

Series HFMS

High Feed End Mills for
Stainless Steel & High Temp Alloys





FEED FASTER IN DIFFICULT MATERIALS

High Performance High Feed End Mills for Stainless Steel & High Temp Alloys

Engineered for high-feed machining of stainless steels and high-temperature alloys, the **Hi-Per Feed MS** combines advanced geometry, premium carbide, and Ti-NAMITE-A coating technology to maximize metal removal while maintaining exceptional process stability. The result is shorter cycle times, extended tool life, and reliable performance in demanding applications.

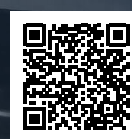
IDEAL FOR:

MATERIALS

M	Stainless Steel
S	High Temp Alloys

INDUSTRIES

 Aerospace	 Mold & Die
 Medical	 Casting & Foundries
 Power Gen & Energy	 General Engineering
 Automotive	



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FEATURES

- ✓ **Higher Feed Rates**
Aggressive feeds for shorter cycle times
- ✓ **Greater Stability**
Reduced deflection for reliable machining
- ✓ **Lower Forces = Great for Small Machines**
Engineered to resist wear and extend performance

OPTIMIZED END GASHING

Promotes efficient chip evacuation and reliable performance during aggressive high-feed milling.

CENTRAL COOLANT HOLE

Delivers coolant directly to the cutting zone for improved chip evacuation and heat control.

HIGH-FEED END GEOMETRY

Designed for shallow depths of cut and high feed rates to maximize metal removal efficiency.

DUAL AXIAL RADIUS CUTTING EDGE

Creates an axial chip thinning effect that redirects cutting forces into the spindle, improving stability and reducing tool deflection.

Ti-NAMITE-A COATING

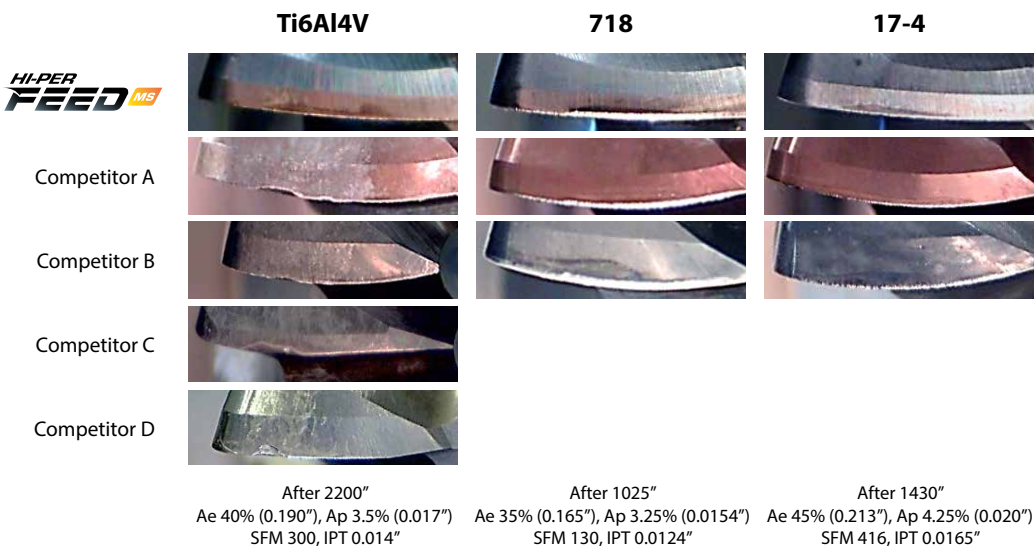
Advanced PVD coating reduces friction, improves wear resistance, and minimizes built-up edge when machining stainless steels and high-temperature alloys.

