

Turning

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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

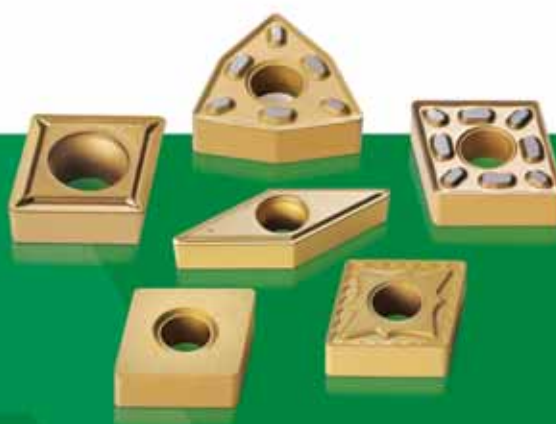
- -UR geometry offers a roughing solution for high-temp materials. Available in WS10PT™ and WS25PT™, the -UR geometry provides smooth chip forming and improved coolant flow for increased tool life. This positive geometry, with its unique chipbreaker without inflection points, reduces cutting forces and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

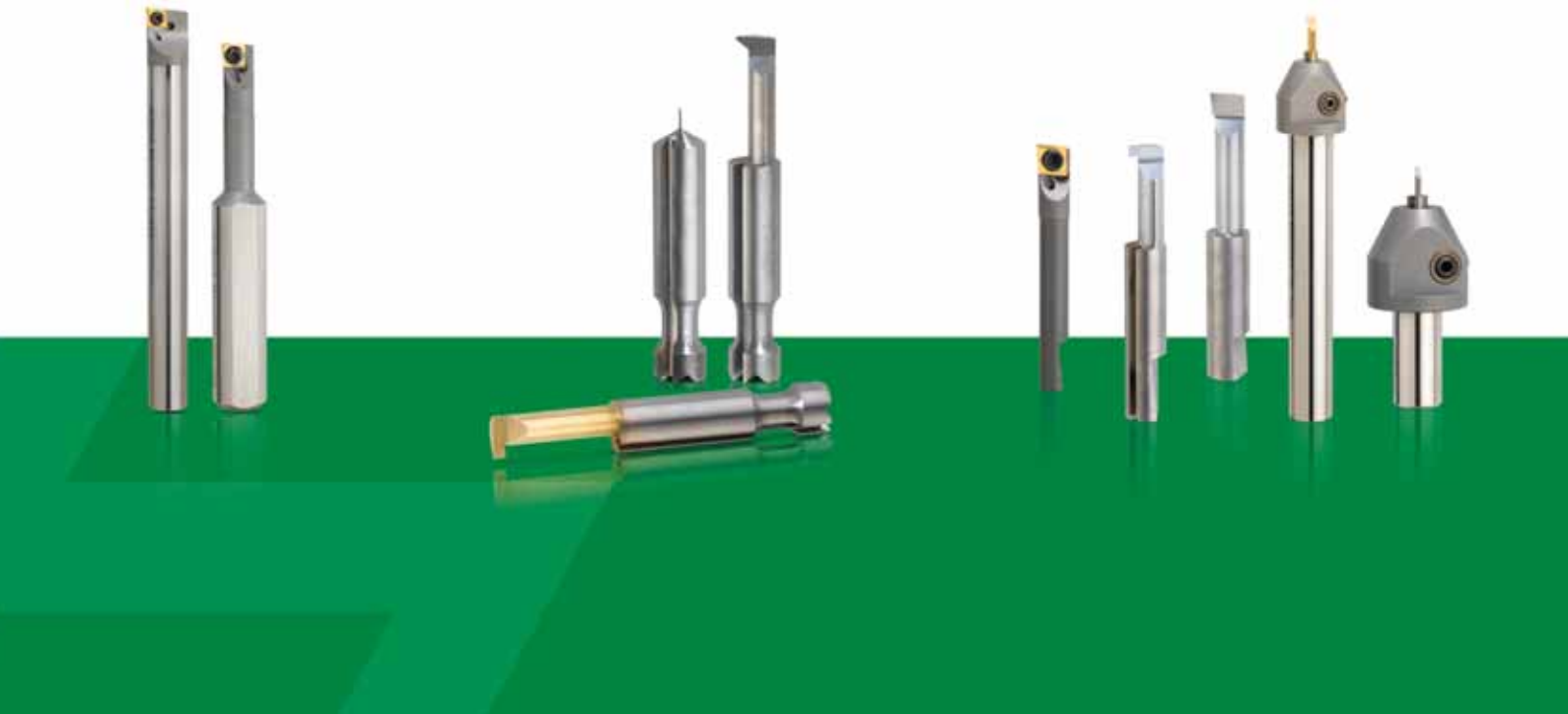
The WMT portfolio offers:

- 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, WP10CT — 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 35mm, 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

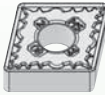
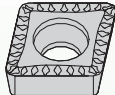
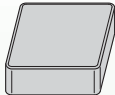
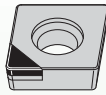
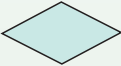
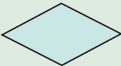
- Versatile and engineered to give exceptional performance for I.D. machining applications. Quick, accurate insert indexing.
- Internal coolant can be used with all tool bodies. Cutting inserts have special slots that direct coolant to the cutting edge.
- Carbide grades for steels, stainless steels,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

A/B Series Tooling

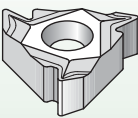
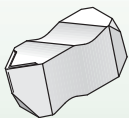
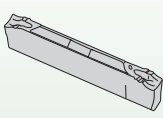
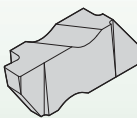
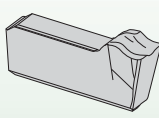
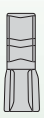
- Inserts repeat within $\pm 0,013\text{mm}$, allowing quick and accurate setups.
- Elliptical, ground insert shanks allow for maximum strength and rigidity.
- Available in boring, grooving, threading, and profiling insert styles.
- Coated and uncoated carbide grades and cubic boron nitride/polycrystalline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

■ ISO Turning Inserts

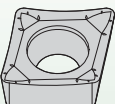
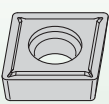
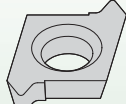
Step 1 • Select Insert Style

						
			Carbide Inserts, Negative	Carbide Inserts, Positive	Ceramic Inserts	PcBN/PCD Inserts
C	Rhomboid 80°		B35–B45	B30–B343 B45–B46	B179–B181	B197–B203
D	Rhomboid 55°		B51–B63	B47–B50 B63–B64	B182–B183	B206–B210
R	Round		B67	B65–B66	B184–B186	B210
S	Square 90°		B70–B77	B68–B70 B78–B80	B187–B192	B210–B212
T	Triangular 60°		B83–B91	B91–B93	B193–B195	B212–B215
V	Rhomboid 35°		B95–B99	B94–B95	B196	B216–B218
W	Trigon 80° with enlarged corner angles		B99–B105	B105	B196	B218

■ Threading, Grooving, and Cut-Off

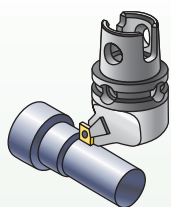
						
	LT	TopThread™	WMT™	TopGroove™	Separator™	ProGroove™
inserts	F42–F68	F8–F22	E12–E26	E48–E72	E112–E121	E94–E101
toolholders	F69–F77	F23–F35	E28–E39	E73–E79	E122–E128	E102–E104

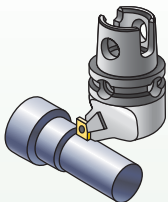
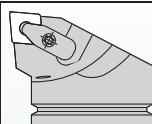
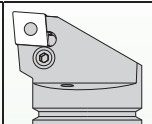
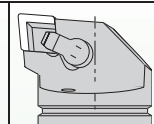
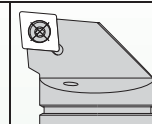
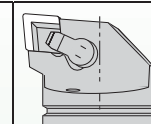
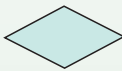
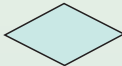
■ WIDIA™ Turning Solutions

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

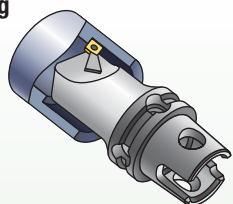
Step 2 • Select Application and Clamping System

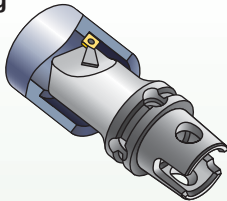
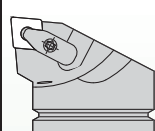
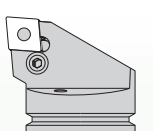
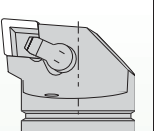
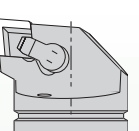
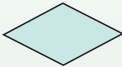
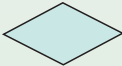
External Machining



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

Internal Machining



Internal Machining									
					D-Style Clamping	P-Style Clamping	Negative C-Style Clamping	S-Style Clamping	Positive C-Style Clamping
C	Rhomboid 80°		conventional	C56	C60	C62	C66–C70	–	
D	Rhomboid 55°			C56–C57	–	C63	C71–C76	–	
R	Round		conventional	–	–	–	–	–	
S	Square 90°		conventional	–	–	C63–C64	–	–	
T	Triangular 60°		conventional	C58	C60	–	C77–C80	C65	
V	Rhomboid 35°		conventional	C58	–	–	C80–C81	–	
W	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 Aluminum	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.

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

Victory™

Steel and Stainless Steel Grades

- Reduce 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-coloured for easier wear detection.

Post-coat treatment

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

Improved edge toughness

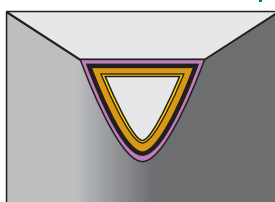
- Provides smooth outer surface to reduce forces, friction, and workpiece sticking.

Post-coat grinding

- Provides secure seating surface.

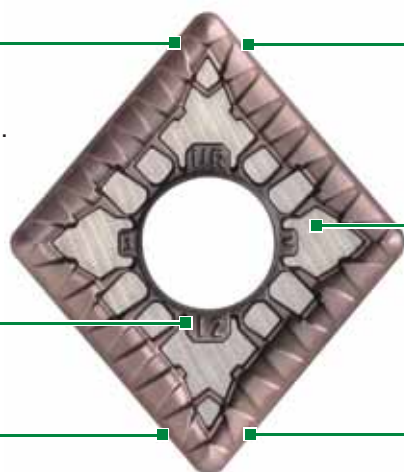
New geometry identification system

MT-CVD/CVD-TiN-TiCN-Al₂O₃-ZrCN



Alpha alumina layer

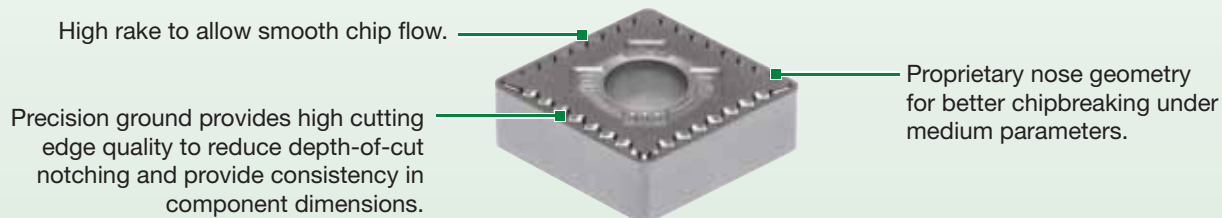
- Provides coating integrity at elevated speeds.
- Higher productivity and dependability at high cutting temperatures.



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

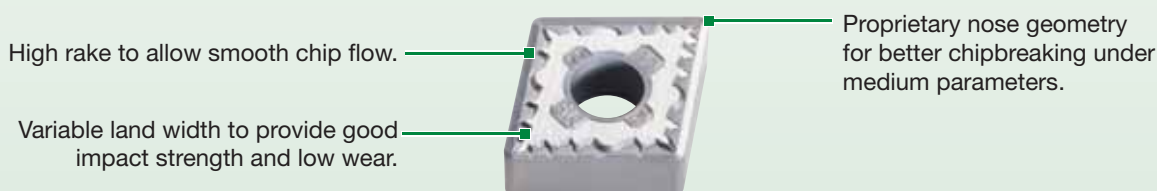
..GG-FS Geometry

- 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.



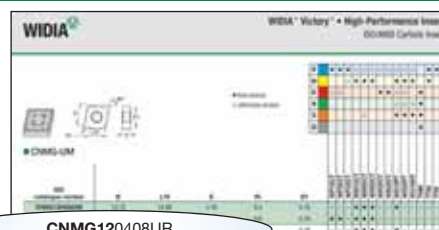
..MG-MS Geometry

- 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?

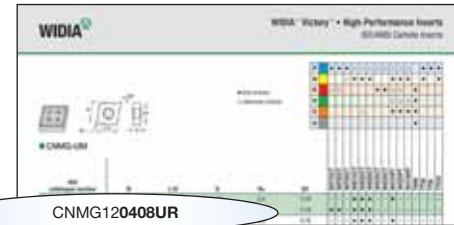
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



C	N	M	G	12																																																																																																																																																																																																																								
Insert Shape	Insert Clearance Angle	Tolerance Class	Insert Features	Size																																																																																																																																																																																																																								
H Hexagon 120°	A 3°	Tolerances apply prior to edge prep and coating D = Theoretical diameter of the insert inscribed circle S = Thickness B = See figures below	N R F A M G W T Q U B H C J X V Special Design	Code for inch cutting edge length "L10" <table><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><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></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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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

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 "Rε"

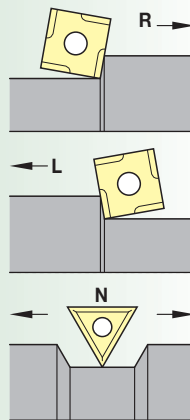
symbol	corner radius
mm	mm
X0	0,04
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
28	2,8
32	3,2
00	round insert
M0	
—	

Hand of Insert
(optional)

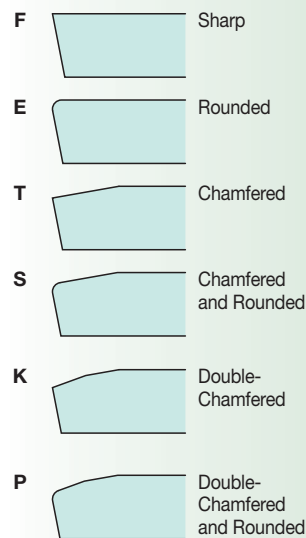
R = Right hand

L = Left hand

N = Neutral



Cutting Edge
(optional)



UR

Chipbreaker
(optional)

- 13 = Railroad Light
- CT = Copy Turning
- FF = Fine Finishing
- FP = Finish Positive
- FW = Finish Wiper
- ML = Medium Light
- MR = Medium Roughing
- MW = Medium Wiper
- RH = Roughing Heavy
- T = Negative Land
- UF = Universal Finishing
- UM = Universal Medium
- UR = Universal Roughing
- .NMP = Sharp Medium
- MP = Medium Positive
- FS = Finishing High-Temp(S)
- MS = Medium High-Temp(S)
- MU = Medium Universal
- SR = Super Roughing
- 65 = Heavy Roughing

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

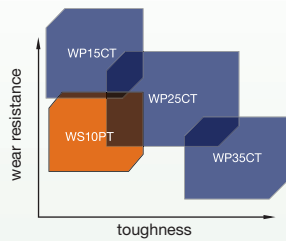
A system of grades, geometries, and application guidelines to provide optimal solutions for your metalcutting needs. It's easy to determine which WIDIA™ chip-control cutting tool will work best in your specific workpiece materials and applications!



W	P	15	C	T
Brand	Primary Workpiece Material	Application Range*	Insert Material	Application
P Steel M Stainless Steel K Cast Iron N Non-Ferrous S High-Temp Alloys H Hardened Materials U Universal Machining		05 = fine finishing 10 = finishing 15 = { medium to roughing 20 = { 25 = { 30 = { roughing 35 = { 40 = { 45 = { heaviest roughing 50 = { *Samples shown are based on turning and will differ within applications	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	T = Turning M = Milling H = Holmaking D = Solid Drills E = Solid End Mills G = Taps R = Reamer V = Thread Mills

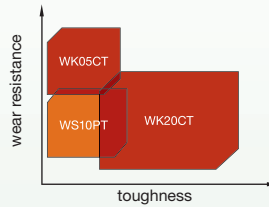


Victory Toughness/Wear Resistance



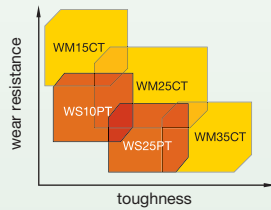
WP Grades for Steel

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



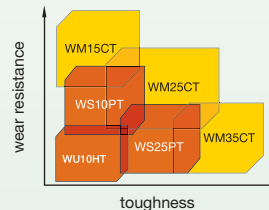
WK Grades for Cast Iron

- Three grades across 12 geometries for use in roughing to finishing 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

- Two grades to cover all of your cast iron turning 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

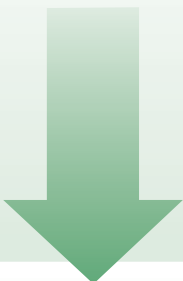
■ Step 1 • Select the insert geometry

Given: depths of cut = 1mm (.040")
feed = 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

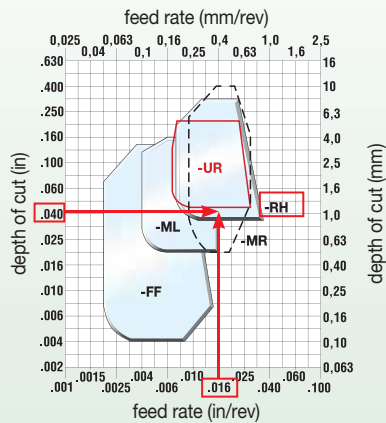
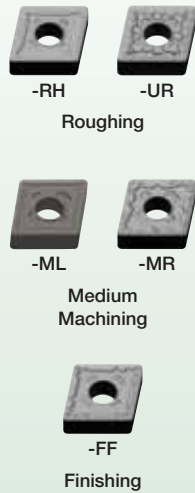
Given: grade WP35CT™ 
cutting conditions
material CK15
Unknown: cutting speed
Solution: 210 m/min

Need help in selecting a product?

Additional information can be obtained by contacting
the WIDIA Customer Application Support Team.
Go to www.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
heavily interrupted cut		WP15CT	WP25CT	WP35CT/ WP25CT	WP35CT	WP35CT	WP25CT/ WS25PT	WP35CT
lightly interrupted cut		WP15CT	WP25CT	WP25CT	WP35CT	WP35CT	WP25CT	WP25CT
varying depth of cut, casting, or forging skin		WP15CT	WP15CT	WP15CT	WP25CT	WP25CT	WP15CT	WP15CT
smooth cut, pre-turned surface		WP15CT	WP15CT	WP15CT	WP25CT	WP25CT	WP15CT	WP15CT

■ Step 3 • Selecting the cutting speed

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	WP15CT										395
	WP25CT										275
	WP35CT										210
	WS10PT										280

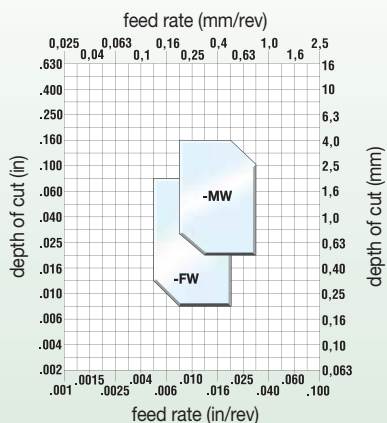
WIDIA Material Group Selection Guide:

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

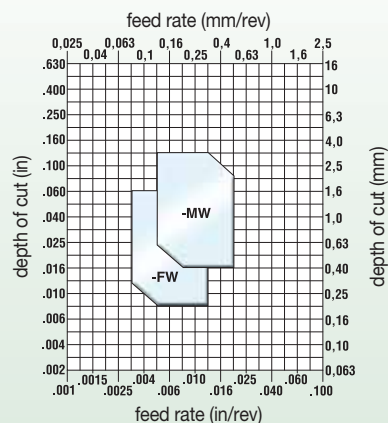
material	material group ISO code	number of material subgroups
steel	P	1–6
stainless steel	M	1–3
cast iron	K	1–3
non-ferrous materials	N	1–8
high-temp alloys	S	1–4
hardened materials	H	1

■ Step 1 • Select the insert geometry

Negative Wiper Inserts



Positive Wiper Inserts

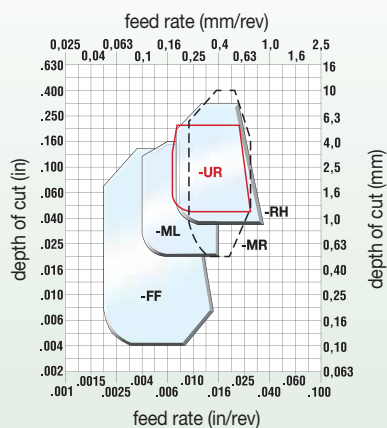
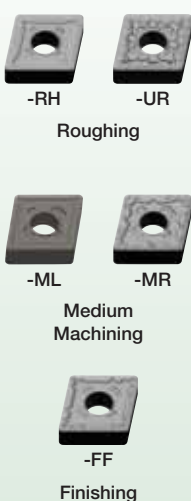


■ Step 2 • Select the grade

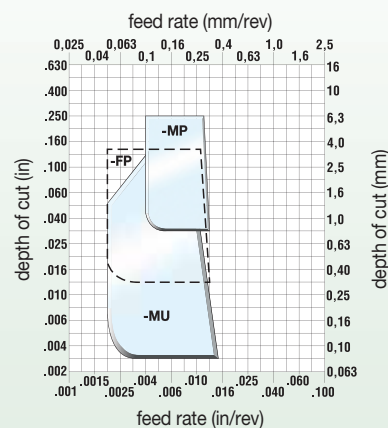
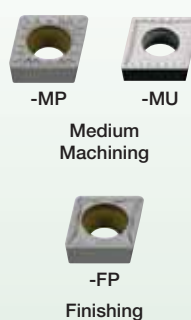
cutting condition		Negative Insert Geometry		Positive Insert Geometry	
		-FW	-MW	-FW	-MW
heavily interrupted cut		WP15CT	WP25CT	–	WP25CT
lightly interrupted cut		WP15CT	WP25CT	WP15CT	WP25CT
varying depth of cut, casting, or forging skin		WP15CT	WP15CT	WP15CT	WP15CT
smooth cut, pre-turned surface		WP15CT	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/ WP10CT	WP25CT	WP15CT	WP25CT/ WP10CT	WP15CT
smooth cut, pre-turned surface		WP15CT	WP15CT	WP15CT	WP25CT/ WP10CT	WP25CT	WP15CT	WP25CT/ WP10CT	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

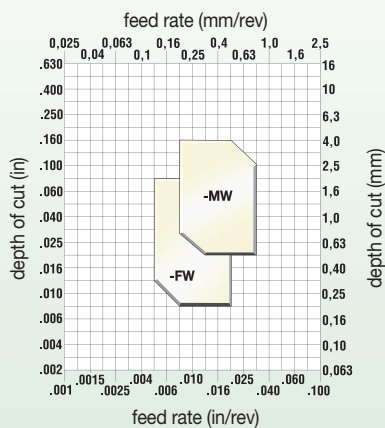
Starting Conditions

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

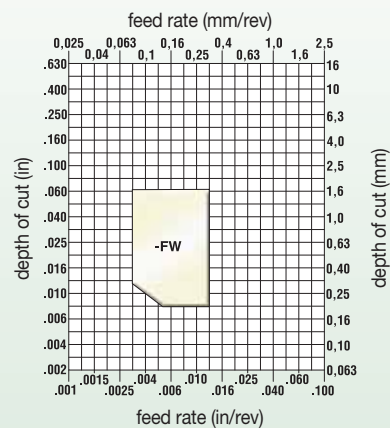
■ Step 1 • Select the insert geometry



Negative Wiper Inserts



Positive Wiper Inserts

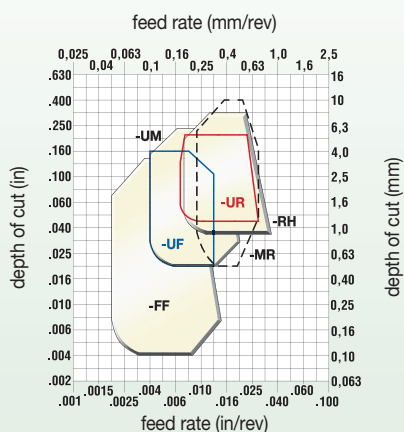
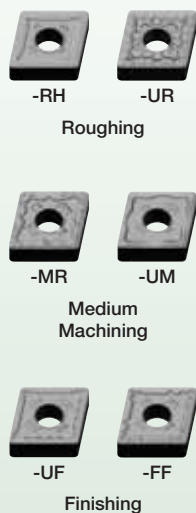


■ Step 2 • Select the grade

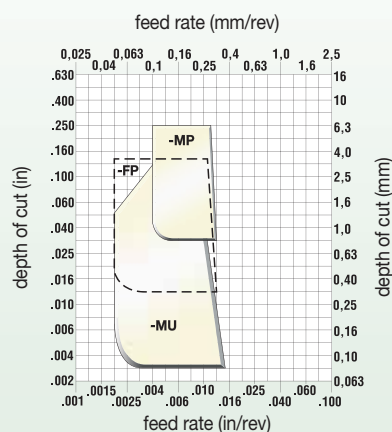
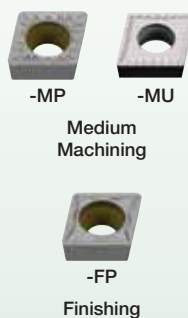
cutting condition		Negative Insert Geometry		Positive Insert Geometry
		-FW	-MW	-FW
heavily interrupted cut		WM15CT	WM15CT	WM15CT
lightly interrupted cut		WM15CT	WM25CT	WM15CT
varying depth of cut, casting, or forging skin		WM15CT	WM25CT	WM15CT
smooth cut, pre-turned surface		WM15CT	WM25CT	WM15CT

■ Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



(continued)

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

		Negative Insert Geometry					
cutting condition		-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

		Positive Insert Geometry		
cutting condition		-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											180

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											165

**Austenitic Stainless Steel: Duplex
(Ferritic and Austenitic Mixture)**

speed – m/min

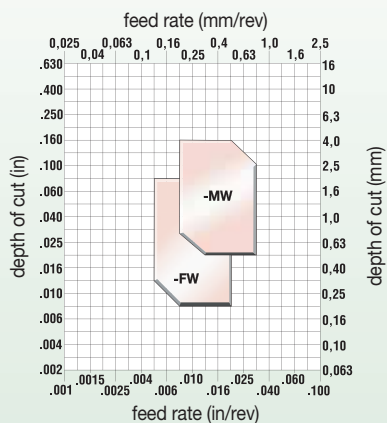
Starting Conditions

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											150

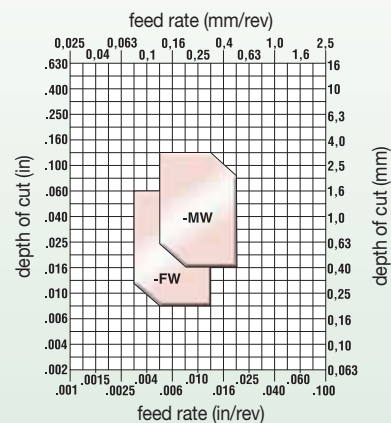
■ Step 1 • Select the insert geometry

WIDIA
VICTORY

Negative Wiper Inserts



Positive Wiper Inserts

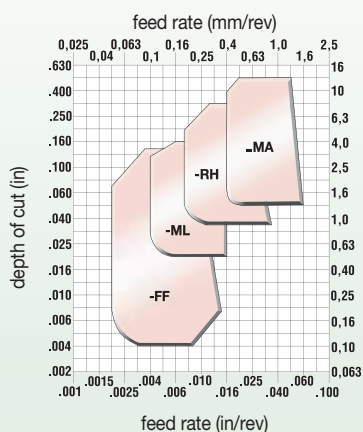


■ Step 2 • Select the grade

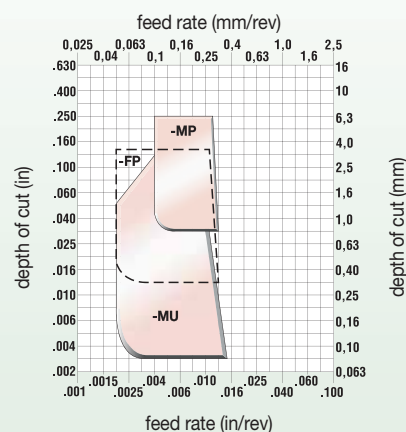
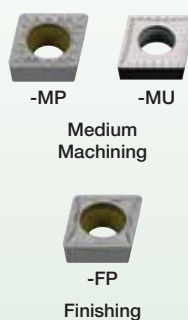
cutting condition		Negative Insert Geometry		Positive Insert Geometry	
		-FW	-MW	-FW	-MW
heavily interrupted cut		-	-	-	-
lightly interrupted cut		WK05CT	WK05CT	WK05CT	WK05CT
varying depth of cut, casting, or forging skin		WK05CT	WK05CT	WK05CT	WK05CT
smooth cut, pre-turned surface		WK05CT	WK05CT	WK05CT	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
K1	WK05CT											450
	WK20CT											300

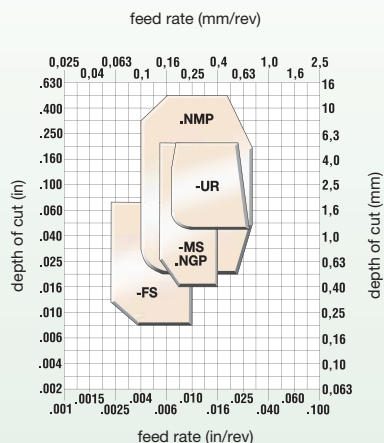
Ductile, Compacted Graphite, and Malleable Cast Irons (<600 MPa tensile strength)		speed — m/min										Starting Conditions 
material group	grade	90	135	180	225	275	320	360	410	460	500	m/min
K2	WS10PT											200
	WK05CT											360
	WK20CT											240

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
K3	WS10PT											150
	WK05CT											240
	WK20CT											210

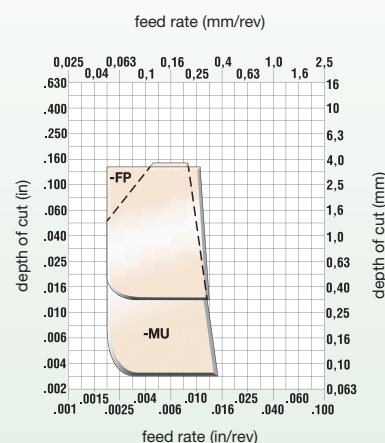
■ Step 1 • Select the insert geometry



Negative Inserts



Positive Inserts



■ Step 2 • Select the grade

cutting condition		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)

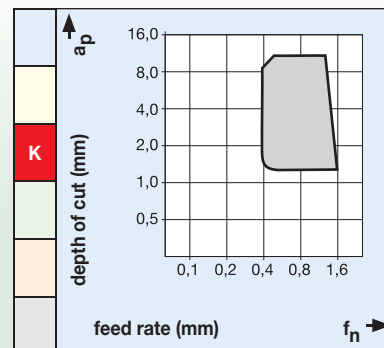
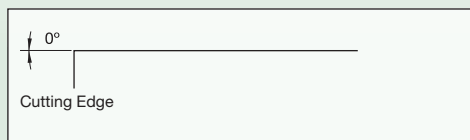
material group	grade	speed — m/min										Starting Conditions
		15	45	75	105	140	170	200	230	290	310	m/min
S4	WU10HT		◊									45
	WM15CT			◊								70
	WM25CT/WM35CT		◊									55

■ Negative Inserts

..MA



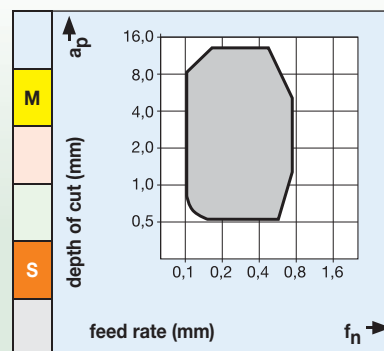
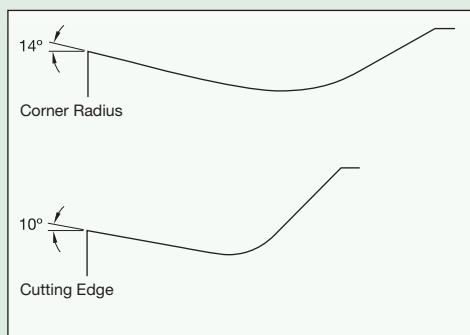
Flat top geometry for machining cast iron. For finishing to roughing applications.



.NMP



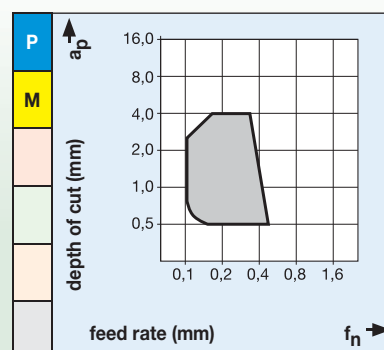
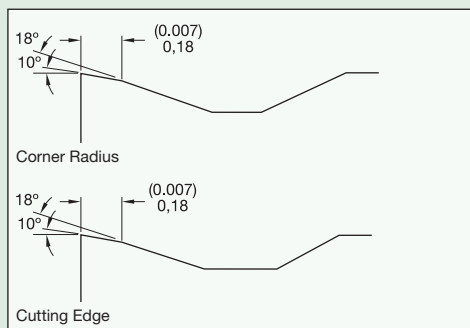
For medium-duty machining of tough work materials, such as chrome- and nickel-based alloys. Minimises tendency for materials to adhere to insert.



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.

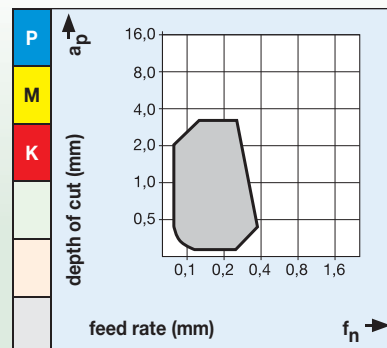
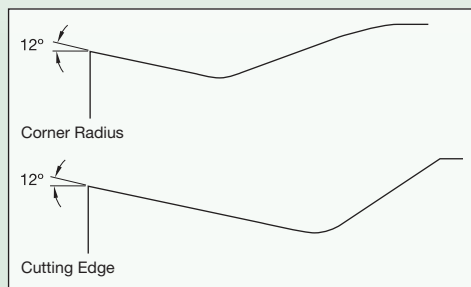
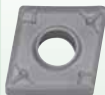


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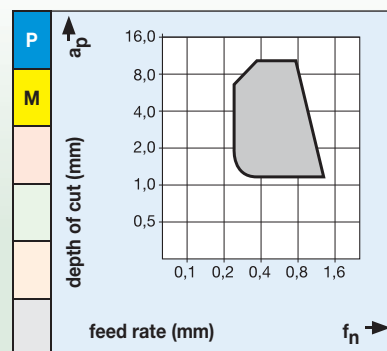
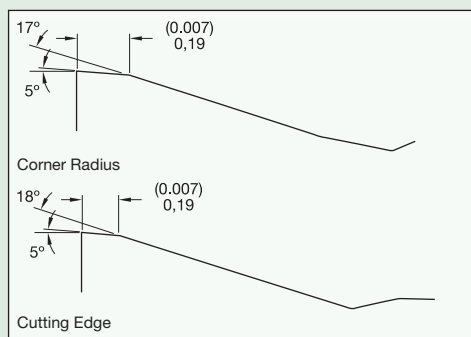
■ Negative Inserts *(continued)*

22

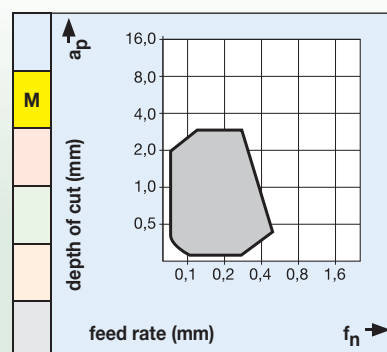
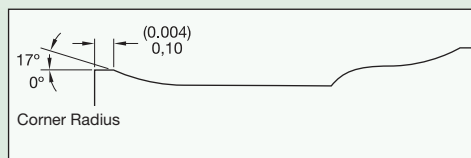

For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.


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.

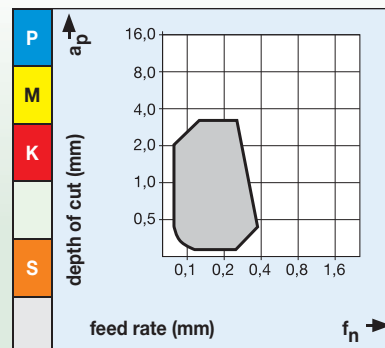
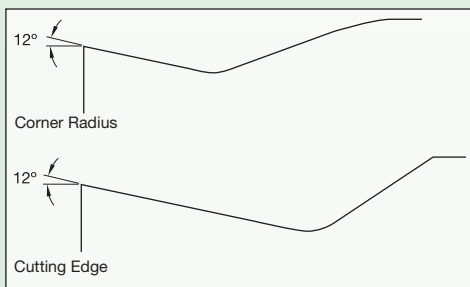

(continued)

■ Negative Inserts (continued)

FF



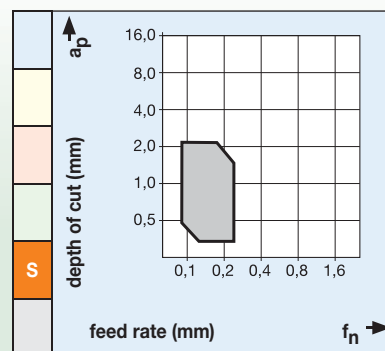
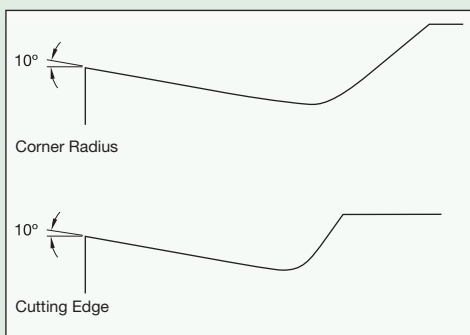
For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.



FS



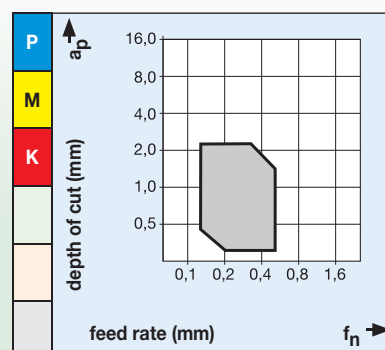
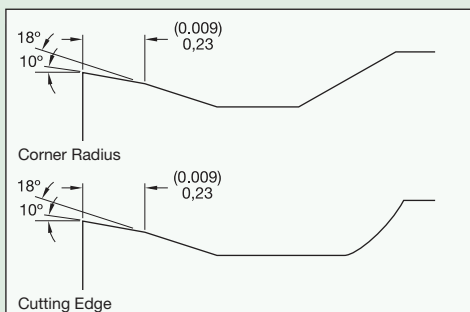
For finishing applications. Ground periphery with positive cutting edge ideally suited for high-temp alloys. Micro finished edge on the ground periphery adds just a slight hone for improved edge integrity and reliability.



FW



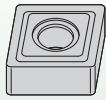
Wiper geometry for finishing when good surface finish is needed using high feed rates. First choice for high-performance finishing.



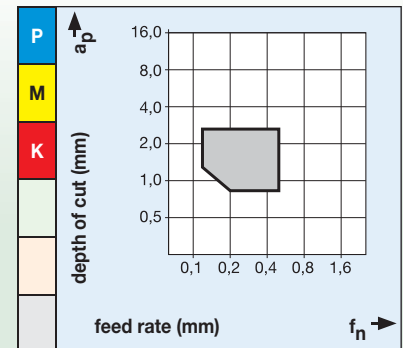
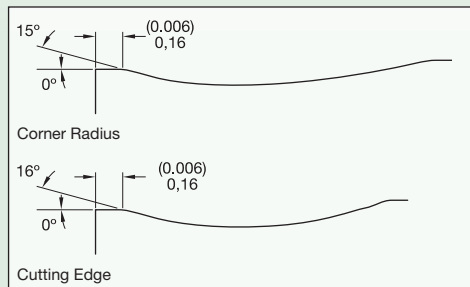
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■ Negative Inserts *(continued)*

MG



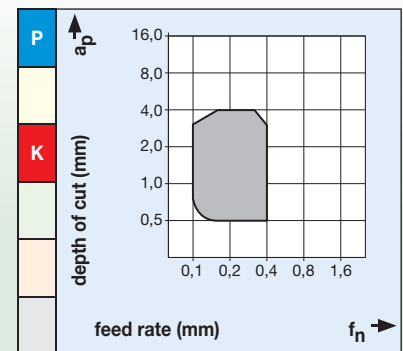
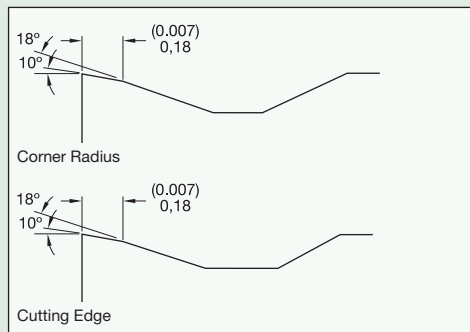
For light machining to light roughing.



ML



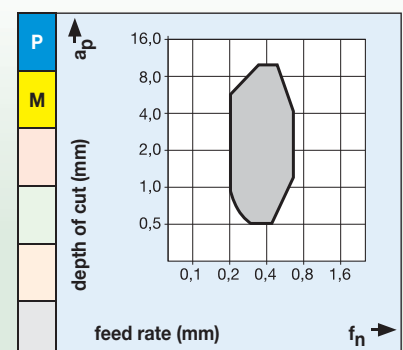
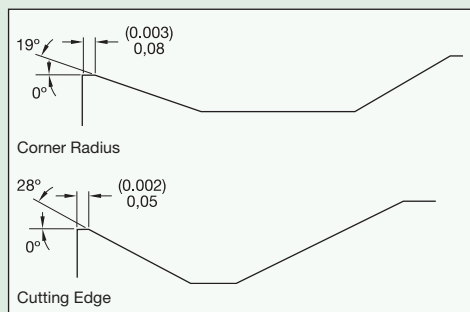
For finishing to medium machining with a negative, stable cutting edge.



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.



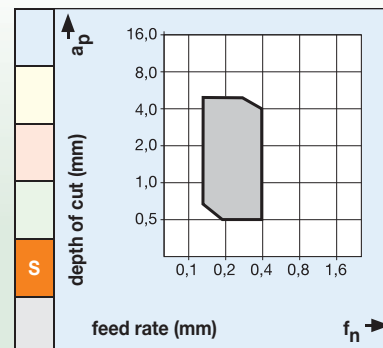
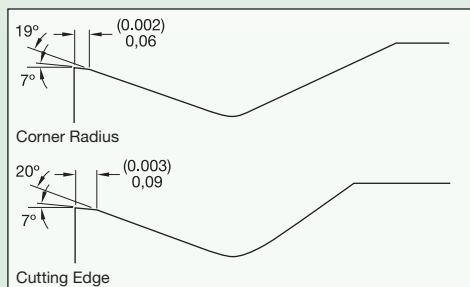
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■ Negative Inserts *(continued)*

MS



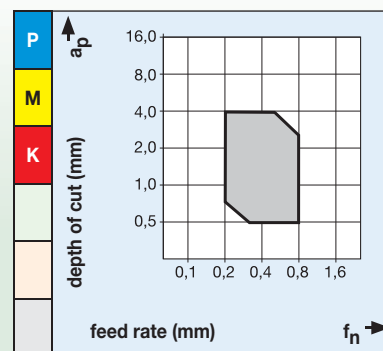
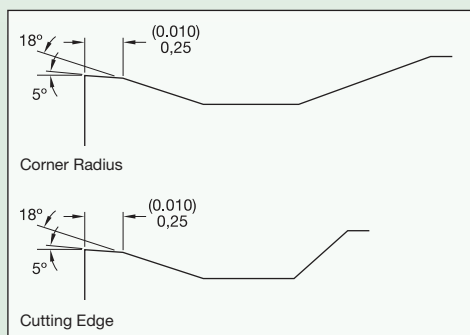
For medium machining in high-temp materials. Utilises a micro-finished edge preparation to increase edge toughness.



MW



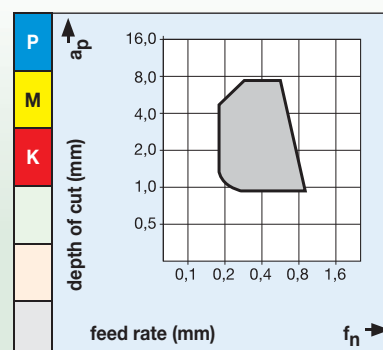
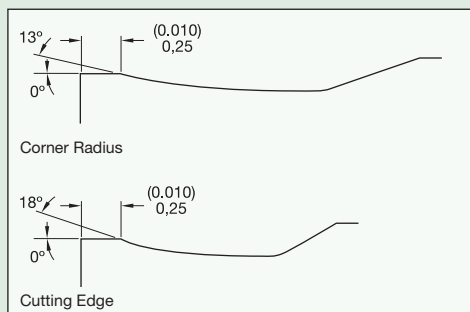
Wiper geometry for light to medium turning with high feed rates. Feed twice as high as with edges with full corner radii to produce same surface finish.



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.



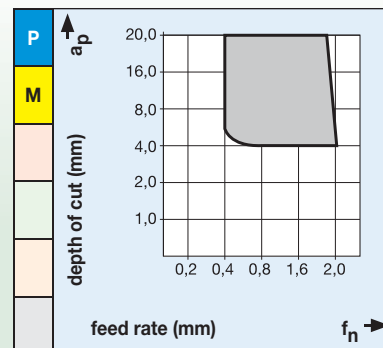
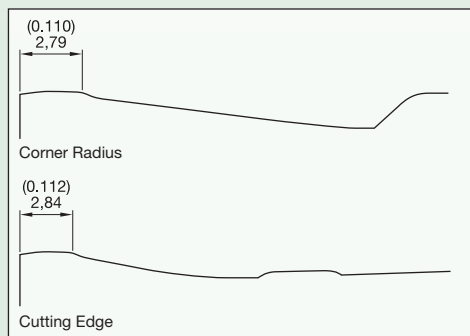
(continued)

■ Negative Inserts *(continued)*

SR



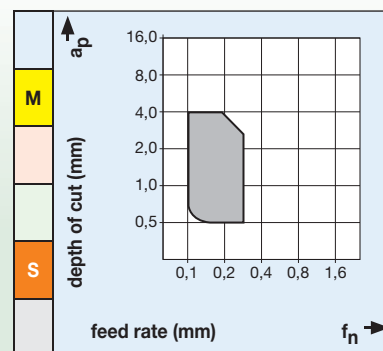
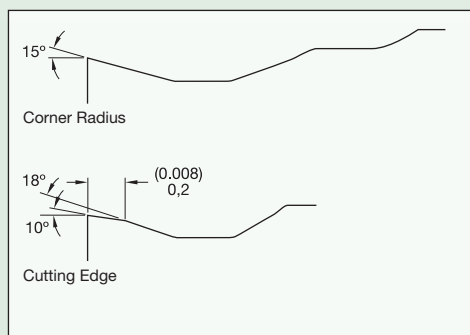
A super roughing geometry. The SR has a strong cutting edge to support high cutting loads in roughing applications. Can produce high metal removal rates.



UF



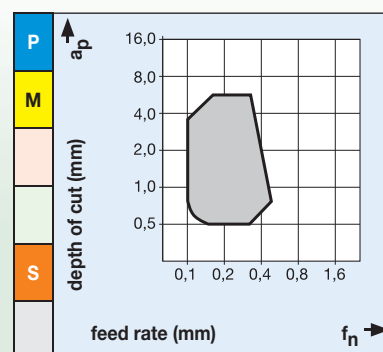
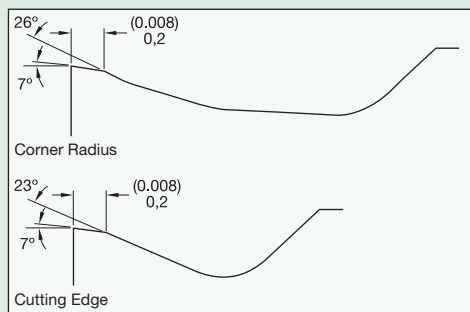
For finishing with a positive cutting edge for reduced cutting forces and superior surface quality.



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.



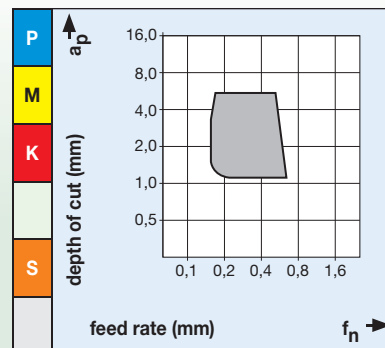
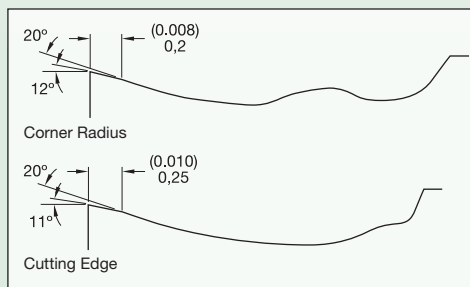
(continued)

■ 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.

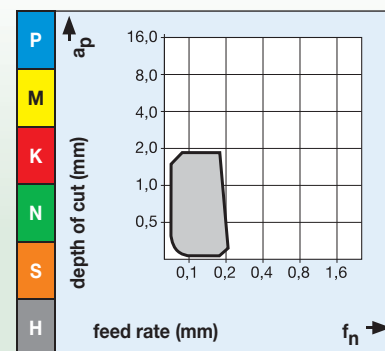
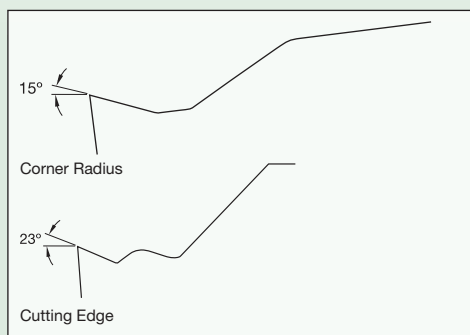


■ Positive Inserts

2



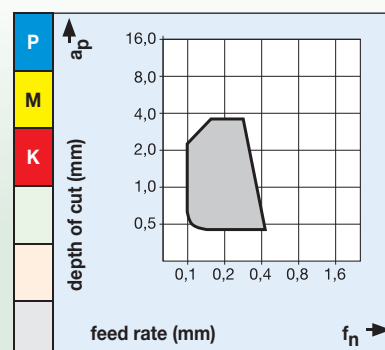
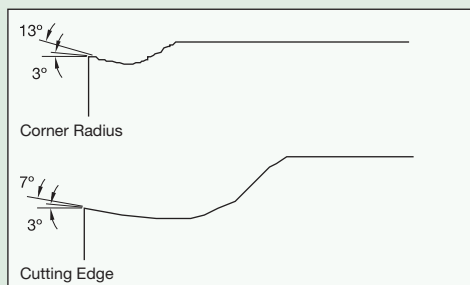
Sharp edge for finish machining. Good chip control with very small chip sections. High dimensional accuracy and smooth surface finishes. Inserts with .008" corner radius precision-ground on all sides.



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.



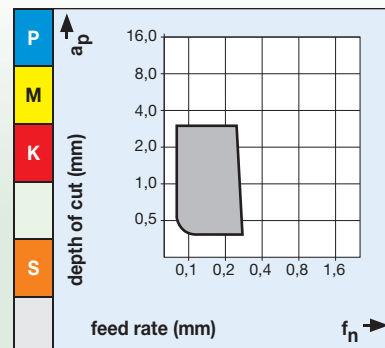
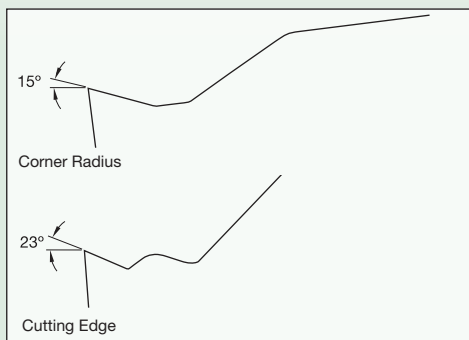
(continued)

■ Positive Inserts (continued)

FP



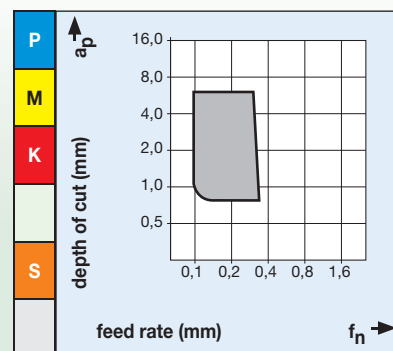
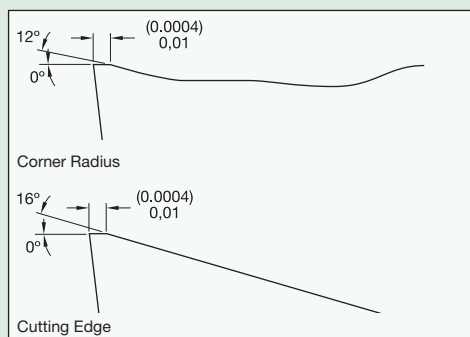
For finishing to medium turning operations with optimal chip control over a wide range of cutting conditions and workpiece materials.



MP



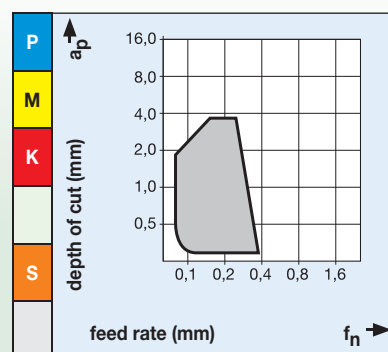
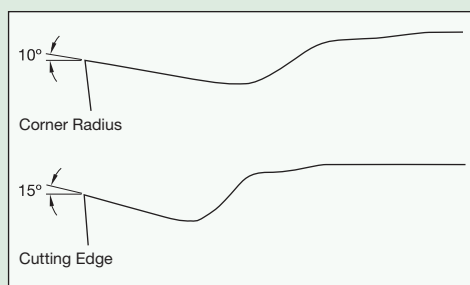
For medium to rough turning with reduced cutting forces and improved chip control for high feed rates. Suitable for high metal removal rates and spindling applications.

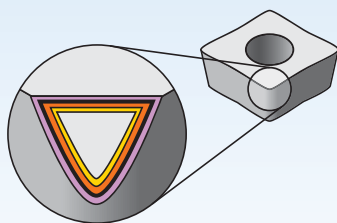


MU



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.

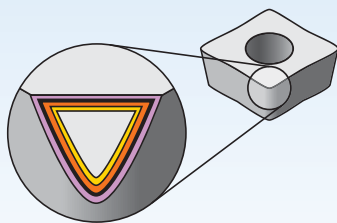




Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

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

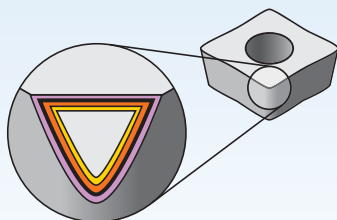
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Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

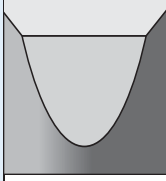
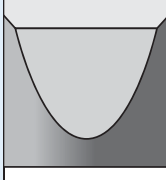
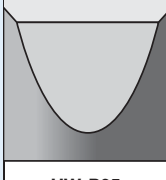
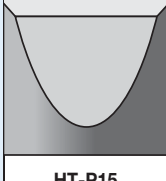
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

		wear resistance ← → toughness										
Coating		Grade Description		05	10	15	20	25	30	35	40	45
WK05CT		Coated carbide. MT-CVD/CVD — TiN-TiCN-Al ₂ O ₃ . Increased wear resistance for long tool life at high cutting speeds. Enhanced edge strength against depth-of-cut notching in interrupted cuts. Maximum wear resistance for long tool life at high cutting speeds in finish to medium machining.	P									
			M									
			K									
			N									
			S									
WK20CT		Coated carbide. MT-CVD/CVD — TiN-TiCN-Al ₂ O ₃ . First choice for a wide range of machining on all grey and ductile irons, light to heavy machining, smooth or interrupted cuts, and wet or dry.	P									
			M									
			K									
			N									
			S									
WS10PT		An advanced multilayer PVD coating over a very deformation-resistant unalloyed carbide substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. WS10PT™ is ideal for finishing to general machining of most workpiece materials at a wide range of speed and feed capabilities. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials, and super alloys with improved edge toughness and higher cutting speed and feed capabilities.	P									
			M									
			K									
			N									
			S									
WS25PT		An advanced PVD grade with hard AlTiN coating and fine-grain unalloyed substrate. The new and improved coating improves edge stability with wide range speed and feed capabilities. WS25PT™ is ideal for general machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials at moderate speeds and over a wide range of feeds, with improved edge toughness for interrupted cut and high feed rates.	P									
			M									
			K									
			N									
			S									
WU10HT		An uncoated, hard, low-binder content, unalloyed WC/Co fine-grain grade. WU10HT™ offers exceptional edge wear and superior thermal deformation and depth-of-cut notch resistance. The grain structure is well controlled for minimal pits and flaws, which contributes to long, reliable service.	P									
			M									
			K									
			N									
			S									
C3-C4			P									
			M									
			K									
			N									
			S									



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

		wear resistance ← → toughness											
Coating		Grade Description			05	10	15	20	25	30	35	40	45
THM		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.	HW-K15										
				K									
				N									
				S									
				H									
TTM		Uncoated carbide. Medium machining. For steel.	HW-P25	P									
				M									
TTR		Uncoated carbide. Light and medium machining. For steel. To be used at low cutting speeds. Effective in unfavorable conditions.	HW-P35	P									
TT15		Cermet. Light machining. Extremely good wear resistance at higher cutting speeds. For steels and nodular cast iron. Recommended for high cutting speeds under favourable conditions.	HT-P15	P									
				M									
				K									



Experience Powering Productivity™

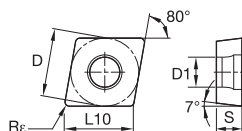
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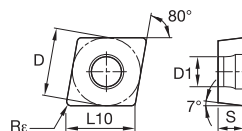


- first choice
- alternate choice

[illegible]

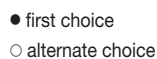
CCMT

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						2031658	2031666	2031693	2031706	2031723	2027432	2027472	2027484							
CCMT060202	6,35	6,45	2,38	0,2	2,80	■	■	■	■	■	■	■	■	■	■	■	2031658	■	■	■
CCMT060204	6,35	6,45	2,38	0,4	2,80	■	■	■	■	■	■	■	■	■	■	■	2031666	■	2031668	2031665
CCMT090304	9,53	9,67	3,18	0,4	4,40	■	■	■	■	■	■	■	■	■	■	■	2031693	■	2031695	■
CCMT090308	9,53	9,67	3,18	0,8	4,40	■	■	■	■	■	■	■	■	■	■	■	2031706	■	2027339	■
CCMT09T304	9,53	9,67	3,97	0,4	4,40	■	■	■	■	■	■	■	■	■	■	■	2031723	■	■	■
CCMT09T308	9,53	9,67	3,97	0,8	4,40	■	■	■	■	■	■	■	■	■	■	■	2027432	■	■	■
CCMT09T312	9,53	9,67	3,97	1,2	4,40	■	■	■	■	■	■	■	■	■	■	■	■	■	2027465	■
CCMT120408	12,70	12,90	4,76	0,8	5,50	■	■	■	■	■	■	■	■	■	■	■	2027472	■	2027484	■



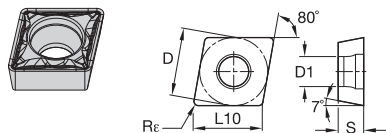
■ CCMT-2

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Inserts

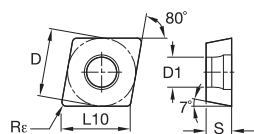
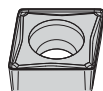
■ CCMT-41

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■ CCMT-FP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4169857 4170140	- -	- 4168738	4168778 4168779	- -	- 4170032	- 5684337	- 5684340	- -	- 4170083	- 5684342	- 5684344	- -	- -	- -
CCMT060202FP	6,35	6,45	2,38	0,2	2,80	4169857 4170140	- -	- 4168738	4168778 4168779	- -	- 4170032	- 5684337	- 5684340	- -	- -	- -	- -	- -	- -	- -
CCMT060204FP	6,35	6,45	2,38	0,4	2,80	4169858 4170141	- -	- 4168738	4168779 4168780	- -	- 4170032	- 5684337	- 5684340	- -	- -	- -	- -	- -	- -	- -
CCMT060208FP	6,35	6,45	2,38	0,8	2,80	4169859 4170142	- -	- 4168739	4168780 4168781	- -	- 4170083	- 5684342	- 5684344	- -	- -	- -	- -	- -	- -	- -
CCMT09T302FP	9,53	9,67	3,97	0,2	4,40	- 4170293	- -	- -	4168781 4168782	- -	- -	- 4170084	- 5684341	- 5684343	- -	- -	- -	- -	- -	- -
CCMT09T304FP	9,53	9,67	3,97	0,4	4,40	4169860 4170294	- -	- 4168740	4168782 4168783	- -	- 4170085	- 5684341	- 5684343	- -	- -	- -	- -	- -	- -	- -
CCMT09T308FP	9,53	9,67	3,97	0,8	4,40	4169861 4170295	- -	- 4168741	4168783 4168784	- -	- 4170086	- 5684341	- 5684338	- -	- -	- -	- -	- -	- -	- -
CCMT120404FP	12,70	12,90	4,76	0,4	5,50	4169862 4170296	- -	- 4168742	4168784 4168785	- -	- 4170087	- 4170088	- -	- -	- -	- -	- -	- -	- -	- -
CCMT120408FP	12,70	12,90	4,76	0,8	5,50	4169993 4170297	- -	- 4168763	4168785 4168786	- -	- 4170087	- 4170088	- -	- -	- -	- -	- -	- -	- -	- -
CCMT120412FP	12,70	12,90	4,76	1,2	5,50	4169994 4170298	- -	- 4168786	- -	- 4170088	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

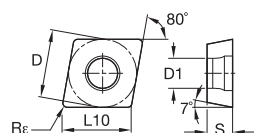
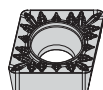




- alternate choice

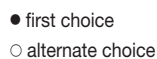
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■ CCMT-FW

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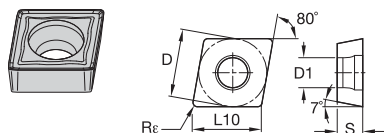
■ CCMT-MP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4170197	4170217	-	4168893	4168906	-	-	-	4170237	5684351	-	-	-	-	-
CCMT060204MP	6,35	6,45	2,38	0,4	2,80	4170198	4170218	-	4168894	4168907	-	-	4170238	5684352	-	-	-	-	-	-
CCMT09T304MP	9,53	9,67	3,97	0,4	4,40	4170199	4170219	-	4168895	4168908	-	-	4170239	5684350	-	-	-	-	-	-
CCMT09T308MP	9,53	9,67	3,97	0,8	4,40	4170220	4170221	-	4168896	4168909	-	-	4170240	5684349	-	-	-	-	-	-
CCMT09T312MP	9,53	9,67	3,97	1,2	4,40	4170222	4170223	-	4168897	4168910	-	-	4170241	5684348	-	-	-	-	-	-
CCMT120408MP	12,70	12,90	4,76	0,8	5,50	4170224	4170225	-	4168898	4168911	-	-	4170242	5684347	-	-	-	-	-	-
CCMT120412MP	12,70	12,90	4,76	1,2	5,50	4170226	4170227	-	4168899	4168912	-	-	4170243	5684346	-	-	-	-	-	-

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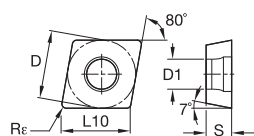
Inserts

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
CCMT060208MU	6,35	6,45	2,38	0,8	2,80	■	■	■	■	5623159	■	■	5623158	■	■	■	■	■	■	■
CCMT090304MU	9,53	9,67	3,18	0,4	4,40	■	5623420	■	■	5623421	■	■	■	■	■	■	■	■	■	■
CCMT090308MU	9,53	9,67	3,18	0,8	4,40	■	5623425	■	■	5623423	■	■	■	■	■	■	■	■	■	■
CCMT09T304MU	9,53	9,67	3,97	0,4	4,40	5623431	5623430	■	■	5623427	■	5623429	5623432	5623428	5623426	■	■	■	■	■
CCMT09T308MU	9,53	9,67	3,97	0,8	4,40	5623440	5623436	5623439	■	5623435	■	■	5623433	5623438	■	■	■	■	■	■
CCMT120408MU	12,70	12,90	4,76	0,8	5,50	■	5623443	■	■	5623442	■	■	5623441	■	5623444	■	■	■	■	■



ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						5623471	5623472	5623473	5623474	5623475	5623476	5623477	5623478	5623479	5623480	5623481	5623482	5623483	5623484	5623485
CCMT09T304MW	9,53	9,67	3,97	0,4	4,40	5623471	5623472	5623473	5623474	5623475	5623476	5623477	5623478	5623479	5623480	5623481	5623482	5623483	5623484	5623485
CCMT09T308MW	9,53	9,67	3,97	0,8	4,40	5623471	5623472	5623473	5623474	5623475	5623476	5623477	5623478	5623479	5623480	5623481	5623482	5623483	5623484	5623485
CCMT120404MW	12,70	12,90	4,76	0,4	5,50	5623476	5623477	5623478	5623479	5623480	5623481	5623482	5623483	5623484	5623485	5623486	5623487	5623488	5623489	5623490
CCMT120408MW	12,70	12,90	4,76	0,8	5,50	5623476	5623477	5623478	5623479	5623480	5623481	5623482	5623483	5623484	5623485	5623486	5623487	5623488	5623489	5623490



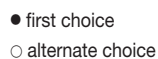


- first choice
- alternate choice

 CCMW

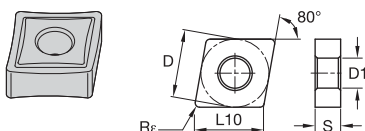
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ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
CCMW060202	6,35	6,45	2,38	0,2	2,80	■	■	■	■	■	■	■	■	■	■	■	2031733	■	■
CCMW060204	6,35	6,45	2,38	0,4	2,80	■	■	■	■	■	■	4170464	4170368	■	■	■	2027507	■	■
CCMW090302	9,53	9,67	3,18	0,2	4,40	■	■	■	■	■	■	■	■	■	■	■	2031734	■	■
CCMW090304	9,53	9,67	3,18	0,4	4,40	■	■	■	■	■	■	4170465	4170369	■	■	■	2027509	■	■
CCMW090308	9,53	9,67	3,18	0,8	4,40	■	■	■	■	■	■	4170466	4170370	■	■	■	■	■	■
CCMW09T304	9,53	9,67	3,97	0,4	4,40	■	■	■	■	■	■	4170467	4170371	■	■	■	2027511	■	■
CCMW09T308	9,53	9,67	3,97	0,8	4,40	■	■	■	■	■	■	4170468	4170372	■	■	■	2027512	■	■
CCMW120404	12,70	12,90	4,76	0,4	5,50	■	■	■	■	■	■	4170469	4170373	■	■	■	2027524	■	■
CCMW120408	12,70	12,90	4,76	0,8	5,50	■	■	■	■	■	■	4170470	4170374	■	■	■	2027525	■	■

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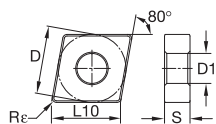
Inserts

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
CNGG120401FS	12,70	12,90	4,76	0,1	5,16	■	■	■	■	■	■	■	■	5548576	5548576	■	■	■	■	■
CNGG120402FS	12,70	12,90	4,76	0,2	5,16	■	■	■	■	■	■	■	■	5548575	5548575	■	■	■	■	■
CNGG120404FS	12,70	12,90	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5548577	5548577	5538204	5549945	■	■	■
CNGG120408FS	12,70	12,90	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5548578	5548578	5538205	5549946	■	■	■
CNGG120412FS	12,70	12,90	4,76	1,2	5,16	■	■	■	■	■	■	■	■	5548579	5548579	■	■	■	■	■



ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
CNGP120401	12,70	12,90	4,76	0,1	5,16	■	■	■	■	■	■	■	■	5549137	■	■	■	■	■	■
CNGP120402	12,70	12,90	4,76	0,2	5,16	■	■	■	■	■	■	■	■	5549138	■	5549206	■	■	■	■
CNGP120404	12,70	12,90	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5549139	■	5549207	■	■	■	■
CNGP120408	12,70	12,90	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5549190	■	5549208	■	■	■	■



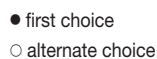


- first choice
- alternate choice

■ CNMA

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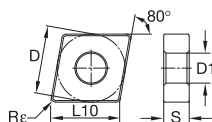
ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
CNMA120404	12,70	12,90	4,76	0,4	5,16	■	■	■	■	■	■	4171595	4171595	■	■	■	■	■	■	■
CNMA120408	12,70	12,90	4,76	0,8	5,16	■	■	■	■	■	■	4171596	4171596	■	■	■	■	■	■	■
CNMA120412	12,70	12,90	4,76	1,2	5,16	■	■	■	■	■	■	4171597	4171597	■	■	■	■	■	■	■
CNMA120416	12,70	12,90	4,76	1,6	5,16	■	■	■	■	■	■	4171598	4171598	■	■	■	■	■	■	■
CNMA160608	15,88	16,12	6,35	0,8	6,35	■	■	■	■	■	■	■	4171867	4171867	■	■	■	■	■	■
CNMA160612	15,88	16,12	6,35	1,2	6,35	■	■	■	■	■	■	4171599	4171868	■	■	■	■	■	■	■
CNMA160616	15,88	16,12	6,35	1,6	6,35	■	■	■	■	■	■	4171600	4171869	■	■	■	■	■	■	■
CNMA190608	19,05	19,34	6,35	0,8	7,93	■	■	■	■	■	■	4171601	4171870	■	■	■	■	■	■	■
CNMA190612	19,05	19,34	6,35	1,2	7,93	■	■	■	■	■	■	4171602	4171871	■	■	■	■	■	■	■
CNMA190616	19,05	19,34	6,35	1,6	7,93	■	■	■	■	■	■	4171633	4171872	■	■	■	■	■	■	■

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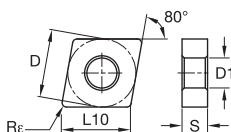
inserts

CNMG

ISO catalogue number	D	L10	S	R _ε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK06CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
CNMG120404	12,70	12,90	4,76	0,4	5,16	■	■	■	■	■	■	■	■	■	■	■	2559561	■	■	■
CNMG120408	12,70	12,90	4,76	0,8	5,16	■	■	■	■	■	■	■	■	■	■	■	2027567	■	■	■
CNMG190612	19,05	19,34	6,35	1,2	7,93	■	■	■	■	■	■	■	■	■	■	■	2559382	■	■	■
CNMG190616	19,05	19,34	6,35	1,6	7,93	■	■	■	■	■	■	■	■	■	■	■	2559317	■	■	■

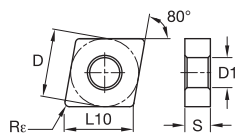
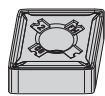


■ CNMG-22

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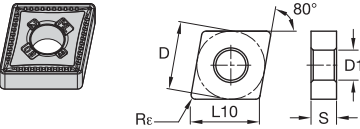
■ CNMG-FF

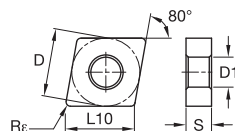
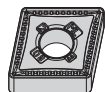
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- alternate choice

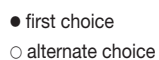
■ CNMG-FW

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
CNMG120404FW	12,70	12,90	4,76	0,4	5,16	■	■	■	4171755	4172702	■	4171680	■	■	■	■	■	■	■	■
CNMG120408FW	12,70	12,90	4,76	0,8	5,16	5623480	■	■	4171756	4173103	■	4171681	■	■	■	■	■	■	■	■
CNMG120412FW	12,70	12,90	4,76	1,2	5,16	5623481	■	■	4171757	4173104	■	4171683	■	■	■	■	■	■	■	■
																				
ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
CNMG120404ML	12,70	12,90	4,76	0,4	5,16	4171059	4170458	■	■	■	■	4171657	4171390	■	■	■	■	■	■	■
CNMG120408ML	12,70	12,90	4,76	0,8	5,16	4171060	4170459	■	■	■	■	4171658	4171391	■	■	■	■	■	■	■
CNMG120412ML	12,70	12,90	4,76	1,2	5,16	4171348	4170460	■	■	■	■	4171659	4171392	■	■	■	■	■	■	■
CNMG120416ML	12,70	12,90	4,76	1,6	5,16	5684346	■	■	■	■	■	4171393	4171392	■	■	■	■	■	■	■



■ CNMG-ML

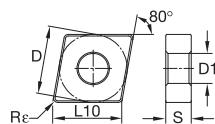
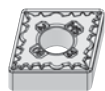
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
						4171059	4170458	—	—	—	—	4171657	4171390	—	—	—	—	—	—
CNMG120404ML	12,70	12,90	4,76	0,4	5,16	4171060	4170459	—	—	—	—	4171658	4171391	—	—	—	—	—	—
CNMG120408ML	12,70	12,90	4,76	0,8	5,16	4171060	4170459	—	—	—	—	4171658	4171391	—	—	—	—	—	—
CNMG120412ML	12,70	12,90	4,76	1,2	5,16	4171348	4170460	—	—	—	—	4171659	4171392	—	—	—	—	—	—
CNMG120416ML	12,70	12,90	4,76	1,6	5,16	—	5684346	—	—	—	—	—	4171393	—	—	—	—	—	—

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Inserts

ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4171130	4170546	4170043	—	—	—	—	—	—	—	—	—	—	—	—
CNMG120404MR	12,70	12,90	4,76	0,4	5,16	4171131	4170547	4170044	—	4172955	4173120	—	—	—	—	—	—	—	—	—
CNMG120408MR	12,70	12,90	4,76	0,8	5,16	4171132	4170548	4170045	—	4172956	4173121	—	—	—	—	—	—	—	—	—
CNMG120412MR	12,70	12,90	4,76	1,2	5,16	4171133	5684353	—	—	4172957	4173122	—	—	—	—	—	—	—	—	—
CNMG120416MR	12,70	12,90	4,76	1,6	5,16	4171134	4170549	4170046	—	4172958	4173133	—	—	—	—	—	—	—	—	—
CNMG160608MR	15,88	16,12	6,35	0,8	6,35	4171135	4170550	4170047	—	4172959	4173134	—	—	—	—	—	—	—	—	—
CNMG160612MR	15,88	16,12	6,35	1,2	6,35	4171136	4170551	4170048	—	4172960	4173135	—	—	—	—	—	—	—	—	—
CNMG160616MR	15,88	16,12	6,35	1,6	6,35	4171137	4170552	4170049	—	4172961	4173136	—	—	—	—	—	—	—	—	—
CNMG190612MR	19,05	19,34	6,35	1,2	7,93	4171138	4170563	4170049	—	4172962	4173137	—	—	—	—	—	—	—	—	—
CNMG190616MR	19,05	19,34	6,35	1,6	7,93	4171139	4170564	4170050	—	4172963	4173138	—	—	—	—	—	—	—	—	—



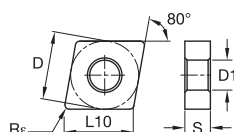
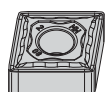


- first choice
- alternate choice

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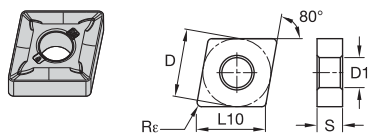
■ CNMG-MS

ISO catalogue number						WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
	D	L10	S	Rε	D1															
CNMG120404MS	12,70	12,90	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5908742	5908743	5908744	■	■	■	■
CNMG120408MS	12,70	12,90	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5908745	5908746	5908747	■	■	■	■
CNMG120412MS	12,70	12,90	4,76	1,2	5,16	■	■	■	■	■	■	■	■	5908748	5908749	5908750	■	■	■	■
CNMG120416MS	12,70	12,90	4,76	1,6	5,16	■	■	■	■	■	■	■	■	5908751	5908752	5908753	■	■	■	■
CNMG160608MS	15,88	16,12	6,35	0,8	6,35	■	■	■	■	■	■	■	■	5908754	5908755	5908756	■	■	■	■
CNMG160612MS	15,88	16,12	6,35	1,2	6,35	■	■	■	■	■	■	■	■	5908757	5908758	5908759	■	■	■	■
CNMG190608MS	19,05	19,34	6,35	0,8	7,93	■	■	■	■	■	■	■	■	5908760	5908761	5908762	■	■	■	■
CNMG190612MS	19,05	19,34	6,35	1,2	7,92	■	■	■	■	■	■	■	■	5908763	5908764	5908765	■	■	■	■
CNMG190616MS	19,05	19,34	6,35	1,6	7,92	■	■	■	■	■	■	■	■	5908766	5908767	5908768	■	■	■	■



■ CNMG-MW

	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	TMM	TTM	TTR	TTM
ISO catalogue number																				
CNMG120408MW	12,70	12,90	4,76	0,8	5,16	I	I	I	I	4173112	4173113	4171682	I	I	I	I	I	I	I	I
CNMG120412MW	12,70	12,90	4,76	1,2	5,16	I	I	I	I	4173113	4171684	4171682	I	I	I	I	I	I	I	I



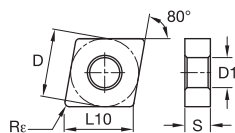
● first choice
○ alternate choice

■ CNMG-RH

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
CNMG120408RH	12,70	12,90	4,76	0,8	5,16	4170979	4170980	4171504	5684356	4173035	4173036	4173037	4173038	4173039	4173040	4173041	4173042	4173043	4173044	4173045
CNMG120412RH	12,70	12,90	4,76	1,2	5,16	4170981	4170982	4171505	4171698	4173035	4173036	4173037	4173038	4173039	4173040	4173041	4173042	4173043	4173044	4173045
CNMG120416RH	12,70	12,90	4,76	1,6	5,16	4170981	4170982	4171506	4171699	4173037	4173038	4173039	4173040	4173041	4173042	4173043	4173044	4173045	4173046	4173047
CNMG160608RH	15,88	16,12	6,35	0,8	6,35	4170982	4170983	4171507	4171700	4173038	4173039	4173040	4173041	4173042	4173043	4173044	4173045	4173046	4173047	4173048
CNMG160612RH	15,88	16,12	6,35	1,2	6,35	4170983	4170984	4171508	4171701	4173039	4173040	4173041	4173042	4173043	4173044	4173045	4173046	4173047	4173048	4173049
CNMG160616RH	15,88	16,12	6,35	1,6	6,35	4170984	4170985	4171509	4171702	4173040	4173041	4173042	4173043	4173044	4173045	4173046	4173047	4173048	4173049	4173050
CNMG190608RH	19,05	19,34	6,35	0,8	7,93	4170985	4170986	4171510	4171703	4173041	4173042	4173043	4173044	4173045	4173046	4173047	4173048	4173049	4173050	4173051
CNMG190612RH	19,05	19,34	6,35	1,2	7,93	4170986	4170987	4171511	4171704	4173042	4173043	4173044	4173045	4173046	4173047	4173048	4173049	4173050	4173051	4173052
CNMG190616RH	19,05	19,34	6,35	1,6	7,93	4170987	4170988	4171512	4171705	4173043	4173044	4173045	4173046	4173047	4173048	4173049	4173050	4173051	4173052	4173053
CNMG190624RH	19,05	19,34	6,35	2,4	7,93	4170988	4170989	4171513	4171706	4173044	4173045	4173046	4173047	4173048	4173049	4173050	4173051	4173052	4173053	4173054

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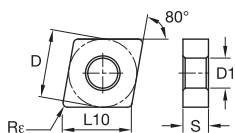
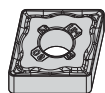




- alternate choice

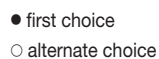
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■ CNMG-UF

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CNMG-UM

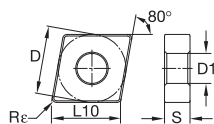
ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WU10HT	THM	TTM	TTR	TT15
CNMG120404UM	12,70	12,90	4,76	0,4	5,16	■	■	■	4172334	4172380	4172410	■	■	5645217	■	■	■	■	■
CNMG120408UM	12,70	12,90	4,76	0,8	5,16	5645250	5645219	■	4172335	4172381	4172411	■	■	■	■	■	■	■	■
CNMG120412UM	12,70	12,90	4,76	1,2	5,16	■	■	■	4172336	4172382	4172412	■	■	5301414	■	■	■	■	■

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Inserts

	D	L10	S	Rε	D1	WP15CT WP25CT WP35CT WM15CT WM25CT WM35CT WK05CT WK20CT WS10PT WS25PT WU10HT THM TTM TTR TTI15
ISO catalogue number	D	L10	S	Rε	D1	WP15CT WP25CT WP35CT WM15CT WM25CT WM35CT WK05CT WK20CT WS10PT WS25PT WU10HT THM TTM TTR TTI15
CNMG120404UR	12,70	12,90	4,76	0,4	5,16	4171022 4170500 4169408 4169444 4169479 - -
CNMG120408UR	12,70	12,90	4,76	0,8	5,16	4171093 4170501 4169960 4169407 4169445 4169480 5680086 5680085
CNMG120412UR	12,70	12,90	4,76	1,2	5,16	4171094 4170502 4169961 4169408 4169446 4169481 5680087 4171419
CNMG120416UR	12,70	12,90	4,76	1,6	5,16	4171095 4170503 - 4169409 4169447 4169482 - 4171420
CNMG160608UR	15,88	16,12	6,35	0,8	6,35	4171096 4170504 - 4169410 4169448 4169483 - 4171421
CNMG160612UR	15,88	16,12	6,35	1,2	6,35	4171097 4170505 4169962 4169411 4169449 4169484 - 4171422
CNMG160616UR	15,88	16,12	6,35	1,6	6,35	4171098 4170506 4169963 - 4169450 4169485 - 4171423
CNMG190612UR	19,05	19,34	6,35	1,2	7,93	4171099 4170507 4169964 4169412 4169451 4169486 5680088 4171424
CNMG190616UR	19,05	19,34	6,35	1,6	7,93	4171100 4170508 4169965 4169423 4169452 4169487 - 4171425

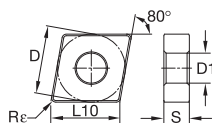




- first choice
- alternate choice

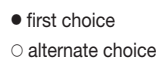
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■ CNMM-65

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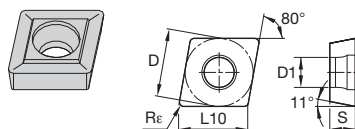
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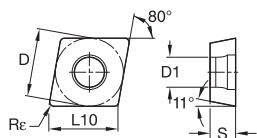
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Inserts

ISO catalogue number	D	L10	S	Rε	D1	Technical specifications and standards															
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CNMP120404	12,70	12,90	4,76	0,4	5,16	■	■	■	4171585	4173552	4173681	■	■	4172439	■	■	■	■	■		
CNMP120408	12,70	12,90	4,76	0,8	5,16	■	■	■	4171586	4173653	4173682	■	■	4172440	4172614	■	■	■	■		
CNMP120412	12,70	12,90	4,76	1,2	5,16	■	■	■	4171587	4173654	4173693	■	■	4172441	4172615	■	■	■	■		
CNMP160608	15,88	16,12	6,35	0,8	6,35	■	■	■	4171588	4173655	4173694	■	■	■	■	■	■	■	■		
CNMP160612	15,88	16,12	6,35	1,2	6,35	■	■	■	4171589	4173656	4173695	■	■	4172442	■	■	■	■	■		
CNMP190612	19,05	19,34	6,35	1,2	7,93	■	■	■	■	■	■	■	■	4172483	■	■	■	■	■		
CNMP190616	19,05	19,34	6,35	1,6	7,93	■	■	■	4171590	4173657	4173696	■	■	■	■	■	■	■	■		

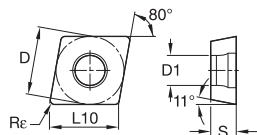
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- first choice
- alternate choice

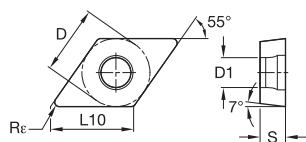
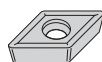
■ CPMT-FP

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4170015	4170325	4170326	4168812	4168823	4168822	4168825	4168824	4170105	4170106	4168814	4168827	4168826	4170107	4170108
CPMT060202FP	6,35	6,45	2,38	0,2	2,80	4170015	4170325	4170326	4168812	4168823	4168822	4168825	4168824	4170105	4170106	4168814	4168827	4168826	4170107	4170108
CPMT060204FP	6,35	6,45	2,38	0,4	2,80	4170016	4170326	4170327	4168813	4168824	4168825	4168826	4170106	4170107	4170108	4168815	4168827	4168826	4170107	4170108
CPMT060208FP	6,35	6,45	2,38	0,8	2,80	4170017	4170327	4170328	4168814	4168825	4168826	4170107	4170108	4168815	4168827	4168826	4170107	4170108	4168815	4168827
CPMT09T302FP	9,53	9,67	3,97	0,2	4,40	4170018	4170328	4170329	4168815	4168827	4168826	4170107	4170108	4168815	4168827	4168826	4170107	4170108	4168815	4168827
CPMT09T304FP	9,53	9,67	3,97	0,4	4,40	4170019	4170329	4170330	4168816	4168828	4168827	4170108	4170109	4168816	4168828	4168827	4170108	4170109	4168816	4168828
CPMT09T308FP	9,53	9,67	3,97	0,8	4,40	4170020	4170330	4170331	4168817	4168829	4168828	4170109	4170110	4168817	4168829	4168828	4170109	4170110	4168817	4168829



■ CPMT-MP

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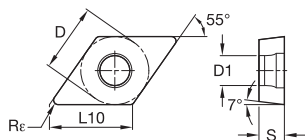
- first choice
- alternate choice

DCMT

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
DCMT070204	6,35	7,75	2,38	0,4	2,80	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
DCMT11T304	9,53	11,63	3,97	0,4	4,40	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
DCMT11T308	9,53	11,63	3,97	0,8	4,40	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
DCMT11T312	9,53	11,63	3,97	1,2	4,40	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
DCMT150404	12,70	15,50	4,76	0,4	5,50	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
DCMT150408	12,70	15,50	4,76	0,8	5,50	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
DCMT150412	12,70	15,50	4,76	1,2	5,50	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○
DCMT150416	12,70	15,50	4,76	1,6	5,50	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○

Inserts



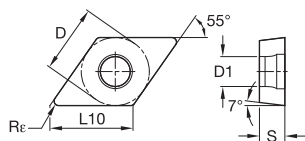


- first choice
- alternate choice

[illegible]

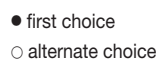
■ DCMT-FP

ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
DCMT070202FP	6,35	7,75	2,38	0,2	2,80	4169995	4170299	4170300	4168764	4168787	4168788	4170089	4170089	4170089	4170089	4170089	4170089	4170089	4170089	4170089
DCMT070204FP	6,35	7,75	2,38	0,4	2,80	4169996	4170301	4170302	4168789	4168790	4168791	4170090	4170091	4170092	4170093	4170094	4170095	4170096	4170097	4170098
DCMT070208FP	6,35	7,75	2,38	0,8	2,80	4169997	4170303	4170304	4168765	4168792	4168793	4170091	4170092	4170093	4170094	4170095	4170096	4170097	4170098	4170099
DCMT11T302FP	9,53	11,63	3,97	0,2	4,40	4169998	4170305	4170306	4168766	4168792	4168793	4170091	4170092	4170093	4170094	4170095	4170096	4170097	4170098	4170099
DCMT11T304FP	9,53	11,63	3,97	0,4	4,40	4169999	4170305	4170306	4168766	4168792	4168793	4170091	4170092	4170093	4170094	4170095	4170096	4170097	4170098	4170099
DCMT11T308FP	9,53	11,63	3,97	0,8	4,40	4170000	4170305	4170306	4168793	4168794	4168795	4170092	4170093	4170094	4170095	4170096	4170097	4170098	4170099	4170100
DCMT11T312FP	9,53	11,63	3,97	1,2	4,40	4170001	4170307	4170308	4168794	4168795	4168796	4170093	4170094	4170095	4170096	4170097	4170098	4170099	4170100	4170101
DCMT150404FP	12,70	15,50	4,76	0,4	5,50	4170002	4170309	4170310	4168795	4168796	4168797	4170094	4170095	4170096	4170097	4170098	4170099	4170100	4170101	4170102
DCMT150408FP	12,70	15,50	4,76	0,8	5,50	4170003	4170311	4170312	4168796	4168797	4168798	4170095	4170096	4170097	4170098	4170099	4170100	4170101	4170102	4170103



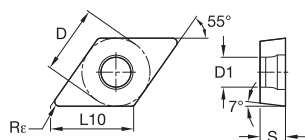
■ DCMT-FW

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[illegible]

Inserts

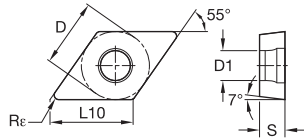
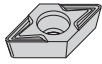
ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
						4170201	4170223	4170202	4170224	4168898	4168912	4170243	4170242	4170225	4170226	4170227	4170228	4170229	4170230	4170231	4170232
DCMT11T304MP	9,53	11,63	3,97	0,4	4,40	4170201	4170223	4170202	4170224	4168898	4168912	4170243	4170242	4170225	4170226	4170227	4170228	4170229	4170230	4170231	4170232
DCMT11T308MP	9,53	11,63	3,97	0,8	4,40	4170201	4170223	4170202	4170224	4168898	4168912	4170243	4170242	4170225	4170226	4170227	4170228	4170229	4170230	4170231	4170232
DCMT11T312MP	9,53	11,63	3,97	1,2	4,40	4170201	4170223	4170202	4170224	4168898	4168912	4170243	4170242	4170225	4170226	4170227	4170228	4170229	4170230	4170231	4170232



ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						5623585	5623583	-	-	5623581	-	5623586	5623587	5623582	5623584	-	-	-	-	-
DCMT11T304MU	9,53	11,63	3,97	0,4	4,40	5623600	-	-	-	5623588	-	5623602	5623589	5623601	5623582	5623603	-	-	-	-
DCMT11T308MU	9,52	11,63	3,97	0,8	4,40	-	-	-	-	-	-	5623605	5623607	5623609	5623610	-	-	-	-	-
DCMT150408MU	12,70	15,50	4,76	0,8	5,50	5623606	5623608	-	-	5623604	-	5623611	5623607	5623609	5623610	-	-	-	-	-
DCMT150412MU	12,70	15,50	4,76	1,2	5,50	-	-	-	-	-	-	5623612	-	-	-	-	-	-	-	-



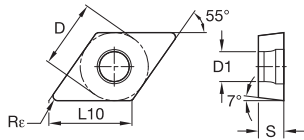
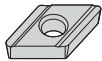
Inserts



- first choice
- alternate choice

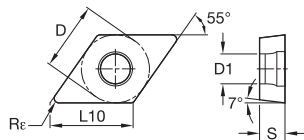
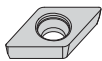
P																											
M																											
K																											
N																											
S																											
H																											

■ DCMT-MW

[illegible]

■ DCMX-18

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	TMM	TTM	TTR	TT15
DCMX11T302R18	9,53	11,63	3,97	0,2	4,30	+	+	+	+	+	+	+	+	+	+	+	201507	+	+	+



■ DCMW

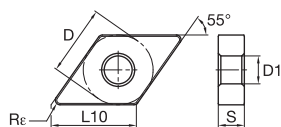
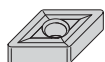
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS25PT	WS10PT	WU10HT	THM	TTM	TTR	TT15
DCMW070204	6,35	7,75	2,38	0,4	2,80	■	■	■	■	■	■	4170471	4170375	■	■	■	2027966	■	■	■
DCMW11T304	9,53	11,63	3,97	0,4	4,40	■	■	■	■	■	■	4170472	4170376	■	■	■	2027967	■	■	■
DCMW150408	12,70	15,50	4,76	0,8	5,50	■	■	■	■	■	■	4170473	4170377	■	■	■	2031737	■	■	■

[illegible]

ISO catalogue number						WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TIM	TTR	TT115
	D	L10	S	R _e	D1															
DNGG110402FS	9,52	11,63	4,76	0,2	3,81	■	■	■	■	■	■	■	■	5548670	5538206	5549947	■	■	■	■
DNGG110404FS	9,52	11,63	4,76	0,4	3,81	■	■	■	■	■	■	■	■	5548671	5538206	5549948	■	■	■	■
DNGG110408FS	9,52	11,63	4,76	0,8	3,81	■	■	■	■	■	■	■	■	5548672	5538206	5549949	■	■	■	■
DNGG150401FS	12,70	15,50	4,76	0,1	5,16	■	■	■	■	■	■	■	■	5548674	5538207	5549991	■	■	■	■
DNGG150402FS	12,70	15,50	4,76	0,2	5,16	■	■	■	■	■	■	■	■	5548673	5538207	5549990	■	■	■	■
DNGG150404FS	12,70	15,50	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5548675	5538207	5549992	■	■	■	■
DNGG150408FS	12,70	15,50	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5548676	5538208	5549993	■	■	■	■
DNGG150412FS	12,70	15,50	4,76	1,2	5,16	■	■	■	■	■	■	■	■	5548677	5538208	5549994	■	■	■	■
DNGG150604FS	12,70	15,50	6,35	0,4	5,16	■	■	■	■	■	■	■	■	5548678	5538209	5549995	■	■	■	■
DNGG150608FS	12,70	15,50	6,35	0,8	5,16	■	■	■	■	■	■	■	■	5548679	5538230	5549996	■	■	■	■



Inserts

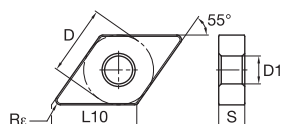
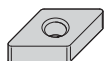


- first choice
- alternate choice

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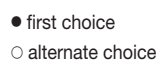
■ DNGP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
DNGP150401	12,70	15,50	4,76	0,1	5,16	■	■	■	■	■	■	■	■	5549191	■	■	■	■	■
DNGP150402	12,70	15,50	4,76	0,2	5,16	■	■	■	■	■	■	■	■	5549192	■	■	■	■	■
DNGP150404	12,70	15,50	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5549193	■	5549209	■	■	■
DNGP150408	12,70	15,50	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5549194	■	5549210	■	■	■

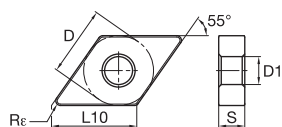


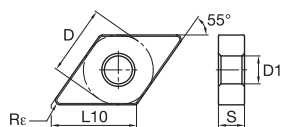
■ DNMA

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
DNMA110408	9,53	11,63	4,76	0,8	3,81	■	■	■	■	■	■	4171634	4171873	■	■	■	■	■	■	■
DNMA110412	9,53	11,63	4,76	1,2	3,81	■	■	■	■	■	■	■	4171874	■	■	■	■	■	■	■
DNMA150408	12,70	15,50	4,76	0,8	5,16	■	■	■	■	■	■	4171635	4171875	■	■	■	■	■	■	■
DNMA150412	12,70	15,50	4,76	1,2	5,16	■	■	■	■	■	■	4171636	4171876	■	■	■	■	■	■	■
DNMA150416	12,70	15,50	4,76	1,6	5,16	■	■	■	■	■	■	■	4171877	■	■	■	■	■	■	■
DNMA150608	12,70	15,50	6,35	0,8	5,16	■	■	■	■	■	■	4171637	4171878	■	■	■	■	■	■	■
DNMA150612	12,70	15,50	6,35	1,2	5,16	■	■	■	■	■	■	4171638	4171879	■	■	■	■	■	■	■
DNMA150616	12,70	15,50	6,35	1,6	5,16	■	■	■	■	■	■	■	4171880	■	■	■	■	■	■	■

[illegible]

Inserts

[illegible][illegible]



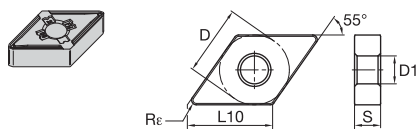
- first choice

- alternate choice

[illegible]

■ DNMG-FF

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
						4171028	4171029	4171030	4171031	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043
DNMG110404FF	9,53	11,63	4,76	0,4	3,81	4171028	4171029	4171030	4171031	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043
DNMG110408FF	9,53	11,63	4,76	0,8	3,81	4171028	4171029	4171030	4171031	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043
DNMG110412FF	9,53	11,63	4,76	1,2	3,81	4171028	4171029	4171030	4171031	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043
DNMG150404FF	12,70	15,50	4,76	0,4	5,16	4171030	4171031	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043	4171044	4171045
DNMG150408FF	12,70	15,50	4,76	0,8	5,16	4171031	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043	4171044	4171045	4171046
DNMG150412FF	12,70	15,50	4,76	1,2	5,16	4171031	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043	4171044	4171045	4171046
DNMG150604FF	12,70	15,50	6,35	0,4	5,16	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043	4171044	4171045	4171046	4171047
DNMG150608FF	12,70	15,50	6,35	0,8	5,16	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043	4171044	4171045	4171046	4171047
DNMG150612FF	12,70	15,50	6,35	1,2	5,16	4171032	4171033	4171034	4171035	4171036	4171037	4171038	4171039	4171040	4171041	4171042	4171043	4171044	4171045	4171046	4171047



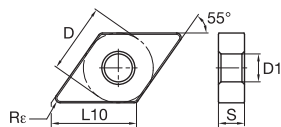
- first choice
- alternate choice

■ DNMG-FW

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
DNMG110404FW	9,53	11,63	4,76	0,4	3,81	5623490	5623491	5623492	5623493	5623496	5623497	4171758	4171759	4171760	4171761	4171762	4171763	4171764	4171765	4171766
DNMG110408FW	9,53	11,63	4,76	0,8	3,81	5623491	5623492	5623493	5623496	5623497	4171758	4171759	4171760	4171761	4171762	4171763	4171764	4171765	4171766	4171767
DNMG150404FW	12,70	15,50	4,76	0,4	5,16	5623492	5623493	5623496	5623497	4171758	4171759	4171760	4171761	4171762	4171763	4171764	4171765	4171766	4171767	4171768
DNMG150408FW	12,70	15,50	4,76	0,4	5,16	5623493	5623496	5623497	4171759	4171760	4171761	4171762	4171763	4171764	4171765	4171766	4171767	4171768	4171769	4171770
DNMG150604FW	12,70	15,50	6,35	0,4	5,16	5623496	5623497	4171760	4171761	4171762	4171763	4171764	4171765	4171766	4171767	4171768	4171769	4171770	4171771	4171772
DNMG150608FW	12,70	15,50	6,35	0,4	5,16	5623497	4171761	4171762	4171763	4171764	4171765	4171766	4171767	4171768	4171769	4171770	4171771	4171772	4171773	4171774

Inserts



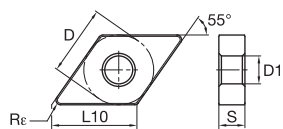


- first choice
- alternate choice

■ DNMG-ML

[illegible]

ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4171062 4170461						4171660 4171394								
DNMG110404ML	9,53	11,63	4,76	0,4	3,81															
DNMG110408ML	9,53	11,63	4,76	0,8	3,81															
DNMG110412ML	9,53	11,63	4,76	1,2	3,81															
DNMG150404ML	12,70	15,50	4,76	0,4	5,16															
DNMG150408ML	12,70	15,50	4,76	0,8	5,16															
DNMG150412ML	12,70	15,50	4,76	1,2	5,16															
DNMG150604ML	12,70	15,50	6,35	0,4	5,16															
DNMG150608ML	12,70	15,50	6,35	0,8	5,16															
DNMG150612ML	12,70	15,50	6,35	1,2	5,16															



- first choice
- alternate choice

[illegible]

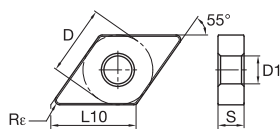
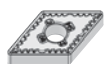
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ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4171139	4170564	4170050												
DNMG110408MR	9,53	11,63	4,76	0,8	3,81	4171140	4170565	4170051												
DNMG150404MR	12,70	15,50	4,76	0,4	5,16	4171141	4170566	4170052												
DNMG150408MR	12,70	15,50	4,76	0,8	5,16	4171142	4170567	4170053												
DNMG150412MR	12,70	15,50	4,76	1,2	5,16	4171143	4170568	4170054												
DNMG150604MR	12,70	15,50	6,35	0,4	5,16	4171144	4170569	4170055		4173023	4173138									
DNMG150608MR	12,70	15,50	6,35	0,8	5,16	4170570	4170056													
DNMG150612MR	12,70	15,50	6,35	1,2	5,16	4171145	4170570	4170056		4173024	4173139									





Inserts

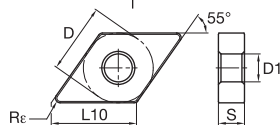
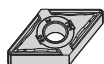


- first choice
- alternate choice

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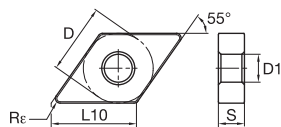
■ DNMG-MS

ISO catalogue number	D	L10	S	Rε	D1	Technical specifications															
						WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TTHF		
DNMG110408MS	9,53	11,63	4,76	0,8	3,81	■	■	■	■	■	■	■	■	■	5908769	5908770	5908781	■	■	■	■
DNMG150404MS	12,70	15,50	4,76	0,4	5,16	■	■	■	■	■	■	■	■	■	5908782	5908770	5908784	■	■	■	■
DNMG150408MS	12,70	15,50	4,76	0,8	5,16	■	■	■	■	■	■	■	■	■	5908785	5908787	5908788	■	■	■	■
DNMG150412MS	12,70	15,50	4,76	1,2	5,16	■	■	■	■	■	■	■	■	■	5908789	5908790	5908791	■	■	■	■
DNMG150604MS	12,70	15,50	6,35	0,4	5,16	■	■	■	■	■	■	■	■	■	5908792	5908793	5908794	■	■	■	■
DNMG150608MS	12,70	15,50	6,35	0,8	5,16	■	■	■	■	■	■	■	■	■	5908795	5908796	5908797	■	■	■	■
DNMG150612MS	12,70	15,50	6,35	1,2	5,16	■	■	■	■	■	■	■	■	■	5908798	5908799	5908800	■	■	■	■



■ DNMG-MW

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
DNMG150408MW	12,70	15,50	4,76	0,4	5,16	5623494	5623495	■	■		4173114	4171687	■	■	■	■	■	■	■	■
DNMG150412MW	12,70	15,50	4,76	1,2	5,16	■	■	■	■		4173115	4171688	■	■	■	■	■	■	■	■
DNMG150608MW	12,70	15,50	6,35	0,4	5,16	5623498	5623499	■	■		4173116	4171691	■	■	■	■	■	■	■	■
DNMG150612MW	12,70	15,50	6,35	1,2	5,16	■	■	■	■		4173117	4171692	■	■	■	■	■	■	■	■

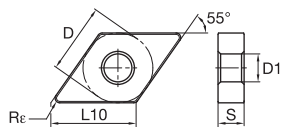


- first choice
- alternate choice

[illegible]

Inserts

[illegible]

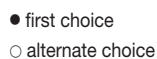


- first choice
- alternate choice

■ DNMG-UF

P																	
M																	
K																	
N																	
S																	
H																	

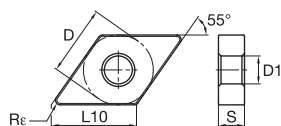
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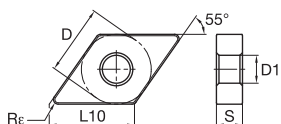
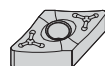
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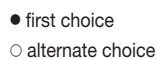
- first choice
- alternate choice

■ DNMG-UR

[illegible]

■ DNMM-65

[illegible]

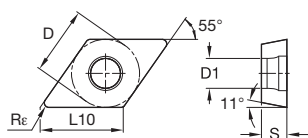
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inserts

■ DNMP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
DNMP150404	12,70	15,50	4,76	0,4	5,16	■	■	■	4171591	4173658	4173697	■	■	4172484	■	■	■	■	■	■
DNMP150408	12,70	15,50	4,76	0,8	5,16	■	■	■	4171592	4173659	4173698	■	■	4172485	■	■	■	■	■	■
DNMP150412	12,70	15,50	4,76	1,2	5,16	■	■	■	4172133	4173660	4173699	■	■	■	■	■	■	■	■	■
DNMP150604	12,70	15,50	6,35	0,4	5,16	■	■	■	4172134	4173661	4173700	■	■	4172486	■	■	■	■	■	■
DNMP150608	12,70	15,50	6,35	0,8	5,16	■	■	■	4172135	4173662	4173701	■	■	4172487	4172616	■	■	■	■	■
DNMP150612	12,70	15,50	6,35	1,2	5,16	■	■	■	4172136	4173663	4173702	■	■	4172488	4172617	■	■	■	■	■

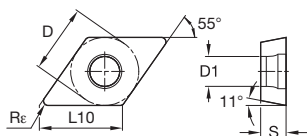
NOTE: DNMP-style inserts are single sided.



