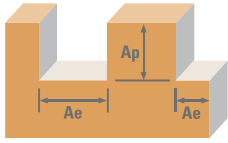


# Speeds and Feeds

**Instructions:**

- rpm = use speed from INCH or METRIC Baseline chart
- ipm = INCH Baseline Feed (ipm) x Feed Multiplier [from selected chart below]
- mm/min = METRIC Baseline Feed (mm/min) x Feed Multiplier [from selected chart below]
- Reduce speed and feed 30 percent when using uncoated tools
- Find Width of Cut (Ae) and Depth of Cut (Ap) recommendations on chart below
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series



INCH 2-Flute, Square, Corner Radius & Ball Without Reach	Flute Length	1.5 x DC		3 x DC									
	Feed Multiplier	1		0.9									
	Width/Depth	Ae x DC	Ap x DC	Ae x DC	Ap x DC								
	Diameter (DC)	≤0.0312	>0.0312	≤0.0312	>0.0312								
<table border="0"> <tr><td>P</td></tr> <tr><td>H</td></tr> <tr><td>K</td></tr> <tr><td>M</td></tr> <tr><td>S</td></tr> <tr><td>N</td></tr> </table> <b>ALL</b>	P	H	K	M	S	N	Profile	≤.30	≤.50	≤1	≤.10	≤.25	≤2
	P												
H													
K													
M													
S													
N													
Slot	1	≤.20	≤.50	1	≤.15	≤.35							

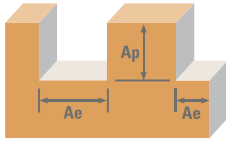
INCH 4-Flute, Square, Corner Radius & Ball Without Reach	Flute Length	1.5 x DC		3 x DC		5 x DC		8 x DC		12 x DC												
	Feed Multiplier	1.57		1.41		0.59		0.59		0.36												
	Width/Depth	Ae x DC	Ap x DC	Ae x DC	Ap x DC	Ae x DC	Ap x DC	Ae x DC	Ap x DC	Ae x DC	Ap x DC											
	Diameter (DC)	≤0.0312	>0.0312	≤0.0312	>0.0312	≤0.0312	>0.0312	≤0.0312	>0.0312	≤0.0312	>0.0312											
<table border="0"> <tr><td>P</td></tr> <tr><td>H</td></tr> <tr><td>K</td></tr> <tr><td>M</td></tr> <tr><td>S</td></tr> <tr><td>N</td></tr> </table> <b>ALL</b>	P	H	K	M	S	N	Profile	≤.30	≤.50	≤1	≤.10	≤.25	≤2	≤.10	≤.25	≤3	≤.05	≤.10	≤4	≤.03	≤.06	≤6
	P																					
H																						
K																						
M																						
S																						
N																						
Slot	1	≤.20	≤.50	1	≤.15	≤.35	1	≤.10	≤.20													

METRIC 2-Flute Square & Ball Without Reach	Flute Length	1.5 x DC		3 x DC									
	Feed Multiplier	1		0.9									
	Width/Depth	Ae x DC	Ap x DC	Ae x DC	Ap x DC								
	Diameter (DC)	≤0.0312	>0.0312	≤0.0312	>0.0312								
<table border="0"> <tr><td>P</td></tr> <tr><td>H</td></tr> <tr><td>K</td></tr> <tr><td>M</td></tr> <tr><td>S</td></tr> <tr><td>N</td></tr> </table> <b>ALL</b>	P	H	K	M	S	N	Profile	≤.30	≤.50	≤1	≤.10	≤.25	≤2
	P												
H													
K													
M													
S													
N													
Slot	1	≤.20	≤.50	1	≤.15	≤.35							

METRIC 4-Flute Square & Ball Without Reach	Flute Length	1.5 x DC		3 x DC									
	Feed Multiplier	1.57		1.41									
	Width/Depth	Ae x DC	Ap x DC	Ae x DC	Ap x DC								
	Diameter (DC)	≤0.0312	>0.0312	≤0.0312	>0.0312								
<table border="0"> <tr><td>P</td></tr> <tr><td>H</td></tr> <tr><td>K</td></tr> <tr><td>M</td></tr> <tr><td>S</td></tr> <tr><td>N</td></tr> </table> <b>ALL</b>	P	H	K	M	S	N	Profile	≤.30	≤.50	≤1	≤.10	≤.25	≤2
	P												
H													
K													
M													
S													
N													
Slot	1	≤.20	≤.50	1	≤.15	≤.35							

