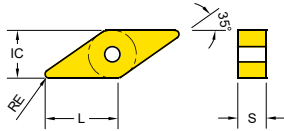


Turning Inserts - Negative

VNMG / VNMA (35° Negative)



Series	L	IC	S
VN** 1604	15.8	9.525	4.76

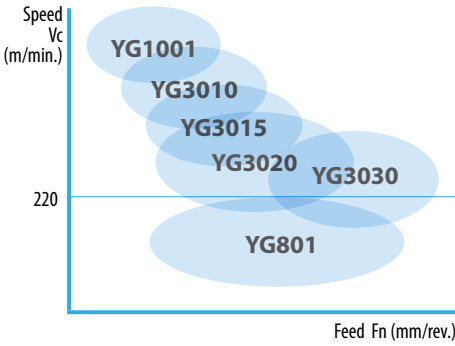
VNMA VNMG		Designation	RE	Fn (mm/rev.)	Ap (mm)	EDP 2200..																					
						P05		P10		P15		P20		P30		P20		M15		M30		M40		N20		N20	
						K10	K20							M20				S10	S20	S30							
..MA Cast iron	VNMA 160408	0.8	0.15 ~ 0.5	1 ~ 3	● 0162	● 1275																					
	VNMG 160404 - UF	0.4	0.05 ~ 0.25	0.5 ~ 2		● 0306			● 0307	● 0308	● 0049																
-UF Finishing	VNMG 160408 - UF	0.8	0.05 ~ 0.25	1 ~ 2.5		● 0309			● 0310	● 0311																	
	VNMG 160404 - UL	0.4	0.1 ~ 0.3	0.5 ~ 3		● 0886			● 0912	● 0723																	
-UL Light Machining and Sticky Material	VNMG 160408 - UL	0.8	0.10 ~ 0.30	1 ~ 2.5		● 0428	● 0790	● 0429																			
	VNMG 160412 - UM	1.2	0.15 ~ 0.3	1.5 ~ 3	● 1230	● 0736	● 0870	● 0737	● 1214																		
-UM Medium Machining Unstable condition	VNMG 160404 - UG	0.4	0.2 ~ 0.4	0.5 ~ 3		● 0993			● 0940	● 0994																	
	VNMG 160408 - UG	0.8	0.2 ~ 0.4	1 ~ 3	● 0462	● 0312			● 0313	● 0314	● 0050																
	VNMG 160412 - UG	1.2	0.2 ~ 0.4	1.5 ~ 3		● 0931			● 0927	● 0917																	

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	
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

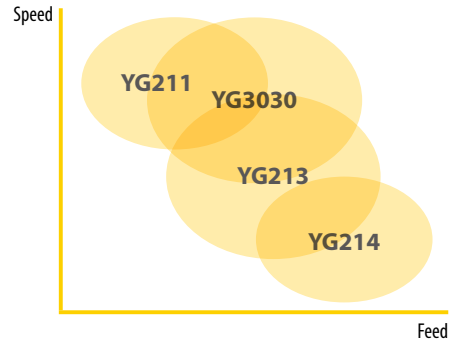
Product Overview

Turning Grades Map

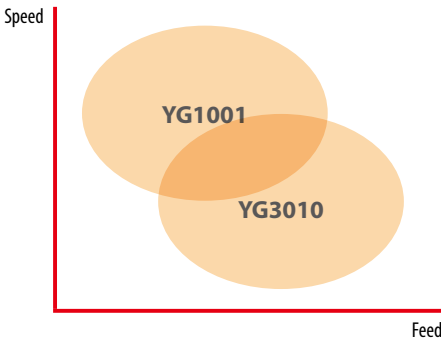
Steels



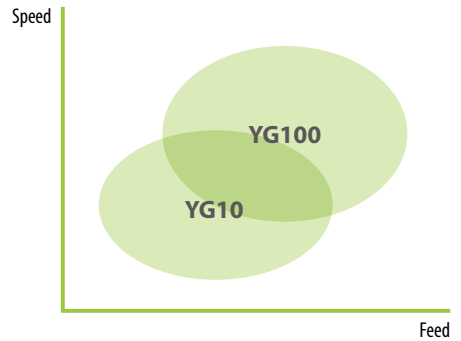
Stainless steels



Cast iron



Non-ferrous Metals



Product Overview Turning Grades

TURNING

PARTICLE GRINDING / VING

MILLING

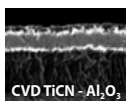
DRILLING

TECHNICAL INFORMATION

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

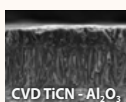


First choice for stable machining of Cast iron

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

YG3010

P05 - P20
K15 - K35



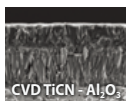
First choice for Finishing Steels, and Ductile Cast iron