■ DPMT-FP

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4170020	4170330	4168816	4168828											
DPMT070204FP	6,35	7,75	2,38	0,4	2,80	4170021	4170331	4168817	4168829	4168830										
DPMT11T304FP	9,53	11,63	3,97	0,4	4,40	4170022	4170332			4168830										
DPMT11T308FP	9,53	11,63	3,97	0,8	4,40							4170109								



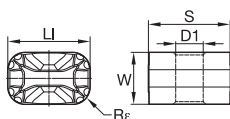
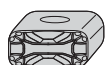


- first choice
- alternate choice

[illegible]

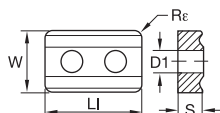
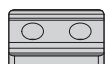
■ DPMT-MP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
DPMT11T308MP	9,53	11,63	3,97	0,8	4,40	4170260							4170268							



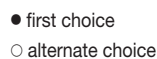
■ LNUX-13

ISO catalogue number	W	LI	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TT15
LINUX19194013	10,00	19,05	19,05	4,0	6,35	■	■	■	■	■	■	■	4170966	■	■	■	■	■	■
LINUX30194013	12,00	30,00	19,05	4,0	6,35	■	■	■	■	■	■	■	4170968	■	■	■	■	■	■



■ LNUX-EN95

[illegible]

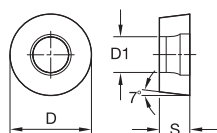


P														
M														
K														
N														
S														
H														

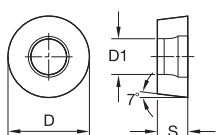
Inserts

■ **LNUX-T**

ISO catalogue number	W	LI	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
LINUX191940T	10,00	19,05	19,05	4,0	6,35	■	■	■	■	■	■	■	4170967	■	■	■	■	■	■	■
LINUX301940T	12,00	30,00	19,05	4,0	6,35	■	■	■	■	■	■	■	4170969	■	■	■	■	■	■	■

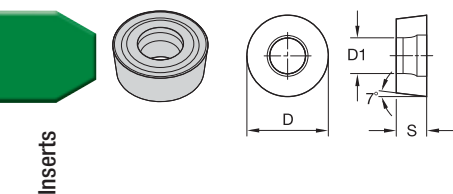


■ RCMT

[illegible]

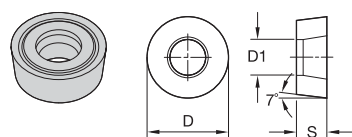
■ RCMT-43

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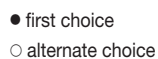
- first choice
- alternate choice

■ RCMT-T

[illegible]

■ RCMX

[illegible][illegible]

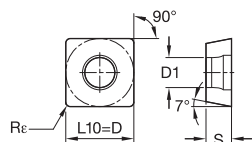
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Inserts

ISO catalogue number	D	S	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
RNMA120400	12,70	4,76	5,16	-	-	-	-	-	-	4171639	4171881	-	-	-	-	-	-	-

ISO catalogue number	D	S	D1																
				WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
RNMG090300RH	9,53	3,18	3,81	4170995	4171530	-	-	-	-	-	-	-	-	-	-	-	-	-	
RNMG120400RH	12,70	4,76	5,16	4170996	4171531	4171713	-	-	-	-	-	-	-	-	-	-	-	-	
RNMG190600RH	19,05	6,35	7,93	4170997	4171532	4171714	-	-	-	-	4171917	-	-	-	-	-	-	-	



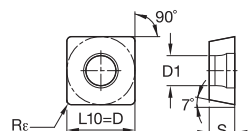


- first choice
- alternate choice

SCMT

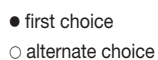
[illegible]

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
SCMT090304	9,53	9,53	3,18	0,4	4,40	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SCMT09T304	9,53	9,53	3,97	0,4	4,40	■	■	■	■	■	■	■	■	■	■	■	2028255	■	■	2028225
SCMT09T308	9,53	9,53	3,97	0,8	4,40	■	■	■	■	■	■	■	■	■	■	■	2028270	■	■	2028272
SCMT120408	12,70	12,70	4,76	0,8	5,50	■	■	■	■	■	■	■	■	■	■	■	2028286	■	■	2028289
SCMT120412	12,70	12,70	4,76	1,2	5,50	■	■	■	■	■	■	■	■	■	■	■	2028296	■	■	2028295
SCMT150512	15,88	15,88	5,56	1,2	5,50	■	■	■	■	■	■	■	■	■	■	■	2028306	■	■	2028307



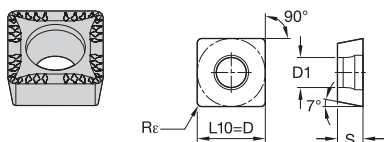
■ SCMT-FP

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
						4170002 4170308	4168767 4168795	4170093	4170094	4170095	4170096	4170097	4170098	4170099	4170100	4170101	4170102	4170103	4170104	4170105	4170106
SCMT09T304FP	9,53	9,53	3,97	0,4	4,40	4170002 4170308	4168767 4168795	4170093	4170094	4170095	4170096	4170097	4170098	4170099	4170100	4170101	4170102	4170103	4170104	4170105	4170106
SCMT09T308FP	9,53	9,53	3,97	0,8	4,40	4170003 4170309	4168768 4168796	4170094	4170095	4170096	4170097	4170098	4170099	4170100	4170101	4170102	4170103	4170104	4170105	4170106	4170107
SCMT120404FP	12,70	12,70	4,76	0,4	5,50	4170004 4170310	4168769 4168797	4170095	4170096	4170097	4170098	4170099	4170100	4170101	4170102	4170103	4170104	4170105	4170106	4170107	4170108
SCMT120408FP	12,70	12,70	4,76	0,8	5,50	4170004 4170311	4168769 4168798	4170095	4170096	4170097	4170098	4170099	4170100	4170101	4170102	4170103	4170104	4170105	4170106	4170107	4170108
SCMT120412FP	12,70	12,70	4,76	1,2	5,50	4170005 4170312	4168770 4168799	4170096	4170097	4170098	4170099	4170100	4170101	4170102	4170103	4170104	4170105	4170106	4170107	4170108	4170109

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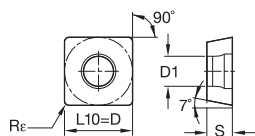
inserts

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4170214	4170227	4170228	4168900	4168914	4168915	4170245	4170247	4170248	4168903	4168917	4170248	4168903	4168917	4170248
SCMT09T304MP	9,53	9,53	3,97	0,4	4,40	-	4170226	-	4168899	4168913	-	-	4170244	-	-	-	-	-	-	-
SCMT09T308MP	9,53	9,53	3,97	0,8	4,40	-	4170227	-	4168900	4168914	-	-	4170245	-	-	-	-	-	-	-
SCMT120404MP	12,70	12,70	4,76	0,4	5,50	-	4170228	-	4168901	4168915	-	-	4170246	-	-	-	-	-	-	-
SCMT120408MP	12,70	12,70	4,76	0,8	5,50	-	4170229	-	4168902	4168916	-	-	4170247	-	-	-	-	-	-	-
SCMT120412MP	12,70	12,70	4,76	1,2	5,50	-	4170230	-	4168903	4168917	-	-	4170248	-	-	-	-	-	-	-



ISO catalogue number						WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
	D	L10	S	Re	D1															
SCMT090308MU	9,53	9,53	3,18	0,8	4,40	5623446	■	■	■	■	■	■	5623445	■	■	■	■	■	■	■
SCMT09T304MU	9,53	9,53	3,97	0,4	4,40	■	■	■	■	5623447	■	■	■	■	■	■	■	■	■	■
SCMT09T308MU	9,53	9,53	3,97	0,8	4,40	5623461	5623464	5623462	■	5623448	■	■	5623449	5623460	■	■	■	■	■	■

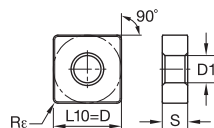




- first choice
- alternate choice

■ SCMW

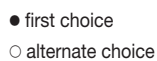
ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
SCMW090304	9,53	9,53	3,18	0,4	4,40	■	■	■	■	■	■	4170474	4170378	■	■	■	2028308	■	■	■
SCMW09T308	9,53	9,53	3,97	0,8	4,40	■	■	■	■	■	■	■	4170379	■	■	■	■	■	■	■
SCMW120408	12,70	12,70	4,76	0,8	5,50	■	■	■	■	■	■	4170475	4170380	■	■	■	2028310	■	■	■



■ SNGG-FS

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
SNGG120408FS	12,70	12,70	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5548680	■	5549997	■	■	■

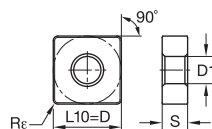
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inserts

■ SNMA

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
SNMA120408	12,70	12,70	4,76	0,8	5,16	■	■	■	■	■	■	4171640	4171882	■	■	■	2028371	■	■	■
SNMA120412	12,70	12,70	4,76	1,2	5,16	■	■	■	■	■	■	4171641	4171883	■	■	■		■	■	■
SNMA120416	12,70	12,70	4,76	1,6	5,16	■	■	■	■	■	■	4171642	4171884	■	■	■	■	■	■	■
SNMA150608	15,88	15,88	6,35	0,8	6,35	■	■	■	■	■	■	■	4171885	■	■	■	■	■	■	■
SNMA150612	15,88	15,88	6,35	1,2	6,35	■	■	■	■	■	■	4171643	4171886	■	■	■	■	■	■	■
SNMA150616	15,88	15,88	6,35	1,6	6,35	■	■	■	■	■	■	4171644	4171887	■	■	■	■	■	■	■
SNMA190612	19,05	19,05	6,35	1,2	7,93	■	■	■	■	■	■	4171645	4171888	■	■	■	■	■	■	■
SNMA190616	19,05	19,05	6,35	1,6	7,93	■	■	■	■	■	■	4171646	4171889	■	■	■	■	■	■	■



SNMG

[illegible]

C2-C49

C50–C81

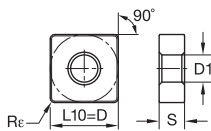
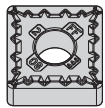
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B8-B25

B26-B28

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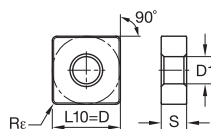
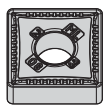
Inserts



- first choice
- alternate choice

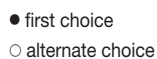
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■ SNMG-FF

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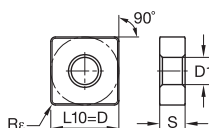
■ SNMG-ML

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
						4171071	4171072	4170488					4171668	4171402						
SNMG090304ML	9,53	9,53	3,18	0,4	3,81															
SNMG090308ML	9,53	9,53	3,18	0,8	3,81															
SNMG120404ML	12,70	12,70	4,76	0,4	5,16								4171403							
SNMG120408ML	12,70	12,70	4,76	0,8	5,16							4171669	4171404							
SNMG120412ML	12,70	12,70	4,76	1,2	5,16							4171670	4171405							
SNMG120416ML	12,70	12,70	4,76	1,6	5,16								4171406							



■ SNMG-MR

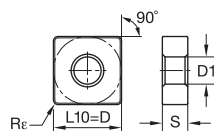
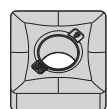
ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WN15CT	WN25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4171146	4170571	4170057	-	4173025	4173140	-	-	-	-	-	-	-	-	-
SNMG120408MR	12,70	12,70	4,76	0,8	5,16	5684354	4170571	4170057	-	4173025	4173140	-	-	-	-	-	-	-	-	-
SNMG120412MR	12,70	12,70	4,76	1,2	5,16	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	R _e	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	■	■	■	■	■



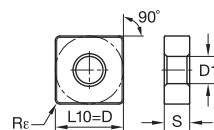
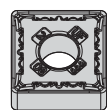


- first choice
- alternate choice

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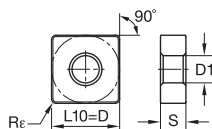
■ SNMG-RH

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP26CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS28PT	WU10HT	THM	TTM	TTR	TT15
						4170998 4170999	4171533 4171534	4171715 4171716	- 4173050	4173049 4173051	- 4173052	- 4173053	4171918 4171919	- 4171920	- 4171921	- 4171922	4171923	4171924	- 4171925	- 4171926
SNMG120408RH	12,70	12,70	4,76	0,8	5,16				-		-	-		-	-	-	-	-	-	-
SNMG120412RH	12,70	12,70	4,76	1,2	5,16				-		-	-		-	-	-	-	-	-	-
SNMG120416RH	12,70	12,70	4,76	1,6	5,16				-		-	-		-	-	-	-	-	-	-
SNMG150608RH	15,88	15,88	6,35	0,8	6,35				-		-	-		-	-	-	-	-	-	-
SNMG150612RH	15,88	15,88	6,35	1,2	6,35				-		-	-		-	-	-	-	-	-	-
SNMG150616RH	15,88	15,88	6,35	1,6	6,35				-		-	-		-	-	-	-	-	-	-
SNMG190608RH	19,05	19,05	6,35	0,8	7,93				-		-	-		-	-	-	-	-	-	-
SNMG190612RH	19,05	19,05	6,35	1,2	7,93				-		-	-		-	-	-	-	-	-	-
SNMG190616RH	19,05	19,05	6,35	1,6	7,93				-		-	-		-	-	-	-	-	-	-



■ SNMG-UF

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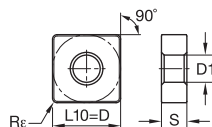


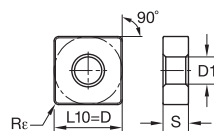
- first choice
- alternate choice

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inserts

ISO catalogue number	D	L10	S	R_{ε}	D1																
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SNMG120404UM	12,70	12,70	4,76	0,4	5,16	■	■	■	4172366	4172393	4172423	■	■	■	■	■	■	■	■	■	
SNMG120408UM	12,70	12,70	4,76	0,8	5,16	■	■	■	4172367	4172394	4172424	■	■	■	■	■	■	■	■	■	
SNMG120412UM	12,70	12,70	4,76	1,2	5,16	■	■	■	4172368	4172395	4172425	■	■	■	■	■	■	■	■	■	

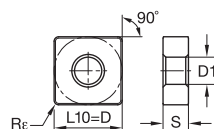
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- first choice
- alternate choice

■ SNMM-65

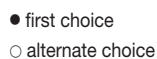
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ISO catalogue number						
SNMM12040865	12,70	12,70	4,76	0,8	5,16	- - -
SNMM12041265	12,70	12,70	4,76	1,2	5,16	- - -
SNMM15061665	15,88	15,88	6,35	1,6	6,35	- - -
SNMM19061265	19,05	19,05	6,35	1,2	7,93	- - -
SNMM19061665	19,05	19,05	6,35	1,6	7,93	- - -
SNMM19062465	19,05	19,05	6,35	2,4	7,93	- - -



■ SNMM-SR

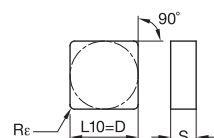
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SNMM190616SR	19,05	19,05	6,35	1,6	7,93	•	•	•	•	5696648	•	•	•	•	•	•	•	•	•
SNMM190624SR	19,05	19,05	6,35	2,4	7,93	5696680	5696681	•	•	5696649	•	•	•	•	•	•	•	•	•

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■ SNMP

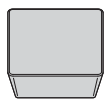
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SNMP120408	12,70	12,70	4,76	0,8	5,16	■	■	■	4172137	4173664	4173703	■	■	4172489	4172618	■	■	■	■	■
SNMP120412	12,70	12,70	4,76	1,2	5,16	■	■	■	4172138	4173665	4173704	■	■	4172490	4172619	■	■	■	■	■
SNMP150608	15,88	15,88	6,35	0,8	6,35	■	■	■	4172139	4173666	4173705	■	■	■	4172620	4172621	■	■	■	■
SNMP150612	15,88	15,88	6,35	1,2	6,35	■	■	■	4172140	4173667	4173706	■	■	■	4172621	4172622	■	■	■	■
SNMP150616	15,88	15,88	6,35	1,6	6,35	■	■	■	4172141	4173668	4173707	■	■	■	4172622		■	■	■	■
SNMP190616	19,05	19,05	6,35	1,6	7,93	■	■	■	4172142	4173669	4173708	■	■	■	■	■	■	■	■	■



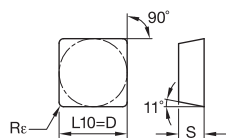
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ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
SNUN120408	12,70	12,70	4,76	0,8	■	■	■	■	■	■	■	4170962	■	■	■	■	■	■
SNUN120412	12,70	12,70	4,76	1,2	■	■	■	■	■	■	■	4170963	■	■	■	■	■	■



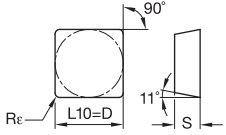


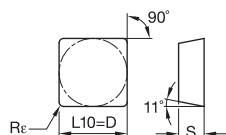
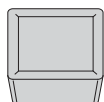
Inserts



- first choice
- alternate choice

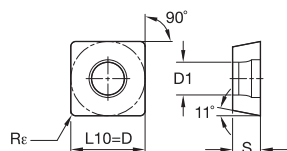
■ SPG

ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
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	■	■	■	■	■	■	■
																			
ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
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	■	■	■	■	■	■	■



■ SPMR

ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
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	■	■	■	■	■	■

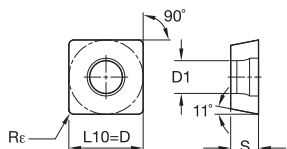


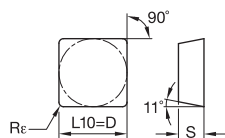
- first choice
- alternate choice

[illegible]

Inserts

	D	L10	S	R _E	D1	WP15CT 4170023	WP25CT 4170333	WP35CT -	WM15CT -	WM25CT 4168831	WM35CT -	WK05CT -	WK20CT 4170110	WS10PT -	WS25PT -	WU10HT -	TMM -	TTM -	TTR -	TTI15 -
ISO catalogue number								-	-											
SPMT09T304FP	9,53	9,53	3,97	0,4	4,40	4170024	4170334	-	-	4168832	-	-	4170111	-	-	-	-	-	-	-
SPMT09T308FP	9,53	9,53	3,97	0,8	4,40			-	-					-	-	-	-	-	-	-

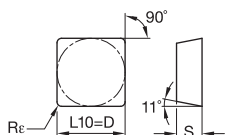
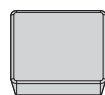
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- alternate choice

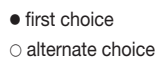
■ SPU

ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
					2028543	2028547	2028555	2028560	2028562	2028565	2028568	2561892	2561892	2561892	2561892	2561892	2561892	2561892	2561892
SPUN090308	9,53	9,53	3,18	0,8	1	1	1	1	1	1	1	1	1	1	1	2028543	1	1	1
SPUN120304	12,70	12,70	3,18	0,4	4170856	1	1	1	1	1	1	1	1	1	1	2028547	1	1	1
SPUN120308	12,70	12,70	3,18	0,8	4170857	1	1	1	1	1	4170950	1	1	1	1	2028555	1	1	1
SPUN120312	12,70	12,70	3,18	1,2	1	1	1	1	1	1	4170951	1	1	1	1	2028560	1	1	1
SPUN120412	12,70	12,70	4,76	1,2	1	1	1	1	1	1	1	1	1	1	1	2028562	1	1	1
SPUN150412	15,88	15,88	4,76	1,2	1	1	1	1	1	1	1	1	1	1	1	2028565	1	2028567	1
SPUN190412	19,05	19,05	4,76	1,2	1	1	1	1	1	1	1	1	1	1	1	2028568	1	1	1
SPUN190416	19,05	19,05	4,76	1,6	1	1	1	1	1	1	1	1	1	1	1	2561892	1	1	1



■ SPU-T

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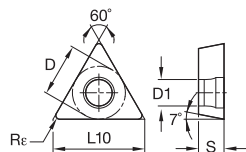
inserts

ISO
catalogue number

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TIM	TTR	TT15
TCMT110202	6,35	11,00	2,38	0,2	2,80	■	■	■	■	■	■	■	■	■	■	■	2028579	2028587	■	■
TCMT110204	6,35	11,00	2,38	0,4	2,80	■	■	■	■	■	■	■	■	■	■	■	2028587	2028589	■	■
TCMT16T304	9,53	16,50	3,97	0,4	4,40	■	■	■	■	■	■	■	■	■	■	■	2028607	2028627	■	■
TCMT16T308	9,53	16,50	3,97	0,8	4,40	■	■	■	■	■	■	■	■	■	■	■	2028624	2028627	■	■
TCMT220408	12,70	22,00	4,76	0,8	5,50	■	■	■	■	■	■	■	■	■	■	■	2028660	■	■	■

ISO
catalogue number

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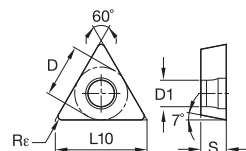


- first choice
- alternate choice

■ TCMT-FP

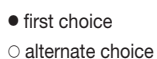
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TCMT110202FP	6,35	11,00	2,38	0,2	2,90	-	-	-	-	4168800	-	-	-	-	-	-	-
TCMT110204FP	6,35	11,00	2,38	0,4	2,80	4170006	4170313	-	4168770	4168801	-	-	4170097	-	-	-	-
TCMT110208FP	6,35	11,00	2,38	0,8	2,80	4170007	4170314	-	4168771	4168802	-	-	4170098	-	-	-	-
TCMT16T304FP	9,53	16,50	3,97	0,4	4,40	4170008	4170315	-	4168772	4168803	-	-	4170099	-	-	-	-
TCMT16T308FP	9,53	16,50	3,97	0,8	4,40	4170009	4170316	-	4168773	4168804	-	-	4170100	-	-	-	-
TCMT16T312FP	9,53	16,50	3,97	1,2	4,40	4170010	-	-	-	4168805	-	-	4170101	-	-	-	-
TCMT220408FP	12,70	22,00	4,76	0,8	5,50	4170011	4170317	-	-	4168806	-	-	4170102	-	-	-	-

ISO catalogue number	D	L10	S	R _ε	D1												
						WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM
TCMT110208MP	6,35	11,00	2,38	0,8	2,80	-	4170231	-	-	-	-	-	4170249	-	-	-	-
TCMT16T304MP	9,53	16,50	3,97	0,4	4,40	-	4170232	-	4168904	4168918	-	-	4170250	-	-	-	-
TCMT16T308MP	9,53	16,50	3,97	0,8	4,40	-	4170233	-	4168905	4168919	-	-	4170251	-	-	-	-
TCMT16T312MP	9,53	16,50	3,97	1,2	4,40	-	4170234	-	-	4168920	-	-	4170252	-	-	-	-



■ TCMT-MP

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inserts

■ TCMT-MU																			
	ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TT15
TCMT16T304MU	9,53	16,50	3,97	0,4	4,40	5623614	5623615	-	-	5623613	-	-	5623616	-	5623617	-	-	-	-
TCMT16T308MU	9,53	16,50	3,97	0,8	4,40	5623621	5623620	-	-	5623619	-	-	5623618	5623622	-	-	-	-	-

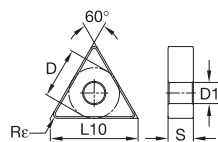


ISO catalogue number	D	L10	S	R _ε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TTR15		
												4170476	4170381					4170477	4170382		
TCMW110204	6,35	11,00	2,38	0,4	2,80	■	■	■	■	■	■			■	■	■			■	■	■
TCMW16T304	9,53	16,50	3,97	0,4	4,40	■	■	■	■	■	■			■	■	■			■	■	■



ISO catalogue number	D	L10	S	R _ε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT115
TNGG160404FS	9,53	16,50	4,76	0,4	3,81	■	■	■	■	■	■	■	■	5548681	5538231	5549998	■	■	■
TNGG220408FS	12,70	22,00	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5548682	■	■	■	■	■

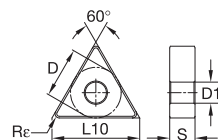




- first choice
- alternate choice

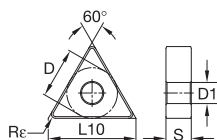
TNMA

ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
TNMA160408	9,53	16,50	4,76	0,8	3,81	■	■	■	■	■	■	4171647	4171890	■	■	■	■	■	■	■
TNMA160412	9,53	16,50	4,76	1,2	3,81	■	■	■	■	■	■	4171648	4171891	■	■	■	■	■	■	■
TNMA160416	9,53	16,50	4,76	1,6	3,81	■	■	■	■	■	■	■	4171892	■	■	■	■	■	■	■
TNMA220408	12,70	22,00	4,76	0,8	5,16	■	■	■	■	■	■	4171649	4171893	■	■	■	■	■	■	■
TNMA220412	12,70	22,00	4,76	1,2	5,16	■	■	■	■	■	■	4172230	4171894	■	■	■	■	■	■	■
TNMA220416	12,70	22,00	4,76	1,6	5,16	■	■	■	■	■	■	4171651	4171895	■	■	■	■	■	■	■
TNMA270616	15,88	27,50	6,35	1,6	6,35	■	■	■	■	■	■	■	4171896	■	■	■	■	■	■	■



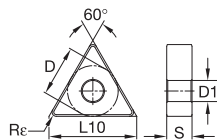
■ TNMG-FF

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
TNMG110304FF	6,35	11,00	3,18	0,4	2,26	■	■	■	■	■	■	■	4171383	5684331	■	■	■	■	■	■
TNMG110308FF	6,35	11,00	3,18	0,8	2,26	■	■	■	■	■	■	■	4171384	5684332	■	■	■	■	■	■
TNMG160404FF	9,53	16,50	4,76	0,4	3,81	4171050	■	■	■	4172691	■	■	4171385	■	■	■	■	■	■	■
TNMG160408FF	9,53	16,50	4,76	0,8	3,81	4171051	■	■	■	4172692	■	■	4171386	■	■	■	■	■	■	■
TNMG160412FF	9,53	16,50	4,76	1,2	3,81	4171052	■	■	■	4172693	■	■	4171387	■	■	■	■	■	■	■



Inserts

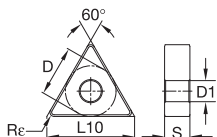
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- first choice
- alternate choice

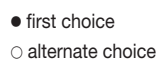
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■ TNMG-MR

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■ TNMG-MS

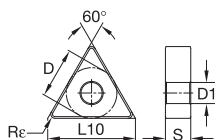
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
TNMG160404MS	9,53	16,50	4,76	0,4	3,81	■	■	■	■	■	■	■	■	5908927	5908928	5908929	■	■	■	■
TNMG160408MS	9,53	16,50	4,76	0,8	3,81	■	■	■	■	■	■	■	■	5908930	5908931	5908932	■	■	■	■
TNMG220404MS	12,70	22,00	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5908933	5908934	5908935	■	■	■	■
TNMG220408MS	12,70	22,00	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5908936	5908937	5908938	■	■	■	■
TNMG220412MS	12,70	22,00	4,76	1,2	5,16	■	■	■	■	■	■	■	■	5908939	5908940	5908941	■	■	■	■
TNMG270608MS	15,88	27,50	6,35	0,8	6,35	■	■	■	■	■	■	■	■	5908942	5908943	5908944	■	■	■	■



ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115			
						4171007	4171542	4171724	4173058	4173059	4173058	4171927	4171928	4171929	4171930	4171931	4171012	4171547	4171729	4171730	4171013	4171548	4171730
TNMG160408RH	9,53	16,50	4,76	0,8	3,81	4171008	4171543	4171725	4173059	4173058	4173059	4171928	4171928	4171929	4171930	4171931	4171012	4171547	4171729	4171730	4171013	4171548	4171730
TNMG160412RH	9,53	16,50	4,76	1,2	3,81	4171009	4171544	4171726	4173060	4173061	4173060	4171929	4171930	4171931	4171932	4171933	4171013	4171549	4171731	4171731	4171014	4171549	4171731
TNMG220408RH	12,70	22,00	4,76	0,8	5,16	4171010	4171545	4171727	4173061	4173062	4173061	4171929	4171930	4171931	4171932	4171933	4171014	4171550	4171732	4171732	4171015	4171550	4171732
TNMG220412RH	12,70	22,00	4,76	1,2	5,16	4171011	4171546	4171728	4173062	4173063	4173062	4171930	4171931	4171932	4171933	4171934	4171015	4171551	4171733	4171733	4171016	4171551	4171733
TNMG220416RH	12,70	22,00	4,76	1,6	5,16	4171012	4171547	4171729	4173063	4173064	4173063	4171931	4171932	4171933	4171934	4171935	4171016	4171552	4171734	4171734	4171017	4171552	4171734
TNMG270612RH	15,88	27,50	6,35	1,2	6,35	4171013	4171548	4171730	4173064	4173065	4173064	4171932	4171933	4171934	4171935	4171936	4171017	4171553	4171735	4171735	4171018	4171553	4171735
TNMG270616RH	15,88	27,50	6,35	1,6	6,35	4171014	4171549	4171730	4173065	4173066	4173065	4171933	4171934	4171935	4171936	4171937	4171018	4171554	4171736	4171736	4171019	4171554	4171736
TNMG330924RH	19,05	33,00	9,53	2,4	7,93	4171015	4171550	4171731	4173066	4173067	4173066	4171934	4171935	4171936	4171937	4171938	4171019	4171555	4171737	4171737	4171020	4171555	4171737

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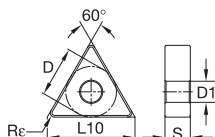




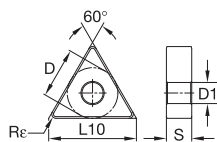
- first choice
- alternate choice

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ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
TNMG160404UF	9,53	16,50	4,76	0,4	3,81	■	■	■	4169367	4169393	■	■	■	5432605	■	■	■	■	■	■
TNMG160408UF	9,53	16,50	4,76	0,8	3,81	5645615	■	■	4169368	4169394	■	■	■	5432606	■	■	■	■	■	■
TNMG160412UF	9,53	16,50	4,76	1,2	3,81	■	■	■	4169369	4169395	■	■	■	5645613	■	■	■	■	■	■
TNMG220404UF	12,70	22,00	4,76	0,4	5,16	■	■	■	4169370	4169396	■	■	■	5645612	■	■	■	■	■	■
TNMG220408UF	12,70	22,00	4,76	0,8	5,16	■	■	■	4169371	4169397	■	■	■	5645614	■	■	■	■	■	■



16	-	5645266	-	-	-	-	-	-	WP15CT	-	-	-	-	5645615	-	-	WP15CT
	-	-	-	-	-	-	-	-	WP25CT	-	-	-	-	-	-	-	WP25CT
	-	-	-	-	-	-	-	-	WP35CT	-	-	-	-	-	-	-	WP35CT
4172374	4172373	4172372	-	4172371	4172370	4172369	4172368	4169367	WM15CT	4169371	4169370	4169369	4169368	4169367	WM15CT		WM15CT
4172402	4172401	4172400	4172399	4172398	4172397	4172396	4172395	4169393	WM25CT	4169397	4169396	4169395	4169394	4169393	WM25CT		WM25CT
-	4172431	4172430	4172429	4172428	4172427	4172426	-	-	WM35CT	-	-	-	-	-	WM35CT		WM35CT
-	-	-	-	-	-	-	-	-	WK05CT	-	-	-	-	-	WK05CT		WK05CT
-	-	-	-	-	-	-	-	-	WK20CT	-	-	-	-	-	WK20CT		WK20CT
5473222	5645265	-	-	-	5550228	5550226	-	5432605	WS10PT	5645614	5645612	5645613	5432606	5432605	WS10PT		WS10PT
-	-	-	-	-	-	-	-	-	WS25PT	-	-	-	-	-	WS25PT		WS25PT
-	-	-	-	-	-	-	-	-	WU10HT	-	-	-	-	-	WU10HT		WU10HT
-	-	-	-	-	-	-	-	-	THM	-	-	-	-	-	THM		THM
-	-	-	-	-	-	-	-	-	TTM	-	-	-	-	-	TTM		TTM
-	-	-	-	-	-	-	-	-	TTR	-	-	-	-	-	TTR		TTR
-	-	-	-	-	-	-	-	-	TT145	-	-	-	-	-	TT145		TT145



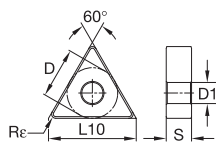
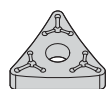
- first choice
- alternate choice

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WN15CT	WN25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4171115	4170522	4170035	4169434	4169465	-	-	-	4171441	-	5579395	-	-	-	-
TNMG160408UR	9,53	16,50	4,76	0,8	3,81	4171116	4170523	-	-	4169466	4169465	-	-	-	5680175	-	-	-	-	-
TNMG160412UR	9,53	16,50	4,76	1,2	3,81	4171117	-	-	-	4169467	-	-	4171443	-	-	-	-	-	-	-
TNMG160416UR	9,53	16,50	4,76	1,6	3,81	4171118	4170524	4170036	4169435	4169468	4169467	-	-	-	5579397	-	-	-	-	-
TNMG220408UR	12,70	22,00	4,76	0,8	5,16	4171119	4170525	4170037	4169436	4169469	4169468	-	-	-	5473198	-	-	-	-	-
TNMG220412UR	12,70	22,00	4,76	1,2	5,16	4171120	4170526	-	-	4169470	4169469	-	-	-	-	-	-	-	-	-
TNMG220416UR	12,70	22,00	4,76	1,6	5,16	4171121	4170527	-	4169437	4169471	4169470	-	-	-	-	-	-	-	-	-
TNMG270612UR	15,88	27,50	6,35	1,2	6,35	4171122	4170528	-	4169438	4169472	4169471	-	-	-	5579405	-	-	-	-	-
TNMG270616UR	15,88	27,50	6,35	1,6	6,35	4171123	4170529	-	4169439	4169473	4169472	-	-	-	-	-	-	-	-	-

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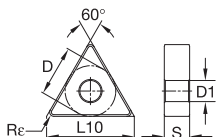
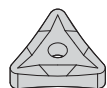


Inserts



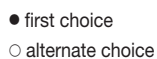
- first choice
- alternate choice

■ **TNMM-65**

[illegible]

■ TNMP

ISO catalogue number	D	L10	S	Rε	D1	Technical specifications															
						WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
TNMP160404	9,53	16,50	4,76	0,4	3,81	■	■	■	4172143	4172143	4173670	4173709	■	■	4172491	■	■	■	■	■	
TNMP160408	9,53	16,50	4,76	0,8	3,81	■	■	■	4172144	4173671	4173710	4173709	■	■	4172492	4172623	■	■	■	■	
TNMP160412	9,53	16,50	4,76	1,2	3,81	■	■	■	4172145	4173672	4173711	4173711	■	■	4172493	4172624	■	■	■	■	
TNMP220404	12,70	22,00	4,76	0,4	5,16	■	■	■	4172146	4173673	4173712	4173711	■	■	4172494	■	■	■	■	■	
TNMP220408	12,70	22,00	4,76	0,8	5,16	■	■	■	4172147	4173674	4173713	4173713	■	■	4172495	4172625	■	■	■	■	
TNMP220412	12,70	22,00	4,76	1,2	5,16	■	■	■	4172148	4173675	4173714	4173713	■	■	4172496	4172626	■	■	■	■	

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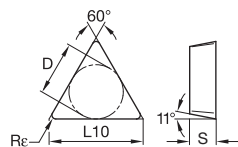
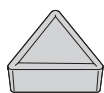
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ISO catalogue number	D	L10	S	R _E	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
TNUN160408	9,53	16,50	4,76	0,8	■	■	■	■	■	■	■	4170964	■	■	■	■	■	■	■

ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
TPGN110308	6,35	11,00	3,18	0,8	■	■	■	■	■	■	■	4170952	■	■	■	■	■	■	■
TPGN160308	9,53	16,50	3,18	0,8	■	■	■	■	■	■	■	4170953	■	■	■	■	■	■	■

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
TPGA110204	6,35	11,00	2,38	0,4	2,80	■	■	■	■	■	■	■	■	■	■	■	2015081	■	■	■
TPGA110208	6,35	11,00	2,38	0,8	2,80	■	■	■	■	■	■	■	■	■	■	■	2031786	■	■	■

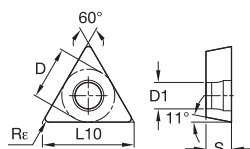
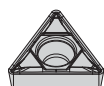




- first choice
- alternate choice

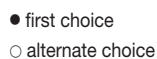
Inserts

■ **TPMR**

[illegible]

■ TPMT-FP

[illegible]

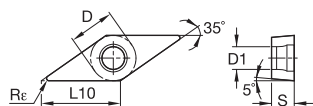
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inserts

ISO catalogue number	D	L10	S	Re	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
TPMT110208MP	6,35	11,00	2,38	0,8	2,80	■	4170263	■	■	■	■	■	4170271	■	■	■	■	■	■	■
TPMT16T308MP	9,53	16,50	3,97	0,8	4,40	■	4170264	■	■	■	■	■	4170272	■	■	■	■	■	■	■
TPMT16T312MP	9,53	16,50	3,97	1,2	4,40	■	4170265	■	■	■	■	■	4170273	■	■	■	■	■	■	■

TPU																			
ISO catalogue number	D	L10	S	Rε	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
TPUN110304	6,35	11,00	3,18	0,4	4170864	-	4170789	-	-	-	-	-	-	-	-	2028806	-	-	-
TPUN110308	6,35	11,00	3,18	0,8	4170865	-	-	-	-	-	-	-	-	-	-	2028814	-	-	-
TPUN160304	9,53	16,50	3,18	0,4	4170866	4170645	-	-	-	-	-	4170958	-	-	-	2028821	-	-	-
TPUN160308	9,53	16,50	3,18	0,8	4170867	4170646	-	-	-	-	-	4170959	-	-	-	2028830	-	2028832	-
TPUN160312	9,53	16,50	3,18	1,2	-	4170647	-	-	-	-	-	4170960	-	-	-	2028833	-	-	-
TPUN220408	12,70	22,00	4,76	0,8	4170868	4170648	4170790	-	-	-	-	-	-	-	-	-	-	-	-
TPUN220412	12,70	22,00	4,76	1,2	-	4170649	4170791	-	-	-	-	4170961	-	-	-	2028843	-	2028847	-

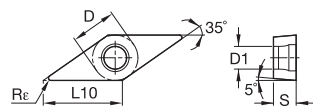




- first choice
- alternate choice

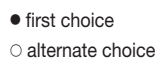
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■ VBMT

[illegible]

■ VBMT-FP

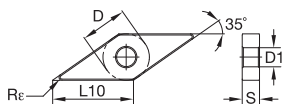
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Inserts

VBMT-MP

ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	TMM	TTR	TTI15
VBMT160404MP	9,53	16,61	4,76	0,4	4,40	I	4170235	I	I	4168921	I	I	4170253	I	I	I	I	I	I
VBMT160408MP	9,53	16,61	4,76	0,8	4,40	I	4170236	I	I	4168922	I	I	4170254	I	I	I	I	I	I

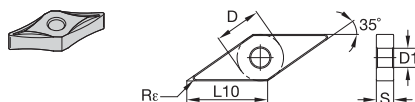


■ VNGG-FS

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
VNKG160401FS	9,53	16,61	4,76	0,1	3,81	■	■	■	■	■	■	■	■	5548684	■	■	5550000	■	■	■	■
VNKG160402FS	9,53	16,61	4,76	0,2	3,81	■	■	■	■	■	■	■	■	5548683	■	■	5549999	■	■	■	■
VNKG160404FS	9,53	16,61	4,76	0,4	3,81	■	■	■	■	■	■	■	■	5548685	5538232	■	5550001	■	■	■	■
VNKG160408FS	9,53	16,61	4,76	0,8	3,81	■	■	■	■	■	■	■	■	5548686	5538233	5550002	■	■	■	■	



Inserts

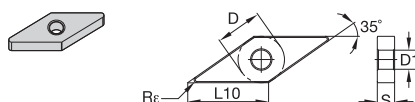


- first choice
- alternate choice

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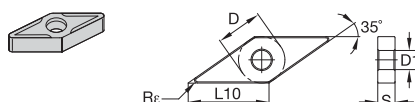
VNGP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	TMM	TTR	TT145
VNGP160401	9,53	16,61	4,76	0,1	3,81	■	■	■	■	■	■	■	■	5549195	■	5549211	■	■	■
VNGP160402	9,53	16,61	4,76	0,2	3,81	■	■	■	■	■	■	■	■	5549196	■	■	■	■	■
VNGP220404	12,70	22,14	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5549197	■	■	■	■	■
VNGP220408	12,70	22,14	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5549198	■	5549212	■	■	■



■ VNMA

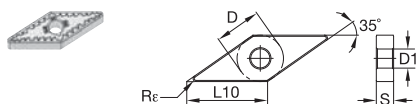
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
VNMA160408	9,53	16,61	4,76	0,8	3,81	■	■	■	■	■	■	4171652	4171897	■	■	■	■	■	■	■



VNMG

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTH5
VNMG12T304	7,14	12,45	3,97	0,4	3,60	■	■	■	■	■	■	■	■	5095163	5095164	■	■	■	■
VNMG12T308	7,14	12,45	3,97	0,8	3,65	■	■	■	■	■	■	■	4170965	5095165	5095166	■	■	■	■



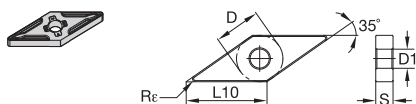


- first choice
- alternate choice

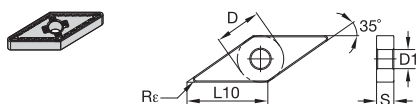
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■ VNMG-MS

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
VNMG160404MS	9,53	16,61	4,76	0,4	3,81	■	■	■	■	■	■	■	■	5908944	5908945	5908946	■	■	■	■
VNMG160408MS	9,53	16,61	4,76	0,8	3,81	■	■	■	■	■	■	■	■	5908947	5908948	5908949	■	■	■	■
VNMG220404MS	12,70	22,14	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5908950	5908961	5908962	■	■	■	■
VNMG220408MS	12,70	22,14	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5908963	5908964	5908965	■	■	■	■

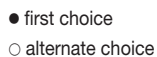


■ VNMG-RH

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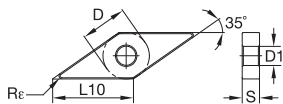
■ VNMG-UF

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inserts

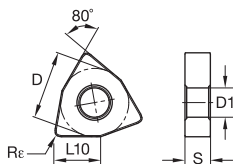
■ VNMG-UR

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VNMP

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
VNMP160404	9,53	16,61	4,76	0,4	3,81	■	■	■	■	■	■	■	■	4172497	■	■	■	■	■
VNMP160408	9,52	16,61	4,76	0,8	3,81	■	■	■	■	■	■	■	■	4172498	■	■	■	■	■

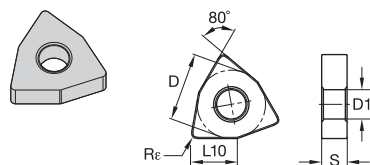
NOTE: DNMP-style inserts are single-sided.



■ WNGG-FS

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
WNGG080404FS	12,70	8,69	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5548687	5538234	5550003	■	■	■
WNGG080408FS	12,70	8,69	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5548688	5538235	5550004	■	■	■



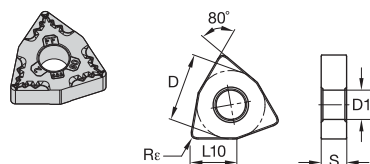


- first choice
- alternate choice

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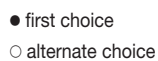
WNMA

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WN15CT	WN25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
WNMA060408	9,53	6,52	4,76	0,8	3,81	■	■	■	■	■	■	4171653	4171898	■	■	■	■	■	■	■
WNMA060412	9,53	6,52	4,76	1,2	3,81	■	■	■	■	■	■	4171899	■	■	■	■	■	■	■	■
WNMA080408	12,70	8,69	4,76	0,8	5,16	■	■	■	■	■	■	4171654	4171900	■	■	■	■	■	■	■
WNMA080412	12,70	8,69	4,76	1,2	5,16	■	■	■	■	■	■	4171655	4171901	■	■	■	■	■	■	■
WNMA080416	12,70	8,69	4,76	1,6	5,16	■	■	■	■	■	■	4171656	4171902	■	■	■	■	■	■	■



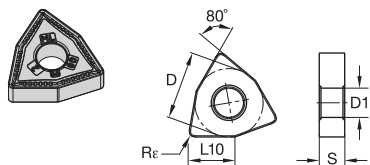
■ WNMG-FF

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TTM	TTM5	
						4171055	■	■	■	4172696	■	■	4171388	■	■	■	■	■	■	■	■
WNMG060404FF	9,53	6,52	4,76	0,4	3,81	4171056	■	■	■	■	■	■	4171389	■	■	■	■	■	■	■	■
WNMG060408FF	9,53	6,52	4,76	0,8	3,81	4171057	■	■	■	■	■	■	4171390	■	■	■	■	■	■	■	■
WNMG080404FF	12,70	8,69	4,76	0,4	5,16	4171058	■	■	■	4172697	■	■	■	5684336	■	■	■	■	■	■	■
						4172698	■	■	■	■	■	■	■								
WNMG080408FF	12,70	8,69	4,76	0,8	5,16	4172699	■	■	■	■	■	■	■	5684335	■	■	■	■	■	■	■

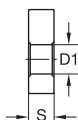
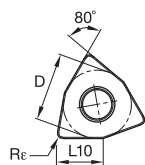
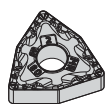


P	Blue	Black	Black	Black	White	White	White	White	White	White	White	White	White	White	Black	Black	Black
M	Yellow	White	White	White	Black	Black	Black	White	White	Black	Black	Black	White	White	Black	Black	Black
K	Red	White	White	White	White	White	White	Black	Black	White	White	White	White	Black	White	White	White
N	Green	White	White	White	White	White	White	White	White	White	White	White	White	White	Black	White	White
S	Orange	White	White	White	White	White	White	White	White	Black	Black	Black	Black	White	White	White	White
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inserts

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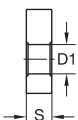
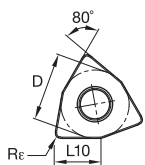
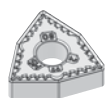
Inserts



- first choice
- alternate choice

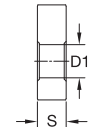
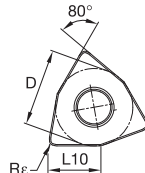
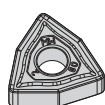
■ WNMG-MR

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WN15CT	WN25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	T1M	T1R	T115	
						4171158	4171159	4170581	4170582	4170067	4170068	4173033	4173034	4173148	4173149	4170583	4170584	4170585	4170586	4170587	4170588
WNMG080408MR	12,70	8,69	4,76	0,8	5,16	4171158	4171159	4170581	4170582	4170067	4170068	4173033	4173034	4173148	4173149	4170583	4170584	4170585	4170586	4170587	4170588
WNMG080412MR	12,70	8,69	4,76	1,2	5,16	4171159	4170582	4170068	4170069	4173034	4173149	4173035	4173150	4173036	4173151	4170584	4170585	4170586	4170587	4170588	4170589
WNMG080416MR	12,70	8,69	4,76	1,6	5,16	4171160	4170583	4170069	4170070	4173035	4173150	4173036	4173151	4173037	4173152	4170585	4170586	4170587	4170588	4170589	4170590



■ WNMG-MS

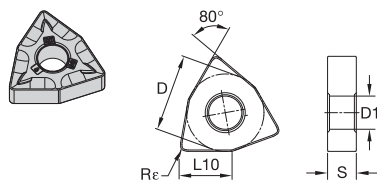
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WN15CT	WN25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
WNMG060408MS	9,53	6,52	4,76	0,8	3,81	■	■	■	■	■	■	■	■	5908966	5908967	5908968	■	■	■	■
WNMG080404MS	12,70	8,69	4,76	0,4	5,16	■	■	■	■	■	■	■	■	5908969	5908970	5908971	■	■	■	■
WNMG080408MS	12,70	8,69	4,76	0,8	5,16	■	■	■	■	■	■	■	■	5908972	5908973	5908974	■	■	■	■



■ WNMG-MW

ISO catalogue number	D	L10	S	R _e	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
WNMG060408MW	9,53	6,52	4,76	0,8	3,81	5623512	5623513	■	■	■	■	■	■	■	■	■	■	■	■
WNMG080408MW	12,70	8,69	4,76	0,8	5,16	5623516	5623517	■	■	4173118	4171695	■	■	■	■	■	■	■	■
WNMG080412MW	12,70	8,69	4,76	1,2	5,16	■	■	■	■	4173119	4171697	■	■	■	■	■	■	■	■

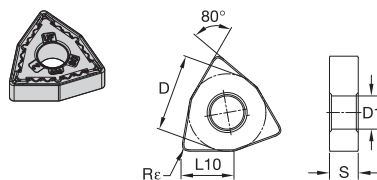
P																		
M																		
K																		
N																		
S																		
H																		



- first choice
- alternate choice

WNMG-RH

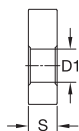
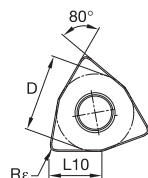
ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
WNMG060408RH	9,53	6,52	4,76	0,8	3,81	4171018	4171018	4171553	4171735	4173063										
WNMG080408RH	12,70	8,69	4,76	0,8	5,16	4171019	4171554	4171736	4173064	4173063			4171932							
WNMG080412RH	12,70	8,69	4,76	1,2	5,16	4171020	4171555	4171737	4173065	4173065			4171933							
WNMG080416RH	12,70	8,69	4,76	1,6	5,16	4171021	4171556	4171738	4173066	4173066			4171934							



WNMG-UF

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTI15
WNMG060404UF	9,53	6,52	4,76	0,4	3,81				4169374	4169400					5645621					
WNMG060408UF	9,53	6,52	4,76	0,8	3,81				4169375	4169401					5645622					
WNMG080404UF	12,70	8,69	4,76	0,4	5,16				4169376	4169402					5645619					
WNMG080408UF	12,70	8,69	4,76	0,8	5,16				4169377	4169403					5645623					
WNMG080412UF	12,70	8,69	4,76	1,2	5,16				4169378	4169404					5645624					



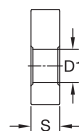
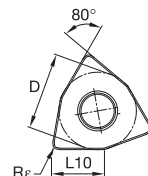
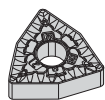


- first choice
- alternate choice

[illegible]

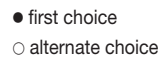
■ WNMG-UM

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
WNMG060404UM	9,53	6,52	4,76	0,4	3,81	■	■	■	4172375	4172403	4172432	■	■	5645268	■	■	■	■	■	■
WNMG060408UM	9,53	6,52	4,76	0,8	3,81	■	■	■	4172376	4172404	4172433	■	■	5645267	■	■	■	■	■	■
WNMG060412UM	9,53	6,52	4,76	1,2	3,81	■	■	■	■	4172405	4172434	■	■	■	■	■	■	■	■	■
WNMG080404UM	12,70	8,69	4,76	0,4	5,16	■	■	■	4172377	4172406	4172435	■	■	■	■	■	■	■	■	■
WNMG080408UM	12,70	8,69	4,76	0,8	5,16	■	5645270	■	4172378	4172407	4172436	■	■	■	■	■	■	■	■	■
WNMG080412UM	12,70	8,69	4,76	1,2	5,16	5645271	■	■	4172379	4172408	4172437	■	■	5645269	■	■	■	■	■	■
WNMG080416UM	12,70	8,69	4,76	1,6	5,16	■	■	■	■	4172409	4172438	■	■	■	■	■	■	■	■	■



■ WNMG-UR

ISO catalogue number	D	L10	S	Rε	D1	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
						4171125 4171126	4170531 4170532	4170039 -	4169441 -	4169475 -	- -	4171451 4171452	5680178 -	5680177 -	- -	- -	- -	- -	- -	- -
WNMG060408UR	9,53	6,52	4,76	0,8	3,81															
WNMG060412UR	9,53	6,52	4,76	1,2	3,81															
WNMG080408UR	12,70	8,69	4,76	0,8	5,16															
WNMG080412UR	12,70	8,69	4,76	1,2	5,16															
WNMG080416UR	12,70	8,69	4,76	1,6	5,16															



Inserts

The Gold Standard for Value • WIDIA™ 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.

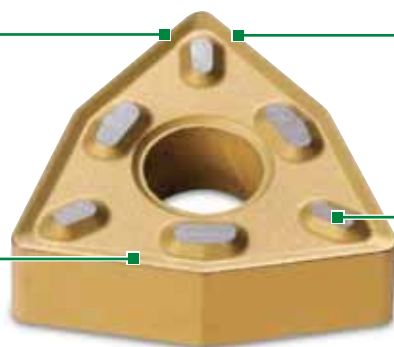
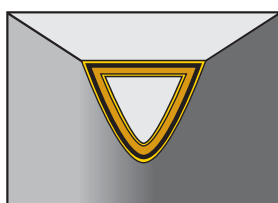
- Engineered to optimise performance.
- Gold coating on every insert.
- Proven grade technologies.

VariTurn

Post-coat treatment

- Improves edge toughness.
- Wide range of applications.

MT-CVD/CVD-
TiN-TiCN-Al₂O₃-TiN

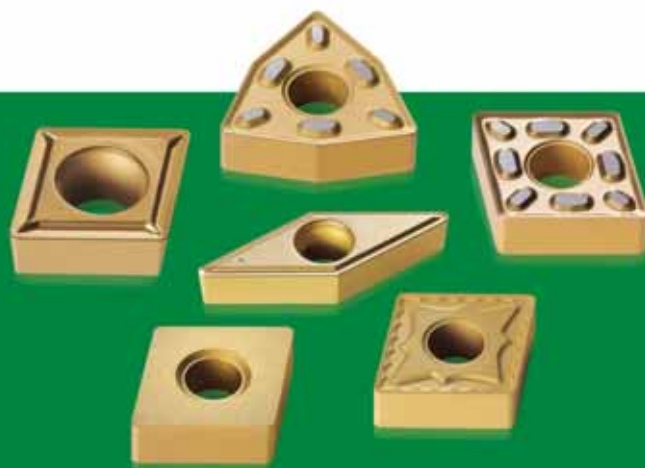


Improved edge toughness

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

Post-coat grinding

- Provides secure seating surface.



Getting the Most from Every Insert

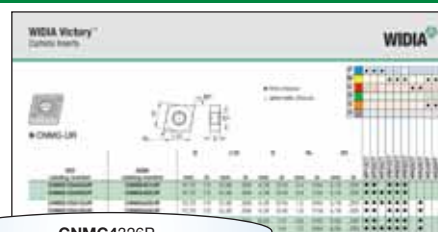
WIDIA™ VariTurn™ products make it simple to get the most out of your inserts, and your money. Every insert is gold, which exposes wear as the tool continues to be used. This makes it easy to detect when an insert is ready to be changed — maximising the product's value and protecting the workpiece. Also, 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?

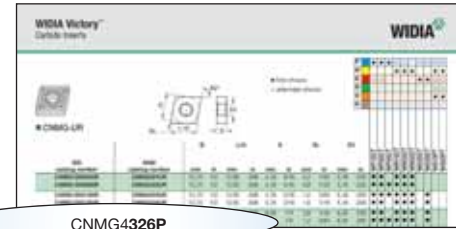
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



CNMG4326P

C	N	M	G	4																																																																																																																																																																																																
Insert Shape	Insert Clearance Angle	Tolerance Class	Insert Features	Size																																																																																																																																																																																																
H Hexagon 120°	A 3°	Tolerances apply prior to edge prep and coating	N R F A M G W T Q U B H C J X Special Design V	"Code for mm cutting edge length "L10" "D" mm <table><tr><th></th><th>C</th><th>D</th><th>R</th><th>S</th><th>T</th><th>V</th><th>W</th></tr><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></table>		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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C D E M V Rhomboid 80° 55° 75° 86° 35°	G 30°	D = Theoretical diameter of the insert inscribed circle S = Thickness B = See figures below																																																																																																																																																																																																		
W Trigon 80° with enlarged corner angles	N 0°																																																																																																																																																																																																			
L Rectangular 90°	P 11°																																																																																																																																																																																																			
A B N/K Parallelogram 85° 82° 55°	O Indicated for other clearance angles requiring descriptions.																																																																																																																																																																																																			

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



CNMG4326P

3

Thickness
S

symbol mm	thickness 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

2

Corner
Radius "R_ε"

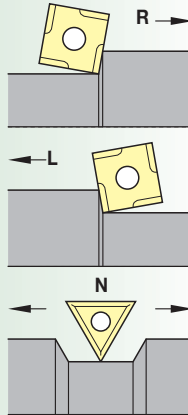
symbol mm	corner radius mm
X0	0,04
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
28	2,8
32	3,2
00	round insert
M0	
—	

Hand of Insert
(optional)

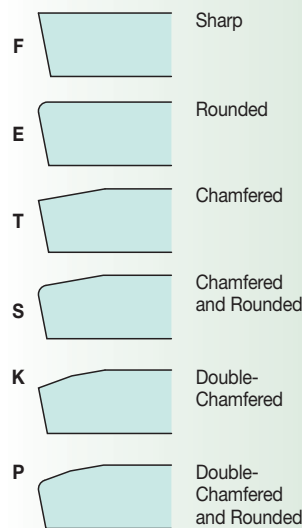
R = Right hand

L = Left hand

N = Neutral



Cutting Edge
(optional)



6P

Chipbreaker
(optional)

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

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

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

Brand

TN = WIDIA

15

Relative Hardness
(ISO 513)

01 = Hardest

10

20

30

40

50 = Toughest

M

Primary
Workpiece
Material (ISO 513)

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



WIN WITH WIDIATM



WIDIATM Tunable Tooling

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 KMTM 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 www.widia.com

WIDIA 

Step 1 • Select the insert geometry

Negative Inserts



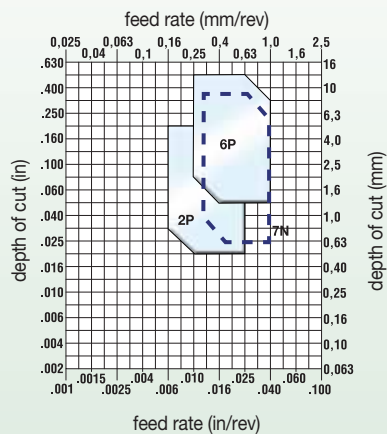
2P
Finishing



6P
Roughing



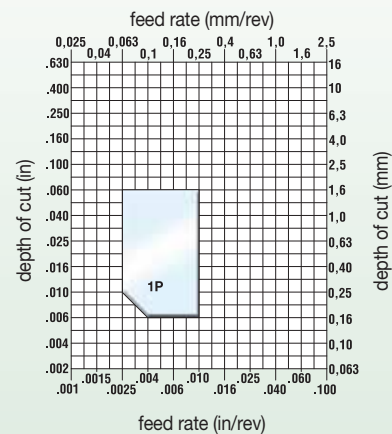
7N
Heavy Roughing



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



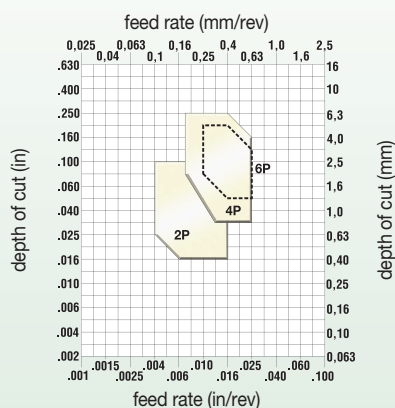
2P
Finishing



4P
Medium



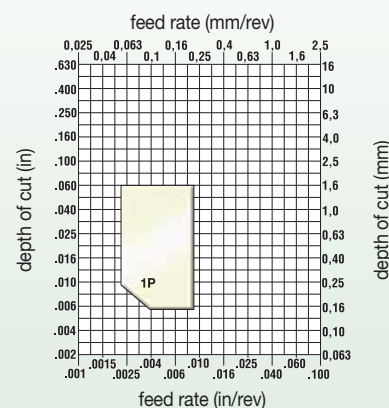
6P
Roughing



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

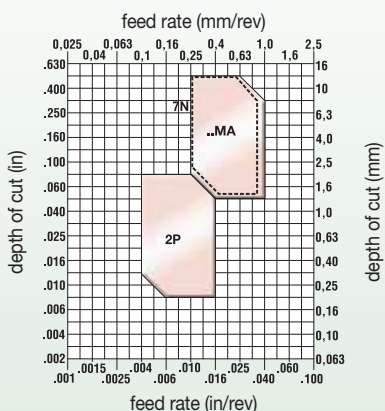
Austenitic Stainless Steel		speed – m/min									Starting Conditions
Material Group	grade	90	135	180	225	270	315	360	405	450	m/min
M1	TN15M										162
	TN30M										135
	TN10U										194
	TN15U										129

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

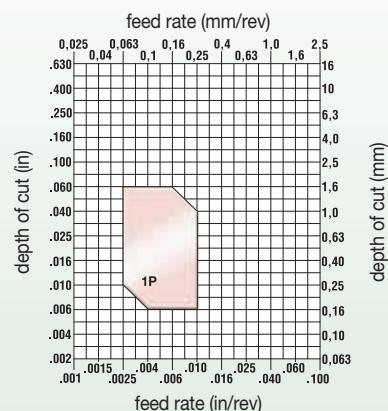
Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture)		speed – m/min									Starting Conditions
Material Group	grade	90	135	180	225	270	315	360	405	450	m/min
M3	TN15M										135
	TN30M										108
	TN10U										167
	TN15U										111

■ Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



■ 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

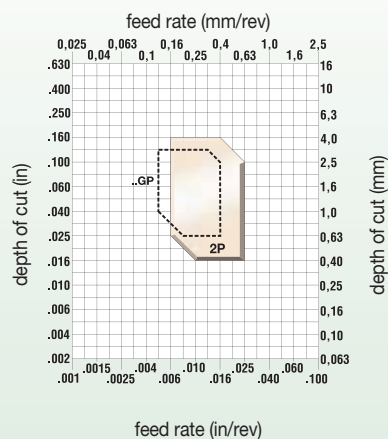
Grey Cast Iron		speed — m/min									Starting Conditions
Material Group	grade	60	150	240	330	420	510	600	690	780	m/min
K1	TN20K										270

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
K2	TN20K										216

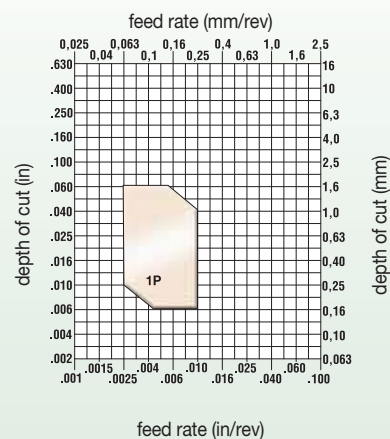
Ductile, Compacted Graphite, and Malleable Cast Irons (>80 KSI tensile strength)		speed — m/min									Starting Conditions
Material Group	grade	60	150	240	330	420	510	600	690	780	m/min
K3	TN20K										189

■ Step 1 • Select the insert geometry

Negative Inserts

2P
Finishing..GP
Medium

Positive Inserts

1P
Finishing

■ 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)

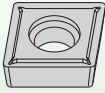
Material Group	grade	speed — m/min									Starting Conditions
		15	45	75	105	140	170	200	230	260	m/min
S3	TN10U										63
	TN15U										42

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

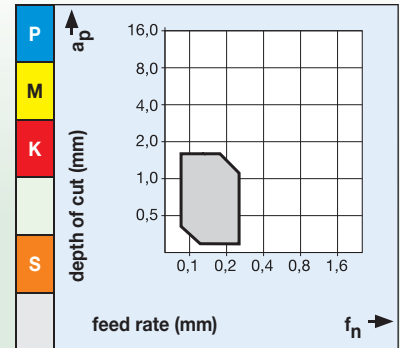
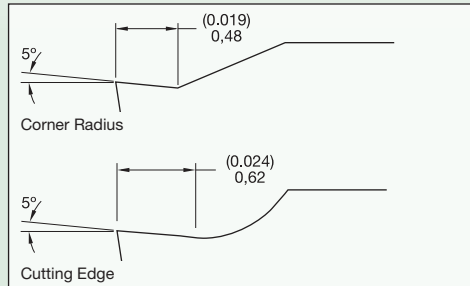
Material Group	grade	speed — m/min									Starting Conditions
		15	45	75	105	140	170	200	230	260	m/min
S4	TN10U										63
	TN15U										42

■ Positive and Negative Inserts

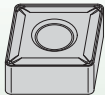
1P



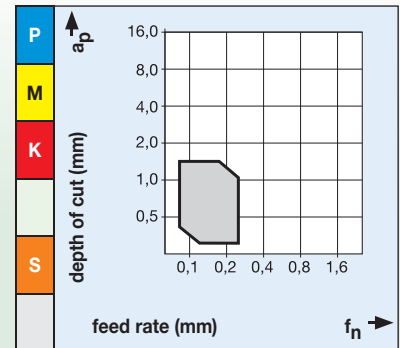
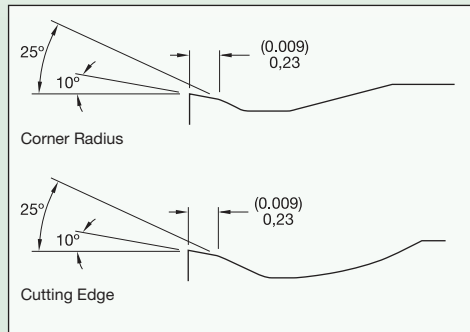
Preferred for light finishing. Low cutting forces and reduced power requirements due to positive rake angle. Good chip control over a wide range.



2P



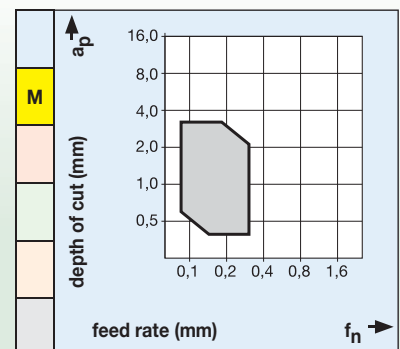
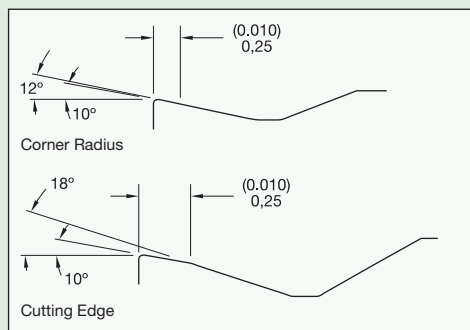
For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.



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.



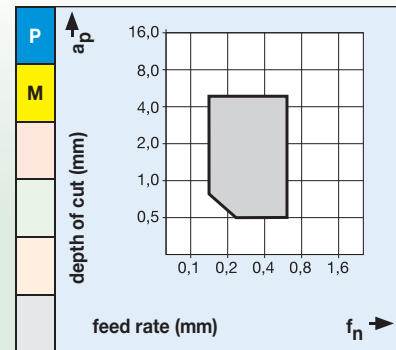
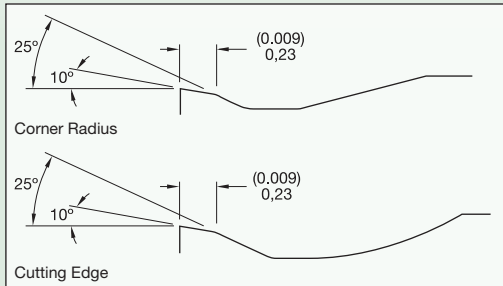
(continued)

■ **Positive and Negative Inserts** *(continued)*

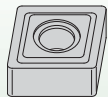
6P



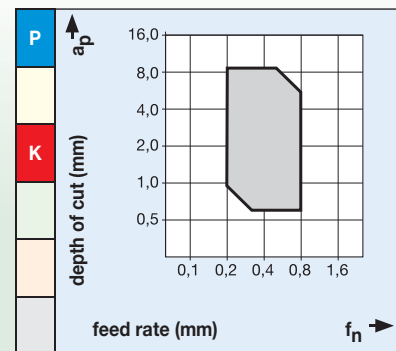
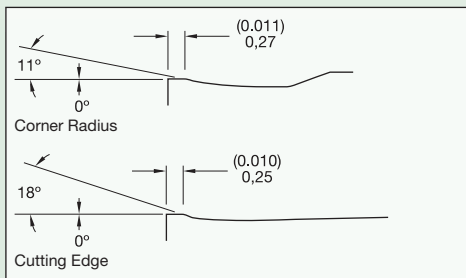
For medium to rough turning. Outstanding chip control due to specially configured chipbreaker element in corner area. Good chip forming with low depths of cut.



7N



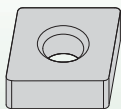
For medium-duty to roughing. Outstanding chip control. High edge strength for interrupted cuts, forging skin, or scale. Preferred for all cast iron such as grey, malleable, and nodular.



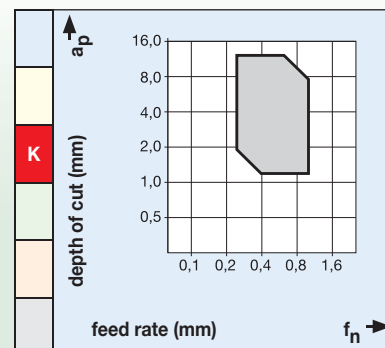
(continued)

■ Positive and Negative Inserts *(continued)*

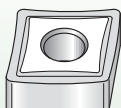
..MA



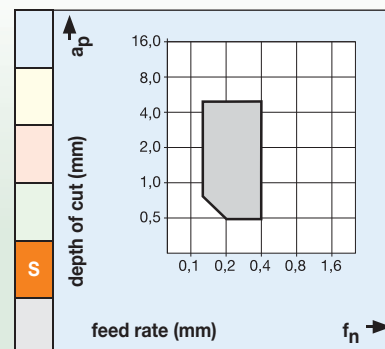
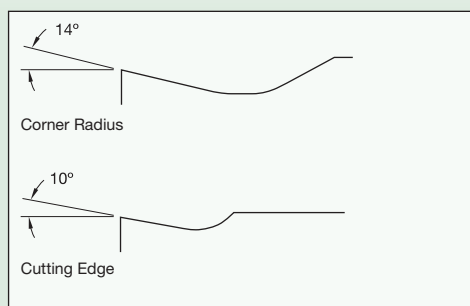
Flat top geometry for machining cast iron. For finishing to roughing applications.

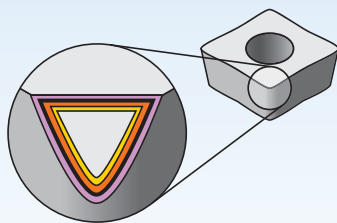


..GP



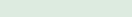
For light machining to light roughing.

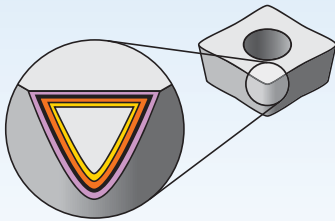




Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

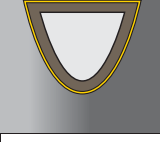
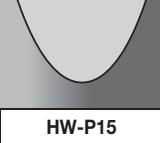
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

		wear resistance ← → toughness											
Coating		Grade Description		05	10	15	20	25	30	35	40	45	
TN10P		Coated carbide. MTCVD-TiN-TiCN-Al ₂ O ₃ -TiN. Ideal for light finishing to medium machining applications. Superior wear resistance.	P										
	K												
TN20P		Coated carbide. MTCVD-TiN-TiCN-Al ₂ O ₃ -TiN. Great general-purpose turning grade for steels. Ideal for semi-finishing to moderately heavy roughing.	P										
	K												
TN30P		Coated carbide. MTCVD-TiN-TiCN-Al ₂ O ₃ -TiN. Tough carbide grade. Ideal for roughing and heavy roughing applications.	P										
TN15M		Coated carbide. MTCVD-TiN-TiCN-Al ₂ O ₃ -TiN. Ideal for general-purpose machining of stainless steels.	P										
	M												
	S												
HC-M15													

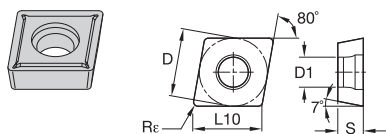


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

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

		wear resistance ← → toughness											
Coating		Grade Description			05	10	15	20	25	30	35	40	45
TN30M		Coated carbide. MTCVD-TiN-TiCN-Al ₂ O ₃ -TiN. Ideal for general-purpose machining of stainless steels.		P									
	M												
	S												
	HC-M30												
TN20K		Coated carbide. MTCVD-TiN-TiCN-Al ₂ O ₃ -TiN. Great when used for straight or lightly interrupted cut applications of ductile and cast irons.		P									
	K												
	HC-K20												
TN10U		Coated carbide. PVD-TiAlN-TiN. Ideal for finishing of difficult to machine alloys and stainless steels.		P									
	M												
	K												
	N												
	HC-S10												
TN15U		Uncoated carbide. Excellent abrasion resistance for machining cast irons, austenitic stainless steels, and most high-temperature alloys.		P									
	M												
	K												
	N												
	HW-P15												

Inserts

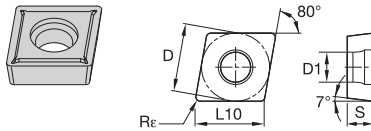


● first choice
○ alternate choice

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

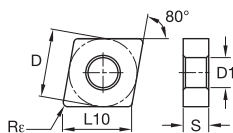
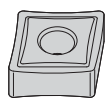
P	M	K	N	S	H	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
●	●	○	○	○	○	○	○	○	○	○	○	○	○
●	●	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○	○	○

■ 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	4166324	4165244	-	4166242	4166323	4165245	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	4166558	-
CCMT1204081P	12,70	12,90	4,76	0,8	5,50	4166559	4166560	-	4166562	4166561	4166562	-	-



Inserts

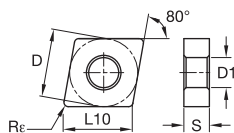
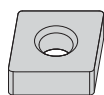


● first choice
○ alternate choice

■ 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	■	■	■	■	■	■	4164565	■
CNGP120402	12,70	12,90	4,76	0,2	5,16	■	■	■	■	■	■	4164564	■
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

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



- first choice
- alternate choice

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

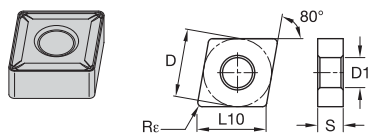
Inserts

■ 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	■	■	■	■	■	4165470	■	■
CNMA120408	12,70	12,90	4,76	0,8	5,16	■	■	■	■	■	4165471	■	■
CNMA120412	12,70	12,90	4,76	1,2	5,16	■	■	■	■	■	4165472	■	■
CNMA120416	12,70	12,90	4,76	1,6	5,16	■	■	■	■	■	4165833	■	■
CNMA160612	15,88	16,12	6,35	1,2	6,35	■	■	■	■	■	4165834	■	■
CNMA160616	15,88	16,12	6,35	1,6	6,35	■	■	■	■	■	4165835	■	■
CNMA190612	19,05	19,34	6,35	1,2	7,93	■	■	■	■	■	4165836	■	■
CNMA190616	19,05	19,34	6,35	1,6	7,93	■	■	■	■	■	4165837	■	■



Inserts

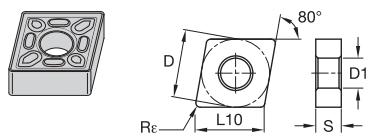


● first choice
○ alternate choice

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M	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
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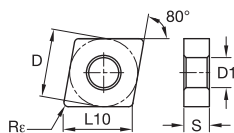
CNMG-2P

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

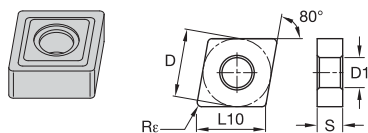
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Inserts

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN4EU
						4165948	4165949	-	4165950	4165951	-	-	-
CNMG0903086P	9,53	9,67	3,18	0,8	3,81	4165952	4165963	-	4165964	4165965	-	-	-
CNMG1204046P	12,70	12,90	4,76	0,4	5,16	4165966	4165967	4165968	4165969	4165970	-	-	-
CNMG1204086P	12,70	12,90	4,76	0,8	5,16	4165971	4165972	4165973	4165974	4165975	-	-	-
CNMG1204126P	12,70	12,90	4,76	1,2	5,16	-	4165976	4165977	4165978	4165979	-	-	-
CNMG1606126P	15,88	16,12	6,35	1,2	6,35	4165980	4165981	4165982	4165983	-	-	-	-
CNMG1906126P	19,05	19,34	6,35	1,2	7,93	-	-	-	-	-	-	-	-



Inserts

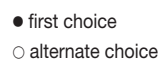


● first choice
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P		●	●	●	○	○	○	○	○
M					●	●		●	●
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N								○	○
S					○	○		●	●
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■ CNMG-7N

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								



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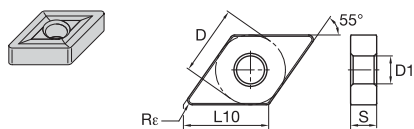
Inserts

Technical drawing of a mechanical part. The isometric view shows a rectangular block with a circular hole. The front view shows a trapezoidal shape with a circular hole. Dimensions include: D (top width), $L10$ (bottom width), $R\frac{1}{2}$ (fillet radius), 55° (top angle), $D1$ (inner hole diameter), 7° (bottom angle), and S (thickness).

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	┆	┆	┆	┆	┆	┆	4166625	4166626
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	┆	┆	┆	┆	┆	┆	4166634	4166635
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	4166652	┆
DCMT1504041P	12,70	15,50	4,76	0,4	5,50	4166653	4166654	┆	┆	┆	4166655	┆	┆
DCMT1504081P	12,70	15,50	4,76	0,8	5,50	4166656	4166657	┆	┆	┆	4166361	┆	┆



Inserts

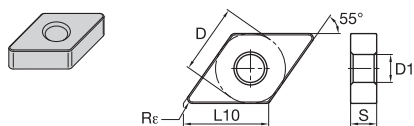


● first choice
○ alternate choice

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

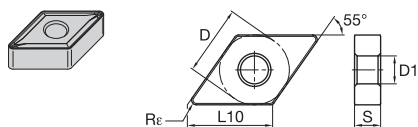
DNGP

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	■	■



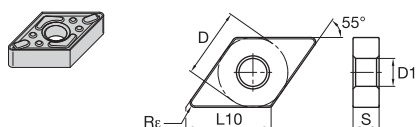
- first choice
- alternate choice

P		●	●	○	○	○	○	○	○
M				●	●	○	○	○	○
K		○	○			●	○	○	○
N							○	○	○
S				○	○		●	●	
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Inserts

■ 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	-

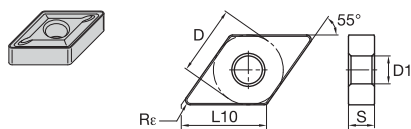


■ DNMG-4P

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

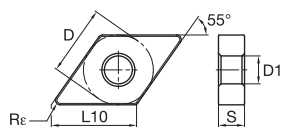


● first choice
○ alternate choice

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

■ DNMG-6P

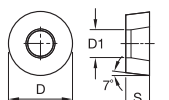
ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
DNMG1104086P	9,53	11,63	4,76	0,8	3,81	4165984	4165985	-	-	4165986	-	-	-
DNMG1504046P	12,70	15,50	4,76	0,4	5,16	4165987	4165988	-	4165989	4165990	-	-	-
DNMG1506046P	12,70	15,50	6,35	0,4	5,16	4166767	4166768	-	4166769	4166770	-	-	-
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	-	-	-	-	-	-	-	-



Inserts

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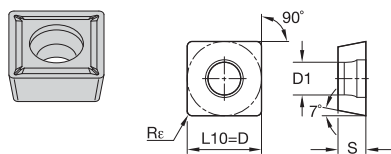
ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN4EU
						4166458	4166459	—	—	—	—	—	—
DNMG1504047N	12,70	15,50	4,76	0,4	5,16	4166460	4166461	4166462	—	—	—	—	—
DNMG1504087N	12,70	15,50	4,76	0,8	5,16	—	—	—	—	—	4166463	—	—
DNMG1506087N	12,70	15,50	6,35	0,8	5,16	4166484	4166485	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	—	4166489	4166490	—	—	4166491	—	—
DNMG1906127N	15,88	19,38	6,35	1,2	6,35	—	4166492	4166493	—	—	—	—	—



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

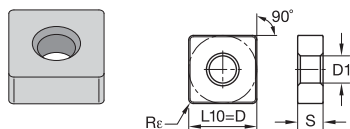


● first choice
○ alternate choice

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

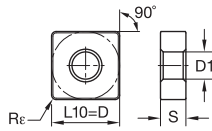
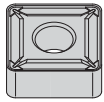
SCMT-1P

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	-	-	-	-	-	-	-	-
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	-	-



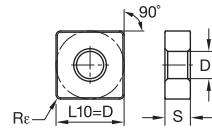
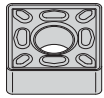
● first choice
○ alternate choice

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

Inserts

■ 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

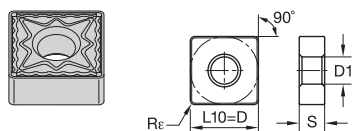


■ SNMG-4P

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

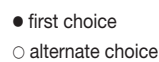


● first choice
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M	●	●	●	●	●	●	●	●	●
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N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○

■ SNMG-6P

ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
SNMG0903086P	9,53	9,53	3,18	0,8	3,81	4166802	4166803	4166804	4166805	4166806	4166807	4166808	4166809
SNMG1204046P	12,70	12,70	4,76	0,4	5,16	4166810	4166811	4166812	4166813	4166814	4166815	4166816	4166817
SNMG1204086P	12,70	12,70	4,76	0,8	5,16	4166818	4166819	4166820	4166821	4166822	4166823	4166824	4166825
SNMG1204126P	12,70	12,70	4,76	1,2	5,16	4166826	4166827	4166828	4166829	4166830	4166831	4166832	4166833
SNMG1906166P	19,05	19,05	6,35	1,6	7,92	4166834	4166835	4166836	4166837	4166838	4166839	4166840	4166841
SNMG1906126P	19,05	19,05	6,35	1,2	7,93	4166842	4166843	4166844	4166845	4166846	4166847	4166848	4166849



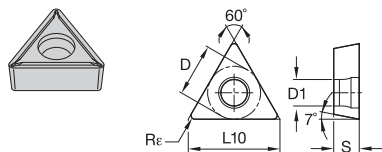
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Inserts

ISO catalogue number	D	L10	S	R _ε	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

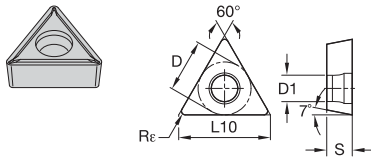


● first choice
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M	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
H	○	○	○	○	○	○	○	○	○

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

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

Inserts

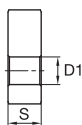
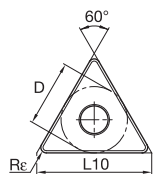
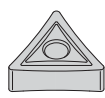
TCMT-1P

ISO catalogue number	D	L10	S	Rε	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

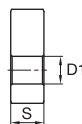
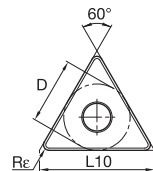
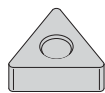


● first choice
○ alternate choice

P	●	●	●	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●
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N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
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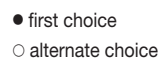
TNGP

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	■	■	■	■	■	■	■	■



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

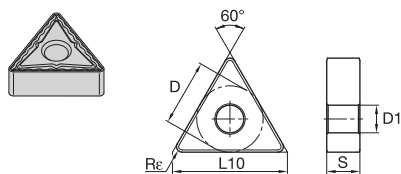
Inserts

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	4166865	4166868	-
TNMG1604082P	9,53	16,50	4,76	0,8	3,81	4166870	4166871	-	4166873	-	4166872	4166874	4166869
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

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	■	5359250	■	■	■	■	■	■



Inserts

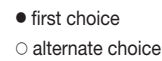


● first choice
○ alternate choice

P	●	●	●	○	○	○	○	○	○
M	●	●	●	●	●	●	●	●	●
K	○	○	○	○	○	○	○	○	○
N	○	○	○	○	○	○	○	○	○
S	○	○	○	○	○	○	○	○	○
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■ TNMG-6P

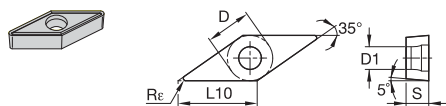
ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
TNMG1604046P	9,53	16,50	4,76	0,4	3,81	4166822	4166823	-	4166824	4167086	-	-	-
TNMG1604086P	9,53	16,50	4,76	0,8	3,81	4167087	4167088	4167089	4167090	4167091	-	-	-
TNMG1604126P	9,53	16,50	4,76	1,2	3,81	4167092	4167113	-	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	-	-	-



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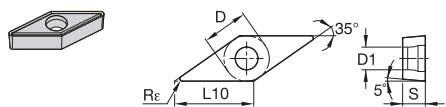


● first choice
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M	●	●	●	●	●	●	●	●	●
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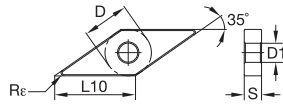
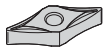
VBGT-1P

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	■	■	■	■	■	■	4164546	4164547
VBGT1103021P	6,35	11,07	3,18	0,2	2,80	■	■	■	■	■	■	4164544	4164545
VBGT1103041P	6,35	11,07	3,18	0,4	2,80	■	■	■	■	■	■	4164548	■
VBGT1604011P	9,53	16,61	4,76	0,1	4,40	■	■	■	■	■	■	4164551	■
VBGT1604021P	9,53	16,61	4,76	0,2	4,40	■	■	■	■	■	■	4164549	4164550
VBGT1604041P	9,53	16,61	4,76	0,4	4,40	■	■	■	■	■	■	4164552	4164563



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	■	■	■	■	■	■	4166573	4166574
VBMT1103041P	6,35	11,07	3,18	0,4	2,80	4166575	4166576	■	4166578	4166579	4166577	4166580	4166581
VBMT1103081P	6,35	11,07	3,18	0,8	2,80	4166582	4166583	■	4166585	■	4166584	4166586	■
VBMT1604021P	9,53	16,61	4,76	0,2	4,40	4166587	■	■	4166589	4166588	4166590	4166591	■
VBMT1604041P	9,53	16,61	4,76	0,4	4,40	4166592	4166593	■	4166595	4166596	4166594	4166597	4166598
VBMT1604081P	9,53	16,61	4,76	0,8	4,40	4166600	■	■	4166602	4166603	4166601	4166604	4166605



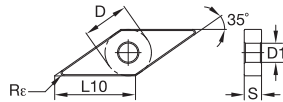
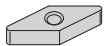
● first choice
○ alternate choice

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

Inserts

VNGP

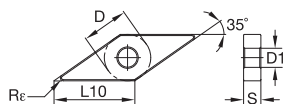
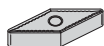
ISO catalogue number	D	L10	S	Rε	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
VNGP160401	9,53	16,61	4,76	0,1	3,81	■	■	■	■	■	■	4164795	4164796
VNGP160402	9,53	16,61	4,76	0,2	3,81	■	■	■	■	■	■	4164794	■
VNGP220404	12,70	22,14	4,76	0,4	5,16	■	■	■	■	■	■	4164797	4164798
VNGP220408	12,70	22,14	4,76	0,8	5,16	■	■	■	■	■	■	4164799	4164800



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	■	■	■	■	■	4165849	■	■



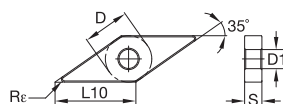
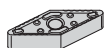


- first choice
- alternate choice

P									
M									
K									
N									
S									
H									

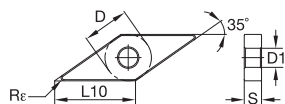
■ VNMG-2P

ISO catalogue number	D	L10	S	Rε	D1	Technical drawing							
						TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TAH11
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	R _e	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
						5359251	5359253	4165884	4165886	4165887	5359252	5359254	
VNMG1604044P	9,53	16,61	4,76	0,4	3,81	-	-	-	4165884	4165885	-	5359252	-
VNMG1604084P	9,53	16,61	4,76	0,8	3,81	-	5359253	-	4165886	4165887	-	5359254	-

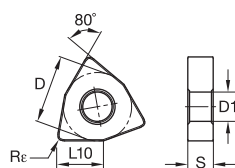
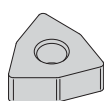


- first choice
- alternate choice

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

VNMG-6P

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

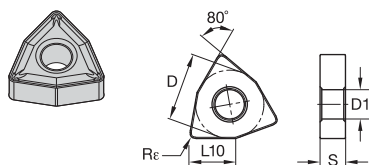


WNMA

ISO catalogue number	D	L10	S	Re	D1	TN10P	TN20P	TN30P	TN15M	TN30M	TN20K	TN10U	TN15U
WNMA060408	9,53	6,52	4,76	0,8	3,81	4165850	4165851	4165852	4165853	4165854	4165855	4165856	4165857
WNMA080408	12,70	8,69	4,76	0,8	5,16	4165858	4165859	4165860	4165861	4165862	4165863	4165864	4165865
WNMA080412	12,70	8,69	4,76	1,2	5,16	4165866	4165867	4165868	4165869	4165870	4165871	4165872	4165873



Inserts

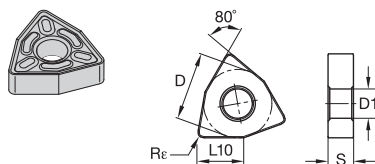


● first choice
○ alternate choice

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

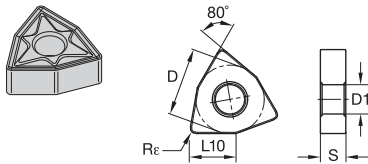
WNMG-2P

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	-	-	-	-



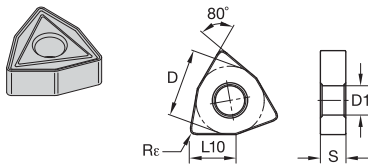
● first choice
○ alternate choice

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

Inserts

■ 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	4167129	4167130	-	4167131	4167132	-	-	-
WNMG0804086P	12,70	8,69	4,76	0,8	5,16	4167133	4167134	4167135	4167136	4167137	-	-	-
WNMG0804126P	12,70	8,69	4,76	1,2	5,16	4167138	4167139	4167140	4167141	4167142	-	-	-



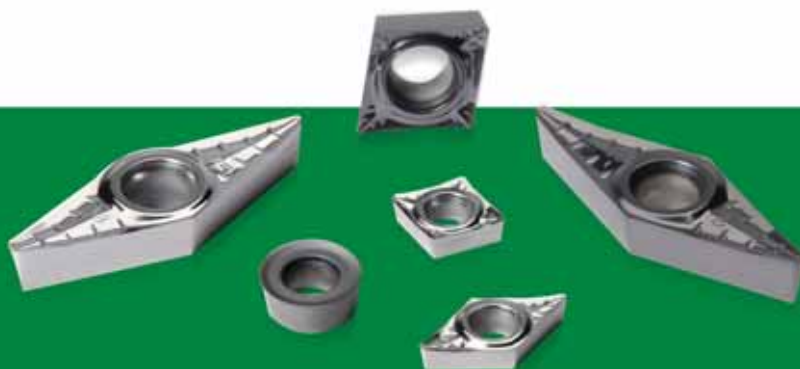
■ WNMG-7N

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	4166547	4166548	4166549	-	-	-	-	-
WNMG0804127N	12,70	8,69	4,76	1,2	5,16	4166551	4166552	4166553	-	-	-	-	-
WNMG0804167N	12,70	8,69	4,76	1,6	5,16	-	4166555	4166556	-	-	4166557	-	-



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.

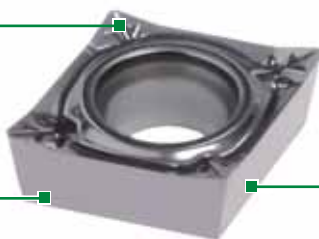


Inserts for Aluminium

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

High positive rake for
smooth chip flow.

G tolerance inserts for
better precision.



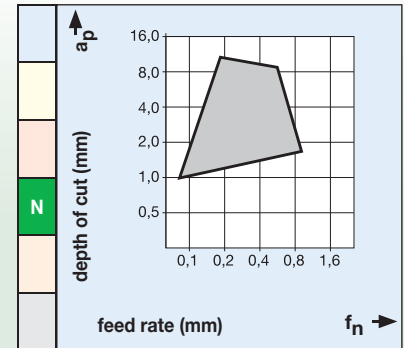
High polish inserts to prevent built-up edge
and for longer tool life.

