



2017 Master Catalog

WIDIA  TM



A Complete High-Performance Turning Portfolio • **WIDIA™ Victory™**

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



Victory

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

Steel and Stainless Steel Grades

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

Post-coat treatment

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

Improved edge toughness

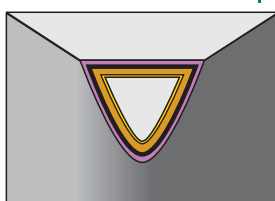
- Provides smooth outer surface to reduce forces, friction, and workpiece sticking.

Post-coat grinding

- Provides secure seating surface.

New geometry identification system.

MT-CVD/CVD-TiN-TiCN-
Al₂O₃-ZrCN



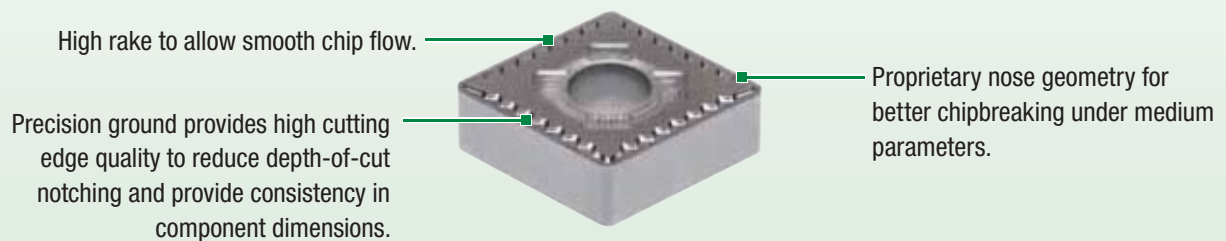
Alpha alumina layer

- 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.

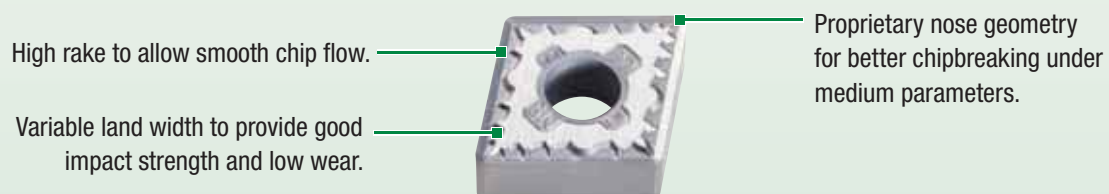
..GG-FS Geometry

- 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.



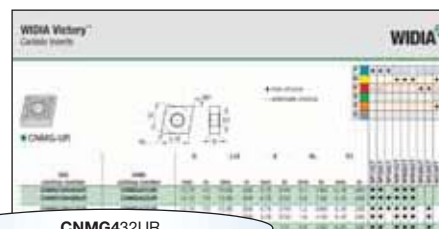
..MG-MS Geometry

- 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 optimized edge treatment.
- Improved chipbreaking at various depths of cut due to variable land width, which improves impact strength.
- All MG-MS inserts are molded, which supports increased tool life due to the elimination of grinding stress.

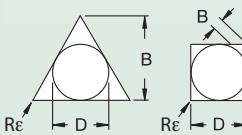
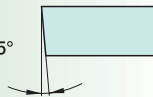
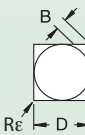
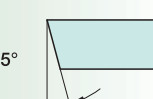
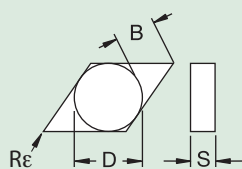
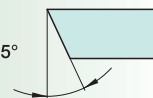
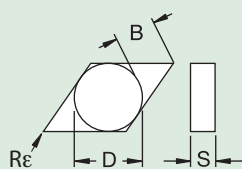
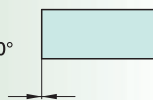


How Do Catalog Numbers Work?

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

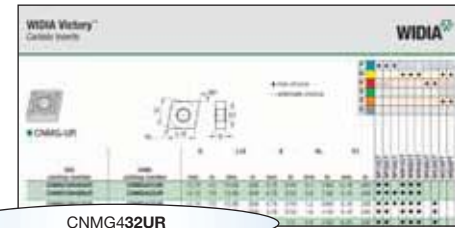


CNMG432UR

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Insert Shape	Insert Clearance Angle	Tolerance Class	Insert Features	Size																																																																																																																																																																																																																								
H Hexagon 120° 	A 3° 	Tolerances apply prior to edge prep and coating 	N 	Code for inch cutting edge length "L10" <table><thead><tr><th>inch</th><th>"D"</th><th>C</th><th>D</th><th>R</th><th>S</th><th>T</th><th>V</th><th>W</th></tr></thead><tbody><tr><td>1.2 (5)</td><td>5/32</td><td>S4</td><td>04</td><td>03</td><td>03</td><td>06</td><td>—</td><td>—</td></tr><tr><td>1.5 (6)</td><td>3/16</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>1.8 (7)</td><td>7/32</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>—</td><td>.236</td><td>—</td><td>—</td><td>06</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>2</td><td>1/4</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>2.5</td><td>5/16</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>—</td><td>.315</td><td>—</td><td>—</td><td>08</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>3</td><td>3/8</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>—</td><td>.394</td><td>—</td><td>—</td><td>10</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>3.5</td><td>7/16</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>—</td><td>.472</td><td>—</td><td>—</td><td>12</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>4</td><td>1/2</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>4.5</td><td>9/16</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>5</td><td>5/8</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>—</td><td>.630</td><td>—</td><td>—</td><td>16</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5.5</td><td>11/16</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>6</td><td>3/4</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>—</td><td>.787</td><td>—</td><td>—</td><td>20</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>7</td><td>7/8</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>—</td><td>.984</td><td>—</td><td>—</td><td>25</td><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>8</td><td>1</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>10</td><td>1-1/4</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>—</td><td>1.260</td><td>—</td><td>—</td><td>32</td><td>—</td><td>—</td><td>—</td><td>—</td></tr></tbody></table>	inch	"D"	C	D	R	S	T	V	W	1.2 (5)	5/32	S4	04	03	03	06	—	—	1.5 (6)	3/16	04	05	04	04	08	08	S3	1.8 (7)	7/32	05	06	05	05	09	09	03	—	.236	—	—	06	—	—	—	—	2	1/4	06	07	06	06	11	11	04	2.5	5/16	08	09	07	07	13	13	05	—	.315	—	—	08	—	—	—	—	3	3/8	09	11	09	09	16	16	06	—	.394	—	—	10	—	—	—	—	3.5	7/16	11	13	11	11	19	19	07	—	.472	—	—	12	—	—	—	—	4	1/2	12	15	12	12	22	22	08	4.5	9/16	14	17	14	14	24	24	09	5	5/8	16	19	15	15	27	27	10	—	.630	—	—	16	—	—	—	—	5.5	11/16	17	21	17	17	30	30	11	6	3/4	19	23	19	19	33	33	13	—	.787	—	—	20	—	—	—	—	7	7/8	22	27	22	22	38	38	15	—	.984	—	—	25	—	—	—	—	8	1	25	31	25	25	44	44	17	10	1-1/4	32	38	31	31	54	54	21	—	1.260	—	—	32	—	—	—	—
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P Pentagon 108° 	C 7° 		A 																																																																																																																																																																																																																									
R Round — 	D 15° 		M 																																																																																																																																																																																																																									
S Square 90° 	E 20° 		G 																																																																																																																																																																																																																									
T Triangular 60° 	F 25° 	D = Theoretical diameter of the insert inscribed circle S = Thickness B = See figures below	W 																																																																																																																																																																																																																									
C Rhomboid 80° 	G 30° 		T 																																																																																																																																																																																																																									
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W Trigon 80° with enlarged corner angles 	O Indicated for other clearance angles requiring descriptions.		C 																																																																																																																																																																																																																									
L Rectangular 90° 			J 																																																																																																																																																																																																																									
A Parallelogram 85° 			X Special Design																																																																																																																																																																																																																									
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tolerance class	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±.0010"	±.0005"	±.001"
H	±.0005"	±.0005"	±.001"
E	±.0010"	±.0010"	±.001"
G	±.0010"	±.0010"	±.005"
M	See tables on next page		±.005"
U	See tables on next page		±.005"

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



CNMG432UR

3

Thickness
S

symbol	thickness
inch	inch
.5 (1)	1/32
.6	.040
1 (2)	1/16
1.2	5.64
1.5	3/32
2	1/8
2.5	5/32
3	3/16
3.5	7/32
4	1/4
5	5/16
6	3/8
7	7/16
18	1/2

2

Corner
Radius "R_c"

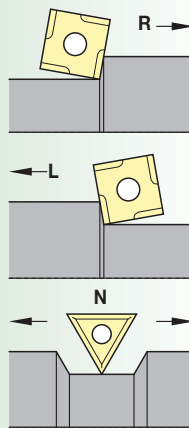
symbol	corner radius
inch	inch
X0	.0015
0	.004
.5	.008
1	1/64
2	1/32
3	3/64
4	1/16
5	5/64
6	3/32
7	7/64
8	1/8
—	round insert
—	

Hand of Insert
(optional)

R = Right hand

L = Left hand

N = Neutral



Cutting Edge
(optional)

F		Sharp
E		Rounded
T		Chamfered
S		Chamfered and Rounded
K		Double-Chamfered
P		Double-Chamfered and Rounded

UR

Chipbreaker
(optional)

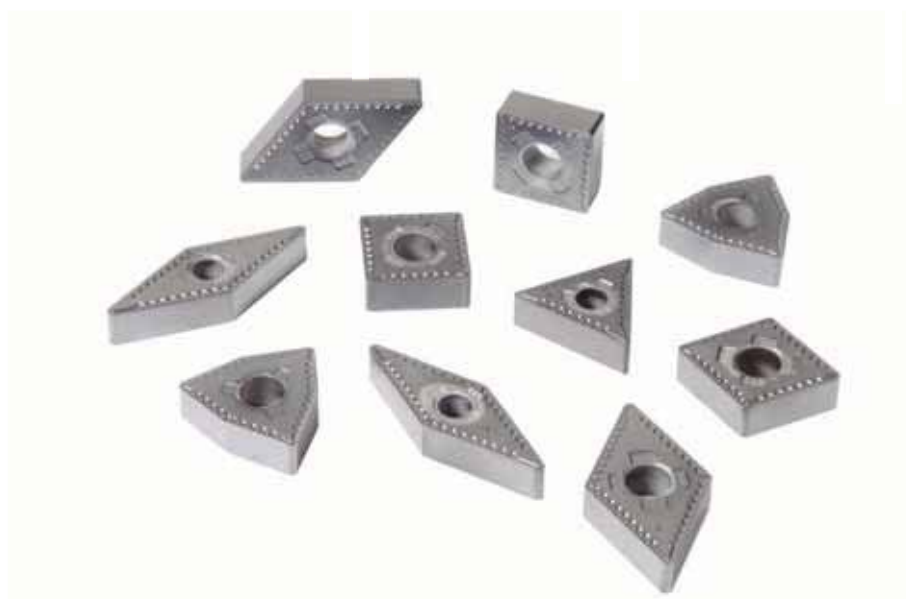
13	= Railroad Light
CT	= Copy Turning
FF	= Fine Finishing
FP	= Finish Positive
FW	= Finish Wiper
ML	= Medium Light
MR	= Medium Roughing
MW	= Medium Wiper
RH	= Roughing Heavy
T	= Negative Land
UF	= Universal Finishing
UM	= Universal Medium
UR	= Universal Roughing
.NMP	= Sharp Medium
MP	= Medium Positive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

± Tolerance on "D"					± Tolerance on "B"				
"D"	Class M Tolerance				"D"	Class M 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
inch	inch	inch	inch	inch	inch	inch	inch	inch	inch
5/32	.002	—	—	—	5/32	.003	—	—	—
3/16	.002	—	—	.003	3/16	.003	—	—	.005
7/32	.002	.002	.002	.003	7/32	.003	.004	—	.005
1/4	.002	.002	.002	.003	1/4	.003	.004	—	.005
5/16	.002	.002	.002	.003	5/16	.003	.004	—	.005
3/8	.002	.002	.002	.003	3/8	.003	.004	.007	.005
7/16	.003	.003	.003	.005	7/16	.005	.006	—	—
1/2	.003	.003	.003	.005	1/2	.005	.006	.010	.008
9/16	.003	.003	.003	.005	9/16	.005	.006	—	—
5/8	.004	.004	.004	.007	5/8	.006	.007	—	.011
11/16	.004	.004	.004	.007	11/16	.006	.007	—	.011
3/4	.004	.004	.004	.007	3/4	.006	.007	—	.011
7/8	.005	—	—	.010	7/8	.006	—	—	.015
1	.005	—	—	.010	1	.007	—	—	.015
1 1/4	.006	—	—	.010	1 1/4	.008	—	—	.015

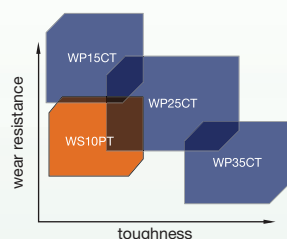
A system of grades, geometries, and application guidelines to provide optimal solutions for your metalcutting needs. It's easy to determine which WIDIA™ chip-control cutting tool will work best in your specific workpiece materials and applications!



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 = {	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	
		*Samples shown are based on turning and will differ within applications.		

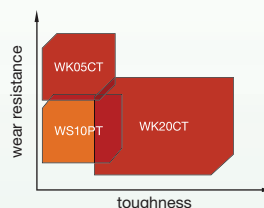


Victory Toughness/Wear Resistance



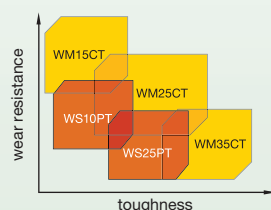
WP Grades for Steel

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



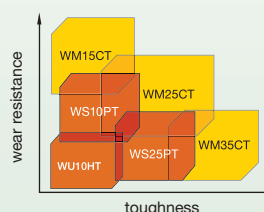
WK Grades for Cast Iron

- 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 molded 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 molded 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, optimizing selection accuracy.

Example:

Six workpiece material groups

■ Step 1 • Select the insert geometry

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

■ Step 2 • Select the grade

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

■ Step 3 • Select the cutting speed

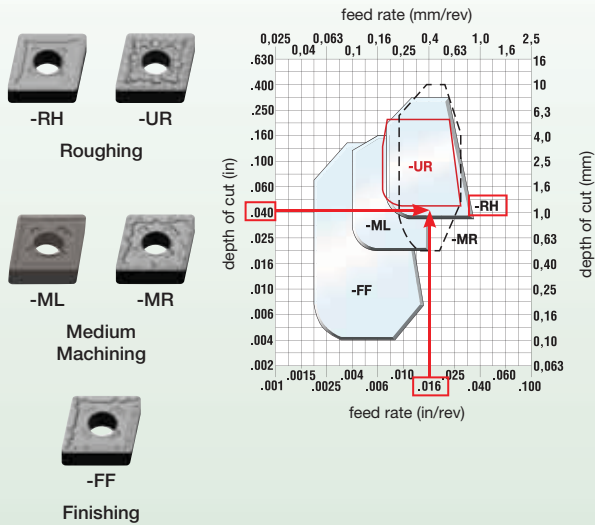
Given: grade WP35CT™ 
cutting conditions
material CK15
Unknown: cutting speed
Solution: 210 m/min

Need help in selecting a product?

Additional information can be obtained by contacting
the WIDIA Customer Application Support Team.
Go to widia.com for your country's phone number.

■ Step 1 • Select the insert geometry

Negative Inserts

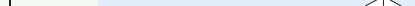
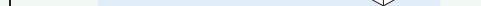
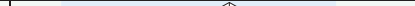


P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

■ 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						speed – m/min (SFM)					Starting Conditions		
material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM	
P0/P1 	WP15CT										395	1320	
	WP25CT										275	925	
	WP35CT										210	700	
	WS10PT										280	925	

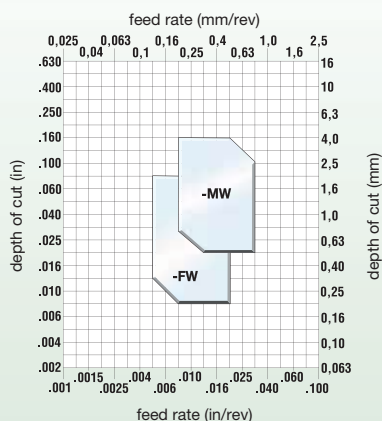
WIDIA Material Group Selection Guide:

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

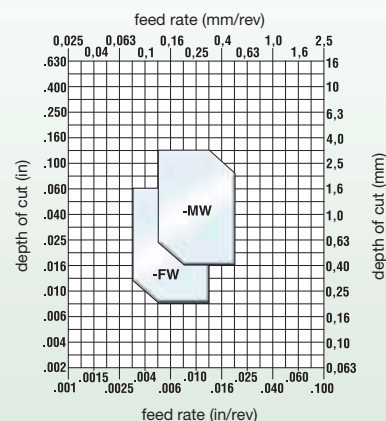
material	material group ISO code	number of material subgroups
steel	P	1–6
stainless steel	M	1–3
cast iron	K	1–3
non-ferrous materials	N	1–8
high-temp alloys	S	1–4
hardened materials	H	1

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

Negative Wiper Inserts



Positive Wiper Inserts

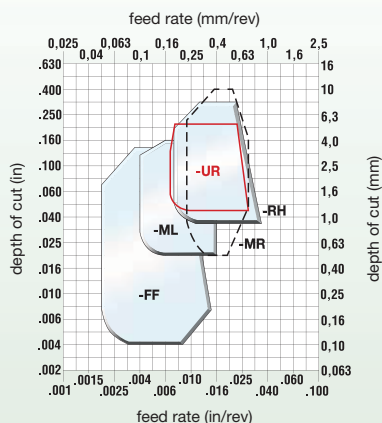
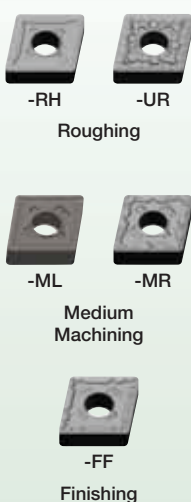


■ **Step 2 • Select the grade**

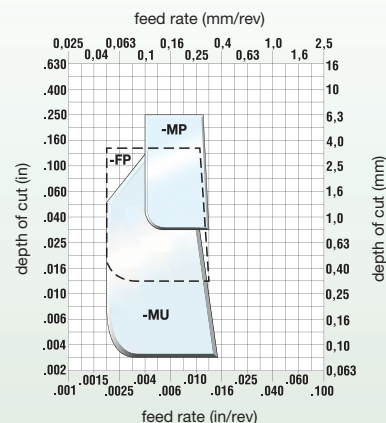
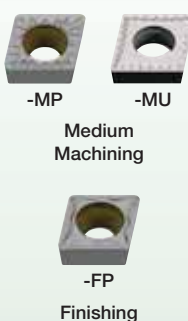
cutting condition		Negative Insert Geometry		Positive Insert Geometry	
		-FW	-MW	-FW	-MW
heavily interrupted cut		WP15CT	WP25CT	—	WP25CT
lightly interrupted cut		WP15CT	WP25CT	WP15CT	WP25CT
varying depth of cut, casting, or forging skin		WP15CT	WP15CT	WP15CT	WP15CT
smooth cut, pre-turned surface		WP15CT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

Starting Conditions



material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P0/P1	WP15CT										395	1320
	WP25CT										275	925
	WP35CT										210	700
	WS10PT										280	925
	WM35CT										180	600

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

speed – m/min (SFM)

Starting Conditions



material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P2	WP15CT										265	880
	WP25CT										195	650
	WP35CT										150	500
	WS10PT										200	650
	WM35CT										120	500

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

speed – m/min (SFM)

Starting Conditions



material group	grade	135 (450)	180 (600)	225 (800)	275 (900)	320 (1050)	360 (1200)	410 (1350)	455 (1500)	495 (1650)	m/min	SFM
P3	WP15CT										190	630
	WP25CT										155	510
	WP35CT										120	400
	WS10PT										155	510
	WM35CT										90	300

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

speed – m/min (SFM)

Starting Conditions



material group	grade	60 (200)	90 (300)	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	m/min	SFM
P4	WP15CT										145	480
	WP25CT										105	360
	WP35CT										95	325
	WS10PT										110	360
	WM35CT										65	225

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

speed – m/min (SFM)

Starting Conditions



material group	grade	120 (400)	150 (500)	180 (600)	210 (700)	240 (800)	270 (900)	300 (1000)	330 (1100)	360 (1200)	m/min	SFM
P5	WP15CT										215	720
	WP25CT										195	650
	WP35CT										135	450
	WS10PT										200	660

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

speed – m/min (SFM)

