	205	100	32	150	37	—	619205
3653764	WMTBR2525M412-032-052	4	4,00	24,8	24,8	23,0	13	52	32	32	150	34	—	619205
3653766	WMTBR2525M415-052-070	4	4,00	24,8	24,8	23,0	16	70	52	32	150	34	—	619205
3653770	WMTBR2525M418-100-205	4	4,00	24,8	24,8	23,0	19	205	100	32	150	37	—	619205
3653431	WMTBR2525M519-052-070	5	5,00	24,8	24,8	22,5	19	70	52	34	150	38	446102	619168
3653433	WMTBR2525M519-070-100	5	5,00	24,8	24,8	22,5	19	100	70	34	150	42	446104	619168
3653435	WMTBR2525M525-100-205	5	5,00	24,8	24,8	22,5	25	205	100	34	150	42	446104	619168
3653437	WMTBR2525M616-038-052	6	6,00	24,8	24,8	22,0	16	52	38	35	150	38	446102	619168
3653441	WMTBR2525M619-070-100	6	6,00	24,8	24,8	22,0	19	100	70	36	150	42	446104	619168
3653443	WMTBR2525M625-100-205	6	6,00	24,8	24,8	22,0	25	205	100	34	150	42	446104	619168
<b>left hand</b>														
3653422	WMTBL2525M313-038-052	3	3,00	24,8	24,8	23,5	13	52	38	32	150	34	—	619205
3653424	WMTBL2525M316-052-070	3	3,00	24,8	24,8	23,5	16	70	52	32	150	34	—	619205
3653426	WMTBL2525M316-070-100	3	3,00	24,8	24,8	23,5	16	100	70	32	150	34	—	619205
3653428	WMTBL2525M319-100-205	3	3,00	24,8	24,8	23,5	19	205	100	32	150	37	—	619205
3653765	WMTBL2525M412-032-052	4	4,00	24,8	24,8	23,0	13	52	32	32	150	34	—	619205
3653767	WMTBL2525M415-052-070	4	4,00	24,8	24,8	23,0	16	70	52	32	150	34	—	619205
3653769	WMTBL2525M415-070-100	4	4,00	24,8	24,8	23,0	16	100	70	32	150	34	—	619205
3653771	WMTBL2525M418-100-205	4	4,00	24,8	24,8	23,0	19	205	100	32	150	37	—	619205
3653432	WMTBL2525M519-052-070	5	5,00	24,8	24,8	22,5	19	70	52	34	150	38	446101	619168
3653434	WMTBL2525M519-070-100	5	5,00	24,8	24,8	22,5	19	100	70	34	150	42	446103	619168
3653436	WMTBL2525M525-100-205	5	5,00	24,8	24,8	22,5	25	205	100	34	150	42	446103	619168
3653438	WMTBL2525M616-038-052	6	6,00	24,8	24,8	22,0	16	52	38	35	150	38	446101	619168
3653444	WMTBL2525M625-100-205	6	6,00	24,8	24,8	22,0	25	205	100	34	150	42	446103	619168

NOTE: Initial cut of tool must be between D min and D max. Due to the insert being positioned 0,75mm above centre, minimum diameter after initial cut is 12,6mm.  
Toolholders that accept 3mm and 4mm width inserts have an integral clamp.  
Toolholders that accept 5mm and 6mm width inserts are supplied with a detachable clamp.

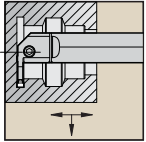


■ Curve In

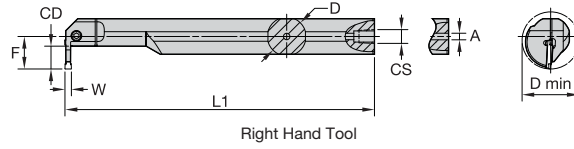


order number	catalogue number	seat size	W	H	B	FS	CD	D max	D min	H2	L1	L2	clamp	clamp screw
<b>right hand</b>														
3634282	WMTAR2525M316-070-100	3	3,00	24,8	24,8	23,5	16	100	70	32	150	34	—	MS326
3634284	WMTAR2525M319-100-205	3	3,00	24,8	24,8	23,5	19	205	100	32	150	37	—	MS326
3634290	WMTAR2525M619-070-100	6	6,00	24,8	24,8	22,0	19	100	70	34	150	42	446104	619168
<b>left hand</b>														
3634283	WMTAL2525M316-070-100	3	3,00	24,8	24,8	23,5	16	100	70	32	150	34	—	MS326
3634285	WMTAL2525M319-100-205	3	3,00	24,8	24,8	23,5	19	205	100	32	150	37	—	MS326

NOTE: Initial cut of tool must be between D min and D max. Due to the insert being positioned 0,75mm above centre, minimum diameter after initial cut is 12,6mm.  
Toolholders that accept 3mm and 4mm width inserts have an integral clamp.  
Toolholders that accept 5mm and 6mm width inserts are supplied with a detachable clamp.

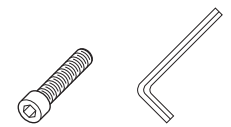


Steel shank with through coolant.



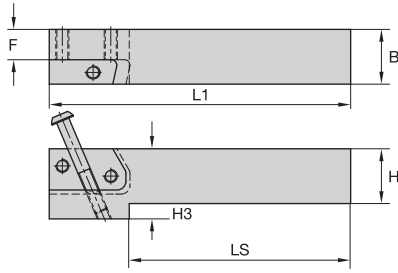
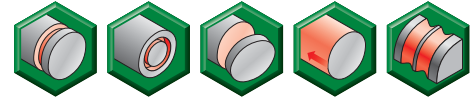
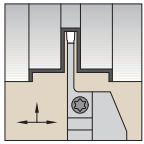
■ I.D. Boring Bars

order number	catalogue number	insert size	W	F	CD	D	D min	L1	A	clamp screw	hex
<b>right hand</b>											
5423874	A25RWMTER0316M	3	3,00	26,0	16	25,00	41	200	6,40	619168	5 mm
5423875	A32SWMTER0319M	3	3,00	29,0	19	32,00	47	250	6,40	619168	5 mm
5423876	A25RWMTER0416M	4	4,00	26,0	16	25,00	41	200	6,40	619168	5 mm
5423877	A32SWMTER0419M	4	4,00	29,0	19	32,00	47	250	6,40	619168	5 mm
5423878	A32SWMTER0519M	5	5,00	29,0	19	32,00	47	250	6,40	619168	5 mm
5423879	A40TWMTER0522M	5	5,00	32,0	22	40,00	54	300	6,40	619168	5 mm
5423880	A32SWMTER0619M	6	6,00	29,0	19	32,00	47	250	6,40	619168	5 mm
5423881	A40TWMTER0622M	6	6,00	31,8	22	40,00	54	300	6,40	619168	5 mm
<b>left hand</b>											
5423882	A25RWMTEL0316M	3	3,00	26,0	16	25,00	41	200	6,40	619168	5 mm
5423883	A32SWMTEL0319M	3	3,00	29,0	19	32,00	47	250	6,40	619168	5 mm
5423884	A25RWMTEL0416M	4	4,00	26,0	16	25,00	41	200	6,40	619168	5 mm
5423885	A32SWMTEL0419M	4	4,00	29,0	19	32,00	47	250	6,40	619168	5 mm
5423886	A32SWMTEL0519M	5	5,00	29,0	19	32,00	47	250	6,40	619168	5 mm
5423887	A40TWMTEL0522M	5	5,00	32,0	22	40,00	54	300	6,40	619168	5 mm
5423888	A32SWMTEL0619M	6	6,00	29,0	19	32,00	47	250	6,40	619168	5 mm
5423889	A40TWMTEL0622M	6	6,00	31,8	22	40,00	54	300	6,40	619168	5 mm

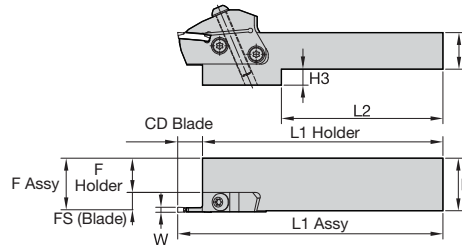


Grooving and Cut-Off



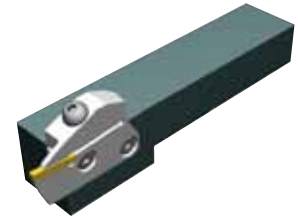


Right Hand Tool  
2 blade screws required





$$F \text{ Assy} = F \text{ (Holder)} + FS \text{ (Blade)} + W/2$$

$$L1 \text{ Assy} = L1 \text{ (Holder)} + CD \text{ (Blade)}$$



Grooving and Cut-Off

■ Straight Mount • Grooving, Cut-Off, and Face Grooving

order number	catalogue number	H	B	L1	LS	F	H3		Torx for blade screw		Torx for clamp screw
<b>right hand</b>											
5349628	WGMSR2020	20	20	108,0	68,00	8,84	12	MS2002	T25	MS1162	T25
5349629	WGMSR2525	25	25	126,0	95,78	13,84	7	MS2002	T25	MS1162	T25
5349641	WGMSR3232	32	32	126,0	69,85	20,81	—	MS2002	T25	MS1162	T25
<b>left hand</b>											
5349625	WGMSL1620	16	20	108,0	68,00	8,84	16	MS2002	T25	MS1162	T25
5349626	WGMSL2020	20	20	108,0	68,00	8,84	12	MS2002	T25	MS1162	T25
5349627	WGMSL2525	25	25	126,0	95,78	13,84	7	MS2002	T25	MS1162	T25
5349640	WGMSL3232	32	32	126,0	69,85	20,81	—	MS2002	T25	MS1162	T25

NOTE: Use the larger seat size toolholder for optimal performance.  
Blade screws and clamp screw included with holder.

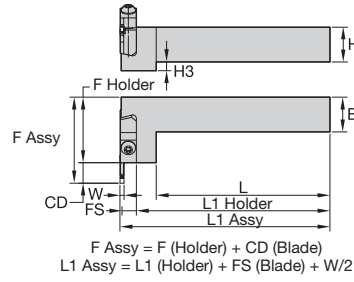
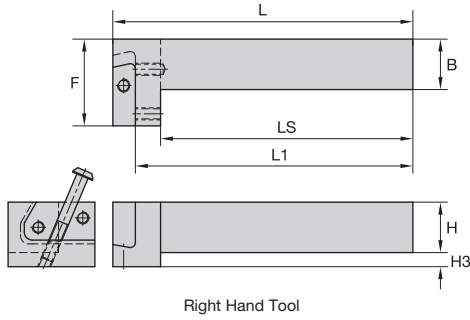
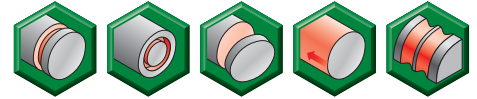
Toolholder Style	Hand of Holder	Hand of Blade
WGMS – Straight Mount	Right	Right
	Left	Left
WGME – End Mount	Right	Left
	Left	Right



Grooving and Cut-Off Blades found on page E38.



Face Grooving Blades found on page E39.



■ End Mount • Grooving, Cut-Off, and Face Grooving

order number	catalogue number	H	B	L	L1	LS	F	H3
<b>right hand</b>								
5514979	WGMR2525	25	25	150,3	139,3	125,25	42,75	9
5515021	WGMR3232	32	32	170,3	159,3	145,25	42,75	—
<b>left hand</b>								
5514978	WGME2525	25	25	150,3	139,3	125,25	42,75	9
5515020	WGME3232	32	32	170,3	159,3	145,25	42,75	—

Toolholder Style	Hand of Holder	Hand of Blade
WGMS – Straight Mount	Right	Right
	Left	Left
WGME – End Mount	Right	Left
	Left	Right

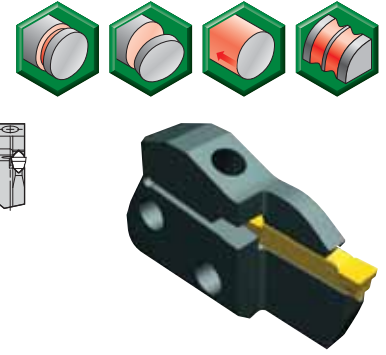
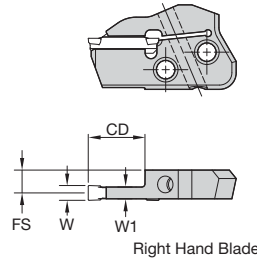
Grooving and Cut-Off



Grooving and Cut-Off Blades found on page E38.



Face Grooving Blades found on page E39.



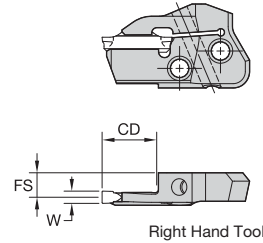
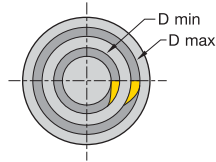
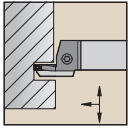
Grooving and Cut-Off

■ Grooving and Cut-Off

order number	catalogue number	seat size	CD	W	FS	W1
<b>right hand</b>						
5359127	WMTWGMR114S	1	14,00	1,50	11,04	1,22
5359128	WMTWGMR213S	2	13,00	2,00	10,81	1,68
5359129	WMTWGMR2B16S	2B	16,50	2,39	10,71	1,88
5359130	WMTWGMR319S	3	19,00	3,00	10,38	2,54
5359131	WMTWGMR419S	4	19,00	4,00	10,00	3,30
5359132	WMTWGMR522S	5	22,00	5,00	9,82	3,66
5359133	WMTWGMR622S	6	22,00	6,00	9,26	4,78
<b>left hand</b>						
5359120	WMTWGML114S	1	14,00	1,50	11,04	1,22
5359121	WMTWGML213S	2	13,00	2,00	10,81	1,68
5359122	WMTWGML2B16S	2B	16,50	2,39	10,71	1,88
5359123	WMTWGML319S	3	19,00	3,00	10,38	2,54
5359124	WMTWGML419S	4	19,00	4,00	10,00	3,30
5359125	WMTWGML522S	5	22,00	5,00	9,82	3,66
5359126	WMTWGML622S	6	22,00	6,00	9,26	4,78

NOTE: Blade and clamp screw torque equals 8–10 Nm.

Toolholder Style	Hand of Holder	Hand of Blade
WGMS – Straight Mount	Right	Right
	Left	Left
WGME – End Mount	Right	Left
	Left	Right



■ Face Grooving

order number	catalogue number	seat size	D min	D max	CD	W	FS
<b>right hand</b>							
5359150	WMTWGMR313B038-052	3	38,00	52,00	12,70	3,00	11,00
5359151	WMTWGMR316B052-070	3	52,00	70,00	15,88	3,00	11,00
5359154	WMTWGMR416B052-070	4	52,00	70,00	15,88	4,00	10,50
5359152	WMTWGMR316B070-100	3	70,00	100,00	15,88	3,00	11,00
5359155	WMTWGMR416B070-100	4	70,00	100,00	15,88	4,00	10,50
5359153	WMTWGMR319B100-205	3	100,00	205,00	19,05	3,00	11,00
5359156	WMTWGMR419B100-205	4	100,00	205,00	19,05	4,00	10,50
5359157	WMTWGMR522B100-205	5	100,00	205,00	22,00	5,00	10,00
5359158	WMTWGMR622B100-205	6	100,00	205,00	22,00	6,00	10,00
<b>left hand</b>							
5359146	WMTWGML616B030-052	6	30,00	52,00	15,88	6,00	10,00
5359134	WMTWGML313B038-052	3	38,00	52,00	12,70	3,00	11,00
5359138	WMTWGML413B038-052	4	38,00	52,00	12,70	4,00	10,50
5359142	WMTWGML516B038-052	5	38,00	52,00	15,88	5,00	10,00
5359135	WMTWGML316B052-070	3	52,00	70,00	15,88	3,00	11,00
5359139	WMTWGML416B052-070	4	52,00	70,00	15,88	4,00	10,50
5359143	WMTWGML519B052-070	5	52,00	70,00	19,05	5,00	10,00
5359147	WMTWGML619B052-070	6	52,00	70,00	19,05	6,00	10,00
5359136	WMTWGML316B070-100	3	70,00	100,00	15,88	3,00	11,00
5359140	WMTWGML416B070-100	4	70,00	100,00	15,88	4,00	10,50
5359144	WMTWGML519B070-100	5	70,00	100,00	19,05	5,00	10,00
5359148	WMTWGML619B070-100	6	70,00	100,00	19,05	6,00	10,00
5359137	WMTWGML319100-205	3	100,00	205,00	19,05	3,00	11,00
5359141	WMTWGML419B100-205	4	100,00	205,00	19,05	4,00	10,50
5359145	WMTWGML522B100-205	5	100,00	205,00	22,00	5,00	10,00
5359149	WMTWGML622B100-205	6	100,00	205,00	22,00	6,00	10,00

NOTE: Blade and clamp screw torque equals 8–10 Nm.

Toolholder Style	Hand of Holder	Hand of Blade
WGMS – Straight Mount	Right	Right
	Left	Left
WGME – End Mount	Right	Left
	Left	Right

## WIDIA™ TopGroove™ for Shallow Grooving and Face Grooving

# TopGroove

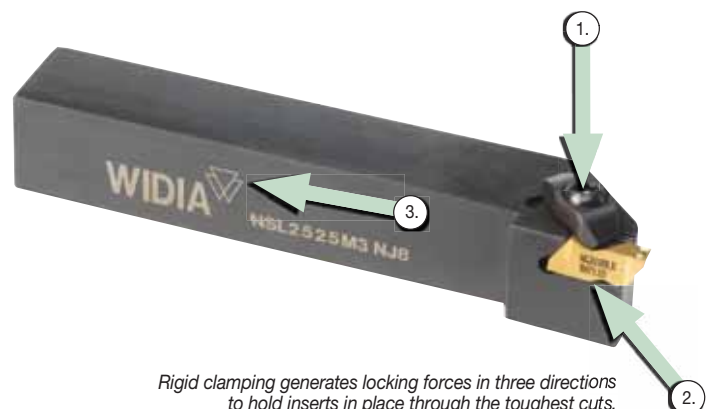


WIDIA has set the industry standard for threading and grooving productivity with the TopGroove clamping design. The TopGroove design provides consistent tool performance, accurate indexing, and superior clamping to provide excellent surface finish and outstanding tool life.

Let us help you select the correct insert for your application needs or upgrade your current TopGroove tooling inventory to include chip control geometries and the high productivity grades available from WIDIA.

### Rigidity, Versatility, and Chip Control

- TopGroove clamping design features a rugged bridge clamp, which locates in a groove moulded into the insert to provide superior resistance to side and radial cutting forces.
- TopGroove inserts are available for shallow grooving, deep grooving, light turning, profiling, shallow and deep face grooving, back turning, undercutting, and Poly-Vee grooving.
- The proprietary WIDIA chip control design works in multi-directional turning as well as radial feed applications to provide excellent chip evacuation in deep grooving applications.



*Rigid clamping generates locking forces in three directions to hold inserts in place through the toughest cuts.*

TopGroove inserts employ a unique top rake chip control geometry that efficiently evacuates chips and produces better quality parts faster.

The WIDIA™ TopGroove™ clamping system offers a complete line of grooving geometries and an extensive grade selection.



## Carbide Grades and Proven Solutions for High Productivity

- The TopGroove system has a carbide grade to match your application needs that include uncoated grades, PVD-coated grades, CVD-coated grades, and advanced material grades, including cermets, ceramics, PcBNs, and PCDs (as custom solutions).
- PVD TiAlN-coated grades are designed to cut a variety of workpiece materials.
- Versatile design enables one system to handle O.D. and I.D. grooving, face grooving, back turning, undercutting, and even threading operations.

## The Most Advanced Turning Solutions in the Industry

Perfect for shallow grooving operations, the WIDIA™ TopGroove clamping system provides a complete line of grooving geometries and an extensive grade selection to meet even the most demanding application requirements. For increased rigidity, versatility, chip control, and carbide grade options, the TopGroove clamping system is the proven solution.

With maximum clamping rigidity and superior versatility, TopGroove inserts employ a unique top rake chip control geometry that efficiently evacuates chips and produces better quality parts, faster than ever before.

Utilise this comprehensive, easy-to-use guide for the information necessary to identify, choose, and select the appropriate cutting tools for your specific needs.

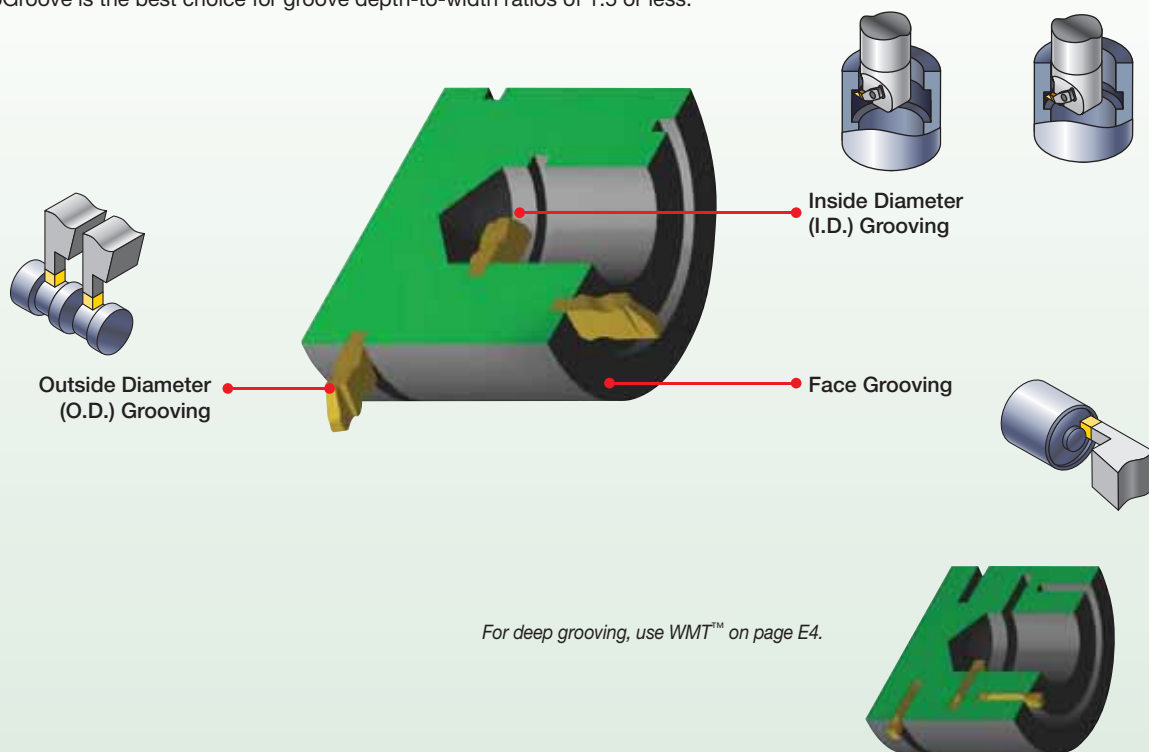
### What you need to know:

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

### 1 Choose the application to be performed:

Groove depth, width, and profile.

TopGroove is the best choice for groove depth-to-width ratios of 1.5 or less.



### TopGroove™ for Internal, External, and Face Grooving Applications

system capabilities		minimum	maximum	
	O.D./I.D. Grooving	width	0,50mm	9,53mm
		depth	—	12,7mm
	Face Grooving	width	3,2mm	6,35mm
		depth	—	12,7mm
	Internal Grooving	diameter	11,2mm	—
	Face Grooving Diameter	standard	23,9mm	—
		deep	—	—
	Deep O.D./I.D. Grooving	width	1,50mm	6,35mm
		depth	—	12,7mm
	Deep Face Grooving	width	3,18mm	6,35mm
		depth	—	12,7mm

**2 Identify the material to be machined:**

Each tool has a material grid marked with a letter indicating the materials that can be machined.

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

**3 Select your toolholder based on the application:**

- A** Choose the appropriate gage insert (width) required for the application.
- B** Choose the shortest cutting depth "CD" dimension for increased tool rigidity.
- C** Select the largest toolholder shank "H" and "B" dimensions for maximum rigidity.

**TopGroove™**  
Toolholders

order number	catalogue number	C		F	L1	L2	B4	CD	A	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
		H	B											
<b>right hand</b>														
3641682	NSR1010E2	10,0	10,0	14,0	70	19	9	4	N.2R	CM74	MS1200	—	—	T10
3641660	NSR1212F2	12,0	12,0	16,0	80	19	9	4	N.2R	CM74	MS1200	—	—	T10
3636542	NSR1616H2	16,0	16,0	20,0	100	19	9	4	N.2R	CM74	MS1200	—	—	T10
3638589	NSR2020K2	20,0	20,0	25,0	125	19	9	4	N.2R	CM74	MS1200	—	—	T10
3638588	NSR2020K3	20,0	20,0	25,0	125	32	13	5	N.3R	CM72LP	—	MS2111	25 IP	
3638590	NSR2525M2	25,0	25,0	32,0	150	19	9	4	N.2R	CM74	MS1200	—	—	T10
3636536	NSR2525M3	25,0	25,0	32,0	150	32	13	5	N.3R	CM72LP	—	MS2111	25 IP	
3636540	NSR2525M4	25,0	25,0	32,0	150	35	14	7	N.4R	CM72LP	—	MS2111	25 IP	
3641664	NSR3225P3	32,0	25,0	32,0	170	32	13	5	N.3R	CM72LP	—	MS2111	25 IP	
3641675	NSR3225P4	32,0	25,0	32,0	170	35	14	7	N.4R	CM72LP	—	MS2111	25 IP	
3641666	NSR3232P3	32,0	32,0	40,0	170	32	13	5	N.3R	CM72LP	—	MS2111	25 IP	
3641669	NSR3232P4	32,0	32,0	40,0	170	35	14	7	N.4R	CM72LP	—	MS2111	25 IP	
<b>left hand</b>														
3641683	NSL1010E2	10,0	10,0	14,0	70	19	9	4	N.2L	CM75	MS1200	—	—	T10
3641681	NSL1212F2	12,0	12,0	16,0	80	19	9	4	N.2L	CM75	MS1200	—	—	T10
3636545	NSL1616H2	16,0	16,0	20,0	100	19	9	4	N.2L	CM75	MS1200	—	—	T10
3639045	NSL2020K2	20,0	20,0	25,0	125	19	9	4	N.2L	CM75	MS1200	—	—	T10

		application	conventional toolholders	modular blades
		O.D. Grooving and Plunge and Turn	pages E74–E76	—
		I.D. Grooving	pages E78–E79	—



**4 Select chipbreaker style for the application:**

See application guide on page E48 for a complete list of insert styles.



NOTE: Chart shows recommended starting feed rates.

See page E49.

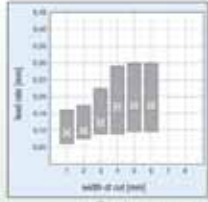
**WIDIA**
**TopGroove™**  
Feed Values for Grooving Inserts

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**TopGroove • NG -K, NG-1L, and NG**



- Chip control enables true optimisation and productivity.
- For general-purpose, O-ring, and circlip grooving applications.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.



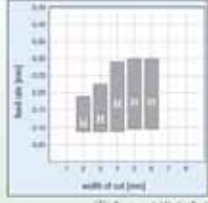
① Recommended Starting Feed

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**TopGroove • NGP and NGD-K**



- Positive rake angles.
- For deep, O-ring, circlip, and general-purpose grooving applications.
- Chip geometry for excellent chip control.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.



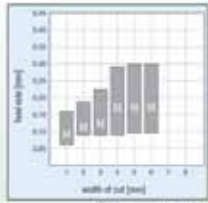
① Recommended Starting Feed

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**TopGroove • NR and NR-K**

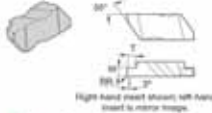
- For full radius grooving and turning profiling applications.
- Chip geometry for excellent chip control.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.



① Recommended Starting Feed

- A Choose the appropriate insert width “W” for your specific application.
- B Select the required corner radius value “RR”.

**WIDIA**
**TopGroove™**  
Grooving Inserts







Right hand insert shown with feed insert to mirror image.

■ **NG • Grooving Inserts**

catalogue number	insert size	A		T	
		W	RR		
NG201R	2	0.79	0.08	1.27	3607123 3607123 3607123 3607123
NG204R	2	1.04	0.08	1.27	3607124 3607124 3607124 3607124
NG3047R	3	1.19	0.19	1.91	3607021 3607021 3607021 3607021
NG206R	2	1.47	0.19	1.27	3607022 3607022 3607022 3607022
NG3062R	3	1.68	0.19	2.26	3607023 3607023 3607023 3607023
NG2062R	2	1.55	0.19	2.79	3607024 3607024 3607024 3607024
NG3094R	3	2.29	0.19	3.81	3607025 3607025 3607025 3607025

first choice  
 alternate choice

**5 Select grade:**

cutting condition		Recommended Grades					
		steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
smooth cut, pre-turned surface		TN7110	TN6010	TN7110	TN6010/THM	TN6010	TN6010
varying depth of cut, casting, or forging skin		TN6010	TN6010	TN6010	TN6010/THM	TN6010	TN6010
lightly interrupted cut		TN6025	TN6025	TN6025	TN6010/THM	TN6010	TN6025
heavily interrupted cut		TN6025	TN6025	TN6025	TN6010/THM	TN6010	TN6025

See page E47 for Grades and Grade Descriptions.

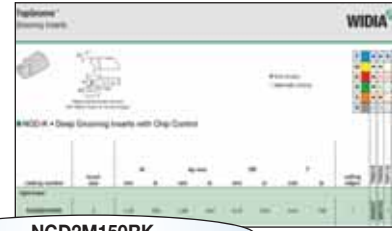
**6 Determine cutting data:**

- A Based on material group and grade, identify starting speed (vc).
- B First choice starting speed is in **bold**.

See page E50 for cutting data.

Material Group		Cutting Speed – vc m/min											
		TN6010			TN6025			TN7110			THM		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0 / 1	140	175	210	130	148	150	200	215	230	90	85	100
	2	115	145	175	110	145	175	170	220	270	75	100	125
	3	115	145	175	110	145	175	170	220	270	75	100	125
	4	75	100	120	75	95	115	115	145	175	55	65	80
	5	100	140	170	100	125	145	105	<b>190</b>	220	70	85	100
	6	45	60	75	40	55	65	65	85	100	30	40	45
M	1	90	115	140	60	75	90	--	--	--	90	75	90
	2	55	70	90	40	50	55	--	--	--	50	60	75
	3	60	80	95	40	60	60	--	--	--	40	60	55
K	1	120	150	180	60	80	90	175	220	275	70	90	100
	2	120	150	180	60	75	85	185	215	265	50	65	80
	3	110	140	170	60	75	90	180	<b>230</b>	280	60	70	80
N	1	600	750	900	600	750	900	--	--	--	600	750	900
	2	535	685	835	535	685	835	--	--	--	500	650	800
	3	230	300	370	230	300	370	--	--	--	400	750	900
	4	135	190	225	135	190	225	--	--	--	500	650	800
	5	70	90	110	70	90	110	--	--	--	230	300	370
	6	445	565	690	445	565	690	--	--	--	150	200	250
	7	560	700	850	560	700	850	--	--	--	150	200	250
S	1	35	40	50	25	35	40	--	--	--	25	35	45
	2	20	30	30	15	20	20	--	--	--	20	30	35
	3	60	70	80	40	60	70	--	--	--	15	25	30
	4	30	35	45	20	30	35	--	--	--	10	15	20
H	1	--	--	--	15	30	60	15	30	60	--	--	--
	2	--	--	--	15	30	60	15	30	60	--	--	--
	3	--	--	--	15	30	60	15	30	60	--	--	--
	4	--	--	--	15	30	60	15	30	60	--	--	--

# TopGroove Insert Identification System



NGD2M150RK

N	G	D	2	M	150	R		K													
Type of Insert	Insert Style	Additional Information	Insert Size	Size Identification	Groove Size**	Hand of Insert	Cutting Depth	Chipbreaker Design	Definition of Inserts												
<p><b>N</b> – TopGroove</p>	<p><b>D</b> – Deep grooving</p> <p><b>P</b> – Positive</p> <p><b>C</b> – Groove and chamfer</p>	<p><b>M</b> – Metric insert groove width</p> <p><b>C</b> – Circlip groove insert width is nominal circlip size</p> <p><b>Blank</b> – Indicates inch width insert</p>	<table border="1"> <thead> <tr> <th>insert number</th> <th>W1 mm</th> </tr> </thead> <tbody> <tr><td>1</td><td>2,54</td></tr> <tr><td>2</td><td>3,81</td></tr> <tr><td>3</td><td>4,95</td></tr> <tr><td>4</td><td>6,98</td></tr> <tr><td>5</td><td>9,65</td></tr> <tr><td>6</td><td>9,73</td></tr> </tbody> </table>	insert number	W1 mm	1	2,54	2	3,81	3	4,95	4	6,98	5	9,65	6	9,73	<p><b>L</b> – Left hand</p> <p><b>R</b> – Right hand</p>	<p>Shown for groove and chamfer inserts in 0,01mm increments.</p>	<p><b>K</b> – Standard chip control</p> <p><b>E</b> – Hone only</p>	<p><b>Groove size</b></p> <p><b>J or L</b> – Poly-Vee inserts</p> <p><b>I</b> – Internal face grooving</p>
insert number	W1 mm																				
1	2,54																				
2	3,81																				
3	4,95																				
4	6,98																				
5	9,65																				
6	9,73																				
<p><b>B</b> – Blank (for special forms)</p> <p><b>F</b> – Face grooving</p> <p><b>G</b> – Grooving</p> <p><b>P</b> – Back turning</p> <p><b>R</b> – Full radius</p> <p><b>U</b> – Undercutting (or relieving)</p> <p><b>V</b> – Poly-Vee</p>																					
<p>Position pertains to groove width for F-, G-, and U-style inserts, radii for R-style grooving inserts, and circlip size for groove and chamfer inserts. Dimension in 0,01mm.</p> <p><b>Example:</b> 3,25mm width groove or radius equals “325” catalogue position number.</p> <p><b>Width Tolerance:</b> ±0,025mm unless otherwise specified.</p>																					

\*\*Omit position for TopGroove NB-style blanks.

### TopGroove/TopThread Threading and Grooving Insert Dimensions

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

### TopGroove/TopThread Holder Design

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

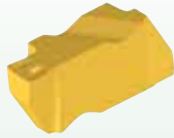
WIDIA™ TopGroove and TopThread™ tooling technology combine to bring you the very best threading and grooving system available in the world today.



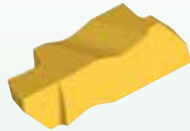
insert style	application	rake angle	page(s)	insert style	application	rake angle	page(s)
<b>NG</b> 	<ul style="list-style-type: none"> <li>• General-purpose grooving.</li> <li>• O-ring grooving.</li> <li>• Circlip grooving.</li> </ul>	neutral	<b>E51–E52</b>	<b>NFD-KI*</b> 	<ul style="list-style-type: none"> <li>• Internal deep face grooving with chip control.</li> <li>• For use in boring bars for internal face grooves.</li> </ul>	10° positive	–
<b>NG-K</b> 	<ul style="list-style-type: none"> <li>• Chip control geometry.</li> <li>• General-purpose grooving.</li> <li>• O-ring grooving.</li> <li>• Circlip grooving.</li> <li>• Light turning.</li> </ul>	10° positive	<b>E53–E59</b>	<b>NP-K</b> 	<ul style="list-style-type: none"> <li>• Turning.</li> <li>• Back turning positive.</li> <li>• Profiling with chip control.</li> </ul>	10° positive	<b>E66</b>
<b>NGC-K*</b> 	<ul style="list-style-type: none"> <li>• Combined groove and chamfered edge break in one positive plunge with chip control.</li> <li>• Designed for DIN 471/472 standard circlip grooves.</li> </ul>	10° positive	–	<b>NR</b> 	<ul style="list-style-type: none"> <li>• Full radius grooving.</li> <li>• Turning and profiling.</li> </ul>	neutral	<b>E67–E69</b>
<b>NGD*</b> 	<ul style="list-style-type: none"> <li>• Deep grooving.</li> </ul>	neutral	–	<b>NR-K</b> 	<ul style="list-style-type: none"> <li>• Chip control geometry.</li> <li>• Full radius grooving, turning, and profiling.</li> </ul>	10° positive	<b>E70</b>
<b>NGD-K</b> 	<ul style="list-style-type: none"> <li>• Chip control geometry.</li> <li>• Deep grooving.</li> <li>• Light turning.</li> </ul>	10° positive	<b>E60–E62</b>	<b>NRD</b> 	<ul style="list-style-type: none"> <li>• Deep grooving.</li> <li>• Full radius end-form.</li> </ul>	neutral	<b>E71</b>
<b>NGP</b> 	<ul style="list-style-type: none"> <li>• General-purpose grooving.</li> <li>• O-ring grooving.</li> <li>• Circlip grooving.</li> </ul>	5° positive	<b>E63–E64</b>	<b>NRP*</b> 	<ul style="list-style-type: none"> <li>• Full radius grooving.</li> <li>• Light-turning profiling.</li> </ul>	5° positive	–
<b>NF*</b> 	<ul style="list-style-type: none"> <li>• Face grooving.</li> <li>• Additional side clearance.</li> </ul>	neutral	–	<b>NU*</b> 	<ul style="list-style-type: none"> <li>• Undercutting.</li> </ul>	neutral	–
<b>NF-K</b> 	<ul style="list-style-type: none"> <li>• Face grooving with chip control.</li> <li>• Additional side clearance.</li> </ul>	10° positive	<b>E65</b>	<b>NV*</b> 	<ul style="list-style-type: none"> <li>• Poly-Vee grooving.</li> </ul>	neutral	–
<b>NFD-K</b> 	<ul style="list-style-type: none"> <li>• Deep face grooving with chip control.</li> <li>• Additional side clearance.</li> </ul>	10° positive	<b>E66</b>	<b>NB/NBD</b> 	<ul style="list-style-type: none"> <li>• Blanks.</li> <li>• Blanks for deep grooving.</li> <li>• Available in uncoated grades only.</li> </ul>	–	<b>E72</b>

\*Inserts are available as custom solutions.

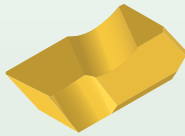
**TopGroove • NG -K, NG-1L, and NG**



**NG-K**

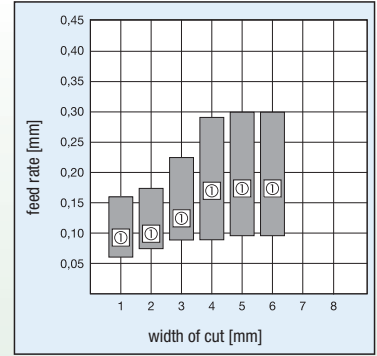


**NG**



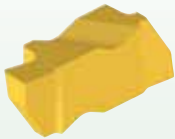
**NG-1L**

- Chip control enables true optimisation and productivity.
- For general-purpose, O-ring, and circlip grooving applications.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.

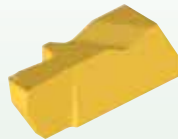


① Recommended Starting Feed

**TopGroove • NGP and NGD-K**

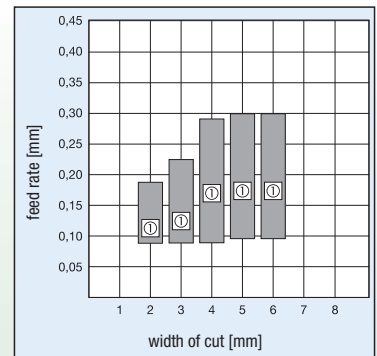


**NGP**



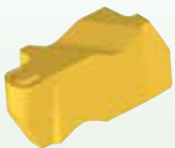
**NGD-K**

- Positive rake angles.
- For deep, O-ring, circlip, and general-purpose grooving applications.
- Chip geometry for excellent chip control.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.

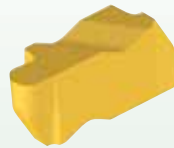


① Recommended Starting Feed

**TopGroove • NR and NR-K**

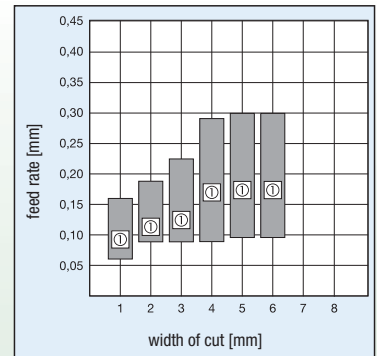


**NR**



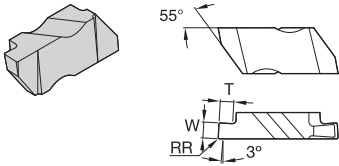
**NR-K**

- For full radius grooving and turning profiling applications.
- Chip geometry for excellent chip control.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.



① Recommended Starting Feed

Material Group		Cutting Speed – vc m/min											
		TN6010			TN6025			TN7110			THM		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0/1	140	175	210	130	140	150	200	215	230	90	95	100
	2	115	145	175	110	145	175	170	220	270	75	100	125
	3	115	145	175	110	145	175	170	220	270	75	100	125
	4	75	100	120	75	95	115	115	145	175	55	65	80
	5	105	140	170	100	125	145	155	190	220	70	85	100
	6	45	60	75	40	55	65	65	85	100	30	40	45
M	1	90	115	140	60	75	90	-	-	-	60	75	90
	2	55	70	90	40	50	55	-	-	-	50	60	75
	3	60	80	95	40	50	60	-	-	-	40	50	55
K	1	120	150	180	60	80	90	175	220	275	70	90	100
	2	120	150	180	60	75	85	165	215	265	50	65	80
	3	110	140	170	60	75	90	180	230	280	60	70	80
N	1	600	750	900	600	750	900	-	-	-	600	750	900
	2	535	685	835	535	685	835	-	-	-	500	650	800
	3	230	300	370	230	300	370	-	-	-	600	750	900
	4	135	180	225	135	180	225	-	-	-	500	650	800
	5	70	90	110	70	90	110	-	-	-	230	300	370
	6	445	565	690	445	565	690	-	-	-	150	200	250
	7	550	700	850	550	700	850	-	-	-	150	200	250
S	1	35	40	50	25	35	40	-	-	-	25	35	45
	2	20	20	30	15	20	20	-	-	-	20	30	35
	3	60	70	80	40	60	70	-	-	-	15	25	30
	4	30	35	45	20	30	35	-	-	-	10	15	20
H	1	15	30	60	15	30	60	-	-	-	10	20	35
	2	15	30	60	15	30	60	-	-	-	10	20	35
	3	15	30	60	15	30	60	-	-	-	10	20	35
	4	15	30	60	15	30	60	-	-	-	10	20	35



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

● first choice  
○ alternate choice

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

**■ NG • Grooving Inserts**

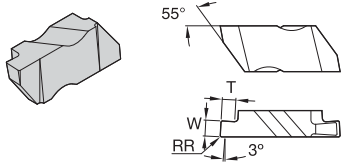
catalogue number	insert size	W	RR	T	TN6010	TN6025	TN7110	THM
<b>right hand</b>								
NG2031R	2	0,79	0,09	1,27	3607153	3607495	•	3607030
NG2041R	2	1,04	0,09	1,27	•	3607330	•	•
NG3047R	3	1,19	0,19	1,91	3607157	3607416	•	•
NG2058R	2	1,47	0,19	1,27	•	3607450	•	•
NG2062R	2	1,58	0,19	2,79	3607167	3607453	•	3607027
NG3062R	3	1,58	0,19	2,39	3607109	3607403	•	•
NG3094R	3	2,39	0,19	3,81	3607137	3607406	•	3607018
NG3125R	3	3,18	0,19	3,81	3607110	3607375	•	3607020
NG4250R	4	6,35	0,57	6,35	3607143	3607382	•	•
<b>left hand</b>								
NG2031L	2	0,79	0,09	1,27	•	3607482	•	•
NG3047L	3	1,19	0,19	1,91	3607179	3607501	•	3607036
NG2058L	2	1,47	0,19	1,27	•	3607498	•	•
NG2062L	2	1,58	0,19	2,79	•	3607481	•	•
NG3062L	3	1,58	0,19	2,39	3607158	3607459	•	•



(continued)



(NG • Grooving Inserts — continued)



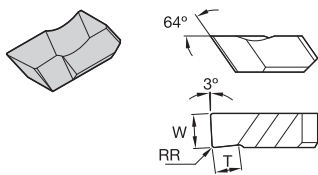
Right-hand insert shown; left-hand insert is mirror image.

● first choice  
○ alternate choice

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

Grooving and Cut-Off

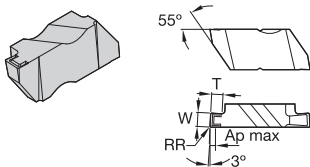
catalogue number	insert size	W	RR	T	TN6010	TN6025	TN7110	THM
NG3094L	3	2,39	0,19	3,81	3607160	3607323	—	—
NG3125L	3	3,18	0,19	3,81	3607152	3607445	—	3607022
NG5M500L	5	5,00	0,32	9,52	—	3636572	—	—
NG4250L	4	6,35	0,57	6,35	3607175	3607513	—	—



■ NG-1L • Grooving Inserts

catalogue number	insert size	W	RR	T	cutting edges	TN6010	TN6025	TN7110	THM
<b>left hand</b>									
NG1047L	1	1,19	0,19	1,91	1	—	3636571	—	—
NG1062L	1	1,58	0,19	1,91	1	—	3636569	—	—
NG1094L	1	2,39	0,19	1,91	1	—	3636570	—	—

NOTE: Width tolerance is +/- 0,076mm on NG-1L inserts.



