

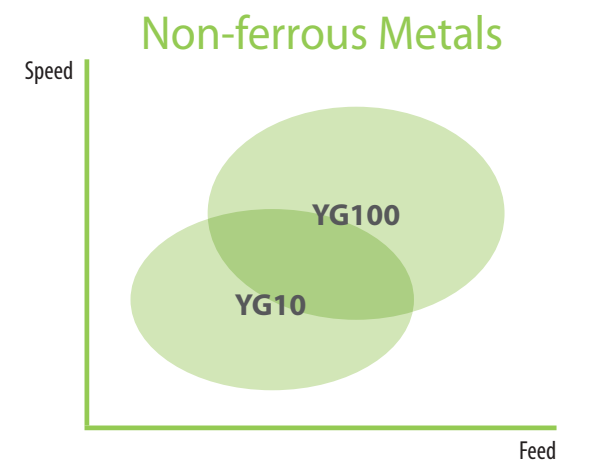
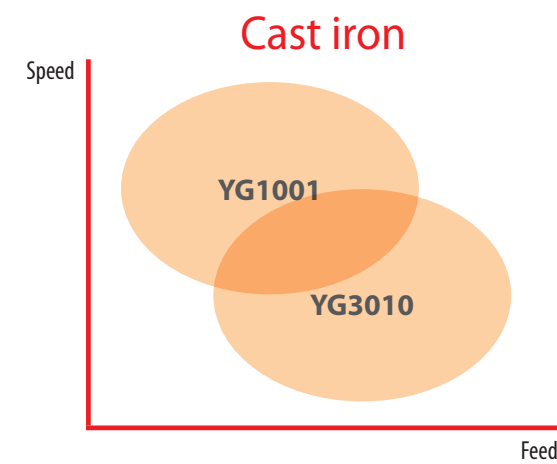
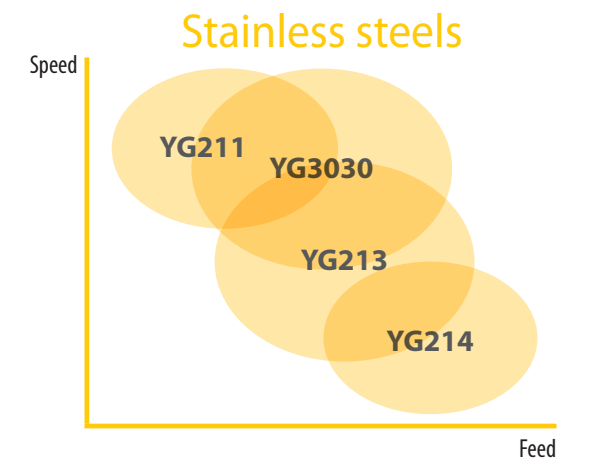
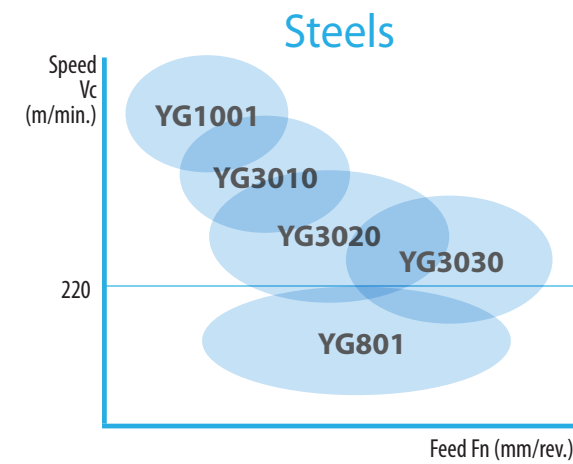
Product Overview Turning Grades

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	YG1001	1001						1001						
	YG3010		3010					3010						
	YG3020			3020										
	YG3030				3030									
PVD	YG801	801												
	YG211					211							211	
	YG213						213							213
	YG214							214						214
DLC	YG100										100			
	- YG10										10			

