SINE-POWER

HIGH PERFORMANCE HSS ROUGHER for TITANIUM, TITANIUM ALLOYS AND STAINLESS STEELS

YG

Leading Through Innovation

SINE-POWER

SINE-POWER for Titanium and Titanium alloys is specifically designed for Aerospace and Power-Generation applications where efficient roughing of difficult to machine materials is essential.

Moreover, the engineered geometry allows exceptional metal removal rates at increased feeds and results in a better surface finish than a standard rougher.

ENGINEERED FLUTE GEOMETRY

- Optimal chip formation and evacuation
- Reduces friction and heat generation

APPLICATIONS:
TITANIUM
TITANIUM ALLOYS
STAINLESS STEELS

CORNER PROTECTION:

- Standard chamfer
- Corner radius on request

MATERIAL:

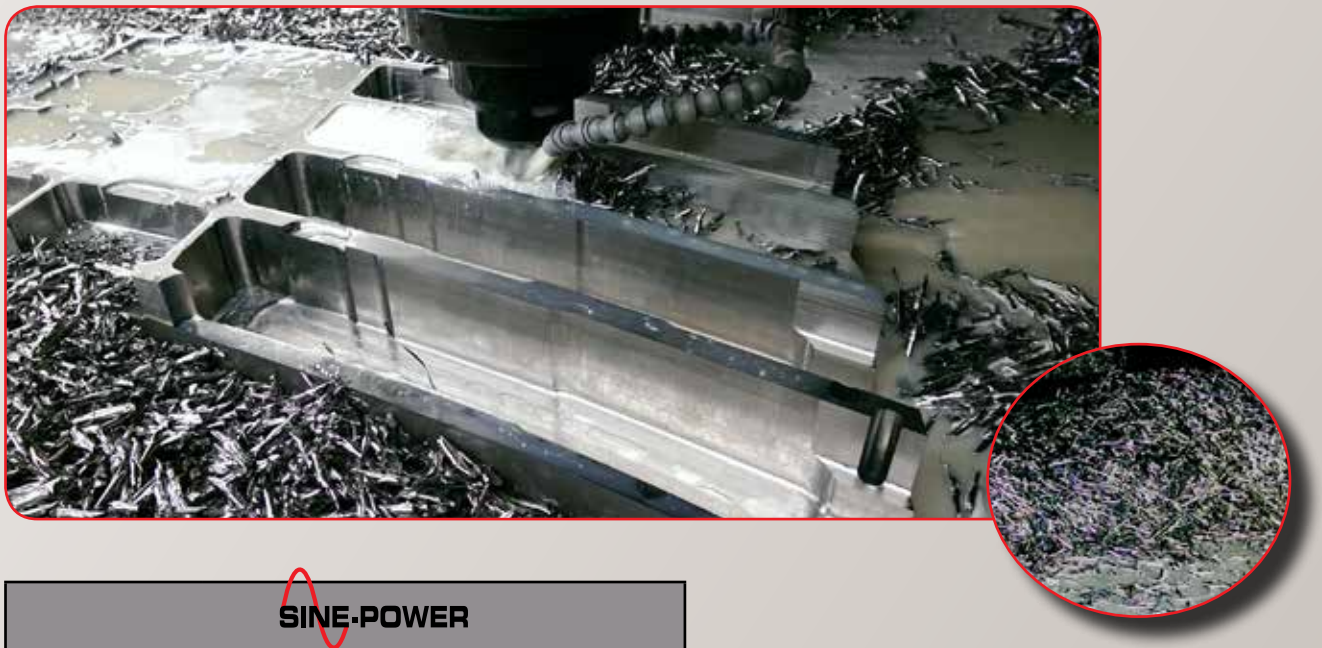
HSS Co8%

VARIABLE FACE PROFILE & SINUSOIDAL CUTTING EDGES

- Reduces vibrations and chatter
- Allows large depths of cut in slotting and profiling operations

CENTER CUTTING

- 4&6 flute
- Higher stability
- Axial machining



Excellent
chip formation

SINE-POWER	
Material	HSS Co8%
Dimension	ø2”(R.125”) x ø2” x 4” x 7-3/4”
No. of Flute	6
Coating	Uncoated

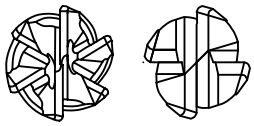
CUTTING CONDITIONS		
Milling Method	Slotting	Profiling
Material	6Al4V Titanium	
Coolant	Wet Cut	
RPM	100 rev/min	100 rev/min
Feed	2 IPM	3.15 ~ 4.2 IPM
Axial Depth	1-1/2 inch	1-1/2 inch
Radial Depth	2 inch	0.1 ~ 0.2 inch
Feed/Tooth	.0018 inch/tooth	.0053 ~ .007 inch/tooth

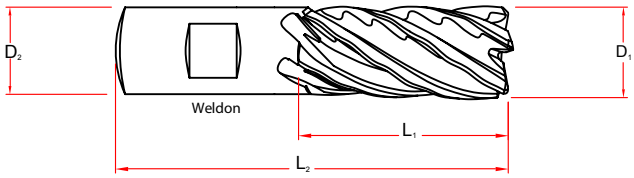
The above cutting conditions achieved 5 hours machining

THE SINE-POWER SPECIFIC GEOMETRY DESIGN HELPS OUR CUSTOMERS TO INCREASE THEIR PRODUCTIVITY BY 15% IN TITANIUM MACHINING.

