Recommended Cutting Conditions - Boring (Positive Insert: Cutting Dia under 0.375")

ISO Classification	Workpiece Material	Hardness	Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner R (rε)	Lower Limit - Recommendation - Upper Limit		
								Vc(sfm)	doc (inch)	f(ipr)
P	Low-carbon Steel Low-carbon Alloy	HB ≦ 1000	Finishing (Solid Type)	Continuous Interruption	(VNB)	PR930	0.001 0.008	100 - 200 - 330 100 - 200 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing	Continuous Interruption	F , FSF	PR1025	0.004 0.008	100 - 200 - 330 100 - 200 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing-Medium	Continuous Interruption	GQ	PR1025	0.008 1/64	100 - 200 - 330 100 - 200 - 270	0.004 - 0.008 - 0.012 0.004 - 0.008 - 0.012	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
	Medium-carbon Steel Medium-carbon Alloy	HB ≦ 1000	Finishing (Solid Type)	Continuous Interruption	(VNB)	PR930	0.001 0.008	100 - 200 - 330 100 - 200 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing	Continuous Interruption	F , FSF	PR1025	0.004 0.008	100 - 200 - 330 100 - 200 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing-Medium cutting	Continuous Interruption	GQ	PR1025	0.008 1/64	100 - 200 - 330 100 - 200 - 270	0.004 - 0.008 - 0.012 0.004 - 0.008 - 0.012	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
	High-carbon Alloy	HB ≦ 2270	Finishing (Solid Type)	Continuous Interruption	(VNB)	PR930	0.001 0.008	100 - 200 - 330 100 - 170 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing	Continuous Interruption	F , FSF	PR1225	0.004 0.008	100 - 200 - 330 100 - 170 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing-Medium	Continuous Interruption	GQ	PR1225	0.008 1/64	100 - 200 - 330 100 - 170 - 270	0.004 - 0.008 - 0.012 0.004 - 0.008 - 0.012	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
M	Stainless Steel	HB ≦ 220	Finishing (Solid Type)	Continuous Interruption	(VNB)	PR930	0.001 0.008	100 - 200 - 330 100 - 170 - 250	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing	Continuous Interruption	F , FSF	PR1225	0.004 0.008	100 - 200 - 330 100 - 170 - 250	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing-Medium	Continuous Interruption	GQ	PR1225	0.008 1/64	100 - 200 - 330 100 - 170 - 250	0.004 - 0.008 - 0.012 0.004 - 0.008 - 0.012	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
	Stainless Steel	HB ≦ 1000	Finishing (Solid Type)	Continuous Interruption	(VNB)	PR930	0.001 0.008	100 - 200 - 270 20 - 125 - 200	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing	Continuous Interruption	F , FSF	PR1225	0.004 0.008	100 - 200 - 270 70 - 125 - 200	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing-Medium	Continuous Interruption	GQ	PR1225	0.008 1/64	100 - 200 - 270 70 - 125 - 200	0.004 - 0.008 - 0.012 0.004 - 0.008 - 0.012	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
K	Gray Cast Iron	HB ≦ 250	Finishing (Solid Type)	Continuous Interruption	(VNB) (VNB-NB)	KW10	0.001 0.008	100 - 200 - 330 100 - 200 - 330	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing	Continuous Interruption	F	KW10	0.004 0.008	100 - 200 - 330 100 - 200 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing-Medium	Continuous Interruption	HQ	CA4505 CA4515	0.008 1/64	100 - 200 - 330 100 - 200 - 270	0.004 - 0.008 - 0.012 0.004 - 0.008 - 0.012	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
