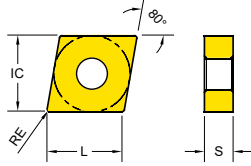


# Turning Inserts - Negative CNMG / CNMA (80° Negative)



Series	L	IC	S
CN** 1204	12	12.7	4.76
CN** 1606	16	15.875	6.35
CN** 1906	19	19.05	6.35

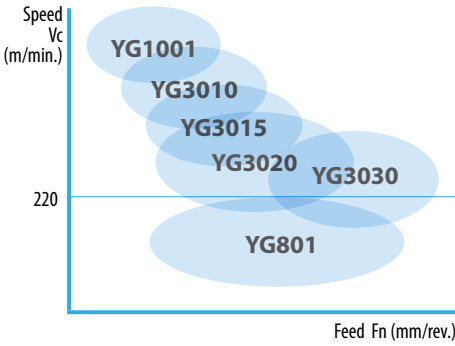
CNMA CNMG	Designation	RE	Fn (mm/rev.)	Ap (mm)	EDP 2200..																							
					P05		P10		P15		P20		P30		M15		M30		M40		N20		N20					
					K10	K20	K10	K20	K15	K20	K15	K20	K15	K20	M15	M20	M15	M20	M15	M20	M15	M20	N20	N20				
-UG Medium Machining at stable condition	CNMG 120404 - UG	0.4	0.2 ~ 0.4	0.5 ~ 2.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
	CNMG 120408 - UG	0.8	0.2 ~ 0.4	1.0 ~ 3.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
	CNMG 120412 - UG	1.2	0.2 ~ 0.4	1.5 ~ 4.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
	CNMG 160608 - UG	0.8	0.20 ~ 0.40	1.5 ~ 5.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	CNMG 160612 - UG	1.2	0.2 ~ 0.4	1.5 ~ 5.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	CNMG 160616 - UG	1.6	0.2 ~ 0.4	1.8 ~ 5.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
-UC Cast iron and Medium roughing	CNMG 120404 - UC	0.4	0.2 ~ 0.4	0.5 ~ 2.5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	CNMG 120408 - UC	0.8	0.2 ~ 0.4	1.0 ~ 4.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	CNMG 120412 - UC	1.2	0.2 ~ 0.4	1.5 ~ 4.5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
-UR Roughing	CNMG 120408 - UR	0.8	0.3 ~ 0.5	1.0 ~ 4.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	CNMG 120412 - UR	1.2	0.3 ~ 0.5	1.5 ~ 5.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CNMG 120416 - UR	1.6	0.3 ~ 0.5	2.0 ~ 5.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CNMG 160608 - UR	0.8	0.3 ~ 0.5	1.0 ~ 5.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CNMG 160612 - UR	1.2	0.3 ~ 0.5	1.5 ~ 5.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CNMG 160616 - UR	1.6	0.3 ~ 0.5	2.0 ~ 5.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
-UR	CNMG 190608 - UR	0.8	0.3 ~ 0.8	3.0 ~ 9.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CNMG 190612 - UR	1.2	0.3 ~ 0.8	3.0 ~ 9.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CNMG 190616 - UR	1.6	0.3 ~ 0.8	3.0 ~ 9.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	CNMG 190616 - UR	1.6	0.3 ~ 0.8	3.0 ~ 9.0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Cutting Speed			Vc (m/min.)												
ISO	VDI	Sub Group	YG1001	YG3010	YG3015	YG3020	YG3030	YG3015	YG801	YG211	YG213	YG214	YG100	YG10	
			Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max	Min Max
P	1~5	Non-Alloyed Steel	220 480	170 450	170 410	180 380	150 350	120 200	- -	- -	- -	- -	- -	- -	- -
	6~9	Low-Alloyed Steel	220 420	180 380	130 360	110 350	90 300	70 200	- -	- -	- -	- -	- -	- -	- -
	10~11	High-Alloyed Steel	- -	100 330	80 310	60 300	70 250	- -	- -	- -	- -	- -	- -	- -	- -
M	12~13	Ferritic & Martensitic	- -	- -	- -	- -	120 230	- -	130 230	110 180	80 150	- -	- -	- -	
	14	Austenitic Stainless Steel	- -	- -	- -	- -	80 200	- -	100 200	40 130	30 120	- -	- -	- -	
K	15~16	Grey Cast Iron	170 420	120 300	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
	17~18	Nodular Cast Iron	120 410	120 280	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
N	21~30	Non-Ferrous Metals (Al)	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	350 1200	250 800	
S	31~37	Superalloys & Titanium	- -	- -	- -	- -	35 80	- -	30 90	20 40	20 40	- -	- -	- -	
H	38~41	Hard Materials	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	