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

● first choice  
○ alternate choice

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

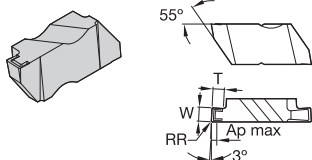
■ **NG-K • Grooving Inserts with Chip Control**

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
<b>right hand</b>									
NG2M050RK	2	0,50	0,64	0,09	0,64	3606991	3607394	●	●
NG2031RK	2	0,79	0,76	0,09	1,27	3607090	3607313	●	●
NG2M080RK	2	0,80	0,76	0,09	1,27	3606903	3607291	●	●
NG2M100RK	2	1,00	0,76	0,09	1,27	3607129	3607218	●	●
NG3M100RK	3	1,00	0,76	0,19	1,91	3607219	3607219	●	●
NG2047RK	2	1,19	0,76	0,09	1,27	3607123	3607404	●	●
NG3047RK	3	1,19	0,76	0,19	1,91	3607084	3607238	●	●
NG2M120RK	2	1,20	0,76	0,09	1,27	3606679	3607299	●	●
NG3M120RK	3	1,20	0,76	0,19	1,91	3606915	3607412	●	●
NG2M140RK	2	1,40	0,76	0,09	1,27	3607151	3607318	●	●
NG2M150RK	2	1,50	1,09	0,19	2,79	3607234	3607234	●	●
NG3M150RK	3	1,50	1,02	0,19	2,39	3607221	3607221	●	●
NG2062RK	2	1,58	1,09	0,19	2,79	3607089	3607215	●	●
NG3062RK	3	1,58	1,02	0,19	2,39	3607055	3607070	●	●
NG2M170RK	2	1,70	1,09	0,19	2,79	3606673	3607242	●	●

(continued)



(NG-K • Grooving Inserts with Chip Control — continued)



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

● first choice  
○ alternate choice

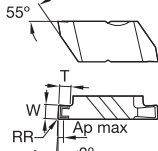
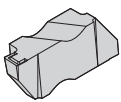
P		●	●	●	●
M		●	●	○	○
K		●	○	○	○
N		●	○	○	●
S		●	●	○	●
H		○	○	○	○

Grooving and Cut-Off

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
NG2M175RK	2	1,75	1,09	0,19	2,79	●	●	●	●
NG3M175RK	3	1,75	1,02	0,19	2,39	●	○	○	○
NG3072RK	3	1,83	1,02	0,19	2,39	○	○	○	○
NG2M195RK	2	1,95	1,09	0,19	2,79	○	○	○	○
NG3078RK	3	1,98	1,02	0,19	2,39	○	○	○	○
NG2M200RK	2	2,00	1,09	0,19	2,79	○	○	○	○
NG3M200RK	3	2,00	1,02	0,19	2,39	○	○	○	○
NG2M220RK	2	2,20	1,09	0,19	2,79	○	○	○	○
NG3M220RK	3	2,20	1,02	0,19	2,39	○	○	○	○
NG3M225RK	3	2,24	1,02	0,19	2,39	○	○	○	○
NG2M225RK	2	2,25	1,09	0,19	2,79	○	○	○	○
NG2094RK	2	2,39	1,09	0,19	2,79	○	○	○	○
NG3094RK	3	2,39	1,02	0,19	3,81	○	○	○	○
NG2M250RK	2	2,50	1,09	0,19	2,79	○	○	○	○
NG3M250RK	3	2,50	1,02	0,19	3,81	○	○	○	○
NG2M275RK	2	2,75	1,09	0,19	2,79	○	○	○	○

(continued)

(NG-K • Grooving Inserts with Chip Control — continued)



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

● first choice  
○ alternate choice

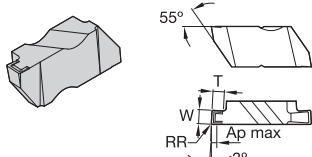
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M		●	●	○	○
K		●	○	○	○
N		●	○	○	●
S		●	●	○	●
H		○	○	○	○

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
NG3M275RK	3	2,75	1,02	0,19	3,81	3606677	3606676	3607337	3607340
NG2M300RK	2	3,00	1,09	0,19	2,79	3606676	3607340	3607337	3607340
NG3M300RK	3	3,00	1,02	0,19	3,81	3607138	3607072	3607655	3607655
NG4M300RK	4	3,00	1,02	0,19	3,81	3607388	3607388	3607655	3607655
NG2125RK	2	3,18	1,09	0,19	2,79	3607155	3607381	3607381	3607381
NG3125RK	3	3,18	1,02	0,19	3,81	3607057	3607068	3607381	3607381
NG4125RK	4	3,18	1,06	0,19	3,81	3607163	3607449	3607449	3607449
NG3M320RK	3	3,20	1,02	0,19	3,81	3607365	3607365	3607365	3607365
NG2M325RK	2	3,25	1,09	0,19	2,79	3607533	3607533	3607533	3607533
NG3M325RK	3	3,25	1,02	0,19	3,81	3607515	3607515	3607515	3607515
NG3M350RK	3	3,50	2,92	0,32	3,81	3607302	3607302	3607302	3607302
NG4M350RK	4	3,50	2,92	0,57	6,35	3607370	3607370	3607370	3607370
NG3156RK	3	3,96	2,92	0,19	3,81	3607127	3607456	3607456	3607456
NG3M400RK	3	3,99	2,92	0,32	3,81	3606678	3607235	3607235	3607235
NG4M400RK	4	4,00	2,92	0,57	6,35	3606908	3607364	3607364	3607364
NG3M425RK	3	4,24	2,92	0,32	3,81	3606914	3607517	3607517	3607517



Grooving and Cut-Off

(NG-K • Grooving Inserts with Chip Control — continued)



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

● first choice  
○ alternate choice

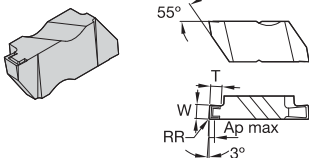
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K	●	○	○	○
N	●	○	○	●
S	●	●	○	●
H	○	○	○	○

Grooving and Cut-Off

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
NG3M450RK	3	4,50	2,92	0,32	3,81	●	●	●	○
NG4M450RK	4	4,50	2,92	0,57	6,35	●	●	○	○
NG3189RK	3	4,80	2,92	0,57	3,81	3607108	3607305	3607630	●
NG4189RK	4	4,80	2,92	0,57	6,35	3607103	3607220	3607630	●
NG4M500RK	4	5,00	2,92	0,32	6,35	3606830	3607447	●	○
NG4M550RK	4	5,50	3,81	0,57	6,35	●	3607383	3607385	●
NG4M600RK	4	6,00	3,81	0,57	6,35	●	3607385	3607385	●
NG4250RK	4	6,35	3,81	0,57	6,35	3607168	3607304	●	○
<b>left hand</b>									
NG2M050LK	2	0,50	0,64	0,09	0,64	3606990	3607463	●	○
NG2031LK	2	0,79	0,76	0,09	1,27	3607112	3607443	●	○
NG2M080LK	2	0,80	0,76	0,09	1,27	3606911	3607534	●	○
NG2M100LK	2	1,00	0,76	0,09	1,27	3607159	3607239	●	○
NG3M100LK	3	1,00	0,76	0,19	1,91	●	3607419	●	○
NG2047LK	2	1,19	0,76	0,09	1,27	●	3607376	●	○
NG3047LK	3	1,19	0,76	0,19	1,91	3607105	3607374	●	○

(continued)

(NG-K • Grooving Inserts with Chip Control — continued)



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

● first choice  
○ alternate choice

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

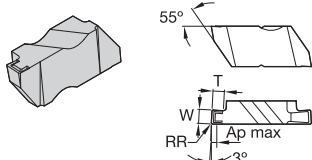
catalogue number	insert size	W	Ap max	RR	T	TN6010	3606827	TN6025	3607334	TN7110	THM
NG2M120LK	2	1,20	0,76	0,09	1,27	●	●	○	○	○	○
NG3M120LK	3	1,20	0,76	0,19	1,91	○	○	○	○	○	○
NG2M140LK	2	1,40	0,76	0,09	1,27	○	○	○	○	○	○
NG2M150LK	2	1,50	1,09	0,19	2,79	○	○	○	○	○	○
NG3M150LK	3	1,50	1,02	0,19	2,39	○	○	○	○	○	○
NG2062LK	2	1,58	1,09	0,19	2,79	○	○	○	○	○	○
NG3062LK	3	1,58	1,02	0,19	2,39	○	○	○	○	○	○
NG2M170LK	2	1,70	1,09	0,19	2,79	○	○	○	○	○	○
NG2M175LK	2	1,75	1,09	0,19	2,79	○	○	○	○	○	○
NG3M175LK	3	1,75	1,02	0,19	2,39	○	○	○	○	○	○
NG3072LK	3	1,83	1,02	0,19	2,39	○	○	○	○	○	○
NG2M195LK	2	1,95	1,09	0,19	2,79	○	○	○	○	○	○
NG3078LK	3	1,98	1,02	0,19	2,39	○	○	○	○	○	○
NG2M200LK	2	2,00	1,09	0,19	2,79	○	○	○	○	○	○
NG3M200LK	3	2,00	1,02	0,19	2,39	○	○	○	○	○	○
NG2M220LK	2	2,20	1,09	0,19	2,79	○	○	○	○	○	○



Grooving and Cut-Off

(continued)

(NG-K • Grooving Inserts with Chip Control — continued)



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

● first choice  
○ alternate choice

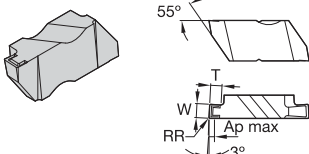
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K	●	○	○	○
N	●	○	○	●
S	●	●	○	●
H	○	○	○	○

Grooving and Cut-Off

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
NG3M220LK	3	2,20	1,02	0,19	2,39	●	●	●	●
NG3M225LK	3	2,24	1,02	0,19	2,39	●	●	○	○
NG2M225LK	2	2,25	1,09	0,19	2,79	●	●	○	○
NG2094LK	2	2,39	1,09	0,19	2,79	●	●	○	○
NG3094LK	3	2,39	1,02	0,19	3,81	●	●	○	○
NG2M250LK	2	2,50	1,09	0,19	2,79	●	●	○	○
NG3M250LK	3	2,50	1,02	0,19	3,81	●	●	○	○
NG2M275LK	2	2,75	1,09	0,19	2,79	●	●	○	○
NG3M275LK	3	2,75	1,02	0,19	3,81	●	●	○	○
NG2M300LK	2	3,00	1,09	0,19	2,79	●	●	○	○
NG3M300LK	3	3,00	1,02	0,19	3,81	●	●	○	○
NG4M300LK	4	3,00	1,02	0,19	3,81	●	●	○	○
NG2125LK	2	3,18	1,09	0,19	2,79	●	●	○	○
NG3125LK	3	3,18	1,02	0,19	3,81	●	●	○	○
NG4125LK	4	3,18	1,06	0,19	3,81	●	●	○	○
NG3M320LK	3	3,20	1,02	0,19	3,81	●	●	○	○

(continued)

(NG-K • Grooving Inserts with Chip Control — continued)



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

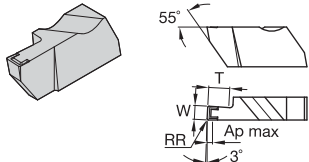
● first choice  
○ alternate choice

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

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
NG2M325LK	2	3,25	1,09	0,19	2,79	●	●	○	○
NG3M325LK	3	3,25	1,02	0,19	3,81	●	●	○	○
NG3M350LK	3	3,50	2,92	0,32	3,81	●	●	○	○
NG4M350LK	4	3,50	2,92	0,57	6,35	●	●	○	○
NG3156LK	3	3,96	2,92	0,19	3,81	●	●	○	○
NG3M400LK	3	3,99	2,92	0,32	3,81	●	●	○	○
NG4M400LK	4	4,00	2,92	0,57	6,35	●	●	○	○
NG3M425LK	3	4,24	2,92	0,32	3,81	●	●	○	○
NG3M450LK	3	4,50	2,92	0,32	3,81	●	●	○	○
NG4M450LK	4	4,50	2,92	0,57	6,35	●	●	○	○
NG3189LK	3	4,80	2,92	0,57	3,81	●	●	○	○
NG4189LK	4	4,80	2,92	0,57	6,35	●	●	○	○
NG4M500LK	4	5,00	2,92	0,32	6,34	●	●	○	○
NG4M550LK	4	5,50	3,81	0,57	6,35	●	●	○	○
NG4M600LK	4	6,00	3,81	0,57	6,35	●	●	○	○
NG4250LK	4	6,35	3,81	0,57	6,35	●	●	○	○

Grooving and Cut-Off





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

● first choice  
○ alternate choice

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

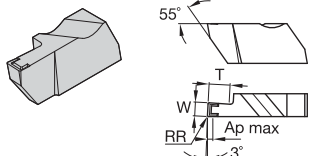
■ NGD-K • Deep Grooving Inserts with Chip Control

catalogue number	insert size	W	Ap max	RR	T	cutting edges	TN6010	TN6025	TN7110	THM
right hand										
NGD2M150RK	2	1,50	1,09	0,19	4,06	1	3606937	3607503	●	●
NGD3062RK	3	1,58	1,02	0,19	3,18	2	3607104	3607233	●	●
NGD2M200RK	2	2,00	1,09	0,19	5,08	1	3606938	3607465	●	●
NGD3M200RK	3	2,00	1,02	0,19	4,06	1	3606945	3607505	●	●
NGD3094RK	3	2,39	1,02	0,19	6,35	1	3607083	3607205	●	3607029
NGD2M250RK	2	2,50	1,09	0,19	5,08	1	3606939	3607504	●	●
NGD3M250RK	3	2,50	1,02	0,19	6,35	1	3606946	3607425	●	●
NGD3M300RK	3	3,00	1,02	0,19	6,35	1	3606922	3607426	●	●
NGD3125RK	3	3,18	1,02	0,19	6,35	1	3607088	3607210	●	●
NGD4125RK	4	3,18	1,02	0,19	6,35	2	3607133	3607312	●	●
NGD3M350RK	3	3,50	2,92	0,32	6,35	1	3607506	3607427	●	●
NGD3M400RK	3	4,00	2,92	0,32	6,35	1	3606940	3607427	●	●
NGD4M400RK	4	4,00	2,92	0,57	9,53	1	3606986	3607507	●	●
NGD4M450RK	4	4,50	2,92	0,57	12,70	1	3607508	3607508	●	●
NGD3189RK	3	4,80	2,92	0,57	6,35	1	3607170	3607373	●	●

(continued)

Grooving and Cut-Off

(NGD-K • Deep Grooving Inserts with Chip Control – continued)



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

● first choice  
○ alternate choice

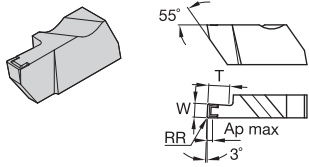
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M	●	●	●	○	○
K	●	○	○	○	○
N	●	○	○	●	●
S	●	●	●	●	●
H	○	○	○	○	○

catalogue number	insert size	W	Ap max	RR	T	cutting edges	TN6010	TN6025	TN7110	THM
NGD4189RK	4	4,80	2,92	0,57	9,53	1	3607161	3607321	●	●
NGD4M500RK	4	5,00	2,92	0,57	12,70	1	3606988	3607509	●	●
NGD4M550RK	4	5,50	3,81	0,57	12,70	1	3606989	●	●	●
NGD4250RK	4	6,35	3,81	0,57	12,70	1	3607134	3607414	●	●
<b>left hand</b>										
NGD2M150LK	2	1,50	1,09	0,19	4,06	1	3606935	3607402	●	●
NGD3062LK	3	1,58	1,02	0,19	3,18	2	3607098	3607451	●	●
NGD2M200LK	2	2,00	1,09	0,19	5,08	1	3606936	3607399	●	●
NGD3M200LK	3	2,00	1,02	0,19	4,06	1	3606941	3607487	●	●
NGD3094LK	3	2,39	1,02	0,19	6,34	1	3607096	3607240	●	3607035
NGD2M250LK	2	2,50	1,09	0,19	5,08	1	3606992	3607391	●	●
NGD3M250LK	3	2,50	1,02	0,19	6,35	1	3606942	3607423	●	●
NGD3M300LK	3	3,00	1,02	0,19	6,35	1	3606943	3607400	●	●
NGD3125LK	3	3,18	1,02	0,19	6,35	1	3607097	3607209	●	●
NGD4125LK	4	3,18	1,02	0,19	6,35	2	3607132	3607316	●	●
NGD3M350LK	3	3,50	2,92	0,32	6,35	1	3607488	●	●	●

Grooving and Cut-Off

(continued)

(NGD-K • Deep Grooving Inserts with Chip Control – continued)



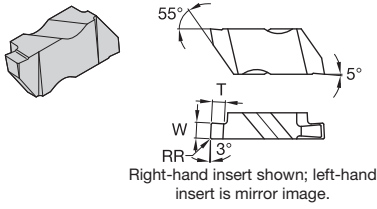
Right-hand insert shown; left-hand insert is mirror image.

● first choice  
○ alternate choice







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

Grooving and Cut-Off

catalogue number	insert size	W	Ap max	RR	T	cutting edges	TN6010	TN6025	TN7110	THM
NGD3M400LK	3	4,00	2,92	0,32	6,35	1	3606921	3607424	○	○
NGD4M400LK	4	4,00	2,92	0,57	9,53	1	3606923	3607489	○	○
NGD4M450LK	4	4,50	2,92	0,57	12,70	1	○	3607490	○	○
NGD3189LK	3	4,80	2,92	0,57	6,35	1	3607148	3607410	○	○
NGD4189LK	4	4,80	2,92	0,57	9,53	1	3607147	3607314	○	○
NGD4M500LK	4	5,00	2,92	0,57	12,70	1	○	3607491	○	○
NGD4M550LK	4	5,50	3,81	0,57	12,70	1	○	3607492	○	○
NGD4250LK	4	6,35	3,80	0,57	12,70	1	3607178	3607422	○	○



● first choice  
○ alternate choice

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

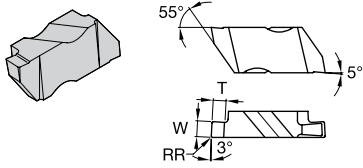
■ **NGP • Grooving Positive Rake Inserts**

catalogue number	insert size	W	RR	T	TN6010	TN6025	TN7110	THM
<b>right hand</b>								
NGP2M150R	2	1,50	0,19	2,79	3606975			3607045
NGP3M150R	3	1,50	0,19	1,90	3606979			3607049
NGP2062R	2	1,58	0,19	2,79	3607128			
NGP2M200R	2	2,00	0,19	2,79	3606976			3607046
NGP3M200R	3	2,00	0,19	2,79	3606980			3607050
NGP2M250R	2	2,50	0,19	2,79	3606977			3607047
NGP3M250R	3	2,50	0,19	3,81	3606981			3607051
NGP2M300R	2	3,00	0,19	2,79	3606978			3607048
NGP3M300R	3	3,00	0,19	3,81				3607052

(continued)



(NGP • Grooving Positive Rake Inserts – continued)



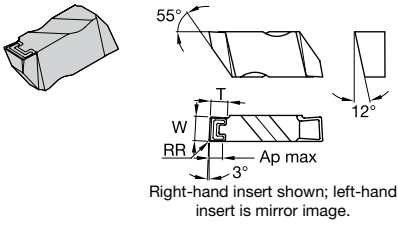
Right-hand insert shown; left-hand insert is mirror image.

● first choice  
○ alternate choice







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M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Grooving and Cut-Off

catalogue number	insert size	W	RR	T	TN6010	TN6025	TN7110	THM
<b>left hand</b>								
NGP2M150L	2	1,50	0,19	2,79	3606967			3607037
NGP3M150L	3	1,50	0,19	1,90	3606971			3607041
NGP2062L	2	1,57	0,19	2,79	3607182			
NGP2M200L	2	2,00	0,19	2,79	3606968			3607038
NGP3M200L	3	2,00	0,19	2,79	3606972			3607042
NGP2M250L	2	2,50	0,19	2,79	3606969			3607039
NGP3M250L	3	2,50	0,19	3,81	3606973			3607043
NGP2M300L	2	3,00	0,19	2,79				3607040
NGP3M300L	3	3,00	0,19	3,81	3606974			3607044



● first choice  
○ alternate choice

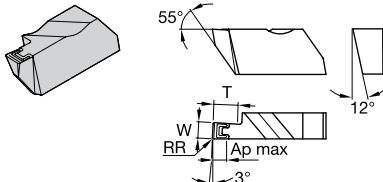
P		●	●	●	
M		●	●	○	○
K		●	○	○	○
N		●	○	○	●
S		●	●	○	●
H		○	○		

■ **NF-K • Face Grooving Positive Rake Inserts**

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
<b>right hand</b>									
NF3M200RK	3	2,00	1,02	0,19	1,78	●	●	○	○
NF3M300RK	3	3,00	1,02	0,19	3,81	●	●	○	○
NF3125RK	3	3,18	1,02	0,19	3,81	●	●	○	○
<b>left hand</b>									
NF3M200LK	3	2,00	1,02	0,19	1,78	○	○	●	●
NF3M300LK	3	3,00	1,02	0,19	3,81	○	○	●	●
NF3125LK	3	3,18	1,02	0,19	3,81	○	○	●	●
NF3156LK	3	3,96	2,92	0,19	3,81	○	○	●	●



Grooving and Cut-Off



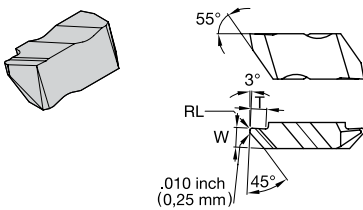
Right-hand insert shown; left-hand insert is mirror image.

● first choice  
○ alternate choice

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

■ **NFD-K • Face Grooving Deep-Grooving Inserts**

catalogue number	insert size	W	Ap max	RR	T	cutting edges	TN6010	TN6025	TN7110	THM
<b>right hand</b>										
NFD3M300RK	3	3,00	1,02	0,19	6,35	1	●	●	○	○
NFD3125RK	3	3,18	1,02	0,19	6,35	1	●	●	○	○
NFD4189RK	4	4,80	2,92	0,57	9,53	1	●	●	○	○
NFD4250RK	4	6,35	3,81	0,57	12,70	1	●	●	○	○
<b>left hand</b>										
NFD3M300LK	3	3,00	1,02	0,19	6,35	1	○	○	●	●
NFD3125LK	3	3,18	1,02	0,19	6,35	1	○	○	●	●
NFD4189LK	4	4,80	2,92	0,57	9,53	1	○	○	●	●

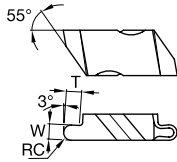
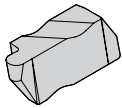


Right-hand insert shown; left-hand insert is mirror image.

■ **NP-K • Profiling Inserts**

catalogue number	insert size	W	RL	T	TN6010	TN6025	TN7110	THM
<b>right hand</b>								
NP2002RK	2	3,68	0,25	2,79	●	●	○	○
NP3002RK	3	4,83	0,25	5,08	●	●	○	○
NP3012RK	3	4,83	0,25	5,08	○	○	●	●

NOTE: Width tolerance is +/- 0,13mm.



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

● first choice  
○ alternate choice

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

■ NR • Full Radius Inserts

catalogue number	insert size	W	RC	T	TN6010	TN6025	TN7110	THM
right hand								
NR2M050R	2	1,00	0,50	1,27	3606957	3607393		
NR2M075R	2	1,50	0,75	2,79	3606929	3607489		
NR2031R	2	1,58	0,79	2,79	3607174	3607301		
NR3031R	3	1,58	0,79	2,39	3607125	3607475		3607015
NR2M100R	2	2,00	1,00	2,79	3606930	3607470		
NR3M100R	3	2,00	1,00	2,39	3606958	3607397		
NR2047R	2	2,39	1,19	2,79	-	3607494		
NR3047R	3	2,39	1,19	3,81	3607093	3607502		3607031
NR2M125R	2	2,50	1,25	2,79	3606931	3607471		
NR3M125R	3	2,50	1,25	3,81	3606959	3607439		
NR2M150R	2	3,00	1,50	2,79	3606932	3607472		
NR3M150R	3	3,00	1,50	3,81	3606960	3607440		
NR3062R	3	3,18	1,59	3,81	3607131	3607473		3607026
NR2M175R	2	3,50	1,75	2,79	3606933	3607483		
NR3M175R	3	3,50	1,75	3,81	3606961	3607441		

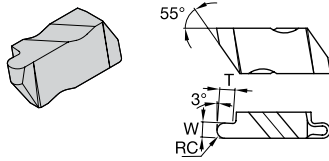
(continued)



Grooving and Cut-Off



(NR • Full Radius Inserts – continued)



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

● first choice  
○ alternate choice

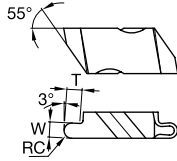
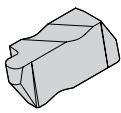
P		●	●	●	
M		●	●	○	○
K		●	○	○	○
N		●	○	○	●
S		●	●	○	●
H		○	○		

Grooving and Cut-Off

catalogue number	insert size	W	RC	T	TN6010	TN6025	TN7110	THM
NR3M200R	3	4,00	2,00	3,81	●	●	○	○
NR4M200R	4	4,00	2,00	6,35	●	●	○	○
NR3M225R	3	4,50	2,25	3,81	●	●	○	○
NR4M225R	4	4,50	2,25	6,35	●	●	○	○
NR3094R	3	4,78	2,39	3,81	●	●	○	○
NR4M250R	4	5,00	2,50	6,35	●	●	○	○
NR4125R	4	6,35	3,18	6,35	●	●	○	○
<b>left hand</b>								
NR2M050L	2	1,00	0,50	1,27	●	●	○	○
NR2M075L	2	1,50	0,75	2,79	●	●	○	○
NR2031L	2	1,58	0,79	2,79	●	●	○	○
NR3031L	3	1,58	0,79	2,39	●	●	○	○
NR2M100L	2	2,00	1,00	2,79	●	●	○	○
NR3M100L	3	2,00	1,00	2,39	●	●	○	○
NR2047L	2	2,39	1,19	2,79	○	○	○	○
NR3047L	3	2,39	1,19	3,81	○	○	○	○

(continued)

(NR • Full Radius Inserts — continued)



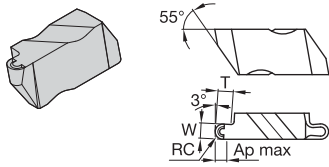
Right-hand insert shown; left-hand insert is mirror image.

● first choice  
○ alternate choice

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

catalogue number	insert size	W	RC	T	TN6010	TN6025	TN7110	THM
NR2M125L	2	2,50	1,25	2,79	3606926	3607432		
NR3M125L	3	2,50	1,25	3,81	3606950	3607435	3607689	
NR2M150L	2	3,00	1,50	2,79	3606927	3607433		
NR3M150L	3	3,00	1,50	3,81	3606951	3607436		
NR3062L	3	3,18	1,59	3,81	3607171	3607497		3607032
NR2M175L	2	3,50	1,75	2,79	3606928	3607434		
NR3M175L	3	3,50	1,75	3,81	3606952	3607437	3607691	
NR3M200L	3	4,00	2,00	3,81	3606953	3607396		
NR4M200L	4	4,00	2,00	6,35	3606954	3607466		
NR3M225L	3	4,50	2,25	3,81	3606934	3607438		
NR4M225L	4	4,50	2,25	6,35	3606955	3607467		
NR3094L	3	4,78	2,39	3,81	3607169	3607339		
NR4M250L	4	5,00	2,50	6,35	3606956	3607468		
NR4125L	4	6,35	3,18	6,35	3607181	3607514		





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

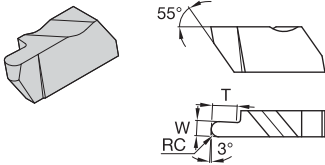
● first choice  
○ alternate choice

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

■ NR-K • Full Radius Inserts with Chip Control

Grooving and Cut-Off

catalogue number	insert size	W	Ap max	RC	T	TN6010	TN6025	TN7110	THM
<b>right hand</b>									
NR3031RK	3	1,57	1,97	0,79	2,39	3607062	3607206	○	○
NR3047RK	3	2,39	1,91	1,19	3,81	3607086	3607214	○	○
NR3062RK	3	3,18	2,92	1,59	3,81	3607056	3607236	○	○
NR4062RK	4	3,18	2,92	1,59	3,81	3607461	3607461	○	○
NR3078RK	3	3,96	2,54	1,98	3,81	3607094	3607407	○	○
NR4094RK	4	4,78	3,81	2,39	6,35	3607101	3607480	○	○
NR4125RK	4	6,35	3,81	3,18	6,35	3607141	3607303	○	○
<b>left hand</b>									
NR3031LK	3	1,58	1,98	0,79	2,39	3607095	3607222	○	○
NR3047LK	3	2,39	1,91	1,19	3,81	3607102	3607408	○	○
NR3062LK	3	3,18	2,92	1,59	3,81	3607091	3607216	○	○
NR4062LK	4	3,18	2,92	1,59	3,81	3607156	3607405	○	○
NR3078LK	3	3,96	2,54	1,98	3,81	3607172	3607306	○	○
NR4094LK	4	4,78	3,81	2,39	6,35	3607150	3607452	○	○
NR4125LK	4	6,35	3,81	3,18	6,35	3607166	3607458	○	○



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

● first choice  
○ alternate choice

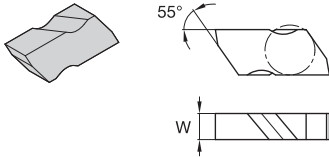
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N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
H	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

■ **NRD • Full Radius Deep-Grooving Inserts**

catalogue number	insert size	W	T	cutting edges	TN6010	TN6025	TN7110	THM
<b>right hand</b>								
NRD3031R	3	1,58	3,18	2	3607087	3607457		
NRD3062R	3	3,18	6,35	1	3607099	3607474		
NRD4062R	4	3,18	6,35	2	3607173	3607499		
NRD4125R	4	6,35	12,70	1		3607496		
<b>left hand</b>								
NRD3031L	3	1,58	3,18	2	3607085	3607455		
NRD3062L	3	3,18	6,35	1	3607124	3607462		
NRD4062L	4	3,18	6,35	2	3607162	3607295		
NRD4125L	4	6,35	12,70	1	3607186	3607298		



Grooving and Cut-Off



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

● first choice  
○ alternate choice

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

■ NB • Blanks

catalogue number	insert size	W	TN6010	TN6025	TN7110	THM
<b>right hand</b>						
NB2R	2	3,81	●	●	○	3607064
NB3R	3	4,95	●	●	○	3607019
<b>left hand</b>						
NB2L	2	3,81	●	●	○	3607016
NB3L	3	4,95	●	●	○	3607017

NOTE: NB blanks are designed to allow modification of the W dimension and end form.  
W dimension is provided to indicate maximum possible width.  
Available in uncoated grades only.

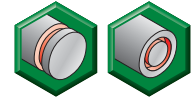
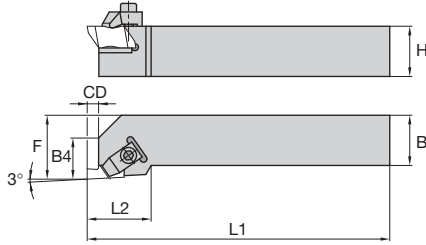
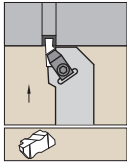
Grooving and Cut-Off

**TopGroove™**  
**Holder Identification System**



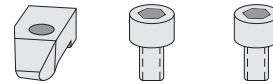
NSR2525M4

N	S	R		2525	M	4																																																																	
Insert Holding Method	Insert Mounting Location	Hand of Tool	Drop Head	Shank Size	Tool Length	Insert Size	Qualified Surface and Length																																																																
<p><b>N</b> – TopGroove*</p> <p>*Proprietary standard only.</p>	<p>End mount</p> <p>Side mount Offset</p> <p>Side mount No offset for swiss machining</p> <p>NRR undercut</p>	<p>End mount</p> <p>Side mount</p>	<p>Drop Head</p> <p><b>DH</b> = Drop Head</p>	<p>Shank height and width in mm and holder length according to ISO standard.</p>	<table border="1"> <thead> <tr> <th>L1</th> <th>ISO</th> </tr> </thead> <tbody> <tr><td>32</td><td>A</td></tr> <tr><td>40</td><td>B</td></tr> <tr><td>50</td><td>C</td></tr> <tr><td>60</td><td>D</td></tr> <tr><td>70</td><td>E</td></tr> <tr><td>80</td><td>F</td></tr> <tr><td>90</td><td>G</td></tr> <tr><td>100</td><td>H</td></tr> <tr><td>110</td><td>I</td></tr> <tr><td>125</td><td>J</td></tr> <tr><td>140</td><td>K</td></tr> <tr><td>150</td><td>L</td></tr> <tr><td>160</td><td>M</td></tr> <tr><td>170</td><td>N</td></tr> <tr><td>180</td><td>P</td></tr> <tr><td>200</td><td>Q</td></tr> <tr><td>250</td><td>R</td></tr> <tr><td>300</td><td>S</td></tr> <tr><td>350</td><td>T</td></tr> <tr><td>400</td><td>U</td></tr> <tr><td>450</td><td>V</td></tr> <tr><td>500</td><td>W</td></tr> <tr><td>Special Length</td><td>Y</td></tr> <tr><td></td><td>X</td></tr> </tbody> </table>	L1	ISO	32	A	40	B	50	C	60	D	70	E	80	F	90	G	100	H	110	I	125	J	140	K	150	L	160	M	170	N	180	P	200	Q	250	R	300	S	350	T	400	U	450	V	500	W	Special Length	Y		X	<table border="1"> <thead> <tr> <th>insert size</th> <th>W1</th> </tr> </thead> <tbody> <tr><td>2</td><td>3,81mm</td></tr> <tr><td>3</td><td>4,95mm</td></tr> <tr><td>4</td><td>6,98mm</td></tr> <tr><td>5</td><td>9,65mm</td></tr> <tr><td>6</td><td>9,73mm</td></tr> <tr><td>8</td><td>11,13mm</td></tr> </tbody> </table>	insert size	W1	2	3,81mm	3	4,95mm	4	6,98mm	5	9,65mm	6	9,73mm	8	11,13mm	<p><b>Q</b> – qualified metric holder</p> <p><b>NOTE:</b> Holders are designed to locate insert inclined to 3° to provide back clearance down open side.</p>
L1	ISO																																																																						
32	A																																																																						
40	B																																																																						
50	C																																																																						
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125	J																																																																						
140	K																																																																						
150	L																																																																						
160	M																																																																						
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180	P																																																																						
200	Q																																																																						
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350	T																																																																						
400	U																																																																						
450	V																																																																						
500	W																																																																						
Special Length	Y																																																																						
	X																																																																						
insert size	W1																																																																						
2	3,81mm																																																																						
3	4,95mm																																																																						
4	6,98mm																																																																						
5	9,65mm																																																																						
6	9,73mm																																																																						
8	11,13mm																																																																						



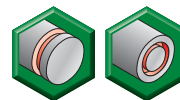
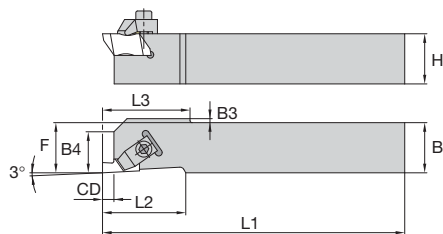
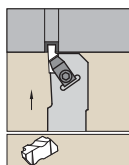
Grooving and Cut-Off

■ NS






order number	catalogue number	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
<b>right hand</b>													
3641682	NSR1010E2	10,0	10,0	14,0	70	19	9	4	N.2R	CM74	MS1200	—	T10
3641660	NSR1212F2	12,0	12,0	16,0	80	19	9	4	N.2R	CM74	MS1200	—	T10
3636542	NSR1616H2	16,0	16,0	20,0	100	19	9	4	N.2R	CM74	MS1200	—	T10
3638589	NSR2020K2	20,0	20,0	25,0	125	19	9	4	N.2R	CM74	MS1200	—	T10
3638588	NSR2020K3	20,0	20,0	25,0	125	32	13	5	N.3R	CM72LP	—	MS2111	25 IP
3638590	NSR2525M2	25,0	25,0	32,0	150	19	9	4	N.2R	CM74	MS1200	—	T10
3636536	NSR2525M3	25,0	25,0	32,0	150	32	13	5	N.3R	CM72LP	—	MS2111	25 IP
3636540	NSR2525M4	25,0	25,0	32,0	150	35	14	7	N.4R	CM72LP	—	MS2111	25 IP
3641664	NSR3225P3	32,0	25,0	32,0	170	32	13	5	N.3R	CM72LP	—	MS2111	25 IP
3641675	NSR3225P4	32,0	25,0	32,0	170	35	14	7	N.4R	CM72LP	—	MS2111	25 IP
3641666	NSR3232P3	32,0	32,0	40,0	170	32	13	5	N.3R	CM72LP	—	MS2111	25 IP
3641669	NSR3232P4	32,0	32,0	40,0	170	35	14	7	N.4R	CM72LP	—	MS2111	25 IP
<b>left hand</b>													
3641683	NSL1010E2	10,0	10,0	14,0	70	19	9	4	N.2L	CM75	MS1200	—	T10
3641681	NSL1212F2	12,0	12,0	16,0	80	19	9	4	N.2L	CM75	MS1200	—	T10
3636545	NSL1616H2	16,0	16,0	20,0	100	19	9	4	N.2L	CM75	MS1200	—	T10
3639045	NSL2020K2	20,0	20,0	25,0	125	19	9	4	N.2L	CM75	MS1200	—	T10
3639046	NSL2020K3	20,0	20,0	32,0	125	32	13	5	N.3L	CM73LP	—	MS2111	25 IP
3639047	NSL2525M2	25,0	25,0	32,0	150	19	9	4	N.2L	CM75	MS1200	—	T10
3636539	NSL2525M3	25,0	25,0	32,0	150	32	13	5	N.3L	CM73LP	—	MS2111	25 IP
3636544	NSL2525M4	25,0	25,0	32,0	150	35	14	7	N.4L	CM73LP	—	MS2111	25 IP
3641670	NSL3225P3	32,0	25,0	32,0	170	32	13	5	N.3L	CM73LP	—	MS2111	25 IP
3641678	NSL3225P4	32,0	25,0	32,0	170	35	14	7	N.4L	CM73LP	—	MS2111	25 IP
3641671	NSL3232P3	32,0	32,0	40,0	170	32	13	5	N.3L	CM73LP	—	MS2111	25 IP
3641679	NSL3232P4	32,0	32,0	40,0	170	35	14	7	N.4L	CM73LP	—	MS2111	25 IP
3641688	NSL3232P5	32,0	32,0	40,0	170	51	16	11	N.5L	CM81	MS352	—	6 mm

NOTE: F dimension measured over sharp point of insert.



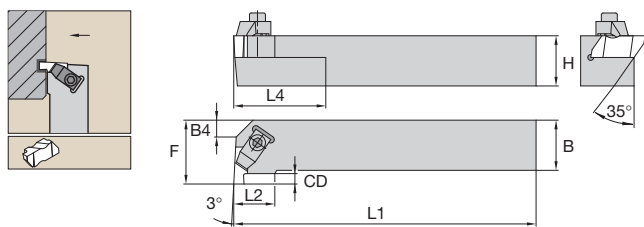
■ **NAS**

order number	catalogue number	H	B	F	L1	L2	B4	CD	B3	L3	gage insert	 clamp	 clamp screw	 clamp screw	hex/ Torx Plus
<b>right hand</b>															
3641667	NASR1010M2Q	10,0	10,0	10,0	150	19	9	3,5	2,03	19	N.2R	CM182	MS1200	—	T10
3641662	NASR1212M2Q	12,0	12,0	12,0	150	19	9	3,5	—	—	N.2R	CM182	MS1200	—	T10
3639048	NASR1616K3Q	16,0	16,0	16,0	125	32	12	5,3	—	—	N.3R	CM184LP	—	MS2111	25 IP
<b>left hand</b>															
3641691	NASL1010M2Q	10,0	10,0	10,0	150	19	9	3,5	2,03	19	N.2L	CM183	MS1200	—	T10
3641686	NASL1212M2Q	12,0	12,0	12,0	150	19	9	3,5	—	—	N.2L	CM183	MS1200	—	T10
3641687	NASL1616K3Q	16,0	16,0	16,0	125	32	12	5,3	—	—	N.3L	CM185LP	—	MS2111	25 IP

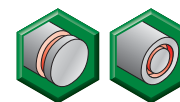
NOTE: F dimension measured over sharp point of insert.

Grooving and Cut-Off









































Right-hand toolholder shown.



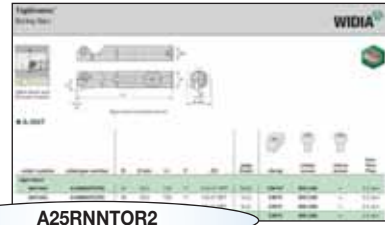
Grooving and Cut-Off

■ NE

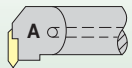
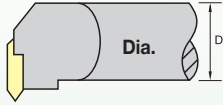
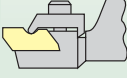

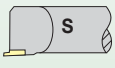



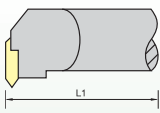
order number	catalogue number	H	B	F	L1	L2	L4	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
<b>right hand</b>														
3641674	NER1616H2	16,0	16,0	20,0	100	15	25	—	4	N.2L			—	T10
3641658	NER2020K2	20,0	20,0	25,0	125	15	25	6	4	N.2L			—	T10
3641665	NER2525M2	25,0	25,0	32,0	150	15	25	12	4	N.2L			—	T10
3636541	NER2525M3	25,0	25,0	32,0	150	22	51	—	5	N.3L		—		25 IP
3641672	NER2525M4	25,0	25,0	35,0	150	24	51	—	7	N.4L		—		25 IP
3641680	NER3225P3	32,0	25,0	32,0	170	22	51	—	4	N.3L		—		25 IP
3641689	NER3225P4	32,0	25,0	35,0	170	24	51	—	7	N.4L		—		25 IP
3641693	NER3232P4	32,0	32,0	40,0	170	24	51	—	6	N.4L		—		25 IP
3641692	NER3232P5	32,0	32,0	50,0	170	35	51	—	11	N.5L			—	6 mm
<b>left hand</b>														
3641684	NEL1616H2	16,0	16,0	20,0	100	15	25	—	4	N.2R			—	T10
3641677	NEL2020K2	20,0	20,0	25,0	125	15	25	6	4	N.2R			—	T10
3641676	NEL2525M2	25,0	25,0	32,0	150	15	25	12	4	N.2R			—	T10
3636543	NEL2525M3	25,0	25,0	32,0	150	22	51	—	5	N.3R		—		25 IP
3641668	NEL2525M4	25,0	25,0	35,0	150	24	51	—	7	N.4R		—		25 IP
3641685	NEL3225P3	32,0	25,0	32,0	170	22	51	—	4	N.3R		—		25 IP
3641694	NEL3225P4	32,0	25,0	35,0	170	24	51	—	7	N.4R		—		25 IP
3641696	NEL3232P4	32,0	32,0	40,0	170	24	51	—	6	N.4R		—		25 IP
3641695	NEL3232P5	32,0	32,0	50,0	170	35	51	—	11	N.5R			—	6 mm

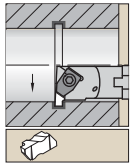
NOTE: F dimension measured over sharp point of insert.

# TopGroove Boring Bar Identification System

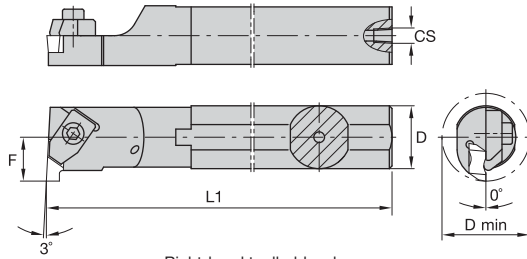


**A25RRNTOR2**

<b>A</b>	<b>25</b>	<b>R</b>	<b>N</b>	<b>N</b>	<b>T</b>	<b>0</b>	<b>R</b>	<b>2</b>																														
Bar Type	Bar Diameter	Bar Length	Insert Holding Method	Insert Shape	Insert Location	Rake Angle	Hand of Tool	Insert Size																														
Steel with coolant 			N – TopGroove 		End mount  Side mount 		Right hand  Left hand 																															
																																						
			<table border="1"> <thead> <tr> <th colspan="2">Metric Bars</th> </tr> </thead> <tbody> <tr><td>M</td><td>150mm</td></tr> <tr><td>Q</td><td>180mm</td></tr> <tr><td>R</td><td>200mm</td></tr> <tr><td>S</td><td>250mm</td></tr> <tr><td>T</td><td>300mm</td></tr> <tr><td>U</td><td>350mm</td></tr> </tbody> </table>	Metric Bars		M	150mm	Q	180mm	R	200mm	S	250mm	T	300mm	U	350mm					<table border="1"> <thead> <tr> <th>insert size</th> <th>W1</th> </tr> </thead> <tbody> <tr><td>1</td><td>3,54mm</td></tr> <tr><td>2</td><td>3,81mm</td></tr> <tr><td>3</td><td>5,35mm</td></tr> <tr><td>4</td><td>6,40mm</td></tr> <tr><td>5</td><td>9,65mm</td></tr> <tr><td>6</td><td>9,73mm</td></tr> <tr><td>8</td><td>11,13mm</td></tr> </tbody> </table>	insert size	W1	1	3,54mm	2	3,81mm	3	5,35mm	4	6,40mm	5	9,65mm	6	9,73mm	8	11,13mm
Metric Bars																																						
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6	9,73mm																																					
8	11,13mm																																					



Steel shank with through coolant.

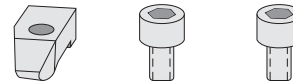


Right-hand toolholder shown.



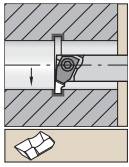
Grooving and Cut-Off

**A-NNT**

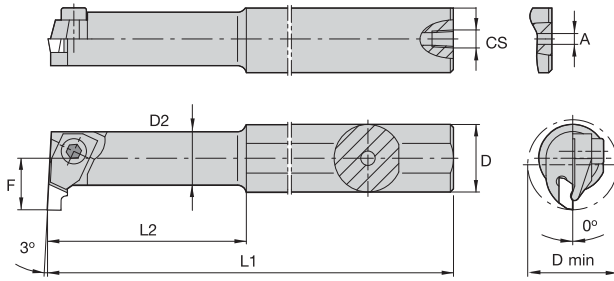


order number	catalogue number	D	D min	L1	F	CS	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
<b>right hand</b>											
3641644	A12MNNTOR2	12	18,5	150	11	1/16-27 NPT	NG2L	CM147	MS1200	—	2.5 mm
3641643	A16MNNTOR2	16	22,0	150	11	1/8-27 NPT	N.2L	CM75	MS1200	—	2.5 mm
3641645	A20QNNTOR2	20	26,0	180	13	1/8-27 NPT	N.2L	CM75	MS1200	—	2.5 mm
3641651	A25RNNTOR2	25	34,0	200	17	1/4-18 NPT	N.2L	CM75	MS1200	—	2.5 mm
3641622	A25RNNTOR3	25	34,0	200	17	1/8 - 27 NPT	N.3L	CM73LP	—	MS2111	25 IP
3641646	A32SNNTOR3	32	44,0	250	22	1/4-18 NPT	N.3L	CM73LP	—	MS2111	25 IP
3641653	A40TNNTOR3	40	54,0	300	27	1/4-18 NPT	N.3L	CM73LP	—	MS2111	25 IP
3641654	A40TNNTOR4	40	54,0	300	27	1/4-18 NPT	N.4L	CM73LP	—	MS2111	25 IP
3641661	A50UNNTOR4	50	70,0	350	35	1/4-18 NPT	N.4L	CM73LP	—	MS2111	25 IP
<b>left hand</b>											
3641655	A12MNNTOL2	12	18,5	150	11	1/16-27 NPT	NG2R	CM146	MS1200	—	2.5 mm
3641649	A16MNNTOL2	16	22,0	150	11	1/8-27 NPT	N.2R	CM74	MS1200	—	2.5 mm
3641652	A20QNNTOL2	20	26,0	180	13	1/8-27 NPT	N.2R	CM74	MS1200	—	2.5 mm
3641657	A25RNNTOL2	25	34,0	200	17	1/4-18 NPT	N.2R	CM74	MS1200	—	2.5 mm
3641650	A25RNNTOL3	25	34,0	200	17	1/4-18 NPT	N.3R	CM72LP	—	MS2111	25 IP
3641656	A32SNNTOL3	32	44,0	250	22	1/4-18 NPT	N.3R	CM72LP	—	MS2111	25 IP
3641659	A40TNNTOL3	40	54,0	300	27	1/4-18 NPT	N.3R	CM72LP	—	MS2111	25 IP
3641663	A40TNNTOL4	40	54,0	300	27	1/4-18 NPT	N.4R	CM72LP	—	MS2111	25 IP
3641690	A50UNNTOL4	50	70,0	350	35	1/4-18 NPT	N.4R	CM72LP	—	MS2111	25 IP

NOTE: Minimum bore capability varies with depth of groove. See pages E86–E87 for details.  
F dimension measured over sharp point of insert.



Necked steel shank with through coolant.



Right-hand toolholder shown.

■ **A-NNT-1**

order number	catalogue number	D	D min	D2	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex/Torx Plus
<b>right hand</b>													
3641648	A10KNNTOR1	10	11,5	10,0	125	—	7	3,2	—	NG1L	CM109	MS1034	1.5 mm
3641647	A12MNNTOR1	12	11,5	8,7	150	31,30	7	4,0	1/16-27 NPT	N.1L	CM109	MS1034	1.5 mm

NOTE: Minimum bore capability varies with depth of groove. See pages E86–E87 for details.  
F dimension measured over sharp point of insert.

Grooving and Cut-Off

## TopGroove™ Inserts: The Best Platform for Customisation

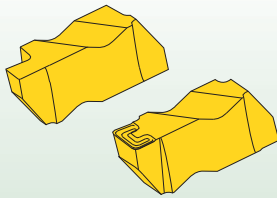
All TopGroove custom order inserts benefit from the superior rigidity of our TopGroove toolholder and clamping system. For added productivity, most custom orders can be incorporated into the double-ended inserts.

Custom orders start with proven WIDIA™ carbide grade technology as the basis for optimising tool performance. Positive top rake angles are also available in most inserts.

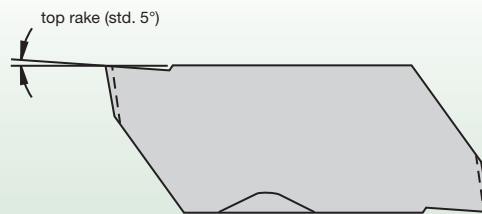
State-of-the-art CAD enables rapid development of your custom insert design. For convenience, a concept drawing is always available to facilitate engineering development of an insert.

There are limitless variations of the flat-top TopGroove design. Additionally, chip control in the most common styles enables true optimisation and productivity. WIDIA offers NB- and NBD-style insert blanks as well. These blanks can be end-form ground in your own shop.

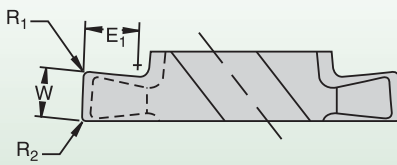
Whatever your special grooving requirements may be, WIDIA can provide an effective solution. We have the technical expertise, resources, and commitment to help you develop insert designs that satisfy your metalcutting application demands.



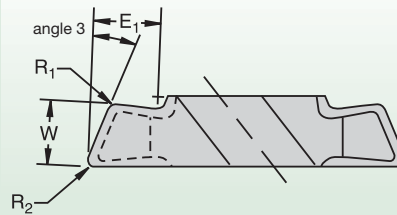
**top rake**



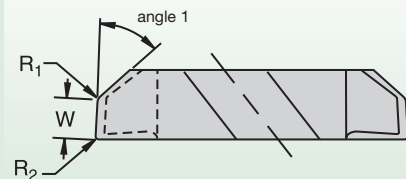
**style A**



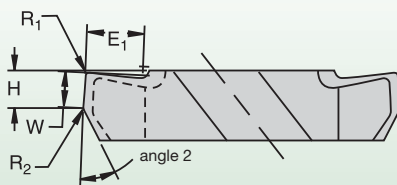
**style B1**



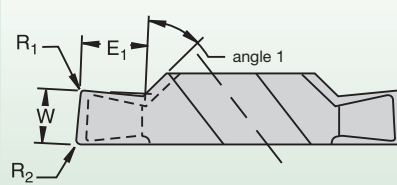
**style B2**



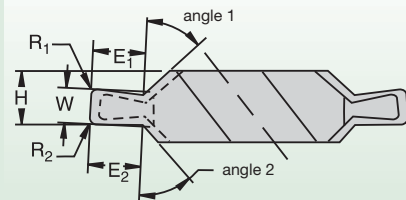
**style B3**



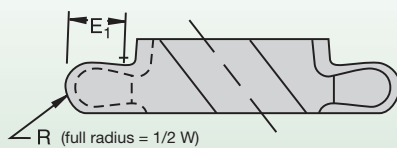
**style B4**



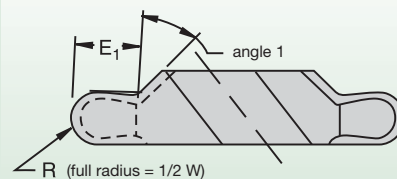
**style C1**



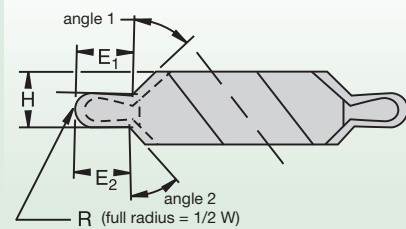
**style D**



**style F**



**style G**



NOTE: Common styles are shown here in right-hand versions. Left-hand versions are also available.

### TopGroove Grooving Systems

Use this Custom Order Worksheet to modify an existing product to meet your specifications. If your custom requirements do not fall into these categories, simply contact your WIDIA™ Distributor.

Trust our experienced distributors and WIDIA engineering team to design the best solution for you.

Date

#### Customer-Specified Dimensions

Style (circle one)

A	B1	B2	B3	B4	C1	D	F	G
---	----	----	----	----	----	---	---	---

Orientation (circle one)

left hand	right hand
-----------	------------

Top Rake

Total Width (T)

Cutting Width (W)

Angle 1

Corner Radius 1 (R<sub>1</sub>)

Angle 2

Corner Radius 2 (R<sub>2</sub>)

Offset (H)

Cutting Depth (E<sub>1</sub>)

Other (please specify)

#### Special Instructions

*(please make any necessary notes or sketches in the box at right)*

Closest Catalogue Standard

Customer

Distributor

#### Shipping Requirements

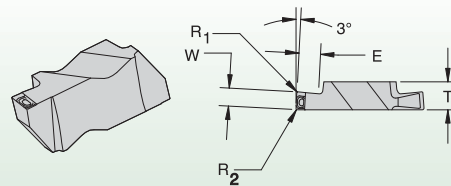
*Attention Distributors: Use this worksheet to collect information for your customer.*

Ground
  Next Day Air
  2nd Day Air
  3rd Day Air

**■ A-SK Specials**

10° positive cutting action

- Grooving
- Face grooving



insert catalogue number		width range W	corner radii range R <sub>1</sub> and R <sub>2</sub>	E	T	grades
right hand	left hand					
<b>NG2-R-SK</b>	<b>NG2-L-SK</b>	0,66–1,42	0,00–0,18	1,27	3,810	Carbide grades quoted upon request. <b>See page E47.</b>
or <b>NF2-R-SK</b>	or <b>NF2-L-SK</b>	1,45–3,43	0,08–0,33	2,79		
<b>NG3-R-SK</b> or <b>NF3-R-SK</b>	<b>NG3-L-SK</b> or <b>NF3-L-SK</b>	1,07–1,70	0,08–0,33	2,39	4,950	
		1,73–1,93	0,13–0,51	2,39		
		1,96–2,39	0,13–0,76	3,81		
		2,41–2,67	0,13–0,51	3,81		
		2,69–3,18	0,13–0,76	3,81		
		3,20–3,40	0,13–0,51	3,81		
<b>NG4-R-SK</b> or <b>NF4-R-SK</b>	<b>NG4-L-SK</b> or <b>NF4-L-SK</b>	3,43–3,96	0,13–0,76	3,81	6,480	
		3,99–4,42	0,20–0,46	3,81		
		4,67–4,98	0,46–0,71	3,81		
		2,54–2,79	0,13–0,51	3,81		
		2,82–3,18	0,13–0,76	3,81		
		3,20–3,33	0,13–0,51	3,81		
3,35–3,96	0,13–0,76	3,81				
3,99–4,11	0,13–0,51	3,81				
3,89–4,80	0,13–0,76	6,35				
4,83–4,85	0,46–0,71	6,35				
4,88–5,18	0,20–0,46	6,35				
6,22–6,53	0,46–0,64	6,35				

NG-SK, NF-SK, NGD-SK, and NFD-SK inserts may be specially ordered within the specifications listed in the above charts.

Order example: NF3R-SK W = .090,  
R<sub>1</sub> = .010, R<sub>2</sub> = .010, grade TN6010™.

Unless otherwise specified, a standard tolerance of ±0,03mm on width (W) will be applied, and a standard tolerance of ±0,06mm on radii (R<sub>1</sub> and R<sub>2</sub>) will be applied.

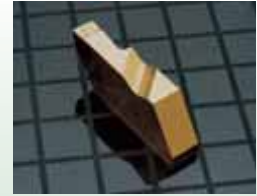
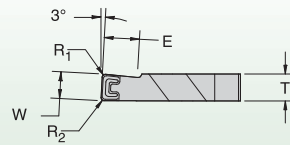
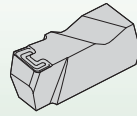
If deeper cutting depth (E) is required, please specify. Refer to the application drawing and charts for maximum face groove depths and minimum face groove diameters.

In addition to the guidelines above, full radius face groove inserts may be quoted. Under certain conditions, chip control performance may vary from standard insert styles.

