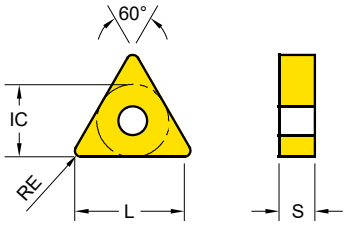
Turning Inserts - Negative

TNMG / TNMA (60° Negative)



Series	L	IC	S
TN** 1604	15.7	9.525	4.76
TN** 2204	22.0	12.700	4.76

EDP 2200.. ●: Stock item ○: Order made item

TNMA TNMG		Designation	RE	Fn (mm/rev.)	Ap (mm)	K10	P05 K20	P10 K30	P15	P20	P30 M20	P20	M15 S10	M30 S20	M40 S30	S10	N20	N20
						YG1010	YG1001	YG3010	YG3015	YG3020	YG3030	YG801	YG211	YG213	YG214	YG401	YG100	YG10
..MA	 Cast iron	TNMA 160404	0.4	0.15 ~ 0.50	0.5 ~ 5.0	● 1582	● 1446	● 1448										
		TNMA 160408	0.8	0.15 ~ 0.50	1.0 ~ 5.0	● 1486	● 0035	● 1191										
		TNMA 160412	1.2	0.15 ~ 0.50	1.5 ~ 5.0	● 1485	● 0036	● 1192										
-UF	 Finishing	TNMG 160404 - UF	0.4	0.05 ~ 0.25	0.5 ~ 2.5			● 0270		● 0271	● 0272	● 0039						
		TNMG 160408 - UF	0.8	0.05 ~ 0.25	1.0 ~ 2.5			● 0276		● 0277	● 0278							
		TNMG 160412 - UF	1.2	0.05 ~ 0.25	1.5 ~ 2.5			● 0721		● 0588	● 1197							
		TNMG 220404 - UF	0.4	0.10 ~ 0.35	0.5 ~ 4.0			● 0407		● 1203	● 1205	● 0042						
-UL	 Light Machining and Sticky Material	TNMG 160404 -UL	0.4	0.10 ~ 0.30	0.5 ~ 3.0			● 1605		● 1606	● 1607							
		TNMG 160408 -UL	0.8	0.10 ~ 0.30	1.0 ~ 3.0			● 0279	○ 0752	● 0280	● 0281							
		TNMG 160412 -UL	1.2	0.10 ~ 0.30	1.5 ~ 3.0			● 0884	○ 0868	● 0621	● 1198							
-UM	 Medium Machining Unstable condition	TNMG 160404 - UM	0.4	0.15 ~ 0.30	0.5 ~ 3.0		● 0949	● 0948	○ 0844	● 0952	● 0954							
		TNMG 160408 - UM	0.8	0.15 ~ 0.30	1.0 ~ 3.0		● 1053	● 0282	○ 0758	● 0283	● 0284							
		TNMG 160412 - UM	1.2	0.15 ~ 0.30	1.5 ~ 3.0	● 1143	● 0596	● 0597	○ 0760	● 0586	● 0710							

Cutting Speed — Vc (m/min.)

