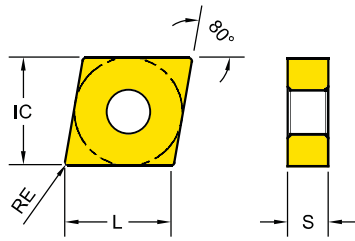


Turning - Inserts - Negative

CNMG / CNMA (80° Negative)



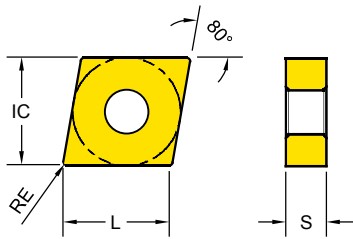
Series	L	IC	S
CNM□ 1204	12	12.7	4.76
CNM□ 1606	16	15.88	6.35
CNM□ 1906	19	19.05	6.35

● : Stock item ○ : Order made item

CNMA CNMG	Designation	RE	Fn (mm/rev.)	Ap (mm)	YG1001	YG3010	YG3020	YG3030	YG801	YG211	YG100	YG10
..MA  Cast Iron	CNMA 120404	0.4	0.15~0.35	0.5~2.5	●	○						
	CNMA 120408	0.8	0.2~0.4	1~3.5	●	○						
	CNMA 120412	1.2	0.2~0.5	1.5~5	●	○						
	CNMA 160612	1.2	0.3~0.5	1.5~5	●	○						
	CNMA 160616	1.6	0.3~0.6	1.5~6	●	●						
	CNMA 190616	1.6	0.3~0.6	1.5~8	●	●						
-UF  Finishing	CNMG 120404 - UF	0.4	0.05~0.2	0.5~1.5		●	●	●	●			
	CNMG 120408 - UF	0.8	0.1~0.25	1~2.5		●	●	●				
-UL  Light Machining and Sticky Material	CNMG 120404 - UL	0.4	0.05~0.25	0.5~2		●	●					
	CNMG 120408 - UL	0.8	0.1~0.3	1~3		●	●	●				
	CNMG 120412 - UL	1.2	0.1~0.3	1.5~3.5		○	○	○				
-UM  Medium Maching Unstable condition	CNMG 120404 - UM	0.4	0.15~0.25	0.5~1.5		●	●	●				
	CNMG 120408 - UM	0.8	0.15~0.3	0.5~2	●	●	●	●				

Cutting Speed			Vc (m/min.)											
ISO	VDI	Sub Group	YG1001 Min. Max.	YG3010 Min. Max.	YG3020 Min. Max.	YG3030 Min. Max.	YG801 Min. Max.	YG211 Min. Max.	YG100 Min. Max.	YG10 Min. Max.				
P	1~5	Non Alloy Steel	220 480	170 450	180 380	150 350	120 250	- -	- -	- -				
	6~9	Low Alloy Steel	220 420	180 380	110 350	90 300	70 230	- -	- -	- -				
	10~11	High Alloy Steel	- -	100 330	60 300	70 250	70 180	- -	- -	- -				
M	12~13	Ferritic & Martensitic	- -	- -	- -	120 220	60 180	100 200	- -	- -				
	14	Austenitic Stainless Steel	- -	- -	- -	50 180	60 150	70 160	- -	- -				
K	15~16	Grey Cast Iron	170 420	120 300	- -	- -	60 160	- -	- -	- -				
	17~18	Nodular Cast Iron	120 410	120 280	- -	- -	60 120	- -	- -	- -				
N	21~30	Aluminum	- -	- -	- -	- -	- -	- -	350 1200	250 800				
S	31~37	Heat Resistant Super Alloy	- -	- -	- -	35 80	35 60	30 90	- -	- -				
H	38~41	Hardened Material	- -	- -	- -	- -	40 80	- -	- -	- -				

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



Series	L	IC	S
CNM□ 1204	12	12.7	4.76
CNM□ 1606	16	15.88	6.35
CNM□ 1906	19	19.05	6.35