Starting Conditions

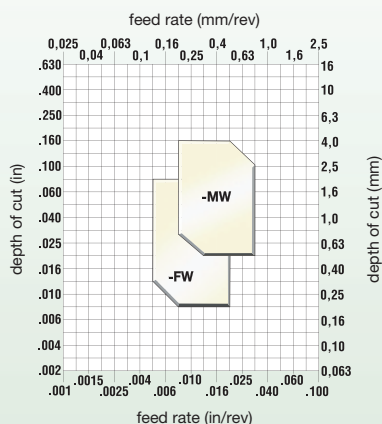


material group	grade	105 (350)	135 (450)	165 (550)	195 (650)	225 (750)	255 (850)	285 (950)	315 (1050)	345 (1150)	m/min	SFM
P6	WP15CT										180	600
	WP25CT										150	500
	WP35CT										105	350
	WS10PT										150	500

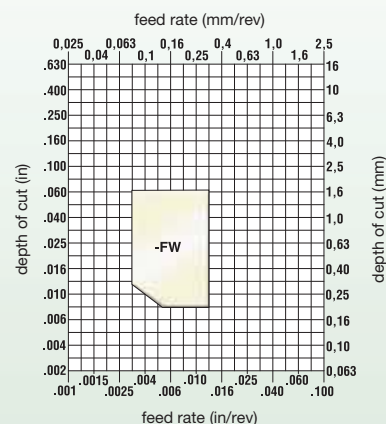
■ Step 1 • Select the insert geometry



Negative Wiper Inserts



Positive Wiper Inserts

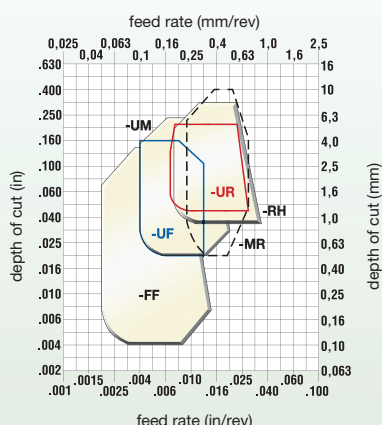
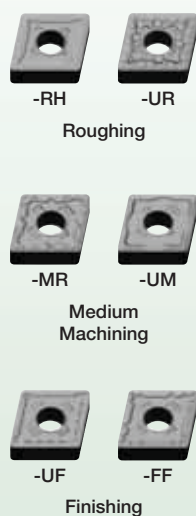


■ Step 2 • Select the grade

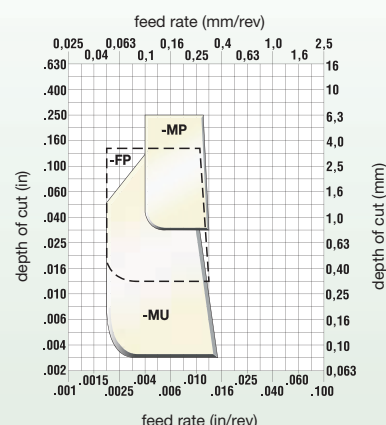
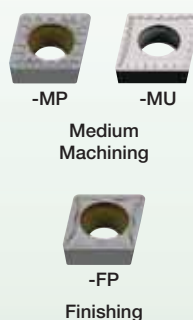
cutting condition		Negative Insert Geometry		Positive Insert Geometry
		-FW	-MW	-FW
heavily interrupted cut		WM15CT	WM15CT	WM15CT
lightly interrupted cut		WM15CT	WM25CT	WM15CT
varying depth of cut, casting, or forging skin		WM15CT	WM25CT	WM15CT
smooth cut, pre-turned surface		WM15CT	WM25CT	WM15CT

■ 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 (SFM)										Starting Conditions	
material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	200 (650)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M1	WM15CT											180	600
	WM25CT											150	500
	WM35CT											120	400
	WS10PT											215	700
	WS25PT											180	550

Austenitic Stainless Steel

		speed — m/min (SFM)										Starting Conditions	
material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	200 (650)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M2	WM15CT											165	550
	WM25CT											140	450
	WM35CT											105	350
	WS10PT											200	650
	WS25PT											165	500

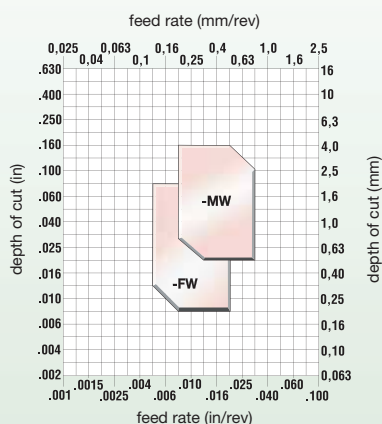
Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture)

		speed — m/min (SFM)										Starting Conditions	
material group	grade	90 (300)	135 (450)	180 (600)	225 (800)	270 (900)	315 (1050)	200 (650)	360 (1200)	405 (1350)	450 (1500)	m/min	SFM
M3	WM15CT											150	500
	WM25CT											120	400
	WM35CT											90	300
	WS10PT											185	600
	WS25PT											150	450

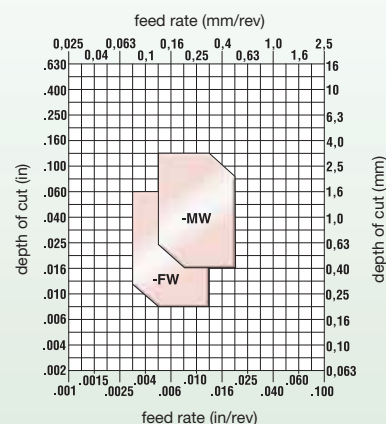
■ Step 1 • Select the insert geometry



Negative Wiper Inserts



Positive Wiper Inserts

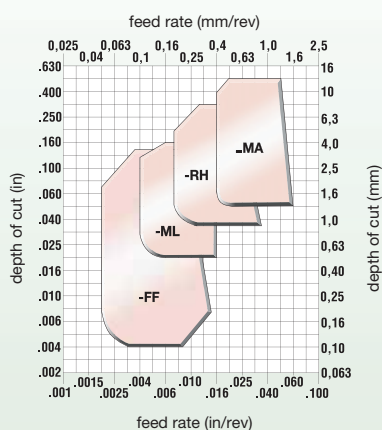


■ Step 2 • Select the grade

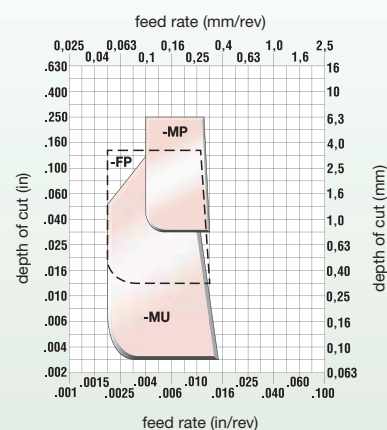
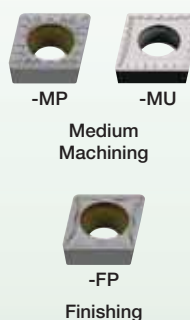
cutting condition		Negative Insert Geometry		Positive Insert Geometry	
		-FW	-MW	-FW	-MW
heavily interrupted cut		-	-	-	-
lightly interrupted cut		WK05CT	WK05CT	WK05CT	WK05CT
varying depth of cut, casting, or forging skin		WK05CT	WK05CT	WK05CT	WK05CT
smooth cut, pre-turned surface		WK05CT	WK05CT	WK05CT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

■ Step 1 • Select the insert geometry

Negative Inserts



Positive Inserts



(continued)

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

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

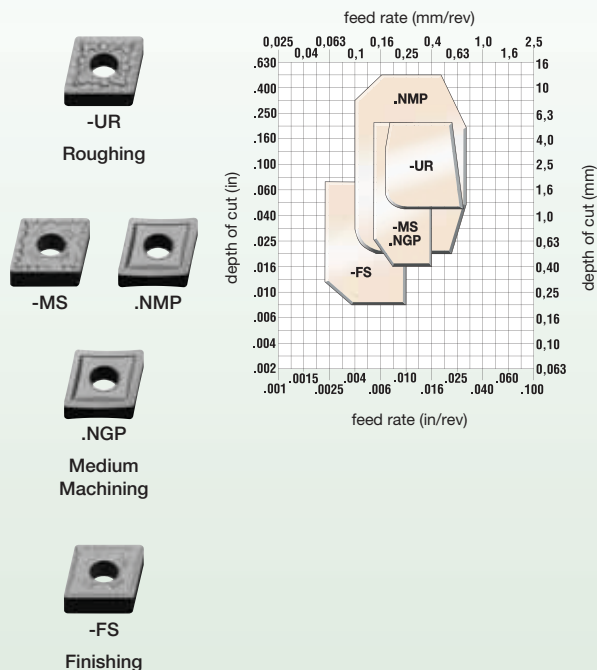
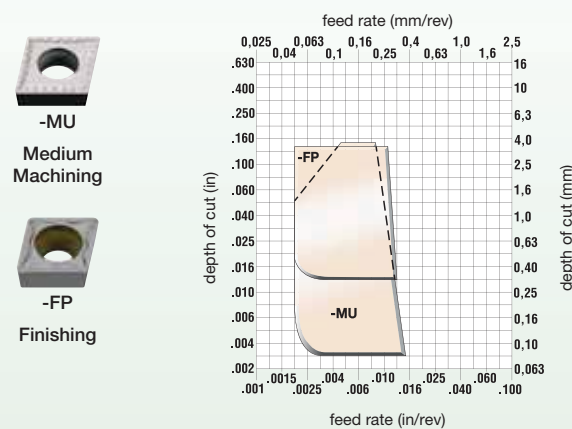
■ Step 3 • Select the cutting speed

Gray Cast Iron		speed – m/min (SFM)										Starting Conditions	
material group	grade	60 (200)	180 (600)	305 (1000)	430 (1400)	550 (1800)	675 (2200)	800 (2600)	920 (3000)	1040 (3400)	1160 (3800)	m/min	SFM
K1	WK05CT											450	1500
	WK20CT											300	1000

Ductile, Compacted Graphite, and Malleable Cast Irons (<600 MPa tensile strength)		speed – m/min (SFM)										Starting Conditions	
material group	grade	90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	500 (1650)	m/min	SFM
K2	WS10PT											200	650
	WK05CT											360	1200
	WK20CT											240	800

Ductile, Malleable, and Austempered Cast Irons (>600 MPa tensile strength)		speed – m/min (SFM)										Starting Conditions	
material group	grade	90 (300)	135 (450)	180 (600)	225 (750)	275 (900)	320 (1050)	360 (1200)	410 (1350)	460 (1500)	500 (1650)	m/min	SFM
K3	WS10PT											150	500
	WK05CT											240	800
	WK20CT											210	700

■ 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)

speed — m/min (SFM)

Starting Conditions



material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	290 (950)	310 (1050)	m/min	SFM
S1	WU10HT											30	100
	WS10PT											55	180
	WS25PT											40	125
	WM15CT											55	180
	WM25CT/WM35CT											40	125

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

speed — m/min (SFM)

Starting Conditions



material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	290 (950)	310 (1050)	m/min	SFM
S2	WU10HT											35	110
	WS10PT											60	195
	WS25PT											30	100
	WM15CT											60	195
	WM25CT/WM35CT											30	100

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

speed — m/min (SFM)

Starting Conditions



material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	290 (950)	310 (1050)	m/min	SFM
S3	WU10HT											40	125
	WS10PT											70	225
	WS25PT											40	125
	WM15CT											70	225
	WM25CT/WM35CT											40	125

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

speed — m/min (SFM)

Starting Conditions



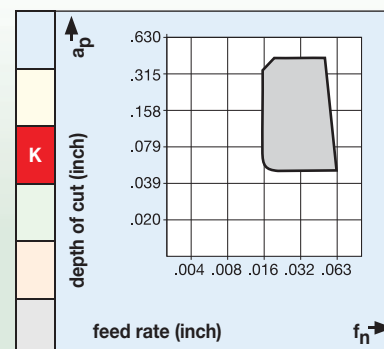
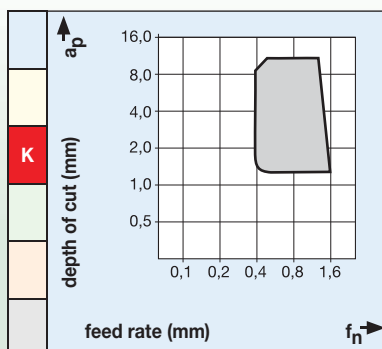
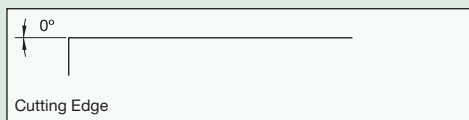
material group	grade	15 (50)	45 (150)	75 (250)	105 (350)	140 (450)	170 (550)	200 (650)	230 (750)	290 (950)	310 (1050)	m/min	SFM
S4	WU10HT											45	150
	WM15CT											70	225
	WM25CT/WM35CT											55	175

■ Negative Inserts

..MA



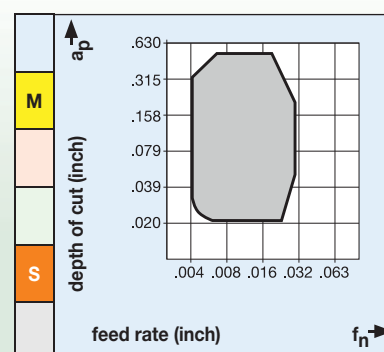
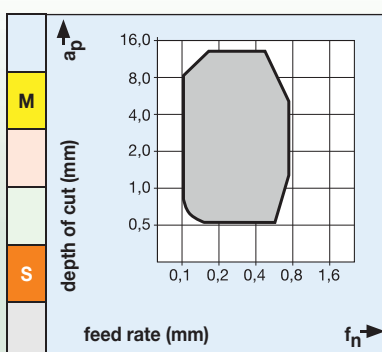
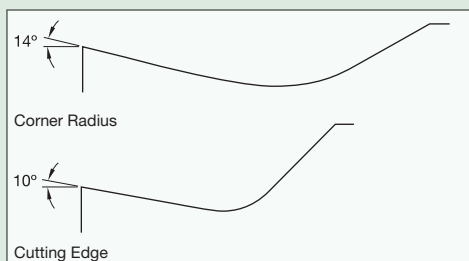
Flat top geometry for machining cast iron. For finishing to roughing applications.



.NMP



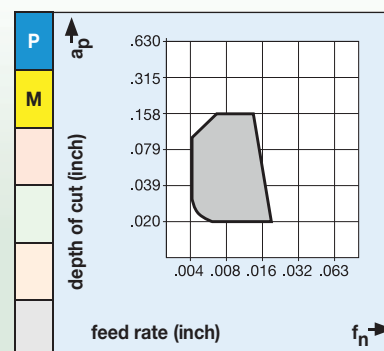
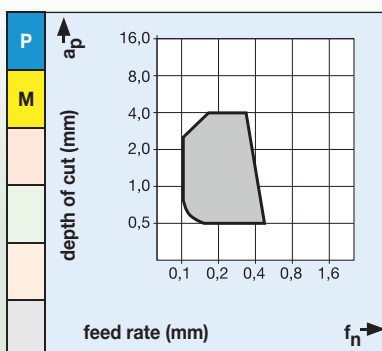
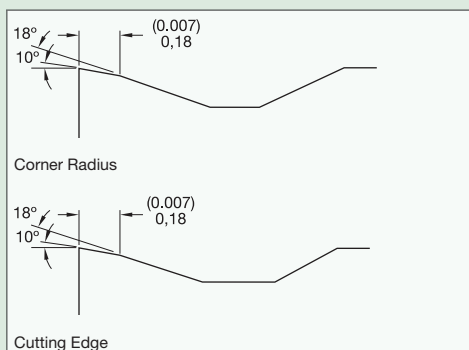
For medium-duty machining of tough work materials, such as chrome- and nickel-based alloys. Minimizes tendency for materials to adhere to insert.



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.



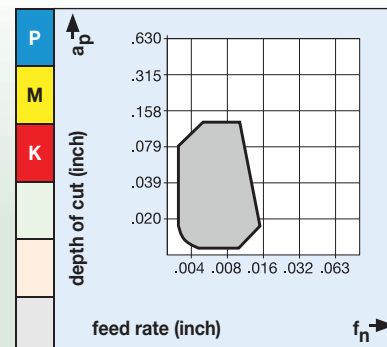
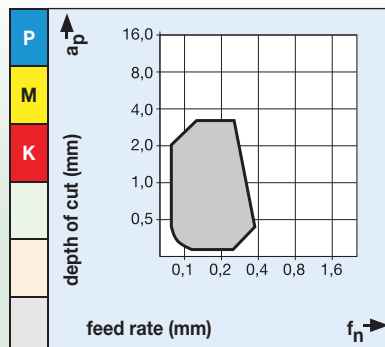
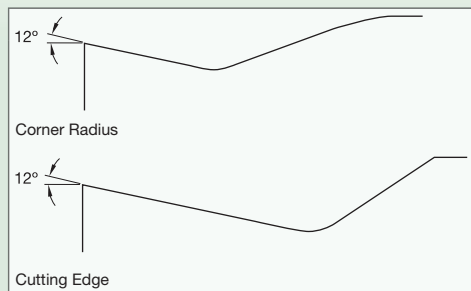
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■ **Negative Inserts** *(continued)*

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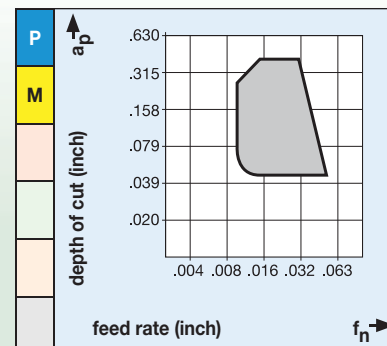
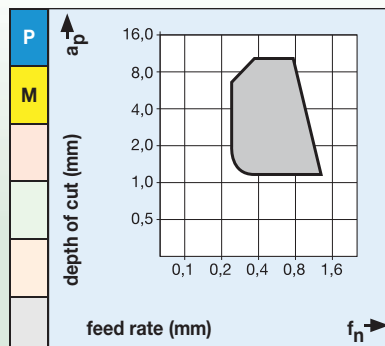
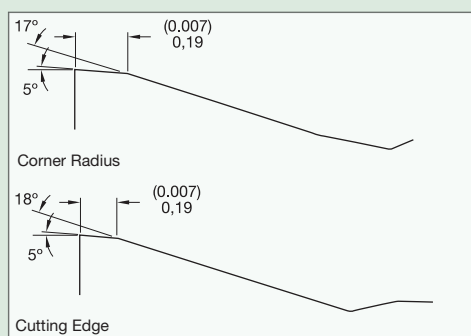
For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.



65



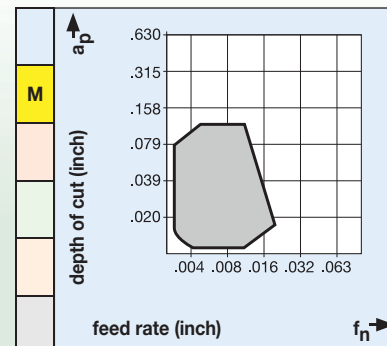
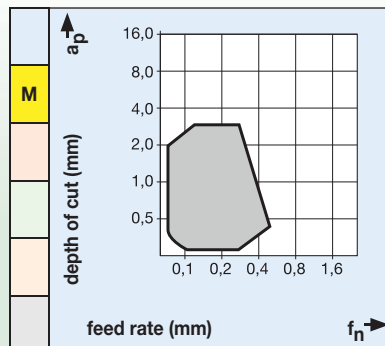
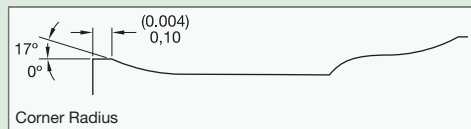
Rough-turning geometry with chip control extending to the medium-duty range. Positive rake angle lowers cutting forces, reducing power requirements. Used on low-tensile and stainless steels.