	Nodular Cast Iron	HB ≦ 270	Finishing (Solid Type)	Continuous Interruption	(VNB) (VNB-NB)	KW10	0.001 0.008	100 - 200 - 270 100 - 200 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing	Continuous Interruption	F , U	KW10	0.004 0.008	100 - 200 - 270 100 - 200 - 270	0.002 - 0.003 - 0.004 0.002 - 0.004 - 0.006	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
			Finishing-Medium	Continuous Interruption	Standard	CA4505 CA4515	0.008 1/64	100 - 200 - 330 100 - 200 - 270	0.004 - 0.008 - 0.012 0.004 - 0.008 - 0.012	0.001 - 0.002 - 0.003 0.001 - 0.003 - 0.004
N	Non-ferrous Metals	HB ≦ 330	High Speed Cutting (Rainbow Surface Gross)	Continuous	Without Chipbreaker	KPD001	0.002	500 - 660 - 990	0.002 - 0.004 - 0.012	0.002 - 0.004 - 0.006
			Finishing	Continuous Interruption	F , U	KW10	0.004 0.008	330 - 500 - 660 330 - 500 - 660	0.002 - 0.012 - 0.020 0.002 - 0.012 - 0.020	0.001 - 0.004 - 0.008 0.001 - 0.004 - 0.008
S	Titanium Alloy	HB ≦ 400	Precision Cutting (Rainbow Surface Gross)	Continuous Interruption	Without Chipbreaker	KPD001	0.004 0.008	330 - 400 - 500 250 - 330 - 400	0.002 - 0.004 - 0.012 0.002 - 0.004 - 0.012	0.001 - 0.003 - 0.004 0.001 - 0.003 - 0.004
			Finishing	Continuous Interruption	F , U	KW10	0.004 0.008	40 - 100 - 170 40 - 100 - 170	0.002 - 0.008 - 0.020 0.002 - 0.008 - 0.020	0.001 - 0.004 - 0.008 0.001 - 0.004 - 0.008
	Heat-resistant Alloys	HB ≦ 350	Finishing (Solid Type)	Continuous Interruption	(VNB)	KW10	0.008 0.008	40 - 100 - 170 40 - 100 - 170	0.002 - 0.004 - 0.012 0.002 - 0.004 - 0.012	0.001 - 0.002 - 0.004 0.001 - 0.002 - 0.003
			Finishing	Continuous Interruption	F , U	KW10	0.008 0.008	10 - 100 - 170 10 - 100 - 170	0.002 - 0.008 - 0.016 0.002 - 0.008 - 0.016	0.001 - 0.002 - 0.004 0.001 - 0.002 - 0.004
H	Hard Materials	40~50 HRC	Finishing	Continuous Interruption	(VNB)	PR930	0.008 0.008	200 - 270 - 330 100 - 200 - 270	0.002 - 0.004 - 0.016 0.002 - 0.004 - 0.008	0.01 - 0.008 - 0.002 0.01 - 0.008 - 0.001
		45~68 HRC	Finishing	Continuous Interruption	SE SET	KBN25M	0.008 1/64	200 - 330 - 400 200 - 270 - 330	0.002 - 0.004 - 0.008 0.002 - 0.004 - 0.008	0.008 - 0.002 - 0.004 0.008 - 0.002 - 0.004

* Please use it with PR3305 set to Vc=150m/min or below, for machining of free-cutting steel such as small size 11SMn (SUM). For ap and feed, see low carbon steel.

Recommended Cutting Conditions - Boring (Positive Insert: Cutting Dia over 0.375")

ISO Classification	Workpiece Material	Hardness	Cutting Range	Application	Recommended Chipbreaker	Recommended Grade	Corner R (rε)	Lower Limit - Recommendation - Upper Limit Vc(sfm)	doc (inch)	f(ipr)
P	Low-carbon Steel Low-carbon Alloy	HB ≦ 1000	Precision Cutting	Continuous	FSF, USF	TN6020	0.004	830 - 1000 - 1500	0.002 - 0.012 - 0.020	0.001 - 0.004 - 0.006
				Interruption		PR1025	0.008	330 - 500 - 200	0.002 - 0.012 - 0.020	0.001 - 0.004 - 0.006
			Finishing	Continuous	XP	PV7010	1/64	200 - 830 - 1000	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
				Interruption		CA5525	1/64	500 - 200 - 830	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