● : Stock item ○ : Order made item

CNMA CNMG	Designation	RE	Fn (mm/rev.)	Ap (mm)	YG1001	YG3010	YG3020	YG3030	YG801	YG211	YG100	YG10
-UG  Medium Machining at stable condition	CNMG 120404 - UG	0.4	0.2~0.3	0.5~2		●	●	●				
	CNMG 120408 - UG	0.8	0.2~0.4	1~3	●	●	●	●	●			
	CNMG 120412 - UG	1.2	0.2~0.45	1.5~4		●	●	●				
-UC  Cast Iron and Medium roughing	CNMG 120404 - UC	0.4	0.25~0.35	0.5~2.5	●	●	●	●				
	CNMG 120408 - UC	0.8	0.25~0.45	1~4	●	●	●	●				
	CNMG 120412 - UC	1.2	0.3~0.55	1.5~4.5	●	●	●	●				
-UR  Roughing	CNMG 120408 - UR	0.8	0.25~0.55	1~4		●	●	●				
	CNMG 120412 - UR	1.2	0.3~0.6	1.5~5		●	●	●	●			
	CNMG 190612 - UR	1.2	0.3~0.6	1.5~6	●	●						
-MM  Stainless Steel Medium	CNMG 120408 - MM	0.8	0.2~0.35	1~3.5			○	●	●	●		

