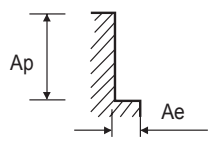
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF25, 26 SERIES — 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/64	1/16	5/16	3/32	1/8	9/64	3/16	13/64	7/32	1/4
P	1-8	Non-alloy steel Low alloy steel	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010
					RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570
					IPM(FEED)	12	11	12	14	13	19	24	25	27	27
	9	Low alloy steel	0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011
					RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970
					IPM(FEED)	7	7	7	9	8	12	15	15	17	17
	10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010
					RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570
					IPM(FEED)	12	11	12	14	13	19	24	25	27	27
	11.1-11.2		0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011
					RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970
					IPM(FEED)	7	7	7	9	8	12	15	15	17	17
M	14.1	Stainless steel	0.05D	1.0D	SFM(Vc)	140	145	650	175	180	190	205	205	210	220
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010
					RPM	11340	8860	7940	7170	5460	5200	4160	3830	3710	3350
					IPM(FEED)	6	6	6	7	7	10	12	13	13	13
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010
					RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570
					IPM(FEED)	12	11	12	14	13	19	24	25	27	27
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	110	115	130	135	130	140	155	150	155	155
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0003
					RPM	9070	7090	6350	5510	3970	3860	3110	2810	2670	2360
					IPM(FEED)	2	2	2	3	2	3	3	3	3	3
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011
					RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970
					IPM(FEED)	7	7	7	9	8	12	15	15	17	17
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	110	115	130	135	130	140	155	150	155	155
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0003
					RPM	9070	7090	6350	5510	3970	3860	3110	2810	2670	2360
					IPM(FEED)	2	2	2	3	2	3	3	3	3	3

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



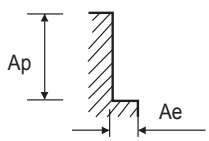
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF25, 26 SERIES — 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø) 17/64	9/32	19/64	5/16	11/32	23/64	3/8	7/16	1/2	9/16	5/8	3/4
P	1-8	0.05D	1.0D	SFM(Vc)	435	440	440	435	435	430	420	425	425	445	455	430
				IPT(fz)	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016
				RPM	6290	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200
				IPM(FEED)	28	28	29	30	28	27	27	23	21	19	18	14
	9	0.05D	1.0D	SFM(Vc)	265	265	265	260	260	260	255	260	260	275	280	275
				IPT(fz)	.0011	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013
				RPM	3800	3610	3390	3170	2910	2790	2620	2280	1980	1860	1710	1400
				IPM(FEED)	17	16	16	16	15	14	13	11	10	9	9	7
	10	0.05D	1.0D	SFM(Vc)	435	440	440	435	435	430	420	425	425	445	455	430
				IPT(fz)	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016
				RPM	6290	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200
				IPM(FEED)	28	28	29	30	28	27	27	23	21	19	18	14
	11.1-11.2	0.05D	1.0D	SFM(Vc)	265	265	265	260	260	260	255	260	260	275	280	275
				IPT(fz)	.0011	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013
				RPM	3800	3610	3390	3170	2910	2790	2620	2280	1980	1860	1710	1400
				IPM(FEED)	17	16	16	16	15	14	13	11	10	9	9	7
M	14.1	0.05D	1.0D	SFM(Vc)	225	225	220	215	220	220	215	215	210	220	225	215
				IPT(fz)	.0011	.0011	.0013	.0014	.0014	.0014	.0015	.0015	.0015	.0015	.0015	.0015
				RPM	3200	3030	2840	2650	2420	2330	2200	1880	1610	1510	1390	1100
				IPM(FEED)	14	14	14	15	14	13	13	11	10	9	8	6
K	15-20	0.05D	1.0D	SFM(Vc)	435	440	440	435	435	430	420	425	425	445	455	430
				IPT(fz)	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016
				RPM	6290	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200
				IPM(FEED)	28	28	29	30	28	27	27	23	21	19	18	14
H	38.1-38.2	0.05D	1.0D	SFM(Vc)	160	165	170	175	175	175	175	180	180	185	185	175
				IPT(fz)	.0004	.0004	.0005	.0006	.0005	.0005	.0006	.0006	.0005	.0006	.0007	.0006
				RPM	2310	2250	2190	2120	1950	1870	1780	1560	1370	1260	1140	890
				IPM(FEED)	4	4	4	5	4	4	4	4	3	3	3	2
	40	0.05D	1.0D	SFM(Vc)	265	265	265	260	260	260	255	260	260	275	280	275
				IPT(fz)	.0011	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013
				RPM	3800	3610	3390	3170	2910	2790	2620	2280	1980	1860	1710	1400
				IPM(FEED)	17	16	16	16	15	14	13	11	10	9	9	7
	41	0.05D	1.0D	SFM(Vc)	160	165	170	175	175	175	175	180	180	185	185	175
				IPT(fz)	.0004	.0004	.0005	.0006	.0005	.0005	.0006	.0006	.0005	.0006	.0007	.0006
				RPM	2310	2250	2190	2120	1950	1870	1780	1560	1370	1260	1140	890
				IPM(FEED)	4	4	4	5	4	4	4	4	3	3	3	2