**■ A-SK Specials**

10° positive cutting action

- Deep grooving
- Deep face grooving



insert catalogue number		width range W	corner radii range R <sub>1</sub> and R <sub>2</sub>	E	T	grades
right hand	left hand					
<b>NGD3-R-SK</b>	<b>NGD3-L-SK</b>	1,45–1,75	.008–.033	3,18	4,95	Carbide grades quoted upon request. <b>See page E47.</b>
or	or	2,26–2,57*	.008–.033	6,35		
<b>NFD3-R-SK</b>	<b>NFD3-L-SK</b>	3,05–3,35*	.008–.033	6,35		
		4,67–4,98*	.046–.071	6,35		
<b>NGD4-R-SK</b>	<b>NG4-L-SK</b>	3,05–3,35*	.008–.033	6,35	6,48	
or	or	4,57–4,98*	.046–.071	9,53		
<b>NFD4-R-SK</b>	<b>NF4-L-SK</b>	6,22–6,53*	.046–.071	12,70		

\*One cutting edge.

NG-SK, NF-SK, NGD-SK, and NFD-SK inserts may be specially ordered within the specifications listed in the above charts.

Order example: NF3R-SK W = .090, R<sub>1</sub> = .010, R<sub>2</sub> = .010, grade TN6010™.

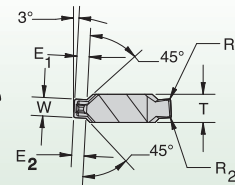
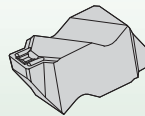
Unless otherwise specified, a standard tolerance of ±0,03mm on width (W) will be applied, and a standard tolerance of ±0,06mm on radii (R<sub>1</sub> and R<sub>2</sub>) will be applied.

If deeper cutting depth (E) is required, please specify. Refer to the application drawing and charts for maximum face groove depths and minimum face groove diameters.

In addition to the guidelines above, full radius face groove inserts may be quoted. Under certain conditions, chip control performance may vary from standard insert styles.

**■ C1-SK Specials**

- Groove and chamfer

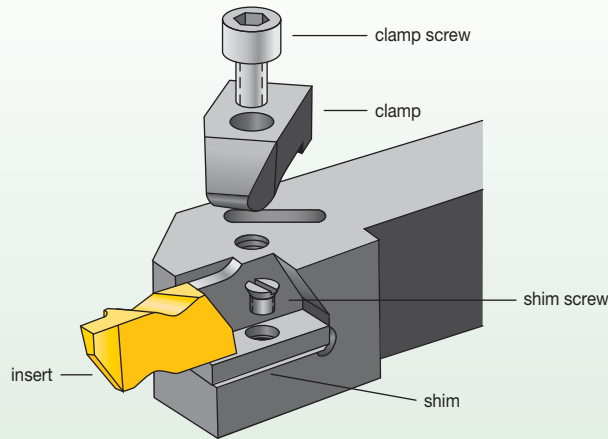












insert catalogue number		width range W	corner radii range R <sub>1</sub> and R <sub>2</sub>	E	T	grades
right hand	left hand					
<b>NB2-R-K</b>	<b>NB2-L-K</b>	1,19–3,18	0,13–0,38	2,54	3,81	Carbide grades quoted upon request. <b>See page E47.</b>
<b>NB3-R-K</b>	<b>NB3-L-K</b>	2,39–4,32	0,13–0,64	3,81	4,95	

NOTE: The above insert style is for simultaneous groove and chamfer operations with chip control.



**TopGroove Toolholders and Boring Bars**



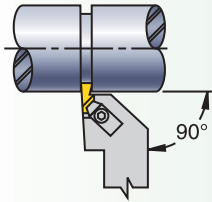
insert size and style	 clamp	 clamp screw	 shim	 shim screw
NG-1L 	CM-109	S-304	—	—
NG-2R	CM-182	S-310	—	—
NG-2L	CM-183	S-310	—	—
NG-2R 	CM-74	S-310	—	—
NG-2L	CM-75	S-310	—	—
NG-3R	CM-184	S-412	—	—
NG-3L	CM-185	S-412	—	—
NG-3R	CM-72	S-412	—	—
NG-3L 	CM-73	S-412	—	—
NG-3R*	CM-78	S-412	—	—
NG-3L*	CM-70	S-412	—	—
NG-4R	CM-72	S-412	SM-420	SL-344
NG-4L 	CM-73	S-412	SM-420	SL-344
NG-5R	CM-80	S-352	—	—
NG-5L 	CM-81	S-352	—	—
NG-6R	CM-120	S-412	SM-416	S-111
NG-6L 	CM-121	S-412	SM-416	S-111
<b>TopGroove relief grooving</b>				
NU-3125R	CM-72	S-412	—	—
NU-3125L	CM-73	S-412	—	—
NU-3125R**	CM-72	S-618	—	—
NU-3125L**	CM-73	S-618	—	—
<b>Utility threading</b>				
NTU-4R	CM-72	S-412	—	—
NTU-4L	CM-73	S-412	—	—

\*25mm diameter boring head.  
\*\*Boring head.

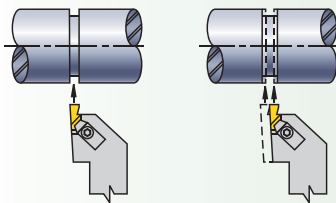
**Grooving Tool Failure and Solution Guide**

**Practical Solutions to Common Grooving Problems**

**Holder Position for Grooving Operation**

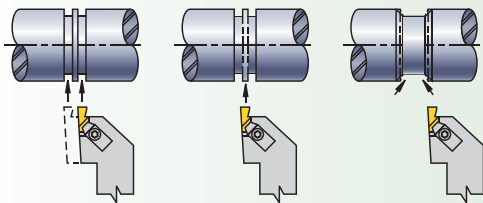


**How to Cut a Groove Slightly Wider than the Groove Tool**



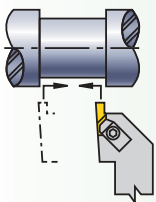
1. Plunge the centre of the groove.
2. Plunge each side of the groove to get the specified width. Use a slower feed rate when cutting groove sides.

**How to Cut Wider Grooves**



1. Plunge out both sides of groove width.
2. Plunge centre area to remove web of material remaining.
3. Plunge both sides of groove at the required angle, using approximately one-half the width of the grooving tool for maximum width of cut.

**Finish Turning the Groove**



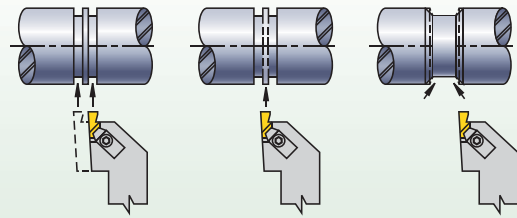
1. Follow recommendations explained above.
2. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined here.
3. Use the lightest depth of cut that still enables good chip surface finishing.

problem	solution
bur	<ol style="list-style-type: none"> <li>1. Ensure tool centre height.</li> <li>2. Use sharp tool (index more often).</li> <li>3. Use positive rake PVD-coated insert.</li> <li>4. Use correct grade for workpiece material.</li> <li>5. Use correct geometry (e.g., positive rake for work-hardening material).</li> <li>6. Chamfer before grooving.</li> <li>7. Change tool path.</li> </ol>
poor surface finish	<ol style="list-style-type: none"> <li>1. Increase speed.</li> <li>2. Use sharp tool (index more often).</li> <li>3. Dwell tool in bottom 1–3 revolutions (max).</li> <li>4. Use proper chip control geometry.</li> <li>5. Increase coolant flow/concentration.</li> <li>6. Ensure proper setup (overhang, shank size).</li> <li>7. Use correct geometry (e.g., positive rake for work-hardening material).</li> </ol>
groove bottom that is not flat	<ol style="list-style-type: none"> <li>1. Use sharp tool (index more often).</li> <li>2. Dwell tool in bottom 1–3 revolutions (max).</li> <li>3. Reduce tool overhang (increase rigidity).</li> <li>4. Ensure correct tool alignment.</li> <li>5. Reduce feed rate at groove bottom.</li> <li>6. Use a wider insert.</li> <li>7. Ensure tool centre height.</li> </ol>
poor chip control	<ol style="list-style-type: none"> <li>1. Use “K” chip control geometry insert.</li> <li>2. Use sharp tool (index more often).</li> <li>3. Increase coolant concentration.</li> <li>4. Adjust feed rate (usually increase first).</li> </ol>
chatter	<ol style="list-style-type: none"> <li>1. Reduce tool and workpiece overhang.</li> <li>2. Adjust speed and feed (usually increase first).</li> <li>3. Ensure centre height.</li> </ol>
insert chipping	<ol style="list-style-type: none"> <li>1. Use correct grade for workpiece material.</li> <li>2. Increase speed.</li> <li>3. Reduce feed.</li> <li>4. Use a stronger grade.</li> <li>5. Increase tool and setup rigidity.</li> </ol>
side walls not straight	<ol style="list-style-type: none"> <li>1. Check tool alignment for square.</li> <li>2. Use correct insert hand.</li> <li>3. Reduce workpiece and tool overhang.</li> <li>4. Use sharp insert (index more often).</li> </ol>

### Machining Guidelines for Chip Control • Grooving

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

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

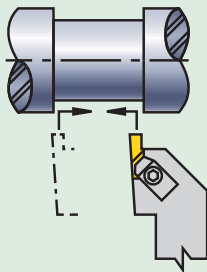


### Machining Guidelines for Chip Control • Turning/Profiling

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

- 0,79–1,6mm wide insert can cut up to 0,6mm deep.
- 1,7–3,3mm wide insert can cut up to 1mm deep.
- 3,5–4,8mm wide insert can cut up to 2mm deep.
- 5–6,35mm wide insert can cut up to 3mm deep.

#### Finish Turning the Groove

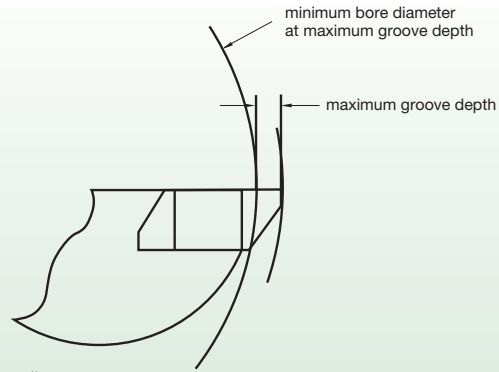


1. Plunge both sides of groove width.
2. Plunge centre area to remove web of material remaining.
3. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined.
4. Use the lightest depth of cut that still allows good chipbreaking, tool life, and surface finish.

Groove Limits		
insert catalogue number	maximum internal groove depth mm	minimum bore diameter mm
NG-1094L	1,91	20,32
—	1,02	11,18
NG-2031R/L	1,27	18,54
NG-2041R/L	—	—
NG-2047R/L	—	—
NG-2058R/L	—	—
—	2,79	63,50
NG-2062R/L	2,59	44,45
NG-2094R/L	2,49	38,10
NG-2125R/L	2,03	25,40
—	1,40	18,54
NG-3047R/L	—	—
NG-3062R/L	2,39	44,45
NG-3072R/L	2,29	41,28
NG-3078R/L	1,91	34,93
NG-3088R/L	—	—
NG-3094R/L	—	—
NG-3097R/L	3,81	60,33
NG-3105R/L	—	—
NG-3110R/L	3,68	53,98
NG-3122R/L	—	—
NG-3125R/L	3,51	47,63
NG-3142R/L	—	—
NG-3156R/L	3,18	41,28
NG-3178R/L	—	—
NG-3185R/L	2,79	34,93
NG-3189R/L	—	—
NG-4125R/L	3,81	69,85
—	6,35	146,05
NG-4189R/L	6,22	127,00
NG-4213R/L	6,10	114,30
NG-4219R/L	5,54	82,55
NG-4250R/L	5,08	63,50

NOTE: The same maximum groove depth and minimum bore diameter values also apply to metric, NG-K (chip control), and NR (full radius) inserts of similar size. The same internal grooving depth limits are a function of bar clearance versus bore diameters.

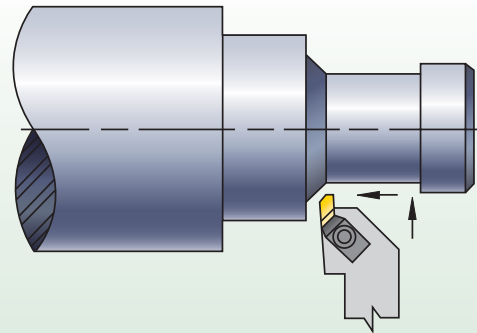
### Internal Groove Depth versus Bar Interference



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

### Machining Guidelines for Back Turning/Turning/Profiling

The NP-K-style TopGroove inserts were engineered specifically for back turning on small automatic lathes, but they also find applications for other light turning and profiling operations. For general applications, maximum depth of cut should not exceed 2,74mm for size 2 inserts or 3,84mm for size 3 inserts.



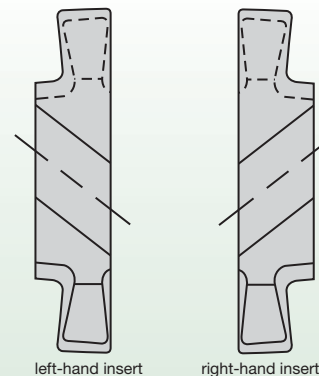
### Machining Guidelines for Using TopGroove Deep Grooving Inserts (NGD)

Typically, those NGD- and NRD-style inserts with two cutting edges require no machine offset changes. However, those inserts with only one cutting edge do require offset changes. Refer to the chart here to ensure proper offset adjustments.

insert catalogue number	add to C dimension mm	add to F dimension mm
NGD-3062	0,00	0,00
NGD-3094	2,54	2,54
NGD-3125	2,54	2,54
NGD-3189	2,54	2,54
NGD-4125	0,00	0,00
NGD-4189	3,18	3,18
NGD-4250	6,35	6,35
NRD-3031	0,00	0,00
NRD-3062	2,54	2,54
NRD-4062	0,00	0,00
NRD-4094	6,35	6,35
NRD-4125	6,35	6,35

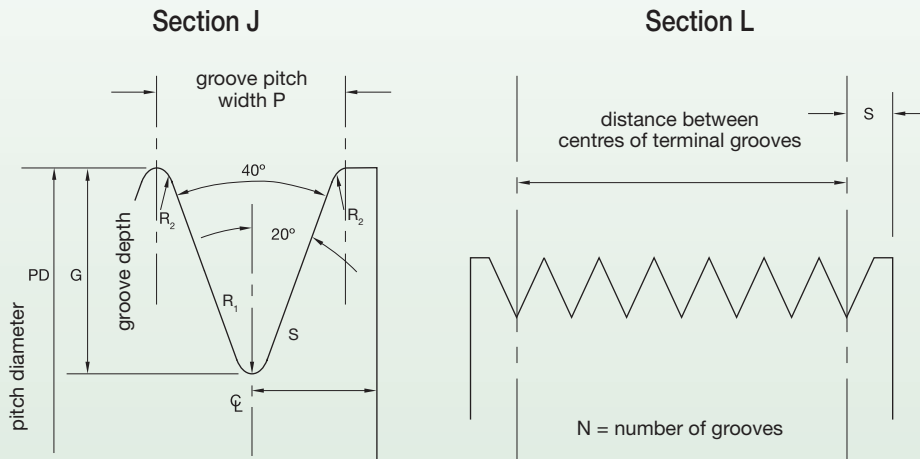
### TopGroove Insert Selection Guide

- All TopGroove inserts are precision ground to provide accurate edge location and secure locking of the insert in the toolholder pocket.
- TopGroove inserts can be used in either toolholders or boring bars.
- Right-hand TopGroove toolholders use right-hand inserts. Left-hand TopGroove toolholders use left-hand inserts.
- Right-hand TopGroove boring bars use left-hand inserts. Left-hand TopGroove boring bars use right-hand inserts.



### Machining Guidelines for Poly-Vee Grooving with Custom Solution and TopGroove NV Inserts (NV3-J and NV4-L)

- To machine cross section “J”, use insert NV3-J.
- To machine cross section “L”, use insert NV4-L.

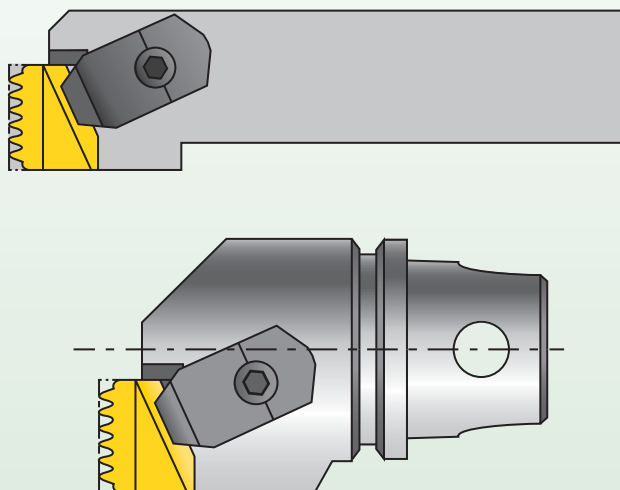


### Groove Dimensions and Tolerances for Sheaves

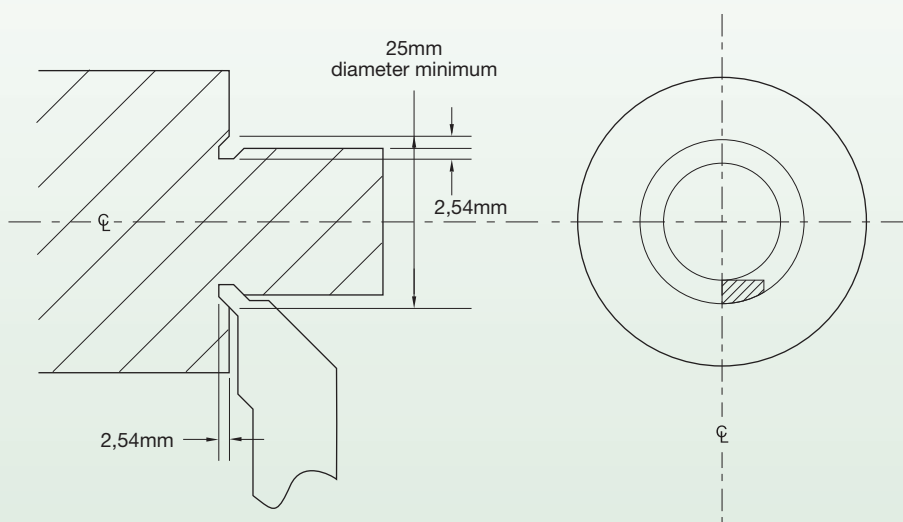
groove cross section	pitch width (P)	groove depth (G)	minimum radius (R2)	radius (R1)	terminal distance	distance between centres of terminal grooves and maximum accumulated tolerance
J	2,34 ±0,03	2,21 ±0,13	0,20	0,32 ±0,06	3,18	(N-1)4,88 ±0,25
L	4,70 ±0,05	5,11 ±0,13	0,38	0,32 ±0,06	3,18	(N-1)4,70 ±0,25

### Multiple Tooth Poly-Vee Grooving

Let WIDIA™ quote your multiple tooth poly-vee grooving applications. Semi-standard inserts and holders are available. The strong TopGroove design holds the insert rigid and outperforms any other tooling method for this application.

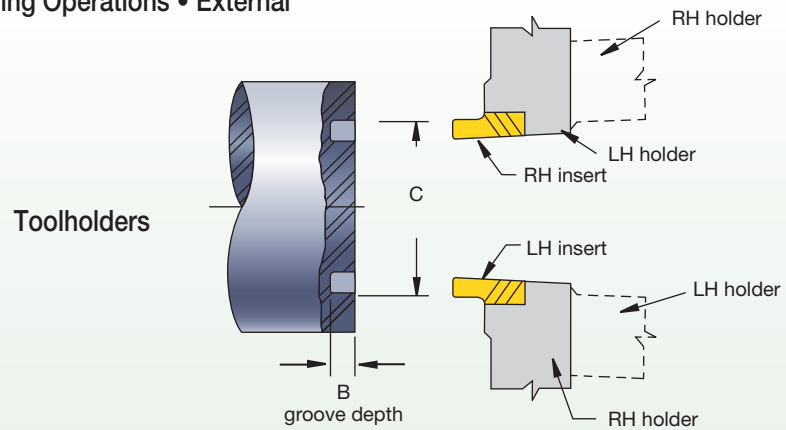


### Machining Guidelines for Undercutting Operations Performed with Custom Solution and TopGroove NU Inserts (NU3094, NU3125, and NU3156)



NOTE: Items shown are non-standard items.

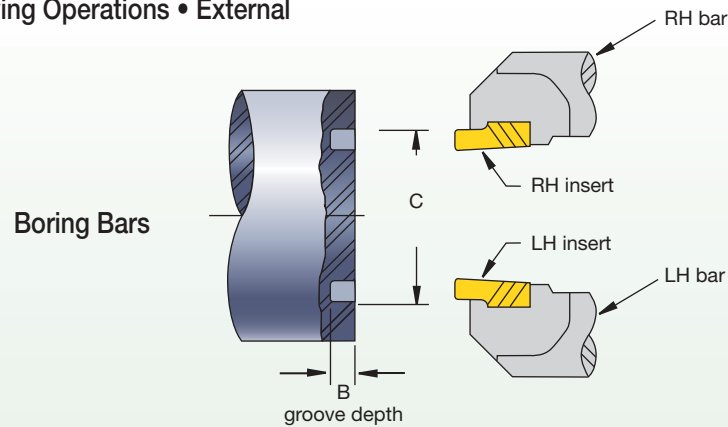
Machining Guidelines for Face Grooving Operations • External



Standard NF/NDF Inserts

insert family	maximum groove depth B mm	minimum groove diameter C mm
NF-3	1,52	23,9
NF-3	2,39	30,5
NF-3	3,18	36,1
NF-3	3,81	41,3
NFD-3	6,35	47,6
NFD-4	9,53	57,2
NFD-4	12,70	57,2

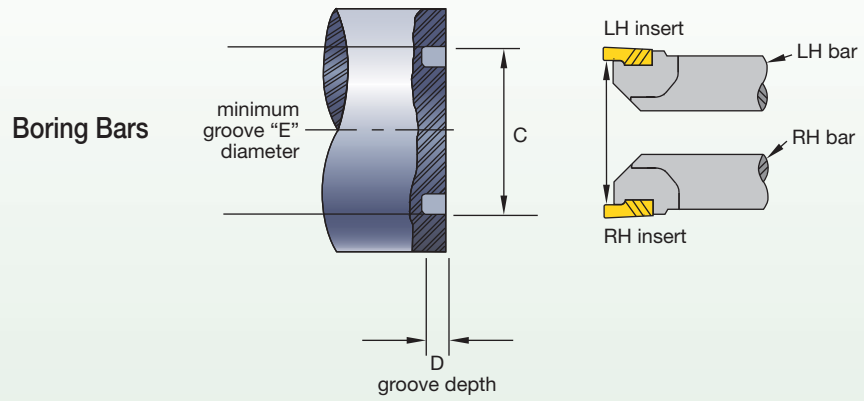
Machining Guidelines for Face Grooving Operations • External



Standard NG/NGD Inserts

insert family	maximum groove depth B mm	minimum groove diameter C mm
NG-2	1,27	54,0
NG-2	2,79	88,9
NG-3	2,39	101,6
NG-3	3,18	127,0
NG-3	3,81	139,7
NGD-3	6,35	174,6
NG-4	3,81	152,4
NG-4	6,35	209,6
NGD-4	9,53	222,3
NGD-4	12,70	222,3

Machining Guidelines for Face Grooving Operations • Internal



Standard NG/NGD Inserts

insert family	maximum groove depth B mm	minimum groove diameter C mm
NFD-3-KI	6,35	63,5

*NOTE: Also check minimum bore diameter of boring bar. See page E78.*



**ProGroove™ •**  
Grooving and Cut-Off

# ProGroove



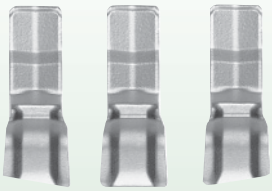
With easy-to-change inserts available in multiple high-performance carbide grades, the ProGroove system ensures accurate, reliable, and reproducible cutting edge performance.

- Single-end grooving and cut-off inserts.
- Offered with integral toolholders and blades.
- Shallow, deep grooving, and cut-off capabilities.
- Available in four different geometries.



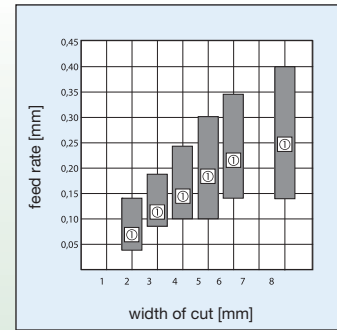


### PGU



left-hand    neutral    right-hand

For grooving and parting operations, universal use. Positive chipbreaker groove for light cutting action. Right-hand and left-hand styles with 6° front angle.

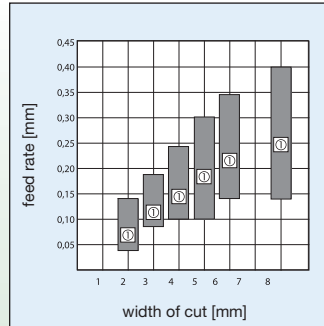


① Recommended Starting Feed

### PGM



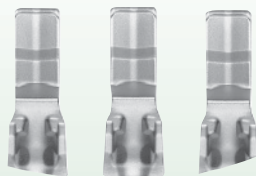
neutral



① Recommended Starting Feed

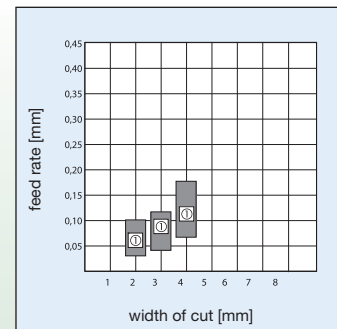
For grooving and parting, also capable of copy and straight turning as well as chamfering. With additional chip forming element for good chip control with varying depths of cut.

### PGS



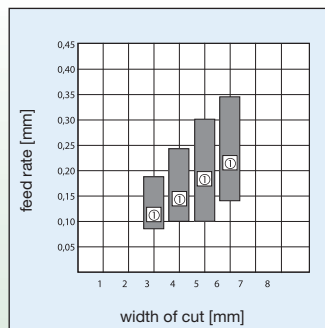
left-hand    neutral    right-hand

For low-bur parting with straight flanks and smooth surface finishes. All inserts are recommended for parting and grooving slender workpieces, part diameter <32mm, and thin-wall tubes.



① Recommended Starting Feed

### PGR



① Recommended Starting Feed

Full round inserts for profiling, grooving, and copy turning. Very good chip control for broad general use. Accurate, reproducible cutting edge positioning.

### LG System • 0 and 1

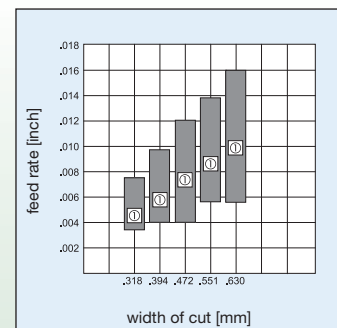


0

1

...0  
Inserts with wide range of applications in grooving and deep grooving. With additional chip control element for good chip control, even with varying widths of cut.

...1  
Inserts with wide range of uses in grooving and deep grooving of short chipping materials.



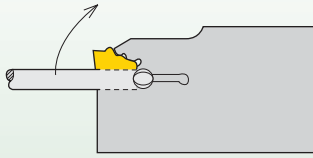
① Recommended Starting Feed

Material Group		Cutting Speed – vc m/min																	
		TN6030			TN7525			TN7535			TN8025			THM			TTM		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0/1	130	140	150	200	215	230	140	175	210	-	-	-	-	-	-	90	95	100
	2	110	145	175	170	220	270	115	145	175	-	-	-	-	-	-	75	100	125
	3	110	145	175	170	220	270	115	145	175	-	-	-	-	-	-	75	100	125
	4	75	95	115	115	145	175	75	100	120	-	-	-	-	-	-	55	65	80
	5	100	125	145	155	190	220	105	140	170	-	-	-	-	-	-	70	85	100
	6	40	55	65	65	85	100	45	60	75	-	-	-	-	-	-	30	40	45
M	1	90	110	140	-	-	-	-	-	-	90	120	150	-	-	-	60	75	90
	2	55	70	90	-	-	-	-	-	-	55	75	95	-	-	-	40	50	55
	3	60	75	95	-	-	-	-	-	-	60	80	100	-	-	-	40	50	60
K	1	60	80	90	120	150	180	-	-	-	-	-	-	60	80	90	-	-	-
	2	60	75	85	120	150	180	-	-	-	-	-	-	60	75	85	-	-	-
	3	60	75	90	110	140	170	-	-	-	-	-	-	60	75	90	-	-	-
N	1	-	-	-	-	-	-	-	-	-	-	-	-	600	750	900	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	535	685	835	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	230	300	370	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	135	180	225	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	70	90	110	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	445	565	690	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	550	700	850	-	-	-
S	1	-	-	-	-	-	-	-	-	-	-	-	-	25	35	40	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	15	20	20	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	40	60	70	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	20	30	35	-	-	-
H	1	-	-	-	-	-	-	-	-	-	-	-	-	10	20	35	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	10	20	35	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	10	20	35	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	10	20	35	-	-	-

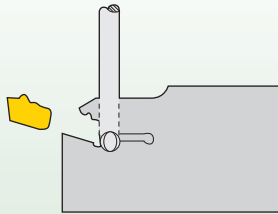


Grooving and Cut-Off

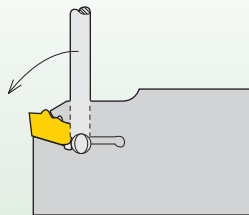
## ProGroove System



To change the cutting insert, place the wrench into the blade recess.  
The blade mouth is opened by turning through 90°.

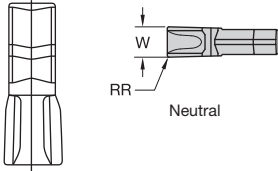


In this position, the wrench is self-locking, leaving both hands free  
for changing the cutting insert.



The cutting insert is pressed against the rear seat in the blade mouth,  
releasing the wrench. The insert is accurately positioned and securely clamped.





P	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
H	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

● first choice  
○ alternate choice

■ PGU

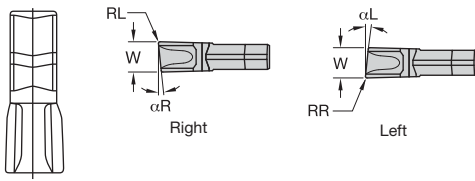
catalogue number	insert size	W	RR	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567320	2	2,10	0,20	N - Neutral	2953289	2498725	2498713	2021804	2008876	-
123567330	3	3,10	0,30	N - Neutral	2953284	-	2498714	2017822	2008931	-
123567340	4	4,10	0,30	N - Neutral	2953286	2498727	2498715	-	2009080	-
123567350	5	5,10	0,30	N - Neutral	2953673	2498728	2498716	-	2021873	-
123567360	6	6,10	0,40	N - Neutral	2953674	2952333	2952350	-	2009385	-
123567380	8	8,15	0,60	N - Neutral	2953666	-	2952351	2009482	2009504	-

NOTE: W tolerance on all = ±0,05mm.

(continued)



(PGU – continued)



● first choice  
○ alternate choice

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

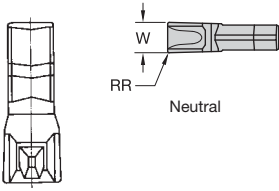
Grooving and Cut-Off

catalogue number	insert size	W	RR	αL	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567231	3	3,10	0,25	6	L - Left	2953672	2498730	2498718	■	■	■
123567241	4	4,10	0,25	6	L - Left	2953676	■	■	■	■	■

catalogue number	insert size	W	RL	αR	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567230	3	3,10	0,25	6	R - Right	2953291	2498729	2498717	■	■	■
123567240	4	4,10	0,25	6	R - Right	2953667	2498731	2498719	■	■	■

NOTE: W tolerance on all = ±0,05mm.



● first choice  
○ alternate choice

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

■ PGM

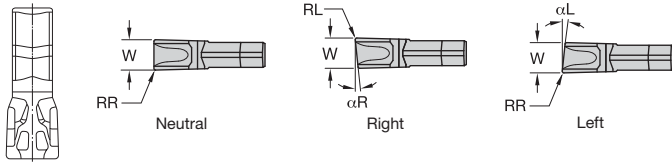
catalogue number	insert size	W	RR	hand	TN6030	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567420	2	2,10	0,20	N - Neutral	2953679	2953679	2498733	2498721	■	■	■
123567430	3	3,10	0,30	N - Neutral	2953678	2953678	2498734	2498722	■	■	■
123567440	4	4,10	0,30	N - Neutral	2953663	2953663	2498735	2498723	■	■	■
123567450	5	5,10	0,30	N - Neutral	2953671	2953671	2498736	2498724	■	■	■
123567460	6	6,10	0,40	N - Neutral	2953677	2953677	2952335	2952352	■	■	■
123567480	8	8,15	0,60	N - Neutral	2953675	2953675	2952336	2952353	■	■	■

NOTE: W tolerance on all = ±0,05mm.



Grooving and Cut-Off





● first choice  
○ alternate choice

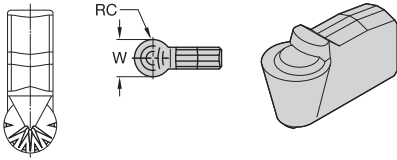
P	●	●	●	○	●
M	●	○	○	●	●
K	●	●	●	●	●
N	○	○	○	○	○
S	○	○	○	○	○
H	○	○	○	○	○

■ PGS

catalogue number	insert size	W	RR	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM	
123567702	2	2,25	0,20	N - Neutral	●	●	●	○	○	○	
123567703	3	3,25	0,20	N - Neutral	●	●	●	○	○	○	
123567704	4	4,25	0,20	N - Neutral	●	●	●	○	○	○	
catalogue number	insert size	W	RR	αL	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567721	2	2,25	0,20	6	L - Left	●	●	●	○	○	○
123567731	3	3,25	0,20	6	L - Left	●	●	●	○	○	○
catalogue number	insert size	W	RL	αR	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567720	2	2,25	0,20	6	R - Right	●	●	●	○	○	○
123567730	3	3,25	0,20	6	R - Right	●	●	●	○	○	○
123567740	4	4,25	0,20	6	R - Right	●	●	●	○	○	○

NOTE: W tolerance on all = ±0,05mm.

Grooving and Cut-Off



● first choice  
○ alternate choice

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

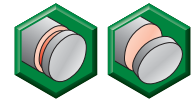
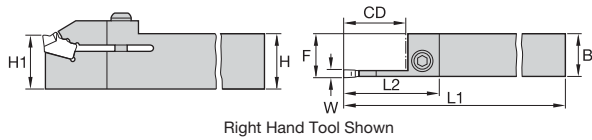
■ PGR

catalogue number	insert size	W	RC	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567803	3	3,00	1,50	●	○	○	○	○	○
123567804	4	4,00	2,00	○	○	○	○	○	○
123567805	5	5,00	2,50	○	○	○	○	○	○
123567806	6	6,00	3,00	○	○	○	○	○	○

NOTE: W tolerance on all = ±0,07mm.

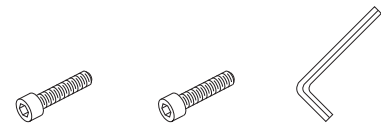


Grooving and Cut-Off

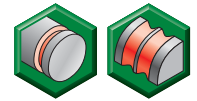
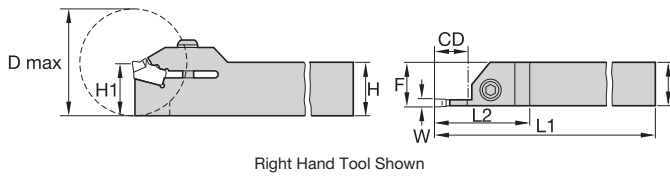


■ Grooving and Cut-Off

Grooving and Cut-Off



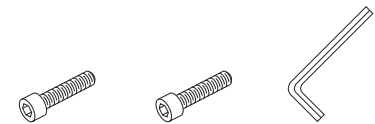
order number	catalogue number	seat size	W	CD	H	B	F	L1	L2	H1	cap screw	cap screw	wrench
<b>right hand</b>													
2007136	12251782000	2	2,10	16,0	16	16,0	16,2	100	27	16	—	12146012600	12148041100
2962743	12250023000	3	3,10	20,0	19	19,1	19,4	127	32	19	12148596200	—	—
2962745	12250023200	3	3,10	25,0	25	25,4	25,7	152	40	25	12148596200	—	—
2022560	12251783000	3	3,10	20,0	20	20,0	20,3	125	32	20	12148596200	—	—
2007142	12251783200	3	3,10	25,0	25	25,0	25,3	150	40	25	12148596200	—	—
2008153	12251783600	3	3,10	25,0	32	25,0	25,3	170	40	32	12148596200	—	—
2022562	12251784000	4	4,10	25,0	20	20,0	20,4	125	40	20	12148596200	—	—
2007148	12251784200	4	4,10	25,0	25	25,0	25,4	150	40	25	12148596200	—	—
2022564	12251785200	5	5,10	32,0	25	25,0	25,4	150	53	25	12148596200	—	—
2022566	12251785400	5	5,10	32,0	32	25,0	25,4	170	53	32	12148596200	—	—
2962751	12250025200	5	5,11	32,0	25	25,4	25,8	152	53	25	12148596200	—	—
2015814	12251784400	6	4,10	32,0	32	25,0	25,4	170	53	32	12148596200	—	—
2022568	12251786400	6	6,10	32,0	32	25,0	25,5	170	53	32	—	12146012700	12148041300
2022569	12251788400	8	8,10	40,0	32	25,0	25,6	170	66	32	—	12146012700	12148041300
<b>left hand</b>													
2007139	12251782100	2	2,10	16,0	16	16,0	16,2	100	27	16	—	12146012600	12148041100
2962744	12250023100	3	3,10	20,0	19	19,1	19,4	127	32	19	12148596200	—	—
2022561	12251783100	3	3,10	20,0	20	20,0	20,3	125	32	20	12148596200	—	—
2007145	12251783300	3	3,10	25,0	25	25,0	25,3	150	40	25	12148596200	—	—
2008150	12251783700	4	3,10	25,0	32	25,0	25,3	170	40	32	12148596200	—	—
2022563	12251784100	4	4,10	25,0	20	20,0	20,4	125	40	20	12148596200	—	—
2007151	12251784300	4	4,10	25,0	25	25,0	25,4	150	40	25	12148596200	—	—
2015816	12251784500	4	4,10	32,0	32	25,0	25,4	170	53	32	12148596200	—	—
2015839	12251786500	4	6,10	32,0	32	25,0	25,5	170	53	32	—	12146012700	12148041300
2022565	12251785300	5	5,10	32,0	25	25,0	25,4	150	53	25	12148596200	—	—
2022567	12251785500	5	5,10	32,0	32	25,0	25,4	170	53	32	12148596200	—	—
2015842	12251788500	8	8,10	40,0	32	25,0	25,6	170	66	32	—	12146012700	12148041300



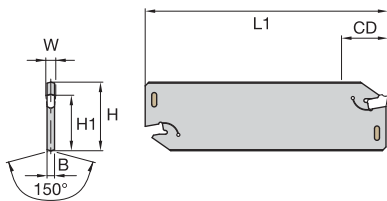
■ Grooving and Profiling

order number	catalogue number	seat size	W	CD	D max	H	B	F	L1	L2	H1	cap screw	cap screw	wrench
<b>right hand</b>														
2007105	12251762000	2	2,10	10,0	25,4	16	16,0	16,2	100	26	16	—	12146012600	12148041100
2021637	12251762400	2	2,10	10,0	25,4	25	25,0	25,2	150	26	25	—	12146012600	12148041100
2007111	12251763200	2	3,10	10,0	25,4	25	25,0	25,3	150	26	20	12148596200	—	—
2007127	12251763400	3	3,10	10,0	25,4	16	16,0	16,3	100	26	25	12148596200	—	—
2007130	12251764200	3	4,10	12,5	32,0	25	25,0	25,4	150	31	25	12148596200	—	—
2007832	12251762200	4	2,10	10,0	25,4	20	20,0	20,2	125	26	25	—	12146012600	12148041100
2022548	12251764000	4	4,10	12,5	32,0	20	20,0	20,4	125	31	20	12148596200	—	—
2022550	12251764400	4	4,10	12,5	32,0	32	25,0	25,4	170	31	32	12148596200	—	—
2022552	12251765200	5	5,10	12,5	—	25	25,0	25,5	150	31	25	12148596200	—	—
2015792	12251768400	5	8,10	16,0	—	32	25,0	25,7	170	36	32	—	12146012700	12148041300
2022555	12251766200	6	6,10	16,0	—	25	25,0	25,6	150	35	25	—	12146012700	12148041300
2022557	12251766400	6	6,10	16,0	—	32	25,0	25,6	170	35	32	—	12146012700	12148041300
2015754	12251763000	8	3,10	10,0	25,4	20	20,0	20,3	125	26	25	12148596200	—	—
<b>left hand</b>														
2007108	12251762100	2	2,10	10,0	25,4	16	16,0	16,2	100	26	16	—	12146012600	12148041100
2021636	12251762500	2	2,10	10,0	25,4	25	25,0	25,2	150	26	25	—	12146012600	12148041100
2007124	12251763300	2	3,10	10,0	25,4	25	25,0	25,3	150	26	20	12148596200	—	—
2021631	12251762300	3	2,10	10,0	25,4	20	20,0	20,2	125	26	16	—	12146012600	12148041100
2022547	12251763100	3	3,10	10,0	25,4	20	20,0	20,3	125	26	20	12148596200	—	—
2007133	12251764300	3	4,10	12,5	32,0	25	25,0	25,4	150	31	25	12148596200	—	—
2015782	12251765500	3	5,10	12,5	—	32	25,0	25,5	170	31	20	12148596200	—	—
2022549	12251764100	4	4,10	12,5	32,0	20	20,0	20,4	125	31	20	12148596200	—	—
2022551	12251764500	4	4,10	12,5	32,0	32	25,0	25,4	170	31	32	12148596200	—	—
2022553	12251765300	5	5,10	12,5	—	25	25,0	25,5	150	31	25	12148596200	—	—
2022556	12251766300	6	6,10	16,0	—	25	25,0	25,6	150	35	25	—	12146012700	12148041300
2022558	12251766500	6	6,10	16,0	—	32	25,0	25,6	170	35	32	—	12146012700	12148041300
2021627	12251763500	8	3,10	10,0	25,4	16	16,0	16,3	100	26	32	12148596200	—	—
2022559	12251768500	8	8,10	16,0	—	32	25,0	25,7	170	36	32	—	12146012700	12148041300

NOTE: Select shorter CD dimension for added stability.



Grooving and Cut-Off



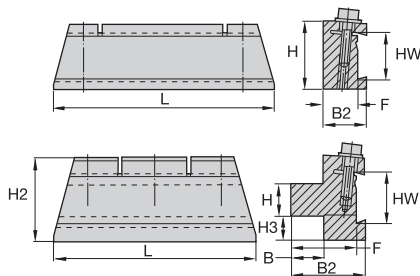
■ Cut-Off Blades



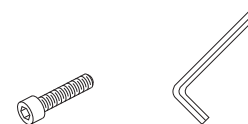
order number	catalogue number	seat size	W	H	H1	L1	B	CD	wrench
2021629	12251332000	2	2,1	19,0	15,7	90	1,7	20	12146003800
2021639	12251342000	2	2,1	26,0	21,4	110	1,7	25	12146003800
2008113	12251352000	2	2,1	32,0	25,0	150	1,7	25	12146003800
2021640	12251343000	3	3,1	26,0	21,4	110	2,4	40	12146003800
2008116	12251353000	3	3,1	32,0	25,0	150	2,4	50	12146003800
2021641	12251344000	4	4,1	26,0	21,4	110	3,2	40	12146003800
2008119	12251354000	4	4,1	32,0	25,0	150	3,2	50	12146003800
2008122	12251355000	5	5,1	32,0	25,0	150	4,2	60	12146003800
2008135	12251356000	6	6,1	32,0	25,0	150	5,0	60	12146009500
2008138	12251358000	8	8,1	32,0	25,0	150	6,8	60	12146009500
2021743	12251368000	8	8,1	52,5	45,0	250	6,8	100	12146009500

NOTE: Order wrench separately.

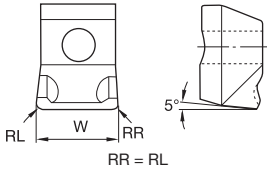
Blade Holders



■ Cut-Off Blade Holders



order number	catalogue number	HW	H	B	F	H2	B2	H3	L	cap screw	wrench
2021625	12251221900	19	16,0	16,0	28,3	30	30	4	100	12148036000	12148041300
2021634	12251212500	19	25,0	19,0	17,3	25	19	—	100	12148036000	12148041300
2021626	12251221600	26	16,0	16,0	31,0	40	36	12	100	12148036000	12148041300
2007826	12251222000	26	20,0	18,0	33,0	40	38	8	100	12148036000	12148041300
2008141	12251213200	26	32,0	20,0	15,0	32	20	—	125	12148036000	12148041300
2021635	12251222500	32	25,0	20,0	35,0	50	40	10	125	12148036000	12148041300
2008156	12251223200	32	32,0	25,0	40,0	50	45	3	125	12148036000	12148041300
2008159	12251233200	53	32,0	25,0	50,0	82	57	30	160	12146013400	12148041400
2021723	12251234000	53	40,0	40,0	58,0	82	65	22	160	12146013400	12148041400



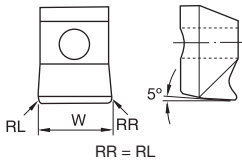
● first choice  
○ alternate choice

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

■ **LGNO**

catalogue number	W	RR	TN6030	TN7525	TN7535	TN8025	THM	TTM
123568080	8,15	0,80	-	2952341	2952363	-	2017973	2009562
123568100	10,15	0,80	-	2952342	2952364	-	2017976	-
123568120	12,20	0,80	-	2952343	2952365	-	2017980	-
123568140	14,20	0,80	-	2952344	2952366	-	2022789	-
123568160	16,20	0,80	-	2952345	2952367	-	2022790	2021798

NOTE: W tolerance on all = ± 0,05mm.



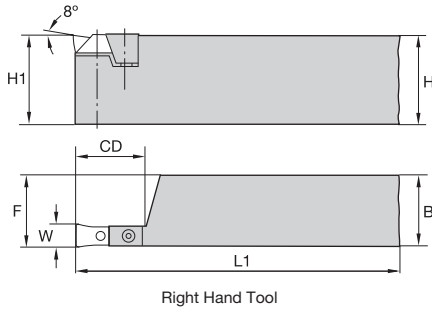
■ **LGN1**

catalogue number	W	RR	TN6030	TN7525	TN7535	TN8025	THM	TTM
123568081	8,15	0,80	-	-	-	-	2022787	-
123568121	12,20	0,80	-	-	-	-	2017993	-
123568141	14,20	0,80	-	-	-	-	2017996	-
123568161	16,20	0,80	-	-	-	-	2022791	-

NOTE: W tolerance on all = ± 0,05mm.



Grooving and Cut-Off

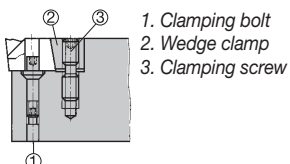


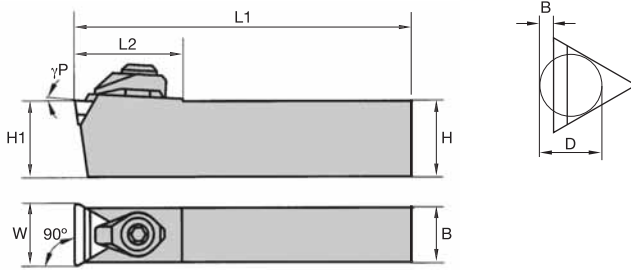
■ Grooving

order number	catalogue number	seat size	W	CD	H	B	F	L1	H1
<b>right hand</b>									
2022446	12250110100	1	8,00	20,0	32	25,0	25,5	170	32
2008147	12250110300	1	10,00	20,0	32	25,0	25,5	170	32
2021719	12250110500	1	12,00	25,0	40	32,0	33,0	200	40
2021721	12250110700	1	14,00	28,0	40	32,0	33,0	200	40
2008521	12250110900	1	16,00	32,0	40	32,0	33,0	200	40
<b>left hand</b>									
2022447	12250110200	1	8,00	20,0	32	25,0	25,5	170	32
2008144	12250110400	1	10,00	20,0	32	25,0	25,5	170	32
2021718	12250110600	1	12,00	25,0	40	32,0	33,0	200	40
2021720	12250110800	—	14,00	28,0	40	32,0	33,0	200	40
2021722	12250111000	1	16,00	32,0	40	32,0	33,0	200	40

■ Spare Parts

catalogue number	clamping bolt	wedge clamp	clamping screw	wrench for clamp screw	wrench for clamp screw	wrench for clamping bolt
<b>right hand</b>						
12250110100	12148060600	12148094300	12148574100	12148041000	—	12148046000
12250110300	12148060600	12148094400	12148574900	—	12148041100	12148046000
12250110500	12148060700	12148094500	12148574900	—	12148041100	12148040900
12250110700	12148060700	12148094600	12148574000	—	12148041200	12148040900
12250110900	12148060800	12148094700	12148574000	12148041000	12148041200	—
<b>left hand</b>						
12250110200	12148060600	12148094300	12148574100	12148041000	—	12148046000
12250110400	12148060600	12148094400	12148574900	—	12148041100	12148046000
12250110600	12148060700	12148094500	12148574900	—	12148041100	12148040900
12250110800	12148060700	12148094600	12148574000	—	12148041200	12148040900
12250111000	12148060800	12148094700	12148574000	12148041000	12148041200	—





■ Grooving

order number	W	H1	H	B	L1	L2	γP°	gage insert
2022921	10,40	20	20	9,5	125	21	3	TP..1103../TP..22..
2007414	15,30	20	20	13,0	150	27	3	TP..1603../TP..32..
2022922	15,30	25	25	13,0	150	27	3	TP..1603../TP..32..
2058066	20,20	25	25	18,0	150	35	3	TP..2204../TP..43..
2022923	20,20	32	32	18,0	180	35	3	TP..2204../TP..43..

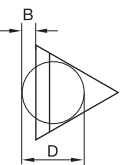
NOTE: Gage inserts listed are ISO-/ANSI-style inserts.  
 Holders are supplied without chipbreaker. For chipbreaker order numbers, see below.

■ For Grooving without Chipbreaker

catalogue number	clamp	clamp screw	clamp screw	shim	shim screw	shim screw	washer	wrench
12191061900	12148589200	12148589800	—	12148032586	—	12148021900	—	—
12191062086	12148586800	—	12148586000	12148031686	12148024100	—	12148024200	—
12191062586	12148586800	—	12148586000	12148031686	12148024100	—	12148024200	—
12191062686	12148586900	—	12148021100	12148032086	12148024500	—	12148024800	—
12191063286	12148586900	—	12148021100	12148032086	12148024500	—	12148024800	—

■ For Grooving with Chipbreaker (Order Additional Clamp and Chipbreaker)

inserts	clamp with chipbreaker	D	chipbreakers B – edge width					
			0,4mm	1,2mm	1,8mm	2,5mm	3,2mm	4,0mm
TP...1103...	12148589200	6,35	12148591011	12148588211	12148588311	12148588411	—	—
TP...1603...	12148589300	9,52	12148591111	12148586611	12148587011	12148587111	12148580011	435101
TP...2204...	12148586900	12,70	—	—	12148580411	12148580511PKG	12148580611	12148582511





## Separator™ for Cut-Off

Specifically engineered to deliver toolholder flexibility with integral, component, universal, and blade-style designs.

# Separator



### Features

- Insert widths 2–4mm.
- Toolholder shank sizes 10–31, 75mm.
- Cut-off up to 76mm bar capacity.

