ENGRAVING CUTTERS
Technical Information

Engraving Cutters									
Material Guide		HRc	RPM	Engraving Cutters Pointed			Engraving Cutters Marking		
				Chip Load (IPT)			Chip Load (IPT)		
				60°	90°	Axial DOC	60°	90°	Axial DOC
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastelloy		6000+	.00048	.00530	< .010	.00045	.00049	< .010
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpeneter 22-b3		6000+	.00048	.00530	< .010	.00045	.00049	< .010
MONEL	Monel-65% Nickel		6000+	.00048	.00530	< .010	.00045	.00049	< .010
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si	< 32 32 < 45	6000+	.00060 .00030	.00066 .00033	< .010	.00056 .00028	.00062 .00031	< .010
STAINLESS STEEL (PRECIPITATION)	13/8, 15/5, 17-4, AM-350/355	< 32 32 < 45	6000+	.00060 .00030	.00066 .00034	< .010	.00056 .00028	.00062 .00031	< .010
STAINLESS STEEL (AUSTENITIC)	200 Series, 302, 303, 304, 316, 304L, 316L	< 32 32 < 45	6000+	.00060 .00030	.00066 .00035	< .010	.00056 .00028	.00062 .00031	< .010
STAINLESS STEEL (MARTENSITIC)	403,410,416,440	< 32 32 < 45	6000+	.00060 .00030	.00066 .00036	< .010	.00056 .00028	.00062 .00031	< .010
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01	< 29 30 < 39 40 < 45	6000+	.00072 .00054 .00030	.00079 .00059 .00033	< .010	.00068 .00052 .00028	.00075 .00057 .00031	< .010
MEDIUM ALLOY STEELS	200,250,300	< 29 30 < 39 40 < 45	6000+	.00072 .00054 .00030	.00079 .00059 .00033	< .010	.00068 .00052 .00028	.00075 .00057 .00031	< .010
CARBON STEELS	1000's, 1100's, 1300's	< 29 30 < 39 40 < 45	6000+	.00072 .00054 .00030	.00079 .00059 .00033	< .010	.00068 .00052 .00028	.00075 .00057 .00031	< .010
DUCTILE	Ductile Cast Irons		6000+	.00060	.00066	< .010	.00056	.00062	< .010
CAST IRONS	Gray Cast Irons	< 30 30+	6000+	.0012 .00048	.00132 .00053	< .010	.00112 .00045	.00123 .00049	< .010
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		6000+	.00120	.00132	< .010	.00112	.00123	< .010
COPPER, COPPER ALLOYS			6000+	.00120	.00132	< .010	.00112	.00123	< .010
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		6000+	.00120	.00132	< .010	.00112	.00123	< .010
PLASTICS	ACRYLICS, PHENOLICS		6000+	.00180	.00198	< .010	-	-	-
CARBON, GRAPHITES			6000+	.00180	.00198	< .010	-	-	-

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions (minimal runout is required for best results).
Suggested speed is 6000 rpm or more. Choose an rpm value that creates the least amount of internal machine vibration. In many cases, a speed increaser is helpful.
Posted chip loads reflect axial depths of cut up to .009. For depths of cut = .010" -.015", reduce posted chip loads by 20%. For depths of cut = .016" -.020", reduce posted chip loads by 30%.
Posted chip loads reflect uncoated cutters. Coating is better suited to prolong tool life rather than decrease cycle time.
Posted chip loads reflect HORIZONTAL milling conditions. For VERTICAL plunge milling to depth, reduce posted chip loads by 50% (ramping is preferred to maintain tip integrity).