■ Negative Inserts

AL1



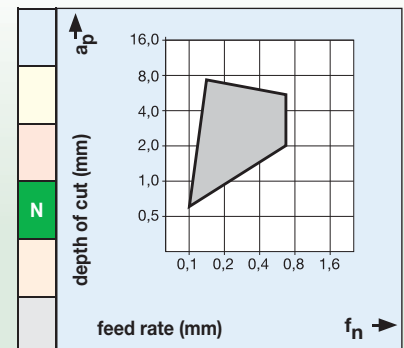
For turning cast aluminium, light alloys, non-ferrous metals, high-melting metals, plastics, glass fibre, reinforced plastics, laminated board, carbon, and fine ceramics.



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

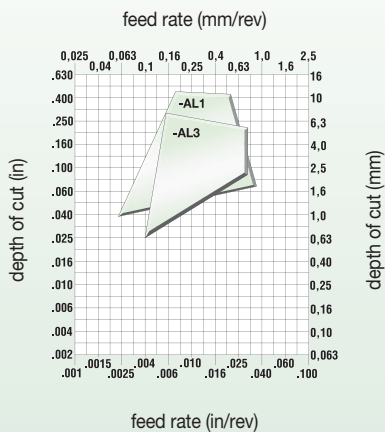
Positive Inserts



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

Material Group	grade	speed — m/min										Starting Conditions
		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

Material Group	grade	speed — m/min										Starting Conditions
		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)

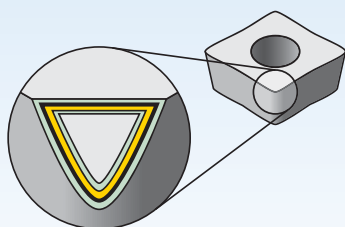
Material Group	grade	speed — m/min				Starting Conditions
		250	500	750	1000	m/min
N6	HCK10	◊				200

MMCs (Aluminium-Based Metal Matrix Composites)

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

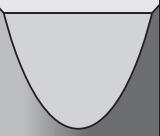
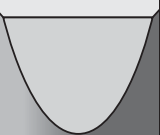
Tin Alloys, Cast: ASTM 823, Alloys 1, 2, 3, 11

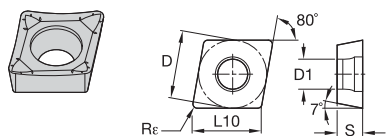
Material Group	grade	speed — m/min				Starting Conditions
		250	500	750	1000	m/min
N8	HCK10	◊				215
	HWK10/HWK15	◊				180



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

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

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



- first choice
- alternate choice

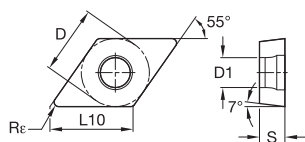
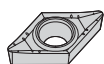
P			
M			
K			
N	●	●	●
S			
H			

Inserts

■ 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	2022258
CCGT060204AL3	6,35	6,45	2,38	0,4	2,80	2022259	2022260	2022260
CCGT09T302AL3	9,53	9,67	3,97	0,2	4,40	2022261	2022262	2022262
CCGT09T304AL3	9,53	9,67	3,97	0,4	4,40	2022261	2022262	2022262
CCGT09T308AL3	9,53	9,67	3,97	0,8	4,40	2022261	2022262	2022262
CCGT120402AL3	12,70	12,90	4,76	0,2	5,50	2022323	2022324	2022324
CCGT120404AL3	12,70	12,90	4,76	0,4	5,50	2022325	2022326	2022326
CCGT120408AL3	12,70	12,90	4,76	0,8	5,50	2022325	2022326	2022326



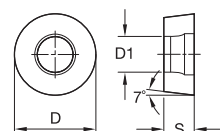
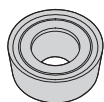


- first choice
- alternate choice

P			
M			
K			
N	●	●	●
S			
H			

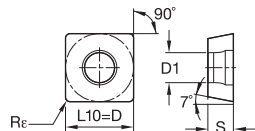
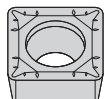
■ DCGT-AL3

ISO catalogue number	D	L10	S	Rε	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	2022331	2022861
DCGT11T304AL3	9,53	11,63	3,97	0,4	4,40	2022332	2022483	2022483



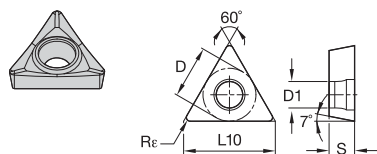
■ RCGT-AL1

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	Rε	D1	HCK10	HWK10	HWK15
SCGT120408AL3	12,70	12,70	4,76	0,8	5,50	2023638	2023638	2023638



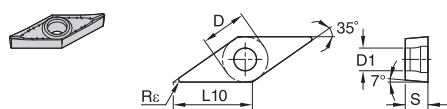
- first choice
- alternate choice

P				
M				
K				
N	●	●	●	
S				
H				

Inserts

TCGT-AL1

ISO catalogue number	D	L10	S	Rε	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

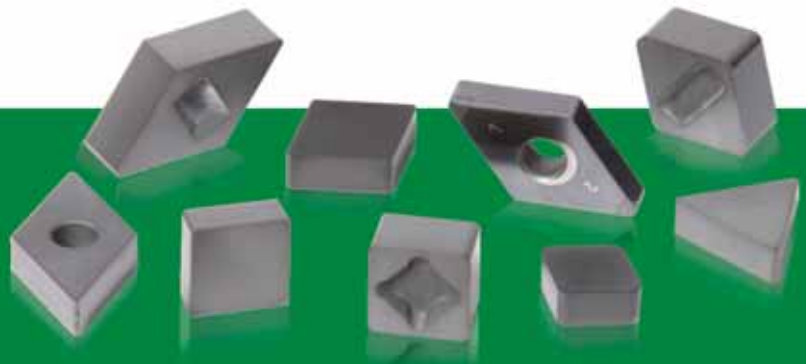
ISO catalogue number	D	L10	S	Rε	D1	HCK10	HWK10	HWK15
VCGT110302AL3	6,35	11,07	3,18	0,2	2,80	●	2024559	●
VCGT110304AL3	6,35	11,07	3,18	0,4	2,80	●	2024561	●
VCGT160404AL3	9,53	16,61	4,76	0,4	4,40	●	2022484	●
VCGT160408AL3	9,53	16,61	4,76	0,8	4,40	●	2022487	●
VCGT160412AL3	9,53	16,61	4,76	1,2	4,40	●	2022488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



Ceramic, PcBN, and PCD 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.

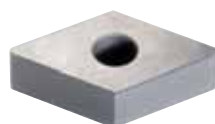


Advanced Material Inserts

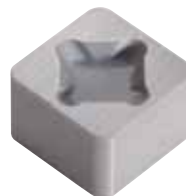
Ceramic Inserts

- 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**

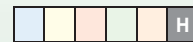


PcBN

Solid Inserts

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

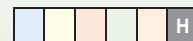
WBH25P



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



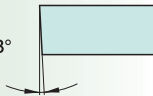
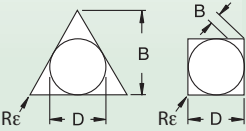
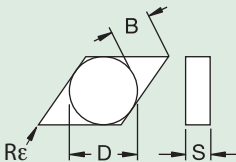
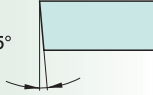
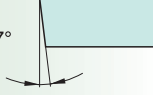
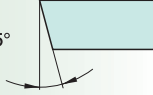
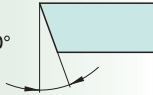
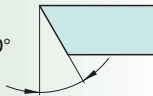
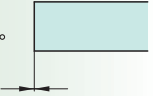
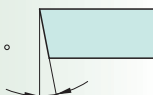
How Do Catalogue Numbers Work?

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.

WIDIA Cubic Boron Nitride and Polycrystalline Diamond Inserts ISO Inserts

CCGW2 1505EC

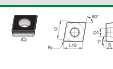
ISO catalogue number	D	L10	S	Rr	DT
CCGW2 1505EC	6,35	6,45	2,35	0,2	2,83
CCGW2 1505EC	6,35	6,45	2,35	0,2	2,83

C	C	G	W	2																																																																																																																																																																																																								
Insert Shape	Insert Clearance Angle	Tolerance Class	Insert Features	Size																																																																																																																																																																																																								
H Hexagon 120° 	A 3° 	Tolerances apply prior to edge prep and coating   D = Theoretical diameter of the insert inscribed circle S = Thickness B = See figures below	N R F A M G W T Q U B H C J X V Special Design	Code for metric cutting edge length "L10" <table><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><tr><td>mm</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><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></table>	"D"	C	D	R	S	T	V	W	mm								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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P Pentagon 108° 	C 7° 																																																																																																																																																																																																											
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L Rectangular 90° 	P 11° 																																																																																																																																																																																																											
A B N/K Parallelogram 85° 82° 55° 	O For other clearance angles requiring descriptions.																																																																																																																																																																																																											

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

*Tolerances apply prior to edge prep and coating.

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

Cubic Boron Nitride and Polycrystalline Diamond Inserts ISO Inserts									
									
CCGW-C	D	L	S	R	DT				
CCGW21505EC	0,31	0,40	2,35	0,2	2,00				
CCGW21505EC	0,31	0,40	2,35	0,2	2,00				
				0,4	2,00				

CCGW21505EC

15

Thickness
"S"

symbol	thick- ness
mm	mm
—	0,79
T0	1,00
01	11,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94
09	9,52
11	11,11
12	12,70

05

Corner
Radius "Re"

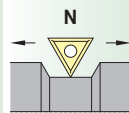
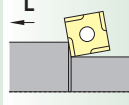
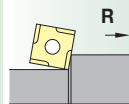
symbol	corner radius
mm	mm
X0	.04
01	0,1
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
28	2,8
32	3,2
00	round insert
M0	

Hand of Insert
(optional)

R = Right
hand

L = Left
hand

N = Neutral



E

Cutting Edge
(optional)

F*
Sharp

E
Rounded

T*
Chamfered

S*
Chamfered and Rounded

K
Double-Chamfered

P
Double-Chamfered and Rounded

*Also available in wiper style.

T-Land Width
(optional)

symbol	mm size
ISO	size
010	0,01
020	0,02

T-Land Angle
(optional)

symbol	size
10	10°
15	15°
20	20°
25	25°
30	30°

C

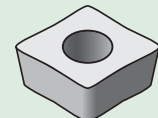
Tip
Style
(optional)

FW = Finishing
Wiper

MW = Medium
Wiper

Chipbreaker
(optional)

symbol	usage
C	full top
M	mini tip
MT	multi-tip
ST	single tip



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

WBH25P for Enhanced Performance — Five Unique Features

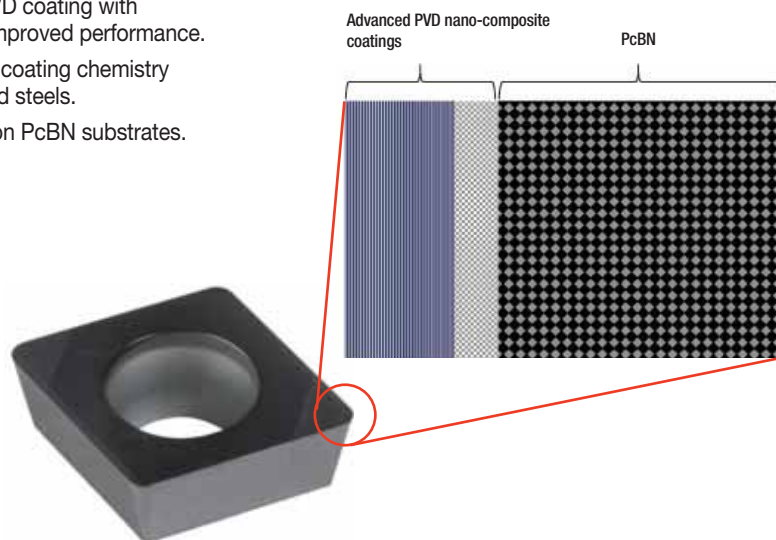
1 Newly developed substrate enables application in a wide variety of demanding situations.

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.

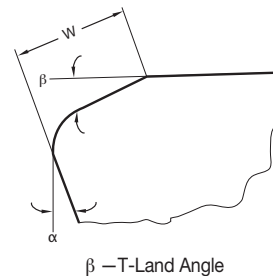
A critical performance factor is the edge preparation itself. The grind direction, surface roughness, hone sizes, and tolerances have great impact on performance and process reliability. WIDIA™ has performed significant research work and optimised edge preparation to improve your overall machining effectiveness.

4 Large standard portfolio.

Standard edge preparation — the optimum combination of T-land angle, T-land width, and hone size — is paramount in achieving maximum performance. WIDIA™ has developed three standard edge configurations, including wiper inserts.

• Light machining edge prep E.	E: Honed cutting edge
• Medium machining edge prep S01015.	S01015: $W \times \beta = 0,10\text{mm} \times 15^\circ$
• Heavy machining edge prep S01025.	S01025: $W \times \beta = 0,10\text{mm} \times 25^\circ$

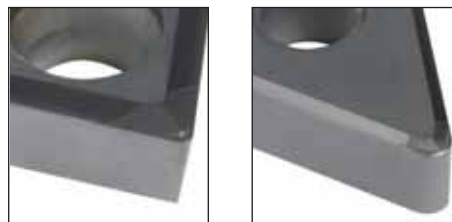
These edge preps are available in common styles, sizes, and nose radii in both positive and negative geometries.



5 CB1 chipbreaker in positive and negative geometries, solving chipbreaking and chip control issues.

Chipbreaker — when machining case-hardened steel with a hard outer skin and a tough and softer core, a chipbreaker provides a great advantage. The CB1 chipbreaker is a proven solution to effectively breaking chips. Long chips can form bird nests, causing machine malfunctions, increasing scrap-rates, and reducing the overall equipment effectiveness.

Available as a custom solution product.



Insert without Chipbreaker



- Long chips.
- Bird-nest formation.

Insert with Chipbreaker



- Chips are broken.

Grade Numbering System — Ceramics

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



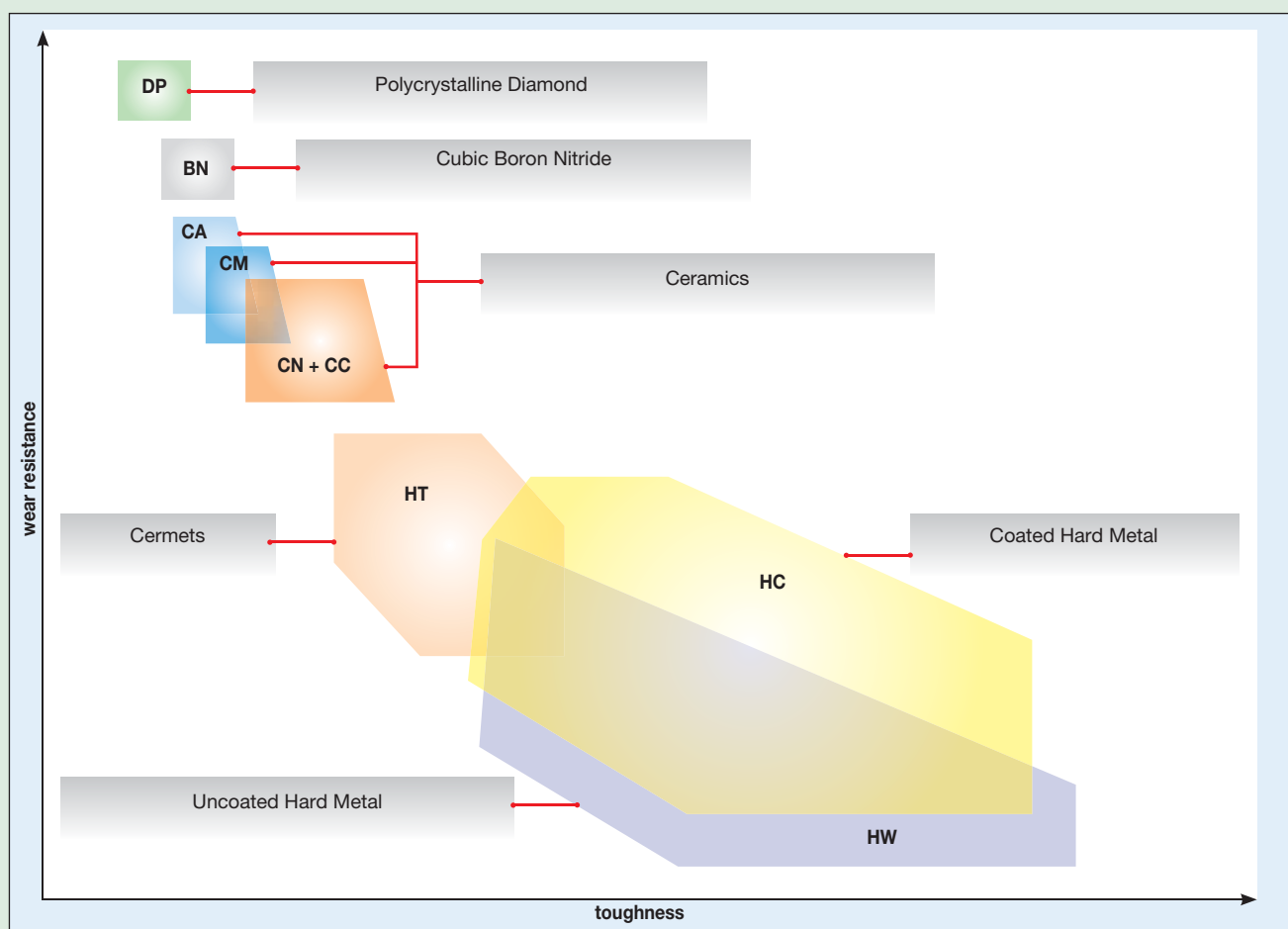
Grade Numbering System — PcBN and PCD

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



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.



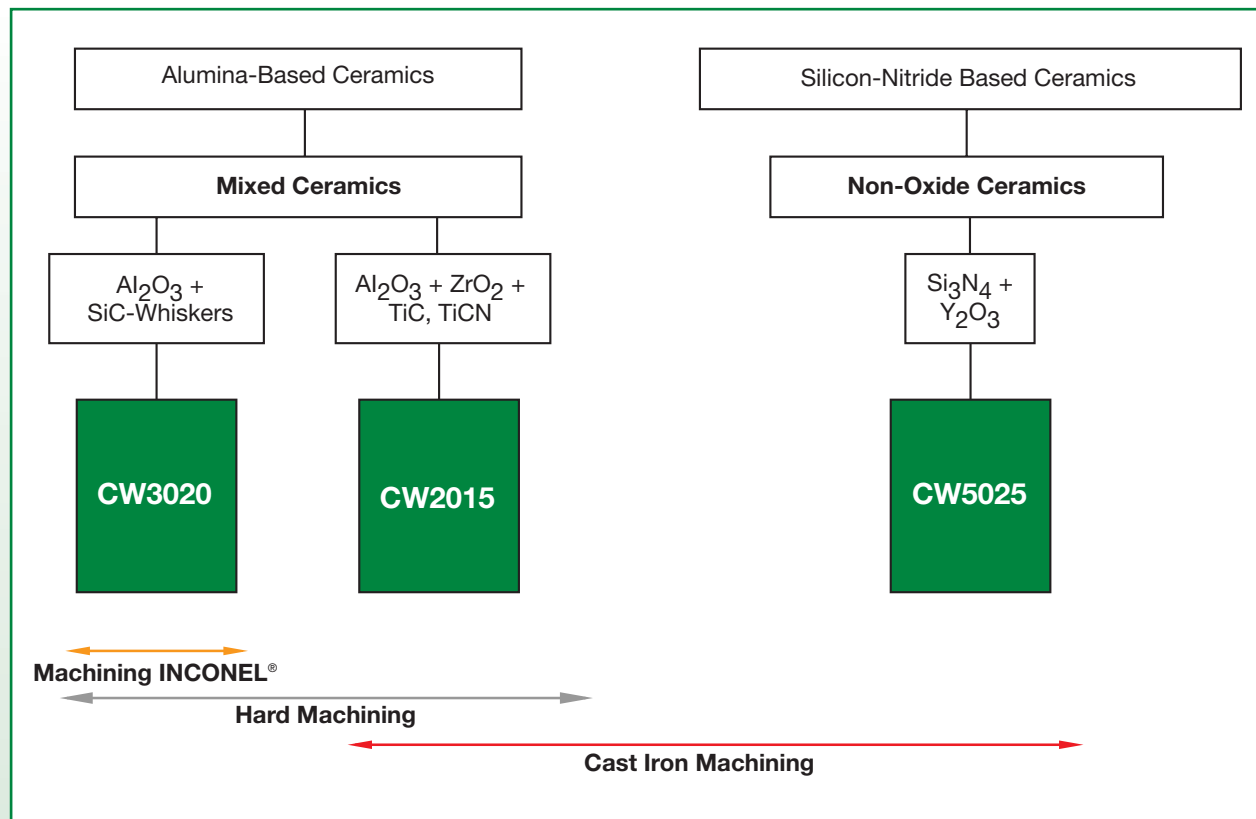
main group	sub-group (symbol)	feature
hard metal	HW	Uncoated WC-base hard metal
	HT	Uncoated TiC/TiN-base hard metal (cermets)
	HC	Coated hard metal
ceramics	CA	Al ₂ O ₃ -base oxide ceramics
	CM	Composite ceramics Al ₂ O ₃ + metal carbide
	CN	Si ₃ N ₄ -base nitride ceramics
	CC	Coated ceramics
cubic 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.

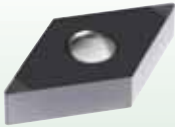
CW3020™

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

CW5025™

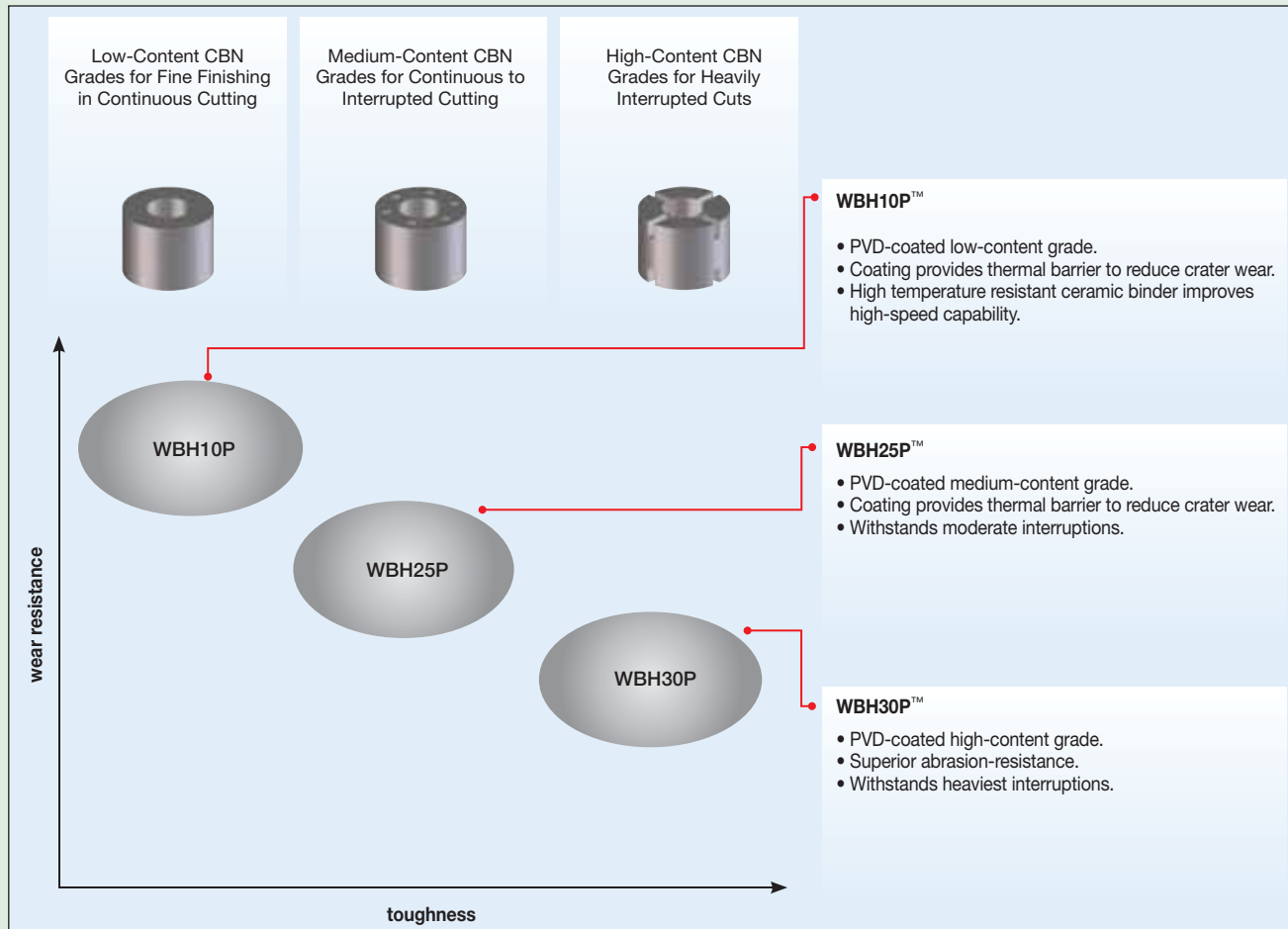
- Pure silicon-nitride composition.
- Used in high-speed turning applications.
- Designed for use in grey cast iron and lower tensile ductile irons.

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

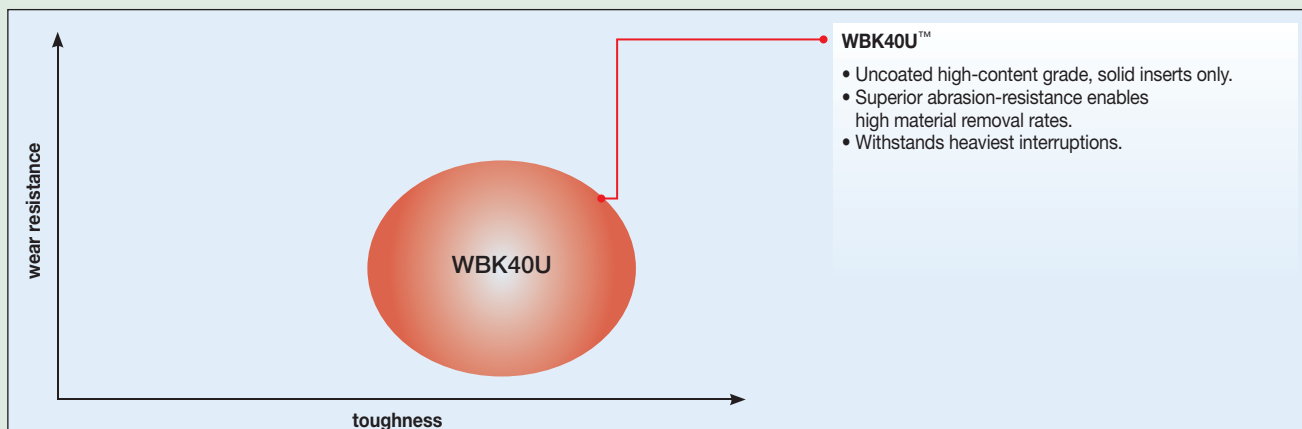


- PVD-coated grades available.
- Complete range of CBN grades for continuous to heavily interrupted turning.
- Industry-leading grades for grey cast iron machining.
- Full line of grades for hard turning.
- For best performance: solid, full-top, and tipped inserts are available.

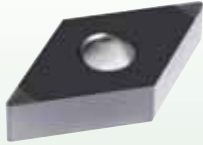
Hard Turning Grades



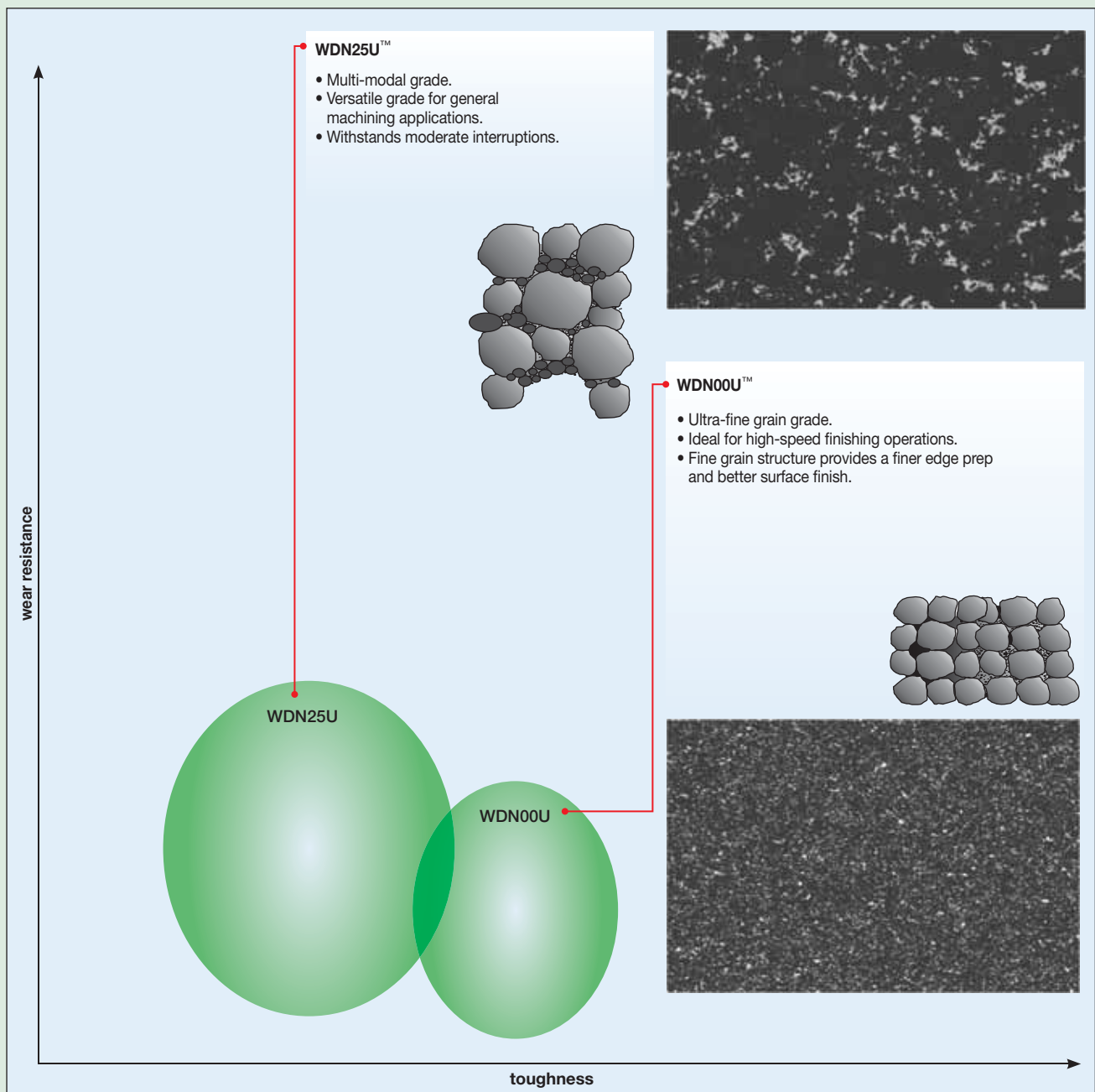
Grey Cast Iron Grades



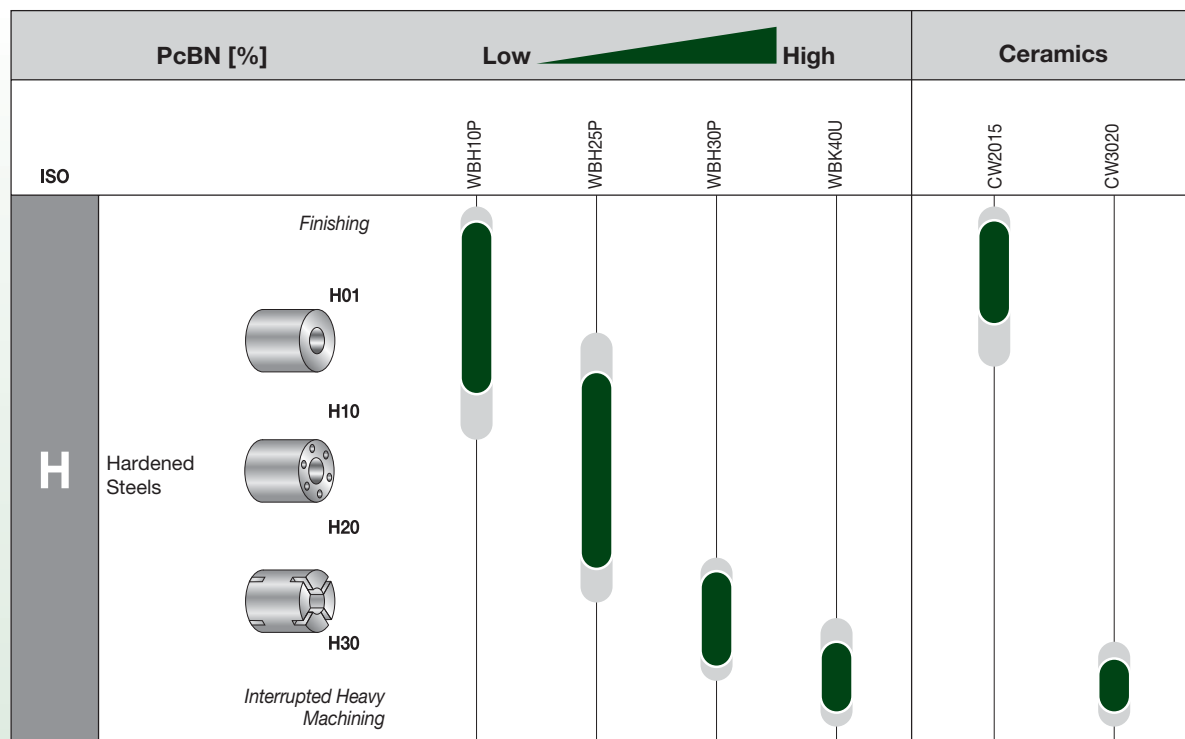
PCD Grades for Turning Non-Ferrous Materials



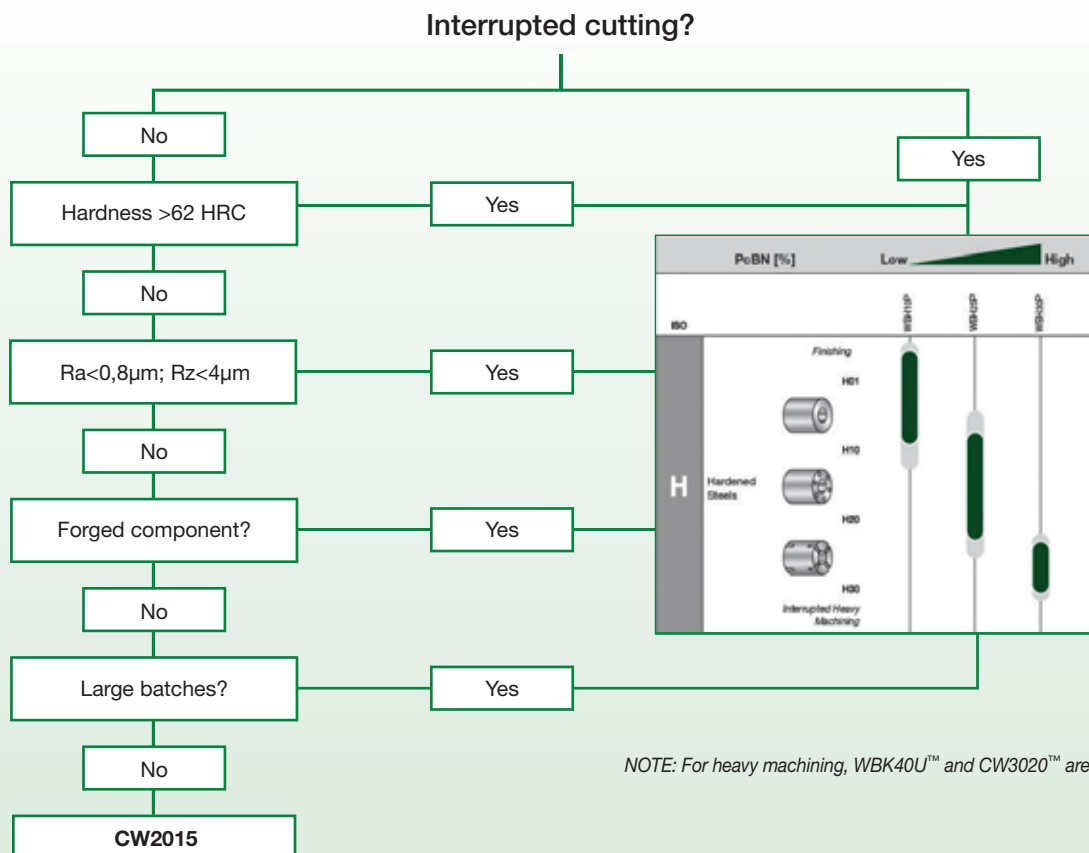
- Two PCD grades — WDN25U and WDN00U — cover a wide range of applications.
- New grades provide outstanding performance to increase productivity and cut manufacturing costs.
- High abrasion and chipping resistance.
- Used in machining aluminium alloys with low- and high-silicon content, copper alloys,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



Advanced Materials for Hard Turning

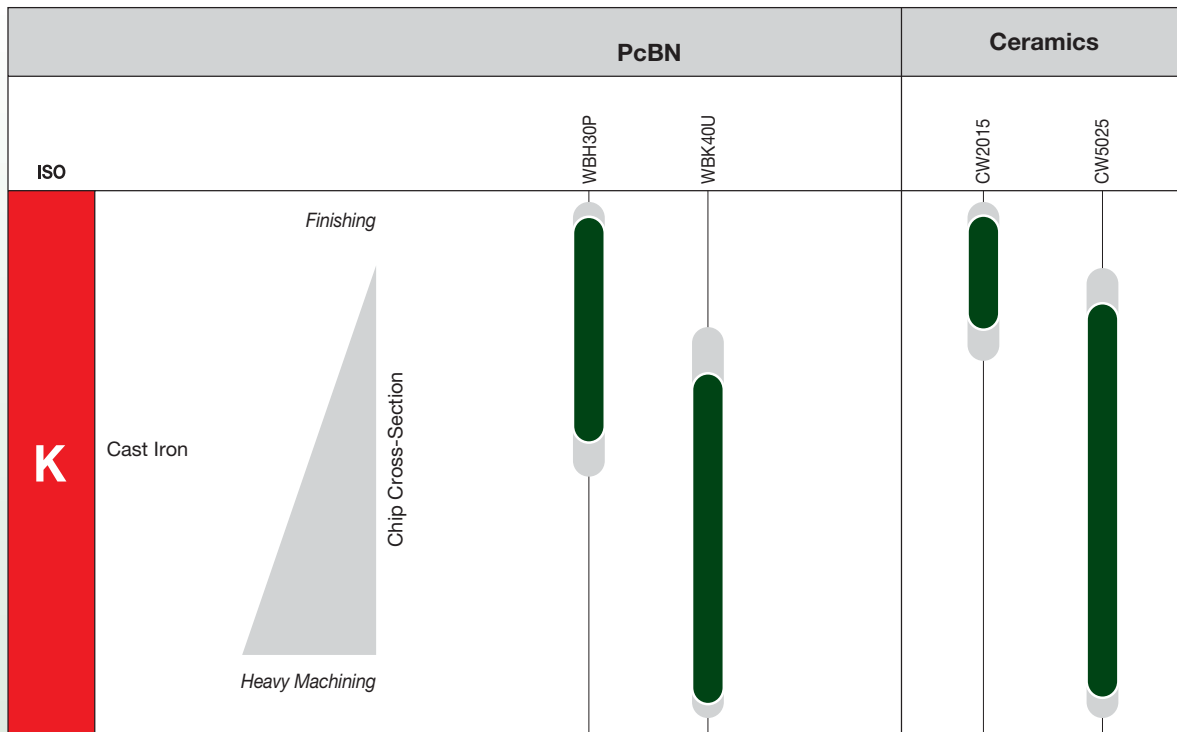


Hard Turning Grade Selection

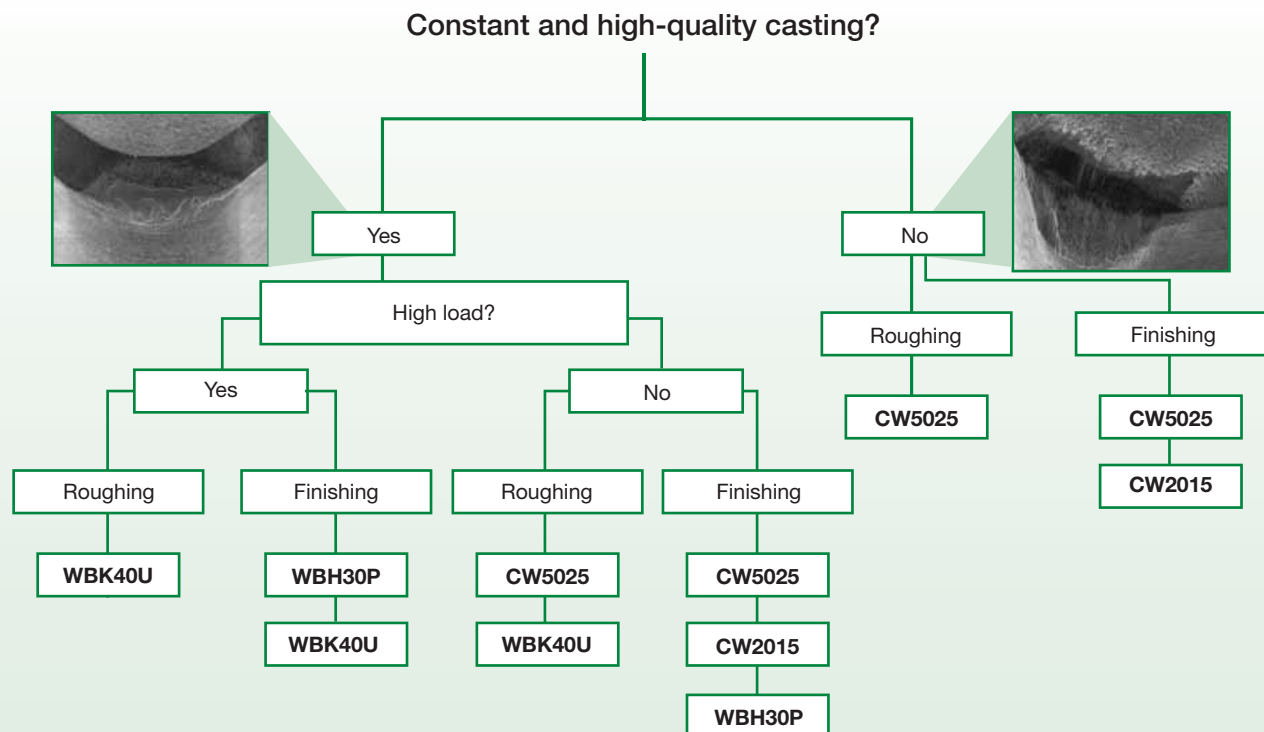


NOTE: For heavy machining, WBK40U™ and CW3020™ are the ideal choices.

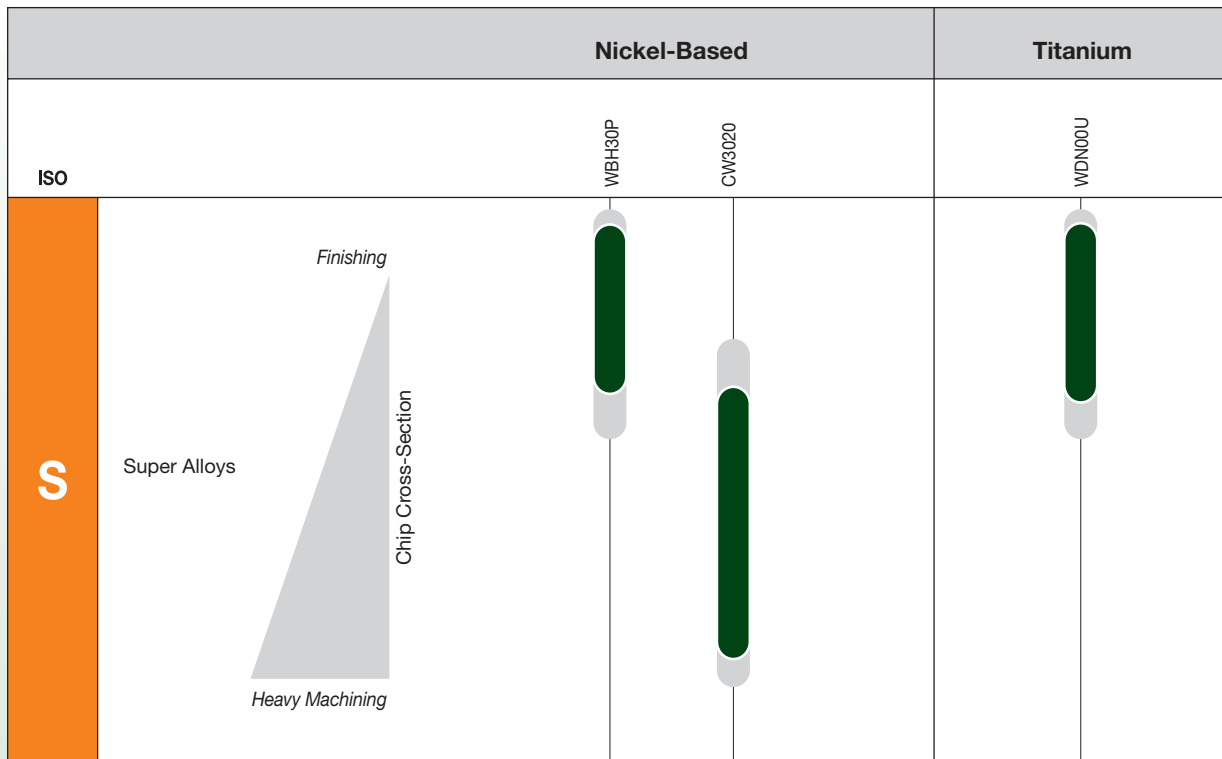
Advanced Materials for Cast Iron Machining



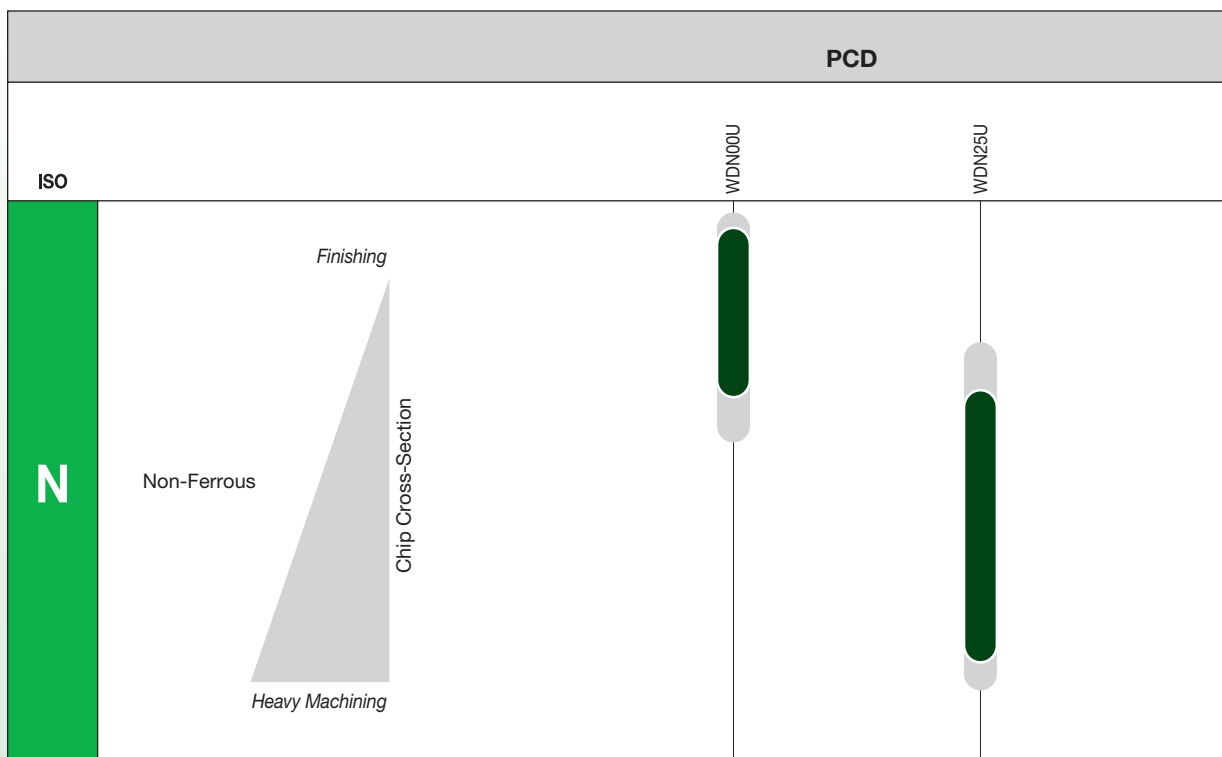
Cast Iron Machining Grade Selection

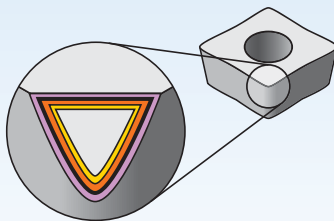


Advanced Materials for High-Temperature Machining



Advanced Materials for Non-Ferrous Machining

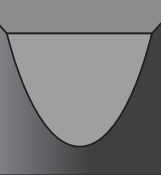
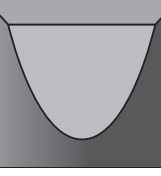
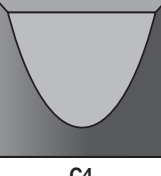
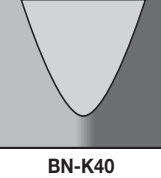
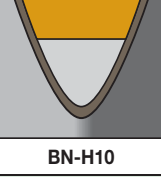


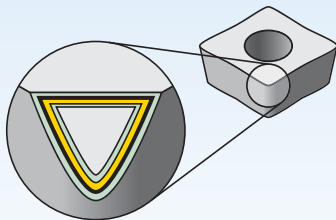


Reduce cycle times. High speed and feed capability. Long tool life. New multi-layer coating provides better wear resistance.

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

wear resistance ← → toughness

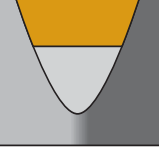
Coating		Grade Description		05	10	15	20	25	30	35	40	45
Grade		Mixed (black) ceramic. Matrix Al ₂ O ₃ and TiCN. Good toughness properties combined with good wear resistance. Semi-finishing and finishing. For hardened iron base materials and grey cast iron (finishing).										
												
												
												
												
												
		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.										
												
												
												
												
												
	Whisker ceramic with a matrix of Al ₂ O ₃ + 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.											
												
												
												
	C4											
												
	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.											
												
												
												
												
												
	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.											
												
												
												
												
												



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

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

wear resistance ← → toughness

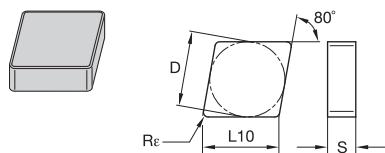
Coating		Grade Description		05	10	15	20	25	30	35	40	45
WBH25P		A PVD-TiAlN coating over a low content, CBN tip brazed onto a carbide insert. Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburised and nitrided irons, and some hard coatings.										
	BN-H25		H									
WBH30P		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.										
	BN-H30		K									
WDN00U*		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.										
	DP-N10		S									
WDN25U		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/GC) materials, MMC, carbon-fibre reinforced plastics, and other abrasive non-metallic materials.										
	DP-N25		N									

*Grade available as Custom Solution only.

Cutting Speed — vc m/min										
Material Group		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	475	725	–	–	–	250	760	1000
	2	300	550	800	–	–	–	275	365	490
	3	250	400	600	–	–	–	275	335	440
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–
	7	–	–	–	–	–	–	–	–	–
	8	–	–	–	–	–	–	–	–	–
S	1	–	–	–	170	200	375	–	–	–
	2	–	–	–	170	200	375	–	–	–
	3	–	–	–	190	250	375	–	–	–
	4	–	–	–	–	–	–	–	–	–
H	1	60	100	140	45	85	125	–	–	–
	2	60	100	140	45	85	125	–	–	–
	3	60	100	140	45	85	125	–	–	–
	4	60	100	140	45	85	125	–	–	–

Inserts

		Cutting Speed — vc m/min																	
Material Group		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	●			

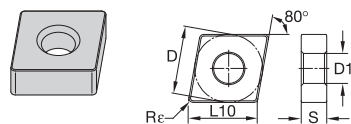
Inserts

■ 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

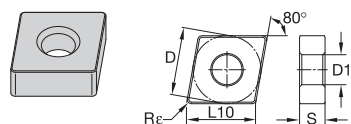


● first choice
○ alternate choice

P				
M				
K	●		●	
N				
S		●		
H	●			

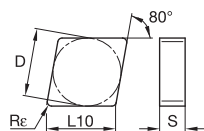
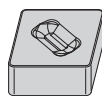
CNGA

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGA120404T02020	12,70	12,90	4,76	0,4	5,16	2952526	2952527	2952159
CNGA120408T02020	12,70	12,90	4,76	0,8	5,16	2952528	2952173	2952161
CNGA120412T02020	12,70	12,90	4,76	1,2	5,16	2952529	2952174	2952175
CNGA120416T02020	12,70	12,90	4,76	1,6	5,16	2952530	2952176	2952177
CNGA160612T02020	15,88	16,12	6,35	1,2	6,35	2952531	2952178	2952179
CNGA160616T02020	15,88	16,12	6,35	1,6	6,35	2952532	2952180	2952181
CNGA190612T02020	19,05	19,34	6,35	1,2	7,93	2952533	2952182	2952183
CNGA190616T02020	19,05	19,34	6,35	1,6	7,93	2952534	2952184	2952185



CNGA-FW

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
CNGA120408T01020FW	12,70	12,90	4,76	0,8	5,16	2952160	2952161	2952162
CNGA120412T01020FW	12,70	12,90	4,76	1,2	5,16	2952163	2952164	2952165
CNGA120416T01020FW	12,70	12,90	4,76	1,6	5,16	2952166	2952167	2952168



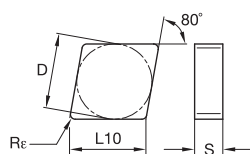
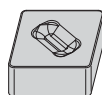
- first choice
- alternate choice

P			
M			
K	●		●
N			
S		●	
H	●		

Inserts

■ CNGX

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

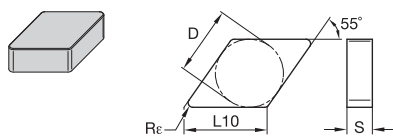


■ CNGX-FW

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



Inserts

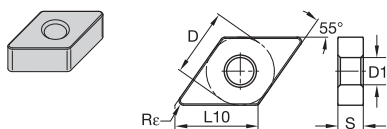


● first choice
○ alternate choice

P				
M				
K	●		●	
N				
S		●		
H	●			

■ DNGN/DNG

ISO catalogue number	D	L10	S	Rε	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	—



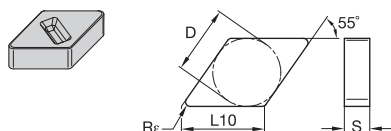
- first choice
- alternate choice

P				
M				
K		●	●	
N				
S			●	
H		●		

Inserts

■ DNGA

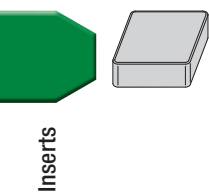
ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
DNGA150404T02020	12,70	15,50	4,76	0,4	5,16	2952532	■	■
DNGA150408T02020	12,70	15,50	4,76	0,8	5,16	2952533	■	■
DNGA150412T02020	12,70	15,50	4,76	1,2	5,16	2952534	■	2952184
DNGA150604T02020	12,70	15,50	6,35	0,4	5,16	2952535	■	■
DNGA150608T02020	12,70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





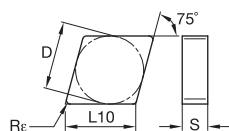
Inserts

● first choice
○ alternate choice

P				
M				
K	●			●
N				
S			●	
H	●			

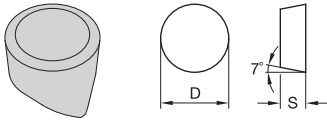
■ ENGN/ENG

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



■ ENGX

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



- first choice
- alternate choice

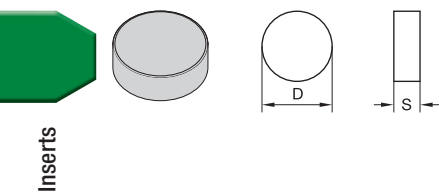
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Inserts

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	-	-



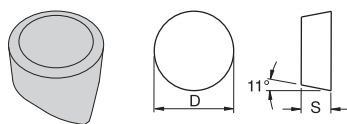


- first choice
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■ RNGN/RNG

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



- first choice
- alternate choice

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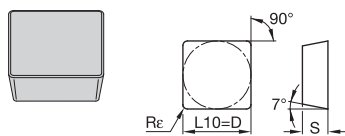
Inserts

■ RPGV

ISO catalogue number	D	S	CW2015	CW3020	CW5025
RPGX060400T01020	6,35	4,78	1	3869753	1
RPGX090700T01020	9,53	7,92	1	3869754	1
RPGX120700T01020	12,70	7,94	1	3869755	1



Inserts

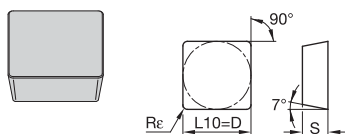


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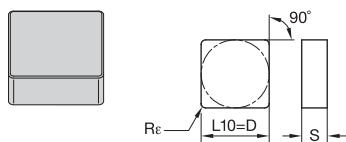
■ SCGN/SCG

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



- first choice
- alternate choice

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Inserts

■ SNGN/SNG

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

(continued)



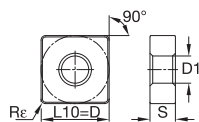
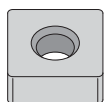
(SNGN/SNG — continued)

Inserts

- first choice
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ISO catalogue number	D	L10	S	R _ε	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		



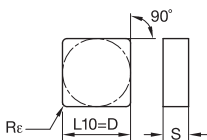
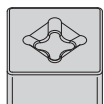
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Inserts

■ 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	2952187
SNGA120416T02020	12,70	12,70	4,76	1,6	5,16	2952540	2952189	2952187
SNGA150612T02020	15,88	15,88	6,35	1,2	6,35	2952190	2952190	2952191
SNGA150616T02020	15,88	15,88	6,35	1,6	6,35	2952191	2952191	2952191

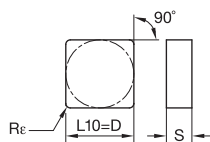
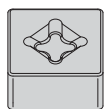


■ SNGX

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



Inserts

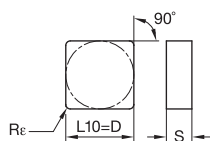
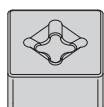


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■ SNGX-FW

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



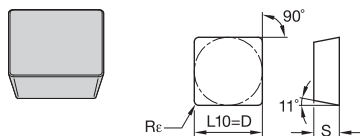
■ SNMX

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	■	■



- first choice
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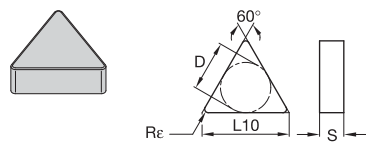
Inserts

■ SPUN-T

ISO catalogue number	D	L10	S	Re	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	—	—



Inserts

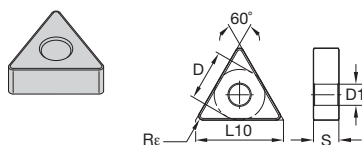


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■ TNGN/TNG

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



- first choice
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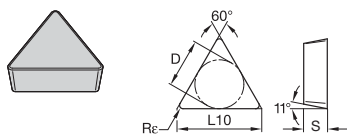
Inserts

TNGA

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
TNGA160408T02020	9,53	16,50	4,76	0,8	3,81	2952541	2952195	2952195
TNGA160412T02020	9,53	16,50	4,76	1,2	3,81	2952542	2952196	2952196
TNGA160416T02020	9,53	16,50	4,76	1,6	3,81	2952543	2952197	2952197
TNGA220408T02020	12,70	22,00	4,76	0,8	5,16	2952544	2952198	2952198



Inserts

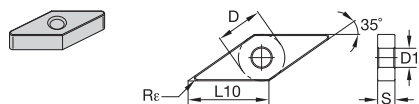


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■ TPG

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



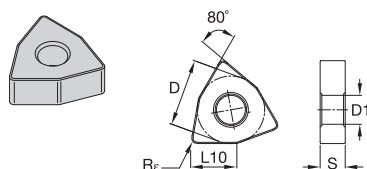
- first choice
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Inserts

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	●	●

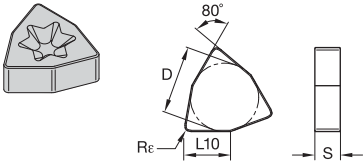


WNGA

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

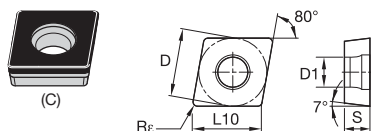


- first choice
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WNGX

ISO catalogue number	D	L10	S	Rε	D1	CW2015	CW3020	CW5025
WNGX080712T02020	12,70	8,69	7,94	1,2	—	I	I	2952157



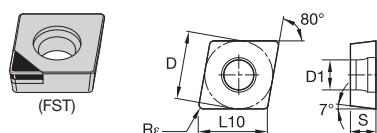
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Inserts

■ 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	●	●	●	●	●	●
CCGW060202S01015C	6,35	6,45	2,38	0,2	2,80	○	○	○	○	○	○
CCGW060204S01015C	6,35	6,45	2,38	0,4	2,80	○	○	○	○	○	○
CCGW09T304S01015C	9,53	9,67	3,97	0,4	4,40	○	○	○	○	○	○
CCGW09T308S01015C	9,53	9,67	3,97	0,8	4,40	○	○	○	○	○	○

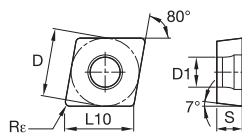


■ CCGW-FST

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	○	○	○	○	○	○
CCGW09T304FST	9,53	9,67	3,97	0,4	4,40	○	○	○	○	○	○
CCGW09T308FST	9,53	9,67	3,97	0,8	4,40	○	○	○	○	○	○



Inserts

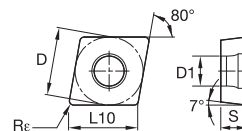


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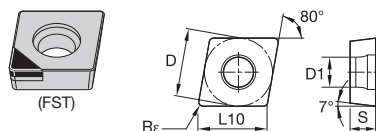
■ CCGW-FWC

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	■	3883560	■	■	■	■
CCGW060204EFWC	6,35	6,45	2,38	0,4	2,80	■	3883562	■	■	■	■
CCGW09T304EFWC	9,53	9,67	3,97	0,4	4,40	■	3883574	■	■	■	■
CCGW09T308EFWC	9,53	9,67	3,97	0,8	4,40	■	3883576	■	■	■	■



■ 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	3883507	■	■	■	■	■
CCGW09T308S01015MT	9,52	9,67	3,99	0,8	4,40	3883508	■	6018004	■	■	■



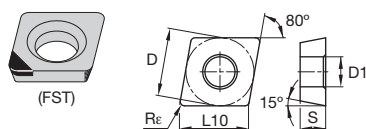
- first choice
- alternate choice

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Inserts

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	●	●	●	●	●	●
CCMW060208FST	6,35	6,45	2,38	0,8	2,80	●	●	●	●	●	●
CCMW09T304FST	9,53	9,67	3,97	0,4	4,40	●	●	●	●	●	●
CCMW09T308FST	9,53	9,67	3,97	0,8	4,40	●	●	●	●	●	●



CDHB-FST

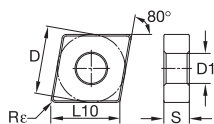
ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
CDHBS4T002FST	3,97	4,03	1,02	0,1	2,13	●	●	●	●	●	●
CDHBS4T004FST	3,97	4,03	1,02	0,2	2,13	●	●	●	●	●	●



Inserts



(EMT)

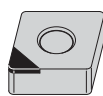


- first choice
○ alternate choice

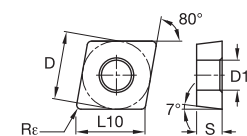
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K			●	●		
N					●	●
S			●	●	●	
H		●	●	●	●	

■ 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	┌	┌	┌	┌

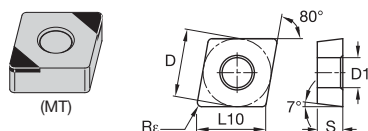


(FST)



■ 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

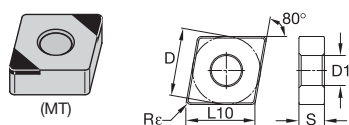


- first choice
- alternate choice

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●	●	●	●	●	●
●	●	●	●	●	●
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●	●	●	●	●	●
●	●	●	●	●	●

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	●	●	●	●	●	●
CNGA120408EFWMT	12,70	12,90	4,76	0,8	5,16	●	●	●	●	●	●
CNGA120408S01025FWMT	12,70	12,90	4,78	0,8	5,16	●	●	●	●	●	●

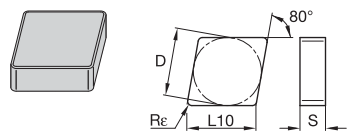


CNGA-MT

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	●	●	●	●	●	●
CNGA120408S01025MT	12,70	12,90	4,78	0,8	5,16	●	●	●	●	●	●
CNGA120412S01020MT	12,70	12,90	4,78	1,2	5,16	●	●	●	●	●	●
CNGA120412S01025MT	12,70	12,90	4,78	1,2	5,16	●	●	●	●	●	●



Inserts

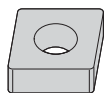


- first choice
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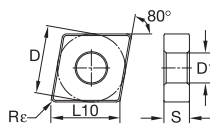
■ CNMN

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	—	—



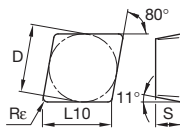
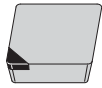
■ CNMA

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



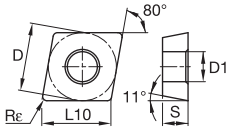
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Inserts

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	—	●	●	●	●	●	●

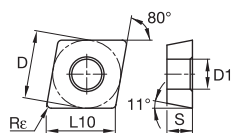


CPGW-C

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

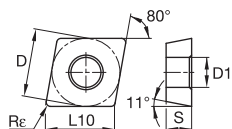


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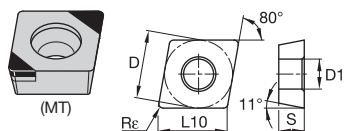
■ CPGW-FST

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	■	■	■	■	■	■



■ 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	■	■	■	■	■	■



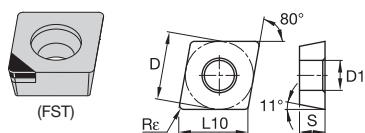
- first choice
- alternate choice

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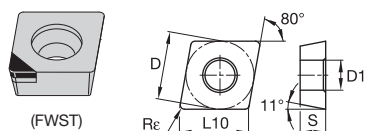
■ CPGW-MT

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	3883527	6018084			
CPGW09T308S01015MT	9,53	9,67	3,99	0,8	4,40			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						
CPMW060204FST	6,35	6,45	2,38	0,4	2,80						



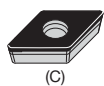
■ CPMW-FWST

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						

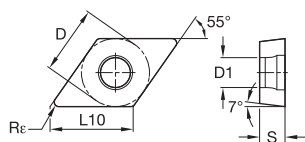




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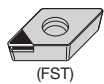


- first choice
○ alternate choice

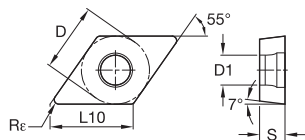
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■ DCGW-C

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	●	●	●	●	●	●
DCGW070202S01015C	6,35	7,75	2,38	0,2	2,80	○	○	○	○	○	○
DCGW070204S01015C	6,35	7,75	2,38	0,4	2,80	○	○	○	○	○	○

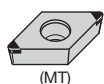


(FST)



■ DCGW-FST

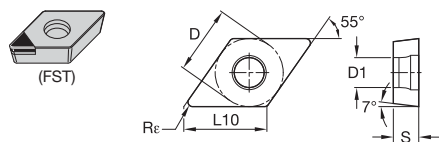
ISO catalogue number	D	L10	S	Rε	D1	WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
DCGW070204FST	6,35	7,75	2,38	0,4	2,80	●	●	●	●	●	●
DCGW11T304FST	9,53	11,63	3,97	0,4	4,40	○	○	○	○	○	○



(MT)

■ 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	○	○	○	○	○	○
DCGW11T308S01015MT	9,52	11,63	3,99	0,8	4,40	○	○	○	○	○	○



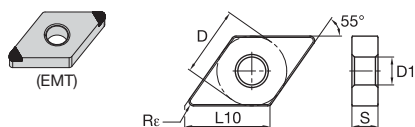
- first choice
- alternate choice

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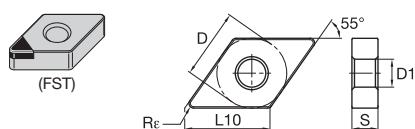
DCMW-FST

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	●	●	●	●	●	●
DCMW11T304FST	9,53	11,63	3,97	0,4	4,40	●	●	●	●	●	●
DCMW11T308FST	9,53	11,63	3,97	0,8	4,40	●	●	●	●	●	●



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	●	●	●	●	●	●
DNGA150412EMT	12,70	15,50	4,76	1,2	5,16	●	●	●	●	●	●

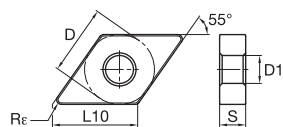
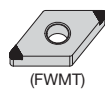


DNGA-FST

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	●	●	●	●	●	●
DNGA150408FST	12,70	15,50	4,76	0,8	5,16	●	●	●	●	●	●



Inserts

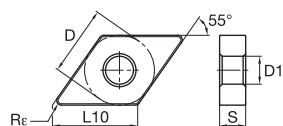
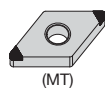


- first choice
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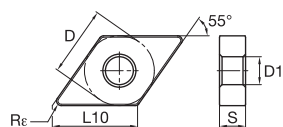
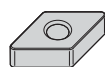
■ DNGA-FWMT

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	●	●	●	●	●	●
DNGA150408EFWMT	12,70	15,50	4,76	0,8	5,16	●	●	●	●	●	●
DNGA150412EFWMT	12,70	15,50	4,76	1,2	5,16	●	●	●	●	●	●



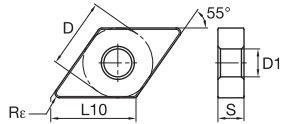
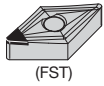
■ DNGA-MT

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	●	●	●	●	●	●
DNGA150408S01025MT	12,70	15,50	4,78	0,8	5,16	●	●	●	●	●	●



■ 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	●	●	●	●	●	●



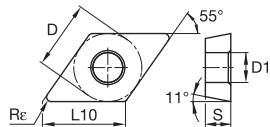
- first choice
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■ DNMS-FST

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	●	●	●	●	●	●
DNMS150408FST	12,70	15,50	4,76	0,8	5,16	●	●	●	●	●	●

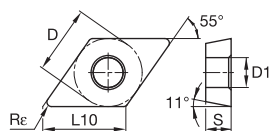
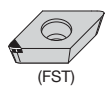


■ DPGW-C

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	●	●	●	●	●	●
DPGW070204S01015C	6,35	7,75	2,38	0,4	2,80	●	●	●	●	●	●
DPGW070208S01015C	6,35	7,75	2,38	0,8	2,80	●	●	●	●	●	●



Inserts

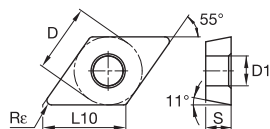
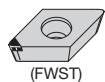


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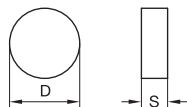
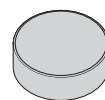
■ DPGW-FST

ISO catalogue number	D	L10	S	R _e	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



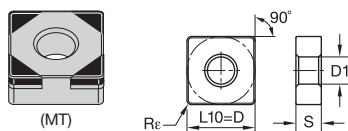
■ DPGW-FWST

ISO catalogue number	D	L10	S	R _e	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	■	■



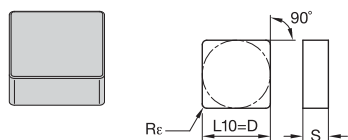
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Inserts

■ 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	—	3883328	—	—	—	—
SNGA120408S01025MT	12,70	12,70	4,78	0,8	5,16	—	—	—	—	—	—
SNGA120412S01025MT	12,70	12,70	4,78	1,2	5,16	—	3883891	—	—	—	—

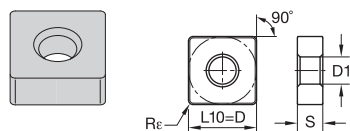


■ SNM

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

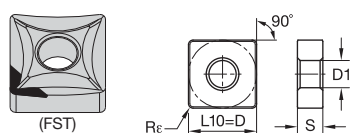


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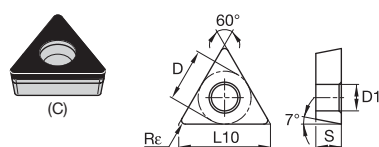
■ SNMA

ISO catalogue number	D	L10	S	Rε	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	●	●	●	●	●	●



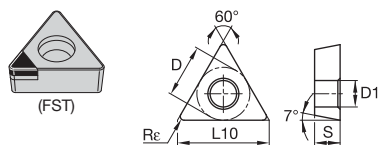
■ SNMS-FST

ISO catalogue number	D	L10	S	Rε	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	Rε	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	●	●	●	●	●	●



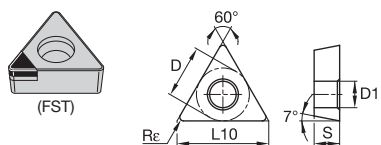
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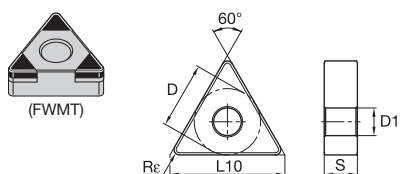
TCGW-FST

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	●	●	●	●	●	●
TCGW16T304FST	9,53	16,50	3,97	0,4	4,40	●	●	●	●	●	●



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	●	●	●	●	●	●

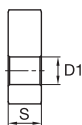
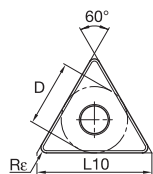


TNGA-FWMT

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	●	●	●	●	●	●
TNGA160412EFWMT	9,53	16,50	4,76	1,2	3,81	●	●	●	●	●	●



Inserts

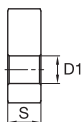
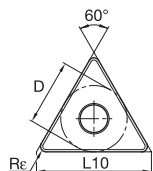


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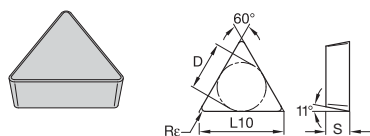
■ TNGA-MT

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	■	3883329	■	■	■	■
TNGA160408S01025MT	9,53	16,50	4,78	0,8	3,81	■	3883892	■	■	■	■
TNGA160412S01025MT	9,53	16,50	4,78	1,2	3,81	■	3883893	■	■	■	■



■ 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	■	■	■	■	■	3898734
TNMS160408FST	9,53	16,50	4,76	0,8	3,81	■	■	■	■	■	3898735



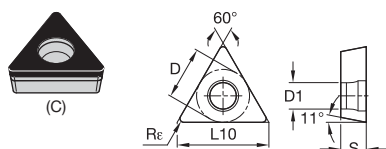
- first choice
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Inserts

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	—	●	●	●	●	●	●

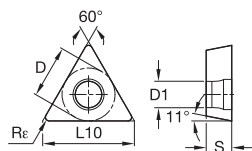


TPGW-C

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

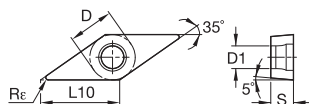
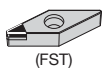


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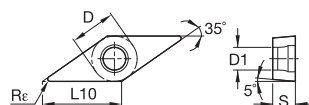
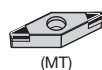
■ TPGW-FST

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	■	■	■	■	■	■
TPGW110208FST	6,35	11,00	2,38	0,8	2,80	■	■	■	■	■	■
TPGW16T304FST	9,53	16,50	3,97	0,4	4,40	■	■	■	■	■	■
TPGW16T308FST	9,53	16,50	3,97	0,8	4,40	■	■	■	■	■	■



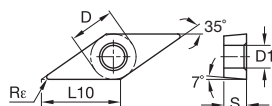
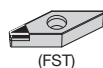
■ VBGW-FST

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	■	■	■	■	■	■
VBGW160404FST	9,53	16,61	4,76	0,4	4,40	■	■	■	■	■	■



■ 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	■	■	■



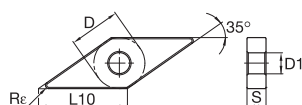
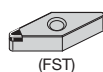
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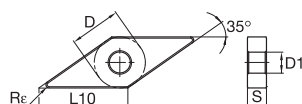
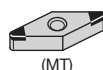
VCMW-FST

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

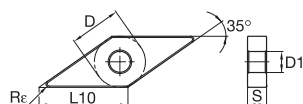
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VNGA160404FST	9,53	16,61	4,76	0,4	3,81	●	●	●	●	●	3898736
VNGA160408FST	9,53	16,61	4,76	0,8	3,81	●	●	●	●	●	3898737



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	●	●	●



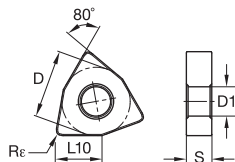


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■ VNMS-FST

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

WIN WITH WIDIA™



TopThread™ System

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.

.....

- Largest selection of insert geometries and grades in the industry.
- 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 www.widia.com.

WIDIA 



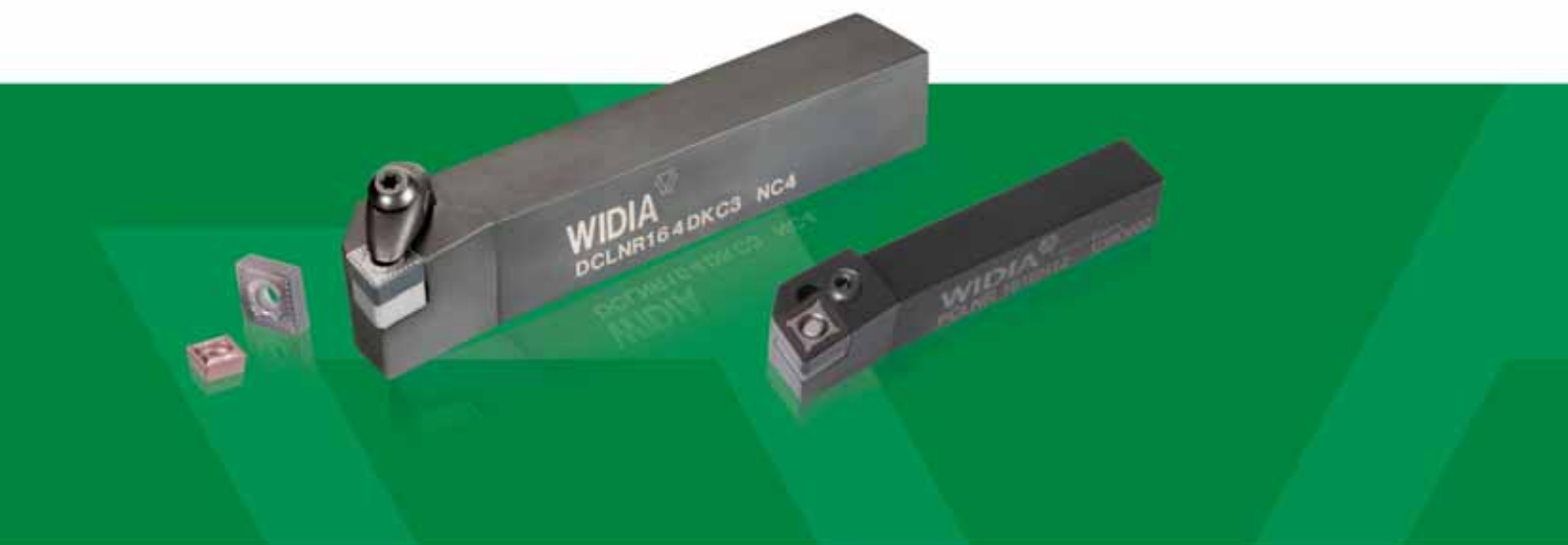
Tools for External Turning and Internal Boring

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

Tools for External Turning

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.

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.



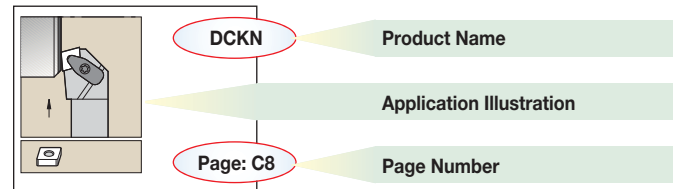
S-Style Clamping

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

C-Style Clamping

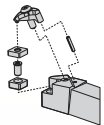
- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.

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.

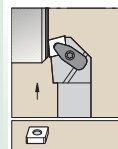


D-Style Clamping

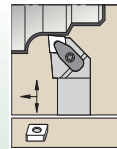
D



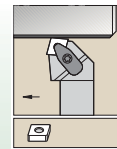
One-piece clamp assembly holder for use with negative style inserts. An extremely rigid clamping system. The tool is protected by a carbide shim.



DCKN
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C8



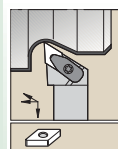
DCLN
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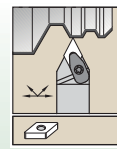
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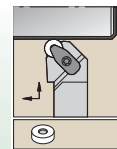
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C10



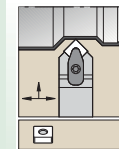
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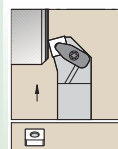
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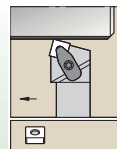
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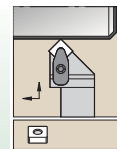
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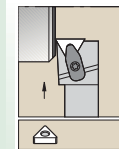
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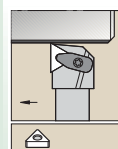
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C14



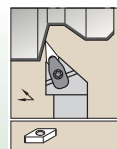
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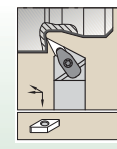
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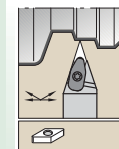
DTGN
90°
Page:
C16



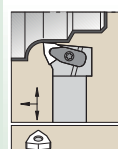
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93°
Page:
C17



DVON
117,5°
Page:
C18



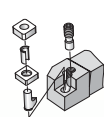
DVVN
72,5°
Page:
C18



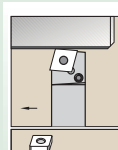
DWLN
95°
Page:
C19

P-Style Clamping

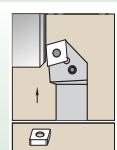
P



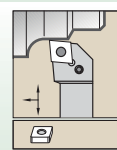
Lever-type clamping system for negative indexable inserts with hole to DIN 4988 and positive round inserts more than 20mm in diameter. Inserts with one- and two-side chip control geometries have positive rakes from 6° to 18°. Advantages of this system are fast insert changes and no interference with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



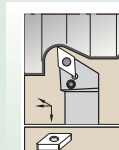
PCBN
75°
Page:
C20



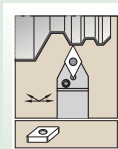
PCKN
75°
Page:
C21



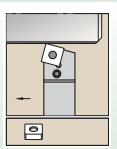
PCLN
95°
Page:
C22



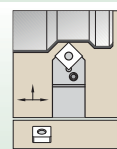
PDJN
93°
Page:
C23



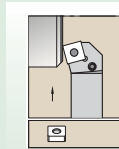
PDNN
62,5°
Page:
C24



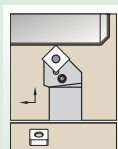
PSBN
75°
Page:
C25



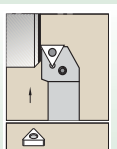
PSDN
45°
Page:
C26



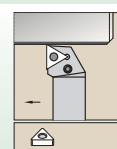
PSKN
75°
Page:
C26



PSSN
45°
Page:
C27



PTFN
90°
Page:
C28

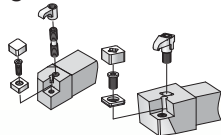


PTGN
90°
Page:
C29

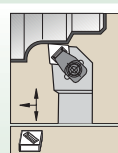


PWLN
95°
Page:
C30

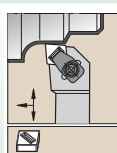
C-Style Clamping

C


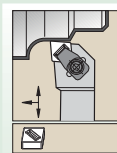
Top clamping system for negative and positive indexable inserts to DIN 4968. This universal clamping system is robust and easy to handle. Some height-adjustable clamps enable the use of additional chipbreakers. A carbide shim provides additional tool protection. Toolholders with cutting edge heights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



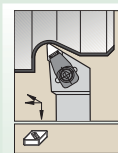
CCLN-MX
95°
Page:
C31



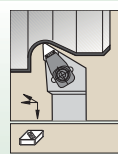
CCLN-MN
95°
Page:
C31



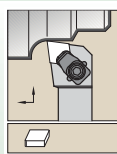
CCLN-MF
95°
Page:
C32



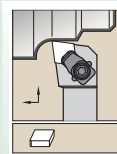
CDJN-MX
93°
Page:
C32



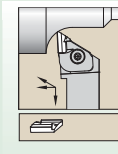
CDJN-MN
93°
Page:
C33



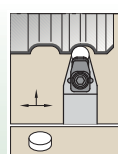
CELN-MF
97,5°
Page:
C33



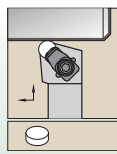
CELN-MN
97,5°
Page:
C34



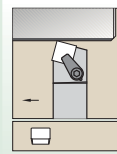
CKJN
Page:
C34



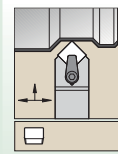
CRDN-MN
Page:
C35



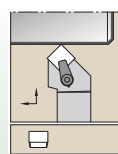
CRSN-MN
Page:
C35



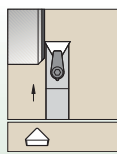
CSBP
75°
Page:
C36



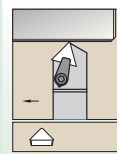
CSDP
45°
Page:
C36



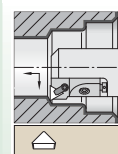
CSSP
45°
Page:
C37



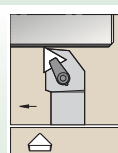
CTCP
90°
Page:
C37



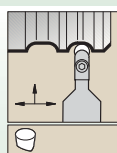
CTDP
45°
Page:
C38



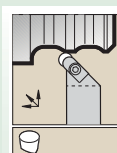
CTFP
90°
Page:
C38



CTGP
90°
Page:
C39



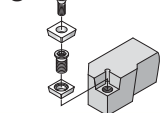
CRDP*
Page:
C40



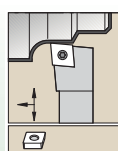
CRGP*
Page:
C41

*Exact Clamping System not shown.

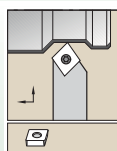
S-Style Clamping

S


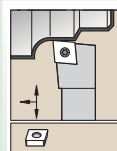
Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967. Compact design using a minimum of spare parts for high reliability and cost efficiency. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of 16mm and insert iCs from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



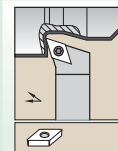
SCLC
95°
Page:
C42



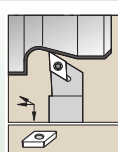
SCDP
45°
Page:
C42



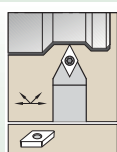
SCLP
95°
Page:
C43



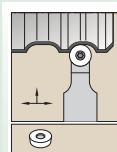
SDHC
107,5°
Page:
C43



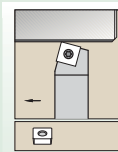
SDJC
93°
Page:
C44



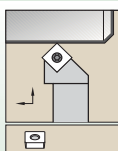
SDNC
62,5°
Page:
C45



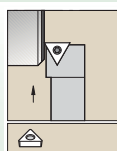
SRDC
Page:
C45



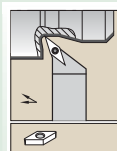
SSBC
75°
Page:
C46



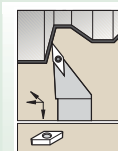
SSSC
45°
Page:
C47



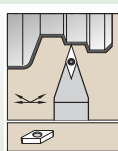
STFC
90°
Page:
C48



SVHB
107,5°
Page:
C48



SVJB
93°
Page:
C49



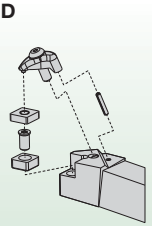
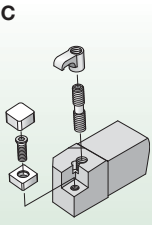
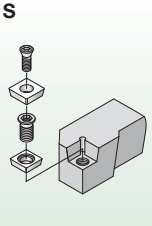
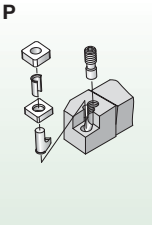
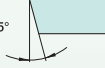
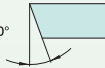
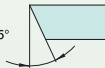
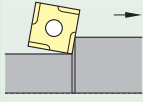
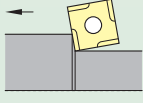
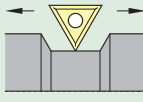
SVVB
72,5°
Page:
C49

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
D  C  S  P 	A  B  C  D  E  H  K  L  M  O  P  R  S  T  V  W	A  B  C  D  E  F  G  L  P  Q  R  S  U  V  Y 	N  B  C  P  D  E  F 	R = Right hand L = Left hand N = Neutral R  L  N 	C = Deep pocket for ceramic insert S = Single pocket locating wall F = Straight shank, no offset

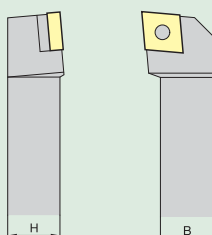
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



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

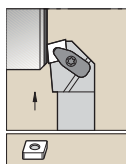
04

Insert Thickness (optional)

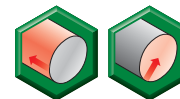
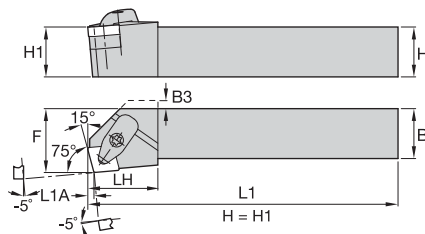
04 = 4,76mm
06 = 6,35mm

Cutting Edge Length L10

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

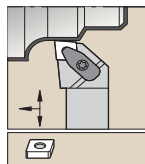


See pages B30–B46
for inserts.

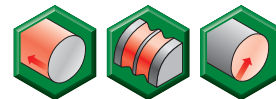
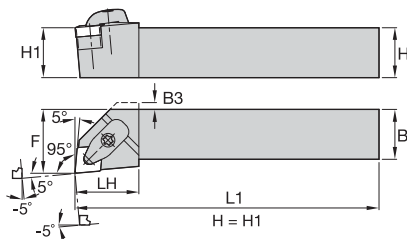


■ DCKN 75°

order number	catalogue number	H	B	F	L1	LH	L1A	B3	gage insert							
right hand																
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
left hand																
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

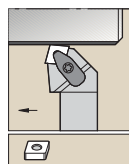


See pages B30–B46 for inserts.

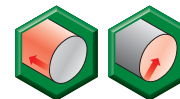
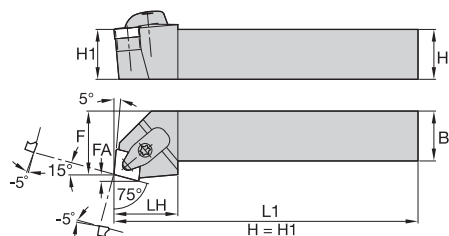


■ DCLN 95°

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
right hand															
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
left hand															
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

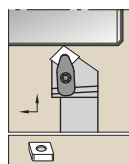


See pages B30–B46
for inserts.

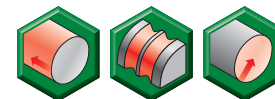
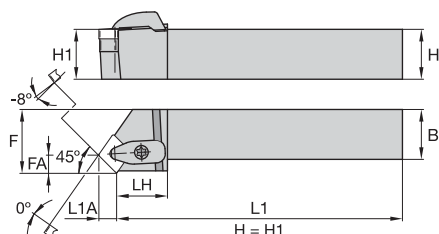


DCRN 75°

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
right hand															
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
left hand															
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

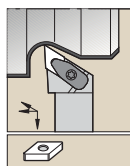


See pages B30–B46
for inserts.

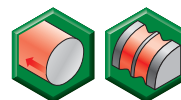
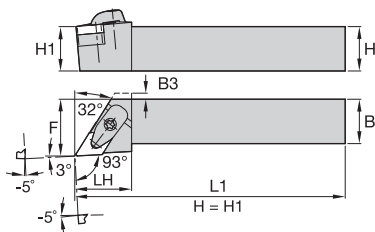


DCSN 45°

																
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
right hand																
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
left hand																
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

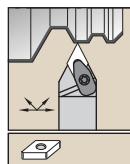


See pages B47–B64 for inserts.

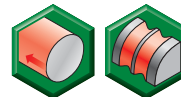
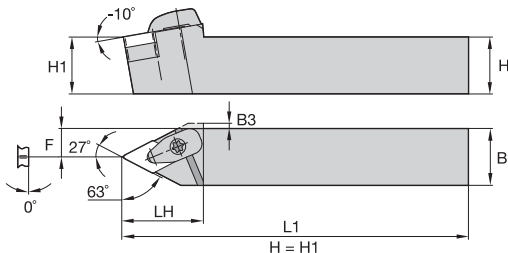


DDJN 93°

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
right hand															
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
left hand															
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

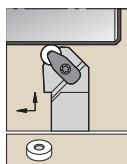


See pages B47–B64 for inserts.

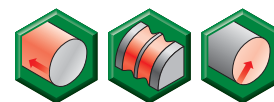
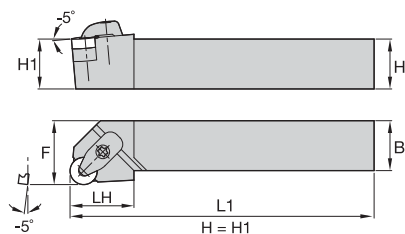


DDNN 63°

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
right hand															
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
left hand															
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

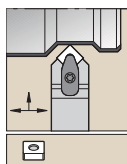


See pages B65–B67
for inserts.

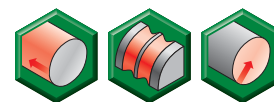
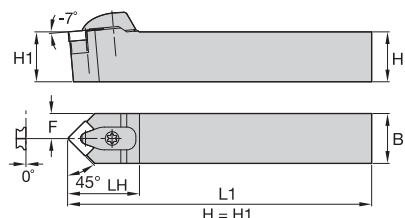


■ DRGN

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
right hand														
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
left hand														
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

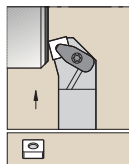


See pages B68–B80
for inserts.

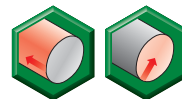
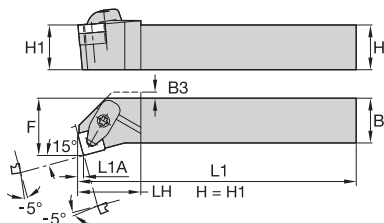


■ DSDN 45°

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

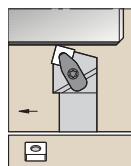


See pages B68–B80 for inserts.

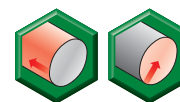
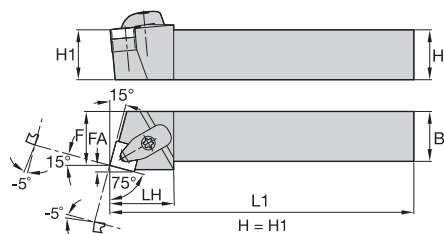


■ DSKN 75°

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
right hand																
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
left hand																
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

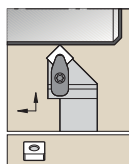


See pages B68–B80
for inserts.

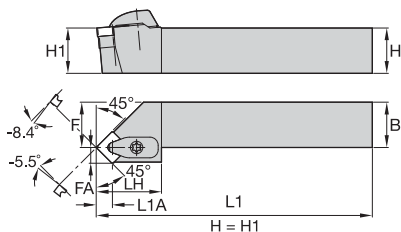


■ DSRN 75°

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
right hand															
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
left hand															
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

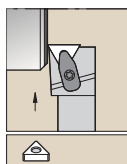


See pages B68–B80 for inserts.

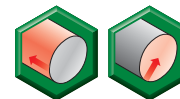
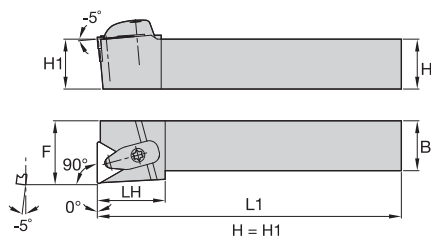


■ DSSN 45°

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
right hand																
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
left hand																
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

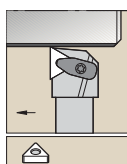


See pages B81–B93
for inserts.

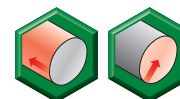
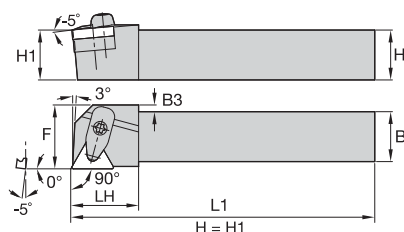


DTFN 90°

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
right hand														
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
left hand														
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

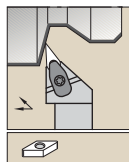


See pages B81–B93
for inserts.

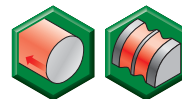
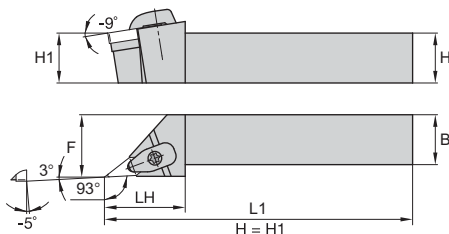


DTGN 90°

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
right hand															
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
left hand															
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

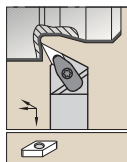


See pages B94–B99 for inserts.