### Benefits

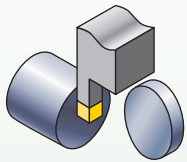
- Quick, reliable insert indexing.
- Positive mechanical clamping.
- CNC square shank, screw machine, and PL blade-style toolholders.



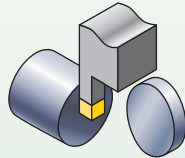
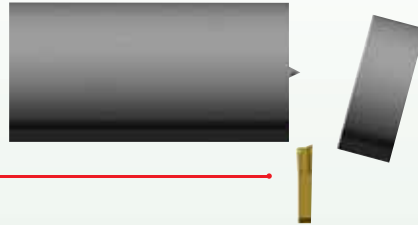


**1 Choose the application to be performed:**

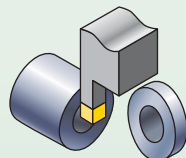
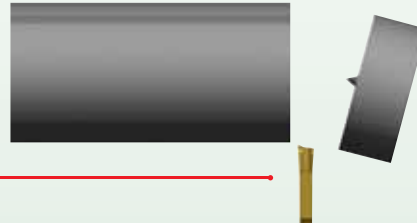
Choose lead angle of insert for application.



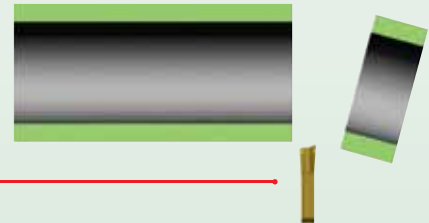
R.H. Lead Angle



L.H. Lead Angle



R.H. Lead Angle



**2 Identify the material to be machined:**

Each tool has a material grid marked with a letter indicating the materials that can be machined.

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

**3 Select your toolholder based on the application:**

- A Choose the appropriate width of insert required for the application.
- B Choose the shortest cutting depth "CD" dimension for increased tool rigidity.
- C Select the largest toolholder shank "H" and "B" dimensions for maximum rigidity.

Separator™ Toolholders

WIDIA

■ Square Shank • Extended Capacity

order number	catalogue number	A	B	C	FB	H	L2	L1	clamp	clamp screw
3538741	206417	3,00	25,00	24,74	23,30	25,00	42,30	150,00	435190	819168
3538742	206418	4,00	25,00	24,88	23,30	25,00	42,30	150,00	435190	819168
3538743	206419	3,00	25,00	24,74	23,30	25,00	42,30	150,00	435181	819168
3615303	206424	4,00	25,00	24,88	23,30	25,00	42,30	150,00	435181	819168

**4 Select chipbreaker style for the application:**

See the application guide on page E112 for a complete list of insert styles.

insert type	steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
first choice	X <sup>2</sup> -Ultra (X <sup>2</sup> has wipers)	X <sup>2</sup> -Ultra	X <sup>2</sup> -Ultra	X <sup>2</sup> -Ultra	X <sup>2</sup> -Ultra	—
second choice	S <sup>2</sup> -Ultra	S <sup>2</sup> -Ultra	Classic	S <sup>2</sup> -Ultra	S <sup>2</sup> -Ultra	X <sup>2</sup>

**5 Select grade:**

machining condition	Recommended Grades					
	steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
<b>high performance</b> for optimal conditions (clean cuts, good machine condition, higher speed capability)	M93	M433B	M93	M93	M433B	—
	—	M93	—	—	M93	—
<b>general purpose</b> (1st choice for general machining)	M43	M43	M43	M43	M43	M93
<b>unfavourable conditions</b> (interrupted cuts, low speeds, etc.)	M45	M45	M45	M45	M45	—
	M40	M40	M40	M40	M40	—

See page E109 for Grades and Grade Descriptions.

**6 Determine cutting data:**

- A** Based on material group and grade, identify starting speed (vc).
- B** First choice starting speed is in **bold**.

See page E113 for cutting data.

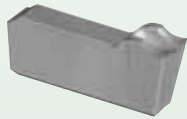
Material Group		Cutting Speed – vc – m/min														
		M40			M43			M433B			M45			M93		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0 / 1	40	<b>80</b>	115	110	<b>180</b>	210	—	—	—	45	<b>95</b>	125	150	<b>200</b>	245
	2	30	<b>60</b>	85	75	<b>120</b>	165	—	—	—	40	<b>85</b>	95	115	<b>150</b>	185
	3	35	<b>95</b>	85	75	<b>120</b>	165	—	—	—	40	<b>95</b>	95	115	<b>150</b>	185
	4	25	<b>45</b>	60	55	<b>90</b>	125	30	<b>70</b>	115	25	<b>45</b>	70	60	<b>110</b>	140
M	5	35	<b>80</b>	85	85	<b>110</b>	140	85	<b>115</b>	145	80	<b>95</b>	95	105	<b>140</b>	170
	6	15	<b>30</b>	40	35	<b>50</b>	65	35	<b>50</b>	70	20	<b>30</b>	45	45	<b>60</b>	75
	7	30	<b>45</b>	60	50	<b>75</b>	100	55	<b>90</b>	130	35	<b>50</b>	65	90	<b>120</b>	150
K	2	20	<b>30</b>	40	35	<b>50</b>	65	35	<b>60</b>	80	25	<b>35</b>	50	55	<b>75</b>	95
	3	20	<b>35</b>	40	35	<b>50</b>	65	35	<b>60</b>	85	25	<b>40</b>	50	60	<b>80</b>	100
	1	65	<b>95</b>	125	90	<b>135</b>	175	200	<b>260</b>	320	75	<b>110</b>	145	130	<b>175</b>	225
N	2	65	<b>95</b>	125	90	<b>135</b>	175	210	<b>270</b>	330	75	<b>110</b>	145	135	<b>175</b>	225
	3	65	<b>90</b>	120	80	<b>125</b>	170	215	<b>275</b>	335	85	<b>105</b>	145	110	<b>140</b>	215
	1	210	<b>270</b>	520	275	<b>440</b>	610	—	—	—	245	<b>400</b>	550	305	<b>490</b>	670
	2	170	<b>325</b>	480	230	<b>400</b>	570	—	—	—	200	<b>355</b>	510	265	<b>450</b>	630
	3	135	<b>205</b>	275	180	<b>260</b>	335	—	—	—	150	<b>230</b>	305	210	<b>305</b>	400
	4	80	<b>120</b>	165	105	<b>150</b>	190	—	—	—	95	<b>135</b>	175	130	<b>180</b>	235
	5	45	<b>75</b>	100	60	<b>85</b>	115	—	—	—	60	<b>80</b>	110	70	<b>105</b>	135
6	165	<b>290</b>	420	220	<b>360</b>	500	—	—	—	190	<b>320</b>	450	255	<b>410</b>	560	
7	160	<b>340</b>	490	245	<b>410</b>	560	—	—	—	215	<b>370</b>	520	275	<b>460</b>	640	
H	1	25	<b>35</b>	40	25	<b>40</b>	50	30	<b>45</b>	50	30	<b>35</b>	45	35	<b>45</b>	60

### Separator • X<sup>2</sup> and X<sup>2</sup>-Ultra



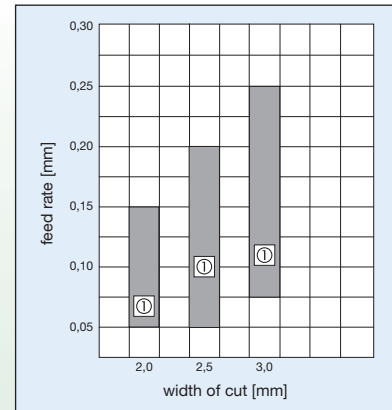
X<sup>2</sup>

This insert has the same geometry as the WMT-SX™. Chip control geometry offers the widest range of speed and feed capabilities and provides excellent flatness and finish. This chipbreaker cuts with the least amount of tool pressure, extending tool life. The geometry also includes wipers and a corner radius. This geometry works well on a variety of materials.



X<sup>2</sup>-Ultra

This insert has the same geometry as the WMT-SX-Ultra. The X<sup>2</sup>-Ultra is an enhanced version of the X<sup>2</sup> and is ideal for stainless steels, nickel-based alloys, tool steel, INCONEL®, and titanium.



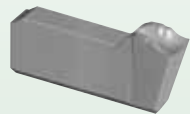
① Recommended Starting Feed

### Separator • S<sup>2</sup> and S<sup>2</sup>-Ultra



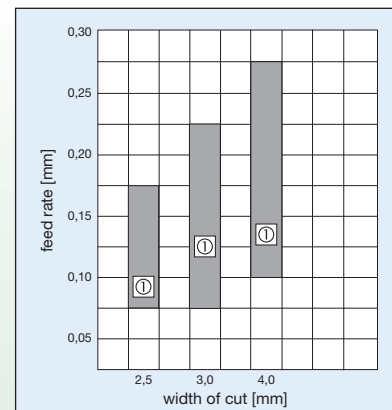
S<sup>2</sup>

High positive rake with a more open chipbreaker enables increased speeds and feeds for moderate- to high-speed applications. The geometry includes wipers and a corner radius that provides superior flatness and finish. This insert is also available with sharp corners. Its greatest strengths can be seen on stainless steels and soft gummy steels.



S<sup>2</sup>-Ultra

The S<sup>2</sup>-Ultra is an enhanced version of the S<sup>2</sup> and is ideal for 300 series stainless steels, nickel-based alloys, tool steel, INCONEL, and titanium at moderate to high speeds and feeds.



① Recommended Starting Feed

### Separator • Classic and F<sup>2</sup>



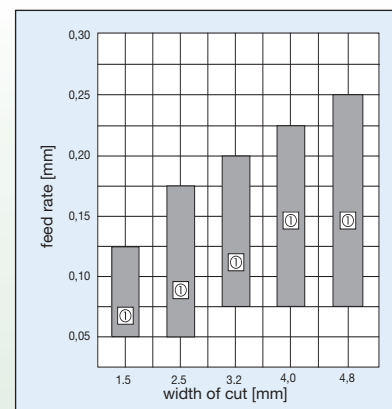
Classic

A good general-purpose insert for carbon steels, alloy steels, and most stainless steels. The Separator Classic chipbreaker is designed to perform well at moderate to slow speeds and feeds. The Classic provides standard high lead angles and sharp corners, making it the first choice when choosing an insert for nib-free cut-off.



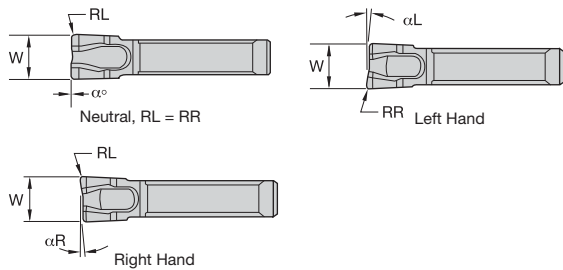
F<sup>2</sup>

This insert provides superior flatness and finish on a wide variety of materials. Ideal for thick wall parts or cutting off larger diameter parts to centre. The Separator F<sup>2</sup> performs well at slow to moderate speeds and feeds.



① Recommended Starting Feed

Material Group		Cutting Speed – vc m/min														
		M40			M43			M433B			M45			M93		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
<b>P</b>	0/1	40	<b>80</b>	115	110	<b>160</b>	210	–	–	–	45	<b>85</b>	125	150	<b>200</b>	245
	2	30	<b>60</b>	85	75	<b>120</b>	165	–	–	–	40	<b>65</b>	95	115	<b>150</b>	185
	3	30	<b>60</b>	85	75	<b>120</b>	165	–	–	–	40	<b>65</b>	95	115	<b>150</b>	185
	4	25	<b>45</b>	60	55	<b>90</b>	125	30	<b>70</b>	115	25	<b>45</b>	70	80	<b>110</b>	140
	5	35	<b>60</b>	85	85	<b>110</b>	140	85	<b>115</b>	145	40	<b>65</b>	95	105	<b>140</b>	170
	6	15	<b>30</b>	40	35	<b>50</b>	65	35	<b>50</b>	70	20	<b>30</b>	45	45	<b>60</b>	75
<b>M</b>	1	30	<b>45</b>	60	50	<b>75</b>	100	55	<b>90</b>	130	35	<b>50</b>	65	90	<b>120</b>	150
	2	20	<b>30</b>	40	35	<b>50</b>	65	35	<b>60</b>	80	25	<b>35</b>	50	55	<b>75</b>	95
	3	20	<b>35</b>	40	35	<b>50</b>	65	35	<b>60</b>	85	25	<b>40</b>	50	60	<b>80</b>	100
<b>K</b>	1	65	<b>95</b>	125	90	<b>135</b>	175	200	<b>260</b>	320	75	<b>110</b>	145	130	<b>175</b>	225
	2	65	<b>95</b>	125	90	<b>135</b>	175	210	<b>270</b>	330	75	<b>110</b>	140	135	<b>170</b>	225
	3	55	<b>90</b>	120	80	<b>125</b>	170	215	<b>275</b>	335	65	<b>105</b>	145	110	<b>140</b>	215
<b>N</b>	1	210	<b>370</b>	520	275	<b>440</b>	610	–	–	–	245	<b>400</b>	550	305	<b>490</b>	670
	2	170	<b>325</b>	480	230	<b>400</b>	570	–	–	–	200	<b>355</b>	510	265	<b>450</b>	630
	3	135	<b>205</b>	275	180	<b>260</b>	335	–	–	–	150	<b>230</b>	305	210	<b>305</b>	400
	4	80	<b>120</b>	165	105	<b>150</b>	190	–	–	–	95	<b>135</b>	175	130	<b>180</b>	225
	5	45	<b>75</b>	100	60	<b>85</b>	115	–	–	–	50	<b>80</b>	110	70	<b>105</b>	135
	6	165	<b>290</b>	420	220	<b>360</b>	500	–	–	–	190	<b>320</b>	450	255	<b>410</b>	560
	7	180	<b>340</b>	490	245	<b>410</b>	580	–	–	–	215	<b>370</b>	520	275	<b>460</b>	640
<b>S</b>	1	25	<b>35</b>	40	25	<b>40</b>	50	30	<b>45</b>	50	30	<b>35</b>	45	35	<b>45</b>	60
	2	10	<b>15</b>	20	15	<b>20</b>	25	15	<b>20</b>	25	10	<b>15</b>	20	20	<b>25</b>	30
	3	35	<b>45</b>	60	35	<b>50</b>	65	40	<b>55</b>	70	35	<b>50</b>	65	55	<b>65</b>	80
	4	15	<b>25</b>	30	25	<b>30</b>	35	25	<b>30</b>	40	20	<b>25</b>	35	30	<b>35</b>	45
<b>H</b>	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



● first choice  
○ alternate choice

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

■ X<sup>2</sup>

Grooving and Cut-Off

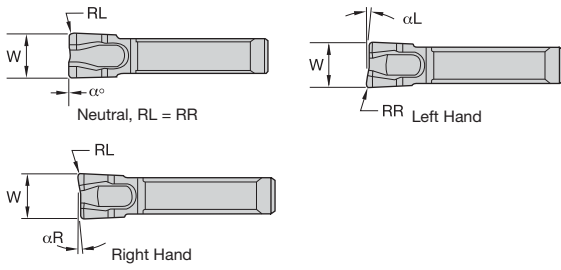
catalogue number	insert size	W	RR	hand	M40	M43	M433B	M45	M93
507305	2	2,39	0,14	N - Neutral	●	●	●	3540872	3540873
507308	3	3,20	0,17	N - Neutral	●	3540878	●	3540879	3540880

catalogue number	insert size	W	RR	alphaL	hand	M40	M43	M433B	M45	M93
507307	2	2,39	0,14	5	L - Left	●	●	●	3540884	3540876
507310	3	3,20	0,17	5	L - Left	●	●	●	3540885	3540877

catalogue number	insert size	W	RL	alphaR	hand	M40	M43	M433B	M45	M93
507306	2	2,39	0,14	5	R - Right	●	●	●	3540874	3540875
507309	3	3,20	0,17	5	R - Right	●	●	●	3540882	3540883



● first choice  
○ alternate choice

P	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

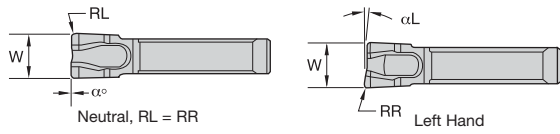
**X<sup>2</sup> Ultra**

catalogue number	insert size	W	RR	hand	M40	M43	M43B	M45	M93	
507354	2	2,39	0,15	N - Neutral			3540926			
507357	3	3,20	0,15	N - Neutral			3540929			
catalogue number	insert size	W	RR	αL	hand	M40	M43	M43B	M45	M93
507356	2	2,39	0,13	5	L - Left			3540928		
507359	3	3,20	0,15	5	L - Left			3540931		
catalogue number	insert size	W	RL	αR	hand	M40	M43	M43B	M45	M93
507355	2	2,39	0,13	5	R - Right			3540927		
507358	3	3,20	0,15	5	R - Right			3540930		



Grooving and Cut-Off





● first choice  
○ alternate choice

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

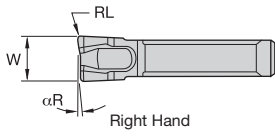
■ S²

Grooving and Cut-Off

catalogue number	insert size	W	RR	hand	M40	M43	M433B	M45	M93
507275	2	2,39	0,20	N - Neutral	3540807	3540803		3540805	3540806
507295	3	3,00	0,25	N - Neutral		3540857		3540858	3540859
507278	3	3,20	0,25	N - Neutral	3540822	3540818		3540820	3540821
507378	4	4,00	0,25	N - Neutral		3540951		3540952	3540953
507281	5	4,78	0,25	N - Neutral		3540833		3540835	3540836

catalogue number	insert size	W	RR	αL	hand	M40	M43	M433B	M45	M93
507277	2	2,39	0,20	5	L - Left				3540815	3540816
507297	3	3,00	0,20	5	L - Left		3540863			3540865
507280	3	3,20	0,20	5	L - Left				3540830	
507283	5	4,78	0,20	5	L - Left					3540846



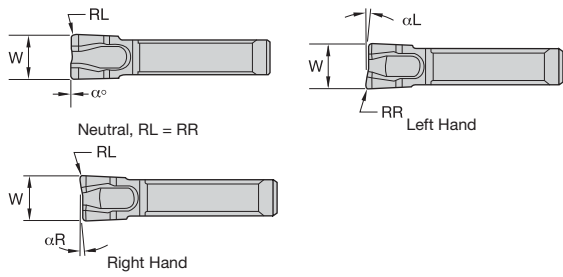
● first choice  
○ alternate choice

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

catalogue number	insert size	W	RL	αR	hand	M40	M43	M433B	M45	M93
507276	2	2,39	0,20	5	R - Right	3540812	3540808		3540810	3540811
507301	2	2,39	—	5	R - Right				3540870	
507296	3	3,00	0,20	5	R - Right		3540860		3540861	3540862
507279	3	3,20	0,20	5	R - Right	3540827	3540823		3540825	3540826
507298	3	3,20	—	5	R - Right		3540866		3540867	3540868
507379	4	4,00	0,25	5	R - Right		3540954		3540955	
507282	5	4,78	0,20	5	R - Right		3540838		3540840	3540841



Grooving and Cut-Off



● first choice  
○ alternate choice

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

■ S² Ultra

Grooving and Cut-Off

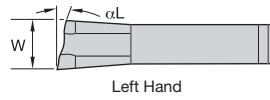
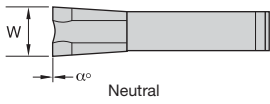
catalogue number	insert size	W	RR	hand	M40	M43	M433B	M45	M93
507329	2	2,39	0,15	N - Neutral	●	●	3540907	○	○
507332	3	3,18	0,15	N - Neutral	●	●	3540910	○	○

catalogue number	insert size	W	RR	αL	hand	M40	M43	M433B	M45	M93
507331	2	2,39	0,15	5	L - Left	●	●	3540909	○	○
507334	3	3,18	0,15	5	L - Left	●	●	3540912	○	○

catalogue number	insert size	W	RL	αR	hand	M40	M43	M433B	M45	M93
507330	2	2,39	0,15	5	R - Right	●	●	3540908	○	○
507333	3	3,18	0,15	5	R - Right	●	●	3540911	○	○



● first choice  
○ alternate choice

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

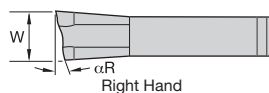
■ Classic

catalogue number	insert size	W	hand	M40	M43	M433B	M45	M93	
507196	2	1,60	N - Neutral	3540664			3540663		
507140	2	2,39	N - Neutral	3540530			3540528	3540529	
507117	3	3,20	N - Neutral	3540461			3540459	3540460	
507116	5	4,78	N - Neutral	3540449			3540447		
catalogue number	insert size	W	alphaL	hand	M40	M43	M433B	M45	M93
507152	2	2,36	12	L - Left	3540594				
507144	2	2,39	4	L - Left	3540554			3540553	
507154	3	3,15	12	L - Left	3540598			3540597	
507129	3	3,20	4	L - Left	3540510			3540509	
507125	5	4,78	4	L - Left	3540487				

(continued)



(Classic – continued)



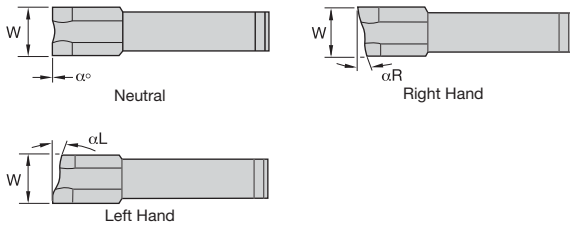
● first choice  
○ alternate choice

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

Grooving and Cut-Off

catalogue number	insert size	W	αR	hand	M40	M43	M433B	M45	M93
507197	2	1,60	4	R - Right	3540666	3540666			
507214	2	1,60	12	R - Right	3540692	3540692		3540691	
507207	2	2,31	4	R - Right				3540685	
507151	2	2,36	12	R - Right	3540589	3540585		3540587	
507143	2	2,39	4	R - Right	3540544	3540544		3540542	3540543
507161	2	2,39	18	R - Right	3540613	3540613		3540612	
507171	3	3,12	6	R - Right	3540628	3540628			
507146	3	3,15	12	R - Right	3540562	3540562		3540560	
507155	3	3,15	18	R - Right	3540603	3540603		3540602	
507128	3	3,20	4	R - Right	3540498	3540498		3540496	3540497
507224	3	3,20	4	R - Right	3540700	3540700		3540698	
507176	5	4,72	12	R - Right	3540634	3540634		3540633	
507124	5	4,78	4	R - Right	3540479	3540479		3540477	3540478

NOTE: 507207 and 507224 have a modified aggressive chip control design.



● first choice  
○ alternate choice

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

**F2**

catalogue number	insert size	W	hand	M40	M43	M433B	M45	M93
507240	2	2,39	N - Neutral	3540744	•	•	•	•
507244	3	3,20	N - Neutral	3540756	•	•	3540743	•

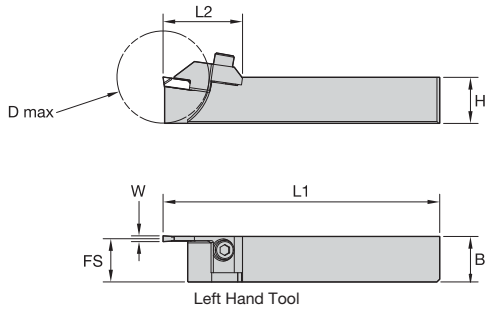
  

catalogue number	insert size	W	$\alpha^L$	hand	M40	M43	M433B	M45	M93
507255	2	2,39	12	L - Left	3540781	•	•	•	•
507257	3	3,18	4	L - Left	•	•	3540784	•	•

catalogue number	insert size	W	$\alpha^R$	hand	M40	M43	M433B	M45	M93
507241	2	2,39	4	R - Right	3540747	•	•	3540746	•
507242	2	2,39	12	R - Right	3540750	•	•	3540749	•
507243	2	2,39	18	R - Right	3540753	•	•	3540752	•
507245	3	3,18	4	R - Right	3540759	•	•	3540758	•
507246	3	3,18	12	R - Right	3540762	•	•	3540761	•
507247	3	3,18	18	R - Right	3540764	•	•	3540763	•
507252	5	4,75	4	R - Right	3540774	•	•	3540773	•
507253	5	4,78	12	R - Right	3540777	•	•	3540776	•





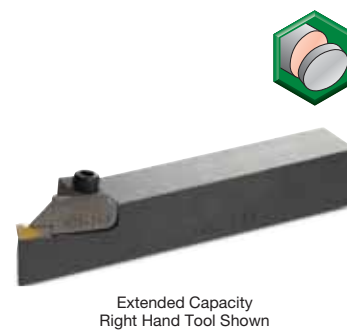
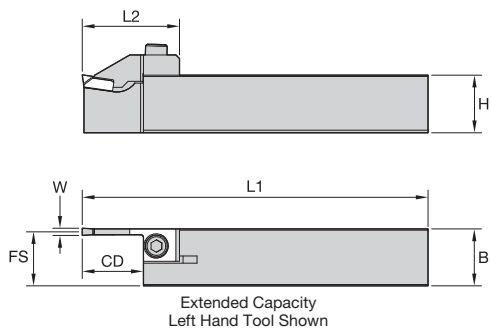
■ Square Shank

Grooving and Cut-Off



order number	catalogue number	W	D max	B	FS	H	L2	L1	clamp	clamp screw
<b>right hand</b>										
3614290	206445	2,00	20,00	9,86	9,00	10,00	21,55	75,00	435200	MS318
3538751	206446	2,00	20,00	11,86	11,00	12,00	21,55	90,00	435200	MS318
3538752	206447	2,00	26,00	9,86	9,00	10,00	24,83	150,00	435201	MS318
3587590	206448	2,00	26,00	11,86	11,00	12,00	24,83	150,00	435201	MS318
3615308	206449	2,00	38,00	15,86	15,00	16,00	32,83	100,00	435202	MS412
3538753	206450	2,00	38,00	19,86	19,00	20,00	32,84	125,00	435202	MS412
3538706	206265	2,50	20,00	11,74	10,81	12,00	21,51	89,95	435170	MS318
3538718	206279	2,50	26,00	9,75	8,81	10,00	24,80	150,00	435152	MS318
3538719	206280	2,50	26,00	11,73	10,80	12,00	24,80	150,00	435152	MS318
3538721	206282	2,50	38,00	15,75	14,81	16,00	32,80	100,00	435140	MS412
3538723	206284	2,50	38,00	19,74	18,80	20,00	32,80	125,00	435140	MS412
3538720	206281	3,00	26,00	11,68	10,39	12,00	23,62	150,00	435130	MS318
3538722	206283	3,00	38,00	15,70	14,40	16,00	32,85	100,00	435126	MS412
3565364	206285	3,00	38,00	19,68	18,39	20,00	32,85	125,00	435126	MS412
<b>left hand</b>										
3614291	206451	2,00	20,00	9,86	9,00	10,00	21,55	75,00	435203	MS318
3538754	206452	2,00	20,00	11,86	11,00	12,00	21,55	90,00	435203	MS318
3614292	206453	2,00	26,00	9,86	9,00	10,00	24,83	150,00	435204	MS318
3538755	206454	2,00	26,00	11,00	11,00	12,00	24,83	150,00	435204	MS318
3538756	206455	2,00	38,00	15,86	15,00	16,00	32,83	100,00	435205	MS412
3615309	206456	2,01	38,00	19,86	19,00	20,00	32,84	125,00	435205	MS412
3538705	206264	2,50	20,00	9,75	8,80	10,00	21,51	74,96	435171	MS318
3538707	206266	2,50	20,00	11,74	10,81	12,00	21,51	89,95	435171	MS318
3538711	206272	2,50	26,00	9,75	8,81	10,00	24,80	150,00	435153	MS318
3538712	206273	2,50	26,00	11,73	10,80	12,00	24,80	150,00	435153	MS318
3538714	206275	2,50	38,00	15,75	14,81	16,00	32,80	100,00	435141	MS412
3538716	206277	2,50	38,00	19,74	18,80	20,00	32,80	125,00	435141	MS412
3538713	206274	3,00	26,00	11,68	10,39	12,00	23,62	150,00	435131	MS318
3538715	206276	3,00	38,00	15,70	14,40	16,00	32,85	100,00	435127	MS412
3538717	206278	3,00	38,00	19,68	18,39	20,00	32,85	125,00	435127	MS412

NOTE: Above toolholders are supplied with clamp and clamp screw.



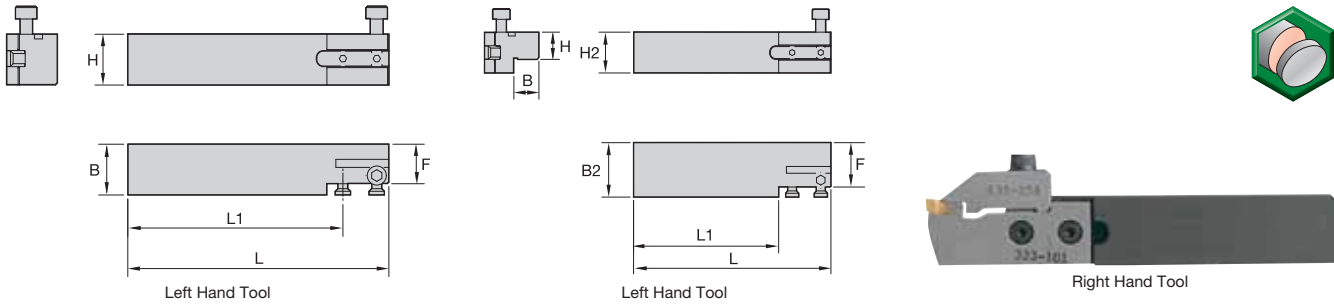
■ Square Shank • Extended Capacity

order number	catalogue number	W	CD	B	FS	H	L2	L1	clamp	clamp screw
<b>right hand</b>										
3538741	206417	3,00	25,00	24,74	23,50	25,00	42,92	150,00	435180	619168
3538742	206418	4,00	25,00	24,69	23,00	25,00	42,97	150,00	435180	619168
<b>left hand</b>										
3538743	206419	3,00	25,00	24,74	23,50	25,00	42,92	150,00	435181	619168
3615303	206424	4,00	25,00	24,69	23,00	25,00	42,96	150,00	435181	619168

NOTE: Above toolholders are supplied with clamp and clamp screw.

Grooving and Cut-Off



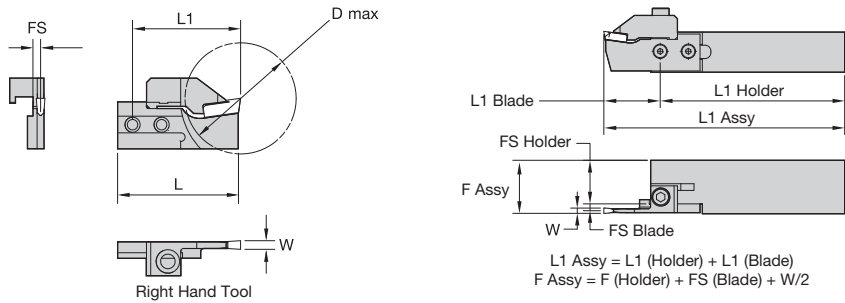


■ 12mm and 20mm Shank Toolholders

Grooving and Cut-Off

order number	catalogue number	H	B	B2	L	L1	H2	F	support blade screw	clamp screw
<b>right hand</b>										
3538772	206518	12,00	11,53	24,99	102,77	84,68	19,05	20,55	606247	MS1495
3614344	206522	20,00	20,00	—	102,77	84,68	—	15,55	606247	MS1495
<b>left hand</b>										
3538773	206519	12,00	11,53	24,99	102,77	84,68	19,05	20,55	606247	MS1495
3538774	206523	20,00	20,00	—	102,77	84,68	—	15,55	606247	MS1495

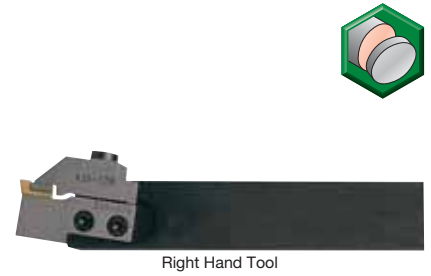
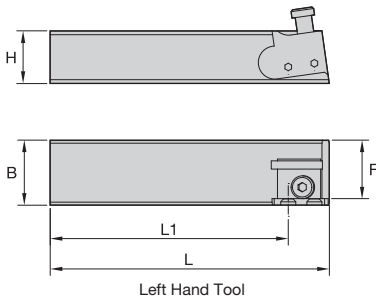
Support Blade Assembly



■ 12mm and 20mm Shank Blades

order number	catalogue number	W	D max	FS	L	L1	clamp
<b>right hand</b>							
3539515	333101	2,50	41,28	3,25	44,88	40,13	435154
3539516	333102	3,00	41,28	2,84	44,88	40,13	435155
3539522	333111	2,00	41,28	3,40	44,88	40,13	435194
<b>left hand</b>							
3539517	333103	2,50	41,28	3,25	44,88	40,13	435156
3539518	333104	3,00	41,28	2,84	44,88	40,13	435157

NOTE: Clamps do not ship with blades. Order clamps separately.



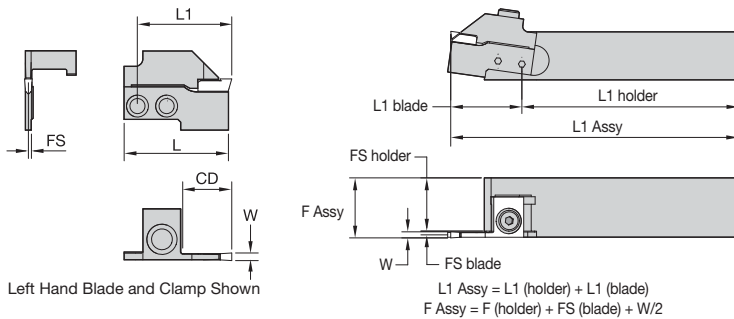
■ 25mm and 32mm Shank Toolholders

order number	catalogue number	H	B	L	L1	F	support blade screw	clamp screw	clamp screw
<b>right hand</b>									
3538772	206518	12,00	11,53	102,77	84,68	20,55	606247	—	MS1495
3614344	206522	20,00	20,00	102,77	84,68	15,55	606247	—	MS1495
3538710	206271	25,00	24,61	131,90	112,16	21,41	MS1073	MS1071	—
<b>left hand</b>									
3538773	206519	12,00	11,53	102,77	84,68	20,55	606247	—	MS1495
3538774	206523	20,00	20,00	102,77	84,68	15,55	606247	—	MS1495
3615305	206440	32,00	31,60	132,03	112,18	28,42	MS1073	MS1071	—



Grooving and Cut-Off

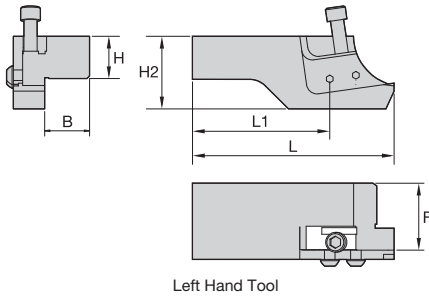
Support Blade Assembly



■ 25mm and 32mm Shank Blades

order number	catalogue number	W	CD	FS	L	L1	clamp
<b>right hand</b>							
3563591	331117	2,50	12,70	2,39	36,03	29,60	435142
3539504	331101	3,00	20,64	1,98	43,80	37,63	435128
3539508	331109	4,00	20,64	1,98	43,80	37,63	435128
<b>left hand</b>							
3539510	331118	2,50	12,70	2,39	36,03	29,60	435143
3539505	331102	3,00	20,64	1,98	43,80	37,63	435129
3539509	331110	4,00	20,64	1,98	43,80	37,63	435129

NOTE: Clamps do not ship with blades. Order clamps separately.



Left Hand Tool



Right Hand Tool

■ Universal Style Toolholder • 56mm Bar Capacity

Grooving and Cut-Off

order number	catalogue number	B	H	H2	F	L1	L	clamp screw
<b>right hand</b>								
3614289	206408	26,97	25,00	43,66	40,16	105,46	144,14	MS1294

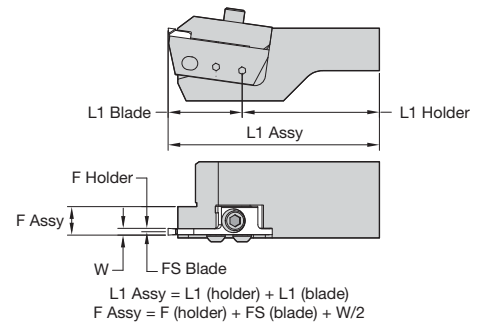


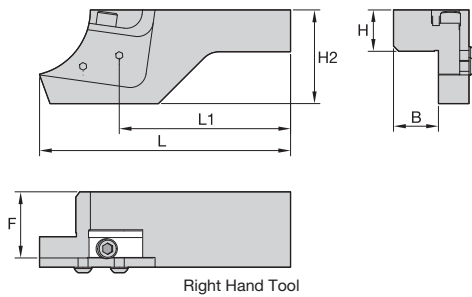
NOTE: Support blade requires two screws.  
Order blades separately.

■ Components

W	L1	FS	left hand clamp for 206410	left hand clamp for 206442	support blade	right hand clamp for 206441	right hand clamp for 206408
2.5	44,50	0,91	435149	435151	310109	435150	435148
3.0	44,50	1,27	435104	435110	310102	435116	435101
4.0	44,50	1,84	435105	435109	310108	435117	435102

NOTE: All components ship separately.





**■ Universal Style Toolholder • 76mm Bar Capacity**

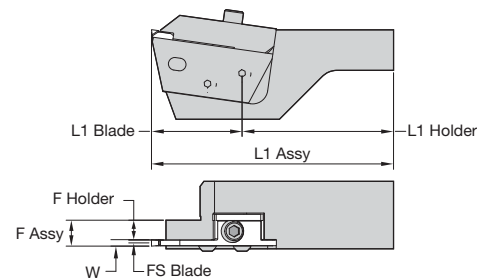
order number	catalogue number	B	H	H2	F	L1	L	support blade screw	clamp screw
<b>right hand</b>									
3538739	206411	27,00	25,00	56,36	39,78	102,96	150,85	MS1072	MS352
3615306	206443	27,00	32,00	56,36	39,78	102,96	150,85	MS1072	MS1294

NOTE: Support blade requires two screws.  
Order blades separately.

**■ Components**

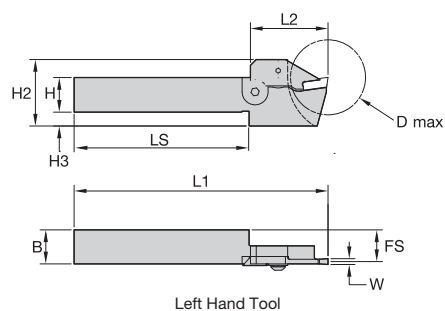
W	L1	FS	left hand clamp	support blade	right hand clamp
3.0	57,05	1,27	435137	309111	435136
4.0	57,05	1,84	435106	309105	435103

NOTE: All components ship separately.



L1 Assy = L1 (holder) + L1 (blade)  
F Assy = F (holder) + FS (blade) + W/2

Grooving and Cut-Off



■ Sub-Spindle

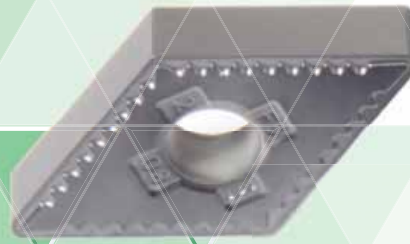
Grooving and Cut-Off



order number	catalogue number	W	D max	B	FS	H	H2	H3	L1	LS	L2	button-head cap screw	clamp	flat-head cap screw	washer
<b>right hand</b>															
3538766	206506	3,00	66,70	24,76	23,50	25,00	44,45	9,52	150,00	89,05	60,31	MS518	409182	606243	613139
<b>left hand</b>															
3538769	206509	2,50	42,00	19,75	18,80	20,00	37,65	7,62	140,00	96,57	42,66	MS518	409185	606244	613139
3538767	206507	3,00	66,70	24,76	23,50	25,00	44,45	9,52	150,00	89,05	60,32	MS518	409183	606243	613139

# WIDIA™ Victory™

## High-Temp Turning



The new -FS and -MS geometries from WIDIA are specifically designed for use in high-temperature alloys, nickel-based (INCONEL®, Udimet®, Rene) materials, cobalt-based (Haynes®), Fe-based (Airmet 100) materials, titanium and titanium alloys, as well as difficult-to-machine stainless (460SS, duplex, high-alloy stainless), cobalt-chrome, and stainless-based powdered metals.

### **..GG-FS Geometry**

- All ..GG-FS inserts are periphery ground to provide a G tolerance. This is a critical in some applications, especially in the aerospace industry.
- Precision grinding provides a high quality cutting edge which reduces depth-of-cut notching and delivers consistent surface quality in finishing applications.
- Be more productive by utilising the higher speed capability provided by the latest in PVD coating technology and optimised post-coat treatment.
- Achieve better tool life through the high positive rake angle which reduces cutting forces and built-up edge.

### **..MG-MS Geometry**

- High positive rake angle delivers improved tool life by reducing cutting forces and built-up edge when machining high-temp alloys.
- Improved chip control and reduced crater wear due to proprietary chipbreakers with varying shapes and distances.
- Reduced thermal wear and cracking due to near sharp cutting edge with optimised edge treatment.
- Improved chipbreaking at various depths of cut due to variable land width, which improves impact strength.
- All MG-MS inserts are moulded, which supports increased tool life due to the elimination of grinding stress.

To learn more, contact your local  
Authorised Distributor or visit [widia.com](http://widia.com).

**WIDIA™**  
**VICTORY**

### Definitions and Guidelines

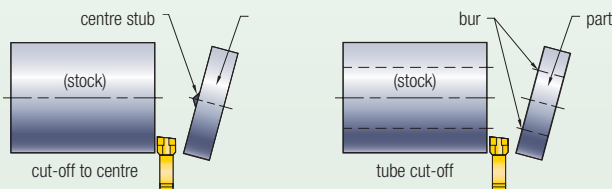
1. Width of cut (W) = width of the insert.
2. Lead angle = 0° (neutral); 4°, 5°, 12°, 18° (RH or LH).

### Reduce 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.

Figure 1

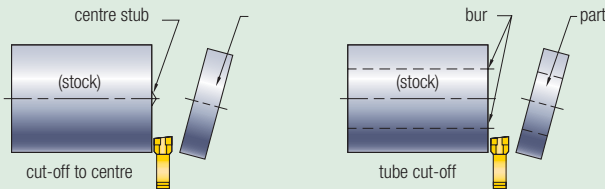
Insert selection **left-hand lead**



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

Figure 2

Insert selection **right-hand lead**

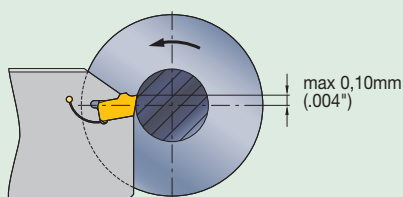


Right-hand lead insert leaves centre stub or bur on stock and produces clean part surface.

- Check total height and maintain on centre with part diameter.
- The cutting edge height should be within  $\pm 0,1\text{mm}$  to the centre; recommended cutting position is 0,05mm above centre.

Figure 3

Above centre



- If 0° lead angle is mandatory, use the narrowest possible cut-off insert and blade. This will minimise the centre stub or cut-off bur length. Decrease the feed rate to maximum 0,05mm or less at the point where diameter equals insert width.
- 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 4). Note the part may drop onto the chamfering bar, which, in this case, will act like a catcher for the part.

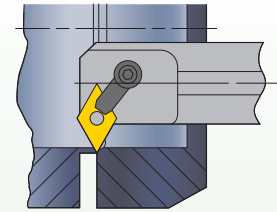


Figure 4

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 5.
- Decrease the feed rate near the break-through point of the cut.
- Check that the grooving tool is set at the correct angle.
- Use blades with the greatest possible face height and smallest possible cutting width.
- Increase the speed.

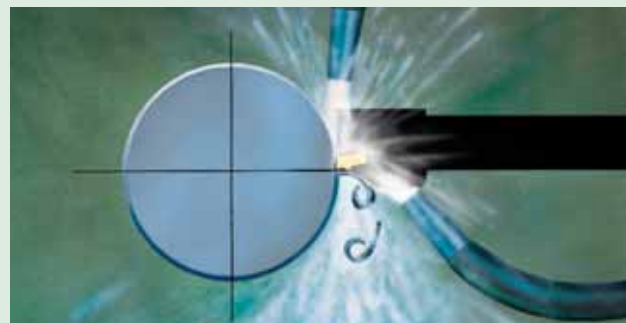


Figure 5

Preferred method for applying coolant

- Mount cut-off tool upside down. This enables gravity to remove chips and avoid cutting the chips twice. Another benefit of mounting the tool upside down is preventing chips from wedging between the tool insert and the groove side walls, which galls the side wall surfaces.

**Improve chip control:**

- Adjust feed rate up or down to accommodate chip formation.
- Use a 0° or smallest lead available.
- Use ample amounts of well-directed coolant (see Figure A).
- Maintain sharp cutting edge and corners.

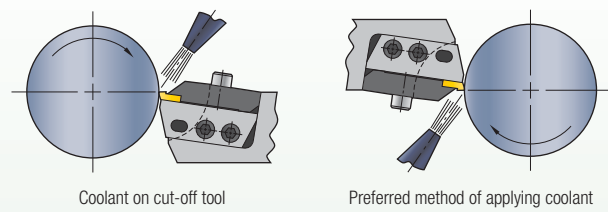
**Improve flatness of cut-off surfaces:**

- Maintain 90° position (perpendicular alignment) between cut-off tool and workpiece.
- For low to moderate speed (sfpm), use Separator F<sup>2</sup>.
- For moderate to high speed (sfpm), use Separator S<sup>2</sup> or X<sup>2</sup>.
- Use strongest toolholder system possible.
- Use 0° lead angle inserts when possible. If lead angle inserts are needed, reduce the feed rate.
- Check for minimum overhang of holder and blade.
- Set up for minimum workpiece overhang (distance out of chuck).
- Reduce feed rate.
- Maintain sharp edge and corners on cut-off insert.
- Increase speed (RPM).
- Use ample amounts of well-directed coolant (see Figure A).
- Maintain proper tool centre height 0–0,1mm above centre (see Figure B).

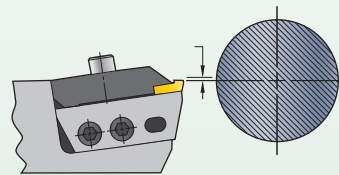
**Improve surface finish:**

- For low to moderate speed (sfpm), use Separator F<sup>2</sup>.
- For moderate to high speed (sfpm), use Separator S<sup>2</sup> or X<sup>2</sup>.
- Avoid overly aggressive chip control.
- Increase speed.
- Reduce lead angle and feed rate.
- Determine if corner radius is too large or small.
- Use a coated grade.
- Use coolant (see Figure A).

**Figure A**



**Figure B**



**Minimise edge chipping:**

- Check to see if tool is significantly above or below centre.
- Reduce feed prior to part drop-off.
- Use Separator S<sup>2</sup> or X<sup>2</sup>.
- Choose the proper speed associated with the insert grade used.
- Call Technical Support to see if a larger hone size is needed.
- Eliminate chatter.
- Avoid chip re-cutting.
- Check for these part and machine problems:
  - Slide is loose.
  - Slide travel is irregular.
  - Bar/tube I.D. and/or O.D. is out of round.
  - Bar/tube is bent.
  - Thin wall collapses (deforms) in the cut.
  - Part is unstable.
  - Cut-off through unturned stock.
  - Excessive tool overhang.
  - Bent or partly attached flash ring.

(continued)



*(continued)***Eliminate chatter:**

- Minimise tool blade and holder overhang.
- Minimise part overhang.
- Use strongest toolholder system.
- Use a more narrow width of insert.
- Chipbreaker might be too aggressive. (Call Technical Support.)
- Adjust speed and feed rate up or down.
- Hold workpiece rigidly.
- With a longer part, support with steady rest or live centre.
- Avoid machine dwell.
- Use S<sup>2</sup> or X<sup>2</sup> to reduce cutting forces.

**Reduce cut-off nib on solid bar or I.D. bur on tubing:**

- Check tool height. Insert cutting edge should be on centre to 0,05mm above centreline of workpiece.
- To reduce nib on part, use a high lead angle-type insert. Lead angle on a cut-off insert reduces the nib, which remains on the workpiece. CAUTION: the higher the lead, the more tool-side deflection.
- Use the narrowest possible cut-off insert to minimise the cut-off bur length.
- Reduce feed rate at the end of a cut.
- On most tubing-type parts, a 4° or 5° lead angle will be sufficient.
- Add support to a long slender-type part.
- Maintain proper sub-spindle alignment.
- If nib or bur persists, call Technical Support about reducing hone size.
- Use small- or no-corner radius.

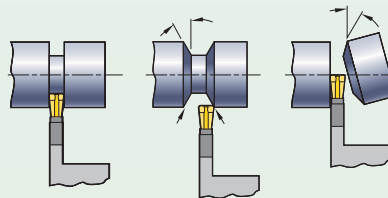
**Eliminate built-up edge:**

- Select proper grade for insert.
- Increase speed (RPM).
- Increase the feed rate.
- Use ample amounts of well-directed coolant (see Figure A on page E131).

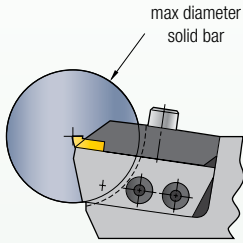
**Chamfer and cut-off operations:**

- Use Separator S<sup>2</sup> or X<sup>2</sup>.
- Groove or breakdown workpiece surface being machined.
- Machine the chamfer.
- For jobs requiring a chamfer on both ends of the part, begin by plunging to a depth just beyond the depth of the chamfers. Then, return to the part O.D. and profile each chamfer individually. Finish the cut-off after completion of the second chamfer.
- Cut off the workpiece (see Figure C).