**Instructions:**

- rpm = use speed from INCH or METRIC Baseline chart
- ipm = INCH Baseline Feed (ipm) x Feed Multiplier [from selected chart below]
- mm/min = METRIC Baseline Feed (mm/min) x Feed Multiplier [from selected chart below]
- Reduce speed and feed 30 percent when using uncoated tools
- Find Width of Cut (Ae) and Depth of Cut (Ap) recommendations on chart below
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series



	INCH 2-Flute Square & Ball With Reach	Flute Length		8 x DC		12 x DC		
		Feed Multiplier		0.6		0.5		
		Width/Depth		Ae x DC	Ap x DC	Ae x DC	Ap x DC	
		Diameter (DC)		≤0.0312	>0.0312	≤0.0312	>0.0312	
P	ALL	Profile	≤.25	≤.50	≤.30	≤.22	≤.45	≤.25
H								
K		Slot	1	≤.07	≤.17	1	≤.06	≤.15
M								
S								
N								

	INCH 3-Flute Square, Corner Radius & Ball With Reach	Flute Length		3 x DC		5 x DC		8 x DC		12 x DC		15 x DC		20 x DC		25 x DC							
		Feed Multiplier		1.4		1.15		0.9		0.7		0.6		0.45		0.35							
		Width/Depth		Ae x DC	Ap x DC	Ae x DC	Ap x DC	Ae x DC	Ap x DC	Ae x DC	Ap x DC	Ae x DC	Ap x DC	Ae x DC	Ap x DC	Ae x DC	Ap x DC						
		Diameter (DC)		≤0.0312	>0.0312	≤0.0312	>0.0312	≤0.0312	>0.0312	≤0.0312	>0.0312	≤0.0312	>0.0312	≤0.0312	>0.0312	≤0.0312	>0.0312						
P	ALL	Profile	≤.30	≤.60	≤.5	≤.30	≤.60	≤.35	≤.25	≤.50	≤.30	≤.22	≤.45	≤.25	≤.15	≤.30	≤.25	≤.12	≤.25	≤.20	≤.12	≤.25	≤.20
H																							
K		Slot	1	≤.15	≤.30	1	≤.08	≤.20	1	≤.07	≤.17	1	≤.06	≤.15	1	≤.06	≤.15	1	≤.04	≤.10	1	≤.04	≤.10
M																							
S																							
N																							

	INCH 4-Flute Square & Ball With Reach	Flute Length		8 x DC		12 x DC		
		Feed Multiplier		0.95		0.75		
		Width/Depth		Ae x DC	Ap x DC	Ae x DC	Ap x DC	
		Diameter (DC)		≤0.0312	>0.0312	≤0.0312	>0.0312	
P	ALL	Profile	≤.25	≤.50	≤.30	≤.22	≤.45	≤.25
H								
K		Slot	1	≤.07	≤.17	1	≤.06	≤.15
M								
S								
N								

















**Note:**

- Bhn (Brinell)      HRC (Rockwell C)
- reduce speed and feed 30 percent when using uncoated tools
- Fz x No. of Flutes x max available rpm when recommendation exceeds machine limit
- helical ramp at 1 degrees or less, using slotting speed and feed rates (plunging is not recommended)
- reduce speed and feed for materials harder than listed
- reduce feed and Ae when finish milling (.02 x DC maximum)
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series













# FRACTIONAL Baseline

INCH Baseline  
Speed and Feed  
Square, Corner Radius  
& Ball End  
With and Without Reach Hardness

