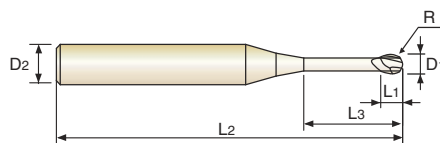



CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- ▶ Excellent performance when cutting steels, up to HRC55



P.522~524

R≤1/8

R>1/8

Unit : inch

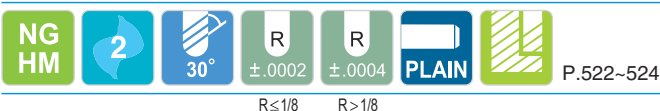
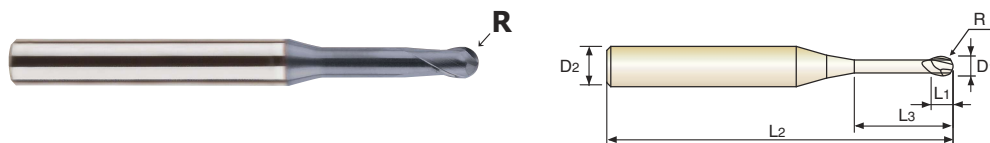
EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length
	R	D1	D2	L1	L3	L2
GMF16901	R.004	.008	3/16	.008	1/64	1-1/2
GMF16902	R.004	.008	3/16	.008	3/64	1-1/2
GMF16903	R.006	.012	3/16	.010	3/64	1-1/2
GMF16904	R.006	.012	3/16	.010	5/64	1-1/2
GMF16905	R.006	.012	3/16	.010	1/8	1-1/2
GMF16906	R.0075	.015	3/16	1/64	3/64	1-1/2
GMF16907	R.0075	.015	3/16	1/64	5/64	1-1/2
GMF16908	R.0075	.015	3/16	1/64	1/8	1-1/2
GMF16909	R.0075	.015	3/16	1/64	5/32	1-1/2
GMF16910	R.010	.020	3/16	1/64	3/64	1-3/4
GMF16911	R.010	.020	3/16	1/64	5/64	1-3/4
GMF16912	R.010	.020	3/16	1/64	1/8	1-3/4
GMF16913	R.010	.020	3/16	1/64	5/32	1-3/4
GMF16914	R.010	.020	3/16	1/64	3/16	1-3/4
GMF16915	R.010	.020	3/16	1/64	1/4	1-3/4
GMF16916	R.010	.020	3/16	1/64	5/16	1-3/4
GMF16917	R.010	.020	3/16	1/64	3/8	1-3/4
GMF16918	R.012	.024	3/16	1/32	5/64	1-3/4
GMF16919	R.012	.024	3/16	1/32	1/8	1-3/4
GMF16920	R.012	.024	3/16	1/32	5/32	1-3/4
GMF16921	R.012	.024	3/16	1/32	3/16	1-3/4
GMF16922	R.012	.024	3/16	1/32	1/4	1-3/4
GMF16923	R.012	.024	3/16	1/32	5/16	1-3/4
GMF16924	R.012	.024	3/16	1/32	3/8	1-3/4
GMF16925	R.012	.024	3/16	1/32	1/2	1-3/4
GMF16002	R1/64	1/32	3/16	1/32	5/64	1-3/4
GMF16926	R1/64	1/32	3/16	1/32	1/8	1-3/4
GMF16927	R1/64	1/32	3/16	1/32	5/32	1-3/4
GMF16928	R1/64	1/32	3/16	1/32	3/16	1-3/4
GMF16929	R1/64	1/32	3/16	1/32	1/4	1-3/4
GMF16930	R1/64	1/32	3/16	1/32	5/16	1-3/4
GMF16931	R1/64	1/32	3/16	1/32	3/8	1-3/4

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70							
○	◎	◎	◎	○				○				

CARBIDE, 2 FLUTE BALL NOSE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- ▶ Excellent performance when cutting steels, up to HRC55



R ≤ 1/8 R > 1/8

Unit : inch

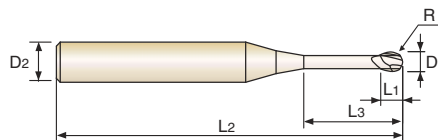
EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2
GMF16003	R.0234	3/64	3/16	3/64	1/8	2
GMF16932	R.0234	3/64	3/16	3/64	5/32	2
GMF16933	R.0234	3/64	3/16	3/64	3/16	2
GMF16934	R.0234	3/64	3/16	3/64	1/4	2
GMF16935	R.0234	3/64	3/16	3/64	5/16	2
GMF16936	R.0234	3/64	3/16	3/64	3/8	2
GMF16937	R.0234	3/64	3/16	3/64	1/2	2
GMF16938	R.0234	3/64	3/16	3/64	9/16	2
GMF16939	R.0234	3/64	3/16	3/64	5/8	2
GMF16940	R.0234	3/64	3/16	3/64	3/4	2
GMF16004	R1/32	1/16	3/16	1/16	5/32	2
GMF16941	R1/32	1/16	3/16	1/16	1/4	2
GMF16942	R1/32	1/16	3/16	1/16	5/16	2
GMF16943	R1/32	1/16	3/16	1/16	3/8	2
GMF16944	R1/32	1/16	3/16	1/16	1/2	2
GMF16945	R1/32	1/16	3/16	1/16	9/16	2
GMF16946	R1/32	1/16	3/16	1/16	5/8	2
GMF16947	R1/32	1/16	3/16	1/16	3/4	2
GMF16005	R.0391	5/64	3/16	5/64	1/4	2
GMF16948	R.0391	5/64	3/16	5/64	5/16	2
GMF16949	R.0391	5/64	3/16	5/64	3/8	2
GMF16950	R.0391	5/64	3/16	5/64	1/2	2
GMF16951	R.0391	5/64	3/16	5/64	9/16	2
GMF16952	R.0391	5/64	3/16	5/64	5/8	2
GMF16953	R.0391	5/64	3/16	5/64	11/16	2
GMF16954	R.0391	5/64	3/16	5/64	3/4	2
GMF16955	R.0391	5/64	3/16	5/64	1	2-3/8
GMF16956	R.0391	5/64	3/16	5/64	1-3/16	2-3/4
GMF16006	R3/64	3/32	3/16	3/32	3/8	2
GMF16957	R3/64	3/32	3/16	3/32	3/4	2
GMF16008	R1/16	1/8	1/4	1/8	5/16	2
GMF16958	R1/16	1/8	1/4	1/8	3/8	2

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
○	◎	◎	◎	○				○				


CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
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**NG
HM**
2
30°
R
±.0002

R
±.0004

PLAIN


P.522~524

R≤1/8

R>1/8

Unit : inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length
	R	D1	D2	L1	L3	L2
GMF16959	R1/16	1/8	1/4	1/8	1/2	2
GMF16960	R1/16	1/8	1/4	1/8	9/16	2-3/8
GMF16961	R1/16	1/8	1/4	1/8	5/8	2-3/8
GMF16962	R1/16	1/8	1/4	1/8	11/16	2-3/8
GMF16963	R1/16	1/8	1/4	1/8	3/4	2-3/8
GMF16964	R1/16	1/8	1/4	1/8	1	2-3/4
GMF16965	R1/16	1/8	1/4	1/8	1-3/16	2-3/4
GMF16966	R1/16	1/8	1/4	1/8	1-3/8	2-3/4
GMF16012	R3/32	3/16	1/4	5/32	3/8	2
GMF16967	R3/32	3/16	1/4	5/32	1/2	2
GMF16968	R3/32	3/16	1/4	5/32	9/16	2-3/8
GMF16969	R3/32	3/16	1/4	5/32	5/8	2-3/8
GMF16970	R3/32	3/16	1/4	5/32	11/16	2-3/8
GMF16971	R3/32	3/16	1/4	5/32	3/4	2-3/8
GMF16972	R3/32	3/16	1/4	5/32	1	2-3/4
GMF16973	R3/32	3/16	1/4	5/32	1-3/16	2-3/4
GMF16974	R3/32	3/16	1/4	5/32	1-3/8	2-3/4
GMF16975	R3/32	3/16	1/4	5/32	1-1/2	3-1/8
GMF16013	R.102	13/64	1/4	1/4	1-3/16	2-3/4
GMF16016	R1/8	1/4	1/4	5/16	3/4	2-3/8
GMF16976	R1/8	1/4	1/4	5/16	1-3/16	2-3/8
GMF16020	R5/32	5/16	5/16	3/8	1	2-3/4
GMF16977	R5/32	5/16	5/16	9/16	1-3/8	4
GMF16024	R3/16	3/8	3/8	1/2	1-3/16	3
GMF16978	R3/16	3/8	3/8	11/16	1-3/16	4
GMF16979	R3/16	3/8	3/8	11/16	1-1/2	4
GMF16032	R1/4	1/2	1/2	9/16	1-1/4	3-1/8
GMF16980	R1/4	1/2	1/2	7/8	1-1/4	4-1/4

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0005	h6
over Ø1/4	±.0004	0~-.0006	

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70							
○	◎	◎	◎	○				○				


CARBIDE, 2 FLUTE BALL NOSE WITH NECK
GMF16 SERIES

MATERIAL		NON-ALLOYED STEELS ALLOY STEELS CAST IRON			ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS		
HARDNESS		~ HRc 35			HRc 35 ~ HRc 45			HRc 45 ~ HRc 55		
STRENGTH		~ 1100N/mm ²			1110 ~ 1500N/mm ²			1500 ~ 2000N/mm ²		
DIA.	LBS	RPM	FEED	Ap(inch)	RPM	FEED	Ap(inch)	RPM	FEED	Ap(inch)
1/16	5/32	22580	58.9	.0056	21350	50.4	.0047	18900	40.0	.0031
1/16	1/4	22580	58.9	.0039	21350	50.4	.0033	18900	40.0	.0022
1/16	5/16	22580	58.9	.0039	21350	50.4	.0033	18900	40.0	.0022
1/16	3/8	20320	47.6	.0022	19220	40.8	.0019	17010	32.5	.0013
1/16	1/2	20320	47.6	.0022	19220	40.8	.0019	17010	32.5	.0013
1/16	9/16	20320	47.6	.0014	19220	40.8	.0012	17010	32.5	.0008
1/16	5/8	20320	47.6	.0014	19220	40.8	.0012	17010	32.5	.0008
1/16	3/4	18070	37.6	.0014	17080	32.3	.0012	15120	25.6	.0008
5/64	1/4	18140	71.3	.0049	17130	60.4	.0041	15120	50.9	.0027
5/64	5/16	18140	71.3	.0049	17130	60.4	.0041	15120	51.0	.0027
5/64	3/8	18140	71.3	.0049	17130	60.4	.0041	15120	51.0	.0027
5/64	1/2	16330	57.7	.0028	15420	49.0	.0024	13610	41.3	.0016
5/64	9/16	16330	57.7	.0028	15420	49.0	.0024	13610	41.3	.0016
5/64	5/8	16330	57.7	.0028	15420	49.0	.0024	13610	41.3	.0016
5/64	11/16	16330	57.7	.0018	15420	49.0	.0015	13610	41.3	.0010
5/64	3/4	16330	57.7	.0018	15420	49.0	.0015	13610	41.3	.0010
5/64	1	14510	45.7	.0018	13710	38.8	.0015	12090	32.7	.0010
5/64	1-3/16	10890	29.9	.0011	10280	25.4	.0009	9070	21.5	.0006
3/32	3/8	16590	79.5	.0059	15640	66.3	.0049	13860	53.9	.0033
3/32	3/4	14930	64.4	.0034	14080	53.7	.0028	12470	43.7	.0019
1/8	5/16	12940	76.2	.0113	12190	64.4	.0094	10770	53.4	.0063
1/8	3/8	12940	76.2	.0113	12190	64.4	.0094	10770	53.4	.0063
1/8	1/2	12940	76.2	.0079	12190	64.4	.0066	10770	53.4	.0044
1/8	9/16	12940	76.2	.0079	12190	64.4	.0066	10770	53.4	.0044
1/8	5/8	12940	76.2	.0079	12190	64.4	.0066	10770	53.4	.0044
1/8	11/16	11650	61.8	.0045	10970	52.2	.0037	9690	43.3	.0025
1/8	3/4	11650	61.8	.0045	10970	52.2	.0037	9690	43.3	.0025
1/8	1	11650	61.8	.0045	10970	52.2	.0037	9690	43.3	.0025
1/8	1-3/16	11650	61.8	.0028	10970	52.2	.0024	9690	43.3	.0016
1/8	1-3/8	10360	48.8	.0028	9750	41.1	.0024	8620	34.3	.0016
3/16	3/8	8230	65.0	.0169	7810	55.3	.0141	6890	46.1	.0094
3/16	1/2	8230	65.0	.0169	7810	55.3	.0141	6890	46.1	.0094
3/16	9/16	8230	65.0	.0169	7810	55.3	.0141	6890	46.1	.0094
3/16	5/8	8230	65.0	.0118	7810	55.3	.0098	6890	46.1	.0066
3/16	11/16	8230	65.0	.0118	7810	55.3	.0098	6890	46.1	.0066
3/16	3/4	8230	65.0	.0118	7810	55.3	.0098	6890	46.1	.0066
3/16	1	7410	52.6	.0067	7030	44.7	.0056	6200	37.4	.0037
3/16	1-3/16	7410	52.6	.0067	7030	44.7	.0056	6200	37.4	.0037
3/16	1-3/8	7410	52.6	.0067	7030	44.7	.0056	6200	37.4	.0037
3/16	1-1/2	7410	52.6	.0067	7030	44.7	.0056	6200	37.4	.0037
13/64	1-3/16	6720	57.1	.0073	6370	44.9	.0061	5580	39.8	.0041
1/4	3/4	6140	70.7	.0225	5860	59.5	.0187	5200	49.4	.0125