SINE-POWER

HSS Co8, 4&6 FLUTE, FLAT SHANK





HSS Co8 | 4&6 | FLAT | Bright

Cutting Dia. Tolerance	Shank Dia. Tolerance
.0000 / + .0030 inch	- .0001/ - .0005 inch

INCH SERIES

Unit: Inch

EDP No.	Cutting Diameter D_1	Shank Diameter D_2	Length of Cut L_1	Overall Length L_2	Chamfer	No. of Flute
E2F64048	3/4	3/4	1 5/8	3 7/8	.030	4
E2F64901	3/4	3/4	2 1/4	4 1/2	.030	4
E2F64902	3/4	3/4	3	5 1/4	.030	4
E2F64064	1	1	2	4 1/2	.030	4
E2F64903	1	1	2	4 1/2	.030	6
E2F64904	1	1	3	5 1/2	.030	4
E2F64905	1	1	3	5 1/2	.030	6
E2F64906	1	1	4	6 1/2	.030	4
E2F64907	1	1	4	6 1/2	.030	6
E2F64116	1 1/4	1 1/4	2	4 1/2	.040	4
E2F64908	1 1/4	1 1/4	2	4 1/2	.040	6
E2F64909	1 1/4	1 1/4	3	5 1/2	.040	4
E2F64910	1 1/4	1 1/4	3	5 1/2	.040	6
E2F64911	1 1/4	1 1/4	4	6 1/2	.040	4
E2F64912	1 1/4	1 1/4	4	6 1/2	.040	6
E2F64132	1 1/2	1 1/4	2	4 1/2	.040	6
E2F64913	1 1/2	1 1/4	3	5 1/2	.040	6
E2F64914	1 1/2	1 1/4	4	6 1/2	.040	6
E2F64915	1 1/2	1 1/4	6	8 1/2	.040	6
E2F64200	2	2	2	5 3/4	.040	6
E2F64916	2	2	3	6 3/4	.040	6
E2F64917	2	2	4	7 3/4	.040	6
E2F64918	2	2	6	9 3/4	.040	6
E2F64919	2	2	8	11 3/4	.040	6

Corner radius available on request

SPEED AND FEED RECOMMENDATIONS						Diameter (inch)				
ISO HARDNESS (BHN)	Work Materials	Type of cut			Parameters	3/4	1	1 1/4	1 1/2	2
M < 250	Stainless Steel - Free Machining 303, 416, 420F, 430F 440F	Profiling 	2	0.5	SFM (Vc)	110 (88-132)				
					RPM	560	420	336	280	210
					Fz	0.0020	0.0030	0.0040	0.0050	0.0060
					Feed (IPM)	7	8	8	8	8
		Slotting 	1	1	SFM (Vc)	95 (76-114)				
					RPM	484	363	290	242	181
					Fz	0.0025	0.0035	0.0045	0.0055	0.0065
					Feed (IPM)	7	8	8	8	7
M < 275	Stainless Steel - Difficult 304, 304L,316, 316L	Profiling 	1.5	0.5	SFM (Vc)	100 (80-120)				
					RPM	509	382	306	255	191
					Fz	0.0020	0.0030	0.0040	0.0050	0.0060
					Feed (IPM)	6	7	7	8	7
		Slotting 	1	1	SFM (Vc)	80 (64-96)				
					RPM	407	306	244	204	153
					Fz	0.0025	0.0035	0.0045	0.0055	0.0065
					Feed (IPM)	6	6	7	7	6
M < 325	Stainless Steel PH 13-8 PH,15-5PH,17-4 PH, Custom 450	Profiling 	1.5	0.5	SFM (Vc)	85 (68-102)				
					RPM	433	325	260	216	162
					Fz	0.0020	0.0030	0.0040	0.0050	0.0060
					Feed (IPM)	5	6	6	6	6
		Slotting 	1	1	SFM (Vc)	75 (60-90)				
					RPM	382	287	229	191	143
					Fz	0.0025	0.0035	0.0045	0.0055	0.0065
					Feed (IPM)	6	6	6	6	6
S < 350	Titanium Base Alloy Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	Profiling 	2	0.5	SFM (Vc)	75 (60-90)				
					RPM	382	287	229	191	143
					Fz	0.0017	0.0025	0.0030	0.0035	0.0045
					Feed (IPM)	4	4	4	4	4
		Slotting 	1	1	SFM (Vc)	65 (52-78)				
					RPM	331	248	199	166	124
					Fz	0.0017	0.0025	0.0030	0.0035	0.0045
					Feed (IPM)	3	4	4	3	3
S < 450	Titanium Base Alloy - Difficult Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	Profiling 	1.5	0.5	SFM (Vc)	60 (48-72)				
					RPM	306	229	183	153	115
					Fz	0.0017	0.0025	0.0030	0.0035	0.0045
					Feed (IPM)	3	3	3	3	3
		Slotting 	1	1	SFM (Vc)	40 (32-48)				
					RPM	204	153	122	102	76
					Fz	0.0017	0.0025	0.0030	0.0035	0.0045
					Feed (IPM)	2	2	2	2	2

* Maximum recommended depth shown
* Reduce speed & feed for material harder than listed
* Above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 3/4”