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



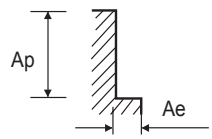
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF27 SERIES — 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3/64	3/64	3/64	3/64	1/16	5/64	5/64	5/64	5/64	3/32	3/32	1/8	1/8
					LOC	1/8	5/32	3/16	1/4	1/4	5/16	3/8	1/2	9/16	3/8	1/2	3/8	1/2
P	1-8	Non-alloy steel Low alloy steel	0.05D	2.5D	SFM(Vc)	200	200	200	180	215	220	220	195	195	230	210	230	230
					IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004
					RPM	16330	16330	16330	14690	13040	10670	10670	9600	9600	9440	8500	7000	7000
					IPM(FEED)	8	8	8	7	8	10	10	8	8	11	10	10	10
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	115	115	115	105	120	125	125	110	110	135	120	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003
					RPM	9310	9310	9310	8380	7430	6100	6100	5490	5490	5420	4880	4050	4050
					IPM(FEED)	3	3	3	3	3	4	4	3	3	5	4	5	5
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	200	200	200	180	215	220	220	195	195	230	210	230	230
					IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004
					RPM	16330	16330	16330	14690	13040	10670	10670	9600	9600	9440	8500	7000	7000
					IPM(FEED)	8	8	8	7	8	10	10	8	8	11	10	10	10
	11.1-11.2		0.05D	2.5D	SFM(Vc)	115	115	115	105	120	125	125	110	110	135	120	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003
					RPM	9310	9310	9310	8380	7430	6100	6100	5490	5490	5420	4880	4050	4050
					IPM(FEED)	3	3	3	3	3	4	4	3	3	5	4	5	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	200	200	200	180	215	220	220	195	195	230	210	230	230
					IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004
					RPM	16330	16330	16330	14690	13040	10670	10670	9600	9600	9440	8500	7000	7000
					IPM(FEED)	8	8	8	7	8	10	10	8	8	11	10	10	10
H	38.1-38.2	Hardened steel	0.02	2.0D	SFM(Vc)	70	70	70	65	75	80	80	70	70	85	75	80	80
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002
					RPM	5710	5710	5710	5140	4560	3810	3810	3430	3430	3370	3030	2490	2490
					IPM(FEED)	2	2	2	1	2	2	2	2	2	3	2	2	2
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	115	115	115	105	120	125	125	110	110	135	120	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003
					RPM	9310	9310	9310	8380	7430	6100	6100	5490	5490	5420	4880	4050	4050
					IPM(FEED)	3	3	3	3	3	4	4	3	3	5	4	5	5
	41	Hardened Cast Iron	0.05D	2.5D	SFM(Vc)	70	70	70	65	75	80	80	70	70	85	75	80	80
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002
					RPM	5710	5710	5710	5140	4560	3810	3810	3430	3430	3370	3030	2490	2490
					IPM(FEED)	2	2	2	1	2	2	2	2	2	3	2	2	2

