Micro Grain Solid Carbide End Mill

EPSM-CR-W-PN | Recommended Cutting Conditions High Efficient Side Milling

Material group	Example	Tensile strength	Parameter		Tool Diameter (mm)										
					D 1	D 2	D 3	D 4	D 5	D 6	D 8	D 10	D 12	D 16	D 20
Carbon Steels Alloy Steels Cast Irons EN-JL(GG) Ductile Cast Iron: EN-JS (GGG) (-300HB)			V_c	m/min	160	160	160	160	160	160	160	160	160	160	160
			n	min^{-1}	51,000	25,500	17,000	12,700	10,200	8,500	6,400	5,100	4,200	3,200	2,500
			f_z	mm/tooth	0.006	0.012	0.019	0.027	0.036	0.042	0.057	0.070	0.074	0.098	0.115
			V_f	mm/min	1150	1230	1300	1350	1450	1440	1450	1430	1250	1260	1150
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	0.5	1	1.5	2	2.5	3	4	5	6	8	10
			Q	cm^3/min	0.58	2.46	5.85	10.80	18.13	25.92	46.40	71.50	90.00	161.28	230.00
Tool Steels Alloy Steels (35-45HRC)			V_c	m/min	125	125	125	125	125	125	125	125	125	125	125
			n	min^{-1}	39,800	19,900	13,300	10,000	8,000	6,600	5,000	4,000	3,300	2,500	2,000
			f_z	mm/tooth	0.004	0.008	0.013	0.018	0.024	0.029	0.038	0.047	0.052	0.064	0.075
			V_f	mm/min	600	640	670	730	750	750	760	750	680	640	600
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	0.3	0.6	0.9	1.2	1.5	1.8	2.4	3	3.6	4.8	6
			Q	cm^3/min	0.18	0.77	1.81	3.50	5.63	8.10	14.59	22.50	29.38	49.15	72.00
Tool Steels Pre-Hardened Steels (45-55HRC)			V_c	m/min	85	85	85	85	85	85	85	85	85	85	85
			n	min^{-1}	27,100	13,500	9,000	6,800	5,400	4,500	3,400	2,700	2,300	1,700	1,400
			f_z	mm/tooth	0.003	0.006	0.010	0.015	0.019	0.023	0.030	0.038	0.041	0.051	0.060
			V_f	mm/min	330	350	360	400	410	410	410	410	380	350	340
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	0.06	0.12	0.18	0.24	0.3	0.36	0.48	0.6	0.72	0.96	1.2
			Q	cm^3/min	0.02	0.08	0.19	0.38	0.62	0.89	1.57	2.46	3.28	5.38	8.16
Stainless Steel Ferritic, Martensitic	1.4034 (X46Cr13), 1.4021(X20Cr13), 1.4112(X90CrMoV18)	<750 N/mm²	V_c	m/min	114	114	114	114	114	114	114	115	114	114	110
			n	min^{-1}	36,300	18,100	12,100	9,100	7,300	6,000	4,500	3,700	3,000	2,300	1,800
			f_z	mm/tooth	0.005	0.011	0.016	0.023	0.03	0.036	0.048	0.06	0.065	0.082	0.096
			V_f	mm/min	730	800	770	840	880	860	860	890	780	750	690