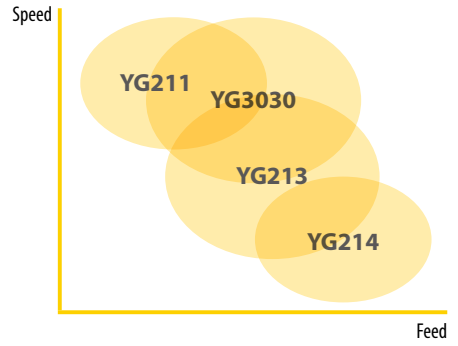
Product Overview

**Turning Grades Map**

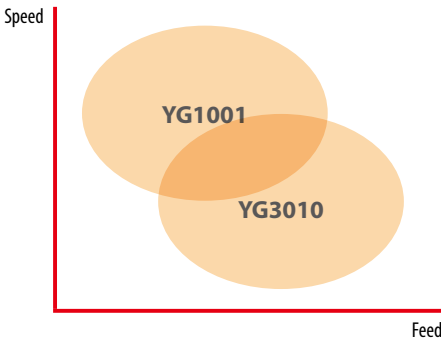
**Steels**



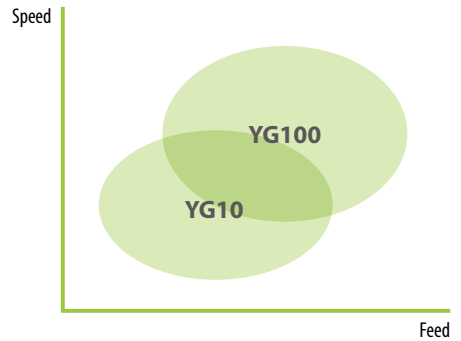
**Stainless steels**



**Cast iron**



**Non-ferrous Metals**



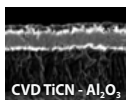
## Product Overview Turning Grades

TURNING  
PARTIAL GROOVING  
MILLING

Turning Grades	P Steel				M Stainless steel			K Cast iron			N Non-ferrous		S Superalloys	
	P10	P20	P30	P40	M10	M20	M30	K10	K20	K30	N10	N20	S10	S20
CVD	YG1001	1001							1001					
	YG3010		3010							3010				
	YG3015			3015										
	YG3020				3020		3030							
	YG3030					3030								
PVD	YG801		801											
	YG211					211							211	
	YG213						213							213
	YG214							214						214
DLC	YG100										100			
-	YG10											10		

### YG1001

P01 - P10  
K10 - K25

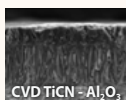


#### First choice for stable machining of Cast iron

- Substrate especially designed for high wear resistance
- Thick Al<sub>2</sub>O<sub>3</sub> layer ensures good wear resistance at high cutting speeds including dry machining

### YG3010

P05 - P20  
K15 - K35



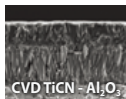
#### First choice for Finishing Steels, and Ductile Cast iron

- Finishing and light machining of steel under in stable condition
- New Al<sub>2</sub>O<sub>3</sub> coating technology and excellent surface smoothness increase wear resistance and chipping resistance

NEW

### YG3015

P10 - P25

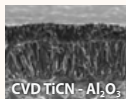


#### Balanced productivity for Continuous cut

- High wear resistance and improved toughness ensures high productivity with less trouble

### YG3020

P15 - P30

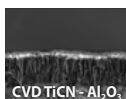


#### First Choice grade for general Steel application

- Substrate especially designed for good toughness
- Excellent surface smoothness increases wear resistance and reliability

### YG3030

P20 - P35  
M10 - M30

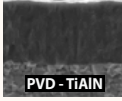
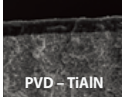
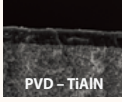
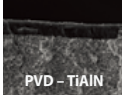
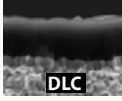
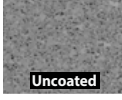