ISO	VDI	Sub Group	YG1010 Min	YG1010 Max	YG1001 Min	YG1001 Max	YG3010 Min	YG3010 Max	YG3015 Min	YG3015 Max	YG3020 Min	YG3020 Max	YG3030 Min	YG3030 Max	YG801 Min	YG801 Max	YG211 Min	YG211 Max	YG213 Min	YG213 Max	YG214 Min	YG214 Max	YG401 Min	YG401 Max	YG100 Min	YG100 Max	YG10 Min	YG10 Max
P	1~5	Non-Alloyed Steel	-	-	220	480	230	450	200	430	160	380	130	350	120	200	-	-	-	-	-	-	-	-	-	-	-	-
P	6~9	Low-Alloyed Steel	-	-	220	420	180	380	150	350	140	320	130	280	70	200	-	-	-	-	-	-	-	-	-	-	-	-
P	10~11	High-Alloyed Steel	-	-	-	-	60	200	90	180	60	130	70	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M	12~13	Ferritic & Martensitic	-	-	-	-	-	-	-	-	-	-	110	220	-	-	170	270	120	180	100	150	-	-	-	-	-	-
M	14	Austenitic Stainless Steel	-	-	-	-	-	-	-	-	-	-	50	150	-	-	150	230	40	160	100	150	-	-	-	-	-	-
K	15~16	Grey Cast Iron	300	450	250	420	120	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K	17~18	Nodular Cast Iron	120	350	120	300	120	280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	21~30	Non-Ferrous Metals (Al)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250	1200	250	800
S	31~37	Superalloys & Titanium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	100	30	70	30	50	30	90	-	-	-	-
H	38~41	Hard Materials	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Insert ISO Code System

*Metric : According to ISO 1832

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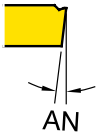
1	2	3	4	5	6	7	8	9
C	N	M	G	12	04	08	-UG	YG3020
Shape	Clearance	Tolerance	Clamping & Chipbreaker	Insert Size	Insert Thickness	Corner Radius	Chipbreaker Geometry	Grade

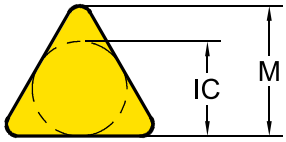
1 - Shape

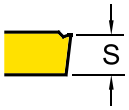
Symbol	Shape	
H	Hexagonal	
O	Octagonal	
P	Pentagonal	
S	Square	
T	Triangular	
C	Rhombic 80°	
D	Rhombic 55°	
V	Rhombic 35°	
W	Trigon	
L	Rectangular	
K	Parallelogram 55°	
R	Round	

2 - Relief Angle (AN)

Symbol	Relief Angle (AN)	
N	No Relief Angle	
B	Relief 5°	
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)
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		

Insert ISO Code System

*Inch

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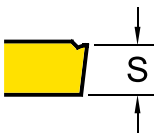
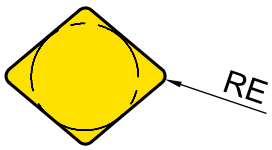
1	2	3	4	5	6	7	8	9
C	N	M	G	4	3	2	-UG	YG3020
Shape	Clearance	Tolerance	Clamping & Chipbreaker	Insert Size	Insert Thickness	Corner Radius	Chipbreaker Geometry	Grade

5 - Insert Size

Metric							Inner Circle IC (mm)	Inch
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	Stable — Wear Resistant Grade, Stable Application, Continuous Cut, Finishing
10	
15	
20	General — Balanced Grade, High Versatility, General Application
25	
30	
35	
40	Unstable — Tougher Grade, Unstable Application, Interrupted Cut, Chipping Resistance, Roughing
45	

3 — Grade Version

(6) — (Minor Variation)