CT



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



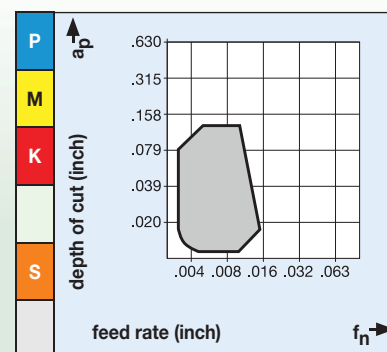
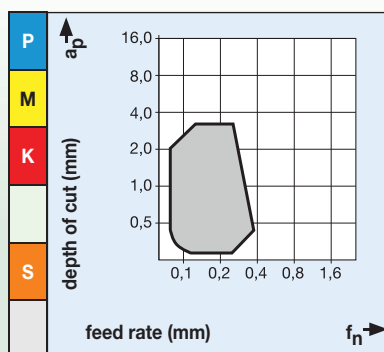
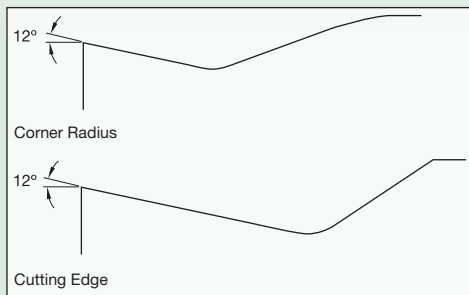
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■ **Negative Inserts** *(continued)*

FF



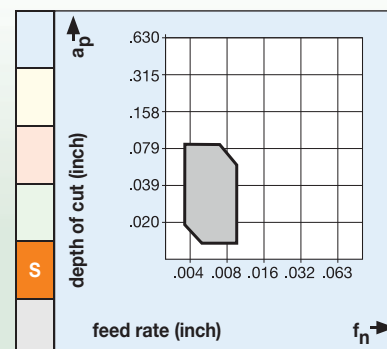
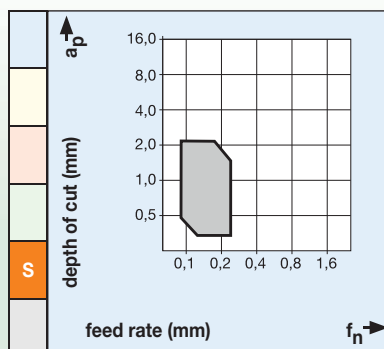
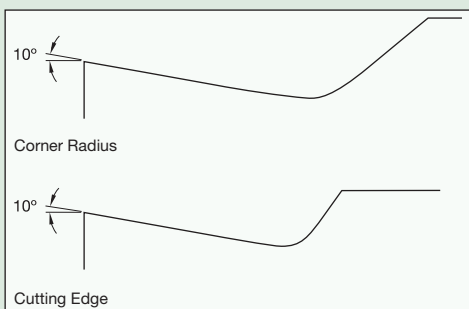
For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.



FS



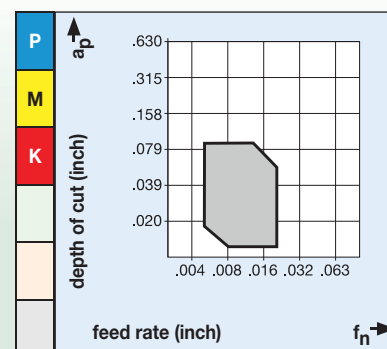
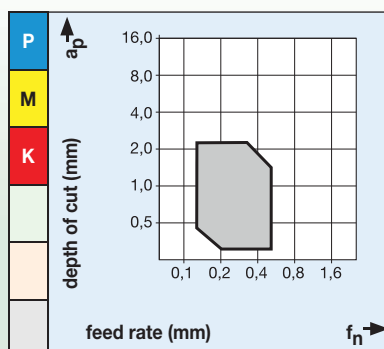
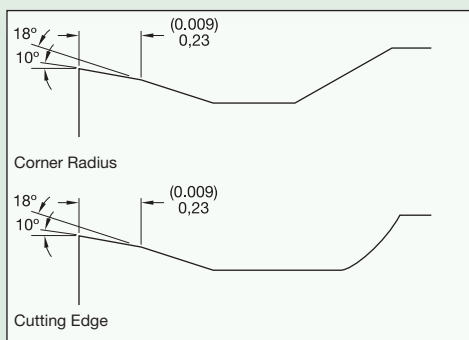
For finishing applications. Ground periphery with positive cutting edge ideally suited for high-temp alloys. Micro finished edge on the ground periphery adds just a slight hone for improved edge integrity and reliability.



FW



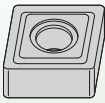
Wiper geometry for finishing when good surface finish is needed using high feed rates. First choice for high-performance finishing.



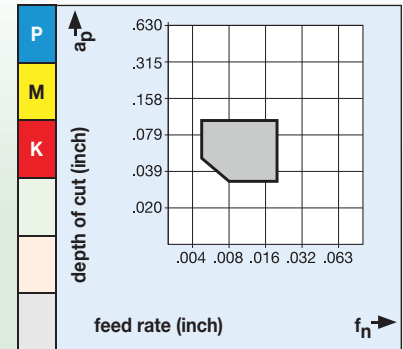
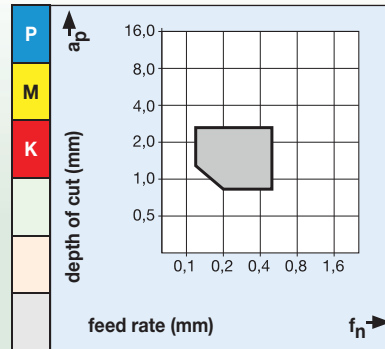
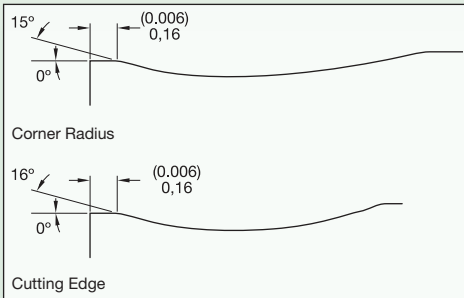
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■ Negative Inserts *(continued)*

MG



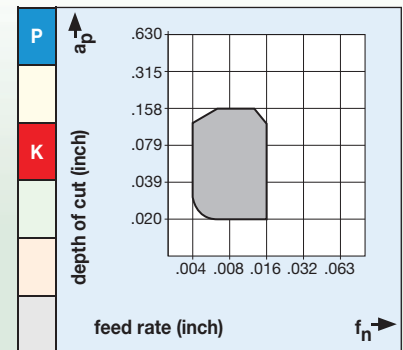
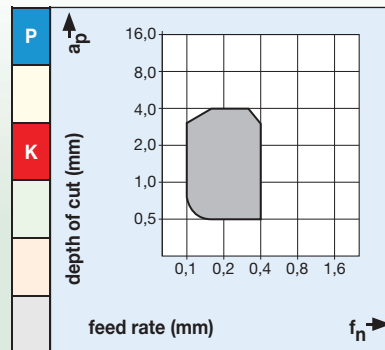
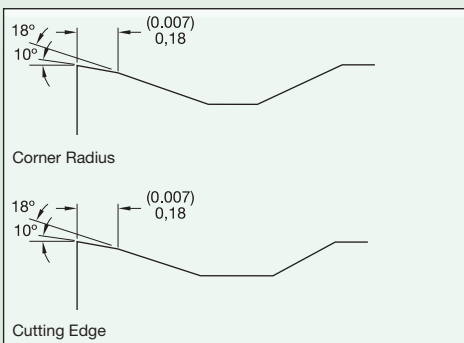
For light machining to light roughing.



ML



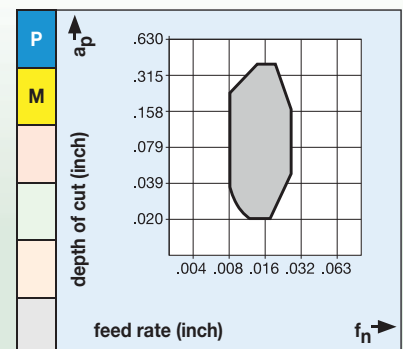
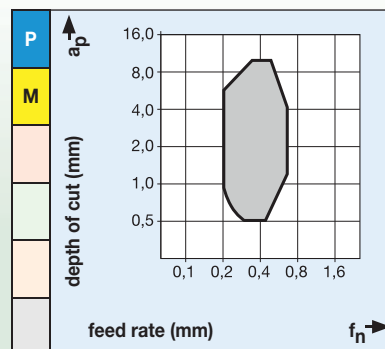
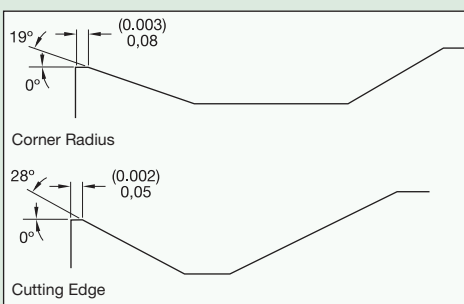
For finishing to medium machining with a negative, stable cutting edge.



MR



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



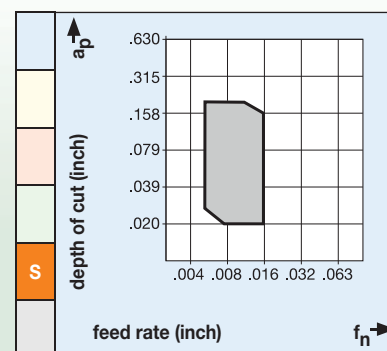
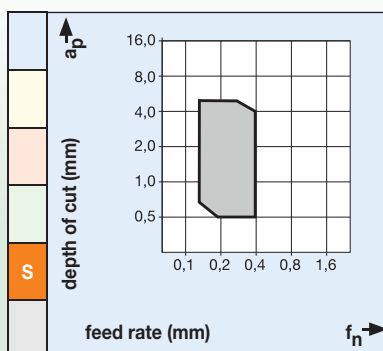
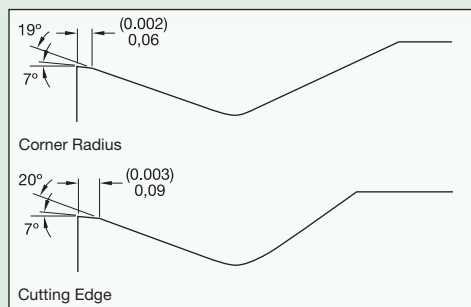
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■ **Negative Inserts** *(continued)*

MS



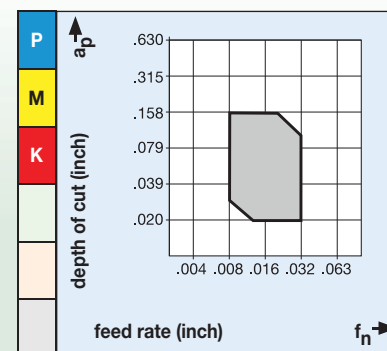
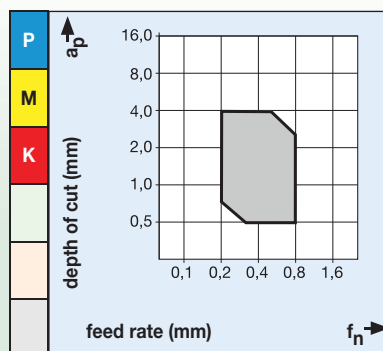
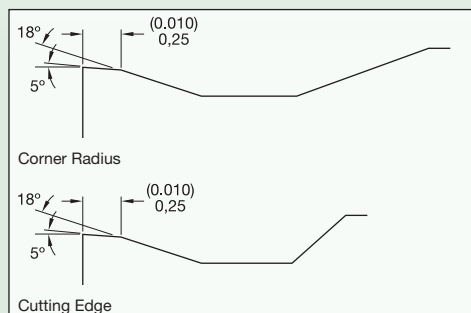
For medium machining in high-temp materials. Utilizes a micro-finished edge preparation to increase edge toughness.



MW



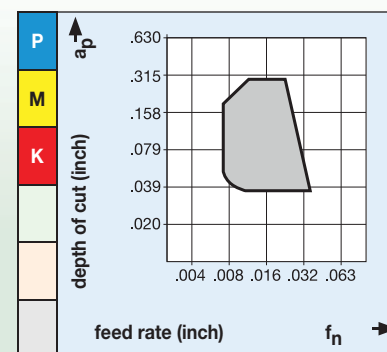
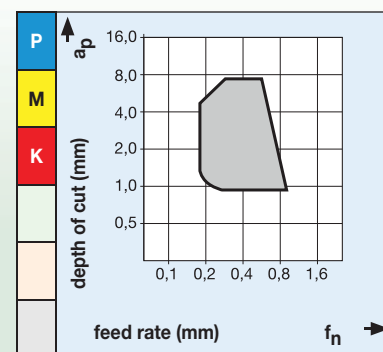
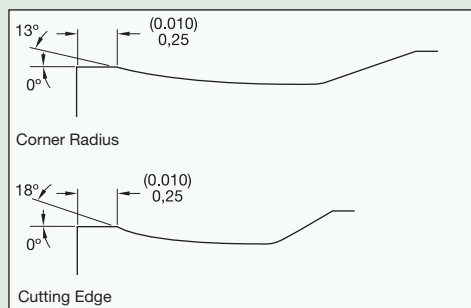
Wiper geometry for light to medium turning with high feed rates. Feed twice as high as with edges with full corner radii to produce same surface finish.



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 gray, malleable, and nodular.



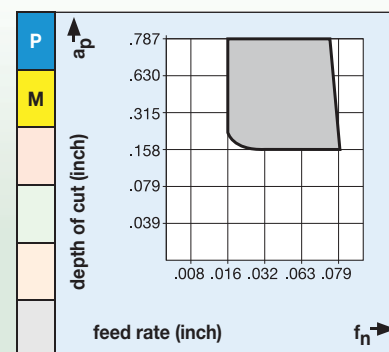
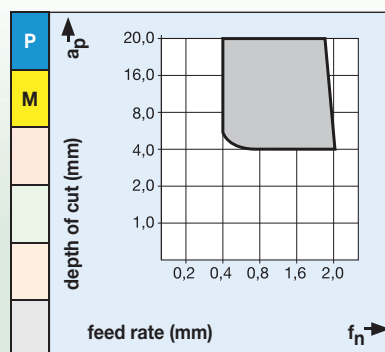
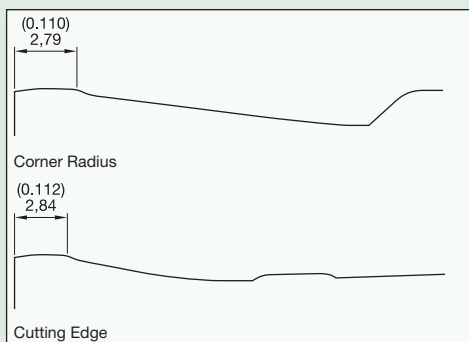
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■ Negative Inserts *(continued)*

SR



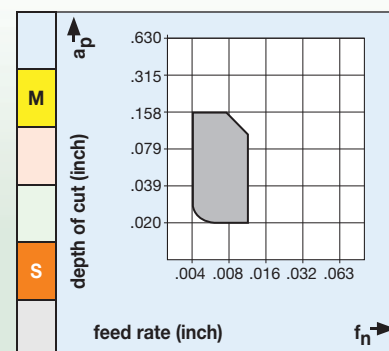
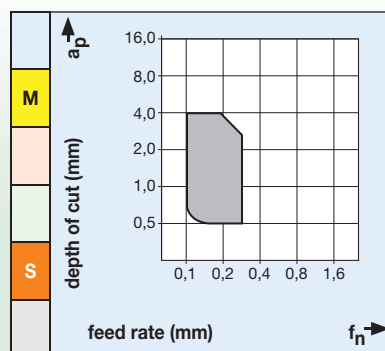
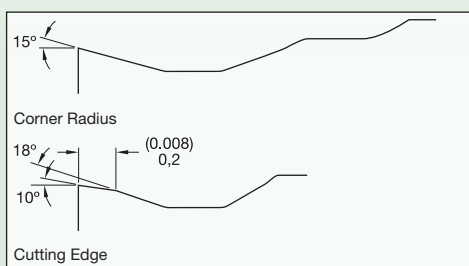
A super roughing geometry. The SR has a strong cutting edge to support high cutting loads in roughing applications. Can produce high metal removal rates.



UF



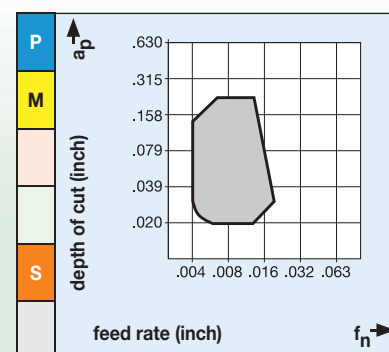
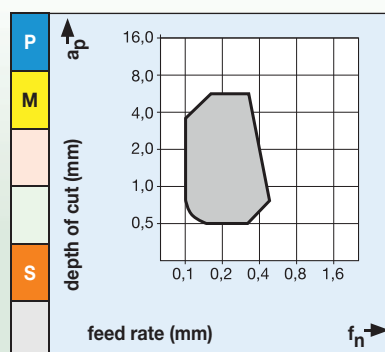
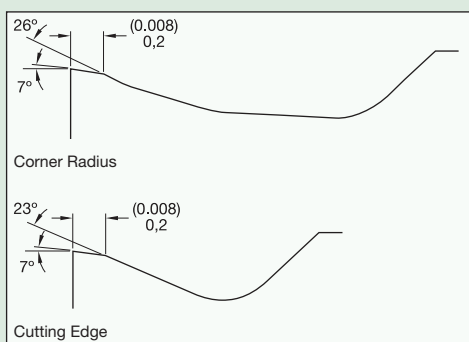
For finishing with a positive cutting edge for reduced cutting forces and superior surface quality.



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.



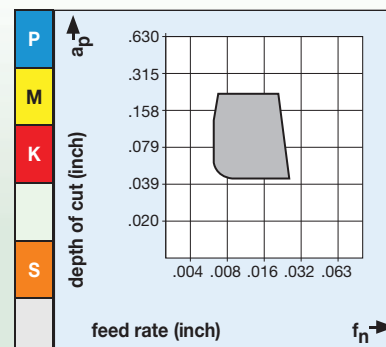
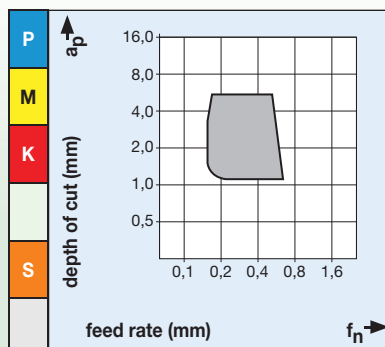
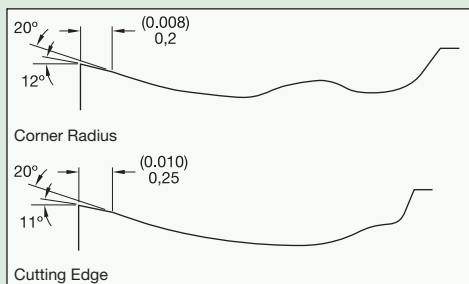
(continued)

■ 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.

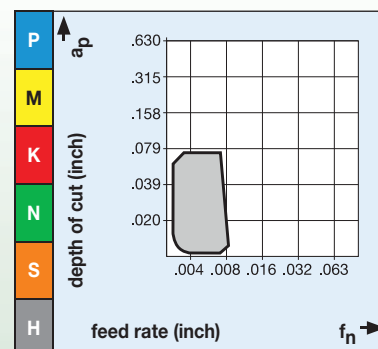
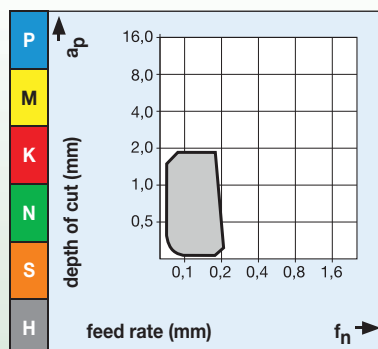
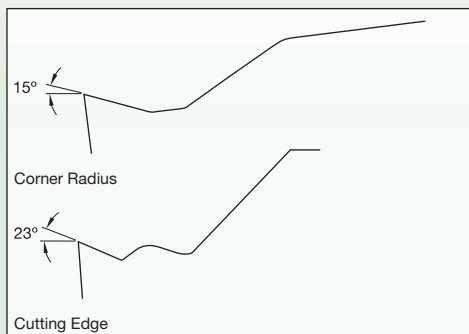


■ Positive Inserts

2



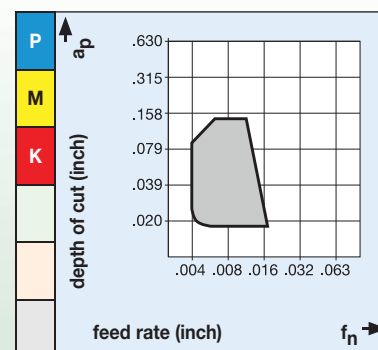
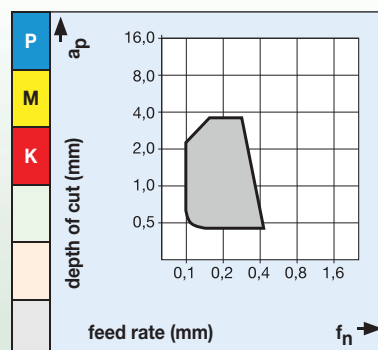
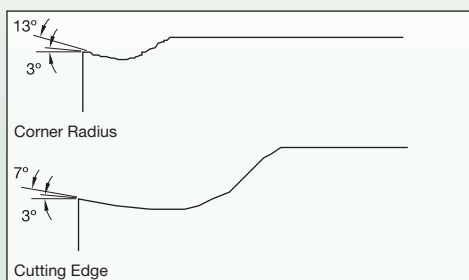
Sharp edge for finish machining. Good chip control with very small chip sections. High dimensional accuracy and smooth surface finishes. Inserts with .008" corner radius precision-ground on all sides.



41



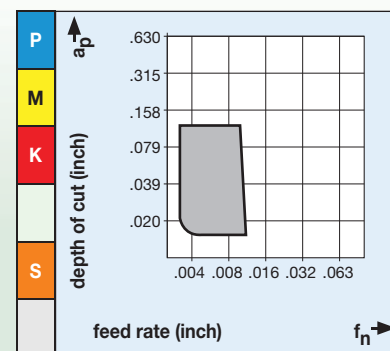
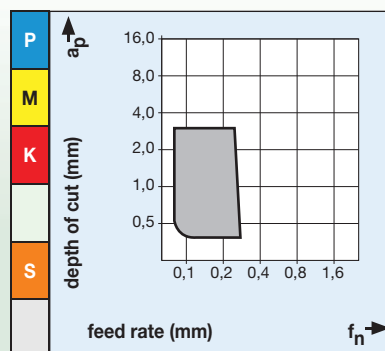
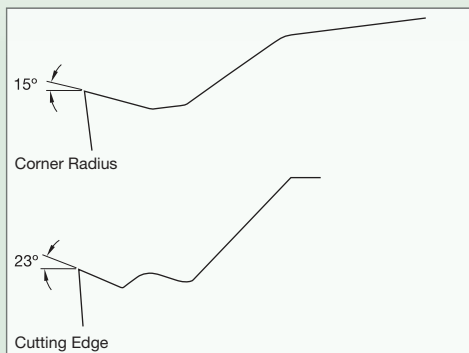
Preferred for light- to medium-duty machining. Low cutting forces and reduced power requirements due to positive rake angle. Good chip control over a wide range. Also used on short-chipping cast iron.



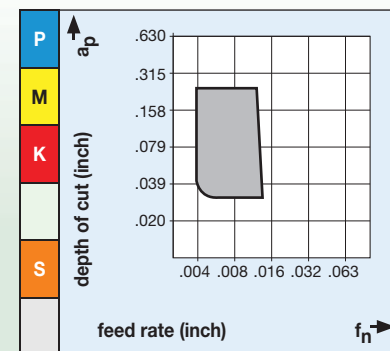
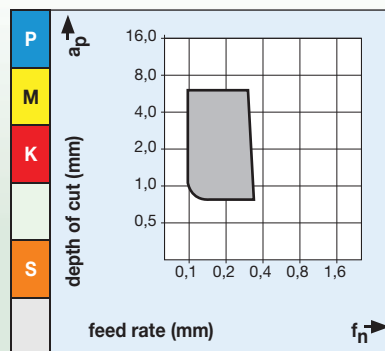
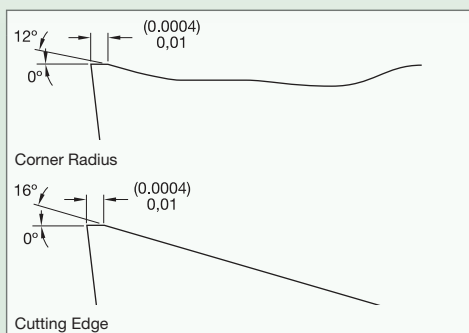
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Positive Inserts *(continued)*
FP

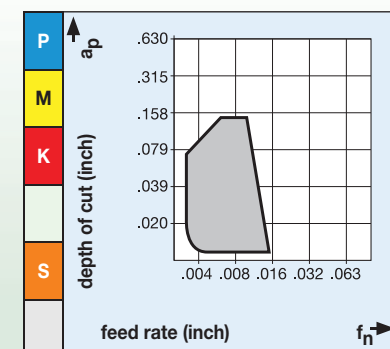
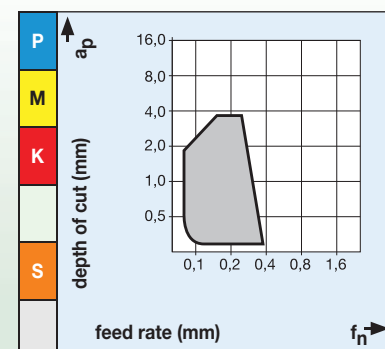
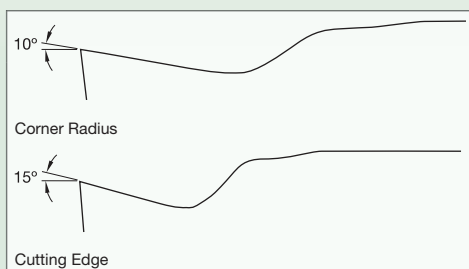

For finishing to medium turning operations with optimal chip control over a wide range of cutting conditions and workpiece materials.

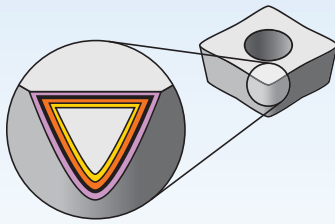

MP


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.

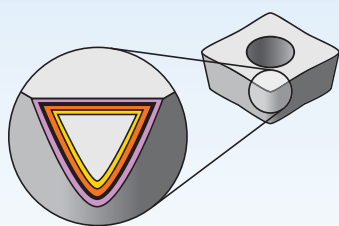




Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

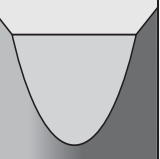
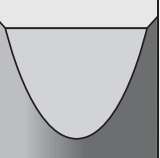
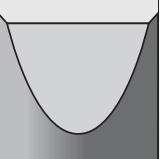
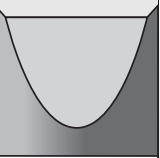
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

		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										
			K										
WK20CT		Coated carbide. MT-CVD/CVD — TiN-TiCN-Al ₂ O ₃ . First choice for a wide range of machining on all gray and ductile irons, light to heavy machining, smooth or interrupted cuts, and wet or dry.	P										
			K										
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										
			H										
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.	M										
			N										
			S										
C3-C4													



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 unfavorable 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 favorable conditions.	HT-P15	P									
				M									
				K									



Victory™ -UR Geometry

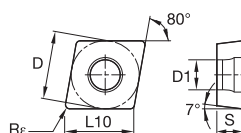
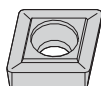
EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

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

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

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

WIDIA™
VICTORY

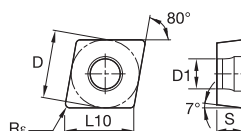
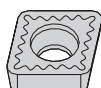


- first choice
- alternate choice

[illegible]

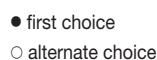
CCMT

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
CCMT060202	CCMT21505	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110												2031658			
CCMT060204	CCMT2151	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110												2031666		2031668	2031666
CCMT090304	CCMT321	9,53	3/8	9,67	.381	3,18	1/8	0,4	1/64	4,40	.173												2031693		2031695	
CCMT090308	CCMT322	9,53	3/8	9,67	.381	3,18	1/8	0,8	1/32	4,40	.173												2031706		2037339	
CCMT09T304	CCMT3251	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173												2031723			
CCMT09T308	CCMT3252	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173												2027432			
CCMT09T312	CCMT3253	9,53	3/8	9,67	.381	3,97	5/32	1,2	3/64	4,40	.173														2027465	
CCMT120408	CCMT432	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,50	.217												2027472		2027484	



■ CCMT-2

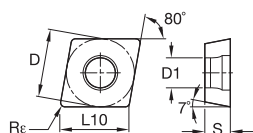
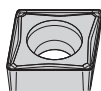
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[illegible]

Inserts

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WN25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TIM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
CCMT060202FP	CCMT21505FP	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110	4169857	4170140	-	-	4168778	-	-	-	-	-	-	-	-	-	-
CCMT060204FP	CCMT2151FP	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110	4169858	4170141	-	4168738	4168779	-	-	4170032	5684337	5684340	-	-	-	-	-
CCMT060208FP	CCMT2152FP	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110	4169859	4170142	-	4168739	4168780	-	-	4170083	5684342	5684344	-	-	-	-	-
CCMT09T302FP	CCMT32505FP	9,53	3/8	9,67	.381	3,97	5/32	0,2	.008	4,40	.173	-	4170293	-	-	4168781	-	-	-	-	-	-	-	-	-	-
CCMT09T304FP	CCMT3251FP	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173	4169860	4170294	-	4168740	4168782	-	-	4170084	5684341	5684343	-	-	-	-	-
CCMT09T308FP	CCMT3252FP	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173	4169861	4170295	-	4168741	4168783	-	-	4170085	5684338	-	-	-	-	-	-
CCMT120404FP	CCMT431FP	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,50	.217	4169862	4170296	-	4168742	4168784	-	-	4170086	-	-	-	-	-	-	-
CCMT120408FP	CCMT432FP	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,50	.217	4169993	4170297	-	4168763	4168785	-	-	4170087	-	-	-	-	-	-	-
CCMT120412FP	CCMT433FP	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,50	.217	4169994	4170298	-	4168786	-	-	-	4170088	-	-	-	-	-	-	-

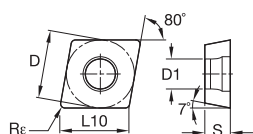
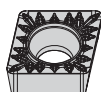




- first choice
- alternate choice

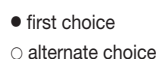
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■ CCMT-FW

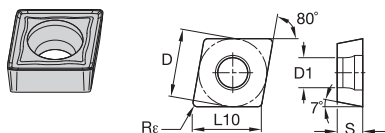
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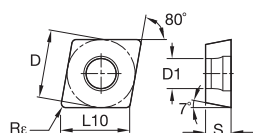
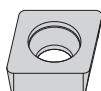
■ CCMT-MP

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
CCMT060204MP	CCMT2151MP	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110	4170197	4170217	■	■	4168893	4168906	■	■	■	■	■	■	■	■	■
CCMT09T304MP	CCMT3251MP	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173	4170198	4170218	■	■	4168894	4168907	■	■	4170238	5684352	■	■	■	■	■
CCMT09T308MP	CCMT3252MP	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173	4170199	4170219	■	■	4168895	4168908	■	■	4170239	5684350	■	■	■	■	■
CCMT09T312MP	CCMT3253MP	9,53	3/8	9,67	.381	3,97	5/32	1,2	3/64	4,40	.173	■	4170220	■	■	4168909	■	■	■	■	■	■	■	■	■	
CCMT120408MP	CCMT432MP	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,50	.217	4170200	4170221	■	■	4168896	4168910	■	■	4170240	5684349	■	■	■	■	■
CCMT120412MP	CCMT433MP	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,50	.217	■	4170222	■	■	4168897	4168911	■	■	4170241	■	■	■	■	■	■

[illegible]

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
CCMT060208MU	CCMT2152MU	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
CCMT090304MU	CCMT321MU	9,53	3/8	9,67	.381	3,18	1/8	0,4	1/64	4,40	.173	■	5623420	■	■	■	5623421	5623159	■	■	■	■	■	■	■	■
CCMT090308MU	CCMT322MU	9,53	3/8	9,67	.381	3,18	1/8	0,8	1/32	4,40	.173	■	5623425	■	■	■	5623423	■	■	■	■	■	■	■	■	■
CCMT09T304MU	CCMT3251MU	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173	■	5623431	■	■	■	5623427	5623423	■	■	■	■	■	■	■	■
CCMT09T308MU	CCMT3252MU	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173	■	5623434	■	■	■	5623435	■	■	■	■	■	■	■	■	■
CCMT120408MU	CCMT432MU	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,50	.217	■	5623440	■	■	■	5623442	5623435	■	■	■	■	■	■	■	■

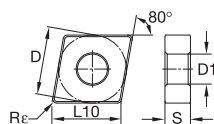
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- first choice
- alternate choice

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ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
CCMW060202	CCMW21505	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110															
CCMW060204	CCMW2151	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110						4170464	4170368					2027507	2031733		
CCMW090302	CCMW3205	9,53	3/8	9,67	.381	3,18	1/8	0,2	.00787	4,40	.173															
CCMW090304	CCMW321	9,53	3/8	9,67	.381	3,18	1/8	0,4	1/64	4,40	.173						4170465	4170369					2027509	2031734		
CCMW090308	CCMW322	9,53	3/8	9,67	.381	3,18	1/8	0,8	1/32	4,40	.173						4170466	4170370								
CCMW09T304	CCMW3251	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173						4170467	4170371					2027511	2027512		
CCMW09T308	CCMW3252	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173						4170468	4170372					2027512	2027512		
CCMW120404	CCMW431	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,50	.217						4170469	4170373					2027524	2027524		
CCMW120408	CCMW432	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,50	.217						4170470	4170374					2027525	2027525		

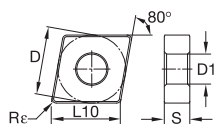
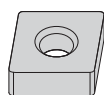


Inserts

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ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15	
		mm	in	mm	in	mm	in	mm	in	mm	in															
CNGP120402	CNGP4305	12,70	1/2	12,90	.508	4,76	3/16	0,2	.008	5,16	.203															
CNGP120401	CNGP430	12,70	1/2	12,90	.508	4,76	3/16	0,1	.004	5,16	.203									5549137	5549138					
CNGP120404	CNGP431	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203															
CNGP120408	CNGP432	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203									5549190	5549139					
																					5549208	5549207				



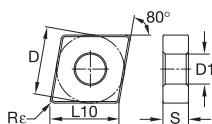


- first choice
- alternate choice

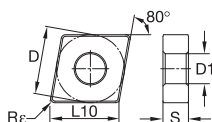
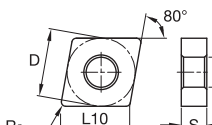
■ CNMA

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ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
CNMA120404	CNMA431	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203							4171595	4171863							
CNMA120408	CNMA432	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203							4171596	4171864							
CNMA120412	CNMA433	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203							4171597	4171865							
CNMA120416	CNMA434	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203							4171598	4171866							
CNMA160608	CNMA542	15,88	5/8	16,12	.635	6,35	1/4	0,8	1/32	6,35	.250								4171867							
CNMA160612	CNMA543	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250							4171599	4171868							
CNMA160616	CNMA544	15,88	5/8	16,12	.635	6,35	1/4	1,6	1/16	6,35	.250							4171600	4171869							
CNMA190608	CNMA642	19,05	3/4	19,34	.762	6,35	1/4	0,8	1/32	7,93	.313							4171601	4171870							
CNMA190612	CNMA643	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313							4171602	4171871							
CNMA190616	CNMA644	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,93	.313							4171633	4171872							

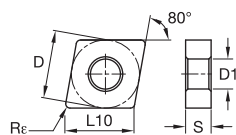
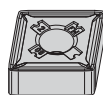


Inserts

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ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT11
		mm	in	mm	in	mm	in	mm	in	mm	in	4171025	4171026	4171027	4172345	4172346	4172347	4171319	4171320	5684271	5684272	4171321	4171322	4171323	4171324	4171325
CNMG120404FF	CNMG431FF	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	4171025	4171026	4171027	4172345	4172346	4172347	4171319	4171320	5684271	5684272	4171321	4171322	4171323	4171324	4171325
CNMG120408FF	CNMG432FF	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	4171025	4171026	4171027	4172345	4172346	4172347	4171319	4171320	5684271	5684272	4171321	4171322	4171323	4171324	4171325
CNMG120412FF	CNMG433FF	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	4171025	4171026	4171027	4172345	4172346	4172347	4171319	4171320	5684271	5684272	4171321	4171322	4171323	4171324	4171325



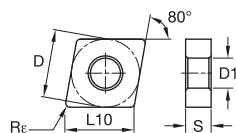
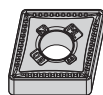


- first choice
- alternate choice

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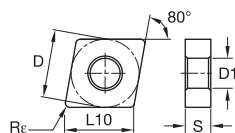
■ CNMG-FW

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in															
CNMG120404FW	CNMG431FW	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	■	■	■	4171755	4172702	■	4171680	■	■	■	■	■	■	■	■
CNMG120408FW	CNMG432FW	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	5623480	■	■	4171756	4173103	■	4171681	■	■	■	■	■	■	■	■
CNMG120412FW	CNMG433FW	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	5623481	■	■	4171757	4173104	■	4171683	■	■	■	■	■	■	■	■



■ CNMG-ML

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WJ10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in														
CNMG120404ML	CNMG431ML	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	4171059	4170458				4171657	4171390							
CNMG120408ML	CNMG432ML	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	4171060	4170459				4171658	4171391							
CNMG120412ML	CNMG433ML	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	4171348	4170460				4171659	4171392							
CNMG120416ML	CNMG434ML	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203	5684346					4171393								

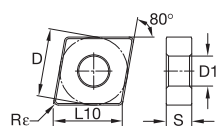
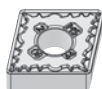


Inserts

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ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in	WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
CNMG120404MR	CNMG431MR	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	4171130	4170546	4170043	■	■	■	■	■	■	■	■	■	■	■	■
CNMG120408MR	CNMG432MR	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	4171131	4170547	4170044	■	4172955	4173120	■	■	■	■	■	■	■	■	■
CNMG120412MR	CNMG433MR	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	4171132	4170548	4170045	■	4172956	4173121	■	■	■	■	■	■	■	■	■
CNMG120416MR	CNMG434MR	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203	4171133	5684353	■	■	4172957	4173122	■	■	■	■	■	■	■	■	■
CNMG160608MR	CNMG542MR	15,88	5/8	16,12	.635	6,35	1/4	0,8	1/32	6,35	.250	4171134	4170549	■	■	4172958	4173133	■	■	■	■	■	■	■	■	■
CNMG160612MR	CNMG543MR	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250	4171135	4170550	4170046	■	4172959	4173134	■	■	■	■	■	■	■	■	■
CNMG160616MR	CNMG544MR	15,88	5/8	16,12	.635	6,35	1/4	1,6	1/16	6,35	.250	4171136	4170551	4170047	■	4172960	4173135	■	■	■	■	■	■	■	■	■
CNMG190612MR	CNMG643MR	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313	4171137	4170552	4170048	■	4172961	4173136	■	■	■	■	■	■	■	■	■
CNMG190616MR	CNMG644MR	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,93	.313	4171138	4170563	4170049	■	4172962	4173137	■	■	■	■	■	■	■	■	■



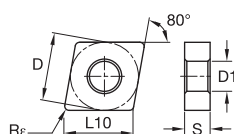


- first choice
- alternate choice

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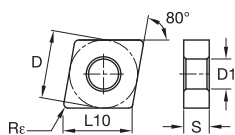
■ CNMG-MS

ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
CNMG120404MS	CNMG431MS	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	■	■	■	■	■	■	■	■	5908742	5908743	5908744	■	■	■	■
CNMG120408MS	CNMG432MS	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	■	■	■	■	■	■	■	■	5908745	5908746	5908747	■	■	■	■
CNMG120412MS	CNMG433MS	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	■	■	■	■	■	■	■	■	5908748	5908749	5908750	■	■	■	■
CNMG120416MS	CNMG434MS	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203	■	■	■	■	■	■	■	■	5908751	5908752	5908753	■	■	■	■
CNMG160608MS	CNMG542MS	15,88	5/8	16,12	.635	6,35	1/4	0,8	1/32	6,35	.250	■	■	■	■	■	■	■	■	5908754	5908755	5908756	■	■	■	■
CNMG160612MS	CNMG543MS	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250	■	■	■	■	■	■	■	■	5908757	5908758	5908759	■	■	■	■
CNMG190608MS	CNMG642MS	19,05	3/4	19,34	.762	6,35	1/4	0,8	1/32	7,93	.313	■	■	■	■	■	■	■	■	5908760	5908761	5908762	■	■	■	■
CNMG190612MS	CNMG643MS	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,92	.312	■	■	■	■	■	■	■	■	5908763	5908764	5908765	■	■	■	■
CNMG190616MS	CNMG644MS	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,92	.312	■	■	■	■	■	■	■	■	5908766	5908767	5908768	■	■	■	■



■ CNMG-MW

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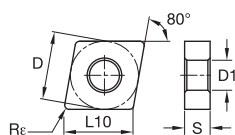
- first choice
- alternate choice

