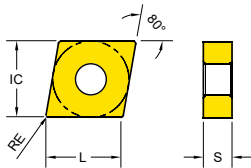


Turning Inserts - Negative CNMG / CNMA (80° Negative)



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

TURNING

PAINTING & COATING

MILLING

DRILLING

TECHNICAL CONSULTATION

EDP 2200..

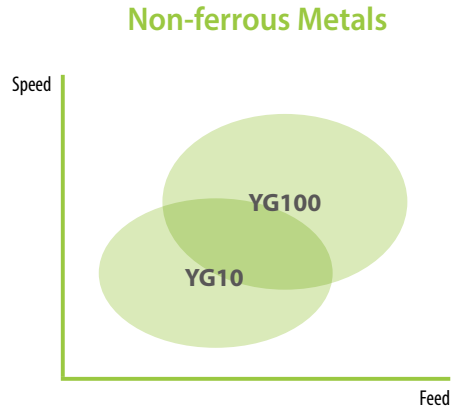
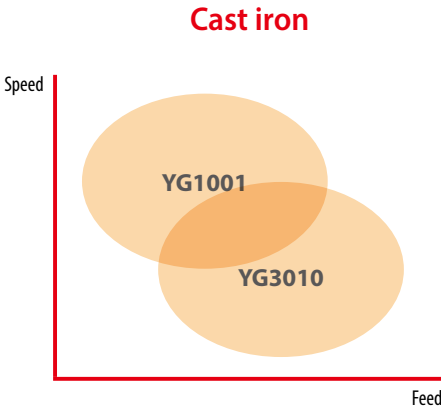
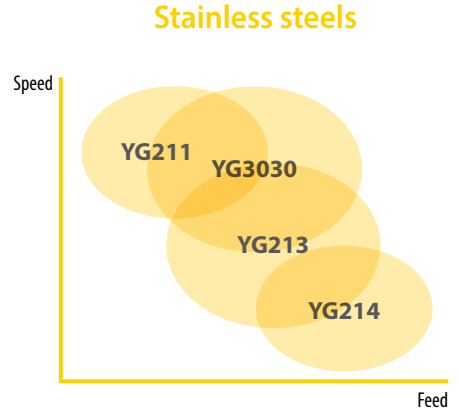
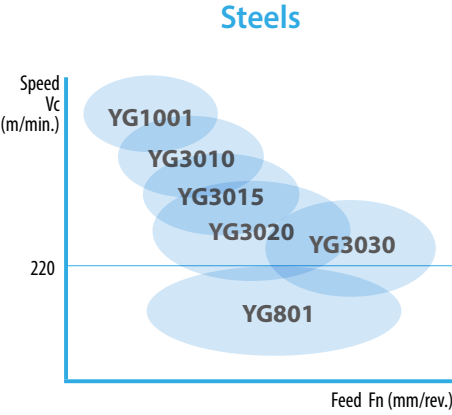
● : Stock item ○ : Order made item

CNMA CNMG	Designation	RE	Fn (mm/rev.)	Ap (mm)	P05	P10	P15	P20	P30	P20	M15	M30	M40	N20	N20
					K10	K20	M20	M20	S10	S20	S30	N20	N20		
-MF Stainless steel Finishing	CNMG 120404 - MF	0.4	0.07 ~ 0.3	0.2 ~ 1.5	●	○	○	○	○	○	●	●	○	○	○
	CNMG 120408 - MF	0.8	0.07 ~ 0.3	0.2 ~ 1.5	○	○	○	○	○	○	●	●	○	○	○
	CNMG 120412 - MF	1.2	0.07 ~ 0.3	0.2 ~ 1.5	○	○	○	○	○	○	●	●	○	○	○
-MM Stainless steel Medium	CNMG 120404 - MM	0.4	0.2 ~ 0.35	0.5 ~ 3.0	○	○	○	○	○	○	○	○	○	○	○
	CNMG 120408 - MM	0.8	0.2 ~ 0.35	1.0 ~ 3.5	○	○	○	○	○	○	○	○	○	○	○
	CNMG 120412 - MM	1.2	0.2 ~ 0.35	1.5 ~ 3.5	○	○	○	○	○	○	○	○	○	○	○
-MR Stainless steel Roughing	CNMG 120408 - MR	0.8	0.3 ~ 0.55	1.2 ~ 5.5	○	○	○	○	○	○	○	○	○	○	○
	CNMG 120412 - MR	1.2	0.3 ~ 0.55	1.5 ~ 5.5	○	○	○	○	○	○	○	○	○	○	○
-KR Cast Iron Heavy Roughing	CNMG 120408 - KR	0.8	0.30 ~ 0.60	1.0 ~ 5.0	○	○	○	○	○	○	○	○	○	○	○
	CNMG 120412 - KR	1.2	0.30 ~ 0.60	1.5 ~ 5.0	○	○	○	○	○	○	○	○	○	○	○