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



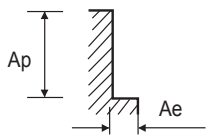
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF27 SERIES — 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	13/64	13/64	13/64	1/4
					LOC	5/8	3/4	1	1-3/16	1/2	5/8	3/4	1	1-3/16	3/4	1	1-3/16	5/8
P	1-8	Non-alloy steel Low alloy steel	0.05D	2.5D	SFM(Vc)	230	205	205	205	245	245	245	225	225	265	265	240	275
					IPT(fz)	.0004	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0008	.0008	.0008	.0012
					RPM	7000	6300	6300	6300	5040	5040	5040	4540	4540	4970	4970	4470	4170
					IPM(FEED)	10	8	8	8	11	11	11	10	9	17	17	13	19
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	135	120	120	120	140	140	140	125	125	150	150	135	155
					IPT(fz)	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0009
					RPM	4050	3640	3640	3640	2860	2860	2860	2580	2580	2810	2810	2530	2380
					IPM(FEED)	5	4	3	3	5	5	5	4	4	7	7	5	8
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	230	205	205	205	245	245	245	225	225	265	265	240	275
					IPT(fz)	.0004	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0008	.0008	.0008	.0012
					RPM	7000	6300	6300	6300	5040	5040	5040	4540	4540	4970	4970	4470	4170
					IPM(FEED)	10	8	8	8	11	11	11	10	9	17	17	13	19
	11.1-11.2		0.05D	2.5D	SFM(Vc)	135	120	120	120	140	140	140	125	125	150	150	135	155
					IPT(fz)	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0009
					RPM	4050	3640	3640	3640	2860	2860	2860	2580	2580	2810	2810	2530	2380
					IPM(FEED)	5	4	3	3	5	5	5	4	4	7	7	5	8
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	230	205	205	205	245	245	245	225	225	265	265	240	275
					IPT(fz)	.0004	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0008	.0008	.0008	.0012
					RPM	7000	6300	6300	6300	5040	5040	5040	4540	4540	4970	4970	4470	4170
					IPM(FEED)	10	8	8	8	11	11	11	10	9	17	17	13	19
H	38.1-38.2	Hardened steel	0.02	2.0D	SFM(Vc)	80	75	75	75	90	90	90	80	80	100	100	90	100
					IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0006
					RPM	2490	2250	2250	2250	1800	1800	1800	1620	1620	1840	1840	1650	1550
					IPM(FEED)	2	2	2	2	2	2	2	2	2	3	3	3	4
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	135	120	120	120	140	140	140	125	125	150	150	135	155
					IPT(fz)	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0009
					RPM	4050	3640	3640	3640	2860	2860	2860	2580	2580	2810	2810	2530	2380
					IPM(FEED)	5	4	3	3	5	5	5	4	4	7	7	5	8
	41	Hardened Cast Iron	0.05D	2.5D	SFM(Vc)	80	75	75	75	90	90	90	80	80	100	100	90	100
					IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0006
					RPM	2490	2250	2250	2250	1800	1800	1800	1620	1620	1840	1840	1650	1550
					IPM(FEED)	2	2	2	2	2	2	2	2	2	3	3	3	4