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	0.5	1	1.5	2	2.5	3	4	5	6	8	10
			Q	cm^3/min	0.37	1.6	3.47	6.72	11	15.48	27.52	44.5	56.16	96	138
Stainless Steel Austenitic	1.4301(X5CrNi18-10), 1.4404(X2CrNi-Mo17-12-2), 1.4571(X6CrNiMo-Ti17-12-2)	750-850 N/mm²	V_c	m/min	95	95	95	95	95	95	95	96	95	95	92
			n	min^{-1}	30030	15015	9975	7560	5985	5040	3780	3045	2520	1890	1470
			f_z	mm/tooth	0.004	0.009	0.013	0.019	0.025	0.03	0.04	0.05	0.054	0.068	0.08
			V_f	mm/min	460	490	510	550	570	580	580	580	520	490	450
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	0.5	1	1.5	2	2.5	3	4	5	6	8	10
			Q	cm^3/min	0.23	0.98	2.3	4.4	7.13	10.44	18.56	29	37.44	62.72	90
Stainless Steel Duplex, Precipitation-hardenable	1.4542 (X5CrNi-CuNb16-4), 1.4501(X2CrNiMoCu-WN25-7-4)	850-1100 N/mm²	V_c	m/min	76	76	76	76	76	76	76	77	76	76	74
			n	min^{-1}	24,200	12,100	8,100	6,000	4,800	4,000	3,000	2,500	2,000	1,500	1,200
			f_z	mm/tooth	0.003	0.007	0.01	0.015	0.02	0.024	0.032	0.04	0.043	0.054	0.064
			V_f	mm/min	290	340	320	360	380	380	380	400	340	320	310
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	0.3	0.6	0.9	1.2	1.5	1.8	2.4	3	3.6	4.8	6
			Q	cm^3/min	0.09	0.41	0.86	1.73	2.85	4.1	7.3	12	14.69	24.58	37.2
Titanium, Ti alloys	3.7164 (TiAl6V4)	1100-1300 N/mm²	V_c	m/min	80	80	80	80	80	80	80	80	80	80	80
			n	min^{-1}	25,500	12,700	8,500	6,400	5,100	4,200	3,200	2,500	2,100	1,600	1,300
			f_z	mm/tooth	0.004	0.009	0.012	0.018	0.024	0.029	0.038	0.048	0.051	0.065	0.076
			V_f	mm/min	410	460	410	460	490	490	490	480	430	420	400
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	0.4	0.7	1.1	1.4	1.8	2.1	2.8	3.5	4.2	5.6	7
			Q	cm^3/min	0.16	0.64	1.35	2.58	4.41	6.17	10.98	16.8	21.67	37.63	56
Super alloy, Heat-resist-ance alloy	Inconel 718 Hastelloy	>1300 N/mm²	V_c	m/min	38	38	38	38	38	38	38	38	38	38	37
			n	min^{-1}	12,100	6,000	4,000	3,000	2,400	2,000	1,500	1,200	1,000	800	600
			f_z	mm/tooth	0.002	0.005	0.008	0.011	0.015	0.018	0.024	0.03	0.032	0.041	0.048
			V_f	mm/min	100	120	130	130	140	140	140	140	130	130	120
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1
			Q	cm^3/min	0.01	0.02	0.08	0.1	0.21	0.25	0.45	0.7	0.94	1.66	2.4

