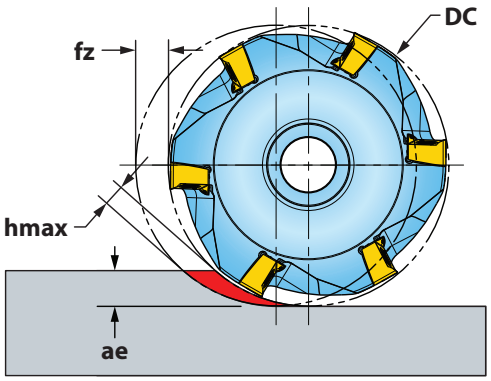
OPERATING GUIDELINES

Chip Thinning



* Chip Thinning Calculator is recommended to ensure hmax is within fz range.

Materials				Vc Cutting Speed SFM	fz* Feed/Tooth (inch)	Harder <----------> Tougher				Coolant
						CBN	Carbide			
ISO	Mat'l Group #VDI 3323	Type	Examples			IN80B	IN2504	IN2510	IN2505	
P	1-5	Non-alloy Steel	1018, A36, 1045, A572, 1070	500-1000	.004-.010		2		1	No
	6-9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	400-700						
	10-11	High-alloy Steel	H13, A2, D2, M2, T1	300-600						
M	12-13	"Stainless Steel (Ferritic & Martensitic)"	410, 416, 440	350-600	.004-.010				1	Yes
	14	"Stainless Steel (Austenitic)"	303, 304, 316, 15-5, 17-4	300-550						May not be required at high speeds
K	15-16	Gray Cast Iron	CLS. 20, 30, 45	500-1000	.003-.008		1	2	3	No
				1400-2600	.003-.006	1				
	17-20	Nodular Cast Iron	"60-40-18, 100-70-03"	400-800	.003-.008		1	2	3	No
				1300-2000	.003-.006	1				
		CGI	CGI	300-500	.003-.005		1	2	3	
S	31-35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	65-120	.004-.010				1	Yes
		Co Based > 35 HRC	Stellite, Haynes	250-500	.002-.005				1	
		Ni Based > 35 HRC	Inconel, Hasteloy	200-450	.002-.005				1	
		Fe Based > 35 HRC		150-350	.002-.005				1	
	36-37	Titanium Alloys	"6Al-4V 5Al-5Mo-5V-3Cr"	85-130	.004-.010				1	
H	38-39	Hardened Steel >48	A2, O1, D2	250-600	.003-.006	1	2			No

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. Additionally, DOC and WOC may need to be revised to optimize the tools performance.