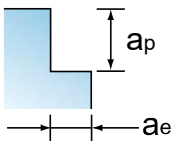
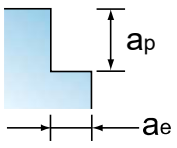
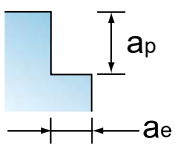
CUTTING CONDITION - IPVE/IPVRIT

Side Milling 	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536			ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		
Hardness BRINELL	≦ 275			≦ 375			≦ 375			> 375 ≦ 475			> 475 ≦ 655		
HRC	≦ 28.5			≦ 39.8			≦ 39.8			> 39.8 ≦ 49.1			> 50 ≦ 65		
Vc (SFM)	555 (442-662)			315 (253-378)			405 (324-486)			210 (168-252)			90 (72-108)		
ae/ap	ae=0.5D ap=1.5D			ae=0.5D ap=1.5D			ae=0.5D ap=1.5D			ae=0.5D ap=1.5D			ae=0.5D ap=1.5D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes
1/8	16,894	0.00040	27.0	9,629	0.00030	11.56	12,332	0.00050	24.7	6,420	0.00040	10.3	2,703	0.00020	2.2
9/64	15,017	0.00048	28.5	8,559	0.00028	9.42	10,962	0.00059	25.8	5,706	0.00048	10.8	2,403	0.00024	2.3
5/32	13,515	0.00055	29.7	7,704	0.00035	10.78	9,866	0.00068	26.6	5,136	0.00055	11.3	2,162	0.00028	2.4
11/64	12,286	0.00063	30.7	7,003	0.00043	11.91	8,969	0.00076	27.4	4,669	0.00063	11.7	1,966	0.00031	2.5
3/16	11,262	0.00070	31.5	6,420	0.00050	12.84	8,222	0.00085	28.0	4,280	0.00070	12.0	1,802	0.00035	2.5
13/64	10,396	0.00078	32.2	5,926	0.00058	13.63	7,589	0.00094	28.5	3,951	0.00078	12.2	1,663	0.00039	2.6
7/32	9,654	0.00085	32.8	5,503	0.00065	14.31	7,047	0.00103	28.9	3,668	0.00085	12.5	1,545	0.00043	2.6
15/64	9,010	0.00093	33.3	5,136	0.00073	14.89	6,577	0.00111	29.3	3,424	0.00093	12.7	1,442	0.00046	2.7
1/4	8,447	0.00100	33.8	4,815	0.00080	15.41	6,166	0.00120	29.6	3,210	0.00010	1.3	1,351	0.00005	0.3
17/64	7,950	0.00113	35.8	4,531	0.00088	15.86	5,803	0.00134	31.0	3,021	0.00113	13.6	1,272	0.00056	2.9
9/32	7,508	0.00123	36.9	4,280	0.00095	16.26	5,481	0.00148	32.3	2,853	0.00123	14.0	1,201	0.00061	2.9
19/64	7,113	0.00134	38.1	4,054	0.00103	16.62	5,193	0.00161	33.5	2,703	0.00134	14.5	1,138	0.00067	3.0
5/16	6,757	0.00145	39.2	3,852	0.00110	16.95	4,933	0.00175	34.5	2,568	0.00145	14.9	1,081	0.00073	3.1
21/64	6,436	0.00156	40.2	3,668	0.00118	17.24	4,698	0.00189	35.5	2,446	0.00156	15.3	1,030	0.00078	3.2
11/32	6,143	0.00168	41.3	3,502	0.00125	17.51	4,485	0.00203	36.3	2,334	0.00168	15.6	983	0.00084	3.3
23/64	5,876	0.00178	41.8	3,349	0.00133	17.75	4,290	0.00216	37.1	2,233	0.00179	16.0	940	0.00089	3.4
3/8	5,631	0.00190	42.8	3,210	0.00140	17.97	4,111	0.00230	37.8	2,140	0.00190	16.3	901	0.00095	3.4
25/64	5,406	0.00198	42.7	3,081	0.00146	18.03	3,946	0.00239	37.7	2,054	0.00198	16.2	865	0.00099	3.4
13/32	5,198	0.00205	42.6	2,963	0.00153	18.07	3,795	0.00248	37.6	1,975	0.00205	16.2	832	0.00103	3.4
27/64	5,006	0.00213	42.5	2,853	0.00159	18.12	3,654	0.00256	37.5	1,902	0.00213	16.2	801	0.00106	3.4
7/16	4,827	0.00220	42.5	2,751	0.00165	18.16	3,524	0.00265	37.3	1,834	0.00220	16.1	772	0.00110	3.4
29/64	4,660	0.00228	42.4	2,656	0.00171	18.20	3,402	0.00274	37.3	1,771	0.00228	16.1	746	0.00114	3.4
15/32	4,505	0.00235	42.3	2,568	0.00178	18.23	3,289	0.00283	37.2	1,712	0.00235	16.1	721	0.00118	3.4
31/64	4,360	0.00243	42.3	2,485	0.00184	18.26	3,183	0.00231	29.4	1,657	0.00243	16.1	698	0.00121	3.4
1/2	4,223	0.00250	42.2	2,407	0.00190	18.30	3,083	0.00300	37.0	1,605	0.00250	16.0	676	0.00125	3.4
9/16	3,754	0.00210	31.5	2,140	0.00215	18.40	2,741	0.00345	37.8	1,427	0.00285	16.3	601	0.00143	3.4
5/8	3,379	0.00310	41.9	1,926	0.00240	18.49	2,466	0.00390	38.5	1,284	0.00320	16.4	541	0.00160	3.5
11/16	3,072	0.00315	38.7	1,751	0.00245	17.16	2,242	0.00405	36.3	1,167	0.00335	15.6	491	0.00168	3.3
3/4	2,816	0.00320	36.0	1,605	0.00250	16.05	2,055	0.00420	34.5	1,070	0.00350	15.0	450	0.00175	3.2
7/8	2,413	0.00335	32.3	1,376	0.00260	14.31	1,762	0.00460	32.4	917	0.00365	13.4	386	0.00183	2.8
1	2,112	0.00350	29.6	1,204	0.00270	13.00	1,542	0.00500	30.8	802	0.00380	12.2	338	0.00190	2.6
Depth of cut															