COMPREHENSIVE OFFERING

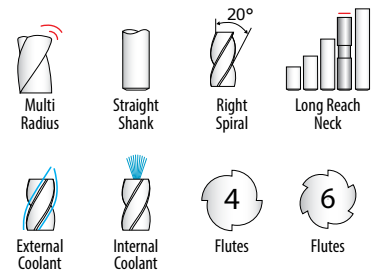
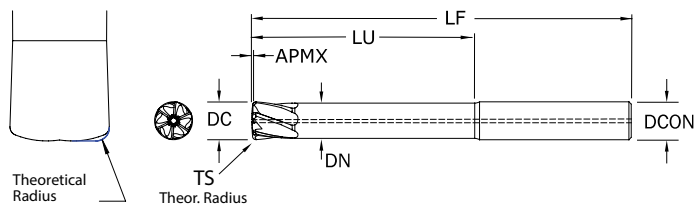
- Available in metric and imperial sizes
- Available in 2xD, 4xD, and 6xD reach lengths
- Available in 4 and 6 flutes based on diameter
- Ti-NAMITE-A coating technology for a variety of demanding machining applications



WEAR COMPARISON (Internal Evaluation)



The Hi-Per Feed MS demonstrated significantly lower and more consistent wear than Competitors A-D after machining 2,200" of Ti6Al4V, 1,025" of Inconel 718, and 1,430" of 17-4 stainless steel.



Cutting Diameter	Length of Cut	Overall Length	Shank Diameter	Reach	Neck Diameter	Theoretical Radius	Number of Flutes	TI-NAMITE-A (TA) EDP Numbers by Type	
DC	APMX	LF	DCON	LU	DN	TS		Standard	Internal Coolant
1/8	0.007	2-1/2	1/4	1/4	0.113	0.017	4	39950	—
1/8	0.007	2-1/2	1/4	1/2	0.113	0.017	4	39951	—
1/8	0.007	3	1/4	3/4	0.113	0.017	4	39952	—
3/16	0.010	2-1/2	1/4	3/8	0.173	0.025	4	39953	—
3/16	0.010	3	1/4	3/4	0.173	0.025	4	39954	—
3/16	0.010	3	1/4	1-1/8	0.173	0.025	4	39955	—
1/4	0.013	2-1/2	1/4	1/2	0.233	0.033	6	—	39956
1/4	0.013	3	1/4	1	0.233	0.033	6	—	39957
1/4	0.013	3-1/2	1/4	1-1/2	0.233	0.033	6	—	39958
5/16	0.016	2-1/2	3/8	5/8	0.291	0.042	6	—	39959
5/16	0.016	3-1/4	3/8	1-1/4	0.291	0.042	6	—	39960
5/16	0.016	4	3/8	1-7/8	0.291	0.042	6	—	39961
3/8	0.019	2-1/2	3/8	3/4	0.349	0.050	6	—	39962
3/8	0.019	3-1/2	3/8	1-1/2	0.349	0.050	6	—	39963
3/8	0.019	4	3/8	2-1/2	0.349	0.050	6	—	39964
1/2	0.026	3	1/2	1	0.465	0.067	6	—	39965
1/2	0.026	4	1/2	2	0.465	0.067	6	—	39966
1/2	0.026	5	1/2	3	0.465	0.067	6	—	39967

TOLERANCES (inch)

1/8–1/4 DIAMETER

DC = +0.0000/–0.0012

DCON = h₆

>1/4–3/8 DIAMETER

DC = +0.0000/–0.0016

DCON = h₆

>3/8–1/2 DIAMETER

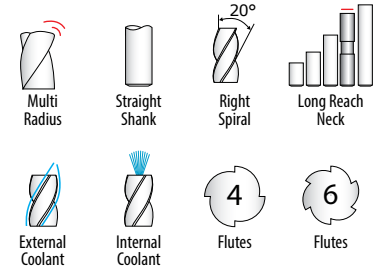
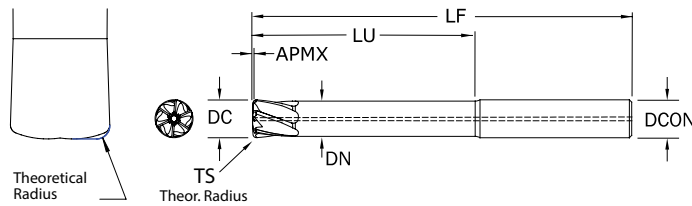
DC = +0.0000/–0.0020