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Inserts

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
		mm	in	mm	in	mm	in	mm	in	mm	in																
CNMG120408RH	CNMG432RH	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	4170979	4171504	5684356	4173035	4173036	4173037	4171903	4171904	4171905	4171906	4171907	4171908	4171909	4171910	4171911	4171912
CNMG120412RH	CNMG433RH	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	4170980	4171505	4171698	4173036	4173037	4173038	4171904	4171905	4171906	4171907	4171908	4171909	4171910	4171911	4171912	4171913
CNMG120416RH	CNMG434RH	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203	4170981	4171506	4171699	4173037	4173038	4173039	4171905	4171906	4171907	4171908	4171909	4171910	4171911	4171912	4171913	4171914
CNMG160608RH	CNMG542RH	15,88	5/8	16,12	.635	6,35	1/4	0,8	1/32	6,35	.250	4170982	4171507	4171700	4173038	4173039	4173040	4171906	4171907	4171908	4171909	4171910	4171911	4171912	4171913	4171914	4171915
CNMG160612RH	CNMG543RH	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250	4170983	4171508	4171701	4173039	4173040	4173041	4171907	4171908	4171909	4171910	4171911	4171912	4171913	4171914	4171915	4171916
CNMG160616RH	CNMG544RH	15,88	5/8	16,12	.635	6,35	1/4	1,6	1/16	6,35	.250	4170984	4171509	4171702	4173040	4173041	4173042	4171908	4171909	4171910	4171911	4171912	4171913	4171914	4171915	4171916	4171917
CNMG190608RH	CNMG642RH	19,05	3/4	19,34	.762	6,35	1/4	0,8	1/32	7,93	.313	4170985	4171510	4171703	4173041	4173042	4173043	4171909	4171910	4171911	4171912	4171913	4171914	4171915	4171916	4171917	4171918
CNMG190612RH	CNMG643RH	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313	4170986	4171511	4171704	4173042	4173043	4173044	4171910	4171911	4171912	4171913	4171914	4171915	4171916	4171917	4171918	4171919
CNMG190616RH	CNMG644RH	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,93	.313	4170987	4171512	4171705	4173043	4173044	4173045	4171911	4171912	4171913	4171914	4171915	4171916	4171917	4171918	4171919	4171920
CNMG190624RH	CNMG646RH	19,05	3/4	19,34	.762	6,35	1/4	2,4	3/32	7,93	.313	4170988	4171523	4171706	4173044	4173045	4173046	4171912	4171913	4171914	4171915	4171916	4171917	4171918	4171919	4171920	4171921

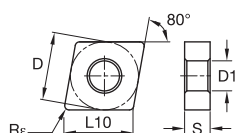
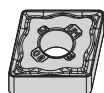




- first choice
- alternate choice

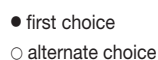
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■ CNMG-UF

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■ CNMG-UM

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in															
CNMG120404UM	CNMG431UM	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203				4172334	4172380	4172410			5645217						
CNMG120408UM	CNMG432UM	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	5645250	5645219		4172335	4172381	4172411									
CNMG120412UM	CNMG433UM	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203				4172336	4172382	4172412			5301414						

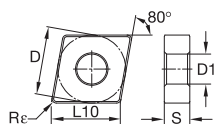


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Inserts

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
CNMG120404UR	CNMG431UR	12,70	1/2	12,90	.508	4,76	3/16	0,4	1/64	5,16	.203	4171022	4170500	-	4169406	4169444	4169479	-	-	5578894	5578895	-	-	-	-	-
CNMG120408UR	CNMG432UR	12,70	1/2	12,90	.508	4,76	3/16	0,8	1/32	5,16	.203	4171093	4170501	4169960	4169407	4169445	4169480	5680086	5680085	5301400	5301402	-	-	-	-	-
CNMG120412UR	CNMG433UR	12,70	1/2	12,90	.508	4,76	3/16	1,2	3/64	5,16	.203	4171094	4170502	4169961	4169408	4169446	4169481	5680087	4171419	5301413	5301416	-	-	-	-	-
CNMG120416UR	CNMG434UR	12,70	1/2	12,90	.508	4,76	3/16	1,6	1/16	5,16	.203	4171095	4170503	-	4169409	4169447	4169482	-	4171420	5680089	5680170	-	-	-	-	-
CNMG160608UR	CNMG542UR	15,88	5/8	16,12	.635	6,35	1/4	0,8	1/32	6,35	.250	4171096	4170504	-	4169410	4169448	4169483	-	4171421	5578896	5578897	-	-	-	-	-
CNMG160612UR	CNMG543UR	15,88	5/8	16,12	.635	6,35	1/4	1,2	3/64	6,35	.250	4171097	4170505	4169962	4169411	4169449	4169484	-	4171422	5578898	-	-	-	-	-	-
CNMG160616UR	CNMG544UR	15,88	5/8	16,12	.635	6,35	1/4	1,6	1/16	6,35	.250	4171098	4170506	4169963	-	4169450	4169485	-	4171423	5578900	5578901	-	-	-	-	-
CNMG190612UR	CNMG643UR	19,05	3/4	19,34	.762	6,35	1/4	1,2	3/64	7,93	.313	4171099	4170507	4169964	4169412	4169451	4169486	5680088	4171424	5578902	5512536	-	-	-	-	-
CNMG190616UR	CNMG644UR	19,05	3/4	19,34	.762	6,35	1/4	1,6	1/16	7,93	.313	4171100	4170508	4169965	4169423	4169452	4169487	-	4171425	5345183	5579234	-	-	-	-	-

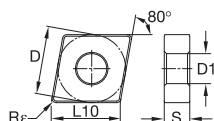
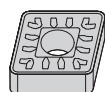




- first choice
- alternate choice

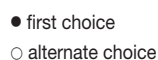
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■ CNMM-65

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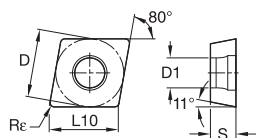
■ CNMM-SR

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Inserts

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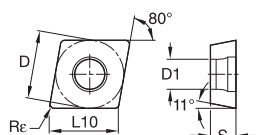
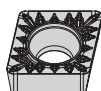


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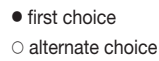
■ CPMT-FP

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTU15
		mm	in	mm	in	mm	in	mm	in	mm	in	4170015	4170025	4169812	4169822	4169825	4170105	4170106	4170107	4170108	4169814	4169826	4169827	4170107	4170108	4170109
CPMT060202FP	CPMT21505FP	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110	4170015	4170025	4169812	4169822	4169825	4170105	4170106	4170107	4170108	4169814	4169826	4169827	4170107	4170108	4170109
CPMT060204FP	CPMT2151FP	6,35	1/4	6,45	.254	2,38	3/32	0,4	1/64	2,80	.110	4170016	4170026	4169812	4169823	4169825	4170105	4170106	4170107	4170108	4169814	4169826	4169827	4170107	4170108	4170109
CPMT060208FP	CPMT2152FP	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110	4170017	4170027	4169813	4169824	4169825	4170106	4170107	4170108	4170109	4169814	4169826	4169827	4170107	4170108	4170109
CPMT09T302FP	CPMT32505FP	9,53	3/8	9,67	.381	3,97	5/32	0,2	.008	4,40	.173	4170018	4170028	4169814	4169826	4169827	4170107	4170108	4170109	4169815	4169827	4169828	4170107	4170108	4170109	
CPMT09T304FP	CPMT3251FP	9,53	3/8	9,67	.381	3,97	5/32	0,4	1/64	4,40	.173	4170019	4170029	4169815	4169827	4169828	4170107	4170108	4170109	4169815	4169827	4169828	4170107	4170108	4170109	
CPMT09T308FP	CPMT3252FP	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173	4170020	4170030	4169816	4169828	4169829	4170109	4170110	4170111	4169816	4169828	4169829	4170109	4170110	4170111	



■ CPMT-MP

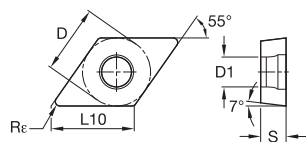
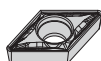
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		mm	in	mm	in	mm	in	mm	in	mm	in															
CPMT060208MP	CPMT2152MP	6,35	1/4	6,45	.254	2,38	3/32	0,8	1/32	2,80	.110	4170255	4170257	■	■	■	■	■	■	■	■	■	■	■	■	■
CPMT09T308MP	CPMT3252MP	9,53	3/8	9,67	.381	3,97	5/32	0,8	1/32	4,40	.173	4170256	4170258	■	4168923	4168926	■	■	4170266	■	■	■	■	■	■	■
CPMT09T312MP	CPMT3253MP	9,53	3/8	9,67	.381	3,97	5/32	1,2	3/64	4,40	.173	■	4170259	■	4168924	■	■	■	4170267	■	■	■	■	■	■	■

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■ DCMT

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	T _{HM}	T _{TR}	T _{TT15}
		mm	in	mm	in	mm	in	mm	in	mm	in														
DCMT070204	DCMT2151	6,35	1/4	7,75	.305	2,38	3/32	0,4	1/64	2,80	.110												2027768		
DCMT11T304	DCMT3251	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173												2027805	2027807	2027804
DCMT11T308	DCMT3252	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173												2027843		
DCMT11T312	DCMT3253	9,53	3/8	11,63	.458	3,97	5/32	1,2	3/64	4,40	.173												2027868		
DCMT150404	DCMT431	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,50	.217												2027887		
DCMT150408	DCMT432	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,50	.217												2027908		2027910
DCMT150412	DCMT433	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,50	.217												2027932		
DCMT150416	DCMT434	12,70	1/2	15,50	.610	4,76	3/16	1,6	.063	5,50	.217												2027965		



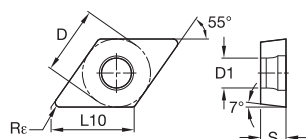
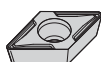


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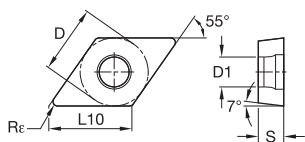
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		mm	in	mm	in	mm	in	mm	in	mm	in															
DCMT070202FP	DCMT21505FP	6,35	1/4	7,75	.305	2,38	3/32	0,2	.008	2,80	.110	4169995	4170299			4168764	4168787									
DCMT070204FP	DCMT2151FP	6,35	1/4	7,75	.305	2,38	3/32	0,4	1/64	2,80	.110	4170300			4168788			4170089								
DCMT070208FP	DCMT2152FP	6,35	1/4	7,75	.305	2,38	3/32	0,8	1/32	2,80	.110	4170301			4168789											
DCMT11T302FP	DCMT32505FP	9,53	3/8	11,63	.458	3,97	5/32	0,2	.008	4,40	.173	4169996	4170302			4168790										
DCMT11T304FP	DCMT3251FP	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173	4169997	4170303			4168791			4170090							
DCMT11T308FP	DCMT3252FP	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173	4169998	4170304			4168792			4170091							
DCMT11T312FP	DCMT3253FP	9,53	3/8	11,63	.458	3,97	5/32	1,2	3/64	4,40	.173	4169999	4170305													
DCMT150404FP	DCMT431FP	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,50	.217	4170000	4170306			4168793										
DCMT150408FP	DCMT432FP	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,50	.217	4170001	4170307			4168794			4170092							



■ DCMT-FW

[illegible]



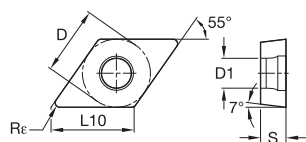
- first choice
- alternate choice

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Inserts

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	T1M	T1R	T115	
		mm	in	mm	in	mm	in	mm	in	mm	in															
DCMT11T304MU	DCMT3251MU	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173	5623585	5623583	■	■	5623581	■	5623586	5623587	5623582	5623584	■	■	■	■	■
DCMT11T308MU	DCMT3252MU	9,52	3/8	11,63	.458	3,97	.156	0,8	.0315	4,40	.173	5623600	■	■	■	5623588	■	5623602	5623589	5623601	5623603	■	■	■	■	■
DCMT150408MU	DCMT432MU	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,50	.217	5623606	5623608	■	■	5623604	■	5623605	5623607	5623609	5623610	■	■	■	■	■
DCMT150412MU	DCMT433MU	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,50	.217	■	■	■	■	■	5623611	5623612	■	■	■	■	■	■	■	

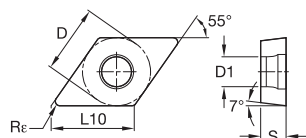
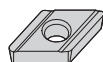




- first choice
- alternate choice

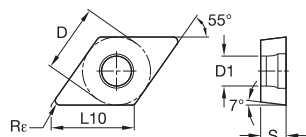
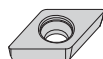
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■ DCMT-MW

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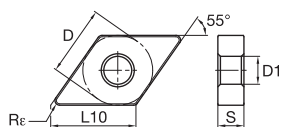
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		mm	in	mm	in	mm	in	mm	in	mm	in															
DCMX11T302R18	DCMX32505R18	9,53	3/8	11,63	.458	3,97	5/32	0,2	.008	4,30	.169	-	-	-	-	-	-	-	-	-	-	-	2011507	-	-	-



■ DCMW

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in															
DCMW070204	DCMW2151	6,35	1/4	7,75	.305	2,38	3/32	0,4	1/64	2,80	.110							4170471	4170375				2027966			
DCMW11T304	DCMW3251	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173							4170472	4170376				2027967			
DCMW150408	DCMW432	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,50	.217							4170473	4170377				2031737			

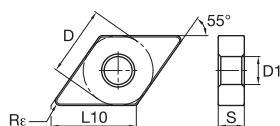
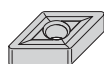


Inserts

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ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
DNGG110402FS	DNGG3305FS	9,52	3/8	11,63	.458	4,76	3/16	0,2	.008	3,81	.150	■	■	■	■	■	■	■	■	5548670	5548670	5538206	■	■	■	■
DNGG110404FS	DNGG331FS	9,52	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150	■	■	■	■	■	■	■	■	5548671	5548671	5549948	■	■	■	■
DNGG110408FS	DNGG332FS	9,52	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	■	■	■	■	■	■	■	■	5548672	5548672	■	■	■	■	■
DNGG150402FS	DNGG4305FS	12,70	1/2	15,50	.610	4,76	3/16	0,2	.008	5,16	.203	■	■	■	■	■	■	■	■	5548673	5548673	5549990	■	■	■	■
DNGG150401FS	DNGG430FS	12,70	1/2	15,50	.610	4,76	3/16	0,1	.004	5,16	.203	■	■	■	■	■	■	■	■	5548674	5548674	■	■	■	■	■
DNGG150404FS	DNGG431FS	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	■	■	■	■	■	■	■	■	5548675	5548675	5538207	■	■	■	■
DNGG150408FS	DNGG432FS	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	■	■	■	■	■	■	■	■	5548676	5548676	5538208	■	■	■	■
DNGG150412FS	DNGG433FS	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	■	■	■	■	■	■	■	■	5548677	5548677	5549994	■	■	■	■
DNGG150604FS	DNGG441FS	12,70	1/2	15,50	.610	6,35	1/2	0,4	1/64	5,16	.203	■	■	■	■	■	■	■	■	5548678	5548678	5538209	■	■	■	■
DNGG150608FS	DNGG442FS	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	■	■	■	■	■	■	■	■	5548679	5548679	5549995	■	■	■	■

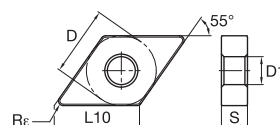
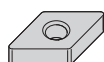




- first choice
- alternate choice

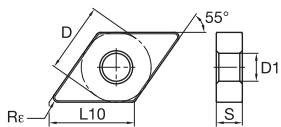
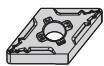
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■ DNGP

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■ DNMA

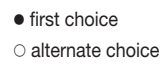
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		mm	in	mm	in	mm	in	mm	in	mm	in															
DNMA110408	DNMA332	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	■	■	■	■	■	■	4171634	4171873	■	■	■	■	■	■	■
DNMA110412	DNMA333	9,53	3/8	11,63	.458	4,76	3/16	1,2	3/64	3,81	.150	■	■	■	■	■	■	4171874	4171874	■	■	■	■	■	■	■
DNMA150408	DNMA432	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	■	■	■	■	■	■	4171635	4171875	■	■	■	■	■	■	■
DNMA150412	DNMA433	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	■	■	■	■	■	■	4171636	4171876	■	■	■	■	■	■	■
DNMA150416	DNMA434	12,70	1/2	15,50	.610	4,76	3/16	1,6	1/16	5,16	.203	■	■	■	■	■	■	4171877	4171877	■	■	■	■	■	■	■
DNMA150608	DNMA442	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	■	■	■	■	■	■	4171637	4171878	■	■	■	■	■	■	■
DNMA150612	DNMA443	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	■	■	■	■	■	■	4171638	4171879	■	■	■	■	■	■	■
DNMA150616	DNMA444	12,70	1/2	15,50	.610	6,35	1/4	1,6	1/16	5,16	.203	■	■	■	■	■	■	4171880	4171880	■	■	■	■	■	■	■



- first choice
- alternate choice

■ DNMG-FF

ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TIM	TTR	TT15
		D		L10		S		R6		D1																
mm	in	mm	in	mm	in	mm	in	mm	in	mm	in															
DNMG110404FF	DNMG331FF	9,53	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150	4171028	4171029					4172348	4172349			4171321	4171322	5684273		
DNMG110408FF	DNMG332FF	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150															
DNMG110412FF	DNMG333FF	9,53	3/8	11,63	.458	4,76	3/16	1,2	3/64	3,81	.150							4172350	4172351							
DNMG150404FF	DNMG431FF	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	4171030									5684274					
DNMG150408FF	DNMG432FF	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	4171031						4172352	4172353			4171373	4171374	5684275		
DNMG150412FF	DNMG433FF	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203															
DNMG150604FF	DNMG441FF	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	4171032	4171043					4172683	4172684			4171375	4171376	5684276		
DNMG150608FF	DNMG442FF	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203															
DNMG150612FF	DNMG443FF	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	4171044						4172685	4172686			4171377				

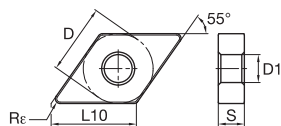


■ DNMG-FW

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS25PT	WU10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in														
DNMG110404FW	DNMG331FW	9,53	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150	5623490													
DNMG110408FW	DNMG332FW	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	5623491													
DNMG150404FW	DNMG431FW	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	5623492			4171758	4173105		4171685							
DNMG150408FW	DNMG432FW	12,70	1/2	15,50	.610	4,76	3/16	0,4	.016	5,16	.203	5623493			4171759	4173106		4171686							
DNMG150604FW	DNMG441FW	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	5623496			4171760	4173107		4171689							
DNMG150608FW	DNMG442FW	12,70	1/2	15,50	.610	6,35	1/4	0,4	.016	5,16	.203	5623497			4171761	4173108		4171690							

Inserts

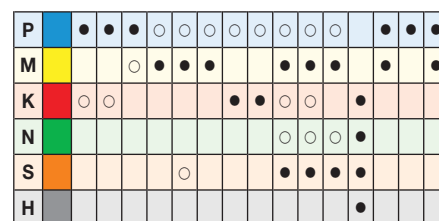




- first choice
- alternate choice

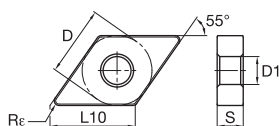
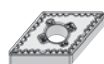
■ DNMG-ML

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		mm	in	mm	in	mm	in	mm	in	mm	in														
DNMG110404ML	DNMG331ML	9,53	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150	4171062	4170461	■	■	■	■	4171680	4171394	■	■	■	■	■	■
DNMG110408ML	DNMG332ML	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	4171063	4170462	■	■	■	■	4171661	4171395	■	■	■	■	■	■
DNMG110412ML	DNMG333ML	9,53	3/8	11,63	.458	4,76	3/16	1,2	3/64	3,81	.150	4171064	4171064	■	■	■	■	■	■	■	■	■	■	■	■
DNMG150404ML	DNMG431ML	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	4171065	4170483	■	■	■	■	4171662	4171396	■	■	■	■	■	■
DNMG150408ML	DNMG432ML	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	4171066	4170484	■	■	■	■	4171663	4171397	■	■	■	■	■	■
DNMG150412ML	DNMG433ML	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	4171067	4170485	■	■	■	■	4171664	4171398	■	■	■	■	■	■
DNMG150604ML	DNMG441ML	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	4171068	4170485	■	■	■	■	4171665	4171399	■	■	■	■	■	■
DNMG150608ML	DNMG442ML	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	4171069	4170486	■	■	■	■	4171666	4171400	■	■	■	■	■	■
DNMG150612ML	DNMG443ML	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	4171070	4170487	■	■	■	■	4171667	4171401	■	■	■	■	■	■



ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
DNMG110408MR	DNMG332MR	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	4171139	4170564	4170050	■	■	■	■	■	■	■	■	■	■	■	■
DNMG150404MR	DNMG431MR	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	4171140	4170565	4170051	■	■	■	■	■	■	■	■	■	■	■	■
DNMG150408MR	DNMG432MR	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	4171141	4170566	4170052	■	■	■	■	■	■	■	■	■	■	■	■
DNMG150412MR	DNMG433MR	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	4171142	4170567	4170053	■	■	■	■	■	■	■	■	■	■	■	■
DNMG150604MR	DNMG441MR	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	4171143	4170568	4170054	■	■	■	■	■	■	■	■	■	■	■	■
DNMG150608MR	DNMG442MR	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	4171144	4170569	4170055	■	4173023	4173138	■	■	■	■	■	■	■	■	■
DNMG150612MR	DNMG443MR	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	4171145	4170570	4170056	■	4173024	4173139	■	■	■	■	■	■	■	■	■