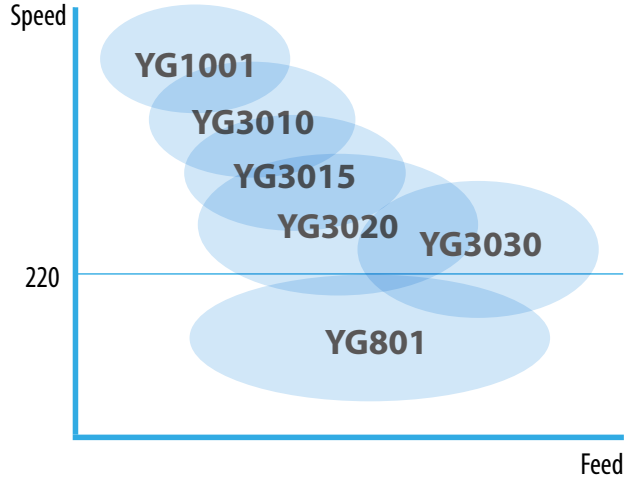
G — Gold Coated Version

Product Overview

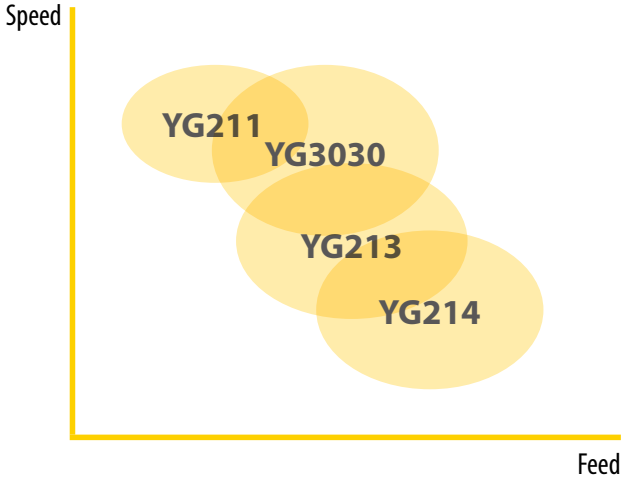
Turning Grades Map

Speed : Vc(m/min.)
Feed : Fn (mm/rev.)

