

Recommended Cutting Conditions - External Turning (Negative Insert)

ISO Classification	Work Material (Hardness)	Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner-R (r)	Lower Limit - Recommendation - Upper Limit			
							Cutting Speed (SFM)	D.O.C.(inch)	Feed Rate (ipr)	
D	Low-carbon Steel Low-carbon Alloy 1010,4115 5015 etc.	Finishing (Gloss Oriented)	Continuous	XP	TN6020	1/64	830 - 1060 - 1250	.0079 - .0197 - .0276	.0028 - .0047 - .0079	
			Interrupted	XP	TN6020	1/64	660 - 920 - 1060	.0079 - .0197 - .0276	.0028 - .0047 - .0079	
		Finishing (Life Oriented)	Continuous	XP	PV7010	1/64	830 - 990 - 1160	.0079 - .0197 - .0276	.0028 - .0047 - .0079	
			Interrupted	XP	PV7025	1/64	660 - 860 - 990	.0079 - .0197 - .0276	.0028 - .0047 - .0079	
		Finishing-Medium (Finish Oriented)	Continuous	XQ	TN6020	1/64	830 - 990 - 1160	.0197 - .0394 - .0591	.0067 - .0098 - .0118	
			Interrupted	XQ	TN6020	1/32	590 - 790 - 990	.0197 - .0394 - .0591	.0067 - .0098 - .0118	
		Finishing-Medium (Life Oriented)	Continuous	XQ	PV7010	1/32	830 - 990 - 1160	.0197 - .0394 - .0591	.0067 - .0098 - .0118	
			Interrupted	XQ	PV7025	1/32	530 - 730 - 920	.0197 - .0394 - .0591	.0067 - .0098 - .0118	
		Medium-Roughing	Continuous	XS	PV7025	1/32	660 - 830 - 990	.0315 - .0591 - .0787	.0098 - .0118 - .0157	
	Interrupted		XS	CA5515	1/32	530 - 690 - 860	.0315 - .0591 - .0787	.0098 - .0118 - .0157		
	Roughing	Continuous	PS	CA5515	1/32	590 - 730 - 860	.0394 - .0984 - .1378	.0079 - .0118 - .0157		
		Interrupted	PS	CA5525	3/64	500 - 660 - 790	.0394 - .0984 - .1378	.0079 - .0118 - .0157		
	Medium-Roughing (High Feed)	Continuous	PT	CA5515	1/32	500 - 660 - 790	.0591 - .1181 - .1772	.0098 - .0138 - .0177		
		Interrupted	PT	CA5525	3/64	400 - 590 - 730	.0591 - .1181 - .1772	.0098 - .0138 - .0177		
	Roughing (High Feed)	Continuous	PH	CA5515	3/64	500 - 660 - 790	.0787 - .1969 - .3150	.0157 - .0236 - .0315		
		Interrupted	PH	CA5525	1/16	400 - 590 - 730	.0787 - .1969 - .3150	.0118 - .0197 - .0276		
	Roughing (Low Cutting Force)	Continuous	PX	CA5515	3/64	500 - 660 - 790	.0787 - .1969 - .3150	.0157 - .0236 - .0315		
		Interrupted	PX (Single Sided)	CA5525	1/16	400 - 590 - 730	.0787 - .1969 - .3150	.0118 - .0197 - .0276		
	P	Medium-carbon Steel Medium-carbon Alloy 1045,4135 etc.	Finishing (Time Oriented)	Continuous	WP (Wiper)	PV7010	1/32	660 - 830 - 990	.0118 - .0197 - .0394	.0079 - .0118 - .0157
				Interrupted	WP (Wiper)	CA5515	1/32	530 - 730 - 920	.0118 - .0197 - .0394	.0079 - .0118 - .0157
			Finishing-Medium (Time Oriented)	Continuous	WQ (Wiper)	PV7010	1/32	590 - 730 - 860	.0394 - .0787 - .1181	.0079 - .0118 - .0157
