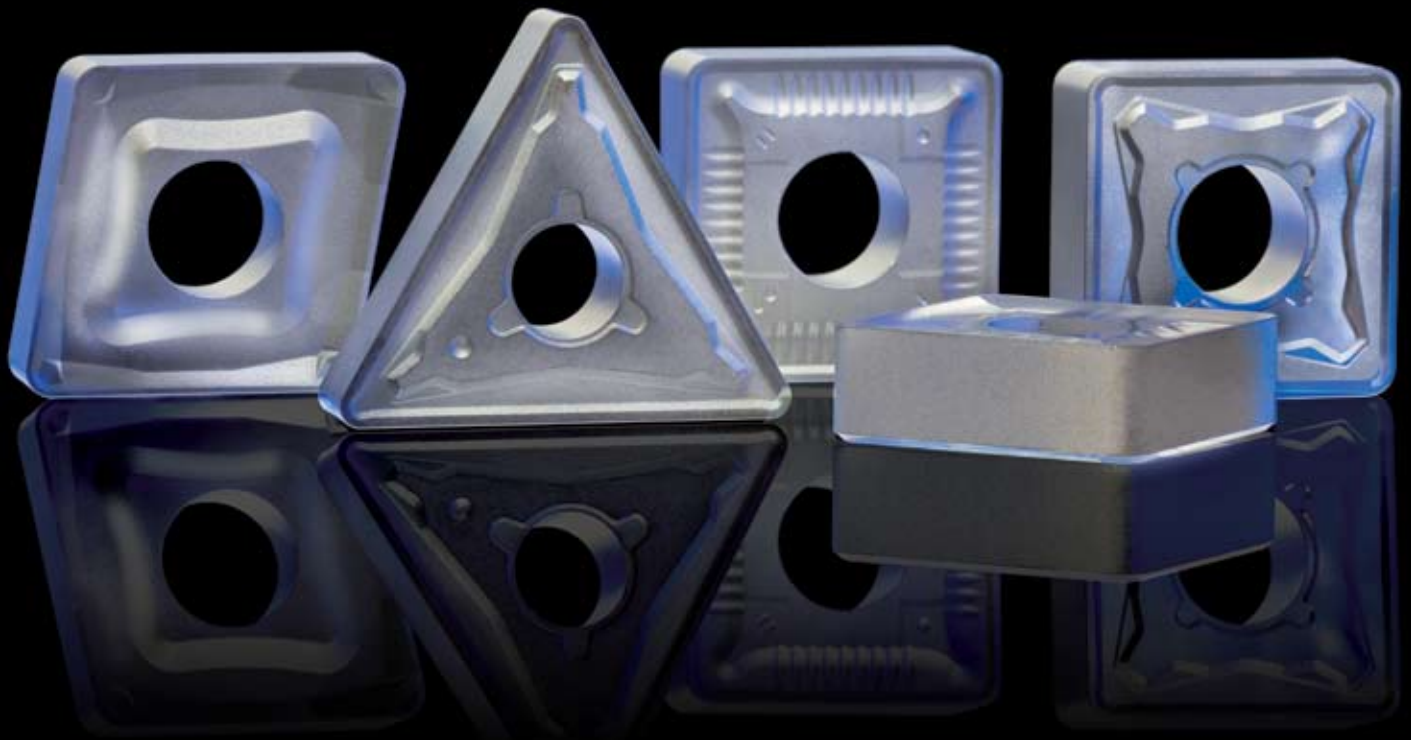


## 5600 SERIES

It's Simple. Just Run It 20% Faster.



**NEW TURNING GRADES FOR STEEL**

REALIZE UP TO 50% OR MORE IN COST SAVINGS

MAKE US PROVE IT

**Valenite®**  
WE NEVER STOP...



## 5600 SERIES

# ACHIEVE VALENITE VELOCITY!

**JUST RUN IT FASTER!** Our new 5600 Series for your steel turning challenges.

Accelerate your steel turning operations to unsurpassed performance with our new 5600 Series turning grades. Combining industry-leading substrates, coatings, edge preparation and post-coating surface treatment extends the operating range of all three grades.

- ➔ **VP5615**  
For semi-finish and finishing operations in carbon and alloy steels, and select cast iron applications
- ➔ **VP5625**  
Multi-purpose grade for roughing to semi-finishing in plain carbon, alloy and stainless steels
- ➔ **NEW! VP5635**  
Tough grade for roughing steels, stainless steels and cast iron



# 5600 SERIES

## INDUSTRIES

AUTOMOTIVE

DIE & MOLD

OIL/GAS

AEROSPACE

POWER GENERATION

OFF HIGHWAY

MEDICAL

MARINE



## TEST RESULTS PROVE IT

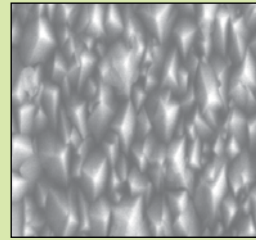
	Speed Rate	Feed Rate	Tool Life	Production Cost Savings	Material
<b>VP5615</b>	<b>600</b>	0.01	<b>100</b>	<b>45%</b>	440C
Competitor	350	0.01	60		
<b>Improvement</b>	<b>71%</b>	-	<b>67%</b>		
<b>VP5625</b>	<b>800</b>	<b>0.0150</b>	<b>2</b>	<b>33%</b>	Steel, Steel Bar
Competitor	650	0.0126	1		
<b>Improvement</b>	<b>23%</b>	<b>19%</b>	<b>100%</b>		
<b>VP5635</b>	735	0.01	<b>95</b>	<b>3%</b>	303 SS
Competitor	735	0.01	75		
<b>Improvement</b>	-	-	<b>26%</b>		

# 5600 SERIES

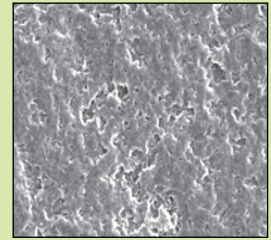
4

## TOP SURFACE

The coated surface is "polished smooth" in a unique, patented, post-coating process. The process results in a smoother surface with increased edge strength by relieving inherent stresses in the coating.



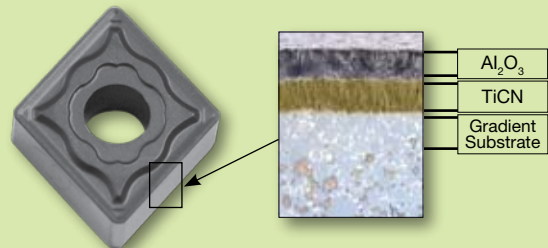
Non-Treated Surface



Treated Surface

## COATING

Aluminum Oxide layer two times the thickness of prior levels.



## SUBSTRATE

Precisely controlled gradient substrate technology. Each grade is optimized for the correct core hardness for the application.

## EDGE PREPARATION

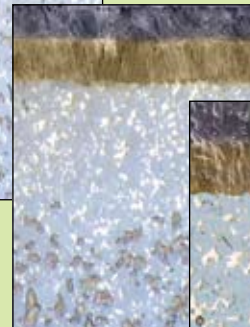
Exclusive edge preparation process provides accurate control of cutting edge from insert nose to depth of cut line. Precise edge control optimizes the strength and wear characteristics of the insert regardless of depth of cut and feed rate.

## BI-COLOR

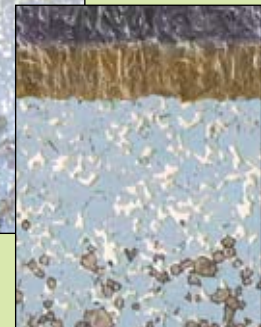
Gray-colored flank face to easily detect tool wear development for the proper time to index.



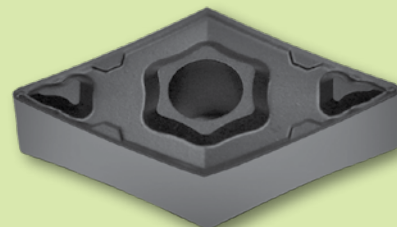
VP5615



VP5625

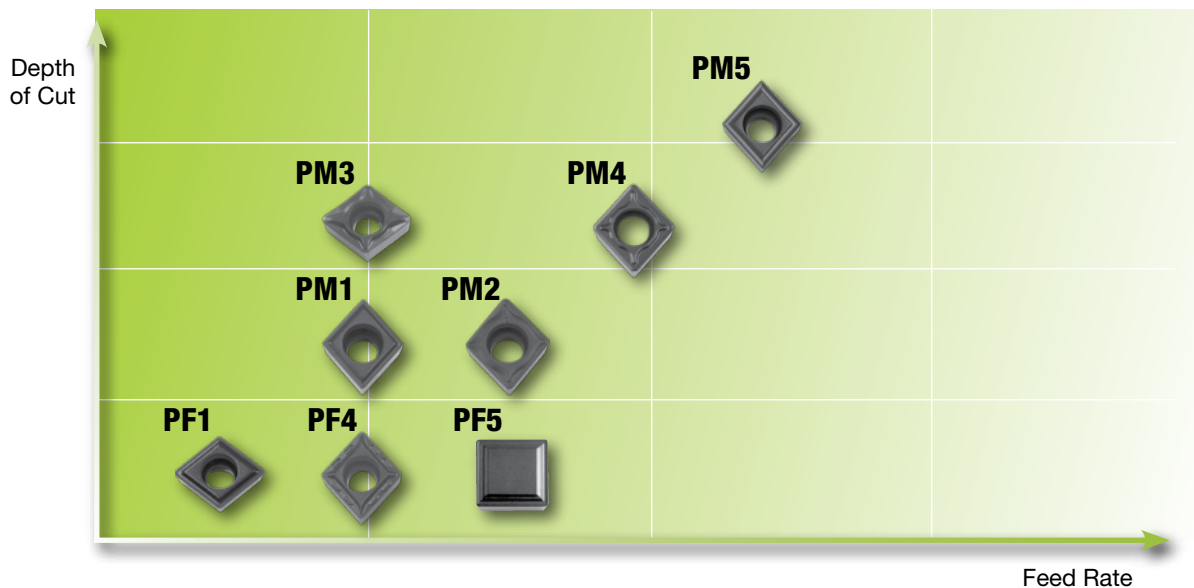


VP5635



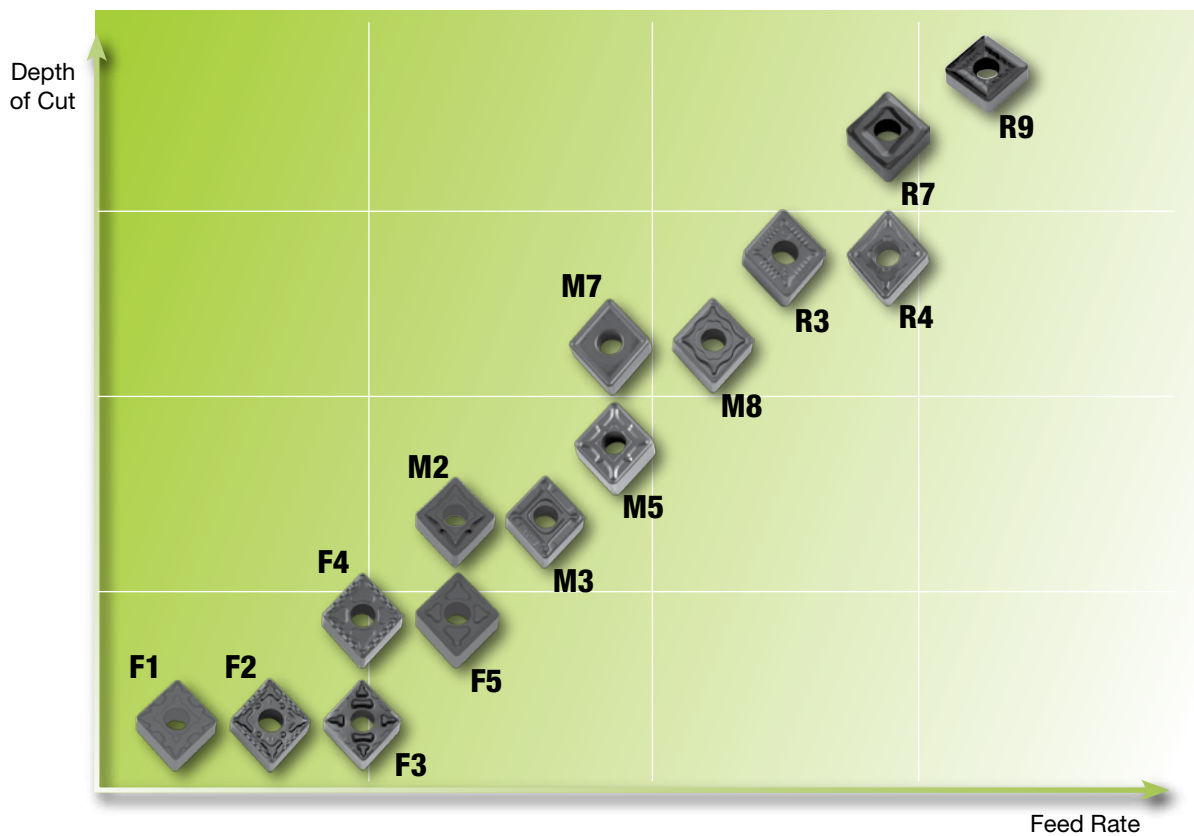
# 5600 SERIES

## CHIPBREAKER GUIDE - POSITIVE INSERTS




5

## CHIPBREAKER GUIDE - NEGATIVE INSERTS



# 5600 SERIES

## CUTTING DATA

Steel 	Operation	Depth of Cut mm (inch)	Feed mm/rev (ipr)	Cutting Speed / Chipbreaker Designation											
				Free Machining and Low Carbon Steels				Medium Carbon and High Carbon Steels		Alloy Steels and Easy to Machine Tool Steels		Tool Steels and Die Steels			
				v <sub>c</sub> m/min (SFM)	Geometries		v <sub>c</sub> m/min (SFM)	Geometries		v <sub>c</sub> m/min (SFM)	Geometries		v <sub>c</sub> m/min (SFM)	Geometries	
					1 <sup>st</sup>	2 <sup>nd</sup>		1 <sup>st</sup>	2 <sup>nd</sup>		1 <sup>st</sup>	2 <sup>nd</sup>		1 <sup>st</sup>	2 <sup>nd</sup>

### NEGATIVE TOP FORM GEOMETRY

VP5615	R	2.0-7.6 (.080-.300)	0.25-0.64 (.010-.025)	288 (945)	<b>R3</b> R4	247 (810)	<b>R3</b> M8	205 (675)	<b>R3</b> M8	165 (540)	<b>R3</b> M8
	GP	1.0-3.8 (.040-.150)	0.2-0.4 (.008-.015)	535 (1755)	<b>M5</b> M8	412 (1350)	<b>M5</b> M8	370 (1215)	<b>M5</b> M8	205 (675)	<b>M5</b> M8
	F	0.5-1.3 (.020-.050)	0.1-0.2 (.004-.008)	617 (2025)	<b>F2</b> F4	494 (1620)	<b>F2</b> F4	412 (1350)	<b>F2</b> F4	227 (742.5)	<b>M5</b> M3
VP5625	R	2.0-7.6 (.080-.300)	0.25-0.64 (.010-.025)	229 (750)	<b>R3</b> R4	190 (625)	<b>R3</b> M8	153 (500)	<b>R3</b> M8	95 (313)	<b>R3</b> M8
	GP	1.0-3.8 (.040-.150)	0.2-0.4 (.008-.015)	419 (1375)	<b>M5</b> M8	305 (1000)	<b>M5</b> M8	266 (875)	<b>M8</b> M5	114 (375)	<b>M5</b> M8
	F	0.5-1.3 (.020-.050)	0.1-0.2 (.004-.008)	458 (1500)	<b>F2</b> F4	381 (1250)	<b>F2</b> F4	305 (1000)	<b>F2</b> F4	134 (438)	<b>M5</b> M3
VP5635	R	2.0-7.6 (.080-.300)	0.25-0.64 (.010-.025)	167 (550)	<b>R3</b> <b>M8</b>	134 (440)	<b>R3</b> <b>M8</b>	100 (330)	<b>R3</b> <b>M8</b>	58 (192.5)	<b>M8</b> M5
	GP	1.0-3.8 (.040-.150)	0.2-0.4 (.008-.015)	268 (880)	<b>R3</b> <b>M8</b>	201 (660)	<b>R3</b> <b>M8</b>	167 (550)	<b>R3</b> <b>M8</b>	67 (220)	<b>M8</b> M5
	F	-	-	-	-	-	-	-	-	-	-

### POSITIVE TOP FORM GEOMETRY

VP5615	R	-	-	-	-	-	-	-	-	-	-
	GP	0.8-3.1 (.030-.120)	0.13-0.5 (.005-.020)	535 (1755)	PM2* PM4**	412 (1350)	PM2* PM4**	370 (1215)	PM2* PM4**	-	-
	F	0.5-1.0 (.020-.040)	0.1-0.25 (.004-.010)	617 (2025)	<b>PF4*</b>	494 (1620)	<b>PF4*</b>	412 (1350)	<b>PF4*</b>	-	-
VP5625	R	-	-	-	-	-	-	-	-	-	-
	GP	0.8-3.1 (.030-.120)	0.13-0.5 (.005-.020)	419 (1375)	PM2* PM4**	305 (1000)	PM2* PM4**	266 (875)	PM2* PM4**	-	-
	F	0.5-1.0 (.020-.040)	0.1-0.25 (.004-.010)	458 (1500)	<b>PF4*</b>	381 (1250)	<b>PF4*</b>	305 (1000)	<b>PF4*</b>	-	-
VP5635	R	0.3-3.1 (.010-.120)	0.13-0.5 (.005-.020)	234 (770)	<b>PM2*</b>	201 (660)	<b>PM2*</b>	167 (550)	<b>PM2*</b>	-	-
	GP	0.8-3.1 (.030-.120)	0.13-0.5 (.005-.020)	268 (880)	<b>PM2*</b>	167 (550)	<b>PM2*</b>	151 (495)	<b>PM2*</b>	-	-
	F	-	-	-	-	-	-	-	-	-	-

Consult Turning Catalog for additional grades availability and application information.