DC • in

	Hardness	Vc (sfm)	DC • in							
			0.0050	0.0156	0.0312	0.0625	0.0938	0.1200		
<b>P</b>	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536  ≤ 275 Bhn or ≤ 28 HRc	Profile 	365 RPM	278860	89378	44689	22309	14865	11619	
			(292-438)	Fz	0.000022	0.00007	0.00013	0.00027	0.00041	0.00052
			Feed (ipm)	12.05	12.05	12.05	12.05	12.05	12.05	
		Slot 	290 RPM	221560	71013	35506	17725	11810	9232	
			(232-348)	Fz	0.000022	0.00007	0.00013	0.00027	0.00041	0.00052
			Feed (ipm)	9.57	9.57	9.57	9.57	9.57	9.57	
<b>P</b>	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100  ≤ 375 Bhn or ≤ 40 HRc	Profile 	210 RPM	160440	51423	25712	12835	8552	6685	
			(168-252)	Fz	0.000019	0.00006	0.00012	0.00024	0.00036	0.00046
			Feed (ipm)	6.16	6.16	6.16	6.16	6.16	6.16	
		Slot 	165 RPM	126060	40404	20202	10085	6720	5253	
			(132-198)	Fz	0.000019	0.00006	0.00012	0.00024	0.00036	0.00046
			Feed (ipm)	4.84	4.84	4.84	4.84	4.84	4.84	
<b>M</b>	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F  ≤ 275 Bhn or ≤ 28 HRc	Profile 	340 RPM	259760	83256	41628	20781	13846	10823	
			(272-408)	Fz	0.000022	0.00007	0.00013	0.00027	0.00041	0.00052
			Feed (ipm)	11.22	11.22	11.22	11.22	11.22	11.22	
		Slot 	270 RPM	206280	66115	33058	16502	10996	8595	
			(216-324)	Fz	0.000022	0.00007	0.00013	0.00027	0.00041	0.00052
			Feed (ipm)	8.91	8.91	8.91	8.91	8.91	8.91	
<b>M</b>	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L  ≤ 275 Bhn or ≤ 28 HRc	Profile 	235 RPM	179540	57545	28772	14363	9570	7481	
			(188-282)	Fz	0.000019	0.00006	0.00012	0.00024	0.00036	0.00046
			Feed (ipm)	6.90	6.90	6.90	6.90	6.90	6.90	
		Slot 	185 RPM	141340	45301	22651	11307	7534	5889	
			(148-222)	Fz	0.000019	0.00006	0.00012	0.00024	0.00036	0.00046
			Feed (ipm)	5.43	5.43	5.43	5.43	5.43	5.43	
<b>M</b>	STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450  ≤ 325 Bhn or ≤ 35 HRc	Profile 	215 RPM	164260	52647	26324	13141	8756	6844	
			(172-258)	Fz	0.000014	0.00004	0.00008	0.00017	0.00025	0.00033
			Feed (ipm)	4.46	4.46	4.46	4.46	4.46	4.46	
		Slot 	170 RPM	129880	41628	20814	10390	6923	5412	
			(136-204)	Fz	0.000014	0.00004	0.00008	0.00017	0.00025	0.00033
			Feed (ipm)	3.53	3.53	3.53	3.53	3.53	3.53	
<b>K</b>	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile  ≤ 220 Bhn or ≤ 19 HRc	Profile 	305 RPM	233020	74686	37343	18642	12421	9709	
			(244-366)	Fz	0.000022	0.00007	0.00014	0.00027	0.00041	0.00052
			Feed (ipm)	10.08	10.08	10.08	10.08	10.08	10.08	
		Slot 	245 RPM	187180	59994	29997	14974	9978	7799	
			(196-294)	Fz	0.000022	0.00007	0.00014	0.00027	0.00041	0.00052
			Feed (ipm)	8.10	8.10	8.10	8.10	8.10	8.10	
<b>N</b>	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075  ≤ 150 Bhn or ≤ 7 HRc	Profile 	1000 RPM	764000	244872	122436	61120	40725	31833	
			(800-1200)	Fz	0.000064	0.00020	0.00040	0.00080	0.00120	0.00153
			Feed (ipm)	97.50	97.50	97.50	97.50	97.50	97.50	
		Slot 	800 RPM	611200	195897	97949	48896	32580	25467	
			(640-960)	Fz	0.000064	0.00020	0.00040	0.00080	0.00120	0.00153
			Feed (ipm)	78.00	78.00	78.00	78.00	78.00	78.00	
<b>N</b>	COPPER ALLOYS Alum Bronze, C110, Muntz Brass  ≤ 140 Bhn or ≤ 3 HRc	Profile 	515 RPM	393460	126109	63054	31477	20973	16394	
			(412-618)	Fz	0.000048	0.00015	0.00030	0.00060	0.00090	0.00115
			Feed (ipm)	37.68	37.68	37.68	37.68	37.68	37.68	
		Slot 	410 RPM	313240	100397	50199	25059	16697	13052	
			(328-492)	Fz	0.000048	0.00015	0.00030	0.00060	0.00090	0.00115
			Feed (ipm)	30.00	30.00	30.00	30.00	30.00	30.00	

















