Operating Guidelines - 5xD

Materials				Condition	Tensile Strength (N/mm2)	HB Hardness	Vc Cutting Speed SFM	IPR Cutting Diameter (in/rev)					
ISO	Mtl Group No.	Type						3.0-6.0 mm (.118-.235")	6.0-9.0 mm (.236-.353")	9.0-12.0 mm (.354-.471")	12.0-16.0 mm (.472-.629")	16.0-19.05 mm (.630-.749")	19.05-20.0 mm (.750-.787")
P	1	Non alloy steel and cast steel free cutting steel	< 0.25 %C	Annealed	420	125	375	.0030 - .0050	.0050 - .0075	.0075 - .0100	.0100 - .0130	.0130 - .0153	.0153 - .0160
	2		>= 0.25 %C	Annealed	650	190							
	3		< 0.55 %C	Quenched and Tempered	850	250							
	4		>= 0.55 %C	Annealed	750	220							
	5		> 0.55 %C	Quenched and Tempered	1000	300							
	6	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	600	200							
	7			Quenched and Tempered	930	275							
	8				1000	300							
	9				1200	350							
	10	High alloyed steel, cast steel, and tool steel		Annealed	680	200	275	.0030 - .0050	.0050 - .0075	.0075 - .0100	.0100 - .0130	.0130 - .0153	.0153 - .0160
	11			Quenched and Tempered	1100	325							
M	12	Stainless steel (410, 416, 420, 440)		Ferritic/ Martensitic	680	200	230	.0023 - .0047	.0047 - .0070	.0070 - .0094	.0094 - .0126	.0126 - .0138	.0138 - .0140
	13	Stainless steel (15-5, 17-4)		Martensitic	820	240							
	14	Stainless steel (302, 303, 304)		Austenitic	600	180							
		Stainless steel (310, 316, 321)					180	.0020 - .0040	.0040 - .0060	.0060 - .0080	.0080 - .0110	.0110 - .0121	.0121 - .0125
	14	Stainless steel (323, 329, F55, 2205)		Austenitic/ Ferritic	820	240	150	.0020 - .0035	.0035 - .0045	.0045 - .0050	.0050 - .0055	.0055 - .0059	.0059 - .0060
N	21	Aluminum Alloy Forging		<12% Si 1000 - 8000 series			820	.0120 - .0140	.0140 - .0200	.0200 - .0250	.0250 - .0260	.0260 - .0268	.0268 - .0270
	22												
	23	Aluminum Alloy Casting		>12% Si 4000 series & Castings			820	.0110 - .0150	.0150 - .0190	.0190 - .0230	.0230 - .0240	.0240 - .0248	.0248 - .0250
	24												
	25												
S	36	Titanium Ti alloys TI1100, TI6AL4V			Rm 400		150	.0020 - .0030	.0030 - .0040	.0040 - .0050	.0050 - .0065	.0065 - .0084	.0080 - .0084
	37			Alpha + Beta alloys cured	Rm1050								

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases.