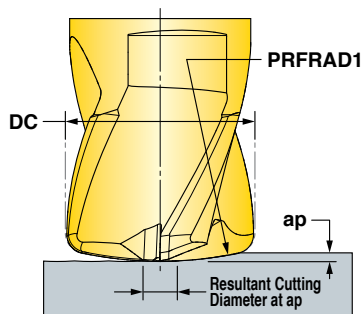


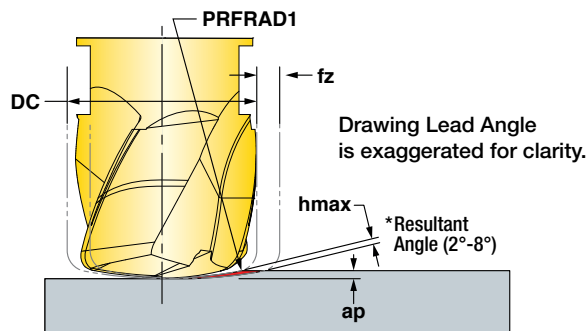
CHIP SURFER™ OPERATING GUIDELINES LENS FORM

RPM Calculation



* RPM calculation is to be made using the resultant diameter at ap.

Chip Thinning



** Chip Thinning Calculator is recommended to ensure hmax is in range.

Materials				Cutting Speed SFM *	DC Cutting Dia. (inch/mm)	fz Feed per Tooth (inch)	ap Axial Depth of Cut	hmax** Chip Thickness (inch)	Coolant
ISO	Mat'l Group #VDI 3323	Type	Examples						
P	1 thru 5	Non-alloy Steel	1018, A36, 1045, A572, 1070	700-900	.312" / 8	.0020-.0040	.002-.004	.0010-.0030	No
					.375" / 10	.0020-.0040	.002-.004	.0010-.0035	
					.500" / 12	.0020-.0050	.003-.006	.0010-.0040	
					.625" / 16	.0020-.0060	.004-.012	.0010-.0045	
	6 thru 9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	600-700	.750" / 20	.0020-.0060	.004-.015	.0010-.0050	
					.312" / 8	.0015-.0030	.002-.004	.0010-.0030	
					.375" / 10	.0015-.0030	.002-.004	.0010-.0035	
					.500" / 12	.0015-.0040	.003-.006	.0010-.0040	
	10, 11	High-alloy Steel	H13, A2, D2, M2, T1	500-650	.625" / 16	.0015-.0050	.004-.012	.0010-.0045	
					.750" / 20	.0015-.0050	.004-.015	.0010-.0050	
					.312" / 8	.0010-.0025	.002-.004	.0010-.0025	
					.375" / 10	.0010-.0025	.002-.004	.0010-.0030	
M	12 thru 14	Stainless Steel	410, 416, 440, 303, 304, 316, 15-5, 17-4	200-450	.500" / 12	.0010-.0030	.003-.006	.0010-.0035	May be required at high speeds
					.625" / 16	.0010-.0040	.004-.012	.0010-.0040	
					.750" / 20	.0010-.0040	.004-.015	.0010-.0045	
					.312" / 8	.0015-.0030	.002-.004	.0010-.0030	
K	15 thru 20	Iron	CLS. 20, 30, 45, 60-40-18, 100-70-03	600-850	.375" / 10	.0015-.0030	.002-.004	.0010-.0035	No
					.500" / 12	.0015-.0040	.003-.006	.0010-.0040	
					.625" / 16	.0015-.0050	.004-.012	.0010-.0045	
					.750" / 20	.0015-.0050	.004-.015	.0010-.0050	
S	31 thru 37	High-Temp, Ti	Inconel, Hastelloy, 6Al-4V, 5Al-5Mo-5V-3Cr	120-250	.312" / 8	.0010-.0025	.002-.004	.0010-.0025	Yes
					.375" / 10	.0010-.0025	.002-.004	.0010-.0030	
					.500" / 12	.0010-.0030	.003-.006	.0010-.0035	
					.625" / 16	.0010-.0040	.004-.012	.0010-.0040	
					.750" / 20	.0010-.0040	.004-.015	.0010-.0045	

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.