				Interrupted	WQ (Wiper)	CA5525	1/32	430 - 590 - 790	.0394 - .0787 - .1181	.0079 - .0118 - .0157
			Finishing (Finish Oriented)	Continuous	GP	TN6010	1/64	660 - 830 - 990	.0118 - .0197 - .0394	.0020 - .0039 - .0079
				Interrupted	GP	TN6010	1/32	590 - 760 - 920	.0118 - .0197 - .0394	.0020 - .0039 - .0079
			Finishing (Life Oriented)	Continuous	GP	PV7010	1/64	660 - 830 - 990	.0118 - .0197 - .0394	.0020 - .0039 - .0079
				Interrupted	GP	PV7025	1/32	590 - 730 - 860	.0118 - .0197 - .0394	.0020 - .0039 - .0079
			Finishing-Medium (Finish Oriented)	Continuous	CQ	TN6010	1/32	590 - 760 - 890	.0197 - .0591 - .0984	.0039 - .0079 - .0098
				Interrupted	CQ	TN6020	3/64	500 - 690 - 830	.0197 - .0591 - .0984	.0039 - .0059 - .0079
			Finishing-Medium (Life Oriented)	Continuous	CQ	PV7010	1/32	530 - 690 - 860	.0197 - .0591 - .0984	.0039 - .0079 - .0098
				Interrupted	CQ	CA5525	1/32	460 - 660 - 790	.0197 - .0591 - .0984	.0039 - .0059 - .0079
Medium-Roughing			Continuous	GS	CA5515	1/32	500 - 660 - 790	.0394 - .0787 - .1181	.0079 - .0118 - .0197	
			Interrupted	GS	CA5525	3/64	400 - 590 - 730	.0394 - .0787 - .1181	.0059 - .0079 - .0118	
Roughing			Continuous	PS	CA5515	1/32	500 - 660 - 790	.0394 - .0984 - .1378	.0079 - .0118 - .0157	
	Interrupted	PS	CA5525	3/64	400 - 530 - 660	.0394 - .0984 - .1378	.0079 - .0118 - .0157			
Medium-Roughing (High Feed)	Continuous	PT	CA5515	1/32	400 - 590 - 760	.0591 - .1181 - .1772	.0098 - .0138 - .0177			
	Interrupted	PT	CA5525	3/64	330 - 500 - 660	.0591 - .1181 - .1772	.0098 - .0138 - .0177			
Roughing (High Feed)	Continuous	PH	CA5515	3/64	400 - 590 - 760	.0787 - .1969 - .3150	.0157 - .0236 - .0315			
	Interrupted	PH	CA5525	1/16	330 - 500 - 660	.0787 - .1969 - .3150	.0118 - .0197 - .0276			
Roughing (Low Cutting Force)	Continuous	PX	CA5515	3/64	400 - 590 - 760	.0787 - .1969 - .3150	.0157 - .0236 - .0315			
	Interrupted	PX (Single Sided)	CA5525	1/16	330 - 500 - 660	.0787 - .1969 - .3150	.0118 - .0197 - .0276			
H	High-carbon Alloy D2,H13 etc.	Finishing (Finish Oriented)	Continuous	GP	TN6010	1/64	500 - 660 - 830	.0118 - .0197 - .0394	.0020 - .0039 - .0079	
			Interrupted	GP	TN6020	1/32	400 - 590 - 730	.0118 - .0197 - .0394	.0020 - .0039 - .0079	
		Finishing (Life Oriented)	Continuous	GP	PV7010	1/64	400 - 590 - 790	.0118 - .0197 - .0394	.0020 - .0039 - .0079	
			Interrupted	GP	CA5515	1/32	330 - 500 - 660	.0118 - .0197 - .0394	.0020 - .0039 - .0079	
		Finishing-Medium	Continuous	CQ	CA5515	1/32	400 - 530 - 730	.0197 - .0591 - .0984	.0059 - .0098 - .0118	
			Interrupted	CQ	CA5525	1/32	330 - 460 - 590	.0197 - .0591 - .0984	.0059 - .0079 - .0098	