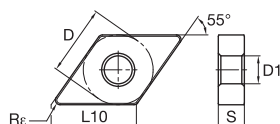
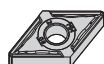


- first choice
- alternate choice

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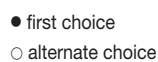
■ DNMG-MS

ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTH5
		D		L10		S		Rε		D1																
		mm	in	mm	in	mm	in	mm	in	mm	in															
DNMG110408MS	DNMG332MS	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	■	■	■	■	■	■	■	■	5908769	5908770	5908781	■	■	■	■
DNMG150404MS	DNMG431MS	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203	■	■	■	■	■	■	■	■	5908782	5908783	5908784	■	■	■	■
DNMG150408MS	DNMG432MS	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	■	■	■	■	■	■	■	■	5908785	5908787	5908788	■	■	■	■
DNMG150412MS	DNMG433MS	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	■	■	■	■	■	■	■	■	5908789	5908790	5908791	■	■	■	■
DNMG150604MS	DNMG441MS	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203	■	■	■	■	■	■	■	■	5908792	5908793	5908794	■	■	■	■
DNMG150608MS	DNMG442MS	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	■	■	■	■	■	■	■	■	5908795	5908796	5908797	■	■	■	■
DNMG150612MS	DNMG443MS	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	■	■	■	■	■	■	■	■	5908798	5908799	5908800	■	■	■	■



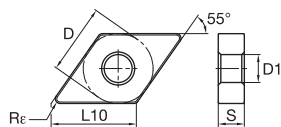
■ DNMG-MW

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in															
DNMG150408MW	DNMG432MW	12,70	1/2	15,50	.610	4,76	3/16	0,4	.016	5,16	.203	5623494	5623495	■	■	4173114	4171687	■	■	■	■	■	■	■	■	■
DNMG150412MW	DNMG433MW	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	■	■	■	■	4173115	4171688	■	■	■	■	■	■	■	■	■
DNMG150608MW	DNMG442MW	12,70	1/2	15,50	.610	6,35	1/4	0,4	.016	5,16	.203	5623498	5623499	■	■	4173116	4171691	■	■	■	■	■	■	■	■	■
DNMG150612MW	DNMG443MW	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	■	■	■	■	4173117	4171692	■	■	■	■	■	■	■	■	■

[illegible]

Inserts

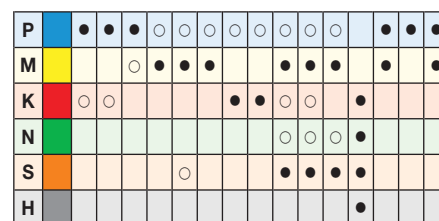
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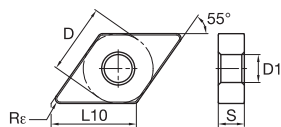


- first choice
- alternate choice

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ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in														
DNMG110404UF	DNMG331UF	9,53	3/8	11,63	.458	4,76	3/16	0,4	1/64	3,81	.150				4169356	4169382				5645603					
DNMG110408UF	DNMG332UF	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150				4169357	4169383				5645604					
DNMG150404UF	DNMG431UF	12,70	1/2	15,50	.610	4,76	3/16	0,4	1/64	5,16	.203				4169358	4169384				5645601					
DNMG150408UF	DNMG432UF	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	5645606	5645605		4169359	4169385				5645602					
DNMG150412UF	DNMG433UF	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203				4169360	4169386									
DNMG150604UF	DNMG441UF	12,70	1/2	15,50	.610	6,35	1/4	0,4	1/64	5,16	.203				4169361	4169387				5645608					
DNMG150608UF	DNMG442UF	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203		5645609		4169362	4169388				5645607					
DNMG150612UF	DNMG443UF	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203				4169363	4169389									

[illegible]

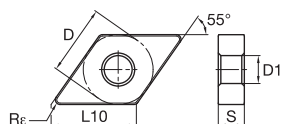
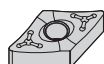


- first choice
- alternate choice

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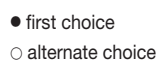
■ DNMG-UR

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
DNMG110408UR	DNMG332UR	9,53	3/8	11,63	.458	4,76	3/16	0,8	1/32	3,81	.150	4171101	4170509	4169966	4169424	4169453	4169488	-	4171426	-	-	-	-	-	-	-
DNMG110412UR	DNMG333UR	9,53	3/8	11,63	.458	4,76	3/16	1,2	3/64	3,81	.150	4171102	4170510	-	4169425	-	-	-	4171427	-	-	-	-	-	-	-
DNMG150408UR	DNMG432UR	12,70	1/2	15,50	.610	4,76	3/16	0,8	1/32	5,16	.203	4171103	4170511	4169967	4169426	4169454	4169489	-	4171428	-	-	-	-	-	-	-
DNMG150412UR	DNMG433UR	12,70	1/2	15,50	.610	4,76	3/16	1,2	3/64	5,16	.203	4171104	4170512	4169968	-	4169455	4169490	-	4171429	-	5579292	5579271	-	-	-	-
DNMG150416UR	DNMG434UR	12,70	1/2	15,50	.610	4,76	3/16	1,6	1/16	5,16	.203	-	-	-	-	-	4169491	-	4171430	5680171	-	-	-	-	-	-
DNMG150608UR	DNMG442UR	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	4171105	4170513	4169969	4169427	4169456	4169492	4169491	4171431	-	5579276	-	-	-	-	-
DNMG150612UR	DNMG443UR	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	4171106	4170514	4169970	4169428	4169457	4169493	5680172	4171432	-	-	-	-	-	-	-
DNMG150616UR	DNMG444UR	12,70	1/2	15,50	.610	6,35	1/4	1,6	1/16	5,16	.203	4171107	4170515	4169971	-	-	4169494	-	4171433	-	-	-	-	-	-	-



■ DNMM-65

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TIM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
DNMM15060865	DNMM44265	12,70	1/2	15,50	.610	6,35	1/4	0,8	1/32	5,16	.203	5698413	5698414	5698415	5698416	5698417	5698418	5698419	5698420	5698421	5698422	5698423	5698424	5698425	5698426	5698427
DNMM15061265	DNMM44365	12,70	1/2	15,50	.610	6,35	1/4	1,2	3/64	5,16	.203	5698417	5698418	5698419	5698420	5698421	5698422	5698423	5698424	5698425	5698426	5698427	5698428	5698429	5698430	5698431
DNMM15061665	DNMM44465	12,70	1/2	15,50	.610	6,35	1/4	1,6	1/16	5,16	.203	5698418	5698419	5698420	5698421	5698422	5698423	5698424	5698425	5698426	5698427	5698428	5698429	5698430	5698431	5698432

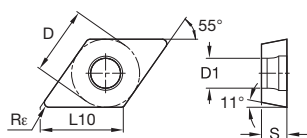
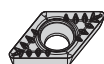
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Inserts

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ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TIM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in	4170020	4170330	4168816	4168828	4168829	4168830	4170109	4170332	4170333	4168830	4170109	4170332	4170333	4168830	4170109
DPMT070204FP	DPMT2151FP	6,35	1/4	7,75	.305	2,38	3/32	0,4	1/64	2,80	.110			-			-	-	-	-	-	-	-	-	-	-
DPMT11T304FP	DPMT3251FP	9,53	3/8	11,63	.458	3,97	5/32	0,4	1/64	4,40	.173	4170021	4170331	-	4168817	4168829	-	-	-	-	-	-	-	-	-	-
DPMT11T308FP	DPMT3252FP	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173	4170022	4170332	-	-	4168830	-	4170109	-	-	-	-	-	-	-	-

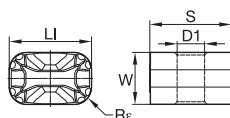
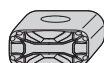




- first choice
- alternate choice

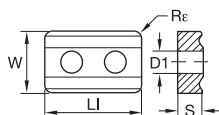
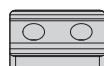
■ DPMT-MP

ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT145
		D		L10		S		Re		D1																
		mm	in	mm	in	mm	in	mm	in	mm	in															
DPMT11T308MP	DPMT3252MP	9,53	3/8	11,63	.458	3,97	5/32	0,8	1/32	4,40	.173		4170260						4170268							



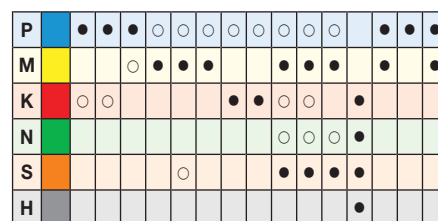
■ LNUX-13

ISO catalog number	ANSI catalog number	W		LI		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in														
LNUX19194013	LNUX19194013	10,00	.394	19,05	.750	19,05	3/4	4,0	.158	6,35	.250	■	■	■	■	■	■	■	4170966	■	■	■	■	■	■
LNUX30194013	LNUX30194013	12,00	.472	30,00	1.181	19,05	3/4	4,0	.158	6,35	.250	■	■	■	■	■	■	■	4170968	■	■	■	■	■	■

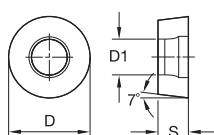
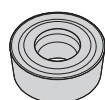


■ LNUX-EN95

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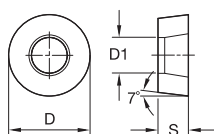
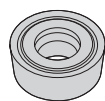


Inserts



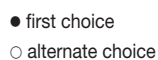
- first choice
- alternate choice

■ RCMT-T

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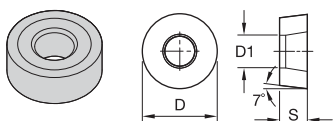
■ RCMX

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Inserts

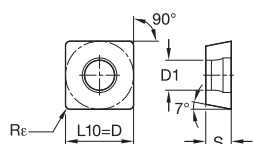
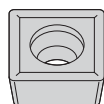
ISO catalog number	ANSI catalog number	D		S		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TT15
		mm	in	mm	in	mm	in														
RNMA120400	RNMA43	12,70	1/2	4,76	3/16	5,16	.203	-	-	-	-	-	-	4171639	4171881	-	-	-	-	-	-



Inserts

ISO catalog number	ANSI catalog number	D		S		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in															
RNMG090300RH	RNMG32RH	9,53	3/8	3,18	1/8	3,81	.150	4170995	4171530	■	■	■	■	■	■	■	■	■	■	■	■	■
RNMG120400RH	RNMG43RH	12,70	1/2	4,76	3/16	5,16	.203	4170996	4171531	4171713	■	■	■	■	■	■	■	■	■	■	■	■
RNMG190600RH	RNMG64RH	19,05	3/4	6,35	1/4	7,93	.313	4170997	4171532	4171714	■	■	■	■	4171917	■	■	■	■	■	■	■

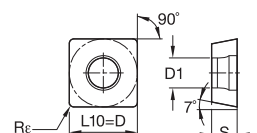
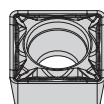




- first choice
- alternate choice

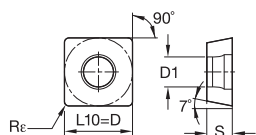
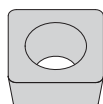
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■ SCMT

[illegible]

■ SCMT-FP

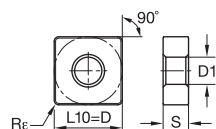
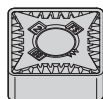
ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
SCMT09T304FP	SCMT3251FP	9,53	3/8	9,53	.375	3,97	5/32	0,4	1/64	4,40	.173	4170002	4170308	4168767	4168795			4170093								
SCMT09T308FP	SCMT3252FP	9,53	3/8	9,53	.375	3,97	5/32	0,8	1/32	4,40	.173	4170003	4170309	4168768	4168796			4170094								
SCMT120404FP	SCMT431FP	12,70	1/2	12,70	.500	4,76	3/16	0,4	1/64	5,50	.217	4170004	4170310	4168769	4168797			4170095								
SCMT120408FP	SCMT432FP	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,50	.217	4170031	4170311	4168798	4168798											
SCMT120412FP	SCMT433FP	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,50	.217	4170005	4170312	4168799	4168799			4170096								



- first choice
- alternate choice

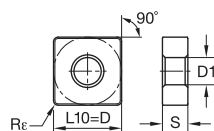
SCMW

ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		D		L10		S		Rε		D1																
		mm	in	mm	in	mm	in	mm	in	mm	in															
SCMW090304	SCMW321	9,53	3/8	9,53	.375	3,18	1/8	0,4	1/64	4,40	.173						4170474	4170378					2028308			
SCMW09T308	SCMW3252	9,53	3/8	9,53	.375	3,97	5/32	0,8	1/32	4,40	.173							4170379								
SCMW120408	SCMW432	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,50	.217						4170475	4170380					2028310			



■ SNGG-FS

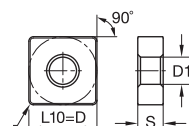
ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WU10HT	TMM	TTM	TTR	TTM5
		D		L10		S		Re		D1															
		mm	in	mm	in	mm	in	mm	in	mm	in														
SNGG120408FS	SNGG432FS	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203								5548680		5549997				

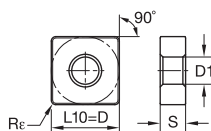
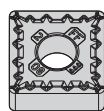


Inserts

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ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTT15
		mm	in	mm	in	mm	in	mm	in	mm	in														
SNMA120408	SNMA432	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203							4171640	4171882						
SNMA120412	SNMA433	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203							4171641	4171883						
SNMA120416	SNMA434	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203							4171642	4171884						
SNMA150608	SNMA542	15,88	5/8	15,88	.625	6,35	1/4	0,8	1/32	6,35	.250							4171643	4171885						
SNMA150612	SNMA543	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250							4171644	4171886						
SNMA150616	SNMA544	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250							4171644	4171887						
SNMA190612	SNMA643	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313							4171645	4171888						
SNMA190616	SNMA644	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313							4171646	4171889						

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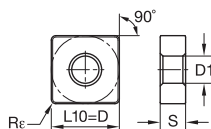
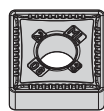


- first choice
- alternate choice

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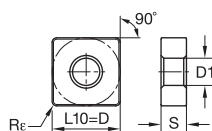
■ SNMG-FF

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
SNMG090304FF	SNMG321FF	9,53	3/8	9,53	.375	3,18	1/8	0,4	1/64	3,81	.150	4171045	4171045	4171045	4171045	4171045	4171045	4171378	4171378	5684279	5684279	5684279	5684279	5684279	5684279	5684279
SNMG090308FF	SNMG322FF	9,53	3/8	9,53	.375	3,18	1/8	0,8	1/32	3,81	.150	4171046	4171046	4171046	4171046	4172686	4172686	4171379	4171379	5684277	5684277	5684277	5684277	5684277	5684277	5684277
SNMG120404FF	SNMG431FF	12,70	1/2	12,70	.500	4,76	3/16	0,4	1/64	5,16	.203	4171047	4171047	4171047	4171047	4172687	4172687	4171380	4171380	5684330	5684330	5684330	5684330	5684330	5684330	5684330
SNMG120408FF	SNMG432FF	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	4171048	4171048	4171048	4171048	4172688	4172688	4171381	4171381	5684278	5684278	5684278	5684278	5684278	5684278	5684278
SNMG120412FF	SNMG433FF	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	4171049	4171049	4171049	4171049	4172689	4172689	4171382	4171382	5684278	5684278	5684278	5684278	5684278	5684278	5684278
SNMG120416FF	SNMG434FF	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203	4172690	4172690	4172690	4172690	4172690	4172690	4171382	4171382	5684278	5684278	5684278	5684278	5684278	5684278	5684278



■ SNMG-ML

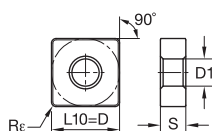
ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
SNMG090304ML	SNMG321ML	9,53	3/8	9,53	.375	3,18	1/8	0,4	1/64	3,81	.150	4171071														
SNMG090308ML	SNMG322ML	9,53	3/8	9,53	.375	3,18	1/8	0,8	1/32	3,81	.150	4171072	4170488					4171688	4171402							
SNMG120404ML	SNMG431ML	12,70	1/2	12,70	.500	4,76	3/16	0,4	1/64	5,16	.203								4171403							
SNMG120408ML	SNMG432ML	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	4171073	4170489					4171689	4171404							
SNMG120412ML	SNMG433ML	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	4171074	4170490					4171670	4171405							
SNMG120416ML	SNMG434ML	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203							4171406								



Inserts

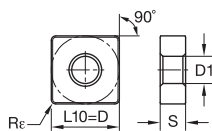
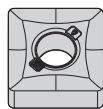
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ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT145
		mm	in	mm	in	mm	in	mm	in	mm	in															
SNMG120408MR	SNMG432MR	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	5684354 4171146	5684355 4170571	4170057 4170057	4170057 4170057	4173025 4173025	4173140 4173140									
SNMG120412MR	SNMG433MR	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	5684354 5684355	4170571 4170571	4170057 4170057	4170057 4170057	4173026 4173026	4173141 4173141									
SNMG120416MR	SNMG434MR	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203					4173027 4173027	4173142 4173142									
SNMG150608MR	SNMG542MR	15,88	5/8	15,88	.625	6,35	1/4	0,8	1/32	6,35	.250					4173028 4173028	4173143 4173143									
SNMG150612MR	SNMG543MR	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250	4171147 4171147				4173029 4173029	4173144 4173144									
SNMG150616MR	SNMG544MR	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250					4173030 4173030	4173145 4173145									
SNMG190612MR	SNMG643MR	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313	4171148 4171149	4170572 4170572	4170058 4170058		4173031 4173031	4173146 4173146									
SNMG190616MR	SNMG644MR	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313	4171149 4171149				4173032 4173032	4173147 4173147									



ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT11.5
		mm	in	mm	in	mm	in	mm	in	mm	in															
SNMG120408MS	SNMG432MS	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	■	■	■	■	■	■	■	■	5909847	5909848	5909849	■	■	■	■
SNMG120412MS	SNMG433MS	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	■	■	■	■	■	■	■	■	5909850	5909821	5909822	■	■	■	■
SNMG150612MS	SNMG543MS	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250	■	■	■	■	■	■	■	■	■	5909823	5909824	■	■	■	■
SNMG190612MS	SNMG643MS	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,94	.312	■	■	■	■	■	■	■	■	5908925	5908926	■	■	■	■	

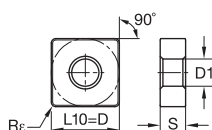
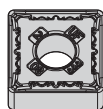




- first choice
- alternate choice

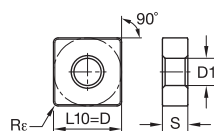
■ SNMG-RH

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WN25CT	WK05CT	WK20CT	WS10PT	WU10HT	THM	TMM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in													
SNMG120408RH	SNMG432RH	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	4170998	4171533	4171715	-	4173049	-	4171918	-	-	-	-	-	-
SNMG120412RH	SNMG433RH	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	4170999	4171534	4171716	-	4173050	-	4171919	-	-	-	-	-	-
SNMG120416RH	SNMG434RH	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203	4171000	4171535	4171717	-	4173051	-	4171920	-	-	-	-	-	-
SNMG150608RH	SNMG542RH	15,88	5/8	15,88	.625	6,35	1/4	0,8	1/32	6,35	.250	4171001	4171536	4171718	-	4173052	-	4171921	-	-	-	-	-	-
SNMG150612RH	SNMG543RH	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250	4171002	4171537	4171719	-	4173053	-	4171922	-	-	-	-	-	-
SNMG150616RH	SNMG544RH	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250	4171003	4171538	4171720	-	4173054	-	4171923	-	-	-	-	-	-
SNMG190608RH	SNMG642RH	19,05	3/4	19,05	.750	6,35	1/4	0,8	1/32	7,93	.313	4171004	4171539	4171721	-	4173055	-	4171924	-	-	-	-	-	-
SNMG190612RH	SNMG643RH	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313	4171005	4171540	4171722	-	4173056	-	4171925	-	-	-	-	-	-
SNMG190616RH	SNMG644RH	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313	4171006	4171541	4171723	-	4173057	-	4171926	-	-	-	-	-	-



■ SNMG-UF

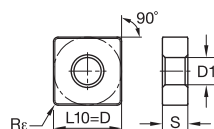
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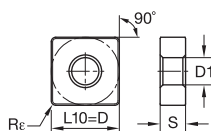
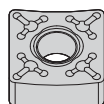
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ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in															
SNMG120404UM	SNMG431UM	12,70	1/2	12,70	.500	4,76	3/16	0,4	1/64	5,16	.203				4172366	4172393	4172423									
SNMG120408UM	SNMG432UM	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203				4172367	4172394	4172424									
SNMG120412UM	SNMG433UM	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203				4172368	4172395	4172425									