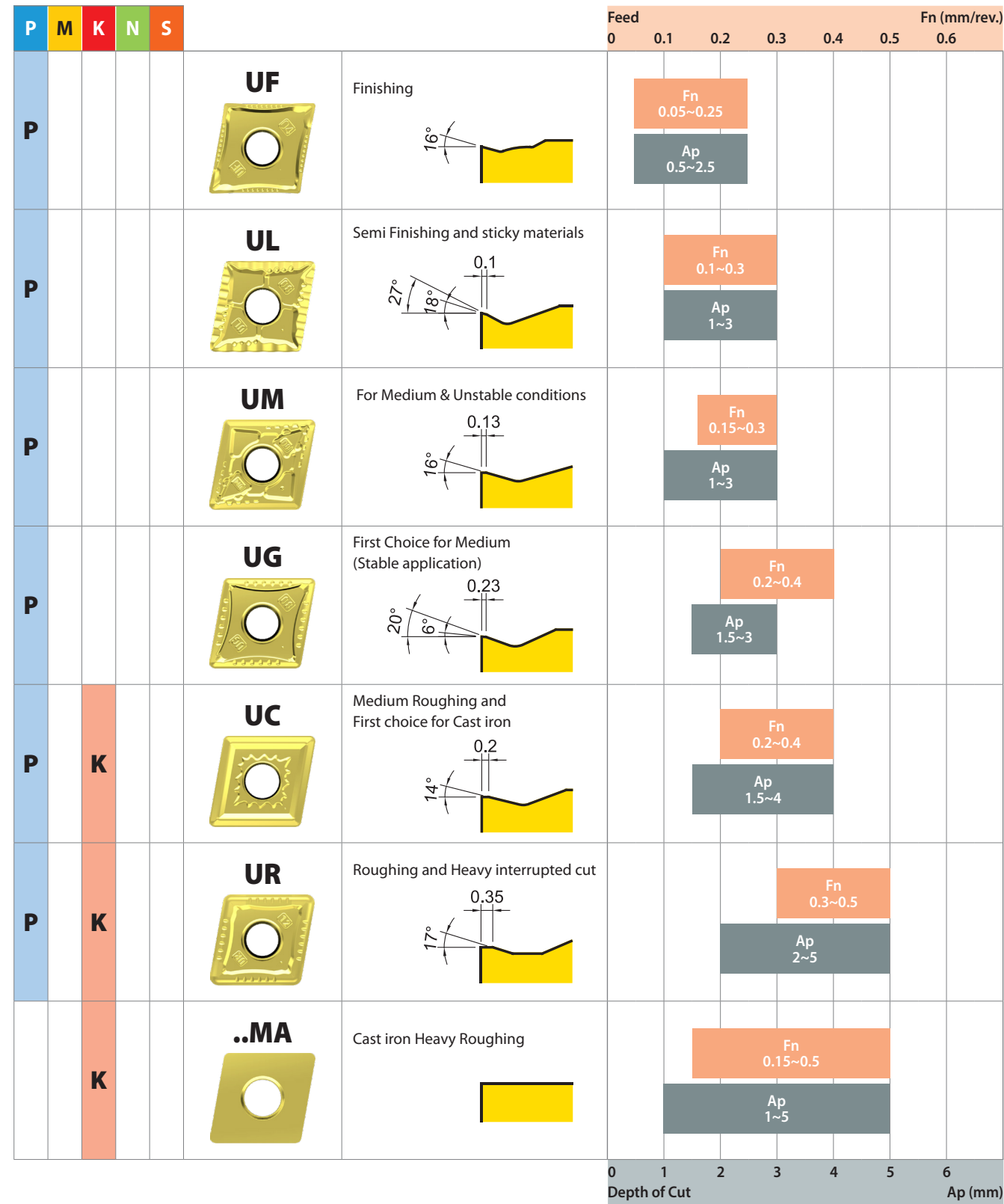
YG1001 P01 - P10 K10 - K25	<p>CVD TiCN - Al₂O₃</p>	First choice for stable machining of Cast iron <ul style="list-style-type: none"> Substrate especially designed for high wear resistance Thick Al₂O₃ layer ensures good wear resistance at high cutting speeds including dry machining
YG3010 P05 - P20 K15 - K35	<p>CVD TiCN - Al₂O₃</p>	First choice for Finishing Steels, and Ductile Cast iron <ul style="list-style-type: none"> Finishing and light machining of steel under in stable condition New Al₂O₃ coating technology and excellent surface smoothness increase wear resistance and chipping resistance
YG3020 P15 - P30	<p>CVD TiCN - Al₂O₃</p>	First Choice grade for general Steel application <ul style="list-style-type: none"> Substrate especially designed for good toughness Excellent surface smoothness increases wear resistance and reliability
YG3030 P20 - P35 M10 - M30	<p>CVD TiCN - Al₂O₃</p>	Interrupted cut of Steel and Stainless steel <ul style="list-style-type: none"> Heavy interrupted cut for Steel High cutting speed for Stainless steel
YG801 P10 - P30	<p>PVD - TiAlN</p>	for Carbon Steel with Low cutting speed <ul style="list-style-type: none"> Recommended for mild steel and boring application Substrate and special PVD coating for excellent wear resistance
YG100 N05 - N25	<p>DLC</p>	First Choice grade for aluminum with DLC coating <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
YG10 N05 - N25	<p>Uncoated</p>	Uncoated Grade for General Aluminum <ul style="list-style-type: none"> Substrate consisted of submicron carbide for high wear resistance Shining surface to prevent built up edge