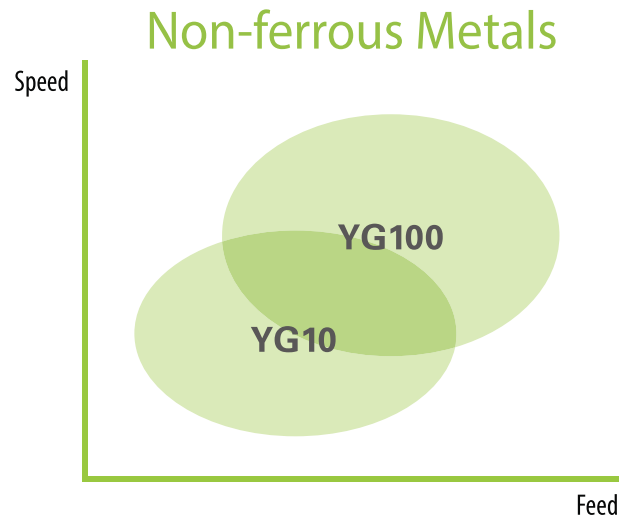
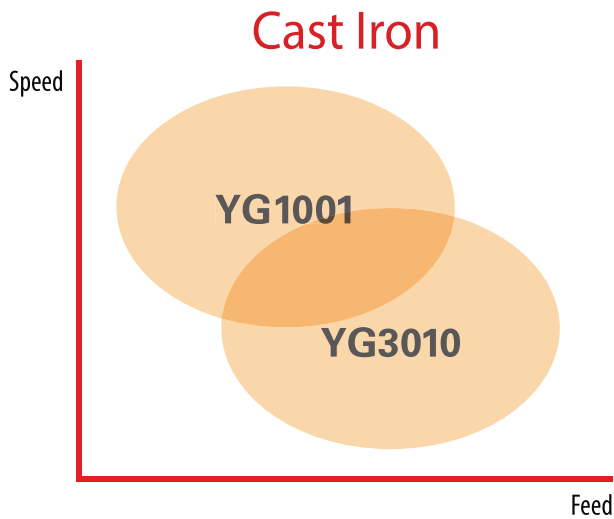
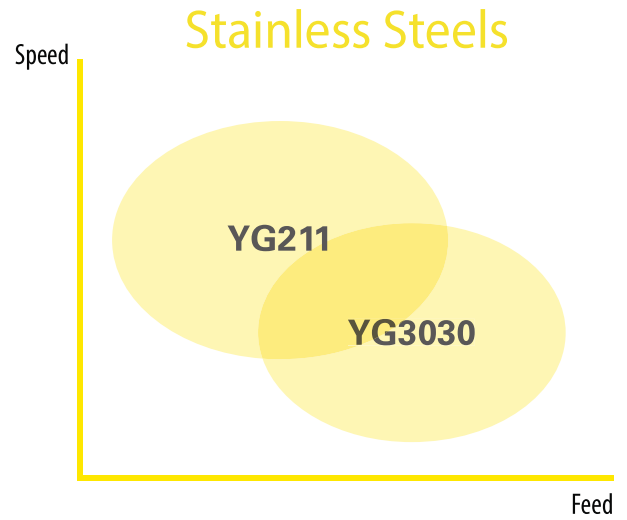
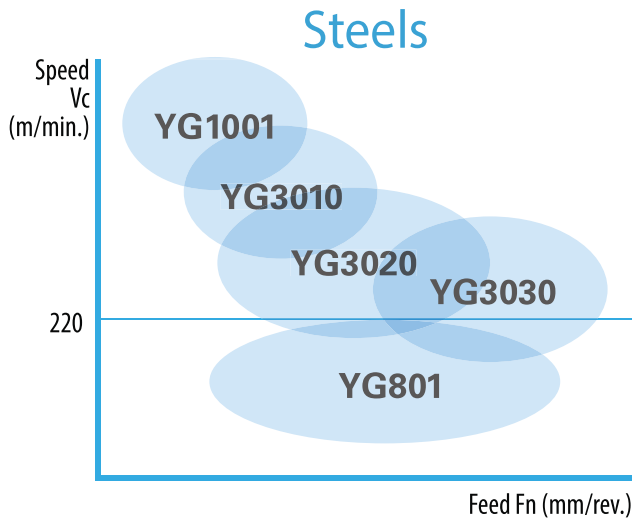
Cutting Speed			Vc (m/min.)															
ISO	VDI	Sub Group	YG1001		YG3010		YG3020		YG3030		YG801		YG211		YG100		YG10	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
P	1~5	Non Alloy Steel	220	480	170	450	180	380	150	350	120	250	-	-	-	-	-	-
	6~9	Low Alloy Steel	220	420	180	380	110	350	90	300	70	230	-	-	-	-	-	-
	10~11	High Alloy Steel	-	-	100	330	60	300	70	250	70	180	-	-	-	-	-	-
M	12~13	Ferritic & Martensitic	-	-	-	-	-	-	120	220	60	180	100	200	-	-	-	-
	14	Austenitic Stainless Steel	-	-	-	-	-	-	50	180	60	150	70	160	-	-	-	-
K	15~16	Grey Cast Iron	170	420	120	300	-	-	-	-	60	160	-	-	-	-	-	-
	17~18	Nodular Cast Iron	120	410	120	280	-	-	-	-	60	120	-	-	-	-	-	-
N	21~30	Aluminum	-	-	-	-	-	-	-	-	-	-	-	-	350	1200	250	800
S	31~37	Heat Resistant Super Alloy	-	-	-	-	-	-	35	80	35	60	30	90	-	-	-	-
H	38~41	Hardened Material	-	-	-	-	-	-	-	-	40	80	-	-	-	-	-	-

Turning Grades

Turning Grades		P Steel				M Stainless Steel				K Cast Iron				N Non Ferrous			
		P05	P15	P25	P35	M05	M15	M25	M35	K05	K15	K25	K35	N05	N15	N25	N35
CVD	YG1001	1001									1001						
	YG3010		3010								3010						
	YG3020			3020													
	YG3030				3030			3030									
PVD	YG801		801			801											
	YG211					211											
DLC	YG100															100	
Uncoated	YG10															10	

