4G MILL END MILLS

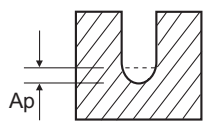
RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				.008	.008	.012	.012	.012	.015	.015	.015	.015	.020	.020	.020	.020	.020	.020
			LBS	1/64	3/64	3/64	5/64	1/8	3/64	5/64	1/8	5/32	3/64	5/64	1/8	5/32	3/16	1/4
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	105	95	155	140	125	170	150	150	135	175	175	160	160	160	140
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	49210	44290	49210	44290	39370	43040	38740	38740	34440	33660	33660	30300	30300	30300	26930
			IPM(FEED)	13	10	19	15	12	20	16	16	13	27	27	22	22	22	17
			Ap	.0007	.0003	.0007	.0004	.0003	.0009	.0006	.0004	.0004	.0018	.0013	.0007	.0007	.0004	.0004
	9	Low alloy steel	SFM(Vc)	105	95	155	140	125	160	145	145	130	165	165	150	150	150	135
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	49210	44290	49210	44290	39370	40730	36660	36660	32590	31790	31790	28610	28610	28610	25430
			IPM(FEED)	12	10	17	14	11	18	14	14	11	22	22	18	18	18	14
			Ap	.0006	.0002	.0006	.0004	.0002	.0008	.0004	.0003	.0003	.0015	.0011	.0006	.0006	.0004	.0004
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	105	95	155	140	125	170	150	150	135	175	175	160	160	160	140
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	49210	44290	49210	44290	39370	43040	38740	38740	34440	33660	33660	30300	30300	30300	26930
			IPM(FEED)	13	10	19	15	12	20	16	16	13	27	27	22	22	22	17
			Ap	.0007	.0003	.0007	.0004	.0003	.0009	.0006	.0004	.0004	.0018	.0013	.0007	.0007	.0004	.0004
	11.2		SFM(Vc)	105	95	155	140	125	160	145	145	130	165	165	150	150	150	135
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	49210	44290	49210	44290	39370	40730	36660	36660	32590	31790	31790	28610	28610	28610	25430
			IPM(FEED)	12	10	17	14	11	18	14	14	11	22	22	18	18	18	14
			Ap	.0006	.0002	.0006	.0004	.0002	.0008	.0004	.0003	.0003	.0015	.0011	.0006	.0006	.0004	.0004
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	105	95	155	140	125	170	150	150	135	175	175	160	160	160	140
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	49210	44290	49210	44290	39370	43040	38740	38740	34440	33660	33660	30300	30300	30300	26930
			IPM(FEED)	13	10	19	15	12	20	16	16	13	27	27	22	22	22	17
			Ap	.0007	.0003	.0007	.0004	.0003	.0009	.0006	.0004	.0004	.0018	.0013	.0007	.0007	.0004	.0004
H	38.1-38.2	Hardened steel	SFM(Vc)	90	80	130	120	105	140	125	125	115	145	145	130	130	130	115
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	42520	38270	42130	37910	33700	35910	32310	32310	28720	28050	28050	25250	25250	25250	22440
			IPM(FEED)	10	8	14	11	9	14	11	11	9	20	20	16	16	16	13
			Ap	.0004	.0002	.0004	.0002	.0002	.0005	.0003	.0002	.0002	.0010	.0007	.0004	.0004	.0002	.0002
	40	Chilled Cast Iron	SFM(Vc)	105	95	155	140	125	160	145	145	130	165	165	150	150	150	135
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	49210	44290	49210	44290	39370	40730	36660	36660	32590	31790	31790	28610	28610	28610	25430
			IPM(FEED)	12	10	17	14	11	18	14	14	11	22	22	18	18	18	14
			Ap	.0006	.0002	.0006	.0004	.0002	.0008	.0004	.0003	.0003	.0015	.0011	.0006	.0006	.0004	.0004
	41	Hardened Cast Iron	SFM(Vc)	90	80	130	120	105	140	125	125	115	145	145	130	130	130	115
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	42520	38270	42130	37910	33700	35910	32310	32310	28720	28050	28050	25250	25250	25250	22440
			IPM(FEED)	10	8	14	11	9	14	11	11	9	20	20	16	16	16	13
			Ap	.0004	.0002	.0004	.0002	.0002	.0005	.0003	.0002	.0002	.0010	.0007	.0004	.0004	.0002	.0002