		Medium-Roughing	Continuous	PS	CA5515	1/32	400 - 500 - 660	.0394 - .0787 - .1181	.0079 - .0118 - .0197	
Interrupted	PS		CA5525	1/32	330 - 430 - 590	.0394 - .0787 - .1181	.0059 - .0079 - .0118			
Medium-Roughing (High Feed)	Continuous	PT	CA5515	1/32	330 - 460 - 590	.0591 - .1181 - .1772	.0098 - .0138 - .0177			
	Interrupted	PT	CA5525	3/64	260 - 400 - 530	.0591 - .1181 - .1772	.0098 - .0138 - .0177			
Roughing (High Feed)	Continuous	PH	CA5515	3/64	330 - 460 - 590	.0787 - .1969 - .3150	.0157 - .0236 - .0315			
	Interrupted	PH	CA5525	1/16	260 - 400 - 530	.0787 - .1969 - .3150	.0118 - .0197 - .0276			
Roughing (Low Cutting Force)	Continuous	PX	CA5515	3/64	330 - 460 - 590	.0787 - .1969 - .3150	.0157 - .0236 - .0315			
	Interrupted	PX (Single Sided)	CA5525	1/16	260 - 400 - 530	.0787 - .1969 - .3150	.0118 - .0197 - .0276			

D



External Turning
Toolholders

P

Recommended Cutting Conditions - External Turning (Negative Insert)

ISO Classification	Work Material (Hardness)	Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner-R (r)	Lower Limit - Recommendation - Upper Limit			
							Cutting Speed (SFM)	D.O.C.(inch)	Feed Rate (ipr)	
M	Stainless Steel AISI 303,304 AISI 316,420 etc.	HB 220	Finishing (Finish Oriented)	Continuous Interrupted	HQ	TN6020 TN6020	1/32 1/32	400 - 530 - 660 330 - 400 - 500	.0197 - .0394 - .0591 .0197 - .0394 - .0591	.0031 - .0059 - .0079 .0020 - .0039 - .0059
			Finishing	Continuous Interrupted	MQ	CA6515 CA6525	1/64 1/32	400 - 590 - 790 330 - 530 - 730	.0197 - .0394 - .0591 .0197 - .0394 - .0591	.0031 - .0059 - .0079 .0020 - .0039 - .0059
		Medium-Roughing (Chip Control)	Continuous Interrupted	MS	CA6515 CA6525	1/64 1/32	400 - 530 - 660 260 - 460 - 590	.0394 - .0787 - .1181 .0394 - .0787 - .1181	.0039 - .0079 - .0118 .0079 - .0118 - .0157	
		Medium-Roughing (Sharpness Oriented)	Continuous Interrupted	MU	CA6515 CA6525	1/64 1/32	400 - 530 - 660 260 - 460 - 590	.0394 - .0787 - .1181 .0394 - .0787 - .1181	.0059 - .0098 - .0138 .0059 - .0098 - .0118	
		Roughing	Continuous Interrupted	Standard	CA6515 CA6525	1/32 3/64	330 - 460 - 590 260 - 400 - 500	.0394 - .0787 - .1575 .0394 - .0787 - .1575	.0079 - .0118 - .0157	
	Stainless Steel AISI 630 etc.	HB 300	Finishing (Finish Oriented)	Continuous Interrupted	HQ	TN6020 TN6020	1/32 1/32	330 - 400 - 500 260 - 330 - 400	.0197 - .0394 - .0591 .0197 - .0394 - .0591	.0020 - .0039 - .0059 .0020 - .0031 - .0039
			Finishing	Continuous Interrupted	MQ	CA6515 CA6525	1/64 1/32	330 - 400 - 500 260 - 330 - 400	.0197 - .0394 - .0591 .0197 - .0394 - .0591	.0031 - .0059 - .0079 .0020 - .0039 - .0059