			Finishing-Medium	Continuous	XQ	PV7010	1/64	500 - 200 - 830	0.020 - 0.040 - 0.080	0.004 - 0.006 - 0.010
				Interruption		CA5525	1/64	330 - 500 - 200	0.020 - 0.040 - 0.060	0.004 - 0.006 - 0.008
			Medium cutting	Continuous	Standard	PV7020	1/32	330 - 500 - 200	0.040 - 0.060 - 0.100	0.004 - 0.006 - 0.012
				Interruption		CA5525	1/32	270 - 400 - 500	0.040 - 0.060 - 0.080	0.004 - 0.006 - 0.008
	Medium-carbon Steel Medium-carbon Alloy	HB ≦ 1000	Precision Cutting	Continuous	FSF, USF	TN6020	0.008	500 - 200 - 830	0.002 - 0.012 - 0.020	0.001 - 0.004 - 0.006
				Interruption		PR1025	1/64	330 - 400 - 500	0.002 - 0.012 - 0.020	0.001 - 0.004 - 0.006
			Finishing	Continuous	GP	PV7010	1/64	500 - 200 - 830	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
				Interruption		CA5525	1/64	400 - 600 - 200	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
			Finishing-Medium	Continuous	HQ	PV7010	1/64	400 - 600 - 220	0.020 - 0.040 - 0.080	0.004 - 0.006 - 0.010
				Interruption		CA5525	1/64	330 - 500 - 200	0.020 - 0.040 - 0.060	0.004 - 0.006 - 0.008
			Medium cutting	Continuous	Standard	PV7020	1/32	330 - 500 - 200	0.040 - 0.060 - 0.100	0.004 - 0.006 - 0.012
				Interruption		CA5525	1/32	270 - 400 - 500	0.040 - 0.060 - 0.080	0.004 - 0.006 - 0.008
	High-carbon Alloy	HB ≦ 2270	Precision Cutting	Continuous	FSF, USF	TN6020	0.008	400 - 500 - 600	0.002 - 0.012 - 0.020	0.001 - 0.004 - 0.006
				Interruption		PR1025	1/64	330 - 400 - 500	0.002 - 0.012 - 0.020	0.001 - 0.004 - 0.006
			Finishing	Continuous	GP	PV7010	1/64	400 - 500 - 600	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
				Interruption		CA5525	1/64	330 - 400 - 500	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
			Finishing-Medium	Continuous	HQ	PV7010	1/64	400 - 500 - 600	0.020 - 0.040 - 0.080	0.004 - 0.006 - 0.010
				Interruption		CA5525	1/64	330 - 400 - 500	0.020 - 0.040 - 0.060	0.004 - 0.006 - 0.008
			Medium cutting	Continuous	Standard	CA5515	1/32	330 - 400 - 500	0.040 - 0.060 - 0.100	0.004 - 0.006 - 0.012
				Interruption		CA5525	1/32	270 - 330 - 400	0.040 - 0.060 - 0.080	0.004 - 0.006 - 0.008
M	Stainless Steel	HB ≦ 220	Finishing	Continuous	MQ	CA6525	1/64	400 - 500 - 600	0.008 - 0.020 - 0.033	0.002 - 0.08 - 0.004
				Interruption			1/32	330 - 400 - 500	0.008 - 0.020 - 0.033	0.002 - 0.08 - 0.004
			Medium cutting	Continuous	Standard	CA6525	1/64	400 - 500 - 600	0.020 - 0.040 - 0.060	0.002 - 0.004 - 0.008
				Interruption			1/32	330 - 400 - 500	0.020 - 0.040 - 0.060	0.002 - 0.004 - 0.008
	Stainless Steel	HB ≦ 1000	Finishing	Continuous	MQ	CA6525	1/64	270 - 330 - 400	0.008 - 0.028 - 0.040	0.002 - 0.004 - 0.006
				Interruption			1/32	200 - 270 - 330	0.008 - 0.028 - 0.040	0.002 - 0.004 - 0.006
			Medium cutting	Continuous	Standard	CA6525	1/64	270 - 330 - 400	0.020 - 0.040 - 0.060	0.002 - 0.004 - 0.008
				Interruption			1/32	200 - 270 - 330	0.020 - 0.040 - 0.060	0.002 - 0.004 - 0.008
K	Gray Cast Iron	HB ≦ 250	High Speed Cutting	Continuous	Without Chipbreaker	KBN60M	1/64	400 - 500 - 2000	0.002 - 0.008 - 0.020	0.002 - 0.004 - 0.006
				Interruption		PT600M	1/32	200 - 830 - 1500	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.006
			Finishing (Gloss Oriented)	Continuous	Standard	PV7005	1/32	200 - 830 - 1000	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