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)

(Depth of Cut per one pass)



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

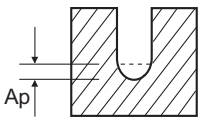
GMF16 SERIES — 2FLUTE BALL NOSE - SLOTTING

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				.020	.020	.024	.024	.024	.024	.024	.024	.024	.024	1/32	1/32	1/32	1/32	1/32
			LBS	5/16	3/8	5/64	1/8	5/32	3/16	1/4	5/16	3/8	1/2	5/64	1/8	5/32	3/16	1/4
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	105	105	210	190	190	190	170	170	125	65	280	280	280	255	255
			IPT(fz)	.0003	.0003	.0006	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0006	.0006
			RPM	20200	20200	33660	30300	30300	30300	26930	26930	20200	10100	34470	34470	34470	31020	31020
			IPM(FEED)	11	11	40	32	32	32	25	25	17	7	49	49	49	40	40
			Ap	.0003	.0002	.0015	.0009	.0009	.0009	.0006	.0003	.0003	.0002	.0028	.0020	.0020	.0011	.0011
	9	Low alloy steel	SFM(Vc)	100	100	200	180	180	180	160	160	120	60	265	265	265	240	240
			IPT(fz)	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006
			RPM	19070	19070	31790	28610	28610	28610	25430	25430	19070	9540	32550	32550	32550	29300	29300
			IPM(FEED)	10	10	33	26	26	26	21	21	14	6	41	41	41	33	33
			Ap	.0002	.0002	.0013	.0007	.0007	.0007	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	105	105	210	190	190	190	170	170	125	65	280	280	280	255	255
			IPT(fz)	.0003	.0003	.0006	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0006	.0006
			RPM	20200	20200	33660	30300	30300	30300	26930	26930	20200	10100	34470	34470	34470	31020	31020
			IPM(FEED)	11	11	40	32	32	32	25	25	17	7	49	49	49	40	40
			Ap	.0003	.0002	.0015	.0009	.0009	.0009	.0006	.0003	.0003	.0002	.0028	.0020	.0020	.0011	.0011
	11.2		SFM(Vc)	100	100	200	180	180	180	160	160	120	60	265	265	265	240	240
			IPT(fz)	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006
			RPM	19070	19070	31790	28610	28610	28610	25430	25430	19070	9540	32550	32550	32550	29300	29300
			IPM(FEED)	10	10	33	26	26	26	21	21	14	6	41	41	41	33	33
			Ap	.0002	.0002	.0013	.0007	.0007	.0007	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	105	105	210	190	190	190	170	170	125	65	280	280	280	255	255
			IPT(fz)	.0003	.0003	.0006	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0006	.0006
			RPM	20200	20200	33660	30300	30300	30300	26930	26930	20200	10100	34470	34470	34470	31020	31020
			IPM(FEED)	11	11	40	32	32	32	25	25	17	7	49	49	49	40	40
			Ap	.0003	.0002	.0015	.0009	.0009	.0009	.0006	.0003	.0003	.0002	.0028	.0020	.0020	.0011	.0011
H	38.1-38.2	Hardened steel	SFM(Vc)	90	90	175	160	160	160	140	140	105	55	235	235	235	210	210
			IPT(fz)	.0003	.0003	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0005	.0005
			RPM	16830	16830	28050	25250	25250	25250	22440	22440	16830	8420	28720	28720	28720	25850	25850
			IPM(FEED)	9	9	27	22	22	22	17	17	11	5	34	34	34	28	28
			Ap	.0002	.0000	.0008	.0005	.0005	.0005	.0003	.0002	.0002	.0001	.0016	.0011	.0011	.0006	.0006
	40	Chilled Cast Iron	SFM(Vc)	100	100	200	180	180	180	160	160	120	60	265	265	265	240	240
			IPT(fz)	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006
			RPM	19070	19070	31790	28610	28610	28610	25430	25430	19070	9540	32550	32550	32550	29300	29300
			IPM(FEED)	10	10	33	26	26	26	21	21	14	6	41	41	41	33	33
			Ap	.0002	.0002	.0013	.0007	.0007	.0007	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
	41	Hardened Cast Iron	SFM(Vc)	90	90	175	160	160	160	140	140	105	55	235	235	235	210	210
			IPT(fz)	.0003	.0003	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0005	.0005
			RPM	16830	16830	28050	25250	25250	25250	22440	22440	16830	8420	28720	28720	28720	25850	25850
			IPM(FEED)	9	9	27	22	22	22	17	17	11	5	34	34	34	28	28
			Ap	.0002	.0000	.0008	.0005	.0005	.0005	.0003	.0002	.0002	.0001	.0016	.0011	.0011	.0006	.0006