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



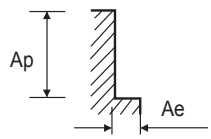
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF27 SERIES — 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)													
					1/4	1/4	1/4	1/4	1/4	1/4	5/16	5/16	5/16	5/16	5/16	5/16	3/8	3/8	3/8
				LOC	3/4	1	1-3/16	1-3/8	1-1/2	1-3/4	1	1-3/16	1-3/8	1-1/2	1-3/4	2	1-3/16	1-3/8	1-1/2
P	1-8	0.05D	2.5D	SFM(Vc)	275	275	275	245	245	245	275	275	275	275	250	250	290	290	290
				IPT(fz)	.0012	.0012	.0010	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019
				RPM	4170	4170	4170	3760	3760	3760	3390	3390	3390	3390	3050	3050	2960	2960	2960
				IPM(FEED)	19	19	16	15	13	13	22	22	22	19	17	15	23	23	23
	9	0.05D	2.5D	SFM(Vc)	155	155	155	140	140	140	155	155	155	155	140	140	170	170	170
				IPT(fz)	.0009	.0009	.0007	.0007	.0006	.0006	.0011	.0011	.0011	.0010	.0009	.0008	.0013	.0013	.0013
				RPM	2380	2380	2380	2140	2140	2140	1910	1910	1910	1910	1720	1720	1730	1730	1730
				IPM(FEED)	8	8	7	6	6	6	9	9	9	7	7	6	9	9	9
	10	0.05D	2.5D	SFM(Vc)	275	275	275	245	245	245	275	275	275	275	250	250	290	290	290
				IPT(fz)	.0012	.0012	.0010	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019
				RPM	4170	4170	4170	3760	3760	3760	3390	3390	3390	3390	3050	3050	2960	2960	2960
				IPM(FEED)	19	19	16	15	13	13	22	22	22	19	17	15	23	23	23
	11.1-11.2	0.05D	2.5D	SFM(Vc)	155	155	155	140	140	140	155	155	155	155	140	140	170	170	170
				IPT(fz)	.0009	.0009	.0007	.0007	.0006	.0006	.0011	.0011	.0011	.0010	.0009	.0008	.0013	.0013	.0013
				RPM	2380	2380	2380	2140	2140	2140	1910	1910	1910	1910	1720	1720	1730	1730	1730
				IPM(FEED)	8	8	7	6	6	6	9	9	9	7	7	6	9	9	9
K	15-20	0.05D	2.5D	SFM(Vc)	275	275	275	245	245	245	275	275	275	275	250	250	290	290	290
				IPT(fz)	.0012	.0012	.0010	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019
				RPM	4170	4170	4170	3760	3760	3760	3390	3390	3390	3390	3050	3050	2960	2960	2960
				IPM(FEED)	19	19	16	15	13	13	22	22	22	19	17	15	23	23	23
H	38.1-38.2	0.02	2.0D	SFM(Vc)	100	100	100	90	90	90	105	105	105	105	95	95	105	105	105
				IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0007	.0008	.0007	.0011	.0011	.0011
				RPM	1550	1550	1550	1400	1400	1400	1270	1270	1270	1270	1140	1140	1060	1060	1060
				IPM(FEED)	4	4	3	3	3	3	4	4	4	4	3	3	5	5	5
	40	0.05D	2.5D	SFM(Vc)	155	155	155	140	140	140	155	155	155	155	140	140	170	170	170
				IPT(fz)	.0009	.0009	.0007	.0007	.0006	.0006	.0011	.0011	.0011	.0010	.0009	.0008	.0013	.0013	.0013
				RPM	2380	2380	2380	2140	2140	2140	1910	1910	1910	1910	1720	1720	1730	1730	1730
				IPM(FEED)	8	8	7	6	6	6	9	9	9	7	7	6	9	9	9
	41	0.05D	2.5D	SFM(Vc)	100	100	100	90	90	90	105	105	105	105	95	95	105	105	105
				IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0007	.0008	.0007	.0011	.0011	.0011
				RPM	1550	1550	1550	1400	1400	1400	1270	1270	1270	1270	1140	1140	1060	1060	1060
				IPM(FEED)	4	4	3	3	3	3	4	4	4	4	3	3	5	5	5