CUTTING CONDITION - IPVE/IPVRIT

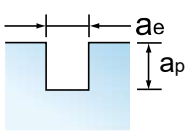
SideMilling 	CAST IRONS LOW&MEDIUM ALLOY) Gray, Malleable, Ductile			CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile			STAINLESS STEELS (FREE MACHINING) 304, 416,420F,430F,440F			STAINLESS STEELS (DIFFICULT) 304, 304L,316,316L			STAINLESS STEELS(PH) 13-8 PH,15-5PH,17-4PH, Custom 450		
Hardness BRINELL	≦ 220			> 220 ≦ 260			≦ 275			≦ 275			≦ 325		
HRC	≦ 18.8			> 18.8 ≦ 26.6			≦ 28.5			≦ 28.5			≦ 34.4		
Vc (SFM)	355 (284-426)			340 (272-408)			490 (392-588)			340 (272-408)			310 (248-372)		
ae/ap	ae=0.5D ap=1.5D			ae=0.5D ap=1.5D			ae=0.5D ap=1.5D			ae=0.5D ap=1.5D			ae=0.5D ap=1.5D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes
1/8	10,812	0.00040	17.3	10,305	0.00030	12.40	14,866	0.00030	17.8	10,305	0.00020	8.2	9,460	0.00020	7.6
9/64	9,611	0.00048	18.3	9,160	0.00035	12.80	13,215	0.00035	18.5	9,160	0.00025	9.2	8,409	0.00025	8.4
5/32	8,650	0.00055	19.0	8,244	0.00040	13.20	11,893	0.00040	19.0	8,244	0.00030	9.9	7,568	0.00030	9.1
11/64	7,863	0.00063	19.7	7,495	0.00045	13.50	10,812	0.00045	19.5	7,495	0.00035	10.5	6,880	0.00035	9.6
3/16	7,208	0.00070	20.2	6,870	0.00050	13.70	9,911	0.00050	19.8	6,870	0.00040	11.0	6,307	0.00040	10.1
13/64	6,654	0.00078	20.6	6,342	0.00055	14.00	9,149	0.00055	20.1	6,342	0.00045	11.4	5,822	0.00045	10.5
7/32	6,178	0.00085	21.0	5,889	0.00060	14.10	8,495	0.00060	20.4	5,889	0.00050	11.8	5,406	0.00050	10.8
15/64	5,766	0.00093	21.3	5,496	0.00065	14.30	7,929	0.00065	20.6	5,496	0.00055	12.1	5,046	0.00055	11.1
1/4	5,406	0.00100	21.6	5,153	0.00070	14.40	7,433	0.00070	20.8	5,153	0.00060	12.4	4,730	0.00060	11.4
17/64	5,088	0.00110	22.4	4,849	0.00079	15.30	6,996	0.00079	22.0	4,849	0.00066	12.9	4,452	0.00066	11.8
9/32	4,805	0.00120	23.1	4,580	0.00088	16.00	6,607	0.00088	23.1	4,580	0.00073	13.3	4,205	0.00073	12.2
19/64	4,552	0.00130	23.7	4,339	0.00096	16.70	6,260	0.00096	24.1	4,339	0.00079	13.7	3,983	0.00079	12.5
