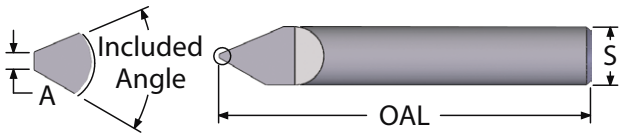
ENGRAVING TOOLS - SOLID CARBIDE



- The tool tip (A) is held to ±0.001 inch tolerance
- ALTiN+ coating extends tool life
- Made with premium submicron carbide

INCLUDED ANGLE	"S" SHANK DIA.	OAL	"A" TIP DIA.	ORDER #		EDP #	
				UNCOATED	ALTiN+	UNCOATED	ALTiN+
30°	0.1250	1.50	0.005	EN125-30	EN125-30A	500804	500894
30°	0.1875	2.00	0.007	EN187-30	EN187-30A	500819	500909
30°	0.2500	2.50	0.009	EN250-30	EN250-30A	500834	500924
30°	0.3125	2.50	0.011	EN312-30	EN312-30A	500849	500939
30°	0.3750	2.50	0.013	EN375-30	EN375-30A	500864	500954
30°	0.5000	3.00	0.015	EN500-30	EN500-30A	500879	500969
40°	0.1250	1.50	0.005	EN125-40	EN125-40A	500807	500897
40°	0.1875	2.00	0.007	EN187-40	EN187-40A	500822	500912
40°	0.2500	2.50	0.009	EN250-40	EN250-40A	500837	500927
40°	0.3125	2.50	0.011	EN312-40	EN312-40A	500852	500942
40°	0.3750	2.50	0.013	EN375-40	EN375-40A	500867	500957
40°	0.5000	3.00	0.015	EN500-40	EN500-40A	500882	500972
60°	0.1250	1.50	0.005	EN125-60	EN125-60A	500810	500900
60°	0.1875	2.00	0.007	EN187-60	EN187-60A	500825	500915
60°	0.2500	2.50	0.009	EN250-60	EN250-60A	500840	500930
60°	0.3125	2.50	0.011	EN312-60	EN312-60A	500855	500945
60°	0.3750	2.50	0.013	EN375-60	EN375-60A	500870	500960
60°	0.5000	3.00	0.015	EN500-60	EN500-60A	500885	500975
90°	0.1250	1.50	0.005	EN125-90	EN125-90A	500813	500903
90°	0.1875	2.00	0.007	EN187-90	EN187-90A	500828	500918
90°	0.2500	2.50	0.009	EN250-90	EN250-90A	500843	500933
90°	0.3125	2.50	0.011	EN312-90	EN312-90A	500858	500948
90°	0.3750	2.50	0.013	EN375-90	EN375-90A	500873	500963
90°	0.5000	3.00	0.015	EN500-90	EN500-90A	500888	500978
120°	0.1250	1.50	0.005	EN125-120	EN125-120A	500801	500891
120°	0.1875	2.00	0.007	EN187-120	EN187-120A	500816	500906
120°	0.2500	2.50	0.009	EN250-120	EN250-120A	500831	500921
120°	0.3125	2.50	0.011	EN312-120	EN312-120A	500846	500936
120°	0.3750	2.50	0.013	EN375-120	EN375-120A	500861	500951
120°	0.5000	3.00	0.015	EN500-120	EN500-120A	500876	500966

SPECIALTY TOOL - CORNER ROUNDING END MILL
FEED AND SPEED CHART

MATERIAL	ROCKWELL HARDNESS	SPEED (SFM) UNCOATED	SPEED (SFM) AlTiN+	FEED (Inches per tooth) Tool Size				
				CR125	CR187	CR250	CR375	CR500
Cast Iron	85Rb	200	350	0.0004	0.0005	0.0009	0.0015	0.0017
Carbon Steel	18Rc	200	400	0.0004	0.0005	0.0008	0.0013	0.0015
Alloy Steel	20Rc	160	330	0.0003	0.0004	0.0007	0.0012	0.0014
Heat Treated Alloys (38-45Rc)	40Rc	60	100	0.0002	0.0003	0.0004	0.0007	0.0009
Tool Steel	20Rc	125	150	0.0002	0.0003	0.0004	0.0007	0.0009
Stainless Steel	95Rb	120	250	0.0003	0.0004	0.0007	0.0012	0.0014
Titanium	25Rc	110	150	0.0002	0.0003	0.0004	0.0007	0.0009
Aluminum	60Rb	450	750	0.0008	0.0011	0.0017	0.0028	0.0033
Brass, Zinc,	41Rb	300	500	0.0007	0.0010	0.0015	0.0025	0.0030

SPECIALTY TOOL - ENGRAVING TOOL
FEED AND SPEED CHART

MATERIAL	RPM	FEED (Inches per tooth) INCLUDED ANGLE 30° SHANK DIAMETER		40°		60°		90°		120°	
		.125-.187	.250-.500	.125-.187	.250-.500	.125-.187	.250-.500	.125-.187	.250-.500	.125-.187	.250-.500
Cast Iron	6000+	0.0011	0.0014	0.0012	0.0016	0.0016	0.0020	0.0017	0.0022	0.0019	0.0024
Carbon Steel	6000+	0.0006	0.0008	0.0007	0.0009	0.0009	0.0012	0.0010	0.0013	0.0011	0.0014
Alloy Steel	6000+	0.0005	0.0006	0.0005	0.0007	0.0007	0.0009	0.0007	0.0009	0.0008	0.0010
Heat Treated Alloys	6000+	0.0002	0.0003	0.0003	0.0004	0.0004	0.0005	0.0004	0.0005	0.0004	0.0006
Tool Steel	6000+	0.0004	0.0005	0.0005	0.0006	0.0006	0.0008	0.0007	0.0008	0.0007	0.0009
Stainless Steel	6000+	0.0005	0.0007	0.0006	0.0008	0.0008	0.0010	0.0008	0.0011	0.0009	0.0012
Titanium	6000+	0.0005	0.0007	0.0006	0.0008	0.0008	0.0010	0.0008	0.0011	0.0009	0.0012
Aluminum	6000+	0.0011	0.0014	0.0012	0.0016	0.0016	0.0020	0.0017	0.0022	0.0019	0.0024
Plastics	6000+	0.0016	0.0021	0.0019	0.0024	0.0024	0.0030	0.0026	0.0033	0.0028	0.0036

Suggested chip loads reflect engraving depths up to .010". For depths of cut between .010"-.015", reduce suggested chip loads by 20%. For depths of cut between .015"-.020", reduce suggested chip load by 30%.

Ramping into the part is preferred but if plunge milling into the part, reduce suggested chip load by 50%.