Product Overview Turning Grade Map

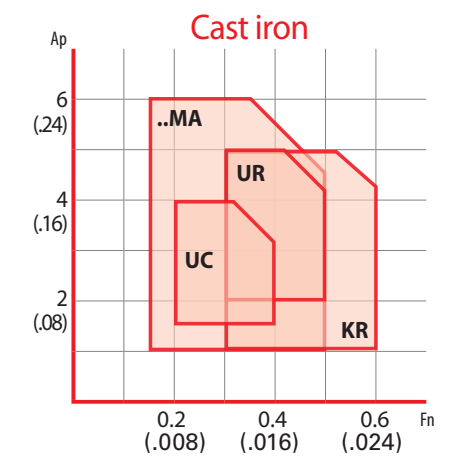
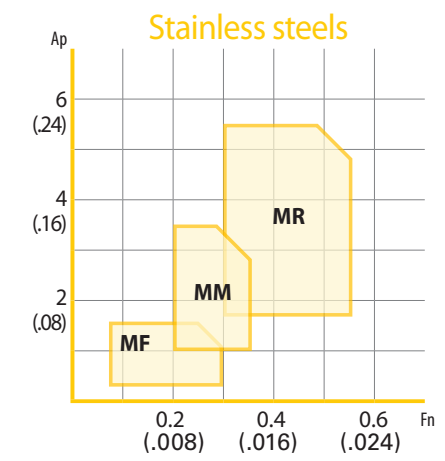
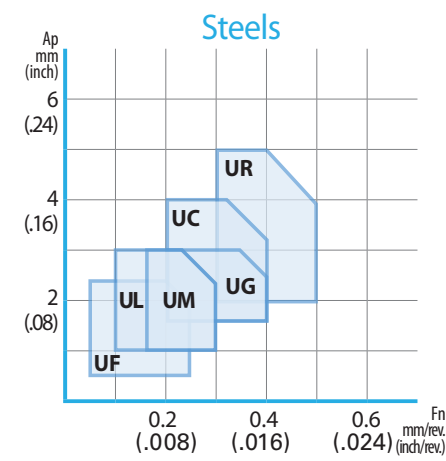
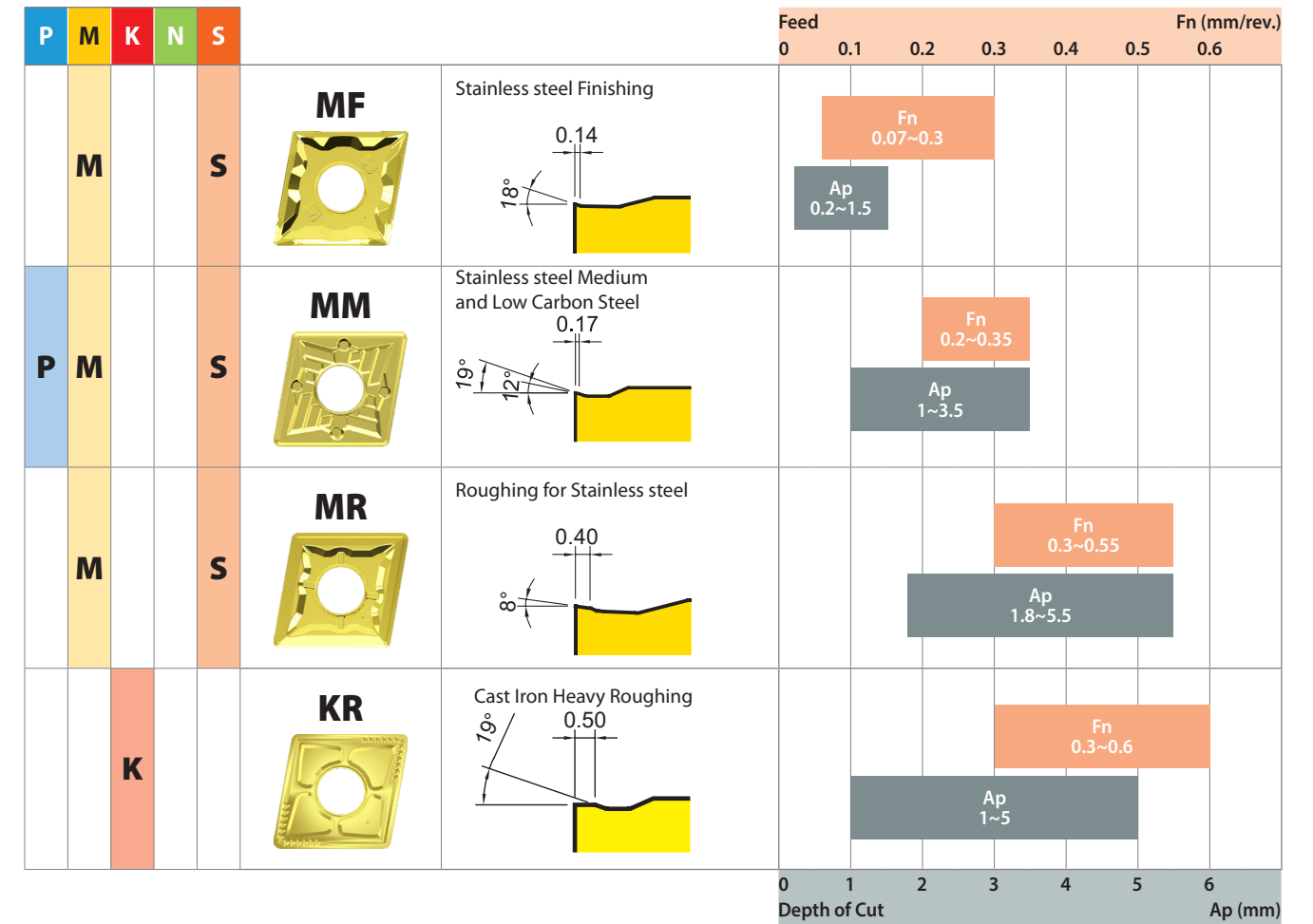
YG211 M05 - M25 S05 - S20		High wear resistance grade for Super alloys and Stainless steel <ul style="list-style-type: none"> Finishing Stainless steel Finishing Super alloys and Titanium
YG213 M20 - M35 S15 - S25		First Choice Grade on low cutting speed of Stainless steel <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> For Heavy Interrupted cut on Stainless steel Minimize risk of Mechanical fracture or Chipping