5/16	4,325	0.00140	24.2	4,122	0.00105	17.30	5,947	0.00105	25.0	4,122	0.00085	14.0	3,784	0.00085	12.9
21/64	4,119	0.00150	24.7	3,926	0.00114	17.90	5,663	0.00114	25.8	3,926	0.00091	14.3	3,604	0.00091	13.2
11/32	3,932	0.00160	25.2	3,747	0.00123	18.40	5,406	0.00123	26.5	3,747	0.00098	14.6	3,440	0.00098	13.4
23/64	3,761	0.00170	25.6	3,584	0.00131	18.80	5,171	0.00131	27.1	3,584	0.00104	14.9	3,291	0.00104	13.7
3/8	3,604	0.00180	25.9	3,435	0.00140	19.20	4,955	0.00140	27.8	3,435	0.00110	15.1	3,153	0.00110	13.9
25/64	3,460	0.00188	25.9	3,298	0.00145	19.10	4,757	0.00145	27.6	3,298	0.00114	15.0	3,027	0.00114	13.8
13/32	3,327	0.00195	25.9	3,171	0.00150	19.00	4,574	0.00150	27.4	3,171	0.00118	14.9	2,911	0.00118	13.7
27/64	3,204	0.00203	25.9	3,053	0.00155	18.90	4,405	0.00155	27.3	3,053	0.00121	14.8	2,803	0.00121	13.6
7/16	3,089	0.00210	25.9	2,944	0.00160	18.80	4,248	0.00160	27.2	2,944	0.00125	14.7	2,703	0.00125	13.5
29/64	2,983	0.00218	25.9	2,843	0.00165	18.80	4,101	0.00165	27.1	2,843	0.00013	1.5	2,610	0.00013	1.3
15/32	2,883	0.00225	25.9	2,748	0.00170	18.70	3,964	0.00170	27.0	2,748	0.00133	14.6	2,523	0.00133	13.4
31/64	2,790	0.00233	25.9	2,659	0.00175	18.60	3,837	0.00175	26.9	2,659	0.00136	14.5	2,441	0.00136	13.3
1/2	2,703	0.00240	25.9	2,576	0.00180	18.50	3,717	0.00180	26.8	2,576	0.00140	14.4	2,365	0.00140	13.2
9/16	2,403	0.00270	25.9	2,290	0.00205	18.80	3,304	0.00205	27.1	2,290	0.00160	14.7	2,102	0.00160	13.5
5/8	2,162	0.00300	25.9	2,061	0.00230	19.00	2,973	0.00230	27.4	2,061	0.00180	14.8	1,892	0.00180	13.6
11/16	1,966	0.00305	24.0	1,874	0.00245	18.40	2,703	0.00245	26.5	1,874	0.00185	13.9	1,720	0.00185	12.7
3/4	1,802	0.00310	22.3	1,718	0.00240	16.50	2,478	0.00240	23.8	1,718	0.00190	13.1	1,577	0.00190	12.0
7/8	1,545	0.00325	20.1	1,472	0.00245	14.40	2,124	0.00245	20.8	1,472	0.00195	11.5	1,351	0.00195	10.5
1	1,351	0.00340	18.4	1,288	0.00250	12.90	1,858	0.00250	18.6	1,288	0.00200	10.3	1,183	0.00200	9.5
Depth of cut															