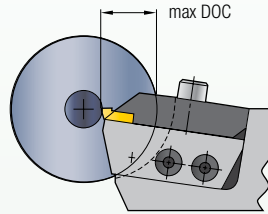
Figure C



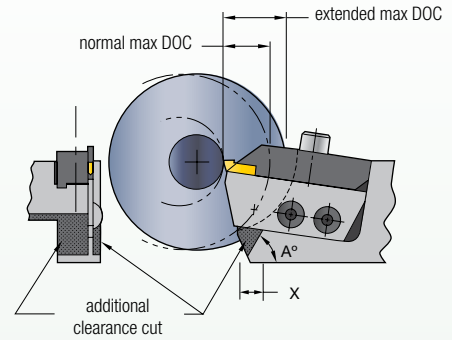
**Modifications for Increased Depth of Cut**



**Figure 1**  
Standard bar capacity shown



**Figure 2**  
Larger bar diameter shown



**Figure 3**  
Modified toolholder with larger bar diameter shown

**Capacity Chart for 57,15mm Diameter Bar Capacity Tooling**

bar diameter	63,50	76,20	88,90	101,60	114,30	127,00	152,40	NOTE
max DOC	23,88	19,05	15,75	14,22	12,70	11,94	11,18	with no modification on toolholder
	28,45	26,16	24,64	24,64	22,10	21,34	19,81	with no modification on toolholder X = 10,16mm A = 1270mm

**Capacity Chart for 76,2mm Diameter Bar Capacity Tooling**

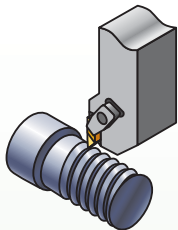
bar diameter	88,90	101,60	114,30	127,00	152,40	NOTE
max DOC	28,45	25,40	22,35	19,81	17,53	with no modification on toolholder
	36,58	34,80	33,27	31,75	28,45	with no modification on toolholder X = 10,16mm A = 1270mm



## Turning • Threading

Threading Application Guide.....	F2–F3
TopThread.....	F4–F37
Laydown Threading.....	F38–F78
Technical Information.....	F79–F101

**TopThread  
External Threading**



**Square Shank Toolholder Sizes:**

- Metric — 10–32mm

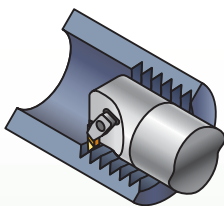
**Cresting (Full Profile):**

- UN TPI of 32–7
- ISO 1,5–3,0mm pitch

**60° Partial Profile — Flat Top**

- (NTF and NTK):**
- UN 44–4,5 TPI
- ISO 0,6–5,5mm pitch

**TopThread  
Internal Threading**



**Boring Bar Diameters:**

- Metric — 10–50mm
- Minimum bore — 11,5mm
- Steel

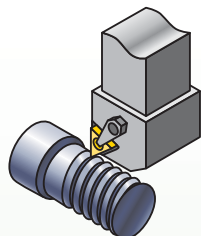
**Cresting (Full Profile):**

- UN 16–8 TPI
- ISO 1,5–3,0mm pitch

**60° Partial Profile — Flat Top**

- (NT-1L, NTF, and NTK):**
- UN 24–4,5 TPI
- ISO 1,0–5,5mm pitch

**Laydown  
External Threading**



**Square Shank Toolholder Sizes:**

- Metric — 8–40mm

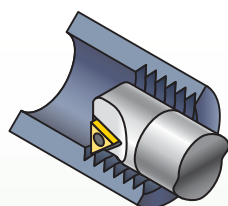
**Cresting (Full Profile):**

UN 48–8 TPI  
ISO 0,5–5,0mm pitch

**60° Partial Profile:**

UN 48–4 TPI  
ISO 0,5–6,0mm pitch

**Laydown  
Internal Threading**



**Boring Bar Diameters:**

- Metric — 12–50mm
- Minimum bore — (13mm)
- Steel and carbide

**Cresting (Full Profile)**

**and Partial Profile:**  
UN 48–8 TPI  
ISO 0,5–5,0mm pitch

**60° Partial Profile:**

UN 48–4 TPI  
ISO 0,5–6,0mm pitch

**55° Partial Profile:**

UN 48–5 TPI  
ISO 0,5–5,0mm pitch

WIDIA™ TopThread™

# TopThread



High heat and high edge line load concentrated to a small nose radius, combined with high feed rates, places high demands on carbide threading inserts. The WIDIA TopThread system is the best solution for these problems.

The WIDIA TopThread system is the superior choice for high-demand applications like machining Acme, Buttress, and API threads.

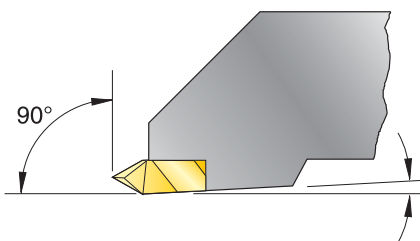
## TopThread Insert Technology

TopThread insert technology brings superior chip control to your threading operations. Unlike competitors' designs, the WIDIA recessed chip groove, when used according to our recommendations, will control the chip in most applications, bringing you better tool life and lower cutting pressures.

- Reduced inconsistencies and better workpiece finish.
- Superior chip control reduces the danger to operators.
- Increased productivity in all of your threading operations.
- Excellent choice for special thread forms and toolholder designs.

TopThread™ inserts are available in TN6010™ and TN6025™ grades to withstand the demands placed on the cutting edge of the threading insert.

The versatility of the TopThread steel enables you to use both threading and grooving inserts in the same toolholder.



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

## The Simple Solution

With the WIDIA™ TopThread solution, there is no need to worry about costly setup mistakes. TopThread insert selection is easy, quick, and enables accurate indexing to keep your machine spindle turning.

- Rigid design for increased insert stability during threading applications.
- Good quality threads, improved tool life, and improved surface finishes.
- Locking forces in three directions for superior resistance to tangential force.
- Unique 3° insert relief angle for back clearance.
- Available in partial profile inserts for 60° thread forms.



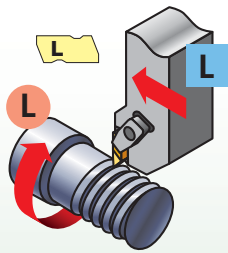
**Step 1 • Select Threading Method and Hand of Tooling**

**Required Information:**

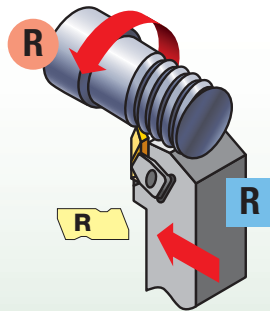
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



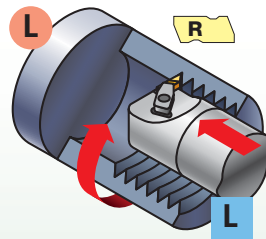
**Feed direction toward the chuck • RECOMMENDED**



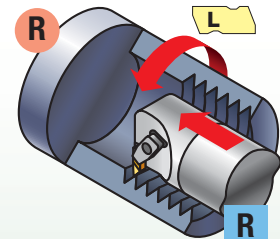
external left-hand thread



external right-hand thread

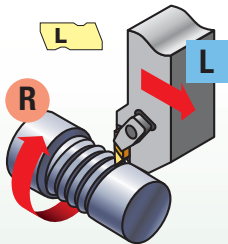


internal left-hand thread

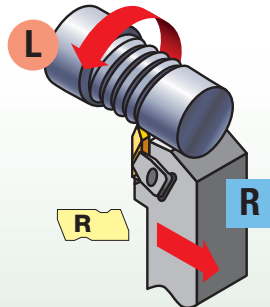


internal right-hand thread

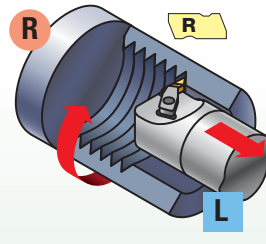
**Feed direction away from the chuck**



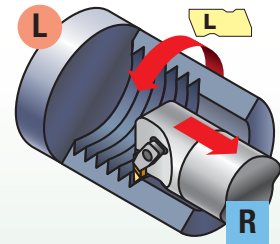
external right-hand thread



external left-hand thread



internal right-hand thread



internal left-hand thread

**Step 2 • Select Holder from Catalogue Page**

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

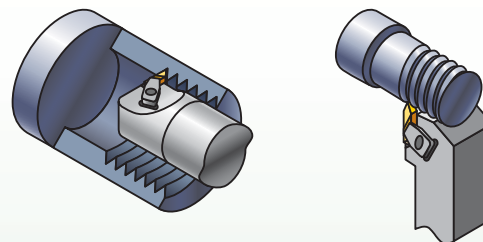
**Required Information:**

- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

catalogue number	gage insert
NSR-163D	N.3R
NSR-164D	N.4R

*NOTE: TopThread toolholders and boring bars are listed with a gage insert to indicate the size and hand required. They are compatible with both grooving and threading inserts of the same size.*

**Select the appropriate holder for the insert size and hand:**

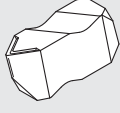


*NOTE: Optimise your threading operation by using the proper infeed method and the recommended infeed values.*

*See the Technical section on pages F79–F101 of this catalogue. For internal threading, minimum bore varies depending on thread type. See page F92 for details.*






**Step 3 • Choose Insert for Application**

- See threading insert overview on page F8.
- Select cresting inserts for fully controlled thread form including diameter control. Cresting inserts eliminate the need for deburring.
- Non-cresting partial profile inserts can cut a variety of thread pitches.
- Note insert size for toolholder selection.

	insert size	catalogue number	TN6025	TN6010
	2	NT-2RK	•	•
	3	NT-3RK	•	•
	4	NT-4RK	•	•

**Step 4 • Select Grade and Speed**

Recommendations for Grade and Speed Selection — m/min

workpiece material	steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys
insert style	chip control or neutral 	chip control or positive 	neutral 	positive 	positive 
optimum cutting conditions	<b>TN6010</b> 160–750	<b>TN6010</b> 160–600	<b>TN6010</b> 230–700	–	<b>TN6010</b> 65–400
first choice	<b>TN6025</b> 130–650	<b>TN6025</b> 130–450	<b>TN6025</b> 200–475	<b>TN6025</b> 160–1150	<b>TN6025</b> 35–330

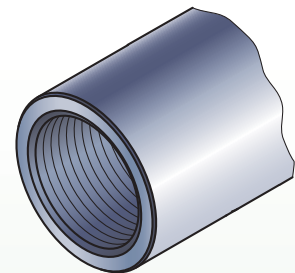
**Examples:**

- Chip Control:** NT-K or NT-CK (partial profile only)
- Neutral:** NT, NT-C, NTF, NTC, NJ, NJF, NDC-V, NA, NDC, NTB-A/B
- Positive:** NTP, NTK, NJP, NJK

**TopThread Threading Example:**

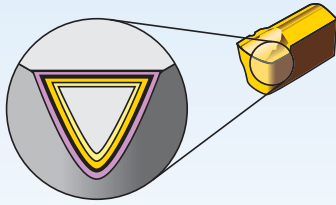
**application:** 8 TPI Acme internal right-hand thread  
**material:** alloy steel  
**workpiece diameter:** 114,3mm  
good cutting conditions  
feed towards the chuck

**Recommendation:**  
**insert:** NA3L8  
**grade:** TN6010  
**insert size:** 3  
**boring bar:** A40NER3  
**gage insert:** N.3L  
**speed:** 150 m/min  
**infeed passes\*:** 12 passes



\* Infeed recommendations provided in technical data section on pages F88–F91.

chip control — K		style			thread profile	standard	tolerance class	cresting	application	page(s)
		neutral	positive							
NT-K		NT			Partial Profile 60°	-	-	N	General use for 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches.	F13-F15
NT-CK					Partial Profile 60° — coarse pitch	-	-	N	Coarse pitch 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches.	F15
		NTF			Partial Profile 60° — fine pitch	-	-	N	Fine pitch 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches — able to thread close to shoulders.	F16
		NTC			American UN	ANSI B1.1:74	2A/2B	Y	Widely used inch-based 60° V-form for all industries.	F17
				NJP	UNJ	SAEA588791	3A/3B	N	Controlled root radius on external threads for military and aerospace industries.	F18
				NJK	UNJ — fine pitch	SAEA588790	3A/3B	N	Controlled root radius on external threads for military and aerospace industries — able to thread close to shoulders.	F18
		NDC-V			NPT	ANSI/ACME B1.201:1983	Standard NPT	Y	National Pipe Thread standard forms for pipe fittings.	F18
		NDC-V-M			NPT — multi-tooth	ANSI/ACME B1.201:1983	Standard NPT	Y	High-productivity multi-tooth threading inserts for NPT threads.	F19
		NWC-E			Whitworth, BSW, BSP	BS 84:1956, ISO 228/1:1982, DIN 259	Medium Class A	Y	Widely used 55° form for gas and water connections.	F19
		NDC-RD			API Round	API STD. 5B:1979	Standard API RD	Y	60° V-form with large radius for casing, tubing, and line pipe in the oil and gas industry, including 8 and 10 round forms.	F20
		NA			Acme	ANSI B1.5:1988	3G	N	29° truncated thread form for motion applications in a wide variety of industries.	F21
		NAS			Stub Acme	ANSI B1.8:1988	2G	N	Shallow depth 29° truncated thread form for motion applications in a wide variety of industries.	F22
		NTB-B			American Buttress — 45° clearance flank leading (Pull)	ANSI B1.9:1973	Class 2	N	Sawtooth form for axial load bearing applications in a variety of industries — use the “B” style when the 45° clearance flank is the leading flank.	F22



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

- Reduce cycle times — high speed capability.
- Longer tool life — new multilayer coating provides better wear resistance.

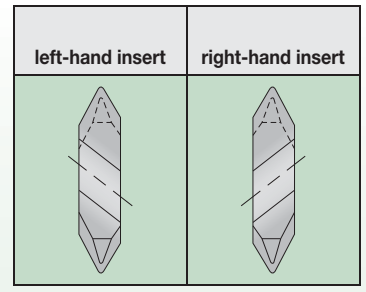
<b>P</b>	Steel
<b>M</b>	Stainless Steel
<b>K</b>	Cast Iron
<b>N</b>	Non-Ferrous
<b>S</b>	High-Temp Alloys
<b>H</b>	Hardened Materials

wear resistance ← → toughness

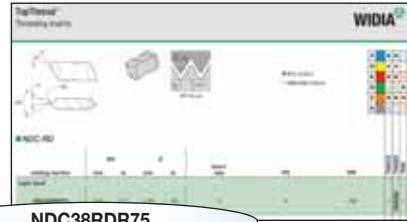
Grade	Coating	Grade Description	Material Group																				
			P	M	K	N	S	H	05	10	15	20	25	30	35	40	45						
TN6010	HC-P10	An advanced PVD TiAlN coating over a very deformation-resistant unalloyed carbide substrate. TN6010 is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys under stable conditions. It also performs well in machining hardened and short chipping materials.	P																				
			M																				
			K																				
			N																				
			S																				
TN6025	HC-P25	An advanced PVD TiAlN-coated grade with a tough, ultra-fine-grain unalloyed substrate. For general-purpose machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.	P																				
			M																				
			K																				
			N																				
			S																				
THM	HW-K15	Uncoated carbide for light and medium machining. For cast iron, all non-ferrous metals, and non-metals. Also capable of machining hardened materials at low cutting speeds.	P																				
			M																				
			K																				
			N																				
			S																				

- All TopThread inserts are precision-ground to provide accurate edge location and secure locking of the insert in the toolholder pocket.
- TopThread inserts can be used in either toolholders or boring bars.
- All non-cresting-type threading inserts can be used for either external or internal applications. All cresting-type inserts are designated specifically for external or internal use.

- Right-hand TopThread toolholders use right-hand inserts. Left-hand TopThread toolholders use left-hand inserts.
- Right-hand TopThread boring bars use left-hand inserts. Left-hand TopThread boring bars use right-hand inserts.
- See this page for carbide grade selection and more technical information.



# TopThread Insert Identification System

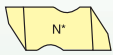


**NDC38RDR75**

**N**

Type of Insert

**N** – TopThread™



**D**

Insert

**C**

Additional Information

- B** – Buttress
- F** – Fine pitch
- S** – Stub Acme
- C** – Cresting
- P** – Positive rake
- K** – Fine pitch, positive

**3**

Insert Size

**8RD**

Industry Thread Identification

Indicates API or drilling industry form designation (e.g., 10RD, 8RD, .038) or controlled root radius threading inserts indicate the root radius in 0,025 increments (NJ, NJF, NJP, NJK) or M indicates metric ISO thread

**R**

Hand of Insert

- R** – Right Hand
- L** – Left Hand

**75**

Definition of Insert

Additional Information

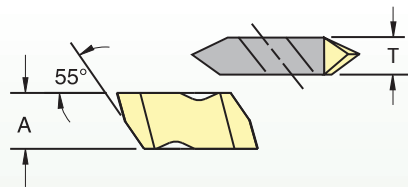
**A** – Acme

**D** – API or NPT

**J** – UNJ thread

**T** – 60° V thread

**W** – 55° V Whitworth



TopThread insert dimensions

insert size	A mm	T mm
1	2,54	2,54
2	5,56	3,81
3	8,74	4,95
4	11,51	6,48
5	17,48	9,65
6	11,51	9,73
8	7,93	11,13

NJF

NDC-V-M

NTC



NA

NT

NT-K



- Threads per inch or pitch (for metric)
- “A” or “B” type Buttress insert
- Taper per foot – API threads

**I** – Internal thread

**E** – External thread (used only if internal and external thread forms are different)

**M** – Multiple tooth

**K** – Standard chip control

**C** – Coarse pitch

**D** – Dryseal

Material Group		Cutting Speed – vc m/min								
		TN6010			TN6025			THM		
		min	Start	max	min	Start	max	min	Start	max
<b>P</b>	0/1	140	<b>175</b>	210	130	<b>140</b>	150	90	<b>95</b>	100
	2	115	<b>145</b>	175	110	<b>145</b>	175	75	<b>100</b>	125
	3	115	<b>145</b>	175	110	<b>145</b>	175	75	<b>100</b>	125
	4	75	<b>100</b>	120	75	<b>95</b>	115	55	<b>65</b>	80
	5	105	<b>140</b>	170	100	<b>125</b>	145	70	<b>85</b>	100
	6	45	<b>60</b>	75	40	<b>55</b>	65	30	<b>40</b>	45
<b>M</b>	1	90	<b>115</b>	140	60	<b>75</b>	90	60	<b>75</b>	90
	2	55	<b>70</b>	90	40	<b>50</b>	55	50	<b>60</b>	75
	3	60	<b>80</b>	95	40	<b>50</b>	60	40	<b>50</b>	55
<b>K</b>	1	120	<b>150</b>	180	60	<b>80</b>	90	70	<b>90</b>	100
	2	120	<b>150</b>	180	60	<b>75</b>	85	50	<b>65</b>	80
	3	110	<b>140</b>	170	60	<b>75</b>	90	60	<b>70</b>	80
<b>N</b>	1	600	<b>750</b>	900	600	<b>750</b>	900	600	<b>750</b>	900
	2	535	<b>685</b>	835	535	<b>685</b>	835	500	<b>650</b>	800
	3	230	<b>300</b>	370	230	<b>300</b>	370	600	<b>750</b>	900
	4	135	<b>180</b>	225	135	<b>180</b>	225	500	<b>650</b>	800
	5	70	<b>90</b>	110	70	<b>90</b>	110	230	<b>300</b>	370
	6	445	<b>565</b>	690	445	<b>565</b>	690	150	<b>200</b>	250
	7	550	<b>700</b>	850	550	<b>700</b>	850	150	<b>200</b>	250
<b>S</b>	1	35	<b>40</b>	50	25	<b>35</b>	40	25	<b>35</b>	45
	2	20	<b>20</b>	30	15	<b>20</b>	20	20	<b>30</b>	35
	3	60	<b>70</b>	80	40	<b>60</b>	70	15	<b>25</b>	30
	4	30	<b>35</b>	45	20	<b>30</b>	35	10	<b>15</b>	20
<b>H</b>	1	15	<b>30</b>	60	-	-	-	-	-	-
	2	15	<b>30</b>	60	-	-	-	-	-	-
	3	15	<b>30</b>	60	-	-	-	-	-	-
	4	15	<b>30</b>	60	-	-	-	-	-	-

# The best solution for demanding threading applications



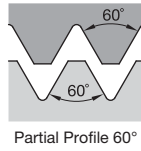
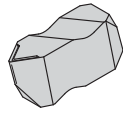
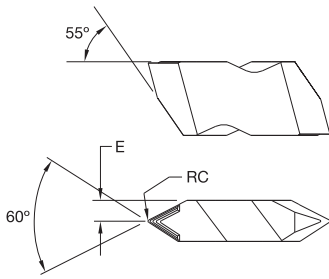
EXTREME **CHALLENGES.**  
EXTREME **RESULTS.**

The WIDIA™ TopThread system is the best solution for demanding threading applications. With unmatched tooling technology, you can trust WIDIA TopThread tools for all of your threading and grooving needs.

- Large selection of insert geometries and grades.
- Rigid insert clamping design ensures the best tool life, surface finish, and workpiece quality.
- Ensures accurate, high-quality threads. Excellent for internal threading operations.

To learn more, contact your local Authorised Distributor or visit [widia.com](http://widia.com).

**WIDIA** 

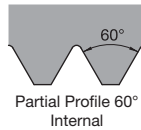
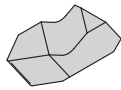
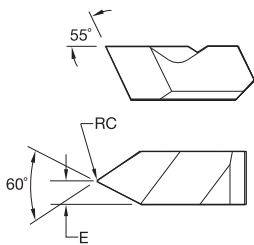


● first choice  
○ alternate choice

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

**NT-K**

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
<b>right hand</b>										
NT2RK	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607651	3607837	—
NT3RK	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607643	3607824	—
NT4RK	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607846	3607837	—
<b>left hand</b>										
NT2LK	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607674	3607833	—
NT3LK	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607645	3607828	—



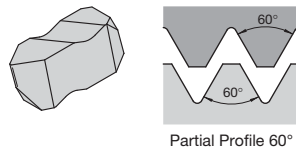
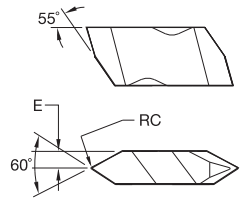
**NT-1L**

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
<b>left hand</b>										
NT1L	0,08	1,09	1	—	1,0-2,0	—	12-24	3636551	3636555	—



Threading





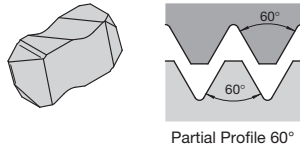
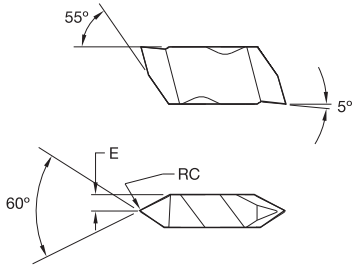
● first choice  
○ alternate choice

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

■ NT

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
<b>right hand</b>										
NT2R	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607647	3607843	—
NT3R	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607530	3607825	—
NT4R	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607676	3607834	—
<b>left hand</b>										
NT2L	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607675	3607835	—
NT3L	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607532	3607826	—
NT4L	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607849	3607826	—

Threading

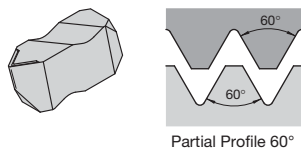
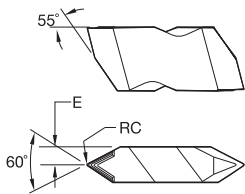


● first choice  
○ alternate choice

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

■ **NTP**

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
<b>right hand</b>										
NTP2R	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607677	3607841	3607841
NTP3R	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607644	3607823	3607823
NTP4R	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607839	3607841	3607841
<b>left hand</b>										
NTP2L	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607678	3607840	3607840
NTP3L	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607650	3607831	3607831

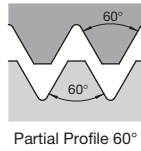
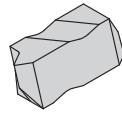
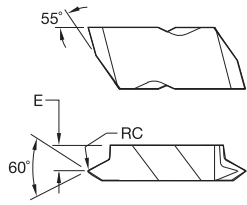


■ **NT-CK**

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
<b>right hand</b>										
NT3RCK	0,34	2,46	3	2,5-4,0	4,0	6-11	6	3607649	3607838	3607838



Threading

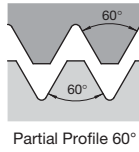
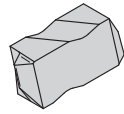
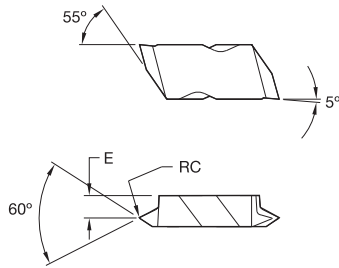


● first choice  
○ alternate choice

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

■ NTF

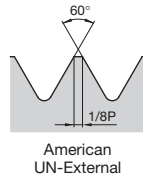
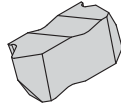
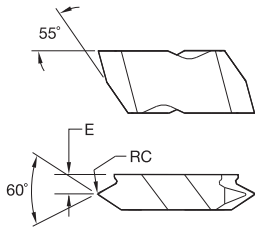
catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTF2R	0,08	2,79	2	0,60-1,75	1,0-2,0	14-44	12-24	3607673	3607852	■
NTF3R	0,08	3,58	3	0,60-2,5	1,0-2,5	10-44	9-24	3607531	3607830	■
left hand										
NTF3L	0,08	3,58	3	0,60-2,5	1,0-2,5	10-44	9-24	3607652	3607832	■



■ NTK

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTK2R	0,08	2,79	2	0,60-1,75	1,0-2,0	14-44	12-24	3607646	3607836	■
NTK3R	0,08	3,58	3	0,60-2,50	1,0-2,5	10-44	9-24	3607528	3607827	■
left hand										
NTK3L	0,08	3,58	3	0,60-2,50	1,0-2,5	10-44	9-24	3607853		■

Threading

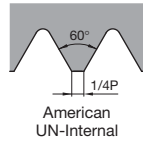
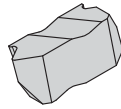
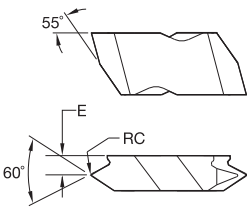


● first choice  
○ alternate choice

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

■ **NTC-E**

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
<b>right hand</b>										
NTC3R16E	0,19	3,76	3	—	—	16	—	3636553	3636557	—
NTC3R14E	0,22	3,76	3	—	—	14	—	3636554	—	—
NTC3R12E	0,25	3,76	3	—	—	12	—	3636549	3636562	—

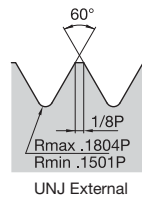
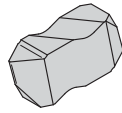
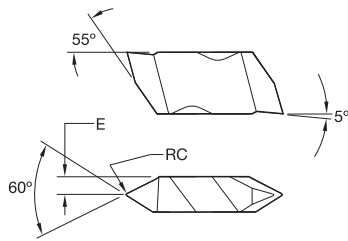


■ **NTC-I**

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
<b>left hand</b>										
NTC3L12I	0,10	3,76	3	—	—	—	12	—	3636556	—



Threading

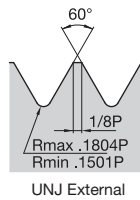
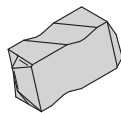
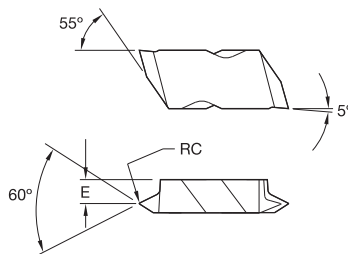


● first choice  
○ alternate choice

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

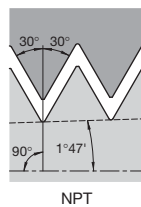
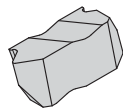
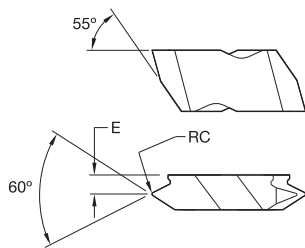
■ NJP

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NJP3014R12	0,33	2,49	3	—	—	12	—	—	3607850	—



■ NJK

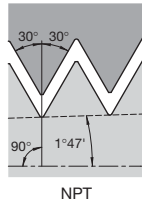
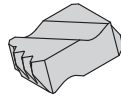
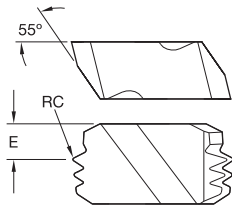
catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NJK3008R20	0,20	3,58	3	—	—	20	—	3607648	—	—



■ NDC-V

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
right hand								
NDC3115VR75	0,10	3,66	3	11,5	.750	3636550	—	—

Threading

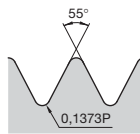
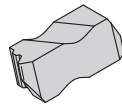
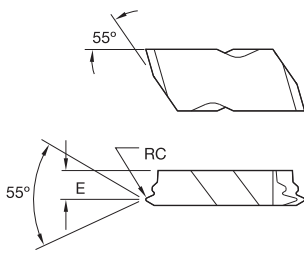


● first choice  
○ alternate choice

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

■ **NDC-V-M**

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
<b>right hand</b>								
NDC8115VR75M	0,10	2,59	8	11,5	.750	3636552		
NDC88VR75M	0,13	2,41	8	8	.750	3636548		



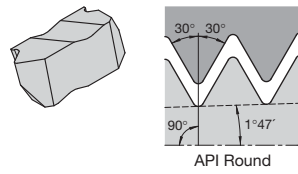
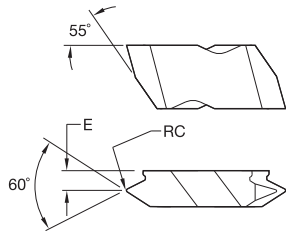
Whitworth BSW,  
BSP-External

■ **NWC-E**

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
<b>right hand</b>								
NWC3R14E	0,24	3,43	3	14	—		3811638	
NWC3R11E	0,30	3,43	3	11	—		3811639	



Threading



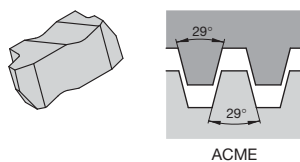
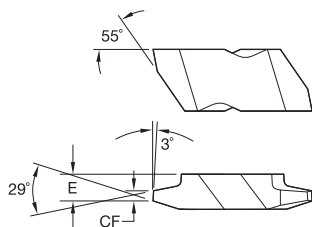
● first choice  
○ alternate choice

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

■ **NDC-RD**

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
<b>right hand</b>								
NDC38RDR75	0,43	3,18	3	8	.750		3636558	
<b>left hand</b>								
NDC310RDL75	0,36	3,18	3	10	.750		3636565	
NDC38RDL75	0,43	3,18	3	8	.750		3636559	

Threading



● first choice  
○ alternate choice

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

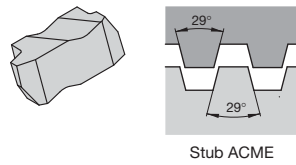
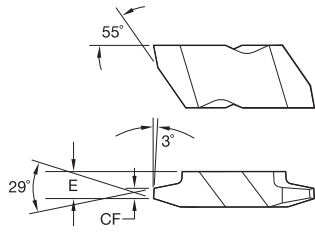
■ NA

catalogue number	CF	E	insert size	TPI	TN6010	TN6025	THM
<b>right hand</b>							
NA3R8	1,04	3,79	3	8		3607854	
NA3R6	1,44	3,79	3	6		3607851	
NA3R4	2,22	3,38	3	4		3607848	
NA4R4	2,22	5,13	4	4		3636566	
NA6R3	3,01	7,19	6	3		3636564	
NA6R2	4,58	7,19	6	2		3636567	
<b>left hand</b>							
NA3L8	1,04	3,79	3	8		3607855	
NA3L6	1,44	3,79	3	6		3607847	
NA3L4	2,22	3,38	3	4		3607842	
NA4L4	2,22	5,13	4	4		3636560	
NA6L3	3,01	7,19	6	3		3636561	
NA6L2	4,58	7,19	6	2		3636568	



Threading



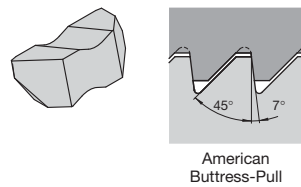
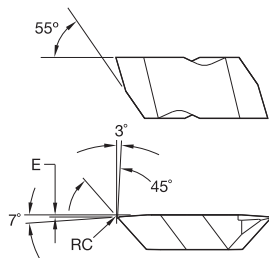


● first choice  
○ alternate choice

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

■ NAS

catalogue number	CF	E	insert size	TPI	TN6010	TN6025	THM
<b>right hand</b>							
NAS3R8	1,21	3,79	3	8		3607856	
<b>left hand</b>							
NAS3L12	0,83	3,79	3	12		3607844	
NAS3L8	1,21	3,79	3	8		3607845	
NAS3L6	1,66	3,79	3	6		3607829	

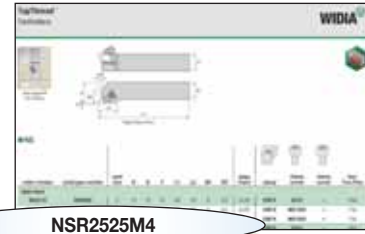


■ NTB-B

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
<b>left hand</b>								
NTB3LB	0,17	0,31	3	8-16	—		3636563	

Threading

**TopThread  
Holder Identification System**

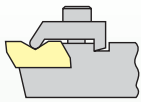


NSR2525M4

**N**

Insert  
Holding  
Method

**N** –  
TopThread™



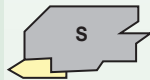
**S**

Insert  
Mounting  
Location

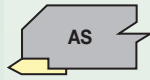
End mount



Side mount,  
offset



Side mount,  
no offset

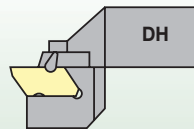


**R**

Hand  
of Tool

**Drop  
Head**

Drop  
Head



**2525**

Shank  
Size

Shank height and  
width in mm and  
holder

**M**

Tool  
Length

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

**4**

Insert  
Size

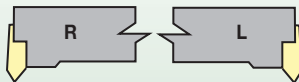


insert size	W1
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73
8	11,13

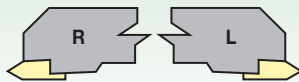
**Qualified  
Holder**

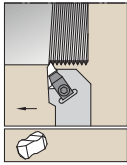
**Q** – Qualified  
holder

End mount

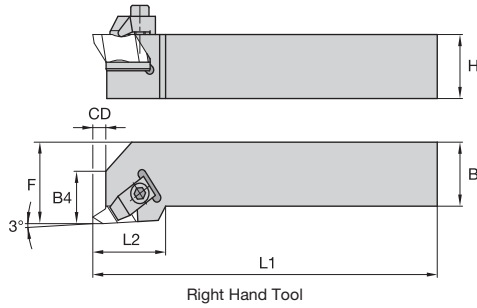


Side mount

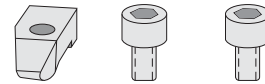




See page F8  
for inserts.



■ NS



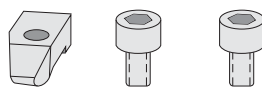
Threading

order number	catalogue number	seat size	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/ Torx Plus
<b>right hand</b>														
3632147	NSR062	2	10	10	14	64	19	9	3,5	N.2R	CM74	S310	—	7/64
3641682	NSR1010E2	2	10	10	14	70	19	9	3,5	N.2R	CM74	MS1200	—	T10
3641660	NSR1212F2	2	12	12	16	80	19	9	3,5	N.2R	CM74	MS1200	—	T10
3639035	NSR082V	2	13	13	19	89	19	9	3,5	N.2R	CM74	S310	—	7/64
3639044	NSR102B	2	16	16	22	114	19	9	3,5	N.2R	CM74	S310	—	7/64
3636542	NSR1616H2	2	16	16	20	100	19	9	3,5	N.2R	CM74	MS1200	—	T10
3639026	NSR122B	2	19	19	25	114	19	9	3,5	N.2R	CM74	S310	—	7/64
3638589	NSR2020K2	2	20	20	25	125	19	9	3,5	N.2R	CM74	MS1200	—	T10
3638590	NSR2525M2	2	25	25	32	150	19	9	3,5	N.2R	CM74	MS1200	—	T10
3639025	NSR162C	2	25	25	32	127	19	9	3,5	N.2R	CM74	S310	—	7/64
3639027	NSR123A	3	19	19	25	102	32	13	5,3	N.3R	CM72LP	—	S2112	25 IP
3639023	NSR123B	3	19	19	25	114	32	13	5,3	N.3R	CM72LP	—	S2112	25 IP
3638588	NSR2020K3	3	20	20	25	125	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
3636536	NSR2525M3	3	25	25	32	150	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
3638592	NSR163C	3	25	25	32	127	32	13	5,3	N.3R	CM72LP	—	S2112	25 IP
3638591	NSR163D	3	25	25	32	152	32	13	5,3	N.3R	CM72LP	—	S2112	25 IP
3637496	NSR853D	3	32	25	32	152	32	13	5,3	N.3R	CM72LP	—	S2112	25 IP
3639028	NSR203D	3	32	32	38	152	32	13	5,3	N.3R	CM72LP	—	S2112	25 IP
3641664	NSR3225P3	3	32	25	32	170	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
3641666	NSR3232P3	3	32	32	40	170	32	13	5,3	N.3R	CM72LP	—	MS2111	25 IP
3637506	NSR243D	3	38	38	51	152	35	13	5,3	N.3R	CM72LP	—	S2112	25 IP
3637535	NSR243E	3	38	38	51	178	35	13	5,3	N.3R	CM72LP	—	S2112	25 IP
3636540	NSR2525M4	4	25	25	32	150	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
3641675	NSR3225P4	4	32	25	32	170	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
3641669	NSR3232P4	4	32	32	40	170	35	14	7,5	N.4R	CM72LP	—	MS2111	25 IP
3637509	NSR205D	5	32	32	38	152	51	15	10,5	N.5R	CM80	S352	—	1/4
3637540	NSR245D	5	38	38	51	152	51	16	10,5	N.5R	CM80	S352	—	1/4

NOTE: F dimension measured over sharp point of insert.

(continued)

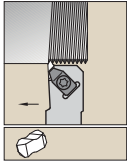
(NS – continued)

order number	catalogue number	seat size	H	B	F	L1	L2	B4	CD	gage insert				hex/ Torx Plus
											clamp	clamp screw	clamp screw	
<b>left hand</b>														
3632161	NSL062	2	10	10	14	64	19	9	3,5	N.2L	CM75	S310	–	7/64
3641683	NSL1010E2	2	10	10	14	70	19	9	3,5	N.2L	CM75	MS1200	–	T10
3641681	NSL1212F2	2	12	12	16	80	19	9	3,5	N.2L	CM75	MS1200	–	T10
3637485	NSL082V	2	13	13	19	89	19	9	3,5	N.2L	CM75	S310	–	7/64
3637510	NSL102B	2	16	16	22	114	19	9	3,5	N.2L	CM75	S310	–	7/64
3636545	NSL1616H2	2	16	16	20	100	19	9	3,5	N.2L	CM75	MS1200	–	T10
3632145	NSL122B	2	19	19	25	114	19	9	3,5	N.2L	CM75	S310	–	7/64
3639045	NSL2020K2	2	20	20	25	125	19	9	3,5	N.2L	CM75	MS1200	–	T10
3639047	NSL2525M2	2	25	25	32	150	19	9	3,5	N.2L	CM75	MS1200	–	T10
3632138	NSL162C	2	25	25	32	127	19	9	3,5	N.2L	CM75	S310	–	7/64
3632152	NSL123A	3	19	19	25	102	32	13	5,3	N.3L	CM73LP	–	S2112	25 IP
3639032	NSL123B	3	19	19	25	114	32	13	5,3	N.3L	CM73LP	–	S2112	25 IP
3639046	NSL2020K3	3	20	20	32	125	32	13	5,3	N.3L	CM73LP	–	MS2111	25 IP
3636539	NSL2525M3	3	25	25	32	150	32	13	5,3	N.3L	CM73LP	–	MS2111	25 IP
3639029	NSL163C	3	25	25	32	127	32	13	5,3	N.3L	CM73LP	–	S2112	25 IP
3639024	NSL163D	3	25	25	32	152	32	13	5,3	N.3L	CM73LP	–	S2112	25 IP
3637508	NSL853D	3	32	25	32	152	32	13	5,3	N.3L	CM73LP	–	S2112	25 IP
3639037	NSL203D	3	32	32	38	152	32	13	5,3	N.3L	CM73LP	–	S2112	25 IP
3641670	NSL3225P3	3	32	25	32	170	32	13	5,3	N.3L	CM73LP	–	MS2111	25 IP
3641671	NSL3232P3	3	32	32	40	170	32	13	5,3	N.3L	CM73LP	–	MS2111	25 IP
3637515	NSL243D	3	38	38	51	152	35	13	5,3	N.3L	CM73LP	–	S2112	25 IP
3637548	NSL243E	3	38	38	51	178	35	13	5,3	N.3L	CM73LP	–	S2112	25 IP
3636544	NSL2525M4	4	25	25	32	150	35	14	7,5	N.4L	CM73LP	–	MS2111	25 IP
3641678	NSL3225P4	4	32	25	32	170	35	14	7,5	N.4L	CM73LP	–	MS2111	25 IP
3641679	NSL3232P4	4	32	32	40	170	35	14	7,5	N.4L	CM73LP	–	MS2111	25 IP
3637536	NSL205D	5	32	32	38	152	51	15	10,5	N.5L	CM81	S352	–	1/4
3641688	NSL3232P5	5	32	32	40	170	51	16	10,5	N.5L	CM81	MS352	–	6 mm

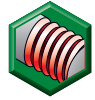
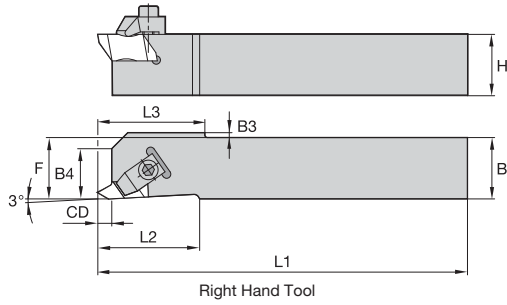
NOTE: F dimension measured over sharp point of insert.



Threading



See page F8 for inserts.



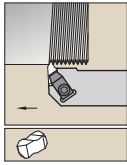
■ NAS



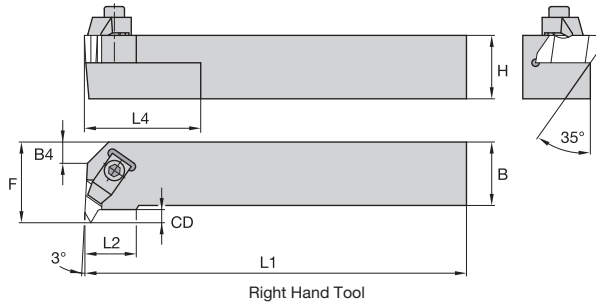
Threading

order number	catalogue number	seat size	H	B	F	L1	L2	B4	CD	B3	L3	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
<b>right hand</b>																
3641667	NASR1010M2Q	2	10	10	10	150	19	9	3,5	2,03	19	N.2R	CM182	MS1200	—	T10
3641662	NASR1212M2Q	2	12	12	12	150	19	9	3,5	—	—	N.2R	CM182	MS1200	—	T10
3639048	NASR1616K3Q	3	16	16	16	125	32	12	5,3	—	—	N.3R	CM184LP	—	MS2111	25 IP
<b>left hand</b>																
3641691	NASL1010M2Q	2	10	10	10	150	19	9	3,5	2,03	19	N.2L	CM183	MS1200	—	T10
3641686	NASL1212M2Q	2	12	12	12	150	19	9	3,5	—	—	N.2L	CM183	MS1200	—	T10
3641687	NASL1616K3Q	3	16	16	16	125	32	12	5,3	—	—	N.3L	CM185LP	—	MS2111	25 IP

NOTE: F dimension measured over sharp point of insert.



See page F8 for inserts.

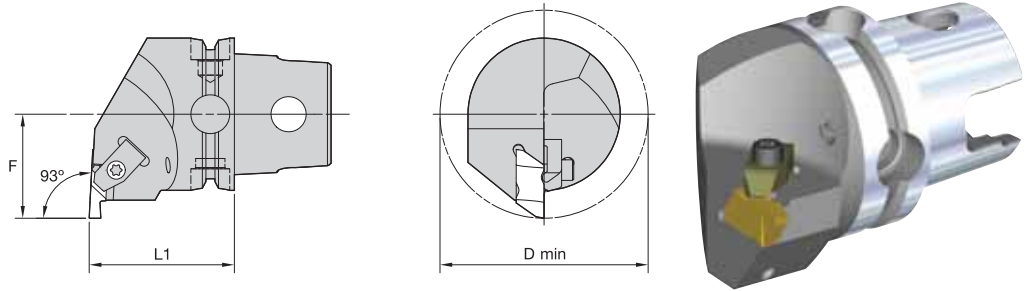


■ NE

order number	catalogue number	seat size	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
<b>right hand</b>														
3641674	NER1616H2	2	16	16	20	100	15	—	3,5	N.2L	CM75	MS1200	—	T10
3641658	NER2020K2	2	20	20	25	125	15	6	3,5	N.2L	CM75	MS1200	—	T10
3641665	NER2525M2	2	25	25	32	150	15	12	3,5	N.2L	CM75	MS1200	—	T10
3636541	NER2525M3	3	25	25	32	150	22	—	5,3	N.3L	CM73LP	—	MS2111	25 IP
3641680	NER3225P3	3	32	25	32	170	22	—	3,8	N.3L	CM73LP	—	MS2111	25 IP
3641672	NER2525M4	4	25	25	35	150	24	—	7,5	N.4L	CM73LP	—	MS2111	25 IP
3641689	NER3225P4	4	32	25	35	170	24	—	7,5	N.4L	CM73LP	—	MS2111	25 IP
3641693	NER3232P4	4	32	32	40	170	24	—	6,4	N.4L	CM73LP	—	MS2111	25 IP
3641692	NER3232P5	5	32	32	50	170	35	—	10,5	N.5L	CM81	MS352	—	6 mm
<b>left hand</b>														
3641684	NEL1616H2	2	16	16	20	100	15	—	3,5	N.2R	CM74	MS1200	—	T10
3641677	NEL2020K2	2	20	20	25	125	15	6	3,5	N.2R	CM74	MS1200	—	T10
3641676	NEL2525M2	2	25	25	32	150	15	12	3,5	N.2R	CM74	MS1200	—	T10
3636543	NEL2525M3	3	25	25	32	150	22	—	5,3	N.3R	CM72LP	—	MS2111	25 IP
3641685	NEL3225P3	3	32	25	32	170	22	—	3,8	N.3R	CM72LP	—	MS2111	25 IP
3641668	NEL2525M4	4	25	25	35	150	24	—	7,5	N.4R	CM72LP	—	MS2111	25 IP
3641694	NEL3225P4	4	32	25	35	170	24	—	7,5	N.4R	CM72LP	—	MS2111	25 IP
3641696	NEL3232P4	4	32	32	40	170	24	—	6,4	N.4R	CM72LP	—	MS2111	25 IP
3641695	NEL3232P5	5	32	32	50	170	35	—	10,5	N.5R	CM80	MS352	—	6 mm

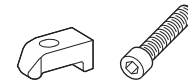
NOTE: F dimension measured over sharp point of insert.

Threading



■ NE 93°

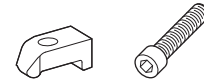
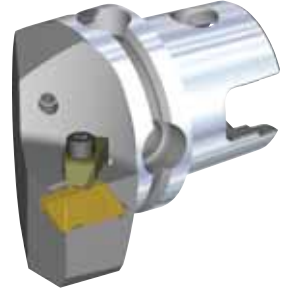
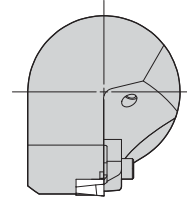
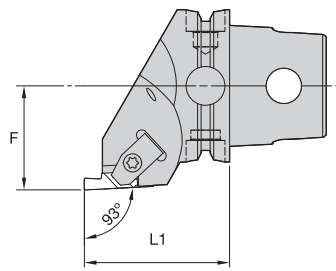
Threading



order number	catalogue number	L1		F		D min		gage insert	clamp	clamp screw	kg	lbs
		mm	in	mm	in	mm	in					
<b>right hand</b>												
3902285	KM40TSNER2	40	1.575	27	1.063	54	2.126	NG2L	CM75	MS1488	0,30	.66
3902286	KM40TSNER3	40	1.575	27	1.063	54	2.126	NG3L	CM73	MS1489	0,30	.67
3902287	KM40TSNER4	40	1.575	27	1.063	54	2.126	NG4L	CM73	MS1489	0,30	.65
<b>left hand</b>												
3902132	KM40TSNEL2	40	1.575	27	1.063	54	2.126	NG2R	CM74	MS1488	0,30	.66
3902283	KM40TSNEL3	40	1.575	27	1.063	54	2.126	NG3R	CM-72	MS1489	0,30	.67
3902284	KM40TSNEL4	40	1.575	27	1.063	54	2.126	NG4R	CM-72	MS1489	0,30	.65



■ NS 93°

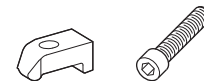
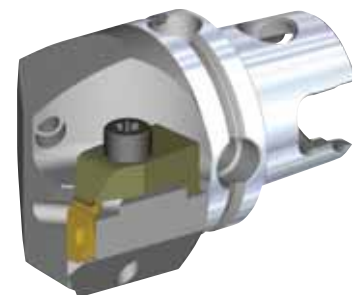
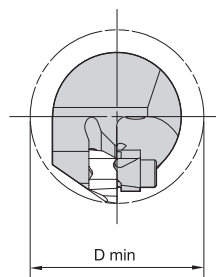
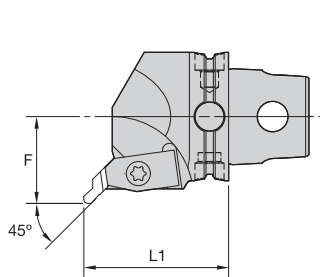


order number	catalogue number	L1		F		gage insert	clamp	clamp screw	kg	lbs
		mm	in	mm	in					
<b>right hand</b>										
3902293	KM40TSNSR2	40	1.575	27	1.063	NG2R	CM74	MS1488	0,32	.70
3902294	KM40TSNSR3	47	1.850	27	1.063	NG3R	CM-72	MS1489	0,32	.71
3902295	KM40TSNSR4	47	1.850	27	1.063	NG4R	CM-72	MS1489	0,30	.66
<b>left hand</b>										
3902290	KM40TSNSL2	40	1.575	27	1.063	NG2L	CM75	MS1488	0,32	.70
3902291	KM40TSNSL3	47	1.850	27	1.063	NG3L	CM73	MS1489	0,33	.72
3902292	KM40TSNSL4	47	1.850	27	1.063	NG4L	CM73	MS1489	0,30	.66

Threading



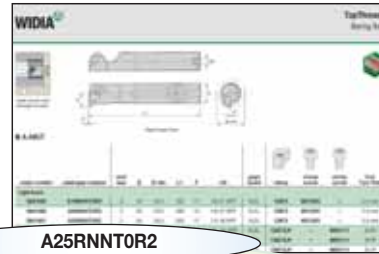
■ NR 45°



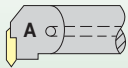
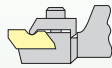


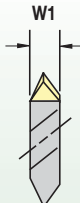
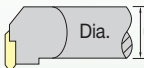
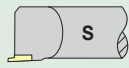

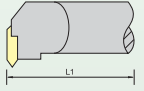
order number	catalogue number	L1		F		D min		gage insert	clamp	clamp screw	kg	lbs
		mm	in	mm	in	mm	in					
<b>right hand</b>												
3902289	KM40TSNRR3045M	45	1.772	27	1.063	54	2.126	NU3L	CM73	MS1489	0,34	.75
<b>left hand</b>												
3902288	KM40TSNRL3045M	45	1.772	27	1.063	54	2.126	NU3R	CM-72	MS1489	0,33	.74

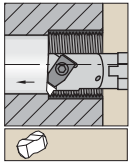


# TopThread Boring Bar Identification System

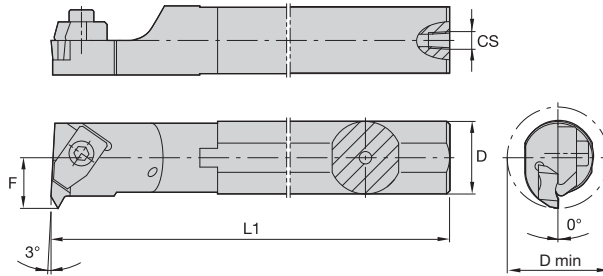


A25RNNT0R2

A	25	R	N	N	T	0	R	2														
Bar Type	Bar Diameter	Bar Length	Insert Holding Method	Insert Shape	Insert Location	Rake Angle 0 = 0°	Hand of Tool	Insert Size														
Steel with coolant 			N – TopThread* 		End mount 		Right hand 															
Bar in millimetres 			*Proprietary standard only.		Side mount 		Left hand 	<table border="1"> <thead> <tr> <th>insert size</th> <th>W1</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>3,81</td> </tr> <tr> <td>3</td> <td>4,95</td> </tr> <tr> <td>4</td> <td>6,98</td> </tr> <tr> <td>5</td> <td>9,65</td> </tr> <tr> <td>6</td> <td>9,73</td> </tr> <tr> <td>8</td> <td>11,13</td> </tr> </tbody> </table>	insert size	W1	2	3,81	3	4,95	4	6,98	5	9,65	6	9,73	8	11,13
insert size	W1																					
2	3,81																					
3	4,95																					
4	6,98																					
5	9,65																					
6	9,73																					
8	11,13																					
<p>Bars</p> <ul style="list-style-type: none"> <li>K = 125,0mm</li> <li>M = 150,0mm</li> <li>Q = 180,0mm</li> <li>R = 200,0mm</li> <li>S = 250,0mm</li> <li>T = 300,0mm</li> <li>U = 350,0mm</li> </ul> 																						



Steel shank with through coolant. See page F8 for inserts.