R = Roughing

GP = General Purpose

F = Finishing

**Bold** print indicates first choice

\* Continuous Cut \*\* Moderate Interruption

Cutting parameters provided for ANSI negative are based on CNMG 433. Cutting parameters provided for ISO positive are based on CCMT 432.

You may increase/decrease cutting parameters to optimize your application depending on many factors including: work piece type and hardness, surface finish required, insert size, shape and nose radius, lead angle, chipbreaker, cycle time required, desired tool life, desired failure mode, and reason for indexing.

# 5600 SERIES

## TEST RESULTS

Speed Rate	Feed Rate	Total Time	Material	Number of Parts Produced	Production Cost	Production Cost Savings
(in./min)	(ipr)	(h)				(\$)

<b>VP5625</b>	<b>450</b>	<b>0.008</b>	<b>386</b>	N-80	6,000	<b>37%</b>	
Competitor	380	0.006	615				
<b>Improvement</b>	<b>18%</b>	<b>33%</b>	<b>59%</b>				

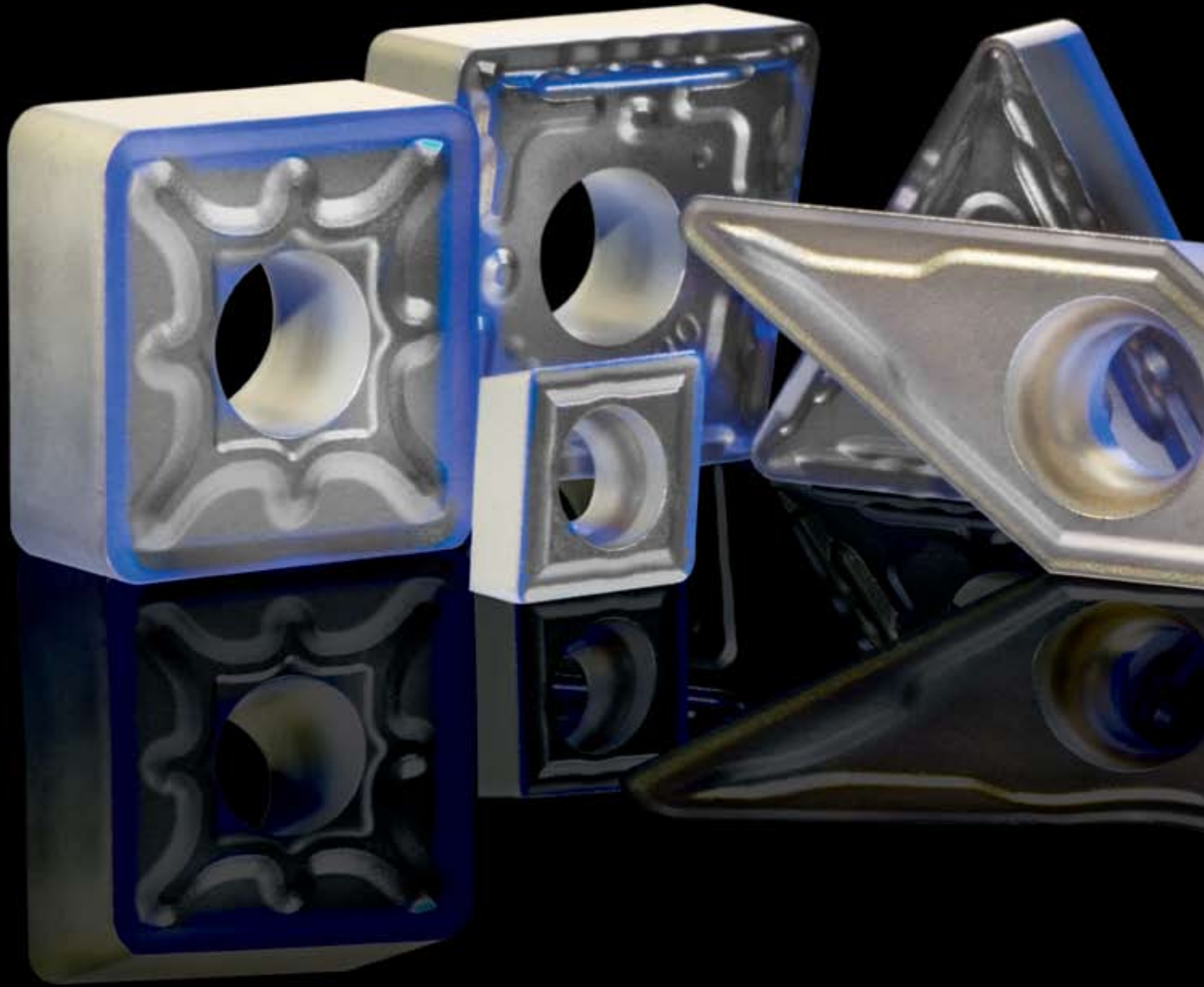
Speed Rate	Feed Rate	Total Time	Material	Number of Parts Produced	Production Cost	Production Cost Savings
(in./min)	(ipr)	(h)				(\$)

<b>VP5615</b>	<b>850</b>	<b>0.012</b>	<b>73</b>	Steel SAE 52100	20,160	<b>51%</b>	
Competitor	750	0.008	151				
<b>Improvement</b>	<b>13%</b>	<b>50%</b>	<b>78%</b>				

Speed Rate	Feed Rate	Total Time	Material	Number of Parts Produced	Production Cost	Production Cost Savings
(in./min)	(ipr)	(h)				(\$)

<b>VP5635</b>	650	0.01	<b>56</b>	400 BHN Threaded Bar Stock	25,000	<b>39%</b>	
Competitor	650	0.01	93				
<b>Improvement</b>	-	-	<b>40%</b>				

**Valenite**<sup>®</sup>






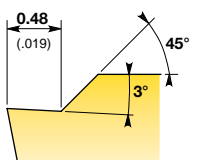
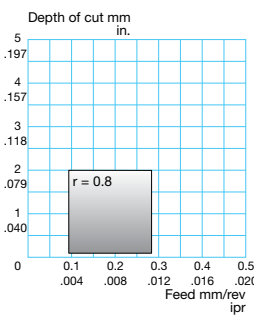
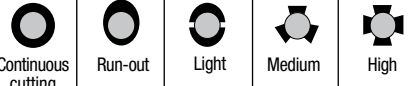

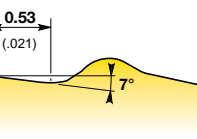
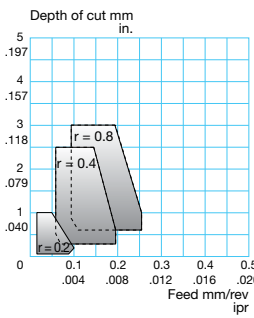
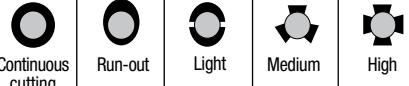

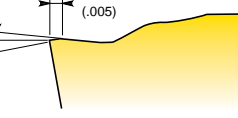
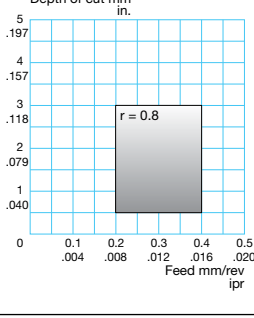
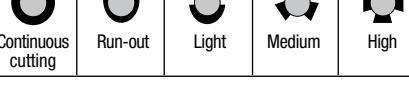

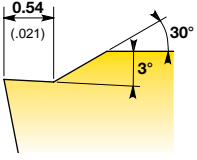
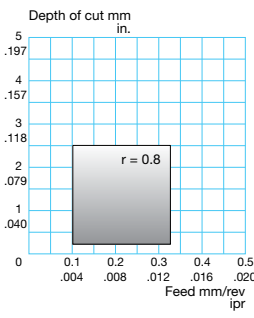
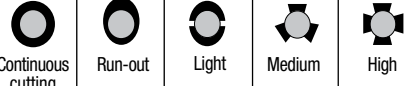
# 5600 SERIES

## APPLICATION GUIDE




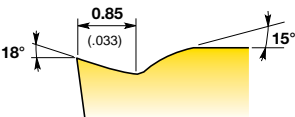
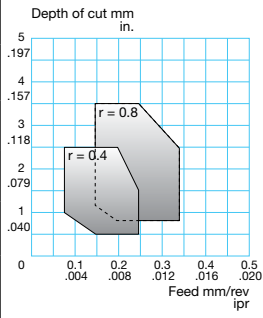
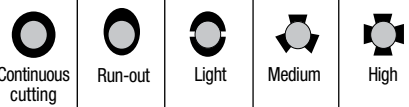

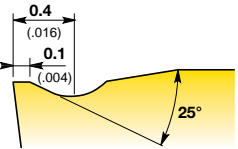
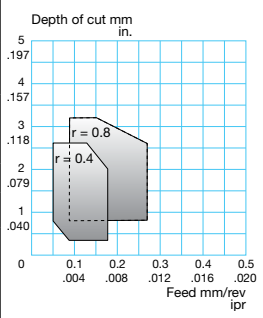
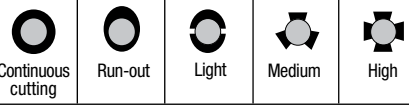

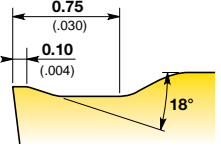
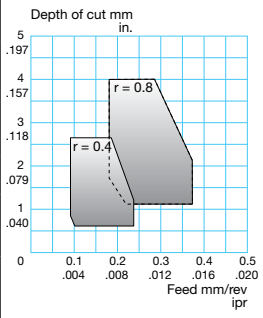
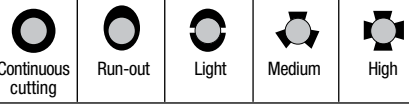

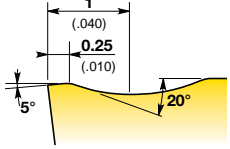
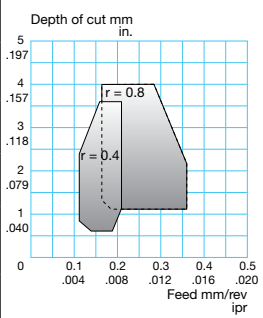
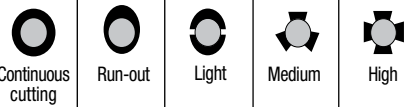
# 5600 SERIES

## APPLICATION GUIDE

ISO Positive	Chipbreaker Profile - mm (in.)	Applications	Description
 <p>PF1</p>	 <p>0.48 (.019)</p> <p>45°</p> <p>3°</p>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p> <p>r = 0.8</p>	 <p>Continuous cutting Run-out Light Medium High</p> <p><b>PF1</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.13 - 2.0 mm            (.005 - .080 inch)            Feed: .....<math>f</math> = 0.08 - 0.28 mm/rev            (.003 - .011 ipr)</p>
 <p>PF4</p>	 <p>0.53 (.021)</p> <p>7°</p>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p> <p>r = 0.8</p> <p>r = 0.4</p> <p>r = 0.2</p>	 <p>Continuous cutting Run-out Light Medium High</p> <p><b>PF4</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.15 - 3.0 mm            (.006 - .120 inch)            Feed: .....<math>f</math> = 0.05 - 0.28 mm/rev            (.002 - .011 ipr)</p>
 <p>PF5</p>	 <p>0.127 (.005)</p> <p>10°</p> <p>5°</p>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p> <p>r = 0.8</p>	 <p>Continuous cutting Run-out Light Medium High</p> <p><b>PF5</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.5 - 3.0 mm            (.020 - .120 inch)            Feed: .....<math>f</math> = 0.2 - 0.4 mm/rev            (.008 - .016 ipr)</p>
 <p>PM1</p>	 <p>0.54 (.021)</p> <p>30°</p> <p>3°</p>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p> <p>r = 0.8</p>	 <p>Continuous cutting Run-out Light Medium High</p> <p><b>PM1</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.25 - 2.5 mm            (.010 - .100 inch)            Feed: .....<math>f</math> = 0.1 - 0.33 mm/rev            (.004 - .013 ipr)</p>

# 5600 SERIES

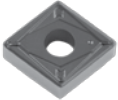
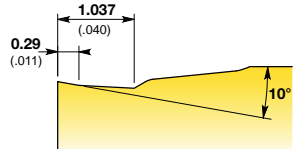

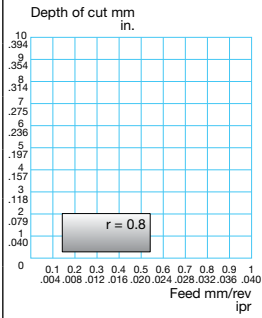
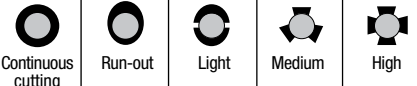

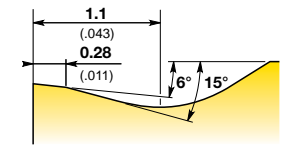

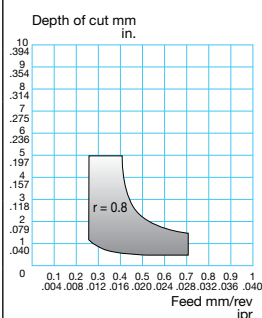
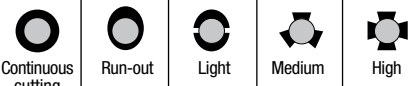

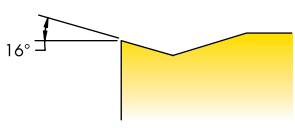

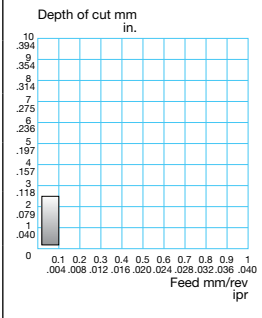
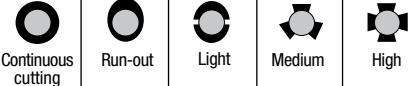
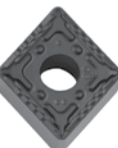
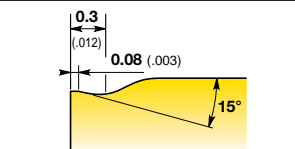

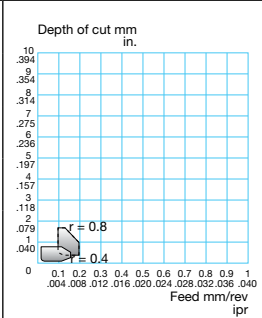
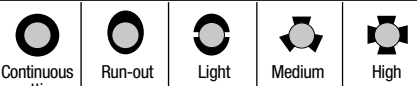
## APPLICATION GUIDE

ISO Positive	Chipbreaker Profile - mm (in.)	Applications	Description
 <p>PM2</p>	 <ul style="list-style-type: none"> <li>Finishing / semi-finishing applications</li> <li>Positive cutting edge for reduced forces</li> <li>Broad chip-control application range</li> <li>Excellent profiling capability</li> </ul>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p>	 <p>Continuous cutting Run-out Light Medium High</p> <p><b>PM2</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = ap 0.5 - 3.5 mm (.020 - .140 inch)            Feed: ..... f = 0.08 - 0.34 mm/rev (.003 - .013 ipr)</p>
 <p>PM3</p>	 <ul style="list-style-type: none"> <li>Finishing and semi-finishing</li> <li>High positive cutting angle</li> <li>Low cutting forces</li> <li>Good chip control at light depth of cut</li> </ul>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p>	 <p>Continuous cutting Run-out Light Medium High</p> <p><b>PM3</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.4 - 3.0 mm (.016 - .120 inch)            Feed: ..... f = 0.06 - 0.28 mm/rev (.002 - .011 ipr)</p>
 <p>PM4</p>	 <ul style="list-style-type: none"> <li>Semi-finishing to medium machining</li> <li>Low to medium feed rates</li> <li>Medium depths of cut</li> <li>Good chip control</li> </ul>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p>	 <p>Continuous cutting Run-out Light Medium High</p> <p><b>PM4</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.6 - 4.0 mm (.024 - .160 inch)            Feed: ..... f = 0.1 - 0.36 mm/rev (.004 - .014 ipr)</p>
 <p>PM5</p>	 <ul style="list-style-type: none"> <li>Semi-finishing to light roughing</li> <li>Medium feed rates</li> <li>Medium depths of cut</li> </ul>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p>	 <p>Continuous cutting Run-out Light Medium High</p> <p><b>PM5</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.6 - 4.0 mm (.024 - .160 inch)            Feed: ..... f = 0.12 - 0.4 mm/rev (.005 - .016 ipr)</p>

# 5600 SERIES

## APPLICATION GUIDE

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ISO Negative	Chipbreaker Profile - mm (in.)	Applications	Description
 <p>WN3</p>	 <ul style="list-style-type: none"> <li>Finishing wiper application</li> <li>High productivity by increased feed rates</li> <li>Produces excellent surface finishes</li> <li>Light to medium depths of cut</li> </ul>	 	 <p style="text-align: center;"><b>WN3</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.3 - 2.0 mm            (.012 - .080 inch)            Feed: .....<math>f</math> = 0.15 - 0.56 mm/rev            (.006 - .022 ipr)</p>
 <p>6W</p>	 <ul style="list-style-type: none"> <li>Wiper geometry for semi-finishing and finishing</li> <li>Good surface finishes at high feed rates</li> <li>Medium to heavy depths of cut</li> </ul>	 	 <p style="text-align: center;"><b>6W</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.6 - 5.0 mm            (.024 - .197 inch)            Feed: .....<math>f</math> = 0.25 - 0.7 mm/rev            (.010 - .028 ipr)</p>
 <p>F1</p>	 <ul style="list-style-type: none"> <li>Fine finishing application</li> <li>High positive cutting angle</li> <li>Produces excellent finishes</li> </ul>	 	 <p style="text-align: center;"><b>F1</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.13 - 2.54 mm            (.005 - .100 inch)            Feed: .....<math>f</math> = 0.05 - 0.25 mm/rev            (.002 - .010 ipr)</p>
 <p>F2</p>	 <ul style="list-style-type: none"> <li>Finishing applications</li> <li>Good chip control on light cuts</li> </ul>	 	 <p style="text-align: center;"><b>F2</b></p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.1 - 2.0 mm            (.004 - .080 inch)            Feed: .....<math>f</math> = 0.04 - 0.2 mm/rev            (.002 - .008 ipr)</p>