continued on next page

INCH Baseline Speed and Feed Square, Corner Radius & Ball End With and Without Reach			Hardness	Vc (sfm)	DC • in						
					0.0050	0.0156	0.0312	0.0625	0.0938	0.1200	
N	PLASTICS Polycarbonate, PVC, Polypropylene	Profile 	1000 (800-1200)	RPM	764000	244872	122436	61120	40725	31833	
				Fz	0.000064	0.00020	0.00040	0.00080	0.00120	0.00153	
				Feed (ipm)	97.50	97.50	97.50	97.50	97.50	97.50	
		Slot 	800 (640-960)	RPM	611200	195897	97949	48896	32580	25467	
				Fz	0.000064	0.00020	0.00040	0.00080	0.00120	0.00153	
				Feed (ipm)	78.00	78.00	78.00	78.00	78.00	78.00	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	Profile 	60 (48-72)	≤ 300 Bhn or ≤ 32 HRc	RPM	45840	14692	7346	3667	2443	1910
				Fz	0.000012	0.00004	0.00008	0.00015	0.00023	0.00029	
				Feed (ipm)	1.11	1.11	1.11	1.11	1.11	1.11	
		Slot 	45 (36-54)	RPM	34380	11019	5510	2750	1833	1433	
				Fz	0.000012	0.00004	0.00008	0.00015	0.00023	0.00029	
				Feed (ipm)	0.83	0.83	0.83	0.83	0.83	0.83	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	Profile 	45 (36-54)	≤ 400 Bhn or ≤ 43 HRc	RPM	34380	11019	5510	2750	1833	1433
				Fz	0.000008	0.00003	0.00005	0.00010	0.00015	0.00019	
				Feed (ipm)	0.55	0.55	0.55	0.55	0.55	0.55	
		Slot 	35 (28-42)	RPM	26740	8571	4285	2139	1425	1114	
				Fz	0.000008	0.00003	0.00005	0.00010	0.00015	0.00019	
				Feed (ipm)	0.43	0.43	0.43	0.43	0.43	0.43	
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	Profile 	160 (128-192)	≤ 350 Bhn or ≤ 38 HRc	RPM	122240	39179	19590	9779	6516	5093
				Fz	0.000014	0.00004	0.00008	0.00017	0.00025	0.00033	
				Feed (ipm)	3.32	3.32	3.32	3.32	3.32	3.32	
		Slot 	130 (104-156)	RPM	99320	31833	15917	7946	5294	4138	
				Fz	0.000014	0.00004	0.00008	0.00017	0.00025	0.00033	
				Feed (ipm)	2.70	2.70	2.70	2.70	2.70	2.70	
S	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	Profile 	60 (48-72)	≤ 440 Bhn or ≤ 47 HRc	RPM	45840	14692	7346	3667	2443	1910
				Fz	0.000010	0.00003	0.00006	0.00012	0.00018	0.00023	
				Feed (ipm)	0.88	0.88	0.88	0.88	0.88	0.88	
		Slot 	45 (36-54)	RPM	34380	11019	5510	2750	1833	1433	
				Fz	0.000010	0.00003	0.00006	0.00012	0.00018	0.00023	
				Feed (ipm)	0.66	0.66	0.66	0.66	0.66	0.66	
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	Profile 	175 (140-210)	≤ 375 Bhn or ≤ 40 HRc	RPM	133700	42853	21426	10696	7127	5571
				Fz	0.000016	0.00005	0.00010	0.00020	0.00030	0.00038	
				Feed (ipm)	4.28	4.28	4.28	4.28	4.28	4.28	
		Slot 	140 (112-168)	RPM	106960	34282	17141	8557	5701	4457	
				Fz	0.000016	0.00005	0.00010	0.00020	0.00030	0.00038	
				Feed (ipm)	3.42	3.42	3.42	3.42	3.42	3.42	













**Note:**

- Bhn (Brinell)      HRc (Rockwell C)
- when recommended speed exceeds your capability, use maximum available and recalculate ipm
- rpm = Vc x 3.82 / DC
- ipm = Fz x No. of flutes x rpm
- reduce speed and feed for materials harder than listed
- reduce feed and Ae when finish milling (.02 x D<sub>1</sub> maximum)
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series

