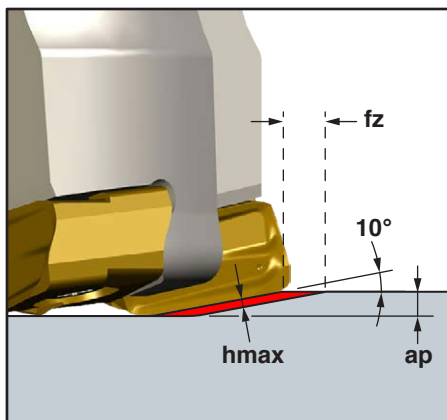


NUMAX HFA™ OPERATING GUIDELINES

Chip Thinning



NOTE:

The operating guidelines table below includes a column for feed-per-tooth (f_z). That column accounts for the axial chip thinning that's generated by the cutting-edge angle (lead angle). All NuMaxHFA high-feed cutters have a 10° cutting edge angle resulting in an f_z that is approximately 6x the recommended chip thickness (hex).

ISO	Materials			V_c Cutting Speed SFM	f_z Feed/ Tooth (inch)	H_{ex} Max. Chip Thickness (inch)	Harder <-----> Tougher						Coolant	Geometry 
	Mat'l Group #VDI 3323	Type	Examples				IN4005	IN2505	IN4030	IN2530	IN4035	IN2535		
P	1 thru 5	Non-alloy Steel	1018, A36, 1045, A572, 1070	400-850	.022-.078	.004-.014	2	1	4	3			NO	1
	6 thru 9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	350-650	.022-.067	.004-.012	2	1	4	3			NO	1
	10, 11	High-alloy Steel	H13, A2, D2, M2, T1	250-500	.022-.062	.004-.011	2	1	4	3			NO	1
M	12 thru 13	"Stainless Steel (Ferritic & Martensitic)"	410, 416, 440	350-550	.017-.062	.003-.011			4	3	2	1	YES	1
	14	Stainless Steel (Austenitic)	"303, 304, 316, 15-5, 17-4"	300-500	.017-.062	.003-.011			4	3	2	1	YES	1
K	15 thru 16	Gray Cast Iron	CLS. 20, 30, 45	500-700	.022-.078	.004-.014	1	2	3	4			NO	1
	17 thru 20	Nodular Cast Iron	"60-40-18, 100-70-03"	400-650	.022-.078	.004-.014	2	1	4	3			NO	1
S	31 thru 35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	60-130	.017-.034	.003-.006			4	3	2	1	YES	1
	36 thru 37	Titanium Alloys	6AL-4V, 5AL-5Mo-5V-3Cr	65-150	.017-.039	.003-.007			4	3	2	1	YES	1
H	38 thru 39	Hardened Steel >48	A2, 01, D2	150-400	.017-.034	.003-.006	3	1	4	2			NO	1

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.