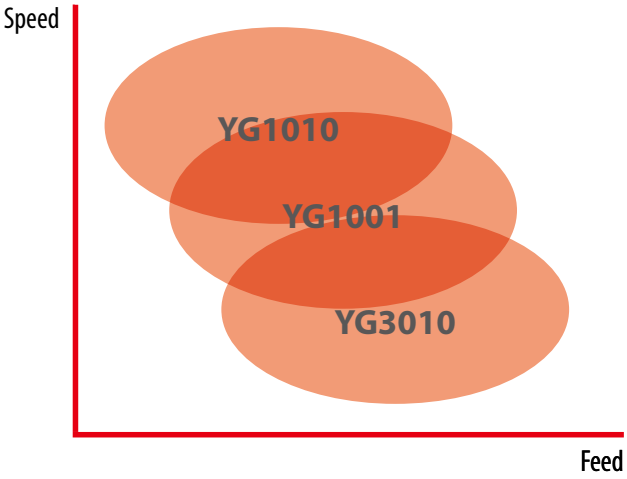
Steels



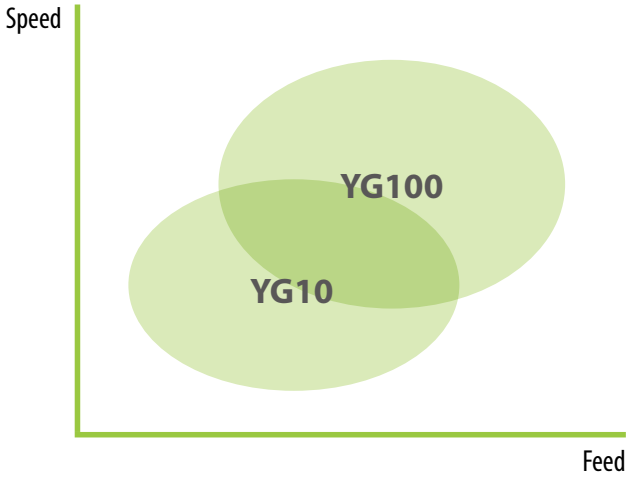
Stainless steels



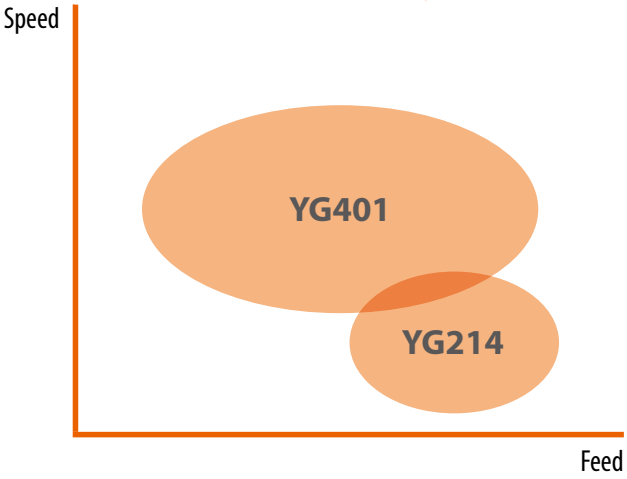
Cast iron



Non-ferrous Metals



Superalloys



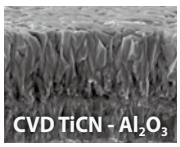
YG TURN

Product Overview

Turning Grades

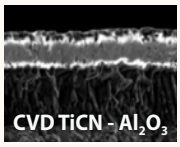
Turning Grades		P Steel				M Stainless steel			K Cast iron			N Non-ferrous		S Superalloys	
		P10	P20	P30	P40	M10	M20	M30	K10	K20	K30	N10	N20	S10	S20
CVD	YG1010								1010						
	YG1001	1001								1001					
	YG3010		3010							3010					
	YG3015		3015												
	YG3020			3020											
	YG3030			3030			3030								
PVD	YG801		801												
	YG211					211									
	YG213						213								
	YG214							214							214
	YG401													401	
DLC	YG100											100			
-	YG10											10			

YG1010
K05 - K15



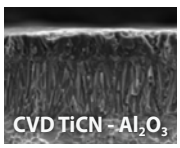
First Choice for Cast Iron
- Effective coating structure enables high speed machining
- Special post treatment for improved chipping resistance

YG1001
P01 - P10
K10 - K25



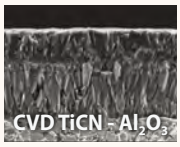
First Choice for Stable Machining of Cast Iron
- Substrate especially designed for high wear resistance
- Thick Al_2O_3 layer ensures good wear resistance at high cutting speeds including dry machining

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_2O_3 coating technology and excellent surface smoothness increase wear resistance and chipping resistance

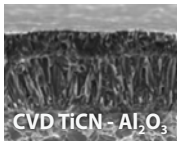
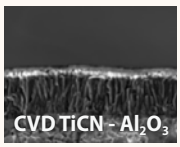
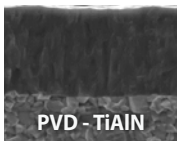
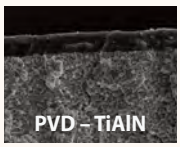
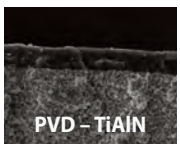
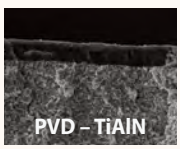
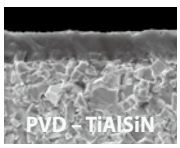
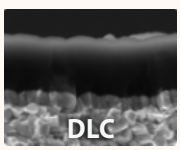
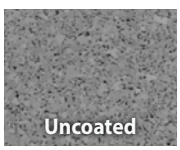
YG3015
P10 - P25



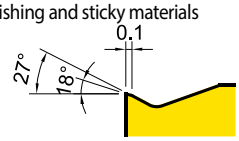
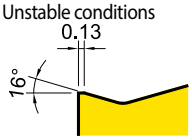
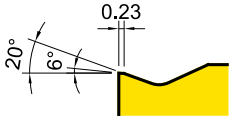
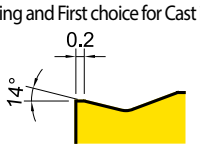
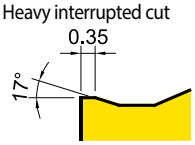
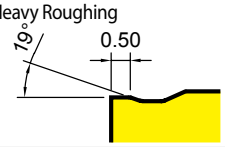
Balanced Productivity for Continuous cut
- High wear resistance and improved toughness ensures high productivity with less trouble

Product Overview

Turning Grades

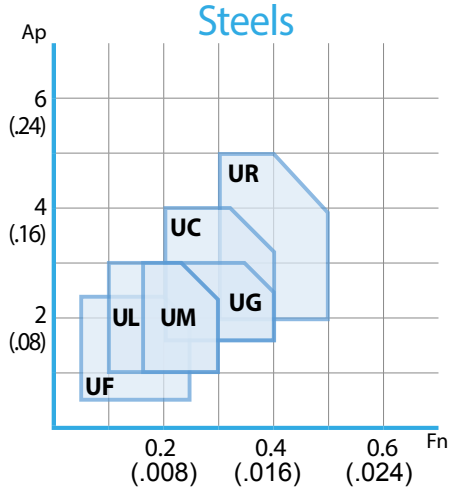
YG3020 P15 - P30		**First Choice Grade for General Steel Application** • Substrate especially designed for good toughness • Excellent surface smoothness increases wear resistance and reliability
YG3030 P20 - P35 M10 - M30		**Interrupted Cutting of Steel and Stainless steel** • Substrate for heavy roughing in mild steel and low carbon alloy steel • New Al_2O_3 technology and optimized surface treatment achieves a good balance between wear resistance and chipping resistance
YG801 P10 - P30		**for Carbon Steel with Low Cutting Speed** • Recommended for mild steel and boring application • Substrate and special PVD coating for excellent wear resistance
YG211 M05 - M25		**High wear Resistance Grade for Stainless steel** • Finishing Stainless steel
YG213 M20 - M35		**First Choice Grade on Low Cutting Speed of Stainless steel** • First choice on Stainless steel for Low cutting speed • For Medium to low cutting speed
YG214 M30 - M40 S25 - S30		**Heavy Interrupted cut for Stainless steel** • For Heavy Interrupted cut on Stainless steel • Minimize risk of Mechanical fracture or Chipping
YG401 S10 - S20		**PVD Turning Grade for HRSA** • Highly heat-resistant TiAlSiN structure for excellent wear resistance • Greatly improved film coating realizes excellent boundary defect resistance • Top coating layer provides a smooth surface and lubricant effect
YG100 N05 - N25		**First Choice Grade for Aluminum with DLC Coating** • Submicron carbide for high wear resistance • DLC coating minimizes Built Up Edge tendency. • Improve tool life in sticky non-ferrous alloy
YG10 N05 - N25		**Uncoated Grade for General Aluminum** • Substrate consisted of submicron carbide for high wear resistance • Shining surface to prevent built up edge

Turning Chipbreakers - Negative

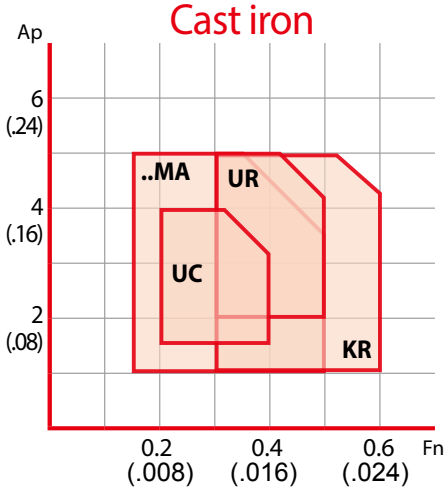
P	M	K	N	S				Feed (Fn mm/rev.) 0 0.1 0.2 0.3 0.4 0.5 0.6
P					UF		Finishing 	Fn 0.05~0.25 / Ap 0.5~2.5
P					UL		Semi Finishing and sticky materials 	Fn 0.1~0.3 / Ap 1.0~3.0
P					UM		For Medium & Unstable conditions 	Fn 0.15~0.3 / Ap 1.0~3.0
P					UG		First Choice for Medium(Stable application) 	Fn 0.2~0.4 / Ap 1.5~3.0
P		K			UC		Medium Roughing and First choice for Cast iron 	Fn 0.2~0.4 / Ap 1.5~4.0
P		K			UR		Roughing and Heavy interrupted cut 	Fn 0.3~0.5 / Ap 2.0~5.0
		K			..MA		Cast iron Heavy Roughing 	Fn 0.15~0.50 / Ap 1.0~5.0
		K			KR		Cast Iron Heavy Roughing 	Fn 0.3~0.6 / Ap 1.0~5.0

Depth of Cut 0 1 2 3 4 5 6 Ap (mm)

Steels

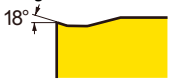
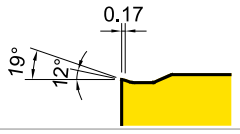
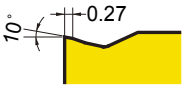
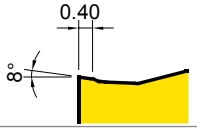
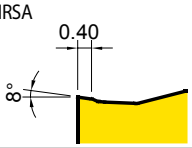


Cast iron



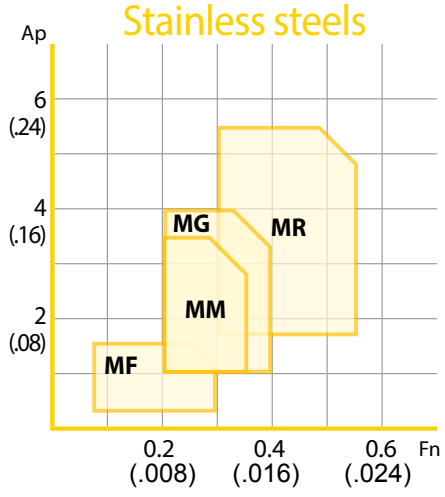
Ap : mm (inch) Fn : mm/rev. (inch/rev.)

Turning Chipbreakers - Negative

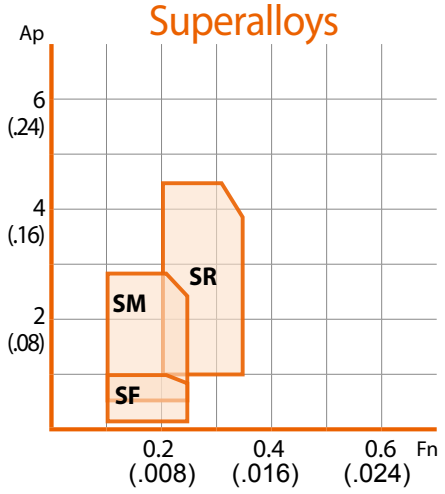
P	M	K	N	S				Feed / Depth of Cut
	M			S	MF		Stainless steel Finishing 	Fn 0.07~0.30 / Ap 0.2~1.5
P	M			S	MM		Stainless steel Medium and Low Carbon Steel 	Fn 0.20~0.35 / Ap 1.0~3.5
	M			S	MG		First Choice for Medium for Stainless steel 	Fn 0.20~0.40 / Ap 1.0 ~ 4.0
	M			S	MR		Roughing for Stainless steel 	Fn 0.30~0.55 / Ap 1.8~5.5
				S	SF		HRSA Finishing 	Fn 0.10~0.25 / Ap 0.2~1.0
				S	SM		HRSA Medium 	Fn 0.10~0.25 / Ap 0.5~3.0
				S	SR		Roughing for HRSA 	Fn 0.20~0.35 / Ap 1.0~4.5

Feed: Fn (mm/rev.) 0 0.1 0.2 0.3 0.4 0.5 0.6
Depth of Cut: Ap (mm) 0 1 2 3 4 5 6

Stainless steels



Superalloys



Ap : mm (inch) Fn : mm/rev. (inch/rev.)