# Baseline

METRIC Baseline Speed and Feed Square & Ball End With and Without Reach			Hardness	Vc (m/min)	DC • (mm)							
					0.1	0.5	1	1.5	2	2.5	3	
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile 	111	RPM	353837	70767	35384	23589	17692	14153	11795
				(89-134)	Fz	0.00043	0.00216	0.00432	0.00648	0.00865	0.01081	0.01297
				Feed (mm/min)	306	306	306	306	306	306	306	
			Slot 	88	RPM	281131	56226	28113	18742	14057	11245	9371
				(71-106)	Fz	0.00043	0.00216	0.00432	0.00648	0.00865	0.01081	0.01297
				Feed (mm/min)	243	243	243	243	243	243	243	
P	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile 	64	RPM	203577	40715	20358	13572	10179	8143	6786
				(51-77)	Fz	0.00038	0.00192	0.00384	0.00576	0.00769	0.00961	0.01153
				Feed (mm/min)	156	156	156	156	156	156	156	
			Slot 	50	RPM	159954	31991	15995	10664	7998	6398	5332
				(40-60)	Fz	0.00038	0.00192	0.00384	0.00576	0.00769	0.00961	0.01153
				Feed (mm/min)	123	123	123	123	123	123	123	
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile 	104	RPM	329602	65920	32960	21973	16480	13184	10987
				(83-124)	Fz	0.00043	0.00216	0.00432	0.00648	0.00865	0.01081	0.01295
				Feed (mm/min)	285	285	285	285	285	285	285	
			Slot 	82	RPM	261742	52348	26174	17449	13087	10470	8725
				(66-99)	Fz	0.00043	0.00216	0.00432	0.00648	0.00865	0.01081	0.01295
				Feed (mm/min)	226	226	226	226	226	226	226	
M	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile 	72	RPM	227813	45563	22781	15188	11391	9113	7594
				(57-86)	Fz	0.00038	0.00192	0.00385	0.00577	0.00769	0.00961	0.01154
				Feed (mm/min)	175	175	175	175	175	175	175	
			Slot 	56	RPM	179342	35868	17934	11956	8967	7174	5978
				(45-68)	Fz	0.00038	0.00192	0.00385	0.00577	0.00769	0.00961	0.01154
				Feed (mm/min)	138	138	138	138	138	138	138	
M	STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450	≤ 325 Bhn or ≤ 35 HRc	Profile 	66	RPM	208425	41685	20842	13895	10421	8337	6947
				(52-79)	Fz	0.00027	0.00136	0.00272	0.00408	0.00544	0.00680	0.00819
				Feed (mm/min)	113	113	113	113	113	113	113	
			Slot 	52	RPM	164801	32960	16480	10987	8240	6592	5493
				(41-62)	Fz	0.00027	0.00136	0.00272	0.00408	0.00544	0.00680	0.00819
				Feed (mm/min)	90	90	90	90	90	90	90	
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile 	93	RPM	295672	59134	29567	19711	14784	11827	9856
				(74-112)	Fz	0.00043	0.00217	0.00433	0.00650	0.00866	0.01083	0.01301
				Feed (mm/min)	256	256	256	256	256	256	256	
			Slot 	75	RPM	237507	47501	23751	15834	11875	9500	7917
				(60-90)	Fz	0.00043	0.00217	0.00433	0.00650	0.00866	0.01083	0.01301
				Feed (mm/min)	206	206	206	206	206	206	206	
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 150 Bhn or ≤ 7 HRc	Profile 	305	RPM	969416	193883	96942	64628	48471	38777	32314
				(244-366)	Fz	0.00128	0.00639	0.01277	0.01916	0.02555	0.03193	0.03832
				Feed (mm/min)	2477	2477	2477	2477	2477	2477	2477	
			Slot 	244	RPM	775533	155107	77553	51702	38777	31021	25851
				(195-293)	Fz	0.00128	0.00639	0.01277	0.01916	0.02555	0.03193	0.03832
				Feed (mm/min)	1981	1981	1981	1981	1981	1981	1981	
N	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	Profile 	157	RPM	499249	99850	49925	33283	24962	19970	16642
				(126-188)	Fz	0.00096	0.00479	0.00959	0.01438	0.01917	0.02396	0.02876
				Feed (mm/min)	957	957	957	957	957	957	957	
			Slot 	125	RPM	397461	79492	39746	26497	19873	15898	13249
				(100-150)	Fz	0.00096	0.00479	0.00959	0.01438	0.01917	0.02396	0.02876
				Feed (mm/min)	762	762	762	762	762	762	762	