Right Hand Tool



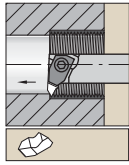
■ **A-NNT**

order number	catalogue number	seat size	D	D min	L1	F	CS	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
<b>right hand</b>												
3641643	A16MNNTOR2	2	16	22,0	150	11	1/8-27 NPT	N.2L	CM75	MS1200	—	2.5 mm
3641645	A20QNNTOR2	2	20	26,0	180	13	1/8-27 NPT	N.2L	CM75	MS1200	—	2.5 mm
3641651	A25RNNTOR2	2	25	34,0	200	17	1/4-18 NPT	N.2L	CM75	MS1200	—	2.5 mm
3641622	A25RNNTOR3	3	25	34,0	200	17	1/8 - 27 NPT	N.3L	CM73LP	—	MS2111	25 IP
3641646	A32SNNTOR3	3	32	44,0	250	22	1/4-18 NPT	N.3L	CM73LP	—	MS2111	25 IP
3641653	A40TNNTOR3	3	40	54,0	300	27	1/4-18 NPT	N.3L	CM73LP	—	MS2111	25 IP
3641654	A40TNNTOR4	4	40	54,0	300	27	1/4-18 NPT	N.4L	CM73LP	—	MS2111	25 IP
3641661	A50UNNTOR4	4	50	70,0	350	35	1/4-18 NPT	N.4L	CM73LP	—	MS2111	25 IP
3641644	A12MNNTOR2	2	12	18,5	150	11	1/16-27 NPT	NG2L	CM147	MS1200	—	2.5 mm
<b>left hand</b>												
3641649	A16MNNTOL2	2	16	22,0	150	11	1/8-27 NPT	N.2R	CM74	MS1200	—	2.5 mm
3641652	A20QNNTOL2	2	20	26,0	180	13	1/8-27 NPT	N.2R	CM74	MS1200	—	2.5 mm
3641657	A25RNNTOL2	2	25	34,0	200	17	1/4-18 NPT	N.2R	CM74	MS1200	—	2.5 mm
3641650	A25RNNTOL3	3	25	34,0	200	17	1/4-18 NPT	N.3R	CM72LP	—	MS2111	25 IP
3641656	A32SNNTOL3	3	32	44,0	250	22	1/4-18 NPT	N.3R	CM72LP	—	MS2111	25 IP
3641659	A40TNNTOL3	3	40	54,0	300	27	1/4-18 NPT	N.3R	CM72LP	—	MS2111	25 IP
3641663	A40TNNTOL4	4	40	54,0	300	27	1/4-18 NPT	N.4R	CM72LP	—	MS2111	25 IP
3641690	A50UNNTOL4	4	50	70,0	350	35	1/4-18 NPT	N.4R	CM72LP	—	MS2111	25 IP
3641655	A12MNNTOL2	2	12	18,5	150	11	1/16-27 NPT	NG2R	CM146	MS1200	—	2.5 mm

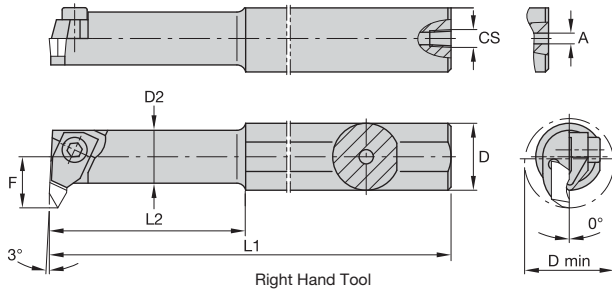
NOTE: F dimension measured over sharp point of insert.



Threading

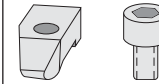


Necked steel shank with through coolant. See page F8 for inserts.



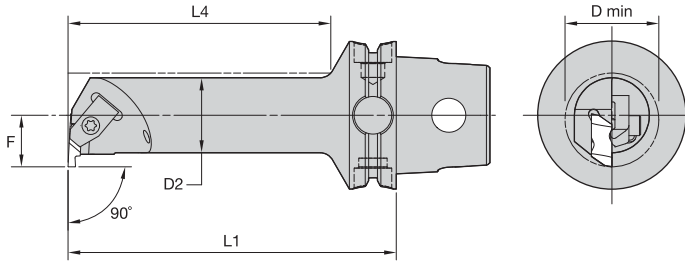
■ **A-NNT-1**

Threading



order number	catalogue number	seat size	D	D min	D2	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex/ Torx Plus
<b>right hand</b>														
3641647	A12MNNTOR1	1	12	11,5	8,7	150	31	7	4,0	1/16-27 NPT	N.1L	CM109	MS1034	1.5 mm
3641648	A10KNNTOR1	1	10	11,5	10,0	125	—	7	3,2	—	NG1L	CM109	MS1034	1.5 mm

NOTE: F dimension measured over sharp point of insert.



■ NE 90° • Steel

order number	catalogue number	D2		D min		F		L4		L1		gage insert	kg	lbs
		mm	in	mm	in	mm	in	mm	in	mm	in			
<b>right hand</b>														
3955481	KM40TSS12ENER2	12	.472	19	.73	11	.433	42	1.655	70	2.756	NG2L	0,27	.58
3955483	KM40TSS16FNER2	16	.630	20	.79	11	.433	56	2.209	80	3.150	NG2L	0,28	.62
3955485	KM40TSS20GNER2	20	.787	25	.98	13	.512	70	2.757	90	3.543	NG2L	0,35	.76
3955487	KM40TSS25ENER2	25	.984	32	1.26	17	.669	55	2.169	70	2.756	NG2L	0,34	.75
3955491	KM40TSS25ENER3	25	.984	34	1.34	17	.669	55	2.169	70	2.756	NG3L	0,35	.77
3955489	KM40TSS25HNER2	25	.984	32	1.26	17	.669	75	2.954	100	3.937	NG2L	0,49	1.08
3955493	KM40TSS25HNER3	25	.984	34	1.34	17	.669	75	2.954	100	3.937	NG3L	0,49	1.09
3955497	KM40TSS32GNER3	32	1.260	40	1.57	22	.866	76	2.993	90	3.543	NG3L	0,55	1.21
3955495	KM40TSS32JNER3	32	1.260	40	1.57	22	.866	96	3.780	110	4.331	NG3L	0,67	1.48
<b>left hand</b>														
3955480	KM40TSS12ENEL2	12	.472	19	.73	11	.433	42	1.655	70	2.756	NG2R	0,27	.59
3955482	KM40TSS16FNEL2	16	.630	20	.79	11	.433	56	2.209	80	3.150	NG2R	0,28	.62
3955484	KM40TSS20GNEL2	20	.787	25	.98	13	.512	70	2.757	90	3.543	NG2R	0,35	.76
3955486	KM40TSS25ENEL2	25	.984	32	1.26	17	.669	55	2.169	70	2.756	NG2R	0,34	.75
3955490	KM40TSS25ENEL3	25	.984	34	1.34	17	.669	55	2.169	70	2.756	NG3R	0,35	.77
3955488	KM40TSS25HNEL2	25	.984	32	1.26	17	.669	75	2.954	100	3.937	NG2R	0,49	1.08
3955492	KM40TSS25HNEL3	25	.984	34	1.34	17	.669	75	2.954	100	3.937	NG3R	0,49	1.09
3955496	KM40TSS32GNEL3	32	1.260	40	1.57	22	.866	76	2.993	90	3.543	NG3R	0,55	1.21
3955494	KM40TSS32JNEL3	32	1.260	40	1.57	22	.866	96	3.780	110	4.331	NG3R	0,67	1.48

(continued)

Threading

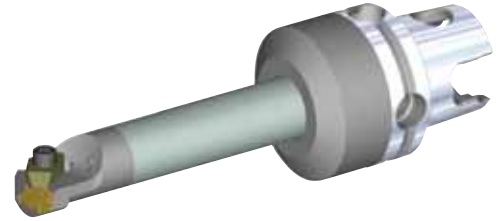
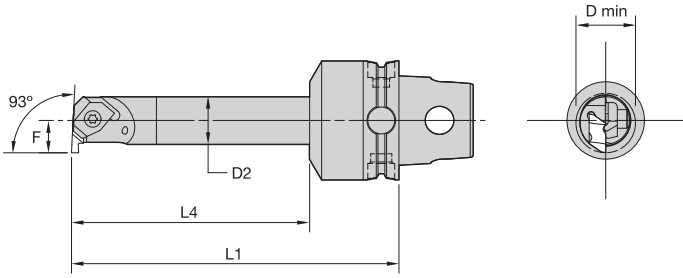
(NE 90° • Steel — continued)

■ Spare Parts



Threading

catalogue number	clamp	clamp screw
<b>right hand</b>		
KM40TSS12ENER2	CM147	MS1488
KM40TSS16FNER2	CM147	MS1488
KM40TSS20GNER2	CM75	MS1488
KM40TSS25ENER2	CM75	MS1488
KM40TSS25ENER3	CM73	MS1489
KM40TSS25HNER2	CM75	MS1488
KM40TSS25HNER3	CM73	MS1489
KM40TSS32GNER3	CM73	MS1489
KM40TSS32JNER3	CM73	MS1489
<b>left hand</b>		
KM40TSS12ENEL2	CM146	MS1488
KM40TSS16FNEL2	CM146	MS1488
KM40TSS20GNEL2	CM74	MS1488
KM40TSS25ENEL2	CM74	MS1488
KM40TSS25ENEL3	CM-72	MS1489
KM40TSS25HNEL2	CM74	MS1488
KM40TSS25HNEL3	CM-72	MS1489
KM40TSS32GNEL3	CM-72	MS1489
KM40TSS32JNEL3	CM-72	MS1489



■ NE 90° • Carbide

order number	catalogue number	D2		D min		F		L4		L1		gage insert	kg	lbs
		mm	in	mm	in	mm	in	mm	in	mm	in			
<b>right hand</b>														
3951836	KM40TSE16JNER2	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2L	0,41	.90
<b>left hand</b>														
3951835	KM40TSE16JNEL2	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2R	0,41	.90



■ Spare Parts



catalogue number	clamp	clamp screw
<b>right hand</b>		
KM40TSE16JNER2	CM146	MS1488
<b>left hand</b>		
KM40TSE16JNEL2	CM147	MS1488

The WIDIA™ high-performance carbide grades, coupled with our rigid TopThread clamping design, offer the metalworking industry optimum threading productivity.

When the large inventory of WIDIA standard products does not completely satisfy your productivity requirements, consider having TopThread inserts custom ground to meet your unique application needs.

The large variety of TopThread blank sizes allows maximum flexibility in threading endform design, especially for extra wide or oil field applications.

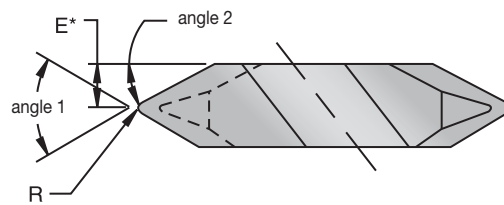
Common examples of special forms are shown here. Please contact your local WIDIA representative for recommendations on satisfying your special threading needs.

**Features and Benefits:**

- Quotes are handled quickly and efficiently using state-of-the-art CAD design software and electronic database software.
- Our Carbide Custom Solutions Design Team is your link to one of the industry's largest electronic databases. They can solve your most challenging design problems.
- Where necessary or required, concept drawings are available to facilitate your engineering development.
- A large number of high-performance carbide grades are available to optimise your productivity. The option of producing standard insert styles in non-standard carbide grades allows you to optimise tool life performance.

**style C2**

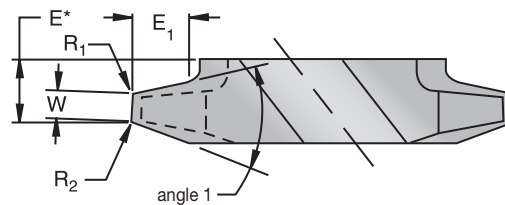
RH shown



\*to theoretical sharp point

**style C3**

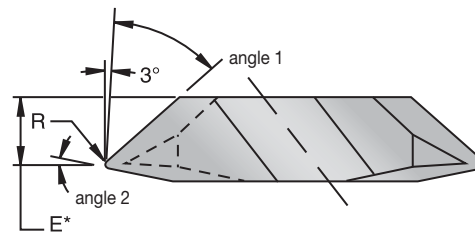
RH shown



\*to theoretical sharp point

**style C4 (NTB-A)**

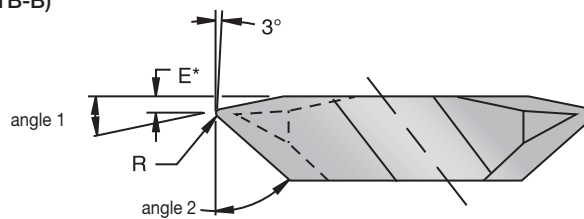
RH shown



\*to theoretical sharp point

**style C5 (NTB-B)**

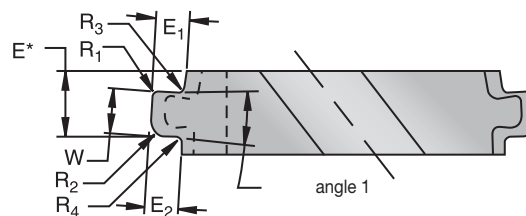
RH shown



\*to theoretical sharp point

**style C6**

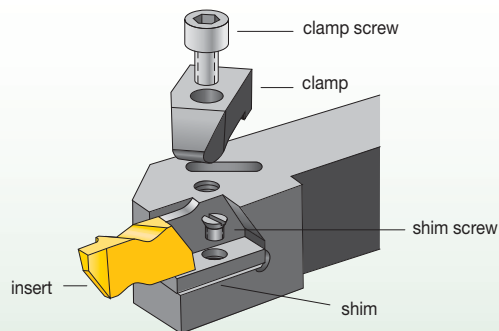
RH shown














\*to theoretical sharp point

NOTE: Right-hand inserts shown; left-hand inserts are also available.

**TopThread and TopGroove  
Toolholders and Boring Bars**



insert size and style	 clamp	 clamp screw	 shim	 shim screw
NG-1L 	CM-109	S-304	-	-
NG-2R	CM-182	S-310	-	-
NG-2L	CM-183	S-310	-	-
NG-2R 	CM-74	S-310	-	-
NG-2L	CM-75	S-310	-	-
NG-3R	CM-184	S-412	-	-
NG-3L	CM-185	S-412	-	-
NG-3R	CM-72	S-412	-	-
NG-3L 	CM-73	S-412	-	-
NG-3R*	CM-78	S-412	-	-
NG-3L*	CM-70	S-412	-	-
NG-4R	CM-72	S-412	SM-420	SL-344
NG-4L 	CM-73	S-412	SM-420	SL-344
NG-5R	CM-80	S-352	-	-
NG-5L 	CM-81	S-352	-	-
NG-6R	CM-120	S-412	SM-416	S-111
NG-6L 	CM-121	S-412	SM-416	S-111
NG-8R	CM-144	S-422	SM-419	S-112
NG-8L	CM-145	S-422	SM-419	S-112
NG-8R** 	CM-144	S-422	SM-427	S-111
NG-8L**	CM-145	S-422	SM-427	S-111
TopGroove relief grooving				
NU-3125R	CM-72	S-412	-	-
NU-3125L	CM-73	S-412	-	-
NU-3125R**	CM-72	S-618	-	-
NU-3125L**	CM-73	S-618	-	-

\*25mm diameter boring head.  
\*\*Boring head.



## WIDIA™ Laydown Threading

For increased reliability and productivity, look no further than the WIDIA Laydown Threading System for all of your I.D. and O.D. threading applications. The Laydown Threading System maximises tool life and thread quality.

# Laydown



This specially engineered system meets all modern production standards. With an extensive range of inserts and toolholders available, the Laydown Threading platform is ideal for all of your threading requirements.

### Laydown Insert Technology

Laydown insert technology, with its wide range of available tools and inserts, guarantees increased tool life, minimised built-up edges, and precise cuts of most common materials.

- TN6025™ premium PVD TiAlN-coated grade outperforms conventional PVD grades.
- Enables superior chip control and reduced cutting forces.
- Partial and full profile insert options available for all common thread forms.

### The Laydown Threading Solution

With the WIDIA™ Laydown Threading System, you experience reliable countersunk screw locking for unhindered chip flow and precise insert positioning accuracy.

- Industry-leading thread quality.
- Four insert sizes available to cover a wide range of thread-making operations.
- Ideal for high-helix/multi-start threads and single-point threading in small-diameter bores.
- Maximised tool life and low-profile design for unhindered chip flow and superior performance.

Reliable TopClamp™ locking guarantees precise insert positioning accuracy.

Choose from both steel and carbide boring bars to satisfy all machining application needs.

Get more parts per insert with the economy of the Laydown Threading insert's three cutting edges.



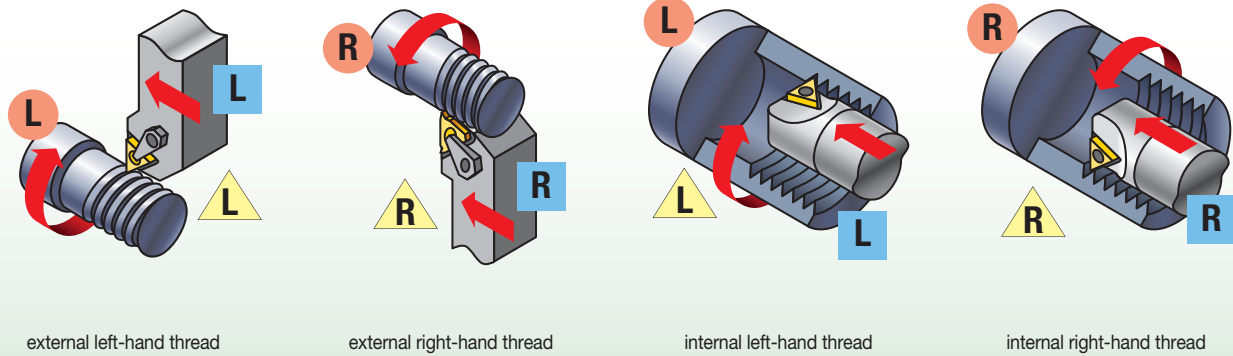
**Step 1 • Select Threading Method and Hand of Tooling**

**Required Information:**

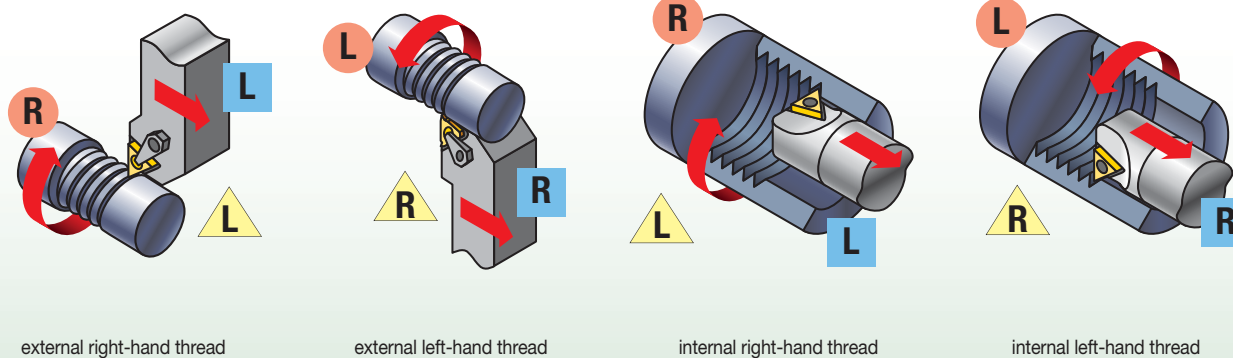
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



**Feed direction toward the chuck • standard helix • RECOMMENDED**



**Feed direction away from the chuck • reverse helix\***



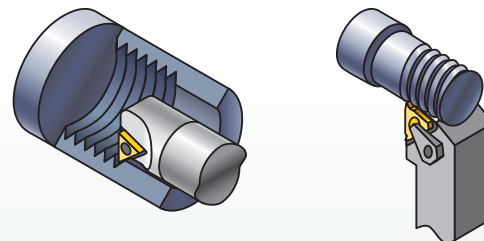
\*Negative shim required

**Step 2 • Select Holder from Catalogue Page**

**Required Information:**

- External/internal operation.
- Minimum bore diameter (for internal operations).
- Hand of tool.
- Insert size (gage insert).

Select the appropriate holder for the insert size and hand:



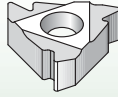
The insert size must match the gage insert size of your toolholder selection:

catalogue number	gage insert	minimum bore diameter	shim
S0812LSER2	2IRA60	16,5mm	—
S2020LSER3	3IR...	36,8mm	SM-Y13

**Step 3 • Choose Insert for Application**

- Select cresting inserts for fully controlled thread form including diameter.
- Cresting inserts eliminate the need for deburring and are optimised for the best tool life at that pitch.
- Non-cresting partial profile inserts offer the flexibility to cut a variety of thread pitches with one insert.
- Note insert size for toolholder selection.

See *threading insert overview* on page F42.

	<b>insert size</b>	<b>catalogue number</b>	<b>TN6025</b>
	11	2IRA60	•
	16	3IRAG60	•

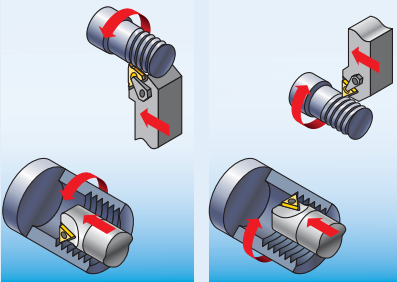
**Step 4 • Select Appropriate Shim**

**Required Information:**

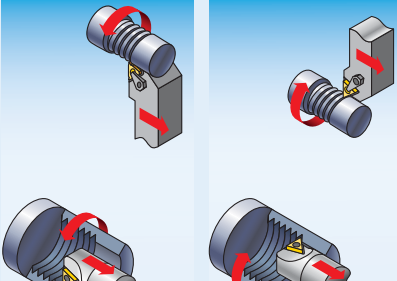
- Thread form (TPI or pitch).
- Pitch diameter.
- Helix method (hand of tool, feed direction, hand of thread).
- Number of starts.

Select the proper shim: SMYE... for external RH or internal LH  
SMYI... for internal RH or external LH

**RH thread/RH tooling**      **LH thread/LH tooling**



**Feed direction toward the chuck • standard helix • RECOMMENDED**



**feed direction away from the chuck • reverse helix**

**LH thread/RH tooling**      **RH thread/LH tooling**

**Laydown Threading Shim Selection Table • Inch**


insert size	lead-in chamfer		pitch diameter (inches)														
	external	internal	standard			reverse helix			standard			reverse helix					
11	0.005	0.005	0.125	0.1875	0.25	0.3125	0.375	0.4375	0.5	0.5625	0.625	0.6875	0.75	0.8125	0.875	0.9375	1.0
16	0.005	0.005	0.125	0.1875	0.25	0.3125	0.375	0.4375	0.5	0.5625	0.625	0.6875	0.75	0.8125	0.875	0.9375	1.0

If recommended shim is different from shim supplied with toolholder, order shim separately.

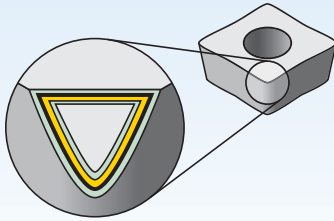
NOTE: Optimise your threading operation by using the proper infeed angle and the recommended infeed values. See the Technical Section on pages F83–F105. Also see detailed shim selection information on pages F104–F105.

**Step 5 • Select Grade and Speed**

Recommendations for Grade and Speed Selection – m/min

workpiece material	steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys
insert style	 precision ground				
first choice	TN6025 40–200 (130–650)	TN6025 40–135 (130–450)	TN6025 60–145 (200–475)	TN6025 50–360 (160–1150)	TN6025 10–100 (35–330)

style		thread profile	standard	tolerance class	cresting	application	page(s)
	flat top						
	60	Partial profile 60°	—	—	N	General use for 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches.	F46—F47
	ISO	Metric ISO	ISO R262, DIN 13	6g/6H	Y	Widely used metric 60° V-form for all industries.	F48—F53
	UN	American UN	ANSI B1.1:74	2A/2B	Y	Widely used inch-based 60° V-form for all industries.	F54—F57
	NPT	NPT	ANSI/ASME B1.20.1S1983	Standard NPT	N	National Pipe Thread standard 60° thread form for pipe fittings.	F58—F59
	55	Partial profile 55°	—	—	N	General use for 55° thread forms such as Whitworth, BSW, and BSP where non-cresting inserts are desired to cut a variety of pitches.	F60—F61
	W	Whitworth, BSW, BSF, BSP	BS 84:1956, ISO 228/1:1982, DIN 259	Medium Class A	Y	Widely used 55° form for gas and water connections.	F62—F63
	API-RD	API round	API STD. 5B:1979	Standard API RD	Y	60° V-form with large radius for casing, tubing, and line pipe in the oil and gas industry, including 8 and 10 round forms.	F64
	PG	PG	DIN 404B0		Y	80° steel conduit thread.	F65
	RD	Round	DIN 405	7e/7H	Y	Round thread form for tube fittings in the chemical and food industries.	F65—F66
	TR	Trapez	DIN 103	7e/7H	N	30° truncated metric thread form for motion applications.	F67—F68




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

- Reduce cycle times — high speed capability.
- Longer tool life — new multilayer coating provides better wear resistance.

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

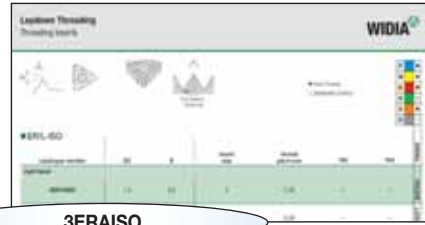
wear resistance ← → toughness

Grade	Coating	Grade Description														
			05	10	15	20	25	30	35	40	45					
TN6025		PVD-TiAlN Nano-multilayer coated carbide. General-purpose machining for steels, stainless steels, cast irons, non-ferrous materials, and difficult-to-machine materials. Recommended at low to medium cutting speeds when higher toughness is required.	<b>P</b>													
			<b>M</b>													
			<b>K</b>													
			<b>N</b>													
			<b>S</b>													
	<b>HC-P25</b>															

**Laydown Threading Thread Form Guide**

- All Laydown Threading inserts are precision ground to provide accurate thread forms and indexing.
- Both cresting and non-cresting partial profile inserts are specifically designed for either external or internal threading operations.
- Cresting inserts provide a fully controlled thread form, including diameter for a given pitch. The need for deburring is eliminated and the inserts are optimised for the best tool life at that pitch.
- Non-cresting partial profile inserts offer the flexibility to cut a variety of thread pitches with one insert.
- Right-hand Laydown Threading toolholders use right-hand inserts. Left-hand Laydown Threading toolholders use left-hand inserts.
- Right-hand Laydown Threading boring bars use right-hand inserts. Left-hand Laydown Threading boring bars use left-hand inserts.

# Laydown Threading Insert Identification System



3ERAISO

<b>3</b>	<b>E</b>	<b>R</b>	<b>A</b>	<b>ISO</b>	
Insert Size	Insert Type	Hand of Insert	Thread Pitch	Thread Profile	Number of Teeth
	<p><b>E</b> – External thread</p> <p><b>I</b> – Internal thread</p>	<p><b>R</b> – Right-hand thread</p> <p><b>L</b> – Left-hand thread</p>			<p>Single tooth profile – No symbol</p> <p>Multi-tooth profile – Number of teeth (cutting edge and symbol)</p> <p>Multi-tooth profile with two teeth – 2M</p>
				<p><b>55</b> Partial Profile 55°</p> <p><b>60</b> Partial Profile 60°</p> <p><b>ISO</b> ISO Metric 60°</p> <p><b>TR</b> ISO Metric 60°</p> <p><b>UN</b> ISO Inch/American UN 60°</p> <p><b>W</b> Whitworth 55°</p> <p><b>NPT</b> American National Pipe Thread 60°</p> <p><b>RD</b> Round</p> <p><b>PG</b> Steel Conduit</p> <p><b>APIRD</b> API Round</p>	

Partial profile inserts

symbol	mm
A	0,5–1,5
AG	0,5–3,0
G	1,7–3,0
N	3,5–5,0
Q	5,5–6,0

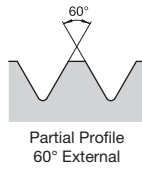
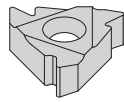
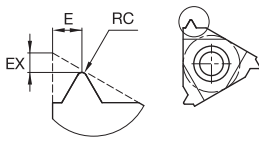
Full profile inserts

symbol	mm
Actual TPI	0,5–0,4

symbol	d	L1
2	0.250	11
3	0.375	16
4	0.500	22
5	0.625	27

		Cutting Speed – vc m/min		
		TN6025		
	Material Group	min	Start	max
P	0/1	130	140	150
	2	110	145	175
	3	110	145	175
	4	75	95	115
	5	100	125	145
	6	40	55	65
M	1	60	75	90
	2	40	50	55
	3	40	50	60
K	1	60	80	90
	2	60	75	85
	3	60	75	90
N	1	600	750	900
	2	535	685	835
	3	230	300	370
	4	135	180	225
	5	70	90	110
	6	445	565	690
	7	550	700	850
S	1	25	35	40
	2	15	20	20
	3	40	60	70
	4	20	30	35





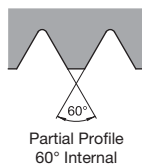
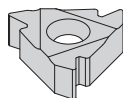
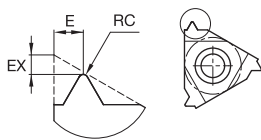
● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-60

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>								
2ERA60	0,05	0,9	0,8	2	0,50-1,5	48-16	—	2007404
3ERA60	0,05	0,8	0,9	3	0,50-1,5	48-16	—	2018214
3ERAG60	0,08	1,2	1,7	3	0,50-3,0	48-8	—	2018246
3ERG60	0,28	1,2	1,7	3	1,75-3,0	14-8	—	2018222
4ERN60	0,53	1,7	2,5	4	3,5-5,0	7-5	—	2018252
5ERQ60	0,64	2,1	3,1	5	5,5-6,0	4,5-4	—	2018256
<b>left hand</b>								
3ELAG60	0,08	1,2	1,7	3	0,50-3,0	48-8	—	2071904
3ELG60	0,28	1,2	1,7	3	1,75-3,0	14-8	—	2018236

Threading



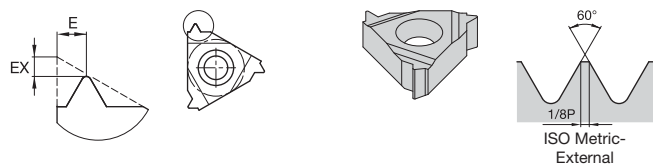
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ IR/L-60

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>								
2IRA60	0,05	0,8	0,9	2	0,50-1,5	48-16	—	2018262
3IRA60	0,05	0,8	0,9	3	0,50-1,5	48-16	—	2018272
3IRAG60	0,05	1,2	1,7	3	0,50-3,0	48-8	—	2018284
3IRG60	0,15	1,2	1,7	3	1,75-3,0	14-8	—	2018278
4IRN60	0,31	1,7	2,5	4	3,5-5,0	7-5	—	2018290
5IRQ60	0,30	1,8	2,7	5	5,5-6,0	4,5-4	—	2018295
<b>left hand</b>								
2ILA60	0,05	0,8	0,9	2	0,50-1,5	48-16	—	2021656
3ILAG60	0,05	1,2	1,7	3	0,50-3,0	48-8	—	2008275
3ILG60	0,15	1,2	1,7	3	1,75-3,0	14-8	—	2007419
4ILN60	0,31	1,7	2,5	4	3,5-5,0	7-5	—	2100489

Threading



● first choice  
○ alternate choice

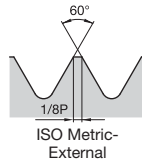
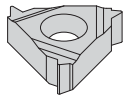
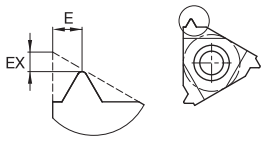
P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-ISO

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							2007542
2ER15ISO	1,0	0,8	2	1,50	—	—	2007542
3ER05ISO	0,6	0,4	3	0,50	—	—	2018377
3ER07ISO	0,6	0,6	3	0,70	—	—	2018389
3ER075ISO	0,6	0,6	3	0,75	—	—	2018395
3ER08ISO	0,6	0,6	3	0,80	—	—	2018403
3ER10ISO	0,7	0,7	3	1,00	—	—	2018411
3ER125ISO	0,8	0,9	3	1,25	—	—	2018421
3ER15ISO	0,8	1,0	3	1,50	—	—	2018429
3ER175ISO	0,9	1,2	3	1,75	—	—	2018445
3ER20ISO	1,0	1,3	3	2,00	—	—	2018460
3ER25ISO	1,1	1,5	3	2,50	—	—	2018472
3ER30ISO	1,2	1,6	3	3,00	—	—	2008256
4ER40ISO	1,6	2,3	4	4,00	—	—	2018501
4ER35ISO	1,6	2,3	4	4,50	—	—	2018495
4ER45ISO	1,7	2,4	4	4,50	—	—	2018508

(continued)

(ER/L-ISO – continued)



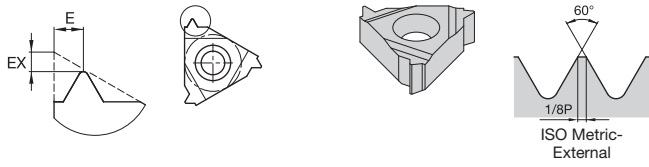
● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
4ER50ISO	1,7	2,5	4	5,00	—	—	2018517
5ER55ISO	2,7	1,9	5	5,50	—	—	2018522
5ER60ISO	2,9	2,0	5	6,00	—	—	2018528
<b>left hand</b>							
2EL05ISO	0,6	0,4	2	0,50	—	—	3118234
2EL06ISO	0,6	0,6	2	0,60	—	—	3118236
2EL07ISO	0,6	0,6	2	0,70	—	—	3118240
2EL075ISO	0,6	0,6	2	0,75	—	—	3118238
2EL08ISO	0,6	0,6	2	0,80	—	—	3118242
2EL10ISO	0,7	0,7	2	1,00	—	—	3118374
2EL125ISO	0,8	0,9	2	1,25	—	—	3118376
2EL15ISO	0,8	1,0	2	1,50	—	—	3118378
2EL175ISO	0,8	1,1	2	1,75	—	—	3118380
3EL035ISO	0,8	0,4	3	0,35	—	—	3122015
3EL04ISO	0,7	0,4	3	0,40	—	—	3122018
3EL045ISO	0,7	0,4	3	0,45	—	—	3122017



(ER/L-ISO – continued)

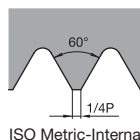
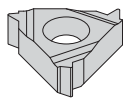
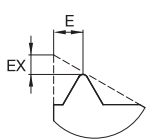


● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

Threading

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TNG025
3EL06ISO	0,6	0,6	3	0,60	—	—	3122021
3EL10ISO	0,7	0,7	3	1,00	—	—	2008187
3EL15ISO	0,8	1,0	3	1,50	—	—	2018435
3EL175ISO	0,9	1,2	3	1,75	—	—	2018447
3EL20ISO	1,3	1,0	3	2,00	—	—	2018466
3EL30ISO	1,2	1,6	3	3,00	—	—	2018489
4EL40ISO	1,6	2,3	4	4,00	—	—	2101539
4EL50ISO	1,7	2,5	4	5,00	—	—	2101597



● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ IR/L-ISO

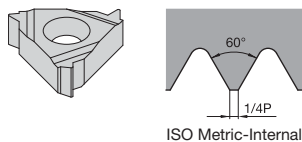
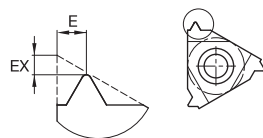
catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>							
2IR075ISO	0,6	0,3	2	0,75	—	—	2007585
2IR10ISO	0,6	0,7	2	1,00	—	—	2007613
2IR125ISO	0,6	0,7	2	1,25	—	—	2007622
2IR15ISO	0,8	1,0	2	1,50	—	—	2018550
2IR175ISO	0,9	1,1	2	1,75	—	—	2018564
3IR05ISO	0,6	0,6	3	0,50	—	—	2018582
3IR075ISO	0,6	0,6	3	0,75	—	—	2018596
3IR10ISO	0,6	0,7	3	1,00	—	—	2018612
3IR125ISO	0,8	0,9	3	1,25	—	—	2018626
3IR15ISO	0,8	1,0	3	1,50	—	—	2018636
3IR175ISO	0,9	1,2	3	1,75	—	—	2018652
3IR20ISO	1,0	1,3	3	2,00	—	—	2018663
3IR25ISO	1,1	1,5	3	2,50	—	—	2018674
3IR30ISO	1,1	1,5	3	3,00	—	—	2018684
4IR35ISO	1,6	2,3	4	3,50	—	—	2018695



Threading

(continued)

(R/L-ISO – continued)



● first choice  
○ alternate choice

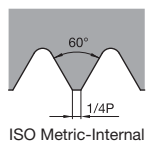
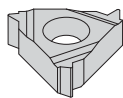
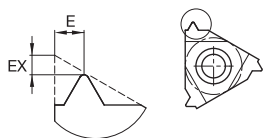
P	●
M	●
K	●
N	○
S	●
H	●

Threading

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
4IR40ISO	1,6	2,3	4	4,00	—	—	2018702
4IR45ISO	1,6	2,4	4	4,50	—	—	2018708
4IR50ISO	1,6	2,3	4	5,00	—	—	2018714
5IR55ISO	1,6	2,3	5	5,50	—	—	2021597
5IR60ISO	1,8	2,5	5	6,00	—	—	2018720
<b>left hand</b>							
2IL035ISO	0,8	0,4	2	0,35	—	—	3118382
2IL04ISO	0,7	0,4	2	0,40	—	—	3118384
2IL05ISO	0,6	0,4	2	0,50	—	—	3118386
2IL06ISO	0,6	0,6	2	0,60	—	—	3118387
2IL07ISO	0,6	0,6	2	0,70	—	—	3118390
2IL075ISO	0,6	0,6	2	0,75	—	—	3118389
2IL08ISO	0,6	0,6	2	0,80	—	—	3118392
2IL125ISO	0,8	0,9	2	1,25	—	—	3123198
2IL15ISO	0,8	1,0	2	1,50	—	—	2018557
2IL20ISO	0,9	1,1	2	2,00	—	—	2071923

(continued)

(R/L-ISO – continued)



● first choice  
○ alternate choice

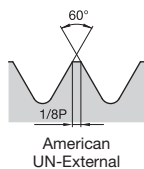
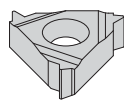
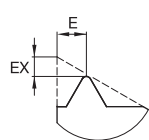
P	●
M	●
K	●
N	○
S	●
H	●

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TNG025
3IL035ISO	0,8	0,3	3	0,35	—	—	3124269
3IL04ISO	0,8	0,4	3	0,40	—	—	3124271
3IL05ISO	0,6	0,4	3	0,50	—	—	3124272
3IL06ISO	0,6	0,6	3	0,60	—	—	3124274
3IL07ISO	0,6	0,6	3	0,70	—	—	3124276
3IL075ISO	0,6	0,6	3	0,75	—	—	2018598
3IL15ISO	0,8	1,0	3	1,50	—	—	2018642
3IL20ISO	1,0	1,3	3	2,00	—	—	2018667
3IL25ISO	1,1	1,5	3	2,50	—	—	2018678
3IL30ISO	1,1	1,5	3	3,00	—	—	2018688
4IL40ISO	1,6	2,3	4	4,00	—	—	2102322
4IL45ISO	1,6	2,4	4	4,50	—	—	2102347
4IL50ISO	1,6	2,3	4	5,00	—	—	2076776
5IL55ISO	1,6	2,3	5	5,50	—	—	2642318
5IL60ISO	1,8	2,5	5	6,00	—	—	2642319



Threading





● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

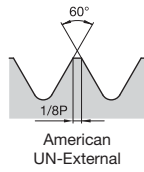
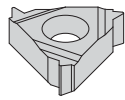
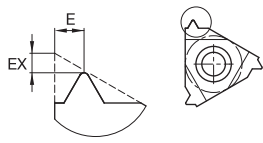
■ ER/L-UN

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							
3ER48UN	0,6	0,6	3	—	48	—	2018736
3ER40UN	0,6	0,6	3	—	40	—	2018744
3ER36UN	0,6	0,6	3	—	36	—	2018748
3ER32UN	0,6	0,6	3	—	32	—	2018752
3ER28UN	0,6	0,7	3	—	28	—	2018756
3ER27UN	0,8	0,7	3	—	27	—	2018760
3ER24UN	0,7	0,8	3	—	24	—	2018766
3ER20UN	0,8	0,9	3	—	20	—	2018772
3ER18UN	0,8	1,0	3	—	18	—	2018778
3ER16UN	0,9	1,1	3	—	16	—	2018782
3ER14UN	1,0	1,2	3	—	14	—	2018790

(continued)

Threading

(ER/L-UN – continued)



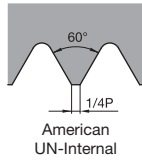
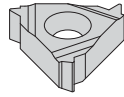
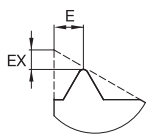
● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
3ER13UN	1,3	1,0	3	—	13	—	2018796
3ER12UN	1,1	1,4	3	—	12	—	2018802
3ER11UN	1,1	1,5	3	—	11	—	2018808
3ER10UN	1,1	1,5	3	—	10	—	2018814
3ER8UN	1,2	1,6	3	—	8	—	2018824
<b>left hand</b>							
3EL13UN	1,0	1,3	3	—	13	—	3122039
3EL12UN	1,1	1,4	3	—	12	—	2192607
3EL11UN	1,1	1,5	3	—	11	—	3122032
3EL10UN	1,1	1,5	3	—	10	—	3122028



Threading



● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

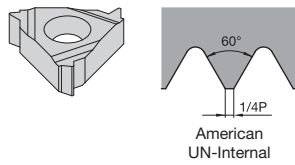
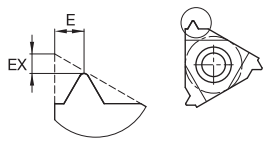
■ IR/L-UN

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							
2IR32UN	0,6	0,6	2	—	32	—	2018860
3IR32UN	0,6	0,6	3	—	32	—	2018918
3IR28UN	0,6	0,7	3	—	28	—	2018922
3IR24UN	0,7	0,8	3	—	24	—	2018932
3IR20UN	0,8	0,9	3	—	20	—	2018938
2IR20UN	0,8	0,9	2	—	20	—	2018876
3IR18UN	0,8	1,0	3	—	18	—	2018944
2IR18UN	0,8	1,0	2	—	18	—	2018882
3IR16UN	0,9	1,1	3	—	16	—	2018950
2IR16UN	0,9	1,1	2	—	16	—	2018886
3IR14UN	0,9	1,2	3	—	14	—	2018955

(continued)

Threading

(IR/L-UN – continued)

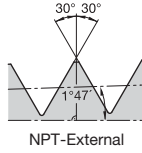
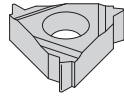
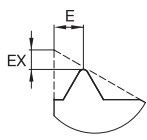


- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
3IR12UN	1,1	1,4	3	—	12	—	2018966
3IR10UN	1,1	1,5	3	—	10	—	2018979
3IR8UN	1,1	1,5	3	—	8	—	2018990
<b>left hand</b>							
3IL64UN	0,8	0,4	3	—	64	—	3122416
3IL56UN	0,7	0,4	3	—	56	—	3122414
2IL32UN	0,6	0,6	2	—	32	—	2102653
3IL12UN	1,1	1,4	3	—	12	—	2102749
3IL9UN	1,2	1,7	3	—	9	—	3122446
3IL8UN	1,1	1,5	3	—	8	—	3122444





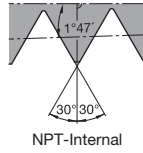
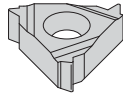
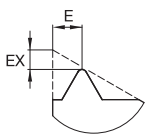
● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-NPT

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							
3ER115NPT	1,1	1,5	3	—	11.5	.7500	2019298
3ER14NPT	0,9	1,2	3	—	14	.7500	2019288
3ER18NPT	0,8	1,0	3	—	18	.7500	2019278
3ER8NPT	1,3	1,8	3	—	8	.7500	2019305

Threading



- first choice
- alternate choice

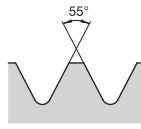
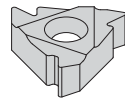
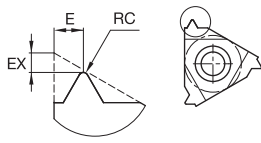
P	●
M	●
K	●
N	○
S	●
H	●

■ IR/L-NPT

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							
3IR115NPT	1,1	1,5	3	—	11.5	.7500	2019335
3IR14NPT	0,9	1,2	3	—	14	.7500	2019329
3IR18NPT	0,8	1,0	3	—	18	.7500	2019323
3IR8NPT	1,3	1,8	3	—	8	.7500	2019339



Threading



Partial Profile  
55° External

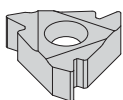
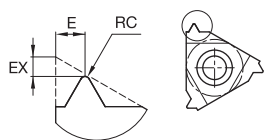
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-55

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>								
3ERA55	0,05	0,8	0,9	3	0,50-1,5	48-16	—	2018301
3ERAG55	0,08	1,2	1,7	3	0,50-3,0	48-8	—	2018314
3ERG55	0,20	1,2	1,7	3	1,75-3,0	14-8	—	2018308
4ERN55	0,43	1,7	2,5	4	3,5-5,0	7-5	—	2018320
<b>left hand</b>								
3ELG55	0,20	1,2	1,7	3	1,75-3,0	14-8	—	2008190

Threading



Partial Profile  
55° Internal

- first choice
- alternate choice

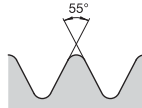
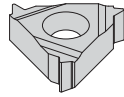
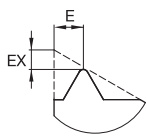
P	●
M	●
K	●
N	○
S	●
H	●

### IR/L-55

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>								
2IRA55	0,05	0,8	0,9	2	0,50-1,5	48-16	—	2018328
3IRA55	0,05	0,8	0,9	3	0,50-1,5	48-16	—	2018334
3IRAG55	0,07	1,2	1,7	3	0,50-3,0	48-8	—	2018346
3IRG55	0,21	1,2	1,7	3	1,75-3,0	14-8	—	2018340
4IRN55	0,43	1,7	2,5	4	3,5-5,0	7-5	—	2018354
<b>left hand</b>								
3ILA55	0,05	0,8	0,9	3	0,50-1,5	48-16	—	3122449
3ILAG55	0,07	1,2	1,7	3	0,50-3,0	48-8	—	2018348

Threading





Whitworth BSW,  
BSF, BSP-External

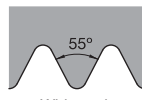
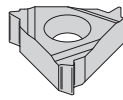
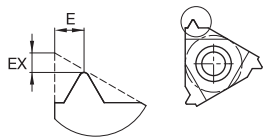
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-W

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>							
3ER32W	0,6	0,6	3	—	32	—	2019023
3ER28W	0,6	0,7	3	—	28	—	2019029
3ER19W	0,8	1,0	3	—	19	—	2019055
3ER18W	0,8	1,0	3	—	18	—	2021677
3ER16W	0,9	1,1	3	—	16	—	2019061
3ER14W	1,0	1,2	3	—	14	—	2019071
3ER12W	1,1	1,4	3	—	12	—	2019077
3ER11W	1,1	1,5	3	—	11	—	2019083
3ER10W	1,1	1,5	3	—	10	—	2019089
3ER8W	1,2	1,5	3	—	8	—	2019101
4ER6W	1,6	2,3	4	—	6	—	2021725
<b>left hand</b>							
3EL11W	1,1	1,5	3	—	11	—	2065289
3EL8W	1,2	1,5	3	—	8	—	2103046

Threading



Whitworth  
BSW, BSF,  
BSP-Internal

- first choice
- alternate choice

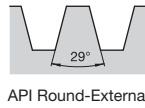
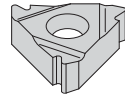
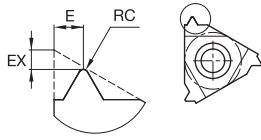
P	●
M	●
K	●
N	○
S	●
H	●

■ IR/L-W

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>							
2IR19W	0,8	1,0	2	—	19	—	2019121
2IR14W	0,9	1,1	2	—	14	—	2019136
3IR19W	0,8	0,9	3	—	19	—	2019172
3IR16W	0,9	1,1	3	—	16	—	2019178
3IR14W	1,0	1,2	3	—	14	—	2019189
3IR12W	1,1	1,4	3	—	12	—	2019195
3IR11W	1,1	1,5	3	—	11	—	2019205
3IR8W	1,2	1,5	3	—	8	—	2019224
4IR6W	1,6	2,3	4	—	6	—	2019234



Threading



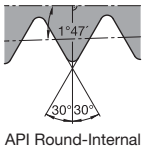
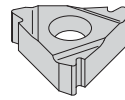
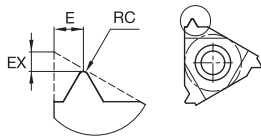
● first choice  
○ alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ ER-APIRD

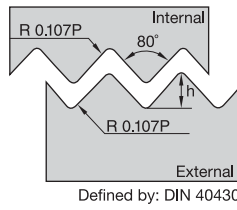
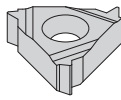
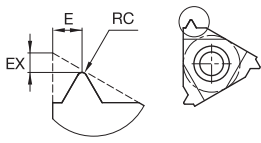
catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								
3ER10APIRD	0,34	1,2	1,4	3	—	10	.750	2019608

Threading



■ IR-APIRD

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								
3IR10APIRD	0,34	1,2	1,4	3	—	10	.750	2019618
3IR8APIRD	0,40	1,3	1,5	3	—	8	.750	2019622

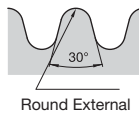
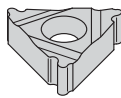
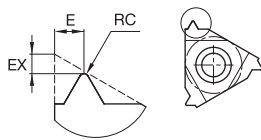


● first choice  
○ alternate choice

P	<input checked="" type="checkbox"/>
M	<input checked="" type="checkbox"/>
K	<input checked="" type="checkbox"/>
N	<input type="checkbox"/>
S	<input checked="" type="checkbox"/>
H	<input type="checkbox"/>

■ IR-PG

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								
3IR16PG	0,11	1,1	0,8	3	—	16	—	2019441

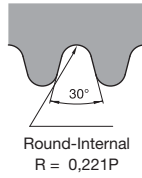
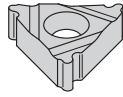
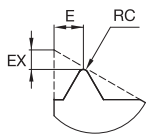


■ ER/L-RD

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								
3ER8RD	0,76	1,4	1,3	3	—	8	—	2019347
4ER6RD	1,01	1,5	1,7	4	—	6	—	2019359
left hand								
3EL8RD	0,76	1,4	1,3	3	—	8	—	2071943



Threading



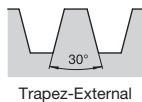
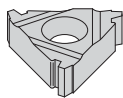
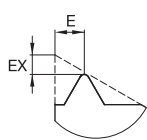
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ IR/L-RD

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>								
3IR10RD	0,70	1,1	1,2	3	—	10	—	2019375
3IR8RD	0,70	1,4	1,4	3	—	8	—	2019381
4IR6RD	0,93	1,5	1,7	4	—	6	—	2019394
4IR4RD	1,40	2,3	2,2	4	—	4	—	2019400
<b>left hand</b>								
3IL8RD	0,06	1,4	1,4	3	—	8	—	3122422

Threading



- first choice
- alternate choice

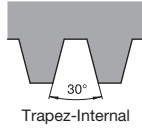
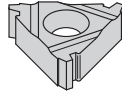
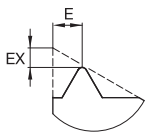
P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-TR

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
<b>right hand</b>							
3ER2TR	1,1	1,3	3	2,00	—	—	2019453
3ER3TR	1,3	1,5	3	3,00	—	—	2019461
4ER4TR	1,7	1,9	4	4,00	—	—	2019469
4ER5TR	2,1	2,5	4	5,00	—	—	2019479
5ER6TR	2,3	2,7	5	6,00	—	—	2019487
<b>left hand</b>							
3EL3TR	1,3	1,5	3	3,00	—	—	2019463
4EL4TR	1,7	1,9	4	4,00	—	—	2019471



Threading



● first choice  
○ alternate choice

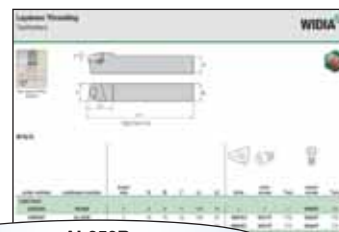
P	●
M	●
K	●
N	○
S	●
H	●

■ IR/L-TR

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							
3IR3TR	1,3	1,5	3	3,00	—	—	2019511
4IR4TR	1,7	1,9	4	4,00	—	—	2019520
4IR5TR	2,1	2,5	4	5,00	—	—	2019528
5IR6TR	2,3	2,7	5	6,00	—	—	2019534

Threading

**Laydown Threading**  
**Toolholder Identification System**



AL253R

**A**

Toolholder  
Construction

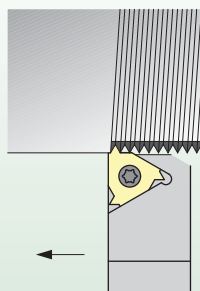
**A** –  
Shim required

**N** –  
Without shim

**L**

Tool Type

**L** – External Thread



**25**

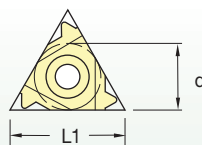
Shank Size

Toolholders

- First two numbers are shank height in mm.