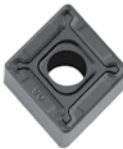
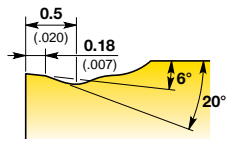
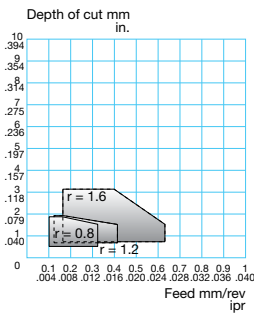
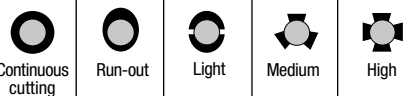
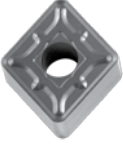
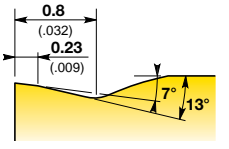
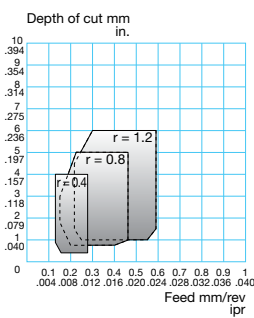
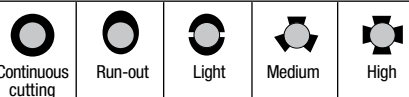
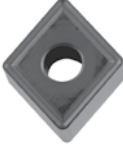
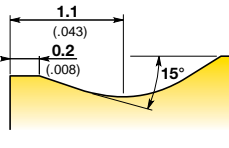
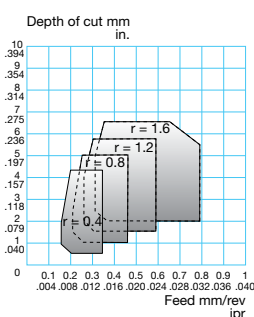
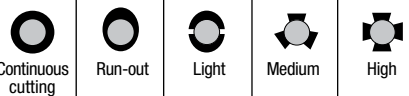
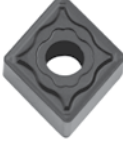
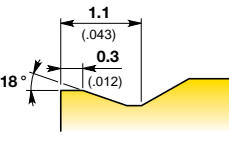
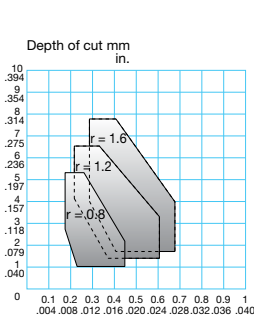
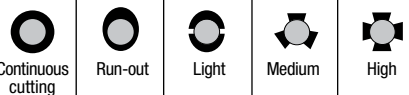
# 5600 SERIES

## APPLICATION GUIDE

ISO Negative	Chipbreaker Profile - mm (in.)	Applications	Description
F3	<ul style="list-style-type: none"> <li>Semi-finishing application</li> <li>Medium positive cutting angle</li> <li>Excellent profiling capability</li> </ul>		<p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.3 - 3.8 mm            (.012 - .150 inch)            Feed: .....<math>f</math> = 0.08 - 0.4 mm/rev            (.003 - .016 ipr)</p>
F4	<ul style="list-style-type: none"> <li>Geometry for finishing and semi-finishing</li> </ul>		<p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.2 - 4.0 mm            (.012 - .150 inch)            Feed: .....<math>f</math> = 0.08 - 0.3 mm/rev            (.003 - .012 ipr)</p>
F5	<ul style="list-style-type: none"> <li>Finishing to medium machining</li> <li>High positive cutting angle</li> <li>Low cutting forces - ideal for soft materials, work hardening materials</li> </ul>		<p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.3 - 5.0 mm            (.012 - .200 inch)            Feed: .....<math>f</math> = 0.05 - 0.4 mm/rev            (.002 - .016 ipr)</p>
M2	<ul style="list-style-type: none"> <li>Semi-finishing to light roughing</li> <li>High positive cutting angle</li> <li>Low cutting forces - ideal for soft materials, work hardening materials</li> </ul>		<p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.4 - 4.0 mm            (.016 - .160 inch)            Feed: .....<math>f</math> = 0.1 - 0.4 mm/rev            (.004 - .016 ipr)</p>

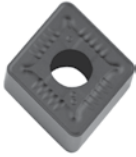
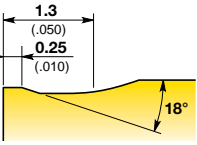
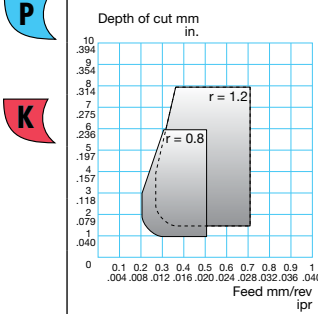
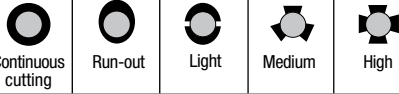

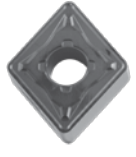
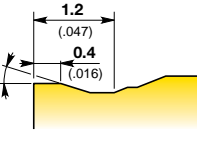
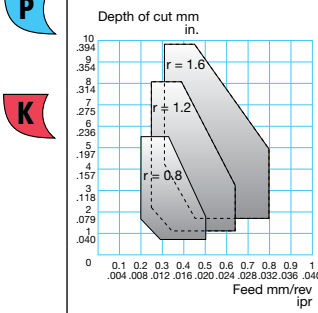
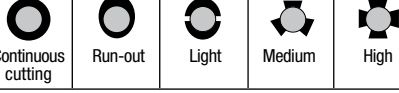

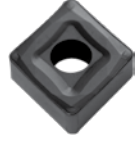
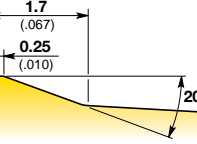
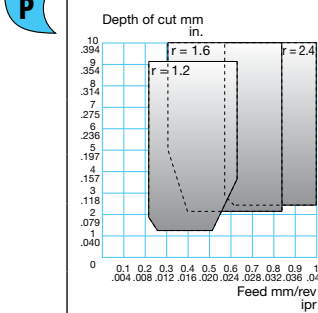
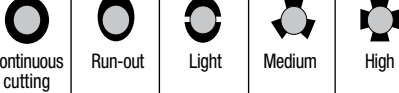

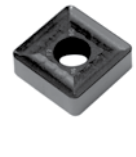
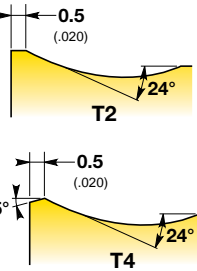
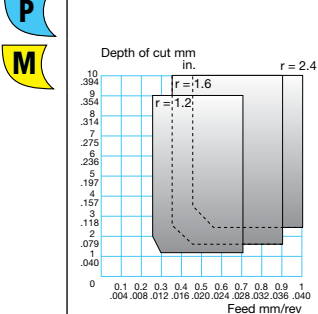
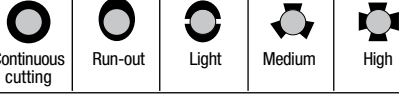

# 5600 SERIES

## APPLICATION GUIDE

ISO Negative	Chipbreaker Profile - mm (in.)	Applications	Description
 <p>M3</p>	 <ul style="list-style-type: none"> <li>Finishing to semi-finishing</li> <li>Neutral land for greater edge strength</li> <li>Medium to high feed rates</li> <li>Slight to moderate interrupted cuts</li> </ul>	<p>P</p> 	 <p>Continuous cutting Run-out Light Medium High</p> <p>M3</p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.5 - 3.0 mm            (.020 - .120 inch)            Feed: .....<math>f</math> = 0.1 - 0.6 mm/rev            (.004 - .024 ipr)</p>
 <p>M5</p>	 <ul style="list-style-type: none"> <li>General machining</li> <li>Wide range of materials</li> <li>Positive cutting angle</li> <li>Medium feed rates and medium depths of cut</li> </ul>	<p>P M K</p> 	 <p>Continuous cutting Run-out Light Medium High</p> <p>M5</p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.5 - 6.0 mm            (.020 - .240 inch)            Feed: .....<math>f</math> = 0.13 - 0.56 mm/rev            (.005 - .022 ipr)</p>
 <p>M7</p>	 <ul style="list-style-type: none"> <li>Medium to light roughing</li> <li>Smooth chipbreaker for soft materials</li> <li>Neutral land for a good resistance</li> </ul>	<p>P M K S</p> 	 <p>Continuous cutting Run-out Light Medium High</p> <p>M7</p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.8 - 6.5 mm            (.031 - .260 inch)            Feed: .....<math>f</math> = 0.15 - 0.8 mm/rev            (.006 - .031 ipr)</p>
 <p>M8</p>	 <ul style="list-style-type: none"> <li>General purpose to light roughing</li> <li>Strong cutting edge for reliability</li> <li>Excellent on forged and cast components</li> </ul>	<p>P</p> 	 <p>Continuous cutting Run-out Light Medium High</p> <p>M8</p> <p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 1.0 - 7.6 mm            (.039 - .300 inch)            Feed: .....<math>f</math> = 0.18 - 0.65 mm/rev            (.007 - .026 ipr)</p>

# 5600 SERIES

## APPLICATION GUIDE

ISO Negative	Chipbreaker Profile - mm (in.)	Applications	Description
 <p>R3</p>	 <ul style="list-style-type: none"> <li>• Roughing applications</li> <li>• Neutral land for strong edge</li> <li>• Suitable for interrupted cuts</li> <li>• Medium to high feed rates and depths of cut</li> </ul>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p>	 <p>Continuous cutting Run-out Light Medium High</p>  <p><b>Main application area:</b>                  Depth of cut:.....<math>a_p</math> = 1.0 - 8.0 mm                  (.039 - .315 inch)                  Feed: .....<math>f</math> = 0.2 - 0.7 mm/rev                  (.008 - .028 ipr)</p>
 <p>R4</p>	 <ul style="list-style-type: none"> <li>• Semi roughing and roughing</li> <li>• Neutral cutting angle for strong edge</li> <li>• Best for interrupted cutting conditions</li> </ul>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p>	 <p>Continuous cutting Run-out Light Medium High</p>  <p><b>Main application area:</b>                  Depth of cut:.....<math>a_p</math> = 1.0 - 10.0 mm                  (.039 - .400 inch)                  Feed: .....<math>f</math> = 0.2 - 0.8 mm/rev                  (.008 - .031 ipr)</p>
 <p>R7</p>	 <ul style="list-style-type: none"> <li>• High feed roughing</li> <li>• Efficient geometry</li> <li>• High cutting depths</li> </ul>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p>	 <p>Continuous cutting Run-out Light Medium High</p>  <p><b>Main application area:</b>                  Depth of cut:.....<math>a_p</math> = 1.2 - 12 mm                  (.047 - .470 inch)                  Feed: .....<math>f</math> = 0.22 - 1 mm/rev                  (.009 - .040 ipr)</p>
 <p>R9</p>	 <ul style="list-style-type: none"> <li>• High metal removal</li> <li>• Coarse roughing and peeling of steels</li> </ul>	 <p>Depth of cut mm in.</p> <p>Feed mm/rev ipr</p>	 <p>Continuous cutting Run-out Light Medium High</p>  <p><b>Main application area:</b>                  Depth of cut:.....<math>a_p</math> = 1.5 - 18.0 mm                  (.059 - .700 inch)                  Feed: .....<math>f</math> = 0.3 - 1.0 mm/rev                  (.012 - .039 ipr)</p>

# 5600 SERIES

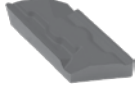
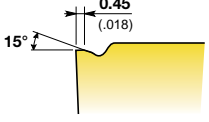

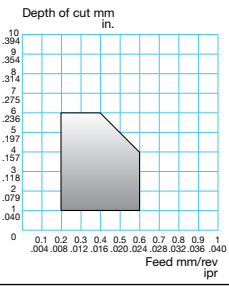
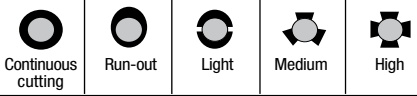
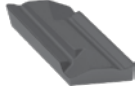
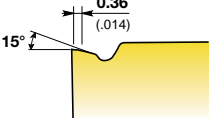

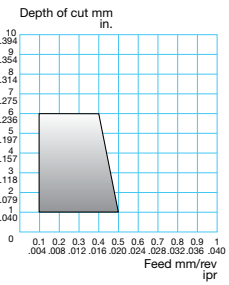
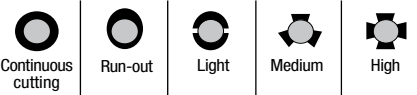

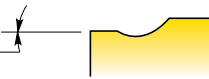

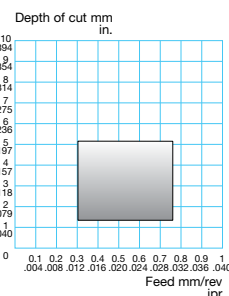
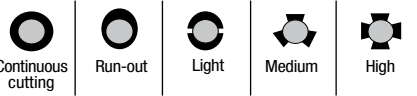

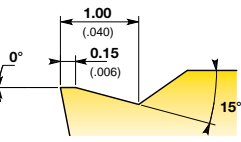

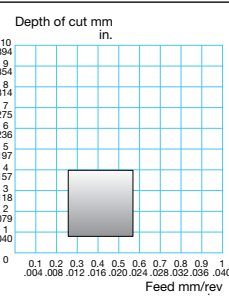
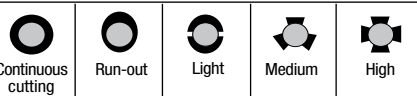

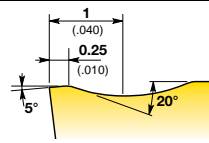

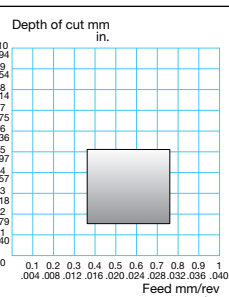
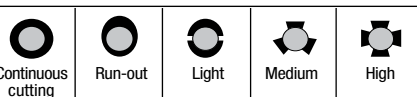
## APPLICATION GUIDE

Complementary	Chipbreaker Profile - mm (in.)	Applications	Description
C2	<ul style="list-style-type: none"> <li>Engineered for automotive stamping materials</li> <li>Effective chip-control at low depths of cut</li> <li>Positive cutting edge for reduced cutting forces</li> <li>Excellent surface finishes</li> </ul>		<p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.5 - 3.0 mm (.020 - .120 inch)            Feed: .....<math>f</math> = 0.1 - 0.25 mm/rev (.004 - .010 ipr)</p>
C6	<ul style="list-style-type: none"> <li>General purpose to light roughing applications</li> <li>Medium positive cutting edge for edge strength</li> <li>Single-sided for improved stability</li> <li>Double positive rake angles</li> </ul>		<p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 1.3 - 6.4 mm (.051 - .250 inch)            Feed: .....<math>f</math> = 0.2 - 0.66 mm/rev (.008 - .026 ipr)</p>
PN1	<ul style="list-style-type: none"> <li>Semi-finishing applications</li> <li>Double positive rake angles</li> <li>High positive cutting edge</li> <li>Reduced cutting forces</li> </ul>		<p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 0.5 - 3.2 mm (.020 - .125 inch)            Feed: .....<math>f</math> = 0.15 - 0.36 mm/rev (.006 - .014 ipr)</p>
PN2	<ul style="list-style-type: none"> <li>General purpose and roughing applications</li> <li>Double positive rake angles</li> <li>High positive cutting edge</li> <li>Reduced cutting forces</li> </ul>		<p><b>Main application area:</b>            Depth of cut:.....<math>a_p</math> = 1.3 - 5.1 mm (.051 - .200 inch)            Feed: .....<math>f</math> = 0.25 - 0.56 mm/rev (.010 - .022 ipr)</p>



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## APPLICATION GUIDE

Complementary	Chipbreaker Profile - mm (in.)	Applications	Description
 <p>KNUX 22</p>	 <ul style="list-style-type: none"> <li>Profiling, copy turning and turning</li> <li>Light cutting</li> <li>Positive geometry generating low cutting force</li> <li>Good chip control</li> </ul>	 	 <p><b>KNUX 22</b></p> <p><b>Main application area:</b>            Depth of cut:..... <math>a_p = 1 - 6</math> mm            (.040 - .236 inch)            Feed: ..... <math>f = 0.2 - 0.6</math> mm/rev            (.008 - .024 ipr)</p>
 <p>KNUX 32</p>	 <ul style="list-style-type: none"> <li>Profiling, copy turning and turning</li> <li>Light cutting</li> <li>Positive geometry generating low cutting force</li> <li>Good chip control</li> </ul>	 	 <p><b>KNUX 32</b></p> <p><b>Main application area:</b>            Depth of cut:..... <math>a_p = 1 - 6</math> mm            (.040 - .236 inch)            Feed: ..... <math>f = 0.1 - 0.5</math> mm/rev            (.004 - .020 ipr)</p>
Rounds	Chipbreaker Profile - mm (in.)	Applications	Description
 <p>RN5</p>	 <ul style="list-style-type: none"> <li>General purpose / light roughing applications</li> <li>Extremely tough / reliable cutting edge</li> <li>Effective chip-control at high feeds</li> <li>Good choice for interrupted cutting conditions</li> </ul>	 	 <p><b>RN5</b></p> <p><b>Main application area:</b>            Depth of cut:..... <math>a_p = 1.3 - 5.1</math> mm            (.051 - .200 inch)            Feed: ..... <math>f = 0.3 - 0.76</math> mm/rev            (.012 - .030 ipr)</p>
 <p>RP4</p>	 <ul style="list-style-type: none"> <li>General purpose applications</li> <li>Neutral cutting edge for reliable performance</li> <li>Effective profiling capability</li> <li>Broad chipbreaking capability</li> </ul>	 	 <p><b>RP4</b></p> <p><b>Main application area:</b>            Depth of cut:..... <math>a_p = 0.8 - 4.0</math> mm            (.031 - .160 inch)            Feed: ..... <math>f = 0.25 - 0.56</math> mm/rev            (.010 - .022 ipr)</p>
 <p>RP5</p>	 <ul style="list-style-type: none"> <li>Semi roughing and roughing</li> <li>Neutral cutting angle for strong edge</li> <li>Best for interrupted cutting conditions</li> </ul>	 	 <p><b>RP5</b></p> <p><b>Main application area:</b>            Depth of cut:..... <math>a_p = 1.5 - 5.1</math> mm            (.059 - .200 inch)            Feed: ..... <math>f = 0.36 - 0.76</math> mm/rev            (.014 - .030 ipr)</p>