DCON = h₆

RECOMMENDED FOR

M Stainless Steel

S High Temp Alloys



Cutting Diameter	Length of Cut	Overall Length	Shank Diameter	Reach	Neck Diameter	Theoretical Radius	Number of Flutes	Ti-NAMITE-A (TA) EDP Numbers by Type	
								Standard	Internal Coolant
DC	APMX	LF	DCON	LU	DN	TS			
2,0	0,10	57,0	6,0	4,0	1,80	0,27	4	47900	—
2,0	0,10	63,0	6,0	8,0	1,80	0,27	4	47901	—
2,0	0,10	75,0	6,0	12,0	1,80	0,27	4	47902	—
3,0	0,15	57,0	6,0	6,0	2,70	0,40	4	47903	—
3,0	0,15	63,0	6,0	12,0	2,70	0,40	4	47904	—
3,0	0,15	75,0	6,0	18,0	2,70	0,40	4	47905	—
4,0	0,21	57,0	6,0	8,0	3,60	0,53	4	47906	—
4,0	0,21	63,0	6,0	16,0	3,60	0,53	4	47907	—
4,0	0,21	75,0	6,0	24,0	3,60	0,53	4	47908	—
5,0	0,26	57,0	6,0	10,0	4,60	0,67	4	47909	—
5,0	0,26	63,0	6,0	20,0	4,60	0,67	4	47910	—
5,0	0,26	75,0	6,0	30,0	4,60	0,67	4	47911	—
6,0	0,31	57,0	6,0	12,0	5,58	0,80	6	—	47912
6,0	0,31	75,0	6,0	24,0	5,58	0,80	6	—	47913
6,0	0,31	89,0	6,0	36,0	5,58	0,80	6	—	47914
8,0	0,41	63,0	8,0	16,0	7,44	1,07	6	—	47915
8,0	0,41	80,0	8,0	32,0	7,44	1,07	6	—	47916
8,0	0,41	100,0	8,0	48,0	7,44	1,07	6	—	47917
10,0	0,52	72,0	10,0	20,0	9,30	1,33	6	—	47918
10,0	0,52	90,0	10,0	40,0	9,30	1,33	6	—	47919
10,0	0,52	110,0	10,0	60,0	9,30	1,33	6	—	47920
12,0	0,62	75,0	12,0	24,0	11,16	1,60	6	—	47921
12,0	0,62	100,0	12,0	48,0	11,16	1,60	6	—	47922
12,0	0,62	125,0	12,0	72,0	11,16	1,60	6	—	47923

TOLERANCES (mm)