CUTTING CONDITION - IPVE/IPVRIT

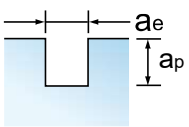
SideMilling 	SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 601,617,625,Incoly 800,Monel 400			SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 718,750X,Incoly 925,Waspalloy,Hastelloy,Rene			TITANIUM ALLOYS Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si			TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al		
Hardness BRINELL	≦ 300			> 300			≦ 350			> 350 ≦ 440		
HRC	≦ 32.1			≦ 32.1								
Vc (SFM)	80 (64-96)			62 (50-74)			215 (172-258)			75 (60-90)		
ae/ap	ae=0.5D ap=1.5D			ae=0.5D ap=1.5D			ae=0.5D ap=1.5D			ae=0.5D ap=1.5D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes
1/8	2,365	0.00020	1.9	1,858	0.00010	0.70	6,757	0.00020	5.4	2,365	0.00020	1.9
9/64	2,102	0.00023	1.9	1,652	0.00013	0.80	6,007	0.00024	5.7	2,102	0.00024	2.0
5/32	1,892	0.00025	1.9	1,487	0.00015	0.90	5,406	0.00028	5.9	1,892	0.00028	2.1
11/64	1,720	0.00028	1.9	1,351	0.00018	0.90	4,915	0.00031	6.1	1,720	0.00031	2.2
3/16	1,577	0.00030	1.9	1,239	0.00020	1.00	4,505	0.00035	6.3	1,577	0.00035	2.2
13/64	1,455	0.00033	1.9	1,144	0.00023	1.00	4,158	0.00039	6.4	1,455	0.00039	2.3
7/32	1,351	0.00035	1.9	1,062	0.00025	1.10	3,861	0.00043	6.6	1,351	0.00043	2.3
15/64	1,261	0.00038	1.9	991	0.00028	1.10	3,604	0.00046	6.7	1,261	0.00046	2.3
1/4	1,183	0.00040	1.9	929	0.00030	1.10	3,379	0.00050	6.8	1,183	0.00050	2.4
17/64	1,113	0.00045	2.0	874	0.00033	1.10	3,180	0.00057	7.2	1,113	0.00057	2.5
9/32	1,051	0.00050	2.1	826	0.00035	1.20	3,003	0.00063	7.6	1,051	0.00063	2.6
19/64	996	0.00055	2.2	782	0.00038	1.20	2,845	0.00069	7.8	996	0.00069	2.7
5/16	946	0.00060	2.3	743	0.00040	1.20	2,703	0.00075	8.1	946	0.00075	2.8
21/64	901	0.00065	2.3	708	0.00043	1.20	2,574	0.00081	8.4	901	0.00081	2.9
11/32	860	0.00070	2.4	676	0.00045	1.20	2,457	0.00088	8.6	860	0.00088	3.0
23/64	823	0.00075	2.5	646	0.00048	1.20	2,350	0.00094	8.8	823	0.00094	3.1
3/8	788	0.00080	2.5	619	0.00050	1.20	2,252	0.00100	9.0	788	0.00100	3.2
25/64	757	0.00083	2.5	595	0.00053	1.20	2,162	0.00104	9.0	757	0.00104	3.1
13/32	728	0.00085	2.5	572	0.00055	1.30	2,079	0.00108	8.9	728	0.00108	3.1
27/64	701	0.00088	2.5	551	0.00058	1.30	2,002	0.00111	8.9	701	0.00111	3.1
7/16	676	0.00090	2.4	531	0.00060	1.30	1,931	0.00115	8.9	676	0.00115	3.1
29/64	652	0.00093	2.4	513	0.00063	1.30	1,864	0.00119	8.9	652	0.00119	3.1
15/32	631	0.00095	2.4	496	0.00065	1.30	1,802	0.00123	8.8	631	0.00123	3.1
31/64	610	0.00098	2.4	480	0.00068	1.30	1,744	0.00126	8.8	610	0.00126	3.1
1/2	591	0.00100	2.4	465	0.00070	1.30	1,689	0.00130	8.8	591	0.00130	3.1
9/16	526	0.00115	2.4	413	0.00080	1.30	1,502	0.00145	8.7	526	0.00145	3.0
5/8	473	0.00130	2.5	372	0.00090	1.30	1,351	0.00160	8.6	473	0.00160	3.0
11/16	430	0.00135	2.3	338	0.00095	1.30	1,229	0.00165	8.1	430	0.00165	2.8
3/4	394	0.00140	2.2	310	0.00100	1.20	1,126	0.00170	7.7	394	0.00170	2.7
7/8	338	0.00145	2.0	265	0.00011	0.10	965	0.00175	6.8	338	0.00175	2.4
1	296	0.00150	1.8	232	0.00110	1.00	845	0.00180	6.1	296	0.00180	2.1
Depth of cut												