# 5600 SERIES


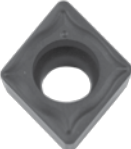
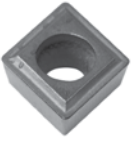

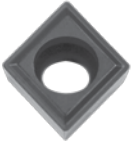
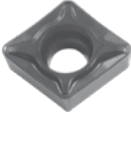
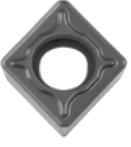
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## PRODUCT OFFERING

# 5600 SERIES




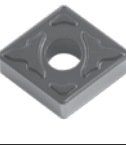

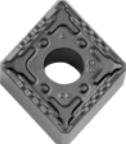

## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	CCGT 32.50.5 PF4	0.375	0.156	0.008	-	00258	-	9.53	3.97	0.2	CCGT 09T302-PF4
	CCGT 21.51 PM2	0.250	0.094	0.016	00254	00255	-	6.35	2.38	0.4	CCGT 060204-PM2
	CCGT 21.52 PM2	0.250	0.094	0.031	00256	00257	-	6.35	2.38	0.8	CCGT 060208-PM2
	CCGT 32.51 PM2	0.375	0.156	0.016	00259	00260	-	9.53	3.97	0.4	CCGT 09T304-PM2
	CCGT 32.52 PM2	0.375	0.156	0.031	00261	00262	-	9.53	3.97	0.8	CCGT 09T308-PM2
	CCGT 432 PM2	0.500	0.188	0.031	00263	00264	-	12.70	4.76	0.8	CCGT 120408-PM2
	CCGT 433 PM2	0.500	0.188	0.047	-	00265	-	12.70	4.76	1.2	CCGT 120412-PM2
	CCMT 21.50 PF1	0.250	0.094	0.004	-	-	18909	6.35	2.38	0.1	CCMT 060201-PF1
	CCMT 21.51 PF1	0.250	0.094	0.016	00270	-	18912	6.35	2.38	0.4	CCMT 060204-PF1
	CCMT 2.520.5 PF4	0.313	0.125	0.008	-	00273	-	7.94	3.18	0.2	CCMT 080302-PF4
	CCMT 2.521 PF4	0.313	0.125	0.016	-	00274	-	7.94	3.18	0.4	CCMT 080304-PF4
	CCMT 21.50.5 PF4	0.250	0.094	0.008	00266	00267	-	6.35	2.38	0.2	CCMT 060202-PF4
	CCMT 21.51 PF4	0.250	0.094	0.016	00271	00060	18776	6.35	2.38	0.4	CCMT 060204-PF4
	CCMT 32.51 PF4	0.375	0.156	0.016	00072	00283	18789	9.53	3.97	0.4	CCMT 09T304-PF4
	CCMT 32.52 PF4	0.375	0.156	0.031	00286	00287	-	9.53	3.97	0.8	CCMT 09T308-PF4
	CCMT 32.51 PM1	0.375	0.156	0.016	-	-	18913	9.53	3.97	0.4	CCMT 09T304-PM1
	CCMT 32.52 PM1	0.375	0.156	0.031	00288	-	18914	9.53	3.97	0.8	CCMT 09T308-PM1
	CCMT 432 PM1	0.500	0.188	0.031	00294	-	18916	12.70	4.76	0.8	CCMT 120408-PM1
	CCMT 2.521 PM3	0.313	0.125	0.016	-	00275	-	7.94	3.18	0.4	CCMT 080304-PM3
	CCMT 2.522 PM3	0.313	0.125	0.031	-	00279	-	7.94	3.18	0.8	CCMT 080308-PM3
	CCMT 21.51 PM3	0.250	0.094	0.016	00272	00066	18784	6.35	2.38	0.4	CCMT 060204-PM3
	CCMT 32.51 PM3	0.375	0.156	0.016	00284	00285	18790	9.53	3.97	0.4	CCMT 09T304-PM3
	CCMT 32.52 PM3	0.375	0.156	0.031	00289	00290	18792	9.53	3.97	0.8	CCMT 09T308-PM3
	CCMT 2.521 PM4	0.313	0.125	0.016	-	00276	18786	7.94	3.18	0.4	CCMT 080304-PM4
	CCMT 2.522 PM4	0.313	0.125	0.031	-	00280	18788	7.94	3.18	0.8	CCMT 080308-PM4
	CCMT 32.52 PM4	0.375	0.156	0.031	00084	00085	18915	9.53	3.97	0.8	CCMT 09T308-PM4
	CCMT 432 PM4	0.500	0.188	0.031	-	00091	18917	12.70	4.76	0.8	CCMT 120408-PM4

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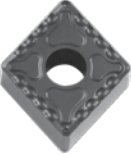

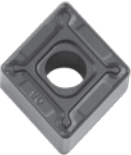
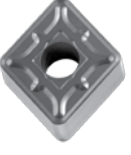
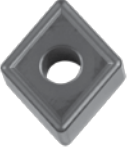
## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	CCMT 2.521 PM5	0.313	0.125	0.016	00277	00278	18787	7.94	3.18	0.4	CCMT 080304-PM5
	CCMT 2.522 PM5	0.313	0.125	0.031	00281	00282	-	7.94	3.18	0.8	CCMT 080308-PM5
	CCMT 21.50.5 PM5	0.250	0.094	0.008	00268	00269	-	6.35	2.38	0.2	CCMT 060202-PM5
	CCMT 21.51 PM5	0.250	0.094	0.016	00068	00071	18785	6.35	2.38	0.4	CCMT 060204-PM5
	CCMT 32.51 PM5	0.375	0.156	0.016	00076	00083	18791	9.53	3.97	0.4	CCMT 09T304-PM5
	CCMT 32.52 PM5	0.375	0.156	0.031	00291	00292	18793	9.53	3.97	0.8	CCMT 09T308-PM5
	CCMT 431 PM5	0.500	0.188	0.016	00293	00086	-	12.70	4.76	0.4	CCMT 120404-PM5
	CCMT 432 PM5	0.500	0.188	0.031	00295	00093	-	12.70	4.76	0.8	CCMT 120408-PM5
	CCMT 433 PM5	0.500	0.188	0.047	-	00296	-	12.70	4.76	1.2	CCMT 120412-PM5
	CNGP 430.5 M2	0.500	0.188	0.008	01011	-	-	12.70	4.76	0.2	CNGG 120402-M2
	CNMG 432 6W	0.500	0.188	0.031	01215	01216	-	12.70	4.76	0.8	CNMG 120408-6W
	CNMG 433 6W	0.500	0.188	0.047	01218	01219	-	12.70	4.76	1.2	CNMG 120412-6W
	CNMG 432 C2	0.500	0.188	0.031	00310	00311	-	12.70	4.76	0.8	CNMG 120408-C2
	CNMG 432 F1	0.500	0.188	0.031	01213	-	-	12.70	4.76	0.8	CNMG 120408-F1
	CNMG 431 F2	0.500	0.188	0.016	00301	00302	-	12.70	4.76	0.4	CNMG 120404-F2
	CNMG 432 F2	0.500	0.188	0.031	00312	00313	-	12.70	4.76	0.8	CNMG 120408-F2
	CNMG 431 F3	0.500	0.188	0.016	00303	00304	-	12.70	4.76	0.4	CNMG 120404-F3
	CNMG 432 F3	0.500	0.188	0.031	00314	-	-	12.70	4.76	0.8	CNMG 120408-F3
	CNMG 433 F3	0.500	0.188	0.047	01217	-	-	12.70	4.76	1.2	CNMG 120412-F3

# 5600 SERIES

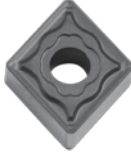
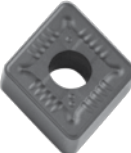
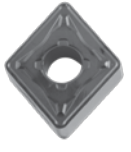
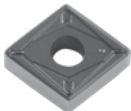
## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	CNMG 431 F4	0.500	0.188	0.016	-	00305	-	12.70	4.76	0.4	CNMG 120404-F4
	CNMG 432 F4	0.500	0.188	0.031	-	00315	-	12.70	4.76	0.8	CNMG 120408-F4
	CNMG 433 F4	0.500	0.188	0.047	00321	-	-	12.70	4.76	1.2	CNMG 120412-F4
	CNMG 431 F5	0.500	0.188	0.016	-	01087	-	12.70	4.76	0.4	CNMG 120404-F5
	CNMG 432 F5	0.500	0.188	0.031	-	01214	-	12.70	4.76	0.8	CNMG 120408-F5
	CNMG 432 M3	0.500	0.188	0.031	00094	00095	18919	12.70	4.76	0.8	CNMG 120408-M3
	CNMG 433 M3	0.500	0.188	0.047	00322	00323	-	12.70	4.76	1.2	CNMG 120412-M3
	CNMG 643 M3	0.750	0.250	0.047	00343	-	-	19.05	6.35	1.2	CNMG 190612-M3
	CNMG 321 M5	0.375	0.125	0.016	00298	00299	-	9.53	3.18	0.4	CNMG 090304-M5
	CNMG 322 M5	0.375	0.125	0.031	-	00300	-	9.53	3.18	0.8	CNMG 090308-M5
	CNMG 332 M5	0.375	0.188	0.031	01032	-	-	9.53	4.76	0.8	CNMG 090408-M5
	CNMG 431 M5	0.500	0.188	0.016	00306	00307	18795	12.70	4.76	0.4	CNMG 120404-M5
	CNMG 432 M5	0.500	0.188	0.031	00097	00186	18920	12.70	4.76	0.8	CNMG 120408-M5
	CNMG 433 M5	0.500	0.188	0.047	00101	00103	18924	12.70	4.76	1.2	CNMG 120412-M5
	CNMG 434 M5	0.500	0.188	0.063	-	00327	-	12.70	4.76	1.6	CNMG 120416-M5
	CNMG 542 M5	0.625	0.250	0.031	-	00331	-	15.88	6.35	0.8	CNMG 160608-M5
	CNMG 543 M5	0.625	0.250	0.047	00109	00333	18802	15.88	6.35	1.2	CNMG 160612-M5
	CNMG 544 M5	0.625	0.250	0.063	00113	00338	-	15.88	6.35	1.6	CNMG 160616-M5
	CNMG 642 M5	0.750	0.250	0.031	-	00341	-	19.05	6.35	0.8	CNMG 190608-M5
	CNMG 643 M5	0.750	0.250	0.047	00345	00347	18805	19.05	6.35	1.2	CNMG 190612-M5
	CNMG 644 M5	0.750	0.250	0.063	-	00353	-	19.05	6.35	1.6	CNMG 190616-M5
	CNMG 431 M7	0.500	0.188	0.016	-	-	18796	12.70	4.76	0.4	CNMG 120404-M7
	CNMG 432 M7	0.500	0.188	0.031	-	00316	18798	12.70	4.76	0.8	CNMG 120408-M7
	CNMG 433 M7	0.500	0.188	0.047	-	00324	18799	12.70	4.76	1.2	CNMG 120412-M7
	CNMG 542 M7	0.625	0.250	0.031	-	-	18801	15.88	6.35	0.8	CNMG 160608-M7
	CNMG 543 M7	0.625	0.250	0.047	-	00334	-	15.88	6.35	1.2	CNMG 160612-M7
	CNMG 642 M7	0.750	0.250	0.031	-	-	18804	19.05	6.35	0.8	CNMG 190608-M7
	CNMG 643 M7	0.750	0.250	0.047	-	-	18806	19.05	6.35	1.2	CNMG 190612-M7

# 5600 SERIES


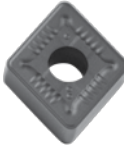
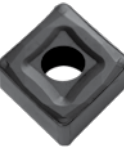
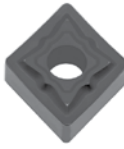
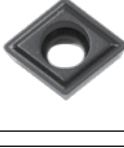
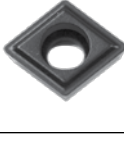
## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
CNMG M8 	CNMG 431 M8	0.500	0.188	0.016	00308	-	18918	12.70	4.76	0.4	CNMG 120404-M8
	CNMG 432 M8	0.500	0.188	0.031	00317	00187	18921	12.70	4.76	0.8	CNMG 120408-M8
	CNMG 433 M8	0.500	0.188	0.047	00325	00104	18925	12.70	4.76	1.2	CNMG 120412-M8
	CNMG 434 M8	0.500	0.188	0.063	00328	00329	18927	12.70	4.76	1.6	CNMG 120416-M8
	CNMG 542 M8	0.625	0.250	0.031	-	00332	-	15.88	6.35	0.8	CNMG 160608-M8
	CNMG 543 M8	0.625	0.250	0.047	00335	00336	18929	15.88	6.35	1.2	CNMG 160612-M8
	CNMG 544 M8	0.625	0.250	0.063	-	00339	-	15.88	6.35	1.6	CNMG 160616-M8
	CNMG 642 M8	0.750	0.250	0.031	-	00342	18933	19.05	6.35	0.8	CNMG 190608-M8
	CNMG 643 M8	0.750	0.250	0.047	00348	00349	18934	19.05	6.35	1.2	CNMG 190612-M8
	CNMG 644 M8	0.750	0.250	0.063	00115	00355	-	19.05	6.35	1.6	CNMG 190616-M8
CNMG R3 	CNMG 432 R3	0.500	0.188	0.031	00098	00100	18922	12.70	4.76	0.8	CNMG 120408-R3
	CNMG 433 R3	0.500	0.188	0.047	00188	00106	18800	12.70	4.76	1.2	CNMG 120412-R3
	CNMG 434 R3	0.500	0.188	0.063	00108	00189	-	12.70	4.76	1.6	CNMG 120416-R3
	CNMG 543 R3	0.625	0.250	0.047	00110	00111	18930	15.88	6.35	1.2	CNMG 160612-R3
	CNMG 544 R3	0.625	0.250	0.063	-	00340	18803	15.88	6.35	1.6	CNMG 160616-R3
	CNMG 643 R3	0.750	0.250	0.047	-	00351	-	19.05	6.35	1.2	CNMG 190612-R3
	CNMG 644 R3	0.750	0.250	0.063	01220	00357	18807	19.05	6.35	1.6	CNMG 190616-R3
CNMG R4 	CNMG 432 R4	0.500	0.188	0.031	00318	00319	18923	12.70	4.76	0.8	CNMG 120408-R4
	CNMG 433 R4	0.500	0.188	0.047	00107	00326	18926	12.70	4.76	1.2	CNMG 120412-R4
	CNMG 434 R4	0.500	0.188	0.063	00330	-	-	12.70	4.76	1.6	CNMG 120416-R4
	CNMG 542 R4	0.625	0.250	0.031	-	-	18928	15.88	6.35	0.8	CNMG 160608-R4
	CNMG 543 R4	0.625	0.250	0.047	00337	00112	18931	15.88	6.35	1.2	CNMG 160612-R4
	CNMG 544 R4	0.625	0.250	0.063	-	-	18932	15.88	6.35	1.6	CNMG 160616-R4
	CNMG 643 R4	0.750	0.250	0.047	00114	00352	18935	19.05	6.35	1.2	CNMG 190612-R4
	CNMG 644 R4	0.750	0.250	0.063	00116	00359	18936	19.05	6.35	1.6	CNMG 190616-R4
CNMG WN3 	CNMG 431 WN3	0.500	0.188	0.016	00309	-	-	12.70	4.76	0.4	CNMG 120404-WN3
	CNMG 432 WN3	0.500	0.188	0.031	00320	-	-	12.70	4.76	0.8	CNMG 120408-WN3

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## PRODUCT OFFERING

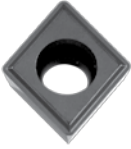
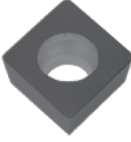