YG1001 P01 - P10 K10 - K25	 CVD TiCN - Al ₂ O ₃	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	 CVD TiCN - Al ₂ O ₃	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 increases wear resistance and chipping resistance
YG3020 P15 - P30	 CVD TiCN - Al ₂ O ₃	First Choice grade for general Steel application - Substrate especially designed for good toughness - Excellent surface smoothness increases wear resistance and reliability
YG3030 P20 - P35 M20 - M35	 CVD TiCN - Al ₂ O ₃	Interrupted cutting of steel and stainless steel - Substrate for heavy roughing in mild steel and low carbon alloy steel - New Al₂O₃ technology and optimized surface treatment achieves a good balance between wear resistance and chipping resistance
YG801 P10 - P30 S05 - S25 M05 - M25 H20 - H40	 PVD - TiAlN	Universal Grade for mid and low cutting conditions - Recommended for mild steel, stainless steel, and boring application - Substrate and special PVD coating for excellent wear resistance
YG211 M05 - M25 S05 - S25	 PVD AlCrN	PVD Grade for Stainless Steel and Super Alloy - For continuous cut and general machining - Surface treatment prevents Built-up-edge - Hard coating prevents rapid wear
YG100 N05 - N35	 DLC	First Choice grade for aluminum with DLC coating - Submicron carbide for high wear resistance - DLC coating minimizes Built Up Edge tendency. - Improves tool life in sticky non-ferrous alloy
YG10 N05 - N35	 Uncoated	Uncoated Grade for General Aluminum - Substrate consisted of submicron carbide for high wear resistance - Shining surface to prevent built up edge

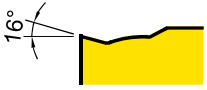
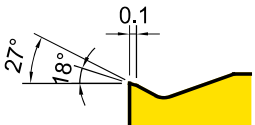
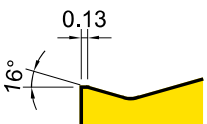
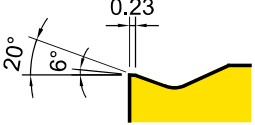
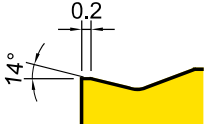
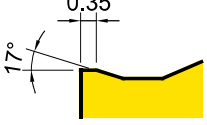
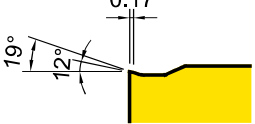
Turning Grade Map