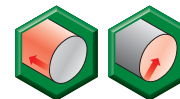
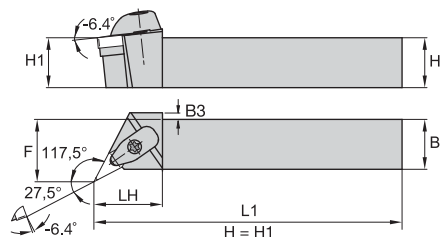


■ DVJN 93°

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
right hand														
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
left hand														
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

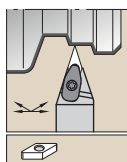


See pages B94–B99
for inserts.

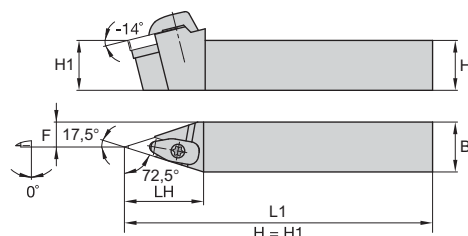


DVON 117,5°

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
right hand															
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
left hand															
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

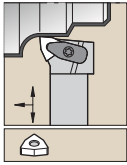


See pages B94–B99
for inserts.

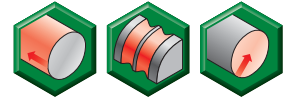
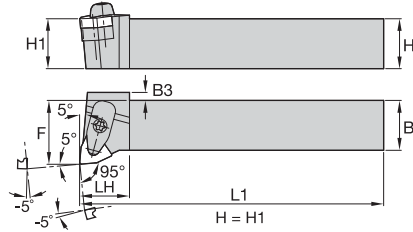


DVN 72,5°

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

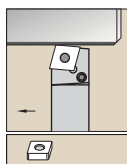


See pages B99–B105 for inserts.

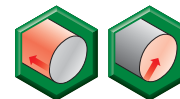
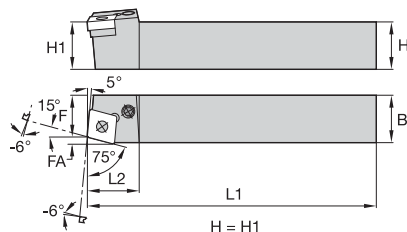


■ DWLN 95°

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
right hand															
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
left hand															
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



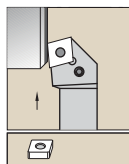
See pages B30–B46 for inserts.



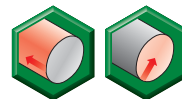
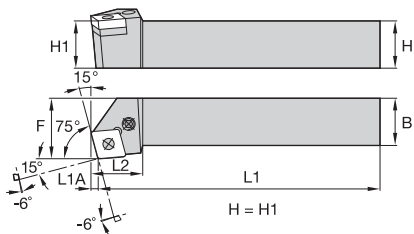
■ PCBN 75°



order number	catalogue number	H	B	F	L1	L2	FA	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
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
left hand														
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

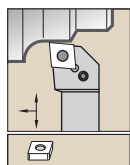


See pages B30–B46 for inserts.

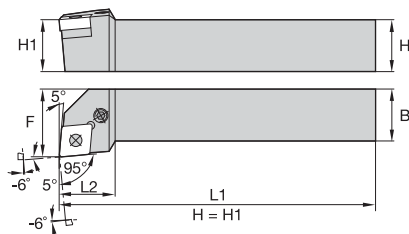


■ PCKN 75°

									    					
order number	catalogue number	H	B	F	L1	L2	L1A	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
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
left hand														
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

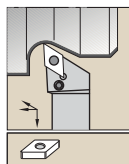


See pages B30–B46
for inserts.

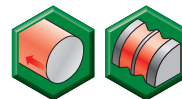
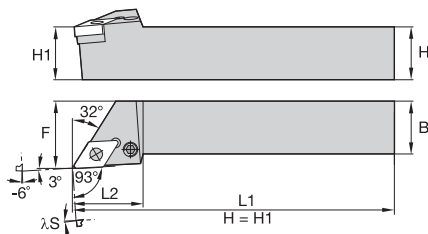


PCLN 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	lever screw wrench size
right hand													
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
left hand													
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

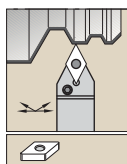


See pages B47–B64 for inserts.

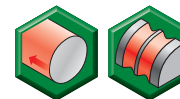
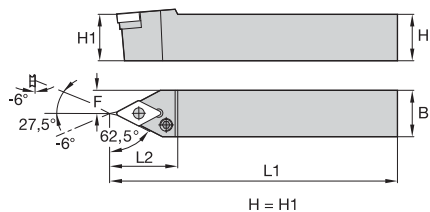


■ PDJN 93°

order number	catalogue number	H	B	F	L1	L2	λS°	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
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
left hand														
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



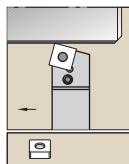
See pages B47–B64
for inserts.



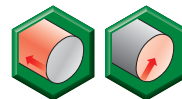
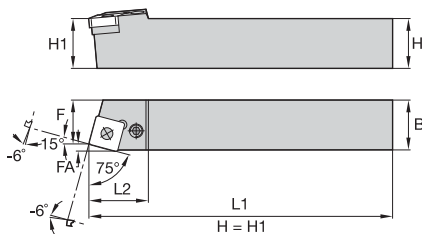
■ PDNN 62,5°



order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand													
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
left hand													
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

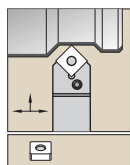


See pages B68–B80 for inserts.

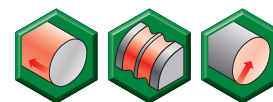
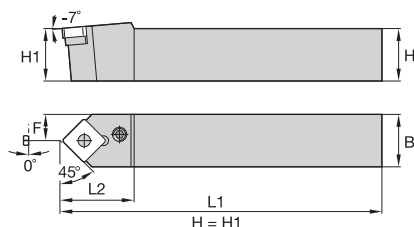


PSBN 75°

order number	catalogue number	H	B	F	L1	L2	FA	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
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
left hand														
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

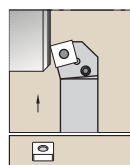


See pages B68–B80 for inserts.

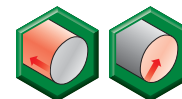
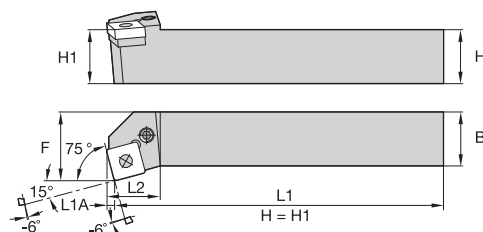


PSDN 45°

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

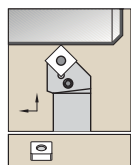


See pages B68–B80 for inserts.

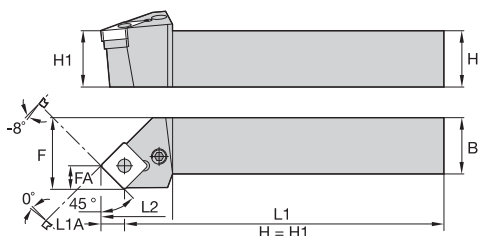


PSKN 75°

order number	catalogue number	H	B	F	L1	L2	L1A	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand														
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
left hand														
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

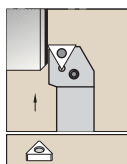


See pages B68–B80 for inserts.

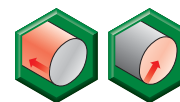
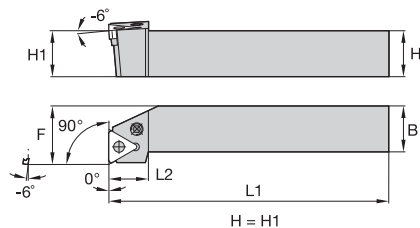


■ PSSN 45°

										    					
order number	catalogue number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand															
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
left hand															
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

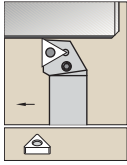


See pages B81–B93 for inserts.

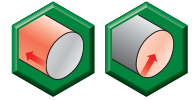
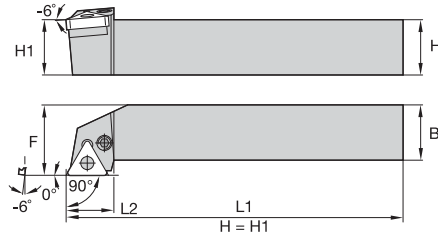


PTFN 90°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand													
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
left hand													
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

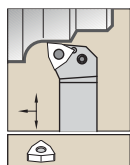


See pages B81–B93 for inserts.

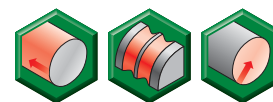
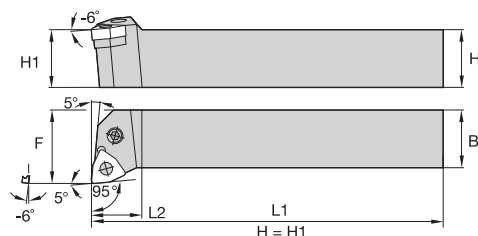


■ PTGN 90°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand													
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
left hand													
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

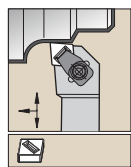


See pages B99–B105 for inserts.

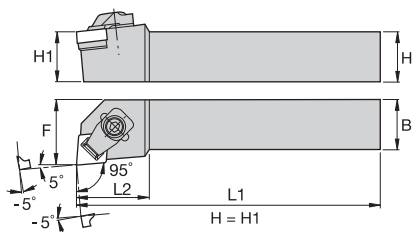


■ PWLN 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim pin	punch pin	lever	lever screw	Torx Plus
right hand													
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
left hand													
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



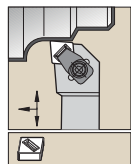
See pages B177–B179 and B197–B205 for inserts.



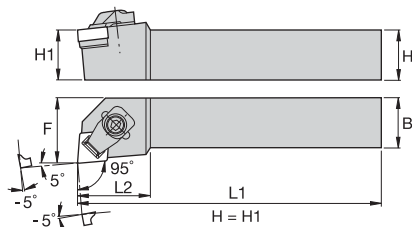
■ CCLN-MX 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand												
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
left hand												
3032692	CCLNL2525M12MX7	25	25	32,0	150	32,0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm

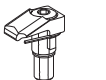
NOTE: MX — clamping version is shown.



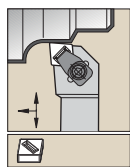
See pages B177–B179 and B197–B205 for inserts.



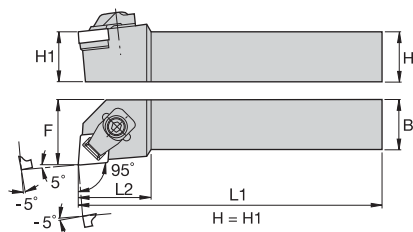
■ CCLN-MN 95°

													
order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
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
left hand													
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.



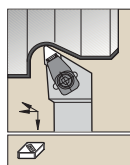
See pages B177–B179 and B197–B205 for inserts.



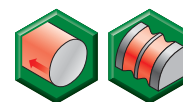
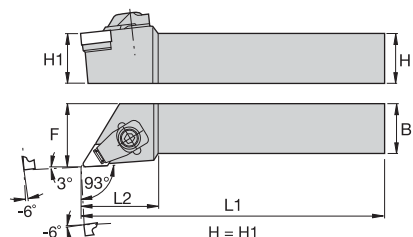
■ CCLN-MF 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	chipbreaker	clamp assembly	hex
right hand													
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.



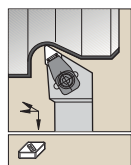
See pages B180–B181 and B206–B216 for inserts.



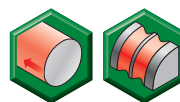
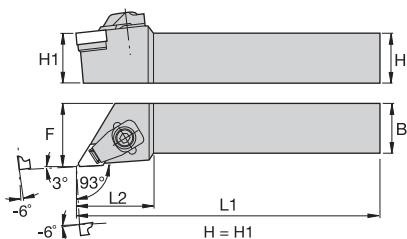
■ CDJN-MX 93°

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



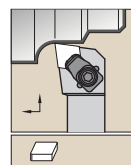
See pages B180–B181 and B206–B216 for inserts.



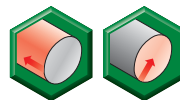
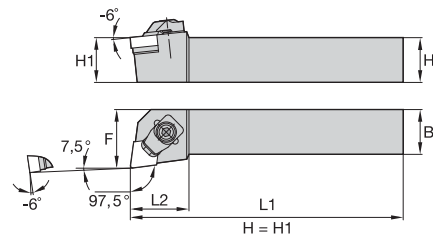
CDJN-MN 93°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
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
left hand													
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.



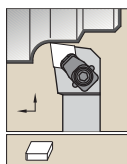
See page B182 for inserts.



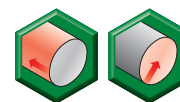
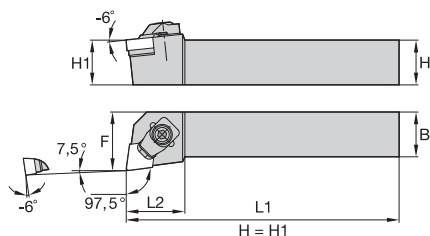
CELN-MF 97,5°

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



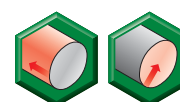
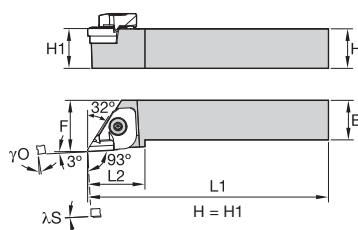
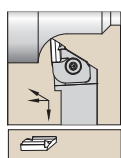
See page B182 for inserts.



■ CELN-MN 97,5°

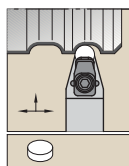
order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
3879701	CELNR2525M13MN7	25	25	32,5	153	32,0	EN.N130708	552.240	554.252	2.5 mm	557.111	551.317	4 mm
left hand													
3879699	CELNL2525M13MN7	25	25	32,5	153	32,0	EN.N130708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

NOTE: MN — clamping version is shown.

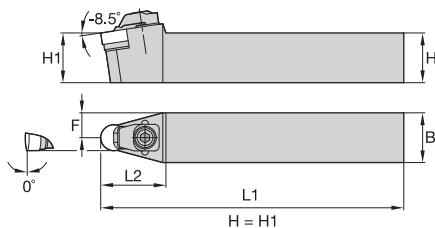


■ CKJN

order number	catalogue number	H	B	F	L1	L2	λS°	γO°	gage insert	shim	shim pin	clamp	clamp assembly	hex	hex wrench	pin
right hand																
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
left hand																
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



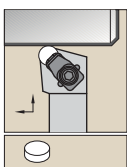
See pages B183–B185 and B210 for inserts.



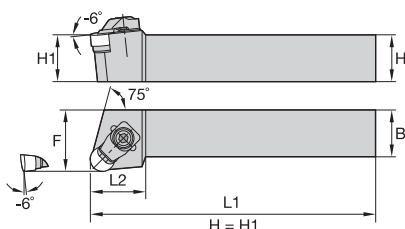
■ CRDN-MN

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.



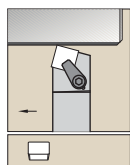
See pages B183–B185 and B210 for inserts.



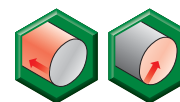
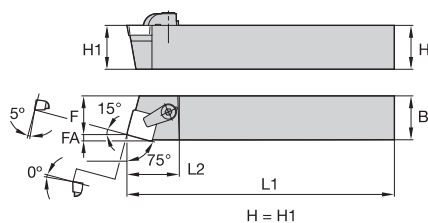
■ CRSN-MN

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand													
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
left hand													
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.

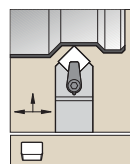


See pages B186–B191 and B211–B212 for inserts.

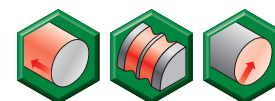
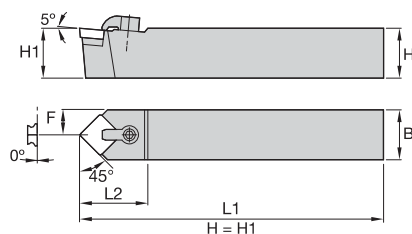


CSBP 75°

order number	catalogue number	H	B	F	L1	L2	FA	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand														
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
left hand														
3870066	CSBPL2020K12	20	20	17,0	125	30,0	3,1	SP..120308	SM840	MS111	2 mm	CKM10	STCM8	4 mm

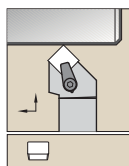


See pages B186–B191 and B211–B212 for inserts.

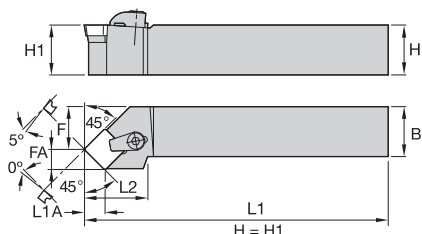


CSDP 45°

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

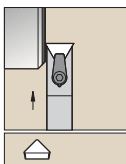


See pages B186–B191 and B211–B212 for inserts.

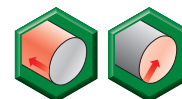
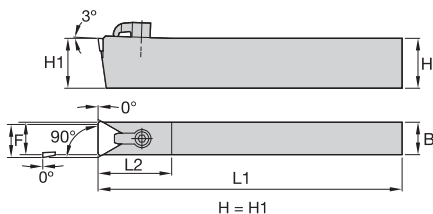


■ CSSP 45°

order number	catalogue number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand															
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
left hand															
3870073	CSSPL2525M12	25	25	32,0	150	32,0	8,7	8,3	SP..120308	SM840	MS111	2 mm	CKM9	STCM4	4 mm

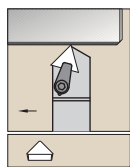


See pages B192–B194 and B212–B216 for inserts.

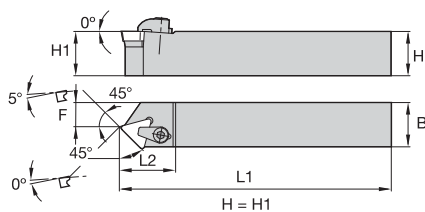


■ CTCP 90°

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

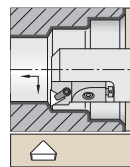


See pages B192–B194 and B212–B216 for inserts.

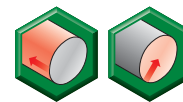
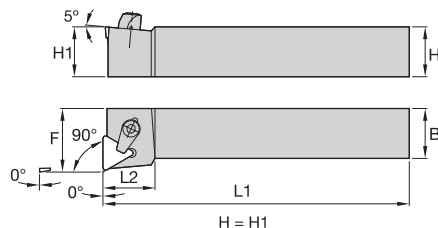


CTDP 45°

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

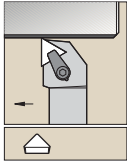


See pages B192–B194 and B212–B216 for inserts.

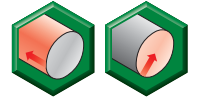
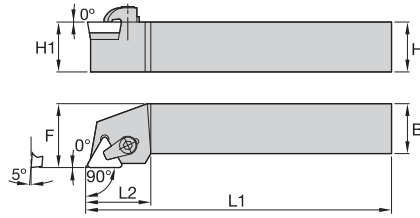


CTFP 90°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand													
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
left hand													
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.

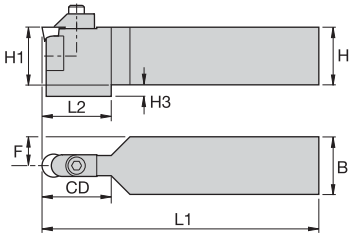


CTGP 90°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand													
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
left hand													
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



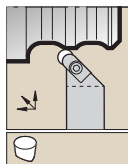
See page B184 for inserts.



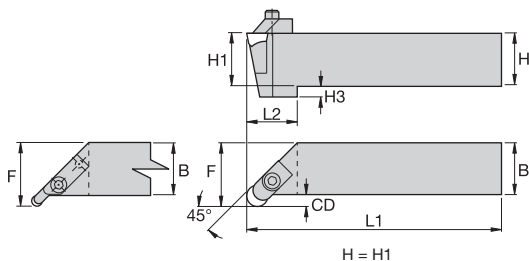
■ CRDP

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.



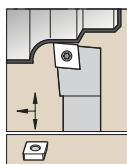
See page B184 for inserts.



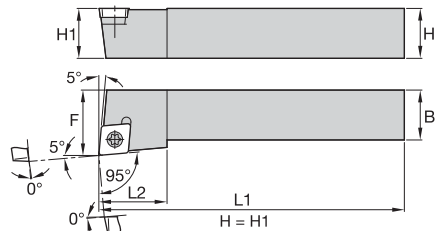
■ CRGP

order number	catalogue number	H	B	F	L1	L2	H3	CD	gage insert	nest	clamp	clamp screw	hex
right hand													
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
left hand													
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.

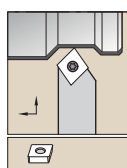


See pages B30–B46
for inserts.

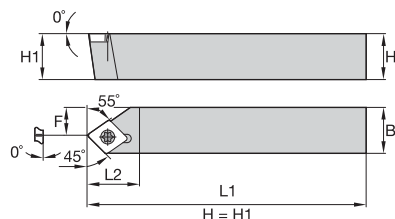


SCLC 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
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
left hand												
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

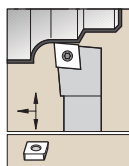


See pages B30–B46
for inserts.

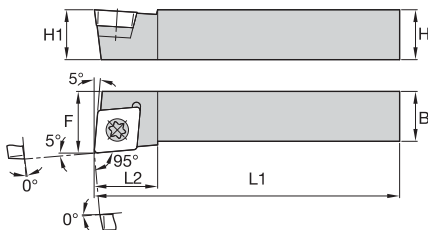


SCDP 45°

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

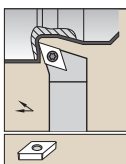


See pages B30–B46 for inserts.

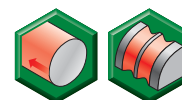
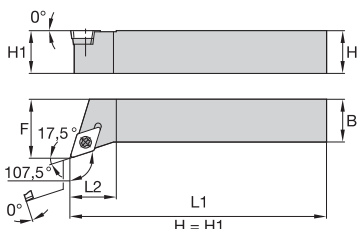


■ SCLP 95°

order number	catalogue number	H	B	F	L1	L2	gage insert	insert screw	Torx
right hand									
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
left hand									
5094212	SCLPL1212M06	12	12	13,0	150	11,4	CP..060203	MS1153	T7

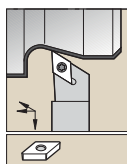


See pages B47–B64 for inserts.

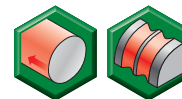
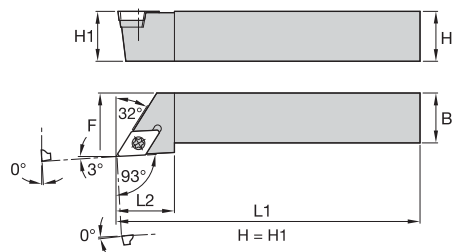


■ SDHC 107,5°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
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
left hand												
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

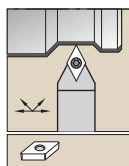


See pages B47–B64
for inserts.

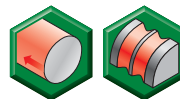
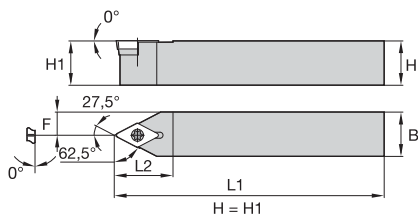


SDJC 93°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
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
left hand												
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

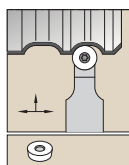


See pages B47–B64 for inserts.

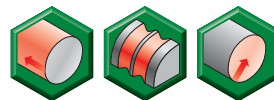
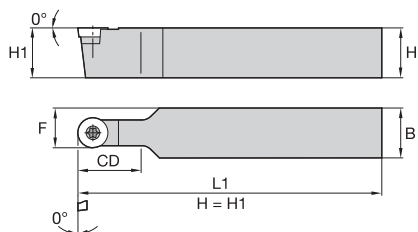


SDNC 62,5°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
left hand												
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

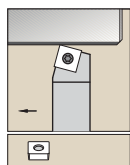


See pages B65–B67 for inserts.

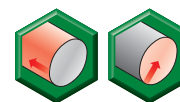
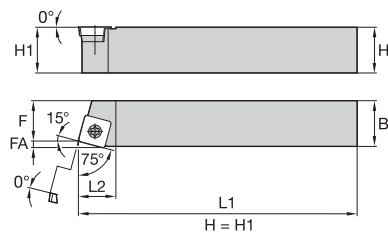


SRDC

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

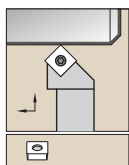


See pages B68–B80
for inserts.

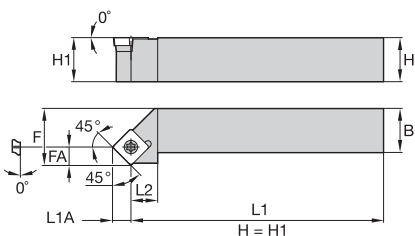


■ SSBC 75°

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



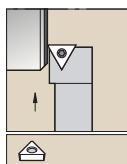
See pages B68–B80 for inserts.



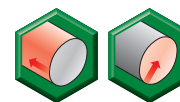
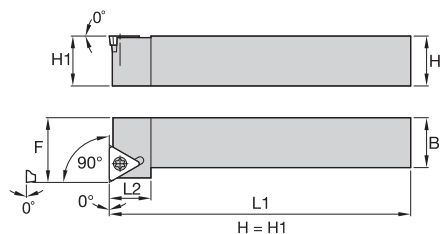
SSSC 45°

order number	catalogue number	H	B	F	L1	L2	FA	L1A	gage insert	shim	shim screw	hex	insert screw	Torx
right hand														
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
left hand														
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



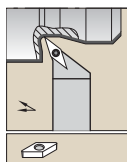


See pages B81–B93
for inserts.

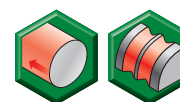
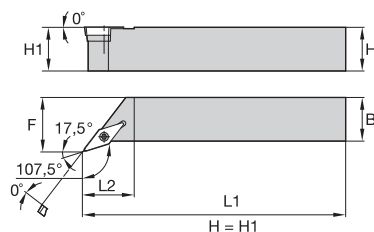


STFC 90°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
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
left hand												
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

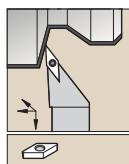


See pages B94–B99
for inserts.

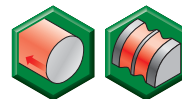
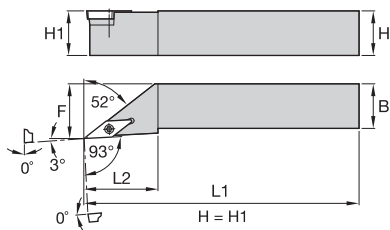


SVHB 107,5°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
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
left hand												
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

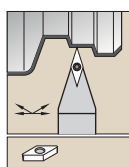


See pages B94–B99 for inserts.

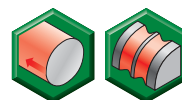
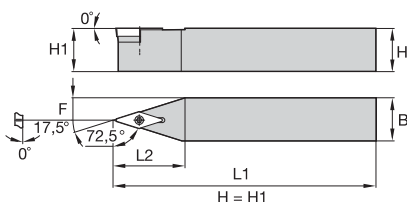


SVJB 93°

order number	catalogue number	H	B	F	L1	L2	gage insert	shim	shim screw	hex	insert screw	Torx
right hand												
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
left hand												
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

Tools for Internal Boring

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.

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.



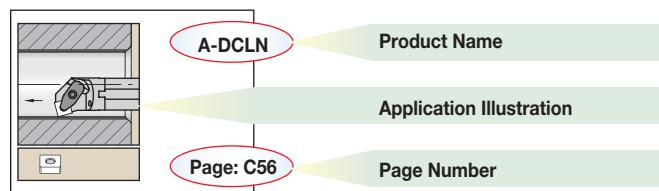
S-Style Clamping

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

C-Style Clamping

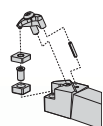
- Height-adjustable clamp permits use of additional chipbreakers.
- Universal clamping system for positive and negative flat top inserts.
- Robust engineering makes it easy to handle.
- Carbide shim for extra tool protection.

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.

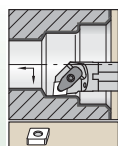


D-Style Clamping

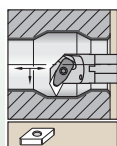
D



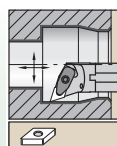
One-piece clamp assembly holder for use with negative style inserts. An extremely rigid clamping system. The tool is protected by a carbide shim.



A-DCLN
95°
Page:
C56



A-DDPN
117,5°
Page:
C56



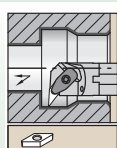
A-DDQN
107,5°
Page:
C57



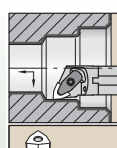
A-DDUN
93°
Page:
C57



A-DTFN
90°
Page:
C58



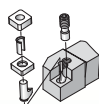
DVUN
93°
Page:
C58



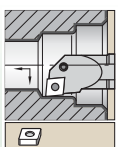
A-DWLN
95°
Page:
C59

P-Style Clamping

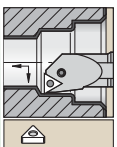
P



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

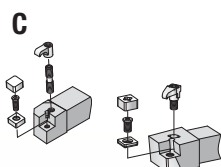


A-PTFN
90°
Page:
C60

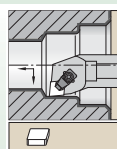


A-PWLN
95°
Page:
C61

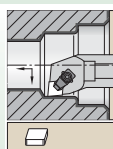
C-Style Clamping



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.



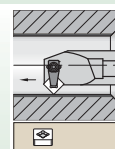
S-CCLN-MX
95°
Page: C62



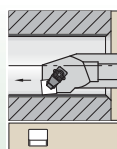
S-CCLN-MN
95°
Page: C62



S-CDQN-MX
Page: C63



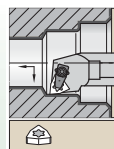
S-CSSN-MX
45°
Page: C63



S-CSYN-MN
85°
Page: C64

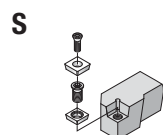


S-CWLN-MX
95°
Page: C64

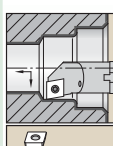


A-CTFP
90°
Page: C65

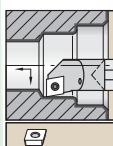
S-Style Clamping



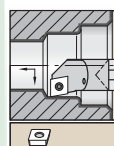
Screw clamping system for positive indexable inserts with countersunk hole to DIN 4967. Compact design using a minimum of spare parts for high reliability and cost efficiency. A carbide shim provides additional tool protection. Toolholders with cutting edge heights upwards of .625" and insert iCs from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



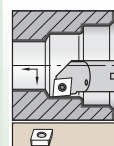
A-SCFP
90°
Page: C66



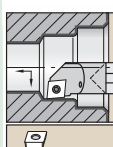
E-SCFC
90°
Page: C66



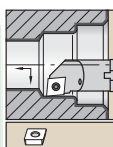
E-SCFP
90°
Page: C67



A-SCLC
95°
Page: C67



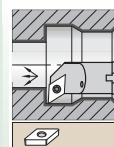
E-SCLC
95°
Page: C68



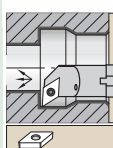
A-SCLP
95°
Page: C69



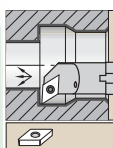
E-SCLP
95°
Page: C70



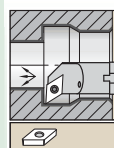
A-SDQC
107,5°
Page: C71



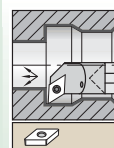
E-SDQC
107,5°
Page: C72



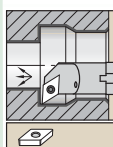
A-SDQP
Page: C72



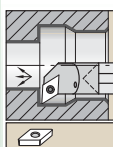
A-SDUC
93°
Page: C73



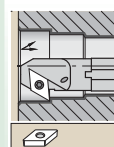
E-SDUC
93°
Page: C74



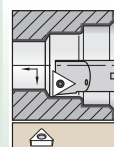
A-SDUP
93°
Page: C75



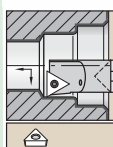
E-SDUP
93°
Page: C75



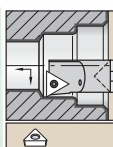
A-SDXP
95°
Page: C76



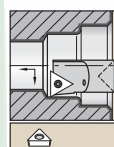
A-STFC
90°
Page: C76



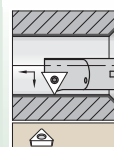
E-STFC
90°
Page: C77



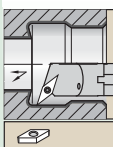
A-STFP
90°
Page: C78



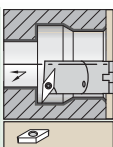
E-STFP
90°
Page: C79



A-STWP
60°
Page: C80



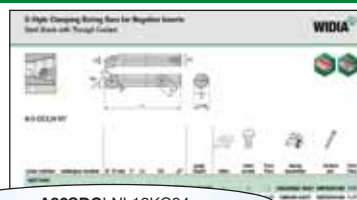
A-SVQB
107,5°
Page: C80

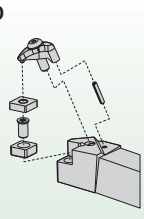
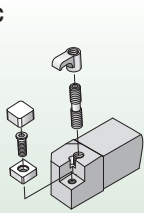
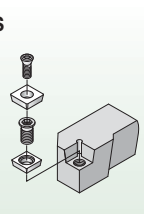
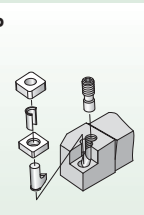
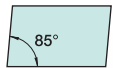
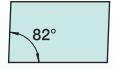
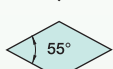
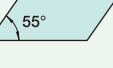
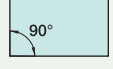
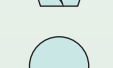
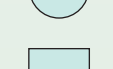


A-SVUB
93°
Page: C81

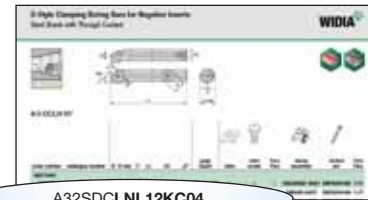
How Do Catalogue Numbers Work?

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
A  Steel bar with coolant S  Steel bar without coolant C  Carbide bar D  DeVibrator bar with coolant D  Tunable bar with coolant E  Carbide bar with coolant B  DeVibrator H  Interchangeable head L  Heavy metal bar with coolant	Metric: A two-digit number indicates the bar diameter in mm. If the diameter is represented by a one digit number, a 0 (zero) will be used in front of it. Example: 8mm = 08	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 **Used only when more than one length is available or a special length is required.	D  C  S  P 	A  85° B  82° C  80° D  55° E  75° H  120° K  55° L  90° M  86° O  135° P  108° R  Circular S  90° T  60° V  35° W  80°

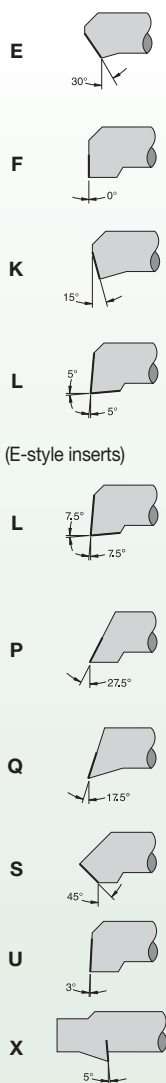
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



A32SDCLNL12KC04

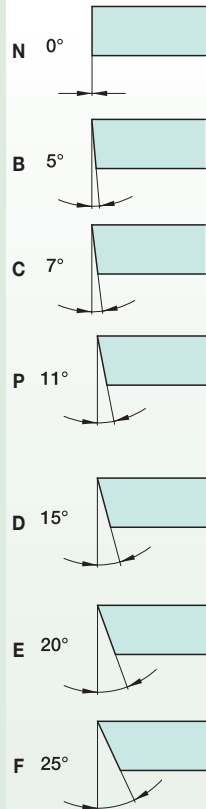
L

Bar Style or
Lead Angle



N

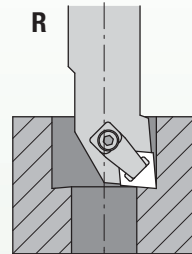
Insert
Clearance Angle



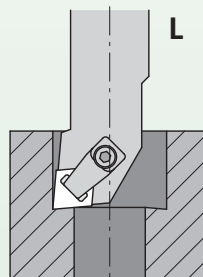
L

Hand of Tool

R =
Right-hand boring bar

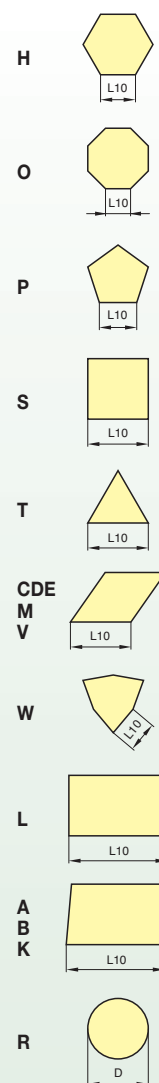


L =
Left-hand boring bar



12

Insert Size
Cutting Edge
Length L10



KC04

Additional
Information

M... =

M.. MF, MN, MX,
for ceramic and
PcBN inserts

KC =

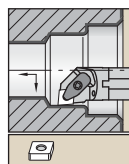
D-Style Clamping

+ =

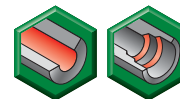
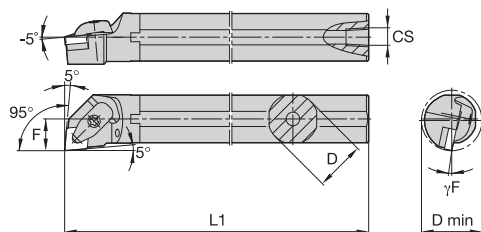
Insert thickness

D-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant

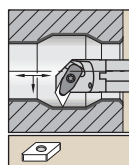


Steel shank with through coolant.
See pages B30–B46 for inserts.

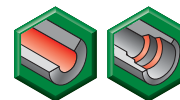
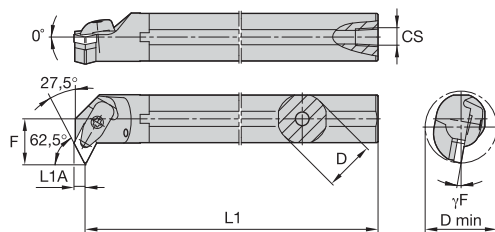


A-DCLN 95°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand														
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
left hand														
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

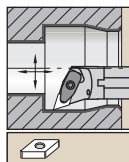


Steel shank with through coolant.
See pages B47–B64 for inserts.



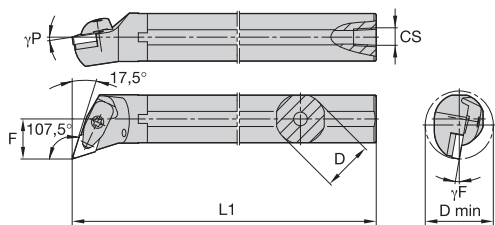
A-DDPN 117,5°

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
right hand															
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
left hand															
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



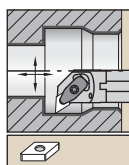
Steel shank with through coolant.

See pages B47–B64 for inserts.



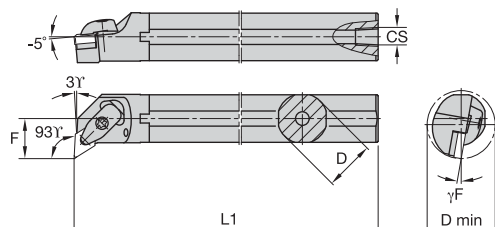
■ A-DDQN 107,5°

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
right hand															
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
left hand															
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.

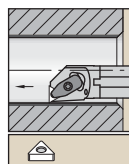


■ A-DDUN 93°

																
order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus		
right hand																
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		
left hand																
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		

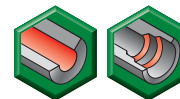
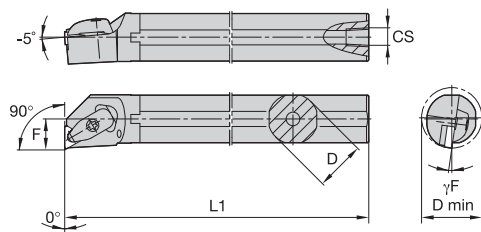
D-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant



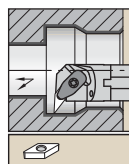
Steel shank with through coolant.

See pages B81–B93 for inserts.



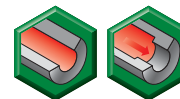
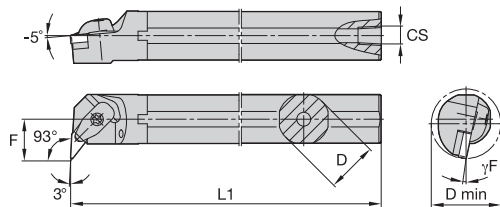
A-DTFN 90°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand														
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
left hand														
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



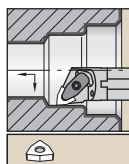
Steel shank with through coolant.

See pages B94–B99 for inserts.



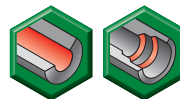
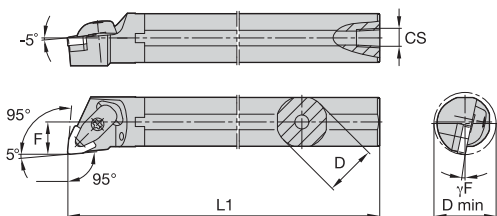
A-DVUN 93°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand														
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
left hand														
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.



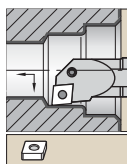
■ A-DWLN 95°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	Torx Plus	clamp assembly	slotted pin	Torx Plus
right hand														
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
left hand														
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



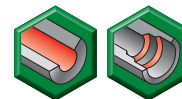
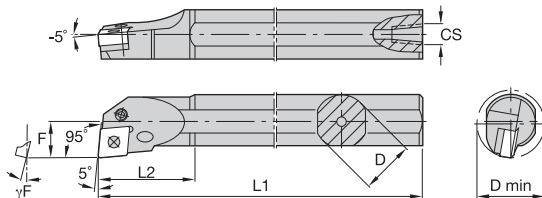
P-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant



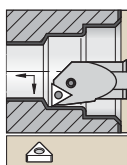
Steel shank with through coolant.

See pages B30–B46 for inserts.



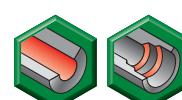
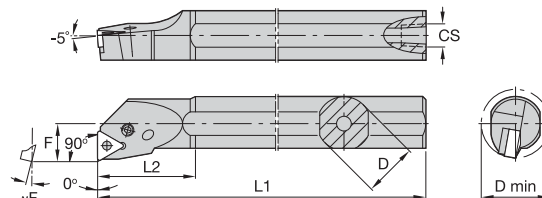
■ A-PCLN 95°

order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
right hand															
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
left hand															
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



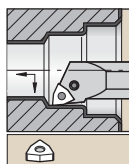
Steel shank with through coolant.

See pages B81–B93 for inserts.



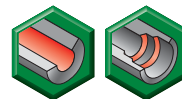
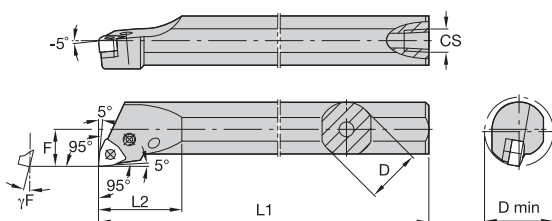
■ A-PTFN 90°

order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert	shim	shim pin	pin	toggle lever	lever screw	Torx Plus
right hand															
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
left hand															
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.

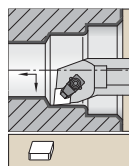


■ A-PWLN 95°

order number	catalogue number	D	D min	F	L1	L2	CS	γF°	gage insert						
right hand															
3883459	A16RPWLNRO6	16	27,0	11,0	200	32	1/8-27 NPT	-12.0	WN..060408	—	—	—	511.030	514.112	—
3883455	A20SPWLNRO6	20	25,0	13,0	250	—	1/8-27 NPT	-14.0	WN..060408	—	—	—	511.030	514.112	8 IP
3883458	A25RPWLNRO8	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	A32SPWLNRO8	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	—
left hand															
3883461	A16RPWLNLO6	16	27,0	11,0	200	32	1/8-27 NPT	-12.0	WN..060408	—	—	—	511.030	514.112	—
3883457	A20SPWLNLO6	20	25,0	13,0	250	—	1/8-27 NPT	-14.0	WN..060408	—	—	—	511.030	514.112	8 IP
3883456	A32SPWLNLO8	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	—

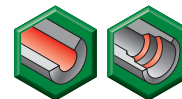
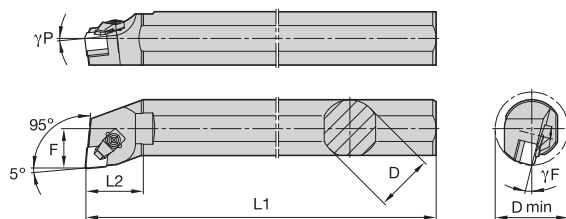
C-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant



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

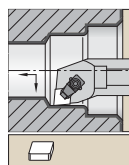
Steel shank with through coolant.



■ S-CCLN-MX 95°

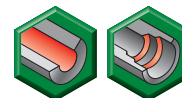
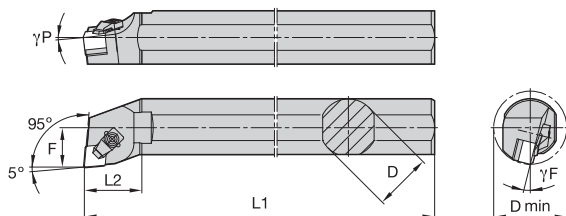
order number	catalogue number	D	D min	F	L1	L2	γF°	γP°	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand														
3883565	S32SCCLNR12MX7	32	40,0	22,0	251	43	-14.0	-5.0	CN.X120708	—	—	—	551.316	4 mm
3029009	S40TCCLNR12MX7	40	55,0	27,0	300	40	-14.0	-6.0	CN.X120708	552.221	554.252	2.5 mm	551.316	4 mm
left hand														
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.

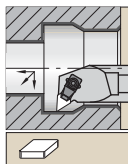
Steel shank with through coolant.



■ S-CCLN-MN 95°

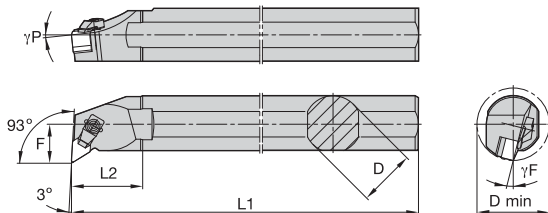
order number	catalogue number	D	D min	F	L1	L2	γF°	γP°	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand															
3029011	S40TCCLNR12MN4	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120408	552.220	554.252	2.5 mm	557.111	551.317	4 mm
3029143	S40TCCLNR12MN7	40	55,0	27,0	300	40	-14.0	-6.0	CN.N120708	552.221	554.253	2.5 mm	557.111	551.317	4 mm
left hand															
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.

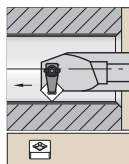
Steel shank with through coolant.



■ S-CDQN-MX

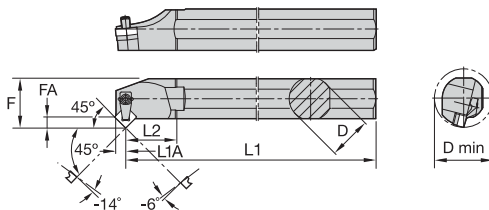
order number	catalogue number	D	D min	F	L1	L2	γF°	γP°	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand														
3883567	S40TCDQNR12MX7	40	50,0	27,0	302	45,0	-14,0	-5,0	DN.X120708	552.225	554.254	2.5 mm	551.316	4 mm
left hand														
3883566	S40TCDQNL12MX7	40	50,0	27,0	302	45,0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



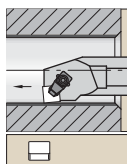
■ S-CSSN-MX 45°

order number	catalogue number	D	D min	F	L1	L2	L1A	FA	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand														
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
left hand														
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.

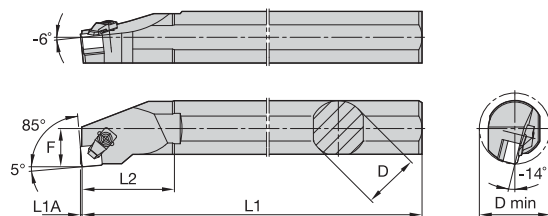
C-Style Clamping Boring Bars for Negative Inserts

Steel Shank with Through Coolant



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

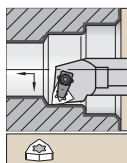
Steel shank with through coolant.



■ S-CSYN-MN 85°

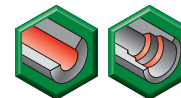
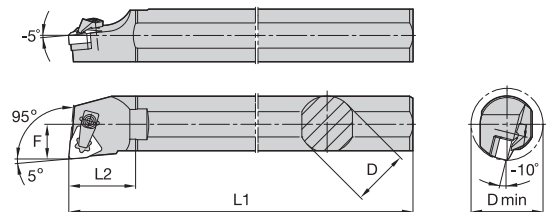
order number	catalogue number	D	D min	F	L1	L2	L1A	gage insert	shim	shim screw	hex	thrust plate	clamp assembly	hex
right hand														
3883569	S40TCSYNR12MN7	40	55,0	27,0	300	67,0	1,0	SN.N120708	552.232	554.252	2.5 mm	557.111	551.317	4 mm
left hand														
3883568	S40TCSYNL12MN7	40	55,0	27,0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

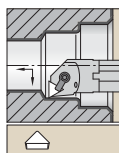
Steel shank with through coolant.



■ S-CWLN-MX 95°

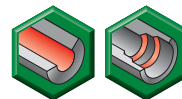
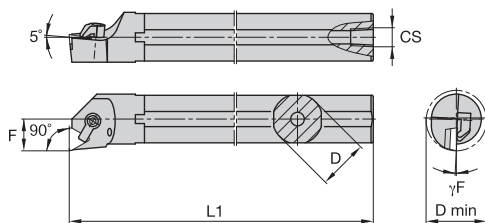
order number	catalogue number	D	D min	F	L1	L2	gage insert	shim	shim screw	hex	clamp assembly	hex
right hand												
3029153	S40TCWLNRO8MX7	40	80,0	27,0	300	55,0	WN.X080708	552.210	554.252	2.5 mm	551.316	4 mm
left hand												
3029154	S40TCWLNLO8MX7	40	80,0	27,0	300	55,0	WN.X080708	552.210	554.252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

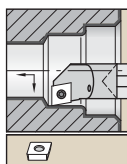


■ A-CTFP 90°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	shim	shim screw	hex	clamp	clamp screw	hex
right hand														
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
left hand														
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

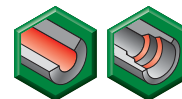
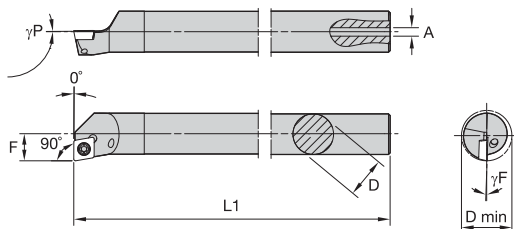
S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.

See pages B30–B46 for inserts.

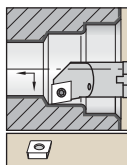


■ E-SCFC 90°



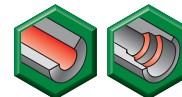
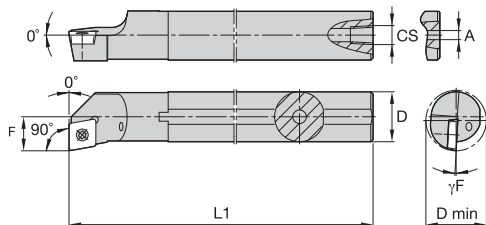
order number	catalogue number	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand											
2023600	E08KSCFCR06	8	11,0	6,0	125	3,0	-12,0	0,0	CC..060204	12148036300	T8
left hand											
2031019	E08KSCFCL06	8	11,0	6,0	125	3,0	-12,0	0,0	CC..060204	12148036300	T8

Steel Shank with Through Coolant



Steel shank with through coolant.

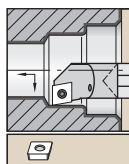
See pages B30–B46 for inserts.



■ A-SCFP 90°

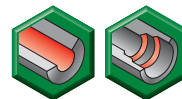
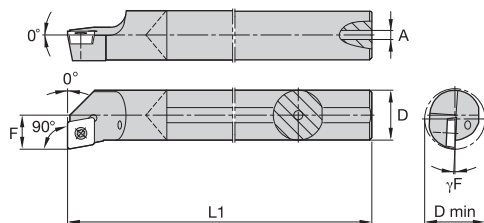


order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand											
5077442	A08JSCFP06	8	11,0	6,0	110	2,4	—	-8,0	CP..0602..	MS1153	T7
5077449	A10KSCFP06	10	13,0	7,0	125	3,2	—	-6,0	CP..0602..	MS1153	T7
5077497	A12MSCFP06	12	16,0	9,0	150	—	1/16 - 27 NPT	-4,0	CP..0602..	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	A20SSCFP06	20	25,0	13,0	250	—	1/8 - 27 NPT	-3,0	CC..0602..	MS1153	T7
5077615	A20SSCFP09	20	25,0	13,0	250	—	1/8 - 27 NPT	-2,0	CP..09T3..	MS1155	T15
left hand											
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.

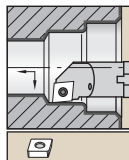


■ E-SCFP 90°

order number	catalogue number	D	D min	F	L1	A	A1	γF°	gage insert	insert screw	Torx
right hand											
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
left hand											
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

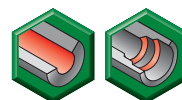
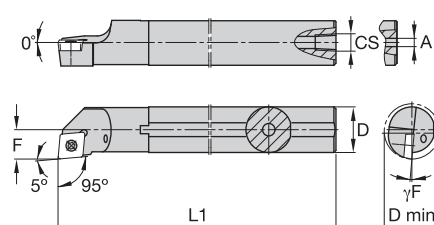


Steel Shank with Through Coolant



Steel shank with through coolant.

See pages B30–B46 for inserts.



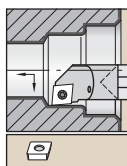
■ A-SCLC 95°

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex	insert screw	Torx
right hand														
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
left hand														
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



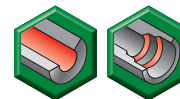
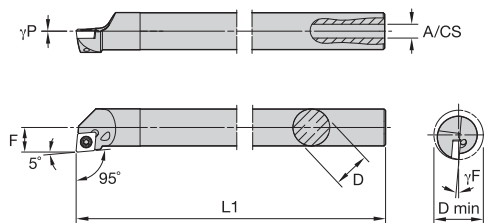
S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.

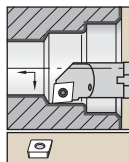
See pages B30–B46 for inserts.



■ E-SCLC 95°

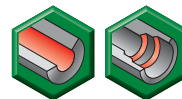
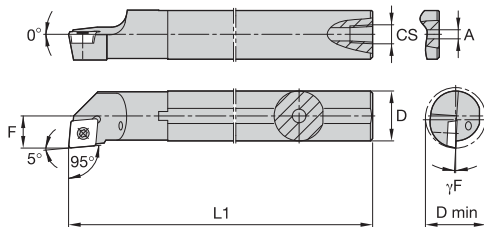


order number	catalogue number	D	D min	F	L1	A	CS	γF°	γP°	gage insert	insert screw	Torx
right hand												
2010068	E08KSCLCR06	8	11,0	6,0	125	3,0	—	-12.0	0.0	CC..060204	12148036300	T8
2023603	E08KSCLCR065	8	10,0	5,0	125	3,0	—	-15.0	0.0	CC..060204	12148036300	T8
2031021	E10MSCLCR06	10	13,0	7,0	150	3,5	—	-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	E25TSCLCR09	25	32,0	17,0	300	—	G 1/4	-3.0	0.0	CC..090308	12148038800	T15
2010224	E25TSCLCR09T3	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
left hand												
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	E25TSCLCL09	25	32,0	17,0	300	—	G 1/4	-3.0	0.0	CC..090308	12148038800	T15
2031028	E25TSCLCL09T3	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.



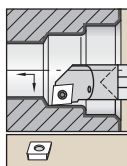
■ A-SCLP 95°

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand											
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
left hand											
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



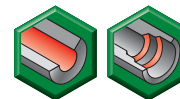
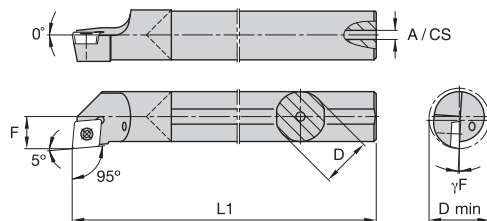
S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.

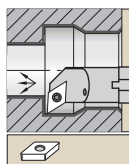
See pages B30–B46 for inserts.



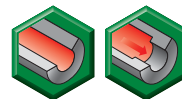
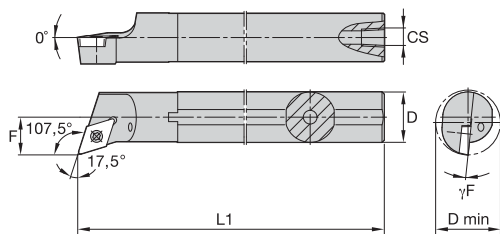
■ E-SCLP 95°



order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand										
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
left hand										
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.



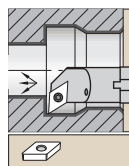
■ A-SDQC 107,5°



order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
right hand										
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
left hand										
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

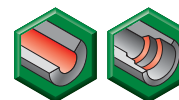
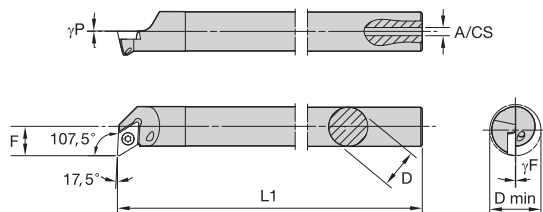
S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.

See pages B47–B64 for inserts.

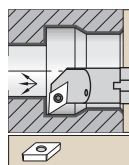


■ E-SDQC 107,5°

order number	catalogue number	D	D min	F	L1	A	CS	γF°	γP°	gage insert	insert screw	Torx
right hand												
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
left hand												
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

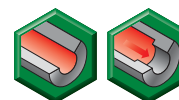
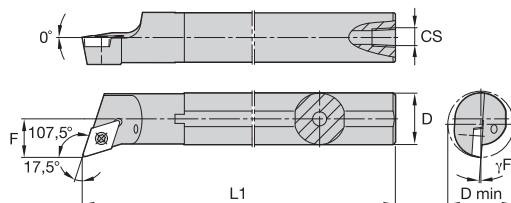


Steel Shank with Through Coolant



Steel shank with through coolant.

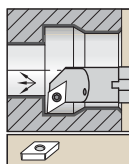
See pages B47–B64 for inserts.



■ A-SDQP

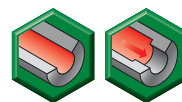
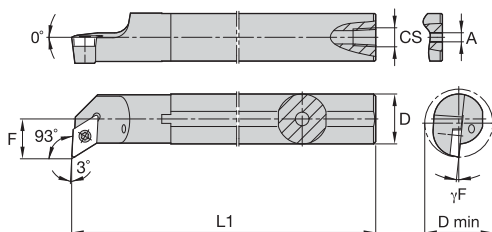
order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
right hand										
5078292	A12MSDQPR07	12	16,0	9,0	150	1/16-27 NPT	2.0	DP..0702..	MS1153	T7
5078295	A16RSDQPR07	16	20,0	11,0	200	1/8-27 NPT	0.0	DP..0702..	MS1153	T7
5078298	A20SSDQPR11	20	25,0	13,0	250	1/8-27 NPT	2.0	DP..11T3..	MS1155	T15
5078320	A25TSDQPR11	25	32,0	17,0	300	1/4-18 NPT	0.0	DP..11T3..	MS1155	T15
left hand										
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.



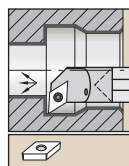
■ A-SDUC 93°

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	shim	shim screw	hex	insert screw	Torx
right hand														
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
left hand														
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

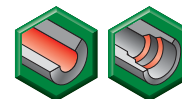
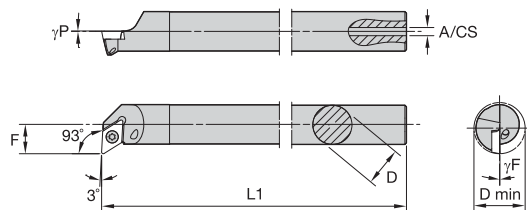


S-Style Clamping Boring Bars for Positive Inserts

Carbide Shank with Through Coolant



Carbide shank with through coolant.

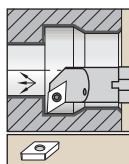


See pages B47–B64 for inserts.

■ E-SDUC 93°

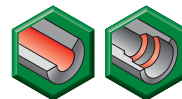
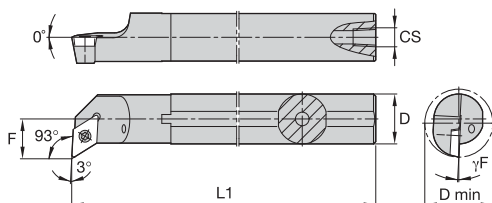


order number	catalogue number	D	D min	F	L1	A	CS	γF°	γP°	gage insert	insert screw	Torx
right hand												
2023611	E12QSDUCR07	12	16,0	9,0	180	4,5	—	-7.0	0.0	DC..070204	12148068700	T8
2010157	E16RSDUCR07	16	20,0	11,0	200	4,5	—	-5.0	0.0	DC..070204	12148080000	T8
2023624	E20SSDUCR11	20	25,0	13,0	250	—	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
left hand												
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



Steel shank with through coolant.

See pages B47–B64 for inserts.

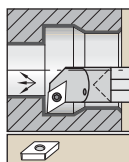


■ A-SDUP 93°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
right hand										
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
left hand										
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

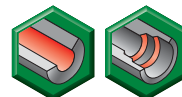
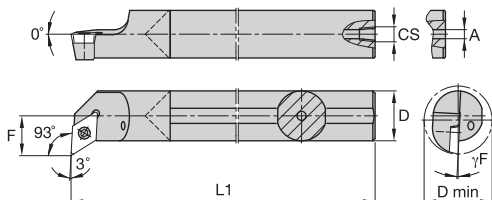


Carbide Shank with Through Coolant



Carbide shank with through coolant.

See pages B47–B64 for inserts.



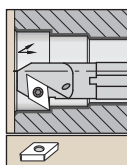
■ E-SDUP 93°

order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand										
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
left hand										
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



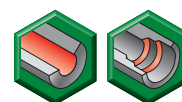
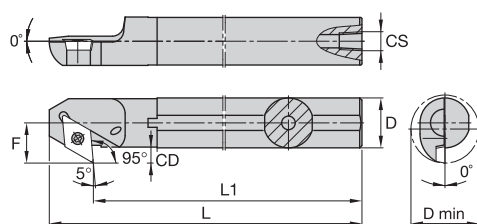
S-Style Clamping Boring Bars for Positive Inserts

Steel Shank with Through Coolant



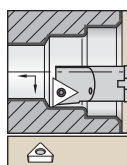
Steel shank with through coolant.

See pages B47–B64 for inserts.



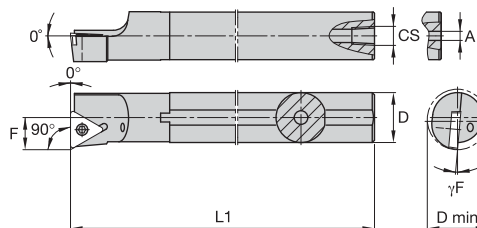
A-SDXP 95°

order number	catalogue number	D	D min	F	L1	L	CD	CS	gage insert	insert screw	Torx
right hand											
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
left hand											
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.

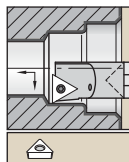
See pages B81–B93 for inserts.



A-STFC 90°

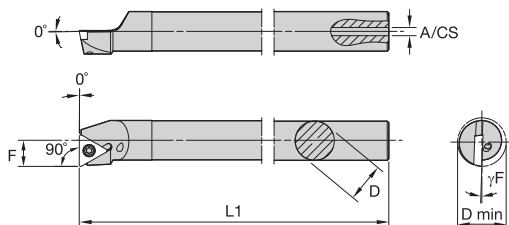
order number	catalogue number	D	D min	F	L1	A	γF°	gage insert	insert screw	Torx
right hand										
3883382	A10KSTFCR11	10	13,0	7,0	125	3,2	-7.0	TC..110204	MS1153	T7
left hand										
3883443	A10KSTFCL11	10	13,0	7,0	125	3,2	-7.0	TC..110204	MS1153	T7





Carbide shank with through coolant.

See pages B81–B93 for inserts.



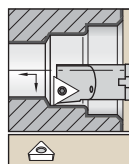
■ E-STFC 90°

order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand											
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
left hand											
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



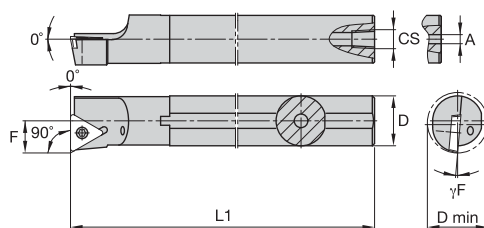
S-Style Clamping Boring Bars for Positive Inserts

Steel Shank with Through Coolant



Steel shank with through coolant.

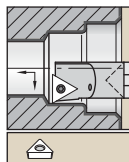
See pages B81–B93 for inserts.



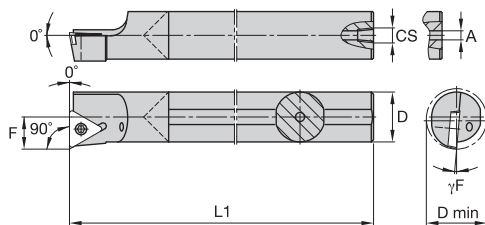
■ A-STFP 90°



order number	catalogue number	D	D min	F	L1	A	CS	γF°	gage insert	insert screw	Torx
right hand											
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
left hand											
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



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



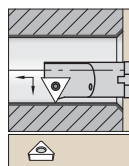
■ E-STFP 90°

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

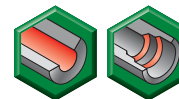
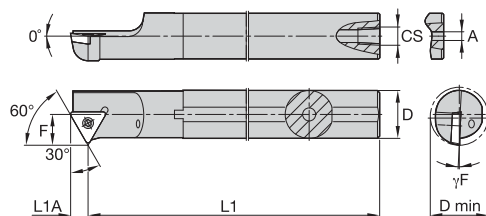


S-Style Clamping Boring Bars for Positive Inserts

Steel Shank with Through Coolant



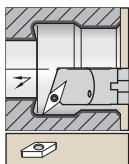
Steel shank with through coolant.



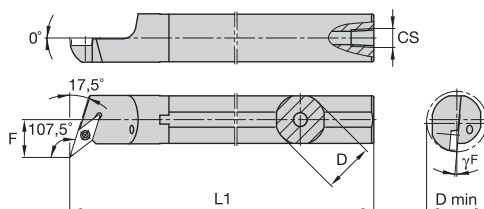
See pages B81–B93 for inserts.

■ A-STWP 60°

order number	catalogue number	D	D min	F	L1	L1A	A	γF°	gage insert	insert screw	Torx
right hand											
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
left hand											
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



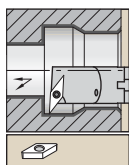
Steel shank with through coolant.



See pages B94–B99 for inserts.

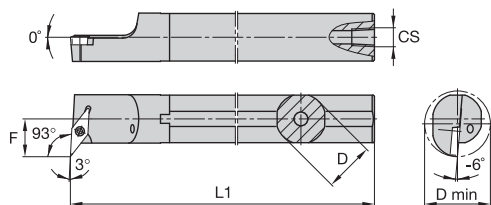
■ A-SVQB 107,5°

order number	catalogue number	D	D min	F	L1	CS	γF°	gage insert	insert screw	Torx
right hand										
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
left hand										
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°

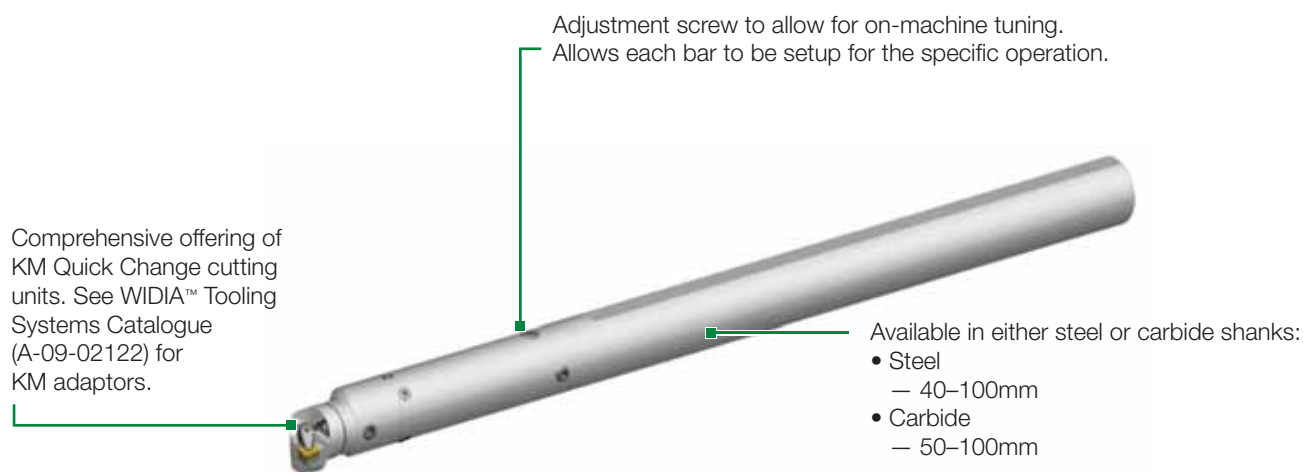
order number	catalogue number	D	D min	F	L1	CS	gage insert	insert screw	Torx
right hand									
3883440	A20SSVUBR11	20	25,0	13,0	250	1/8-27 NPT	VB..110304	MS1153	T7
3883438	A25TSVUBR16	25	32,0	17,0	300	1/4-18 NPT	VB..160408	MS1155	T15
left hand									
3883439	A25TSVUBL16	25	32,0	17,0	300	1/4-18 NPT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

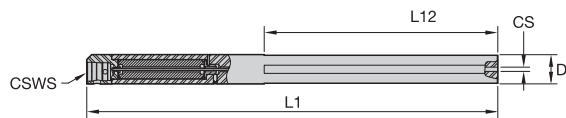
Tunable Boring Bars



Features	Function	Benefit
Robust internal clamping package	• Eliminates chatter and vibration. • Higher metal removal rate. • Larger depths of cut.	• High surface quality. • Low scrap rate. • Increased productivity. • Reduced noise exposure.
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	• Ridged clamping system. • Wide selection of KM Quick Change cutting units.	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.



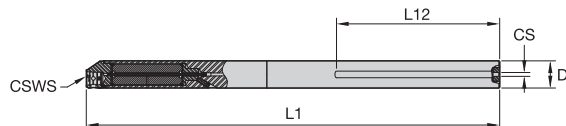
Tunable steel shank with through coolant and front end KM™ clamping unit.



■ 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).

WIN WITH WIDIA™



Separator™

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

Separator Toolholders and Inserts

.....

- 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 www.widia.com.

WIDIA 

Cartridges

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.

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.

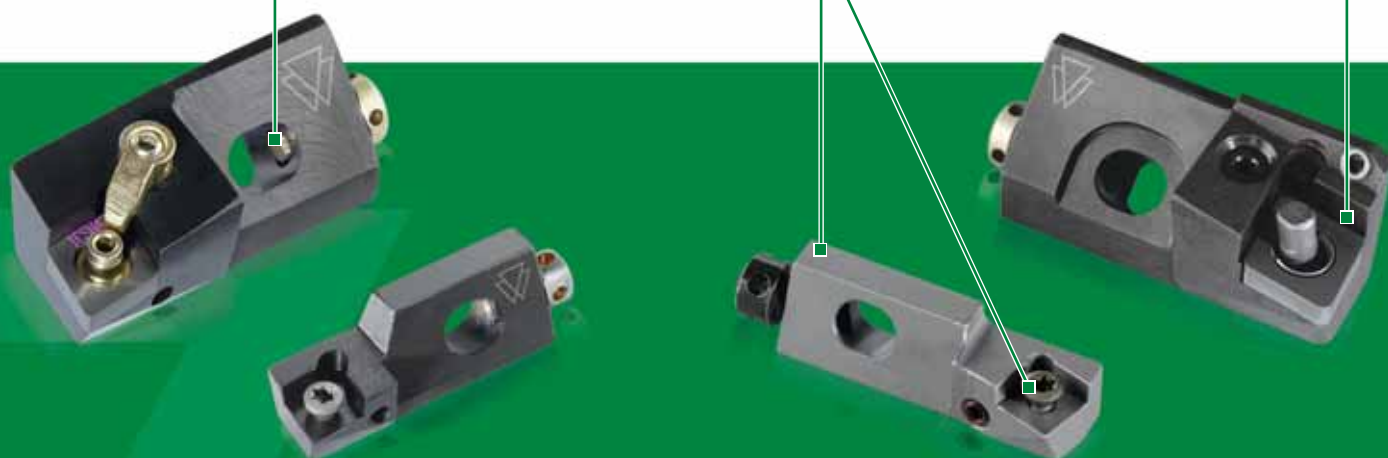
Simple and secure mounting to the tool by a single cartridge clamping screw.

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.

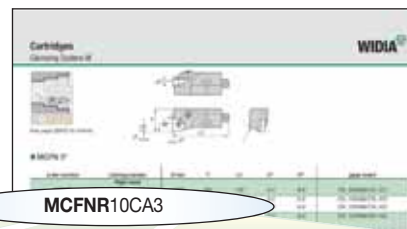


Clamping System S

- 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?

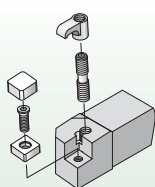
Each character in our catalogue number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



M

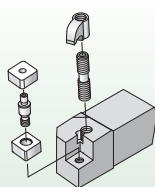
Insert
Clamping System

C



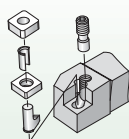
Top clamping by clamping
finger for inserts without hole.

M



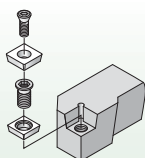
Top and hole clamping
for inserts with hole.

P



Insert clamping by toggle lever
for insert hole.

S



Centre clamping by screw
for inserts with hole.

C

Insert Shape

C



D



R



S



T

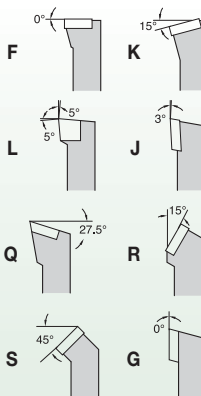


W



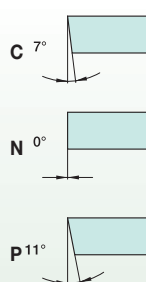
F

Cartridge
Style



N

Insert Clearance
Angle

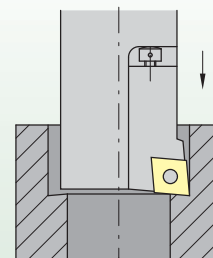


R

Hand of Tool

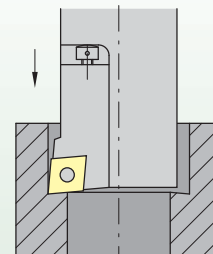
Right-hand cartridge

R

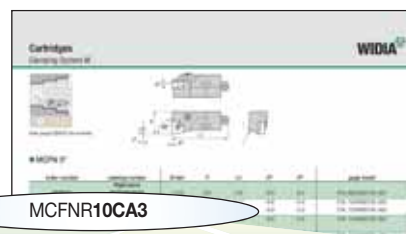


Left-hand cartridge

L



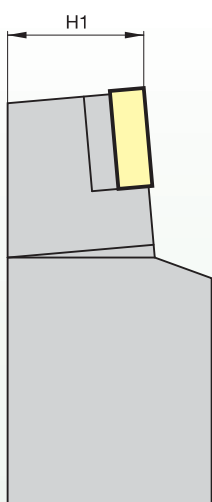
By referencing this easy-to-use guide, you can identify the correct product to meet your needs.



MCFNR10CA3

10

Cartridge Size



H1 = Cutting edge height of cartridge, in inches

C

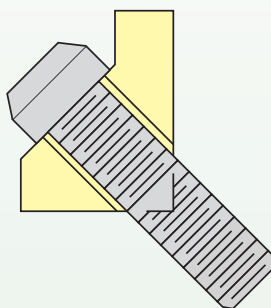
Identifying Code of Cartridge

C = Cartridge

A

Mounting Design of Cartridge

A-design conforming to ISO 5611



3

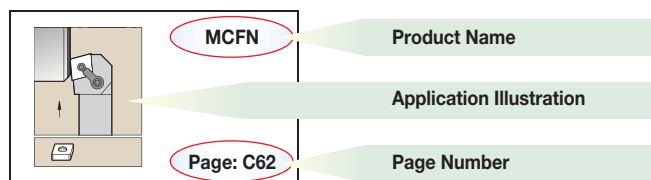
Insert Size



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

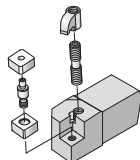
Additional Information

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.

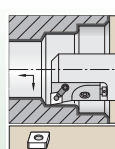


Clamping System M

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.

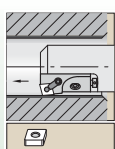


MCFN

90°

Page:

C92

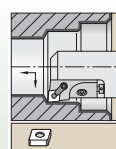


MCKN

75°

Page:

C93

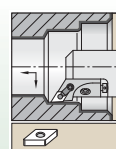


MCLN

95°

Page:

C94

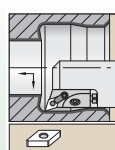


MDJN

93°

Page:

C95

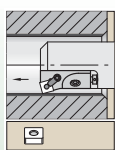


MDQN

107,5°

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C96



MSKN

75°

Page:

C97



MSRN

75°

Page:

C98

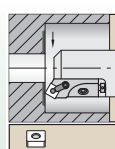


MSSN

45°

Page:

C99

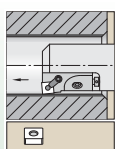


MSTN

60°

Page:

C100



MSYN

85°

Page:

C101



MTFN

90°

Page:

C102



MTGN

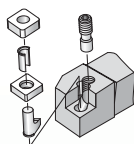
90°

Page:

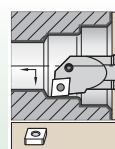
C103

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.

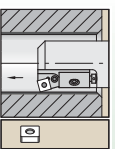


PCLN

95°

Page:

C104



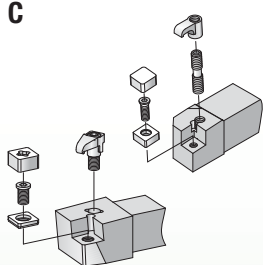
PSKN

75°

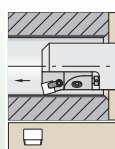
Page:

C105

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.

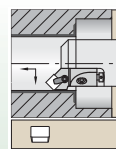

CSKP

75°

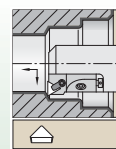
Page:
C106

CSRP

75°

Page:
C107

CSSP

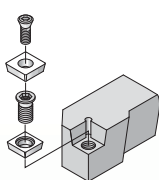
45°

Page:
C108

CTFP

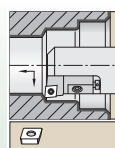
90°

Page:
C109

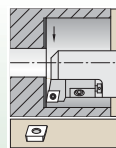
Clamping System S

S


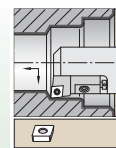
Combined pin/wedge clamp for negative inserts. An extremely sturdy clamping system, specially designed for interrupted cuts. The tool is protected by a carbide shim.


SCFP

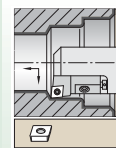
90°

Page:
C110

SCGP

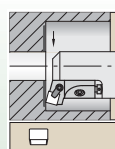
90°

Page:
C111

SCLC

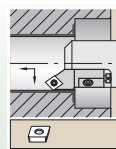
95°

Page:
C112

SCLP

95°

Page:
C113

SCRJP

75°

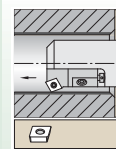
Page:
C114

SCSP

45°

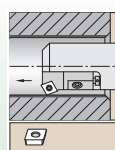
Page:
C115

SCTP

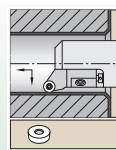
60°

Page:
C116

SCWP

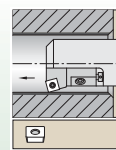
60°

Page:
C117

SDJP

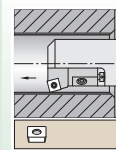
93°

Page:
C118

SRGC

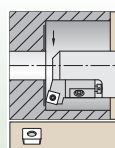
75°

Page:
C119

SSKC

75°

Page:
C120

SSKP

75°

Page:
C121

SSRC

75°

Page:
C122

SSRP

75°

Page:
C123

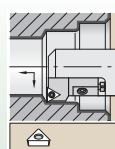
SSSC

45°

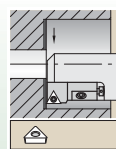
Page:
C124

SSSP

45°

Page:
C125

STFP

90°

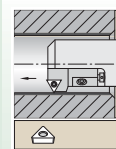
Page:
C126

STGP

90°

Page:
C127

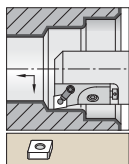
STTP

60°

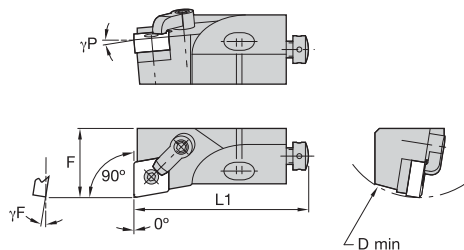
Page:
C128

STWP

60°

Page:
C129



See pages B30–B46
for inserts.



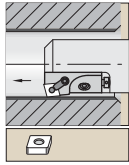
MCFN 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

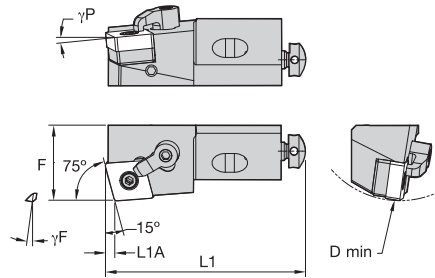
Spare Parts



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.



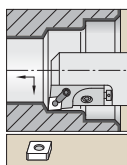
MCKN 75°

order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
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
left hand								
3870417	MCKNL12CA12	50	20,0	55	3	-9.0	-5.0	CN..120408/CN..432

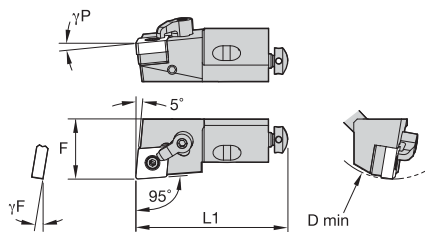
Spare Parts



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.



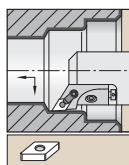
MCLN 95°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

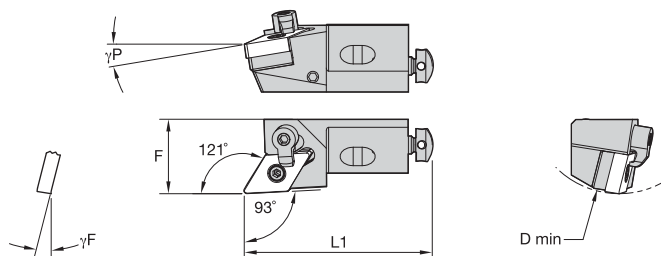
Spare Parts



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.



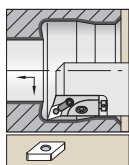
MDJN 93°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
3870406	MDJNL16CA15	60	25,0	63	-9.0	-9.0	DN..150408/DN..3.532

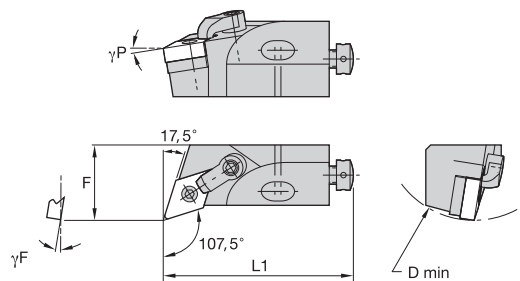
Spare Parts



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.



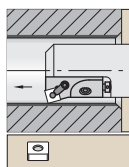
■ MDQN 107,5°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

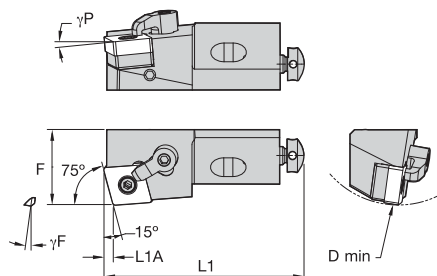
■ Spare Parts



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



See pages B68–B80 for inserts.



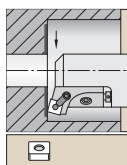
■ MSKN 75°

order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
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
left hand								
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

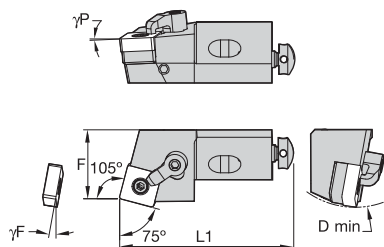
■ Spare Parts



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.



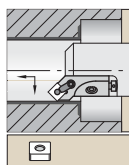
■ MSRN 75°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

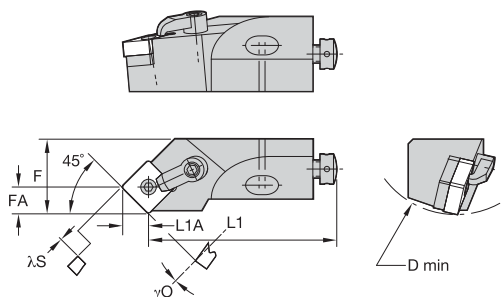
■ Spare Parts



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



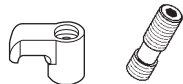
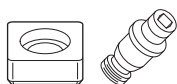
See pages B68–B80 for inserts.



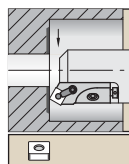
■ MSSN 45°

order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
right hand								
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
left hand								
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

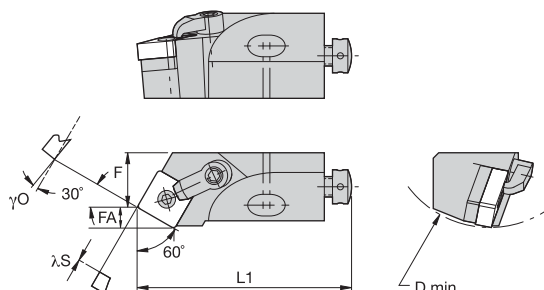
■ Spare Parts



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	Sksen566K	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.



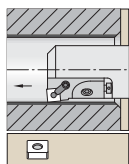
■ MSTN 60°

order number	catalogue number	D min	F	L1	FA	λS°	γO°	gage insert
right hand								
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

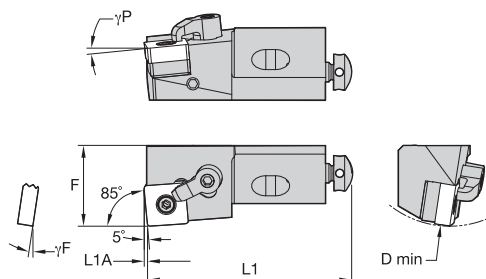
■ Spare Parts



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



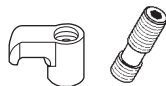
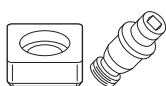
See pages B68–B80 for inserts.



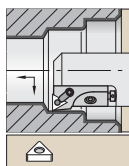
■ MSYN 85°

order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
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
left hand								
3870309	MSYNL10CA09	40,0	14,0	50	0,8	-9.0	-5.0	SN..090308/SN..322

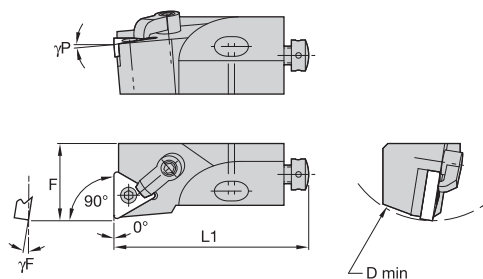
■ Spare Parts



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.



MTFN 90°

order number	catalogue number	D min	F	L1	γ_F°	γ_P°	gage insert
right hand							
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
left hand							
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

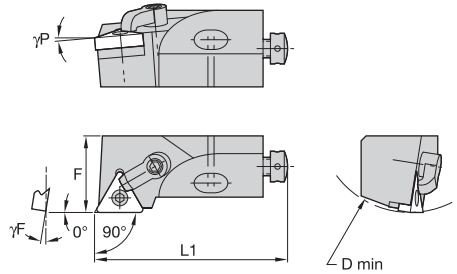
Spare Parts



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.



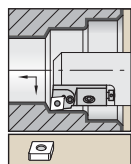
■ MTGN 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

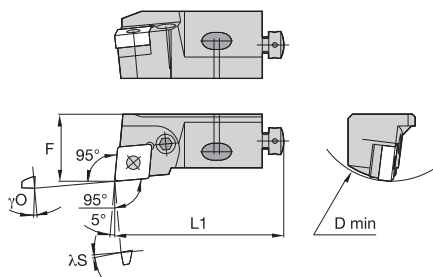
■ Spare Parts



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.



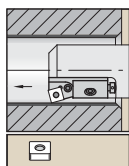
■ PCLN 95°

order number	catalogue number	D min	F	L1	λS°	γO°	gage insert
right hand							
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
left hand							
3871293	PCLNL16CA12	60	25,0	63	-6.0	-7.0	CN..120408/CN..432
3871292	PCLNL20CA16	70	25,0	70	—	—	CN..160612/CN..543

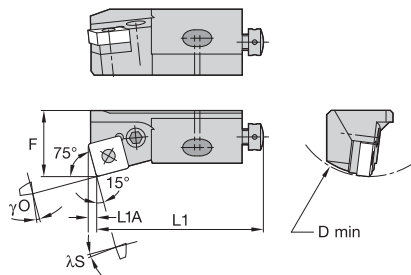
■ Spare Parts



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.



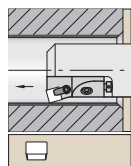
PSKN 75°

order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
right hand								
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
left hand								
3871288	PSKNL16CA12	60,0	25,0	63	3,1	-6.0	-6.0	SN..120408/SN..432

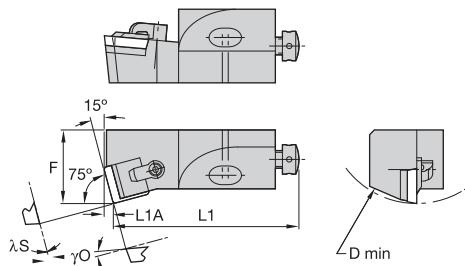
Spare Parts



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.



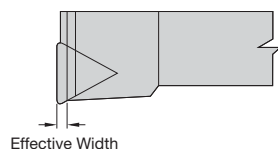
CSKP 75°

order number	catalogue number	D min	F	L1	L1A	λS°	γO°	gage insert
right hand								
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

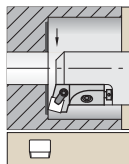


D min	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050

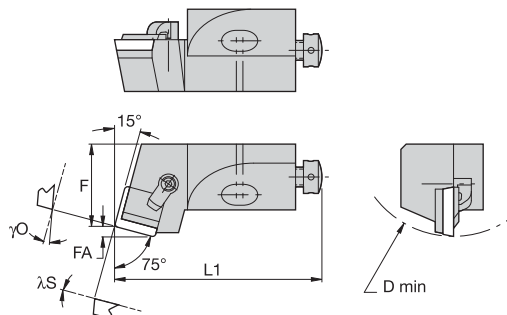


Chipbreakers for C-Style Cartridges

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.



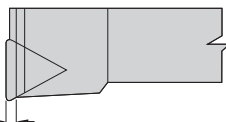
■ CSRP 75°

order number	catalogue number	D min	F	L1	FA	λS°	γO°	gage insert
right hand								
3870435	CSRP10CA09	40,0	14,0	50	2,2	0.0	0.0	SP..090308/SP..322
3870434	CSRP12CA12	50,0	20,0	55	3,0	3.0	0.0	SP..120308/SP..422

■ Spare Parts



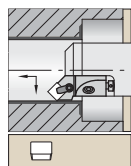
D min	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050



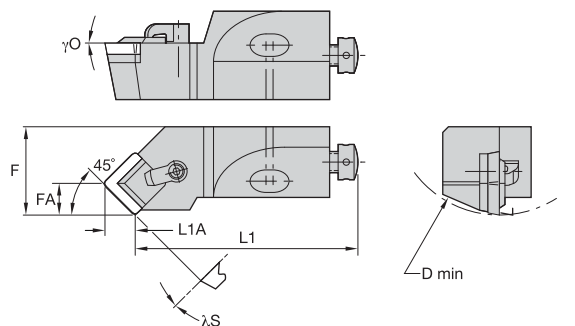
Effective Width

■ 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.



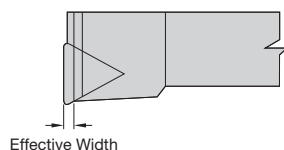
■ CSSP 45°

order number	catalogue number	D min	F	L1	FA	L1A	λS°	γO°	gage insert
right hand									
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
left hand									
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

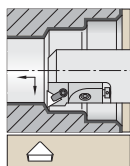


D min	shim	shim screw	hex	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	—	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	—	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
70	SM840	MS111	2 mm	CKM20	STCM11	3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

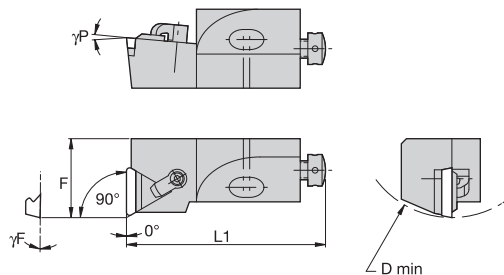


■ Chipbreakers for C-Style Cartridges

Chipbreakers			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 B192–B194 and B212–B216 for inserts.



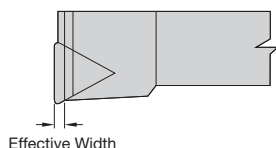
CTFP 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
3870428	CTFPL12CA16	50,0	20,0	55	0.0	5.0	TP..160308/TP..322

Spare Parts

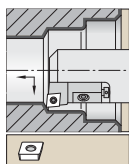


D min	shim	shim screw	clamp	clamp screw	hex	radial adjusting screw	hex	axial adjusting screw	mounting screw	hex	washer
40	—	—	CKM34	STCM38	2 mm	KUAM28	2 mm	KUAM30	191.405	4 mm	CSWM 060 050
50	—	—	CKM34	STCM38	2 mm	KUAM22	2 mm	KUAM31	191.406	4 mm	CSWM 060 050
70	SM837	MS125	CKM35	STCM8	4 mm	KUAM25	2.5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

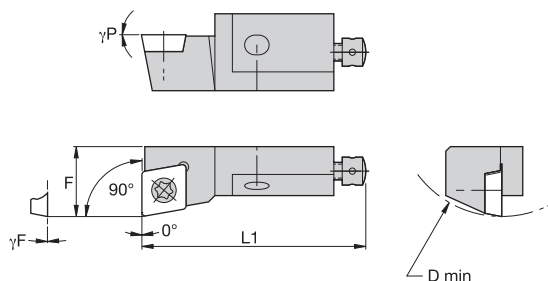


Chipbreakers for C-Style Cartridges

Chipbreakers			note
insert	chipbreaker	effective width	
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.



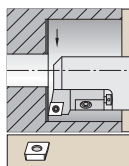
■ SCFP 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
3871285	SCFPL08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151

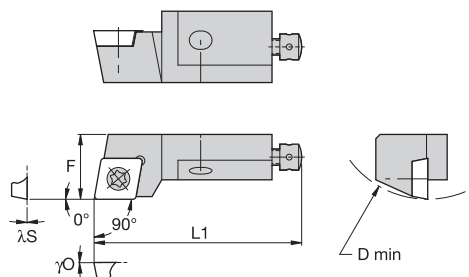
■ Spare Parts



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.



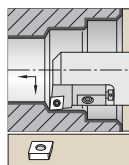
■ SCGP 90°

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

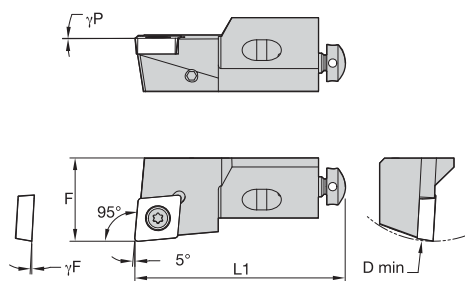
■ Spare Parts



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.



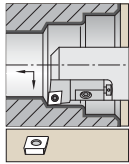
■ SCLC 95°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

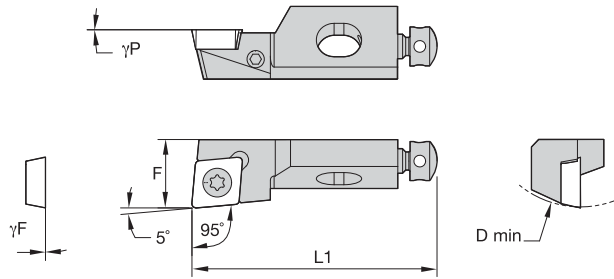
■ Spare Parts



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.