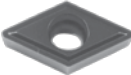

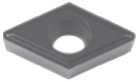
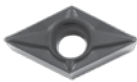
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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	CNMM 431 C6	0.500	0.188	0.016	01177	-	18937	12.70	4.76	0.4	CNMM 120404-C6
	CNMM 432 C6	0.500	0.188	0.031	01178	01179	18938	12.70	4.76	0.8	CNMM 120408-C6
	CNMM 541 C6	0.625	0.250	0.016	01180	-	-	15.88	6.35	0.4	CNMM 160604-C6
	CNMM 542 C6	0.625	0.250	0.031	01181	-	-	15.88	6.35	0.8	CNMM 160608-C6
	CNMM 543 C6	0.625	0.250	0.047	01182	-	-	15.88	6.35	1.2	CNMM 160612-C6
	CNMM 642 C6	0.750	0.250	0.031	01183	-	-	19.05	6.35	0.8	CNMM 190608-C6
	CNMM 643 C6	0.750	0.250	0.047	01184	01185	-	19.05	6.35	1.2	CNMM 190612-C6
	CNMM 544 R3	0.625	0.250	0.063	-	00362	-	15.88	6.35	1.6	CNMM 160616-R3
	CNMM 644 R7	0.750	0.250	0.063	-	-	18808	19.05	6.35	1.6	CNMM 190616-R7
	CNMM 646 R7	0.750	0.250	0.094	-	-	18809	19.05	6.35	2.4	CNMM 190624-R7
	CNMP 431 M2	0.500	0.188	0.016	01221	01222	18794	12.70	4.76	0.4	CNMG 120404-M2
	CNMP 432 M2	0.500	0.188	0.031	01223	01224	18797	12.70	4.76	0.8	CNMG 120408-M2
	CPGT 1.51.21 PF1	0.188	0.078	0.016	-	-	18939	4.76	1.98	0.4	CPGT 04T104-PF1
	CPGT 1.81.51 PF1	0.219	0.094	0.016	-	-	18940	5.56	2.38	0.4	CPGT 050204-PF1
	CPGT 1.81.52 PF1	0.219	0.094	0.031	-	-	18941	5.56	2.38	0.8	CPGT 050208-PF1
	CPGT 1.51.21 PM2	0.188	0.078	0.016	-	00387	-	4.76	1.98	0.4	CPGT 04T104-PM2
	CPGT 1.81.51 PM2	0.219	0.094	0.016	-	00388	-	5.56	2.38	0.4	CPGT 050204-PM2
	CPGT 21.50 PM2	0.250	0.094	0.004	-	01225	-	6.35	2.38	0.1	CPGT 060201-PM2
	CPGT 21.51 PM2	0.250	0.094	0.016	00389	00391	-	6.35	2.38	0.4	CPGT 060204-PM2
	CPGT 21.52 PM2	0.250	0.094	0.031	00392	00393	-	6.35	2.38	0.8	CPGT 060208-PM2
	CPGT 32.51 PM2	0.375	0.156	0.016	00394	00395	-	9.53	3.97	0.4	CPGT 09T304-PM2
	CPGT 32.52 PM2	0.375	0.156	0.031	00117	00396	-	9.53	3.97	0.8	CPGT 09T308-PM2
	CPMT 21.50 PF1	0.250	0.094	0.004	00397	-	18942	6.35	2.38	0.1	CPMT 060201-PF1
	CPMT 21.51 PF1	0.250	0.094	0.016	00399	-	18943	6.35	2.38	0.4	CPMT 060204-PF1



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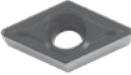




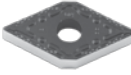

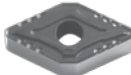
## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
 CPMT PM1	CPMT 32.50 PM1	0.375	0.156	0.004	-	-	18944	9.53	3.97	0.1	CPMT 09T301-PM1
	CPMT 32.51 PM1	0.375	0.156	0.016	00400	-	18945	9.53	3.97	0.4	CPMT 09T304-PM1
	CPMT 32.52 PM1	0.375	0.156	0.031	00401	00402	18946	9.53	3.97	0.8	CPMT 09T308-PM1
	CPMT 432 PM1	0.500	0.188	0.031	00403	-	18947	12.70	4.76	0.8	CPMT 120408-PM1
 CPMW	CPMW 21.51	0.250	0.094	0.016	-	-	18948	6.35	2.38	0.4	CPMW 060204
 DCGT PF4	DCGT 21.50.5 PF4	0.250	0.094	0.008	-	00404	-	6.35	2.38	0.2	DCGT 070202-PF4
	DCGT 32.50.5 PF4	0.375	0.156	0.008	-	00406	-	9.53	3.97	0.2	DCGT 11T302-PF4
 DCGT PM2	DCGT 21.51 PM2	0.250	0.094	0.016	-	00405	-	6.35	2.38	0.4	DCGT 070204-PM2
	DCGT 32.51 PM2	0.375	0.156	0.016	00407	00408	-	9.53	3.97	0.4	DCGT 11T304-PM2
	DCGT 32.52 PM2	0.375	0.156	0.031	00409	01226	-	9.53	3.97	0.8	DCGT 11T308-PM2
	DCGT 431 PM2	0.500	0.188	0.016	00410	-	-	12.70	4.76	0.4	DCGT 150404-PM2
	DCGT 432 PM2	0.500	0.188	0.031	00411	-	-	12.70	4.76	0.8	DCGT 150408-PM2
 DCMT PF1	DCMT 21.50 PF1	0.250	0.094	0.004	-	-	18949	6.35	2.38	0.1	DCMT 070201-PF1
	DCMT 21.51 PF1	0.250	0.094	0.016	00414	-	18950	6.35	2.38	0.4	DCMT 070204-PF1
 DCMT PF4	DCMT 21.50.5 PF4	0.250	0.094	0.008	00412	00413	-	6.35	2.38	0.2	DCMT 070202-PF4
	DCMT 21.51 PF4	0.250	0.094	0.016	00415	00416	18810	6.35	2.38	0.4	DCMT 070204-PF4
	DCMT 21.52 PF4	0.250	0.094	0.031	-	00418	18811	6.35	2.38	0.8	DCMT 070208-PF4
	DCMT 32.51 PF4	0.375	0.156	0.016	00419	00118	18812	9.53	3.97	0.4	DCMT 11T304-PF4
	DCMT 32.52 PF4	0.375	0.156	0.031	00120	00422	18814	9.53	3.97	0.8	DCMT 11T308-PF4
 DCMT PM1	DCMT 32.51 PM1	0.375	0.156	0.016	-	-	18951	9.53	3.97	0.4	DCMT 11T304-PM1
	DCMT 32.52 PM1	0.375	0.156	0.031	00423	-	-	9.53	3.97	0.8	DCMT 11T308-PM1
 DCMT PM3	DCMT 32.51 PM3	0.375	0.156	0.016	-	00420	-	9.53	3.97	0.4	DCMT 11T304-PM3
	DCMT 32.52 PM3	0.375	0.156	0.031	-	00424	-	9.53	3.97	0.8	DCMT 11T308-PM3

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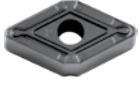
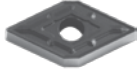
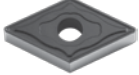
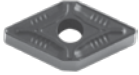
## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
 DCMT PM4	DCMT 21.51 PM4	0.250	0.094	0.016	-	00417	-	6.35	2.38	0.4	DCMT 070204-PM4
	DCMT 32.51 PM4	0.375	0.156	0.016	00119	00421	18813	9.53	3.97	0.4	DCMT 11T304-PM4
	DCMT 32.52 PM4	0.375	0.156	0.031	00425	00121	18952	9.53	3.97	0.8	DCMT 11T308-PM4
	DCMT 32.53 PM4	0.375	0.156	0.047	-	00426	-	9.53	3.97	1.2	DCMT 11T312-PM4
	DCMT 432 PM4	0.500	0.188	0.031	00427	-	18815	12.70	4.76	0.8	DCMT 150408-PM4
 DNMG 6W	DNMG 432 6W	0.500	0.188	0.031	01231	01232	-	12.70	4.76	0.8	DNMG 150408-6W
	DNMG 442 6W	0.500	0.250	0.031	-	01236	-	12.70	6.35	0.8	DNMG 150608-6W
	DNMG 443 6W	0.500	0.250	0.047	-	01238	-	12.70	6.35	1.2	DNMG 150612-6W
 DNMG C2	DNMG 432 C2	0.500	0.188	0.031	-	00122	-	12.70	4.76	0.8	DNMG 150408-C2
	DNMG 442 C2	0.500	0.250	0.031	00458	00459	-	12.70	6.35	0.8	DNMG 150608-C2
 DNMG ER-PN2	DNMG 441 ER PN2	0.500	0.250	0.016	-	-	18817	12.70	6.35	0.4	DNMG 150604 ER-PN2
 DNMG F1	DNMG 331 F1	0.375	0.188	0.016	01227	-	-	9.53	4.76	0.4	DNMG 110404-F1
	DNMG 432 F1	0.500	0.188	0.031	01228	-	-	12.70	4.76	0.8	DNMG 150408-F1
 DNMG F2	DNMG 431 F2	0.500	0.188	0.016	00434	-	-	12.70	4.76	0.4	DNMG 150404-F2
	DNMG 432 F2	0.500	0.188	0.031	00439	00440	-	12.70	4.76	0.8	DNMG 150408-F2
 DNMG F3	DNMG 331 F3	0.375	0.188	0.016	-	00428	-	9.53	4.76	0.4	DNMG 110404-F3
	DNMG 431 F3	0.500	0.188	0.016	-	00435	-	12.70	4.76	0.4	DNMG 150404-F3
	DNMG 432 F3	0.500	0.188	0.031	01229	-	-	12.70	4.76	0.8	DNMG 150408-F3
 DNMG F4	DNMG 441 F4	0.500	0.250	0.016	00454	00455	-	12.70	6.35	0.4	DNMG 150604-F4
	DNMG 442 F4	0.500	0.250	0.031	-	00460	-	12.70	6.35	0.8	DNMG 150608-F4
	DNMG 443 F4	0.500	0.250	0.047	-	00468	-	12.70	6.35	1.2	DNMG 150612-F4

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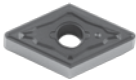
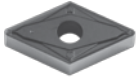
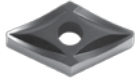


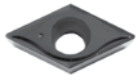
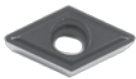

## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
DNMG F5 	DNMG 441 F5	0.500	0.250	0.016	-	01233	-	12.70	6.35	0.4	DNMG 150604-F5
	DNMG 442 F5	0.500	0.250	0.031	-	01234	-	12.70	6.35	0.8	DNMG 150608-F5
DNMG M3 	DNMG 332 M3	0.375	0.188	0.031	00430	00431	-	9.53	4.76	0.8	DNMG 110408-M3
	DNMG 431 M3	0.500	0.188	0.016	00436	00437	-	12.70	4.76	0.4	DNMG 150404-M3
	DNMG 432 M3	0.500	0.188	0.031	00441	00442	-	12.70	4.76	0.8	DNMG 150408-M3
	DNMG 433 M3	0.500	0.188	0.047	00448	00449	-	12.70	4.76	1.2	DNMG 150412-M3
	DNMG 442 M3	0.500	0.250	0.031	00461	00462	-	12.70	6.35	0.8	DNMG 150608-M3
	DNMG 443 M3	0.500	0.250	0.047	00126	00469	-	12.70	6.35	1.2	DNMG 150612-M3
DNMG M5 	DNMG 331 M5	0.375	0.188	0.016	-	00429	-	9.53	4.76	0.4	DNMG 110404-M5
	DNMG 332 M5	0.375	0.188	0.031	-	00432	-	9.53	4.76	0.8	DNMG 110408-M5
	DNMG 333 M5	0.375	0.188	0.047	-	00433	-	9.53	4.76	1.2	DNMG 110412-M5
	DNMG 431 M5	0.500	0.188	0.016	-	00438	18816	12.70	4.76	0.4	DNMG 150404-M5
	DNMG 432 M5	0.500	0.188	0.031	00123	00124	18953	12.70	4.76	0.8	DNMG 150408-M5
	DNMG 433 M5	0.500	0.188	0.047	-	00450	-	12.70	4.76	1.2	DNMG 150412-M5
	DNMG 441 M5	0.500	0.250	0.016	00456	00457	18818	12.70	6.35	0.4	DNMG 150604-M5
	DNMG 442 M5	0.500	0.250	0.031	00463	00125	18819	12.70	6.35	0.8	DNMG 150608-M5
	DNMG 443 M5	0.500	0.250	0.047	-	00470	-	12.70	6.35	1.2	DNMG 150612-M5
	DNMG 444 M5	0.500	0.250	0.063	-	00477	-	12.70	6.35	1.6	DNMG 150616-M5
	DNMG 542 M5	0.625	0.250	0.031	-	00479	-	15.88	6.35	0.8	DNMG 190608-M5
	DNMG 543 M5	0.625	0.250	0.047	00481	01241	-	15.88	6.35	1.2	DNMG 190612-M5
DNMG M8 	DNMG 432 M8	0.500	0.188	0.031	00443	00444	18954	12.70	4.76	0.8	DNMG 150408-M8
	DNMG 442 M8	0.500	0.250	0.031	00464	00465	-	12.70	6.35	0.8	DNMG 150608-M8
	DNMG 443 M8	0.500	0.250	0.047	00471	00472	-	12.70	6.35	1.2	DNMG 150612-M8
	DNMG 532 M8	0.625	0.188	0.031	00478	-	18955	15.88	4.76	0.8	DNMG 190408-M8
	DNMG 542 M8	0.625	0.250	0.031	00127	00480	-	15.88	6.35	0.8	DNMG 190608-M8
	DNMG 543 M8	0.625	0.250	0.047	-	00482	-	15.88	6.35	1.2	DNMG 190612-M8
DNMG R3 	DNMG 432 R3	0.500	0.188	0.031	00445	00446	-	12.70	4.76	0.8	DNMG 150408-R3
	DNMG 433 R3	0.500	0.188	0.047	-	00451	-	12.70	4.76	1.2	DNMG 150412-R3
	DNMG 442 R3	0.500	0.250	0.031	-	00466	18820	12.70	6.35	0.8	DNMG 150608-R3
	DNMG 443 R3	0.500	0.250	0.047	00473	00474	-	12.70	6.35	1.2	DNMG 150612-R3
	DNMG 444 R3	0.500	0.250	0.063	-	01239	-	12.70	6.35	1.6	DNMG 150616-R3

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## PRODUCT OFFERING

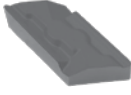
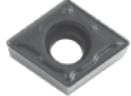


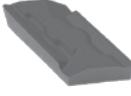



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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	DNMG 433 R4	0.500	0.188	0.047	00452	00453	-	12.70	4.76	1.2	DNMG 150412-R4
	DNMG 442 R4	0.500	0.250	0.031	-	00467	-	12.70	6.35	0.8	DNMG 150608-R4
	DNMG 443 R4	0.500	0.250	0.047	-	00476	-	12.70	6.35	1.2	DNMG 150612-R4
	DNMG 543 R4	0.625	0.250	0.047	00483	-	-	15.88	6.35	1.2	DNMG 190612-R4
	DNMG 432 WN3	0.500	0.188	0.031	00447	-	-	12.70	4.76	0.8	DNMG 150408-WN3
	DNMM 431 C6	0.500	0.188	0.016	01186	-	18956	12.70	4.76	0.4	DNMM 150404-C6
	DNMM 432 C6	0.500	0.188	0.031	01187	01189	18957	12.70	4.76	0.8	DNMM 150408-C6
	DNMM 532 C6	0.625	0.188	0.031	01192	-	-	15.88	4.76	0.8	DNMM 190408-C6
	DNMM 533 C6	0.625	0.188	0.047	01196	-	-	15.88	4.76	1.2	DNMM 190412-C6
	DNMM 432 ER PN2	0.500	0.188	0.031	00484	-	-	12.70	4.76	0.8	DNMM 150408 ER-PN2
	DNMP 431 M2*	0.500	0.188	0.016	-	01242	-	12.70	4.76	0.4	DNMG 150404-M2*
	DNMP 432 M2*	0.500	0.188	0.031	-	01244	-	12.70	4.76	0.8	DNMG 150408-M2*
	DPGT 32.51 PM2	0.375	0.156	0.016	00495	01245	-	9.53	3.97	0.4	DPGT 11T304-PM2
	DPMT 21.51 PF1	0.250	0.094	0.016	00496	-	18958	6.35	2.38	0.4	DPMT 070204-PF1
	DPMT 32.51 PM1	0.375	0.156	0.016	01246	-	18959	9.53	3.97	0.4	DPMT 11T304-PM1
	DPMT 32.52 PM1	0.375	0.156	0.031	00497	-	18960	9.53	3.97	0.8	DPMT 11T308-PM1

\*Available in June 2009.

# 5600 SERIES








## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
ECMT PM3 	ECMT 2.522 PM3	0.313	0.125	0.031	-	-	18825	7.94	3.18	0.8	ECMT 080308-PM3
	ECMT 21.51 PM3	0.250	0.094	0.016	-	-	18821	6.35	2.38	0.4	ECMT 060204-PM3
	ECMT 421 PM3	0.500	0.125	0.016	-	-	18823	12.70	3.18	0.4	ECMT 080304-PM3
ECMT PM4 	ECMT 2.521 PM4	0.313	0.125	0.016	-	00499	-	7.94	3.18	0.4	ECMT 080304-PM4
	ECMT 2.522 PM4	0.313	0.125	0.031	-	00500	18826	7.94	3.18	0.8	ECMT 080308-PM4
	ECMT 21.51 PM4	0.250	0.094	0.016	-	00498	18822	6.35	2.38	0.4	ECMT 060204-PM4
	ECMT 421 PM4	0.500	0.125	0.016	-	-	18824	12.70	3.18	0.4	ECMT 080304-PM4
EPMT PM5 	EPMT 1.81.50.5 PM5	0.219	0.094	0.008	00501	00502	18827	5.56	2.38	0.2	EPMT 050202-PM5
GNMM ER-PN1 	GNMM 2.522 ER	0.313	0.125	0.031	00128	-	-	7.94	3.18	0.8	GNMM 080308 ER
KNUX 22 	KNUX 160405 L 22	0.625	0.187	0.020	-	01247	18828	15.88	4.76	0.5	KNUX 160405 L-22
	KNUX 160405 R 22	0.625	0.187	0.020	-	01253	18830	15.88	4.76	0.5	KNUX 160405 R-22
	KNUX 160410 L 22	0.625	0.187	0.039	-	-	18832	15.88	4.76	1.0	KNUX 160410 L-22
	KNUX 160410 R 22	0.625	0.187	0.039	-	-	18834	15.88	4.76	1.0	KNUX 160410 R-22
KNUX 32 	KNUX 160405 L 32	0.625	0.187	0.020	-	01249	18829	15.88	4.76	0.5	KNUX 160405 L-32
	KNUX 160405 R 32	0.625	0.187	0.020	-	01260	18831	15.88	4.76	0.5	KNUX 160405 R-32
	KNUX 160410 L 32	0.625	0.187	0.039	-	01263	18833	15.88	4.76	1.0	KNUX 160410 L-32
	KNUX 160410 R 32	0.625	0.187	0.039	-	01264	18835	15.88	4.76	1.0	KNUX 160410 R-32
RBGH 	RBGHX 52	0.625	0.125	0.313	-	-	18961	15.88	3.18	7.9	RBGHX 150300
	RBGHX 63	0.750	0.188	0.375	-	-	18962	19.05	4.76	9.5	RBGHX 190400
	RBGHX 84	1.000	0.250	0.500	-	-	18963	25.40	6.35	12.7	RBGHX 250600
RCGT RP4 	RCGT 22 RP4	0.250	0.125	0.125	-	00503	-	6.35	3.18	3.2	RCGT 060300-RP4
	RCGT 32.5 RP4	0.375	0.156	0.188	-	00504	-	9.53	3.97	4.8	RCGT 09T300-RP4
	RCGT 43 RP4	0.500	0.188	0.250	-	00505	-	12.70	4.76	6.4	RCGT 120400-RP4
	RCGT 64 RP4	0.750	0.250	0.375	-	00506	-	19.05	6.35	9.5	RCGT 190600-RP4

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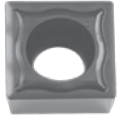
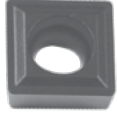


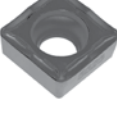

## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	RCMT 32.5 PM1	0.375	0.156	0.188	-	-	18964	9.53	3.97	4.8	RCMT 09T300-PM1
	RCMT 0803M0 RP5	0.315	0.125	0.157	-	00507	-	8.00	3.18	4.0	RCMT 0803M0-RP5
	RCMT 10T3M0 RP5	0.394	0.156	0.197	-	00508	18836	10.00	3.97	5.0	RCMT 10T3M0-RP5
	RCMT 1204M0 RP5	0.472	0.187	0.236	-	00509	18837	12.00	4.76	6.0	RCMT 1204M0-RP5
	RCMT 1204M0-RP5	0.472	0.187	0.236	00129	-	-	12.00	4.76	6.0	RCMT 1204M0-RP5
	RCMT 1605M0 RP5	0.630	0.219	0.315	-	00510	-	16.00	5.56	8.0	RCMT 1605M0-RP5
	RCMW 21.5	0.250	0.094	0.125	-	-	18965	6.35	2.38	3.2	RCMW 060200
	RCMX 2507M0 SN RP5	0.984	0.313	0.492	-	00511	-	25.00	7.94	12.5	RCMX 2507M0SN-RP5
	RCMX 3209M0 SN RP5	1.260	0.375	0.630	-	00512	-	32.00	9.52	16.0	RCMX 3209M0SN-RP5
	RNEA 32	0.375	0.125	0.188	-	-	18966	9.53	3.18	4.8	RNEA 090300
	RNEA 54	0.625	0.250	0.313	-	-	18967	15.88	6.35	7.9	RNEA 150600
	RNMF 55 RN5	0.625	0.313	0.313	00513	-	-	15.88	7.94	7.9	RNMF 150700-RN5
	RNMG 43 M7	0.500	0.188	0.250	-	01265	-	12.70	4.76	6.4	RNMG 120400-M7

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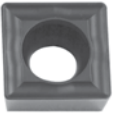
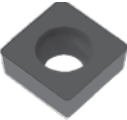




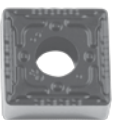
## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
 RNMG RN5	RNMG 32 RN5	0.375	0.125	0.188	00514	-	-	9.53	3.18	4.8	RNMG 090300-RN5
	RNMG 43 RN5	0.500	0.188	0.250	-	00515	-	12.70	4.76	6.4	RNMG 120400-RN5
	RNMG 54 RN5	0.625	0.250	0.313	00516	-	-	15.88	6.35	7.9	RNMG 150600-RN5
	RNMG 64 RN5	0.750	0.250	0.375	00517	-	-	19.05	6.35	9.5	RNMG 190600-RN5
	RNMG 86 RN5	1.000	0.375	0.500	00518	-	-	25.40	9.53	12.7	RNMG 250900-RN5
 SCGT PM2	SCGT 32.51 PM2	0.375	0.156	0.016	-	01266	-	9.53	3.97	0.4	SCGT 09T304-PM2
	SCGT 32.52 PM2	0.375	0.156	0.031	00519	00520	-	9.53	3.97	0.8	SCGT 09T308-PM2
	SCGT 432 PM2	0.500	0.188	0.031	00521	00522	-	12.70	4.76	0.8	SCGT 120408-PM2
	SCGT 433 PM2	0.500	0.188	0.047	-	00523	-	12.70	4.76	1.2	SCGT 120412-PM2
 SCMT PF1	SCMT 21.51 PF1	0.250	0.094	0.016	00524	-	18968	6.35	2.38	0.4	SCMT 060204-PF1
	SCMT 32.52 PF1	0.375	0.156	0.031	-	-	18970	9.53	3.97	0.8	SCMT 09T308-PF1
 SCMT PF4	SCMT 32.51 PF4	0.375	0.156	0.016	-	00525	-	9.53	3.97	0.4	SCMT 09T304-PF4
	SCMT 32.52 PF4	0.375	0.156	0.031	-	00527	-	9.53	3.97	0.8	SCMT 09T308-PF4
 SCMT PM1	SCMT 32.51 PM1	0.375	0.156	0.016	-	-	18969	9.53	3.97	0.4	SCMT 09T304-PM1
	SCMT 32.52 PM1	0.375	0.156	0.031	00528	-	-	9.53	3.97	0.8	SCMT 09T308-PM1
	SCMT 432 PM1	0.500	0.188	0.031	00529	-	-	12.70	4.76	0.8	SCMT 120408-PM1
 SCMT PM3	SCMT 433 PM3	0.500	0.188	0.047	-	00532	-	12.70	4.76	1.2	SCMT 120412-PM3
 SCMT PM4	SCMT 32.51 PM4	0.375	0.156	0.016	-	00526	-	9.53	3.97	0.4	SCMT 09T304-PM4
	SCMT 32.52 PM4	0.375	0.156	0.031	-	00130	18838	9.53	3.97	0.8	SCMT 09T308-PM4

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## PRODUCT OFFERING

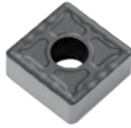


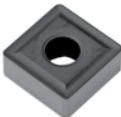

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	SCMT 432 PM5	0.500	0.188	0.031	00530	00531	18839	12.70	4.76	0.8	SCMT 120408-PM5
	SCMT 433 PM5	0.500	0.188	0.047	-	00533	-	12.70	4.76	1.2	SCMT 120412-PM5
	SCMW 32.52	0.375	0.156	0.031	-	-	18971	9.53	3.97	0.8	SCMW 09T308
	SNEA 543	0.625	0.250	0.047	-	-	18972	15.88	6.35	1.2	SNEA 150612
	SNG 633	0.750	0.188	0.047	-	-	18973	19.05	4.76	1.2	SNGN 190412
	SNMA 543	0.625	0.250	0.047	-	-	18974	15.88	6.35	1.2	SNMA 150612
	SNMG 432 C2	0.500	0.188	0.031	00540	-	-	12.70	4.76	0.8	SNMG 120408-C2
	SNMG 322 F2	0.375	0.125	0.031	00534	00535	-	9.53	3.18	0.8	SNMG 090308-F2
	SNMG 432 F2	0.500	0.188	0.031	00541	00542	-	12.70	4.76	0.8	SNMG 120408-F2



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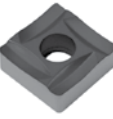
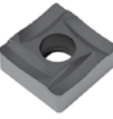


## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
SNMG F4 	SNMG 433 F4	0.500	0.188	0.047	-	00553	-	12.70	4.76	1.2	SNMG 120412-F4
SNMG M3 	SNMG 322 M3	0.375	0.125	0.031	00536	-	18840	9.53	3.18	0.8	SNMG 090308-M3
	SNMG 432 M3	0.500	0.188	0.031	00543	00544	-	12.70	4.76	0.8	SNMG 120408-M3
	SNMG 433 M3	0.500	0.188	0.047	00141	00554	-	12.70	4.76	1.2	SNMG 120412-M3
	SNMG 434 M3	0.500	0.188	0.063	00559	-	-	12.70	4.76	1.6	SNMG 120416-M3
SNMG M5 	SNMG 322 M5	0.375	0.125	0.031	00537	00538	-	9.53	3.18	0.8	SNMG 090308-M5
	SNMG 431 M5	0.500	0.188	0.016	-	00539	-	12.70	4.76	0.4	SNMG 120404-M5
	SNMG 432 M5	0.500	0.188	0.031	00545	00546	18841	12.70	4.76	0.8	SNMG 120408-M5
	SNMG 433 M5	0.500	0.188	0.047	00144	00147	-	12.70	4.76	1.2	SNMG 120412-M5
	SNMG 434 M5	0.500	0.188	0.063	00560	00561	18845	12.70	4.76	1.6	SNMG 120416-M5
	SNMG 543 M5	0.625	0.250	0.047	00563	01267	18846	15.88	6.35	1.2	SNMG 150612-M5
	SNMG 544 M5	0.625	0.250	0.063	-	01269	-	15.88	6.35	1.6	SNMG 150616-M5
	SNMG 643 M5	0.750	0.250	0.047	00569	00570	18847	19.05	6.35	1.2	SNMG 190612-M5
	SNMG 644 M5	0.750	0.250	0.063	-	00574	-	19.05	6.35	1.6	SNMG 190616-M5
SNMG M7 	SNMG 432 M7	0.500	0.188	0.031	-	00547	18842	12.70	4.76	0.8	SNMG 120408-M7
	SNMG 433 M7	0.500	0.188	0.047	-	-	18844	12.70	4.76	1.2	SNMG 120412-M7
	SNMG 643 M7	0.750	0.250	0.047	-	-	18848	19.05	6.35	1.2	SNMG 190612-M7
SNMG M8 	SNMG 432 M8	0.500	0.188	0.031	00131	00548	-	12.70	4.76	0.8	SNMG 120408-M8
	SNMG 433 M8	0.500	0.188	0.047	00555	-	18975	12.70	4.76	1.2	SNMG 120412-M8
	SNMG 543 M8	0.625	0.250	0.047	00564	00565	18976	15.88	6.35	1.2	SNMG 150612-M8
	SNMG 544 M8	0.625	0.250	0.063	-	00567	-	15.88	6.35	1.6	SNMG 150616-M8
	SNMG 643 M8	0.750	0.250	0.047	00571	00572	18977	19.05	6.35	1.2	SNMG 190612-M8
	SNMG 644 M8	0.750	0.250	0.063	00575	00576	-	19.05	6.35	1.6	SNMG 190616-M8

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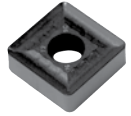
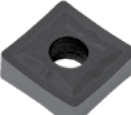

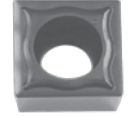
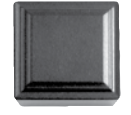
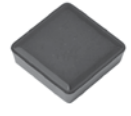
## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	SNMG 432 R3	0.500	0.188	0.031	00549	00550	18843	12.70	4.76	0.8	SNMG 120408-R3
	SNMG 433 R3	0.500	0.188	0.047	00556	00557	-	12.70	4.76	1.2	SNMG 120412-R3
	SNMG 434 R3	0.500	0.188	0.063	-	00562	-	12.70	4.76	1.6	SNMG 120416-R3
	SNMG 543 R3	0.625	0.250	0.047	00148	00149	-	15.88	6.35	1.2	SNMG 150612-R3
	SNMG 544 R3	0.625	0.250	0.063	-	00568	-	15.88	6.35	1.6	SNMG 150616-R3
	SNMG 643 R3	0.750	0.250	0.047	-	01270	-	19.05	6.35	1.2	SNMG 190612-R3
	SNMG 644 R3	0.750	0.250	0.063	-	00577	18849	19.05	6.35	1.6	SNMG 190616-R3
	SNMG 866 R3	1.000	0.375	0.094	-	00579	-	25.40	9.53	2.4	SNMG 250924-R3
	SNMG 432 R4	0.500	0.188	0.031	00551	00552	-	12.70	4.76	0.8	SNMG 120408-R4
	SNMG 433 R4	0.500	0.188	0.047	-	00558	-	12.70	4.76	1.2	SNMG 120412-R4
	SNMG 543 R4	0.625	0.250	0.047	-	00566	-	15.88	6.35	1.2	SNMG 150612-R4
	SNMG 643 R4	0.750	0.250	0.047	-	00573	18978	19.05	6.35	1.2	SNMG 190612-R4
	SNMG 644 R4	0.750	0.250	0.063	00578	00190	18979	19.05	6.35	1.6	SNMG 190616-R4
	SNMG 866 R4	1.000	0.375	0.094	00580	00581	18980	25.40	9.53	2.4	SNMG 250924-R4
	SNMM 431 EL PN2	0.500	0.188	0.016	00582	-	-	12.70	4.76	0.4	SNMM 120404 EL-PN2
	SNMM 432 EL PN2	0.500	0.188	0.031	00583	-	18981	12.70	4.76	0.8	SNMM 120408 EL-PN2
	SNMM 543 EL PN2	0.625	0.250	0.047	-	-	18983	15.88	6.35	1.2	SNMM 150612 EL-PN2
	SNMM 432 ER PN2	0.500	0.188	0.031	-	-	18982	12.70	4.76	0.8	SNMM 120408 ER-PN2
	SNMM 543 ER PN2	0.625	0.250	0.047	-	-	18984	15.88	6.35	1.2	SNMM 150612 ER-PN2
	SNMM 643 ER PN2	0.750	0.250	0.047	00584	-	-	19.05	6.35	1.2	SNMM 190612 ER-PN2
	SNMM 544 R3	0.625	0.250	0.063	-	00150	-	15.88	6.35	1.6	SNMM 150616-R3
	SNMM 866 R4	1.000	0.375	0.094	-	01271	-	25.40	9.53	2.4	SNMM 250924-R4

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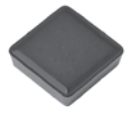




## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
SNMM R7 	SNMM 644 R7	0.750	0.250	0.063	-	-	18852	19.05	6.35	1.6	SNMM 190616-R7
	SNMM 646 R7	0.750	0.250	0.094	-	-	18854	19.05	6.35	2.4	SNMM 190624-R7
	SNMM 856 R7	1.000	0.313	0.094	-	-	18855	25.40	7.94	2.4	SNMM 250724-R7
SNMM R9 	SNMM 432 T2 R9	0.500	0.188	0.031	-	-	18850	12.70	4.76	0.8	SNMM 120408T2-R9
	SNMM 433 T2 R9	0.500	0.188	0.047	-	-	18851	12.70	4.76	1.2	SNMM 120412T2-R9
	SNMM 644 T2 R9	0.750	0.250	0.063	-	-	18853	19.05	6.35	1.6	SNMM 190616T2-R9
	SNMM 856 T4 R9	1.000	0.313	0.094	-	00585	-	25.40	7.94	2.4	SNMM 250724T4-R9
	SNMM 866 T4 R9	1.000	0.375	0.094	-	00586	-	25.40	9.53	2.4	SNMM 250924T4-R9
SNMP M2 	SNMP 432 M2	0.500	0.188	0.031	-	01272	-	12.70	4.76	0.8	SNMG 120408-M2
SPG 	SPG 422	0.500	0.125	0.031	-	01273	-	12.70	3.18	0.8	SPGN 120308
SPGT PM2 	SPGT 32.51 PM2	0.375	0.156	0.016	-	00588	-	9.53	3.97	0.4	SPGT 09T304-PM2
	SPGT 32.52 PM2	0.375	0.156	0.031	00589	-	-	9.53	3.97	0.8	SPGT 09T308-PM2
SPMR PF5 	SPMR 321 PF5	0.375	0.125	0.016	-	00590	-	9.53	3.18	0.4	SPMR 090304-PF5
	SPMR 322 PF5	0.375	0.125	0.031	-	00592	-	9.53	3.18	0.8	SPMR 090308-PF5
	SPMR 421 PF5	0.500	0.125	0.016	-	00594	18856	12.70	3.18	0.4	SPMR 120304-PF5
	SPMR 422 PF5	0.500	0.125	0.031	-	00595	18857	12.70	3.18	0.8	SPMR 120308-PF5
SPMR PM1 	SPMR 322 PM1	0.375	0.125	0.031	-	00593	-	9.53	3.18	0.8	SPMR 090308-PM1
	SPMR 422 PM1	0.500	0.125	0.031	-	-	18985	12.70	3.18	0.8	SPMR 120308-PM1

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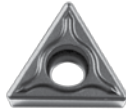



## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	SPMT 2.521 PF1	0.313	0.125	0.016	-	-	18986	7.94	3.18	0.4	SPMT 070304-PF1
	SPMT 32.52 PM1	0.375	0.156	0.031	-	-	18987	9.53	3.97	0.8	SPMT 09T308-PM1
	SPMT 432 PM1	0.500	0.188	0.031	00596	-	18988	12.70	4.76	0.8	SPMT 120408-PM1
	SPUN 421	0.500	0.125	0.016	-	-	18858	12.70	3.18	0.4	SPUN 120304
	SPUN 422	0.500	0.125	0.031	-	-	18989	12.70	3.18	0.8	SPUN 120308
	SPUN 633	0.750	0.188	0.047	-	-	18990	19.05	4.76	1.2	SPUN 190412
	TBEE 1.211	0.156	0.063	0.016	-	-	18991	3.97	1.59	0.4	TBEN 060104
	TBMR 1.211 PF1	0.156	0.063	0.016	-	-	18992	3.97	1.59	0.4	TBMR 060104-PF1
	TCGT 21.51 PM2	0.250	0.094	0.016	00597	00598	-	6.35	2.38	0.4	TCGT 110204-PM2
	TCGT 21.52 PM2	0.250	0.094	0.031	00599	00600	-	6.35	2.38	0.8	TCGT 110208-PM2
	TCGT 32.51 PM2	0.375	0.156	0.016	00601	00602	-	9.53	3.97	0.4	TCGT 16T304-PM2
	TCGT 32.52 PM2	0.375	0.156	0.031	-	00603	-	9.53	3.97	0.8	TCGT 16T308-PM2
	TCGT 432 PM2	0.500	0.188	0.031	00604	-	-	12.70	4.76	0.8	TCGT 220408-PM2
	TCMT 21.51 PF1	0.250	0.094	0.016	00610	-	18993	6.35	2.38	0.4	TCMT 110204-PF1