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



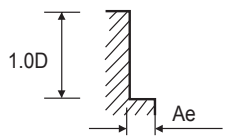
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF27 SERIES — 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)														
						3/8	3/8	1/2	1/2	1/2	1/2	1/2	1/2	9/16	5/8	5/8	5/8	3/4	3/4	1
					LOC	1-3/4	2	1-3/8	1-1/2	1-3/4	2	2-1/8	2-3/8	2	2	2-3/8	2-3/4	2-3/8	3-1/2	3-1/2
P	1-8	Non-alloy steel Low alloy steel	0.05D	2.5D	SFM(Vc)	290	260	285	285	285	285	285	285	305	320	320	320	295	295	285
					IPT(fz)	.0017	.0016	.0019	.0019	.0019	.0016	.0016	.0016	.0016	.0019	.0017	.0017	.0016	.0014	.0016
					RPM	2960	2660	2180	2180	2180	2180	2180	2180	2080	1960	1960	1960	1490	1490	1090
					IPM(FEED)	20	18	16	16	16	14	14	14	13	15	13	13	10	9	7
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	170	150	175	175	175	175	175	175	180	175	175	175	170	170	210
					IPT(fz)	.0011	.0011	.0013	.0013	.0013	.0012	.0012	.0012	.0011	.0014	.0012	.0012	.0011	.0010	.0011
					RPM	1730	1550	1320	1320	1320	1320	1320	1320	1210	1080	1080	1080	860	860	800
					IPM(FEED)	8	7	7	7	7	6	6	6	6	6	5	5	4	3	4
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	290	260	285	285	285	285	285	285	305	320	320	320	295	295	285
					IPT(fz)	.0017	.0016	.0019	.0019	.0019	.0016	.0016	.0016	.0016	.0019	.0017	.0017	.0016	.0014	.0016
					RPM	2960	2660	2180	2180	2180	2180	2180	2180	2080	1960	1960	1960	1490	1490	1090
					IPM(FEED)	20	18	16	16	16	14	14	14	13	15	13	13	10	9	7
	11.1-11.2		0.05D	2.5D	SFM(Vc)	170	150	175	175	175	175	175	175	180	175	175	175	170	170	210
					IPT(fz)	.0011	.0011	.0013	.0013	.0013	.0012	.0012	.0012	.0011	.0014	.0012	.0012	.0011	.0010	.0011
					RPM	1730	1550	1320	1320	1320	1320	1320	1320	1210	1080	1080	1080	860	860	800
					IPM(FEED)	8	7	7	7	7	6	6	6	6	6	5	5	4	3	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	290	260	285	285	285	285	285	285	305	320	320	320	295	295	285
					IPT(fz)	.0017	.0016	.0019	.0019	.0019	.0016	.0016	.0016	.0016	.0019	.0017	.0017	.0016	.0014	.0016
					RPM	2960	2660	2180	2180	2180	2180	2180	2180	2080	1960	1960	1960	1490	1490	1090
					IPM(FEED)	20	18	16	16	16	14	14	14	13	15	13	13	10	9	7
H	38.1-38.2	Hardened steel	0.02	2.0D	SFM(Vc)	105	95	105	105	105	105	105	105	110	110	110	110	105	105	130
					IPT(fz)	.0009	.0009	.0010	.0010	.0010	.0008	.0008	.0008	.0009	.0011	.0009	.0009	.0009	.0009	.0009
					RPM	1060	950	790	790	790	790	790	790	740	680	680	680	530	530	500
					IPM(FEED)	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	170	150	175	175	175	175	175	175	180	175	175	175	170	170	210
					IPT(fz)	.0011	.0011	.0013	.0013	.0013	.0012	.0012	.0012	.0011	.0014	.0012	.0012	.0011	.0010	.0011
					RPM	1730	1550	1320	1320	1320	1320	1320	1320	1210	1080	1080	1080	860	860	800
					IPM(FEED)	8	7	7	7	7	6	6	6	6	6	5	5	4	3	4
	41	Hardened Cast Iron	0.05D	2.5D	SFM(Vc)	105	95	105	105	105	105	105	105	110	110	110	110	105	105	130
					IPT(fz)	.0009	.0009	.0010	.0010	.0010	.0008	.0008	.0008	.0009	.0011	.0009	.0009	.0009	.0009	.0009
					RPM	1060	950	790	790	790	790	790	790	740	680	680	680	530	530	500
					IPM(FEED)	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



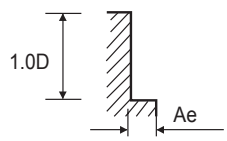
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF28 SERIES — 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) / LBS															
				3/64	3/64	3/64	3/64	1/16	1/16	1/16	1/16	1/16	5/64	5/64	5/64	5/64	1/8	1/8
			LBS	5/32	3/16	1/4	5/16	1/4	5/16	3/8	1/2	5/8	5/16	3/8	1/2	5/8	3/8	1/2
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	240	240	215	215	265	265	235	235	235	285	285	260	260	330	330
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	19650	19650	17690	17690	16060	16060	14460	14460	14460	14010	14010	12610	12610	10110	10110
			IPM(FEED)	12	12	10	10	12	12	10	10	10	13	13	11	11	14	14
			Ae	.0007	.0007	.0004	.0004	.0009	.0009	.0005	.0005	.0003	.0011	.0011	.0007	.0007	.0026	.0019
	9	Low alloy steel	SFM(Vc)	150	150	135	135	165	165	150	150	150	185	185	170	170	205	205
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	12200	12200	10980	10980	10110	10110	9100	9100	9100	9140	9140	8230	8230	6300	6300
			IPM(FEED)	7	7	6	6	7	7	6	6	6	8	8	7	7	9	9
			Ae	.0005	.0005	.0003	.0003	.0007	.0007	.0004	.0004	.0002	.0009	.0009	.0005	.0005	.002	.0014
	10	High alloyed steel, and tool steel	SFM(Vc)	240	240	215	215	265	265	235	235	235	285	285	260	260	330	330
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	19650	19650	17690	17690	16060	16060	14460	14460	14460	14010	14010	12610	12610	10110	10110
			IPM(FEED)	12	12	10	10	12	12	10	10	10	13	13	11	11	14	14
			Ae	.0007	.0007	.0004	.0004	.0009	.0009	.0005	.0005	.0003	.0011	.0011	.0007	.0007	.0026	.0019
	11.1-11.2		SFM(Vc)	150	150	135	135	165	165	150	150	150	185	185	170	170	205	205
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	12200	12200	10980	10980	10110	10110	9100	9100	9100	9140	9140	8230	8230	6300	6300
			IPM(FEED)	7	7	6	6	7	7	6	6	6	8	8	7	7	9	9
			Ae	.0005	.0005	.0003	.0003	.0007	.0007	.0004	.0004	.0002	.0009	.0009	.0005	.0005	.002	.0014
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	240	240	215	215	265	265	235	235	235	285	285	260	260	330	330
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	19650	19650	17690	17690	16060	16060	14460	14460	14460	14010	14010	12610	12610	10110	10110
			IPM(FEED)	12	12	10	10	12	12	10	10	10	13	13	11	11	14	14
			Ae	.0007	.0007	.0004	.0004	.0009	.0009	.0005	.0005	.0003	.0011	.0011	.0007	.0007	.0026	.0019
H	38.1-38.2	Hardened steel	SFM(Vc)	95	95	85	85	100	100	90	90	90	125	125	110	110	125	125
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
			RPM	7560	7560	6800	6800	6140	6140	5530	5530	5530	6050	6050	5440	5440	3810	3810
			IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
			Ae	.004	.004	.002	.002	.006	.006	.003	.003	.002	.007	.007	.004	.004	.016	.011
	40	Chilled Cast Iron	SFM(Vc)	150	150	135	135	165	165	150	150	150	185	185	170	170	205	205
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	12200	12200	10980	10980	10110	10110	9100	9100	9100	9140	9140	8230	8230	6300	6300
			IPM(FEED)	7	7	6	6	7	7	6	6	6	8	8	7	7	9	9
			Ae	.0005	.0005	.0003	.0003	.0007	.0007	.0004	.0004	.0002	.0009	.0009	.0005	.0005	.002	.0014
	41	Hardened Cast Iron	SFM(Vc)	95	95	85	85	100	100	90	90	90	125	125	110	110	125	125
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
			RPM	7560	7560	6800	6800	6140	6140	5530	5530	5530	6050	6050	5440	5440	3810	3810
			IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
			Ae	.004	.004	.002	.002	.006	.006	.003	.003	.002	.007	.007	.004	.004	.016	.011

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
IPT = Inches Per Tooth
IPM = Inches Per Minute
Ap : Inch (Axial Depth of Cut)
Ae : Inch (Radial Depth of Cut)



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF28 SERIES — 4FLUTE SQUARE - SIDE CUTTING