<3 DIAMETER

DC = +0,000/−0,025

DCON = h₆

≥3–6 DIAMETER

DC = +0,000/−0,030

DCON = h₆

>6–10 DIAMETER

DC = +0,000/−0,040

DCON = h₆

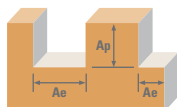
>10–12 DIAMETER

DC = +0,000/−0,050

DCON = h₆

RECOMMENDED FOR

M	Stainless Steel
S	High Temp Alloys



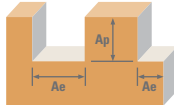
Material	Hardness		Ae x DC	Ap x DC	Vc (sfm)		DC • in					
							1/8	3/16	1/4	5/16	3/8	1/2
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	 Profile	 ≤ 0.50 x DC	 ≤ 0.040 x DC	500	RPM	15280	10187	7640	6112	5093	3820
					(400-600)	Fz	0.0046	0.0071	0.0098	0.0125	0.0154	0.0210
						Feed (ipm)	281	289	449	458	471	481
		 Slot	1 x DC	 ≤ 0.030 x DC	350	RPM	10696	7131	5348	4278	3565	2674
					(280-420)	Fz	0.0034	0.0044	0.0055	0.0072	0.0090	0.0120
						Feed (ipm)	145	125	176	185	193	193
		 1° Ramp	1 x DC	 ≤ 0.040 x DC	500	RPM	15280	10187	7640	6112	5093	3820
					(400-600)	Fz	0.0046	0.0071	0.0098	0.0125	0.0154	0.0210
						Feed (ipm)	281	289	449	458	471	481
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	 Profile	 ≤ 0.50 x DC	 ≤ 0.040 x DC	400	RPM	12224	8149	6112	4890	4075	3056
					(320-480)	Fz	0.0044	0.0068	0.0093	0.0119	0.0146	0.0200
						Feed (ipm)	215	222	341	349	357	367
		 Slot	1 x DC	 ≤ 0.030 x DC	300	RPM	9168	6112	4584	3667	3056	2292
					(240-360)	Fz	0.0025	0.0040	0.0054	0.0068	0.0082	0.0110
						Feed (ipm)	92	98	149	150	150	151
		 1° Ramp	1 x DC	 ≤ 0.040 x DC	400	RPM	12224	8149	6112	4890	4075	3056
					(320-480)	Fz	0.0044	0.0068	0.0093	0.0119	0.0146	0.0200
						Feed (ipm)	215	222	341	349	357	367
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	 Profile	 ≤ 0.45	 ≤ 0.042 x DC	420	RPM	12835	8557	6418	5134	4278	3209
					(336-504)	Fz	0.0038	0.0058	0.0080	0.0103	0.0128	0.0175
						Feed (ipm)	195	199	308	317	329	337
		 Slot	1 x DC	 ≤ 0.030 x DC	370	RPM	11307	7538	5654	4523	3769	2827
					(296-444)	Fz	0.0023	0.0035	0.0046	0.0058	0.0069	0.0092
						Feed (ipm)	104	106	156	157	156	156
		 1° Ramp	1 x DC	 ≤ 0.042 x DC	420	RPM	12835	8557	6418	5134	4278	3209
					(336-504)	Fz	0.0038	0.0058	0.0080	0.0103	0.0128	0.0175
						Feed (ipm)	195	199	308	317	329	337
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	 Profile	 ≤ 0.35 x DC	 ≤ 0.032 x DC	150	RPM	4584	3056	2292	1834	1528	1146
					(120-180)	Fz	0.0036	0.0054	0.0070	0.0090	0.0110	0.0145
						Feed (ipm)	66	66	96	99	101	100
		 Slot	1 x DC	 ≤ 0.030 x DC	130	RPM	3973	2649	1986	1589	1324	993
					(104-156)	Fz	0.0023	0.0035	0.0040	0.0050	0.0060	0.0082
						Feed (ipm)	37	37	48	48	48	49
		 1° Ramp	1 x DC	 ≤ 0.032 x DC	150	RPM	4584	3056	2292	1834	1528	1146
					(120-180)	Fz	0.0036	0.0054	0.0070	0.0090	0.0110	0.0145
						Feed (ipm)	66	66	96	99	101	100
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	 Profile	 ≤ 0.35 x DC	 ≤ 0.032 x DC	130	RPM	3973	2649	1986	1589	1324	993
					(104-156)	Fz	0.0025	0.0040	0.0055	0.0072	0.0090	0.0125
						Feed (ipm)	40	42	66	69	72	74
		 Slot	1 x DC	 ≤ 0.030 x DC	115	RPM	3514	2343	1757	1406	1171	879
					(92-138)	Fz	0.0017	0.0028	0.0035	0.0045	0.0055	0.0075
						Feed (ipm)	24	26	37	38	39	40
		 1° Ramp	1 x DC	 ≤ 0.032 x DC	130	RPM	3973	2649	1986	1589	1324	993
					(104-156)	Fz	0.0025	0.0040	0.0055	0.0072	0.0090	0.0125
						Feed (ipm)	40	42	66	69	72	74
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	 Profile	 ≤ 0.40 x DC	 ≤ 0.035 x DC	300	RPM	9168	6112	4584	3667	3056	2292
					(240-360)	Fz	0.0031	0.0049	0.0068	0.0088	0.0109	0.0150
						Feed (ipm)	114	120	187	194	200	206
		 Slot	1 x DC	 ≤ 0.030 x DC	180	RPM	5501	3667	2750	2200	1834	1375
					(144-216)	Fz	0.0022	0.0034	0.0048	0.0062	0.0076	0.0105
						Feed (ipm)	48	50	79	82	84	87
		 1° Ramp	1 x DC	 ≤ 0.035 x DC	300	RPM	9168	6112	4584	3667	3056	2292
					(240-360)	Fz	0.0031	0.0049	0.0068	0.0088	0.0109	0.0150
						Feed (ipm)	114	120	187	194	200	206
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	 Profile	 ≤ 0.40 x DC	 ≤ 0.035 x DC	180	RPM	5501	3667	2750	2200	1834	1375
					(144-216)	Fz	0.0011	0.0029	0.0048	0.0068	0.0089	0.0130
						Feed (ipm)	24	43	79	90	98	107
		 Slot	1 x DC	 ≤ 0.030 x DC	130	RPM	3973	2649	1986	1589	1324	993
					(104-156)	Fz	0.0010	0.0025	0.0035	0.0045	0.0058	0.0080
						Feed (ipm)	16	26	42	43	46	48
		 1° Ramp	1 x DC	 ≤ 0.035 x DC	180	RPM	5501	3667	2750	2200	1834	1375
					(144-216)	Fz	0.0011	0.0029	0.0048	0.0068	0.0089	0.0130
						Feed (ipm)	24	43	79	90	98	107