www.speedtigertools.com

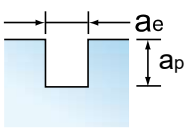
CUTTING CONDITION - IPVE/IPVRIT

Slot Milling	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536			ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		
Hardness BRINELL	≦ 275			≦ 375			≦ 375			> 375 ≦ 475			> 475 ≦ 655		
HRC	≦ 28.5			≦ 39.8			≦ 39.8			> 39.8 ≦ 49.1			> 50 ≦ 65		
Vc (SFM)	440 (352-528)			252 (201-303)			320 (256-384)			170 (136-204)			70 (56-84)		
ae/ap	ae=1D ap=1D			ae=1D ap=1D			ae=1D ap=1D			ae=1D ap=1D			ae=1D ap=1D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes
1/8	13,515	0.00040	21.6	6,163	0.00030	7.40	9,866	0.00050	19.7	5,136	0.00040	8.2	2,162	0.00020	1.7
9/64	12,013	0.00048	22.8	5,478	0.00028	6.03	8,770	0.00059	20.6	4,565	0.00048	8.7	1,922	0.00024	1.8
5/32	10,812	0.00055	23.8	4,930	0.00035	6.90	7,893	0.00068	21.3	4,109	0.00055	9.0	1,730	0.00028	1.9
11/64	9,829	0.00063	24.6	4,482	0.00043	7.62	7,175	0.00076	21.9	3,735	0.00063	9.3	1,573	0.00031	2.0
3/16	9,010	0.00070	25.2	4,109	0.00050	8.22	6,577	0.00085	22.4	3,424	0.00070	9.6	1,442	0.00035	2.0
13/64	8,317	0.00078	25.8	3,793	0.00058	8.72	6,071	0.00094	22.8	3,160	0.00078	9.8	1,331	0.00039	2.1
7/32	7,723	0.00085	26.3	3,522	0.00065	9.16	5,638	0.00103	23.1	2,935	0.00085	10.0	1,236	0.00043	2.1
15/64	7,208	0.00093	26.7	3,287	0.00073	9.53	5,262	0.00111	23.4	2,739	0.00093	10.1	1,153	0.00046	2.1
1/4	6,757	0.00100	27.0	3,081	0.00080	9.86	4,933	0.00120	23.7	2,568	0.00010	1.0	1,081	0.00005	0.2
17/64	6,360	0.00113	28.6	2,900	0.00088	10.15	4,643	0.00134	24.8	2,417	0.00113	10.9	1,018	0.00056	2.3
9/32	6,007	0.00123	29.6	2,739	0.00095	10.41	4,385	0.00148	25.9	2,283	0.00123	11.2	961	0.00061	2.4
19/64	5,691	0.00134	30.5	2,595	0.00103	10.64	4,154	0.00161	26.8	2,162	0.00134	11.6	910	0.00067	2.4
5/16	5,406	0.00145	31.4	2,465	0.00110	10.85	3,946	0.00175	27.6	2,054	0.00145	11.9	865	0.00073	2.5
21/64	5,149	0.00156	32.1	2,348	0.00118	11.03	3,758	0.00189	28.4	1,956	0.00156	12.2	824	0.00078	2.6
11/32	4,915	0.00168	33.0	2,241	0.00125	11.21	3,588	0.00203	29.1	1,868	0.00168	12.5	786	0.00084	2.6
23/64	4,701	0.00178	33.5	2,144	0.00133	11.36	3,432	0.00216	29.7	1,786	0.00179	12.8	752	0.00089	2.7
3/8	4,505	0.00190	34.2	2,054	0.00140	11.50	3,289	0.00230	30.3	1,712	0.00190	13.0	721	0.00095	2.7
25/64	4,325	0.00198	34.2	1,972	0.00146	11.54	3,157	0.00239	30.2	1,643	0.00198	13.0	692	0.00099	2.7
13/32	4,158	0.00205	34.1	1,896	0.00153	11.57	3,036	0.00248	30.1	1,580	0.00205	13.0	665	0.00103	2.7
27/64	4,004	0.00213	34.0	1,826	0.00159	11.60	2,923	0.00256	30.0	1,522	0.00213	12.9	641	0.00106	2.7
7/16	3,861	0.00220	34.0	1,761	0.00165	11.62	2,819	0.00265	29.9	1,467	0.00220	12.9	618	0.00110	2.7
29/64	3,728	0.00228	33.9	1,700	0.00171	11.65	2,722	0.00274	29.8	1,417	0.00228	12.9	597	0.00114	2.7
15/32	3,604	0.00235	33.9	1,643	0.00178	11.67	2,631	0.00283	29.7	1,370	0.00235	12.9	577	0.00118	2.7
31/64	3,488	0.00243	33.8	1,590	0.00184	11.69	2,546	0.00231	23.6	1,325	0.00243	12.9	558	0.00121	2.7
1/2	3,379	0.00250	33.8	1,541	0.00190	11.71	2,466	0.00300	29.6	1,284	0.00250	12.8	541	0.00125	2.7
9/16	3,003	0.00210	25.2	1,370	0.00215	11.78	2,192	0.00345	30.3	1,141	0.00285	13.0	481	0.00143	2.7
5/8	2,703	0.00310	33.5	1,233	0.00240	11.83	1,973	0.00390	30.8	1,027	0.00320	13.1	432	0.00160	2.8
11/16	2,457	0.00315	31.0	1,121	0.00245	10.98	1,794	0.00405	29.1	934	0.00335	12.5	393	0.00168	2.6
3/4	2,252	0.00320	28.8	1,027	0.00250	10.27	1,644	0.00420	27.6	856	0.00350	12.0	360	0.00175	2.5
7/8	1,931	0.00335	25.9	880	0.00260	9.16	1,409	0.00460	25.9	734	0.00365	10.7	309	0.00183	2.3
1	1,689	0.00350	23.7	770	0.00270	8.32	1,233	0.00500	24.7	642	0.00380	9.8	270	0.00190	2.1
Depth of cut															