ISO	VDI 3323	Parameter	Diameter (Ø) / LBS																	
			1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	13/64	13/64	1/4	1/4	5/16	5/16	3/8	3/8	1/2	1/2
			5/8	3/4	1-3/16	1/2	5/8	3/4	1-3/16	1-1/2	3/4	1-1/2	5/8	1-3/16	1	1-5/8	1-3/16	1-3/4	1-3/8	2
P	1-8	SFM(Vc)	330	300	300	375	375	375	335	335	390	350	410	410	415	375	400	400	410	410
		IPT(fz)	.0004	.0003	.0003	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0012	.0012	.0017	.0015	.0018	.0018	.0018	.0018
		RPM	10110	9100	9100	7620	7620	7620	6860	6860	7330	6590	6300	6300	5080	4570	4100	4100	3120	3120
		IPM(FEED)	14	11	11	22	22	22	18	18	28	22	29	29	34	27	30	30	23	23
		Ae	.0019	.0011	.0007	.0039	.0028	.0028	.0016	.0016	.003	.0017	.0052	.0037	.0046	.0026	.0055	.0055	.0105	.0074
	9	SFM(Vc)	205	185	185	230	230	230	205	205	235	210	250	250	250	225	245	245	250	250
		IPT(fz)	.0004	.0003	.0003	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0012	.0012	.0015	.0013	.0015	.0015	.0015	.0015
		RPM	6300	5670	5670	4650	4650	4650	4190	4190	4390	3950	3810	3810	3040	2740	2520	2520	1900	1900
		IPM(FEED)	9	7	7	14	14	14	11	11	16	13	18	18	18	14	15	15	11	11
		Ae	.0014	.0008	.0005	.003	.0021	.0021	.0012	.0012	.0022	.0013	.0039	.0028	.0035	.002	.0041	.0041	.0079	.0055
	10	SFM(Vc)	330	300	300	375	375	375	335	335	390	350	410	410	415	375	400	400	410	410
		IPT(fz)	.0004	.0003	.0003	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0012	.0012	.0017	.0015	.0018	.0018	.0018	.0018
		RPM	10110	9100	9100	7620	7620	7620	6860	6860	7330	6590	6300	6300	5080	4570	4100	4100	3120	3120
		IPM(FEED)	14	11	11	22	22	22	18	18	28	22	29	29	34	27	30	30	23	23
		Ae	.0019	.0011	.0007	.0039	.0028	.0028	.0016	.0016	.003	.0017	.0052	.0037	.0046	.0026	.0055	.0055	.0105	.0074
	11.1-11.2	SFM(Vc)	205	185	185	230	230	230	205	205	235	210	250	250	250	225	245	245	250	250
		IPT(fz)	.0004	.0003	.0003	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0012	.0012	.0015	.0013	.0015	.0015	.0015	.0015
		RPM	6300	5670	5670	4650	4650	4650	4190	4190	4390	3950	3810	3810	3040	2740	2520	2520	1900	1900
		IPM(FEED)	9	7	7	14	14	14	11	11	16	13	18	18	18	14	15	15	11	11
		Ae	.0014	.0008	.0005	.003	.0021	.0021	.0012	.0012	.0022	.0013	.0039	.0028	.0035	.002	.0041	.0041	.0079	.0055
K	15-20	SFM(Vc)	330	300	300	375	375	375	335	335	390	350	410	410	415	375	400	400	410	410
		IPT(fz)	.0004	.0003	.0003	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0012	.0012	.0017	.0015	.0018	.0018	.0018	.0018
		RPM	10110	9100	9100	7620	7620	7620	6860	6860	7330	6590	6300	6300	5080	4570	4100	4100	3120	3120
		IPM(FEED)	14	11	11	22	22	22	18	18	28	22	29	29	34	27	30	30	23	23
		Ae	.0019	.0011	.0007	.0039	.0028	.0028	.0016	.0016	.003	.0017	.0052	.0037	.0046	.0026	.0055	.0055	.0105	.0074
H	38.1-38.2	SFM(Vc)	125	110	110	145	145	145	130	130	145	130	150	150	165	150	170	170	175	175
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004	.0006	.0006	.0006	.0006	.0007	.0007
		RPM	3810	3430	3430	2960	2960	2960	2670	2670	2690	2420	2270	2270	2030	1820	1710	1710	1320	1320
		IPM(FEED)	3	2	2	2	2	2	2	2	3	3	4	4	5	4	4	4	4	4
		Ae	.011	.006	.004	.024	.017	.017	.009	.009	.018	.010	.031	.022	.028	.016	.033	.033	.063	.044
	40	SFM(Vc)	205	185	185	230	230	230	205	205	235	210	250	250	250	225	245	245	250	250
		IPT(fz)	.0004	.0003	.0003	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0012	.0012	.0015	.0013	.0015	.0015	.0015	.0015
		RPM	6300	5670	5670	4650	4650	4650	4190	4190	4390	3950	3810	3810	3040	2740	2520	2520	1900	1900
		IPM(FEED)	9	7	7	14	14	14	11	11	16	13	18	18	18	14	15	15	11	11
		Ae	.0014	.0008	.0005	.003	.0021	.0021	.0012	.0012	.0022	.0013	.0039	.0028	.0035	.002	.0041	.0041	.0079	.0055
	41	SFM(Vc)	125	110	110	145	145	145	130	130	145	130	150	150	165	150	170	170	175	175
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004	.0006	.0006	.0006	.0006	.0007	.0007
		RPM	3810	3430	3430	2960	2960	2960	2670	2670	2690	2420	2270	2270	2030	1820	1710	1710	1320	1320
		IPM(FEED)	3	2	2	2	2	2	2	2	3	3	4	4	5	4	4	4	4	4
		Ae	.011	.006	.004	.024	.017	.017	.009	.009	.018	.010	.031	.022	.028	.016	.033	.033	.063	.044

SFM = Surface Feet per Minute
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Ap : Inch (Axial Depth of Cut)
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