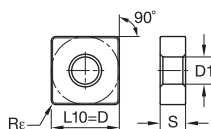
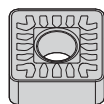
ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
SNMG120408UR	SNMG432UR	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	4171108	4170516	4169989	4169429	4169458	4169495	-	4171434	-	-	-	-	-	-	-
SNMG120412UR	SNMG433UR	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	4171109	4170517	4169990	4169430	4169459	4169496	-	4171435	-	5579350	-	-	-	-	-
SNMG120416UR	SNMG434UR	12,70	1/2	12,70	.500	4,76	3/16	1,6	1/16	5,16	.203	4171110	-	-	-	4169460	4169497	-	4171436	5680174	5680173	-	-	-	-	-
SNMG150612UR	SNMG543UR	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250	4171111	4170518	4169991	4169431	4169461	4169498	-	4171437	-	5579352	-	-	-	-	-
SNMG150616UR	SNMG544UR	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250	4171112	4170519	4169992	4169432	4169462	4169499	-	4171438	-	-	-	-	-	-	-
SNMG190612UR	SNMG643UR	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313	4171113	4170520	4170033	-	4169463	4169500	-	4171439	-	5512538	-	-	-	-	-
SNMG190616UR	SNMG643UR	19,05	3/4	19,05	.750	6,35	1/4	1,2	3/64	7,93	.313	-	-	-	4169433	-	-	-	-	-	-	-	-	-	-	-
SNMG190616UR	SNMG644UR	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313	4171114	4170521	4170034	-	4169464	4169501	-	4171440	-	5579357	-	-	-	-	-





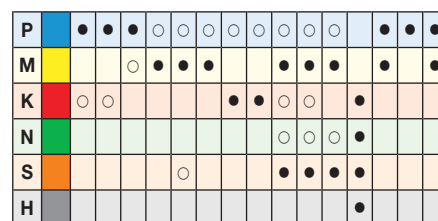
- first choice
- alternate choice

■ SNMM-65

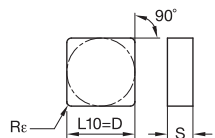
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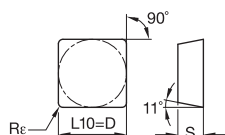
ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TH45
		mm	in	mm	in	mm	in	mm	in	mm	in													
SNMM190616SR	SNMM644SR	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313													
SNMM190624SR	SNMM646SR	19,05	3/4	19,05	.750	6,35	1/4	2,4	3/32	7,93	.313	5696680	5696681		5696649	5696648								



ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT		WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
SNMP120408	SNMP432	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,16	.203	1	1	1	1	4172137	4173664	4173703	1	1	4172489	4172618	1	1	1	1	1
SNMP120412	SNMP433	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	5,16	.203	1	1	1	1	4172138	4173665	4173704	1	1	4172490	4172619	1	1	1	1	1
SNMP150608	SNMP542	15,88	5/8	15,88	.625	6,35	1/4	0,8	1/32	6,35	.250	1	1	1	1	4172139	4173666	4173705	1	1	1	4172620	1	1	1	1	1
SNMP150612	SNMP543	15,88	5/8	15,88	.625	6,35	1/4	1,2	3/64	6,35	.250	1	1	1	1	4172140	4173667	4173706	1	1	1	4172621	1	1	1	1	1
SNMP150616	SNMP544	15,88	5/8	15,88	.625	6,35	1/4	1,6	1/16	6,35	.250	1	1	1	1	4172141	4173668	4173707	1	1	1	4172622	1	1	1	1	1
SNMP190616	SNMP644	19,05	3/4	19,05	.750	6,35	1/4	1,6	1/16	7,93	.313	1	1	1	1	4172142	4173669	4173708	1	1	1	1	1	1	1	1	1



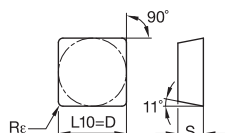
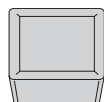
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		mm	in	mm	in	mm	in	mm	in														
SNUN120408	SNU432	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	■	■	■	■	■	■	■	4170962	■	■	■	■	■	■
SNUN120412	SNU433	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64	■	■	■	■	■	■	■	4170963	■	■	■	■	■	■



- first choice
- alternate choice

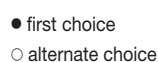
■ SPGN/SPG

ISO catalog number	ANSI catalog number	D		L10		S		Rε		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WJ10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in															
SPGN090308	SPG322	9,53	3/8	9,53	.375	3,18	1/8	0,8	1/32								4170943							
SPGN120308	SPG422	12,70	1/2	12,70	.500	3,18	1/8	0,8	1/32								4170944							
SPGN120312	SPG423	12,70	1/2	12,70	.500	3,18	1/8	1,2	3/64								4170945							



■ SPMR

ISO catalog number	ANSI catalog number	D		L10		S		R _e		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in															
SPMR090308	SPMR322	9,53	3/8	9,53	.375	3,18	1/8	0,8	1/32	■	■	4170650	■	■	■	■	4170946	■	■	■	■	■	■	■
SPMR120304	SPMR421	12,70	1/2	12,70	.500	3,18	1/8	0,4	1/64	4170853	■	4170651	■	■	■	■	4170947	■	■	■	■	■	■	■
SPMR120308	SPMR422	12,70	1/2	12,70	.500	3,18	1/8	0,8	1/32	4170854	■	4170652	■	■	■	■	4170948	■	■	■	■	■	■	■
SPMR120312	SPMR423	12,70	1/2	12,70	.500	3,18	1/8	1,2	3/64	■	■	4170783	■	■	■	■	4170949	■	■	■	■	■	■	■

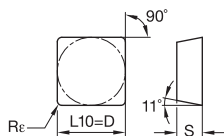


P	Blue	Black	Black	White	White	White	White	White	White	White	White	White	Black	Black	Black
M	Yellow	White	White	White	Black	Black	Black	White	Black	Black	Black	Black	Black	Black	Black
K	Red	White	White	White	White	White	Black	Black	White	White	White	Black	White	White	White
N	Green	White	White	White	White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

Inserts

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1			WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTH5
		mm	in	mm	in	mm	in	mm	in	mm	in														
SPMT09T308MP	SPMT3252MP	9,53	3/8	9,53	.375	3,97	5/32	0,8	1/32	4,40	.173		4170261		4168925			4170269							
SPMT120408MP	SPMT432MP	12,70	1/2	12,70	.500	4,76	3/16	0,8	1/32	5,50	.217		4170262					4170270							

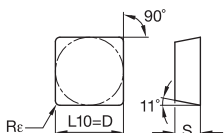
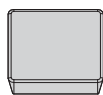




- first choice
- alternate choice

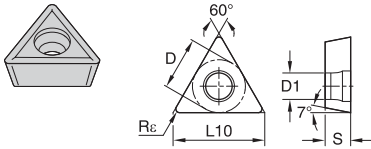
■ SPUN/SPU

ISO catalog number	ANSI catalog number	D		L10		S		Rε		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in															
SPUN090308	SPU322	9,53	3/8	9,53	.375	3,18	1/8	0,8	1/32												2028543			
SPUN120304	SPU421	12,70	1/2	12,70	.500	3,18	1/8	0,4	1/64	4170856											2028547			
SPUN120308	SPU422	12,70	1/2	12,70	.500	3,18	1/8	0,8	1/32	4170857							4170950				2028555			
SPUN120312	SPU423	12,70	1/2	12,70	.500	3,18	1/8	1,2	3/64							4170951					2028560			
SPUN120412	SPU433	12,70	1/2	12,70	.500	4,76	3/16	1,2	3/64												2028562			
SPUN190416	SPU634	19,05	3/4	19,05	.750	4,76	3/16	1,6	1/16												2561892			
SPUN150412	SPUN533	15,88	5/8	15,88	.625	4,76	3/16	1,2	3/64												2028565			2028567
SPUN190412	SPUN633	19,05	3/4	19,05	.750	4,76	3/16	1,2	3/64												2028568			



■ SPUN-T/SPU-T

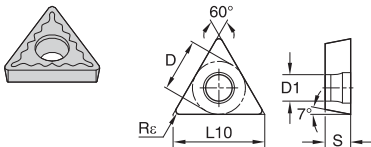
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- first choice
- alternate choice

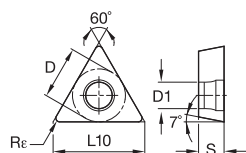
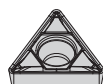
P																					
M																					
K																					
N																					
S																					
H																					

TCMT

[illegible]

■ TCMT-2

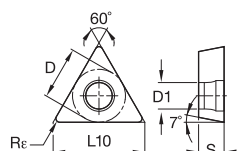
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- first choice
- alternate choice

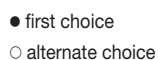
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■ TCMT-FP



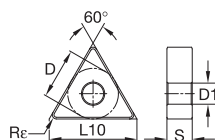
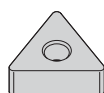
■ TCMT-MP

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WJ10HT	THM	TTM	TTR	TT115	
		mm	in	mm	in	mm	in	mm	in	mm	in																
TCMT110208MP	TCMT2152MP	6,35	1/4	11,00	.433	2,38	3/32	0,8	1/32	2,80	.110	4170231	4170232	4170233	4168904	4168918	4170250	4170251	4170252	4170253	4168905	4168919	4170254	4170255	4170256	4170257	4170258
TCMT16T304MP	TCMT3251MP	9,53	3/8	16,50	.650	3,97	5/32	0,4	1/64	4,40	.173	4170234	4170235	4170236	4168905	4168919	4170251	4170252	4170253	4168905	4168919	4170254	4170255	4170256	4170257	4170258	4170259
TCMT16T308MP	TCMT3252MP	9,53	3/8	16,50	.650	3,97	5/32	0,8	1/32	4,40	.173	4170216	4170233	4170234	4168905	4168919	4170251	4170252	4170253	4168905	4168919	4170254	4170255	4170256	4170257	4170258	4170259
TCMT16T312MP	TCMT3253MP	9,53	3/8	16,50	.650	3,97	5/32	1,2	3/64	4,40	.173	4170234	4170235	4170236	4168905	4168919	4170251	4170252	4170253	4168905	4168919	4170254	4170255	4170256	4170257	4170258	4170259



Inserts

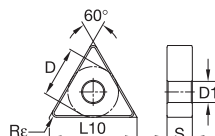
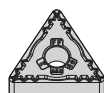




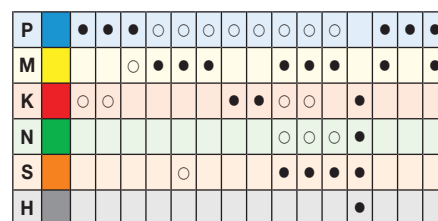
- first choice
- alternate choice

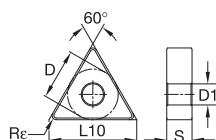
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TNMA



■ TNMG-FF

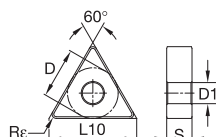
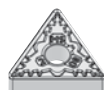
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- first choice
- alternate choice

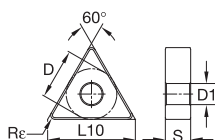
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■ TNMG-MR



■ TNMG-MS

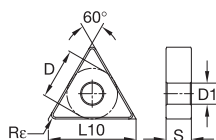
ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
TNMG160404MS	TNMG331MS	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150									5908927	5908928	5908929				
TNMG160408MS	TNMG332MS	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150									5908930	5908931	5908932				
TNMG220404MS	TNMG431MS	12,70	1/2	22,00	.866	4,76	3/16	0,4	1/64	5,16	.203									5908933	5908934	5908935				
TNMG220408MS	TNMG432MS	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203									5908936	5908937	5908938				
TNMG220412MS	TNMG433MS	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203									5908939	5908940	5908941				
TNMG270608MS	TNMG542MS	15,88	5/8	27,50	1.083	6,35	1/4	0,8	1/32	6,35	.250									5908942	5908943					



Inserts

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
TNMG160408RH	TNMG332RH	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	4171007	4171542	4171724	4173058	4173059	4173060	4173061	4173062	4171927	4171928	4171929	4171930	4171931	4171932	4171933	4171934
TNMG160412RH	TNMG333RH	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	4171008	4171543	4171725	4173059	4173060	4173061	4173062	4171928	4171929	4171930	4171931	4171932	4171933	4171934	4171935	4171936
TNMG220408RH	TNMG432RH	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	4171009	4171544	4171726	4173060	4173061	4173062	4171929	4171930	4171931	4171932	4171933	4171934	4171935	4171936	4171937	4171938
TNMG220412RH	TNMG433RH	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203	4171010	4171545	4171727	4173061	4173062	4171930	4171931	4171932	4171933	4171934	4171935	4171936	4171937	4171938	4171939	4171940
TNMG220416RH	TNMG434RH	12,70	1/2	22,00	.866	4,76	3/16	1,6	1/16	5,16	.203	4171011	4171546	4171728	4173062	4171931	4171932	4171933	4171934	4171935	4171936	4171937	4171938	4171939	4171940	4171941	4171942
TNMG270612RH	TNMG543RH	15,88	5/8	27,50	1.083	6,35	1/4	1,2	3/64	6,35	.250	4171012	4171547	4171729	4173062	4171932	4171933	4171934	4171935	4171936	4171937	4171938	4171939	4171940	4171941	4171942	4171943
TNMG270616RH	TNMG544RH	15,88	5/8	27,50	1.083	6,35	1/4	1,6	1/16	6,35	.250	4171013	4171548	4171730	4173062	4171933	4171934	4171935	4171936	4171937	4171938	4171939	4171940	4171941	4171942	4171943	4171944
TNMG330924RH	TNMG666RH	19,05	3/4	33,00	1.299	9,53	3/8	2,4	3/32	7,93	.313	4171014	4171549	4171731	4173062	4171934	4171935	4171936	4171937	4171938	4171939	4171940	4171941	4171942	4171943	4171944	4171945



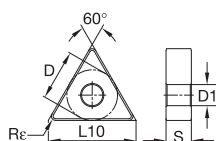


- first choice
- alternate choice

[illegible]

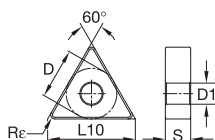
■ TNMG-UF

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WNM25CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TH15
		mm	in	mm	in	mm	in	mm	in	mm	in														
TNMG160404UF	TNMG331UF	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150				4169367	4169393									
TNMG160408UF	TNMG332UF	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	5645615			4169368	4169394				5432605					
TNMG160412UF	TNMG333UF	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150				4169369	4169395									
TNMG220404UF	TNMG431UF	12,70	1/2	22,00	.866	4,76	3/16	0,4	1/64	5,16	.203				4169370	4169396				5645612					
TNMG220408UF	TNMG432UF	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203				4169371	4169397				5645614					



■ TNMG-UM

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT		WP25CT	WP35CT	WM15CT		WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in																	
TNMG160404UM	TNMG331UM	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150					4172369	4172396											
TNMG160408UM	TNMG332UM	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150					4172370	4172397	4172427	4172426			5550228						
TNMG160412UM	TNMG333UM	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150					4172371	4172398	4172428										
TNMG160416UM	TNMG334UM	9,53	3/8	16,50	.650	4,76	3/16	1,6	1/16	3,81	.150						4172399	4172429										
TNMG220404UM	TNMG431UM	12,70	1/2	22,00	.866	4,76	3/16	0,4	1/64	5,16	.203					4172372	4172400	4172430										
TNMG220408UM	TNMG432UM	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	5645266				4172373	4172401	4172431			5645265							
TNMG220412UM	TNMG433UM	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203					4172374	4172402				5473222							



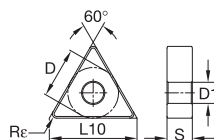
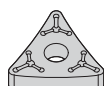
- first choice
- alternate choice

[illegible]

Inserts

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in														
TNMG160408UR	TNMG332UR	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	4171115	4170522	4170035	4169434	4169465	4169502	4170507	4171441	4170525	5579395	4171442	4171443	4171444	4171445
TNMG160412UR	TNMG333UR	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	4171116	4170523	4170036	4169435	4169466	4169503	4170508	4171442	4170526	5579396	4171443	4171444	4171445	4171446
TNMG160416UR	TNMG334UR	9,53	3/8	16,50	.650	4,76	3/16	1,6	1/16	3,81	.150	4171117	4170524	4170037	4169436	4169467	4169504	4170509	4171443	4170527	5579397	4171444	4171445	4171446	4171447
TNMG220408UR	TNMG432UR	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	4171118	4170524	4170036	4169435	4169468	4169503	4170510	4171444	4170528	5579397	4171444	4171445	4171446	4171447
TNMG220412UR	TNMG433UR	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203	4171119	4170525	4170037	4169436	4169469	4169504	4170511	4171445	4170529	5473198	4171445	4171446	4171447	4171448
TNMG220416UR	TNMG434UR	12,70	1/2	22,00	.866	4,76	3/16	1,6	1/16	5,16	.203	4171120	4170526	4170038	4169437	4169470	4169505	4170512	4171446	4170530	5473199	4171446	4171447	4171448	4171449
TNMG270612UR	TNMG543UR	15,88	5/8	27,50	1.083	6,35	1/4	1,2	3/64	6,35	.250	4171121	4170527	4170039	4169437	4169471	4169506	4170513	4171447	4170531	5579405	4171447	4171448	4171449	4171450
TNMG270616UR	TNMG544UR	15,88	5/8	27,50	1.083	6,35	1/4	1,6	1/16	6,35	.250	4171122	4170528	4170040	4169438	4169472	4169507	4170514	4171448	4170532	5579406	4171448	4171449	4171450	4171451

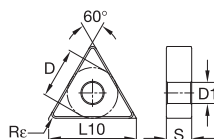
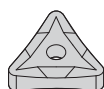




- first choice
- alternate choice

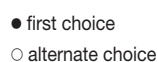
■ TNMM-65

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
TNMM16040865	TNMM33265	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150	■	5696618	5696619	■	■	■	■	■	■	■	■	■	■	■	
TNMM16041265	TNMM33365	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150	■	■	5696620	■	■	■	■	■	■	■	■	■	■	■	
TNMM22040865	TNMM43265	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203	■	5696621	5696622	5696623	■	■	■	■	■	■	■	■	■	■	
TNMM22041265	TNMM43365	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203	■	5696625	5696626	5696627	■	5696624	■	■	■	■	■	■	■	■	
TNMM22041665	TNMM43465	12,70	1/2	22,00	.866	4,76	3/16	1,6	1/16	5,16	.203	■	5696628	5696629	■	■	5696627	■	■	■	■	■	■	■	■	



■ TNMP

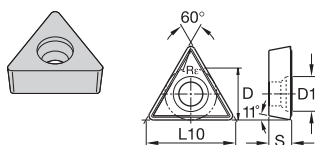
ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT		WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in																
TNMP160404	TNMP331	9,53	3/8	16,50	.650	4,76	3/16	0,4	1/64	3,81	.150					4172143	4173670	4173709			4172491						
TNMP160408	TNMP332	9,53	3/8	16,50	.650	4,76	3/16	0,8	1/32	3,81	.150					4172144	4173671	4173710			4172492	4172623					
TNMP160412	TNMP333	9,53	3/8	16,50	.650	4,76	3/16	1,2	3/64	3,81	.150					4172145	4173672	4173711			4172493	4172624					
TNMP220404	TNMP431	12,70	1/2	22,00	.866	4,76	3/16	0,4	1/64	5,16	.203					4172146	4173673	4173712			4172494						
TNMP220408	TNMP432	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,16	.203					4172147	4173674	4173713			4172495	4172625					
TNMP220412	TNMP433	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	5,16	.203					4172148	4173675	4173714			4172496	4172626					

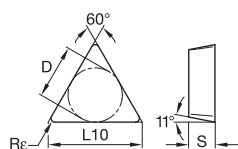
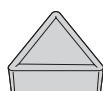
[illegible]

Inserts

The technical drawing illustrates the geometry of a roof structure. It includes a perspective view of a trapezoidal roof element on the left. The central cross-section shows a triangular roof with a 60° angle at the peak. A circle is inscribed within this triangle, with its diameter labeled 'D'. The base of the triangle is divided into two segments: 'Rc' on the left and 'L10' on the right. To the right, a side elevation shows a vertical wall and a roof section with a 11° angle. The horizontal distance from the wall to the edge of the roof is labeled 'S'.