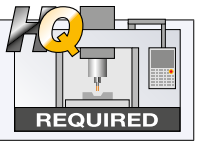
In the case of 5D underneck, please reduce V_c to 85% and keep 100% f_z, reduce 50% a_p und 50% a_e

Please Note:

1. Please confirm your material type first.

- If hardness harder than value in the same column: please follow by real hardness
- If hardness is lower than that value: please follow material type.

2. Use the high-rigidity and high accuracy machine as possible



Micro Grain Solid Carbide End Mill

EPSM-CR-W-PN | Recommended Cutting Conditions High Efficient Finishing

Material group	Example	Tensile strength	Parameter		Tool Diameter (mm)										
					D 1	D 2	D 3	D 4	D 5	D 6	D 8	D 10	D 12	D 16	D 20
Carbon Steels Alloy Steels Cast Irons EN-JL(GG) Ductile Cast Iron: EN-JS (GGG) (-300HB)			V_c	m/min	143	143	143	143	143	143	143	144	143	141	144
			n	min^{-1}	45,500	22,800	15,200	11,400	9,100	7,600	5,700	4,600	3,800	2,800	2,300
			f_z	mm/tooth	0.005	0.012	0.018	0.026	0.034	0.040	0.054	0.067	0.073	0.092	0.108
			V_f	mm/min	980	1050	1110	1170	1230	1230	1230	1240	1110	1030	990
			a_p	mm	1.5	3	4.5	6	7.5	9	12	15	18	24	30
			a_e	mm	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2	0.24	0.32	0.4
			Q	cm^3/min	0.03	0.13	0.30	0.56	0.92	1.33	2.36	3.72	4.80	7.91	11.88
Tool Steels Alloy Steels (35-45HRC)			V_c	m/min	110	110	110	111	110	109	111	110	109	111	113
			n	min^{-1}	35,000	17,500	11,700	8,800	7,000	5,800	4,400	3,500	2,900	2,200	1,800
			f_z	mm/tooth	0.004	0.008	0.012	0.017	0.023	0.027	0.036	0.045	0.048	0.061	0.072
			V_f	mm/min	500	540	570	600	630	630	630	630	560	540	520
			a_p	mm	1.5	3	4.5	6	7.5	9	12	15	18	24	30
			a_e	mm	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2	0.24	0.32	0.4
			Q	cm^3/min	0.02	0.06	0.15	0.29	0.47	0.68	1.21	1.89	2.42	4.15	6.24
Tool Steels Pre-Hardened Steels (45-55HRC)			V_c	m/min	90	90	90	90	90	90	90	90	90	90	90
			n	min^{-1}	28,700	14,300	9,600	7,200	5,700	4,800	3,600	2,900	2,400	1,800	1,400
			f_z	mm/tooth	0.003	0.007	0.011	0.015	0.020	0.024	0.031	0.039	0.042	0.054	0.063
			V_f	mm/min	360	390	410	430	450	460	450	460	410	390	350
			a_p	mm	1.5	3	4.5	6	7.5	9	12	15	18	24	30
			a_e	mm	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2	0.24	0.32	0.4
			Q	cm^3/min	0.01	0.05	0.11	0.21	0.34	0.50	0.86	1.38	1.77	3.00	4.20
Stainless Steel Ferritic, Martensitic	1.4034 (X46Cr13), 1.4021(X20Cr13), 1.4112(X90CrMoV18)	<750 N/mm²	V_c	m/min	119	119	119	119	119	120	118	121	118	121	121
			n	min^{-1}	37,900	18,900	12,600	9,500	7,600	6,400	4,700	3,900	3,100	2,400	1,900