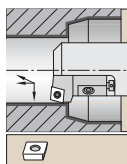
■ SCLP 95°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

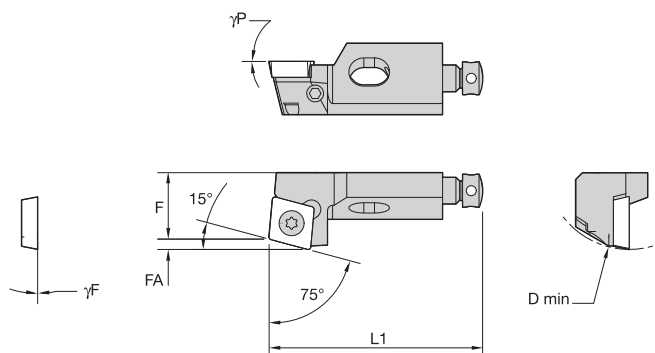
■ Spare Parts



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.



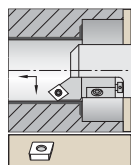
■ SCRP 75°

order number	catalogue number	D min	F	FA	L1	γ_F°	γ_P°	gage insert
right hand								
3871257	SCRPR08CA06	25	10,0	1,5	32	0.0	0.0	CP..060204/CP..2151
left hand								
3871258	SCRPL08CA06	25	10,0	1,5	32	0.0	0.0	CP..060204/CP..2151

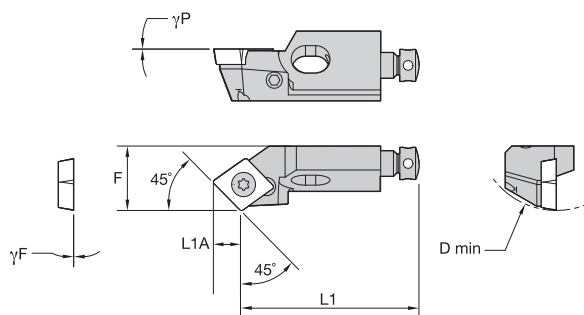
■ Spare Parts



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



See pages B30–B46 for inserts.



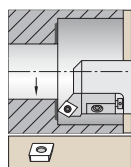
■ SCSP 45°

order number	catalogue number	D min	F	L1	L1A	γF°	γP°	gage insert
right hand								
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

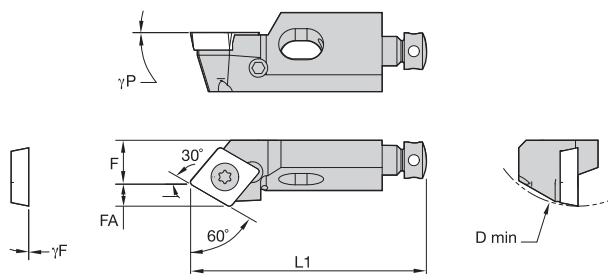
■ Spare Parts



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.



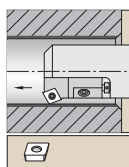
■ SCTP 60°

order number	catalogue number	D min	F	FA	L1	γ_F°	γ_P°	gage insert
right hand								
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
left hand								
3871253	SCTPL08CA06	25	6,0	3,0	32	0.0	0.0	CP..060204/CP..2151

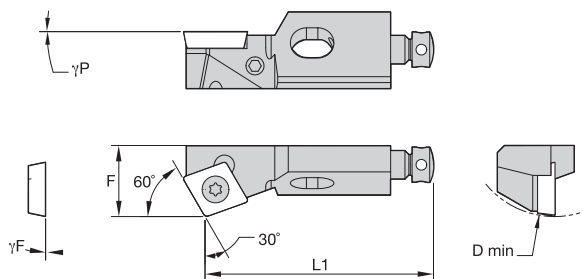
■ Spare Parts



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



See pages B30–B46 for inserts.



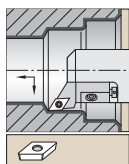
■ SCWP 60°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
3871249	SCWPR08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151
left hand							
3871250	SCWPL08CA06	25	10,0	32	0.0	0.0	CP..060204/CP..2151

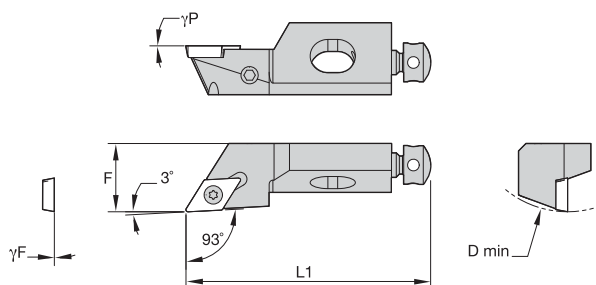
■ Spare Parts



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.



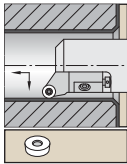
■ SDJP 93°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
3871247	SDJPR10CA07	40	14,0	50	0.0	0.0	DP..070204/DP..2151
left hand							
3871248	SDJPL10CA07	40	14,0	50	0.0	0.0	DP..070204/DP..2151

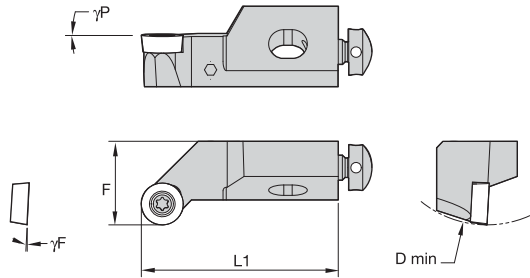
■ Spare Parts



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



See pages B65–B67 for inserts.



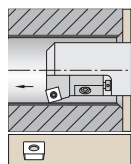
SRGC

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
3871246	SRGCL12CA10	50	20,0	55	-3.0	0.0	RC..10T3M0/RC..10T3M0

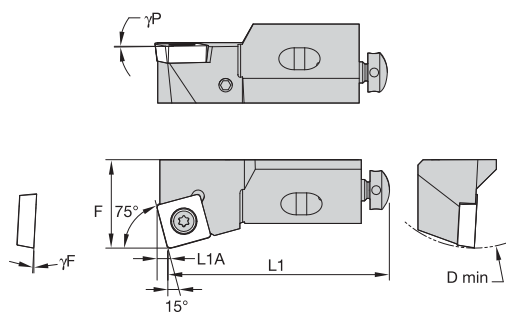
Spare Parts



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.



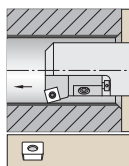
SSKC 75°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
3871243	SSKCL12CA12	50	20,0	55	-3.0	0.0	SC..120408/SC..432

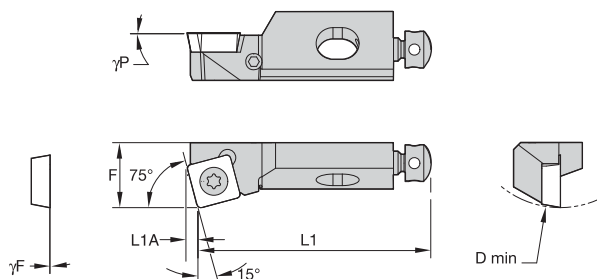
Spare Parts



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.



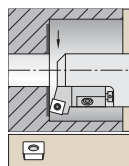
SSKP 75°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
3870394	SSKPL10CA09	40	14,0	50	0.0	0.0	SP..09T308/SP..3252

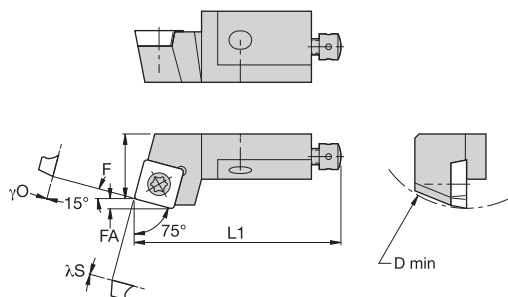
Spare Parts



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.



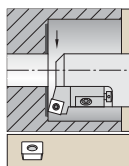
■ SSRC 75°

order number	catalogue number	D min	F	FA	L1	λS°	γO°	gage insert
right hand								
3870390	SSRCR12CA12	50	20,0	3,1	55	-3.0	0.0	SC..120408/SC..432
left hand								
3870391	SSRCL12CA12	50	20,0	3,1	55	-3.0	0.0	SC..120408/SC..432

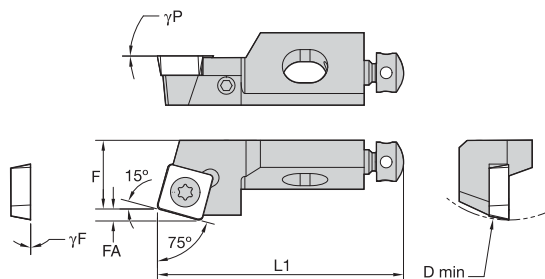
■ Spare Parts



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



See pages B68–B80 for inserts.



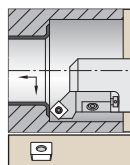
SSRP 75°

order number	catalogue number	D min	F	FA	L1	γF°	γP°	gage insert
right hand								
3870388	SSRPR10CA09	40	14,0	2,2	50	0.0	0.0	SP..09T308/SP..3252
left hand								
3870389	SSRPL10CA09	40	14,0	2,2	50	0.0	0.0	SP..09T308/SP..3252

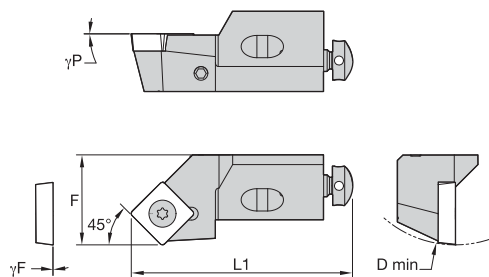
Spare Parts



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.



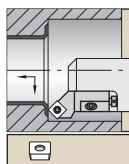
SSSC 45°

order number	catalogue number	D min	F	L1	γ_F°	γ_P°	gage insert
right hand							
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
left hand							
3870387	SSSCL12CA12	50	20,0	47	-3.0	0.0	SC..120408/SC..432

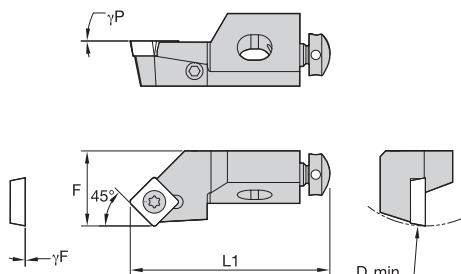
Spare Parts



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.



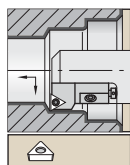
SSSP 45°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
3870382	SSSPR10CA09	40	14,0	44	0.0	0.0	SP..09T308/SP..3252
left hand							
3870383	SSSPL10CA09	40	14,0	44	0.0	0.0	SP..09T308/SP..3252

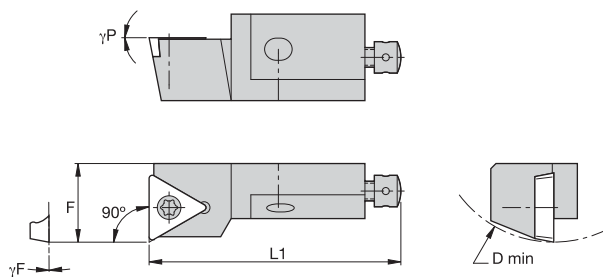
Spare Parts



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.



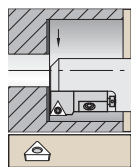
STFP 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

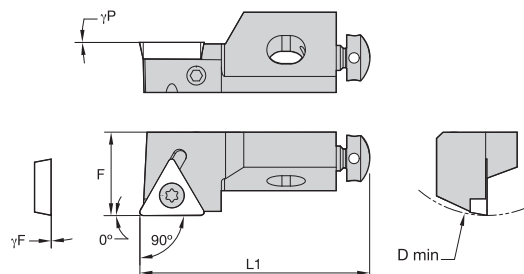
Spare Parts



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.



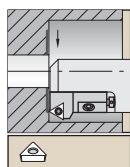
STGP 90°

order number	catalogue number	D min	F	L1	γF°	γP°	gage insert
right hand							
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
left hand							
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

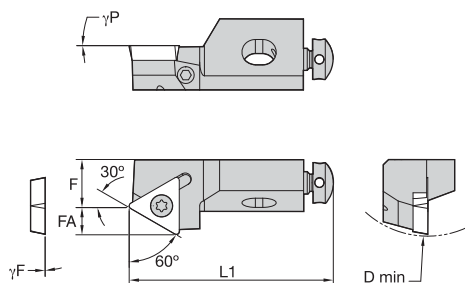
Spare Parts



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.



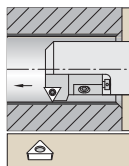
■ STTP 60°

order number	catalogue number	D min	F	FA	L1	γF°	γP°	gage insert
right hand								
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

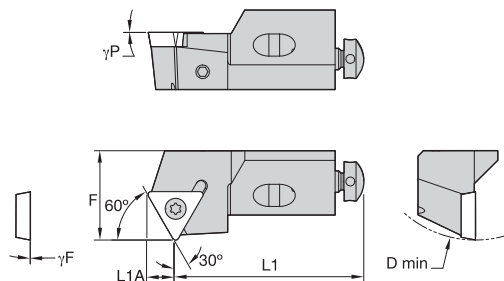
■ Spare Parts



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	γF°	γP°	gage insert
right hand								
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
left hand								
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



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

Small Hole Boring • I.D. Indexable Insert Tooling

The WIDIA™ line of micro boring bars provides accurate holmaking 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.

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.





Triangle Insert Boring Bars

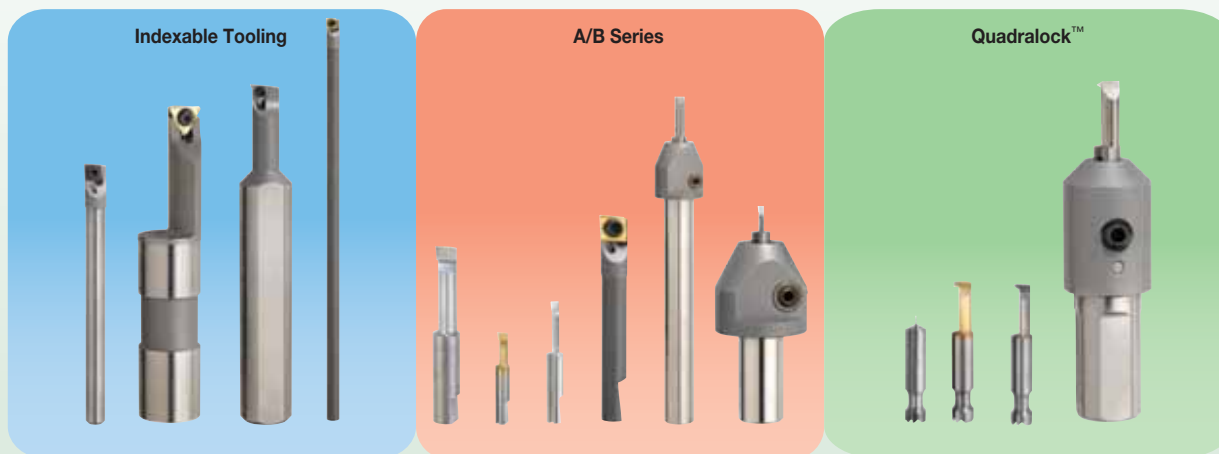
- Designed for less obstruction and greater chip evacuation.
- Positive rake geometry to bore holes >6,98mm diameter.
- Stocked in all grades, including diamond-tipped and borazon-tipped styles.
- Stocked in shanks as small as 6mm for 7,06mm minimum bore diameter.



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).

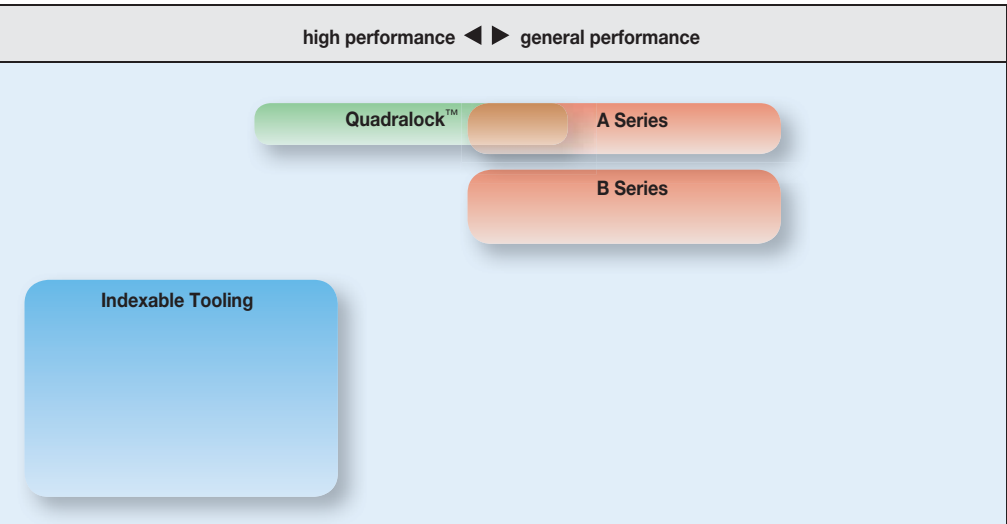
NOTE: Proper bar selection will have largest minimum bore dimension under hole size to be bored.

- Indexable Tooling
- A/B Series
- Quadralock

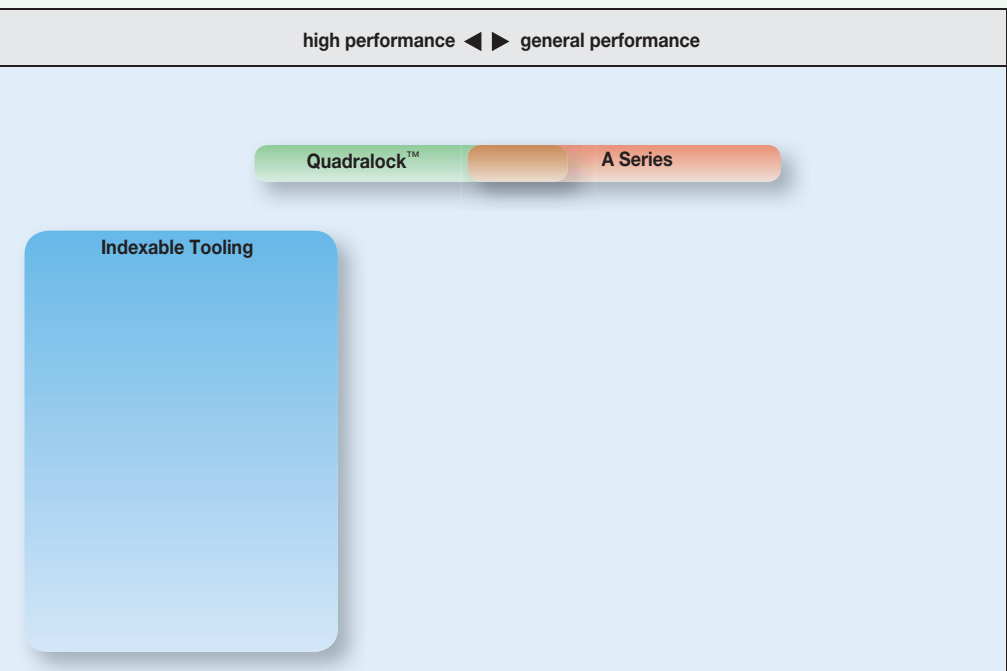
Boring

minimum bore diameter (D min)	high performance ◀ ▶ general performance
1	◀ ▶ ◀ ▶

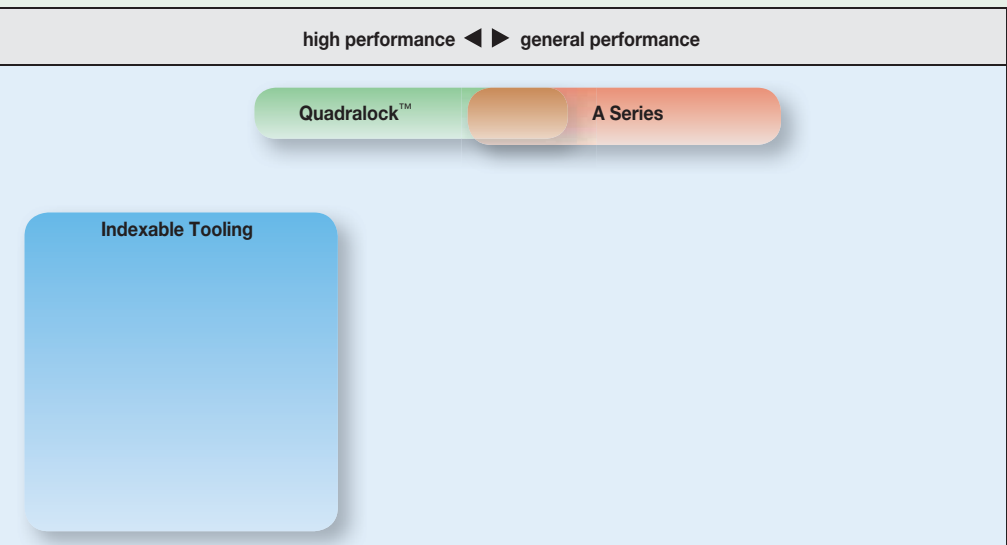
Profiling

minimum bore diameter (D min)	high performance ◀ ▶ general performance
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	

Threading

minimum bore diameter (D min)	high performance ◀ ▶ general performance
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

Grooving

minimum bore diameter (D min)	high performance ◀ ▶ general performance
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

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	KH	D	D min	F	L1	A	qF°	qP°	gage insert	insert screw	Tors
right hand												
2831801	CCBM5100R	90	5.08	5.34	3.18	102.58	1.02	0.0°	5.0°	CD.5470G2	CC11	T8
2896025	CCBM6100R	90	6.00	7.08	3.73	100.33	1.19	0.0°	5.0°	CD.5470G2	CC11	T8
2831277	CCBM61520R	90	8.00	9.04	4.70	152.15	2.36	0.0°	5.0°	CD.5470G2	CC11	T8
2831826	CCBM5100SR	95	5.08	5.34	3.02	100.58	1.02	0.0°	5.0°	CD.5470G2	CC11	T8
2831311	CCBM6152SR	95	6.00	7.08	3.73	152.15	1.19	0.0°	5.0°	CD.5470G2	CC11	T8
2831821	CCBM6100SR	95	6.00	7.08	3.73	100.33	1.19	0.0°	5.0°	CD.5470G2	CC11	T8
2831289	CCBM6152SR	95	8.00	9.04	4.70	152.15	2.36	0.0°	5.0°	CD.5470G2	CC11	T8

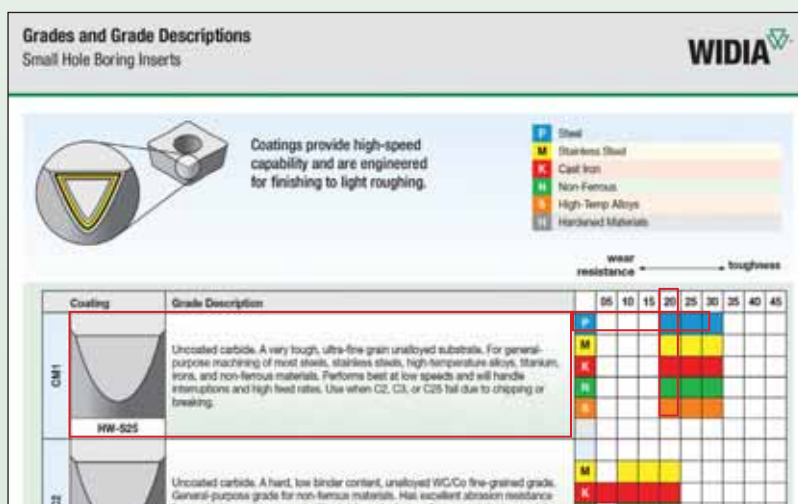
3 Determine which chipbreaker is best for the material to be machined.

Consult the Small Hole Boring Chipbreaker Geometry charts on **pages D34–D37**.

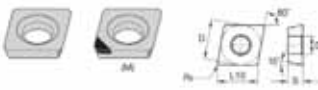


4 Determine which grade is best for the material to be machined.

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										
WIDIA										
										
• first choice ◻ alternate choice										
■ CDHB										
ISO catalogue number	D	L10	S	R _{0.1}	D1	max	C2	C25	C3	CG5
CDHB54T020	3.97	4.03	1.02	0.05	2.13	—	200067	200067	200067	200067
CDHB54T020M	3.97	4.03	1.02	0.05	2.13	1.90	—	—	—	—
CDHB54T022	3.97	4.03	1.02	0.18	2.13	—	200064	200064	200064	200064
CDHB54T022M	3.97	4.03	1.02	0.18	2.13	0.96	—	—	—	—
CDHB54T024M	3.97	4.03	1.02	0.38	2.13	0.96	—	—	—	—
CDHB54T024	3.97	4.03	1.02	0.38	2.13	—	200060	200060	200060	200060

NOTE: Max DOC only applies to tipped inserts, which are designated with an "M" at the end of the catalogue number.

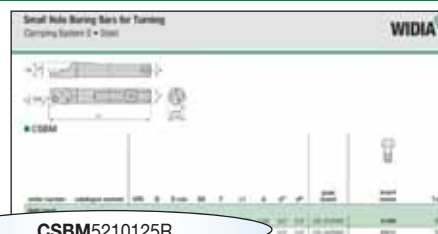
6 Determine the Speed and Feed Chart with the appropriate cutting data.

- 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.

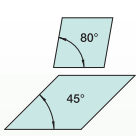
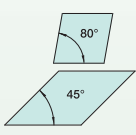
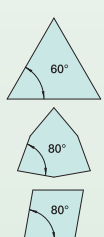
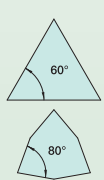
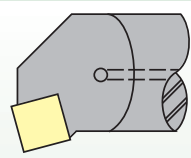
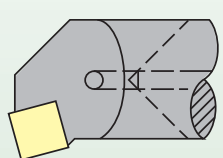
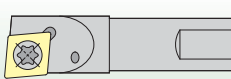
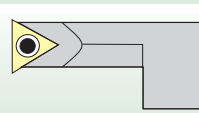
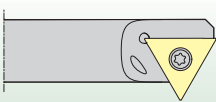
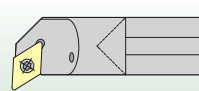
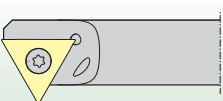
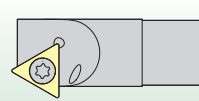
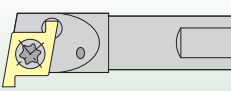
Speed and Feed Chart															
Positive Inserts • Metric															
Cutting Speed — vc m/min															
Material Group	C2			C25			C3			CG5			CG55		
	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	
P	ap [mm]	—	—	—	—	—	—	—	—	0.051	—	0.300	0.051	—	
	f [mm/rev]	—	—	—	—	—	—	—	—	0.025	—	0.300	0.025	—	
	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	
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
	2	50	60	75	55	70	85	55	70	85	65	80	100	75	90
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
	2	65	80	100	75	90	110	75	90	110	75	95	115	85	105
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
	2	295	370	440	295	370	445	295	370	445	295	370	445	325	405
	3	70	85	105	70	85	105	70	85	105	85	105	125	90	115
	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

C	S	B	M	
Series Type	Bar Type	Bar Style Designation	Units	Insert Shape (optional)
C  F  G  L  Q  S 	S  S = Steel (with coolant) C  C = Carbide (with coolant)		M = Metric	C  W 
		B  Boring Bar		O  Offset Boring Bar
		C  External Chamfering Bar		P  Profiling Bar
		I  Internal Threading Bar		R  Reverse Chamfer or Back Chamfer Bar
		M  Offset Internal Grooving Bar		

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
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°

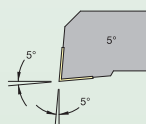
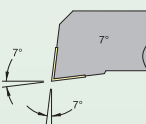
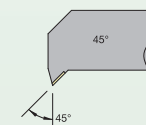
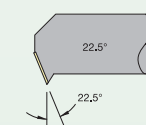
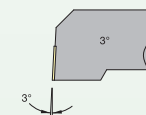
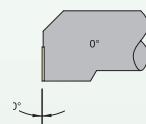
7 = 7°

225 = 22.5°

30 = 30°

45 = 45°

60 = 60°



R

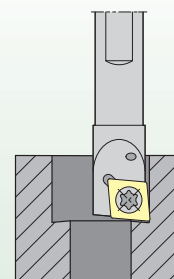
Hand of Tool

R = Right hand

L = Left hand

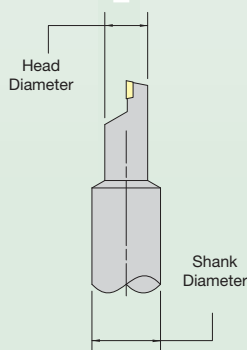
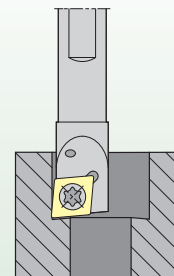
Right-hand boring bar

R



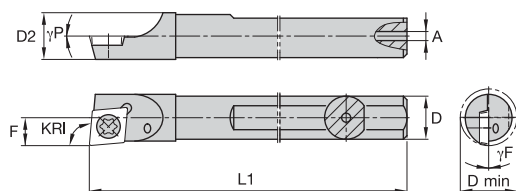
Left-hand boring bar

L



NOTE: Only shown on stepped-style bars.

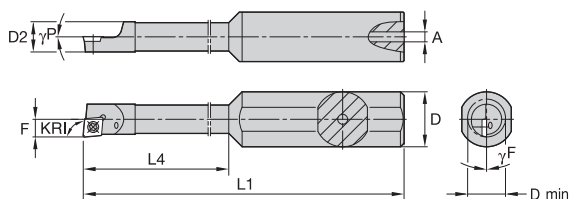
*NOTE: Shown as "KRI" for metric bars.



■ CSBM

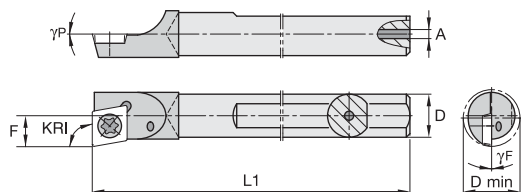
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand													
3896205	CSBM5650R	90	5,00	5,94	5,16	3,10	63,50	1,02	0.0°	5.0°	CD..S4T002	CC09	T6
2831676	CSBM6650R	90	6,00	7,09	6,20	3,73	63,50	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831441	CSBM5655R	95	5,00	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
left hand													
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

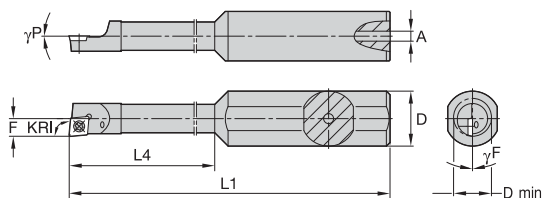
order number	catalogue number	KRI	D	D min	D2	F	L1	L4	A	γF°	γP°	gage insert	insert screw	Torx
right hand														
2831606	CSBM5210250R	90	10,00	5,94	5,16	3,10	70,00	25,72	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831499	CSBM5212250R	90	12,00	5,94	5,16	3,10	70,00	25,40	1,02	0.0°	5.0°	CD..S4T002	CC11	T6
2831477	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
left hand														
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



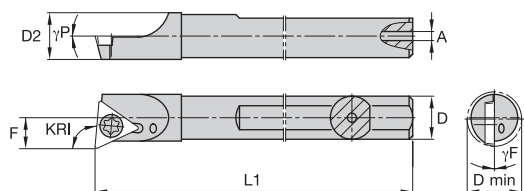
■ CCBM

order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand												
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
left hand												
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



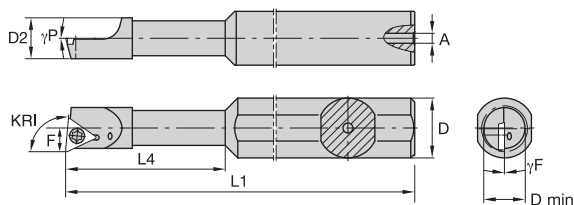

CCBM • STEPPED


order number	catalogue number	KRI	D	D min	F	L1	L4	A	γF°	γP°	gage insert	insert screw	Torx
right hand													
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
left hand													
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



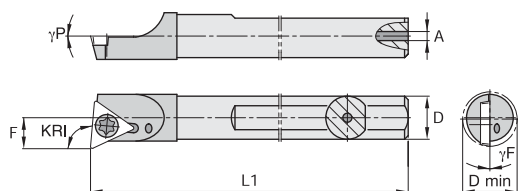
■ FSBM

order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
													
right hand													
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
left hand													
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
right hand														
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
left hand														
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

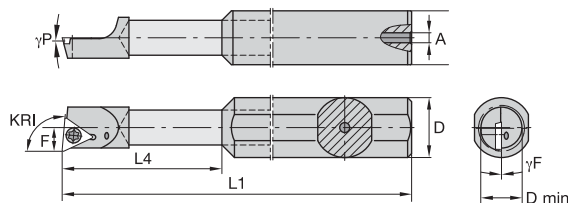




■ FCBM

order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand												
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
left hand												
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

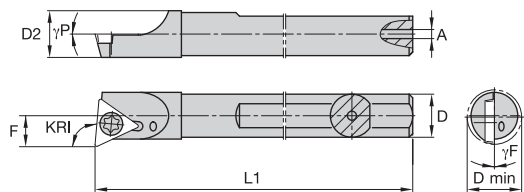




FCBM • STEPPED

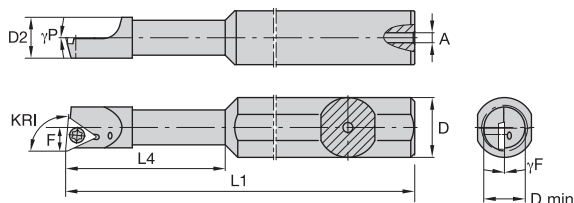
order number	catalogue number	KRI	D	D min	F	L1	L4	A	γF°	γP°	gage insert	insert screw	Torx
right hand													
3896072	FCBM6612630R	90	12,00	7,52	3,96	101,60	63,50	1,19	0.0°	5.0°	TD..07S102	FC14	T7
2829268	FCBM8212790R	90	12,00	9,09	4,75	117,48	79,38	3,18	0.0°	5.0°	TD..07S102	FC14	T7
3896069	FCBM5316250R	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
left hand													
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





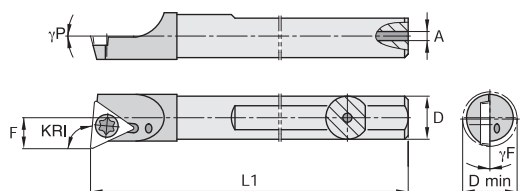
■ QSBM

order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
													
right hand													
3886552	QSBM101275R	95	10,00	11,15	10,21	5,79	127,00	3,20	0.0°	5.0°	TP..110202	QC21	T9
left hand													
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
right hand														
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
left hand														
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

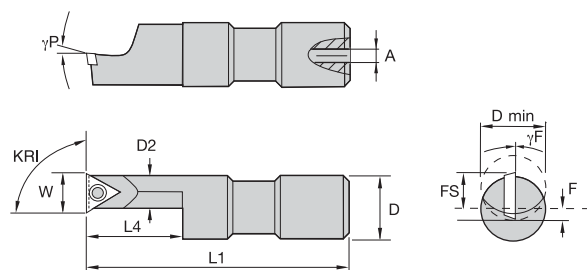




■ QCBM

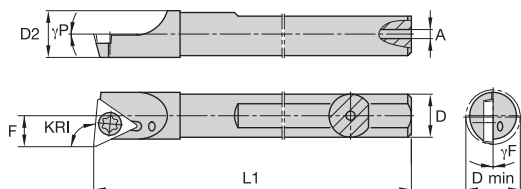
order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand												
3854445	QCBM102540R	90	10,00	11,15	5,79	254,00	3,20	0.0°	5.0°	TP..110202	QC21	T9
2824776	QCBM102545R	95	10,00	11,15	5,79	254,00	3,20	0.0°	5.0°	TP..110202	QC21	T9
2824747	QCBM122545R	95	12,00	13,16	6,81	254,00	4,70	0.0°	5.0°	TP..110202	QC21	T9
left hand												
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	γF°	γP°	gage insert	insert screw	Torx
right hand																
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

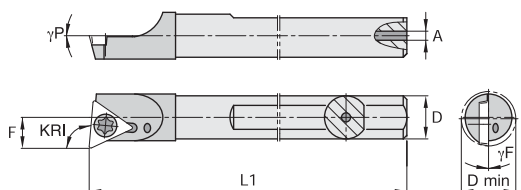


SSBM

order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand													
3886968	SSBM202030R	90	20,00	21,23	20,19	10,90	203,20	4,00	0.0°	5.0°	TP..160302	SC30	T10
left hand													
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



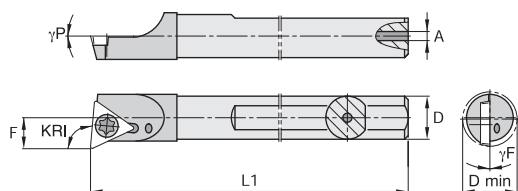
Clamping System S • Carbide



SCBM

order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand												
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
left hand												
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

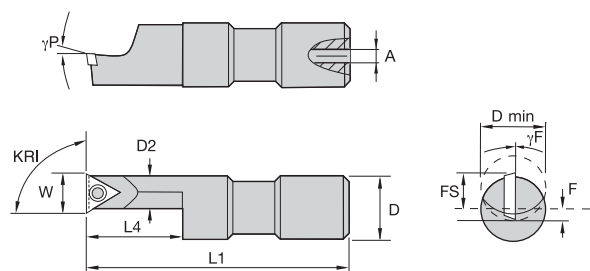




SDBM

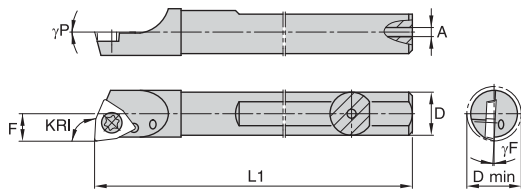
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand													
3896011	SDBM162540R	90	16,00	17,25	—	8,89	254,00	5,51	0.0°	5.0°	TP..160302	SC30	T10
3896014	SDBM202540R	90	20,00	21,25	—	10,90	254,00	7,11	0.0°	5.0°	TP..160302	SC30	T10
2822085	SDBM162545R	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
left hand													
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
right hand																
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

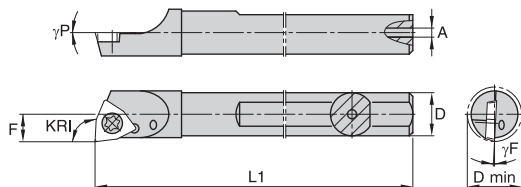


GSBMW

order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand													
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
left hand													
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



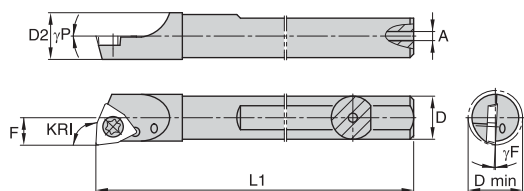
Clamping System S • Carbide



GCBMW

order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand												
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
left hand												
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

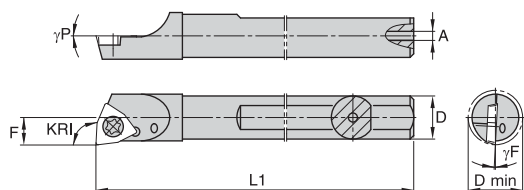




■ QSBMW

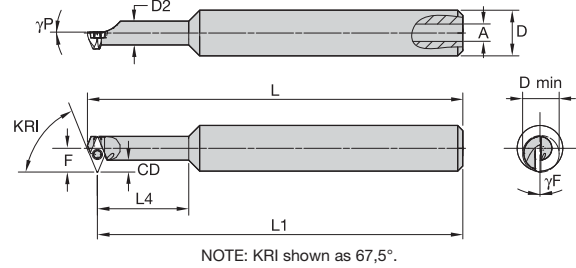
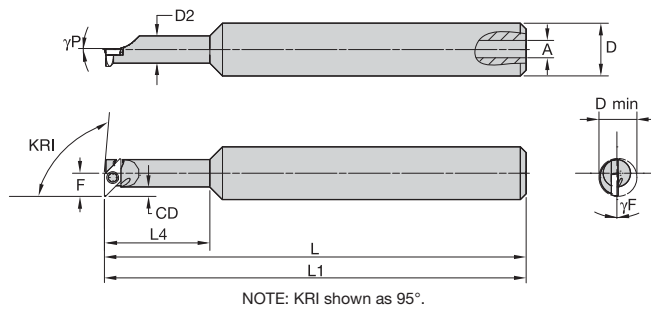
order number	catalogue number	KRI	D	D min	D2	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
													
right hand													
3393828	QSBMW121523R	93	12,00	12,90	12,19	6,55	152,40	4,00	-3.0°	0.0°	WP..040204	QTM20	T7
left hand													
3886952	QSBMW101273L	93	10,00	10,94	10,70	5,59	127,00	3,20	-3.0°	0.0°	WP..040204	QTM20	T7

Clamping System S • Carbide



■ QCBMW

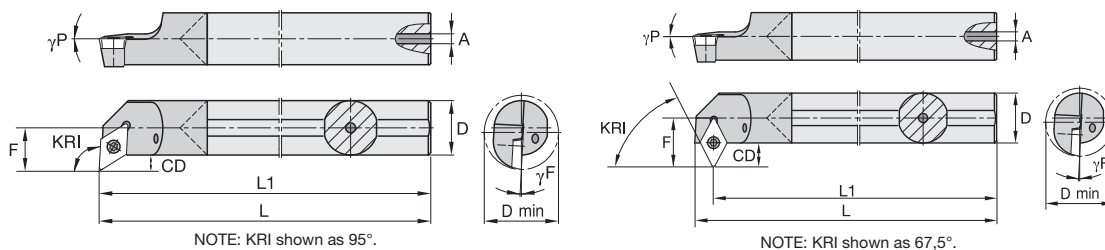
order number	catalogue number	KRI	D	D min	F	L1	A	γF°	γP°	gage insert	insert screw	Torx
												
right hand												
3782378	QCBMW102543R	93	10,00	10,95	5,59	254,00	3,20	-3.0°	0.0°	WP..040204	QTM20	T7
left hand												
3896045	QCBMW102543L	93	10,00	10,95	5,59	254,00	3,20	-3.0°	0.0°	WP..040204	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	γF°	γP°	gage insert	insert screw	Torx
right hand																
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
left hand																
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

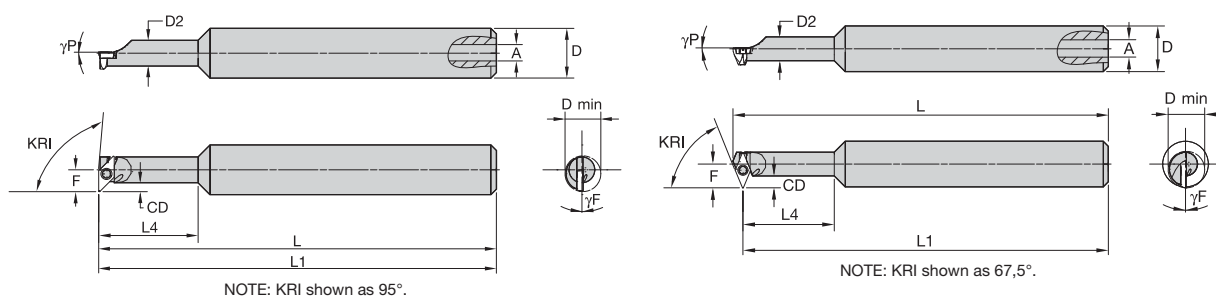




CCPM

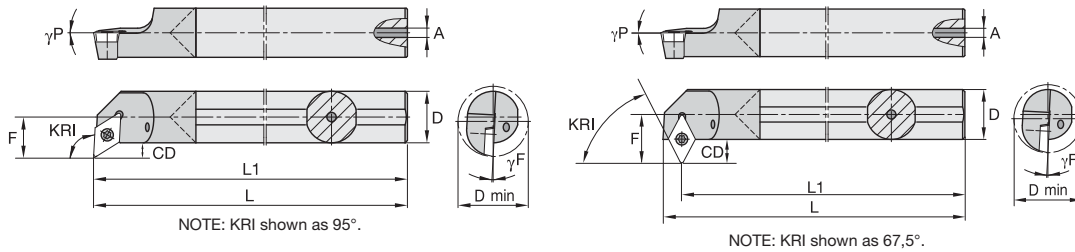
order number	catalogue number	KRI	D	D min	F	CD	L	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand														
2831010	CCPM6152225R	67.5	6,00	10,16	6,60	3,51	154,61	152,40	1,19	0.0°	0.0°	GP..050102	CT15	T6
2831020	CCPM61525R	95.0	6,00	9,14	5,59	2,49	152,40	152,40	1,19	0.0°	0.0°	GP..050102	CT15	T6
left hand														
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



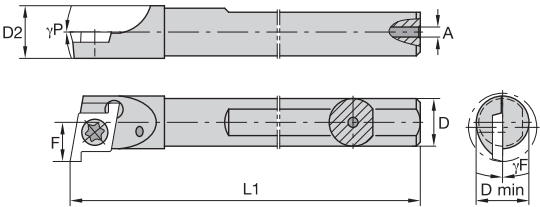
GSPM

order number	catalogue number	KRI	D	D min	D2	F	CD	L	L1	L4	A	γF°	γP°	gage insert	insert screw	Torx
right hand																
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
left hand																
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



GCPM

order number	catalogue number	KRI	D	D min	F	CD	L	L1	A	γF°	γP°	gage insert	insert screw	Torx
right hand														
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
left hand														
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

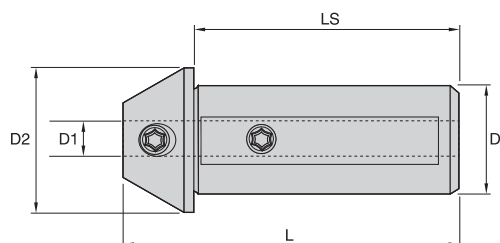


CSMM

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.

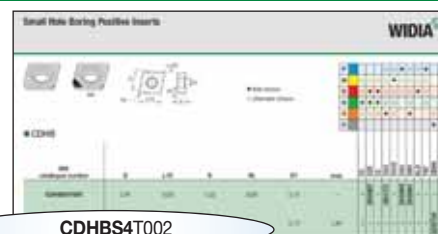
Tools for Small Hole Boring


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

T	60°	
C	80°	
G	45°	
W	80°	

D

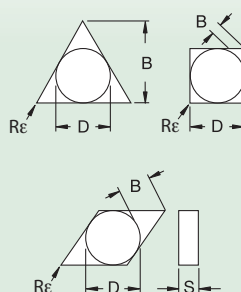
Insert Clearance Angle

B	5°	
C	7°	
D	15°	
P	11°	

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

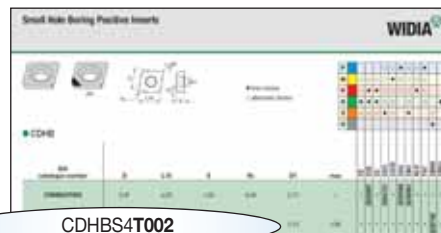
"D" mm	Code for metric cutting edge length "L10"			
	C	G	T	W
3,97	S4	05	06	—
4,06	—	—	07	—
4,76	04	06	08	S3
6,35	06	—	11	04
9,53	09	—	16	06
9,80	—	—	17	—

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

Partly cylindrical hole, 40–60° countersink, single-sided	W	without chipbreaker		
	T	with chipbreaker		

Partly cylindrical hole, 70–90° countersink, single-sided	B	without chipbreaker		
	H	with chipbreaker		

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



CDHBS4T002

T0

Thickness

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

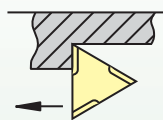
02

Corner
Radius "R_c"

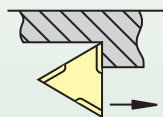
symbol mm	corner radius mm
X0	0,04; 0,05
01	0,1
02	0,2; 0,18
04	0,4; 0,38
05	0,5
08	0,8
09	0,9
12	1,2
16	1,6

Hand of Insert
(optional)

R = Right hand
L = Left hand



R



L

Cutting Edge Condition
or Chip Control Features
(optional)

HP = High positive
LF = Light finishing

Tip Style
(optional)

Symbol
M
Usage
Mini tip

"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					

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					

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.
- CG67** — High-speed, general-purpose grade for all kinds of steel and cast iron.
- CG557** — 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.
- CM17** — 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.

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

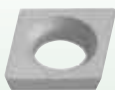
wear resistance = harder

- 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.

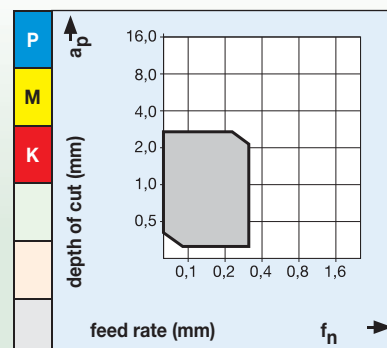
toughness = softer

■ Single-Sided, Positive Inserts

..HB



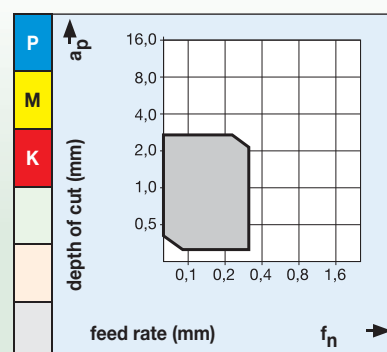
Flat inserts. Peripheral ground for best surface quality and reduced cutting pressure. Very stable cutting edge offers maximum rigidity.



..HT



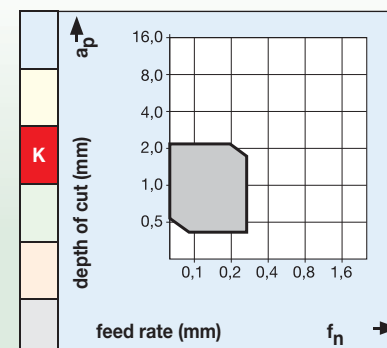
Peripheral ground insert chipbreaker. Good chip control. Geometry for general-purpose applications.



..HB-M



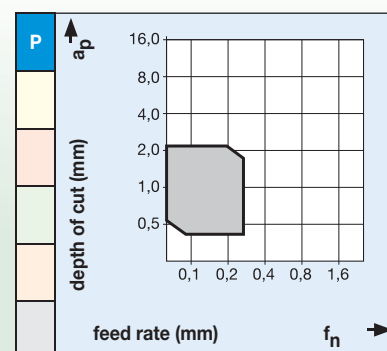
Cubic Boron Nitride (CBN) or Polycrystalline Diamond (PCD) tip for high-temp alloys and non-ferrous machining. Very stable cutting edge offers maximum rigidity.



..LF



Geometry for general-purpose applications. Very good chip control. Recommended for general finish machining.



Geometry Selection Criteria

Flat Top-Type Inserts

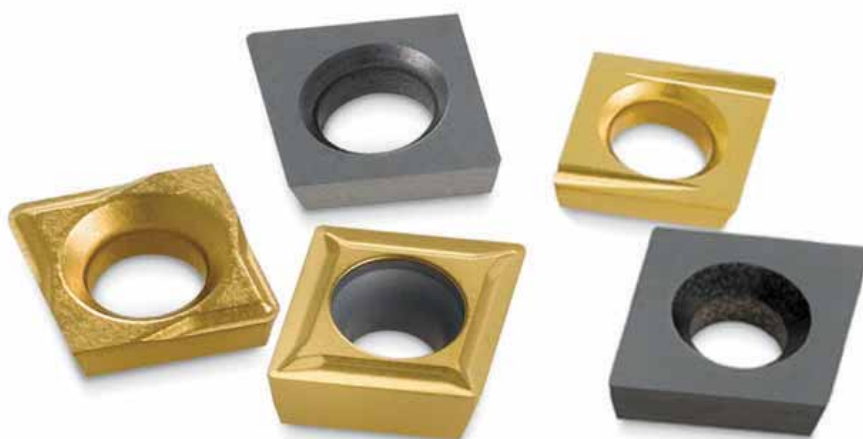
Chipbreaker Geometry ..HB, ..HB-M, ..HW

- 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.

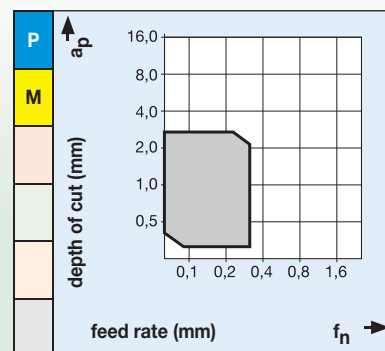


■ Single-Sided, Positive Inserts

..HH



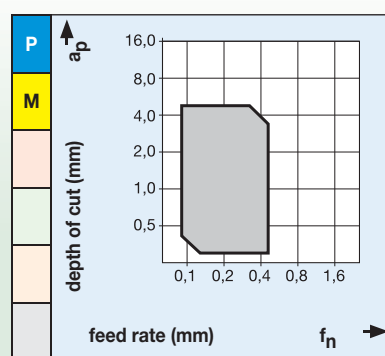
Peripheral ground for best surface quality and reduced cutting pressure. For fine to medium finishes.



HP



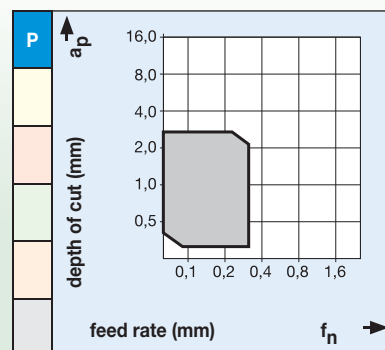
High positive-type chipbreaker. Peripheral ground for best surface quality and reduced cutting pressure. Recommended for high-temp alloys and non-ferrous machining.



..HH-R/L



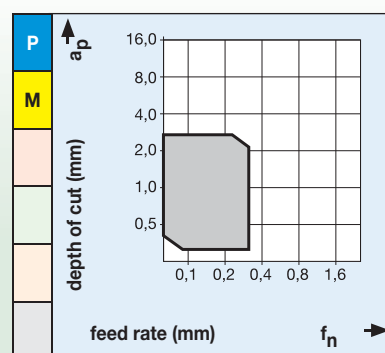
Ground-in chipbreaker. Peripheral ground for best surface quality and reduced cutting pressure.
*Right-hand inserts used in left-hand bars ONLY. Left-hand inserts used in right-hand bars ONLY.



..HW



Flat insert for profiling. Very stable cutting edge offers maximum rigidity.



Geometry Selection Criteria

Pressed Chipbreaker-Type Inserts with Ground Periphery

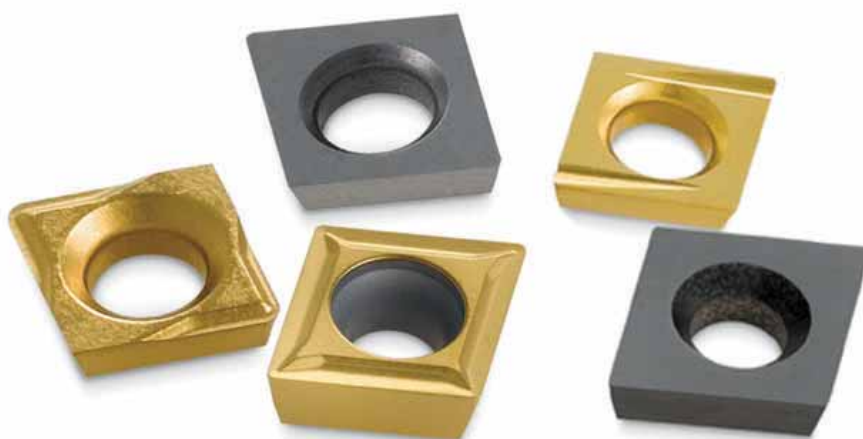
Chipbreaker Geometry ..HH, ..HT, HP

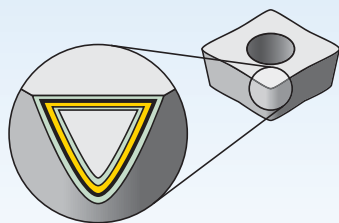
- Suitable for light to moderate interruption of cuts.
- Use when chip control is a concern.
- Superior surface finish and closer tolerance on workpiece.

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.



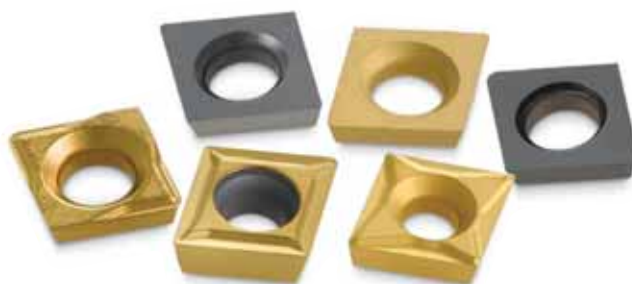


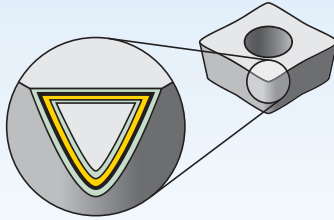
Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45	
CM1		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										
HW-S25													
C2		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										
HW-N15													
C3 and C25		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										
HW-K15													
TN7		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										
			K										
HT-P15													
ALO		Coated carbide. CVD — TiCN-TiC-Al ₂ O ₃ . 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										
HC-K15													



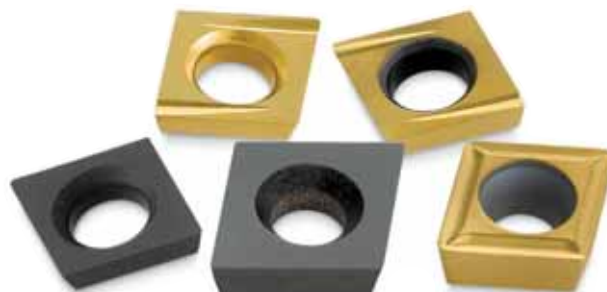


Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45	
CG6		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.	P										
	M												
	K												
	HC-P10												
CG5		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.	P										
	M												
	K												
	N												
	S												
	HC-S25												
CG55		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.	P										
	M												
	K												
	S												
	HC-M20												
CBN6		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.											
	BN-H25												
CPD1		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.											
	N												
	DP-N10												

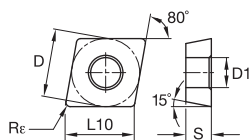
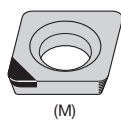


Material Group		Cutting Speed — vc m/min																	
		C2			C25			C3			CG5			CG55			CG6		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	ap [mm]	—	—	—	—	—	—	—	—	—	0,051	—	0,300	0,051	—	0,300	0,051	—	0,300
	f [mm/rev]	—	—	—	—	—	—	—	—	—	0,025	—	0,300	0,025	—	0,300	0,025	—	0,300
	0/1	—	—	—	—	—	—	—	—	—	95	115	140	105	130	155	125	155	190
	2	—	—	—	—	—	—	—	—	—	60	75	90	65	85	100	80	100	125
	3	—	—	—	—	—	—	—	—	—	60	75	90	65	85	100	80	100	125
	4	—	—	—	—	—	—	—	—	—	45	60	70	50	65	80	65	80	95
	5	—	—	—	—	—	—	—	—	—	60	75	90	65	85	100	80	100	125
	6	—	—	—	—	—	—	—	—	—	40	50	60	45	55	70	55	65	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	70	80	60	80	95	60	80	95	75	90	110	80	100	120	95	115	140
	2	50	60	75	55	70	85	55	70	85	65	80	100	75	90	110	85	105	125
	3	35	45	55	45	50	65	45	50	65	50	60	75	55	65	80	60	80	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	65	80	60	70	85	60	70	85	60	75	90	65	80	100	75	90	110
	2	65	80	100	75	90	110	75	90	110	75	95	115	85	105	125	95	115	140
	3	50	60	75	55	65	80	55	65	80	55	70	80	60	75	90	65	85	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	505	605	400	505	605	400	505	605	400	505	605	445	555	665	—	—	—
	2	295	370	440	295	370	445	295	370	445	295	370	445	325	405	490	—	—	—
	3	70	85	105	70	85	105	70	85	105	85	105	125	90	115	135	—	—	—
	4	310	380	465	310	385	465	310	385	465	140	175	210	155	190	230	—	—	—
	5	145	185	220	145	185	220	145	185	220	175	220	265	195	240	290	—	—	—
	6	140	175	210	140	175	210	140	175	210	170	210	255	185	235	280	—	—	—
	7	240	295	355	240	300	360	240	300	360	245	305	365	265	335	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	35	45	30	35	45	30	35	45	30	35	45	35	40	50	—	—	—
	2	25	30	35	25	30	35	25	30	35	25	30	35	25	35	40	—	—	—
	3	25	30	35	25	30	35	25	30	35	30	40	50	35	45	55	—	—	—
	4	25	30	35	25	30	35	25	30	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.

		Cutting Speed — vc m/min														
Material Group		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	65	80	165	205	245	200	245	295	–	–	–	–	–	–
	2	35	45	55	105	135	160	130	160	190	–	–	–	–	–	–
	3	35	45	55	105	135	160	130	160	190	–	–	–	–	–	–
	4	25	35	40	85	105	125	100	125	150	–	–	–	–	–	–
	5	35	45	55	105	135	160	130	160	190	–	–	–	–	–	–
	6	25	30	35	70	90	105	85	105	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	65	80	105	130	160	105	130	155	–	–	–	–	–	–
	2	50	60	75	95	120	145	95	115	140	–	–	–	–	–	–
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	60	70	125	155	185	80	105	125	–	–	–	–	–	–
	2	60	75	90	160	200	240	105	130	160	–	–	–	–	–	–
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	505	605	–	–	–	400	505	605	–	–	–	855	1065	1280
	2	295	370	445	–	–	–	295	370	445	–	–	–	650	810	975
	3	70	85	105	–	–	–	80	100	120	–	–	–	365	455	550
	4	100	125	150	–	–	–	195	240	290	–	–	–	325	405	490
	5	145	185	220	–	–	–	195	245	295	–	–	–	340	425	510
	6	140	175	210	–	–	–	175	220	265	–	–	–	335	420	505
S	ap [mm]	0,025	–	0,200	–	–	–	–	–	–	0,025	–	0,200	–	–	–
	f [mm/rev]	0,025	–	0,127	–	–	–	–	–	–	0,025	–	0,127	–	–	–
	1	25	30	40	–	–	–	–	–	–	90	110	135	–	–	–
	2	20	25	30	–	–	–	–	–	–	70	85	105	–	–	–
H	ap [mm]	–	–	–	–	–	–	–	–	–	0,025	–	0,200	–	–	–
	f [mm/rev]	–	–	–	–	–	–	–	–	–	0,025	–	0,127	–	–	–
	1	–	–	–	–	–	–	–	–	–	110	135	165	–	–	–
	2	–	–	–	–	–	–	–	–	–	105	130	155	–	–	–
	3	–	–	–	–	–	–	–	–	–	100	120	145	–	–	–
	4	–	–	–	–	–	–	–	–	–	90	110	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.



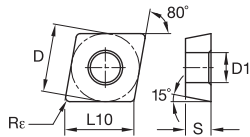
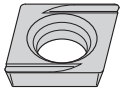
- first choice
- alternate choice

P												
M												
K												
N												
S												
H												

Tools for Small Hole Boring

ISO catalogue number	D	L10	S	Rε	D1	max	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
CDHBS4T0X0	3,97	4,03	1,02	0,05	2,13	—	—	2830897	—	3884731	—	2830888	2830881	—	—	—	—
CDHBS4T0X0M	3,97	4,03	1,02	0,05	2,13	1,90	—	—	—	—	—	—	—	—	—	2830746	—
CDHBS4T002	3,97	4,03	1,02	0,18	2,13	—	—	2830864	—	3884732	—	2830853	2830848	2830870	2830843	—	—
CDHBS4T002M	3,97	4,03	1,02	0,18	2,13	0,96	—	—	—	—	—	—	—	—	—	2830741	2830774
CDHBS4T004M	3,97	4,03	1,02	0,38	2,13	0,96	—	—	—	—	—	—	—	—	—	—	2830769
CDHBS4T004	3,97	4,03	1,02	0,38	2,13	—	—	2830830	—	2830788	—	2830817	2830813	—	2830803	—	—

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

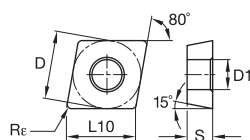
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■ CDHH-R/L

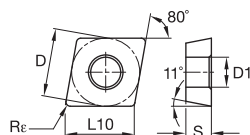
ISO catalogue number	D	L10	S	R _e	D1	C2	C25	C3	C65	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
CDHHS4T002R	3,97	4,03	1,02	0,18	2,13	■	■	■	2830731	■	■	2830706	■	■	■	■
CDHHS4T004R	3,97	4,03	1,02	0,38	2,13	■	■	■	2830682	■	■	■	■	■	■	■
left hand																
CDHHS4T002L	3,97	4,03	1,02	0,18	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.

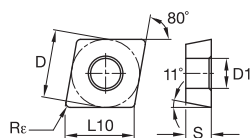
Tools for Small Hole Boring

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Tools for Small Hole Boring



ISO catalogue number	D	L10	S	Re	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CBP1
CPHB06T102	6,35	6,45	1,91	0,18	2,80	■	■	■	2824583	■	■	■	■	■	■	■
CPHB06T104	6,35	6,45	1,91	0,38	2,80	■	■	■	2824562	■	■	■	■	■	■	■

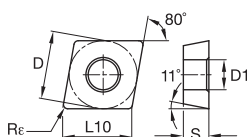


- first choice
- alternate choice

P																							
M																							
K																							
N																							
S																							
H																							

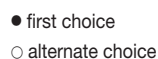
■ CPHH

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CM1	ALO	TN7	CBN6	CPD1
CPHH06T102	6,35	6,45	1,91	0,18	2,79	-	-	-	2824461	-	2824454	-	-	-	-
CPHH06T104	6,35	6,45	1,91	0,38	2,80	-	-	-	2824441	-	-	-	-	-	-



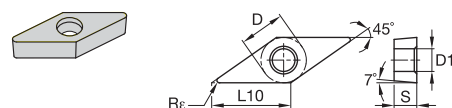
■ CPMT-LF

ISO catalogue number	D	L10	S	R _ε	D1	C2	C25	C3	C65	C655	C66	CM1	ALO	TN7	CBN6	CPD1
CPMT09T302LF	9,53	9,67	3,97	0,20	4,40	■	■	■	2821519	■	■	■	■	■	■	■
CPMT09T304LF	9,53	9,67	3,97	0,40	4,40	■	■	■	2821499	■	■	■	■	■	■	■
CPMT09T308LF	9,52	9,67	3,97	0,79	4,40	■	■	■	2821484	■	■	■	■	■	■	■

[illegible]

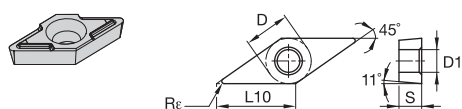
Tools for Small Hole Boring

ISO catalogue number	D	L10	S	Re	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CBP1
GCHW060202	4,76	6,73	2,36	0,18	2,39	■	■	■	2827596	■	■	2827601	■	■	■	■
GCHW060204	4,76	6,73	2,36	0,38	2,39	■	■	■	2827577	■	■	2827584	■	■	■	■



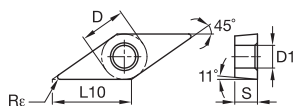
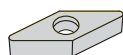
Tools for Small Hole Boring

ISO catalogue number	D	L10	S	Re	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CBP1
GCHT060202	4,83	6,83	2,36	0,18	2,39	-	-	-	2827537	-	-	-	-	-	-	-
GCHT060204	4,76	6,83	2,36	0,38	2,39	-	-	-	2827525	-	-	2827531	-	-	-	-



Tools for Small Hole Boring

ISO catalogue number	D	L10	S	R _ε	D1	C2	C25	C3	CG5	CG55	CG6	CGM1	ALO	TN7	CBN6	CPD1
GPHW050102	3,97	5,61	1,59	0,18	2,13	-	-	-	2827631	-	2827625	2827637	-	-	-	-
GPHW050104	3,97	5,61	1,59	0,38	2,13	-	-	-	2827615	-	2827608	2827621	-	-	-	-

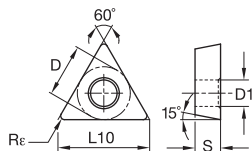
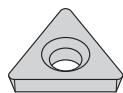


- first choice
- alternate choice

P																		
M																		
K																		
N																		
S																		
H																		

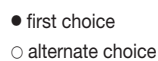
■ GPHT

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
GPHT050102	3,97	5,76	1,57	0,18	2,13	-	-	-	2827560	-	-	2827566	-	-	-	-
GPHT050104	4,08	5,76	1,57	0,38	2,13	-	-	-	2827548	-	-	2827554	-	-	-	-



TBHB

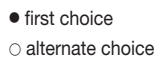
ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TBHB07S1X0	4,06	7,04	1,19	0,05	2,39	■	■	■	2828556	■	■	■	■	■	■	■
TBHB110201	6,35	11,00	2,38	0,10	3,33	■	■	■	2824266	■	■	■	■	■	■	■

[illegible]

Tools for Small Hole Boring

ISO catalogue number	D	L10	S	Rε	D1	max	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CBN1
TDHB07S1X0M	4,06	7,04	1,19	0,05	2,39	1,27	1	1	1	1	1	1	1	1	1	1	2828629
TDHB07S102M	4,06	7,04	1,19	0,18	2,39	1,27	1	1	1	1	1	1	1	1	1	2828579	1
TDHB07S104M	4,06	7,04	1,19	0,38	2,39	1,27	1	1	1	1	1	1	1	1	1	2828634	1
TDHB07S1X0	4,06	7,04	1,19	0,05	2,41	—	1	2828784	1	2828796	1	1	2828778	1	1	1	1
TDHB07S102	4,06	7,04	1,19	0,18	2,41	—	1	2828697	2828732	1	2828755	2828749	2828727	2828763	2828720	1	1
TDHB07S104	4,06	7,04	1,19	0,38	2,41	—	1	2828697	2828708	1	2828693	2828702	2828693	1	2828688	1	1
TDHB07S108	4,06	7,04	1,19	0,79	2,41	—	1	1	1	2828682	1	1	1	1	1	1	1

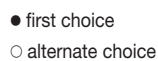
D48

[illegible]

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
TDHH07S102R	4,06	7,04	1,19	0,18	2,41	■	■	■	2828547	■	■	■	■	■	■	■
TDHH07S104R	4,06	7,04	1,19	0,38	2,41	■	■	■	2828499	■	■	■	■	■	■	■
left hand																
TDHH07S102L	4,06	7,04	1,19	0,18	2,41	■	■	■	2828541	■	2828529	2828516	■	2828508	■	■
TDHH07S104L	4,06	7,04	1,19	0,38	2,41	■	■	■	2828494	■	■	2828472	■	2828460	■	■

ISO catalogue number	D	L10	S	Rε	D1	max	C2	C25	C3	C65	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TDHH07S102	4,06	7,04	1,19	0,18	2,41	—	■	■	■	2828398	■	■	■	■	■	■	■
TDHH07S102L	4,06	7,04	1,19	0,18	2,41	4,52	■	■	■	2828541	■	2828529	2828516	■	2828508	■	■
TDHH07S102R	4,06	7,04	1,19	0,18	2,41	4,52	■	■	■	2828547	■	■	■	■	■	■	■
TDHH07S104L	4,06	7,04	1,19	0,38	2,41	4,36	■	■	■	2828494	■	■	2828472	■	2828460	■	■
TDHH07S104R	4,06	7,04	1,19	0,38	2,41	4,36	■	■	■	2828499	■	■	■	■	■	■	■
TDHH07S104	4,06	7,18	1,19	0,38	2,41	—	■	■	■	2828386	■	■	■	■	■	■	■

WIDIA 

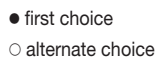


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Tools for Small Hole Boring

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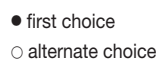
D50



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ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
TPHH110202R	6,35	11,00	2,38	0,18	3,33	■	■	■	2823812	■	■	■	■	■	■	■
TPHH160302R	9,53	16,50	3,18	0,18	3,33	■	■	■	2821213	■	■	■	■	■	■	■
TPHH160304R	9,53	16,50	3,18	0,38	3,33	■	■	■	2821168	■	■	■	■	■	■	■
TPHH160308R	9,53	16,50	3,18	0,79	3,33	■	■	■	2821121	■	■	■	■	■	■	■
left hand																
TPHH110202L	6,35	11,00	2,38	0,18	3,33	■	■	■	2823805	■	■	■	■	■	2823767	■
TPHH110204L	6,35	11,00	2,38	0,38	3,33	■	■	■	2823753	■	2823739	■	■	■	■	■
TPHH160302L	9,53	16,50	3,18	0,18	3,33	■	■	■	2821208	■	■	■	■	■	■	■
TPHH160304L	9,53	16,50	3,18	0,38	3,33	■	■	■	2821162	■	2821150	■	■	■	■	■
TPHH160308L	9,53	16,50	3,18	0,79	3,33	■	■	■	2821115	■	■	■	■	■	■	■

NOTE: Right-hand inserts used in left-hand bars only.

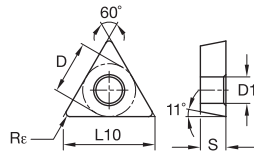
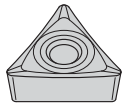


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Tools for Small Hole Boring

ISO catalogue number	D

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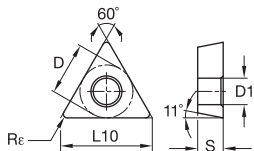
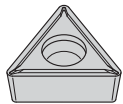


● first choice
○ alternate choice

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

TPGT-HP

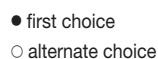
ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPGT110202HP	6,35	11,00	2,38	0,20	2,90	■	■	■	2823605	■	■	■	■	■	■	■
TPGT110204HP	6,35	11,00	2,38	0,40	2,90	■	■	■	2823592	■	■	2823595	■	■	■	■
TPGT16T304HP	9,53	16,50	3,97	0,40	4,40	■	■	■	2821536	■	■	■	■	■	■	■



TPMT-LF

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
TPMT110202LF	6,35	11,00	2,38	0,20	2,80	■	■	■	2823646	■	■	■	■	■	■	■
TPMT110204LF	6,35	11,00	2,38	0,40	2,80	■	■	■	2823625	■	2823619	■	■	■	■	■
TPMT160304LF	9,53	16,50	3,18	0,40	4,40	■	■	■	2821577	■	2821571	■	■	■	■	■
TPMT160308LF	9,53	16,50	3,18	0,79	4,40	■	■	■	2821566	■	■	■	■	■	■	■

Tools for Small Hole Boring

[illegible]

Tools for Small Hole Boring

**ISO
catalogue number**

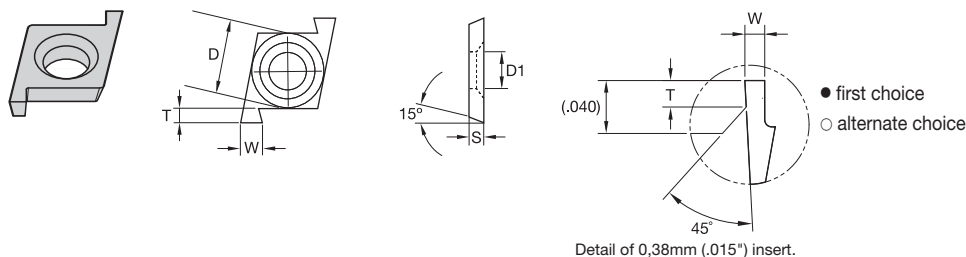
WPMTS3T104LF

WPMT040204LF

WPMT06T304LF

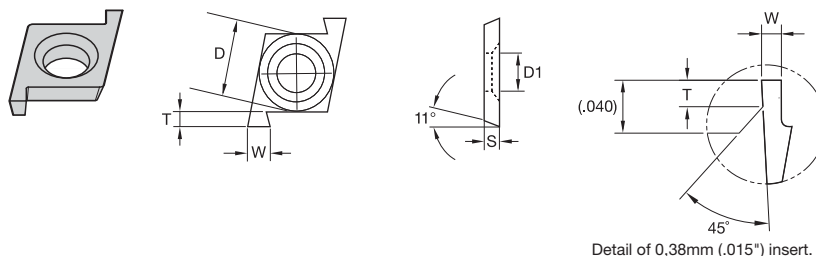
WPMT06T308LF

ISO catalogue number	D	L10	S	Rε	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CBN1
WPMTS3T104LF	4,76	3,25	1,98	0,40	2,15	┐	┐	┐	┐	2827521	┐	┐	┐	┐	┐	┐
WPMT040204LF	6,35	4,34	2,38	0,40	2,90	┐	┐	┐	┐	2824362	┐	┐	┐	┐	┐	┐
WPMT06T304LF	9,53	6,52	3,97	0,40	4,40	┐	┐	┐	┐	2821036	┐	┐	┐	┐	┐	┐
WPMT06T308LF	9,53	6,52	3,97	0,80	4,40	┐	┐	┐	┐	2821023	┐	┐	┐	┐	┐	┐



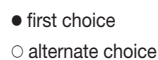
CDG-R/L

ISO catalogue number	D	S	T	W	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
CDG50252R	3,97	1,27	1,02	0,64	2,13	•	•	•	•	•	•	•	•	•	•	•
CDG50302R	3,97	1,27	1,02	0,76	2,13	•	•	•	•	•	•	•	•	•	•	•



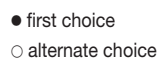
CPG-R/L

ISO catalogue number	D	S	T	W	D1	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																
CPG2032R	6,35	1,91	1,65	0,76	2,79	•	•	•	•	•	•	•	•	•	•	•
CPG2062R	6,35	1,91	1,65	1,52	2,79	•	•	•	•	•	•	•	•	•	•	•

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Tools for Small Hole Boring

ISO catalogue number	D	S	T	RC	D1	TPI min	TPI max	TP min	TP max	C2	C25	C3	CG5	CG55	CG6	ALO	TN7	CBN6	CPD1
right hand																			
CPT20052R	6,35	1,91	1,65	0,13	2,79	10	24	1,0	2,5	-	-	-	2824516	-	-	2824523	-	-	-

[illegible]

ISO catalogue number	D	S	T	E	D1	TPI min	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CPD1
right hand																	
FNT1512ACME2R	5,00	2,35	1,26	1,05	2,50	12	1	1	1	2820829	1	1	1	1	1	1	1

ISO catalogue number	D	S	T	E	D1	TPI min	C2	C25	C3	CG5	CG55	CG6	CM1	ALO	TN7	CBN6	CBN1
right hand																	
FNT1528UN2R	5,00	1,85	0,61	0,65	2,50	28	-	-	-	2820865	-	-	-	-	-	-	-

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 $\pm 0,013\text{mm}$.

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.



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"

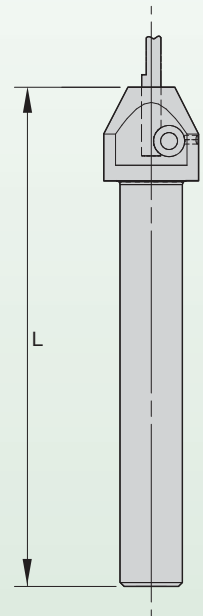
Metric

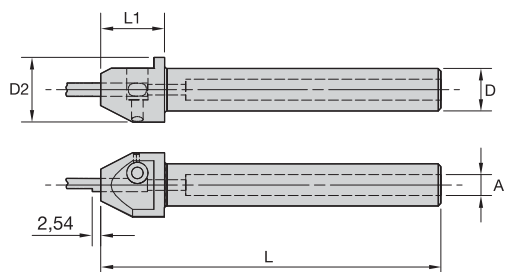
38 = 38,0mm

100 = 100,0mm

102 = 102,0mm

152 = 152,0mm

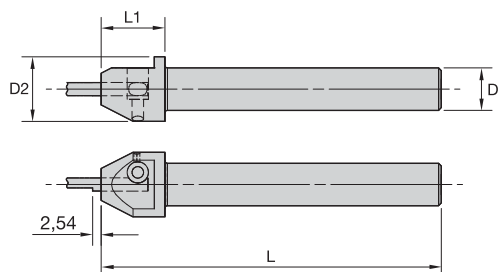




■ **ATBM**

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

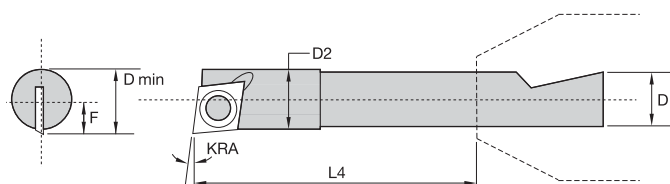
NOTE: These tools will accept any A-Series Solid Carbide Insert (ABD, ABD-M, AGD, APD, and ATD).



■ **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

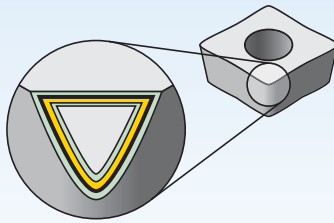

order number	catalogue number	KRA	D	D min	D2	F	L4	gage insert	insert screw	Torx
right hand										
2836656	ABC1000R	-7	3,96	4,57	4,16	2,41	25,40	CD..120605	CC09	T6
2836651	ABC1250R	-7	3,96	4,57	4,16	2,41	31,75	CD..120605	CC09	T6
2836645	ABC1500R	-7	3,96	4,57	4,16	2,41	38,10	CD..120605	CC09	T6
2836667	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



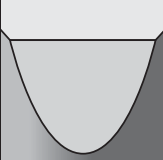
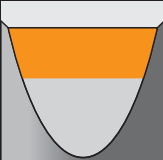
ABD	125	375	R	
Insert Style	Minimum Bore <i>shown as "D min"</i>	Bore Depth, Groove Width, Flat on Thread <i>shown as "L4, W"</i>	Hand of Tool	Tip Style <i>(optional)</i>
A Series = Through Coolant ABC = Indexable Boring ABD = Boring AGD = Grooving APD = Profiling ATD = Threading B Series = Without Coolant BB = Boring BP = Profiling	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	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 = Right hand L = Left hand	Symbol M Usage Mini tip



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

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

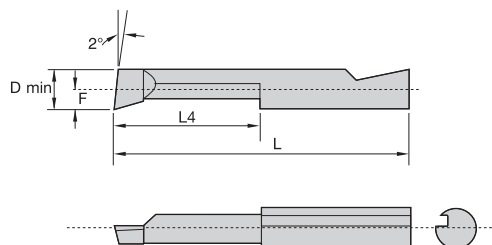
wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45	
Grade	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										
CG5  HC-S25	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.	P											
		M											
		K											
		N											
		S											
CBN6  BN-H25	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.												
		H											



Cutting Speed — vc m/min										
Material Group		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	120	145	55	70	85	—	—	—
	2	65	80	90	40	45	55	—	—	—
	3	65	80	90	40	45	55	—	—	—
	4	50	60	75	30	35	45	—	—	—
	5	65	80	95	40	45	55	—	—	—
	6	45	55	65	25	30	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	95	110	55	70	85	—	—	—
	2	70	85	100	50	65	75	—	—	—
	3	55	65	80	40	50	55	—	—	—
K	ap [mm]	0,001	-	0,010	0,001	-	0,010	—	—	—
	f [mm/rev]	0,0005	-	0,007	0,0005	-	0,007	—	—	—
	1	65	80	95	50	60	75	—	—	—
	2	80	95	115	60	75	90	—	—	—
	3	55	70	85	45	55	65	—	—	—
N	ap [mm]	0,025	—	0,640	0,025	—	0,640	—	—	—
	f [mm/rev]	0,013	—	0,178	0,013	—	0,178	—	—	—
	1	405	505	605	405	505	605	—	—	—
	2	300	370	445	300	370	445	—	—	—
	3	75	95	110	70	90	105	—	—	—
	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	—	—	—
S	ap [mm]	0,025	-	0,200	0,025	-	0,200	—	—	—
	f [mm/rev]	0,013	-	0,178	0,013	-	0,178	—	—	—
	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]	—	—	—	—	—	—	0,025	-	0,200
	f [mm/rev]	—	—	—	—	—	—	0,0005	-	0,004
	1	—	—	—	—	—	—	110	140	165
	2	—	—	—	—	—	—	105	130	155
	3	—	—	—	—	—	—	100	125	150
	4	—	—	—	—	—	—	100	125	150
	5	—	—	—	—	—	—	100	125	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.

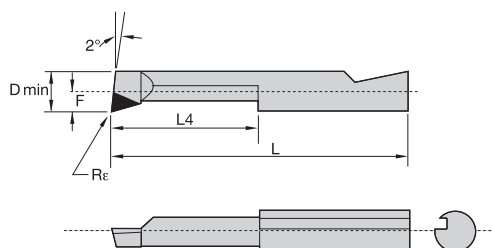


● first choice
○ alternate choice

P	●	○
M	●	○
K	○	●
N	○	●
S	●	○
H	●	○

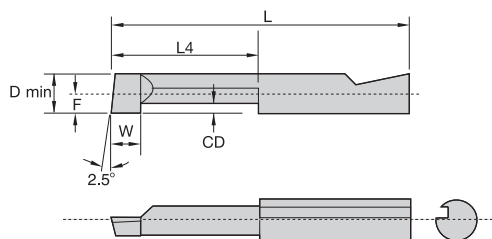
■ ABD

ISO catalogue number	D min	L4	L	F	CG5	CM1	CBN6
right hand							
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	Re	CG5	CM1	CBN6
right hand								
ABD156875RM	3,96	22,23	38,74	1W,85	0,18	■	■	2836679

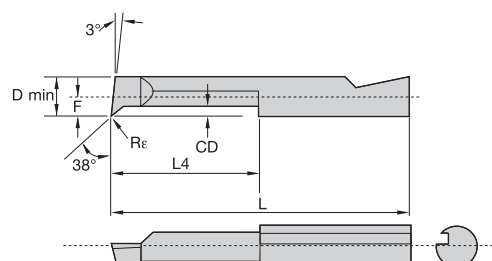


● first choice
○ alternate choice

P	●	○
M	●	○
K	○	●
N	○	●
S	●	○
H	●	○

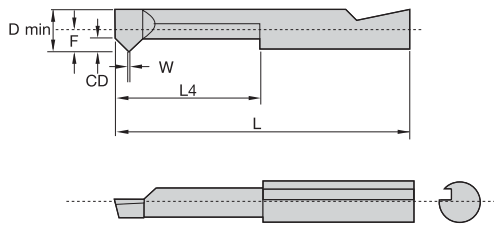
■ AGD

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	I
AGD12504	3,56	9,53	26,04	1,55	0,89	1,02	2836537	I	I
AGD15605	4,45	12,70	29,21	1,93	1,27	1,27	2836524	I	I



■ 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	I	I
APD09281R	2,39	7,14	23,65	1,07	0,71	0,18	I	2836495	I
APD125375R	3,18	9,53	26,04	1,45	1,02	0,18	2836489	I	I
APD156500R	3,96	12,70	29,21	1,85	1,27	0,18	I	2836473	I

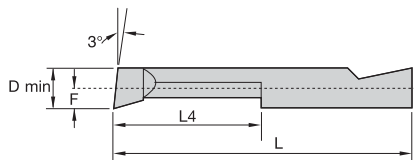


● first choice
○ alternate choice

P	●	○
M	●	○
K	○	●
N	○	●
S	●	○
H	●	○

■ ATD

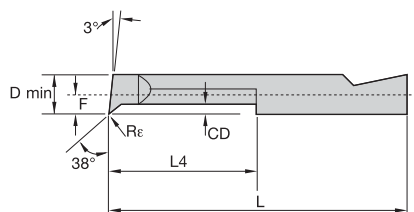
ISO catalogue number	D min	L4	L	F	CD	W	TP min	TP max	TPI min	TPI max	CG5	CM1	CBN6
right hand													
ATD12560F2	3,56	9,53	26,04	1,55	0,69	0,05	1,06	0,53	24	48	2836443	2836450	
ATD15660F2	4,45	12,70	29,21	1,93	0,81	0,05	1,27	0,53	20	48	2836443	2836436	



■ 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	●	○
M	●	○
K	○	●
N	○	●
S	●	○
H		

■ BP

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	I	I
BP250825R	6,35	20,96	47,63	3,05	1,98	0,18	2832689	I	I

■ 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

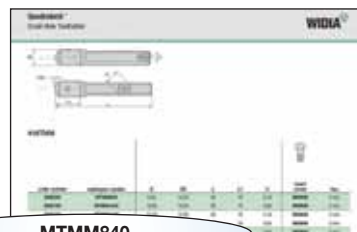
Profile in diameters as small as 1,57mm.



Threading

Thread down to a No. 5; 2,54mm.

Quadralock Boring Bar Identification System



MTMM840

MTM

Quadralock
Boring System

M

Type

M = Metric

8

Shank Diameter
shown as "D"

Metric

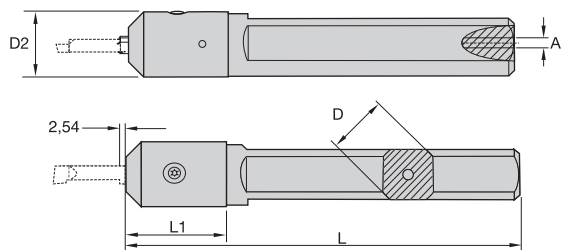
- 8** = 8,00mm
- 10** = 10,00mm
- 12** = 12,00mm
- 16** = 16,00mm
- 22** = 22,00mm

40

Length
shown as "L"

Metric

- 40** = 38,10mm
- 100** = 101,60mm
- 127** = 127,00mm

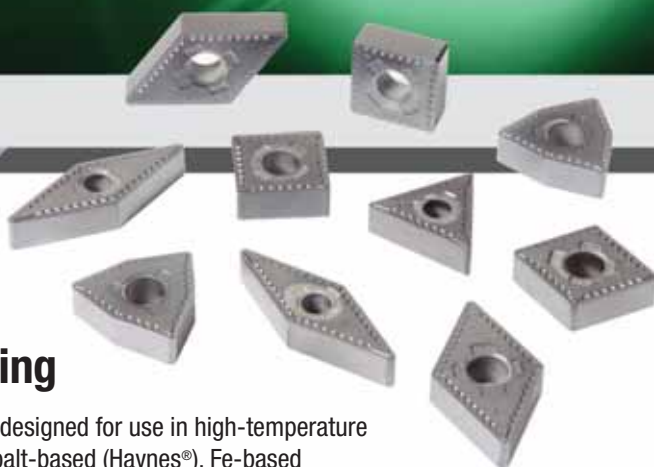


■ **MTMM**

order number	catalogue number	D	D2	L	L1	A	insert screw	hex
3896202	MTMM840	8,00	12,95	38	19	3,18	MSM46	2 mm
3896198	MTMM1040	10,00	12,95	38	19	3,00	MSM46	2 mm
3896200	MTMM1240	12,00	12,95	38	19	3,18	MSM46	2 mm
3896199	MTMM12100	12,00	12,95	102	19	3,00	MSM46	2 mm
3896201	MTMM22127	22,00	12,95	127	19	3,00	MSM46	2 mm



WIN WITH WIDIA™



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 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.

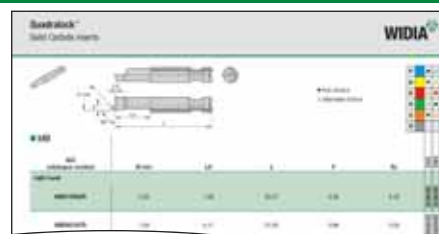
..MG-MS Geometry

- 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.

To learn more, contact your local Authorised Distributor or visit www.widia.com.

WIDIA 

Quadralock Boring Bar Insert Identification System

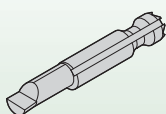


MB125625R

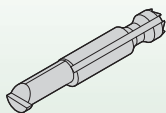
MB

Insert Style

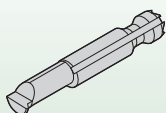
MB = Boring



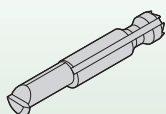
MG = Grooving



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)

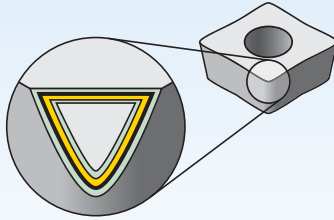
60F2	=	0,05mm
Flat on 60° thread		

R

Hand
of Tool

R =
Right hand

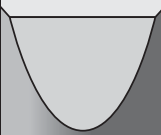
L =
Left hand



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

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

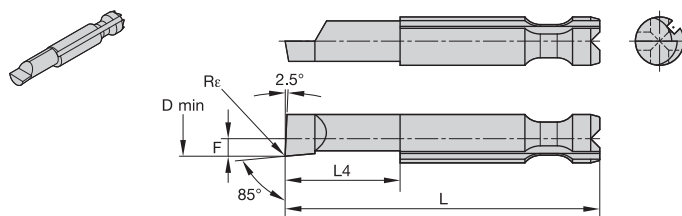
wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45
Grade	CM1		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								
	HW-S25											
CG5		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.	P									
			M									
			K									
			N									
			S									
	HC-S25											



Cutting Speed — vc m/min							
Material Group	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
	6	50	60	70	35	40	45
M	ap [mm]	.001	-	.008	.001	-	.008
	f [mm/rev]	.0005	-	.007	.0005	-	.007
	1	75	95	110	55	70	85
	2	70	85	100	50	65	75
K	ap [mm]	.001	-	.010	.001	-	.010
	f [mm/rev]	.0005	-	.007	.0005	-	.007
	1	65	80	95	50	60	75
	2	80	95	115	60	75	90
N	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
	4	140	175	210	105	125	155
	5	100	125	150	80	100	120
	6	100	125	150	80	100	120
S	ap [mm]	.001	-	.008	.001	-	.008
	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
H	ap [mm]	-	-	-	-	-	-
	f [mm/rev]	-	-	-	-	-	-
	1	-	-	-	-	-	-
	2	-	-	-	-	-	-
	3	-	-	-	-	-	-

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.


■ MB

● first choice
○ alternate choice

P	●	○
M	●	○
K	○	●
N	○	●
S	●	○
H	○	○

ISO catalogue number	D min	L4	L	F	Re	CG5	CM1
right hand							
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	-	3857732
MB094500R	2,39	12,70	29,21	1,04	0,05	2836405	2836251
MB125625R	3,18	15,88	32,39	1,45	0,10	-	2836240
MB156500R	3,96	12,70	29,21	1,85	0,10	2836388	3885997
MB156875R	3,96	22,23	38,74	1,85	0,10	-	2836229

(continued)

Tools for Small Hole Boring

(MB — continued)

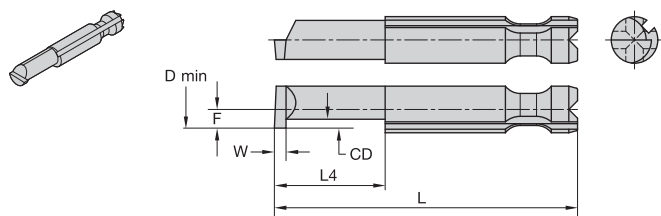
● first choice
○ alternate choice

P	●	○
M	●	○
K	●	○
N	●	○
S	●	○
H	●	○

Tools for Small Hole Boring

ISO catalogue number	D min	L4	L	F	R _ε	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	3885998	3885999

NOTE: Actual bore depth for MB062187R and MB062187L equals 5,41mm.
ANSI Catalog Number MB062187R and ANSI Catalog Number MB062187L have an actual bore depth of .213".



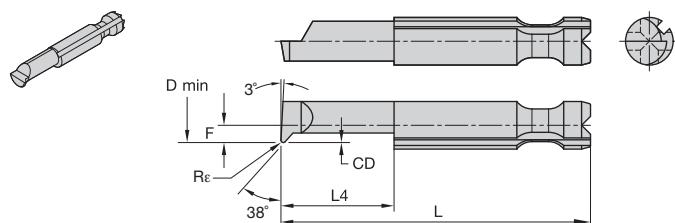
- first choice
- alternate choice

■ MG

ISO catalogue number	D min	L4	L	F	CD	W	CG5	CM1
right hand								
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
left hand								
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

P	●	○
M	●	○
K	●	○
N	●	○
S	●	○
H	●	○

Tools for Small Hole Boring

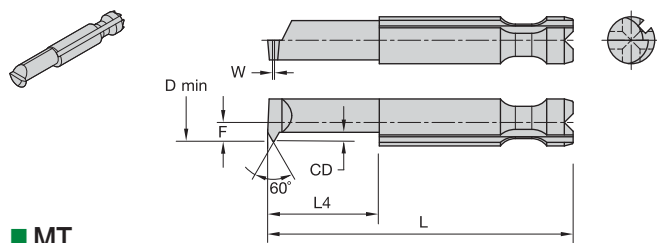


● first choice
○ alternate choice

P			
M			
K			
N			
S			
H			

■ MP

ISO catalogue number	D min	L4	L	F	CD	Rε	CG5	CM1
right hand								
MP062187R	1,58	4,75	21,26	0,66	0,43	0,10	2836357	1
MP094281R	2,39	7,14	23,65	1,07	0,71	0,10	2836351	3897488
MP125375R	3,18	9,53	26,04	1,45	1,02	0,20	2836345	2836190
MP156500R	3,96	12,70	29,21	1,85	1,27	0,20	2836339	2836184
left hand								
MP062187L	1,58	4,75	21,26	0,66	0,43	0,10	1	3897486
MP094281L	2,39	7,14	23,65	1,07	0,71	0,10	3644074	3897487
MP125375L	3,18	9,53	26,04	1,45	1,02	0,20	1	3897490
MP156500L	3,96	12,70	29,21	1,85	1,27	0,20	3897491	3897492



P	●	○
M	●	○
K	○	●
N	○	●
S	●	○
H	○	○

■ MT

ISO catalogue number	D min	L4	L	F	CD	W	CG5	CM1
right hand								
MT09560F2R	2,79	7,93	24,44	1,17	0,56	0,05	-	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	-	2836168
left hand								
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

WIN WITH WIDIA™



WMT™ System

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.



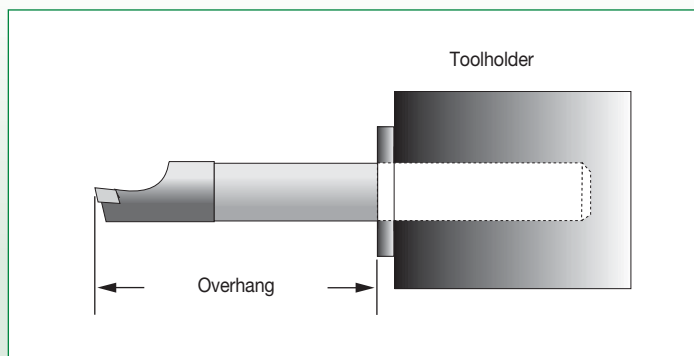
To learn more, contact your local Authorised Distributor or visit www.widia.com.