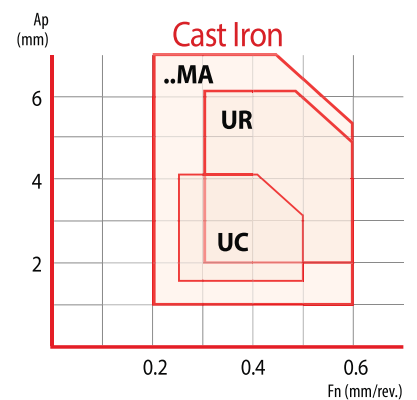
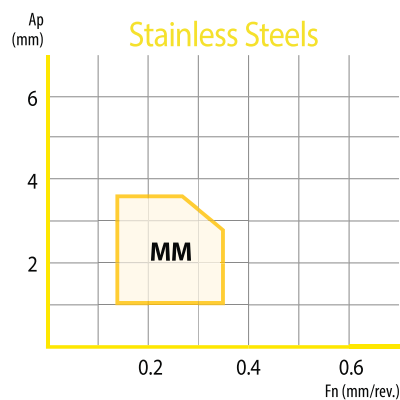
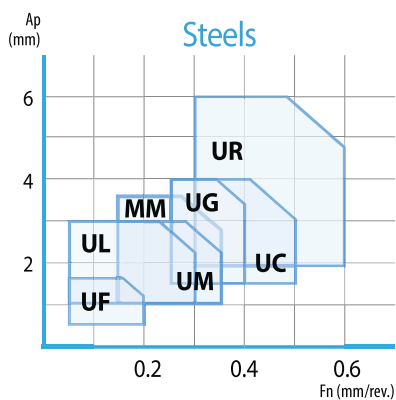
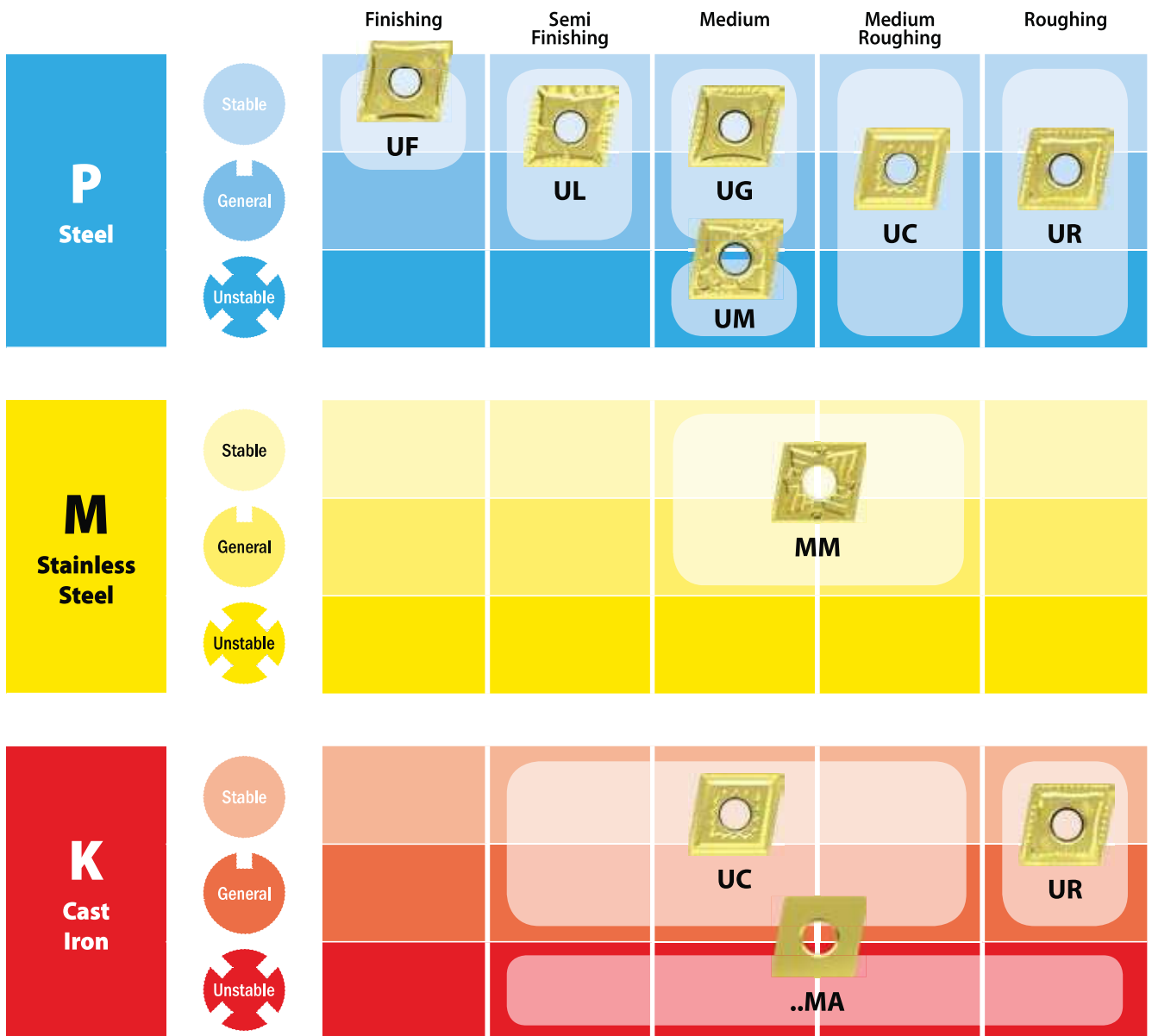
Recommended Cutting Conditions