			Medium-Roughing (Chip Control)	Continuous Interrupted	MS	CA6515 CA6525	1/64 1/32	330 - 400 - 500 260 - 330 - 400	.0394 - .0591 - .0787 .0394 - .0787 - .1181	.0039 - .0059 - .0098 .0039 - .0059 - .0079
			Medium-Roughing (Sharpness Oriented)	Continuous Interrupted	MU	CA6515 CA6525	1/64 1/32	330 - 400 - 500 260 - 330 - 400	.0394 - .0591 - .0787 .0394 - .0787 - .1181	.0039 - .0059 - .0098 .0039 - .0059 - .0079
			Roughing	Continuous Interrupted	Standard	CA6515 CA6525	1/32 3/64	260 - 330 - 400 200 - 260 - 330	.0394 - .0787 - .1181 .0394 - .0787 - .1575	.0079 - .0118 - .0157
K	Gray Cast Iron 30B,35B 45B etc.	HB 250	Finishing (High Speed)	Continuous Interrupted	Without Chipbreaker	KBN60M KBN900 KBN900	1/32 3/64 3/64	1320 - 2310 - 2970 1650 - 2970 - 3960 1650 - 2310 - 2970	.0020 - .0079 - .0197 .0039 - .0197 - .0394 .0197 - .0394 - .0591	.0012 - .0020 - .0039 .0020 - .0039 - .0079 .0020 - .0039 - .0079
			Finishing (Finish Oriented)	Continuous Interrupted	Standard	PV7005 TN6020	1/32 1/32	990 - 1160 - 1320 330 - 500 - 660	.0197 - .0394 - .0591 .0197 - .0394 - .0591	.0039 - .0079 - .0118 .0031 - .0059 - .0079
			Finishing (Ceramic)	Continuous Interrupted	Without Chipbreaker	KA30 PT600M	3/64 1/32	990 - 1650 - 2310 990 - 1490 - 1980	.0118 - .0197 - .0394 .0118 - .0197 - .0394	.0039 - .0079 - .0118 .0039 - .0079 - .0118
			Medium (Ceramic)	Continuous Interrupted	Without Chipbreaker	CS7050 KS6050	3/64 3/64	830 - 1320 - 1650 830 - 1320 - 1650	.0394 - .0787 - .1181 .0394 - .0787 - .1181	.0059 - .0098 - .0138 .0059 - .0079 - .0118
			Medium	Continuous Interrupted	Standard	CA4505 CA4515	1/32 3/64	660 - 830 - 990 500 - 660 - 830	.0197 - .0787 - .0984 .0197 - .0787 - .0984	.0039 - .0079 - .0118 .0031 - .0059 - .0079
	Nodular Cast Iron 60-40-18 80-55-06 etc.	HB 270	Finishing (High Speed)	Continuous Interrupted	Without Chipbreaker	KBN60M PT600M	1/64 1/32	660 - 990 - 1320 660 - 830 - 1160	.0039 - .0118 - .0197 .0039 - .0197 - .0394	.0039 - .0059 - .0079 .0039 - .0079 - .0157
			Finishing (Finish Oriented)	Continuous Interrupted	Standard	PV7005 TN6020	1/32 1/32	500 - 830 - 990 330 - 500 - 590	.0197 - .0394 - .0591 .0197 - .0394 - .0591	.0039 - .0079 - .0118 .0031 - .0059 - .0079
			Medium	Continuous Interrupted	Standard	CA4505 CA4515	1/32 3/64	500 - 660 - 830 400 - 590 - 730	.0197 - .0787 - .0984 .0197 - .0787 - .0984	.0039 - .0079 - .0118 .0031 - .0059 - .0079
			Roughing	Continuous Interrupted	ZS	CA4505 CA4515	1/32 3/64	500 - 660 - 830 500 - 660 - 830	.0394 - .0787 - .1575 .0394 - .0787 - .1575	.0079 - .0118 - .0157 .0079 - .0118 - .0157
				Continuous Interrupted	ZS	CA4505 CA4515	1/32 3/64	500 - 660 - 830 400 - 590 - 730	.0394 - .0787 - .1575 .0394 - .0787 - .1575	.0079 - .0118 - .0157 .0079 - .0118 - .0157