			f_z	mm/tooth	0.005	0.01	0.014	0.02	0.028	0.032	0.043	0.054	0.059	0.073	0.086
			V_f	mm/min	760	760	710	760	850	820	810	840	730	700	650
			a_p	mm	1.5	3	4.5	6	7.5	9	12	15	18	24	30
			a_e	mm	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2	0.24	0.32	0.4
			Q	cm^3/min	0.02	0.09	0.19	0.36	0.64	0.89	1.56	2.52	3.15	5.38	7.8
Stainless Steel Austenitic	1.4301(X5CrNi18-10), 1.4404(X2CrNi-Mo17-12-2), 1.4571(X6CrNiMo-Ti17-12-2)	750-850 N/mm²	V_c	m/min	99	99	99	99	99	100	98	101	98	101	101
			n	min^{-1}	31500	15800	10500	7900	6300	5300	3900	3200	2600	2000	1600
			f_z	mm/tooth	0.004	0.008	0.012	0.017	0.023	0.027	0.036	0.045	0.049	0.061	0.072
			V_f	mm/min	450	480	510	540	570	570	560	580	510	490	460
			a_p	mm	1.5	3	4.5	6	7.5	9	12	15	18	24	30
			a_e	mm	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2	0.24	0.32	0.4
			Q	cm^3/min	0.01	0.06	0.14	0.26	0.43	0.62	1.08	1.74	2.2	3.76	5.52
Stainless Steel Duplex, Precipitation-hardenable	1.4542 (X5CrNi-CuNb16-4), 1.4501(X2CrNiMoCu-WN25-7-4)	850-1100 N/mm²	V_c	m/min	79	79	79	79	79	80	78	81	78	81	81
			n	min^{-1}	25,100	12,600	8,400	6,300	5,000	4,200	3,100	2,600	2,100	1,600	1,300
			f_z	mm/tooth	0.003	0.006	0.01	0.014	0.018	0.022	0.029	0.036	0.039	0.049	0.058
			V_f	mm/min	300	300	340	350	360	370	360	370	330	310	300
			a_p	mm	1.5	3	4.5	6	7.5	9	12	15	18	24	30
			a_e	mm	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2	0.24	0.32	0.4
			Q	cm^3/min	0.01	0.04	0.09	0.17	0.27	0.4	0.69	1.11	1.43	2.38	3.6
Titanium, Ti alloys	3.7164 (TiAl6V4)	1100-1300 N/mm²	V_c	m/min	74	74	74	74	74	75	74	76	74	76	76
			n	min^{-1}	23,600	11,800	7,900	5,900	4,700	4,000	2,900	2,400	2,000	1,500	1,200
			f_z	mm/tooth	0.004	0.008	0.011	0.016	0.022	0.026	0.034	0.043	0.047	0.058	0.068
			V_f	mm/min	380	380	350	380	410	420	390	410	380	350	330
			a_p	mm	1.5	3	4.5	6	7.5	9	12	15	18	24	30
			a_e	mm	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2	0.24	0.32	0.4
			Q	cm^3/min	0.01	0.05	0.09	0.18	0.31	0.45	0.75	1.23	1.64	2.69	3.96
Super alloy, Heat-resist-ance alloy	Inconel 718 Hastelloy	>1300 N/mm²	V_c	m/min	40	40	40	40	40	40	39	40	39	40	40
			n	min^{-1}	12,700	6,400	4,200	3,200	2,500	2,100	1,600	1,300	1,000	800	600
			f_z	mm/tooth	0.002	0.005	0.007	0.01	0.014	0.016	0.022	0.027	0.029	0.037	0.043
			V_f	mm/min	100	130	120	130	140	130	140	140	120	120	100
			a_p	mm	1.5	3	4.5	6	7.5	9	12	15	18	24	30
			a_e	mm	0.02	0.04	0.06	0.08	0.1	0.12	0.16	0.2	0.24	0.32	0.4
			Q	cm^3/min	0	0.02	0.03	0.06	0.11	0.14	0.27	0.42	0.52	0.92	1.2