#### Interrupted cut of Steel and Stainless steel

- Heavy interrupted cut for Steel
- High cutting speed for Stainless steel

## Product Overview

# Turning Grades

<p><b>YG801</b></p> <p>P10 - P30</p>	 <p>PVD - TiAlN</p>	<p><b>for Carbon Steel with Low cutting speed</b></p> <ul style="list-style-type: none"> <li>• Recommended for mild steel and boring application</li> <li>• Substrate and special PVD coating for excellent wear resistance</li> </ul>
<p><b>YG211</b></p> <p>M05 - M25</p> <p>S05 - S20</p>	 <p>PVD - TiAlN</p>	<p><b>High wear resistance grade for Super alloys and Stainless steel</b></p> <ul style="list-style-type: none"> <li>• Finishing Stainless steel</li> </ul>
<p><b>YG213</b></p> <p>M20 - M35</p> <p>S15 - S25</p>	 <p>PVD - TiAlN</p>	<p><b>First Choice Grade on low cutting speed of Stainless steel</b></p> <ul style="list-style-type: none"> <li>• First choice on Stainless steel for Low cutting speed</li> <li>• For Medium to low cutting speed</li> </ul>
<p><b>YG214</b></p> <p>M30 - M40</p> <p>S25 - S30</p>	 <p>PVD - TiAlN</p>	<p><b>Heavy Interrupted cut for Stainless steel</b></p> <ul style="list-style-type: none"> <li>• For Heavy Interrupted cut on Stainless steel</li> <li>• Minimize risk of Mechanical fracture or Chipping</li> </ul>
<p><b>YG100</b></p> <p>N05 - N25</p>	 <p>DLC</p>	<p><b>First Choice grade for aluminum with DLC coating</b></p> <ul style="list-style-type: none"> <li>• Submicron carbide for high wear resistance</li> <li>• DLC coating minimizes Built Up Edge tendency.</li> <li>• Improve tool life in sticky non-ferrous alloy</li> </ul>
<p><b>YG10</b></p> <p>N05 - N25</p>	 <p>Uncoated</p>	<p><b>Uncoated Grade for General Aluminum</b></p> <ul style="list-style-type: none"> <li>• Substrate consisted of submicron carbide for high wear resistance</li> <li>• Shining surface to prevent built up edge</li> </ul>

TURNING

PARTING & GROOVING

MILLING

DRILLING

TECHNICAL INFORMATION

Product Overview

# Turning Chipbreakers - Negative

TURNING

PARTICLE GRINDING/OILING

MILLING

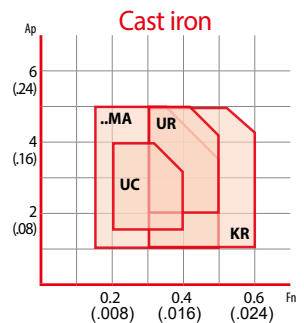
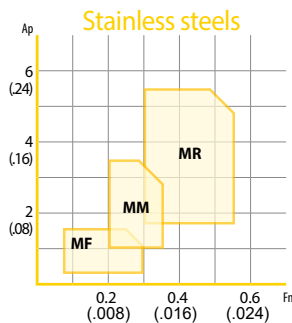
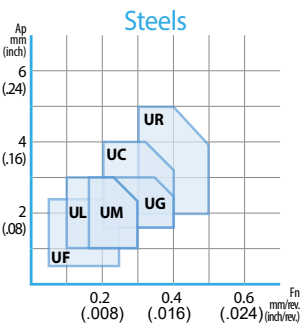
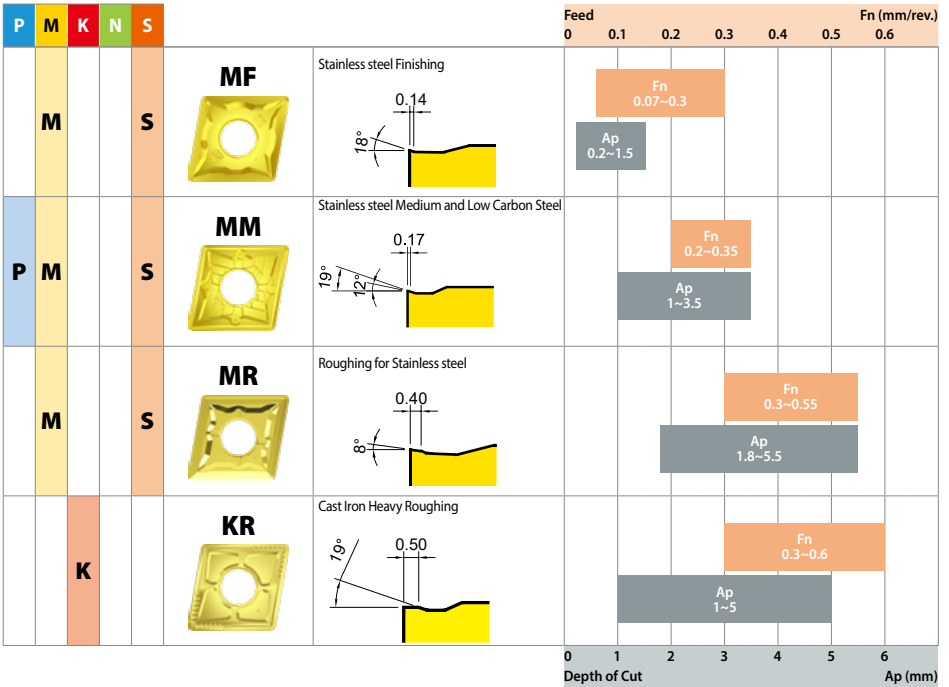
DRILLING