**3**

Insert  
Size



symbol	d	L1
2	6,35	11
3	9,52	16
4	12,7	22
5	15,88	27

**R**

Hand of  
Tool

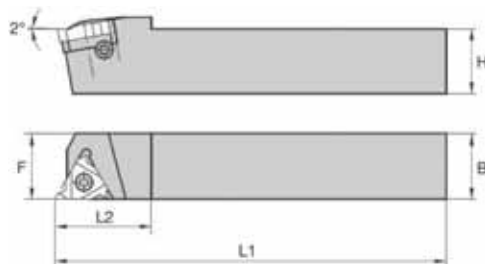
**RH** –  
Thread symbol R

**LH** –  
Thread symbol L

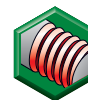




See page F42 for inserts.

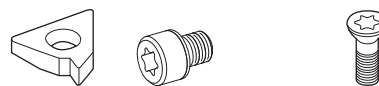


Right Hand Tool

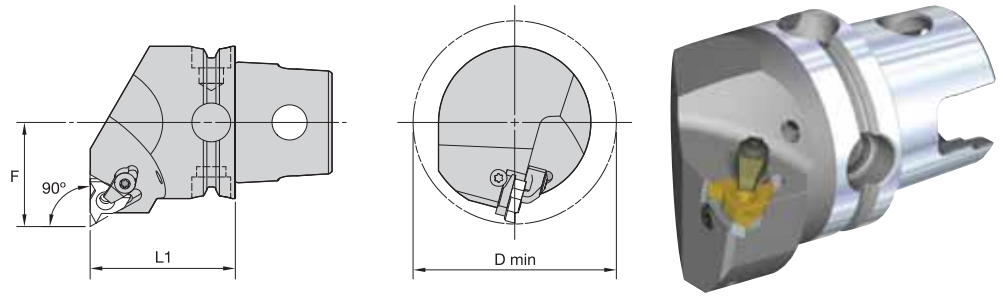


■ N/A

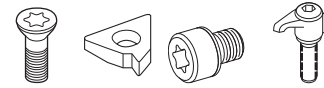
Threading



order number	catalogue number	insert size	H	B	F	L1	L2	shim	shim screw	Torx	insert screw	Torx
<b>right hand</b>												
2022340	NL82R	2	8	8	11	136	18	—	—	—	SSN2T	T8
2009587	AL163R	3	16	16	16	100	25	SMYE3	SSY3T	T10	SSA3T	T10
2009591	AL203R	3	20	20	20	128	30	SMYE3	SSY3T	T10	SSA3T	T10
2009594	AL253R	3	25	25	25	153	30	SMYE3	SSY3T	T10	SSA3T	T10
2009597	AL254R	4	25	25	25	155	36	SMYE4	SSY4T	T20	SSA4T	T20
2009600	AL323R	3	32	32	32	173	30	SMYE3	SSY3T	T10	SSA3T	T10
2009603	AL324R	4	32	32	32	175	36	SMYE4	SSY4T	T20	SSA4T	T20
2022589	AL325R	5	32	32	32	176	40	SMYE5	SSY5T	T25	SSA5T	T25
2016118	AL404R	4	40	40	40	205	36	SMYE4	SSY4T	T20	SSA4T	T20
2016122	AL405R	5	40	40	40	206	40	SMYE5	SSY5T	T25	SSA5T	T25
<b>left hand</b>												
2071294	AL163L	3	16	16	16	100	25	SMYI3	SSY3T	T10	SSA3T	T10
2071295	AL203L	3	20	20	20	125	30	SMYI3	SSY3T	T10	SSA3T	T10
2114772	AL254L	4	25	25	25	150	36	SMYI4	SSY4T	T20	SSA4T	T20

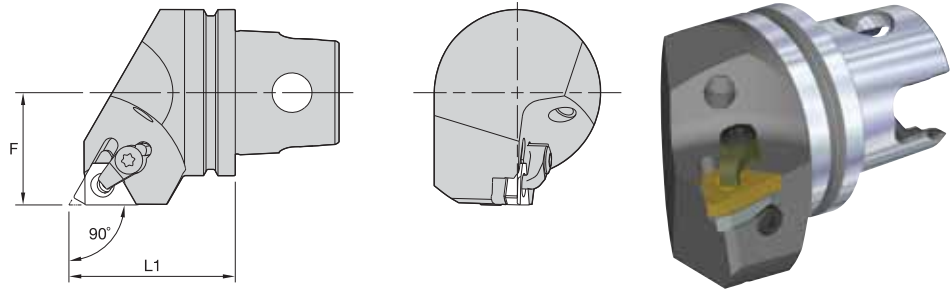


■ LSE-N 90° • Internal Only



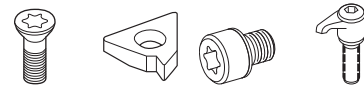
order number	catalogue number	L1		F		D min		gage insert	insert screw	shim	shim screw	clamp assembly	kg	lbs
		mm	in	mm	in	mm	in							
<b>right hand</b>														
3950832	KM40TSLSER16N	40	1.575	27	1.063	54	2.126	LT16NR	SSA3T	SMYI3	SSY3T	CKC3	0,35	.77
3950854	KM40TSLSER22N	40	1.575	27	1.063	54	2.126	LT22NR	SSA4T	SMYI4	SSY4T	CKC4	0,35	.77
3959399	KM40TSLSER27N	45	1.772	27	1.063	54	2.126	LT27NR	SSA5T	SMYI5	SSY5T	CKC5	0,39	.86
<b>left hand</b>														
3950831	KM40TSLSEL16N	40	1.575	27	1.063	54	2.126	LT16NL	SSA3T	SMYE3	SSY3T	CKC3	0,35	.77
3950853	KM40TSLSEL22N	40	1.575	27	1.063	54	2.126	LT22NL	SSA4T	SMYE4	SSY4T	CKC4	0,35	.77
3959398	KM40TSLSEL27N	45	1.772	27	1.063	54	2.126	LT27NL	SSA5T	SMYE5	SSY5T	CKC5	0,39	.86

NOTE: Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.



■ LSS 90°

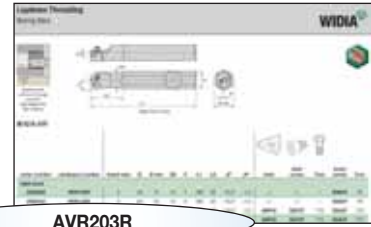
Threading



order number	catalogue number	L1		F		gage insert	insert screw	shim	shim screw	clamp assembly	kg	lbs
		mm	in	mm	in							
<b>right hand</b>												
3950857	KM40TSLSSR16	40	1.575	27	1.063	LT16ER	SSA3T	SMYE3	SSY3T	CKC3	0,31	.68
3950858	KM40TSLSSR22	40	1.575	27	1.063	LT22ER	SSA4T	SMYE4	SSY4T	CKC4	0,30	.66
3959401	KM40TSLSSR27	45	1.772	27	1.063	LT27ER	SSA5T	SMYE5	SSY5T	CKC5	0,37	.82
<b>left hand</b>												
3950855	KM40TSLSSL16	40	1.575	27	1.063	LT16EL	SSA3T	SMYI3	SSY3T	CKC3	0,32	.70
3950856	KM40TSLSSL22	40	1.575	27	1.063	LT22EL	SSA4T	SMYI4	SSY4T	CKC4	0,31	.68
3959400	KM40TSLSSL27	45	1.772	27	1.063	LT27EL	SSA5T	SMYI5	SSY5T	CKC5	0,37	.82

NOTE: Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.

**Laydown Threading**  
**Boring Bar Identification System**



AVR203R

**A**

Shim Requirement

**A** – Shim required

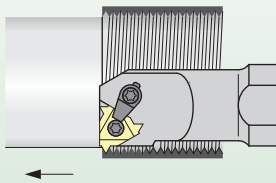
**N** – No shim required

**O** – Miniature holder

**VR**

Tool Type

**VR** – Internal round shank



Coolant Capability

**C** – With coolant

**20**

Shank Head Diameter

10, 12, 13, 16, 20, 25, 32, 40, 50

6.2 (Mini adjust)

8.0 (Mini adjust)

**3**

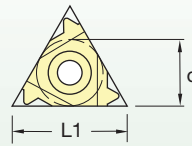
Insert Size

**R**

Hand of Tool

**RH** – Thread symbol R

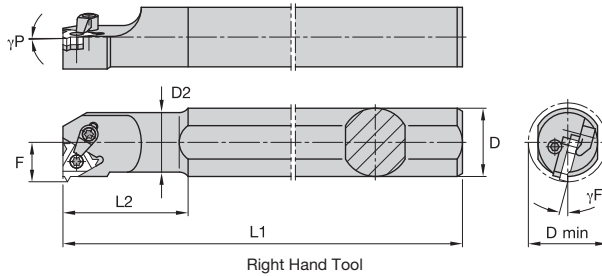
**LH** – Thread symbol L



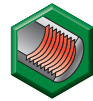
symbol	d	L1
2	6,35	11
3	9,52	16
4	12,7	22
5	15,88	27



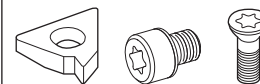
Steel shank without through coolant.  
See page F42 for inserts.



Right Hand Tool



### ■ N/A-VR



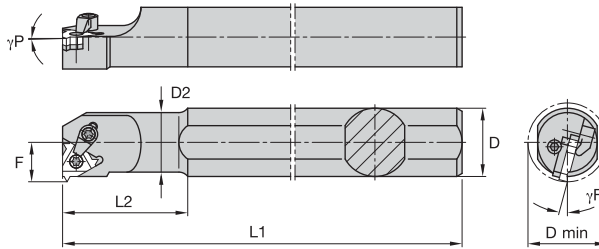
Threading

order number	catalogue number	insert size	D	D min	D2	F	L1	L2	$\gamma_F^\circ$	$\gamma_P^\circ$	shim	shim screw	Torx	insert screw	Torx
<b>right hand</b>															
2025828	NVR102R	2	20	13	10	7	180	25	-15,0°	-1,5	—	—	—	SSN2T	T8
2022342	NVR132R	2	20	16	13	9	180	32	-15,0°	-1,5	—	—	—	SSN2T	T8
2012307	NVR163R	3	20	20	16	12	180	40	-15,0°	-1,5	SMYI3	SSY3T	T10	SSA3T	T10
2009609	AVR203R	3	20	24	20	13	180	50	-15,0°	-1,5	SMYI3	SSY3T	T10	SSA3T	T10
2022343	NVR204R	4	20	27	20	16	180	50	-15,0°	-1,5	SMYI4	SSY4T	T20	SSA4T	T20
2009628	AVR25D3R	3	25	29	25	16	200	45	-15,0°	-1,5	SMYI3	SSY3T	T10	SSA3T	T10
2009631	AVR25D4R	4	25	32	25	17	200	45	-15,0°	-1,5	SMYI4	SSY4T	T20	SSA4T	T20
2009612	AVR253R	3	32	29	25	16	250	60	-15,0°	-1,5	SMYI3	SSY3T	T10	SSA3T	T10
2009625	AVR254R	4	32	32	25	17	250	60	-15,0°	-1,5	SMYI4	SSY4T	T20	SSA4T	T20
2009640	AVR32D3R	3	32	36	32	20	250	60	-15,0°	-1,5	SMYI3	SSY3T	T10	SSA3T	T10
2009634	AVR324R	4	32	39	32	22	250	60	-15,0°	-1,5	SMYI4	SSY4T	T20	SSA4T	T20
2009637	AVR325R	5	32	40	32	22	250	60	-15,0°	-1,5	SMYI5	SSY5T	T25	SSA5T	T25
2009643	AVR403R	3	40	44	40	24	300	60	-15,0°	-1,5	SMYI3	SSY3T	T10	SSA3T	T10
2009646	AVR405R	5	40	48	40	26	300	60	-15,0°	-1,5	SMYI5	SSY5T	T25	SSA5T	T25
2009649	AVR505R	5	50	58	50	31	350	75	-15,0°	-1,5	SMYI5	SSY5T	T25	SSA5T	T25
<b>left hand</b>															
2071317	NVR163L	3	20	20	16	12	180	40	-15,0°	-1,5	SMYE3	SSY3T	—	SSA3T	T10
2071318	AVR203L	3	20	24	20	13	180	40	-15,0°	-1,5	SMYE3	SSY3T	T10	SSA3T	T10
2065134	AVR25D3L	3	25	29	25	16	200	45	-15,0°	-1,5	SMYE3	SSY3T	T10	SSA3T	T10
2065135	AVR25D4L	4	25	32	25	17	200	45	-15,0°	-1,5	SMYE4	SSY4T	T20	SSA4T	T20
2114832	AVR253L	3	32	29	25	16	250	60	-15,0°	-1,5	SMYE3	SSY3T	T10	SSA3T	T10

NOTE: Items listed without a shim are designed for a 1,5° inclination angle.



See page F42 for inserts.

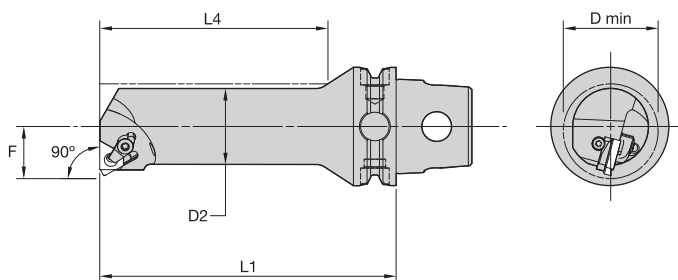


■ OVR



order number	catalogue number	insert size	D	D min	D2	F	L1	L2	$\gamma_F^\circ$	$\gamma_P^\circ$	screw	Torx driver	Torx
<b>right hand</b>													
2012325	OVR122R	2	12	13	10	7	100	25	-15,0°	-0,5	12147789100	12148001100	T8
2022345	OVR152R	2	15	16	13	9	100	32	-15,0°	-0,5	12147789100	12148001100	T8

NOTE: WIDIA™ miniature holders are for use on automatic machines as used in the optical and precision mechanics industries. The shank dimensions correspond to conventional hardmetal or HSS tools. Holders with round or square shanks are available. An internal RH tool can also be used for external LH threads in the same way an internal LH tool can be used for external RH threads. Please use correct inserts. The inclination angle on this tool is 0,5°. Tools are always clamped with the shank parallel to the part.



■ LSE 90°





Threading

order number	catalogue number	D min		D 2		F		L4		L1		gage insert	kg	lbs
		mm	in	mm	in	mm	in	mm	in	mm	in			
<b>right hand</b>														
3955464	KM40TSS10DLSER11	13	.51	10	.39	7	.276	35	1.38	60	2.362	LT11NR	0,22	.49
3955466	KM40TSS12ELSER11	16	.63	12	.47	9	.354	42	1.66	70	2.756	LT11NR	0,25	.56
3955468	KM40TSS16FLSER16	20	.79	16	.63	11	.433	56	2.21	80	3.150	LT16NR	0,28	.61
3955470	KM40TSS20GLSER16	25	.98	20	.79	13	.512	70	2.76	90	3.543	LT16NR	0,34	.75
3955472	KM40TSS25HLSER16	32	1.26	25	.98	17	.669	75	2.95	100	3.937	LT16NR	0,50	1.11
3955474	KM40TSS32JLSER16	40	1.57	32	1.26	22	.866	96	3.78	110	4.331	LT16NR	0,72	1.58
3955476	KM40TSS32JLSER22	40	1.57	32	1.26	22	.866	96	3.78	110	4.331	LT22NR	0,71	1.56
<b>left hand</b>														
3955463	KM40TSS10DLSSEL11	13	.51	10	.39	7	.276	35	1.38	60	2.362	LT11NL	0,22	.49
3955465	KM40TSS12ELSEL11	16	.63	12	.47	9	.354	42	1.65	70	2.756	LT11NL	0,25	.55
3955467	KM40TSS16FLSEL16	20	.79	16	.63	11	.433	56	2.21	80	3.150	LT16NL	0,28	.61
3955469	KM40TSS20GLSEL16	25	.98	20	.79	13	.512	70	2.76	90	3.543	LT16NL	0,34	.75
3955471	KM40TSS25HLSSEL16	32	1.26	25	.98	17	.669	75	2.95	100	3.937	LT16NL	0,50	1.11
3955473	KM40TSS32JLSEL16	40	1.57	32	1.26	22	.866	96	3.78	110	4.331	LT16NL	0,72	1.58
3955475	KM40TSS32JLSEL22	40	1.57	32	1.26	22	.866	96	3.78	110	4.331	LT22NL	0,71	1.56

(continued)

(LSE 90° – continued)

■ Spare Parts

				
catalogue number	insert screw	shim	shim screw	clamp assembly
<b>right hand</b>				
KM40TSS10DLSER11	SSN2T	–	–	–
KM40TSS12ELSER11	SSN2T	–	–	–
KM40TSS16FLSER16	SN3TPKG	–	–	–
KM40TSS20GLSER16	SSA3T	SMYI3	SSY3T	CKC3
KM40TSS25HLSER16	SSA3T	SMYI3	SSY3T	CKC3
KM40TSS32JLSER16	SSA3T	SMYI3	SSY3T	CKC3
KM40TSS32JLSER22	SSA4T	SMYI4	SSY4T	CKC4
<b>left hand</b>				
KM40TSS10DLSEL11	SSN2T	–	–	–
KM40TSS12ELSEL11	SSN2T	–	–	–
KM40TSS16FLSEL16	SN3TPKG	–	–	–
KM40TSS20GLSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS25HSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS32JLSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS32JLSEL22	SSA4T	SMYE4	SSY4T	CKC4



Threading

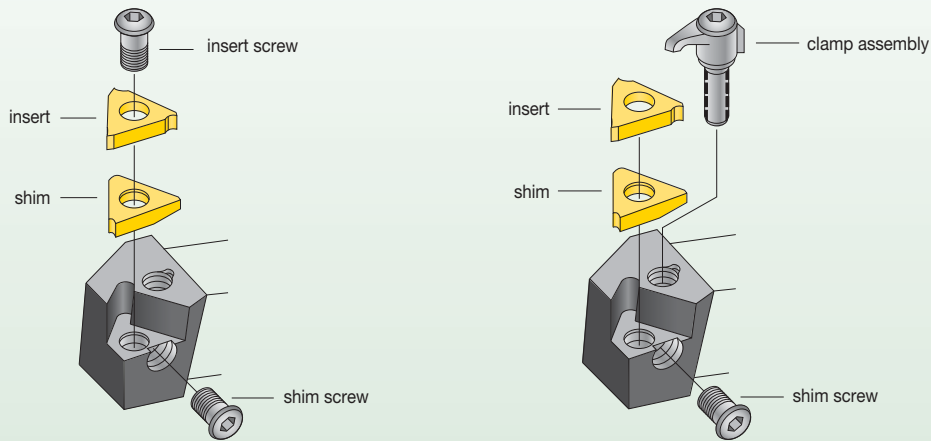
NOTE: Items listed without a shim are designed for a 1,5° inclination angle.  
Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.



### Laydown Threading Toolholders

In all cases, the proper shim selection is important.

WIDIA™ toolholders are supplied with a shim for a 1,5° lead angle. Change the shim if your thread is more than 1° different. For more details on proper shim selections, see pages F100-F101.



insert size and screw		insert screw	shim	shim screw and washer	clamp assembly
3ER		S-SA3T	SM-YIE3	S-SY3T	CK-C3
3EL		S-SA3T	SM-YI3	S-SY3T	CK-C3
4ER		S-SA4T	SM-YIE4	S-SY4T	CK-C4
4EL		S-SA4T	SM-YI4	S-SY4T	CK-C4
Laydown Threading boring bars					
2IR		S-SN2T	—	—	—
2IL		S-SN2T	—	—	—
3IR		S-SA3T	SM-YI3	S-SY3T	CK-C3
3IL		S-SA3T	SM-YIE3	S-SY3T	CK-C3
4IR		S-SA4T	SM-YI4	S-SY4T	CK-C4
4IL		S-SA4T	SM-YIE4	S-SY4T	CK-C4

**SM**

Shim

—

**Y**

Y-shim for Laydown standard inserts

**E**

**E** — External  
**I** — Internal

**3**

iC — 16mm

—

**2N**

Shim Angle

2P	2° positive
1P	1° positive
—	0°
1N	1° negative
2N	2° negative
3N	3° negative

resultant angle		3.5°	2.5°	1.5°	0.5°	-0.5°	-1.5°
insert size (iC)	toolholder	shim ordering code					
16mm	ex. RH/in. LH ex. LH/in. RH	SM-YE3-2P SM-YI3-2P	SM-YE3-1P SM-YI3-1P	SM-YE3 SM-YI3	SM-YE3-1N SM-YI3-1N	SM-YE3-2N SM-YI3-2N	SM-YE3-3N SM-YI3-3N
22mm	ex. RH/in. LH ex. LH/in. RH	SM-YE4-2P SM-YI4-2P	SM-YE4-1P SM-YI4-1P	SM-YE4 SM-YI4	SM-YE4-1N SM-YI4-1N	SM-YE4-2N SM-YI4-2N	SM-YE4-3N SM-YI4-3N

### Slanted Shim Kit

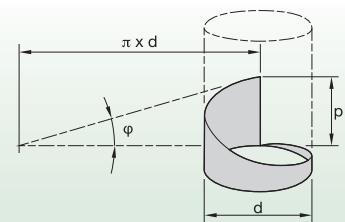
Because you might occasionally need different shims than those supplied with our standard toolholders, we strongly recommend that shim kits be readily available in every tool shop.

insert size	shim size (D)	ordering code	contains slanted shims
3x	16mm	ABY3	SM-YE3-2P, 1P, 1N, 2N, 3N SM-YI3-2P, 1P, 1N, 2N, 3N
4x	22mm	ABY4	SM-YE4-2P, 1P, 1N, 2N, 3N SM-YI4-2P, 1P, 1N, 2N, 3N

### The Helix Angle

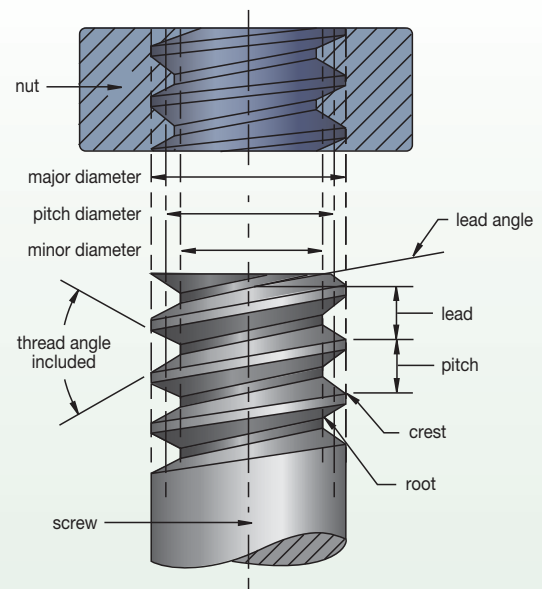
Example:  
 d = 48,06mm (1.892")  
 p = 3,175mm (.125")  
 $\phi$  = Helix angle  
 p = pitch  
 d = pitch diameter

$$\phi = \arctan \left( \frac{p * \text{starts}}{\pi * \varnothing} \right) = 1.13^\circ$$



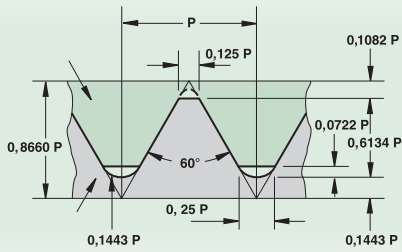
### Screw Thread Definitions

1. Major diameter — The largest diameter of a straight screw thread. This applies to both internal and external threads.
2. Pitch diameter — On a straight thread, it is the diameter which passes through the thread profiles at such points which make the thread width of the groove equal to one-half of the basic pitch. On a “perfect thread,” this occurs at the point where the widths of the thread and groove are equal.
3. Thread angle (included) — The included angle between the individual flanks of the thread form.
4. Minor diameter — The smallest diameter of a straight screw thread. This applies to both internal and external threads.
5. Lead angle — On a straight thread, the lead angle is the angle created by the helix of the thread at the pitch diameter with a plane perpendicular to the axis.
6. Lead — The distance a screw thread advances axially in one revolution. On a single start, the pitch and lead are identical. The lead is equal to the pitch times the number of starts.
7. Pitch — The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the thread axis.
8. Crest — The outer most surface of the thread form which joins the flanks.
9. Root — The inner most surface of the thread form which joins the flanks.



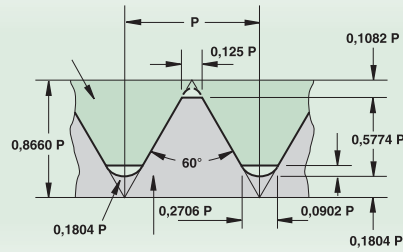
NOTE: Threads per inch (TPI) not shown:  
 The number of threads per inch measured axially.  
 The terms pitch and TPI are often used interchangeably. TPI = 1/pitch

**ISO M (Metric) and UN (Unified National)**



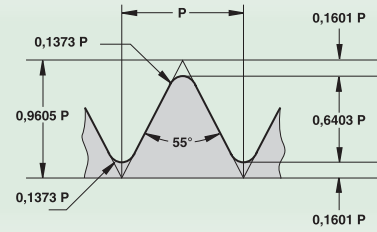
Use: All branches of mechanical industry.

**UNJ (controlled root radius)**



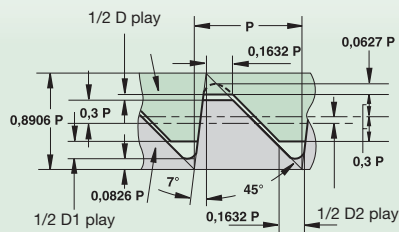
Use: Aircraft and space industry.

**Whitworth (BSW)**



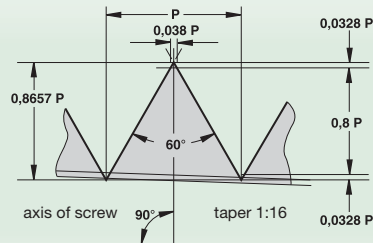
Use: Fittings and pipe couplings for gas, water, and sewer lines (replaced by ISO).

**American Buttress**



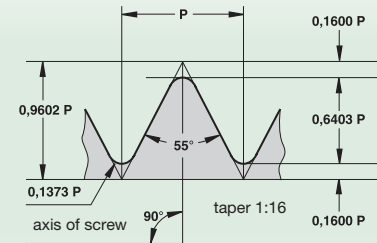
Use: Fittings and pipe couplings.

**NPT (American National Pipe Thread)**



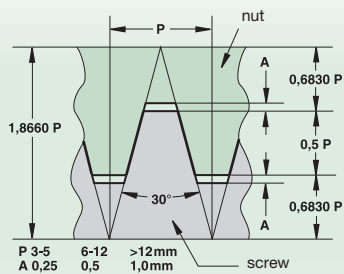
Use: Fittings and pipe couplings.

**BSPT (British Standard Pipe Thread)**



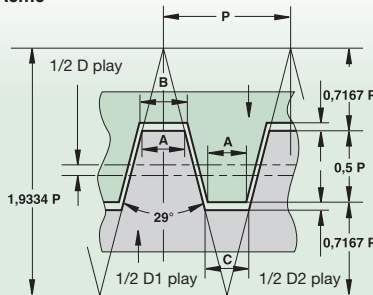
Use: Pipe thread for steam, gas, and water lines.

**TR DIN 103**



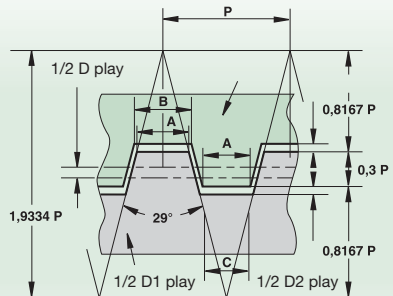
Use: Mechanical industry for motion transmission screws.

**Acme**



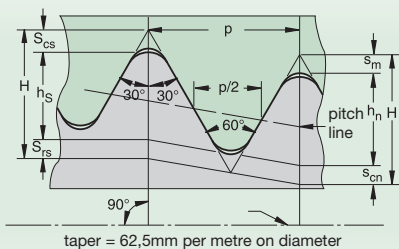
A = 0,0307 P  
B = 0,3707 P - x D play  
C = 0,3707 P - (D1 play - D2 play)  
Use: Acme-General is used in mechanical industry for motion transmission screws.

**Acme, truncated (Stub)**



A = 0,4224 P  
B = 0,4224 P - x D play  
C = 0,4224 P - (D1 play - D2 play)  
Use: Where normal Acme is too deep.

**API Casing and Tubing Round Thread Form**






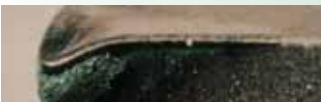



NOTE: Taper shown exaggerated.

**Suggested Grades and Speeds for Threading**  
**Various Workpiece Materials**

workpiece group	workpiece material	recommended surface speed – SFM		
		uncoated	PVD coated	
		THM	TN6010	TN6025
free-machining carbon steel	10L18, 10L45, 1213, 12L13, 12L14, 1140, 1141, 11L44, 1151, 10L50	–	91–98	45–198
plain carbon steel	10063, 1008, 1010, 1015, 1018, 1020, 1025, 1026, 1108, 1117	–	76–198	45–175
alloy steels/tool steels 150–325 HB (up to 35 HRC)	1042, 1045, 1070, 1080, 1085, 1090, 1095, 1541, 1561, 1572, 5140, 8620, W1, O1, S1, P20, H13, D2, A6, H13, L6	–	76–198	38–167
alloy steels/tool steels 330–450 HB (36–47 HRC)		–	61–160	–
martensitic/ferritic stainless/precipitation hardening	416, 420F, 440F, 405, 409, 429, 430, 434, 436, 442, PH	–	45–160	30–120
austenitic stainless steel	201, 202, 301, 302, 303, 304, 304, 305, 321, 347, 348, 310, 314, 316, 316L, 330	61–106	61–198	46–137
grey cast iron 135–270 HB	class 20, 30, 35, 45	61–91	61–237	46–122
grey cast iron 275–450 HB	class 50, 55, 60	45–76	45–175	15–76
alloy/ductile iron	A536, J434C, 60-40-18, 80-55-06, 100-70-03	45–76	45–650	100–525
free-machining aluminium alloys	2024-T4, 2014-T6, 6061-T6, 2011-T3, 3003-H18, A2, Alcan, Alcoa 510, Duralumin	122–244	122–265	–
high-silicon aluminium alloys	A380, A390, A380-1, A390-1, A380-2	–	–	–
copper/zinc/brass		76–183	76–304	46–236
non-metallics	Graphite, Nylon, Plastics, Rubbers, Phenolics, Carbon	122–457	122–396	46–305
high-temperature alloys 125–269 HB (up to 27 HRC)	Nickel 200, Monel, R405, Monel K500, INCONEL 600, INCONEL® 625/901x750/718, Waspaloy, Hastelloy C	24–37	24–122	13–76
high-temperature alloys 260–450 HB (26–47 HRC)	Rene 95, Waspaloy A286, Incoloy 800, Haynes 188, Stellite F, Haynes 25	24–30	30–76	6–61
titanium alloys	Ti-6Al-4V, Ti-5Al-2.5Sn	34–55	34–99	–

NOTE: When workpiece hardness levels are at the top of a range, starting m/min should be at the lower end. Regularly inspect insert clamps for worn flats.

Edge preparation:  
 Uncoated – sharp  
 PVD coated – light hone except positive top rake, top rake-sharp

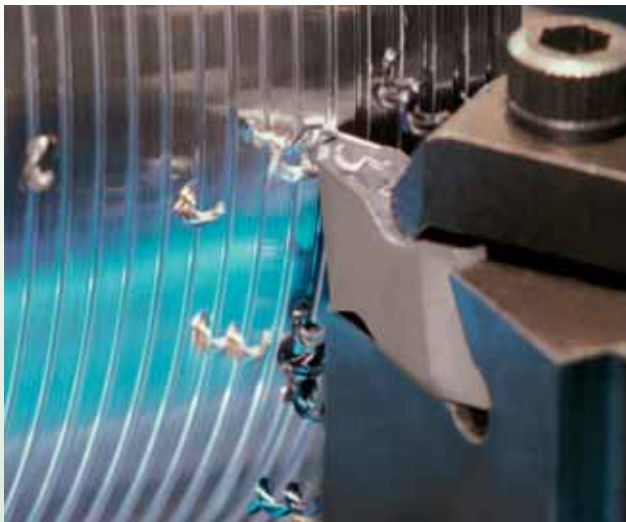
problem	cause	possible solution
<p>thread with torn finish</p> 	<ul style="list-style-type: none"> <li>• Burs.</li> <li>• Torn finish.</li> <li>• Steps.</li> <li>• Improper shim.</li> <li>• Improper infeed.</li> </ul>	<ul style="list-style-type: none"> <li>• Use modified flank infeed.</li> <li>• Use full profile insert.</li> <li>• Increase coolant concentration.</li> <li>• Increases m/min.</li> <li>• Check machine "Z" travel axis.</li> <li>• Check insert form.</li> <li>• Check for correct shim in LT system.</li> <li>• Calculate flank clearance.</li> </ul>
<p>chatter</p> 	<ul style="list-style-type: none"> <li>• Poor rigidity.</li> <li>• Insert movement.</li> <li>• Improper infeed.</li> <li>• Off centreline.</li> </ul>	<ul style="list-style-type: none"> <li>• Use modified flank infeed.</li> <li>• Minimise tool overhang.</li> <li>• Check for workpiece deflection.</li> <li>• Check insert and clamp.</li> <li>• Verify that tool cutting position is at workpiece centreline.</li> <li>• Adjust number of passes. Fewer passes reduce chatter.</li> </ul>
<p>built-up edge</p> 	<ul style="list-style-type: none"> <li>• Speed too low.</li> <li>• Insufficient coolant.</li> <li>• Chip load.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase m/min.</li> <li>• Increase coolant concentration and/or flow.</li> <li>• Adjust infeed angle.</li> <li>• Increase depth of cut per pass.</li> </ul>
<p>deformation</p> 	<ul style="list-style-type: none"> <li>• Wrong grade.</li> <li>• Speed too high.</li> <li>• Improper infeed angle.</li> <li>• Insufficient coolant.</li> </ul>	<ul style="list-style-type: none"> <li>• Use modified flank infeed.</li> <li>• Use a more wear-resistant grade (e.g., TN6010™).</li> <li>• Reduce m/min.</li> <li>• Increase coolant flow.</li> </ul>
<p>chipping</p> 	<ul style="list-style-type: none"> <li>• Improper infeed.</li> <li>• Chip load.</li> <li>• Wrong grade.</li> <li>• Incorrect speed.</li> <li>• Poor rigidity.</li> </ul>	<ul style="list-style-type: none"> <li>• Use modified flank infeed.</li> <li>• Increase or decrease number of passes.</li> <li>• Eliminate spring passes.</li> <li>• Use tougher grade (e.g., TN6025™).</li> <li>• Increase m/min if chipping on trailing edge.</li> <li>• Decrease m/min if chipping on leading edge.</li> <li>• Minimise tool overhang.</li> <li>• Check for insert movement/check clamp. Torque screw or clamp to correct value.</li> <li>• Check for possible part deflection.</li> <li>• Calculate flank clearance.</li> <li>• Ensure correct shim.</li> </ul>
<p>broken nose</p> 	<ul style="list-style-type: none"> <li>• Heavy chip load.</li> <li>• Small nose radius.</li> <li>• Wrong grade.</li> <li>• Improper infeed.</li> </ul>	<ul style="list-style-type: none"> <li>• Use modified flank infeed.</li> <li>• Decrease chip load.</li> <li>• Use large nose radius if possible.</li> <li>• Use tougher grade (e.g., TN6025).</li> </ul>
<p>flank wear</p> 	<ul style="list-style-type: none"> <li>• Improper shim.</li> <li>• Wrong grade.</li> <li>• Insufficient coolant.</li> <li>• Off centreline.</li> <li>• Insufficient flank clearance.</li> <li>• Improper infeed angle.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure correct shim.</li> <li>• Use a more wear-resistant grade (e.g., TN6025).</li> <li>• Increase coolant flow.</li> <li>• Check the centreline height of the tool. (The smaller the diameter, the more critical the need for centreline accuracy.)</li> <li>• Calculate flank clearance and change shim to increase clearance on worn flank.</li> <li>• If wear is on trailing flank, increase infeed angle clearance.</li> </ul>

problem	possible solution																	
	increase m/min	reduce m/min	increase chip load	decrease chip load where failure occurs	use tougher carbide grade	use harder carbide grade	apply coolant	use coated carbide	use topping insert	change infeed angle	check for insert movement and reseat	reduce tool overhang	reselect shim	apply chipbreaker style	reduce DOC	adjust centre height	begin cutting threads 12mm before workpiece	change infeed method
chatter	•			•							•	•				•		•
bur on crest	•								•									•
short tool life		•	•	•		•		•										•
chipped leading edge			•	•	•													
chipped trailing edge					•					•								
broken nose (first pass)	•														•	•		
broken nose (after first pass)				•	•					•			•					•
built-up on cutting edge	•		•				•	•										•
premature topping													•					
splitting threads																	•	
poor chip evacuation														•				•

WIDIA™ insert technology brings chip control to your threading operations with the TopThread™ platform. The proprietary WIDIA recessed chip groove, when used according to our recommendations, controls the chip in most applications. Our positive rake design lowers cutting pressures, which in turn lowers damaging heat generation thus providing better tool life. Long, stringy chips no longer mar the workpiece surface finish. The danger to operators when removing long chips from the workpiece and chuck is eliminated. All of these benefits combine to improve the productivity of your threading operations.

### The Last Pass

Some CNC controls require the last pass to be at a 0° infeed angle because the chip will not break on the last pass. On most carbon and alloy steels, the last pass can remain at 0,127mm depth of cut and produce an acceptable finish. For some materials, a 0,025mm to 0,076mm (spring) pass may be used to improve surface finish, however, chipbreaking action may be compromised.

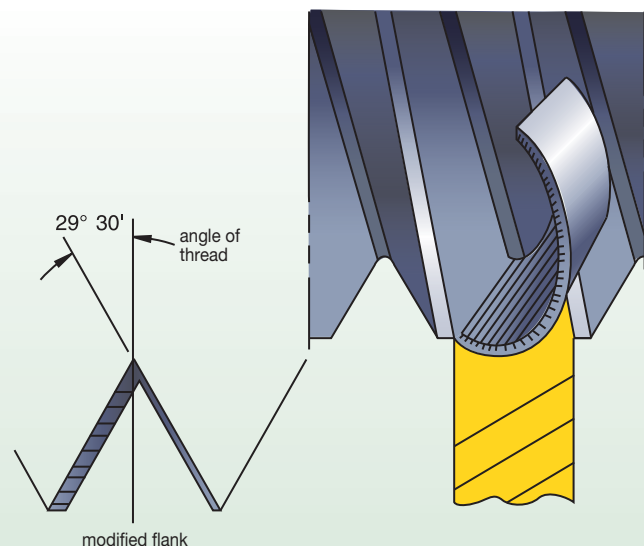


### Machine Programming

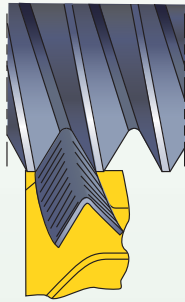
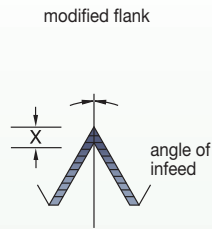
Modern CNC controls allow the programmer to easily adjust infeed angle, the number of passes, and depth of cut for each pass. The chip control threading insert performs best at an infeed angle of 29° 30', although 15° to 30° is acceptable. Also, it is important to maintain a minimum of 0,127mm depth of cut on every pass. In most applications, use of CNC canned cycles produce only marginally successful results. Custom written programmes are better and are recommended.

### Infeed Angle

In order to effectively and consistently break the chip, it is important to use an infeed angle between 28° and 29° 30'. Do not apply chip control inserts at infeed angles less than 15°.



### Radial



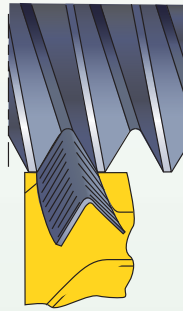
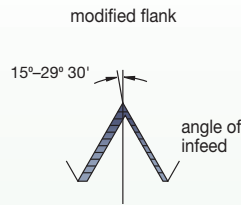
#### Advantage –

- Cutting on both sides of the thread form places all of the cutting edge in the cut and protects edge from chipping.
- Even wear on the insert.

#### Disadvantage –

- Tool develops a channel chip that may be difficult to handle.
- Tip chipping occurs when cutting high-tensile materials.
- Bur condition is increased.
- Entire cutting edge is engaged at finish of thread, causing increased tendency to chatter.

### Modified flank



#### Advantage –

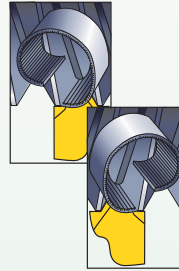
- Tool cuts both sides of thread form, so it is protected from chipping similar to 0° infeed. Channel-type chip develops, but uneven chip thickness helps remove the chip similar to flank infeed.
- This is the preferred method, especially when used with a chip control insert.
- Combined radial and/or alternating flank infeed.
- Results in good tool life, with wear evenly distributed over both flanks.

#### Disadvantage –

- Similar disadvantages as with 0° infeed, although reduced somewhat in magnitude as cutting forces are better equalised and chip flow is much less of a problem.

### Alternating flank

alternating flank



#### Advantage –

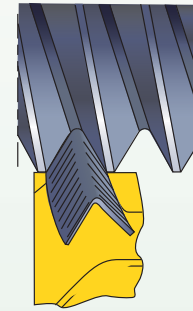
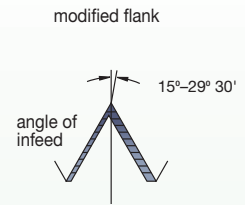
- Increased tool life because both edges are used equally.

*NOTE: Some machine tools may require special programming techniques to achieve this method of infeed.*

#### Disadvantage –

- Difficult to cut on conventional machinery.

### Reversed modified flank



#### Advantage –

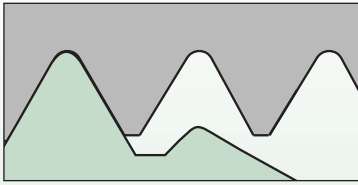
- Tool cuts both sides of thread form, so it is protected from chipping similar to 0° infeed. Channel-type chip develops, but uneven chip thickness helps remove the chip similar to flank infeed.
- This is the preferred method, especially when used with a chip control insert.
- Combined radial and/or alternating flank infeed.
- Results in good tool life, with wear evenly distributed over both flanks.
- As chip flow is the reversed feed direction, it is an excellent choice for internal threading.

#### Disadvantage –

- Programming needs to be done line by line.



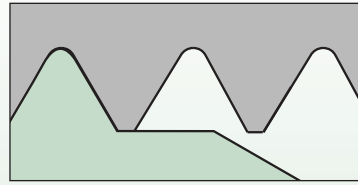
**Partial Profile**



**Tooth profile with universal profile shape:**

- 55° or 60° without cutting edges for the tooth tapers.
- Reduced inventory.
- For various pitches in a limited range.
- Preferably one time production.
- Major/minor diameters must be accurately pre-turned.

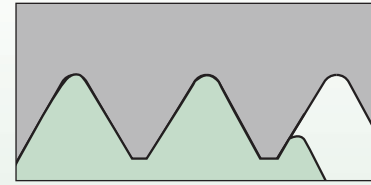
**Full Profile**



**Tooth profile with full profile shape including tooth height:**

- For bur-free, precise threads in the specified pitch.
- General application.
- Machining allowance for outside/core diameter around 0,1-0,15mm.

**Multi-Tooth Profile**



**Multi-tooth full profile generally with 2-3 teeth:**

- Highly productive threading with fewer passes and longer tool life.
- Requires a rigid setup and long thread pass through.
- Minimum clearance width approximately 1.25 x E as per indexable insert dimensions table.

**Formulas**

Metric Formula		
to find	given	formula
m/min	D (mm) RPM	$m/min = \frac{\pi \times D}{1000} \times RPM$
RPM	D (mm) m/min	$RPM = \frac{m/min \times 1000}{D \times \pi}$

**Legend**

- m/min = metres per minute
- RPM = revolutions per minute
- D = part diameter
- $\pi$  = 3.1416

**Maximum Cutting Speeds**

On older machines, cutting speed is often limited by the maximum travel speed mm/min of the tool allowed by the machine.

Check your maximum speed with the following formulas:

metric formula: maximum cutting speed (m/min) =  
 part diameter (mm) x 3.14 x (1/pitch) x  $\frac{\text{max mm/min}}{1000\text{mm}}$

**Flank clearance**

- $\gamma$  =  $\arctan(\sin(\beta/2) * \tan(\alpha))$
- $\gamma$  = side (flank) clearance
- $\beta$  = included angle of thread form
- $\alpha$  = radial inclination angle

Thread	Angle	External	Internal
<b>UN &amp; ISO</b>	60	5.3	8
<b>BSW</b>	55	4.8	7.3
<b>TR</b>	30	2.6	4
<b>ACME</b>	29	2.6	3.9
<b>AMBUT</b>	7	.6	.9
<b>AMBUT</b>	45	4	6

### Recommendation for Threading Infeed Passes

TPI	48-32	28-24	20-16	14-12	11.5-9	8-6	5-4	3-2
metric pitch (mm)	0,50-0,75	0,80-1	1,25-1,5	1,75-2	2,5-3	3,5-4	4,5-6	8
<b>Thread Type</b>	<b>recommended number of passes</b>							
Common V-thread forms ISO, UN, UNJ, NPT, Whitworth, BSPT, API Rotary Shoulder	4-5	5-6	6-8	8-10	9-12	12-15	14-16	15-25
Acme, Trapez, Round, API Round	—	—	5-6	7-8	10-11	12-13	13-15	18-20
Stub Acme, API Buttress	—	—	5	5-6	7-8	8-10	10-12	14-16
American Buttress	—	—	7-8	9-10	11-12	13-15	17-19	22-24

Maintain minimum 0,05mm infeed on last passes to avoid work hardening and excessive abrasion of the threading tool.

### Constant Volume Infeed Values for Threading Operations

In most applications, use of CNC canned cycles produces only marginally successful results. For example, an 8-pitch external thread has a depth of 2mm (.0789").

Formula for constant chip load infeed

$$\Delta ap_x = \frac{ap}{\sqrt{\text{nap}-1}} * \sqrt{\phi}$$

- $\Delta ap$  = radial infeed
- $x$  = actual pass (from 1 to the nap)
- $\text{nap}$  = number of passes
- $\phi$  = 1st pass, 0.3  
2nd pass, 1  
3rd pass and up,  $x-1$

#### Using Radial Infeed

Bending stress on the cutting edge caused by V-shaped chips from long-chipping steel workpiece materials.

High cutting forces with small cutting thicknesses require sharp edges with high strength.

#### Using Flank Infeed

Lower bending stress and stabilised cutting edges produce more favourable chip shapes and larger cutting thicknesses.

Carbides with high hardness, good wear resistance, and temperature stability are advantageous.

### Guidelines for Infeeds – How to Determine the Number and the Size of Passes

The number of passes "s" per thread is decisive for successful threading and crest turning. The following tables give standard values for the application condition when machining steel. The proper number of passes must be determined empirically.

If insert breakage occurs, the number of passes must be increased. With increased wear, we recommend decreasing the number of passes. The chip thickness should not be less than 0,05mm. The allowance at the diameter should not exceed 0,2mm.