ISO catalog number	ANSI catalog number	D		L10		S		Re		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TT15
		mm	in	mm	in	mm	in	mm	in														
TPGN110308	TPG222	6,35	1/4	11,00	.433	3,18	1/8	0,8	1/32	■	■	■	■	■	■	■	4170952	■	■	■	■	■	■
TPGN160308	TPG322	9,53	3/8	16,50	.650	3,18	1/8	0,8	1/32	■	■	■	■	■	■	■	4170953	■	■	■	■	■	■

[illegible]

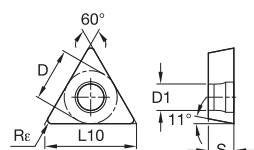
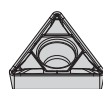


- first choice
- alternate choice

[illegible]

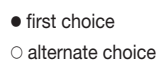
■ **TPMR**

ISO catalog number	ANSI catalog number									WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		D		L10		S		Rε																
		mm	in	mm	in	mm	in	mm	in															
TPMR110304	TPMR221	6,35	1/4	11,00	.433	3,18	1/8	0,4	1/64	4170859	4170860	4170784												
TPMR110308	TPMR222	6,35	1/4	11,00	.433	3,18	1/8	0,8	1/32	4170860	4170785	4170784					4170954							
TPMR160304	TPMR321	9,53	3/8	16,50	.650	3,18	1/8	0,4	1/64	4170861	4170786						4170955							
TPMR160308	TPMR322	9,53	3/8	16,50	.650	3,18	1/8	0,8	1/32	4170862	4170787	4170786					4170956							
TPMR160312	TPMR323	9,53	3/8	16,50	.650	3,18	1/8	1,2	3/64	4170863	4170788						4170957							



■ TPMT-FP

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTM5	
		mm	in	mm	in	mm	in	mm	in	mm	in	4170025	4170035	4170026	4170036	4168818	4168834	4168835	4170112	4170113	4170114	4170115	4170116	4168837	4170117	4168838	4170118
TPMT090208FP	TPMT18152FP	5,56	7/32	9,63	.379	2,38	3/32	0,8	1/32	2,50	.098	4170025	4170035	4170026	4170036	4168818	4168834	4168835	4170112	4170113	4170114	4170115	4170116	4168837	4170117	4168838	4170118
TPMT110204FP	TPMT2151FP	6,35	1/4	11,00	.433	2,38	3/32	0,4	1/64	2,80	.110	4170026	4170036	4170027	4170037	4168819	4168834	4168835	4170113	4170114	4170115	4170116	4168838	4170118	4168839	4170119	4168840
TPMT110208FP	TPMT2152FP	6,35	1/4	11,00	.433	2,38	3/32	0,8	1/32	2,80	.110	4170027	4170037	4170028	4170038	4168820	4168835	4168836	4170114	4170115	4170116	4170117	4168839	4170119	4168840	4170120	4168841
TPMT16T304FP	TPMT3251FP	9,53	3/8	16,50	.650	3,97	5/32	0,4	1/64	4,40	.173	4170028	4170038	4170029	4170039	4168821	4168836	4168837	4170115	4170116	4170117	4170118	4168840	4170120	4168841	4170121	4168842
TPMT16T308FP	TPMT3252FP	9,53	3/8	16,50	.650	3,97	5/32	0,8	1/32	4,40	.173	4170029	4170039	4170030	4170040	4168822	4168837	4168838	4170116	4170117	4170118	4170119	4168841	4170121	4168842	4170122	4168843
TPMT16T312FP	TPMT3253FP	9,53	3/8	16,50	.650	3,97	5/32	1,2	3/64	4,40	.173	4170030	4170040	4170031	4170041	4168823	4168838	4168839	4170117	4170118	4170119	4170120	4168842	4170122	4168843	4170123	4168844
TPMT220408FP	TPMT432FP	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	5,50	.217	4170031	4170041	4170032	4170042	4168824	4168839	4168840	4170118	4170119	4170120	4170121	4168843	4170123	4168844	4170124	4168845

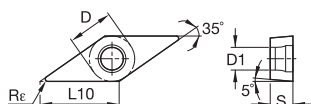
[illegible]

Inserts

The technical drawing illustrates the geometry of a roof structure. It includes a perspective view of a trapezoidal roof element on the left. To its right is a cross-section showing a triangular roof profile with a 60-degree angle at the peak. A dashed circle with radius R_c is inscribed within the triangle, and a horizontal dimension L_{10} is indicated at its base. A vertical dimension D is shown from the base to the top of the circle. On the far right, a side elevation shows a vertical wall of height S and a roof section inclined at an angle of 11 degrees to the horizontal.

ISO catalog number	ANSI catalog number	D		L10		S		Re		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT145
		mm	in	mm	in	mm	in	mm	in	4170864	4170865	4170789	4170789	4170789	4170789	4170789	4170958	4170959	4170960	4170960	2028833	2028833	2028832	2028847
TPUN110304	TPU221	6,35	1/4	11,00	.433	3,18	1/8	0,4	1/64	4170864	4170865	4170789	4170789	4170789	4170789	4170789	4170958	4170959	4170960	4170960	2028833	2028833	2028832	2028847
TPUN110308	TPU222	6,35	1/4	11,00	.433	3,18	1/8	0,8	1/32	4170865	4170866	4170789	4170789	4170789	4170789	4170789	4170958	4170959	4170960	4170960	2028833	2028833	2028832	2028847
TPUN160304	TPU321	9,53	3/8	16,50	.650	3,18	1/8	0,4	1/64	4170866	4170867	4170645	4170645	4170645	4170645	4170645	4170958	4170959	4170960	4170960	2028833	2028833	2028832	2028847
TPUN160308	TPU322	9,53	3/8	16,50	.650	3,18	1/8	0,8	1/32	4170867	4170868	4170646	4170646	4170646	4170646	4170646	4170958	4170959	4170960	4170960	2028833	2028833	2028832	2028847
TPUN160312	TPU323	9,53	3/8	16,50	.650	3,18	1/8	1,2	3/64	4170868	4170869	4170647	4170647	4170647	4170647	4170647	4170958	4170959	4170960	4170960	2028833	2028833	2028832	2028847
TPUN220408	TPU432	12,70	1/2	22,00	.866	4,76	3/16	0,8	1/32	4170869	4170870	4170790	4170790	4170790	4170790	4170790	4170958	4170959	4170960	4170960	2028833	2028833	2028832	2028847
TPUN220412	TPU433	12,70	1/2	22,00	.866	4,76	3/16	1,2	3/64	4170870	4170871	4170791	4170791	4170791	4170791	4170791	4170958	4170959	4170960	4170960	2028833	2028833	2028832	2028847

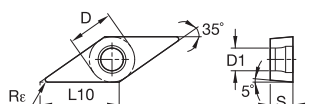




- first choice
- alternate choice

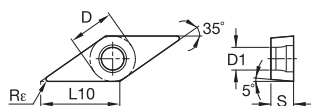
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■ VBMT

[illegible]

■ VBMT-FP

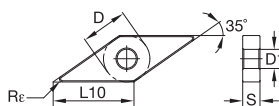
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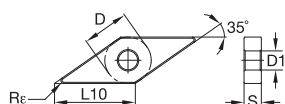


Inserts

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ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15
		D		L10		S		Rε		D1															
		mm	in	mm	in	mm	in	mm	in	mm	in														
VBMT160404MP	VBMT331MP	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	4,40	.173		4170235												
VBMT160408MP	VBMT332MP	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	4,40	.173		4170236				4168922	4168921							
																		4170253	4170254						

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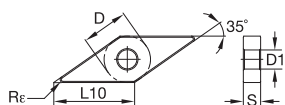


- first choice
- alternate choice

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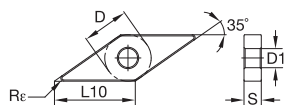
VNGP

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
VNGP160402	VNGP3305	9,53	3/8	16,61	.654	4,76	3/16	0,2	.008	3,81	.150									5549196						
VNGP160401	VNGP330	9,53	3/8	16,61	.654	4,76	3/16	0,1	.004	3,81	.150									5549195		5549211				
VNGP220404	VNGP431	12,70	1/2	22,14	.872	4,76	3/16	0,4	1/64	5,16	.203									5549197						
VNGP220408	VNGP432	12,70	1/2	22,14	.872	4,76	3/16	0,8	1/32	5,16	.203									5549198		5549212				



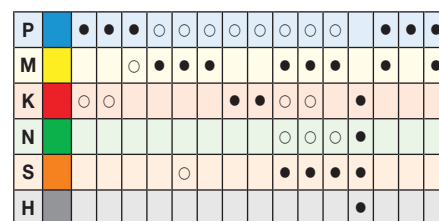
VNMA

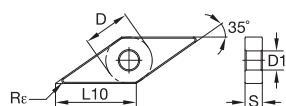
ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
VNMA160408	VNMA332	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150	■	■	■	■	■	■	4171652 4171897	■	■	■	■	■	■	■	■



VNMG

ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TTH5
		D		L10		S		R _e		D1																
		mm	in	mm	in	mm	in	mm	in	mm	in															
VNMG12T304	VNMG12T304	7,14	9/32	12,45	.490	3,97	5/32	0,4	1/64	3,60	.142															
VNMG12T308	VNMG12T308	7,14	9/32	12,45	.490	3,97	5/32	0,8	1/32	3,65	.144							4170965	5095165	5095163	5095166	5095164				

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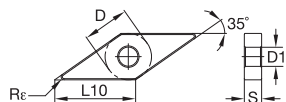


- first choice
- alternate choice

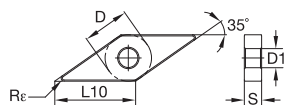
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■ **VNMG-MS**

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in															
VNMG160404MS	VNMG331MS	9,53	3/8	16,61	.654	4,76	3/16	0,4	1/64	3,81	.150									5908944	5908945	5908946				
VNMG160408MS	VNMG332MS	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150									5908947	5908948	5908949				
VNMG220404MS	VNMG431MS	12,70	1/2	22,14	.872	4,76	3/16	0,4	1/64	5,16	.203									5908950	5908961	5908962				
VNMG220408MS	VNMG432MS	12,70	1/2	22,14	.872	4,76	3/16	0,8	1/32	5,16	.203									5908963	5908964	5908965				

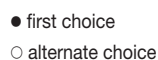


■ VNMG-RH

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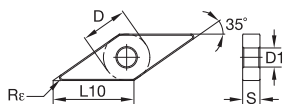
■ VNMG-UF

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[illegible]

■ VNMG-UR

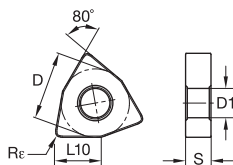
ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TH15
		D		L10		S		R _e		D1														
		mm	in	mm	in	mm	in	mm	in	mm	in													
VNMG160408UR	VNMG332UR	9,53	3/8	16,61	.654	4,76	3/16	0,8	1/32	3,81	.150	4171123	4170529	4170038	4169439	4169473	4169508	-	4171449	-	5579416	-	-	-
VNMG160412UR	VNMG333UR	9,53	3/8	16,61	.654	4,76	3/16	1,2	3/64	3,81	.150	4171124	4170530	-	4169440	4169474	-	-	4171450	5680176	-	-	-	-



VNMP

[illegible]

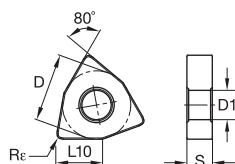
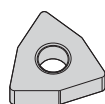
NOTE: DNMP-style inserts are single-sided.



■ WNGG-FS

ISO catalog number	ANSI catalog number											WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTR	TT15	
		D		L10		S		Re		D1																
		mm	in	mm	in	mm	in	mm	in	mm	in															
WNGG080404FS	WNGG431FS	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203															
WNGG080408FS	WNGG432FS	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203								5548688	5548687	5538235	5550004	5550003			

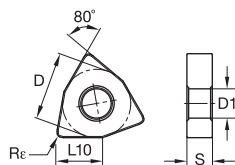




- first choice
- alternate choice

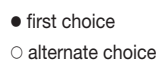
■ **WNMA**

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
WNMA060408	WNMA332	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	■	■	■	■	■	■	4171653	4171898	■	■	■	■	■	■	■
WNMA060412	WNMA333	9,53	3/8	6,52	.257	4,76	3/16	1,2	3/64	3,81	.150	■	■	■	■	■	■	4171899	4171898	■	■	■	■	■	■	■
WNMA080408	WNMA432	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	■	■	■	■	■	■	4171654	4171900	■	■	■	■	■	■	■
WNMA080412	WNMA433	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	■	■	■	■	■	■	4171655	4171901	■	■	■	■	■	■	■
WNMA080416	WNMA434	12,70	1/2	8,69	.342	4,76	3/16	1,6	1/16	5,16	.203	■	■	■	■	■	■	4171656	4171902	■	■	■	■	■	■	■



■ WNMG-FF

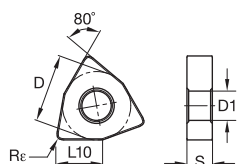
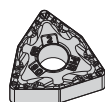
ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TH45
		mm	in	mm	in	mm	in	mm	in	mm	in															
WNMG060404FF	WNMG331FF	9,53	3/8	6,52	.257	4,76	3/16	0,4	1/64	3,81	.150	4171055	4171056	4171057	4172696	4172697	4172698	4171388	4171389	5684336	5684335					
WNMG060408FF	WNMG332FF	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	4171056	4171057	4171058	4172697	4172698	4172699	4171388	4171389	5684336	5684335					
WNMG080404FF	WNMG431FF	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203	4171057	4171058	4171059	4172697	4172698	4172699	4171388	4171389	5684336	5684335					
WNMG080408FF	WNMG432FF	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	4171058	4171059	4171060	4172698	4172699	4172700	4171389	4171390	5684337	5684336					

[illegible]

Inserts

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
WNMG060404ML	WNMG331ML	9,53	3/8	6,52	.257	4,76	3/16	0,4	1/64	3,81	.150	4171081	4171082	4171083	4171084	4171085	4171086	4171087	4171088	4171089	4171090	4171091	4171092	4171093	4171094	4171095
WNMG060408ML	WNMG332ML	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	4171082	4170497	4170498	4170499	4170500	4170501	4171676	4171415	4171416	4171417	4171418	4171419	4171420	4171421	4171422
WNMG080404ML	WNMG431ML	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203	4171083	4171084	4171085	4171086	4171087	4171088	4171678	4171417	4171418	4171419	4171420	4171421	4171422	4171423	4171424
WNMG080408ML	WNMG432ML	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	4171084	4170499	4170500	4170501	4170502	4171679	4171418	4171419	4171420	4171421	4171422	4171423	4171424	4171425	4171426

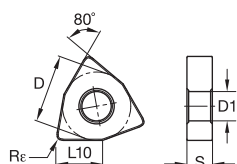




- first choice
- alternate choice

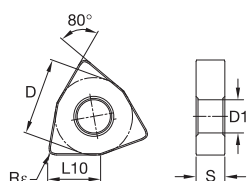
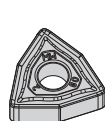
[illegible]

■ WNMG-MR

[illegible]

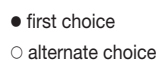
■ WNMG-MS

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT115
		mm	in	mm	in	mm	in	mm	in	mm	in															
WNMG060408MS	WNMG332MS	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	■	■	■	■	■	■	■	■	5908966	5908967	5908968	■	■	■	■
WNMG080404MS	WNMG431MS	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203	■	■	■	■	■	■	■	■	5908969	5908970	5908971	■	■	■	■
WNMG080408MS	WNMG432MS	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	■	■	■	■	■	■	■	■	5908972	5908973	5908974	■	■	■	■

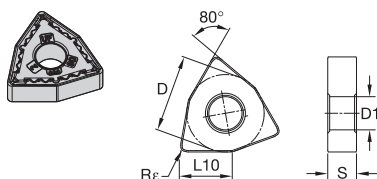


■ WNMG-MW

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS10PT	WS28PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
WNMG060408MW	WNMG332MW	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	5623512	5623513	5623517	5623518	5623519	5623520	5623521	5623522	5623523	5623524	5623525	5623526	5623527	5623528	5623529
WNMG080408MW	WNMG432MW	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	5623516	5623517	5623518	5623519	5623520	5623521	5623522	5623523	5623524	5623525	5623526	5623527	5623528	5623529	5623530
WNMG080412MW	WNMG433MW	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	5623516	5623517	5623518	5623519	5623520	5623521	5623522	5623523	5623524	5623525	5623526	5623527	5623528	5623529	5623530

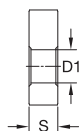
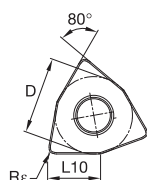
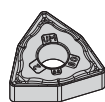
[illegible]

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in														
WNMG060408RH	WNMG332RH	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	4171018	4171018	4171553	4171735		4173063								
WNMG080408RH	WNMG432RH	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	4171019	4171554	4171736		4173064			4171932						
WNMG080412RH	WNMG433RH	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	4171020	4171555	4171737		4173065			4171933						
WNMG080416RH	WNMG434RH	12,70	1/2	8,69	.342	4,76	3/16	1,6	1/16	5,16	.203	4171021	4171556	4171738		4173066			4171934						



ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT		WP25CT	WP35CT	WN15CT	WN25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTT	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in														
WNMG060404UF	WNMG331UF	9,53	3/8	6,52	.257	4,76	3/16	0,4	1/64	3,81	.150					4169374	4169400				5645621						
WNMG060408UF	WNMG332UF	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150					4169375	4169401				5645622						
WNMG080404UF	WNMG431UF	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203					4169376	4169402				5645619						
WNMG080408UF	WNMG432UF	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203					4169377	4169403				5645623						
WNMG080412UF	WNMG433UF	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203					4169378	4169404				5645624						



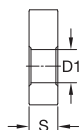
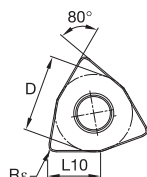
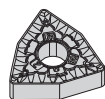


- first choice
- alternate choice

[illegible]

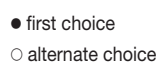
■ WNMG-UM

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WP15CT		WP25CT	WP35CT	WM15CT	WM25CT	WM35CT	WK05CT	WK20CT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in															
WNMG060404UM	WNMG331UM	9,53	3/8	6,52	.257	4,76	3/16	0,4	1/64	3,81	.150					4172375	4172403	4172432								
WNMG060408UM	WNMG332UM	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150					4172376	4172404	4172433			5645267					
WNMG060412UM	WNMG333UM	9,53	3/8	6,52	.257	4,76	3/16	1,2	3/64	3,81	.150						4172405	4172434								
WNMG080404UM	WNMG431UM	12,70	1/2	8,69	.342	4,76	3/16	0,4	1/64	5,16	.203					4172377	4172406	4172435								
WNMG080408UM	WNMG432UM	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203			5645270		4172378	4172407	4172436								
WNMG080412UM	WNMG433UM	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203		5645271			4172379	4172408	4172437			5645269					
WNMG080416UM	WNMG434UM	12,70	1/2	8,69	.342	4,76	3/16	1,6	1/16	5,16	.203						4172409	4172438								



■ WNMG-UR

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WN35CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT1F
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
WNMG060408UR	WNMG332UR	9,53	3/8	6,52	.257	4,76	3/16	0,8	1/32	3,81	.150	4171125	4170531	4170039	4169441	4169475	-	-	4171451	5680178	5680177	-	-	-	-	-
WNMG060412UR	WNMG333UR	9,53	3/8	6,52	.257	4,76	3/16	1,2	3/64	3,81	.150	4171126	4170532	-	-	-	-	-	4171452	-	-	-	-	-	-	-
WNMG080408UR	WNMG432UR	12,70	1/2	8,69	.342	4,76	3/16	0,8	1/32	5,16	.203	4171127	4170533	4170040	4169442	4169476	4169509	5680179	4171453	-	-	-	-	-	-	-
WNMG080412UR	WNMG433UR	12,70	1/2	8,69	.342	4,76	3/16	1,2	3/64	5,16	.203	4171128	4170534	4170041	4169443	4169477	4169510	-	4171454	5579420	-	-	-	-	-	-
WNMG080416UR	WNMG434UR	12,70	1/2	8,69	.342	4,76	3/16	1,6	1/16	5,16	.203	4171129	4170535	4170042	-	4169478	4169511	-	4171455	-	-	-	-	-	-	-

[illegible]

Inserts

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WK05CT	WK20CT	WS10PT	WS25PT	WU10HT	THM	TTM	TTR	TT15
		mm	in	mm	in	mm	in	mm	in	mm	in	1	1	1	1	1	1	1	1	1	1	1	1	1	1
WPMTS3T104FP	WPMT15121FP	4,76	3/16	3,25	.128	1,98	5/64	0,4	1/64	2,15	.085	1	4170343	1	1	4168841	1	1	1	1	1	1	1	1	1
WPMT040204FP	WPMT2151FP	6,35	1/4	4,34	.171	2,38	3/32	0,4	1/64	2,80	.110	1	4170341	1	1	1	1	1	1	1	1	1	1	1	1
WPMT06T304FP	WPMT3251FP	9,53	3/8	6,52	.257	3,97	5/32	0,4	1/64	4,40	.173	1	4170030	1	1	4168821	1	1	1	1	1	1	1	1	1
WPMT06T308FP	WPMT3252FP	9,53	3/8	6,52	.257	3,97	5/32	0,8	1/32	4,40	.173	1	4170031	1	1	4168840	1	1	1	1	1	1	1	1	1