Cutting Speed			Vc (m/min.)															
ISO	VDI	Sub Group	YG1001		YG3010		YG3020		YG3030		YG801		YG211		YG100		YG10	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
P	1~5	Non Alloy Steel	220	480	170	450	180	380	150	350	120	250	-	-	-	-	-	-
	6~9	Low Alloy Steel	220	420	180	380	110	350	90	300	70	230	-	-	-	-	-	-
	10~11	High Alloy Steel	-	-	100	330	60	300	70	250	70	180	-	-	-	-	-	-
M	12~13	Ferritic & Martensitic	-	-	-	-	-	-	120	220	60	180	100	200	-	-	-	-
	14	Austenitic Stainless Steel	-	-	-	-	-	-	50	180	60	150	70	160	-	-	-	-
K	15~16	Grey Cast Iron	170	420	120	300	-	-	-	-	60	160	-	-	-	-	-	-
	17~18	Nodular Cast Iron	120	410	120	280	-	-	-	-	60	120	-	-	-	-	-	-
N	21~30	Aluminum	-	-	-	-	-	-	-	-	-	-	-	-	350	1200	250	800
S	31~37	Heat Resistant Super Alloy	-	-	-	-	-	-	35	80	35	60	30	90	-	-	-	-
H	38~41	Hardened Material	-	-	-	-	-	-	-	-	40	80	-	-	-	-	-	-

Turning Chipbreakers - Negative

P	M	K	N			Feed							Fn (mm/rev.)
						0	0.1	0.2	0.3	0.4	0.5	0.6	
P				UF	Finishing 		Fn 0.05~0.2						
							Ap 0.5~1.5						
P				UL	Semi Finishing and sticky materials 		Fn 0.05~0.3						
							Ap 1~3						
P				UM	For Medium & Unstable conditions 		Fn 0.15~0.35						
							Ap 1~3						
P				UG	First Choice for Medium (Stable application) 		Fn 0.25~0.4						
							Ap 1.5~4						
P		K		UC	Medium Roughing and First choice for Cast Iron 		Fn 0.25~0.5						
							Ap 1.5~4						
P		K		UR	Roughing and Heavy interrupted cut 		Fn 0.3~0.6						
							Ap 2~6						
	M			MM	Stainless Steel Medium 		Fn 0.15~0.35						
							Ap 1~3.5						
		K		..MA	Cast Iron Heavy roughing 		Fn 0.2~0.6						
							Ap 1~7						
						0	1	2	3	4	5	6	
						Depth of Cut							Ap (mm)

Turning Chipbreakers - Negative



Turning - Name Code System

Insert ISO Code System

*Metric

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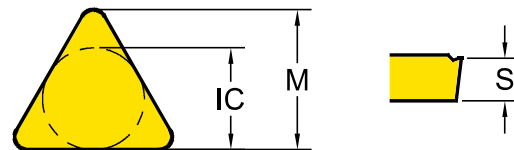
1	2	3	4	5	6	7	8	9
C	N	M	G	12	04	08	-UG	YG3020
Shape	Clearance	Tolerance	Clamping & Chipbreaker	Insert Size	Insert Thickness	Corner Radius	Chipbreaker Geometry	Grade

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	

2 - Relief Angle (AN)

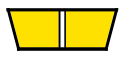
Symbol	Relief Angle (AN)	
N	No Relief Angle	
C	Relief 7°	
P	Relief 11°	
D	Relief 15°	
E	Relief 20°	
F	Relief 25°	
O	Special	



3 - Tolerance Class

Symbol	Inner Circle IC (mm)	Nose Height M (mm)	Thickness S (mm)
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
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

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		

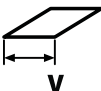
*Inch

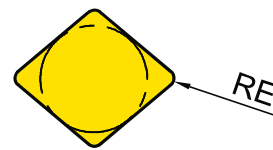
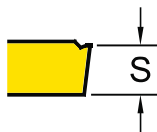
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1	2	3	4	5	6	7	8	9
C	N	M	G	4	3	2	-UG	YG3020
Shape	Clearance	Tolerance	Clamping & Chipbreaker	Insert Size	Insert Thickness	Corner Radius	Chipbreaker Geometry	Grade

5 - Insert Size

Metric							Inner Circle IC (mm)	Inch
								
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					19.05	6
						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

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