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)

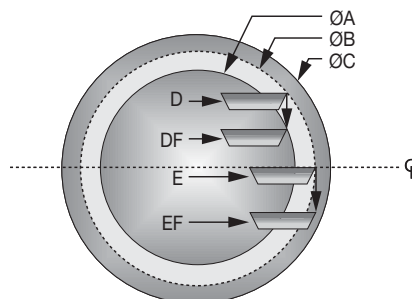
Set $\varnothing B$ is deflected to position "DF," relieving the load by deflecting to a smaller bore, $\varnothing A$. Tool "D" cannot "dig in" because the cut (load) becomes lighter as it deflects.

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.

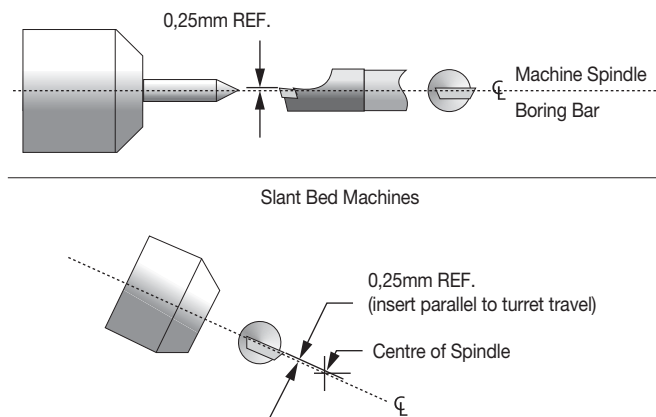


Built-in geometries of WIDIA-CIRCLE™ precision boring bars are based on the concept that the boring bar shank will always be positioned on the machine spindle centreline. The cutting point will be slightly high (against direction of rotation) except when facing centreline or cutting on outside diameters.

Use WIDIA-CIRCLE precision setup level or:

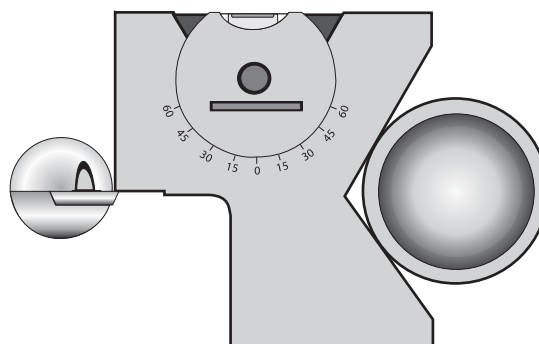
1. Use centre height gage and position insert as shown in illustration.
2. If centre point is unavailable, mark the centre of the bar stock with a centring punch or square. Position the insert as shown in illustration.
3. Lay a straight edge on the insert to help position the insert parallel to the travel 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.

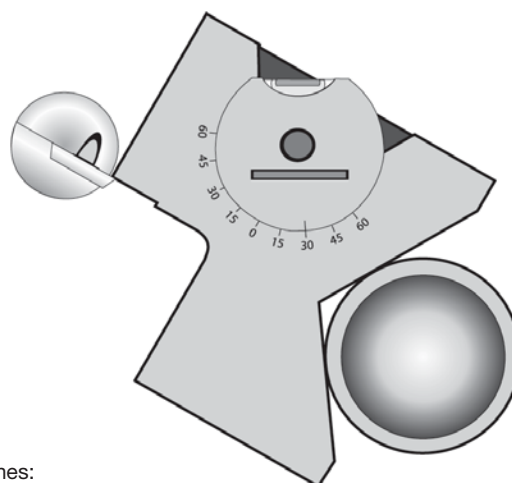




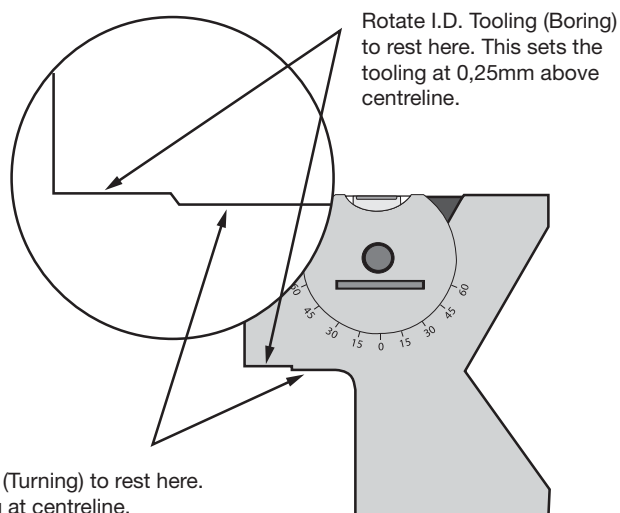
Uni-Level Precision Setup Level



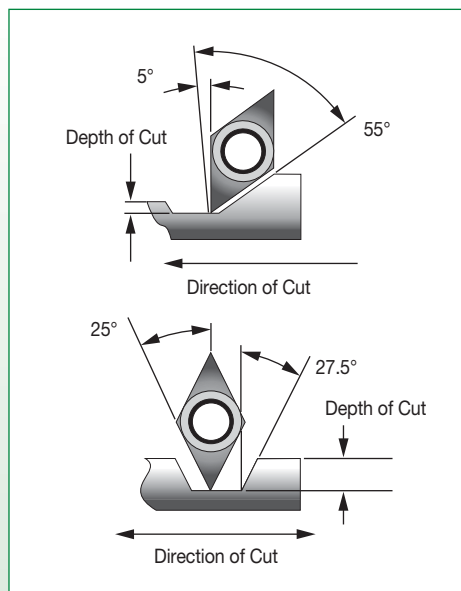
For most machines:
Set the dial to the 0° mark.



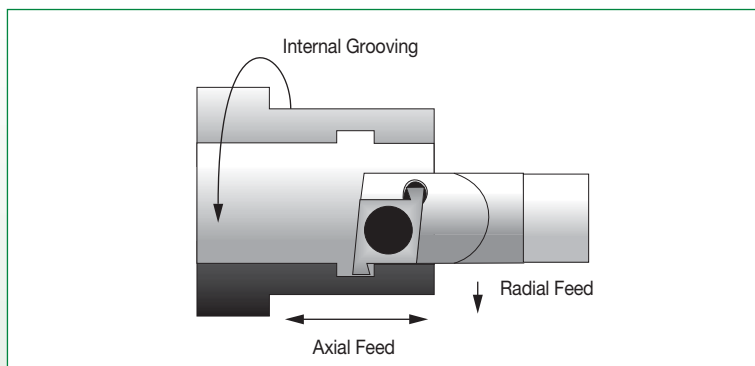
For slant bed-type machines:
Set the dial to the degree of the bed.



Setup Information and Recommendations for Boring and Profiling



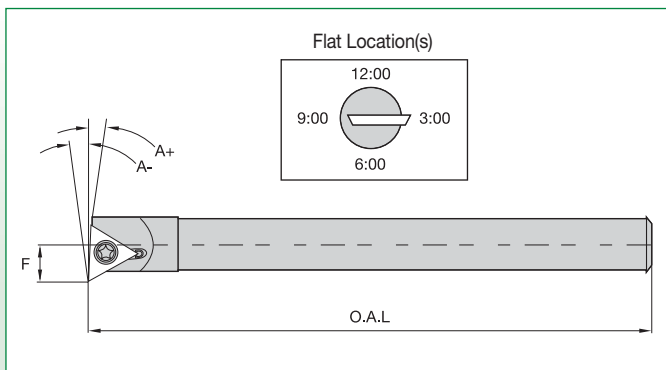
Setup Information and Recommendations for Grooving



■ 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

*Attention Distributors: Use this worksheet
to collect information for your customer.*

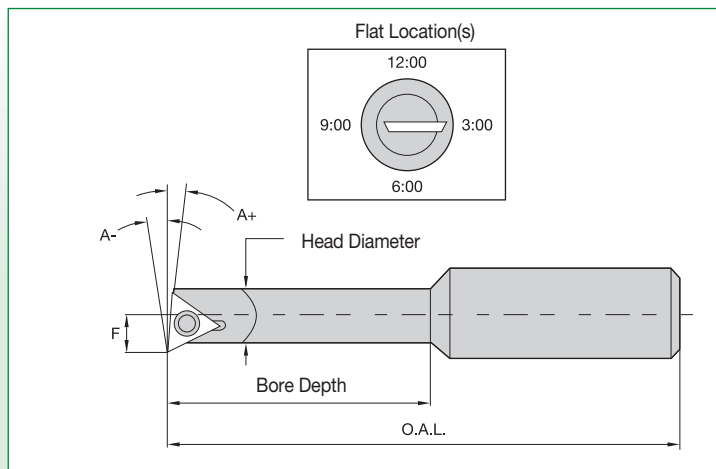
☐ Ground

☐ Next Day Air

☐ 2nd Day Air

☐ 3rd Day Air

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

*Attention Distributors: Use this worksheet
to collect information for your customer.*

☐ Ground

☐ Next Day Air

☐ 2nd Day Air

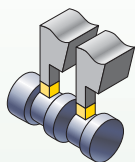
☐ 3rd Day Air



Grooving and Cut-Off

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 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.

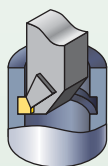
Pages:
E40–E91



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



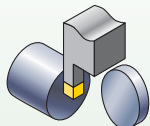
LG

- 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



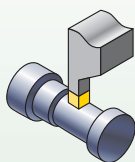
ProGroove

- 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

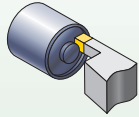
For Light-Cutting Inserts

- 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



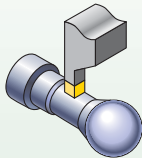
TopGroove™

- 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™

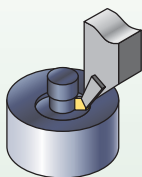
For Light Cutting

- 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

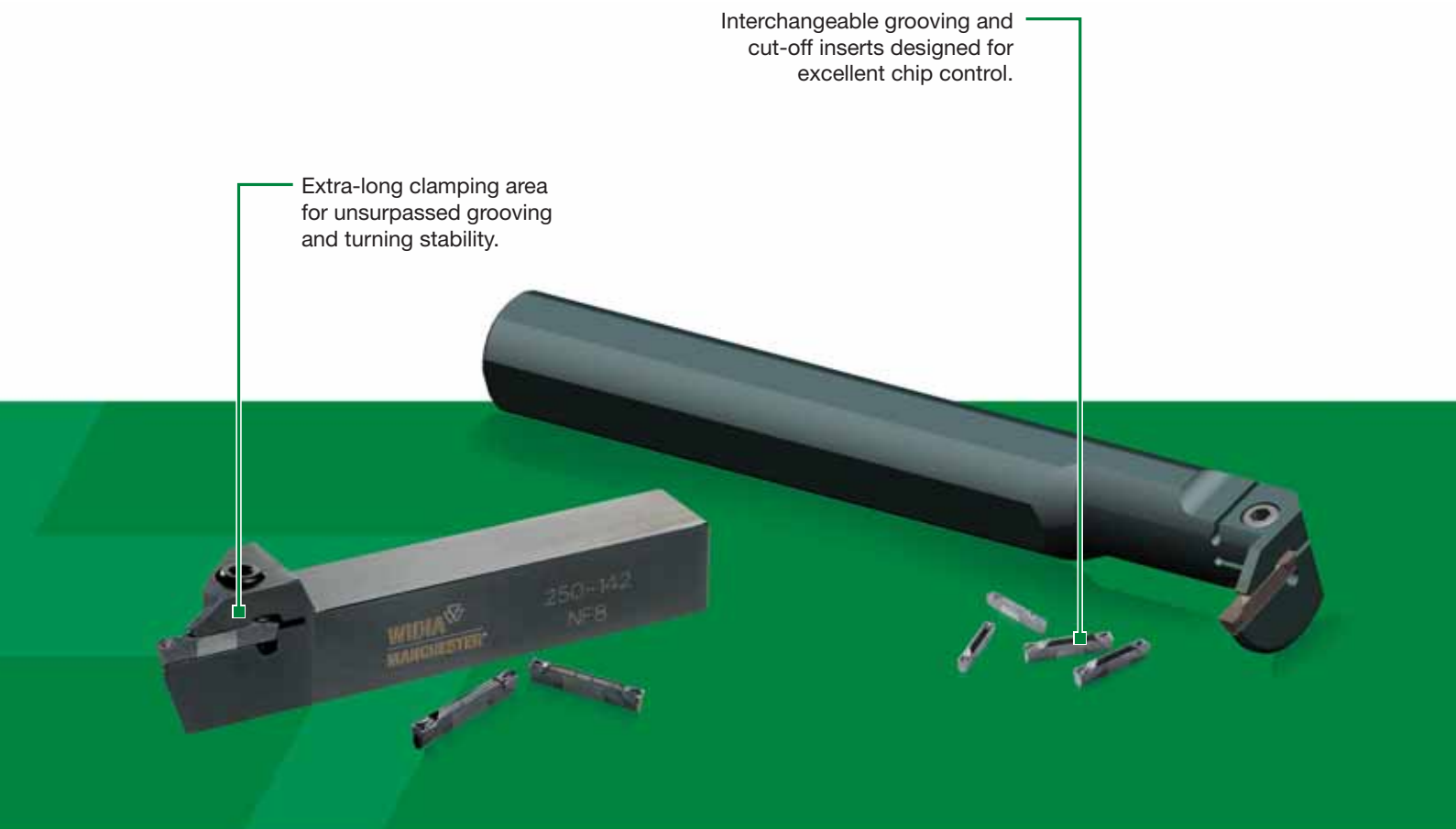
The WMT platform is the economical and reliable option for all your grooving, cut-off, turning, and profiling applications. Trust the WMT system to ensure precise insert positioning and provide only the most accurate machining with exceptionally fast cycle times and superior performance.

WMT

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.



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!

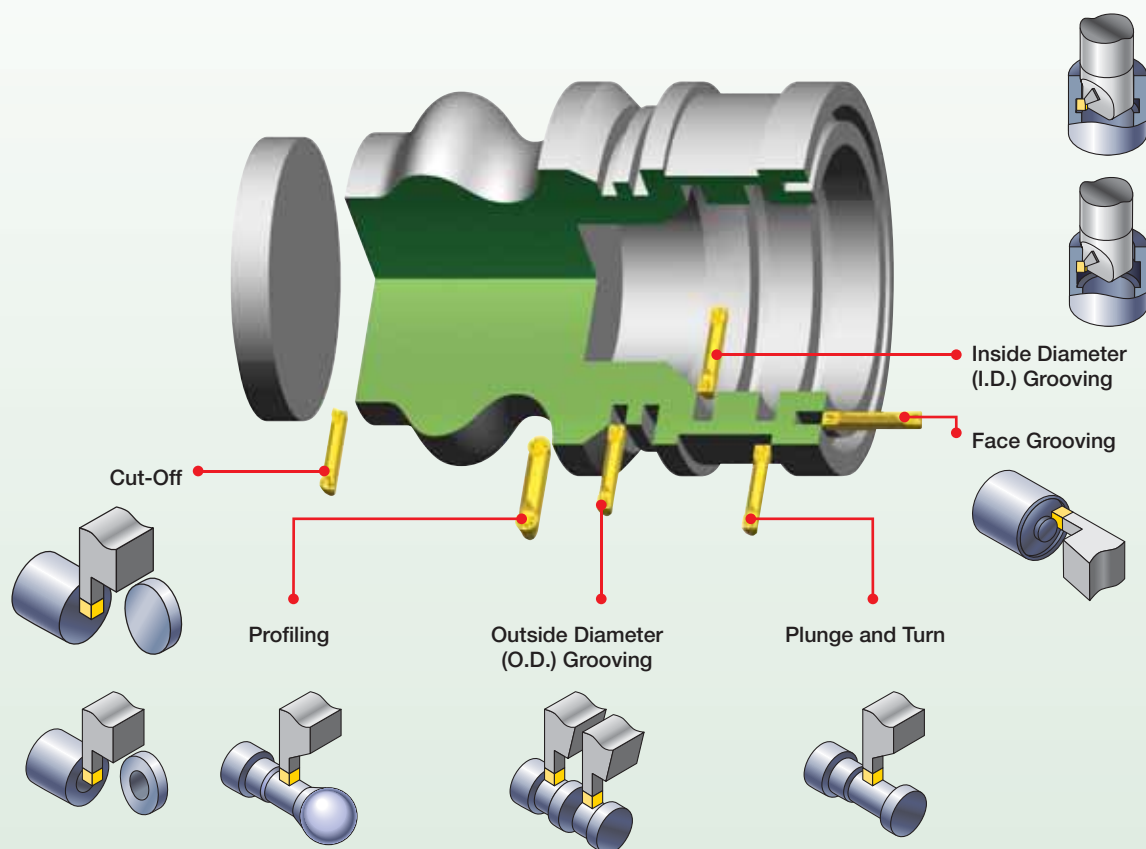
The WMT system, with its extra-long clamping area and precise insert positioning, ensures exceptionally fast and accurate machining, all-in-one tool, for your most demanding grooving, cut-off, turning, and profiling applications.

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.

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 “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

WIDIA

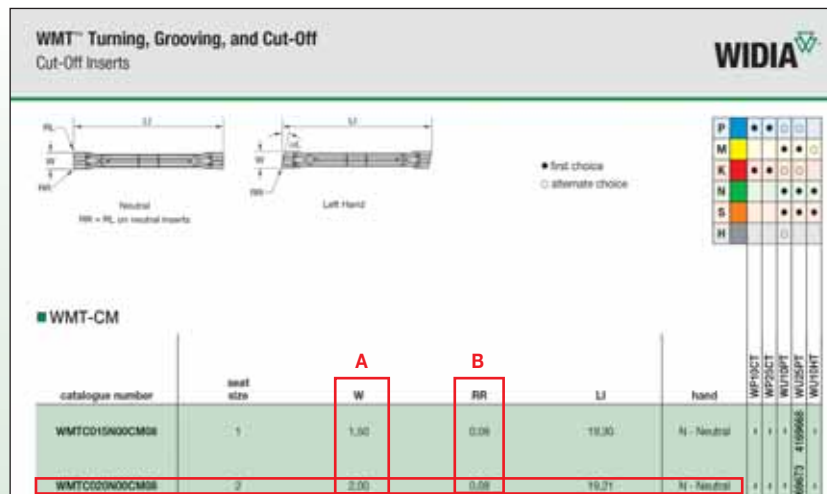
Right Hand Tool

■ O.D. Cut-Off and Grooving

order number	catalogue number	insert size	C	A	B	C	H	L1	L2	L3	clamp screw	clamp nut
			mm	mm	mm	mm	mm	mm	mm	mm		
360016	WMTSR2020M116	1	25.0	5.00	17	25.0	24.5	—	100	116	WMT48	—
3600406	WMTSR1616K216	2	16.0	3.00	17	16.0	15.5	6	125	101	WMT48	—
3600408	WMTSR2020K216	2	20.0	3.00	17	20.0	19.5	—	125	90	WMT48	—
3600506	WMTSR2020M216	2	20.0	3.00	17	20.0	24.5	—	100	116	WMT48	—
3600490	WMTSR1616K211	3	16.0	3.00	11	16.0	15.0	—	120	90	—	Ø10005
3600482	WMTSR1616K222	3	16.0	3.00	22	16.0	15.0	6	120	90	—	Ø10005
3600488	WMTSR2020K211	3	20.0	3.00	11	20.0	19.0	—	120	90	—	Ø10005
3600470	WMTSR2020M211	3	20.0	3.00	22	20.0	19.0	6	120	90	—	Ø10005
3600478	WMTSR2020M211	3	20.0	3.00	11	20.0	24.0	—	100	116	—	Ø10005
3600481	WMTSR2020M202	3	20.0	3.00	20	20.0	24.0	—	100	110	—	Ø10005
3600502	WMTSR1616K11	4	16.0	4.00	11	16.0	15.5	—	125	90	—	Ø10005
3600484	WMTSR1616K222	4	16.0	4.00	22	16.0	15.5	6	125	90	—	Ø10005
3603701	WMTSR2020K20	4	20.0	4.00	20	20.0	20.0	6	100	90	—	Ø10005
3600504	WMTSR2020K111	4	20.0	4.00	11	20.0	19.0	—	100	90	—	Ø10005
3603702	WMTSR2020M11	4	20.0	4.00	11	20.0	24.7	—	100	117	—	Ø10005
3600483	WMTSR2020M222	4	20.0	4.00	22	20.0	24.5	—	100	108	—	Ø10005
3600486	WMTSR1616K214	6	16.0	5.00	14	16.0	15.2	—	125	90	—	Ø10166
3600473	WMTSR2020K214	6	20.0	5.00	14	20.0	19.0	—	125	90	—	Ø10166
3600476	WMTSR2020K226	6	20.0	6.00	26	20.0	19.0	6	140	90	—	Ø10166

	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

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



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:

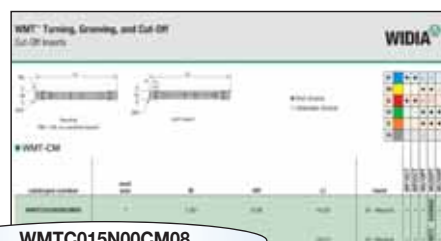
- A** Based on material group and grade, identify starting speed (vc).
- B** First choice starting speed is in **bold**.

NOTE: See page E13 for cutting data.

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	min	Start	max
P	0/1	100	100	110	100	200	210	170	175	180	210	225	240	170	175	180			
	2	95	95	105	180	185	190	150	160	170	210	225	230	185	195	205			
	3	95	95	105	190	185	190	150	160	170	210	220	230	185	195	205			
	4	70	70	75	165	170	175	135	145	155	140	145	155	125	125	135			
M	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			
	1	70	75	80	120	125	130	120	125	130	–	–	–	–	–	–			
	2	50	50	50	100	100	110	70	75	80	–	–	–	–	–	–			
K	3	50	50	50	95	100	105	85	90	95	–	–	–	–	–	–			
	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	180	200	210			
N	1	70	75	80	140	150	160	110	120	130	–	–	–	–	–	–			
	2	70	75	80	140	150	80	110	120	80	–	–	–	–	–	–			
	3	70	75	80	140	150	80	110	120	80	–	–	–	–	–	–			
	4	70	75	80	140	150	80	110	120	80	–	–	–	–	–	–			
S	5	70	75	80	140	150	80	110	120	80	–	–	–	–	–	–			
	6	70	75	80	140	150	80	110	120	80	–	–	–	–	–	–			
	7	70	75	80	140	150	120	110	120	105	–	–	–	–	–	–			
	1	30	25	30	70	75	80	60	65	65	–	–	–	–	–	–			
H	2	30	25	30	65	65	70	50	50	50	–	–	–	–	–	–			
	3	50	50	50	100	100	110	70	75	80	–	–	–	–	–	–			
	4	–	–	–	70	75	80	50	50	50	–	–	–	–	–	–			
	5	–	–	–	15	20	60	15	20	60	–	–	–	–	–	–			

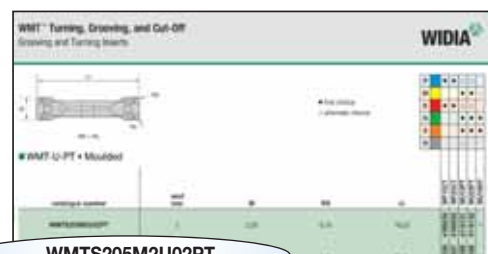
WMT Identification System

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.



WMT-C015N00CM08

Cut-Off						
WMT	C	015	N	00	CM	08
Tooling System	Cut-Off	W in mm* 10	Hand of Insert	Main Cutting Edge Lead Angle	Chipbreaker Geometry CM = Cut-Off Medium CM-W = Cut-Off Medium with Wiper	Corner Radius in mm* 10



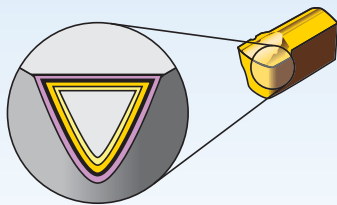
WMTS205M2U02PT

Groove, Plunge, Turn, and Contour Inserts							
WMT	S	205	M	2	U	02	PT
Tooling System	Square	mm* 10 inch* 1000	Unit of Measurement for Width M = mm I = inch	Seat Size	Insert Tolerance	Corner Radius in mm* 10	Chipbreaker Geometry PT = Groove, Plunge, and Turn PH = Groove, Plunge, and Turn PC = Plunge and Contour

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.

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

wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45
WU10PT		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		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		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									
WP10CT		A specially engineered, proprietary, cobalt-enriched carbide grade with thick K-MTCVD-TiCN coating layer, an Al ₂ O ₃ 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									
			N									
WP25CT		A tough cobalt-enriched carbide grade with a newly designed multilayer K-MTCVD TiCN-Al ₂ O ₃ -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									
			N									

CM



- 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

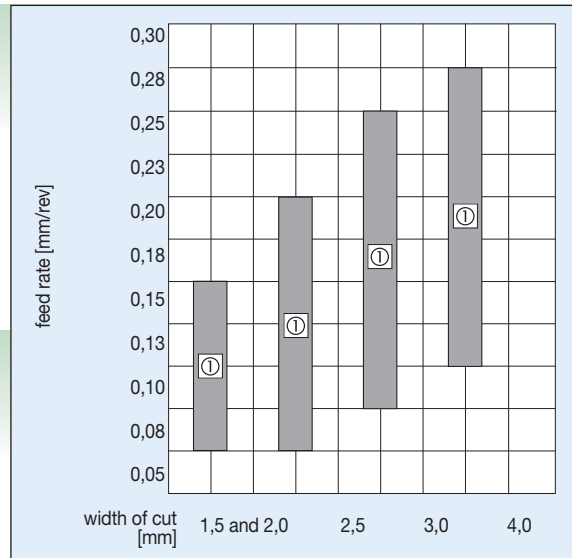


- Superior chip control.
- Full nose radius geometry for plunge and contour operations.
- Effective cutting edge geometry exceeds 180° for increased versatility.

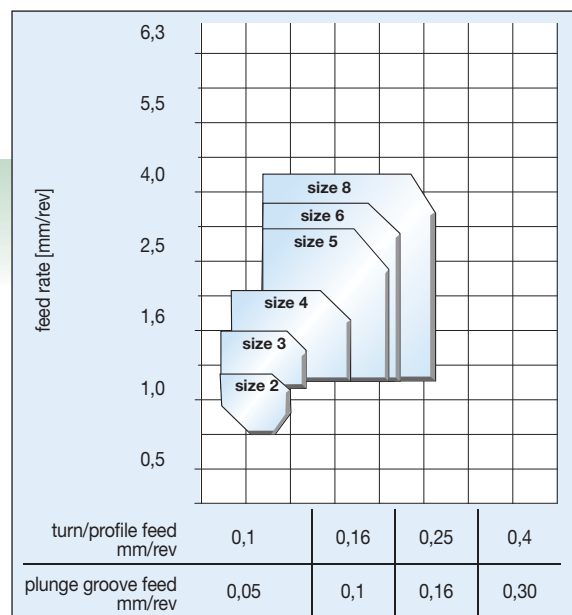
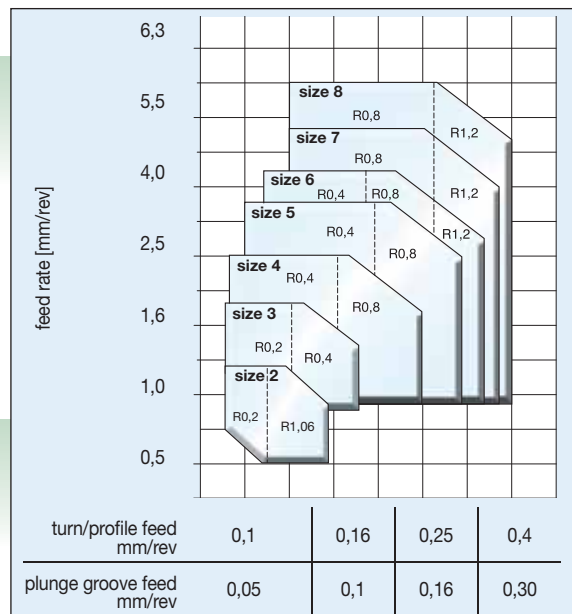
PH Plunge, Groove, and Turn Inserts



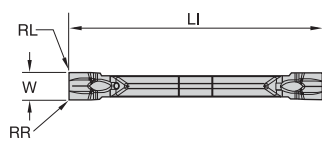
- Excellent performance in greater than 35 HRC.
- Deep grooving tool for plunge and turn O.D. and face grooving operations.
- Delivers chip control over full range of DOC when turning.
- Delivers superior chip control in interrupted cuts.



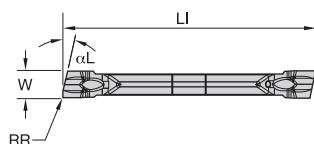
① Recommended Starting Feed



		Cutting Speed — vc m/min														
Material Group		WU10HT			WU10PT			WU25PT			WP10CT			WP25CT		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0/1	100	100	110	190	200	210	170	175	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	180	185	190	150	160	170	210	220	230	185	195	205
	4	70	70	75	165	170	175	135	145	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	85	90	95	—	—	—	—	—	—
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	80	110	120	80	—	—	—	—	—	—
	3	70	75	80	140	150	80	110	120	80	—	—	—	—	—	—
	4	70	75	80	140	150	80	110	120	80	—	—	—	—	—	—
	5	70	75	80	140	150	80	110	120	80	—	—	—	—	—	—
	6	70	75	80	140	150	80	110	120	80	—	—	—	—	—	—
	7	70	75	80	140	150	120	110	120	105	—	—	—	—	—	—
S	1	20	25	30	70	75	80	60	65	65	—	—	—	—	—	—
	2	20	25	30	65	65	70	50	50	50	—	—	—	—	—	—
	3	50	50	50	100	100	110	70	75	80	—	—	—	—	—	—
	4	—	—	—	70	75	80	50	50	50	—	—	—	—	—	—
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	—	—	—	—	—	—



Neutral
RR = RL on neutral inserts



Left Hand

● first choice
○ alternate choice

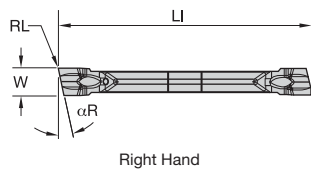
P	Blue	●	●	○	○
M	Yellow	●	●	●	○
K	Red	●	●	○	○
N	Green	●	●	●	●
S	Orange	●	●	●	●
H	Grey	○	○	○	○

WMT-CM

catalogue number	seat size	W	RR	LI	hand	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT	
WMTC015N00CM08	1	1,50	0,08	19,30	N - Neutral	■	■	■	4169668	■	
WMTC020N00CM08	2	2,00	0,08	19,21	N - Neutral	■	■	■	4169673	■	
WMTC094N00CM13	2B	2,39	0,13	22,32	N - Neutral	■	■	■	4169576	■	
WMTC030N00CM17	3	3,00	0,17	25,40	N - Neutral	■	■	■	4169682	■	
WMTC125N00CM17	3	3,17	0,17	25,41	N - Neutral	■	■	■	4169582	■	
WMTC040N00CM17	4	4,00	0,17	25,40	N - Neutral	■	■	■	4169692	■	
catalogue number	seat size	W	RR	LI	αL	hand	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTC015L05CM08	1	1,50	0,08	19,31	5	L - Left	■	■	■	4169671	■
WMTC020L05CM08	2	1,99	0,08	19,21	5	L - Left	■	■	■	4169677	■
WMTC020L12CM08	2	2,00	0,08	19,25	12	L - Left	■	■	■	4169680	■
WMTC030L12CM17	3	3,00	0,17	25,40	12	L - Left	■	■	■	4169690	■
WMTC030L05CM17	3	3,00	0,17	25,40	5	L - Left	■	■	■	4169686	■
WMTC040L12CM17	4	4,00	0,17	25,40	12	L - Left	■	■	■	4169697	■
WMTC040L05CM17	4	4,00	0,17	25,40	5	L - Left	■	■	■	4169695	■

(continued)

(WMT-CM — continued)

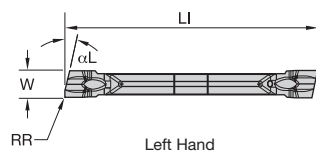
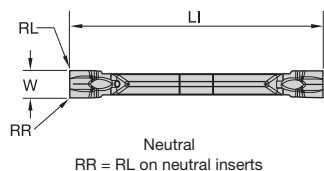


● first choice
○ alternate choice

P	Blue	●	●	○	○
M	Yellow	●	●	●	○
K	Red	●	●	○	○
N	Green	●	●	●	●
S	Orange	●	●	●	●
H	Grey	○	○	○	○

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	■	■	■	4169672	■
WMTC015R05CM08	1	1,50	0,08	19,31	5	R - Right	■	■	■	4169670	■
WMTC020R05CM08	2	2,00	0,08	19,26	5	R - Right	■	■	■	4169675	■
WMTC020R12CM08	2	2,00	0,08	19,26	12	R - Right	■	■	■	4169678	■
WMTC094R12CM13	2B	2,39	0,13	22,28	12	R - Right	■	■	■	4169580	■
WMTC094R05CM13	2B	2,39	0,13	22,32	5	R - Right	■	■	■	4169578	■
WMTC030R05CM17	3	3,00	0,17	25,40	5	R - Right	■	■	■	4169684	■
WMTC030R12CM17	3	3,00	0,17	25,40	12	R - Right	■	■	■	4169688	■
WMTC125R05CM17	3	3,17	0,17	25,40	5	R - Right	■	■	■	4169664	■
WMTC125R12CM17	3	3,18	0,17	25,40	12	R - Right	■	■	■	4169666	■
WMTC040R12CM17	4	4,00	0,17	25,40	12	R - Right	■	■	■	4169696	■
WMTC040R05CM17	4	4,00	0,17	25,40	5	R - Right	■	■	■	4169694	■

Grooving and Cut-Off



● first choice
○ alternate choice

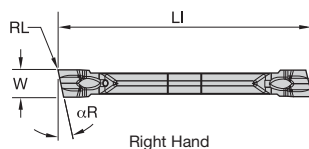
P	Blue	●	●	○	○
M	Yellow	●	●	●	○
K	Red	●	●	○	○
N	Green	●	●	●	●
S	Orange	●	●	●	●
H	Grey	○	○	○	○

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	■	■	■	4169669	■
WMTC020N00CMW08	2	2,00	0,08	19,21	N - Neutral	■	■	■	4169674	■
WMTC094N00CMW13	2B	2,39	0,13	22,32	N - Neutral	■	■	■	4169577	■
WMTC030N00CMW17	3	3,00	0,17	25,40	N - Neutral	■	■	■	4169683	■
WMTC125N00CMW17	3	3,18	0,17	25,41	N - Neutral	■	■	■	4169663	■
WMTC040N00CMW17	4	4,00	0,17	25,40	N - Neutral	■	■	■	4169693	■
WMTC020L12CMW08	2	2,00	0,08	19,27	L - Left	■	■	■	4169681	■
WMTC030L12CMW17	3	3,00	0,17	25,40	L - Left	■	■	■	4169691	■
WMTC030L05CMW17	3	3,00	0,17	25,40	L - Left	■	■	■	4169687	■

(continued)

(WMT-CM-W — continued)

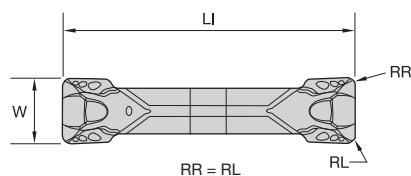


● first choice
○ alternate choice

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	■	■	■	4169676	■
WMTC020R12CMW08	2	2,00	0,08	19,27	12	R - Right	■	■	■	4169679	■
WMTC094R12CMW13	2B	2,39	0,13	22,29	12	R - Right	■	■	■	4169581	■
WMTC094R05CMW13	2B	2,39	0,13	22,32	5	R - Right	■	■	■	4169579	■
WMTC030R05CMW17	3	3,00	0,17	25,40	5	R - Right	■	■	■	4169685	■
WMTC030R12CMW17	3	3,00	0,17	25,40	12	R - Right	■	■	■	4169689	■
WMTC125R05CMW17	3	3,17	0,17	25,41	5	R - Right	■	■	■	4169665	■
WMTC125R12CMW17	3	3,17	0,17	25,41	12	R - Right	■	■	■	4169667	■

Grooving and Cut-Off

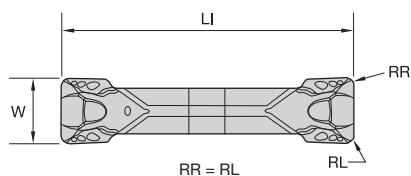


● first choice
○ alternate choice

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

■ WMT-U-PT • Moulded

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

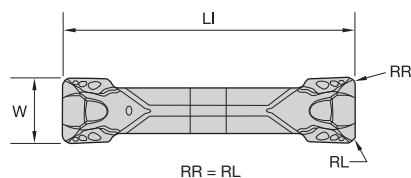
P	●	●	○	○
M	●	●	○	○
K	●	●	○	○
N	●	●	○	○
S	●	●	○	○
H	○	○	○	○

■ WMT-P-PT • Precision

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS200M2P02PT	2	2,00	0,15	19,10	■	■	4116129	4116130	■
WMTS094I2BP02PT	2B	2,38	0,15	22,15	■	■	4118451	4118452	■
WMTS094I2BP04PT	2B	2,38	0,38	22,14	■	■	4118583	4118584	■
WMTS300M3P03PH	3	3,00	0,30	25,65	■	■	5346412	5346413	5346414
WMTS300M3P03PT	3	3,00	0,31	25,65	■	■	4113563	4113564	4113566
WMTS300M3P06PH	3	3,00	0,60	25,65	■	■	5346415	5346416	5346417
WMTS300M3P06PT	3	3,00	0,61	25,65	■	■	4113565	4113567	■
WMTS125I3P03PT	3	3,17	0,23	25,40	■	■	4118585	4118586	■
WMTS125I3P08PT	3	3,17	0,76	25,40	■	■	4118587	4118588	■
WMTS125I3P03PH	3	3,18	0,25	25,40	■	■	5345914	5291300	■
WMTS125I3P08PH	3	3,18	0,75	25,40	■	■	5345915	5331093	■
WMTS156I4P03PH	4	3,95	0,30	25,40	■	■	5345916	5345917	■
WMTS156I4P08PH	4	3,96	0,75	25,40	■	■	5345918	5345919	■
WMTS400M4P03PH	4	4,00	0,30	25,40	■	■	5346418	5346419	5346420
WMTS400M4P03PT	4	4,00	0,31	25,40	■	■	4113572	4113574	4113573
WMTS400M4P06PH	4	4,00	0,60	25,40	■	■	5346421	5346422	5346423

(continued)

(WMT-P-PT • Precision — continued)



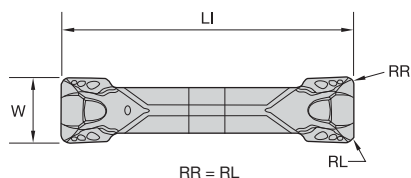
● first choice
○ alternate choice

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

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS400M4P06PT	4	4,00	0,60	25,40	■	■	4113575	4113576	■
WMTS188I5P03PT	5	4,76	0,26	28,63	■	■	4118589	4118590	■
WMTS188I5P03PH	5	4,77	0,25	28,63	■	■	5345980	5331095	■
WMTS188I5P08PH	5	4,77	0,75	28,63	■	■	5345981	5331097	■
WMTS188I5P08PT	5	4,77	0,76	28,63	■	■	4118591	4118592	■
WMTS500M5P03PH	5	5,00	0,30	28,63	■	■	5346424	5346425	5346426
WMTS500M5P03PT	5	5,00	0,30	28,63	■	■	4116143	4116144	4116145
WMTS500M5P06PH	5	5,00	0,60	28,63	■	■	5346427	5346428	5346429
WMTS500M5P06PT	5	5,00	0,61	28,63	■	■	4116146	4116147	■
WMTS600M6P03PH	6	6,00	0,30	28,63	■	■	5346430	5346431	■
WMTS600M6P03PT	6	6,00	0,30	28,63	■	■	4117239	4117240	■
WMTS600M6P06PT	6	6,00	0,58	28,63	■	■	4117241	4117242	■
WMTS600M6P06PH	6	6,00	0,60	28,63	■	■	5346432	5346433	■
WMTS250I6P08PH	6	6,32	0,75	28,63	■	■	5327621	■	■

(continued)

(WMT-P-PT • Precision — continued)

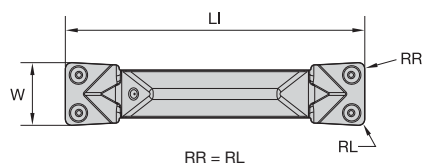


● first choice
○ alternate choice

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	■	■	4118595	4118596	■
WMTS250I6P03PH	6	6,35	0,25	28,63	■	■	5345983	5327620	■
WMTS250I6P03PT	6	6,35	0,25	28,63	■	■	4118593	4118594	■
WMTS312I8P03PH	8	7,92	0,25	28,57	■	■	5345985	5345986	■
WMTS312I8P08PH	8	7,92	0,75	28,57	■	■	5345987	5345988	■
WMTS800M8P03PH	8	8,00	0,30	28,57	■	■	5346436	5346437	■
WMTS800M8P06PH	8	8,00	0,60	28,57	■	■	5346434	5346435	■
WMTS800M8P06PT	8	8,00	0,61	28,57	■	■	4117257	4117258	■
WMTS800M8P15PT	8	8,00	1,50	28,57	■	■	4117259	4117260	■

Grooving and Cut-Off

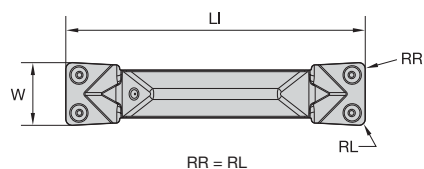


● first choice
○ alternate choice

P					
M					
K					
N					
S					
H					

■ WMT-U-PH • Moulded

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	○	○	○	○

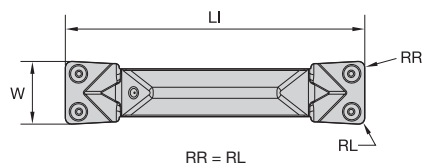
■ WMT-P-PH • Precision

catalogue number	seat size	W	RR	LI	WP10CT	WP25CT	WU10PT	WU25PT	WU10HT
WMTS300M3P03PH	3	3,00	0,30	25,65	■	■	5346412	5346413	5346414
WMTS300M3P06PH	3	3,00	0,60	25,65	■	■	5346415	5346416	5346417
WMTS125I3P03PH	3	3,18	0,25	25,40	■	■	5345914	5291300	■
WMTS125I3P08PH	3	3,18	0,75	25,40	■	■	5345915	5331093	■
WMTS156I4P03PH	4	3,95	0,30	25,40	■	■	5345916	5345917	■
WMTS156I4P08PH	4	3,96	0,75	25,40	■	■	5345918	5345919	■
WMTS400M4P03PH	4	4,00	0,30	25,40	■	■	5346418	5346419	■
WMTS400M4P06PH	4	4,00	0,60	25,40	■	■	5346421	5346422	5346423
WMTS188I5P03PH	5	4,77	0,25	28,63	■	■	5345980	5331095	■
WMTS188I5P08PH	5	4,77	0,75	28,63	■	■	5345981	5331097	■

(continued)

Grooving and Cut-Off

(WMT-P-PH • Precision — continued)

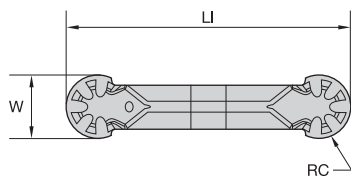


● first choice
○ alternate choice

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	■	■	5346424	5346425	5346426
WMTS500M5P06PH	5	5,00	0,60	28,63	■	■	5346427	5346428	5346429
WMTS600M6P03PH	6	6,00	0,30	28,63	■	■	5346430	5346431	■
WMTS600M6P06PH	6	6,00	0,60	28,63	■	■	5346432	5346433	■
WMTS250I6P08PH	6	6,32	0,75	28,63	■	■	5345984	5327621	■
WMTS250I6P03PH	6	6,35	0,25	28,63	■	■	5345983	5327620	■
WMTS312I8P03PH	8	7,92	0,25	28,57	■	■	5345985	5345986	■
WMTS312I8P08PH	8	7,92	0,75	28,57	■	■	5345987	5345988	■
WMTS800M8P03PH	8	8,00	0,30	28,57	■	■	5346436	5346437	■
WMTS800M8P06PH	8	8,00	0,60	28,57	■	■	5346434	5346435	■



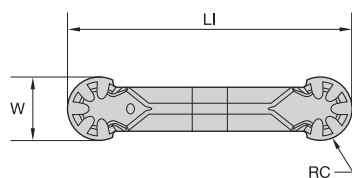
● first choice
○ alternate choice

P	Blue	●	●	○	○
M	Yellow	●	●	●	○
K	Red	●	●	○	○
N	Green	●	●	●	●
S	Orange	●	●	●	●
H	Grey	○	○	○	○

■ 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

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	■	■	4170179	4170180	■
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	■

WIN WITH WIDIATM

Ranger

The industry's only adjustable
face grooving tool!

Features:

- Enables the adjustment of the support blade from 57–406mm diameter for initial plunge.
- Insert widths 3,2mm, 4,9mm, and 6,4mm.

Benefits:

- Available in both CW and CCW rotation and sweep-in or sweep-out styles.
- 57–406mm O.D. face grooving with one adjustable assembly.

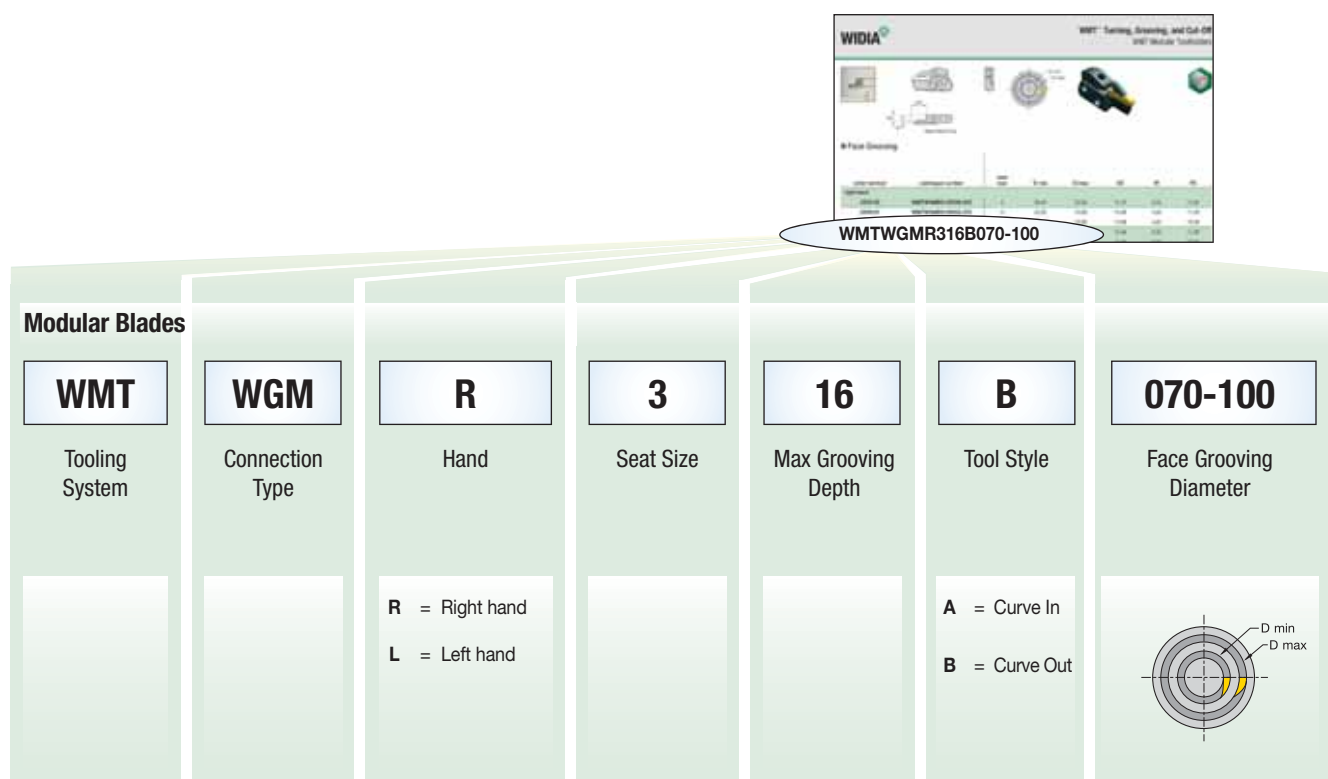
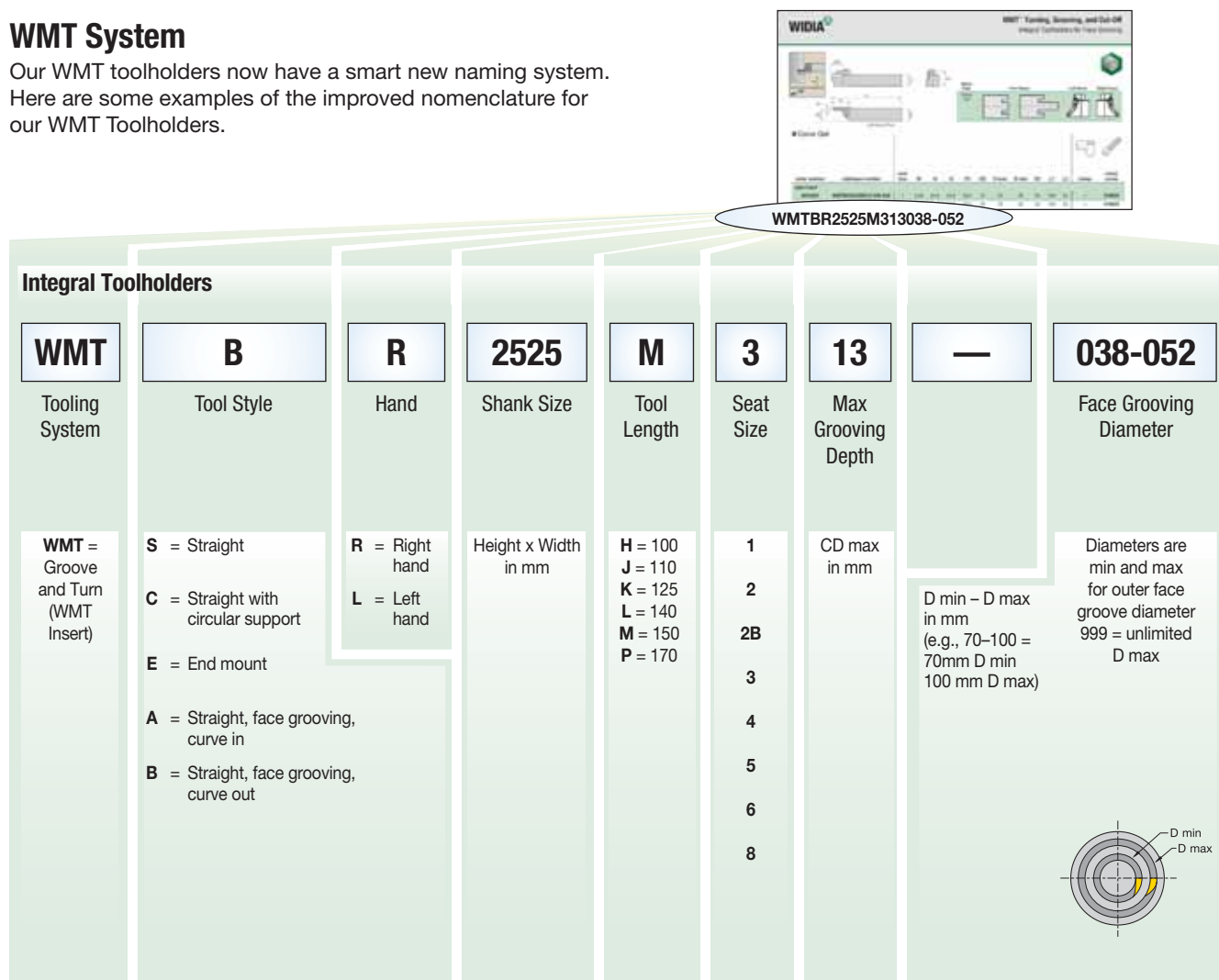


To learn more, contact your local Authorised Distributor or visit www.widia.com.

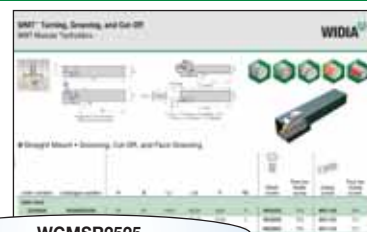
WIDIA 

WMT System

Our WMT toolholders now have a smart new naming system. Here are some examples of the improved nomenclature for our WMT Toolholders.



**WIDIA
VICTORY**



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

Integral Boring Bars

A

Steel
Bar with
Coolant



25

Bar Diameter

R

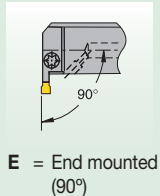
Bar Length

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

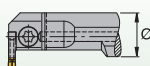
Max
Grooving
Depth

M

Tool Units

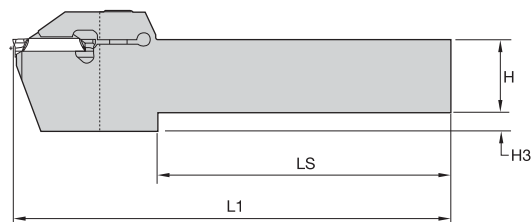
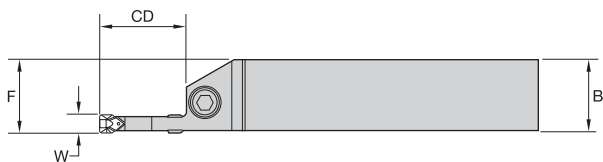
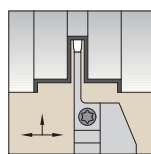
N = Inch
M = Metric

metric bars:	inch bars:
R = 200mm	R = 8"
S = 250mm	S = 10"
T = 300mm	T = 12"

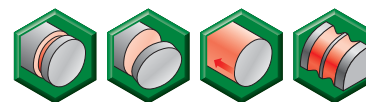


metric bars:	inch bars:
Bar diameter in millimetres	A two-digit number which indicates the bar diameter in 1/16" increments.

conversions:	
mm	inch
7mm	.28"
10mm	.39"
12mm	.47"
16mm	.63"



Right Hand Tool



■ O.D. Grooving and Cut-Off

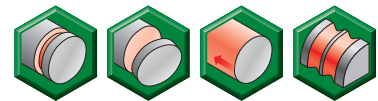
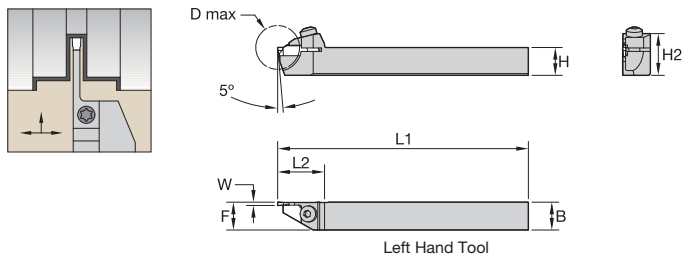
												
order number	catalogue number	seat size	W	H	B	CD	F	H3	L1	LS	clamping screw	clamping screw
right hand												
3650516	WMTSR2525M116	1	1,50	25,0	25,0	17	25,0	—	150	116	606249	—
3650456	WMTSR1616K216	2	2,00	16,0	16,0	17	16,0	6	125	101	606249	—
3650458	WMTSR2020K216	2	2,00	20,0	20,0	17	20,0	—	125	92	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
left hand												
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



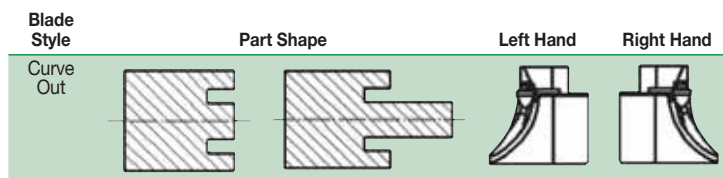
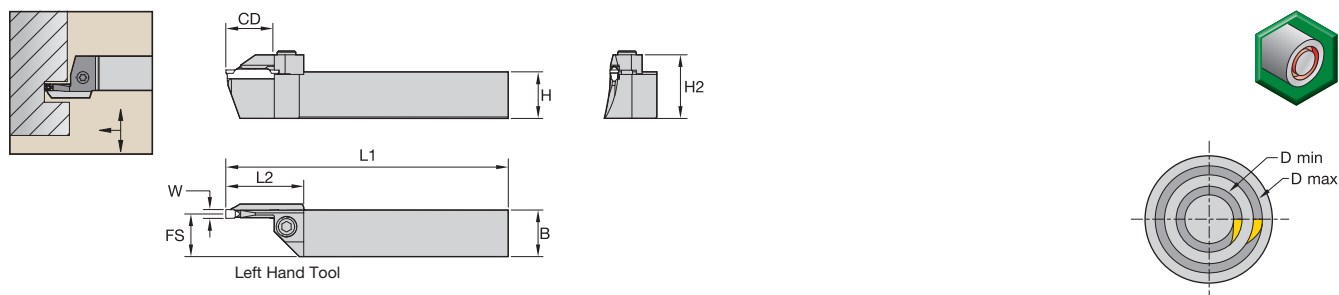
order number	catalogue number	seat size	W	H	B	F	D max	H2	L1	L2	clamp screw
right hand											
3650508	WMTCR1010H110	1	1,50	10,0	10,0	10,0	20	16	100	21	606249
3650510	WMTCR1212H110	1	1,50	12,0	12,0	12,0	20	18	100	21	606249
3650512	WMTCR1616K113	1	1,50	16,0	15,9	16,0	26	24	125	24	606266
3650514	WMTCR2020K113	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
left hand											
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.

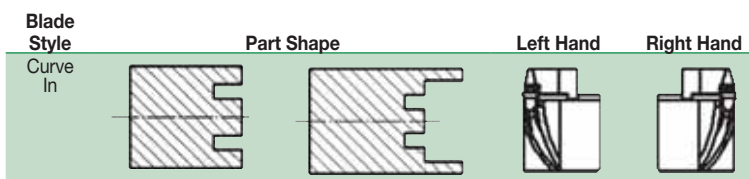
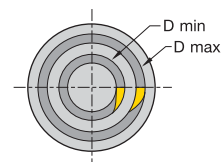
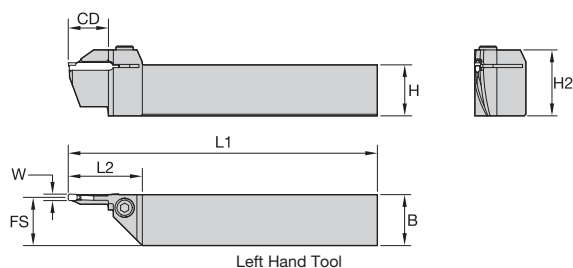
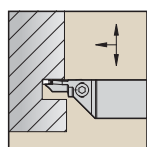
Insert Width	Lead Angle	Old Manchester Catalogue Number	Old Manchester Grade	WMT Cut-Off Insert	WMT Insert Grade	WIDIA™ Order Number
1,5mm	Neutral	583-165	M443B	WMTC015N00CM08	WU25PT	4169668
1,5mm	Right - 5°	583-166	M443B	WMTC015R05CM08	WU25PT	4169670
1,5mm	Right - 12°	583-168	M443B	WMTC015R12CM08	WU25PT	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	WMTC200M2P02PT	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
right hand														
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
left hand														
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

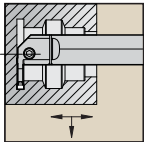
NOTE: Initial cut of tool must be between D min and D max. Due to the insert being positioned 0,75mm above centre, minimum diameter after initial cut is 12,6mm.
Toolholders that accept 3mm and 4mm width inserts have an integral clamp.
Toolholders that accept 5mm and 6mm width inserts are supplied with a detachable clamp.



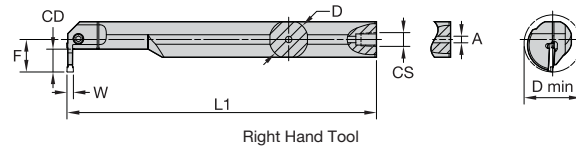
■ Curve In

order number	catalogue number	seat size	W	H	B	FS	CD	D max	D min	H2	L1	L2	clamp	clamp screw
right hand														
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
left hand														
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.



Right Hand Tool



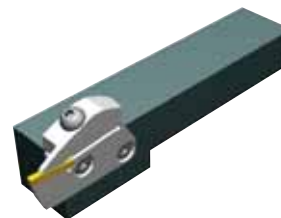
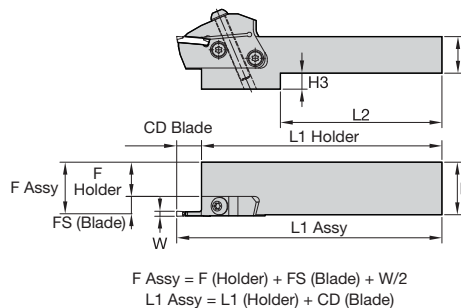
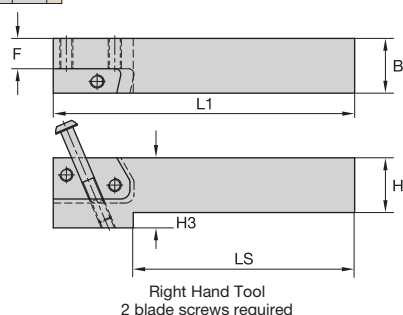
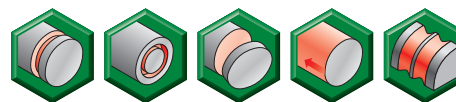
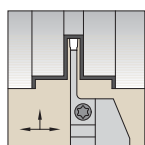
Right Hand Tool



Grooving and Cut-Off

■ I.D. Boring Bars

order number	catalogue number	insert size	W	F	CD	D	D min	L1	A	clamp screw	hex
right hand											
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
left hand											
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



■ Straight Mount • Grooving, Cut-Off, and Face Grooving

order number	catalogue number	H	B	L1	LS	F	H3	blade screw	Torx for blade screw	clamp screw	Torx for clamp screw
right hand											
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
left hand											
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.

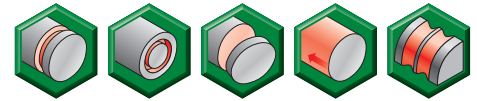
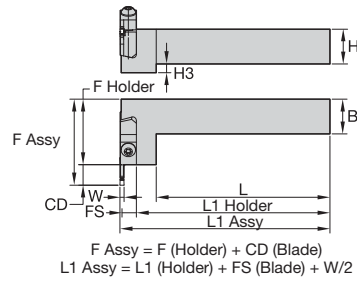
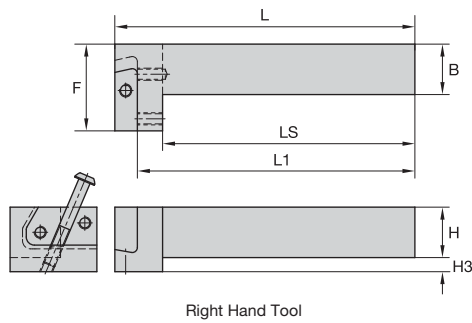
Toolholder Style	Hand of Holder	Hand of Blade
WGMS — Straight Mount	Right	Right
	Left	Left
WGME — End Mount	Right	Left
	Left	Right



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
right hand								
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	—
left hand								
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

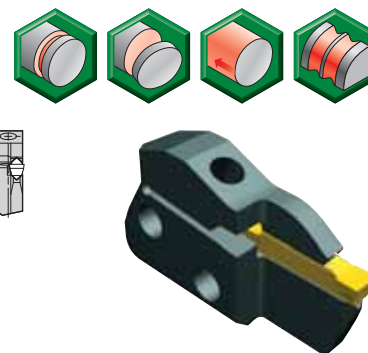
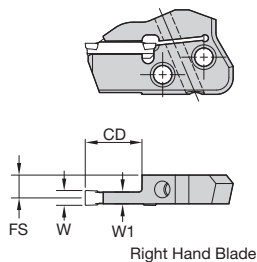
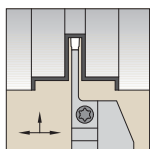
Grooving and Cut-Off



Grooving and Cut-Off Blades
found on page E38.



Face Grooving Blades found on
page E39.

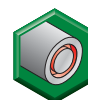
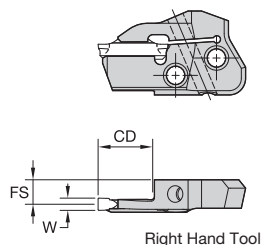
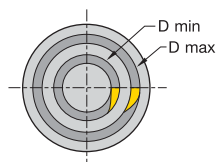
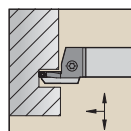


Grooving and Cut-Off

order number	catalogue number	seat size	CD	W	FS	W1
right hand						
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
left hand						
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
right hand							
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
left hand							
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

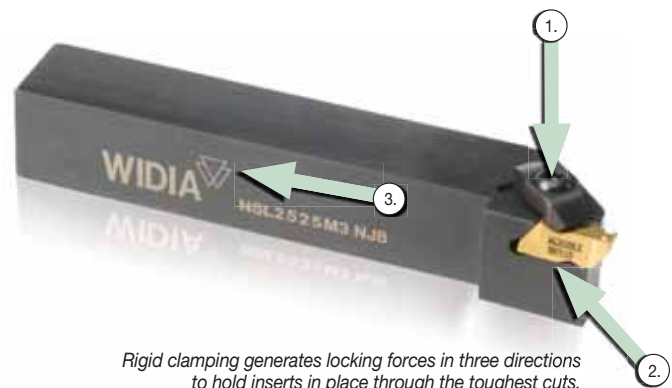
WIDIA has set the industry standard for threading and grooving productivity with the TopGroove clamping design. The TopGroove design provides consistent tool performance, accurate indexing, and superior clamping to provide excellent surface finish and outstanding tool life.

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.

TopGroove

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.

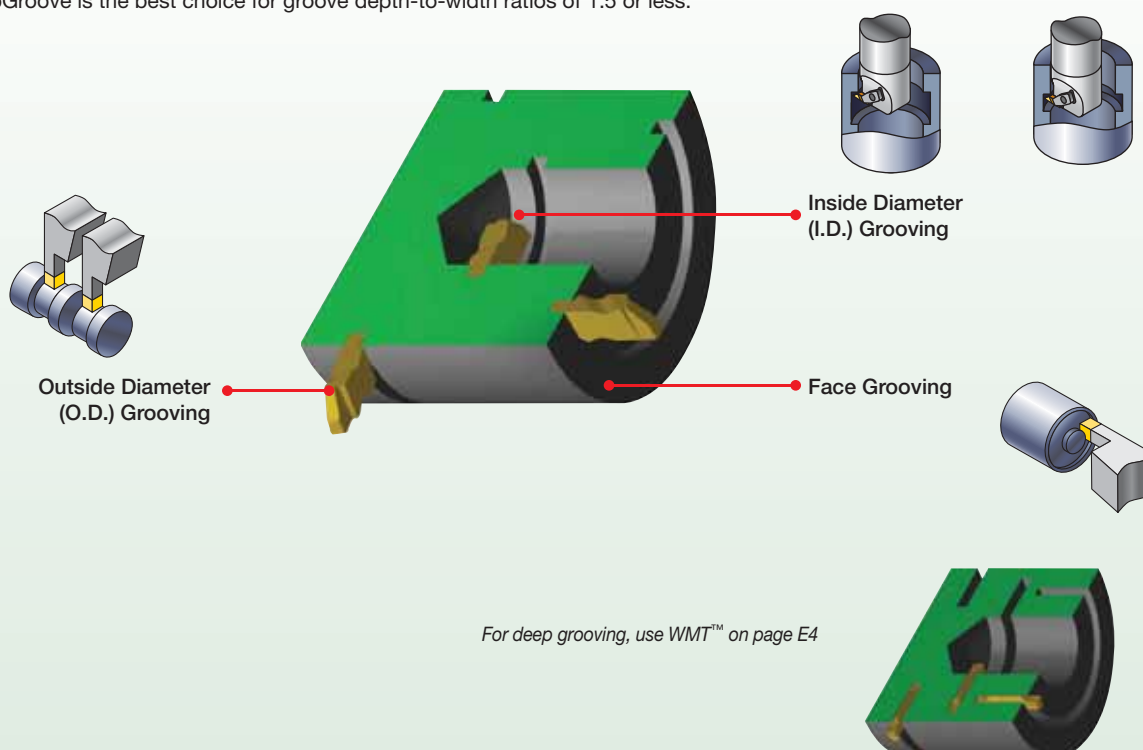
What you need to know:

- 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.

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:

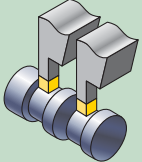
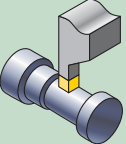
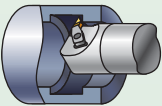
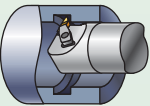
- A Choose the appropriate gage insert (width) required for the application.
- B Choose the shortest cutting depth "CD" dimension for increased tool rigidity.
- C Select the largest toolholder shank "H" and "B" dimensions for maximum rigidity.

TopGroove™ Toolholders

WIDIA

■ NS

order number	catalogue number	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
right hand													
3641662	NSR1010E2	10.0	10.0	14.0	70	18	8	4	N,20	CM74	MS1200	—	T10
3641660	NSR1212F2	12.0	12.0	16.0	90	19	8	4	N,20	CM74	MS1200	—	T10
3636542	NSR1616H2	16.0	16.0	20.0	100	18	8	4	N,20	CM74	MS1200	—	T10
3636568	NSR2020K2	20.0	20.0	25.0	125	19	8	4	N,20	CM74	MS1200	—	T10
3638588	NSR2020K3	20.0	20.0	25.0	125	32	13	5	N,30	CM72LP	—	MS2111	25.9
3638590	NSR2525M2	25.0	25.0	32.0	150	19	8	4	N,20	CM74	MS1200	—	T10
3636536	NSR2525M3	25.0	25.0	32.0	150	32	13	5	N,30	CM72LP	—	MS2111	25.9
3636540	NSR2525M4	25.0	25.0	32.0	150	35	14	7	N,40	CM72LP	—	MS2111	25.9
3641664	NSR3232P3	32.0	32.0	40.0	170	32	13	5	N,30	CM72LP	—	MS2111	25.9
3641675	NSR3232P4	32.0	32.0	40.0	170	35	14	7	N,40	CM72LP	—	MS2111	25.9
3641666	NSR3232P5	32.0	32.0	40.0	170	35	14	7	N,40	CM72LP	—	MS2111	25.9
3641673	NSR3232P6	32.0	32.0	40.0	170	51	16	11	N,50	CM80	MS352	—	8 mm
left hand													
3641663	NSL1010E2	10.0	10.0	14.0	70	18	8	4	N,20	CM75	MS1200	—	T10
3641661	NSL1212F2	12.0	12.0	16.0	90	19	8	4	N,20	CM75	MS1200	—	T10
3636545	NSL1616H2	16.0	16.0	20.0	100	18	8	4	N,20	CM75	MS1200	—	T10

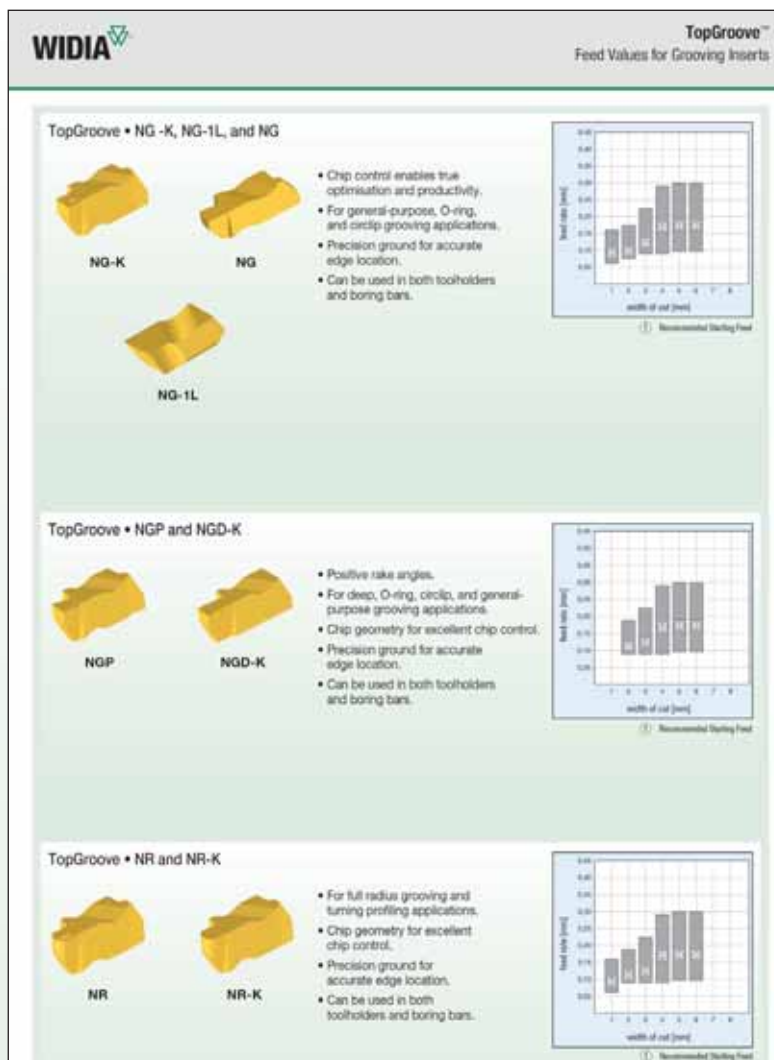
		application	conventional toolholders	modular blades
		O.D. Grooving and Plunge and Turn	pages E74–E76	—
		I.D. Grooving	pages E78–E79	—

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.



- 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; left-hand insert is mirror image.

■ NG • Grooving Inserts

● first choice
○ alternate choice

catalogue number	insert size	A		B		T	
		W	RR	W	RR		
NG2031R	2	0.79	0.09			1.27	1N6013 3M0153 3M0154 3M0155 3M0156 3M0157 3M0158 3M0159 3M0160 3M0161 3M0162 3M0163 3M0164 3M0165 3M0166 3M0167 3M0168 3M0169 3M0170 3M0171 3M0172 3M0173 3M0174 3M0175 3M0176 3M0177 3M0178 3M0179 3M0180 3M0181 3M0182 3M0183 3M0184 3M0185 3M0186 3M0187 3M0188 3M0189 3M0190 3M0191 3M0192 3M0193 3M0194 3M0195 3M0196 3M0197 3M0198 3M0199 3M0200 3M0201 3M0202 3M0203 3M0204 3M0205 3M0206 3M0207 3M0208 3M0209 3M0210 3M0211 3M0212 3M0213 3M0214 3M0215 3M0216 3M0217 3M0218 3M0219 3M0220 3M0221 3M0222 3M0223 3M0224 3M0225 3M0226 3M0227 3M0228 3M0229 3M0230 3M0231 3M0232 3M0233 3M0234 3M0235 3M0236 3M0237 3M0238 3M0239 3M0240 3M0241 3M0242 3M0243 3M0244 3M0245 3M0246 3M0247 3M0248 3M0249 3M0250 3M0251 3M0252 3M0253 3M0254 3M0255 3M0256 3M0257 3M0258 3M0259 3M0260 3M0261 3M0262 3M0263 3M0264 3M0265 3M0266 3M0267 3M0268 3M0269 3M0270 3M0271 3M0272 3M0273 3M0274 3M0275 3M0276 3M0277 3M0278 3M0279 3M0280 3M0281 3M0282 3M0283 3M0284 3M0285 3M0286 3M0287 3M0288 3M0289 3M0290 3M0291 3M0292 3M0293 3M0294 3M0295 3M0296 3M0297 3M0298 3M0299 3M0300 3M0301 3M0302 3M0303 3M0304 3M0305 3M0306 3M0307 3M0308 3M0309 3M0310 3M0311 3M0312 3M0313 3M0314 3M0315 3M0316 3M0317 3M0318 3M0319 3M0320 3M0321 3M0322 3M0323 3M0324 3M0325 3M0326 3M0327 3M0328 3M0329 3M0330 3M0331 3M0332 3M0333 3M0334 3M0335 3M0336 3M0337 3M0338 3M0339 3M0340 3M0341 3M0342 3M0343 3M0344 3M0345 3M0346 3M0347 3M0348 3M0349 3M0350 3M0351 3M0352 3M0353 3M0354 3M0355 3M0356 3M0357 3M0358 3M0359 3M0360 3M0361 3M0362 3M0363 3M0364 3M0365 3M0366 3M0367 3M0368 3M0369 3M0370 3M0371 3M0372 3M0373 3M0374 3M0375 3M0376 3M0377 3M0378 3M0379 3M0380 3M0381 3M0382 3M0383 3M0384 3M0385 3M0386 3M0387 3M0388 3M0389 3M0390 3M0391 3M0392 3M0393 3M0394 3M0395 3M0396 3M0397 3M0398 3M0399 3M0400 3M0401 3M0402 3M0403 3M0404 3M0405 3M0406 3M0407 3M0408 3M0409 3M0410 3M0411 3M0412 3M0413 3M0414 3M0415 3M0416 3M0417 3M0418 3M0419 3M0420 3M0421 3M0422 3M0423 3M0424 3M0425 3M0426 3M0427 3M0428 3M0429 3M0430 3M0431 3M0432 3M0433 3M0434 3M0435 3M0436 3M0437 3M0438 3M0439 3M0440 3M0441 3M0442 3M0443 3M0444 3M0445 3M0446 3M0447 3M0448 3M0449 3M0450 3M0451 3M0452 3M0453 3M0454 3M0455 3M0456 3M0457 3M0458 3M0459 3M0460 3M0461 3M0462 3M0463 3M0464 3M0465 3M0466 3M0467 3M0468 3M0469 3M0470 3M0471 3M0472 3M0473 3M0474 3M0475 3M0476 3M0477 3M0478 3M0479 3M0480 3M0481 3M0482 3M0483 3M0484 3M0485 3M0486 3M0487 3M0488 3M0489 3M0490 3M0491 3M0492 3M0493 3M0494 3M0495 3M0496 3M0497 3M0498 3M0499 3M0500 3M0501 3M0502 3M0503 3M0504 3M0505 3M0506 3M0507 3M0508 3M0509 3M0510 3M0511 3M0512 3M0513 3M0514 3M0515 3M0516 3M0517 3M0518 3M0519 3M0520 3M0521 3M0522 3M0523 3M0524 3M0525 3M0526 3M0527 3M0528 3M0529 3M0530 3M0531 3M0532 3M0533 3M0534 3M0535 3M0536 3M0537 3M0538 3M0539 3M0540 3M0541 3M0542 3M0543 3M0544 3M0545 3M0546 3M0547 3M0548 3M0549 3M0550 3M0551 3M0552 3M0553 3M0554 3M0555 3M0556 3M0557 3M0558 3M0559 3M0560 3M0561 3M0562 3M0563 3M0564 3M0565 3M0566 3M0567 3M0568 3M0569 3M0570 3M0571 3M0572 3M0573 3M0574 3M0575 3M0576 3M0577 3M0578 3M0579 3M0580 3M0581 3M0582 3M0583 3M0584 3M0585 3M0586 3M0587 3M0588 3M0589 3M0590 3M0591 3M0592 3M0593 3M0594 3M0595 3M0596 3M0597 3M0598 3M0599 3M0600 3M0601 3M0602 3M0603 3M0604 3M0605 3M0606 3M0607 3M0608 3M0609 3M0610 3M0611 3M0612 3M0613 3M0614 3M0615 3M0616 3M0617 3M0618 3M0619 3M0620 3M0621 3M0622 3M0623 3M0624 3M0625 3M0626 3M0627 3M0628 3M0629 3M0630 3M0631 3M0632 3M0633 3M0634 3M0635 3M0636 3M0637 3M0638 3M0639 3M0640 3M0641 3M0642 3M0643 3M0644 3M0645 3M0646 3M0647 3M0648 3M0649 3M0650 3M0651 3M0652 3M0653 3M0654 3M0655 3M0656 3M0657 3M0658 3M0659 3M0660 3M0661 3M0662 3M0663 3M0664 3M0665 3M0666 3M0667 3M0668 3M0669 3M0670 3M0671 3M0672 3M0673 3M0674 3M0675 3M0676 3M0677 3M0678 3M0679 3M0680 3M0681 3M0682 3M0683 3M0684 3M0685 3M0686 3M0687 3M0688 3M0689 3M0690 3M0691 3M0692 3M0693 3M0694 3M0695 3M0696 3M0697 3M0698 3M0699 3M0700 3M0701 3M0702 3M0703 3M0704 3M0705 3M0706 3M0707 3M0708 3M0709 3M0710 3M0711 3M0712 3M0713 3M0714 3M0715 3M0716 3M0717 3M0718 3M0719 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3M1149 3M1150 3M1151 3M1152 3M1153 3M1154 3M1155 3M1156 3M1157 3M1158 3M1159 3M1160 3M1161 3M1162 3M1163 3M1164 3M1165 3M1166 3M1167 3M1168 3M1169 3M1170 3M1171 3M1172 3M1173 3M1174 3M1175 3M1176 3M1177 3M1178 3M1179 3M1180 3M1181 3M1182 3M1183 3M1184 3M1185 3M1186 3M1187 3M1188 3M1189 3M1190 3M1191 3M1192 3M1193 3M1194 3M1195 3M1196 3M1197 3M1198 3M1199 3M1200 3M1201 3M1202 3M1203 3M1204 3M1205 3M1206 3M1207 3M1208 3M1209 3M1210 3M1211 3M1212 3M1213 3M1214 3M1215 3M1216 3M1217 3M1218 3M1219 3M1220 3M1221 3M1222 3M1223 3M1224 3M1225 3M1226 3M1227 3M1228 3M1229 3M1230 3M1231 3M1232 3M1233 3M1234 3M1235 3M1236 3M1237 3M1238 3M1239 3M1240 3M1241 3M1242 3M1243 3M1244 3M1245 3M1246 3M1247 3M1248 3M1249 3M1250 3M1251 3M1252 3M1253 3M1254 3M1255 3M1256 3M1257 3M1258 3M1259 3M1260 3M1261 3M1262 3M1263 3M1264 3M1265 3M1266 3M1267 3M1268 3M1269 3M1270 3M1271 3M1272 3M1273 3M1274 3M1275 3M1276 3M1277 3M1278 3M1279 3M1280 3M1281 3M1282 3M1283 3M1284 3M1285 3M1286 3M1287 3M1288 3M1289 3M1290 3M1291 3M1292 3M1293 3M1294 3M1295 3M1296 3M1297 3M1298 3M1299 3M1300 3M1301 3M1302 3M1303 3M1304 3M1305 3M1306 3M1307 3M1308 3M1309 3M1310 3M1311 3M1312 3M1313 3M1314 3M1315 3M1316 3M1317 3M1318 3M1319 3M1320 3M1321 3M1322 3M1323 3M1324 3M1325 3M1326 3M1327 3M1328 3M1329 3M1330 3M1331 3M1332 3M1333 3M1334 3M1335 3M1336 3M1337 3M1338 3M1339 3M1340 3M1341 3M1342 3M1343 3M1344 3M1345 3M1346 3M1347 3M1348 3M1349 3M1350 3M1351 3M1352 3M1353 3M1354 3M1355 3M1356 3M1357 3M1358 3M1359 3M1360 3M1361 3M1362 3M1363 3M1364 3M1365 3M1366 3M1367 3M1368 3M1369 3M1370 3M1371 3M1372 3M1373 3M1374 3M1375 3M1376 3M1377 3M1378 3M1379 3M1380 3M1381 3M1382 3M1383 3M1384 3M1385 3M1386 3M1387 3M1388 3M1389 3M1390 3M1391 3M1392 3M1393 3M1394 3M1395 3M1396 3M1397 3M1398 3M1399 3M1400 3M1401 3M1402 3M1403 3M1404 3M1405 3M1406 3M1407 3M1408 3M1409 3M1410 3M1411 3M1412 3M1413 3M1414 3M1415 3M1416 3M1417 3M1418 3M1419 3M1420 3M1421 3M1422 3M1423 3M1424 3M1425 3M1426 3M1427 3M1428 3M1429 3M1430 3M1431 3M1432 3M1433 3M1434 3M1435 3M1436 3M1437 3M1438 3M1439 3M1440 3M1441 3M1442 3M1443 3M1444 3M1445 3M1446 3M1447 3M1448 3M1449 3M1450 3M1451 3M1452 3M1453 3M1454 3M1455 3M1456 3M1457 3M1458 3M1459 3M1460 3M1461 3M1462 3M1463 3M1464 3M1465 3M1466 3M1467 3M1468 3M1469 3M1470 3M1471 3M1472 3M1473 3M1474 3M1475 3M1476 3M1477 3M1478 3M1479 3M1480 3M1481 3M1482 3M1483 3M1484 3M1485 3M1486 3M1487 3M1488 3M1489 3M1490 3M1491 3M1492 3M1493 3M1494 3M1495 3M1496 3M1497 3M1498 3M1499 3M1500 3M1501 3M1502 3M1503 3M1504 3M1505 3M1506 3M1507 3M1508 3M1509 3M1510 3M1511 3M1512 3M1513 3M1514 3M1515 3M1516 3M1517 3M1518 3M1519 3M1520 3M1521 3M1522 3M

5 Select grade:

		Recommended Grades					
cutting condition		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**.

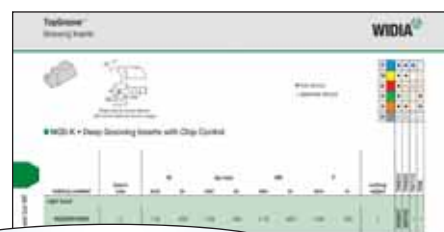
See page E50 for cutting data.

TopGroove™

Recommended Cutting Speeds • Metric

Material Group		Cutting Speed – vc – m/min																							
		min			Start			max			min			Start			max								
P	A	TN6010						TN6025						TN7110						THM					
		0 / 1	140	175	210	130	140	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	105	140	170	100	125	145	155	180	220	70	85	100											
M		6	45	60	75	40	55	65	65	85	100	30	40	45											
		1	90	115	140	60	75	90	–	–	–	60	75	90											
		2	55	70	90	40	50	55	–	–	–	50	60	75											
K		3	60	80	95	40	50	60	–	–	–	40	50	55											
		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											
N		3	110	140	170	60	75	90	180	230	280	60	70	80											
		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											
S		7	550	700	850	550	700	850	–	–	–	150	200	250											
		1	35	45	55	25	35	45	–	–	–	25	35	45											
		2	20	25	30	15	20	25	–	–	–	20	25	30											
		3	60	70	80	40	50	60	–	–	–	15	25	30											
H		4	30	35	45	20	25	35	–	–	–	10	15	20											
		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

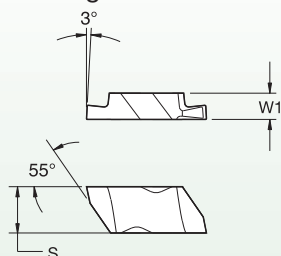


N	G	D	2	M	150	R		K	
Type of Insert	Insert Style	Additional Information	Insert Size	Size Identification	Groove Size**	Hand of Insert	Cutting Depth	Chipbreaker Design	Definition of Inserts
N – TopGroove 	B – Blank (for special forms) F – Face grooving G – Grooving P – Back turning R – Full radius U – Undercutting (or relieving) V – Poly-Vee	D – Deep grooving P – Positive C – Groove and chamfer	2 – Metric insert size M – Metric insert groove width C – Circlip groove insert width is nominal circlip size Blank – Indicates inch width insert	M – Metric insert size C – Circlip groove insert width is nominal circlip size Blank – Indicates inch width insert	150 – Groove size R – Right hand L – Left hand	R – Right hand L – Left hand	Shown for groove and chamfer inserts in .0004" increments.	K – Standard chip control E – Hone only	Groove size J or L – Poly-Vee inserts I – Internal face grooving

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.
Example: 3,25mm width groove or radius equals "325" catalogue position number.
Width Tolerance: ±0,025mm unless otherwise specified.

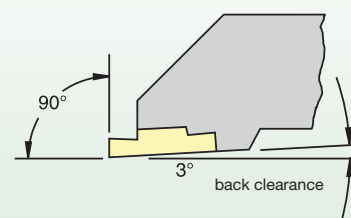
**Omit position for TopGroove NB-style blanks.

TopGroove/TopThread Threading and Grooving Insert Dimensions



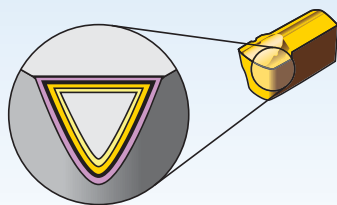
insert size	S		W1	
	mm	inch	mm	inch
1	2,54	.100	2,54	.100
2	5,56	.219	3,81	.150
3	8,74	.344	4,95	.195
4	11,51	.453	6,48	.255
5	17,48	.688	9,65	.380
6	11,51	.453	9,73	.383
8	7,93	.312	11,13	.438

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.



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

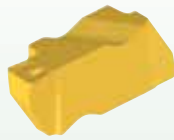
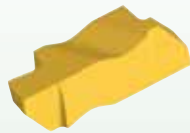
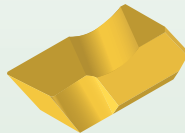
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

		wear resistance ← → toughness									
Coating	Grade Description		05	10	15	20	25	30	35	40	45
TN6010 HC-S10	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 machining hardened and short chipping materials.	P									
		M									
		K									
		N									
		S									
		H									
TN6025 HC-S25	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									
		H									
TN7110 HC-P10	Coated carbide. MTCVD/CVD — TiN-TiCN-Al ₂ O ₃ -TiN. Very wear resistant. Light and medium machining. For steels and nodular cast iron.	P									
		M									
		K									
		N									
		S									
		H									
THM HW-K15	Uncoated carbide. Extraordinarily good balance of hardness, wear resistance, edge stability, and toughness. Light and medium machining. For cast iron and all non-ferrous metals and non-metals. Useful in unfavourable conditions.	P									
		M									
		K									
		N									
		S									
		H									

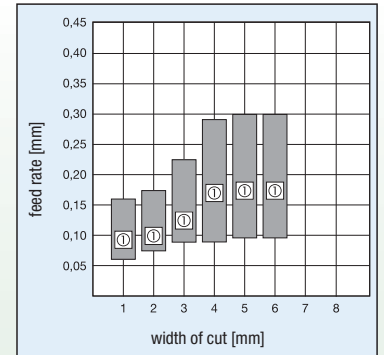


insert style	application	rake angle	page(s)	insert style	application	rake angle	page(s)
NG	- General-purpose grooving. - O-ring grooving. - Circlip grooving.	neutral	E51–E52	NFD-KI*	- Internal deep face grooving with chip control. - For use in boring bars for internal face grooves.	10° positive	—
							
NG-K	- Chip control geometry. - General-purpose grooving. - O-ring grooving. - Circlip grooving. - Light turning.	10° positive	E53–E59	NP-K	- Turning. - Back turning positive. - Profiling with chip control.	10° positive	E66
							
NGC-K*	- Combined groove and chamfered edge break in one positive plunge with chip control. - Designed for DIN 471/472 standard circlip grooves.	10° positive	—	NR	- Full radius grooving. - Turning and profiling.	neutral	E67–E69
							
NGD*	Deep grooving.	neutral	—	NR-K	- Chip control geometry. - Full radius grooving, turning, and profiling.	10° positive	E70
							
NGD-K	- Chip control geometry. - Deep grooving. - Light turning.	10° positive	E60–E62	NRD	- Deep grooving. - Full radius end-form.	neutral	E71
							
NGP	- General-purpose grooving. - O-ring grooving. - Circlip grooving.	5° positive	E63–E64	NRP*	- Full radius grooving. - Light-turning profiling.	5° positive	—
							
NF*	- Face grooving. - Additional side clearance.	neutral	—	NU*	Undercutting.	neutral	—
							
NF-K	- Face grooving with chip control. - Additional side clearance.	10° positive	E65	NV*	Poly-Vee grooving.	neutral	—
							
NFD-K	- Deep face grooving with chip control. - Additional side clearance.	10° positive	E66	NB/NBD	- Blanks. - Blanks for deep grooving. - Available in uncoated grades only.	—	E72
							

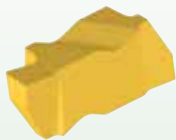
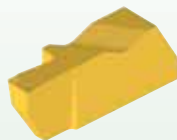
*Inserts are available as custom solutions.

TopGroove • NG -K, NG-1L, and NG

NG-K

NG

NG-1L

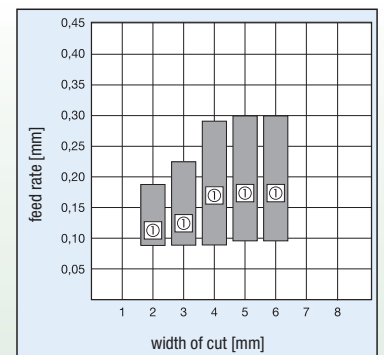
- Chip control enables true optimisation and productivity.
- For general-purpose, O-ring, and circlip grooving applications.
- Precision ground for accurate edge location.
- Can be used in both toolholders and boring bars.



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.



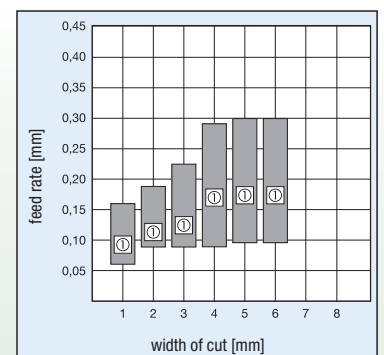
① Recommended Starting Feed

TopGroove • NR and NR-K

NR

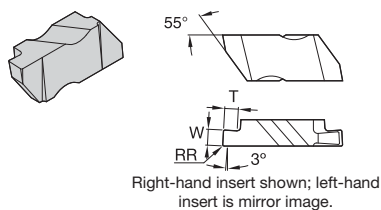
NR-K

- 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



- first choice
- alternate choice

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

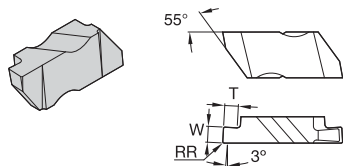
■ NG • Grooving Inserts

catalogue number	insert size	W	RR	T	TN6010	TN6025	TN7110	THM
right hand								
NG2031R	2	0,79	0,09	1,27	3607153	3607495	3607030	
NG2041R	2	1,04	0,09	1,27	3607157	3607330	3607416	
NG3047R	3	1,19	0,19	1,91	3607167	3607453	3607450	
NG2058R	2	1,47	0,19	1,27	3607167	3607453	3607450	
NG2062R	2	1,58	0,19	2,79	3607167	3607453	3607450	
NG3062R	3	1,58	0,19	2,39	3607137	3607406	3607403	
NG3094R	3	2,39	0,19	3,81	3607137	3607406	3607403	
NG3125R	3	3,18	0,19	3,81	3607143	3607382	3607375	
NG4250R	4	6,35	0,57	6,35	3607143	3607382	3607375	
left hand								
NG2031L	2	0,79	0,09	1,27	3607179	3607501	3607482	
NG3047L	3	1,19	0,19	1,91	3607179	3607501	3607482	
NG2058L	2	1,47	0,19	1,27	3607179	3607501	3607482	
NG2062L	2	1,58	0,19	2,79	3607179	3607501	3607482	
NG3062L	3	1,58	0,19	2,39	3607179	3607501	3607482	

Grooving and Cut-Off

(continued)

(NG • Grooving Inserts — continued)

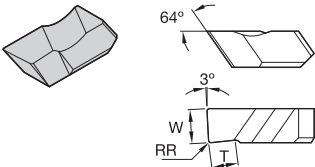


Right-hand insert shown; left-hand insert is mirror image.

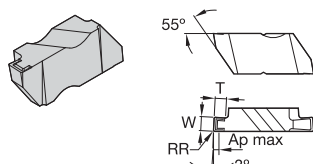
● first choice
○ alternate choice

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
left hand									
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 $\pm 0,076\text{mm}$ on NG-1L inserts.



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

● first choice
○ alternate choice

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

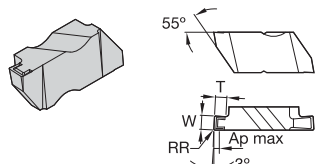
■ NG-K • Grooving Inserts with Chip Control

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
right hand									
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	■	■
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	■	■
NG3M150RK	3	1,50	1,02	0,19	2,39	■	3607221	3607668	■
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)

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

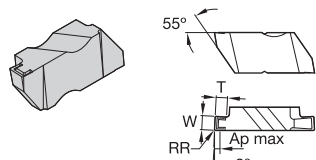
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M		●	●	○	○
K		●	○	○	○
N		●	○	○	●
S		●	●	○	●
H		○	○	○	○

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

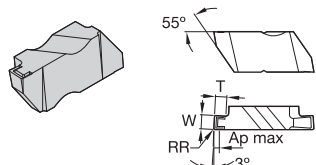
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K	●	○	○	○
N	●	○	○	●
S	●	●	○	●
H	○	○	○	○

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
NG3M275RK	3	2,75	1,02	0,19	3,81	3606677	3607337	■	■
NG2M300RK	2	3,00	1,09	0,19	2,79	3606676	3607340	■	■
NG3M300RK	3	3,00	1,02	0,19	3,81	3607138	3607072	■	■
NG4M300RK	4	3,00	1,02	0,19	3,81	3607388	3607381	■	■
NG2125RK	2	3,18	1,09	0,19	2,79	3607155	3607381	■	■
NG3125RK	3	3,18	1,02	0,19	3,81	3607057	3607068	■	■
NG4125RK	4	3,18	1,06	0,19	3,81	3607163	3607449	■	■
NG3M320RK	3	3,20	1,02	0,19	3,81	3607365	3607365	■	■
NG2M325RK	2	3,25	1,09	0,19	2,79	3607533	3607533	■	■
NG3M325RK	3	3,25	1,02	0,19	3,81	3607515	3607302	■	■
NG3M350RK	3	3,50	2,92	0,32	3,81	3607370	3607370	■	■
NG4M350RK	4	3,50	2,92	0,57	6,35	3607370	3607370	■	■
NG3156RK	3	3,96	2,92	0,19	3,81	3607127	3607456	■	■
NG3M400RK	3	3,99	2,92	0,32	3,81	3606678	3607235	■	■
NG4M400RK	4	4,00	2,92	0,57	6,35	3606908	3607364	■	■
NG3M425RK	3	4,24	2,92	0,32	3,81	3607517	3607517	■	■

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

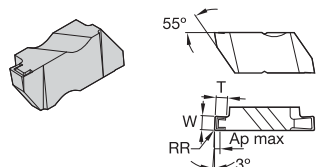
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M		●	●	○	○
K		●	○	○	○
N		●	○	○	●
S		●	●	○	●
H		○	○	○	○

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	—	3607362	—	—
NG4M450RK	4	4,50	2,92	0,57	6,35	—	3607390	—	—
NG3189RK	3	4,80	2,92	0,57	3,81	3607108	3607305	—	—
NG4189RK	4	4,80	2,92	0,57	6,35	3607103	3607220	—	—
NG4M500RK	4	5,00	2,92	0,32	6,35	3606830	3607447	—	—
NG4M550RK	4	5,50	3,81	0,57	6,35	—	3607383	—	—
NG4M600RK	4	6,00	3,81	0,57	6,35	—	3607385	—	—
NG4250RK	4	6,35	3,81	0,57	6,35	3607168	3607304	—	—
left hand									
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

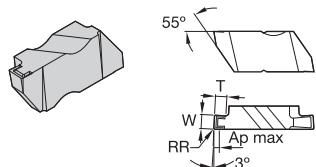
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M	●	●	●	○
K	●	○	○	○
N	●	○	○	●
S	●	●	○	●
H	○	○	○	○

catalogue number	insert size	W	Ap max	RR	T	TN6010	TN6025	TN7110	THM
NG2M120LK	2	1,20	0,76	0,09	1,27	3606827	3607334	■	■
NG3M120LK	3	1,20	0,76	0,19	1,91	3606917	3607384	■	■
NG2M140LK	2	1,40	0,76	0,09	1,27	3606904	3607338	■	■
NG2M150LK	2	1,50	1,09	0,19	2,79	■	3607294	■	■
NG3M150LK	3	1,50	1,02	0,19	2,39	■	3607308	■	■
NG2062LK	2	1,58	1,09	0,19	2,79	3607126	3607307	■	■
NG3062LK	3	1,58	1,02	0,19	2,39	3607092	3607213	■	■
NG2M170LK	2	1,70	1,09	0,19	2,79	3606905	3607327	■	■
NG2M175LK	2	1,75	1,09	0,19	2,79	■	3607421	■	■
NG3M175LK	3	1,75	1,02	0,19	2,39	■	3607331	■	■
NG3072LK	3	1,83	1,02	0,19	2,39	3607184	3607454	■	■
NG2M195LK	2	1,95	1,09	0,19	2,79	3606910	3607420	■	■
NG3078LK	3	1,98	1,02	0,19	2,39	3607106	3607460	■	■
NG2M200LK	2	2,00	1,09	0,19	2,79	3607144	3607207	■	■
NG3M200LK	3	2,00	1,02	0,19	2,39	■	3607211	■	■
NG2M220LK	2	2,20	1,09	0,19	2,79	3607367	■	■	■

(continued)

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

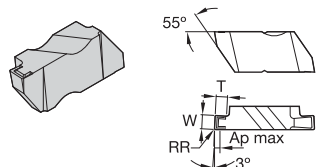
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M	●	●	○	○
K	●	○	○	○
N	●	○	○	○
S	●	●	●	○
H	○	○	○	○

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)



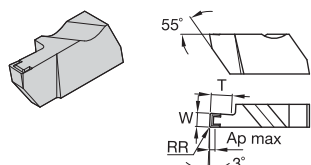
Right-hand insert shown; left-hand insert is mirror image.