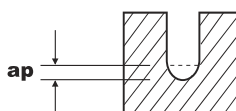
 DIA. = Diameter
 LBS = Length Below Shank

 RPM = rev./min.
 FEED = inch/min.

CARBIDE, 2 FLUTE BALL NOSE WITH NECK
GMF16 SERIES

MATERIAL		NON-ALLOYED STEELS ALLOY STEELS CAST IRON			ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS		
HARDNESS		~ HRc 35			HRc 35 ~ HRc 45			HRc 45 ~ HRc 55		
STRENGTH		~ 1100N/mm ²			1110 ~ 1500N/mm ²			1500 ~ 2000N/mm ²		
DIA.	LBS	RPM	FEED	Ap(inch)	RPM	FEED	Ap(inch)	RPM	FEED	Ap(inch)
1/4	1-3/16	6140	70.7	.0157	5860	59.5	.0131	5200	49.4	.0087
5/16	1	4890	71.5	.0197	4640	59.5	.0164	4030	50.8	.0109
5/16	1-3/8	4890	71.5	.0197	4640	59.5	.0164	4030	50.8	.0109
3/8	1-3/16	4040	68.1	.0236	3860	57.9	.0197	3360	49.6	.0131
3/8	1-3/16	4040	68.1	.0236	3860	57.9	.0197	3360	49.6	.0131
3/8	1-1/2	4040	68.1	.0236	3860	57.9	.0197	3360	49.6	.0131
1/2	1-1/4	3020	56.5	.0450	2880	48.4	.0375	2500	40.9	.0250
1/2	1-1/4	3020	56.5	.0450	2880	48.4	.0375	2500	40.9	.0250

(Depth of Cut per one pass)

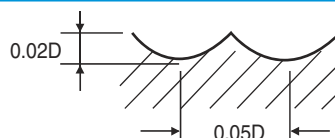


DIA. = Diameter
LBS = Length Below Shank

RPM = rev./min.
FEED = inch/min.

CARBIDE, 2 FLUTE BALL NOSE
GMF17 SERIES

MATERIAL		NON-ALLOYED STEELS ALLOY STEELS CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS		~ HRc 35		HRc 35 ~ HRc 45		HRc 45 ~ HRc 55	
STRENGTH		~ 1100N/mm ²		1110 ~ 1500N/mm ²		1500 ~ 2000N/mm ²	
DIAMETER		RPM	FEED	RPM	FEED	RPM	FEED
R1/16 × 1/8		22700	202.0	16540	144.3	15120	135.8
R3/32 × 3/16		17600	224.4	13020	152.6	12250	143.5
R1/8 × 1/4		14400	231.3	11530	167.3	10490	142.5
R5/32 × 5/16		11400	208.3	9270	157.9	8390	132.9
R3/16 × 3/8		9600	189.8	7720	142.5	6990	118.7
R1/4 × 1/2		7200	158.5	5790	118.7	5230	89.4



RPM = rev./min.
FEED = inch/min.