### Metric ISO, External Thread Cutting

pitch (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
T Ap (mm)	0,305	0,457	0,610	0,762	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
N Ap	4	4	5	6	6	8	8	10	12	14	15	15	16
values for flank infeed (X/Z)													
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,096	0,145	0,167	0,187	0,224	0,221	0,252	0,278	0,302	0,328	0,361	0,405	0,435
2	0,080	0,119	0,138	0,154	0,185	0,182	0,208	0,230	0,249	0,271	0,298	0,335	0,359
3	0,073	0,109	0,126	0,141	0,169	0,167	0,191	0,210	0,228	0,248	0,273	0,306	0,329
4	0,056	0,084	0,097	0,108	0,130	0,128	0,146	0,161	0,175	0,190	0,209	0,235	0,252
5			0,082	0,091	0,110	0,108	0,123	0,136	0,148	0,160	0,176	0,198	0,213
6				0,080	0,097	0,095	0,109	0,120	0,130	0,141	0,155	0,175	0,187
7						0,086	0,098	0,108	0,118	0,128	0,141	0,158	0,169
8						0,079	0,090	0,100	0,108	0,118	0,129	0,145	0,156
9								0,093	0,101	0,109	0,120	0,135	0,145
10								0,087	0,095	0,103	0,113	0,127	0,136
11									0,089	0,097	0,107	0,120	0,129
12									0,085	0,092	0,102	0,114	0,122
13										0,088	0,097	0,109	0,117
14										0,085	0,093	0,105	0,112
15											0,090	0,101	0,108
16													0,104
T Ap (mm)	0,305	0,457	0,610	0,762	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

### Metric ISO, Internal Thread Cutting

thread pitch P (mm)	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,50	4,00	4,50	5,00
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718
N Ap	4	4	5	6	6	8	8	10	11	12	14	15	16
values for flank infeed (X/Z)													
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,088	0,129	0,146	0,168	0,199	0,195	0,226	0,246	0,282	0,315	0,328	0,357	0,384
2	0,073	0,106	0,121	0,139	0,164	0,161	0,187	0,203	0,232	0,260	0,271	0,295	0,317
3	0,067	0,097	0,110	0,127	0,151	0,147	0,171	0,186	0,213	0,238	0,248	0,270	0,291
4	0,051	0,075	0,085	0,097	0,116	0,113	0,131	0,143	0,163	0,183	0,190	0,207	0,223
5			0,071	0,082	0,097	0,095	0,111	0,120	0,138	0,154	0,160	0,175	0,188
6				0,072	0,086	0,084	0,097	0,106	0,121	0,136	0,141	0,154	0,166
7						0,076	0,088	0,096	0,110	0,123	0,128	0,139	0,150
8						0,070	0,081	0,088	0,101	0,113	0,118	0,128	0,138
9								0,082	0,094	0,105	0,109	0,119	0,128
10								0,077	0,088	0,099	0,103	0,112	0,120
11									0,083	0,093	0,097	0,106	0,114
12									0,000	0,089	0,092	0,101	0,108
13										0,000	0,088	0,096	0,103
14											0,000	0,085	0,092
15												0,000	0,089
16													0,092
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

**UN Thread, External Thread Cutting**

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
<b>T Ap (mm)</b>	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
<b>N Ap</b>	5	6	6	7	9	9	10	11	12	13	14	15	16
	values for flank infeed (X/Z)												
<b>order of passes</b>	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
<b>1</b>	0,181	0,193	0,212	0,216	0,177	0,207	0,223	0,264	0,302	0,341	0,374	0,405	0,435
<b>2</b>	0,149	0,159	0,175	0,178	0,146	0,171	0,184	0,218	0,249	0,282	0,309	0,335	0,359
<b>3</b>	0,137	0,146	0,160	0,163	0,134	0,156	0,168	0,200	0,228	0,258	0,283	0,306	0,329
<b>4</b>	0,105	0,112	0,123	0,125	0,103	0,120	0,129	0,153	0,175	0,198	0,217	0,235	0,252
<b>5</b>	0,088	0,094	0,103	0,106	0,087	0,101	0,109	0,129	0,148	0,167	0,183	0,198	0,213
<b>6</b>		0,083	0,091	0,093	0,076	0,089	0,096	0,114	0,130	0,147	0,161	0,175	0,187
<b>7</b>				0,084	0,069	0,080	0,087	0,103	0,118	0,133	0,146	0,158	0,169
<b>8</b>					0,063	0,074	0,080	0,095	0,108	0,122	0,134	0,145	0,156
<b>9</b>					0,059	0,069	0,074	0,088	0,101	0,114	0,125	0,135	0,145
<b>10</b>							0,070	0,083	0,095	0,107	0,117	0,127	0,136
<b>11</b>								0,078	0,089	0,101	0,111	0,120	0,129
<b>12</b>									0,085	0,096	0,105	0,114	0,122
<b>13</b>										0,092	0,101	0,109	0,117
<b>14</b>											0,097	0,105	0,112
<b>15</b>												0,101	0,108
<b>16</b>													0,104
<b>T Ap (mm)</b>	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

**UN Thread, Internal Thread Cutting**

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
<b>T Ap (mm)</b>	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	1,956	2,286	2,743
<b>N Ap</b>	5	6	6	7	8	9	9	10	11	12	13	14	15
	values for flank infeed (X/Z)												
<b>order of passes</b>	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
<b>1</b>	0,160	0,168	0,187	0,193	0,205	0,221	0,241	0,250	0,264	0,285	0,309	0,347	0,402
<b>2</b>	0,132	0,139	0,154	0,159	0,169	0,183	0,199	0,207	0,218	0,236	0,255	0,287	0,332
<b>3</b>	0,121	0,127	0,141	0,146	0,155	0,167	0,182	0,189	0,200	0,216	0,234	0,263	0,304
<b>4</b>	0,093	0,097	0,108	0,112	0,119	0,128	0,140	0,145	0,153	0,166	0,179	0,202	0,233
<b>5</b>	0,078	0,082	0,091	0,094	0,100	0,108	0,118	0,123	0,129	0,140	0,151	0,170	0,196
<b>6</b>		0,072	0,080	0,083	0,088	0,095	0,104	0,108	0,114	0,123	0,133	0,150	0,173
<b>7</b>				0,075	0,080	0,086	0,094	0,098	0,103	0,111	0,120	0,135	0,156
<b>8</b>					0,073	0,079	0,086	0,090	0,095	0,102	0,111	0,124	0,144
<b>9</b>						0,074	0,080	0,084	0,088	0,095	0,103	0,116	0,134
<b>10</b>								0,078	0,083	0,089	0,097	0,109	0,126
<b>11</b>									0,078	0,085	0,092	0,103	0,119
<b>12</b>										0,080	0,087	0,098	0,113
<b>13</b>											0,083	0,094	0,108
<b>14</b>												0,080	0,104
<b>15</b>													0,100
<b>16</b>													
<b>T Ap (mm)</b>	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	2,036	2,286	2,743

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

**NPT Thread, External, and Internal Machining**

TPI	27	18	14	11,5	8
T Ap (mm)	0,762	1,118	1,422	1,727	2,489
N Ap	6	8	10	12	14
values for flank infeed (X/Z)					
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,187	0,231	0,260	0,285	0,378
2	0,154	0,191	0,214	0,236	0,312
3	0,141	0,175	0,196	0,216	0,286
4	0,108	0,134	0,151	0,166	0,219
5	0,091	0,113	0,127	0,140	0,185
6	0,080	0,100	0,112	0,123	0,163
7		0,090	0,101	0,111	0,147
8		0,083	0,093	0,102	0,135
9			0,087	0,095	0,126
10			0,081	0,089	0,118
11				0,085	0,112
12				0,080	0,107
13					0,102
14					0,098
15					
16					
T Ap (mm)	0,762	1,118	1,422	1,727	2,489

**BSPT Thread, External, and Internal Machining**

TPI	28	19	14	11
T Ap (mm)	0,584	0,864	1,168	1,448
N Ap	5	8	10	12
values for flank infeed (X/Z)				
order of passes	X/Z	X/Z	X/Z	X/Z
1	0,160	0,179	0,213	0,239
2	0,132	0,148	0,176	0,197
3	0,121	0,135	0,161	0,181
4	0,093	0,104	0,124	0,139
5	0,078	0,087	0,104	0,117
6		0,077	0,092	0,103
7		0,070	0,083	0,093
8		0,064	0,076	0,086
9			0,071	0,080
10			0,067	0,075
11				0,071
12				0,067
13				
14				
15				
16				
T Ap (mm)	0,584	0,864	1,168	1,448

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

**Trapezoid Thread to DIN 103, External, and Internal Machining**

pitch	1,5	2	3	4	5
T Ap (mm)	1,016	1,245	1,753	2,261	2,743
N Ap	6	8	10	12	14
values for flank infeed (X/Z)					
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,249	0,258	0,320	0,373	0,417
2	0,206	0,213	0,264	0,308	0,344
3	0,188	0,195	0,242	0,282	0,315
4	0,144	0,150	0,186	0,217	0,242
5	0,122	0,126	0,157	0,183	0,204
6	0,107	0,111	0,138	0,161	0,180
7		0,100	0,125	0,145	0,162
8		0,092	0,115	0,134	0,149
9			0,107	0,125	0,139
10			0,100	0,117	0,131
11				0,111	0,123
12				0,105	0,117
13					0,112
14					0,108
15					
16					
T Ap (mm)	1,016	1,245	1,753	2,261	2,743

**Round Thread to DIN 405, External, and Internal Machining**

pitch	10	8	6
T Ap (mm)	1,321	1,626	2,159
N Ap	8	10	12
values for flank infeed (X/Z)			
order of passes	X/Z	X/Z	X/Z
1	0,273	0,297	0,357
2	0,226	0,245	0,294
3	0,207	0,224	0,270
4	0,159	0,172	0,207
5	0,134	0,145	0,174
6	0,118	0,128	0,154
7	0,107	0,116	0,139
8	0,098	0,106	0,128
9		0,099	0,119
10		0,093	0,112
11			0,106
12			0,100
13			
14			
15			
16			
T Ap (mm)	1,321	1,626	2,159

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

**Whitworth, External, and Internal Thread Cutting**

TPI	28	20	19	16	14	12	11	10	9	8	7	6	5
<b>T Ap (mm)</b>	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251
<b>N Ap</b>	5	6	6	8	8	9	9	10	11	12	14	15	16
values for flank infeed (X/Z)													
<b>order of passes</b>	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
<b>1</b>	0,160	0,199	0,199	0,179	0,210	0,261	0,285	0,297	0,312	0,336	0,351	0,398	0,460
<b>2</b>	0,132	0,164	0,164	0,148	0,174	0,215	0,236	0,245	0,258	0,277	0,290	0,329	0,380
<b>3</b>	0,121	0,151	0,151	0,135	0,159	0,197	0,216	0,224	0,236	0,254	0,266	0,301	0,348
<b>4</b>	0,093	0,116	0,116	0,104	0,122	0,151	0,166	0,172	0,181	0,195	0,204	0,231	0,267
<b>5</b>	0,078	0,097	0,097	0,087	0,103	0,128	0,140	0,145	0,153	0,164	0,172	0,195	0,225
<b>6</b>		0,086	0,086	0,077	0,091	0,112	0,123	0,128	0,135	0,145	0,151	0,171	0,198
<b>7</b>				0,070	0,082	0,102	0,111	0,116	0,122	0,131	0,137	0,155	0,179
<b>8</b>				0,064	0,075	0,093	0,102	0,106	0,112	0,120	0,126	0,143	0,165
<b>9</b>						0,087	0,095	0,099	0,104	0,112	0,117	0,133	0,153
<b>10</b>								0,093	0,098	0,105	0,110	0,125	0,144
<b>11</b>									0,093	0,099	0,104	0,118	0,136
<b>12</b>										0,095	0,099	0,112	0,130
<b>13</b>											0,095	0,107	0,124
<b>14</b>											0,091	0,103	0,119
<b>15</b>												0,099	0,114
<b>16</b>													0,110
<b>T Ap (mm)</b>	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

**Multi-Tooth Threads, Internal**

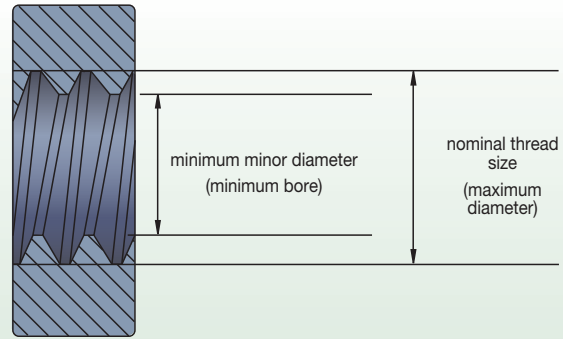
type	ISO metric						ISO UN					Whitworth	NPT		
	3M	2M	3M	2M	3M	2M	2M	3M	2M	3M	2M	2M	2M	3M	2M
<b>pitch (mm)</b>	1,0	1,5	1,5	2,0	2,0	3,0	—	—	—	—	—	—	—	—	—
<b>TPI</b>	—	—	—	—	—	—	16	16	12	12	8	11	11.5	11.5	8
<b>total depth (mm)</b>	0,609	0,838	0,838	1,168	1,168	1,778	0,939	0,939	1,245	1,245	1,880	1,575	1,753	1,753	2,540
<b>pass 10mm</b>	0,330	0,381	0,508	0,508	0,711	0,558	0,431	0,558	0,558	0,762	0,584	0,736	0,584	0,812	0,889
<b>2</b>	0,279	0,254	0,330	0,381	0,457	0,482	0,304	0,381	0,406	0,482	0,508	0,482	0,508	0,558	0,635
<b>3</b>	—	0,203	—	0,279	—	0,431	0,203	—	0,279	—	0,431	0,355	0,355	0,381	0,558
<b>4</b>	—	—	—	—	—	0,304	—	—	—	—	0,355	—	0,304	—	0,457

**Recommendations for Steel Workpieces (<300 BHN)**

catalogue number	insert size	TPI profile	total depth — on radius		
			1st pass	2nd pass	3rd pass
<b>NTC-8R/L8EM</b>	8	8 UN	1,21	1,63	2,00
<b>NTC-8R/L8IM</b>	8	8 UN	1,19	1,55	1,88
<b>NTC-8R/L10EM</b>	8	10 UN	0,92	1,27	1,60
<b>NTC-8R/L10IM</b>	8	10 UN	0,90	1,22	1,52
<b>NTC-8R/L12EM</b>	8	12 UN	0,76	1,04	1,32
<b>NTC-8R/L12IM</b>	8	12 UN	0,76	0,93	1,20
<b>NTC-8R/L14EM</b>	8	14 UN	0,68	0,95	1,12
<b>NTC-8R/L14IM</b>	8	14 UN	0,60	0,78	1,04
<b>NTC-8R/L16EM 8</b>	8	16 UN	0,58	0,81	0,96
<b>NTC-8R/L16IM</b>	8	16 UN	0,50	0,68	0,93
<b>NTC-8R/L18EM</b>	8	18 UN	0,48	0,66	0,86
<b>NTC-8R/L18IM</b>	8	18 UN	0,48	0,60	0,83
<b>NDC-68RDR/L-75M</b>	8	8 round	1,47	1,65	1,85
<b>NDC-61RDR/L-75M</b>	8	10 round	1,11	1,29	1,45
<b>NDC-88RDRD/L-75M</b>	8	8 round	1,29	1,75	1,85
<b>NDC-88VR/L-75M</b>	8	8 NPT	1,01	1,72	2,45
<b>NDC-8115VR/L-75M</b>	8	11.5 NPT	0,96	1,37	1,70
<b>NDN-814VR/L-75M</b>	8	14 NPT	0,96	1,22	1,36

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

The following charts list the largest thread pitch that can be applied on internal applications using TopThread threading inserts for 60° V-threading and Acme threading.



**Metric-sized 60° V-Threading Limits**

internal threading limitations  
NT-1, NT-2 60° V-threading inserts

TPI	nominal thread size		minimum thread diameter (mm)	
	NT-1	NT-2	NT-1	NT-2
4,00	M48 x 4.00	-	43,67	-
3,00	M42 x 3.00	-	38,75	-
2,50	M39 x 2.50	M24 x 2,50	36,29	21,29
2,00	M33 x 2.00	M15 x 2,00	30,84	12,84
1,75	M32 x 1.75	M15 x 1,75	30,11	13,11
1,50	M32 x 1.50	M15 x 1,50	30,38	13,38
1,25	M29 x 1.29	M14 x 1,25	27,65	12,65
1,00*	M27 x 1.00	M14 x 1,00	25,92	12,92
0,75	M22 x 0.75	M12 x 0,75	21,19	11,19

\*Thread pitch of 1mm and less can be cut with an NT-2 insert provided the core thread diameter is 25mm or larger (11mm or larger with NT-1).

internal threading limitations  
NT-3 and NT-4 60° V-threading inserts

TPI	nominal thread size	minimum thread diameter (mm)
6,00**	M76 x 6.00	69,50
5,50**	M73 x 5.50	67,05
5,00	M70 x 5.00	64,59
4,00	M64 x 4.00	59,67
3,00	M52 x 3.00	48,75
2,50	M48 x 2.50	45,29
2,00	M42 x 2.00	39,84
1,75	M40 x 1.75	38,11
1,50*	M38 x 1.50	36,38

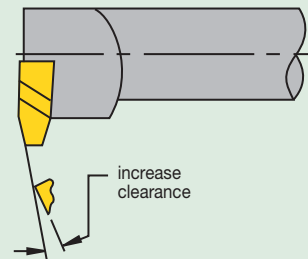
\*Thread pitch of 1,5mm and less can be cut provided core thread diameter is 35mm or larger.  
\*\*NT-4-insert only.

**Acme Threading Limits**

internal threading limitations  
NA and NAS-2, -3, -4, and -6 Acme threading inserts

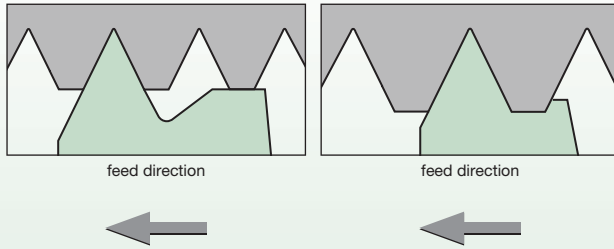
TPI	nominal thread size	minimum thread diameter (mm)	
	NT-1	NT-1	NT-2
2**	5	4.500	114.3
2-1/2**	4-1/2	4.100	104.1
3**	4	3.665	93.1
4	3-1/2	3.250	82.6
5	3	2.800	71.1
6	2-1/2	2.333	59.3
8	2-1/4	2.125	54.0
10	2	1.900	48.3
12	1-3/4	1.667	42.4
14	1-5/8	1.554	39.5
16*	1-1/2	1.438	36.5

\*Sixteen threads per inch and finer can be cut provided minor diameter is 36,5mm or larger.  
\*\*NA-6 insert only.



Additional secondary clearance can be ground on leading edge of insert to provide sufficient helical clearance for machining coarser threads and multiple start threads. Modified standard inserts may be furnished for machining threads outside of the limits shown.

**60° V-Thread Crest Turning Application Data**



NTC crest turning insert for ( $P \leq 2\text{mm}$ ) and finer.

NTC crest turning insert for ( $P \geq 3\text{mm}$ ) and coarser.

*NOTE: NTC inserts automatically control root to crest dimensions. Therefore, in setting up threading operations with NTC inserts, check the O.D. or I.D. at the thread crest for correct dimensions.*

**60° V-Thread Crest Turning Application Data**

insert catalogue number	nose radius on insert (mm)	thread radius per MIL-S-8879A (mm)
NJ-3014R/L12	0,317/0,342	0,317/0,381
NJK-3008R/L20	0,190/0,215	0,190/0,0228

**“J” thread note for catalogue**

The controlled root radius thread form (SAE8879C) is defined for the external thread only. To machine the corresponding internal thread, choose any insert that will cut a unified class 2B thread, then bore the minor diameter to size. Refer to SAE8879C and MIL-S-8879C and SAEAS8879D for the correct “J” thread minor diameter values.

**60° V-Thread Application Data**

insert description	insert	D (mm)	E (mm)	recommended TPI*		recommended TP*	
				external	internal	external	internal
<p>NT-NTP-</p>	NT-1	1,90	1,11	-	24-12	-	1,00-2,00
	NT-2	28,70	1,90	36-8	20-7	0,70-3,00	1,25-3,50
	NT-2-K	28,70	1,90	36-8	20-7	0,70-3,00	1,25-3,50
	NTF-2	15,75	1,01	44-14	24-12	0,60-1,75	1,00-2,00
	NTK-2	15,75	1,01	44-14	24-12	0,60-1,75	1,00-2,00
	NTP-2	28,70	1,90	36-8	20-7	0,70-3,0	1,25-3,50
	NT-3	37,59	2,46	20-6	12-5	1,25-4,00	2,00-5,00
	NT-3-K	37,59	2,46	20-6	12-5	1,25-4,00	2,00-5,00
	NT-3-C	37,59	2,46	11-6	6 (only)	2,50-4,00	4,00 (only)
	NT-3-CK	37,59	2,46	11-6	6 (only)	2,50-4,00	4,00 (only)
<p>NTF-NTK-</p>	NTF-3	21,08	1,37	44-10	24-9	0,60-2,50	1,00-2,50
	NTK-3	21,08	1,37	44-10	24-9	0,60-2,50	1,00-2,50
	NTP-3	37,59	2,46	20-6	12-5	1,25-4,00	2,00-5,00
	NT-4	49,78	3,22	20-4	12-4	1,25-6,25	2,00-6,25
	NT-4-K	49,78	3,22	20-4	12-4	1,25-6,25	2,00-6,25
	NT-4-C	49,78	3,22	11-4 1/2	6-4 1/2	2,50-5,50	4,00-5,50
	NT-4-CK	49,78	3,22	11-4 1/2	6-4 1/2	2,50-5,50	4,00-5,50
	NTF-4	21,08	1,37	44-10	24-9	0,60-2,50	1,00-2,50
	NTK-4	21,08	1,37	44-10	24-9	0,60-2,50	1,00-2,50
	NTP-4	49,78	3,22	20-4	12-4	1,25-6,25	2,00-6,25

\*Based on maximum insert radius size and class 2A and 2B thread specifications.



API Thread Forms • Insert Applications Chart for API Rotary Shouldered Connections

thread form	WIDIA™ insert		tool joint application	minimum box size*
	cresting	non-cresting		
V-.038R 2" TPF 4 TPI	NDC-4038R/L2 4-E/IR4API382	ND-3038R/L	2-3/8 API internal flush 2-7/8 API internal flush 3-1/2 API internal flush 4 API internal flush 4-1/2 API internal flush 5-1/2 API internal flush 6-5/8 API internal flush 4 API full hole API #23, API #26, API #31, API #35, API #38, API #40, API #44, API #46, API #50	API #31 2-7/8 IF
V-.038R 3" TPF 4 TPI	NDC-4038R/L3 4-E/IR4API383	ND-3038R/L	API #56 API #61 API #70 API #77	API #56
V-.050 2" TPF 4 TPI	NDC-4050R/L2 4-E/IRAPI502	ND-4050R/L	5-1/2 API full hole 6-5/8 API regular 6-5/8 API full hole	5-1/2 API full hole
V-.050 3" TPF 4 TPI	NDC-4050R/L3 4-E/IR4API503	ND-4050R/L	5-1/2 API regular 7-5/8 API regular 8-5/8 API regular	5-1/2 API regular
V-.040 3" TPF 5 TPI	NDC-3040R/L3 NDC-4040R/L3 4-E/IR5API403	ND-3040R/L ND-4040R/L	2-3/8 API regular 2-7/8 API regular 3-1/2 API regular 4-1/2 API regular	3-1/2 API regular

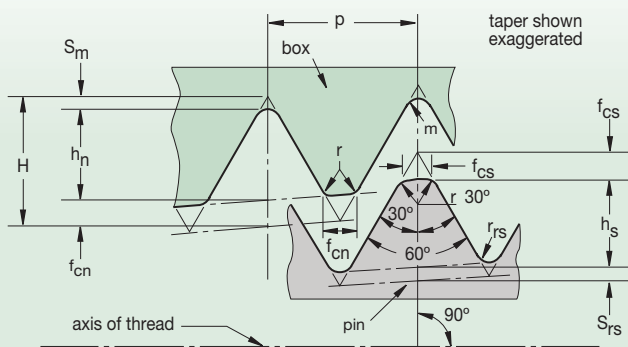
\*Minimum box size that can be threaded with a standard TopThread insert due to minimum bore equipment.

API Thread Forms  
Product Thread Dimensions • Rotary Shouldered Connections (Inch)

threadform	taper inch per ft.	thread height, not truncated H	thread height, truncated h <sub>n</sub> =h <sub>s</sub>	root truncation S <sub>m</sub> =S <sub>rs</sub> f <sub>m</sub> =f <sub>rs</sub>	crest truncation f <sub>cn</sub> =f <sub>cs</sub>	width of flat		root radius r <sub>m</sub> =r <sub>rs</sub>	radius at thread corners r	pitch p
						crest f <sub>cn</sub> =f <sub>cs</sub>	crest f <sub>m</sub> =f <sub>rs</sub>			
V-.038R	2	.216005	.121844	.038000	.056161	.065	—	.038	.015	.250
V-.038R	3	.215379	.121381	.038000	.055998	.065	—	.038	.015	
V-.040	3	.172303	.117842	.020000	.034461	.040	—	.020	.015	.250
V-.050	3	.215379	.147303	.025000	.043076	.050	—	.025	.015	
V-.050	2	.216005	.147804	.025000	.043201	.050	—	.025	.015	.250

NOTE: All dimensions in inches.

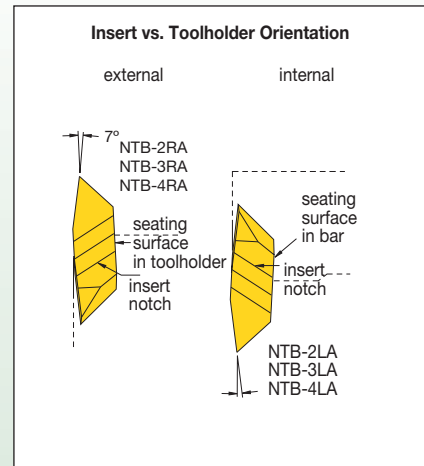
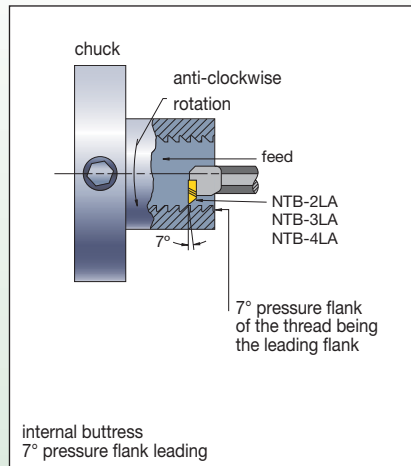
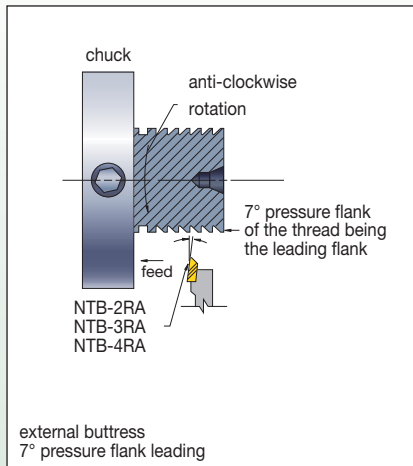
V-.040 and V-.050 Product Thread Form



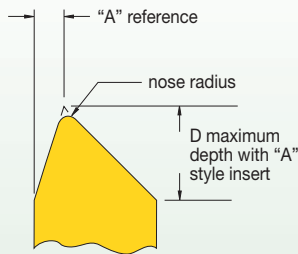
Casing and Tubing Round Thread (Height Dimensions)

thread element	10 TPI p= .1000	8 TPI p= .1250
H	= .866p	.08660
H <sub>s</sub> = h <sub>n</sub>	= .626p - .007	.05560
S <sub>rs</sub> = S <sub>m</sub>	= .120p + .002	.01400
S <sub>cs</sub> = S <sub>cn</sub>	= .120p + .005	.01700
		.02000

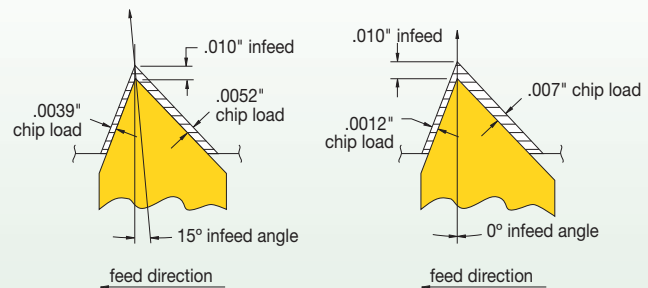
**American Buttress (7° Pressure Flank Leading) NTB-A Inserts • Push Type**



**Reference Dimensions**



**Infeed Angle vs. Chip Load: 7° Pressure Flank Leading**



insert	D (inch)	"A" ref. (inch)	nose radius (inch)	pitch based on maximum radius
NTB-2A	.133	.024	.002-.004	16-20 TPI
NTB-3A	.171	.031	.005-.008	8-16 TPI
NTB-4A	.218	.049	.008-.012	4-6 TPI

NOTE: For balanced chip load, 15° infeed angle is suggested.

NTB-A insert

**Internal Threading Limitations**

**internal threading limitations NTB-2A Buttress threading inserts**

TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

**internal threading limitations NTB-3 and NTB-4A Buttress threading inserts**

TPI	nominal thread size	minimum minor diameter (inch)
4*	2-1/2	2.200
5	2-1/4	2.010
6	2	1.800
8	1-3/4	1.600
10	1-5/8	1.505
12**	1-1/2	1.400

\*NTB-4A insert only.

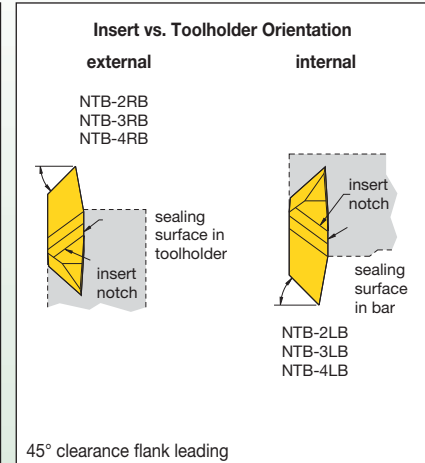
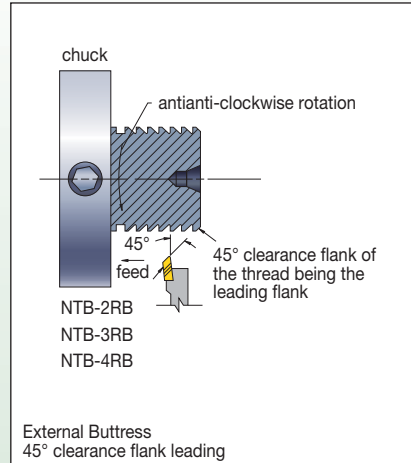
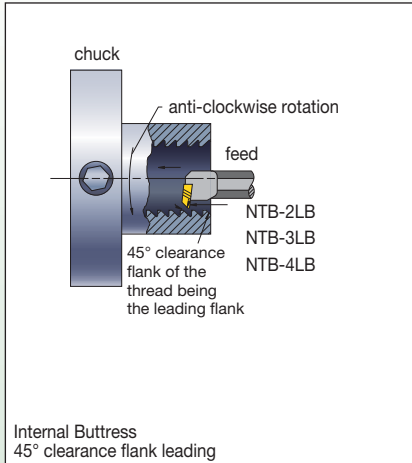
\*\*Can cut 16 or 20 threads per inch provided minor diameter is 1.375" or larger.

**Threads per Inch vs. Maximum Root Radius Chart (Inch)**

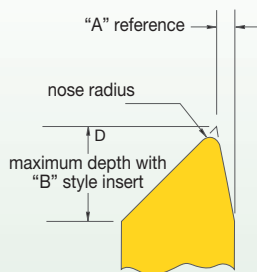
TPI	20	16	12	10	8	6	5	4	3	2-1/2	2	1-1/2	1-1/4	1
maximum root radius	.0036	.0045	.0059	.0071	.0089	.0119	.0143	.0179	.0238	.0268	.0375	.0476	.0572	.0714

NOTE: Special Buttress forms are available upon request.

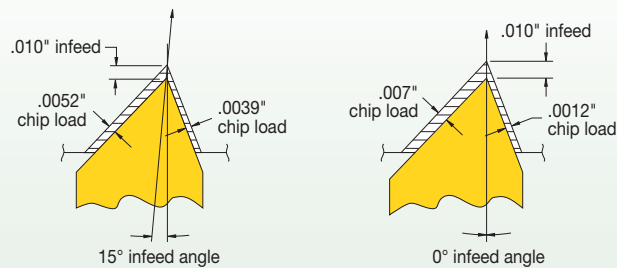
American Buttress (45° Clearance Flank Leading): NTB-B Inserts • PULL-type



Reference Dimensions



Infeed Angle vs. Chip Load: 45° Clearance Flank Leading



NTB-B insert

insert	D (inch)	"A" reference (inch)	nose radius (inch)	pitch based on maximum radius
NTB-3B	.171	.031	.005-.004	8-16 TPI

NOTE: For balanced chip load, a reverse 15° infeed angle is suggested.

Internal Threading Limitations

internal threading limitations NTB-2B Buttress threading inserts		
TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

internal threading limitations NTB-3 and NTB-4B Buttress threading inserts		
TPI	nominal thread size	minimum minor diameter (inch)
4*	2-7/8	2.575
5	2-3/4	2.510
6	2-3/8	2.175
8	2-1/8	1.975
10	1-7/8	1.755
12	1-5/8	1.525
16	1-1/2	1.407
20	1-7/16	1.378

\*NTB-4B insert only.

# Laydown Threading System



EXTREME **CHALLENGES.**  
EXTREME **RESULTS.**

The specially engineered WIDIA™ Laydown Threading System ensures the highest accuracy and quality available to meet all modern production standards. With an extensive range of inserts and toolholders available, the Laydown Threading platform is ideal for all of your internal and external threading applications.

- Low-profile design enables unrestricted chip flow.
- Precision-ground thread forms for industry-leading thread quality.
- Ideal choice for high-helix/multi-start threads and single-point threading in small-diameter bores.

To learn more, contact your local Authorised Distributor or visit [widia.com](http://widia.com).

**WIDIA** 

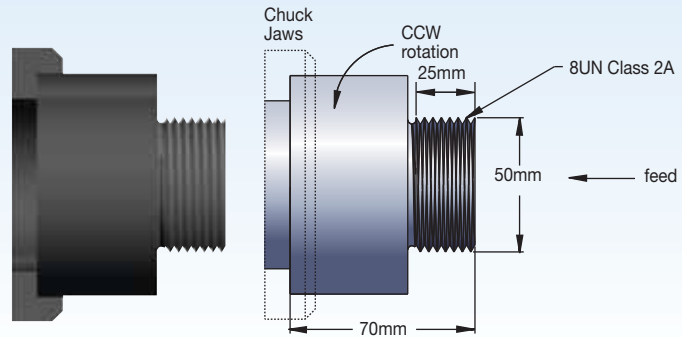
### Required Information

**From Part Drawing:**

- material: 316SS, 200 HB
- thread form: 8UN
- tolerance: class 2A
- operation: external threading
- pitch diameter: 50mm x 25mm deep

**From Machine Setup Data:**

- tooling: 20mm x 20mm
- spindle rotation: anti-clockwise
- feed: toward chuck

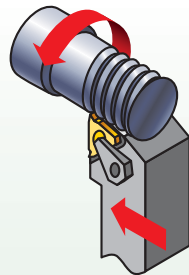


### Steps for a Successful Threading Operation

**Step 1 • Determine Threading Method**

**Need to Know:**

- Operation (external).
- Spindle rotation (CCW).  
*Anti-clockwise rotation.*
- Feed direction (toward chuck).
- Right-hand toolholder.
- Right-hand insert (ER).
- Standard helix method.



**Step 2 • Select Insert**



**Need to Know:**

- Thread form (ISO R262 1mm pitch).
- Hand of insert (right hand – ER).

**Choose the High-Performance Solution**

catalogue number	insert size	TN6025
3ER10ISO	3	•

**High-Performance Selection**

*NOTE: Use insert with largest insert size available.*

- insert: 3ER10ISO
- grade: TN6025
- speed: 150 m/min

**Step 3 • Select the Grade and Speed**

**Need to Know:**

- Workpiece material (316SS-200HB).
- Operation (external).

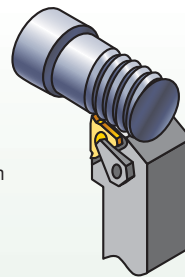
Options: Grade and Speed Selection Guidelines

threading operation	stainless steel
external	general purpose and high performance
	TN6025
	50–360 m/min

**Step 4 • Select Toolholder**

**Need to Know:**

- External or internal operation (external).
- Pitch diameter to determine minimum bore diameter (N/A).
- Type of tooling – toolholder, boring bar (toolholder).
- Hand of tool (right hand).
- Insert size (16).



Options:

catalogue number	insert size	shim
AL203R	3	SM-YE3

**Step 5 • Select Shim**

**Need to Know:**

- Thread form – TPI or pitch (8 TPI).
- Pitch diameter (50mm).
- Helix method (standard).  
See Laydown Threading (LT) shim selection chart.

Select SM-YE3 shim

*NOTE: For this application, the standard shim supplied should be replaced with the recommended shim, SM-YE3.*

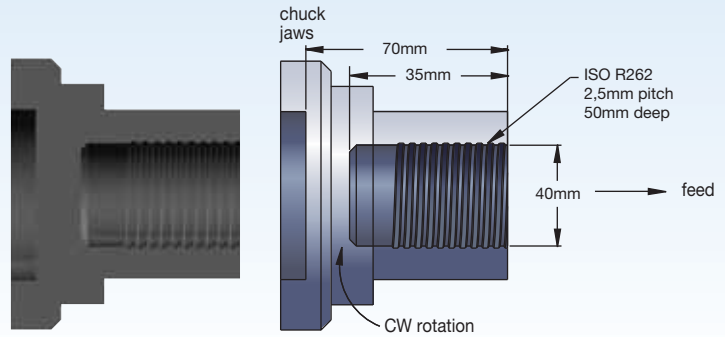
**Required Information**

**From Part Drawing:**

- material: 4140 steel
- thread form: ISO R262 2,5mm pitch
- tolerance: ISO Metric Class 6G/6H
- operation: internal threading
- pitch diameter: 40mm x 35mm deep

**From Machine Setup Data:**

- tooling: 20mm boring bar
- spindle rotation: clockwise
- feed: away from chuck



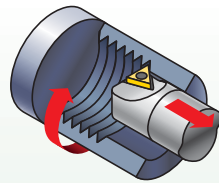
**Steps for a Successful Threading Operation**

**Step 1 •**

**Determine Threading Method**

**Need to Know:**

- Operation (internal).
- Spindle rotation (CW).  
*Clockwise rotation.*
- Feed direction (away from chuck).
- Left-hand toolholder.
- Left-hand insert (NL).
- Reverse helix method.



**Step 2 •**

**Select Insert**



**Need to Know:**

- Thread form (ISO Metric Class 6G/6H).
- Hand of insert (left hand – NL).

**Choose the High-Performance Solution**

catalogue number	insert size	TN6025
3IL25ISO	3	•

**High-Performance Selection**

*NOTE: Use insert with largest possible insert size to go into the bore.*  
insert: 3IL25ISO  
grade: TN6025  
speed: 130 m/min

**Step 3 •**

**Select the Grade and Speed**

**Need to Know:**

- Workpiece material (4010 steel).
- Operation (internal).

Options: Grade and Speed  
Selection Guidelines

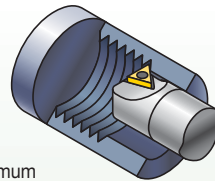
threading operation	steel
internal	general purpose and high performance
	TN6025
	40–200 m/min

**Step 4 •**

**Select Toolholder**

**Need to Know:**

- External or internal operation (internal).
- Pitch diameter to determine minimum bore diameter for internal operations (40mm).
- Type of tooling – toolholder, boring bar (boring bar).
- Hand of tool (left hand).
- Insert size (16).



Options:

catalogue number	insert size	shim
AVR32D3R	3	SM-YE3

**Step 5 •**

**Select Shim**

**Need to Know:**

- Thread form – TPI or pitch (2,5mm pitch).
- Pitch diameter (40mm).
- Helix method (reverse).  
See Laydown Threading (LT) shim selection chart.

Select SM-YE3

*NOTE: For this application, the standard shim supplied should be replaced with the recommended shim, SM-YE3.*

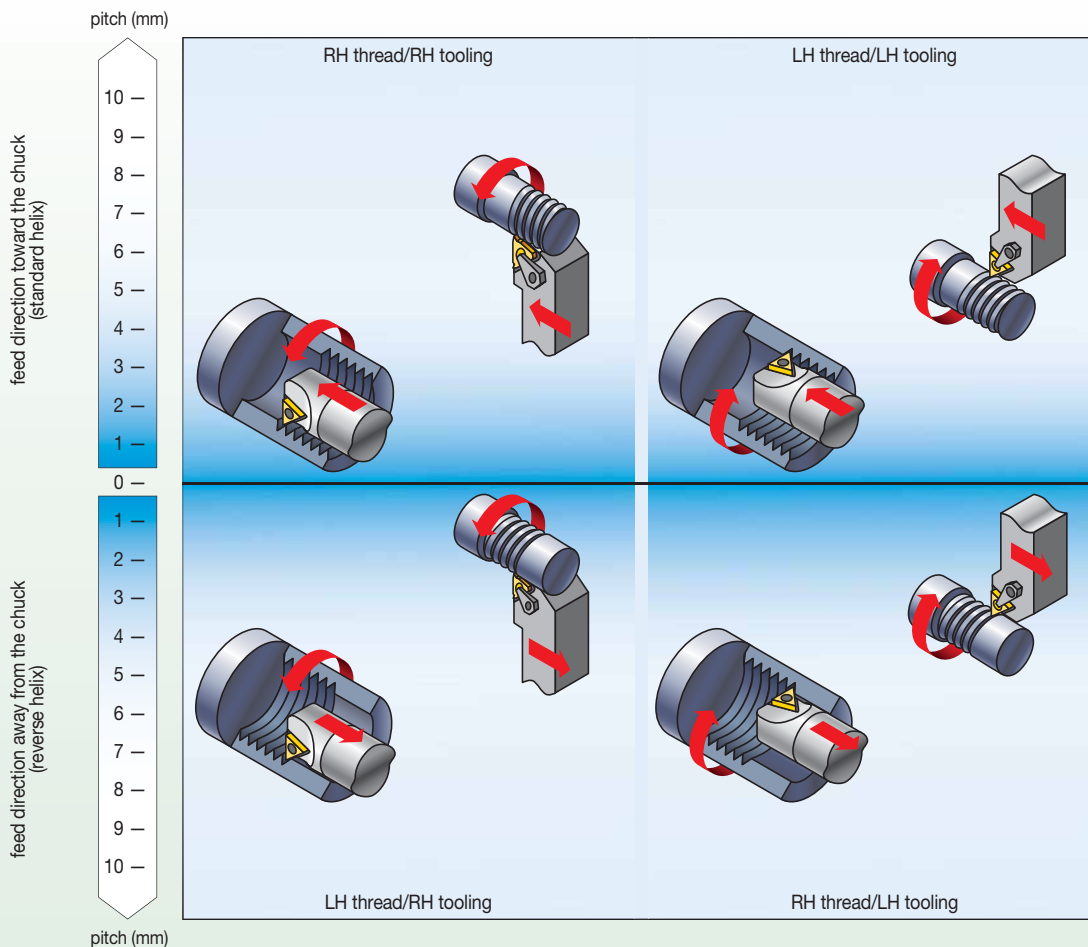
### Laydown Threading Shim Selection Guidelines

It is essential to select the correct shim to ensure thread quality and maximum tool life. These parameters are needed:

- Pitch
- Pitch diameter
- Number of starts
- Feed direction

*NOTE: When considering method of thread cutting, the part's shape and stability and the flow of chips are determining factors in your decision.*

### Laydown Selection Chart



*NOTE: For multi-start threads, use the lead value instead of the pitch.*

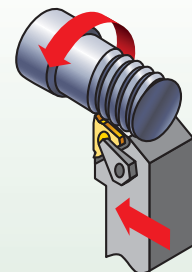
### Diagram of Thread Lead Angles

To calculate the lead angle of a given thread, use this formula:

$$\beta = \text{Arctan} \frac{P \cdot S}{\pi D_e}$$

$\beta$  = thread lead angle  
 $D_e$  = effective pitch diameter of thread wear  
 $P = 1/\text{TPI}$   
 $\text{TPI}$  = threads per inch  
 $S$  = number of starts  
 single-start, lead = pitch  
 multiple-start, lead = pitch (x) number of starts

All toolholders are designed with an inclination angle = 1.5°. When turning standard threads with a lead angle of 1-2°, this guarantees adequate clearance at the flanks of the insert's thread tooth. The thread lead angle and the required inclination angle of the insert are given by  $\beta$ . Cutting edge height is constant at every shim and insert combination. All toolholders are supplied with 1-1/2° lead angle.



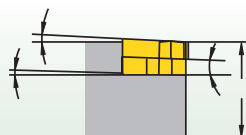
Laydown Threading Shim Selection Table • Metric

insert size	toolholder		shim ordering code (mm)							
	external	internal				standard				
3 (9,52)	RH	LH	SM-YE3-3P	SM-YE3-2P	SM-YE3-1P	SM-YE3	SM-YE3-1N	SM-YE3-1.5N	SM-YE3-2N	SM-YE3-3N
3 (9,52)	LH	RH	SM-YI3-3P	SM-YI3-2P	SM-YI3-1P	SM-YI3	SM-YI3-1N	SM-YI3-1.5N	SM-YI3-2N	SM-YI3-3N
4 (12,7)	RH	LH	SM-YE4-3P	SM-YE4-2P	SM-YE4-1P	SM-YE4	SM-YE4-1N	SM-YE4-1.5N	SM-YE4-2N	SM-YE4-3N
4 (12,7)	LH	RH	SM-YI4-3P	SM-YI4-2P	SM-YI4-1P	SM-YI4	SM-YI4-1N	SM-YI4-1.5N	SM-YI4-2N	SM-YI4-3N
TPI	pitch (mm)		pitch diameter (mm)							
72	-	-	-	-	-	3,1-8	8-21,4	>21,4	21,4-8	8-3,1
-	0,35	-	-	-	-	3,0-8	8-21,3	>21,3	21,3-8	3-8
64	-	-	-	-	-	3,4-9	9-24,1	>24,1	24,1-9	9-3,4
-	0,40	-	-	-	-	3,5-9,1	9,1-24,3	>24,3	24,3-9,1	9,1-3,5
56	-	0,45	-	-	-	3,9-10,3	10,3-27,6	>27,6	27,6-10,3	10,3-3,9
-	0,50	-	-	-	2,8-4,3	4,3-11,4	11,4-30,4	>30,4	30,4-11,4	11,4-4,3
48	-	-	-	-	3-4,6	4,6-12,1	12,1-32,2	>32,2	32,2-12,1	12,1-4,6
44	-	-	-	-	3,3-5	5-13,2	13,2-35,1	>35,1	35,1-13,2	13,2-5
-	0,60	-	2,6-3,4	-	3,4-5,2	5,2-13,7	13,7-36,5	>36,5	36,5-13,7	13,7-5,2
40	-	-	2,8-3,6	-	3,6-5,5	5,5-14,5	14,5-38,6	>38,6	38,6-14,5	14,5-5,5
-	0,70	-	3,0-4	-	4-6,1	6,1-16	16-42,6	>42,6	42,6-16	16-6,1
36	-	-	3,1-4	-	4-6,1	6,1-16,1	16,1-42,9	>42,9	42,9-16,1	16,1-6,1
-	0,75	2,8-3,2	3,3-4,3	-	4,3-6,5	6,5-17,1	17,1-45,6	>45,6	45,6-17,1	17,1-6,5
32	-	3-3,4	3,4-4,5	-	4,5-6,9	6,9-18,1	18,1-48,3	>48,3	48,3-18,1	18,1-6,9
-	0,80	3-3,5	3,5-4,6	-	4,6-6,9	6,9-18,2	18,2-48,6	>48,6	48,6-18,2	18,2-6,9
28	-	3,4-3,9	3,9-5,2	-	5,2-7,9	7,9-20,7	20,7-55,1	>55,1	55,1-20,7	20,7-7,9
27	-	3,6-4,1	4,1-5,4	-	5,4-8,2	8,2-21,4	21,4-57,2	>57,2	57,2-21,4	21,4-8,2
-	1,00	3,8-4,3	4,3-5,7	-	5,7-8,7	8,7-22,8	22,8-60,8	>60,8	60,8-22,8	22,8-8,7
24	-	4-4,6	4,6-6	-	6-9,2	9,2-24,1	24,1-64,3	>64,3	64,3-24,1	24,1-9,2
-	1,25	4,7-5,4	5,4-7,1	-	7,1-10,8	10,9-28,5	28,5-76	>76,0	76-28,5	28,5-10,8
20	-	4,8-5,5	5,5-7,2	-	7,2-11	11-28,9	29-77,2	>77,2	77,2-28,9	29-11
18	-	5,3-6,1	6,1-8	-	8-12,2	12,2-32,2	32,2-85,8	>85,8	85,8-32,2	32,2-12,2
-	1,50	5,7-6,5	6,5-8,5	-	8,5-13	13-34,2	34,2-91,2	>91,2	91,2-34,2	34,2-13
16	-	6-6,9	6,9-9	-	9-13,8	13,8-36,2	36,2-96,5	>96,5	96,5-36,2	36,2-13,8
-	1,75	6,6-7,96	7,6-10	-	10-15,2	15,2-39,9	39,9-106,4	>106,4	106,4-39,9	39,9-15,2
14	-	6,9-7,9	7,9-10,3	-	10,3-15,7	15,7-41,4	41,4-110,3	>110,3	110,3-41,4	41,4-15,7
13	-	7,4-8,5	8,5-11,1	-	11,1-17	17-44,5	44,5-118,8	>118,8	118,8-44,5	44,5-17
-	2,00	7,6-8,7	8,7-11,4	-	11,4-17,4	17,4-45,6	45,6-121,6	>121,6	121,6-45,6	45,6-17,4
12	-	8-9,2	9,2-12	-	12,1-18,4	18,4-48,2	48,3-128,7	>128,7	128,7-48,2	48,2-18,4
11,5	-	8,4-9,6	9,6-12,6	-	12,6-19,2	19,2-50,3	50,3-134,3	>134,3	134,3-50,3	50,3-19,2
11	-	8,8-10	10-13,1	-	13,1-20	20-52,6	52,6-140,4	>140,4	140,4-52,6	52,6-20
-	2,50	9,5-10,8	10,8-14,2	-	14,2-21,7	21,7-57	57-152	>152,0	152-57	57-21,7
10	-	9,6-11	11-14,5	-	14,5-22	22-57,9	57,9-154,4	>154,4	154,4-57,9	57,9-22
9	-	10,7-12,2	12,2-16,1	-	16,1-24,5	24,5-64,3	64,3-171,6	>171,6	171,6-64,3	64,3-24,5
-	3,00	11,4-13	13-17,1	-	17,1-26	26-68,4	68,4-182,4	>182,4	182,4-68,4	68,4-26
8	-	12-13,8	13,8-18,1	-	18,1-27,6	27,6-72,4	72,4-193,0	>193,0	193-72,4	72,4-27,6
-	3,50	13,3-15,2	15,2-19,9	-	19,9-30,4	30,4-79,8	79,8-212,8	>212,8	212,8-79,8	79,8-30,4
7	-	13,8-15,7	15,7-20,7	-	20,7-31,5	31,5-82,7	82,7-220,6	>220,6	220,6-82,7	82,7-31,5
-	4,00	15,2-17,3	17,3-22,8	-	22,8-34,7	34,7-91,2	91,2-243,2	>243,2	243,2-91,2	91,2-34,7
6	-	16-18,3	18,3-24,1	-	24,1-36,7	36,7-96,5	96,5-257,4	>257,4	257,4-96,5	96,5-36,7
-	5,00	19-21,7	21,7-28,5	-	28,5-43,4	43,4-114	114-304	>304,0	304-114	114-43,4
5	-	19,3-22	22-28,9	-	28,9-44,1	44,1-115,8	115,8-308,8	>308,8	308,8-115,8	115,8-44,1
4,5	-	21,4-24,5	24,5-32,1	-	32,1-49	49-128,7	128,7-343,1	>343,1	343,1-128,7	128,7-49
-	6,00	22,7-26	26-34,2	-	34,2-52,1	52,1-136,8	136,8-364,8	>364,8	364,8-136,8	136,8-52,1
4	-	24,1-27,5	27,5-36,2	-	36,2-55,1	55,1-144,8	144,8-386	>386	386-144,8	144,8-55,1
inclination angle			4.5	3.5	2.5	1.5	0.5	0.0	-0.5	-1.5
			standard helix (feed toward the chuck)					reverse helix (feed away from the chuck)		

1. Select TPI or pitch from the left-hand columns.
2. Follow row to specified pitch diameter and the correct feed direction.
3. Follow the column to the top for the required shim based on the toolholder and insert size.

**standard helix method:**

Used when RH thread is cut with RH tool or LH thread with LH tool.



**reverse helix method:**

Used when RH thread is cut with LH tool or when LH thread is cut with RH tool.

