

TABLE I

PART NUMBER	Ø A		Ø A' MIN		Ø D		Ø E MAX		F WRENCH FLATS		(G)		(H)		(L)		R RAD MAX		S MAX		(T HEX ACROSS FLATS)	
	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm
MBF2112-5-()	.332 .325	8.43 8.25	.296	7.52	.1645 .1625	4.178 4.128	.1640	4.166	.085 .080	2.16 2.03	.017	0.43	.070	1.78	.512	13.00	.030	0.76	.015	0.38	.375	9.52
MBF2112-6-()	.385 .378	9.78 9.60	.342	8.69	.1985 .1965	5.042 4.991	.1985	5.042	.113 .108	2.87 2.74	.027	0.68	.077	1.96	.575	14.61	.030	0.76	.019	0.48	.375	9.52
MBF2112-7-()	.416 .409	10.57 10.39	.373	9.47	.2275 .2255	5.778 5.728	.2275	5.778	.121 .116	3.07 2.95	.035	0.89	.077	1.96	.635	16.13	.030	0.76	.020	0.51	.375	9.52
MBF2112-8-()	.507 .499	12.88 12.67	.463	11.76	.2595 .2575	6.591 6.541	.2595	6.591	.135 .130	3.43 3.30	.055	1.40	.104	2.64	.700	17.78	.030	0.76	.020	0.51	.375	9.52
MBF2112-9-()	.538 .530	13.66 13.46	.494	12.55	.2895 .2875	7.353 7.303	.2895	7.353	.152 .147	3.86 3.73	.065	1.65	.104	2.64	.815	20.70	.030	0.76	.020	0.51	.500	12.70
MBF2112-10-()	.635 .626	16.13 15.90	.577	14.66	.3115 .3095	7.912 7.861	.3110	7.899	.152 .147	3.86 3.73	.070	1.78	.136	3.45	.892	22.66	.040	1.02	.026	0.66	.500	12.70
MBF2112-11-()	.666 .657	16.92 16.69	.608	15.44	.3435 .3415	8.725 8.674	.3433	8.720	.185 .180	4.70 4.57	.075	1.90	.136	3.45	.941	23.90	.040	1.02	.026	0.66	.500	12.70
MBF2112-12-()	.762 .752	19.35 19.10	.696	17.68	.3745 .3725	9.512 9.462	.3740	9.500	.185 .180	4.70 4.57	.080	2.03	.162	4.11	1.090	27.69	.040	1.02	.029	0.74	.500	12.70

TABLE I (CONTINUED)

PART NUMBER	MIN AVAILABLE GRIP DASH NO.	INSTALLED DIMENSIONS Δ						MECHANICAL PROPERTIES						V (GAGE PROTRUSION)		Ø W (GAGE)			
		RECOM. HOLE SIZE		Ø J MIN		K MAX		BREAK-OFF LIMITS		TENSILE STRUCTURAL FAILURE MIN		DOUBLE SHEAR MIN						LOCKING TORQUE MIN	
		INCH	mm	INCH	mm	INCH	mm	INCH	mm	LBS	N	LBS	N	IN-LBS	N-m	INCH	mm	INCH	mm
MBF2112-5-()	-150	.168 .165	4.27 4.19	.250	6.35	.300	7.62	+.103 -0.00	+2.62 -0.00	900	4000	3150	14010	1.0	0.113	.0207 .0174	0.526 0.442	.2832 .2830	7.193 7.188
MBF2112-6-()	-150	.202 .199	5.13 5.05	.300	7.62	.350	8.89	+.103 -0.00	+2.62 -0.00	1400	6230	4600	20460	1.5	0.170	.0245 .0212	0.622 0.538	.3272 .3270	8.311 8.306
MBF2112-7-()	-150	.231 .228	5.88 5.79	.350	8.89	.400	10.16	+.103 -0.00	+2.62 -0.00	1600	7120	6050	26910	2.0	0.226	.0358 .0324	0.909 0.823	.3315 .3313	8.420 8.415
MBF2112-8-()	-200	.263 .260	6.68 6.60	.400	10.16	.450	11.43	+.103 -0.00	+2.62 -0.00	2100	9340	7900	35140	2.5	0.282	.0318 .0279	0.808 0.709	.4320 .4318	10.973 10.968
MBF2112-9-()	-200	.293 .290	7.44 7.37	.450	11.43	.500	12.70	+.103 -0.00	+2.62 -0.00	2600	11565	9800	43590	3.0	0.339	.0441 .0407	1.120 1.034	.4320 .4318	10.973 10.968
MBF2112-10-()	-250	.315 .312	8.00 7.92	.475	12.06	.550	13.97	+.103 -0.00	+2.62 -0.00	3600	16010	11350	50480	3.5	0.400	.0405 .0365	1.029 0.927	.5389 .5385	13.688 13.678
MBF2112-11-()	-250	.347 .344	8.81 8.74	.525	13.33	.575	14.60	+.103 -0.00	+2.62 -0.00	4400	19570	13850	61600	4.0	0.452	.0539 .0500	1.369 1.270	.5389 .5385	13.688 13.678
MBF2112-12-()	-250	.378 .375	9.60 9.52	.575	14.60	.625	15.87	+.103 -0.00	+2.62 -0.00	5000	22240	16450	73170	4.0	0.452	.0458 .0415	1.163 1.054	.6532 .6528	16.591 16.581