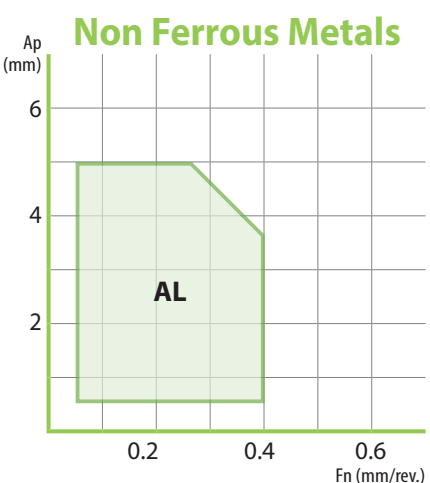
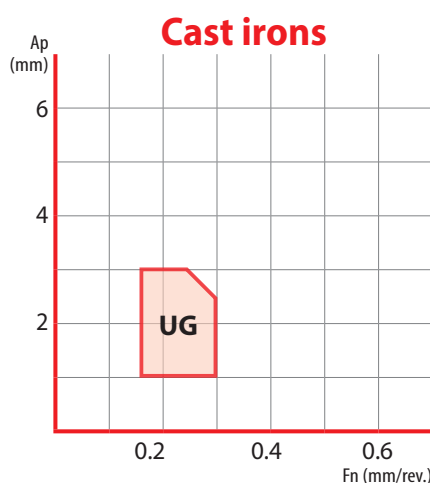
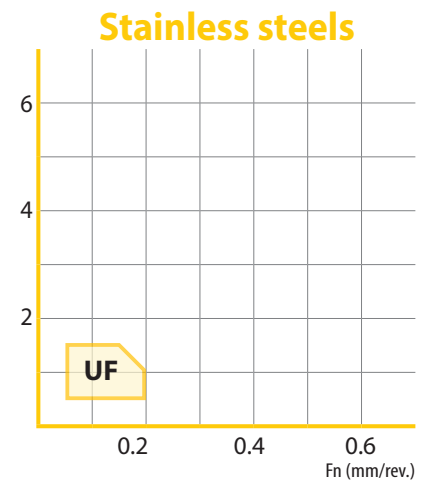
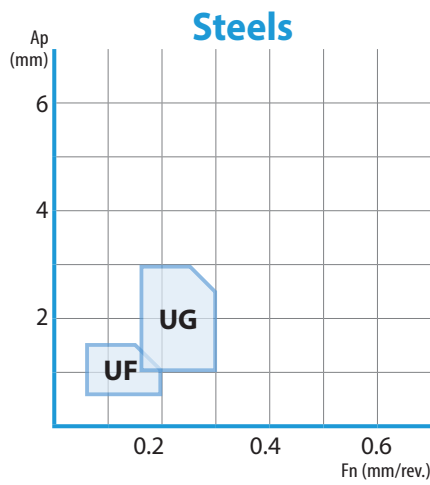
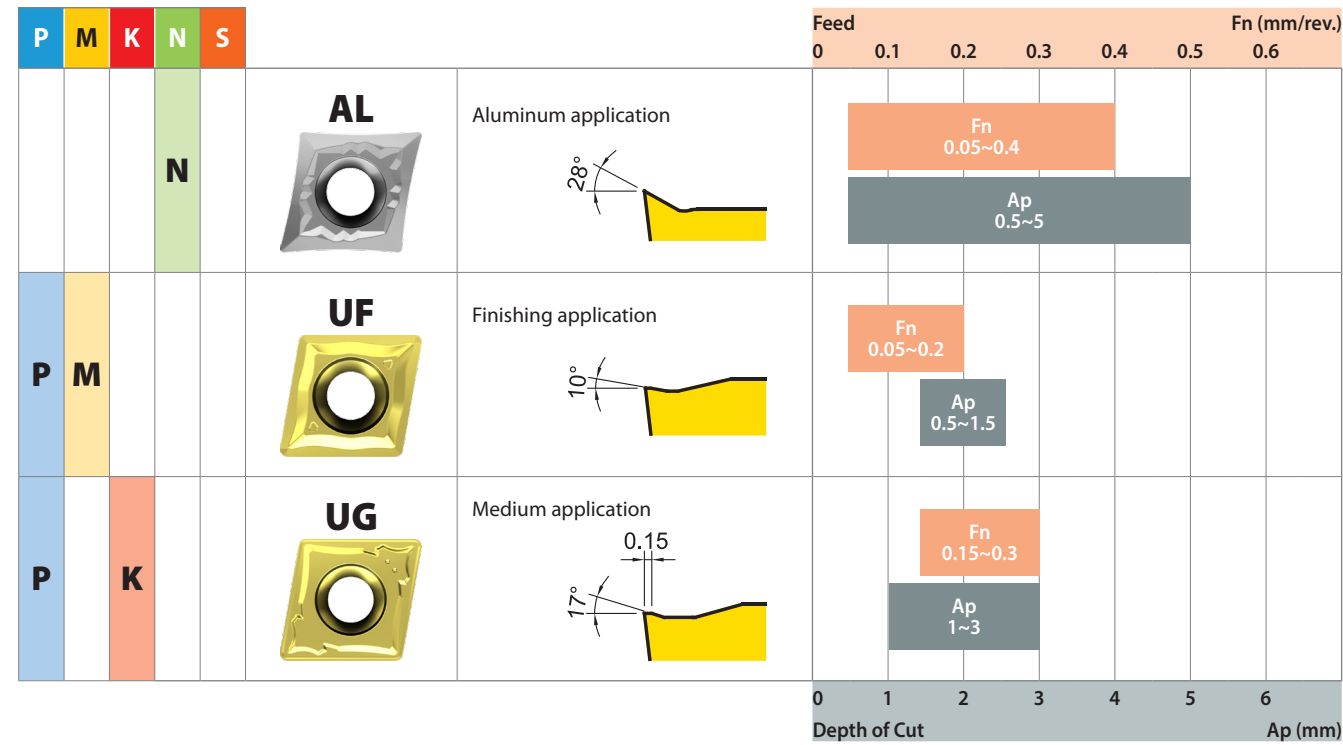
Turning Chipbreakers - Negative