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)

(Depth of Cut per one pass)



4G MILL END MILLS

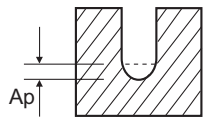
RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				1/32	1/32	3/64	3/64	3/64	3/64	3/64	3/64	3/64	3/64	3/64	3/64	1/16	1/16	1/16
			LBS	5/16	3/8	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	3/4	5/32	1/4	5/16
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	255	225	325	325	325	295	295	295	260	260	260	195	370	370	370
			IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0013	.0013	.0013
			RPM	31020	27580	26510	26510	26510	23860	23860	23860	21210	21210	21210	15900	22580	22580	22580
			IPM(FEED)	40	31	55	55	55	44	44	44	35	35	35	23	59	59	59
			Ap	.0007	.0007	.0042	.0030	.0030	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039
	9	Low alloy steel	SFM(Vc)	240	215	305	305	305	275	275	275	245	245	245	185	350	350	350
			IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0012	.0012	.0012
			RPM	29300	26040	25000	25000	25000	22500	22500	22500	20000	20000	20000	15000	21350	21350	21350
			IPM(FEED)	33	26	46	46	46	37	37	37	29	29	29	19	50	50	50
			Ap	.0006	.0006	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0005	.0005	.0047	.0033	.0033
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	255	225	325	325	325	295	295	295	260	260	260	195	370	370	370
			IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0013	.0013	.0013
			RPM	31020	27580	26510	26510	26510	23860	23860	23860	21210	21210	21210	15900	22580	22580	22580
			IPM(FEED)	40	31	55	55	55	44	44	44	35	35	35	23	59	59	59
			Ap	.0007	.0007	.0042	.0030	.0030	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039
	11.2		SFM(Vc)	240	215	305	305	305	275	275	275	245	245	245	185	350	350	350
			IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0012	.0012	.0012
			RPM	29300	26040	25000	25000	25000	22500	22500	22500	20000	20000	20000	15000	21350	21350	21350
			IPM(FEED)	33	26	46	46	46	37	37	37	29	29	29	19	50	50	50
			Ap	.0006	.0006	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0005	.0005	.0047	.0033	.0033
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	255	225	325	325	325	295	295	295	260	260	260	195	370	370	370
			IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0013	.0013	.0013
			RPM	31020	27580	26510	26510	26510	23860	23860	23860	21210	21210	21210	15900	22580	22580	22580
			IPM(FEED)	40	31	55	55	55	44	44	44	35	35	35	23	59	59	59
			Ap	.0007	.0007	.0042	.0030	.0030	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039
H	38.1-38.2	Hardened steel	SFM(Vc)	210	190	270	270	270	245	245	245	215	215	215	160	310	310	310
			IPT(fz)	.0005	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0011	.0011	.0011
			RPM	25850	22980	22070	22070	22070	19870	19870	19870	17660	17660	17660	13240	18900	18900	18900
			IPM(FEED)	28	22	38	38	38	31	31	31	24	24	24	16	40	40	40
			Ap	.0004	.0004	.0024	.0017	.0017	.0009	.0009	.0009	.0006	.0006	.0004	.0004	.0031	.0022	.0022
	40	Chilled Cast Iron	SFM(Vc)	240	215	305	305	305	275	275	275	245	245	245	185	350	350	350
			IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0012	.0012	.0012
			RPM	29300	26040	25000	25000	25000	22500	22500	22500	20000	20000	20000	15000	21350	21350	21350
			IPM(FEED)	33	26	46	46	46	37	37	37	29	29	29	19	50	50	50
			Ap	.0006	.0006	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0005	.0005	.0047	.0033	.0033
	41	Hardened Cast Iron	SFM(Vc)	210	190	270	270	270	245	245	245	215	215	215	160	310	310	310
			IPT(fz)	.0005	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0011	.0011	.0011
			RPM	25850	22980	22070	22070	22070	19870	19870	19870	17660	17660	17660	13240	18900	18900	18900
			IPM(FEED)	28	22	38	38	38	31	31	31	24	24	24	16	40	40	40
			Ap	.0004	.0004	.0024	.0017	.0017	.0009	.0009	.0009	.0006	.0006	.0004	.0004	.0031	.0022	.0022

