



# RHINOROUNDS™ 5-FLUTE OPERATING GUIDELINES

ISO	Material	Material Examples	Hardness Hb	SFM <sup>2</sup>	MAX% STEPOVER (ae) @ 2x DIA LOC (ap)	Chip Thinning Feed Rate <sup>1</sup>					
						IPT Ø 0.250	IPT Ø 0.375	IPT Ø 0.500	IPT Ø 0.625	IPT Ø 0.750	IPT Ø 1.000
<b>P</b>	MEDIUM & HIGH CARBON STEELS	1000-1200 SERIES	>285	500 - 800	12%	0.0023	0.0033	0.0043	0.0051	0.0063	0.0084
	ALLOY STEELS	4130, 4140, 5140, 6150, 8620,	<330	400 - 900	10%	0.0023	0.0032	0.0043	0.0050	0.0062	0.0082
	TOOL STEEL	A2, P20, S7, H13, L6	<300	450 - 650	9%	0.0021	0.0031	0.0042	0.0049	0.0056	0.0072
	FERRITIC, MARTENSITIC & PH STAINLESS STEELS	"400'S, 15-5, 17-4 CUSTOM 400'S"	>300	300 - 500	9%	0.0020	0.0033	0.0041	0.0050	0.0059	0.0076
<b>M</b>	AUSTENITIC STAINLESS STEELS	INOX, 200 SERIES, 300 SERIES AND 304L	<300	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	AUSTENITIC STAINLESS STEELS & CAST STAINLESS STEELS	310, 314, 316	<300	350 - 500	9%	0.0024	0.0035	0.0046	0.0057	0.0066	0.0088
	DUPLIX STEELS (AUSTENITIC & FERRITIC)	255, 323, 329, 2202, 2205, 2304	<310	350 - 500	8%	0.0025	0.0037	0.0049	0.0063	0.0075	0.0102
<b>K</b>	"CAST IRON - GRAY LOW STRENGTH"	"Class 20, 25, 30, 35 Grade G1800"	<270	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	"CAST IRON - MALLEABLE MEDIUM STRENGTH"	60-14-18, 65-45-12, M3210, M4504	<320	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	"CAST IRON - NODULAR HIGH STRENGTH"	32510, 40010, 5005, 70003, 90001	>300	300 - 400	8%	0.0011	0.0015	0.0021	0.0026	0.0031	0.0044
<b>S</b>	IRON-BASED, HEAT-RESISTANT ALLOYS	A-286, INVAR, Discaloy, INCOLOY 800-802, Nitronic	>200	200 - 425	8%	0.0022	0.0029	0.0039	0.0050	0.0055	0.0065
	COBALT-BASED, HEAT-RESISTANT ALLOYS	Haynes 25, Haynes 188, Stellite, MAR-M302	>180	100 - 225	7%	0.0027	0.0038	0.0048	0.0059	0.0067	0.0091
	NICKEL-BASED, HEAT-RESISTANT ALLOYS	HAST-C, Rene 41, Waspalloy, Monel, Nimonic, UDIMET, INCO 718	>180	65 - 225	7%	0.0018	0.0024	0.0033	0.0043	0.0053	0.0069
	TITANIUM	Ti6AL4V	>270	325 - 450	9%	0.0026	0.0031	0.0043	0.0051	0.0058	0.0073
	TITANIUM	TITANIUM 10-2-3	<390	250 - 400	7%	0.0027	0.0034	0.0048	0.0059	0.0069	0.0093
<b>H</b>	HARDENED TOOL STEELS	D2, H13, S7	>360	325 - 525	7%	0.0022	0.0029	0.0035	0.0043	0.0049	0.0067
	HARDENED TOOL STEELS	D2, H13, S7	>420	300 - 400	7%	0.0020	0.0027	0.0031	0.0037	0.0045	0.0059
	HARDENED TOOL STEELS	D2, H13, S7	>485	225 - 300	6%	0.0017	0.0023	0.0027	0.0034	0.0042	0.0059
	HARDENED TOOL STEELS	D2, H13, S7	>560	180 - 275	6%	0.0013	0.0019	0.0027	0.0034	0.0040	0.0051

<sup>1</sup>Chip thinning calculations are included in the chipload. No need to use a chip thinning calculator.  
 The IPT has been calculated based upon the mid range value for SFM, and based on 2xD depth of cut (ap)  
<sup>2</sup>When SFM exceeds 500 user air blast to cool the tool.  
 Reduce SFM & IPT by 30-40% when running finishing toolpaths if surface finish is not within quality limits