In the case of 5D underneck, please reduce both V_c and f_z to 70%

3. These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.

4. Please adjust it if chatter or abnormal vibration occurs.

5. Please setup feed 1/3 that of slotting parameter and step 0.1Dc for drilling application.

6. Please setup feed 70% of slotting parameter and ramping angle 3° for ramping application.

Micro Grain Solid Carbide End Mill

EPSM-CR-W-PN | Recommended Cutting Conditions Standard Slot Milling

Material group	Example	Tensile strength	Parameter		Tool Diameter (mm)										
					D 1	D 2	D 3	D 4	D 5	D 6	D 8	D 10	D 12	D 16	D 20
Carbon Steels Alloy Steels Cast Irons EN-JL(GG) Ductile Cast Iron: EN-JS (GGG) (-300HB)			V_c	m/min	90	90	90	90	90	90	90	90	90	90	90
			n	min^{-1}	28.700	14.300	9.600	7.200	5.700	4.800	3.600	2.900	2.400	1.800	1.400
			f_z	mm/tooth	0,007	0,013	0,018	0,025	0,032	0,034	0,049	0,061	0,069	0,087	0,096
			V_f	mm/min	790	760	680	730	720	650	710	710	660	630	540
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	1	2	3	4	5	6	8	10	12	16	20
			Q	cm^3/min	0,8	3,0	6,1	11,7	18,0	23,4	45,4	71,0	95,0	161,3	216,0
Tool Steels Alloy Steels (35-45HRC)			V_c	m/min	70	70	70	70	70	70	70	70	70	70	70
			n	min^{-1}	22.300	11.100	7.400	5.600	4.500	3.700	2.800	2.200	1.900	1.400	1.100
			f_z	mm/tooth	0,004	0,008	0,011	0,016	0,020	0,022	0,031	0,039	0,044	0,055	0,061
			V_f	mm/min	390	370	340	360	370	330	350	340	330	310	270
			a_p	mm	0,6	1,2	1,8	2,4	3	3,6	4,8	6	7,2	9,6	12
			a_e	mm	1	2	3	4	5	6	8	10	12	16	20
			Q	cm^3/min	0,2	0,9	1,8	3,5	5,6	7,1	13,4	20,4	28,5	47,6	64,8
Stainless Steel Ferritic, Martensitic	1.4034 (X46Cr13), 1.4021(X20Cr13), 1.4112(X90CrMoV18)	<750N/ mm2	V_c	m/min	80	80	80	80	80	80	80	80	80	80	80
			n	min^{-1}	25.500	12.700	8.500	6.400	5.100	4.200	3.200	2.500	2.100	1.600	1.300
			f_z	mm/tooth	0,004	0,007	0,013	0,018	0,024	0,028	0,038	0,048	0,05	0,064	0,077
			V_f	mm/min	410	360	440	460	490	470	490	480	420	410	400
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	1	2	3	4	5	6	8	10	12	16	20
			Q	cm^3/min	0,41	1,44	3,96	7,36	12,25	16,92	31,36	48	60,48	104,96	160
Stainless Steel Austenitic	1.4301(X5CrNi18-10), 1.4404(X2CrNi-Mo17-12-2), 1.4571(X6CrNiMo-Ti17-12-2)	750-850N/ mm2	V_c	m/min	70	70	70	70	70	70	70	70	70	70	70
			n	min^{-1}	17500	8800	5800	4400	3500	2900	2200	1800	1500	1100	900
			f_z	mm/tooth	0,003	0,006	0,011	0,015	0,02	0,023	0,032	0,04	0,042	0,053	0,064
			V_f	mm/min	210	220	230	250	260	260	260	270	240	220	220
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	1	2	3	4	5	6	8	10	12	16	20
			Q	cm^3/min	0,21	0,88	2,07	4	6,5	9,36	16,64	27	34,56	56,32	88
Stainless Steel Duplex, Precipitation-hardenable	1.4542 (X5CrNi-CuNb16-4), 1.4501(X2CrNiMoCu-WN25-7-4)	850-1100N/ mm2	V_c	m/min	50	50	50	50	50	50	50	50	50	50	50
			n	min^{-1}	15.900	8.000	5.300	4.000	3.200	2.700	2.000	1.600	1.300	1.000	800
			f_z	mm/tooth	0,002	0,005	0,009	0,012	0,016	0,018	0,026	0,032	0,034	0,042	0,051
			V_f	mm/min	130	160	190	190	200	190	210	200	180	170	160
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	1	2	3	4	5	6	8	10	12	16	20
			Q	cm^3/min	0,13	0,64	1,71	3,04	5	6,84	13,44	20	25,92	43,52	64
Titanium, Ti alloys	3.7164 (TiAl6V4)	1100-1300N/ mm2	V_c	m/min	60	60	60	60	60	60	60	60	60	60	60
			n	min^{-1}	19.100	9.500	6.400	4.800	3.800	3.200	2.400	1.900	1.600	1.200	1.000
			f_z	mm/tooth	0,003	0,006	0,01	0,014	0,019	0,022	0,03	0,038	0,04	0,05	0,061
			V_f	mm/min	230	230	260	270	290	280	290	290	260	240	240
			a_p	mm	1	2	3	4	5	6	8	10	12	16	20
			a_e	mm	1	2	3	4	5	6	8	10	12	16	20
			Q	cm^3/min	0,23	0,92	2,34	4,32	7,25	10,08	18,56	29	37,44	61,44	96
Super alloy, Heat-resist-ance alloy	Inconel 718 Hastelloy	>1300N/ mm2	V_c	m/min	20	20	20	20	20	20	20	20	20	20	20
			n	min^{-1}	6.400	3.200	2.100	1.600	1.300	1.100	800	600	500	400	300
			f_z	mm/tooth	0,002	0,004	0,007	0,009	0,012	0,014	0,019	0,024	0,025	0,032	0,038
			V_f	mm/min	50	50	60	60	60	60	60	60	50	50	50
			a_p	mm	0,5	1	1,5	2	2,5	3	4	5	6	8	10
			a_e	mm	1	2	3	4	5	6	8	10	12	16	20
			Q	cm^3/min	0,03	0,1	0,27	0,48	0,75	1,08	1,92	3	3,6	6,4	10

Note: For finishing and precise tool definition for the CAM system please download DXF data (QuickFinder), or contact your local Hitachi Tool staff for more details.