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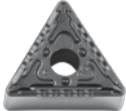

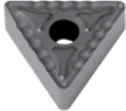


## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	TCMT 1.21.20.5 PF4	0.156	0.078	0.008	00605	-	-	3.97	1.98	0.2	TCMT 06T102-PF4
	TCMT 1.21.21 PF4	0.156	0.078	0.016	00606	00607	-	3.97	1.98	0.4	TCMT 06T104-PF4
	TCMT 1.81.51 PF4	0.219	0.094	0.016	00608	00609	-	5.56	2.38	0.4	TCMT 090204-PF4
	TCMT 21.51 PF4	0.250	0.094	0.016	00611	00612	18859	6.35	2.38	0.4	TCMT 110204-PF4
	TCMT 21.52 PF4	0.250	0.094	0.031	-	00613	-	6.35	2.38	0.8	TCMT 110208-PF4
	TCMT 32.51 PF4	0.375	0.156	0.016	00154	00615	18861	9.53	3.97	0.4	TCMT 16T304-PF4
	TCMT 32.52 PF4	0.375	0.156	0.031	-	00619	18863	9.53	3.97	0.8	TCMT 16T308-PF4
	TCMT 32.51 PM1	0.375	0.156	0.016	-	-	18994	9.53	3.97	0.4	TCMT 16T304-PM1
	TCMT 32.52 PM1	0.375	0.156	0.031	-	-	18995	9.53	3.97	0.8	TCMT 16T308-PM1
	TCMT 32.51 PM3	0.375	0.156	0.016	-	00616	-	9.53	3.97	0.4	TCMT 16T304-PM3
	TCMT 32.52 PM3	0.375	0.156	0.031	00620	-	18864	9.53	3.97	0.8	TCMT 16T308-PM3
	TCMT 21.51 PM4	0.250	0.094	0.016	-	00152	-	6.35	2.38	0.4	TCMT 110204-PM4
	TCMT 21.52 PM4	0.250	0.094	0.031	-	00614	18860	6.35	2.38	0.8	TCMT 110208-PM4
	TCMT 32.52 PM4	0.375	0.156	0.031	-	00622	18865	9.53	3.97	0.8	TCMT 16T308-PM4
	TCMT 32.51 PM5	0.375	0.156	0.016	00617	00618	18862	9.53	3.97	0.4	TCMT 16T304-PM5
	TCMT 32.52 PM5	0.375	0.156	0.031	00623	00624	18866	9.53	3.97	0.8	TCMT 16T308-PM5
	TNFM 2.52.010 RE	0.313	0.125	0.008	01275	-	-	7.94	3.18	0.2	TNMG 130302-RE
	TNMG 332 C2	0.375	0.188	0.031	00646	-	-	9.53	4.76	0.8	TNMG 160408-C2
	TNMG 543 C2	0.625	0.250	0.047	00697	-	-	15.88	6.35	1.2	TNMG 270612-C2

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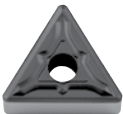


## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
 TNMG ER-PN1	TNMG 431 ER PN1	0.500	0.188	0.016	00667	-	-	12.70	4.76	0.4	TNMG 220404 ER-PN1
 TNMG F1	TNMG 2.521 F1	0.313	0.125	0.016	01281	-	-	7.94	3.18	0.4	TNMG 130304-F1
	TNMG 2.522 F1	0.313	0.125	0.031	01282	-	-	7.94	3.18	0.8	TNMG 130308-F1
	TNMG 221 F1	0.250	0.125	0.016	01276	-	-	6.35	3.18	0.4	TNMG 110304-F1
 TNMG F2	TNMG 331 F2	0.375	0.188	0.016	00639	00640	-	9.53	4.76	0.4	TNMG 160404-F2
	TNMG 332 F2	0.375	0.188	0.031	-	00647	-	9.53	4.76	0.8	TNMG 160408-F2
 TNMG F3	TNMG 222 F3	0.250	0.125	0.031	00626	-	-	6.35	3.18	0.8	TNMG 110308-F3
	TNMG 331 F3	0.375	0.188	0.016	-	00641	-	9.53	4.76	0.4	TNMG 160404-F3
	TNMG 332 F3	0.375	0.188	0.031	-	01283	-	9.53	4.76	0.8	TNMG 160408-F3
	TNMG 432 F3	0.500	0.188	0.031	00672	00673	-	12.70	4.76	0.8	TNMG 220408-F3
 TNMG F4	TNMG 332 F4	0.375	0.188	0.031	00155	00648	-	9.53	4.76	0.8	TNMG 160408-F4
	TNMG 432 F4	0.500	0.188	0.031	-	00674	-	12.70	4.76	0.8	TNMG 220408-F4
 TNMG F5	TNMG 332 F5	0.375	0.188	0.031	-	01290	-	9.53	4.76	0.8	TNMG 160408-F5
 TNMG M3	TNMG 222 M3	0.250	0.125	0.031	-	01279	-	6.35	3.18	0.8	TNMG 110308-M3
	TNMG 321 M3	0.375	0.125	0.016	00628	00630	-	9.53	3.18	0.4	TNMG 160304-M3
	TNMG 322 M3	0.375	0.125	0.031	00632	00633	-	9.53	3.18	0.8	TNMG 160308-M3
	TNMG 331 M3	0.375	0.188	0.016	00642	00643	-	9.53	4.76	0.4	TNMG 160404-M3
	TNMG 332 M3	0.375	0.188	0.031	00650	-	-	9.53	4.76	0.8	TNMG 160408-M3
	TNMG 333 M3	0.375	0.188	0.047	00156	00158	-	9.53	4.76	1.2	TNMG 160412-M3
	TNMG 431 M3	0.500	0.188	0.016	-	00668	-	12.70	4.76	0.4	TNMG 220404-M3
	TNMG 432 M3	0.500	0.188	0.031	00675	00676	-	12.70	4.76	0.8	TNMG 220408-M3
	TNMG 433 M3	0.500	0.188	0.047	-	00159	-	12.70	4.76	1.2	TNMG 220412-M3

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## PRODUCT OFFERING





Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
TNMG M5 	TNMG 221 M5	0.250	0.125	0.016	-	00625	-	6.35	3.18	0.4	TNMG 110304-M5
	TNMG 321 M5	0.375	0.125	0.016	-	-	18867	9.53	3.18	0.4	TNMG 160304-M5
	TNMG 322 M5	0.375	0.125	0.031	00634	00635	18868	9.53	3.18	0.8	TNMG 160308-M5
	TNMG 323 M5	0.375	0.125	0.047	-	00638	-	9.53	3.18	1.2	TNMG 160312-M5
	TNMG 331 M5	0.375	0.188	0.016	00644	00645	18869	9.53	4.76	0.4	TNMG 160404-M5
	TNMG 332 M5	0.375	0.188	0.031	00652	00654	18870	9.53	4.76	0.8	TNMG 160408-M5
	TNMG 333 M5	0.375	0.188	0.047	00664	00665	-	9.53	4.76	1.2	TNMG 160412-M5
	TNMG 431 M5	0.500	0.188	0.016	00669	00670	-	12.70	4.76	0.4	TNMG 220404-M5
	TNMG 432 M5	0.500	0.188	0.031	00677	00678	18874	12.70	4.76	0.8	TNMG 220408-M5
	TNMG 433 M5	0.500	0.188	0.047	00684	00685	-	12.70	4.76	1.2	TNMG 220412-M5
	TNMG 434 M5	0.500	0.188	0.063	00689	00690	-	12.70	4.76	1.6	TNMG 220416-M5
	TNMG 438 M5*	0.500	0.188	0.125	01292	-	-	12.70	4.76	3.2	TNMG 220432-M5*
	TNMG 542 M5	0.625	0.250	0.031	00695	00696	18878	15.88	6.35	0.8	TNMG 270608-M5
	TNMG 543 M5	0.625	0.250	0.047	00698	00699	18879	15.88	6.35	1.2	TNMG 270612-M5
TNMG 544 M5	0.625	0.250	0.063	-	00703	-	15.88	6.35	1.6	TNMG 270616-M5	
TNMG M7 	TNMG 332 M7	0.375	0.188	0.031	-	00656	18871	9.53	4.76	0.8	TNMG 160408-M7
	TNMG 333 M7	0.375	0.188	0.047	-	-	18873	9.53	4.76	1.2	TNMG 160412-M7
	TNMG 431 M7	0.500	0.188	0.016	-	00671	-	12.70	4.76	0.4	TNMG 220404-M7
	TNMG 432 M7	0.500	0.188	0.031	-	00679	18875	12.70	4.76	0.8	TNMG 220408-M7
	TNMG 433 M7	0.500	0.188	0.047	-	-	18877	12.70	4.76	1.2	TNMG 220412-M7
	TNMG 548 M7	0.625	0.250	0.125	-	00707	-	15.88	6.35	3.2	TNMG 270632-M7
TNMG M8 	TNMG 322 M8	0.375	0.125	0.031	00636	00637	-	9.53	3.18	0.8	TNMG 160308-M8
	TNMG 332 M8	0.375	0.188	0.031	00659	00661	18996	9.53	4.76	0.8	TNMG 160408-M8
	TNMG 333 M8	0.375	0.188	0.047	01291	-	-	9.53	4.76	1.2	TNMG 160412-M8
	TNMG 432 M8	0.500	0.188	0.031	00680	00681	18997	12.70	4.76	0.8	TNMG 220408-M8
	TNMG 433 M8	0.500	0.188	0.047	00686	-	18999	12.70	4.76	1.2	TNMG 220412-M8
	TNMG 434 M8	0.500	0.188	0.063	-	00691	-	12.70	4.76	1.6	TNMG 220416-M8
	TNMG 543 M8	0.625	0.250	0.047	-	00160	19003	15.88	6.35	1.2	TNMG 270612-M8
	TNMG 544 M8	0.625	0.250	0.063	00704	00163	-	15.88	6.35	1.6	TNMG 270616-M8
	TNMG 666 M8	0.750	0.375	0.094	-	00708	19007	19.05	9.53	2.4	TNMG 330924-M8

\*Available in June 2009.

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## PRODUCT OFFERING


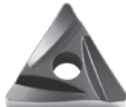



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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
TNMG R3 	TNMG 332 R3	0.375	0.188	0.031	-	00663	18872	9.53	4.76	0.8	TNMG 160408-R3
	TNMG 333 R3	0.375	0.188	0.047	-	00666	-	9.53	4.76	1.2	TNMG 160412-R3
	TNMG 432 R3	0.500	0.188	0.031	-	00682	18876	12.70	4.76	0.8	TNMG 220408-R3
	TNMG 433 R3	0.500	0.188	0.047	-	00687	-	12.70	4.76	1.2	TNMG 220412-R3
	TNMG 434 R3	0.500	0.188	0.063	-	00692	-	12.70	4.76	1.6	TNMG 220416-R3
	TNMG 543 R3	0.625	0.250	0.047	-	00700	-	15.88	6.35	1.2	TNMG 270612-R3
	TNMG 666 R3	0.750	0.375	0.094	-	00709	-	19.05	9.53	2.4	TNMG 330924-R3
TNMG R4 	TNMG 432 R4	0.500	0.188	0.031	-	00683	18998	12.70	4.76	0.8	TNMG 220408-R4
	TNMG 433 R4	0.500	0.188	0.047	-	00688	-	12.70	4.76	1.2	TNMG 220412-R4
	TNMG 434 R4	0.500	0.188	0.063	00693	00694	19000	12.70	4.76	1.6	TNMG 220416-R4
	TNMG 436 R4	0.500	0.188	0.094	-	-	19001	12.70	4.76	2.4	TNMG 220424-R4
	TNMG 438 R4	0.500	0.188	0.125	-	-	19002	12.70	4.76	3.2	TNMG 220432-R4
	TNMG 543 R4	0.625	0.250	0.047	00701	00702	19004	15.88	6.35	1.2	TNMG 270612-R4
	TNMG 544 R4	0.625	0.250	0.063	00705	00706	19005	15.88	6.35	1.6	TNMG 270616-R4
	TNMG 664 R4	0.750	0.375	0.063	-	-	19006	19.05	9.53	1.6	TNMG 330916-R4
TNMG 666 R4	0.750	0.375	0.094	-	00710	19008	19.05	9.53	2.4	TNMG 330924-R4	
TNMM EL-PN1 	TNMM 1.81.51 EL PN1	0.219	0.094	0.016	00711	-	-	5.56	2.38	0.4	TNMM 090204 EL-PN1
	TNMM 2.521 EL PN1	0.313	0.125	0.016	00715	-	-	7.94	3.18	0.4	TNMM 130304 EL-PN1
	TNMM 2.522 EL PN1	0.313	0.125	0.031	00718	-	-	7.94	3.18	0.8	TNMM 130308 EL-PN1
	TNMM 221 EL PN1	0.250	0.125	0.016	00712	-	-	6.35	3.18	0.4	TNMM 110304 EL-PN1
	TNMM 321 EL PN1	0.375	0.125	0.016	00719	-	-	9.53	3.18	0.4	TNMM 160304 EL-PN1
	TNMM 322 EL PN1	0.375	0.125	0.031	00722	-	-	9.53	3.18	0.8	TNMM 160308 EL-PN1
TNMM EL-PN2 	TNMM 2.521 EL PN2	0.313	0.125	0.016	00716	-	-	7.94	3.18	0.4	TNMM 130304 EL-PN2
	TNMM 321 EL PN2	0.375	0.125	0.016	00720	-	-	9.53	3.18	0.4	TNMM 160304 EL-PN2
	TNMM 322 EL PN2	0.375	0.125	0.031	00723	-	19009	9.53	3.18	0.8	TNMM 160308 EL-PN2
	TNMM 331 EL PN2	0.375	0.188	0.016	00725	-	-	9.53	4.76	0.4	TNMM 160404 EL-PN2
	TNMM 332 EL PN2	0.375	0.188	0.031	00727	-	-	9.53	4.76	0.8	TNMM 160408 EL-PN2
	TNMM 431 EL PN2	0.500	0.188	0.016	00729	-	-	12.70	4.76	0.4	TNMM 220404 EL-PN2
	TNMM 432 EL PN2	0.500	0.188	0.031	00731	00732	19011	12.70	4.76	0.8	TNMM 220408 EL-PN2
	TNMM 433 EL PN2	0.500	0.188	0.047	00734	-	-	12.70	4.76	1.2	TNMM 220412 EL-PN2
	TNMM 542 EL PN2	0.625	0.250	0.031	01294	-	-	15.88	6.35	0.8	TNMM 270608 EL-PN2
	TNMM 543 EL PN2	0.625	0.250	0.047	00737	-	19013	15.88	6.35	1.2	TNMM 270612 EL-PN2



# 5600 SERIES

## PRODUCT OFFERING





Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
TNMM ER-PN1 	TNMM 2.521 ER PN1	0.313	0.125	0.016	00717	-	-	7.94	3.18	0.4	TNMM 130304 ER-PN1
	TNMM 221 ER PN1	0.250	0.125	0.016	00713	-	-	6.35	3.18	0.4	TNMM 110304 ER-PN1
	TNMM 222 ER PN1	0.250	0.125	0.031	00714	-	-	6.35	3.18	0.8	TNMM 110308 ER-PN1
TNMM ER-PN2 	TNMM 321 ER PN2	0.375	0.125	0.016	00721	-	-	9.53	3.18	0.4	TNMM 160304 ER-PN2
	TNMM 322 ER PN2	0.375	0.125	0.031	00724	-	19010	9.53	3.18	0.8	TNMM 160308 ER-PN2
	TNMM 331 ER PN2	0.375	0.188	0.016	00726	-	-	9.53	4.76	0.4	TNMM 160404 ER-PN2
	TNMM 332 ER PN2	0.375	0.188	0.031	00728	-	-	9.53	4.76	0.8	TNMM 160408 ER-PN2
	TNMM 431 ER PN2	0.500	0.188	0.016	00730	-	-	12.70	4.76	0.4	TNMM 220404 ER-PN2
	TNMM 432 ER PN2	0.500	0.188	0.031	00165	00733	19012	12.70	4.76	0.8	TNMM 220408 ER-PN2
	TNMM 433 ER PN2	0.500	0.188	0.047	00735	-	-	12.70	4.76	1.2	TNMM 220412 ER-PN2
	TNMM 542 ER PN2	0.625	0.250	0.031	00736	-	-	15.88	6.35	0.8	TNMM 270608 ER-PN2
	TNMM 543 ER PN2	0.625	0.250	0.047	-	-	19014	15.88	6.35	1.2	TNMM 270612 ER-PN2
TNMM R4 	TNMM 666 R4	0.750	0.375	0.094	-	01295	-	19.05	9.53	2.4	TNMM 330924-R4
TNMP M2 	TNMP 331 M2*	0.375	0.188	0.016	-	01296	-	9.53	4.76	0.4	TNMG 160404-M2*
	TNMP 332 M2	0.375	0.188	0.031	-	01297	-	9.53	4.76	0.8	TNMG 160408-M2
	TNMP 431 M2*	0.500	0.188	0.016	-	01298	-	12.70	4.76	0.4	TNMG 220404-M2*
	TNMP 432 M2	0.500	0.188	0.031	-	01299	-	12.70	4.76	0.8	TNMG 220408-M2
TPEE 	TPEE 1.81.51	0.219	0.094	0.016	-	-	19015	5.56	2.38	0.4	TPEN 090204

\*Available in June 2009.