Bhn (Brinell) HRC (Rockwell C)
 rpm = sfm x 3.82 / DC
 ipm = Fz x Flute Count x rpm
 reduce speed and feed for materials harder than listed

Minimum Helical Radius = 20% of DC
 Maximum Helical Radius = 37% of DC
 Rates shown are based off 4xD reach tools,
 reduce IPT by 20% for 6xD reach tools



Refer to the SGS APEX: Application Expert for complete technical information
www.kyocera-sgstool.com/apex



						DC • mm								
Material	Hardness	Ae x DC	Ap x DC	Vc (m/min)		2	3	4	5	6	8	10	12	
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	 Profile ≤ 0.50 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	152 (122-183)	RPM	24266	16178	12133	9707	8089	6067	4853	4044
						Fz	0.0700	0.1080	0.1480	0.1900	0.2340	0.3200	0.4100	0.5040
						Feed (mm/min)	6795	6989	7183	7377	11357	11648	11939	12230
		 Profile ≤ 0.50 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	107 (85-128)	RPM	16986	11324	8493	6795	5662	4247	3397	2831
						Fz	0.0500	0.0760	0.1050	0.1160	0.1300	0.1900	0.2400	0.2900
						Feed (mm/min)	3397	3443	3567	3153	4416	4841	4892	4926
		 Profile ≤ 0.50 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	152 (122-183)	RPM	24266	16178	12133	9707	8089	6067	4853	4044
						Fz	0.0700	0.1080	0.1480	0.1900	0.2340	0.3200	0.4100	0.5040
						Feed (mm/min)	6795	6989	7183	7377	11357	11648	11939	12230
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	 Profile ≤ 0.50 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	122 (98-146)	RPM	19413	12942	9707	7765	6471	4853	3883	3236
						Fz	0.0635	0.0991	0.1372	0.1778	0.2210	0.3048	0.3900	0.4800
						Feed (mm/min)	4931	5130	5327	5523	8581	8876	9085	9318
		 Profile ≤ 0.50 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	91 (73-110)	RPM	14560	9707	7280	5824	4853	3640	2912	2427
						Fz	0.0350	0.0500	0.0800	0.1100	0.1200	0.1700	0.2200	0.2700
						Feed (mm/min)	2038	1941	2330	2563	3494	3713	3844	3931
		 Profile ≤ 0.50 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	122 (98-146)	RPM	19413	12942	9707	7765	6471	4853	3883	3236
						Fz	0.0635	0.0991	0.1372	0.1778	0.2210	0.3048	0.3900	0.4800
						Feed (mm/min)	4931	5130	5327	5523	8581	8876	9085	9318
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	 Profile ≤ 0.45	 Slot 1 x DC	 1° Ramp 1 x DC	128 (102-154)	RPM	20384	13589	10192	8153	6795	5096	4077	3397
						Fz	0.0560	0.0870	0.1200	0.1550	0.1920	0.2640	0.3400	0.4200
						Feed (mm/min)	4566	4729	4892	5055	7827	8072	8317	8561
		 Profile ≤ 0.45	 Slot 1 x DC	 1° Ramp 1 x DC	113 (90-135)	RPM	17957	11971	8979	7183	5986	4489	3591	2993
						Fz	0.0400	0.0550	0.0750	0.0950	0.1100	0.1500	0.1900	0.2200
						Feed (mm/min)	2873	2634	2694	2729	3951	4040	4094	3951
		 Profile ≤ 0.45	 Slot 1 x DC	 1° Ramp 1 x DC	128 (102-154)	RPM	20384	13589	10192	8153	6795	5096	4077	3397
						Fz	0.0560	0.0870	0.1200	0.1550	0.1920	0.2640	0.3400	0.4200
						Feed (mm/min)	4566	4729	4892	5055	7827	8072	8317	8561
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	 Profile ≤ 0.35 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	46 (37-55)	RPM	7280	4853	3640	2912	2427	1820	1456	1213
						Fz	0.0600	0.0880	0.1150	0.1470	0.1650	0.2400	0.2900	0.3500
						Feed (mm/min)	1747	1708	1674	1712	2402	2621	2533	2548
		 Profile ≤ 0.35 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	40 (32-48)	RPM	6309	4206	3155	2524	2103	1577	1262	1052