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)

(Depth of Cut per one pass)



4G MILL END MILLS

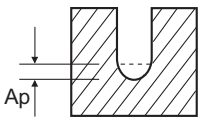
RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				1/16	1/16	1/16	1/16	1/16	5/64	5/64	5/64	5/64	5/64	5/64	5/64	5/64	5/64	5/64
			LBS	3/8	1/2	9/16	5/8	3/4	1/4	5/16	3/8	1/2	9/16	5/8	11/16	3/4	1	1-3/16
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	330	330	330	330	295	370	370	370	335	335	335	335	335	295	225
			IPT(fz)	.0012	.0012	.0012	.0012	.0010	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0014
			RPM	20320	20320	20320	20320	18070	18140	18140	18140	16330	16330	16330	16330	16330	14510	10890
			IPM(FEED)	48	48	48	48	38	71	71	71	58	58	58	58	58	46	30
			Ap	.0022	.0022	.0014	.0014	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0018	.0018	.0011
	9	Low alloy steel	SFM(Vc)	315	315	315	315	280	350	350	350	315	315	315	315	315	280	210
			IPT(fz)	.0011	.0011	.0011	.0011	.0009	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0012
			RPM	19220	19220	19220	19220	17080	17130	17130	17130	15420	15420	15420	15420	15420	13710	10280
			IPM(FEED)	41	41	41	41	32	60	60	60	49	49	49	49	49	39	25
			Ap	.0019	.0019	.0012	.0012	.0012	.0041	.0041	.0041	.0024	.0024	.0024	.0015	.0015	.0015	.0009
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	330	330	330	330	295	370	370	370	335	335	335	335	335	295	225
			IPT(fz)	.0012	.0012	.0012	.0012	.0010	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0014
			RPM	20320	20320	20320	20320	18070	18140	18140	18140	16330	16330	16330	16330	16330	14510	10890
			IPM(FEED)	48	48	48	48	38	71	71	71	58	58	58	58	58	46	30
			Ap	.0022	.0022	.0014	.0014	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0018	.0018	.0011
	11.2		SFM(Vc)	315	315	315	315	280	350	350	350	315	315	315	315	315	280	210
			IPT(fz)	.0011	.0011	.0011	.0011	.0009	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0012
			RPM	19220	19220	19220	19220	17080	17130	17130	17130	15420	15420	15420	15420	15420	13710	10280
			IPM(FEED)	41	41	41	41	32	60	60	60	49	49	49	49	49	39	25
			Ap	.0019	.0019	.0012	.0012	.0012	.0041	.0041	.0041	.0024	.0024	.0024	.0015	.0015	.0015	.0009
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	330	330	330	330	295	370	370	370	335	335	335	335	335	295	225
			IPT(fz)	.0012	.0012	.0012	.0012	.0010	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0014
			RPM	20320	20320	20320	20320	18070	18140	18140	18140	16330	16330	16330	16330	16330	14510	10890
			IPM(FEED)	48	48	48	48	38	71	71	71	58	58	58	58	58	46	30
			Ap	.0022	.0022	.0014	.0014	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0018	.0018	.0011
H	38.1-38.2	Hardened steel	SFM(Vc)	280	280	280	280	245	310	310	310	280	280	280	280	280	245	185
			IPT(fz)	.0010	.0010	.0010	.0010	.0008	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0014	.0012
			RPM	17010	17010	17010	17010	15120	15120	15120	15120	13610	13610	13610	13610	13610	12090	9070
			IPM(FEED)	33	33	33	33	26	51	51	51	41	41	41	41	41	33	22
			Ap	.0013	.0013	.0008	.0008	.0008	.0027	.0027	.0027	.0016	.0016	.0016	.0010	.0010	.0010	.0006
	40	Chilled Cast Iron	SFM(Vc)	315	315	315	315	280	350	350	350	315	315	315	315	315	280	210
			IPT(fz)	.0011	.0011	.0011	.0011	.0009	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0012
			RPM	19220	19220	19220	19220	17080	17130	17130	17130	15420	15420	15420	15420	15420	13710	10280
			IPM(FEED)	41	41	41	41	32	60	60	60	49	49	49	49	49	39	25
			Ap	.0019	.0019	.0012	.0012	.0012	.0041	.0041	.0041	.0024	.0024	.0024	.0015	.0015	.0015	.0009
	41	Hardened Cast Iron	SFM(Vc)	280	280	280	280	245	310	310	310	280	280	280	280	280	245	185
			IPT(fz)	.0010	.0010	.0010	.0010	.0008	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0014	.0012
			RPM	17010	17010	17010	17010	15120	15120	15120	15120	13610	13610	13610	13610	13610	12090	9070
			IPM(FEED)	33	33	33	33	26	51	51	51	41	41	41	41	41	33	22
			Ap	.0013	.0013	.0008	.0008	.0008	.0027	.0027	.0027	.0016	.0016	.0016	.0010	.0010	.0010	.0006