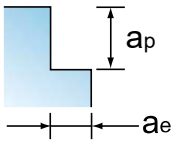
CUTTING CONDITION - IPVE/IPVRIT

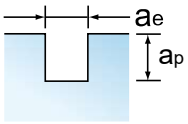
Slot Milling	CAST IRONS (LOW&MEDIUM ALLOY) Gray, Malleable, Ductile			CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile			STAINLESS STEELS (FREE MACHINING) 304, 416,420F,430F,440F			STAINLESS STEELS (DIFFICULT) 304, 304L,316,316L			STAINLESS STEELS(PH) 13-8 PH,15-5PH,17-4PH, Custom 450		
Hardness BRINELL	≦ 220			> 220 ≦ 260			≦ 275			≦ 275			≦ 325		
HRC	≦ 18.8			> 18.8 ≦ 26.6			≦ 28.5			≦ 28.5			≦ 34.4		
Vc (SFM)	284 (356-534)			272 (216-324)			390 (312-468)			270 (216-324)			250 (200-300)		
ae/ap	ae=1D ap=1D			ae=1D ap=1D			ae=1D ap=1D			ae=1D ap=1D			ae=1D ap=1D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes
1/8	6,920	0.00040	11.1	6,595	0.00030	7.90	9,515	0.00030	11.4	6,595	0.00020	5.3	6,055	0.00020	4.8
9/64	6,151	0.00048	11.7	5,862	0.00035	8.20	8,457	0.00035	11.8	5,862	0.00025	5.9	5,382	0.00025	5.4
5/32	5,536	0.00055	12.2	5,276	0.00040	8.40	7,612	0.00040	12.2	5,276	0.00030	6.3	4,844	0.00030	5.8
11/64	5,032	0.00063	12.6	4,797	0.00045	8.60	6,920	0.00045	12.5	4,797	0.00035	6.7	4,403	0.00035	6.2
3/16	4,613	0.00070	12.9	4,397	0.00050	8.80	6,343	0.00050	12.7	4,397	0.00040	7.0	4,036	0.00040	6.5
13/64	4,258	0.00078	13.2	4,059	0.00055	8.90	5,855	0.00055	12.9	4,059	0.00045	7.3	3,726	0.00045	6.7
7/32	3,954	0.00085	13.4	3,769	0.00060	9.00	5,437	0.00060	13.0	3,769	0.00050	7.5	3,460	0.00050	6.9
15/64	3,690	0.00093	13.7	3,517	0.00065	9.10	5,074	0.00065	13.2	3,517	0.00055	7.7	3,229	0.00055	7.1
1/4	3,460	0.00100	13.8	3,298	0.00070	9.20	4,757	0.00070	13.3	3,298	0.00060	7.9	3,027	0.00060	7.3
17/64	3,256	0.00110	14.3	3,104	0.00079	9.80	4,477	0.00079	14.1	3,104	0.00066	8.2	2,849	0.00066	7.6
9/32	3,075	0.00120	14.8	2,931	0.00088	10.30	4,229	0.00088	14.8	2,931	0.00073	8.5	2,691	0.00073	7.8
19/64	2,914	0.00130	15.2	2,777	0.00096	10.70	4,006	0.00096	15.4	2,777	0.00079	8.7	2,549	0.00079	8.0