- 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

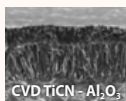


Balanced productivity for Continuous cut

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

YG3020

P15 - P30

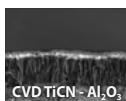


First Choice grade for general Steel application

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

YG3030

P20 - P35
M10 - M30

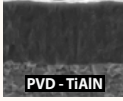
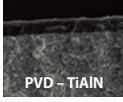
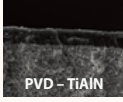
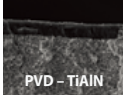
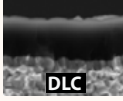



Interrupted cut of Steel and Stainless steel

- 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

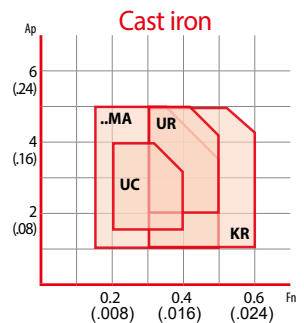
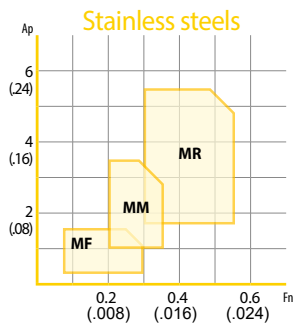
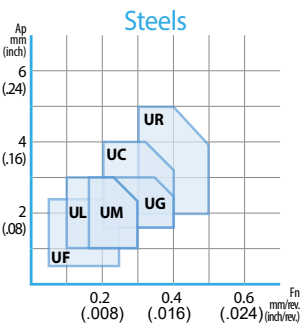
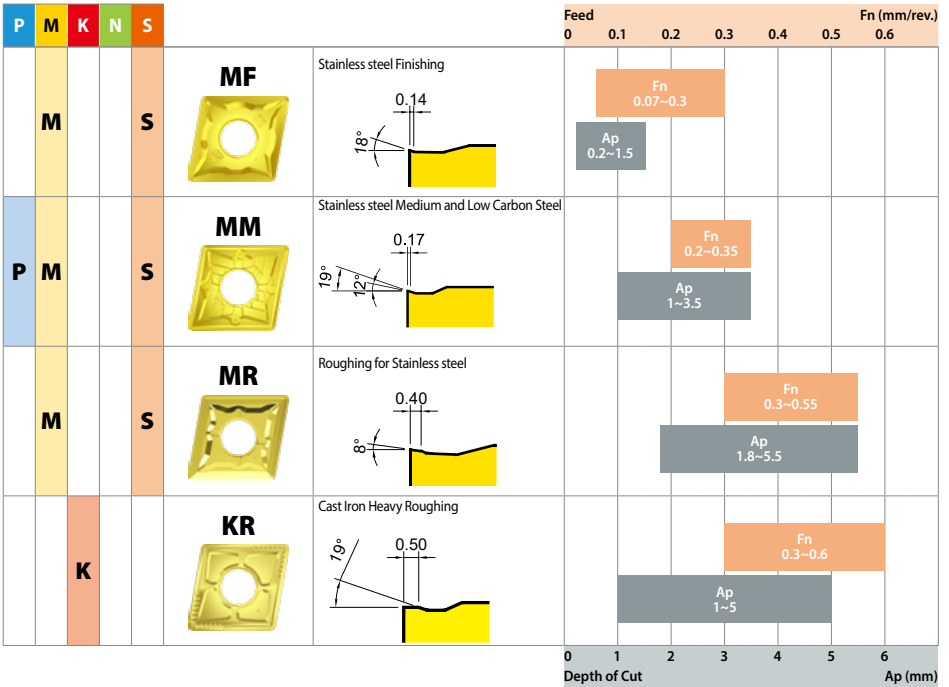
DRILLING

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	
P					UL	Semi Finishing and sticky materials		Fn 0.1~0.3		Ap 1~3	
P					UM	For Medium & Unstable conditions		Fn 0.15~0.3		Ap 1~3	
P					UG	First Choice for Medium (Stable application)		Fn 0.2~0.4		Ap 1.5~3	
P		K			UC	Medium Roughing and First choice for Cast iron		Fn 0.2~0.4		Ap 1.5~4	
P		K			UR	Roughing and Heavy interrupted cut		Fn 0.3~0.5		Ap 2~5	
		K			..MA	Cast iron Heavy Roughing		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



TURNING

PARTING & GROOVING

MILLING

DRILLING

TECHNICAL INFORMATION

Insert ISO Code System

*Metric : According to ISO 1832

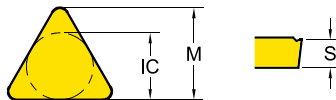
page 14

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)

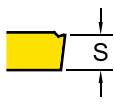
Symbol	Relief Angle (AN)	
N	No Relief Angle	
B	Relief 5°	
C	Relief 7°	
P	Relief 11°	
D	Relief 15°	
E	Relief 20°	
F	Relief 25°	
O	Special	

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 U niversal		●	●	●
7	P Steel		●	●	●
8	U niversal	●			

3 — Grade Version

4 & 5 — Application Range

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

(6) — (Minor Variation)

G — Gold Coated Version