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)

(Depth of Cut per one pass)



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				3/32	3/32	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16
			LBS	3/8	3/4	5/16	3/8	1/2	9/16	5/8	11/16	3/4	1	1-3/16	1-3/8	3/8	1/2	9/16	5/8
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	405	365	425	425	425	425	425	380	380	380	380	340	405	405	405	405
			IPT(fz)	.0024	.0022	.0029	.0029	.0029	.0029	.0029	.0027	.0027	.0027	.0027	.0024	.0039	.0039	.0039	.0039
			RPM	16590	14930	12940	12940	12940	12940	12940	11650	11650	11650	11650	10360	8230	8230	8230	8230
			IPM(FEED)	80	64	76	76	76	76	76	62	62	62	62	49	65	65	65	65
			Ap	.0059	.0034	.0113	.0113	.0079	.0079	.0079	.0045	.0045	.0045	.0028	.0028	.0169	.0169	.0169	.0118
	9	Low alloy steel	SFM(Vc)	385	345	400	400	400	400	400	360	360	360	360	320	385	385	385	385
			IPT(fz)	.0021	.0019	.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0024	.0021	.0035	.0035	.0035	.0035
			RPM	15640	14080	12190	12190	12190	12190	12190	10970	10970	10970	10970	9750	7810	7810	7810	7810
			IPM(FEED)	66	54	64	64	64	64	64	52	52	52	52	41	55	55	55	55
			Ap	.0049	.0028	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0037	.0024	.0024	.0141	.0141	.0141	.0098
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	405	365	425	425	425	425	425	380	380	380	380	340	405	405	405	405
			IPT(fz)	.0024	.0022	.0029	.0029	.0029	.0029	.0029	.0027	.0027	.0027	.0027	.0024	.0039	.0039	.0039	.0039
			RPM	16590	14930	12940	12940	12940	12940	12940	11650	11650	11650	11650	10360	8230	8230	8230	8230
			IPM(FEED)	80	64	76	76	76	76	76	62	62	62	62	49	65	65	65	65
			Ap	.0059	.0034	.0113	.0113	.0079	.0079	.0079	.0045	.0045	.0045	.0028	.0028	.0169	.0169	.0169	.0118
	11.2		SFM(Vc)	385	345	400	400	400	400	400	360	360	360	360	320	385	385	385	385
			IPT(fz)	.0021	.0019	.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0024	.0021	.0035	.0035	.0035	.0035
			RPM	15640	14080	12190	12190	12190	12190	12190	10970	10970	10970	10970	9750	7810	7810	7810	7810
			IPM(FEED)	66	54	64	64	64	64	64	52	52	52	52	41	55	55	55	55
			Ap	.0049	.0028	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0037	.0024	.0024	.0141	.0141	.0141	.0098
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	405	365	425	425	425	425	425	380	380	380	380	340	405	405	405	405
			IPT(fz)	.0024	.0022	.0029	.0029	.0029	.0029	.0029	.0027	.0027	.0027	.0027	.0024	.0039	.0039	.0039	.0039
			RPM	16590	14930	12940	12940	12940	12940	12940	11650	11650	11650	11650	10360	8230	8230	8230	8230
			IPM(FEED)	80	64	76	76	76	76	76	62	62	62	62	49	65	65	65	65
			Ap	.0059	.0034	.0113	.0113	.0079	.0079	.0079	.0045	.0045	.0045	.0028	.0028	.0169	.0169	.0169	.0118
H	38.1-38.2	Hardened steel	SFM(Vc)	340	305	350	350	350	350	350	315	315	315	315	280	340	340	340	340
			IPT(fz)	.0019	.0018	.0025	.0025	.0025	.0025	.0025	.0022	.0022	.0022	.0022	.0020	.0033	.0033	.0033	.0033
			RPM	13860	12470	10770	10770	10770	10770	10770	9690	9690	9690	9690	8620	6890	6890	6890	6890
			IPM(FEED)	54	44	53	53	53	53	53	43	43	43	43	34	46	46	46	46
			Ap	.0033	.0019	.0063	.0063	.0044	.0044	.0044	.0025	.0025	.0025	.0016	.0016	.0094	.0094	.0094	.0066
	40	Chilled Cast Iron	SFM(Vc)	385	345	400	400	400	400	400	360	360	360	360	320	385	385	385	385
			IPT(fz)	.0021	.0019	.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0024	.0021	.0035	.0035	.0035	.0035
			RPM	15640	14080	12190	12190	12190	12190	12190	10970	10970	10970	10970	9750	7810	7810	7810	7810
			IPM(FEED)	66	54	64	64	64	64	64	52	52	52	52	41	55	55	55	55
			Ap	.0049	.0028	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0037	.0024	.0024	.0141	.0141	.0141	.0098
	41	Hardened Cast Iron	SFM(Vc)	340	305	350	350	350	350	350	315	315	315	315	280	340	340	340	340
			IPT(fz)	.0019	.0018	.0025	.0025	.0025	.0025	.0025	.0022	.0022	.0022	.0022	.0020	.0033	.0033	.0033	.0033
			RPM	13860	12470	10770	10770	10770	10770	10770	9690	9690	9690	9690	8620	6890	6890	6890	6890
			IPM(FEED)	54	44	53	53	53	53	53	43	43	43	43	34	46	46	46	46
			Ap	.0033	.0019	.0063	.0063	.0044	.0044	.0044	.0025	.0025	.0025	.0016	.0016	.0094	.0094	.0094	.0066