Turning Chipbreakers - Negative



Product Overview
Turning Chipbreakers - Positive



Application Guide
Steel Guide

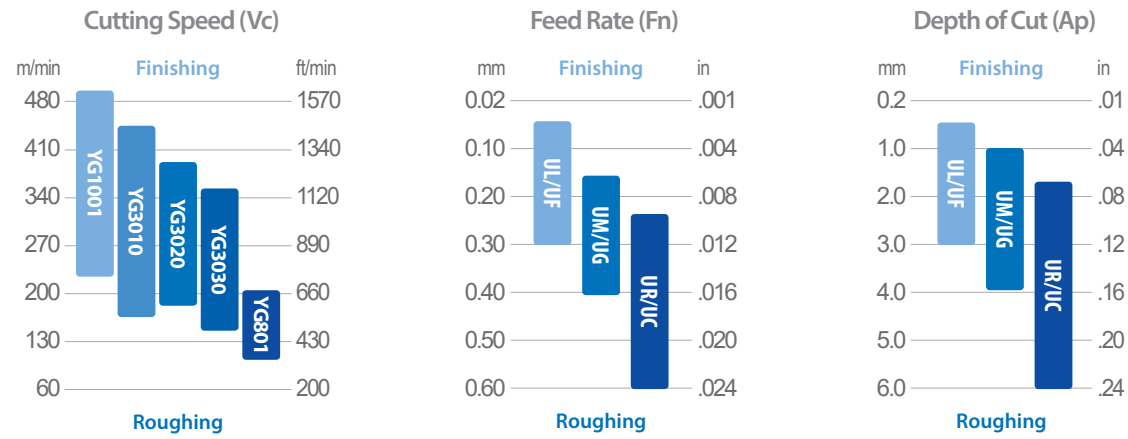
Grade Recommendation based on Workpiece Material Condition

	Pre Machined Condition No Outer Skin Uniform hardness on material Has stable machining condition	↑ HARD YG3010 YG3020 YG3030 ↓ TOUGH
	Welded Condition Soft / No Outer Skin Weld Bead Could be of Different Hardness than Actual Part Stock on Part could even except weld Seam during Machining causing shock loads	
	Cast Condition Hard Outer Skin Could have Sand Inclusion,- if Green Sand Cast Component could have uneven Stock during machining	
	Hot Rolled Condition Soft / No Outer Skin Usually heat treated before machine to reduce Hardness Component could have uneven Stock During Machining	
	Forged Condition Soft Outer Skin Usually heat treated before machine to reduce Hardness Component could have uneven Stock during machining	

Chipbreaker, Feed Rate and Depth of Cut

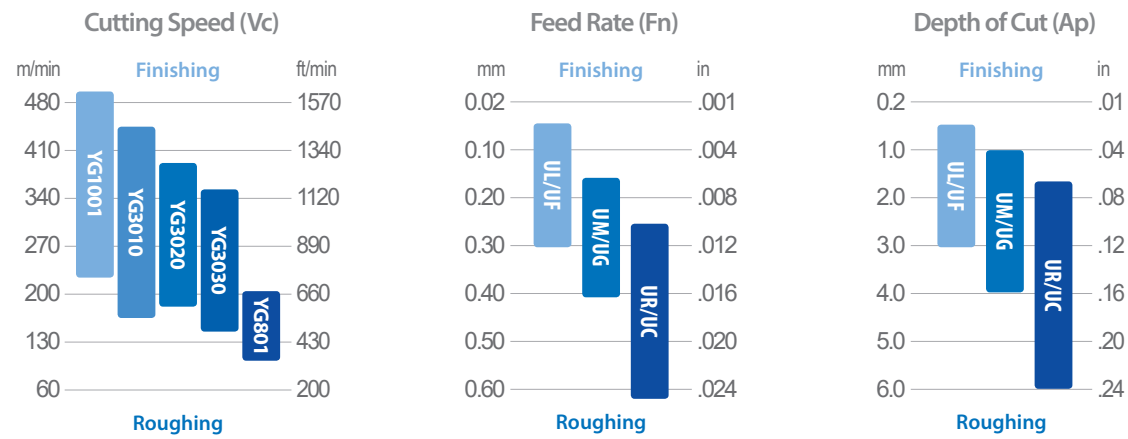
		Sharp Edge	General	Strong Edge
	Continuous	-UF	-UL	
	General		-UM	
	Heavy Interrupt			-UG, -UC, -UR