Nota: Per lavorazioni di finitura e per una precisa e corretta definizione del profilo dell'utensile per l'utilizzo CAM si prega di richiedere file DXF tramite QuickFinder o rivolgendosi al personale Hitachi Tool.

Remarque : Pour les opérations de finition et une définition précise de l'outil dans votre système FAO, demandez nous le fichier DXF des outils, téléchargez les via notre logiciel QuickFinder, ou contactez votre interlocuteur commercial pour plus de détails.

Achtung: Bitte laden Sie sich für die Schlichtbearbeitung und die präzise Definition der Werkzeuge die DXF Daten herunter (QuickFinder) oder wenden Sie sich an Ihren Hitachi Anwendungstechniker.

Nota: En procesos de acabado y para una más precisa definición de la herramienta en el sistema de CAM por favor solicite los ficheros DXF (QuickFinder), o póngase en contacto con Hitachi Tool para obtener más detalles.

Nota: Para o acabamento e precisão assim como melhor definição da ferramenta para o sistema CAM por favor solicitar dados DXF (QuickFinder), ou entre em contato com sua equipe de ferramentas Hitachi local para obter mais detalhes.

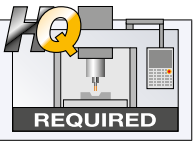
In the case of 5D underneck, please reduce V_c to 85% and keep 100% f_z, reduce 50% a_p

Please Note:

1. Please confirm your material type first.

- If hardness harder than value in the same column: please follow by real hardness
- If hardness is lower than that value: please follow material type.