MONOGRAM AEROSPACE FASTENERS
a TriMas company
3423 SOUTH GARFIELD AVENUE
COMMERCE, CALIFORNIA 90040
(323) 722-4760 FAX (323) 727-1029

TITLE:
**BLIND FASTENER, 100° FLUSH HEAD
FOR ADVANCED COMPOSITE MATERIALS
TITANIUM**

DRAWING NO:
MBF2112()-()-()

DRAWN BY: **A PEREZ** DRAWN DATE: **07/01/13**

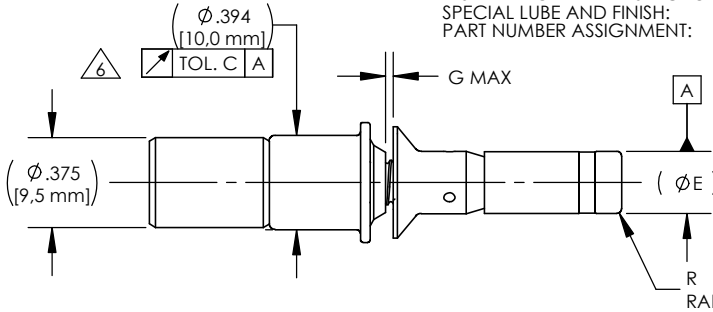
APPROVED BY: _____ CHECKED DATE: _____

PROPRIETARY AND CONFIDENTIAL:
NOTICE: THIS DRAWING IS PART OF THE PROPRIETARY ARTICLE HEREIN DISCLOSED, OWNED BY MONOGRAM AEROSPACE FASTENERS. ANY PARTY BY ACCEPTING THIS DOCUMENT ASSUME CUSTODY THEREOF AND AGREES:
A: THE INFORMATION SET FORTH HEREIN IS GIVEN IN CONFIDENCE AND THIS DOCUMENT WILL NOT BE COPIED OR REPRODUCED IN WHOLE OR IN PART, NOR ITS CONTENTS REVEALED IN ANY MANNER TO ANY PERSON EXCEPT TO MEET THE PURPOSE FOR WHICH IT WAS DELIVERED.
B: WITHOUT THE WRITTEN CONSENT OF MONOGRAM AEROSPACE FASTENERS, THIS DOCUMENT AND THE INFORMATION CONTAINED HEREIN UNDER NO CIRCUMSTANCES WILL BE USED IN THE MANUFACTURE OR REPRODUCTION OF THE ARTICLE DISCLOSED, AND THE DELIVERY OF THIS DOCUMENT SHALL NOT CONSTITUTE ANY RIGHT OR LICENSE TO DO SO.

MONOGRAM ECN NO: **17-0124** REV: **AJ**
CAGE CODE: **98524** ECN DATE: **04/24/17** SHEET 1 OF 2

APPLICABLE SPECIFICATIONS:
 PROCUREMENT SPECIFICATION:
 INSTALLATION AND INSPECTION SPECIFICATION:
 SPECIAL LUBE AND FINISH:
 PART NUMBER ASSIGNMENT:

MBF2000
 MBF2003
 MBF2002
 MBF2004



ROBOTIC PART NUMBER	R RAD		G MAX (GAP)		"TOL C" \triangle			
					GRIP < -500		GRIP > -500 GRIP < -1000	
	INCH	mm	INCH	mm	INCH	mm	INCH	mm
MBF2112()-5-() A	.025 .010	0.635 0.254	.042	1.067	.030	0.762	.030	0.762
MBF2112()-6-() A	.030 .015	0.762 0.381	.050	1.270	.027	0.686	.030	0.762
MBF2112()-8-() A	.035 .020	0.889 0.508	.062	1.575	.022	0.559	.030	0.762