Cutting Speed		Vc (m/min.)													
ISO	VDI	Sub Group	YG1001	YG3010	YG3015	YG3020	YG3030	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	
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



TURNING

PARTING & GROOVING

MILLING

DRILLING

TECHNICAL INFORMATION

Product Overview Turning Grades

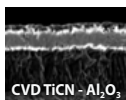
TURNING
PARTIAL GROOVING
MILLING

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		

DRILLING
TECHNICAL INFORMATION

YG1001

P01 - P10
K10 - K25

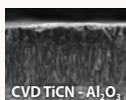


First choice for stable machining of Cast iron

- Substrate especially designed for high wear resistance
- Thick Al₂O₃ layer ensures good wear resistance at high cutting speeds including dry machining

YG3010

P05 - P20
K15 - K35



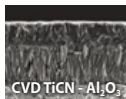
First choice for Finishing Steels, and Ductile Cast iron

- Finishing and light machining of steel under in stable condition
- New Al₂O₃ coating technology and excellent surface smoothness increase wear resistance and chipping resistance

NEW

YG3015

P10 - P25

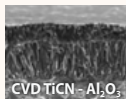


Balanced productivity for Continuous cut

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

YG3020

P15 - P30

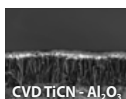


First Choice grade for general Steel application

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

YG3030

P20 - P35
M10 - M30

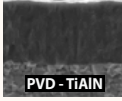
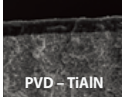
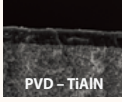
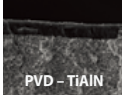
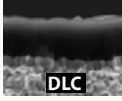
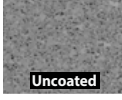