2. Use the high-rigidity and high accuracy machine as possible



Micro Grain Solid Carbide End Mill

EPSM-CR-W-PN | Recommended Cutting Conditions 3D Finishing

Material group	Example	Tensile strength	Parameter		Tool Diameter (mm)										
					D 1	D 2	D 3	D 4	D 5	D 6	D 8	D 10	D 12	D 16	D 20
Carbon Steels Alloy Steels Cast Irons EN-JL(GG) Ductile Cast Iron: EN-JS (GGG) (-300HB)			V_c	m/min	130	130	130	130	130	130	130	130	130	130	130
			n	min^{-1}	41.400	20.700	13.800	10.400	8.300	6.900	5.200	4.100	3.500	2.600	2.100
			f_z	mm/tooth	0,006	0,014	0,022	0,031	0,041	0,049	0,065	0,081	0,088	0,110	0,129
			V_f	mm/min	1070	1140	1210	1280	1350	1340	1350	1330	1230	1150	1080
			a_p	mm	0,2*CR- 0,5CR										
			a_e	mm	0,2*CR- 0,5CR										
Tool Steels Alloy Steels (35-45HRC)			V_c	m/min	110	110	110	110	110	110	110	110	110	110	110
			n	min^{-1}	35.000	17.500	11.700	8.800	7.000	5.800	4.400	3.500	2.900	2.200	1.800
			f_z	mm/tooth	0,004	0,009	0,015	0,020	0,027	0,033	0,043	0,054	0,058	0,074	0,087
			V_f	mm/min	600	650	680	720	760	760	760	760	670	650	620
			a_p	mm	0,1*CR- 0,3CR										
			a_e	mm	0,1*CR- 0,3CR										
Tool Steels Pre-Hardened Steels (45-55HRC)			V_c	m/min	70	70	70	70	70	70	70	70	70	70	70
			n	min^{-1}	22.300	11.100	7.400	5.600	4.500	3.700	2.800	2.200	1.900	1.400	1.100
			f_z	mm/tooth	0,004	0,008	0,012	0,017	0,023	0,027	0,036	0,045	0,049	0,062	0,073
			V_f	mm/min	320	340	360	380	410	400	400	400	370	350	320
			a_p	mm	0,1*CR- 0,3CR										
			a_e	mm	0,1*CR- 0,3CR										
Stainless Steel Ferritic, Martensitic	1.4034 (X46Cr13), 1.4021(X20Cr13), 1.4112(X90CrMoV18)	<750 N/mm²	V_c	m/min	120	120	120	120	120	120	120	120	120	120	120
			n	min^{-1}	38.200	19.100	12.700	9.500	7.600	6.400	4.800	3.800	3.200	2.400	1.900
			f_z	mm/tooth	0,006	0,012	0,017	0,024	0,034	0,038	0,052	0,065	0,071	0,088	0,103
			V_f	mm/min	920	920	850	910	1020	980	990	980	910	840	780
			a_p	mm	0,2*CR- 0,5CR										
			a_e	mm	0,2*CR- 0,5CR										
Stainless Steel Austenitic	1.4301(X5CrNi18-10), 1.4404(X2CrNi-Mo17-12-2), 1.4571(X6CrNiMo-Ti17-12-2)	750-850 N/mm²	V_c	m/min	80	80	80	80	80	80	80	80	80	80	80
			n	min^{-1}	17500	8800	5800	4400	3500	2900	2200	1800	1500	1100	900
			f_z	mm/tooth	0,005	0,010	0,014	0,020	0,028	0,032	0,043	0,054	0,059	0,073	0,086
			V_f	mm/min	210	220	230	250	260	260	260	270	240	220	220
			a_p	mm	0,1*CR- 0,3CR										
			a_e	mm	0,1*CR- 0,3CR										
Stainless Steel Duplex, Precipitation-hardenable	1.4542 (X5CrNi-CuNb16-4), 1.4501(X2CrNiMoCu-WN25-7-4)	850-1100 N/mm²	V_c	m/min	60	60	60	60	60	60	60	60	60	60	60
			n	min^{-1}	19.100	9.500	6.400	4.800	3.800	3.200	2.400	1.900	1.600	1.200	1.000
			f_z	mm/tooth	0,004	0,007	0,012	0,017	0,022	0,026	0,035	0,043	0,047	0,059	0,070
			V_f	mm/min	280	270	310	320	330	340	330	330	300	280	280
			a_p	mm	0,1*CR- 0,3CR										
			a_e	mm	0,1*CR- 0,3CR										
Titanium, Ti alloys	3.7164 (TiAl6V4)	1100-1300 N/mm²	V_c	m/min	70	70	70	70	70	70	70	70	70	70	70
			n	min^{-1}	22.300	11.100	7.400	5.600	4.500	3.700	2.800	2.200	1.900	1.400	1.100
			f_z	mm/tooth	0,005	0,010	0,013	0,019	0,026	0,031	0,041	0,052	0,056	0,070	0,082
			V_f	mm/min	430	430	390	430	480	460	460	450	430	390	360
			a_p	mm	0,1*CR- 0,3CR										
			a_e	mm	0,1*CR- 0,3CR										
Super alloy, Heat-resist-ance alloy	Inconel 718 Hastelloy	>1300 N/mm²	V_c	m/min	40	40	40	40	40	40	40	40	40	40	40
			n	min^{-1}	12.700	6.400	4.200	3.200	2.500	2.100	1.600	1.300	1.100	800	600
			f_z	mm/tooth	0,002	0,006	0,008	0,012	0,017	0,019	0,026	0,032	0,035	0,044	0,052
			V_f	mm/min	120	150	140	150	170	160	170	170	150	140	120
			a_p	mm	0,1*CR- 0,2R										
			a_e	mm	0,1*CR- 0,2CR										

Theoretical cusp height:

Feed pitch and cusp height

$$h = \frac{a_p^2}{8 \cdot CR}$$

In the case of 5D underneck, please reduce V_c to 85% and keep 100% f_z, reduce 50% a_p

3. These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.

4. Please adjust it if chatter or abnormal vibration occurs.

5. Please setup feed 1/3 that of slotting parameter and step 0.1Dc for drilling application.

6. Please setup feed 70% of slotting parameter and ramping angle 3° for ramping application.