P	Non Alloy Steel, About 0.15% C (Low Carbon Steel)									
VDI	JIS	DIN	Mat'l No.	AISI/ASTM	SS	AFNOR	UNI	UNE	BS	GOST
1	S15C	CK15	1.0401	1015	1350	XC18	C15	F.1110	080M15	15



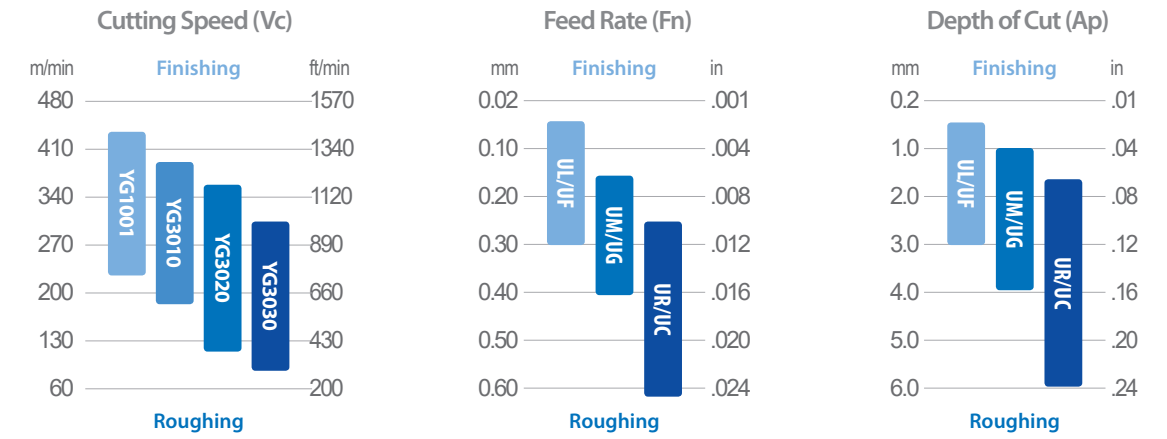
First Choice Grade and Value
 YG3010 - Vc 330m/min (1,080ft/min)
 YG801 - Vc 170m/min (560ft/min)

P	Non Alloy Steel, About 0.45% C (Medium Carbon Steel)									
VDI	JIS	DIN	Mat'l No.	AISI/ASTM	SS	AFNOR	UNI	UNE	BS	GOST
2-3	S45C	C45	1.0503	1045	1672	XC42H1TS	C45	F.1140	060A47	45



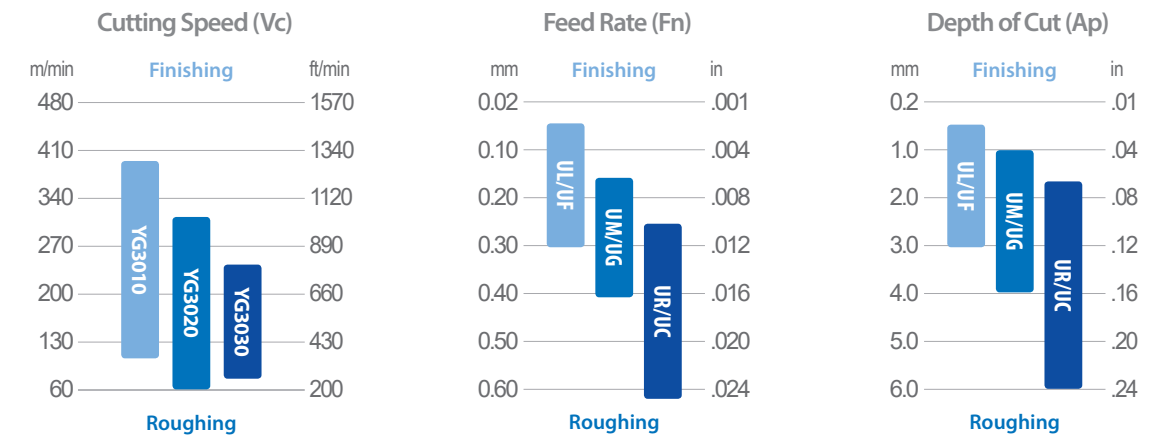
First Choice Grade and Value
 YG3010 - Vc 330m/min (1,080ft/min)
 YG801 - Vc 170m/min (560ft/min)