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## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	TPG 221	0.250	0.125	0.016	-	-	19016	6.35	3.18	0.4	TPGN 110304
	TPG 222	0.250	0.125	0.031	-	-	19017	6.35	3.18	0.8	TPGN 110308
	TPG 320	0.375	0.125	0.004	-	-	19018	9.53	3.18	0.1	TPGN 160301
	TPG 321	0.375	0.125	0.016	-	01300	19019	9.53	3.18	0.4	TPGN 160304
	TPG 322	0.375	0.125	0.031	-	01301	19020	9.53	3.18	0.8	TPGN 160308
	TPG 323	0.375	0.125	0.047	-	-	19021	9.53	3.18	1.2	TPGN 160312
	TPG 324	0.375	0.125	0.063	-	-	19022	9.53	3.18	1.6	TPGN 160316
	TPG 431	0.500	0.188	0.016	-	-	19023	12.70	4.76	0.4	TPGN 220404
	TPG 432	0.500	0.188	0.031	-	01302	19024	12.70	4.76	0.8	TPGN 220408
	TPG 433	0.500	0.188	0.047	-	-	19025	12.70	4.76	1.2	TPGN 220412
	TPG 434	0.500	0.188	0.063	-	-	19026	12.70	4.76	1.6	TPGN 220416
	TPGT 1.81.51 PM2	0.219	0.094	0.016	00746	00747	-	5.56	2.38	0.4	TPGT 090204-PM2
	TPGT 21.51 PM2	0.250	0.094	0.016	00168	00748	-	6.35	2.38	0.4	TPGT 110204-PM2
	TPGT 21.52 PM2	0.250	0.094	0.031	00749	00750	-	6.35	2.38	0.8	TPGT 110208-PM2
	TPGT 32.51 PM2	0.375	0.156	0.016	-	00751	-	9.53	3.97	0.4	TPGT 16T304-PM2
	TPGT 32.52 PM2	0.375	0.156	0.031	00752	00753	-	9.53	3.97	0.8	TPGT 16T308-PM2
	TPGT 432 PM2	0.500	0.188	0.031	00754	00169	-	12.70	4.76	0.8	TPGT 220408-PM2
	TPMR 1.81.51 PF1	0.219	0.094	0.016	00755	-	19027	5.56	2.38	0.4	TPMR 090204-PF1
	TPMR 1.81.52 PF1	0.219	0.094	0.031	-	-	19028	5.56	2.38	0.8	TPMR 090208-PF1
	TPMR 2.522 PF1	0.313	0.125	0.031	-	01303	-	7.94	3.18	0.8	TPMR 130308-PF1
	TPMR 221 PF1	0.250	0.125	0.016	00756	00757	19029	6.35	3.18	0.4	TPMR 110304-PF1
	TPMR 222 PF1	0.250	0.125	0.031	00759	-	-	6.35	3.18	0.8	TPMR 110308-PF1
	TPMR 321 PF1	0.375	0.125	0.016	01304	01305	-	9.53	3.18	0.4	TPMR 160304-PF1
	TPMR 322 PF1	0.375	0.125	0.031	00763	00764	-	9.53	3.18	0.8	TPMR 160308-PF1
	TPMR 432 PF1	0.500	0.188	0.031	00768	-	-	12.70	4.76	0.8	TPMR 220408-PF1
	TPMR 221 PF5	0.250	0.125	0.016	-	00758	18880	6.35	3.18	0.4	TPMR 110304-PF5
	TPMR 222 PF5	0.250	0.125	0.031	-	00760	18881	6.35	3.18	0.8	TPMR 110308-PF5
	TPMR 321 PF5	0.375	0.125	0.016	00761	00762	18882	9.53	3.18	0.4	TPMR 160304-PF5
	TPMR 322 PF5	0.375	0.125	0.031	00765	00766	18883	9.53	3.18	0.8	TPMR 160308-PF5
	TPMR 323 PF5	0.375	0.125	0.047	-	01306	18884	9.53	3.18	1.2	TPMR 160312-PF5

# 5600 SERIES

## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	TPMR 432 PM1	0.500	0.188	0.031	00769	00773	-	12.70	4.76	0.8	TPMR 220408-PM1
	TPMR 433 PM1	0.500	0.188	0.047	00774	-	-	12.70	4.76	1.2	TPMR 220412-PM1
	TPMT 1.81.51 PF1	0.219	0.094	0.016	00775	-	-	5.56	2.38	0.4	TPMT 090204-PF1
	TPMT 21.51 PF1	0.250	0.094	0.016	00776	-	19030	6.35	2.38	0.4	TPMT 110204-PF1
	TPMT 32.51 PF1	0.375	0.156	0.016	-	-	19031	9.53	3.97	0.4	TPMT 16T304-PF1
	TPMT 32.52 PF1	0.375	0.156	0.031	00777	-	19033	9.53	3.97	0.8	TPMT 16T308-PF1
	TPMT 32.51 PM1	0.375	0.156	0.016	-	-	19032	9.53	3.97	0.4	TPMT 16T304-PM1
	TPMT 32.52 PM1	0.375	0.156	0.031	-	-	19034	9.53	3.97	0.8	TPMT 16T308-PM1
	TPMT 432 PM1	0.500	0.188	0.031	00778	-	19035	12.70	4.76	0.8	TPMT 220408-PM1
	TPMW 2.521	0.313	0.125	0.016	-	-	19037	7.94	3.18	0.4	TPMW 130304
	TPMW 21.51	0.250	0.094	0.016	-	-	19036	6.35	2.38	0.4	TPMW 110204
	TPMW 32.52	0.375	0.156	0.031	-	-	19038	9.53	3.97	0.8	TPMW 16T308
	TPUN 321	0.375	0.125	0.016	-	-	18885	9.53	3.18	0.4	TPUN 160304
	TPUN 322	0.375	0.125	0.031	-	-	18886	9.53	3.18	0.8	TPUN 160308
	TPUN 432	0.500	0.188	0.031	-	-	18887	12.70	4.76	0.8	TPUN 220408
	VBMT 331 PF4	0.375	0.188	0.016	00779	00780	18888	9.53	4.76	0.4	VBMT 160404-PF4
	VBMT 331 PM1	0.375	0.188	0.016	-	00781	-	9.53	4.76	0.4	VBMT 160404-PM1
	VBMT 332 PM1	0.375	0.188	0.031	-	00784	-	9.53	4.76	0.8	VBMT 160408-PM1

# 5600 SERIES








## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	VBMT 332 PM3	0.375	0.188	0.031	-	00785	-	9.53	4.76	0.8	VBMT 160408-PM3
	VBMT 331 PM4	0.375	0.188	0.016	00782	00783	18889	9.53	4.76	0.4	VBMT 160404-PM4
	VBMT 332 PM4	0.375	0.188	0.031	00786	00176	18890	9.53	4.76	0.8	VBMT 160408-PM4
	VBMT 333 PM4	0.375	0.188	0.047	-	00787	18891	9.53	4.76	1.2	VBMT 160412-PM4
	VCGT 2.520.5 PF4	0.313	0.125	0.008	00788	00789	-	7.94	3.18	0.2	VCGT 130302-PF4
	VCGT 2.521 PF4	0.313	0.125	0.016	00791	00792	-	7.94	3.18	0.4	VCGT 130304-PF4
	VCGT 2.522 PF4	0.313	0.125	0.031	-	00795	-	7.94	3.18	0.8	VCGT 130308-PF4
	VCGT 2.522 PM4	0.313	0.125	0.031	-	00796	-	7.94	3.18	0.8	VCGT 130308-PM4
	VCGT 2.520.5 PM5	0.313	0.125	0.008	-	00790	18892	7.94	3.18	0.2	VCGT 130302-PM5
	VCGT 2.521 PM5	0.313	0.125	0.016	00793	00794	18893	7.94	3.18	0.4	VCGT 130304-PM5
	VCGT 2.522 PM5	0.313	0.125	0.031	00797	00798	18894	7.94	3.18	0.8	VCGT 130308-PM5
	VCGX 2.520 FR PF4	0.313	0.125	0.004	-	-	18895	7.94	3.18	0.1	VCGX 130301 FR-PF4
	VCMT 32.51 PM1	0.375	0.156	0.016	00799	-	-	9.53	3.97	0.4	VCMT 16T304-PM1
	VCMT 32.52 PM1	0.375	0.156	0.031	00800	-	19039	9.53	3.97	0.8	VCMT 16T308-PM1

# 5600 SERIES

## PRODUCT OFFERING




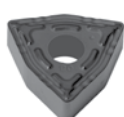
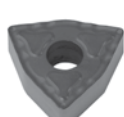


Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
VNMG C2 	VNMG 332 C2	0.375	0.188	0.031	00805	-	-	9.53	4.76	0.8	VNMG 160408-C2
	VNMG 431 C2	0.500	0.188	0.016	00826	-	-	12.70	4.76	0.4	VNMG 220404-C2
VNMG F3 	VNMG 331 F3	0.375	0.188	0.016	-	00801	-	9.53	4.76	0.4	VNMG 160404-F3
	VNMG 332 F3	0.375	0.188	0.031	00806	00807	-	9.53	4.76	0.8	VNMG 160408-F3
VNMG F5 	VNMG 332 F5	0.375	0.188	0.031	-	01307	-	9.53	4.76	0.8	VNMG 160408-F5
VNMG M3 	VNMG 331 M3	0.375	0.188	0.016	00802	00803	-	9.53	4.76	0.4	VNMG 160404-M3
	VNMG 332 M3	0.375	0.188	0.031	00808	00811	-	9.53	4.76	0.8	VNMG 160408-M3
VNMG M5 	VNMG 331 M5	0.375	0.188	0.016	00804	00179	18896	9.53	4.76	0.4	VNMG 160404-M5
	VNMG 332 M5	0.375	0.188	0.031	00813	00817	18897	9.53	4.76	0.8	VNMG 160408-M5
	VNMG 432 M5	0.500	0.188	0.031	00828	00829	-	12.70	4.76	0.8	VNMG 220408-M5
	VNMG 442 M5	0.500	0.250	0.031	00833	00835	-	12.70	6.35	0.8	VNMG 220608-M5
VNMM C6 	VNMM 331 C6	0.375	0.188	0.016	01197	-	19040	9.53	4.76	0.4	VNMM 160404-C6
	VNMM 332 C6	0.375	0.188	0.031	01199	01200	19041	9.53	4.76	0.8	VNMM 160408-C6
	VNMM 442 C6	0.500	0.250	0.031	01203	-	-	12.70	6.35	0.8	VNMM 220608-C6
	VNMM 443 C6	0.500	0.250	0.047	01205	-	-	12.70	6.35	1.2	VNMM 220612-C6
VNMP M2 	VNMP 331 M2*	0.375	0.188	0.016	-	01308	-	9.53	4.76	0.4	VNMP 160404-M2*
	VNMP 332 M2	0.375	0.188	0.031	-	01309	-	9.53	4.76	0.8	VNMP 160408-M2

\*Available in June 2009.

# 5600 SERIES

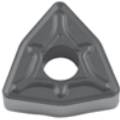

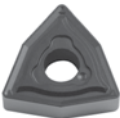
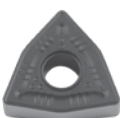
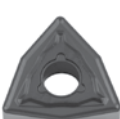
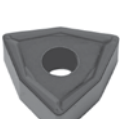

## PRODUCT OFFERING

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Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
	WNGM 432 6W	0.500	0.188	0.031	01311	-	-	12.70	4.76	0.8	WNGM 080408-6W
	WNGM 431 EL PN2	0.500	0.188	0.016	-	-	18899	12.70	4.76	0.4	WNGM 080404 EL-PN2
	WNGM 432 EL PN2	0.500	0.188	0.031	-	-	18902	12.70	4.76	0.8	WNGM 080408 EL-PN2
	WNGM 431 ER PN2	0.500	0.188	0.016	-	-	18900	12.70	4.76	0.4	WNGM 080404 ER-PN2
	WNGM 432 ER PN2	0.500	0.188	0.031	-	-	18903	12.70	4.76	0.8	WNGM 080408 ER-PN2
	WNGM 431 F2	0.500	0.188	0.016	00906	00908	-	12.70	4.76	0.4	WNGM 080404-F2
	WNGM 432 F2	0.500	0.188	0.031	-	00932	-	12.70	4.76	0.8	WNGM 080408-F2
	WNGM 432 F4	0.500	0.188	0.031	00933	-	-	12.70	4.76	0.8	WNGM 080408-F4
	WNGM 431 F5	0.500	0.188	0.016	-	01310	-	12.70	4.76	0.4	WNGM 080404-F5
	WNGM 432 M3	0.500	0.188	0.031	00182	00935	-	12.70	4.76	0.8	WNGM 080408-M3
	WNGM 433 M3	0.500	0.188	0.047	00960	00961	-	12.70	4.76	1.2	WNGM 080412-M3

# 5600 SERIES

## PRODUCT OFFERING

Chipbreaker Style	ANSI Article Number	ANSI Size (in.)			Grade EDP#			ISO Size (mm)			ISO Article Number
		I.C.	Thickness	Radius	VP5615	VP5625	VP5635	I.C.	Thickness	Radius	
WNMG M5 	WNMG 331 M5	0.375	0.188	0.016	00864	00866	-	9.53	4.76	0.4	WNMG 060404-M5
	WNMG 332 M5	0.375	0.188	0.031	-	00868	18898	9.53	4.76	0.8	WNMG 060408-M5
	WNMG 333 M5	0.375	0.188	0.047	-	00904	-	9.53	4.76	1.2	WNMG 060412-M5
	WNMG 431 M5	0.500	0.188	0.016	00909	00928	18901	12.70	4.76	0.4	WNMG 080404-M5
	WNMG 432 M5	0.500	0.188	0.031	00183	00184	19042	12.70	4.76	0.8	WNMG 080408-M5
	WNMG 433 M5	0.500	0.188	0.047	00962	00963	18906	12.70	4.76	1.2	WNMG 080412-M5
WNMG M7 	WNMG 432 M7	0.500	0.188	0.031	-	-	18904	12.70	4.76	0.8	WNMG 080408-M7
WNMG M8 	WNMG 332 M8	0.375	0.188	0.031	00892	-	-	9.53	4.76	0.8	WNMG 060408-M8
	WNMG 432 M8	0.500	0.188	0.031	00936	00938	19043	12.70	4.76	0.8	WNMG 080408-M8
	WNMG 433 M8	0.500	0.188	0.047	01312	00964		12.70	4.76	1.2	WNMG 080412-M8
WNMG R3 	WNMG 432 R3	0.500	0.188	0.031	00185	00943	18905	12.70	4.76	0.8	WNMG 080408-R3
	WNMG 433 R3	0.500	0.188	0.047	00965	00967	18907	12.70	4.76	1.2	WNMG 080412-R3
	WNMG 434 R3	0.500	0.188	0.063	-	00971	-	12.70	4.76	1.6	WNMG 080416-R3
WNMG R4 	WNMG 432 R4	0.500	0.188	0.031	-	00959	-	12.70	4.76	0.8	WNMG 080408-R4
	WNMG 433 R4	0.500	0.188	0.047	-	00969	-	12.70	4.76	1.2	WNMG 080412-R4
WNMG WN3 	WNMG 332 WN3	0.375	0.188	0.031	00903	-	-	9.53	4.76	0.8	WNMG 060408-WN3
WPGT PM2 	WPGT 32.51 PM2	0.375	0.156	0.016	-	00984	-	9.53	3.97	0.4	WPGT 06T304-PM2
	WPGT 32.52 PM2	0.375	0.156	0.031	-	00993	-	9.53	3.97	0.8	WPGT 06T308-PM2

## Valenite Americas

### Valenite LLC

1675 East Whitcomb  
Madison Heights, MI 48071-4628 - USA  
Tel: 1-248-733-6980  
Fax: 1-248-733-7846  
Tech Support: 1-800-488-9073  
Customer Service: 1-800-544-3336  
customer.service@valenite.com

### Valenite - Modco

4510 Rhodes Drive, Unit 920  
Windsor, Ontario N8W 5K5 - Canada  
Tel: 1-519-948-4164  
Fax: 1-519-948-9691  
Customer Service: 1-800-265-9504  
cscanada@valenite.com

### Valenite Mexico

Blvd. Luis Donaldo Colosio  
#2255 2do. piso  
Fracc. San Patricio  
Saltillo, Coah. 25204 - Mexico  
Tel: +52 (844) 450 3500  
Fax: +52 (844) 450 3501  
Customer Service: 01 (800) 248-8256  
customer.servicemexico@valenite.com

## ValeniteSafety Europe

### Safety SAS

43, avenue Edouard Vaillant  
92100 Boulogne Billancourt - France  
Tel: +33 (0)1 46 10 54 00  
Fax: +33 (0)1 46 10 54 54  
info.safety@valenitesafety.com

### Impero S.p.A.

Via Bachelet - Località Crocetta  
29010 S. Polo (Piacenza) - Italia  
Tel: +39 0523 55 19 11  
Fax: +39 0523 55 18 00  
info.impero@valeniteimpero.it

### ValeniteSafety

Philipp - Reis - Str. 7  
D-63110 Rodgau - Deutschland  
Tel: +49 (0)6106-26848-0  
Fax: +49 (0)6106-26848-22  
info.safety-deutschland@valenitesafety.com

### ValeniteSafety

Pol. Ind. Roca  
c./ Verneda s/n  
08107-Martorelles (Barcelona) - España  
Tel: +34 935 71 77 22  
Fax: +34 935 71 77 65  
valenitesafety.es@valenitesafety.com

## Valenite Asia

### Valenite China

Rm 1504. Bldg B,  
No.555 Pudong Ave,  
Shanghai, 200120 - China  
Tel: +86-21-51699781/2  
Fax: +86-21-51380583  
sales.china@valenite.com

### Valenite Japan

2-2-9, Murotani,  
Nishiku, Kobe,  
651-2241 - Japan  
Tel: +81(0)78 992 0970  
Fax: +81(0)78 992 0975  
customer.service@valenite.com



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