N	Non-ferrous Metal Copper Alloy Aluminum Alloy (Si: under 10) etc.	HB 100	Finishing(High Speed) (Rainbow-colored Finish)	Continuous	Without Chipbreaker	KPD001	1/64	1320 - 1320 - 1320	.0020 - .0197 - .0394	.0020 - .0039 - .0059
			Finishing	Continuous Interrupted	A3	KW10 KW10	1/32 1/32	1320 - 1650 - 2310 1320 - 1650 - 2310	.0197 - .0394 - .0787 .0197 - .0394 - .0787	.0039 - .0079 - .0098 .0039 - .0079 - .0098
			Medium	Continuous Interrupted	AH	KW10	1/32	660 - 990 - 1650	.0394 - .0787 - .1378	.0039 - .0118 - .0157
				Continuous Interrupted	AH	KW10	1/32	660 - 990 - 1650	.0394 - .0787 - .1378	.0039 - .0118 - .0157
S	Titanium Alloy Ti-6Al-4V etc.	HB 400	Finishing(Precision) (Rainbow-colored Finish)	Continuous Interrupted	Without Chipbreaker	KPD001 KPD001	1/64 1/64	330 - 500 - 590 230 - 400 - 500	.0020 - .0118 - .0197 .0020 - .0118 - .0197	.0012 - .0039 - .0059 .0012 - .0028 - .0039
			Finishing	Continuous Interrupted	A3	SW05 SW05	1/64 1/64	100 - 170 - 230 100 - 170 - 230	.0197 - .0591 - .0984 .0197 - .0591 - .0984	.0028 - .0059 - .0098 .0028 - .0059 - .0079
				Continuous Interrupted	AH	SW05 SW05	1/32 1/32	100 - 170 - 230 100 - 170 - 230	.0394 - .0787 - .1378 .0394 - .0787 - .1378	.0039 - .0098 - .0138 .0039 - .0079 - .0118
	High-temperature Alloy Inconel625 Inconel 718 etc.	HB 350	Finishing	Continuous Interrupted	MQ	PR1305 PR1310	1/64 1/32	130 - 200 - 260 130 - 200 - 260	.0079 - .0197 - .0394 .0079 - .0197 - .0394	.0012 - .0031 - .0047 .0020 - .0039 - .0059
			Medium	Continuous Interrupted	MS/MU TK	PR1310 PR1325	1/32 3/64	130 - 200 - 260 130 - 200 - 260	.0197 - .060 - .0787 .0197 - .060 - .0787	.0020 - .0039 - .0059 .0039 - .0059 - .0079
H	Heat Treated Steel High Hard Material D2, H13 etc.	40~50 HRC	Finishing	Continuous Interrupted	HQ	CA5515	1/32	200 - 330 - 400	.0039 - .0118 - .0197	.0020 - .0031 - .0039
				Continuous Interrupted	Standard	CA5515	1/32	100 - 170 - 230	.0039 - .0118 - .0197	.0020 - .0031 - .0039
		40~50 HRC	Finishing	Continuous	Without Chipbreaker	PT600M	1/32	200 - 260 - 330	.0079 - .0197 - .0276	.0020 - .0039 - .0059
				Continuous	Without Chipbreaker	PT600M	3/64	100 - 130 - 200	.0079 - .0197 - .0276	.0020 - .0039 - .0059
		50~65 HRC	Finishing	Continuous Interrupted	Without Chipbreaker	KBN05M SET,MET	KBN25M KBN25M	1/32 3/64	330 - 500 - 660 260 - 400 - 530	.0020 - .0118 - .0197 .0020 - .0118 - .0197
50~68 HRC	Medium	Continuous Interrupted	Without Chipbreaker	KBN900 KBN900	3/64 Round	260 - 330 - 400 230 - 300 - 360	.0197 - .0394 - .0787 .0118 - .0276 - .0394	.0020 - .0039 - .0079 .0020 - .0039 - .0059		