SFM = Surface Feet per Minute
RPM = Revolutions Per Minute
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Ap : Inch (Axial Depth of Cut)
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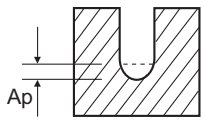
(Depth of Cut per one pass)



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				3/16	3/16	3/16	3/16	3/16	3/16	13/64	1/4	1/4	5/16	5/16	3/8	3/8	3/8	1/2	1/2
			LBS	11/16	3/4	1	1-3/16	1-3/8	1-1/2	13/64	3/4	1-3/16	1	1-3/8	1-3/16	1-3/16	1-1/2	1-1/4	1-1/4
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	405	405	365	365	365	365	355	400	400	400	400	395	395	395	395	395
			IPT(fz)	.0039	.0039	.0035	.0035	.0035	.0035	.0042	.0058	.0058	.0073	.0073	.0084	.0084	.0084	.0094	.0094
			RPM	8230	8230	7410	7410	7410	7410	6720	6140	6140	4890	4890	4040	4040	4040	3020	3020
			IPM(FEED)	65	65	53	53	53	53	57	71	71	72	72	68	68	68	57	57
			Ap	.0118	.0118	.0067	.0067	.0067	.0067	.0073	.0225	.0157	.0197	.0197	.0236	.0236	.0236	.0450	.0450
	9	Low alloy steel	SFM(Vc)	385	385	345	345	345	345	340	385	385	380	380	380	380	380	375	375
			IPT(fz)	.0035	.0035	.0032	.0032	.0032	.0032	.0035	.0051	.0051	.0064	.0064	.0075	.0075	.0075	.0084	.0084
			RPM	7810	7810	7030	7030	7030	7030	6370	5860	5860	4640	4640	3860	3860	3860	2880	2880
			IPM(FEED)	55	55	45	45	45	45	45	60	60	60	60	58	58	58	48	48
			Ap	.0098	.0098	.0056	.0056	.0056	.0056	.0061	.0187	.0131	.0164	.0164	.0197	.0197	.0197	.0375	.0375
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	405	405	365	365	365	365	355	400	400	400	400	395	395	395	395	395
			IPT(fz)	.0039	.0039	.0035	.0035	.0035	.0035	.0042	.0058	.0058	.0073	.0073	.0084	.0084	.0084	.0094	.0094
			RPM	8230	8230	7410	7410	7410	7410	6720	6140	6140	4890	4890	4040	4040	4040	3020	3020
			IPM(FEED)	65	65	53	53	53	53	57	71	71	72	72	68	68	68	57	57
			Ap	.0118	.0118	.0067	.0067	.0067	.0067	.0073	.0225	.0157	.0197	.0197	.0236	.0236	.0236	.0450	.0450
	11.2		SFM(Vc)	385	385	345	345	345	345	340	385	385	380	380	380	380	380	375	375
			IPT(fz)	.0035	.0035	.0032	.0032	.0032	.0032	.0035	.0051	.0051	.0064	.0064	.0075	.0075	.0075	.0084	.0084
			RPM	7810	7810	7030	7030	7030	7030	6370	5860	5860	4640	4640	3860	3860	3860	2880	2880