Interrupted cut of Steel and Stainless steel

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

Product Overview

Turning Grades

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

TURNING

PARTING & GROOVING

MILLING

DRILLING

TECHNICAL INFORMATION

Product Overview

Turning Chipbreakers - Negative

TURNING

PARTICLE GRINDING/OILING

MILLING

DRILLING

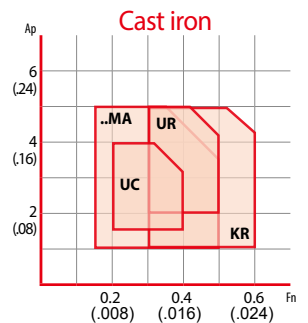
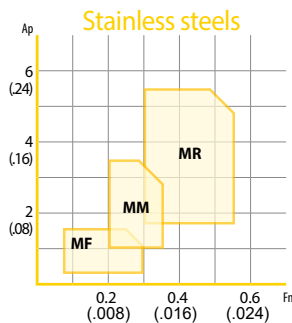
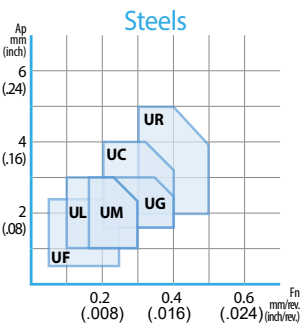
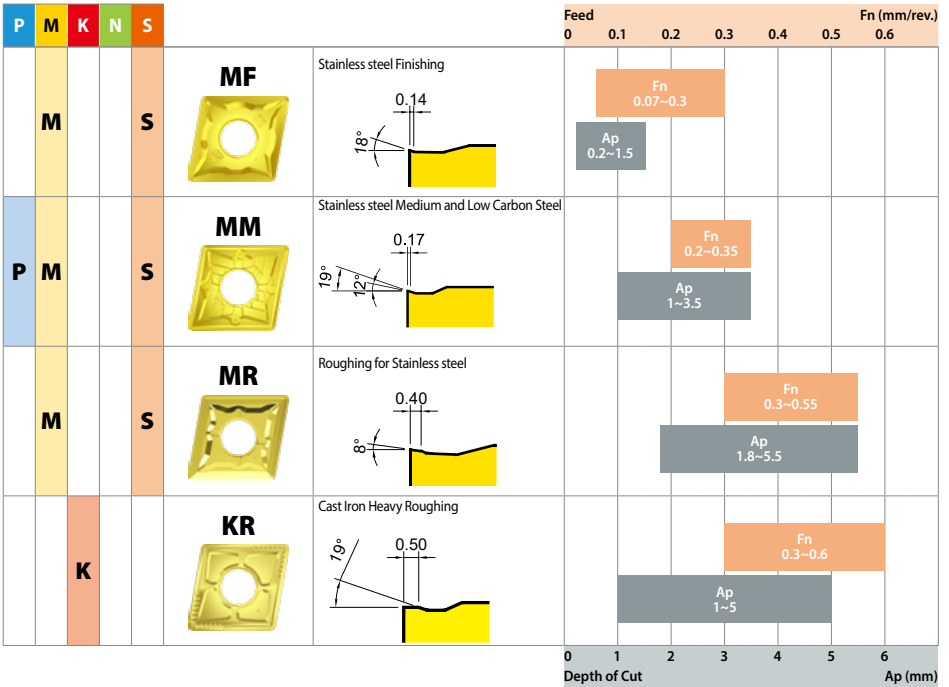
TECHNICAL INFORMATION

					Feed						
P	M	K	N	S	Fn (mm/rev.)						
					0	0.1	0.2	0.3	0.4	0.5	0.6
P					UF Finishing 	Fn 0.05~0.25		Ap 0.5~2.5			
						Fn 0.1~0.3		Ap 1~3			
P					UL Semi Finishing and sticky materials 	Fn 0.15~0.3		Ap 1~3			
						Fn 0.2~0.4		Ap 1.5~3			
P					UM For Medium & Unstable conditions 	Fn 0.2~0.4		Ap 1.5~3			
						Fn 0.2~0.4		Ap 1.5~3			
P					UG 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				UC 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				UR Roughing and Heavy interrupted cut 	Fn 0.15~0.5		Ap 1~5			
						Fn 0.15~0.5		Ap 1~5			
		K			..MA 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

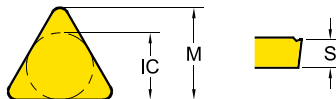
page 14

page 10

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

1 - Shape

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



3 - Tolerance Class

Symbol	Inner Circle IC (mm)	Nose Height M (mm)	Thickness S (mm)
C	± 0.025	± 0.013	± 0.025
E	± 0.025	± 0.025	± 0.025
G	± 0.025	± 0.025	± 0.13
H	± 0.013	± 0.013	± 0.025
K*	± 0.05~0.15*	± 0.013	± 0.025
M*	± 0.05~0.15*	± 0.08~0.2*	± 0.13
U*	± 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
N	No clamping hole	X	
R		One Face	
A	Cylindrical Clamping hole	X	
M		One Face	
G		Both Faces	
W	Screw Hole	X	
T		One Face	
U		Both Faces	
X	Special		

2 - Relief Angle (AN)

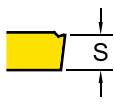
Symbol	Relief Angle (AN)	
N	No Relief Angle	
B	Relief 5°	
C	Relief 7°	
P	Relief 11°	
D	Relief 15°	
E	Relief 20°	
F	Relief 25°	
O	Special	

Insert ISO Code System

*Inch							page 14	page 10
1	2	3	4	5	6	7	8	9
C	N	M	G	4	3	2	-UG	YG3020
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
T1	1.98	1.2
02	2.38	1.5
03	3.18	2
T3	3.97	2.5
04	4.76	3
05	5.56	3.5
06	6.35	4
07	7.94	5
09	9.525	6

7 - Corner Radius (RE)

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

Grade Naming System

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

1 - YG Brand

2 - Workpiece Material

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

4 & 5 — Application Range

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

3 — Grade Version

(6) — (Minor Variation)

G — Gold Coated Version