● 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	—	3607368	—	—
NG3M325LK	3	3,25	1,02	0,19	3,81	—	3607315	—	—
NG3M350LK	3	3,50	2,92	0,32	3,81	—	3607519	—	—
NG4M350LK	4	3,50	2,92	0,57	6,35	—	3607371	3607653	—
NG3156LK	3	3,96	2,92	0,19	3,81	3607177	3607335	—	—
NG3M400LK	3	3,99	2,92	0,32	3,81	3606906	3607237	3607656	—
NG4M400LK	4	4,00	2,92	0,57	6,35	3606912	3607363	—	—
NG3M425LK	3	4,24	2,92	0,32	3,81	3606918	3607520	—	—
NG3M450LK	3	4,50	2,92	0,32	3,81	—	3607369	—	—
NG4M450LK	4	4,50	2,92	0,57	6,35	—	3607389	—	—
NG3189LK	3	4,80	2,92	0,57	3,81	3607107	3607320	3607629	—
NG4189LK	4	4,80	2,92	0,57	6,35	3607140	3607377	—	—
NG4M500LK	4	5,00	2,92	0,32	6,34	3606832	3607522	—	—
NG4M550LK	4	5,50	3,81	0,57	6,35	—	3607366	—	—
NG4M600LK	4	6,00	3,81	0,57	6,35	—	3607387	—	—
NG4250LK	4	6,35	3,81	0,57	6,35	3607142	3607311	—	—

Grooving and Cut-Off



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

● first choice
○ alternate choice

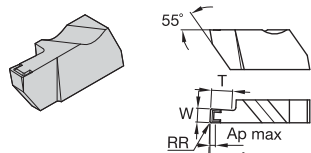
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M	●	●	●	○
K	●	○	○	○
N	●	○	●	●
S	●	●	○	●
H	○	○	○	○

■ 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	■	■
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	■	■
NGD3189RK	3	4,80	2,92	0,57	6,35	1	3607170	3607373	■	■

(continued)

(NGD-K • Deep Grooving Inserts with Chip Control — continued)



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

● first choice
○ alternate choice

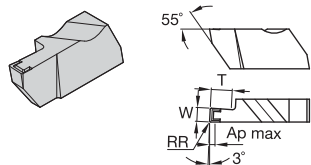
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K		●	○	○	○
N		●	○	●	●
S		●	●	○	○
H		○	○	○	○

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	●	●
left hand							3606935	3607402	●	●
NGD2M150LK	2	1,50	1,09	0,19	4,06	1	3607098	3607451	●	●
NGD3062LK	3	1,58	1,02	0,19	3,18	2	3606936	3607399	●	●
NGD2M200LK	2	2,00	1,09	0,19	5,08	1	3606941	3607487	●	●
NGD3M200LK	3	2,00	1,02	0,19	4,06	1	3607096	3607240	●	●
NGD3094LK	3	2,39	1,02	0,19	6,34	1	3607092	3607391	●	●
NGD2M250LK	2	2,50	1,09	0,19	5,08	1	3606942	3607423	●	●
NGD3M250LK	3	2,50	1,02	0,19	6,35	1	3606943	3607400	●	●
NGD3M300LK	3	3,00	1,02	0,19	6,35	1	3607097	3607209	●	●
NGD3125LK	3	3,18	1,02	0,19	6,35	1	3607132	3607316	●	●
NGD4125LK	4	3,18	1,02	0,19	6,35	2	3607488	●	●	●
NGD3M350LK	3	3,50	2,92	0,32	6,35	1	●	●	●	●

(continued)

Grooving and Cut-Off

(NGD-K • Deep Grooving Inserts with Chip Control — continued)



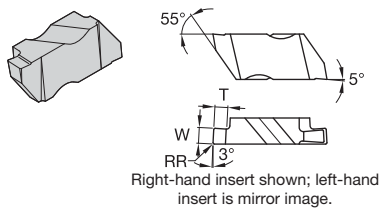
Right-hand insert shown; left-hand insert is mirror image.

● first choice
○ alternate choice

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	○	○	○	○

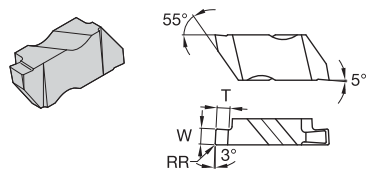
■ NGP • Grooving Positive Rake Inserts

catalogue number	insert size	W	RR	T	TN6010	TN6025	TN7110	THM
right hand								
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)

Grooving and Cut-Off

(NGP • Grooving Positive Rake Inserts — continued)

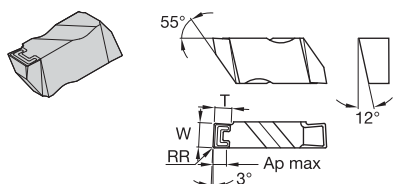


● first choice
○ alternate choice

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

Grooving and Cut-Off

catalogue number	insert size	W	RR	T	TN6010	TN6025	TN7110	THM
left hand								
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



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

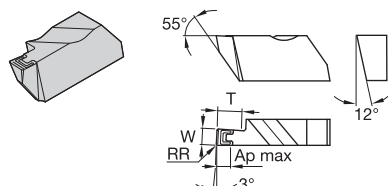
● first choice
○ alternate choice

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
right hand									
NF3M200RK	3	2,00	1,02	0,19	1,78	■	3607511	■	■
NF3M300RK	3	3,00	1,02	0,19	3,81	■	3607512	■	■
NF3125RK	3	3,18	1,02	0,19	3,81	■	3607241	■	■
left hand									
NF3M200LK	3	2,00	1,02	0,19	1,78	■	3607428	■	■
NF3M300LK	3	3,00	1,02	0,19	3,81	■	3607429	■	■
NF3125LK	3	3,18	1,02	0,19	3,81	■	3607322	■	■
NF3156LK	3	3,96	2,92	0,19	3,81	■	3607333	■	■

Grooving and Cut-Off



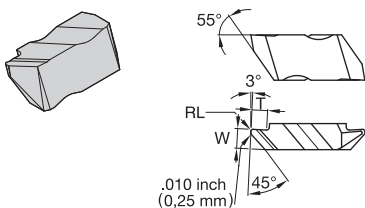
Right-hand insert shown; left-hand insert is mirror image.

● 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
right hand										
NFD3M300RK	3	3,00	1,02	0,19	6,35	1	■	3607523	■	■
NFD3125RK	3	3,18	1,02	0,19	6,35	1	■	3607296	■	■
NFD4189RK	4	4,80	2,92	0,57	9,53	1	■	3607325	■	■
NFD4250RK	4	6,35	3,81	0,57	12,70	1	■	3607378	■	■
left hand										
NFD3M300LK	3	3,00	1,02	0,19	6,35	1	■	3607464	■	■
NFD3125LK	3	3,18	1,02	0,19	6,35	1	■	3607293	■	■
NFD4189LK	4	4,80	2,92	0,57	9,53	1	■	3607415	■	■

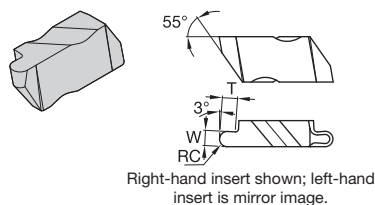


Right-hand insert shown; left-hand insert is mirror image.

■ NP-K • Profiling Inserts

catalogue number	insert size	W	RL	T	TN6010	TN6025	TN7110	THM
right hand								
NP2002RK	2	3,68	0,25	2,79	3607136	3607477	■	■
NP3002RK	3	4,83	0,25	5,08	3607154	3607493	■	■
NP3012RK	3	4,83	0,25	5,08	3607328	■	■	■

NOTE: Width tolerance is +/- 0,13mm.



● first choice
○ alternate choice

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

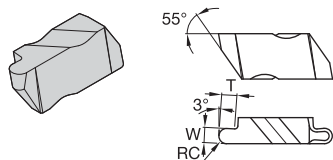
■ NR • Full Radius Inserts

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	3607469	■	■
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

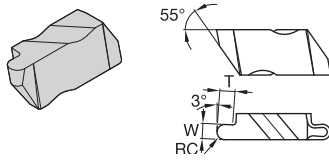
P		●	●	●
M		●	●	○
K		●	○	○
N		●	○	●
S		●	●	●
H		○	○	

Grooving and Cut-Off

catalogue number	insert size	W	RC	T	TN6010	TN6025	TN7110	THM
NR3M200R	3	4,00	2,00	3,81	3606962	3607398	■	■
NR4M200R	4	4,00	2,00	6,35	3606964	3607484	■	■
NR3M225R	3	4,50	2,25	3,81	3606963	3607442	■	■
NR4M225R	4	4,50	2,25	6,35	3606965	3607485	■	■
NR3094R	3	4,78	2,39	3,81	3607180	3607476	■	■
NR4M250R	4	5,00	2,50	6,35	3606966	3607486	■	■
NR4125R	4	6,35	3,18	6,35	3607130	3607500	■	■
left hand								
NR2M050L	2	1,00	0,50	1,27	3606948	3607401	3607672	■
NR2M075L	2	1,50	0,75	2,79	3606924	3607430	■	■
NR2031L	2	1,58	0,79	2,79	3607176	3607319	■	■
NR3031L	3	1,58	0,79	2,39	3607139	3607478	■	3607034
NR2M100L	2	2,00	1,00	2,79	3606925	3607431	3607684	■
NR3M100L	3	2,00	1,00	2,39	3606949	3607395	■	■
NR2047L	2	2,39	1,19	2,79	■	3607446	■	■
NR3047L	3	2,39	1,19	3,81	3607135	3607479	■	3607028

(continued)

(NR • Full Radius Inserts — continued)



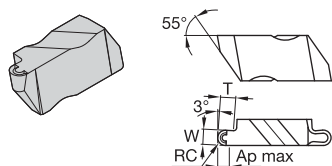
Right-hand insert shown; left-hand insert is mirror image.

● 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	3607689	3607032
NR3M125L	3	2,50	1,25	3,81	3606950	3607435	3607689	3607032
NR2M150L	2	3,00	1,50	2,79	3606927	3607433	3607689	3607032
NR3M150L	3	3,00	1,50	3,81	3606951	3607436	3607689	3607032
NR3062L	3	3,18	1,59	3,81	3607171	3607497	3607689	3607032
NR2M175L	2	3,50	1,75	2,79	3606928	3607434	3607689	3607032
NR3M175L	3	3,50	1,75	3,81	3606952	3607437	3607689	3607032
NR3M200L	3	4,00	2,00	3,81	3606953	3607396	3607689	3607032
NR4M200L	4	4,00	2,00	6,35	3606954	3607466	3607689	3607032
NR3M225L	3	4,50	2,25	3,81	3606934	3607438	3607689	3607032
NR4M225L	4	4,50	2,25	6,35	3606955	3607467	3607689	3607032
NR3094L	3	4,78	2,39	3,81	3607169	3607339	3607689	3607032
NR4M250L	4	5,00	2,50	6,35	3606956	3607468	3607689	3607032
NR4125L	4	6,35	3,18	6,35	3607181	3607514	3607689	3607032

Grooving and Cut-Off



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

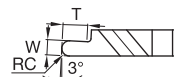
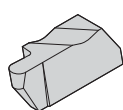
● first choice
○ alternate choice

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

■ NR-K • Full Radius Inserts with Chip Control

catalogue number	insert size	W	Ap max	RC	T	TN6010	TN6025	TN7110	THM
right hand									
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	3607061	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	●	●
left hand									
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	●	●

Grooving and Cut-Off



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

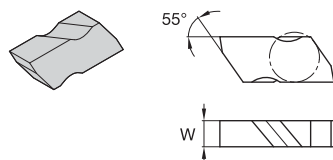
- first choice
- alternate choice

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

■ NRD • Full Radius Deep-Grooving Inserts

catalogue number	insert size	W	T	cutting edges	TN6010	TN6025	TN7110	THM
right hand								
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	■	■
left hand								
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

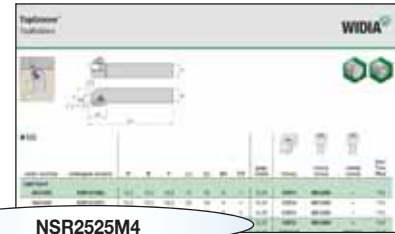
P		●	●	●	
M		●	●	○	
K		●	○	○	○
N		●	○	●	
S		●	●	●	
H		○	○		

■ NB • Blanks

catalogue number	insert size	W	TN6010	TN6025	TN7110	THM
right hand						
NB2R	2	3,81	■	■	■	3607064
NB3R	3	4,95	■	■	■	3607019
left hand						
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.

TopGroove™ Holder Identification System

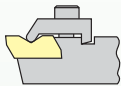


NSR2525M4

N

Insert
Holding
Method

N –
TopGroove*



*Proprietary
standard only.

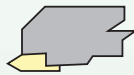
S

Insert
Mounting
Location

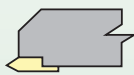
End mount



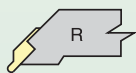
Side mount
Offset



Side mount
No offset
for swiss
machining



NRR undercut



R

Hand
of Tool

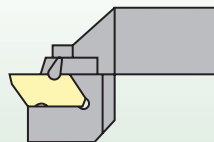
Drop Head

Drop
Head

2525

Shank
Size

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



DH = Drop Head

M

Tool Length

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

4

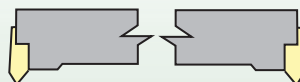
Insert
Size



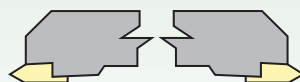
insert size	W1
2	3,81mm
3	4,95mm
4	6,98mm
5	9,65mm
6	9,73mm
8	11,13mm

Qualified
Surface and
Length

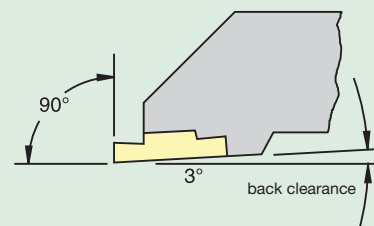
End mount



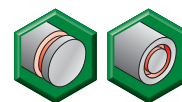
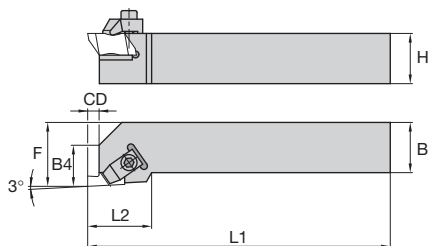
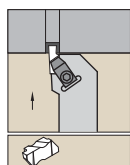
Side mount



Q –
qualified metric holder

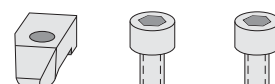


NOTE: Holders are designed to locate
insert inclined to 3° to provide back
clearance down open side.



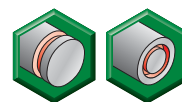
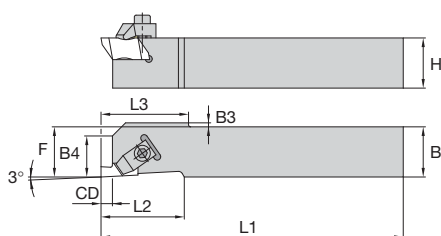
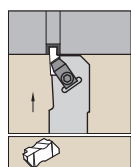
■ NS

Grooving and Cut-Off



order number	catalogue number	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/ Torx Plus
right hand													
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
left hand													
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.

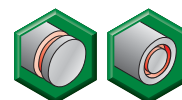
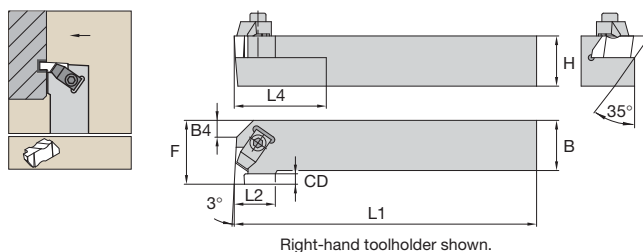


NAS

order number	catalogue number	H	B	F	L1	L2	B4	CD	B3	L3	gage insert	clamp	clamp screw	clamp screw	hex/ Torx Plus
right hand															
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
left hand															
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



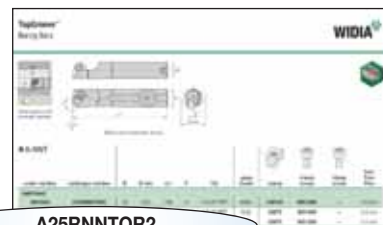
NE

Grooving and Cut-Off

order number	catalogue number	H	B	F	L1	L2	L4	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/ Torx Plus
right hand														
3641674	NER1616H2	16,0	16,0	20,0	100	15	25	—	4	N.2L	CM75	MS1200	—	T10
3641658	NER2020K2	20,0	20,0	25,0	125	15	25	6	4	N.2L	CM75	MS1200	—	T10
3641665	NER2525M2	25,0	25,0	32,0	150	15	25	12	4	N.2L	CM75	MS1200	—	T10
3636541	NER2525M3	25,0	25,0	32,0	150	22	51	—	5	N.3L	CM73LP	—	MS2111	25 IP
3641672	NER2525M4	25,0	25,0	35,0	150	24	51	—	7	N.4L	CM73LP	—	MS2111	25 IP
3641680	NER3225P3	32,0	25,0	32,0	170	22	51	—	4	N.3L	CM73LP	—	MS2111	25 IP
3641689	NER3225P4	32,0	25,0	35,0	170	24	51	—	7	N.4L	CM73LP	—	MS2111	25 IP
3641693	NER3232P4	32,0	32,0	40,0	170	24	51	—	6	N.4L	CM73LP	—	MS2111	25 IP
3641692	NER3232P5	32,0	32,0	50,0	170	35	51	—	11	N.5L	CM81	MS352	—	6 mm
left hand														
3641684	NEL1616H2	16,0	16,0	20,0	100	15	25	—	4	N.2R	CM74	MS1200	—	T10
3641677	NEL2020K2	20,0	20,0	25,0	125	15	25	6	4	N.2R	CM74	MS1200	—	T10
3641676	NEL2525M2	25,0	25,0	32,0	150	15	25	12	4	N.2R	CM74	MS1200	—	T10
3636543	NEL2525M3	25,0	25,0	32,0	150	22	51	—	5	N.3R	CM72LP	—	MS2111	25 IP
3641668	NEL2525M4	25,0	25,0	35,0	150	24	51	—	7	N.4R	CM72LP	—	MS2111	25 IP
3641685	NEL3225P3	32,0	25,0	32,0	170	22	51	—	4	N.3R	CM72LP	—	MS2111	25 IP
3641694	NEL3225P4	32,0	25,0	35,0	170	24	51	—	7	N.4R	CM72LP	—	MS2111	25 IP
3641696	NEL3232P4	32,0	32,0	40,0	170	24	51	—	6	N.4R	CM72LP	—	MS2111	25 IP
3641695	NEL3232P5	32,0	32,0	50,0	170	35	51	—	11	N.5R	CM80	MS352	—	6 mm

NOTE: F dimension measured over sharp point of insert.

TopGroove Boring Bar Identification System

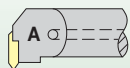


A25RNNNTOR2

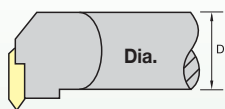
A

Bar
Type

Steel with
coolant



Bar diameter



25

Bar
Diameter

R

Bar
Length

N

Insert
Holding
Method

N —
TopGroove



N

Insert
Shape

T

Insert
Location

End mount



Side mount



0

Rake
Angle

R

Hand
of Tool

Right hand

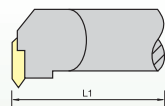


Left hand



2

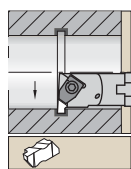
Insert
Size



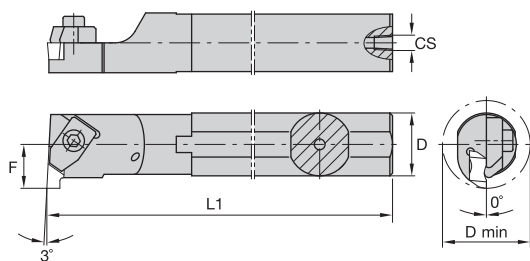
Metric Bars

M	150mm
Q	180mm
R	200mm
S	250mm
T	300mm
U	350mm

insert size	W1
1	3,54mm
2	3,81mm
3	5,35mm
4	6,40mm
5	9,65mm
6	9,73mm
8	11,13mm



Steel shank with through coolant.



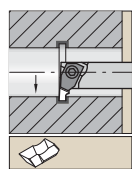
Right-hand toolholder shown.



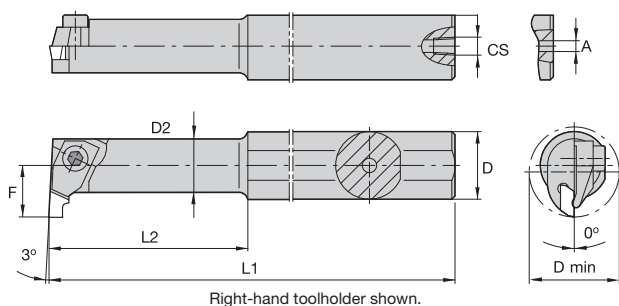
A-NNT

order number	catalogue number	D	D min	L1	F	CS	gage insert	clamp	clamp screw	clamp screw	hex/ Torx Plus
right hand											
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
left hand											
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.



■ **A-NNT-1**

order number	catalogue number	D	D min	D2	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex/Torx Plus
right hand													
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

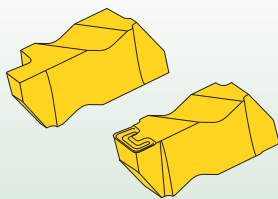
All TopGroove custom order inserts benefit from the superior rigidity of our TopGroove toolholder and clamping system. For added productivity, most custom orders can be incorporated into the double-ended inserts.

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.

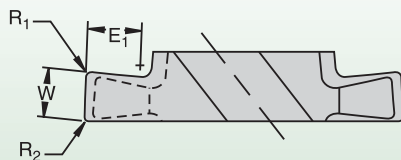
Whatever your special grooving requirements may be, WIDIA can provide an effective solution. We have the technical expertise, resources, and commitment to help you develop insert designs that satisfy your metalcutting application demands.



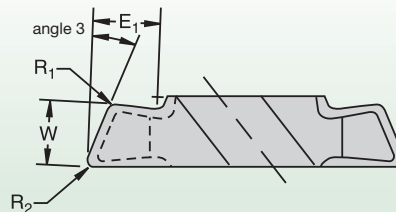
top rake



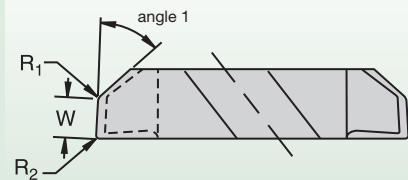
style A



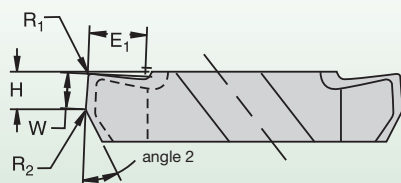
style B1



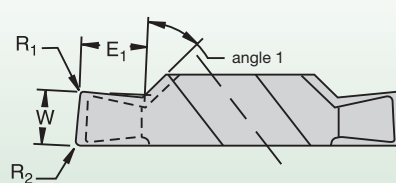
style B2



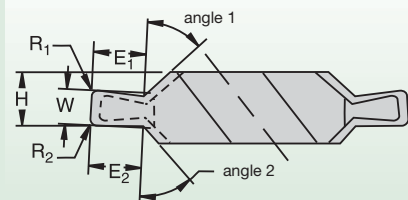
style B3



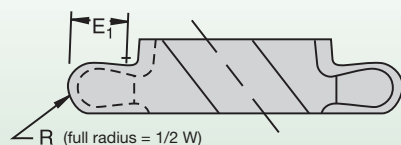
style B4



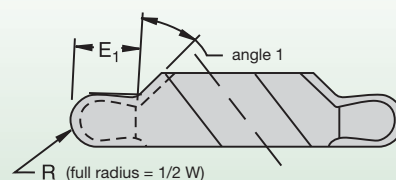
style C1



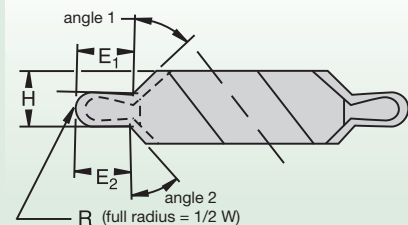
style D



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.

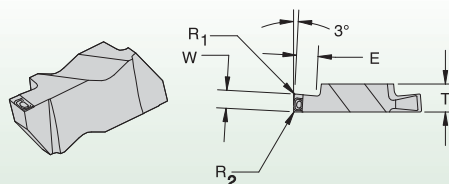
Trust our experienced distributors and WIDIA engineering team to design the best solution for you.

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 (R₁)					Angle 2								
Corner Radius 2 (R₂)					Offset (H)								
Cutting Depth (E₁)					Other (please specify)								
Special Instructions <i>(please make any necessary notes or sketches in the box at right)</i>													
Closest Catalogue Standard													
Customer													
Distributor													
Shipping Requirements													
<i>Attention Distributors: Use this worksheet to collect information for your customer.</i>													
☐ 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 ₁ and R ₂	E	T	grades
right hand	left hand					
NG2-R-SK or NF2-R-SK	NG2-L-SK or NF2-L-SK	0,66–1,42 1,45–3,43	0,00–0,18 0,08–0,33	1,27 2,79	3,810	Carbide grades quoted upon request. See page E47.
NG3-R-SK or NF3-R-SK	NG3-L-SK or NF3-L-SK	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		
		3,43–3,96	0,13–0,76	3,81		
NG4-R-SK or NF4-R-SK	NG4-L-SK or NF4-L-SK	3,99–4,42	0,20–0,46	3,81	6,480	
		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,
R₁ = .010, R₂ = .010, grade TN6010.

Unless otherwise specified, a standard tolerance of $\pm 0,03\text{mm}$ on width (W) will be applied, and a standard tolerance of $\pm 0,06\text{mm}$ on radii (R₁ and R₂) will be applied.

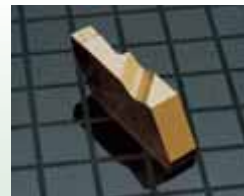
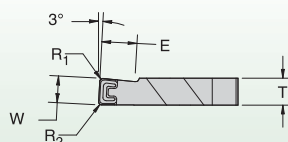
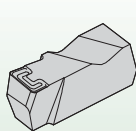
If deeper cutting depth (E) is required, please specify. Refer to the application drawing and charts for maximum face groove depths and minimum face groove diameters.

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 ₁ and R ₂	E	T	grades
right hand	left hand					
NGD3-R-SK	NGD3-L-SK	1,45–1,75	.008–.033	3,18	4,95	Carbide grades quoted upon request. See page E47.
or	or	2,26–2,57*	.008–.033	6,35		
NFD3-R-SK	NFD3-L-SK	3,05–3,35*	.008–.033	6,35		
		4,67–4,98*	.046–.071	6,35		
NGD4-R-SK	NG4-L-SK	3,05–3,35*	.008–.033	6,35	6,48	
or	or	4,57–4,98*	.046–.071	9,53		
NFD4-R-SK	NF4-L-SK	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,
R₁ = .010, R₂ = .010, grade TN6010.

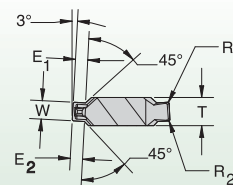
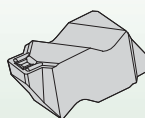
Unless otherwise specified, a standard tolerance of ±0,03mm on width (W) will be applied, and a standard tolerance of ±0,06mm on radii (R₁ and R₂) will be applied.

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

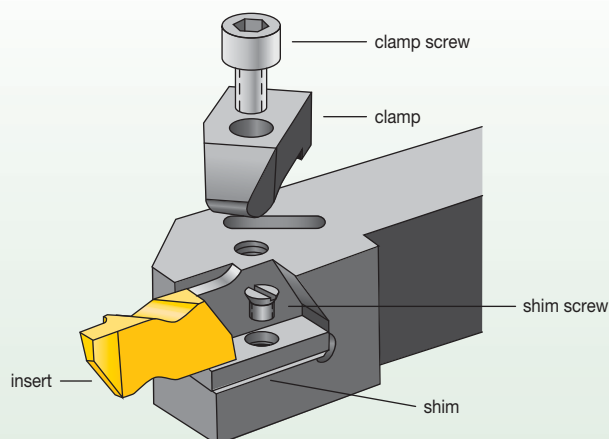
- Groove and chamfer



insert catalogue number		width range W	corner radii range R ₁ and R ₂	E	T	grades
right hand	left hand					
NB2-R-K	NB2-L-K	1,19–3,18	0,13–0,38	2,54	3,81	Carbide grades quoted upon request. See page E47.
NB3-R-K	NB3-L-K	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
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	—	—
Utility threading				
NTU-4R	CM-72	S-412	—	—
NTU-4L	CM-73	S-412	—	—

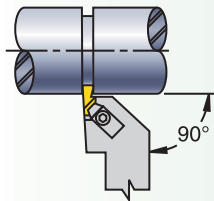
*25mm diameter boring head.

**Boring head.

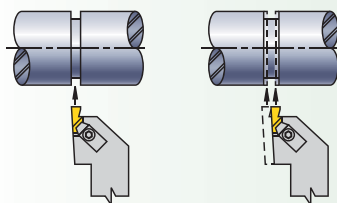
Grooving Tool Failure and Solution Guide

Practical Solutions to Common Grooving Problems

Holder Position for Grooving Operation

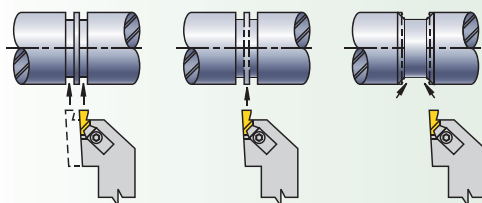


How to Cut a Groove Slightly Wider than the Groove Tool



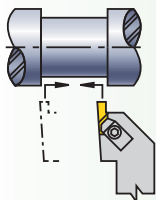
1. Plunge the centre of the groove.
2. Plunge each side of the groove to get the specified width. Use a slower feed rate when cutting groove sides.

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



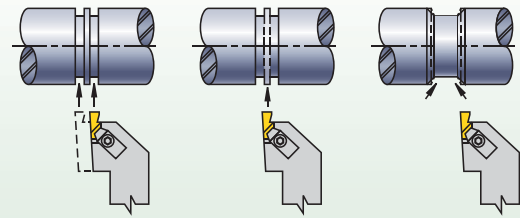
1. Follow recommendations explained above.
2. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined here.
3. Use the lightest depth of cut that still enables good chip surface finishing.

problem	solution
bur	1. Ensure tool centre height. 2. Use sharp tool (index more often). 3. Use positive rake PVD-coated insert. 4. Use correct grade for workpiece material. 5. Use correct geometry (e.g., positive rake for work-hardening material). 6. Chamfer before grooving. 7. Change tool path.
poor surface finish	1. Increase speed. 2. Use sharp tool (index more often). 3. Dwell tool in bottom 1–3 revolutions (max). 4. Use proper chip control geometry. 5. Increase coolant flow/concentration. 6. Ensure proper setup (overhang, shank size). 7. Use correct geometry (e.g., positive rake for work-hardening material).
groove bottom that is not flat	1. Use sharp tool (index more often). 2. Dwell tool in bottom 1–3 revolutions (max). 3. Reduce tool overhang (increase rigidity). 4. Ensure correct tool alignment. 5. Reduce feed rate at groove bottom. 6. Use a wider insert. 7. Ensure tool centre height.
poor chip control	1. Use “K” chip control geometry insert. 2. Use sharp tool (index more often). 3. Increase coolant concentration. 4. Adjust feed rate (usually increase first).
chatter	1. Reduce tool and workpiece overhang. 2. Adjust speed and feed (usually increase first). 3. Ensure centre height.
insert chipping	1. Use correct grade for workpiece material. 2. Increase speed. 3. Reduce feed. 4. Use a stronger grade. 5. Increase tool and setup rigidity.
side walls not straight	1. Check tool alignment for square. 2. Use correct insert hand. 3. Reduce workpiece and tool overhang. 4. Use sharp insert (index more often).

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.

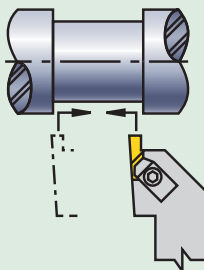


Machining Guidelines for Chip Control • Turning/Profiling

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

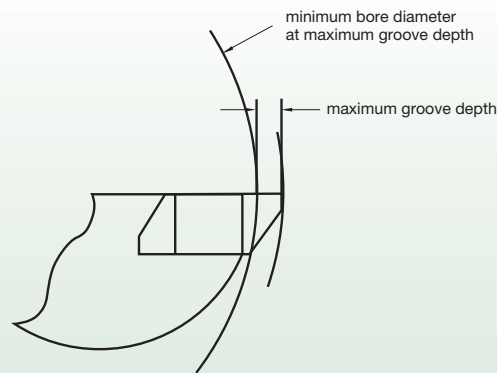


1. Plunge both sides of groove width.
2. Plunge centre area to remove web of material remaining.
3. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined.
4. Use the lightest depth of cut that still allows good chipbreaking, tool life, and surface finish.

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.

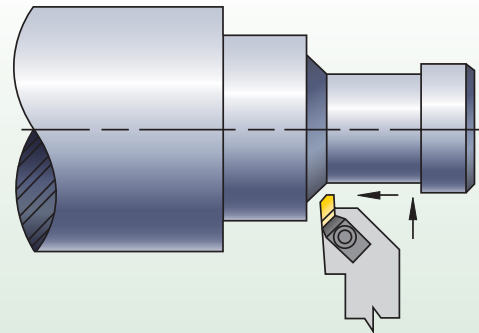
Internal Groove Depth versus Bar Interference



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.



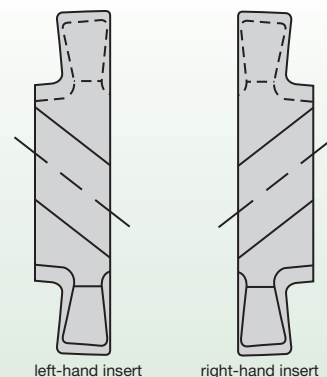
Machining Guidelines for Using TopGroove Deep Grooving Inserts (NGD)

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

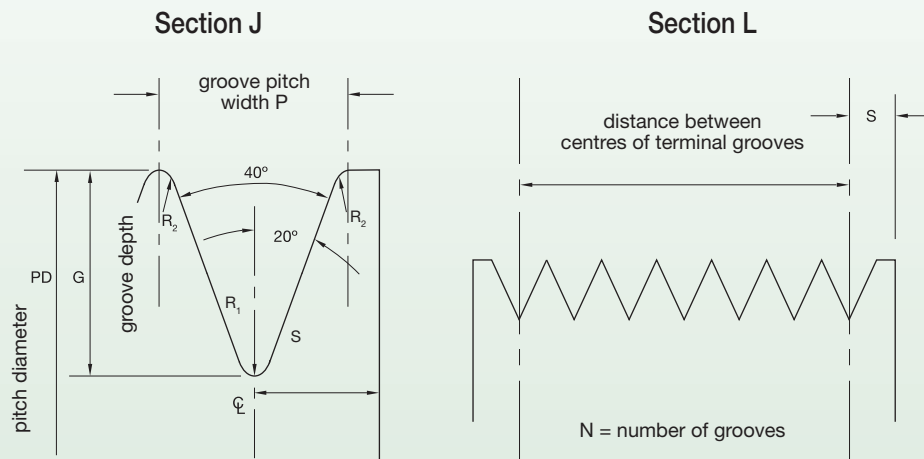
TopGroove Insert Selection Guide

- 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.

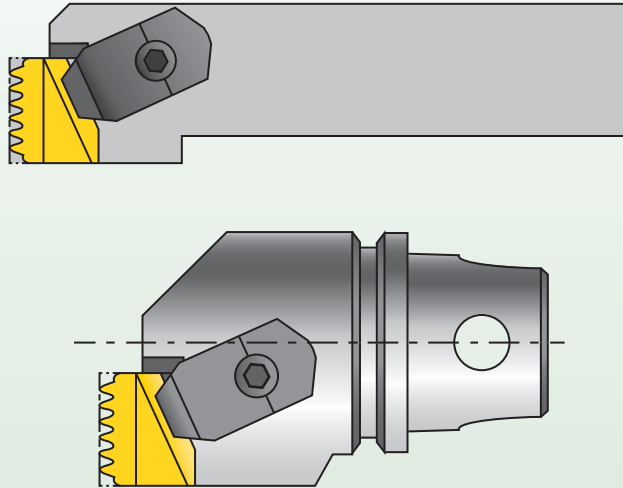


Groove Dimensions and Tolerances for Sheaves

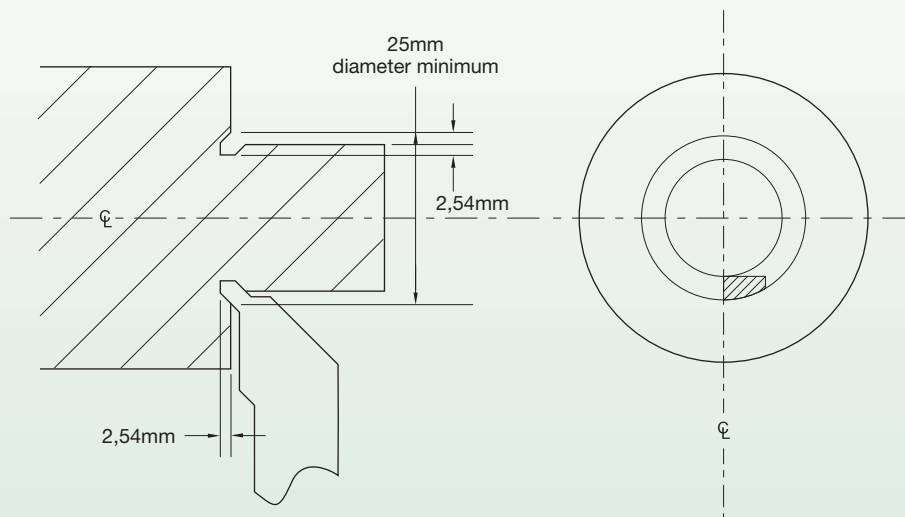
groove cross section	pitch width (P)	groove depth (G)	minimum radius (R2)	radius (R1)	terminal distance	distance between centres of terminal grooves and maximum accumulated tolerance
J	2,34 ±0,03	2,21 ±0,13	0,20	0,32 ±0,06	3,18	(N-1)4,88 ±0,25
L	4,70 ±0,05	5,11 ±0,13	0,38	0,32 ±0,06	3,18	(N-1)4,70 ±0,25

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.

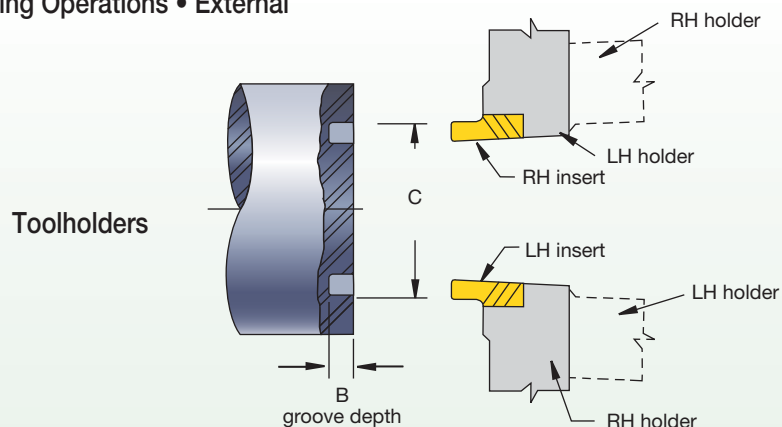


Machining Guidelines for Undercutting Operations Performed with Custom Solution and TopGroove NU Inserts (NU3094, NU3125, and NU3156)



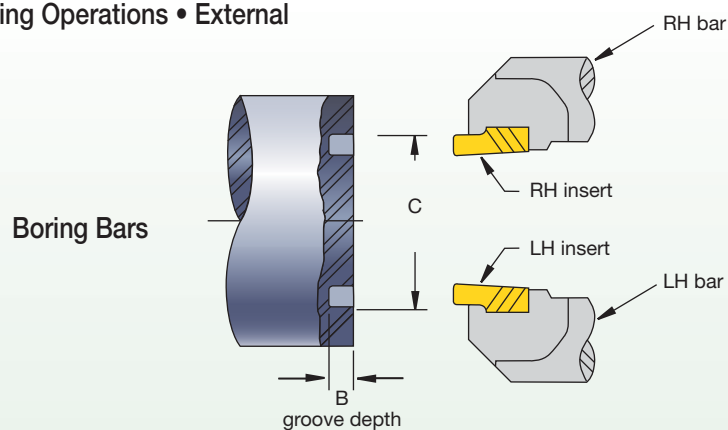
NOTE: Items shown are non-standard items.

Machining Guidelines for Face Grooving Operations • External



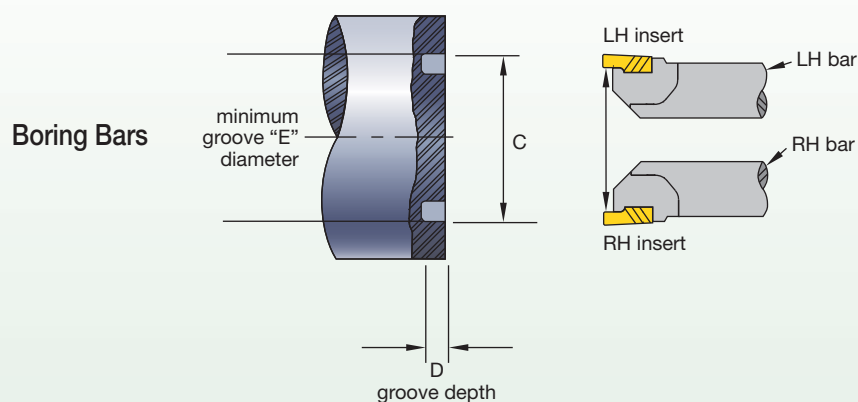
Standard NF/NDF Inserts		
insert family	maximum groove depth B mm	minimum groove diameter C mm
NF-3	1,52	23,9
NF-3	2,39	30,5
NF-3	3,18	36,1
NF-3	3,81	41,3
NFD-3	6,35	47,6
NFD-4	9,53	57,2
NFD-4	12,70	57,2

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

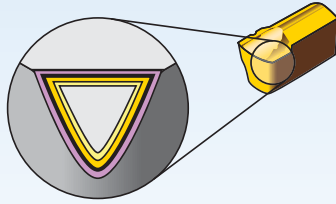
With easy-to-change inserts available in multiple high-performance carbide grades, the ProGroove system ensures accurate, reliable, and reproducible cutting edge performance.

- 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.



ProGroove





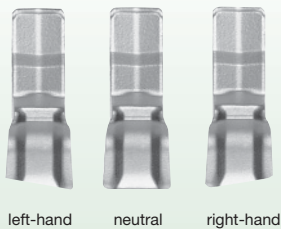
Coatings provide high-speed capability and are engineered for finishing to light roughing.

- Reduce cycle times — high speed and feed capability.
- Longer tool life — new multilayer coating provides better wear resistance.

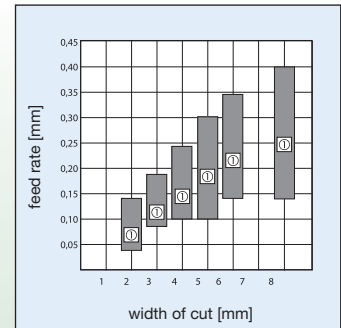
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

		wear resistance ← → toughness											
Coating		Grade Description			05	10	15	20	25	30	35	40	45
TN6030		PVD-TiAlN Nanolayer coated carbide. Medium and heavy machining for steels and nodular cast irons. Recommended at medium cutting speeds when good toughness properties are required.	P										
	M												
	K												
	HC-P30												
TN7525		MT-CVD/CVD — TiN-TiCN-Al ₂ O ₃ -TiN coated carbide. Light and medium machining for steels and nodular cast irons.	P										
	M												
	K												
	HC-P25												
TN7535		MT-CVD/CVD — TiN-TiCN-Al ₂ O ₃ coated carbide. Medium and heavy machining for steels and nodular cast iron.	P										
	M												
	K												
	HC-P35												
TN8025		MT-CVD/CVD-TiN-TiCN-Al ₂ O ₃ -ZrCN coated carbide. Light and medium machining for all stainless steels. Can be used both with or without coolant.											
	M												
	HC-M25												
THM		Uncoated carbide for light and medium machining. For cast iron and all non-ferrous metals and non-metals. Also capable of machining hardened materials at low cutting speeds.											
	K												
	N												
	S												
	HW-K15												
TTM		Uncoated carbide with good toughness and wear properties. Medium machining for steels.	P										
	M												
	HW-P25												

PGU

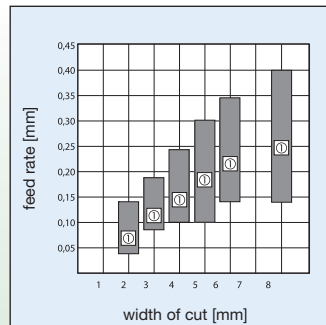


For grooving and parting operations, universal use. Positive chipbreaker groove for light cutting action. Right-hand and left-hand styles with 6° front angle.



① Recommended Starting Feed

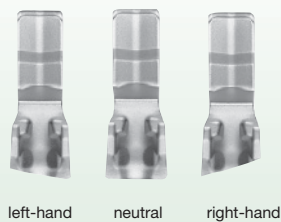
PGM



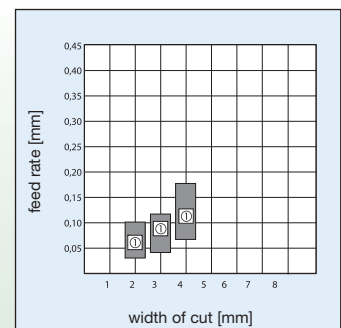
① Recommended Starting Feed

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

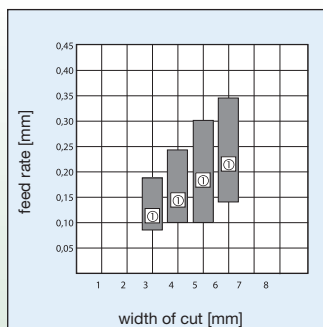


For low-bur parting with straight flanks and smooth surface finishes. All inserts are recommended for parting and grooving slender workpieces, part diameter <32mm, and thin-wall tubes.



① Recommended Starting Feed

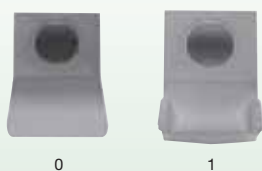
PGR



① Recommended Starting Feed

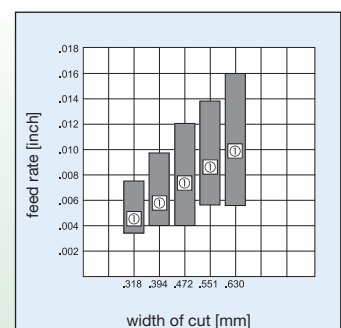
Full round inserts for profiling, grooving, and copy turning. Very good chip control for broad general use. Accurate, reproducible cutting edge positioning.

LG System • 0 and 1



...0
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.

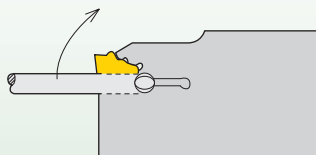


① Recommended Starting Feed

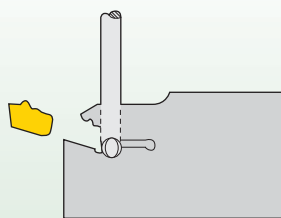
Material Group		Cutting Speed — vc m/min																	
		TN6030			TN7525			TN7535			TN8025			THM			TTM		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0/1	130	140	150	200	215	230	140	175	210	—	—	—	—	—	—	90	95	100
	2	110	145	175	170	220	270	115	145	175	—	—	—	—	—	—	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

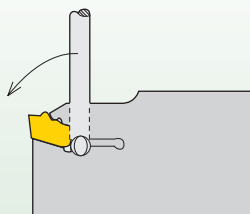
ProGroove System



To change the cutting insert, place the wrench into the blade recess.
The blade mouth is opened by turning through 90°.

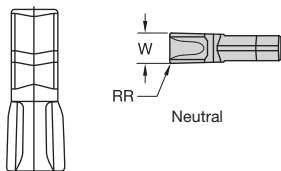


In this position, the wrench is self-locking, leaving both hands free
for changing the cutting insert.



The cutting insert is pressed against the rear seat in the blade mouth,
releasing the wrench. The insert is accurately positioned and securely clamped.





● first choice
○ alternate choice

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

■ PGU

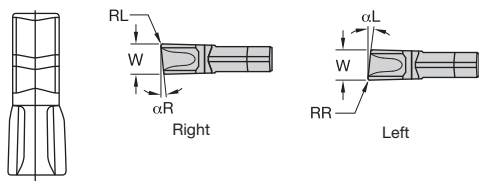
catalogue number	insert size	W	RR	hand	TN6030	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567320	2	2,10	0,20	N - Neutral	2953289	2498725	2498713	2021804	2008876	-	-
123567330	3	3,10	0,30	N - Neutral	2953284	-	2498714	2017822	2008931	-	-
123567340	4	4,10	0,30	N - Neutral	2953286	2498727	2498715	-	2009080	-	-
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 = $\pm 0,05\text{mm}$.

(continued)

Grooving and Cut-Off

(PGU — continued)

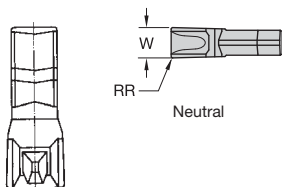


● first choice
○ alternate choice

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

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

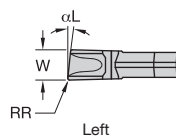
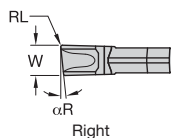
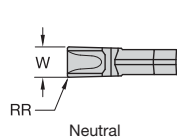
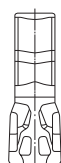
P	●	●	●	○	●	●
M	●	○	○	○	●	●
K	●	●	●	●	●	●
N	○	○	○	○	●	●
S	○	○	○	○	●	●
H	○	○	○	○	●	●

■ PGM

catalogue number	insert size	W	RR	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567420	2	2,10	0,20	N - Neutral	2953679	2953679	2498731	2498721	2498721	2498721
123567430	3	3,10	0,30	N - Neutral	2953678	2953678	2498734	2498722	2498722	2498722
123567440	4	4,10	0,30	N - Neutral	2953663	2953663	2498735	2498723	2498723	2498723
123567450	5	5,10	0,30	N - Neutral	2953671	2953671	2498736	2498724	2498724	2498724
123567460	6	6,10	0,40	N - Neutral	2953677	2953677	2952335	2952352	2952352	2952352
123567480	8	8,15	0,60	N - Neutral	2953675	2953675	2952336	2952353	2952353	2952353

NOTE: W tolerance on all = $\pm 0,05\text{mm}$.

Grooving and Cut-Off



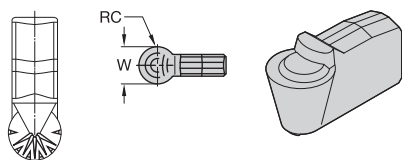
● first choice
○ alternate choice

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	■	■	2952354	2952355	■	■	
123567703	3	3,25	0,20	N - Neutral	■	■	2952355	■	■	■	
123567704	4	4,25	0,20	N - Neutral	■	■	2952356	■	■	■	
catalogue number	insert size	W	RR	αL	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567721	2	2,25	0,20	6	L - Left	■	■	2952358	■	■	■
123567731	3	3,25	0,20	6	L - Left	■	■	2952360	■	■	■
catalogue number	insert size	W	RL	αR	hand	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567720	2	2,25	0,20	6	R - Right	■	■	2952357	■	■	■
123567730	3	3,25	0,20	6	R - Right	■	■	2952359	2017912	■	■
123567740	4	4,25	0,20	6	R - Right	■	■	2952361	■	■	■

NOTE: W tolerance on all = ±0,05mm.



● first choice
○ alternate choice

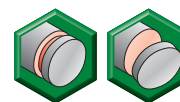
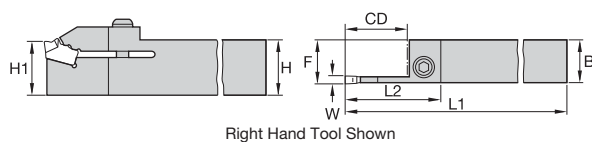
P	●	●	●	○	●	●
M	●	○	○	●	●	●
K	●	●	●	●	●	●
N	○	○	○	○	●	○
S	○	○	○	○	●	○
H	○	○	○	○	●	○

■ PGR

catalogue number	insert size	W	RC	TN6030	TN7525	TN7535	TN8025	THM	TTM
123567803	3	3,00	1,50	—	2952337	—	—	—	—
123567804	4	4,00	2,00	—	2952338	—	—	—	—
123567805	5	5,00	2,50	—	2952339	—	—	—	—
123567806	6	6,00	3,00	—	2952340	—	—	—	—

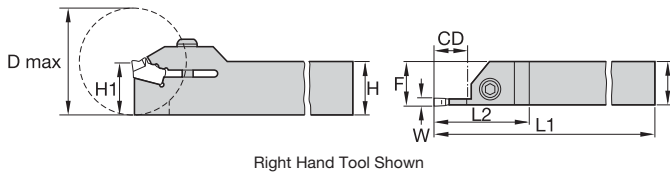
NOTE: W tolerance on all = ($\pm 0,07$ mm).

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
right hand													
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
left hand													
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

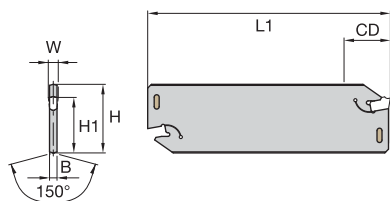


Grooving and Profiling

order number	catalogue number	seat size	W	CD	D max	H	B	F	L1	L2	H1	cap screw	cap screw	wrench
right hand														
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	—	—
left hand														
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

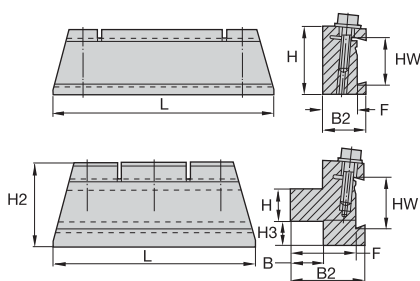


■ Cut-Off Blades

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

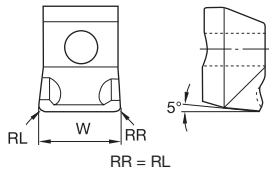
NOTE: Order wrench separately.

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



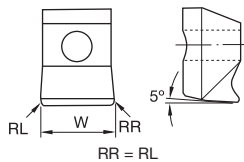
- first choice
- alternate choice

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

■ LGN0

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 = $\pm 0,05\text{mm}$.

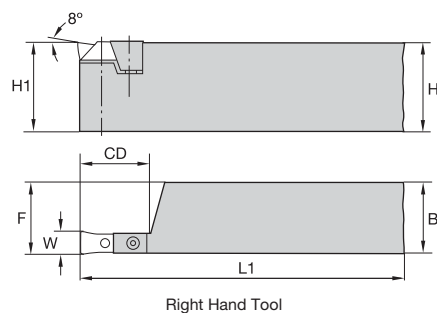


■ LGN1

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 = $\pm 0,05\text{mm}$.

Grooving and Cut-Off

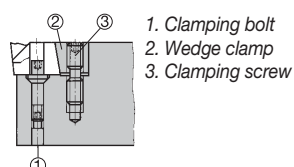


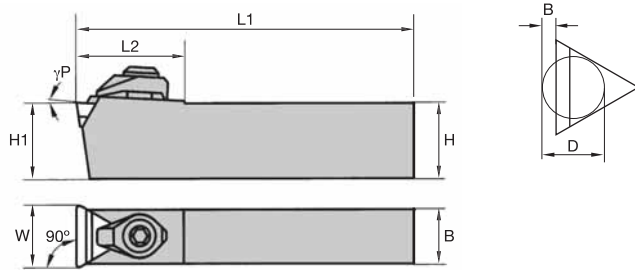
Grooving

order number	catalogue number	seat size	W	CD	H	B	F	L1	H1
right hand									
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
left hand									
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
right hand						
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	—
left hand						
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..

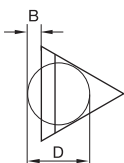
NOTE: Gage inserts listed are ISO-/ANSI-style inserts.
Holders are supplied without chipbreaker. For chipbreaker order numbers, see below.

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

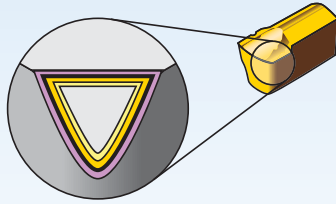
Features

- 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.





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

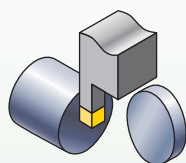
- Reduce cycle times — high speed and feed capability.
- Longer tool life — new multilayer coating provides better wear resistance.

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

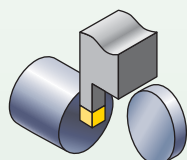
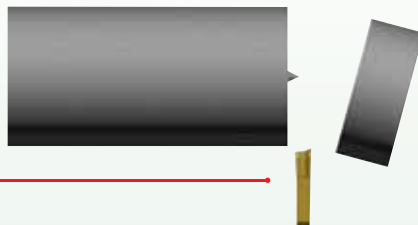
		wear resistance ← → toughness										
Coating		Grade Description										
			05	10	15	20	25	30	35	40	45	
M40		A premium, single-phase PVD TiN coating over a tough, specially formulated substrate that performs well under extremely low to moderate speed conditions found on screw machines. Ideal for carbon steels, alloy steels, most stainless steels, and many high-temperature alloys.	P									
			M									
			K									
			N									
			S									
HC-P35												
M43		PVD-TiAlN multilayer coating over a tough, shock-resistant, fine-grained carbide substrate with increased oxidation resistance. Recommended on low to medium cutting speeds when good toughness properties are required.	P									
			M									
			K									
			N									
			S									
HC-P25												
M433B		PVD-TiAlN single-layer coating over a superiorly tough, fine-grained carbide substrate. Outstanding temperature properties with excellent resistance to avoid built-up edges. Medium to high speeds and feeds. For stainless steels and high-temperature alloys.	P									
			M									
			N									
			S									
HC-M30												
M45		A premium PVD-TiCN coated, shock-resistant carbide designed for low to moderate speeds. Excellent resistance to welding and BUE, along with improved abrasion resistance make this an ideal grade for austenitic stainless steel, low carbon steel, and high-temperature alloys.	P									
			M									
			K									
			N									
			S									
HC-P30												
M93		PVD-TiAlN multilayer coating over a tough, fine-grained carbide substrate with increased resistance to heat. Recommended for medium to higher cutting speeds under moderate conditions.	P									
			M									
			K									
			N									
			S									
HC-P20												

1 Choose the application to be performed:

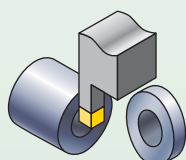
Choose lead angle of insert for application.



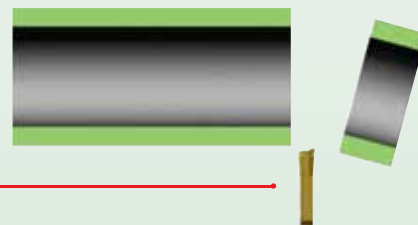
R.H. Lead Angle



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

		A	B	C							
		W	CD	B	FS	H	L2	L1	clamp	clamp screw	
right hand											
3536746	206417	3.00	25.00	34.74	25.50	25.00	42.50	150.00	435180	619166	
3536742	206418	4.00	25.00	34.86	25.50	25.00	42.50	150.00	435180	619166	
left hand											
3536743	206419	3.00	25.00	34.74	25.50	25.00	42.50	150.00	435181	619166	
3615303	206424	4.00	25.00	34.68	25.00	25.00	42.50	150.00	435181	619166	

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 ² -Ultra (X ² has wipers)	X ² -Ultra	X ² -Ultra	X ² -Ultra	X ² -Ultra	—
second choice	S ² -Ultra	S ² -Ultra	Classic	S ² -Ultra	S ² -Ultra	X ²

5 Select grade:

machining condition	Recommended Grades					
	steel	stainless steel	cast iron	non-ferrous metals	high-temp alloys	hardened materials
high performance for optimal conditions (clean cuts, good machine condition, higher speed capability)	M93	M433B	M93	M93	M433B	—
	—	M93	—	—	M93	—
general purpose (1st choice for general machining)	M43	M43	M43	M43	M43	M93
unfavourable conditions (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:

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

See page E113 for cutting data.

WIDIA		Separator™ Recommended Cutting Speeds • Metric											
Material Group		Cutting Speed — vc m/min											
		min	Start	max	min	Start	max	min	Start	max	min	Start	max
P	0 / 1	40	85	115	110	160	210	—	—	—	45	85	125
	2	30	60	85	75	125	165	—	—	—	40	65	95
	3	30	60	85	75	125	165	—	—	—	40	65	95
	4	25	45	60	55	80	125	30	35	115	25	45	70
	5	35	65	85	85	115	145	85	115	145	40	65	95
M	1	30	45	60	50	75	100	55	80	130	35	50	65
	2	20	30	40	35	50	65	35	50	60	25	35	45
	3	20	35	40	35	50	65	35	50	65	25	40	50
K	1	65	95	125	90	135	175	200	260	320	75	110	145
	2	65	95	125	90	135	175	210	270	330	75	110	145
	3	55	85	120	80	125	170	215	275	335	65	105	140
N	1	210	370	520	275	440	610	—	—	—	245	400	550
	2	170	325	480	230	400	570	—	—	—	200	355	510
	3	135	265	375	180	300	435	—	—	—	150	230	335
	4	80	130	185	105	155	190	—	—	—	95	135	175
	5	45	75	100	60	85	115	—	—	—	50	80	110
	6	165	290	420	220	360	500	—	—	—	190	320	450
S	1	180	340	490	245	415	580	—	—	—	215	375	520
	2	25	35	40	25	40	50	30	45	50	30	45	50

Separator • X² and X²-Ultra



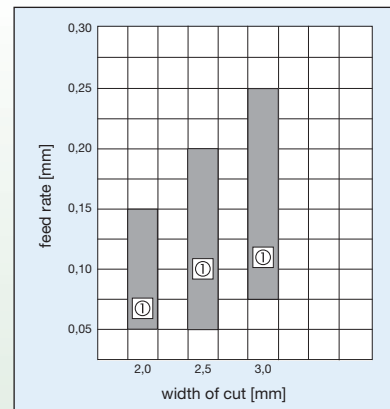
X²

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.



X²-Ultra

This insert has the same geometry as the WMT-SX-Ultra. The X²-Ultra is an enhanced version of the X² and is ideal for stainless steels, nickel-based alloys, tool steel, INCONEL®, and titanium.



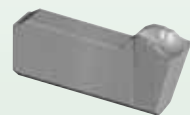
① Recommended Starting Feed

Separator • S² and S²-Ultra



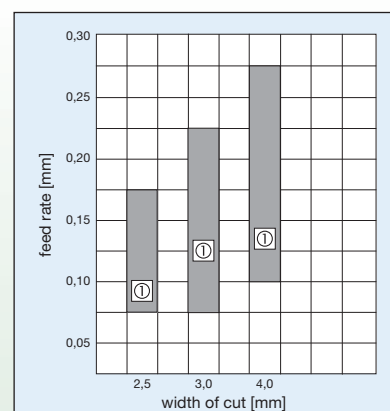
S²

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.



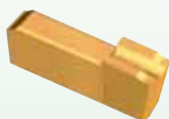
S²-Ultra

The S²-Ultra is an enhanced version of the S² and is ideal for 300 series stainless steels, nickel-based alloys, tool steel, INCONEL, and titanium at moderate to high speeds and feeds.



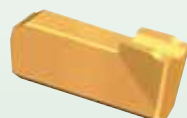
① Recommended Starting Feed

Separator • Classic and F²



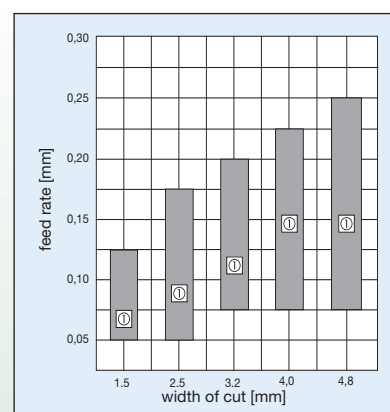
Classic

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.



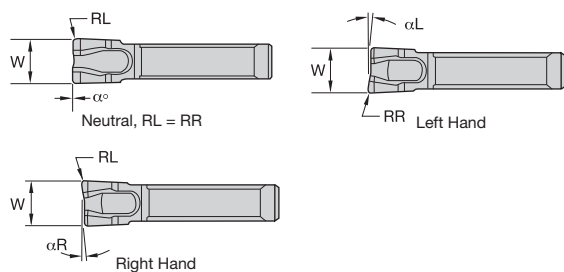
F²

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 F² 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
P	0/1	40	80	115	110	160	210	–	–	–	45	85	125	150	200	245
	2	30	60	85	75	120	165	–	–	–	40	65	95	115	150	185
	3	30	60	85	75	120	165	–	–	–	40	65	95	115	150	185
	4	25	45	60	55	90	125	30	70	115	25	45	70	80	110	140
	5	35	60	85	85	110	140	85	115	145	40	65	95	105	140	170
	6	15	30	40	35	50	65	35	50	70	20	30	45	45	60	75
M	1	30	45	60	50	75	100	55	90	130	35	50	65	90	120	150
	2	20	30	40	35	50	65	35	60	80	25	35	50	55	75	95
	3	20	35	40	35	50	65	35	60	85	25	40	50	60	80	100
K	1	65	95	125	90	135	175	200	260	320	75	110	145	130	175	225
	2	65	95	125	90	135	175	210	270	330	75	110	140	135	170	225
	3	55	90	120	80	125	170	215	275	335	65	105	145	110	140	215
N	1	210	370	520	275	440	610	–	–	–	245	400	550	305	490	670
	2	170	325	480	230	400	570	–	–	–	200	355	510	265	450	630
	3	135	205	275	180	260	335	–	–	–	150	230	305	210	305	400
	4	80	120	165	105	150	190	–	–	–	95	135	175	130	180	225
	5	45	75	100	60	85	115	–	–	–	50	80	110	70	105	135
	6	165	290	420	220	360	500	–	–	–	190	320	450	255	410	560
	7	180	340	490	245	410	580	–	–	–	215	370	520	275	460	640
S	1	25	35	40	25	40	50	30	45	50	30	35	45	35	45	60
	2	10	15	20	15	20	25	15	20	25	10	15	20	20	25	30
	3	35	45	60	35	50	65	40	55	70	35	50	65	55	65	80
	4	15	25	30	25	30	35	25	30	40	20	25	35	30	35	45
H	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–



● first choice
○ alternate choice

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

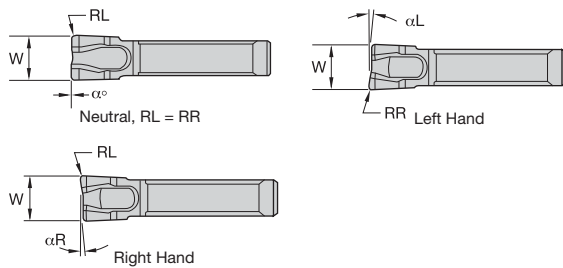
■ X²

catalogue number	insert size	W	RR	hand	M40	M43	M43B	M45	M93
507305	2	2,39	0,14	N - Neutral	■	■	■	3540872	3540873
507308	3	3,20	0,17	N - Neutral	■	3540878	■	3540879 3540880	3540880

catalogue number	insert size	W	RR	αL	hand	M40	M43	M43B	M45	M93
507307	2	2,39	0,14	5	L - Left	■	■	■	3540876	3540877
507310	3	3,20	0,17	5	L - Left	■	■	■	3540884 3540885	3540885

catalogue number	insert size	W	RL	αR	hand	M40	M43	M43B	M45	M93
507306	2	2,39	0,14	5	R - Right	■	■	■	3540874	3540875
507309	3	3,20	0,17	5	R - Right	■	■	■	3540882 3540883	3540883

Grooving and Cut-Off



● first choice
○ alternate choice

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

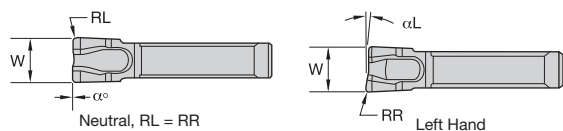
■ X² Ultra

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



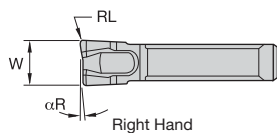
● first choice
○ alternate choice

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

S²

Grooving and Cut-Off

catalogue number	insert size	W	RR	hand	M40	M43	M43B	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
507277	2	2,39	0,20	L - Left	■	■	■	3540815	3540816
507297	3	3,00	0,20	L - Left	■	3540863	■	■	3540865
507280	3	3,20	0,20	L - Left	■	■	■	3540830	■
507283	5	4,78	0,20	L - Left	■	■	■	■	3540846

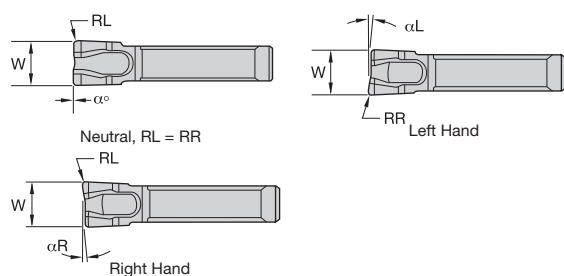


● first choice
 ○ alternate choice

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	—
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

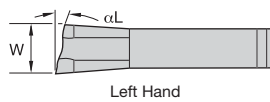
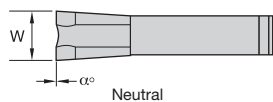
P		●	●	●	●
M		●	●	●	●
K	○				
N		●	●		
S	○	●	●	○	
H					○

S² Ultra

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	○	○	○	○	○

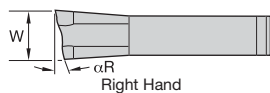
Classic

catalogue number	insert size	W	hand	M40	M43	M43B	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	αL	hand	M40	M43	M43B	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)

Grooving and Cut-Off

(Classic — continued)



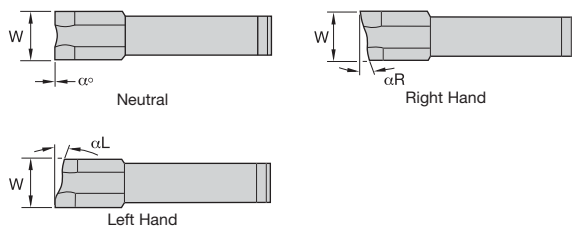
● first choice
○ alternate choice

P	Blue	●	●	●	●	●
M	Yellow	●	●	●	●	●
K	Red	○	○	○	○	○
N	Green	●	●	●	●	●
S	Orange	○	●	●	●	○
H	Grey	○	○	○	○	○

Grooving and Cut-Off

catalogue number	insert size	W	αR	hand	M40	M43	M43B	M45	M93
507197	2	1,60	4	R - Right	3540666	3540666	3540666	3540666	3540666
507214	2	1,60	12	R - Right	3540692	3540692	3540692	3540692	3540692
507207	2	2,31	4	R - Right	3540589	3540589	3540589	3540589	3540589
507151	2	2,36	12	R - Right	3540589	3540589	3540589	3540589	3540589
507143	2	2,39	4	R - Right	3540544	3540544	3540544	3540544	3540544
507161	2	2,39	18	R - Right	3540613	3540613	3540613	3540613	3540613
507171	3	3,12	6	R - Right	3540628	3540628	3540628	3540628	3540628
507146	3	3,15	12	R - Right	3540562	3540562	3540562	3540562	3540562
507155	3	3,15	18	R - Right	3540603	3540603	3540603	3540603	3540603
507128	3	3,20	4	R - Right	3540498	3540498	3540498	3540498	3540498
507224	3	3,20	4	R - Right	3540700	3540700	3540700	3540700	3540700
507176	5	4,72	12	R - Right	3540634	3540634	3540634	3540634	3540634
507124	5	4,78	4	R - Right	3540479	3540479	3540479	3540479	3540479

NOTE: 507207 and 507224 have a modified aggressive chip control design.



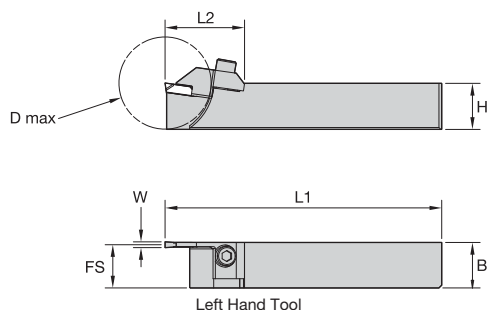
● first choice
○ alternate choice

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

F2

catalogue number	insert size	W	hand	M40	M43	M43B	M45	M02	
507240	2	2,39	N - Neutral	3540744	3540744	3540744	3540743	3540743	
507244	3	3,20	N - Neutral	3540756	3540756	3540755	3540755	3540755	
catalogue number	insert size	W	αL	hand	M40	M43	M43B	M45	M02
507255	2	2,39	12	L - Left	3540781	3540781	3540781	3540781	3540781
507257	3	3,18	4	L - Left	3540784	3540784	3540784	3540784	3540784
catalogue number	insert size	W	αR	hand	M40	M43	M43B	M45	M02
507241	2	2,39	4	R - Right	3540747	3540747	3540746	3540746	3540746
507242	2	2,39	12	R - Right	3540750	3540750	3540749	3540749	3540749
507243	2	2,39	18	R - Right	3540753	3540753	3540752	3540752	3540752
507245	3	3,18	4	R - Right	3540759	3540759	3540758	3540758	3540758
507246	3	3,18	12	R - Right	3540762	3540762	3540761	3540761	3540761
507247	3	3,18	18	R - Right	3540764	3540764	3540763	3540763	3540763
507252	5	4,75	4	R - Right	3540774	3540774	3540773	3540773	3540773
507253	5	4,78	12	R - Right	3540777	3540777	3540776	3540776	3540776

Grooving and Cut-Off



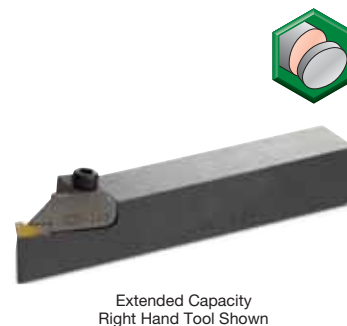
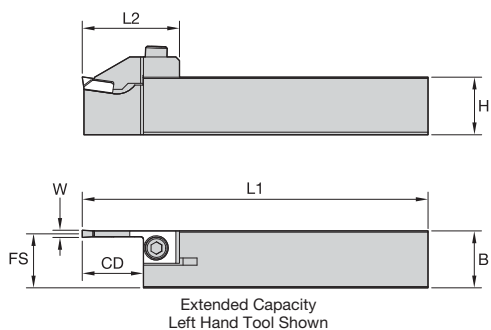
■ Square Shank

Grooving and Cut-Off



order number	catalogue number	W	D max	B	FS	H	L2	L1	clamp	clamp screw
right hand										
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
left hand										
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.

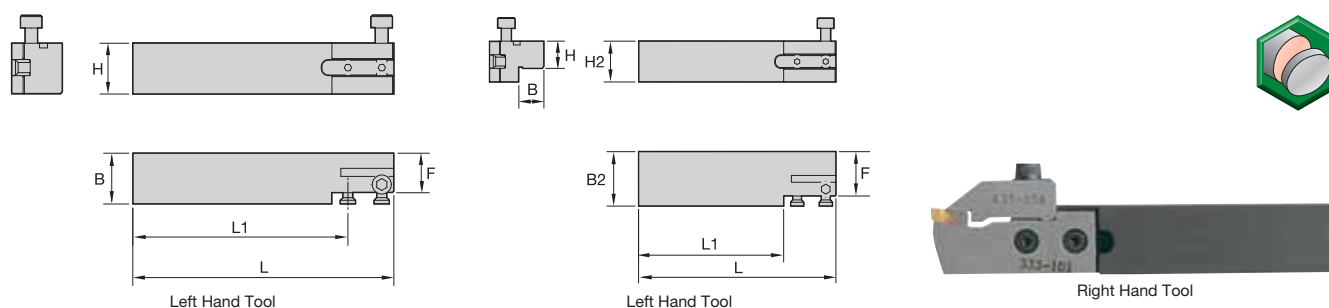


■ Square Shank • Extended Capacity

order number	catalogue number	W	CD	B	FS	H	L2	L1	clamp	clamp screw
right hand										
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
left hand										
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.

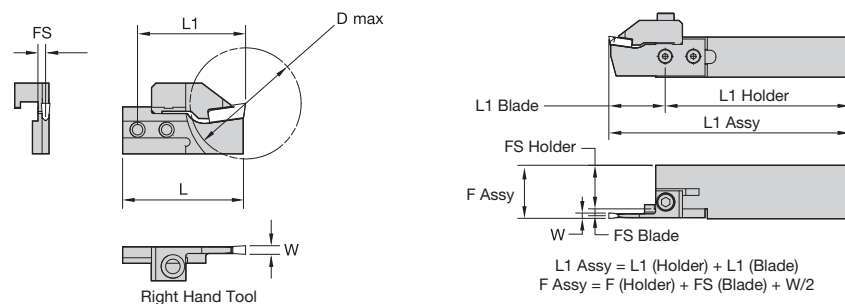
Grooving and Cut-Off



12mm and 20mm Shank Toolholders

order number	catalogue number	H	B	B2	L	L1	H2	F	support blade screw	clamp screw
right hand										
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
left hand										
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

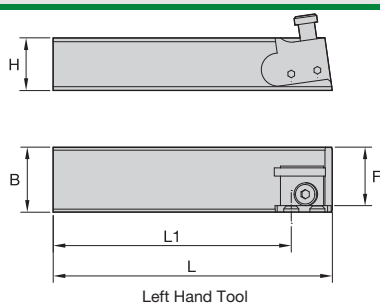
Support Blade Assembly



12mm and 20mm Shank Blades

order number	catalogue number	W	D max	FS	L	L1	clamp
right hand							
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
left hand							
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.



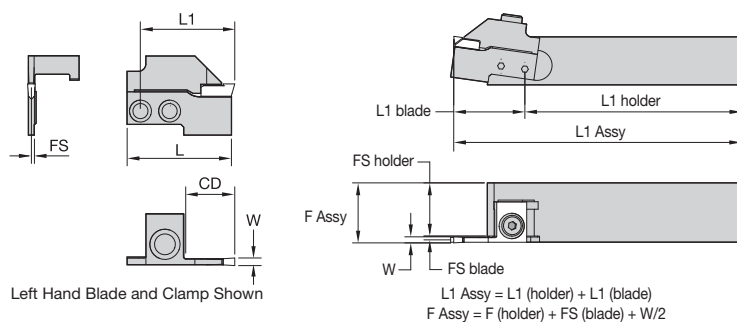
25mm and 32mm Shank Toolholders

order number	catalogue number	H	B	L	L1	F	support blade screw	clamp screw	clamp screw
right hand									
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	—
left hand									
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

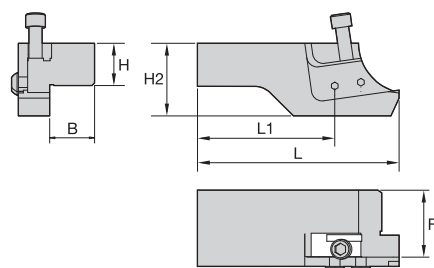
Support Blade Assembly



25mm and 32mm Shank Blades

order number	catalogue number	W	CD	FS	L	L1	clamp
right hand							
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
left hand							
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



■ Universal Style Toolholder • 56mm Bar Capacity

order number	catalogue number	B	H	H2	F	L1	L	clamp screw
right hand								
3614289	206408	26,97	25,00	43,66	40,16	105,46	144,14	MS1294

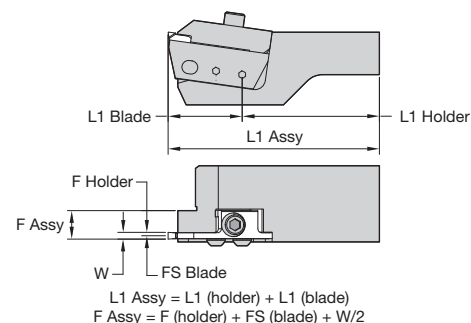


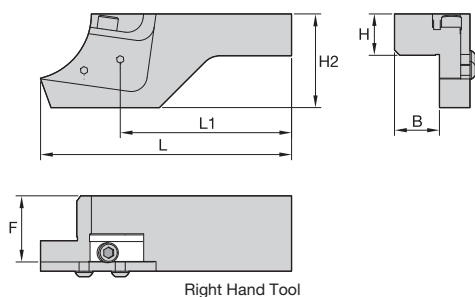
NOTE: Support blade requires two screws.
Order blades separately.

■ 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

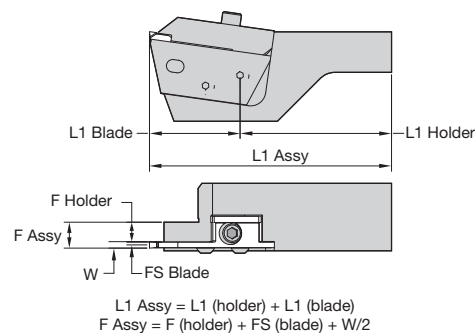
order number	catalogue number	B	H	H2	F	L1	L	support blade screw	clamp screw
right hand									
3538739	206411	27,00	25,00	56,36	39,78	102,96	150,85	MS1072	MS352
3615306	206443	27,00	32,00	56,36	39,78	102,96	150,85	MS1072	MS1294

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.





Grooving and Cut-Off



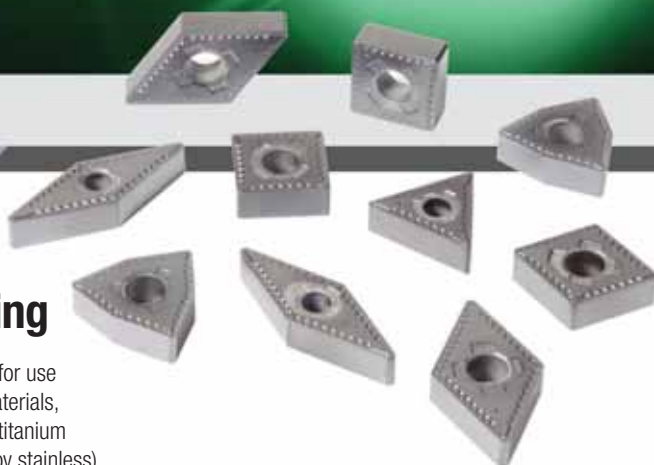
button-head
cap screw

clamp

flat-head
cap screw

washer

WIN WITH WIDIATM



WIDIATM VictoryTM 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 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.

To learn more, contact your local Authorised Distributor or visit www.widia.com.

WIDIA 

Definitions and Guidelines

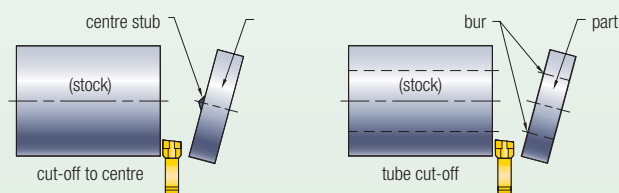
1. Width of cut (W) = width of the insert.
2. Lead angle = 0° (neutral); 4°, 5°, 12°, 18° (RH or LH).

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

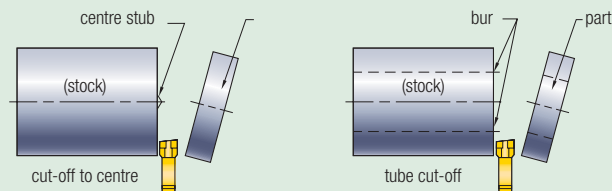
Insert selection **left-hand lead**



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

Figure 2

Insert selection **right-hand lead**

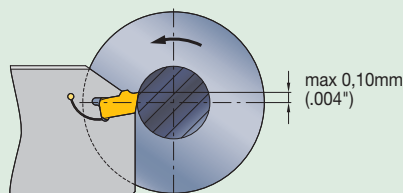


Right-hand lead insert leaves centre stub or bur on stock and produces clean part surface.

- 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.

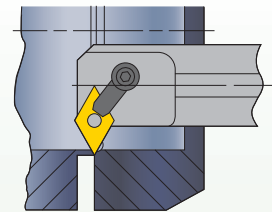


Figure 4

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.

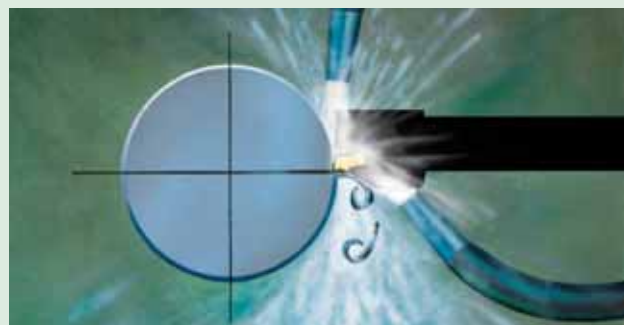


Figure 5

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:

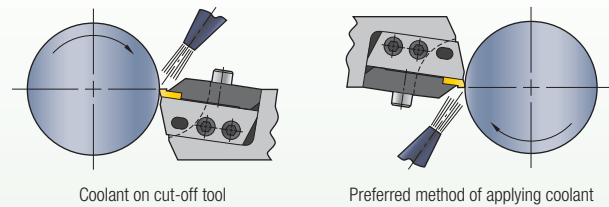
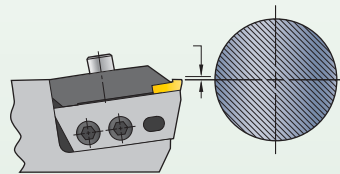
- Adjust feed rate up or down to accommodate chip formation.
- Use a 0° or smallest lead available.
- Use ample amounts of well-directed coolant (see Figure A).
- Maintain sharp cutting edge and corners.

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 F².
- For moderate to high speed (sfpm), use Separator S² or X².
- 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 0–0,0001mm above centre (see Figure B).

Improve surface finish:

- For low to moderate speed (sfpm), use Separator F².
- For moderate to high speed (sfpm), use Separator S² or X².
- 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 S² or X².
- 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 S² or X² 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.

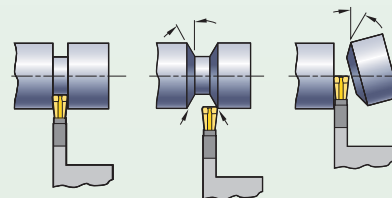
Eliminate built-up edge:

- 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 S² or X².
- 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



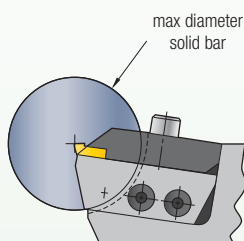
Modifications for Increased Depth of Cut


Figure 1
Standard bar capacity shown

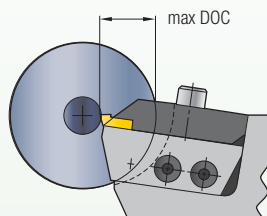


Figure 2
Larger bar diameter shown

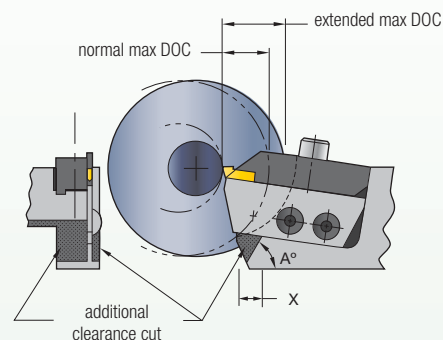


Figure 3
Modified toolholder with larger bar diameter shown

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

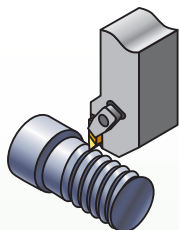
bar diameter	88,90	101,60	114,30	127,00	152,40	NOTE
max DOC	28,45	25,40	22,35	19,81	17,53	with no modification on toolholder
	36,58	34,80	33,27	31,75	28,45	with no modification on toolholder X = 10,16mm A = 1270mm



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):

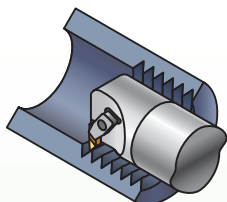
UN TPI of 32–7
ISO 1,5–3,0mm pitch

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):

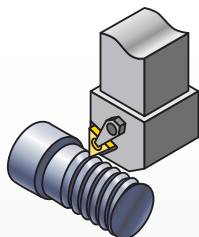
UN 16–8 TPI
ISO 1,5–3,0mm pitch

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

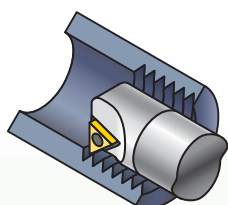
Cresting (Full Profile):

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™

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

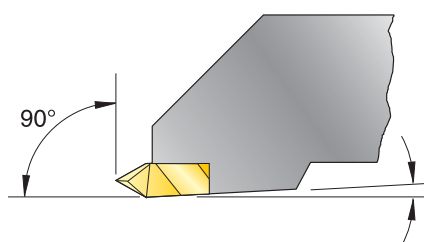
TopThread Insert Technology

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.

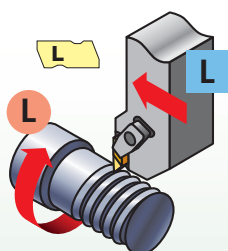
Step 1 • Select Threading Method and Hand of Tooling

Required Information:

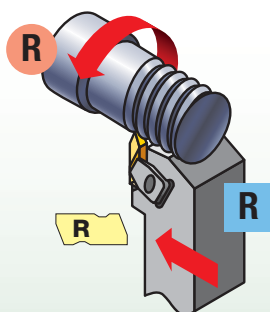
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



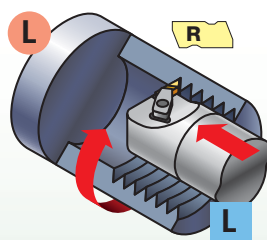
Feed direction toward the chuck • RECOMMENDED



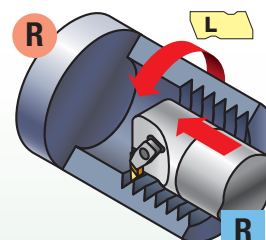
external left-hand thread



external right-hand thread

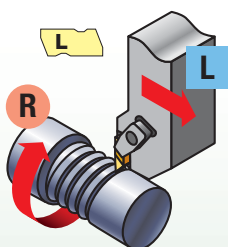


internal left-hand thread

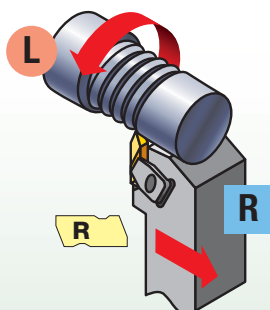


internal right-hand thread

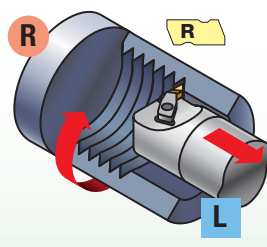
Feed direction away from the chuck



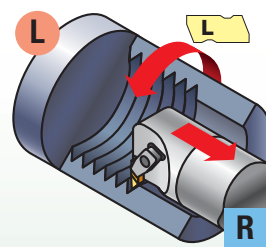
external right-hand thread



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:

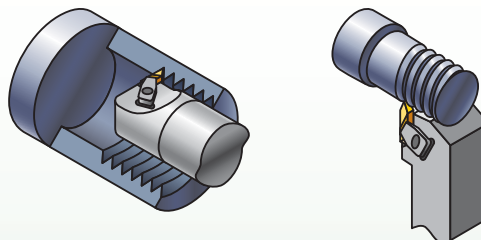
Required Information:

- 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	TN6010 160–750	TN6010 160–600	TN6010 230–700	–	TN6010 65–400
first choice	TN6025 130–650	TN6025 130–450	TN6025 200–475	TN6025 160–1150	TN6025 35–330

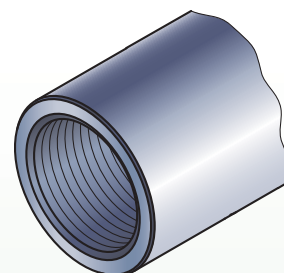
Examples:

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

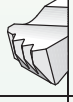
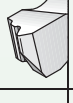
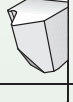
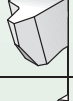
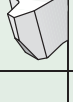
TopThread Threading Example:

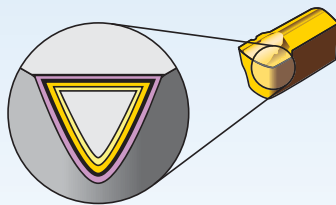
application: 8 TPI Acme internal right-hand thread
material: alloy steel
workpiece diameter: 114,3mm
 good cutting conditions
 feed towards the chuck

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.

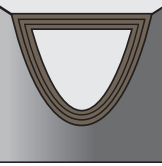
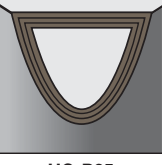
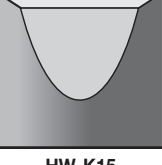
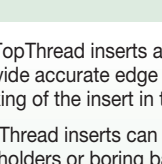
style						thread profile	standard	tolerance class	cresting	application	page(s)
chip control — K		neutral		positive							
NT-K		NT		NTP		Partial Profile 60°	—	—	N	General use for 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches.	F13–F15
NT-CK						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		NTK		Partial Profile 60° — fine pitch	—	—	N	Fine pitch 60° thread forms, such as ISO and UN, where non-cresting inserts are desired to cut a variety of pitches — able to thread close to shoulders.	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.

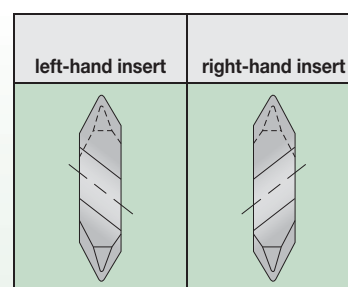
- Reduce cycle times — high speed capability.
- Longer tool life — new multilayer coating provides better wear resistance.

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

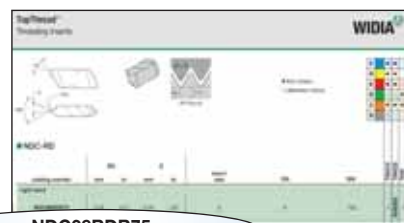
		wear resistance ←————→ toughness											
Coating		Grade Description			05	10	15	20	25	30	35	40	45
Grade	TN6010		An advanced PVD TiAlN coating over a very deformation-resistant unalloyed carbide substrate. TN6010 is ideal for finishing to general machining of most workpiece materials at higher speeds. 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									
	HC-P10			K									
				N									
				S									
				H									
TN6025		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										
	HC-P25			K									
				N									
				S									
THM		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.											
	HW-K15			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 Top Thread boring bars use right-hand inserts.
- See this page for carbide grade selection and more technical information.



TopThread Insert Identification System

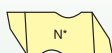


NDC38RDR75

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

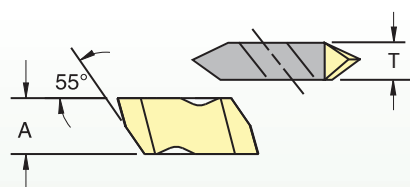
A — Acme

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

Cutting Speed — vc m/min										
Material Group		TN6010			TN6025			THM		
		min	Start	max	min	Start	max	min	Start	max
P	0/1	140	175	210	130	140	150	90	95	100
	2	115	145	175	110	145	175	75	100	125
	3	115	145	175	110	145	175	75	100	125
	4	75	100	120	75	95	115	55	65	80
	5	105	140	170	100	125	145	70	85	100
	6	45	60	75	40	55	65	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	70	90	100
	2	120	150	180	60	75	85	50	65	80
	3	110	140	170	60	75	90	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	—	—	—	—	—	—
	2	15	30	60	—	—	—	—	—	—
	3	15	30	60	—	—	—	—	—	—
	4	15	30	60	—	—	—	—	—	—

WIN WITH WIDIA™



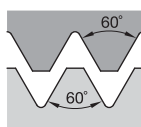
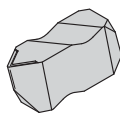
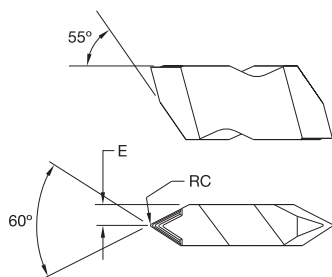
TopThread™ System

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 www.widia.com.