						Fz	0.0350	0.0530	0.0760	0.0910	0.0960	0.1320	0.1600	0.1980
						Feed (mm/min)	883	892	959	919	1211	1249	1211	1249
		 Profile ≤ 0.35 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	46 (37-55)	RPM	7280	4853	3640	2912	2427	1820	1456	1213
						Fz	0.0600	0.0880	0.1150	0.1470	0.1650	0.2400	0.2900	0.3500
						Feed (mm/min)	1747	1708	1674	1712	2402	2621	2533	2548
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	 Profile ≤ 0.35 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	40 (32-48)	RPM	6309	4206	3155	2524	2103	1577	1262	1052
						Fz	0.0360	0.0570	0.0800	0.1050	0.1320	0.1850	0.2400	0.3000
						Feed (mm/min)	909	959	1009	1060	1666	1751	1817	1893
		 Profile ≤ 0.35 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	35 (28-42)	RPM	5581	3721	2791	2233	1860	1395	1116	930
						Fz	0.0260	0.0399	0.0560	0.0740	0.0860	0.1170	0.1450	0.1800
						Feed (mm/min)	580	594	625	661	960	980	971	1005
		 Profile ≤ 0.35 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	40 (32-48)	RPM	6309	4206	3155	2524	2103	1577	1262	1052
						Fz	0.0360	0.0570	0.0800	0.1050	0.1320	0.1840	0.2400	0.3000
						Feed (mm/min)	909	959	1009	1060	1666	1741	1817	1893
TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	 Profile ≤ 0.40 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	91 (73-110)	RPM	14560	9707	7280	5824	4853	3640	2912	2427	
					Fz	0.0460	0.0720	0.1000	0.1300	0.1620	0.2260	0.2900	0.3600	
					Feed (mm/min)	2679	2795	2912	3028	4717	4936	5067	5242	
	 Profile ≤ 0.40 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	55 (44-66)	RPM	8736	5824	4368	3494	2912	2184	1747	1456	
					Fz	0.0322	0.0504	0.0700	0.0910	0.1140	0.1600	0.2030	0.2520	
					Feed (mm/min)	1125	1174	1223	1272	1992	2097	2128	2201	
	 Profile ≤ 0.40 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	91 (73-110)	RPM	14560	9707	7280	5824	4853	3640	2912	2427	
					Fz	0.0460	0.0720	0.1000	0.1300	0.1620	0.2260	0.2900	0.3600	
					Feed (mm/min)	2679	2795	2912	3028	4717	4936	5067	5242	
TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	 Profile ≤ 0.40 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	55 (44-66)	RPM	8736	5824	4368	3494	2912	2184	1747	1456	
					Fz	0.0200	0.0254	0.0560	0.0800	0.1120	0.1500	0.2030	0.3050	
					Feed (mm/min)	699	592	978	1118	1957	1966	2128	2664	
	 Profile ≤ 0.40 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	40 (32-48)	RPM	6309	4206	3155	2524	2103	1577	1262	1052	
					Fz	0.0170	0.0275	0.0510	0.0690	0.0840	0.1160	0.1580	0.1905	
					Feed (mm/min)	429	463	644	697	1060	1098	1196	1202	
	 Profile ≤ 0.40 x DC	 Slot 1 x DC	 1° Ramp 1 x DC	55 (44-66)	RPM	8736	5824	4368	3494	2912	2184	1747	1456	
					Fz	0.0200	0.0254	0.0560	0.0800	0.1120	0.1500	0.2030	0.3050	
					Feed (mm/min)	699	592	978	1118	1957	1966	2128	2664	

Bhn (Brinell) HRC (Rockwell C)

rpm = (Vc x 1000) / (DC x 3.14)

mm/min = Fz x Flute Count x rpm

reduce speed and feed for materials harder than listed

Minimum Helical Radius = 20% of DC

Maximum Helical Radius = 37% of DC

Rates shown are based off 4xD reach tools,

reduce IPT by 20% for 6xD reach tools

Refer to the SGS APEX: Application Expert for complete technical information
www.kyocera-sgstool.com/apex



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