continued on next page

METRIC Baseline Speed and Feed Square & Ball End With and Without Reach			Vc (m/min)	RPM	DC • (mm)						
Hardness		0.1			0.5	1	1.5	2	2.5	3	
N	PLASTICS Polycarbonate, PVC, Polypropylene	Profile 	305		969416	193883	96942	64628	48471	38777	32314
			(244-366)	Fz	0.00128	0.00639	0.01277	0.01916	0.02555	0.03193	0.03832
				Feed (mm/min)	2477	2477	2477	2477	2477	2477	2477
		Slot 	244		775533	155107	77553	51702	38777	31021	25851
			(195-293)	Fz	0.00128	0.00639	0.01277	0.01916	0.02555	0.03193	0.03832
				Feed (mm/min)	1981	1981	1981	1981	1981	1981	1981
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	Profile 	18		58165	11633	5816	3878	2908	2327	1939
			(15-22)	Fz	0.00024	0.00121	0.00242	0.00362	0.00483	0.00604	0.00722
				Feed (mm/min)	28	28	28	28	28	28	28
		Slot 	14		43624	8725	4362	2908	2181	1745	1454
			(11-16)	Fz	0.00024	0.00121	0.00242	0.00362	0.00483	0.00604	0.00722
				Feed (mm/min)	21	21	21	21	21	21	21
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	Profile 	14		43624	8725	4362	2908	2181	1745	1454
			(11-16)	Fz	0.00016	0.00080	0.00161	0.00241	0.00322	0.00402	0.00486
				Feed (mm/min)	14	14	14	14	14	14	14
		Slot 	11		33930	6786	3393	2262	1696	1357	1131
			(9-13)	Fz	0.00016	0.00080	0.00161	0.00241	0.00322	0.00402	0.00486
				Feed (mm/min)	11	11	11	11	11	11	11
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	Profile 	49		155107	31021	15511	10340	7755	6204	5170
			(39-59)	Fz	0.00027	0.00136	0.00272	0.00408	0.00544	0.00680	0.00821
				Feed (mm/min)	84	84	84	84	84	84	84
		Slot 	40		126024	25205	12602	8402	6301	5041	4201
			(32-48)	Fz	0.00027	0.00136	0.00272	0.00408	0.00544	0.00680	0.00821
				Feed (mm/min)	69	69	69	69	69	69	69
S	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	Profile 	18		58165	11633	5816	3878	2908	2327	1939
			(15-22)	Fz	0.00019	0.00096	0.00192	0.00288	0.00384	0.00480	0.00585
				Feed (mm/min)	22	22	22	22	22	22	22
		Slot 	14		43624	8725	4362	2908	2181	1745	1454
			(11-16)	Fz	0.00019	0.00096	0.00192	0.00288	0.00384	0.00480	0.00585
				Feed (mm/min)	17	17	17	17	17	17	17
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	Profile 	53		169648	33930	16965	11310	8482	6786	5655
			(43-64)	Fz	0.00032	0.00160	0.00320	0.00480	0.00640	0.00800	0.00962
				Feed (mm/min)	109	109	109	109	109	109	109
		Slot 	43		135718	27144	13572	9048	6786	5429	4524
			(34-51)	Fz	0.00032	0.00160	0.00320	0.00480	0.00640	0.00800	0.00962
				Feed (mm/min)	87	87	87	87	87	87	87

**Note:**

- Bhn (Brinell)      Hrc (Rockwell C)
- when recommended speed exceeds your capability, use maximum available and recalculate mm/min
- rpm = (Vc x 1000) / (DC x 3.14)
- mm/min = Fz x No. of flutes x rpm
- reduce speed and feed for materials harder than listed
- reduce feed and Ae when finish milling (.02 x D<sub>1</sub> maximum)
- refer to the KYOCERA SGS Tool Wizard® or sgsmicrotools.com for detailed technical charts by series