TECHNICAL INFORMATION

					Feed							
P	M	K	N	S	Fn (mm/rev.)							
					0	0.1	0.2	0.3	0.4	0.5	0.6	
P					<b>UF</b>  Finishing 	Fn 0.05~0.25		Ap 0.5~2.5				
						Fn 0.1~0.3		Ap 1~3				
P					<b>UL</b>  Semi Finishing and sticky materials 	Fn 0.15~0.3		Ap 1~3				
						Fn 0.2~0.4		Ap 1.5~3				
P					<b>UM</b>  For Medium & Unstable conditions 	Fn 0.2~0.4		Ap 1.5~3				
						Fn 0.2~0.4		Ap 1.5~3				
P					<b>UG</b>  First Choice for Medium (Stable application) 	Fn 0.2~0.4		Ap 1.5~3				
						Fn 0.2~0.4		Ap 1.5~4				
P	K				<b>UC</b>  Medium Roughing and First choice for Cast iron 	Fn 0.3~0.5		Ap 2~5				
						Fn 0.3~0.5		Ap 2~5				
P	K				<b>UR</b>  Roughing and Heavy interrupted cut 	Fn 0.15~0.5		Ap 1~5				
						Fn 0.15~0.5		Ap 1~5				
		K			<b>..MA</b>  Cast iron Heavy Roughing 	Fn 0.15~0.5		Ap 1~5				
						Fn 0.15~0.5		Ap 1~5				
					0	1	2	3	4	5	6	
					Depth of Cut						Ap (mm)	

Product Overview

# Turning Chipbreakers - Negative



## Insert ISO Code System

\*Metric : According to ISO 1832

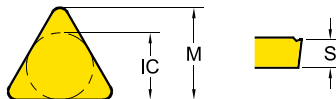
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page 10

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>C</b>	<b>N</b>	<b>M</b>	<b>G</b>	<b>12</b>	<b>04</b>	<b>08</b>	<b>-UG</b>	<b>YG3020</b>
Shape	Clearance	Tolerance	Clamping & Chipbreaker	Insert Size	Insert Thickness	Corner Radius	Chipbreaker Geometry	Grade

### 1 - Shape

Symbol	Shape	
<b>H</b>	Hexagonal	
<b>O</b>	Octagonal	
<b>P</b>	Pentagonal	
<b>S</b>	Square	
<b>T</b>	Triangular	
<b>C</b>	Rhombic 80°	
<b>D</b>	Rhombic 55°	
<b>V</b>	Rhombic 35°	
<b>W</b>	Trigon	
<b>L</b>	Rectangular	
<b>K</b>	Parallelogram 55°	
<b>R</b>	Round	



### 3 - Tolerance Class

Symbol	Inner Circle IC (mm)	Nose Height M (mm)	Thickness S (mm)
<b>C</b>	± 0.025	± 0.013	± 0.025
<b>E</b>	± 0.025	± 0.025	± 0.025
<b>G</b>	± 0.025	± 0.025	± 0.13
<b>H</b>	± 0.013	± 0.013	± 0.025
<b>K*</b>	± 0.05~0.15*	± 0.013	± 0.025
<b>M*</b>	± 0.05~0.15*	± 0.08~0.2*	± 0.13
<b>U*</b>	± 0.08~0.25*	± 0.13~0.38*	± 0.13