				Interruption		TN6020	1/32	330 - 500 - 200	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
			Finishing	Continuous	Standard	CA4505	1/64	500 - 600 - 200	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
				Interruption		CA4515	1/32	330 - 500 - 600	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
			Medium cutting	Continuous	Conventional Without Chipbreaker	CA4505	1/32	330 - 500 - 200	0.020 - 0.040 - 0.080	0.004 - 0.006 - 0.008
				Interruption		CA4515	1/32	270 - 400 - 500	0.020 - 0.040 - 0.080	0.002 - 0.004 - 0.006
	Nodular Cast Iron	HB ≦ 270	High Speed Cutting	Continuous	Without Chipbreaker	KBN60M	1/64	200 - 1000 - 400	0.002 - 0.008 - 0.020	0.001 - 0.002 - 0.004
				Interruption		PT600M	1/32	500 - 200 - 830	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.006
			Finishing (Gloss Oriented)	Continuous	Standard	PV7005	1/32	500 - 200 - 830	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
				Interruption		TN6020	1/32	330 - 400 - 500	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
			Finishing	Continuous	Standard	CA4505	1/64	400 - 500 - 600	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
				Interruption		CA4515	1/32	330 - 400 - 500	0.008 - 0.020 - 0.040	0.002 - 0.004 - 0.008
			Medium cutting	Continuous	Standard	CA4505	1/32	330 - 400 - 500	0.020 - 0.040 - 0.080	0.002 - 0.004 - 0.008
				Interruption		CA4515	1/32	270 - 330 - 400	0.020 - 0.040 - 0.080	0.002 - 0.004 - 0.006
N	Non-ferrous Metals	HB ≦ 330	High Speed Cutting (Rainbow Surface Gross)	Continuous	Without Chipbreaker	KPD001	0.008	660 - 1300-3300	0.002 - 0.004 - 0.012	0.002 - 0.004 - 0.006
			Finishing	Continuous	FSF, USF	KW10	1/64	330 - 200 - 400	0.002 - 0.020 - 0.040	0.001 - 0.004 - 0.008
				Interruption			1/64	330 - 200 - 400	0.002 - 0.020 - 0.040	0.001 - 0.004 - 0.008
S	Titanium Alloy	HB ≦ 400	Precision Cutting (Rainbow Surface Gross)	Continuous	Without Chipbreaker	KPD001	0.008	330 - 400 - 500	0.002 - 0.004 - 0.012	0.001 - 0.07 - 0.004
				Interruption			1/64	240 - 330 - 400	0.002 - 0.004 - 0.012	0.001 - 0.07 - 0.004
			Finishing	Continuous	F , U	KW10	0.008	100 - 50 - 70	0.002 - 0.020 - 0.040	0.001 - 0.004 - 0.008
				Interruption			1/64	100 - 50 - 70	0.002 - 0.020 - 0.040	0.001 - 0.004 - 0.008
	Heat-resistant Alloys	HB ≦ 350	Finishing	Continuous	F , U	KW10	1/64	40 - 100 - 170	0.002 - 0.020 - 0.040	0.001 - 0.004 - 0.008
				Interruption			1/64	40 - 100 - 170	0.002 - 0.020 - 0.040	0.001 - 0.004 - 0.008
			Finishing	Continuous	MQ	PR1310	1/64	125 - 200 - 275	0.004 - 0.012 - 0.020	0.001 - 0.002 - 0.004
				Interruption			1/32	125 - 200 - 275	0.004 - 0.012 - 0.020	0.001 - 0.002 - 0.004
H	Hard Materials	40 ~ 50 HRC	Finishing	Continuous	HQ Without Chipbreaker	CA5515	1/32	200 - 270 - 330	0.002 - 0.012 - 0.020	0.002 - 0.003 - 0.004
				Interruption			1/32	100 - 170 - 240	0.002 - 0.012 - 0.020	0.002 - 0.003 - 0.004
		45 ~ 68 HRC	Finishing	Continuous	Without Chipbreaker	KBN05M	1/64	270 - 400 - 500	0.004 - 0.008 - 0.012	0.001 - 0.003 - 0.004
				Interruption	SET, MET	KBN25M	1/32	200 - 330 - 400	0.004 - 0.008 - 0.012	0.001 - 0.003 - 0.004
			Medium cutting	Continuous	Without Chipbreaker (Negative)	KBN900	1/32	200 - 270 - 330	0.012 - 0.028 - 0.040	0.001 - 0.004 - 0.006