5/16	2,768	0.00140	15.5	2,638	0.00105	11.10	3,806	0.00105	16.0	2,638	0.00085	9.0	2,422	0.00085	8.2
21/64	2,636	0.00150	15.8	2,512	0.00114	11.40	3,625	0.00114	16.5	2,512	0.00091	9.2	2,307	0.00091	8.4
11/32	2,516	0.00160	16.1	2,398	0.00123	11.80	3,460	0.00123	17.0	2,398	0.00098	9.4	2,202	0.00098	8.6
23/64	2,407	0.00170	16.4	2,294	0.00131	12.00	3,309	0.00131	17.4	2,294	0.00104	9.5	2,106	0.00104	8.7
3/8	2,307	0.00180	16.6	2,198	0.00140	12.30	3,172	0.00140	17.8	2,198	0.00110	9.7	2,018	0.00110	8.9
25/64	2,214	0.00188	16.6	2,110	0.00145	12.20	3,045	0.00145	17.7	2,110	0.00114	9.6	1,938	0.00114	8.8
13/32	2,129	0.00195	16.6	2,029	0.00150	12.20	2,928	0.00150	17.6	2,029	0.00118	9.5	1,863	0.00118	8.8
27/64	2,050	0.00203	16.6	1,954	0.00155	12.10	2,819	0.00155	17.5	1,954	0.00121	9.5	1,794	0.00121	8.7
7/16	1,977	0.00210	16.6	1,884	0.00160	12.10	2,718	0.00160	17.4	1,884	0.00125	9.4	1,730	0.00125	8.6
29/64	1,909	0.00218	16.6	1,819	0.00165	12.00	2,625	0.00165	17.3	1,819	0.00013	0.9	1,670	0.00013	0.9
15/32	1,845	0.00225	16.6	1,759	0.00170	12.00	2,537	0.00170	17.3	1,759	0.00133	9.3	1,615	0.00133	8.6
31/64	1,786	0.00233	16.6	1,702	0.00175	11.90	2,455	0.00175	17.2	1,702	0.00136	9.3	1,563	0.00136	8.5
1/2	1,730	0.00240	16.6	1,649	0.00180	11.90	2,379	0.00180	17.1	1,649	0.00140	9.2	1,514	0.00140	8.5
9/16	1,538	0.00270	16.6	1,466	0.00205	12.00	2,114	0.00205	17.3	1,466	0.00160	9.4	1,345	0.00160	8.6
5/8	1,384	0.00300	16.6	1,319	0.00230	12.10	1,903	0.00230	17.5	1,319	0.00180	9.5	1,211	0.00180	8.7
11/16	1,258	0.00305	15.3	1,199	0.00245	11.80	1,730	0.00245	17.0	1,199	0.00185	8.9	1,101	0.00185	8.1
3/4	1,153	0.00310	14.3	1,099	0.00240	10.60	1,586	0.00240	15.2	1,099	0.00190	8.4	1,009	0.00190	7.7
7/8	989	0.00325	12.9	942	0.00245	9.20	1,359	0.00245	13.3	942	0.00195	7.3	865	0.00195	6.7
1	865	0.00340	11.8	824	0.00250	8.20	1,189	0.00250	11.9	824	0.00200	6.6	757	0.00200	6.1
Depth of cut															