P	Low-alloyed Steel									
VDI	JIS	DIN	Mat'l No.	AISI/ASTM	SS	AFNOR	UNI	UNE	BS	GOST
6-9	SCM440	42CrMo4	1.7225	4140	2244	42 CD 4	42CrMo4	F.1252	708M40	38HM



First Choice Grade and Value
 YG3020 - Vc 240m/min (790ft/min)

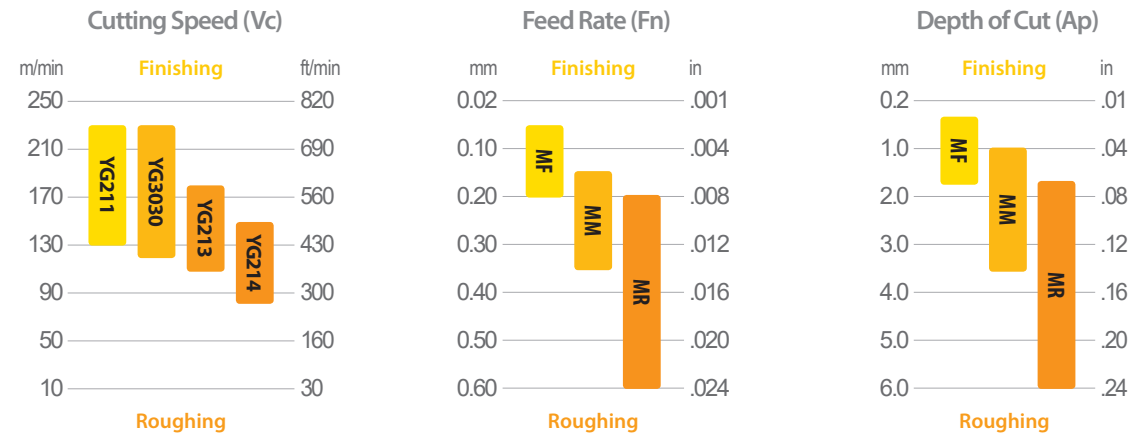
P	High Alloyed Steel, and Tool Steel									
VDI	JIS	DIN	Mat'l No.	AISI/ASTM	SS	AFNOR	UNI	UNE	BS	GOST
10-11	SKD11	X155CrVMo121	1.2379	D2	2310	Z160CDV12	X165CrMoW12KU	F.5318	BD2	KH12MF



First Choice Grade and Value
 YG3020 - Vc 230m/min (750ft/min)

Application Guide Stainless steel Guide

M	Ferritic / Martensitic Stainless									
VDI	JIS	DIN	Mat'l No.	AISI/ASTM	SS	AFNOR	UNI	UNE	BS	GOST
12-13	SUS430	X6Cr17	1.4016	430	2320	Z8C17	Z8C17	F3113	430S15	12C17



First Choice Grade and Value

Ferritic Stainless steel

YG3030 - Vc 200m/min (660ft/min)
YG213 - Vc 160m/min (520ft/min)

Martensitic

YG3030 - Vc 160m/min (520ft/min)
YG213 - Vc 130m/min (430ft/min)

M	Austenitic Stainless steel									
VDI	JIS	DIN	Mat'l No.	AISI/ASTM	SS	AFNOR	UNI	UNE	BS	GOST
14	SUS304	X5CrNi18 9	1.4350	304	2332	Z6CN18 09	X5CrNi18 10	F3551	304S15	03KH18N11



First Choice Grade and Value

YG3030 - Vc 180m/min (590ft/min)
YG213 - Vc 140m/min (460ft/min)

Application Guide Cast iron Guide

K	Grey cast iron									
VDI	JIS	DIN	Mat'l No.	AISI/ASTM	SS	AFNOR	UNI	UNE	BS	GOST
15-16	FC250	GG25	0.6025	A48 40 B	0125	Ft 25 D	G25	FG25	Grade 260	Sc 25



First Choice Grade and Value

YG1001 - Vc 350m/min (1,150ft/min)

K	Nodular cast iron									
VDI	JIS	DIN	Mat'l No.	AISI/ASTM	SS	AFNOR	UNI	UNE	BS	GOST
17-18	FCD500	GGG50	0.7050	80-55-06	0.7050	FGS 500-7	GS 500-7	FGE50-7	SNG 500-7	Vc 50-2



First Choice Grade and Value

YG3010 - Vc 220m/min (720ft/min)