			IPM(FEED)	55	55	45	45	45	45	45	60	60	60	60	58	58	58	48	48
			Ap	.0098	.0098	.0056	.0056	.0056	.0056	.0061	.0187	.0131	.0164	.0164	.0197	.0197	.0197	.0375	.0375
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	405	405	365	365	365	365	355	400	400	400	400	395	395	395	395	395
			IPT(fz)	.0039	.0039	.0035	.0035	.0035	.0035	.0042	.0058	.0058	.0073	.0073	.0084	.0084	.0084	.0094	.0094
			RPM	8230	8230	7410	7410	7410	7410	6720	6140	6140	4890	4890	4040	4040	4040	3020	3020
			IPM(FEED)	65	65	53	53	53	53	57	71	71	72	72	68	68	68	57	57
			Ap	.0118	.0118	.0067	.0067	.0067	.0067	.0073	.0225	.0157	.0197	.0197	.0236	.0236	.0236	.0450	.0450
H	38.1-38.2	Hardened steel	SFM(Vc)	340	340	305	305	305	305	295	340	340	330	330	330	330	330	325	325
			IPT(fz)	.0033	.0033	.0030	.0030	.0030	.0030	.0036	.0048	.0048	.0063	.0063	.0074	.0074	.0074	.0082	.0082
			RPM	6890	6890	6200	6200	6200	6200	5580	5200	5200	4030	4030	3360	3360	3360	2500	2500
			IPM(FEED)	46	46	37	37	37	37	40	49	49	51	51	50	50	50	41	41
			Ap	.0066	.0066	.0037	.0037	.0037	.0037	.0041	.0125	.0087	.0109	.0190	.0131	.0131	.0131	.0250	.0250
	40	Chilled Cast Iron	SFM(Vc)	385	385	345	345	345	345	340	385	385	380	380	380	380	380	375	375
			IPT(fz)	.0035	.0035	.0032	.0032	.0032	.0032	.0035	.0051	.0051	.0064	.0064	.0075	.0075	.0075	.0084	.0084
			RPM	7810	7810	7030	7030	7030	7030	6370	5860	5860	4640	4640	3860	3860	3860	2880	2880
			IPM(FEED)	55	55	45	45	45	45	45	60	60	60	60	58	58	58	48	48
			Ap	.0098	.0098	.0056	.0056	.0056	.0056	.0061	.0187	.0131	.0164	.0164	.0197	.0197	.0197	.0375	.0375
	41	Hardened Cast Iron	SFM(Vc)	340	340	305	305	305	305	295	340	340	330	330	330	330	330	325	325
			IPT(fz)	.0033	.0033	.0030	.0030	.0030	.0030	.0036	.0048	.0048	.0063	.0063	.0074	.0074	.0074	.0082	.0082
			RPM	6890	6890	6200	6200	6200	6200	5580	5200	5200	4030	4030	3360	3360	3360	2500	2500
			IPM(FEED)	46	46	37	37	37	37	40	49	49	51	51	50	50	50	41	41
			Ap	.0066	.0066	.0037	.0037	.0037	.0037	.0041	.0125	.0087	.0109	.0190	.0131	.0131	.0131	.0250	.0250

SFM = Surface Feet per Minute
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(Depth of Cut per one pass)