OVERSIZE PART NUMBER	ϕ A		ϕ A' MIN		ϕ D		ϕ E MAX		F WRENCH FLATS		(G)		(H)		(L)		RECOM. HOLE SIZE		ϕ J MIN		K MAX	
	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm
MBF2112()-5.5-()	.332 .325	8.43 8.25	.296	7.52	.1800 .1780	4.574 4.523	.1796	4.561	.085 .080	2.16 2.03	.017	0.43	.063	1.60	.544	13.81	.183 .181	4.65 4.57	.270	6.86	.325	8.26
MBF2112()-6.5-()	.385 .378	9.78 9.60	.342	8.69	.2140 .2120	5.436 5.385	.2141	5.438	.113 .108	2.87 2.74	.027	0.68	.070	1.78	.605	15.37	.218 .215	5.54 5.46	.330	8.38	.375	9.53
MBF2112()-8.5-()	.507 .499	12.88 12.67	.463	11.76	.2750 .2730	6.985 6.936	.2751	6.987	.135 .130	3.43 3.30	.055	1.40	.096	2.44	.758	19.25	.279 .276	7.08 7.01	.420	10.67	.475	12.07

MATERIAL AND HEAT TREAT:

NUT: 6Al-4V TITANIUM ALLOY PER AMS-T-9047 STA OR AMS4928 OR AMS4967 HEAT TREATED PER AMS-H-81200 TO 95 KSI SHEAR STRENGTH MINIMUM. MAXIMUM HYDROGEN CONTENT 125 PPM.
 SCREW: A286 CRES PER AMS5731, AMS5732 OR AMS5737 HEAT TREATED TO 175 KSI TENSILE MINIMUM.
 SLEEVE: 304 CRES PER AMS5639, FULLY ANNEALED.
 INSERT: ACETAL PER ASTM-D6778
 DRIVE NUT: MILD STEEL

FINISH:

(-) NUT: PHOSPHATE FLOURIDE PER MONOGRAM SPECIFICATION PS741.
 SLEEVE AND SCREW: PASSIVATE PER AMS2700, AS5272 TYPE I OR TYPE II. CONVERSION COATING OPTIONAL.
 INSERT: NONE
 DRIVE NUT: COLOR GRAY (COLOR RED FOR "LL" CODED PARTS)

LUBRICANT:

SOLID FILM LUBRICANT PER AS5272 TYPE I OR TYPE II.
 PARAFFIN WAX, OR CETYL ALCOHOL PER AS87132 (AS REQUIRED FOR PERFORMANCE).
 (SEE FINISH CODE FOR ADDITIONAL RESTRICTIONS).

GENERAL NOTES:

- EXAMPLE OF PART NUMBER:
 MBF2112 () - 6 - 100 ()
 "A" DESIGNATES DUAL DRIVE NUT SYSTEM FOR ROBOTIC INSTALLATION
 DESIGNATES GRIP (TABLE IV)
 DESIGNATES BREAK-OFF LIMITS. SEE NOTE \triangle
 DESIGNATES BASIC DIMENSIONS (TABLE I)
 DESIGNATES SPECIAL FINISH CODE
 DESIGNATES BASIC PART NUMBER
 (BASIC PART: MBF2112SA()-6-100 USE FOR SEALANT APPLICATION)
- LOCKING FEATURE CONSISTS OF THREE (3) INDENTATIONS LOCATED 120° APART ON THE PERIPHERY OF THE NUT COMPONENT AND APPROXIMATELY .040" ABOVE INTERSECTION OF THE NUT NOSE ANGLE AND O.D.
- HEAD MARKINGS: MANUFACTURER'S IDENTIFICATION: MONOGRAM = "MI"
 FASTENER IDENTIFICATION = "2112"
 POSITION OPTIONAL
 ALTERNATE HEAD MARKING: "MI" AND "2012".
- COMPOSI-LOK FASTENERS WITH SELECTED COMBINATIONS OF THE ABOVE LUBRICANTS AND FINISHES ARE SPECIALLY CODED AND MAY BE SUBSTITUTED FOR EQUIVALENT NON-CODED PARTS AT MANUFACTURER'S OPTION. SEE INTERCHANGEABILITY SPECIFICATION MBF2007.
- DISTORTION SHALL NOT PREVENT INSERTION OF THE FASTENER INTO A RING GAUGE OF LENGTH EQUAL TO ONE DIAMETER AND HOLE DIAMETER EQUAL TO A MINIMUM RECOMMENDED HOLE. FORCE FOR INSERTION SHALL NOT EXCEED 5.0 POUNDS.
- MAXIMUM RUNOUT FROM DRIVE NUT TO SCREW HEAD WHEN DRIVE NUT IS FULLY SEATED (G=0) FOR GRIPS UNDER/EQUAL -1000. FOR GRIPS LONGER THAN -1000 "TOL C" TBD.
- ALL OTHER DIMENSIONS ARE THE SAME AS IN TABLE I.
- STANDARD GRIP LENGTHS ARE SHOWN IN TABLE III. INTERMEDIATE GRIP LENGTH MAY BE AVAILABLE UPON REQUEST. EXAMPLE: 2ND DASH NO. 225 SHALL HAVE A MIN GRIP .125 (3,175 mm) AND MAX GRIP .225 (5,715 mm).
- AN "L" IN PLACE OF THE DASH (-) BETWEEN THE DIAMETER DASH NUMBER AND THE GRIP DASH NUMBER DESIGNATES MODIFIED BREAK-OFF LIMITS OF +.053 / -.050. (EXAMPLE: MBF2112()-6L200).
 AN "LL" IN PLACE OF THE DASH (-) BETWEEN THE DIAMETER DASH NUMBER AND THE GRIP DASH NUMBER DESIGNATES MODIFIED BREAK-OFF LIMITS OF +.000 / -.103. (EXAMPLE: MBF2112()-6LL200).