CUTTING CONDITION - IPVE/IPVRIT

Slot Milling 	SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 601,617,625,Incoly 800,Monel 400			SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 718,750X,Incoly 925,Waspalloy,Hastelloy,Rene			TITANIUM ALLOYS Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si			TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al		
Hardness BRINELL	≦ 300			> 300			≦ 350			> 350 ≦ 440		
HRC	≦ 32.1			≦ 32.1								
Vc (SFM)	65 (52-78)			50 (40-60)			170 (136-204)			60 (48-72)		
ae/ap	ae=1D ap=1D			ae=1D ap=1D			ae=1D ap=1D			ae=1D ap=1D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes	RPM	Fz	Feed (IPM) 4 flutes
1/8	1,514	0.00020	1.2	1,189	0.00010	0.50	4,325	0.00020	3.5	1,514	0.00020	1.2
9/64	1,345	0.00023	1.2	1,057	0.00013	0.50	3,844	0.00024	3.7	1,345	0.00024	1.3
5/32	1,211	0.00025	1.2	951	0.00015	0.60	3,460	0.00028	3.8	1,211	0.00028	1.3
11/64	1,101	0.00028	1.2	865	0.00018	0.60	3,145	0.00031	3.9	1,101	0.00031	1.4
3/16	1,009	0.00030	1.2	793	0.00020	0.60	2,883	0.00035	4.0	1,009	0.00035	1.4
13/64	931	0.00033	1.2	732	0.00023	0.70	2,661	0.00039	4.1	931	0.00039	1.4
7/32	865	0.00035	1.2	680	0.00025	0.70	2,471	0.00043	4.2	865	0.00043	1.5
15/64	807	0.00038	1.2	634	0.00028	0.70	2,307	0.00046	4.3	807	0.00046	1.5
1/4	757	0.00040	1.2	595	0.00030	0.70	2,162	0.00050	4.3	757	0.00050	1.5
17/64	712	0.00045	1.3	560	0.00033	0.70	2,035	0.00057	4.6	712	0.00057	1.6
9/32	673	0.00050	1.3	529	0.00035	0.70	1,922	0.00063	4.8	673	0.00063	1.7
19/64	637	0.00055	1.4	501	0.00038	0.80	1,821	0.00069	5.0	637	0.00069	1.8
5/16	605	0.00060	1.5	476	0.00040	0.80	1,730	0.00075	5.2	605	0.00075	1.8
21/64	577	0.00065	1.5	453	0.00043	0.80	1,648	0.00081	5.4	577	0.00081	1.9
11/32	550	0.00070	1.5	432	0.00045	0.80	1,573	0.00088	5.5	550	0.00088	1.9
23/64	526	0.00075	1.6	414	0.00048	0.80	1,504	0.00094	5.6	526	0.00094	2.0
3/8	505	0.00080	1.6	396	0.00050	0.80	1,442	0.00100	5.8	505	0.00100	2.0
25/64	484	0.00083	1.6	381	0.00053	0.80	1,384	0.00104	5.7	484	0.00104	2.0
13/32	466	0.00085	1.6	366	0.00055	0.80	1,331	0.00108	5.7	466	0.00108	2.0
27/64	448	0.00088	1.6	352	0.00058	0.80	1,281	0.00111	5.7	448	0.00111	2.0
7/16	432	0.00090	1.6	340	0.00060	0.80	1,236	0.00115	5.7	432	0.00115	2.0
29/64	418	0.00093	1.5	328	0.00063	0.80	1,193	0.00119	5.7	418	0.00119	2.0
15/32	404	0.00095	1.5	317	0.00065	0.80	1,153	0.00123	5.7	404	0.00123	2.0
31/64	391	0.00098	1.5	307	0.00068	0.80	1,116	0.00126	5.6	391	0.00126	2.0
1/2	378	0.00100	1.5	297	0.00070	0.80	1,081	0.00130	5.6	378	0.00130	2.0
9/16	336	0.00115	1.5	264	0.00080	0.80	961	0.00145	5.6	336	0.00145	2.0
5/8	303	0.00130	1.6	238	0.00090	0.90	865	0.00160	5.5	303	0.00160	1.9
11/16	275	0.00135	1.5	216	0.00095	0.80	786	0.00165	5.2	275	0.00165	1.8
3/4	252	0.00140	1.4	198	0.00100	0.80	721	0.00170	4.9	252	0.00170	1.7
7/8	216	0.00145	1.3	170	0.00011	0.10	618	0.00175	4.3	216	0.00175	1.5
1	189	0.00150	1.1	149	0.00110	0.70	541	0.00180	3.9	189	0.00180	1.4
Depth of cut												

CUTTING CONDITION - IPVR1T

type	IPVR1T		
Side Milling 	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦ 300		
HRC	≦ 31		
Vc (SFM)	60		
ae/ap	ae=0.4D ap=1.5D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 flutes
1/8	5,014	0.0005	9.4
3/16	3,345	0.0007	10.0
1/4	2,507	0.0008	8.4
5/16	2,008	0.0010	7.8
3/8	1,671	0.0013	8.8
1/2	1,254	0.0017	8.4
5/8	1,008	0.0019	7.8
3/4	836	0.0023	7.5
Depth of cut			

type	IPVR1T		
Slot Milling 	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦ 300		
HRC	≦ 31		
Vc (SFM)	60		
ae/ap	ae=1D ap=1.25D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 flutes
1/8	4,013	0.0003	5.0
3/16	2,676	0.0006	6.0
1/4	2,006	0.0008	6.7
5/16	1,607	0.0010	6.3
3/8	1,338	0.0011	6.0
1/2	1,003	0.0017	6.7
5/8	806	0.0017	5.6
3/4	669	0.0021	5.5
Depth of cut			

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