\*Tolerance is different by insert IC size. Please see ISO 1832

### 4 - Clamping & Chipbreaker

Symbol	Clamping	Chipbreaker	Figure
<b>N</b>	No clamping hole	X	
<b>R</b>		One Face	
<b>A</b>	Cylindrical Clamping hole	X	
<b>M</b>		One Face	
<b>G</b>		Both Faces	
<b>W</b>	Screw Hole	X	
<b>T</b>		One Face	
<b>U</b>		Both Faces	
<b>X</b>			Special

### 2 - Relief Angle (AN)

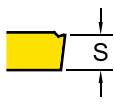
Symbol	Relief Angle (AN)	
<b>N</b>	No Relief Angle	
<b>B</b>	Relief 5°	
<b>C</b>	Relief 7°	
<b>P</b>	Relief 11°	
<b>D</b>	Relief 15°	
<b>E</b>	Relief 20°	
<b>F</b>	Relief 25°	
<b>O</b>	Special	

# Insert ISO Code System

*Inch							page 14	page 10
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>C</b>	<b>N</b>	<b>M</b>	<b>G</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>-UG</b>	<b>YG3020</b>
Shape	Clearance	Tolerance	Clamping & Chipbreaker	Insert Size	Insert Thickness	Corner Radius	Chipbreaker Geometry	Grade

## 5 - Insert Size

Metric							Inner Circle IC(mm)	Inch
S	T	C	D	V	W	R		
06	11	06	07	11			6.35	2
07							7.94	2.5
09	16	09	11	16	06	09 (00)	9.525	3
12	22	12	15	22	08	12 (00)	12.7	4
15		16					15.875	5
19		19					19.05	6
25		25					25.4	8
						06 (M0)	6	
						08 (M0)	8	
						10 (M0)	10	
						12 (M0)	12	
						16 (M0)	16	



## 6 - Insert Thickness (S)

Metric	Thickness - S (mm)	Inch
<b>T1</b>	1.98	<b>1.2</b>
<b>02</b>	2.38	<b>1.5</b>
<b>03</b>	3.18	<b>2</b>
<b>T3</b>	3.97	<b>2.5</b>
<b>04</b>	4.76	<b>3</b>
<b>05</b>	5.56	<b>3.5</b>
<b>06</b>	6.35	<b>4</b>
<b>07</b>	7.94	<b>5</b>
<b>09</b>	9.525	<b>6</b>

## 7 - Corner Radius (RE)

Metric	Corner Radius - RE (mm)	Inch
<b>01</b>	0.1	<b>0</b>
<b>02</b>	0.2	<b>0.5</b>
<b>04</b>	0.4	<b>1</b>
<b>08</b>	0.8	<b>2</b>
<b>12</b>	1.2	<b>3</b>
<b>16</b>	1.6	<b>4</b>
<b>20</b>	2.0	<b>5</b>
<b>24</b>	2.4	<b>6</b>



## Grade Naming System

1	2	3	4	5	(6)
<b>YG</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>(G)</b>
YG Brand	Workpiece Material	Grade Version	Application Range (1st Digit)	Application Range (2nd Digit)	Minor Variation
Carbide CVD (4 Digits)	●	●	●	●	<b>YG3020</b>
Carbide PVD (3 Digits)	●	●	●		<b>YG211</b>
Carbide Uncoated (2 Digits)	●	●			<b>YG10</b>

### 1 - YG Brand

### 2 - Workpiece Material

Symbol	Workpiece Material	Turning	Milling	Drilling	Parting
<b>1</b>	<b>K</b> Cast Iron or <b>N</b> Non-Ferrous	●			
<b>2</b>	<b>M</b> Stainless Steel	●			
<b>3</b>	<b>P</b> Steel	●			
<b>4</b>	<b>S</b> Superalloys	●			
<b>5</b>	<b>K</b> Cast Iron or <b>N</b> Non-Ferrous		●	●	●
<b>6</b>	<b>M</b> Stainless Steel or <b>U</b> niversal		●	●	●
<b>7</b>	<b>P</b> Steel		●	●	●
<b>8</b>	<b>U</b> niversal	●			

### 4 & 5 — Application Range

Symbol	
<b>05</b>	<p>Wear Resistant Grade Stable Application Continuous Cut Finishing</p>
<b>10</b>	
<b>15</b>	
<b>20</b>	<p>Balanced Grade High Versatility General Application</p>
<b>25</b>	
<b>30</b>	
<b>35</b>	<p>Tougher Grade Unstable Application Interrupted Cut Chipping Resistance Roughing</p>
<b>40</b>	
<b>45</b>	

### 3 — Grade Version

### (6) — (Minor Variation)

G — Gold Coated Version