WIDIA 

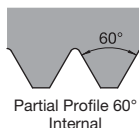
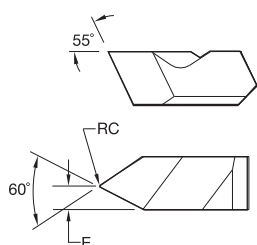


● first choice
○ alternate choice

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

■ NT-K

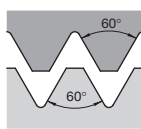
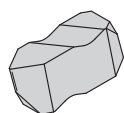
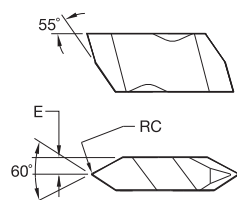
catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NT2RK	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607651	3607837	1
NT3RK	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607643	3607824	1
NT4RK	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607846	3607837	1
left hand										
NT2LK	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607674	3607833	1
NT3LK	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607645	3607828	1



■ NT-1L

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
left hand										
NT1L	0,08	1,09	1	—	1,0-2,0	—	12-24	3636551	3636555	1

Threading



Partial Profile 60°

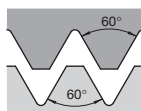
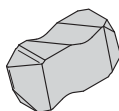
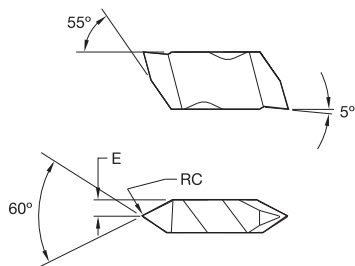
- first choice
○ alternate choice

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
right hand										
NT2R	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607647	3607843	1
NT3R	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607530	3607825	1
NT4R	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607676	3607834	1
left hand										
NT2L	0,10	1,90	2	0,70-3,0	1,25-3,5	8-36	7-20	3607675	3607835	1
NT3L	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607532	3607826	1
NT4L	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607849	3607849	1

Threading



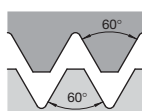
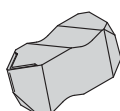
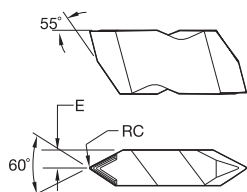
Partial Profile 60°

● 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
right hand										
NTP2R	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607677	3607841	■
NTP3R	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607644	3607823	■
NTP4R	0,17	3,25	4	1,25-6,25	2,0-6,25	4-20	4-12	3607839	3607841	■
left hand										
NTP2L	0,10	1,91	2	0,70-3,0	1,25-3,5	8-36	7-20	3607678	3607840	■
NTP3L	0,17	2,49	3	1,25-4,0	2,0-5,0	6-20	5-12	3607650	3607831	■

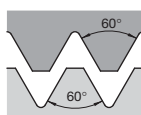
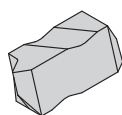
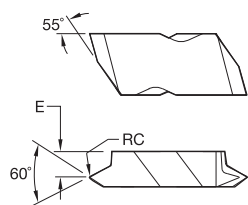


Partial Profile 60°

■ NT-CK

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NT3RCK	0,34	2,46	3	2,5-4,0	4,0	6-11	6	3607649	3607838	■

Threading



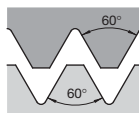
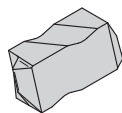
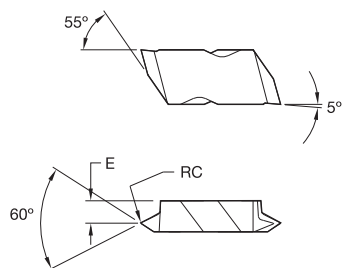
Partial Profile 60°

● first choice
○ alternate choice

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

NTF

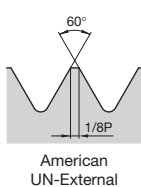
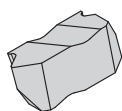
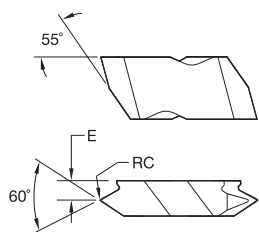
catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTF2R	0,08	2,79	2	0,60-1,75	1,0-2,0	14-44	12-24	3607673	3607852	I
NTF3R	0,08	3,58	3	0,60-2,5	1,0-2,5	10-44	9-24	3607531	3607830	I
left hand										
NTF3L	0,08	3,58	3	0,60-2,5	1,0-2,5	10-44	9-24	3607652	3607832	I



Partial Profile 60°

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	I
NTK3R	0,08	3,58	3	0,60-2,50	1,0-2,5	10-44	9-24	3607528	3607827	I
left hand										
NTK3L	0,08	3,58	3	0,60-2,50	1,0-2,5	10-44	9-24	3607853		I

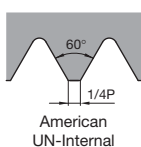
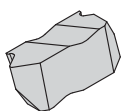
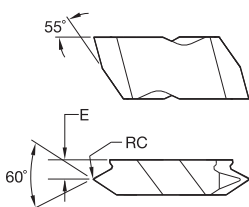


- first choice
○ alternate choice

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

■ NTC-E

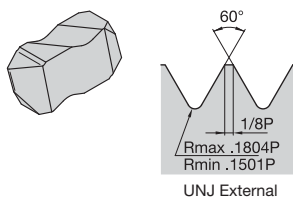
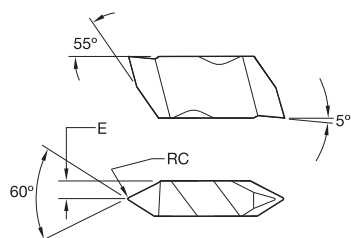
catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
right hand										
NTC3R16E	0,19	3,76	3	—	—	16	—	3636553	3636557	—
NTC3R14E	0,22	3,76	3	—	—	14	—	3636554	—	—
NTC3R12E	0,25	3,76	3	—	—	12	—	3636549	3636562	—



■ NTC-I

catalogue number	RC	E	insert size	external thread pitch mm	internal thread pitch mm	external TPI	internal TPI	TN6010	TN6025	THM
left hand										
NTC3L12I	0,10	3,76	3	—	—	—	12	—	3636556	—

Threading

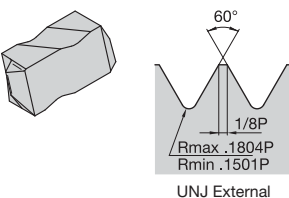
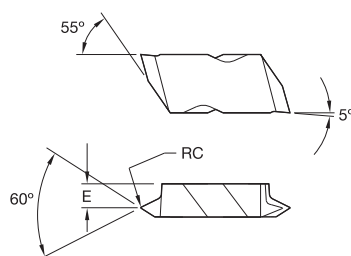


● first choice
○ alternate choice

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

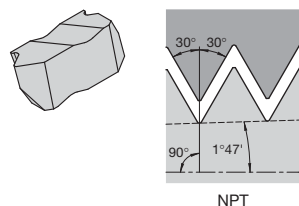
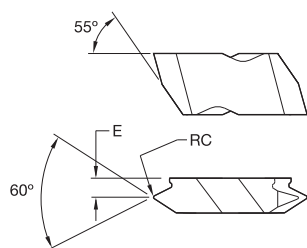
NJP

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	—



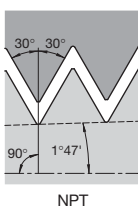
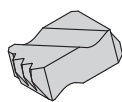
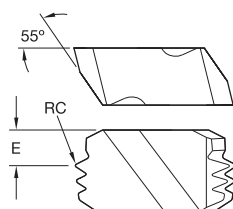
NJK

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	—	—

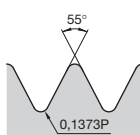
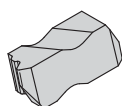
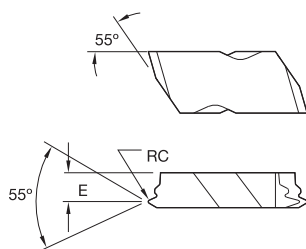


● first choice
 ○ alternate choice

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

■ NDC-V-M

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
right hand								
NDC8115VR75M	0,10	2,59	8	11.5	.750	3636552	■	■
NDC88VR75M	0,13	2,41	8	8	.750	3636548	■	■

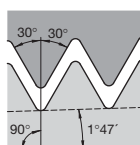
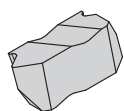
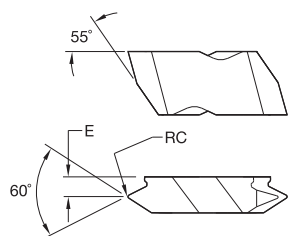


Whitworth BSW,
 BSP-External

■ NWC-E

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
right hand								
NWC3R14E	0,24	3,43	3	14	—	■	3811638	■
NWC3R11E	0,30	3,43	3	11	—	■	3811639	■

Threading



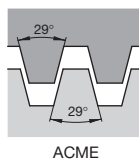
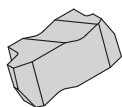
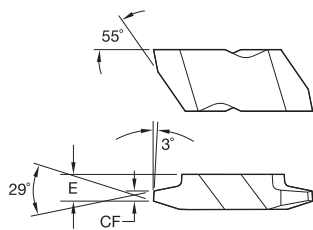
- first choice
- alternate choice

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

■ **NDC-RD**

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
right hand								
NDC38RDR75	0,43	3,18	3	8	.750	■	3636558	■
left hand								
NDC310RDL75	0,36	3,18	3	10	.750	■	3636565	■
NDC38RDL75	0,43	3,18	3	8	.750	■	3636559	■

Threading



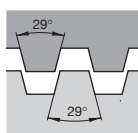
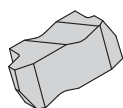
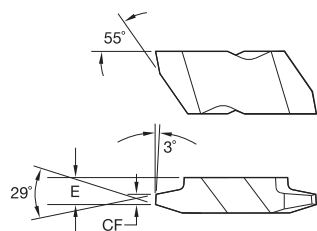
● first choice
 ○ alternate choice

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

■ NA

catalogue number	CF	E	insert size	TPI	TN6010	TN6025	THM
right hand							
NA3R8	1,04	3,79	3	8	●	●	●
NA3R6	1,44	3,79	3	6	●	●	●
NA3R4	2,22	3,38	3	4	●	●	●
NA4R4	2,22	5,13	4	4	●	●	●
NA6R3	3,01	7,19	6	3	●	●	●
NA6R2	4,58	7,19	6	2	●	●	●
left hand							
NA3L8	1,04	3,79	3	8	●	●	●
NA3L6	1,44	3,79	3	6	●	●	●
NA3L4	2,22	3,38	3	4	●	●	●
NA4L4	2,22	5,13	4	4	●	●	●
NA6L3	3,01	7,19	6	3	●	●	●
NA6L2	4,58	7,19	6	2	●	●	●

Threading



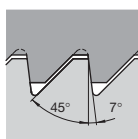
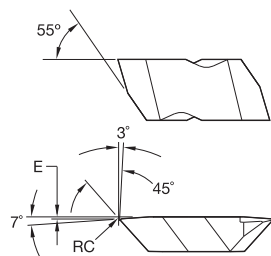
Stub ACME

● first choice
○ alternate choice

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

NAS

catalogue number	CF	E	insert size	TPI	TN6010	TN6025	THM
right hand							
NAS3R8	1,21	3,79	3	8	—	3607856	—
left hand							
NAS3L12	0,83	3,79	3	12	—	3607844	—
NAS3L8	1,21	3,79	3	8	—	3607845	—
NAS3L6	1,66	3,79	3	6	—	3607829	—

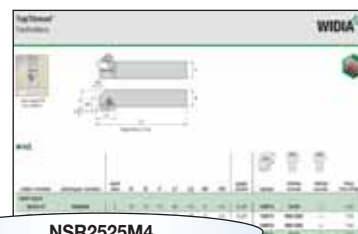


American Buttress-Pull

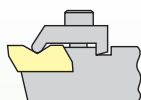
NTB-B

catalogue number	RC	E	insert size	TPI	TPF	TN6010	TN6025	THM
left hand								
NTB3LB	0,17	0,31	3	8-16	—	—	3636563	—

TopThread Holder Identification System


NSR2525M4
N

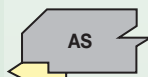
 Insert
Holding
Method

N –
TopThread™

S

 Insert
Mounting
Location

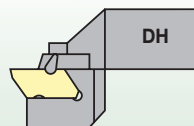
End mount


 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

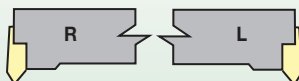
 Insert
Size


insert size	W1
2	3,81
3	4,95
4	6,98
5	9,65
6	9,73
8	11,13

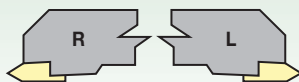
 Qualified
Holder

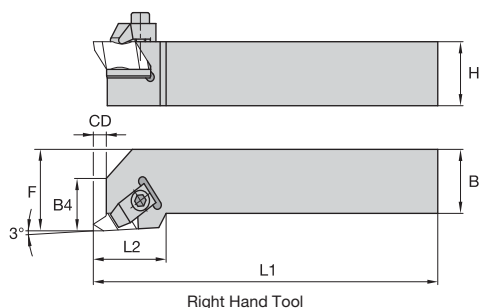
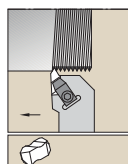
Q – Qualified
holder

End mount



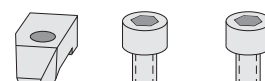
Side mount





■ 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
right hand														
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.

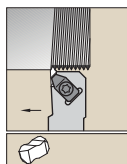
(continued)

(NS — continued)

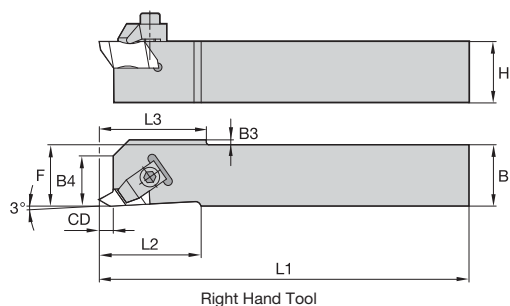
														
order number	catalogue number	seat size	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/ Torx Plus
left hand														
3632161	NSL062	2	10	10	14	64	19	9	3,5	N.2L	CM75	S310	—	7/64
3641683	NSL1010E2	2	10	10	14	70	19	9	3,5	N.2L	CM75	MS1200	—	T10
3641681	NSL1212F2	2	12	12	16	80	19	9	3,5	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.

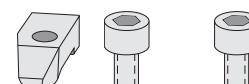


Right Hand Tool



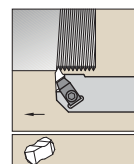
NAS

Threading

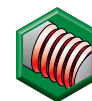
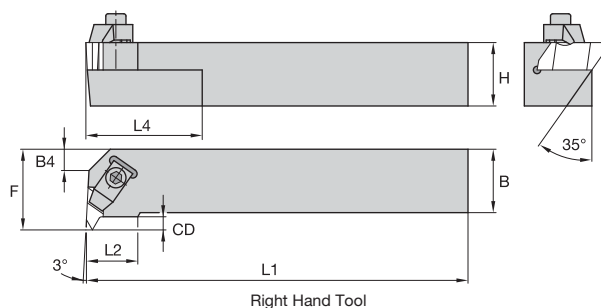


order number	catalogue number	seat size	H	B	F	L1	L2	B4	CD	B3	L3	gage insert	clamp	clamp screw	clamp screw	hex/ Torx Plus
right hand																
3641667	NASR1010M2Q	2	10	10	10	150	19	9	3,5	2,03	19	N.2R	CM182	MS1200	—	T10
3641662	NASR1212M2Q	2	12	12	12	150	19	9	3,5	—	—	N.2R	CM182	MS1200	—	T10
3639048	NASR1616K3Q	3	16	16	16	125	32	12	5,3	—	—	N.3R	CM184LP	—	MS2111	25 IP
left hand																
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

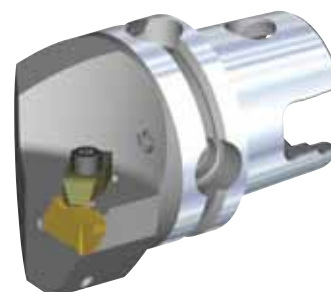
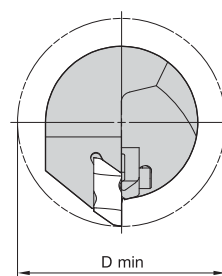
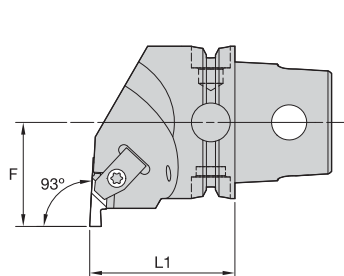
order number	catalogue number	seat size	H	B	F	L1	L2	B4	CD	gage insert	clamp	clamp screw	clamp screw	hex/ Torx Plus
right hand														
3641674	NER1616H2	2	16	16	20	100	15	—	3,5	N.2L	CM75	MS1200	—	T10
3641658	NER2020K2	2	20	20	25	125	15	6	3,5	N.2L	CM75	MS1200	—	T10
3641665	NER2525M2	2	25	25	32	150	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
left hand														
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.

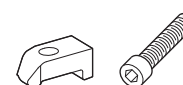
Threading

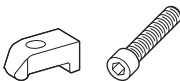


■ NE 93°



Threading

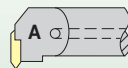
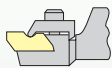
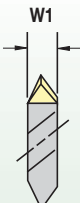
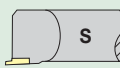


												
		L1		F		D min						
order number	catalogue number	mm	in	mm	in	mm	in	gage insert	clamp	clamp screw	kg	lbs
right hand												
3902285	KM40TSNER2	40	1.575	27	1.063	54	2.126	NG2L	CM75	MS1488	0,30	.66
3902286	KM40TSNER3	40	1.575	27	1.063	54	2.126	NG3L	CM73	MS1489	0,30	.67
3902287	KM40TSNER4	40	1.575	27	1.063	54	2.126	NG4L	CM73	MS1489	0,30	.65
left hand												
3902132	KM40TSNEL2	40	1.575	27	1.063	54	2.126	NG2R	CM74	MS1488	0,30	.66
3902283	KM40TSNEL3	40	1.575	27	1.063	54	2.126	NG3R	CM-72	MS1489	0,30	.67
3902284	KM40TSNEL4	40	1.575	27	1.063	54	2.126	NG4R	CM-72	MS1489	0,30	.65

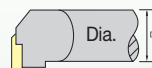
TopThread Boring Bar Identification System



A25RNNT0R2

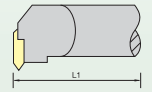
A	25	R	N	N	T	0	R	2														
Bar Type	Bar Diameter	Bar Length	Insert Holding Method	Insert Shape	Insert Location	Rake Angle 0 = 0°	Hand of Tool	Insert Size														
Steel with coolant 			N — TopThread* 		End mount 		Right hand 															
			*Proprietary standard only.		Side mount 		Left 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																					

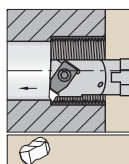
Bar in millimetres



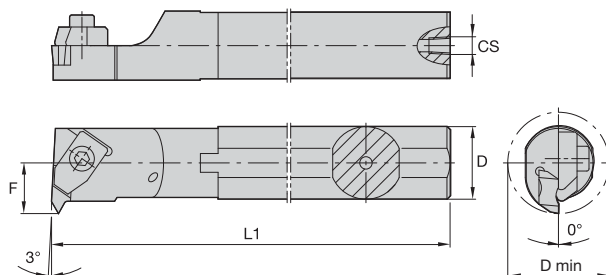
Bars

- K** = 125,0mm
- M** = 150,0mm
- Q** = 180,0mm
- R** = 200,0mm
- S** = 250,0mm
- T** = 300,0mm
- U** = 350,0mm





Steel shank with through coolant. See page F8 for inserts.



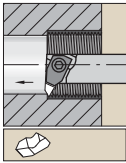
Right Hand Tool



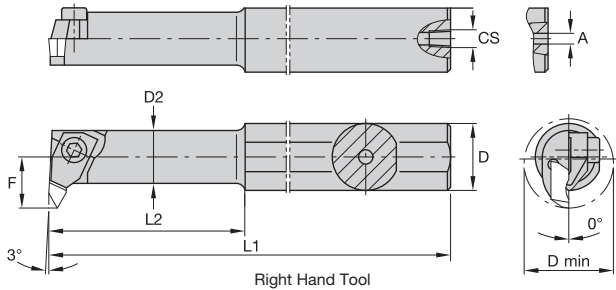
■ A-NNT

order number	catalogue number	seat size	D	D min	L1	F	CS	gage insert	clamp	clamp screw	clamp screw	hex/Torx Plus
right hand												
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
left hand												
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.



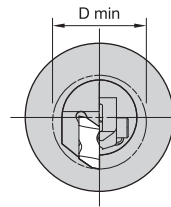
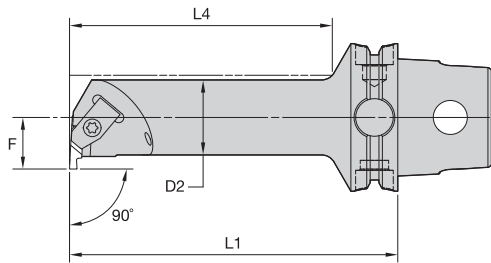
Necked steel shank with through coolant. See page F8 for inserts.



■ A-NNT-1

order number	catalogue number	seat size	D	D min	D2	L1	L2	F	A	CS	gage insert	clamp	clamp screw	hex/ Torx Plus
right hand														
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			
right hand														
3955481	KM40TSS12ENER2	12	.472	19	.73	11	.433	42	1.655	70	2.756	NG2L	0,27	.58
3955483	KM40TSS16FNER2	16	.630	20	.79	11	.433	56	2.209	80	3.150	NG2L	0,28	.62
3955485	KM40TSS20GNER2	20	.787	25	.98	13	.512	70	2.757	90	3.543	NG2L	0,35	.76
3955487	KM40TSS25ENER2	25	.984	32	1.26	17	.669	55	2.169	70	2.756	NG2L	0,34	.75
3955491	KM40TSS25ENER3	25	.984	34	1.34	17	.669	55	2.169	70	2.756	NG3L	0,35	.77
3955489	KM40TSS25HNER2	25	.984	32	1.26	17	.669	75	2.954	100	3.937	NG2L	0,49	1.08
3955493	KM40TSS25HNER3	25	.984	34	1.34	17	.669	75	2.954	100	3.937	NG3L	0,49	1.09
3955497	KM40TSS32GNER3	32	1.260	40	1.57	22	.866	76	2.993	90	3.543	NG3L	0,55	1.21
3955495	KM40TSS32JNER3	32	1.260	40	1.57	22	.866	96	3.780	110	4.331	NG3L	0,67	1.48
left hand														
3955480	KM40TSS12ENEL2	12	.472	19	.73	11	.433	42	1.655	70	2.756	NG2R	0,27	.59
3955482	KM40TSS16FNEL2	16	.630	20	.79	11	.433	56	2.209	80	3.150	NG2R	0,28	.62
3955484	KM40TSS20GNEL2	20	.787	25	.98	13	.512	70	2.757	90	3.543	NG2R	0,35	.76
3955486	KM40TSS25ENEL2	25	.984	32	1.26	17	.669	55	2.169	70	2.756	NG2R	0,34	.75
3955490	KM40TSS25ENEL3	25	.984	34	1.34	17	.669	55	2.169	70	2.756	NG3R	0,35	.77
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)

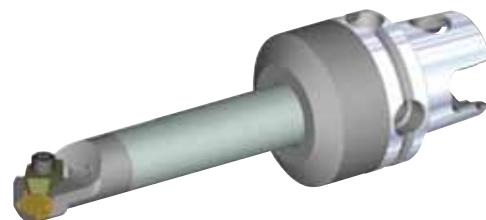
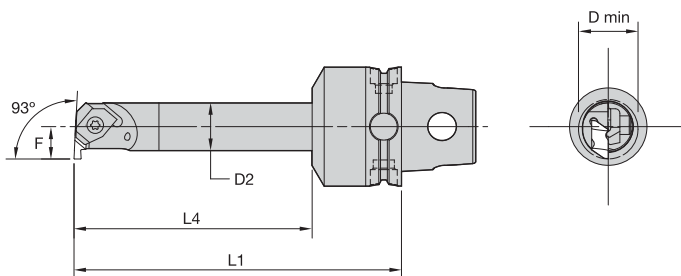
Threading

(NE 90° • Steel — continued)

■ Spare Parts

Threading

			
catalogue number		clamp	clamp screw
right hand			
KM40TSS12ENER2		CM147	MS1488
KM40TSS16FNER2		CM147	MS1488
KM40TSS20GNER2		CM75	MS1488
KM40TSS25ENER2		CM75	MS1488
KM40TSS25ENER3		CM73	MS1489
KM40TSS25HNER2		CM75	MS1488
KM40TSS25HNER3		CM73	MS1489
KM40TSS32GNER3		CM73	MS1489
KM40TSS32JNER3		CM73	MS1489
left hand			
KM40TSS12ENEL2		CM146	MS1488
KM40TSS16FNEL2		CM146	MS1488
KM40TSS20GNEL2		CM74	MS1488
KM40TSS25ENEL2		CM74	MS1488
KM40TSS25ENEL3		CM-72	MS1489
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			
right hand														
3951836	KM40TSE16JNER2	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2L	0,41	.90
left hand														
3951835	KM40TSE16JNEL2	16	.630	20	.79	11	.433	80	3.15	110	4.331	NG2R	0,41	.90

Threading

■ Spare Parts

	catalogue number	clamp	clamp screw
right hand			
	KM40TSE16JNER2	CM146	MS1488
left hand			
	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.

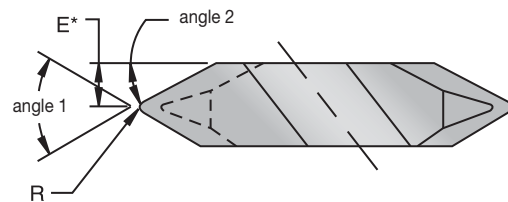
Common examples of special forms are shown here. Please contact your local WIDIA representative for recommendations on satisfying your special threading needs.

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

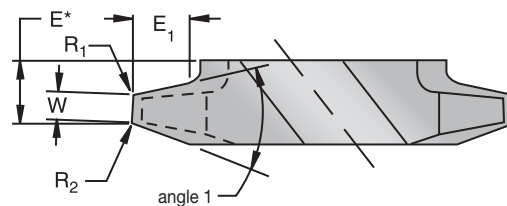
RH shown



*to theoretical sharp point

style C3

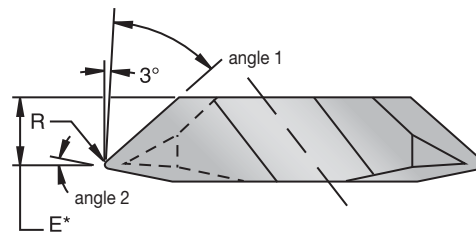
RH shown



*to theoretical sharp point

**style C4
(NTB-A)**

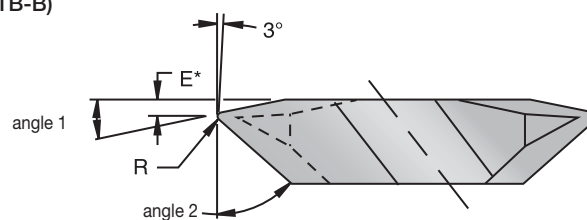
RH shown



*to theoretical sharp point

**style C5
(NTB-B)**

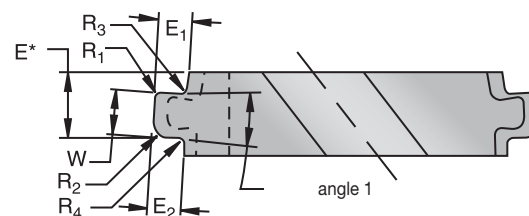
RH shown



*to theoretical sharp point

style C6

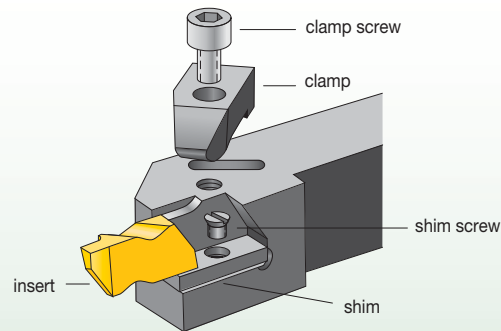
RH shown



*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.

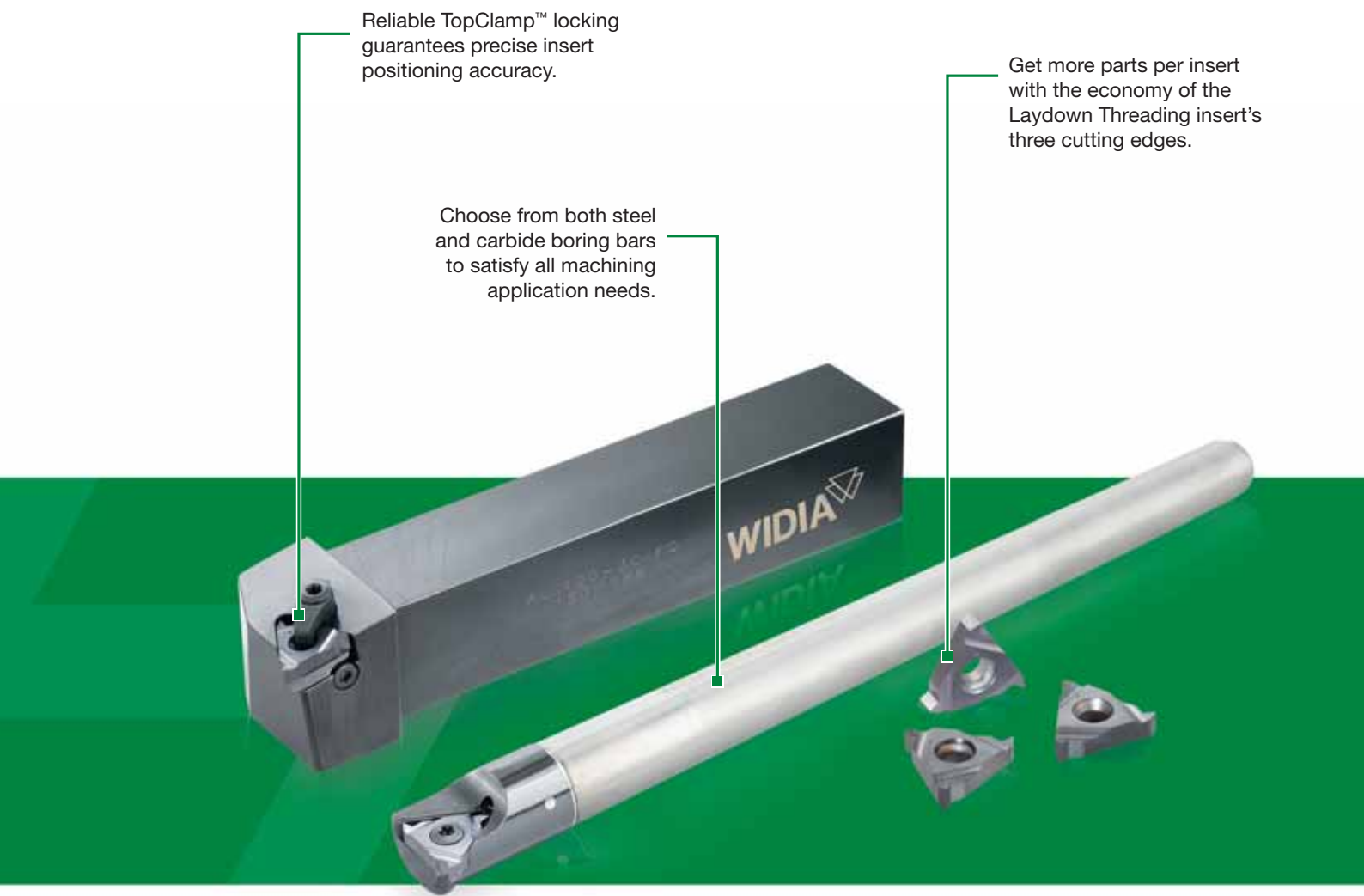
This specially engineered system meets all modern production standards. With an extensive range of inserts and toolholders available, the Laydown Threading platform is ideal for all of your threading requirements.

Laydown

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.

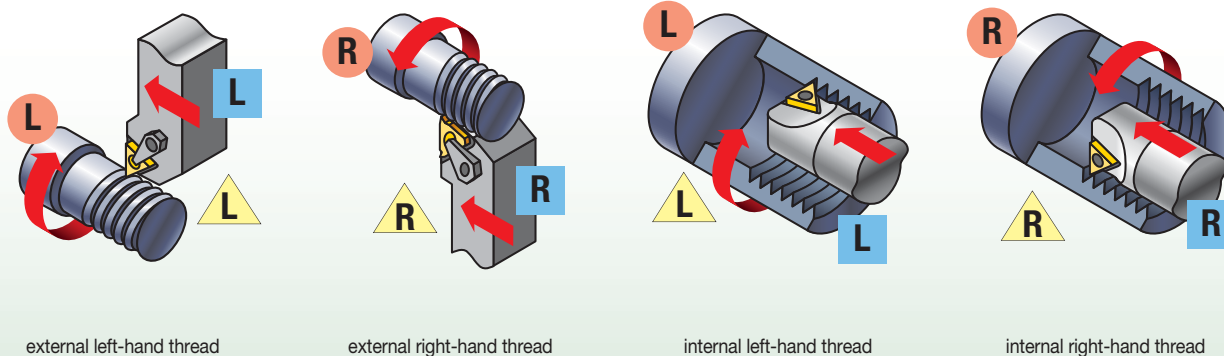
Step 1 • Select Threading Method and Hand of Tooling

Required Information:

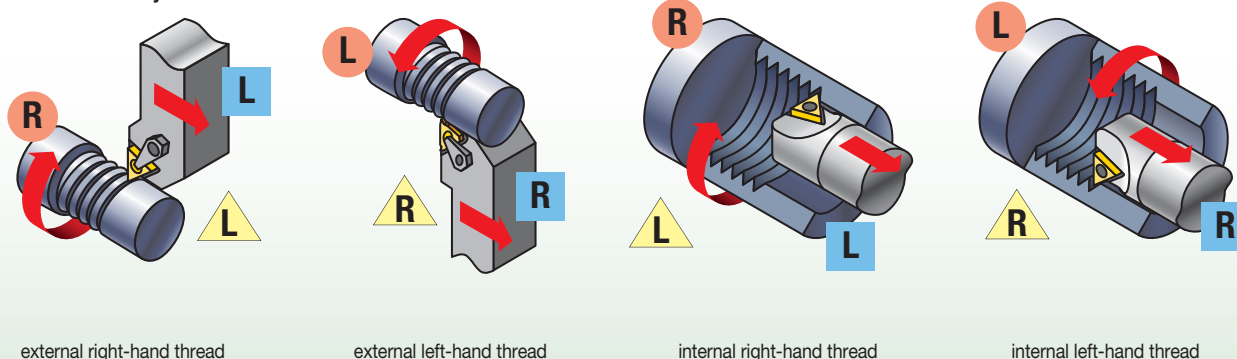
- External/internal operation.
- Spindle rotation/hand of thread.
- Feed direction.



Feed direction toward the chuck • standard helix • RECOMMENDED



Feed direction away from the chuck • reverse helix*



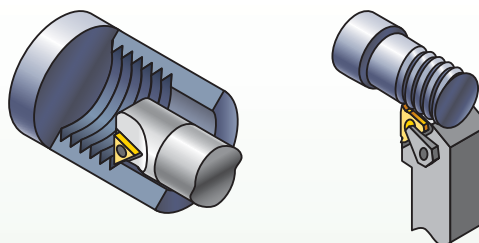
*Negative shim required

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:



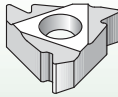
The insert size must match the gage insert size of your toolholder selection:

catalogue number	gage insert	minimum bore diameter	shim
S0812LSER2	2IRA60	16,5mm	—
S2020LSER3	3IR...	36,8mm	SM-YI3

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.

	insert size	catalogue number	TN6025
	11	2IRA60	•
	16	3IRAG60	•

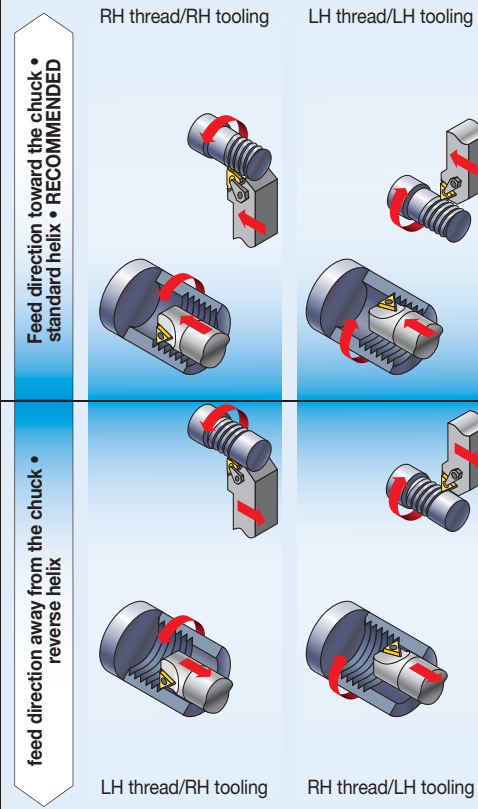
Step 4 • Select Appropriate Shim

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	external	internal	standard	reverse
11	2IRA60	2IRA60	2IRA60	2IRA60
16	3IRAG60	3IRAG60	3IRAG60	3IRAG60

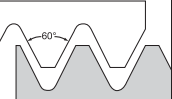
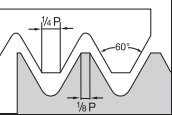
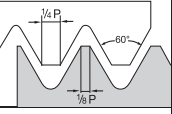
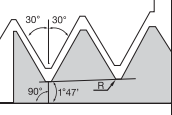
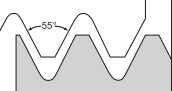
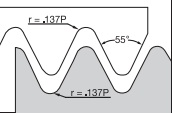
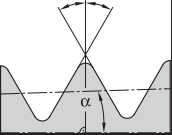
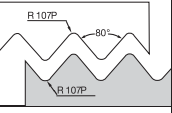
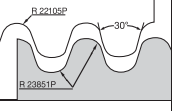
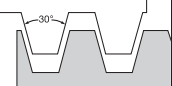
If recommended shim is different from shim supplied with toolholder, order shim separately.

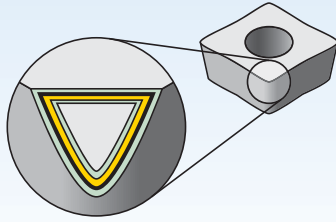
NOTE: Optimise your threading operation by using the proper infeed angle and the recommended infeed values. See the Technical Section on pages F79—F101. Also see detailed shim selection information on page F100—F101.

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.

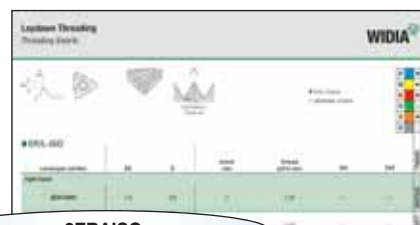
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

[illegible]

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

3

Insert
Size

E

Insert Type

E —
External thread

I —
Internal thread

R

Hand
of Insert

R —
Right-hand
thread

L —
Left-hand
thread

A

Thread
Pitch

ISO

Thread
Profile

Number of Teeth

Single tooth profile —
No symbol

Multi-tooth profile —
Number of teeth
(cutting edge and symbol)

Multi-tooth profile with
two teeth — 2M

55

Partial Profile 55°

60

Partial Profile 60°

ISO

ISO Metric 60°

TR

ISO Metric 60°

UN

ISO Inch/American UN 60°

W

Whitworth 55°

NPT

American National Pipe Thread 60°

RD

Round

PG

Steel Conduit

APIRD

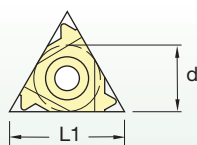
API Round

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

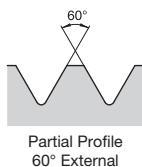
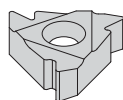
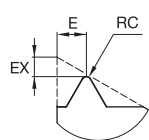
Full profile inserts

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



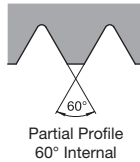
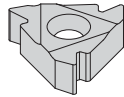
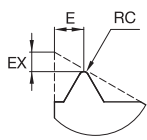
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-60

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								2007404
2ERA60	0,05	0,9	0,8	2	0,50-1,5	48-16	—	2018214
3ERA60	0,05	0,8	0,9	3	0,50-1,5	48-16	—	2018246
3ERAG60	0,08	1,2	1,7	3	0,50-3,0	48-8	—	2018222
3ERG60	0,28	1,2	1,7	3	1,75-3,0	14-8	—	2018252
4ERN60	0,53	1,7	2,5	4	3,5-5,0	7-5	—	2018256
5ERQ60	0,64	2,1	3,1	5	5,5-6,0	4,5-4	—	2018236
left hand								2018236
3ELAG60	0,08	1,2	1,7	3	0,50-3,0	48-8	—	2018236
3ELG60	0,28	1,2	1,7	3	1,75-3,0	14-8	—	2018236

Threading



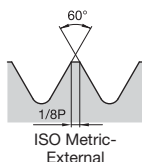
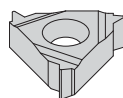
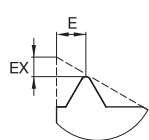
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

IR/L-60

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								
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
left hand								
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

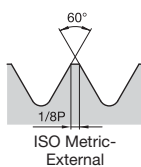
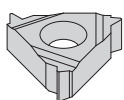
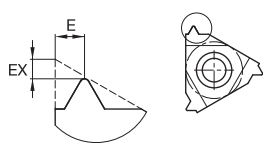
P	●
M	●
K	●
N	○
S	●
H	●

ER/L-ISO

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							
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)



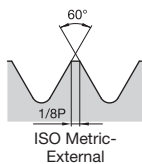
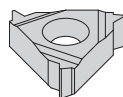
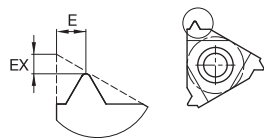
- first choice
- alternate choice

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
left hand							2018528
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

Threading

(ER/L-ISO — continued)

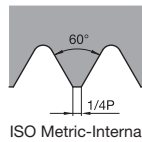
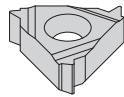
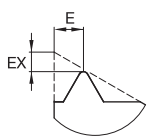


- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

Threading

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
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	○

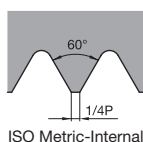
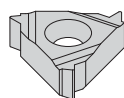
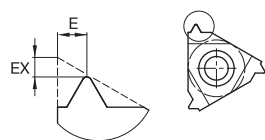
■ IR/L-ISO

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							2007585
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)

(IR/L-ISO — continued)



ISO Metric-Internal

- first choice
- alternate choice

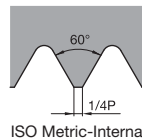
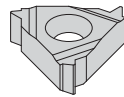
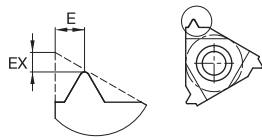
P	●
M	●
K	●
N	○
S	●
H	○

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
left hand							
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)

(IR/L-ISO — continued)

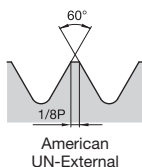
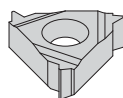
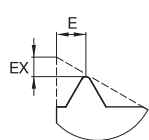


- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	○

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
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

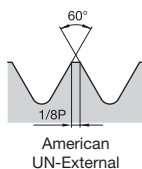
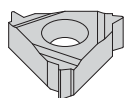
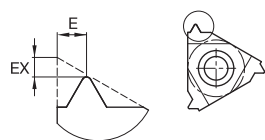
P	●
M	●
K	●
N	○
S	●
H	●

■ 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)

(ER/L-UN — continued)

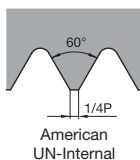
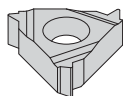
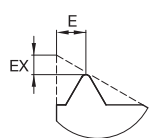


- first choice
- alternate choice

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
left hand							
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	●

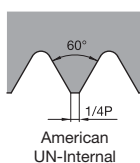
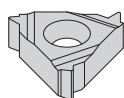
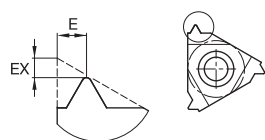
■ IR/L-UN

Threading

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)

(IR/L-UN — continued)

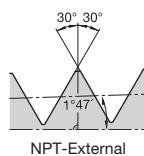
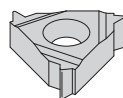
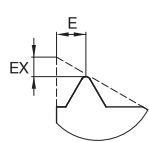


- first choice
- alternate choice

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
left hand							
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

Threading



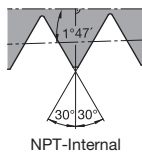
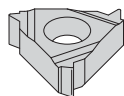
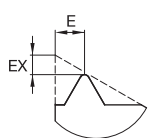
- first choice
- alternate choice

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



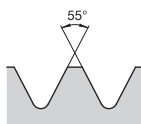
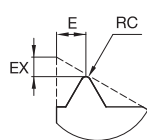
- first choice
- alternate choice

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

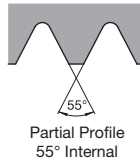
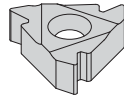
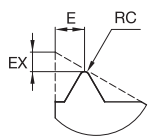
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-55

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								2018301
3ERA55	0,05	0,8	0,9	3	0,50-1,5	48-16	—	2018314
3ERAG55	0,08	1,2	1,7	3	0,50-3,0	48-8	—	2018308
3ERG55	0,20	1,2	1,7	3	1,75-3,0	14-8	—	2018320
4ERN55	0,43	1,7	2,5	4	3,5-5,0	7-5	—	2008190
left hand								2008190
3ELG55	0,20	1,2	1,7	3	1,75-3,0	14-8	—	2008190

Threading



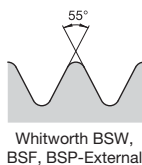
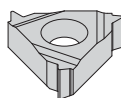
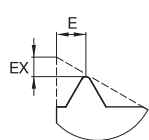
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ IR/L-55

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								2018328
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
left hand								312249
3ILA55	0,05	0,8	0,9	3	0,50-1,5	48-16	—	312249
3ILAG55	0,07	1,2	1,7	3	0,50-3,0	48-8	—	2018348

Threading



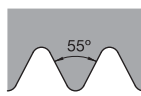
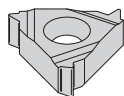
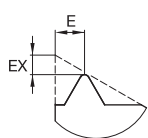
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	

■ ER/L-W

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							2019023
3ER32W	0,6	0,6	3	—	32	—	2019029
3ER28W	0,6	0,7	3	—	28	—	2019055
3ER19W	0,8	1,0	3	—	19	—	201677
3ER18W	0,8	1,0	3	—	18	—	2019061
3ER16W	0,9	1,1	3	—	16	—	2019071
3ER14W	1,0	1,2	3	—	14	—	2019077
3ER12W	1,1	1,4	3	—	12	—	2019083
3ER11W	1,1	1,5	3	—	11	—	2019089
3ER10W	1,1	1,5	3	—	10	—	2019101
3ER8W	1,2	1,5	3	—	8	—	201725
4ER6W	1,6	2,3	4	—	6	—	2065289
left hand							2103046
3EL11W	1,1	1,5	3	—	11	—	2065289
3EL8W	1,2	1,5	3	—	8	—	2103046

Threading



Whitworth
BSW, BSF,
BSP-Internal

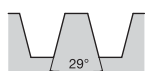
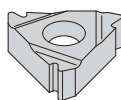
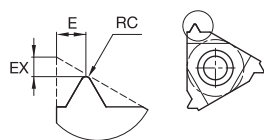
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ IR/L-W

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							
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



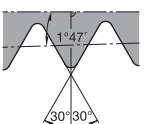
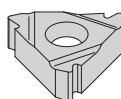
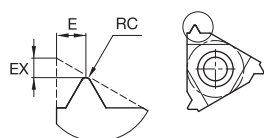
API Round-External

- 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

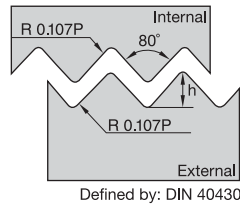
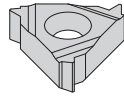
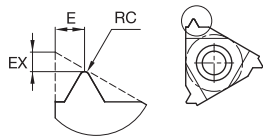


API Round-Internal

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

Threading

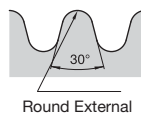
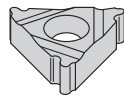
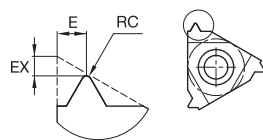


- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

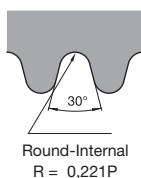
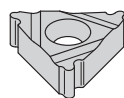
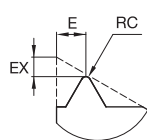
IR-PG

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								2019441
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								2019347
3ER8RD	0,76	1,4	1,3	3	—	8	—	2019347
4ER6RD	1,01	1,5	1,7	4	—	6	—	2019359
left hand								2071943
3EL8RD	0,76	1,4	1,3	3	—	8	—	2071943



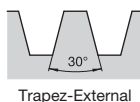
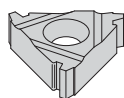
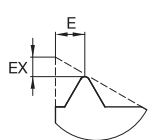
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	○

■ IR/L-RD

catalogue number	RC	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand								2019375
3IR10RD	0,70	1,1	1,2	3	—	10	—	2019381
3IR8RD	0,70	1,4	1,4	3	—	8	—	2019394
4IR6RD	0,93	1,5	1,7	4	—	6	—	2019400
4IR4RD	1,40	2,3	2,2	4	—	4	—	3122422
left hand								
3IL8RD	0,06	1,4	1,4	3	—	8	—	

Threading



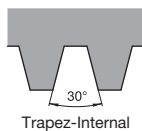
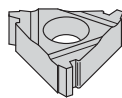
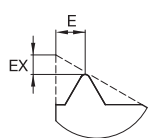
- first choice
- alternate choice

P	●
M	●
K	●
N	○
S	●
H	●

■ ER/L-TR

catalogue number	EX	E	insert size	thread pitch mm	TPI	TPF	TN6025
right hand							
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
left hand							
3EL3TR	1,3	1,5	3	3,00	—	—	2019463
4EL4TR	1,7	1,9	4	4,00	—	—	2019471

Threading



Trapez-Internal

- 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

25

Shank Size

Toolholders

- First two numbers are shank height in mm.

3

Insert
Size

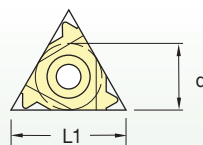
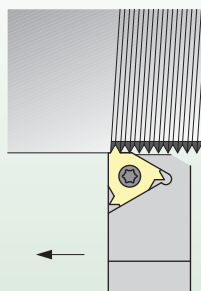
R

Hand of
Tool

RH —
Thread symbol R

LH —
Thread symbol L

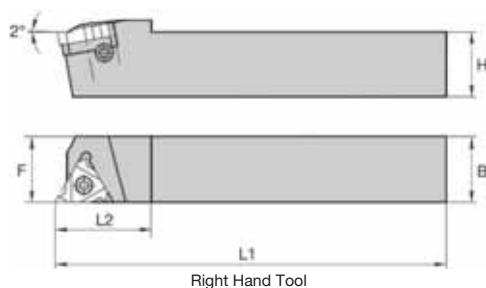
L — External Thread



symbol	d	L1
2	6,35	11
3	9,52	16
4	12,7	22
5	15,88	27



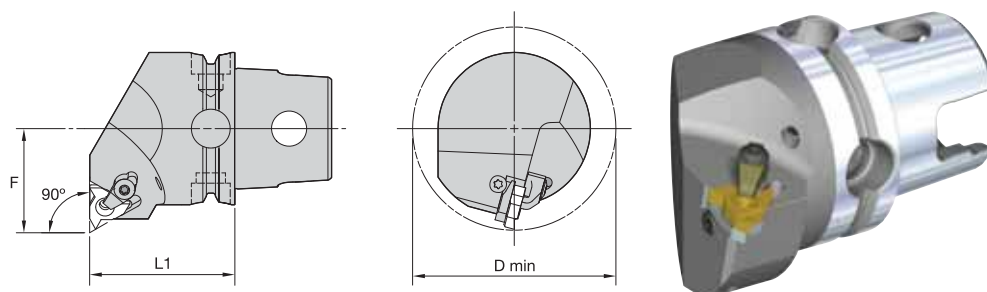
See page F42
for inserts.



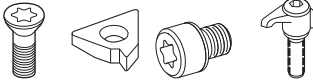
■ N/A

Threading

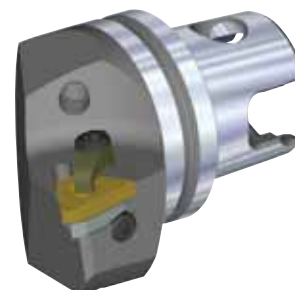
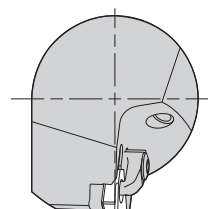
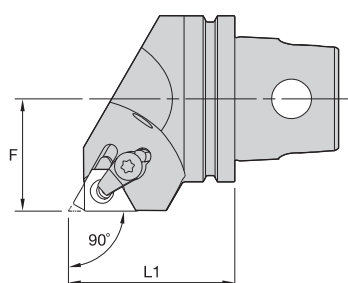
								  				
order number	catalogue number	insert size	H	B	F	L1	L2	shim	shim screw	Torx	insert screw	Torx
right hand												
2022340	NL82R	2	8	8	11	136	18	—	—	—	SSN2T	T8
2009587	AL163R	3	16	16	16	100	25	SMYE3	SSY3T	T10	SSA3T	T10
2009591	AL203R	3	20	20	20	128	30	SMYE3	SSY3T	T10	SSA3T	T10
2009594	AL253R	3	25	25	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
left hand												
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

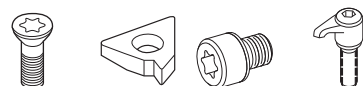
														
order number	catalogue number	L1		F		D min		gage insert	insert screw	shim	shim screw	clamp assembly	kg	lbs
		mm	in	mm	in	mm	in							
right hand														
3950832	KM40TSLSER16N	40	1.575	27	1.063	54	2.126	LT16NR	SSA3T	SMYI3	SSY3T	CKC3	0,35	.77
3950854	KM40TSLSER22N	40	1.575	27	1.063	54	2.126	LT22NR	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
left hand														
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

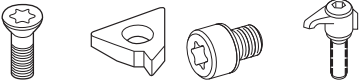
NOTE: Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.



■ LSS 90°

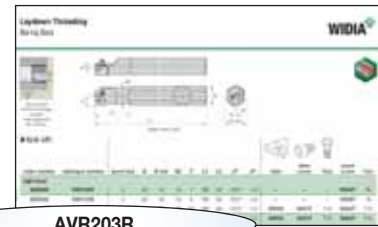
Threading



												
order number	catalogue number	L1		F		gage insert	insert screw	shim	shim screw	clamp assembly	kg	lbs
		mm	in	mm	in							
right hand												
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
left hand												
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

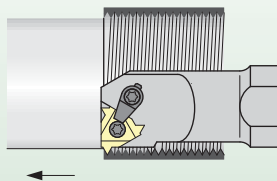
N —
No shim required

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

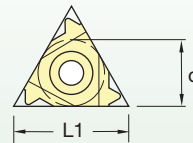
Insert
Size

R

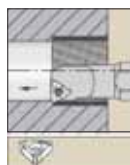
Hand of
Tool

RH —
Thread symbol R

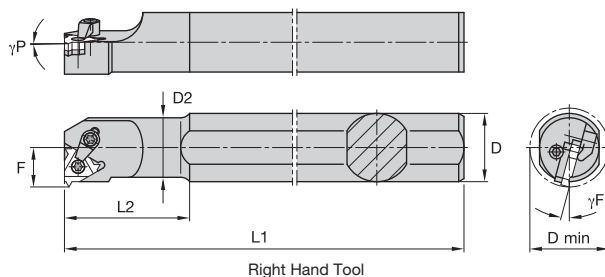
LH —
Thread symbol L



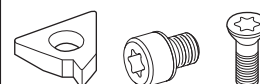
symbol	d	L1
2	6,35	11
3	9,52	16
4	12,7	22
5	15,88	27



Steel shank
without through
coolant.
See page F42
for inserts.

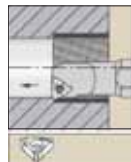


■ N/A-VR

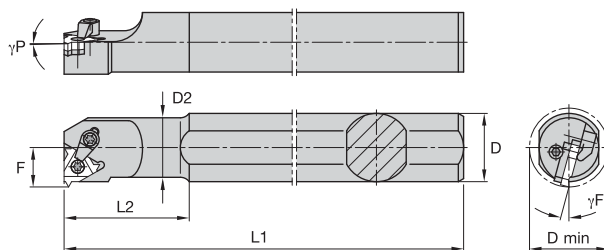


order number	catalogue number	insert size	D	D min	D2	F	L1	L2	γF°	γP°	shim	shim screw	Torx	insert screw	Torx
right hand															
2025828	NVR102R	2	20	13	10	7	180	25	-15,0°	-1,5	—	—	—	SSN2T	T8
2022342	NVR132R	2	20	16	13	9	180	32	-15,0°	-1,5	—	—	—	SSN2T	T8
2012307	NVR163R	3	20	20	16	12	180	40	-15,0°	-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
left hand															
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.

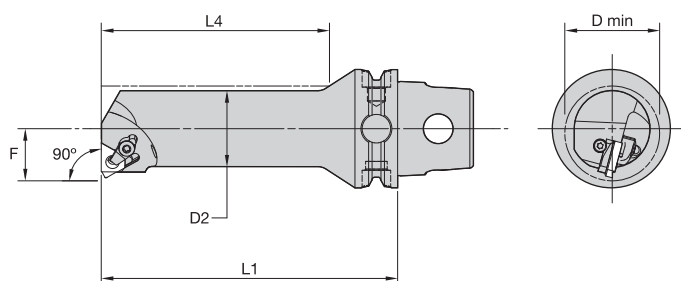


■ OVR

order number	catalogue number	insert size	D	D min	D2	F	L1	L2	γF°	γP°	screw	Torx driver	Torx
right hand													
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.

Threading



■ 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			
right hand														
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
left hand														
3955463	KM40TSS10DLSEL11	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
right hand				
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
left hand				
KM40TSS10DLSEL11	SSN2T	—	—	—
KM40TSS12ELSEL11	SSN2T	—	—	—
KM40TSS16FLSEL16	SN3TPKG	—	—	—
KM40TSS20GLSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS25HLSSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS32JLSEL16	SSA3T	SMYE3	SSY3T	CKC3
KM40TSS32JLSEL22	SSA4T	SMYE4	SSY4T	CKC4

NOTE: Items listed without a shim are designed for a 1,5° inclination angle.

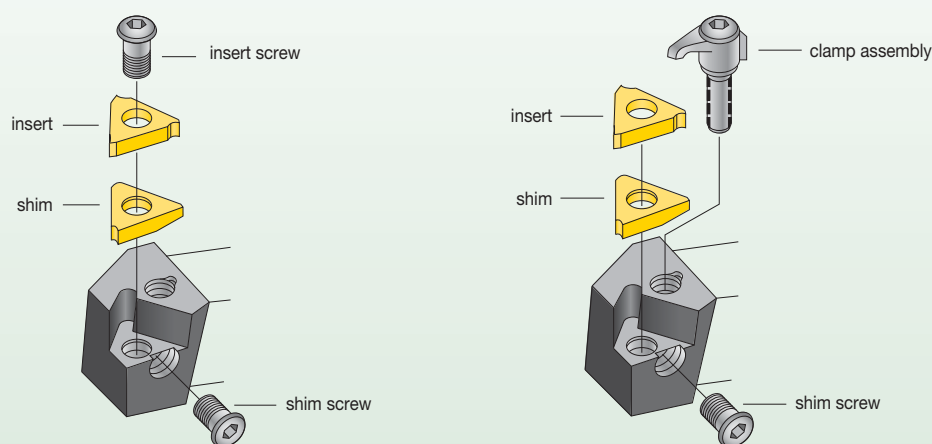
Cutting units are supplied with insert screw and clamp assembly. However, tools are designed to use either the insert screw or the clamp assembly, not both.

Threading

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

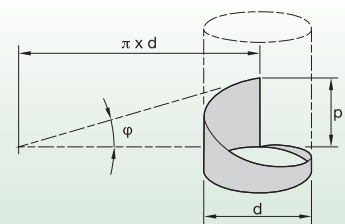
Because you might occasionally need different shims than those supplied with our standard toolholders, we strongly recommend that shim kits be readily available in every tool shop.

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

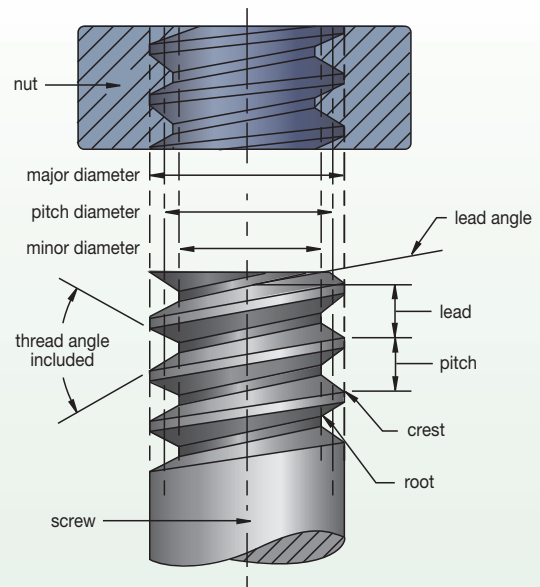
Example:
 $d = 48,06\text{mm}$ (1.892")
 $p = 3,175\text{mm}$ (.125")
 ϕ = Helix angle
 p = pitch
 d = pitch diameter

$$\phi = \arctan \left(\frac{p \cdot \text{starts}}{\pi \cdot \phi} \right) = 1.13^\circ$$



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. $TPI = 1/\text{pitch}$

Use: All branches of mechanical industry.

Use: Aircraft and space industry.

Use: Fittings and pipe couplings for gas, water, and sewer lines (replaced by ISO).

Use: Fittings and pipe couplings.

Use: Fittings and pipe couplings.

Use: Pipe thread for steam, gas, and water lines.

Use: Mechanical industry for motion transmission screws.

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.

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.

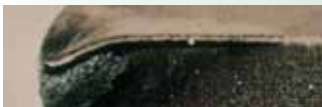
NOTE: Taper shown exaggerated.

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

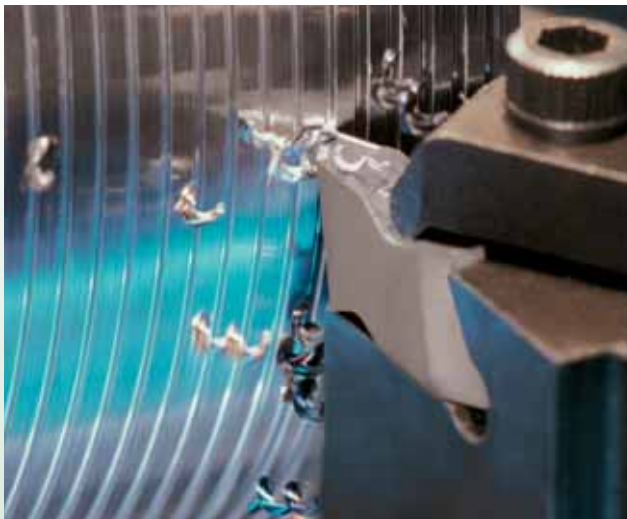
problem	cause	possible solution
thread with torn finish 	• Burs. • Torn finish. • Steps. • Improper shim. • Improper infeed.	• Use modified flank infeed. • Use full profile insert. • Increase coolant concentration. • Increase m/min. • Check machine "Z" travel axis. • Check insert form. • Check for correct shim in LT system. • Calculate flank clearance.
chatter 	• Poor rigidity. • Insert movement. • Improper infeed. • Off centreline.	• Use modified flank infeed. • Minimise tool overhang. • Check for workpiece deflection. • Check insert and clamp. • Verify that tool cutting position is at workpiece centreline. • Adjust number of passes. Fewer passes reduce chatter.
built-up edge 	• Speed too low. • Insufficient coolant. • Chip load.	• Increase m/min. • Increase coolant concentration and/or flow. • Adjust infeed angle. • Increase depth of cut per pass.
deformation 	• Wrong grade. • Speed too high. • Improper infeed angle. • Insufficient coolant.	• Use modified flank infeed. • Use a more wear-resistant grade (e.g., TN6010™). • Reduce m/min. • Increase coolant flow.
chipping 	• Improper infeed. • Chip load. • Wrong grade. • Incorrect speed. • Poor rigidity.	• Use modified flank infeed. • Increase or decrease number of passes. • Eliminate spring passes. • Use tougher grade (e.g., TN6025™). • Increase m/min if chipping on trailing edge. • Decrease m/min if chipping on leading edge. • Minimise tool overhang. • Check for insert movement/check clamp. Torque screw or clamp to correct value. • Check for possible part deflection. • Calculate flank clearance. • Ensure correct shim.
broken nose 	• Heavy chip load. • Small nose radius. • Wrong grade. • Improper infeed.	• Use modified flank infeed. • Decrease chip load. • Use large nose radius if possible. • Use tougher grade (e.g., TN6025).
flank wear 	• Improper shim. • Wrong grade. • Insufficient coolant. • Off centreline. • Insufficient flank clearance. • Improper infeed angle.	• Ensure correct shim. • Use a more wear-resistant grade (e.g., TN6025). • Increase coolant flow. • Check the centreline height of the tool. (The smaller the diameter, the more critical the need for centreline accuracy.) • Calculate flank clearance and change shim to increase clearance on worn flank. • If wear is on trailing flank, increase infeed angle clearance.

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.

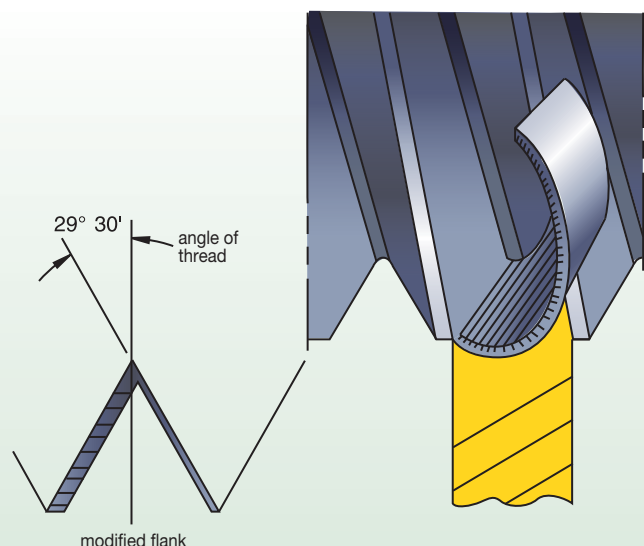


Machine Programming

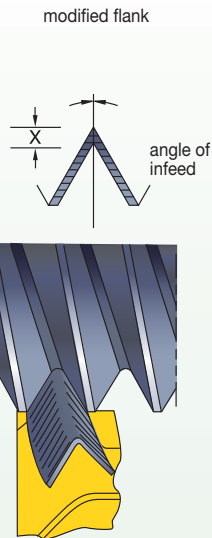
Modern CNC controls allow the programmer to easily adjust infeed angle, the number of passes, and depth of cut for each pass. The chip control threading insert performs best at an infeed angle of 29° 30', although 15° to 30° is acceptable. Also, it is important to maintain a minimum of 0,127mm depth 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



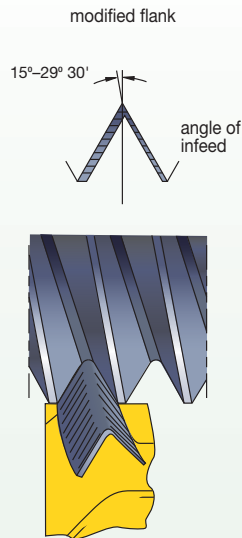
Advantage —

- 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



Advantage —

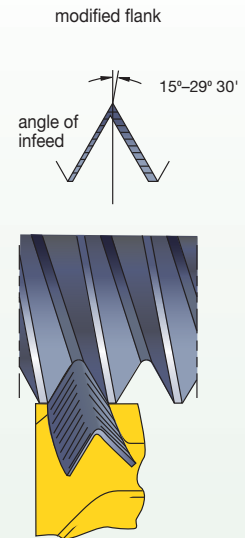
- Increased tool life because both edges are used equally.

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



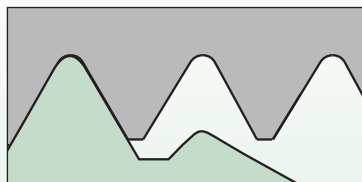
Advantage —

- 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.

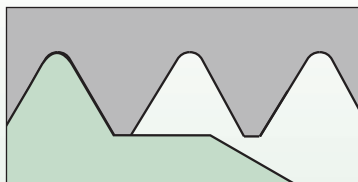
Partial Profile



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.

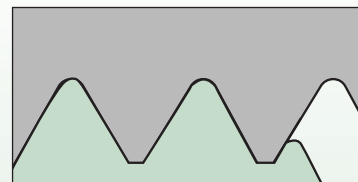
Full Profile



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	$\text{m/min} = \frac{\pi \times D}{1000} \times \text{RPM}$
RPM	D (mm) m/min	$\text{RPM} = \frac{\text{m/min} \times 1000}{D \times \pi}$

Legend

m/min = metres per minute
RPM = revolutions per minute
D = part diameter
 π = 3.1416

Maximum Cutting Speeds

On older machines, cutting speed is often limited by the maximum travel speed 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) $\times$ 3.14 $\times$ (1/pitch) $\times$ $\frac{\text{max mm/min}}{1000\text{mm}}$

Flank clearance

γ = $\arctan(\sin(\beta/2) \times \tan(\alpha))$
 γ = side (flank) clearance
 β = included angle of thread form
 α = radial inclination angle

Thread	Angle	External	Internal
UN & ISO	60	5.3	8
BSW	55	4.8	7.3
TR	30	2.6	4
ACME	29	2.6	3.9
AMTUT	7	.6	.9
AMTUT	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
Thread Type	recommended number of passes							
Common V-thread forms ISO, UN, UNJ, NPT, Whitworth, BSPT, API Rotary Shoulder	4-5	5-6	6-8	8-10	9-12	12-15	14-16	15-25
Acme, Trapez, Round, API Round	—	—	5-6	7-8	10-11	12-13	13-15	18-20
Stub Acme, API Buttress	—	—	5	5-6	7-8	8-10	10-12	14-16
American Buttress	—	—	7-8	9-10	11-12	13-15	17-19	22-24

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

$$\Delta a_{p_x} = \frac{a_p}{\sqrt{\text{nap}-1}} * \sqrt{\phi}$$

Δa_p	=	radial infeed
x	=	actual pass (from 1 to the nap)
nap	=	number of passes
ϕ	=	1st pass, 0.3
		2nd pass, 1
		3rd pass and up, x-1

Using Radial Infeed

Bending stress on the cutting edge caused by V-shaped chips from long-chipping steel workpiece materials.

High cutting forces with small cutting thicknesses require sharp edges with high strength.

Using Flank Infeed

Lower bending stress and stabilised cutting edges produce more favourable chip shapes and larger cutting thicknesses.

Carbides with high hardness, good wear resistance, and temperature stability are advantageous.

Guidelines for Infeeds — How to Determine the Number and the Size of Passes

The number of passes "s" per thread is decisive for successful threading and crest turning. The following tables give standard values for the application condition when machining steel. The proper number of passes must be determined empirically.

If insert breakage occurs, the number of passes must be increased. With increased wear, we recommend decreasing the number of passes. The chip thickness should not be less than 0,05mm. The allowance at the diameter should not exceed 0,2mm.

Metric ISO, External Thread Cutting

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	0,099
15											0,000	0,089	0,096
16													0,092
T Ap (mm)	0,279	0,406	0,533	0,686	0,813	0,940	1,092	1,346	1,626	1,905	2,159	2,438	2,718

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

UN Thread, External Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073
N Ap	5	6	6	7	9	9	10	11	12	13	14	15	16
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,181	0,193	0,212	0,216	0,177	0,207	0,223	0,264	0,302	0,341	0,374	0,405	0,435
2	0,149	0,159	0,175	0,178	0,146	0,171	0,184	0,218	0,249	0,282	0,309	0,335	0,359
3	0,137	0,146	0,160	0,163	0,134	0,156	0,168	0,200	0,228	0,258	0,283	0,306	0,329
4	0,105	0,112	0,123	0,125	0,103	0,120	0,129	0,153	0,175	0,198	0,217	0,235	0,252
5	0,088	0,094	0,103	0,106	0,087	0,101	0,109	0,129	0,148	0,167	0,183	0,198	0,213
6		0,083	0,091	0,093	0,076	0,089	0,096	0,114	0,130	0,147	0,161	0,175	0,187
7				0,084	0,069	0,080	0,087	0,103	0,118	0,133	0,146	0,158	0,169
8					0,063	0,074	0,080	0,095	0,108	0,122	0,134	0,145	0,156
9					0,059	0,069	0,074	0,088	0,101	0,114	0,125	0,135	0,145
10							0,070	0,083	0,095	0,107	0,117	0,127	0,136
11								0,078	0,089	0,101	0,111	0,120	0,129
12									0,085	0,096	0,105	0,114	0,122
13										0,092	0,101	0,109	0,117
14											0,097	0,105	0,112
15												0,101	0,108
16													0,104
T Ap (mm)	0,660	0,787	0,864	0,965	0,914	1,067	1,219	1,524	1,829	2,159	2,464	2,769	3,073

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

UN Thread, Internal Thread Cutting

TPI	24	20	18	16	14	12	11	10	9	8	7	6	5
T Ap (mm)	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	1,956	2,286	2,743
N Ap	5	6	6	7	8	9	9	10	11	12	13	14	15
	values for flank infeed (X/Z)												
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,160	0,168	0,187	0,193	0,205	0,221	0,241	0,250	0,264	0,285	0,309	0,347	0,402
2	0,132	0,139	0,154	0,159	0,169	0,183	0,199	0,207	0,218	0,236	0,255	0,287	0,332
3	0,121	0,127	0,141	0,146	0,155	0,167	0,182	0,189	0,200	0,216	0,234	0,263	0,304
4	0,093	0,097	0,108	0,112	0,119	0,128	0,140	0,145	0,153	0,166	0,179	0,202	0,233
5	0,078	0,082	0,091	0,094	0,100	0,108	0,118	0,123	0,129	0,140	0,151	0,170	0,196
6		0,072	0,080	0,083	0,088	0,095	0,104	0,108	0,114	0,123	0,133	0,150	0,173
7				0,075	0,080	0,086	0,094	0,098	0,103	0,111	0,120	0,135	0,156
8					0,073	0,079	0,086	0,090	0,095	0,102	0,111	0,124	0,144
9						0,074	0,080	0,084	0,088	0,095	0,103	0,116	0,134
10								0,078	0,083	0,089	0,097	0,109	0,126
11									0,078	0,085	0,092	0,103	0,119
12										0,080	0,087	0,098	0,113
13											0,083	0,094	0,108
14											0,080	0,090	0,104
15													0,100
16													
T Ap (mm)	0,584	0,686	0,762	0,864	0,991	1,143	1,245	1,372	1,524	1,727	2,036	2,286	2,743

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

NPT Thread, External, and Internal Machining

TPI	27	18	14	11,5	8
T Ap (mm)	0,762	1,118	1,422	1,727	2,489
N Ap	6	8	10	12	14
values for flank infeed (X/Z)					
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,187	0,231	0,260	0,285	0,378
2	0,154	0,191	0,214	0,236	0,312
3	0,141	0,175	0,196	0,216	0,286
4	0,108	0,134	0,151	0,166	0,219
5	0,091	0,113	0,127	0,140	0,185
6	0,080	0,100	0,112	0,123	0,163
7		0,090	0,101	0,111	0,147
8		0,083	0,093	0,102	0,135
9			0,087	0,095	0,126
10			0,081	0,089	0,118
11				0,085	0,112
12				0,080	0,107
13					0,102
14					0,098
15					
16					
T Ap (mm)	0,762	1,118	1,422	1,727	2,489

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

BSPT Thread, External, and Internal Machining

TPI	28	19	14	11
T Ap (mm)	0,584	0,864	1,168	1,448
N Ap	5	8	10	12
values for flank infeed (X/Z)				
order of passes	X/Z	X/Z	X/Z	X/Z
1	0,160	0,179	0,213	0,239
2	0,132	0,148	0,176	0,197
3	0,121	0,135	0,161	0,181
4	0,093	0,104	0,124	0,139
5	0,078	0,087	0,104	0,117
6		0,077	0,092	0,103
7		0,070	0,083	0,093
8		0,064	0,076	0,086
9			0,071	0,080
10			0,067	0,075
11				0,071
12				0,067
13				
14				
15				
16				
T Ap (mm)	0,584	0,864	1,168	1,448

Trapezoid Thread to DIN 103, External, and Internal Machining

pitch	1,5	2	3	4	5
T Ap (mm)	1,016	1,245	1,753	2,261	2,743
N Ap	6	8	10	12	14
values for flank infeed (X/Z)					
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,249	0,258	0,320	0,373	0,417
2	0,206	0,213	0,264	0,308	0,344
3	0,188	0,195	0,242	0,282	0,315
4	0,144	0,150	0,186	0,217	0,242
5	0,122	0,126	0,157	0,183	0,204
6	0,107	0,111	0,138	0,161	0,180
7		0,100	0,125	0,145	0,162
8		0,092	0,115	0,134	0,149
9			0,107	0,125	0,139
10			0,100	0,117	0,131
11				0,111	0,123
12				0,105	0,117
13					0,112
14					0,108
15					
16					
T Ap (mm)	1,016	1,245	1,753	2,261	2,743

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Round Thread to DIN 405, External, and Internal Machining

pitch	10	8	6
T Ap (mm)	1,321	1,626	2,159
N Ap	8	10	12
values for flank infeed (X/Z)			
order of passes	X/Z	X/Z	X/Z
1	0,273	0,297	0,357
2	0,226	0,245	0,294
3	0,207	0,224	0,270
4	0,159	0,172	0,207
5	0,134	0,145	0,174
6	0,118	0,128	0,154
7	0,107	0,116	0,139
8	0,098	0,106	0,128
9		0,099	0,119
10		0,093	0,112
11			0,106
12			0,100
13			
14			
15			
16			
T Ap (mm)	1,321	1,626	2,159

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
T Ap (mm)	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251
N Ap	5	6	6	8	8	9	9	10	11	12	14	15	16
values for flank infeed (X/Z)													
order of passes	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z	X/Z
1	0,160	0,199	0,199	0,179	0,210	0,261	0,285	0,297	0,312	0,336	0,351	0,398	0,460
2	0,132	0,164	0,164	0,148	0,174	0,215	0,236	0,245	0,258	0,277	0,290	0,329	0,380
3	0,121	0,151	0,151	0,135	0,159	0,197	0,216	0,224	0,236	0,254	0,266	0,301	0,348
4	0,093	0,116	0,116	0,104	0,122	0,151	0,166	0,172	0,181	0,195	0,204	0,231	0,267
5	0,078	0,097	0,097	0,087	0,103	0,128	0,140	0,145	0,153	0,164	0,172	0,195	0,225
6		0,086	0,086	0,077	0,091	0,112	0,123	0,128	0,135	0,145	0,151	0,171	0,198
7				0,070	0,082	0,102	0,111	0,116	0,122	0,131	0,137	0,155	0,179
8				0,064	0,075	0,093	0,102	0,106	0,112	0,120	0,126	0,143	0,165
9						0,087	0,095	0,099	0,104	0,112	0,117	0,133	0,153
10								0,093	0,098	0,105	0,110	0,125	0,144
11									0,093	0,099	0,104	0,118	0,136
12										0,095	0,099	0,112	0,130
13											0,095	0,107	0,124
14											0,091	0,103	0,119
15												0,099	0,114
16													0,110
T Ap (mm)	0,584	0,813	0,813	0,864	1,016	1,346	1,473	1,626	1,803	2,032	2,311	2,718	3,251

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

Multi-Tooth Threads, Internal

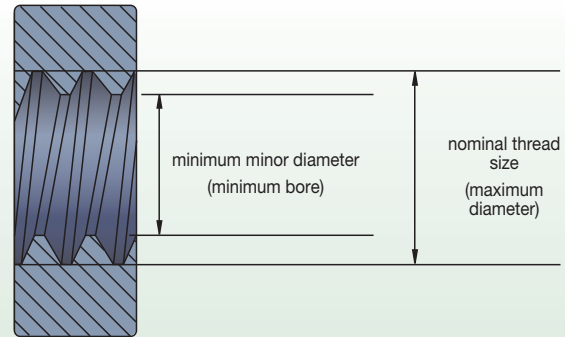
	ISO metric						ISO UN					Whitworth	NPT		
type	3M	2M	3M	2M	3M	2M	2M	3M	2M	3M	2M	2M	2M	3M	2M
pitch (mm)	1,0	1,5	1,5	2,0	2,0	3,0	—	—	—	—	—	—	—	—	—
TPI	—	—	—	—	—	—	16	16	12	12	8	11	11.5	11.5	8
total depth (mm)	0,609	0,838	0,838	1,168	1,168	1,778	0,939	0,939	1,245	1,245	1,880	1,575	1,753	1,753	2,540
pass 10mm	0,330	0,381	0,508	0,508	0,711	0,558	0,431	0,558	0,558	0,762	0,584	0,736	0,584	0,812	0,889
2	0,279	0,254	0,330	0,381	0,457	0,482	0,304	0,381	0,406	0,482	0,508	0,482	0,508	0,558	0,635
3	—	0,203	—	0,279	—	0,431	0,203	—	0,279	—	0,431	0,355	0,355	0,381	0,558
4	—	—	—	—	—	0,304	—	—	—	—	0,355	—	0,304	—	0,457

Recommendations for Steel Workpieces (<300 BHN)

			total depth — on radius		
catalogue number	insert size	TPI profile	1st pass	2nd pass	3rd pass
NTC-8R/L8EM	8	8 UN	1,21	1,63	2,00
NTC-8R/L8IM	8	8 UN	1,19	1,55	1,88
NTC-8R/L10EM	8	10 UN	0,92	1,27	1,60
NTC-8R/L10IM	8	10 UN	0,90	1,22	1,52
NTC-8R/L12EM	8	12 UN	0,76	1,04	1,32
NTC-8R/L12IM	8	12 UN	0,76	0,93	1,20
NTC-8R/L14EM	8	14 UN	0,68	0,95	1,12
NTC-8R/L14IM	8	14 UN	0,60	0,78	1,04
NTC-8R/L16EM 8	8	16 UN	0,58	0,81	0,96
NTC-8R/L16IM	8	16 UN	0,50	0,68	0,93
NTC-8R/L18EM	8	18 UN	0,48	0,66	0,86
NTC-8R/L18IM	8	18 UN	0,48	0,60	0,83
NDC-68RDR/L-75M	8	8 round	1,47	1,65	1,85
NDC-61RDR/L-75M	8	10 round	1,11	1,29	1,45
NDC-88RDRD/L-75M	8	8 round	1,29	1,75	1,85
NDC-88VR/L-75M	8	8 NPT	1,01	1,72	2,45
NDC-8115VR/L-75M	8	11.5 NPT	0,96	1,37	1,70
NDN-814VR/L-75M	8	14 NPT	0,96	1,22	1,36

NOTE: Always allow 0,08–0,13mm extra stock for full profile inserts.

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 1.25	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

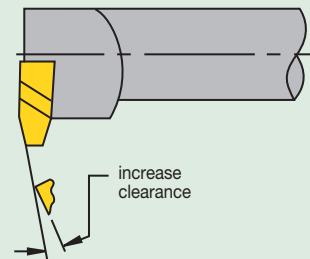
internal threading limitations

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

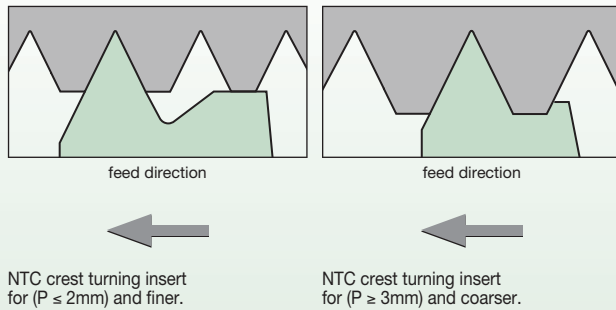
*Sixteen threads per inch and finer can be cut provided minor diameter is 36,5mm or larger.

**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



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
 	NT-1	1,90	1,11	–	24–12	–	1,00–2,00
	NT-2	28,70	1,90	36–8	20–7	0,70–3,00	1,25–3,50
	NT-2-K	28,70	1,90	36–8	20–7	0,70–3,00	1,25–3,50
	NTF-2	15,75	1,01	44–14	24–12	0,60–1,75	1,00–2,00
	NTK-2	15,75	1,01	44–14	24–12	0,60–1,75	1,00–2,00
	NTP-2	28,70	1,90	36–8	20–7	0,70–3,0	1,25–3,50
	NT-3	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-K	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-3-C	37,59	2,46	11–6	6 (only)	2,50–4,00	4,00 (only)
	NT-3-CK	37,59	2,46	11–6	6 (only)	2,50–4,00	4,00 (only)
	NTF-3	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-3	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-3	37,59	2,46	20–6	12–5	1,25–4,00	2,00–5,00
	NT-4	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-K	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25
	NT-4-C	49,78	3,22	11–4 1/2	6–4 1/2	2,50–5,50	4,00–5,50
	NT-4-CK	49,78	3,22	11–4 1/2	6–4 1/2	2,50–5,50	4,00–5,50
	NTF-4	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTK-4	21,08	1,37	44–10	24–9	0,60–2,50	1,00–2,50
	NTP-4	49,78	3,22	20–4	12–4	1,25–6,25	2,00–6,25

*Based on maximum insert radius size and class 2A and 2B thread specifications.

API Thread Forms • Insert Applications Chart for API Rotary Shouldered Connections

thread form	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/IR4API502	ND-4050R/L	5-1/2 API full hole 6-5/8 API regular 6-5/8 API full hole	5-1/2 API full hole
V-.050 3" TPF 4 TPI	NDC-4050R/L3 4-E/IR4API503	ND-4050R/L	5-1/2 API regular 7-5/8 API regular 8-5/8 API regular	5-1/2 API regular
V-.040 3" TPF 5 TPI	NDC-3040R/L3 NDC-4040R/L3 4-E/IR5API403	ND-3040R/L ND-4040R/L	2-3/8 API regular 2-7/8 API regular 3-1/2 API regular 4-1/2 API regular	3-1/2 API regular

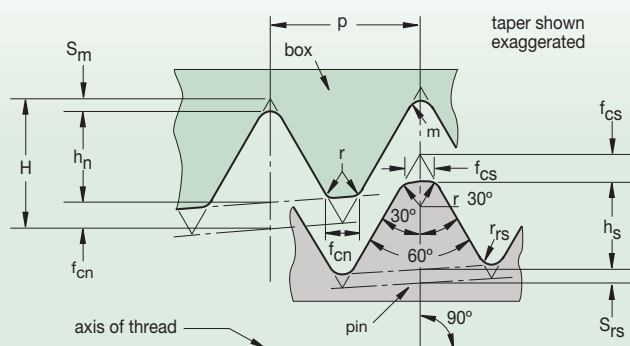
*Minimum box size that can be threaded with a standard TopThread insert due to minimum bore equipment.

API Thread Forms Product Thread Dimensions • Rotary Shouldered Connections (Inch)

threadform	taper inch per ft.	thread height, not truncated H	thread height, truncated $h_n = h_s$	root truncation $S_m = S_{rs}$ $f_m = f_{rs}$	crest truncation $f_{cn} = f_{cs}$	width of flat		root radius $r_m = r_{rs}$	radius at thread corners r	pitch p
						crest $f_{cn} = f_{cs}$	crest $f_m = f_{rs}$			
V-.038R	2	.216005	.121844	.038000	.056161	.065	—	.038	.015	.250
V-.038R	3	.215379	.121381	.038000	.055998	.065	—	.038	.015	.250
V-.040	3	.172303	.117842	.020000	.034461	.040	—	.020	.015	.250
V-.050	3	.215379	.147303	.025000	.043076	.050	—	.025	.015	.250
V-.050	2	.216005	.147804	.025000	.043201	.050	—	.025	.015	.250

NOTE: All dimensions in inches.

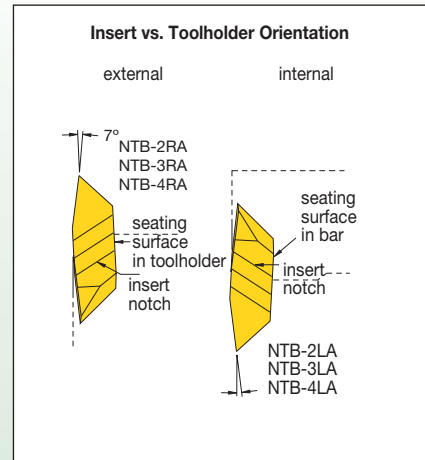
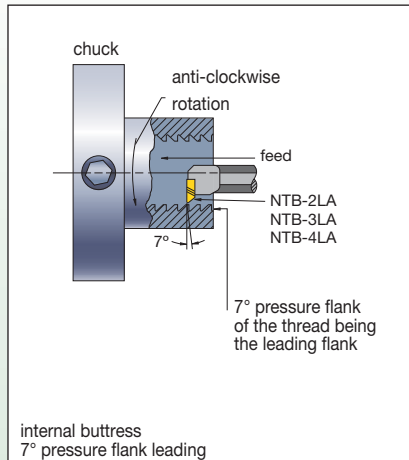
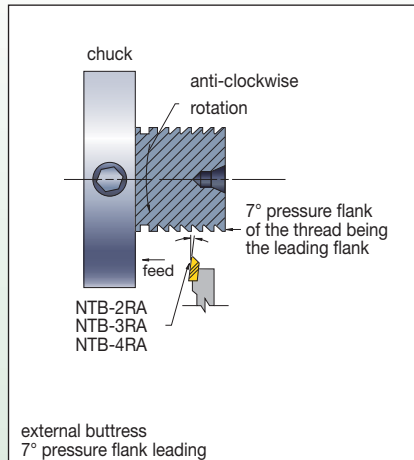
V-.040 and V-.050 Product Thread Form



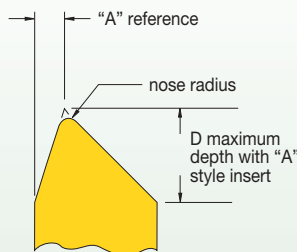
Casing and Tubing Round Thread (Height Dimensions)

thread element	10 TPI p= .1000	8 TPI p= .1250
H = .866p	.08660	.10825
H _s = h _n = .626p - .007	.05560	.07125
S _{rs} = S _m = .120p + .002	.01400	.01700
S _{cs} = S _{cn} = .120p + .005	.01700	.02000

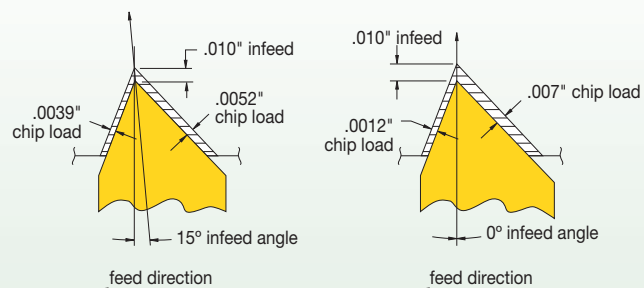
American Buttress (7° Pressure Flank Leading) NTB-A Inserts • Push Type



Reference Dimensions



Infeed Angle vs. Chip Load: 7° Pressure Flank Leading



insert	D (inch)	"A" ref. (inch)	nose radius (inch)	pitch based on maximum radius
NTB-2A	.133	.024	.002-.004	16-20 TPI
NTB-3A	.171	.031	.005-.008	8-16 TPI
NTB-4A	.218	.049	.008-.012	4-6 TPI

NOTE: For balanced chip load, 15° infeed angle is suggested.

Internal Threading Limitations

internal threading limitations NTB-2A Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
8	1-3/4	1.600
10	1-5/8	1.505
12	1-1/2	1.400
16	1-1/4	1.175
20	1-1/16	1.002

internal threading limitations NTB-3 and NTB-4A Buttress threading inserts

TPI	nominal thread size	minimum minor diameter (inch)
4*	2-1/2	2.200
5	2-1/4	2.010
6	2	1.800
8	1-3/4	1.600
10	1-5/8	1.505
12**	1-1/2	1.400

*NTB-4A insert only.

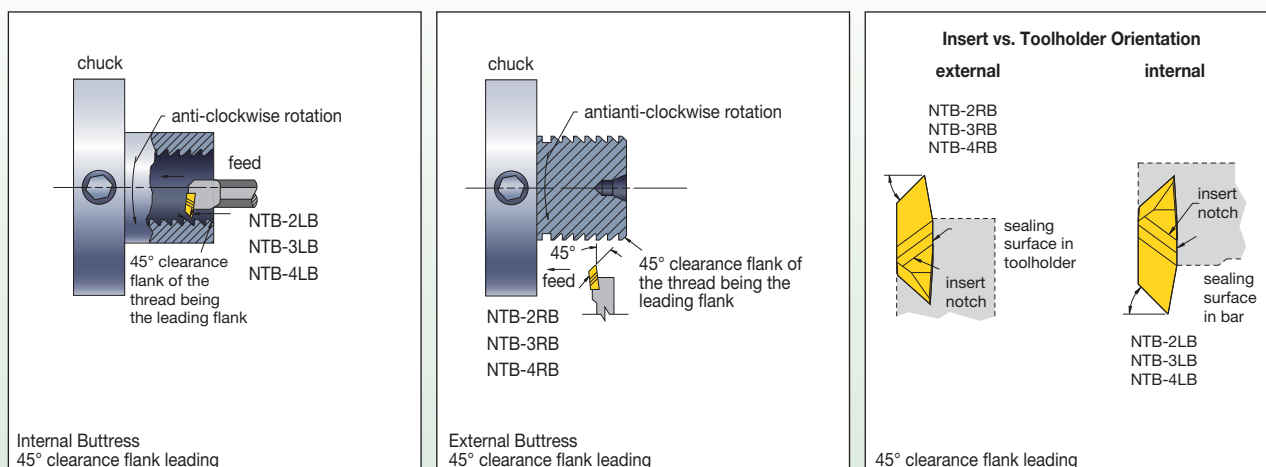
**Can cut 16 or 20 threads per inch provided minor diameter is 1.375" or larger.

Threads per Inch vs. Maximum Root Radius Chart (Inch)

TPI	20	16	12	10	8	6	5	4	3	2-1/2	2	1-1/2	1-1/4	1
maximum root radius	.0036	.0045	.0059	.0071	.0089	.0119	.0143	.0179	.0238	.0268	.0375	.0476	.0572	.0714

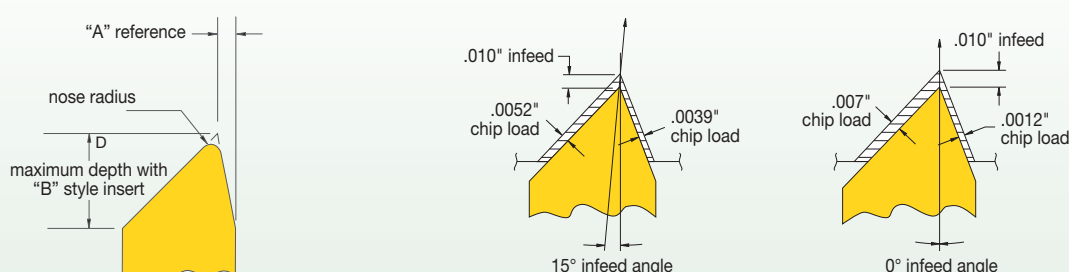
NOTE: Special Buttress forms are available upon request.

American Buttress (45° Clearance Flank Leading): NTB-B Inserts • PULL-type



Reference Dimensions

Infeed Angle vs. Chip Load: 45° Clearance Flank Leading



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.

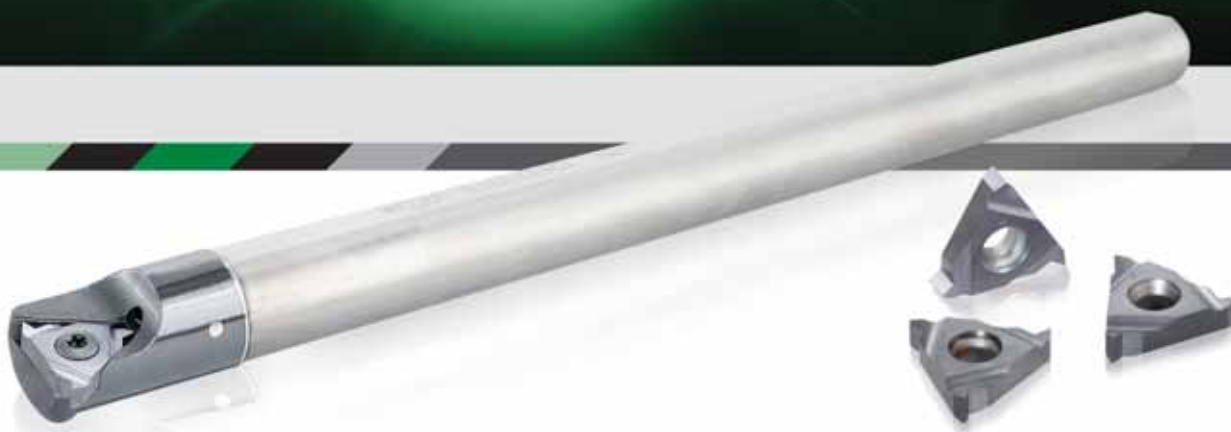
Internal Threading Limitations

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.

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