2ND DASH NO. (GRIP)	GRIP RANGE			
	MIN GRIP		MAX GRIP	
	INCH	mm	INCH	mm
100	.050	1.27	.100	2.54
150	.100	2.54	.150	3.81
200	.150	3.81	.200	5.08
250	.200	5.08	.250	6.35
300	.250	6.35	.300	7.62
350	.300	7.62	.350	8.89
400	.350	8.89	.400	10.16
450	.400	10.16	.450	11.43
500	.450	11.43	.500	12.70
550	.500	12.70	.550	13.97
600	.550	13.97	.600	15.24
650	.600	15.24	.650	16.51
700	.650	16.51	.700	17.78
750	.700	17.78	.750	19.05
800	.750	19.05	.800	20.32
850	.800	20.32	.850	21.59
900	.850	21.59	.900	22.86
950	.900	22.86	.950	24.13
1000	.950	24.13	1.000	25.40
1050	1.000	25.40	1.050	26.67
1100	1.050	26.67	1.100	27.94
1150	1.100	27.94	1.150	29.21
1200	1.150	29.21	1.200	30.48
1250	1.200	30.48	1.250	31.75
1300	1.250	31.75	1.300	33.02
1350	1.300	33.02	1.350	34.29
1400	1.350	34.29	1.400	35.56
1450	1.400	35.56	1.450	36.83
1500	1.450	36.83	1.500	38.10
1550	1.500	38.10	1.550	39.37
1600	1.550	39.37	1.600	40.64
1650	1.600	40.64	1.650	41.91
1700	1.650	41.91	1.700	43.18

3423 SOUTH GARFIELD AVENUE
 COMMERCE, CALIFORNIA 90040
 (323) 722-4760 FAX (323) 727-1029

TITLE:
**BLIND FASTENER, 100° FLUSH HEAD
 FOR ADVANCED COMPOSITE MATERIALS
 TITANIUM**

DRAWING NO: MBF2112()-()-()	
DRAWN BY: A PEREZ	DRAWN DATE: 07/01/13
APPROVED BY:	CHECKED DATE:

PROPRIETARY AND CONFIDENTIAL:
 NOTICE: THIS DRAWING IS PART OF THE PROPRIETARY ARTICLE HEREIN DISCLOSED, OWNED BY MONOGRAM AEROSPACE FASTENERS. ANY PARTY BY ACCEPTING THIS DOCUMENT ASSUME CUSTODY THEREOF AND AGREES:
 A. THE INFORMATION SET FORTH HEREIN IS GIVEN IN CONFIDENCE AND THIS DOCUMENT WILL NOT BE COPIED OR REPRODUCED IN WHOLE OR IN PART, NOR ITS CONTENTS REVEALED IN ANY MANNER TO ANY PERSON EXCEPT TO MEET THE PURPOSE FOR WHICH IT WAS DELIVERED.
 B. WITHOUT THE WRITTEN CONSENT OF MONOGRAM AEROSPACE FASTENERS, THIS DOCUMENT AND THE INFORMATION CONTAINED HEREIN UNDER NO CIRCUMSTANCES WILL BE USED IN THE MANUFACTURE OR REPRODUCTION OF THE ARTICLE DISCLOSED, AND THE DELIVERY OF THIS DOCUMENT SHALL NOT CONSTITUTE ANY RIGHT OR LICENSE TO DO SO.

MONOGRAM CAGE CODE: 98524	ECN NO: 17-0124 ECN DATE: 04/24/17	REV: AJ
---------------------------------	---	------------