

Oil Free Bushings

-Copper Alloy Straight, Standard / Thin Wall, I.D. F7 O.D. m6-

■ Features: Copper Alloy Bushings in general use. Thin wall to be comparable to Multi-Layer LF Bushings, Excels in abrasion resistance compared to Multi-Layer LF Bushings. Usable under high-load conditions.

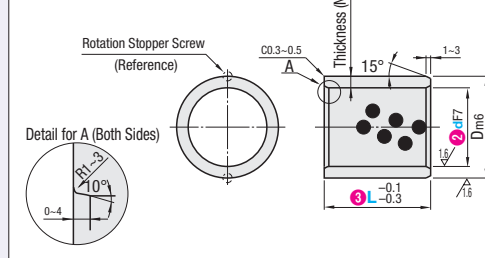
When ordering, select Part Number and Values from Selection Steps ①~③.

Ordering Example	Part number(①Type-②d) - ③L
	MPBZ10 - 15
	MPBZ16 - 20

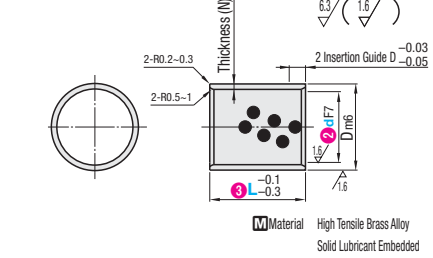
■ Standard / Thin Wall I.D. F7 O.D. m6



MPBZ(Standard I.D. F7 O.D. m6)



MPBZU(Thin Wall I.D. F7 O.D. m6)



Material High Tensile Brass Alloy Solid Lubricant Embedded

Part Number	①Type	②dF7	MPBZ		MPBZU	
			Dm6 (*1)	Thickness (N)	Dm6 (*1)	Thickness (N)
5		+0.022	8	10 12 (15)	9	7
6		+0.010	8 (9)	10 12 15 16 (20)	10	8
8		+0.028	8	10 12 15 16 20 (25)	12	10
10		+0.013	8	10 12 15 16 20 25 (30)	14	12
12			10	12 15 16 20 25 (30) (35)	18	15
13			10	12 15 16 20 25 (30) (35)	19	16
15		+0.034	10	12 15 16 20 25 30 (35) (40)	21	18
16		+0.016	10	12 15 16 (19) 20 25 30 (35) (40)	22	20
18			10	12 15 16 (19) 20 25 30 (35) (40)	24	22
20			10	12 15 16 20 25 30 (35) 40 (50) (60)	28	24
20A		+0.041	10	12 15 16 (20) (25) (30) (35) (40) (50)	30	5
25		+0.020	12	15 16 20 25 30 (35) 40 (50) (60)	33	4
25A			12	15 16 (20) (25) (30) (35) (40) (50) (60)	35	5
30			20	25 30 (35) 40 (50) (60) (70)	38	4
35		+0.050	20	25 30 (35) 40 (50) (60) (70)	44	4.5
40		+0.025	20	25 30 (35) 40 50 (60) (70) (80)	50	5
50			30	35 40 50 (60) (70) (80)	62	6
60		+0.060	50	(60) (70) (80)	75	7.5
80		+0.030	60	(70) (80)	96	8
100		+0.036	80	(100)	120	10

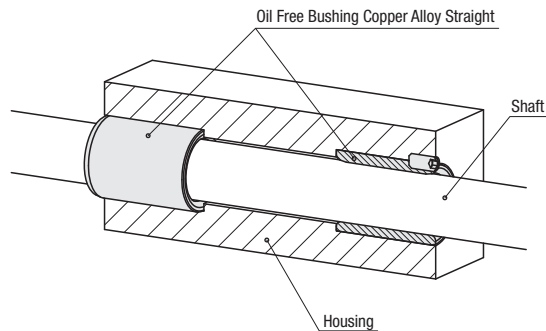
D	O.D. m6 (*1)	Housing Dia. H7 (*2)
7~10	+0.015 +0.006	+0.015 0
11~18	+0.018 +0.007	+0.018 0
19~30	+0.021 +0.008	+0.021 0
31~50	+0.025 +0.009	+0.025 0
51~80	+0.030 +0.011	+0.030 0
81~120	+0.035 +0.013	+0.035 0

⚠ Precautions for use

Recommended Mating Shaft for I.D. F7 Type d8: General Use (High-Load) e7: General Use (Light Load) f8: High Precision Use g6: High Precision Use (Intermittent Operation)
 Use of Rotation Stopper Screws is recommended to affix bushings.



Example



Oil Free Bushings

-Copper Alloy Straight, Standard / Thin Wall, I.D. E7 O.D. r6 / I.D. G6 O.D. m6 / I.D. G6 O.D. h6-

■ Features: Bushings can be affixed only by Press-fit process. No Rotation Stopper Screws is required. Thin wall to be comparable to Multi-Layer LF Bushings, Excels in abrasion resistance compared to Multi-Layer LF Bushings. Usable under high-load conditions.

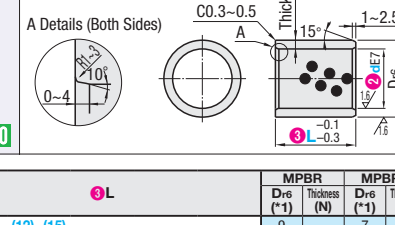
When ordering, select Part Number and Values from Selection Steps ①~③.

Ordering Example	Part number(①Type-②d) - ③L
	MPBR12 - 12
	MPBP20 - 15

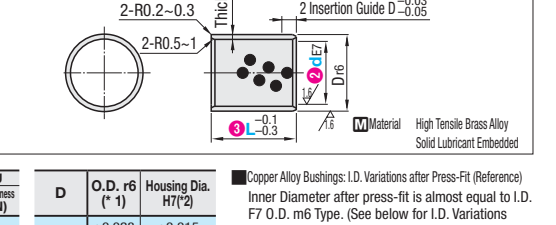
■ Standard / Thin Wall I.D. E7 O.D. r6



MPBR (Standard I.D. E7 O.D. r6)



MPBRU (Thin Wall I.D. E7 O.D. r6)



Material High Tensile Brass Alloy Solid Lubricant Embedded

Part Number	①Type	②dE7	MPBR		MPBRU	
			Dm6 (*1)	Thickness (N)	Dm6 (*1)	Thickness (N)
5		+0.032	9	7		
6		+0.020	10	8		
8		+0.040	12	10		
10		+0.025	14	12		
12		+0.050	18	15	1.5	
15		+0.032	21	18		
16			22	20		
20		+0.061	28	24		
25		+0.040	33	29		
30			38	34		

D	O.D. r6 (*1)	Housing Dia. H7 (*2)
7~10	+0.028 +0.019	+0.015 0
11~18	+0.034 +0.023	+0.018 0
19~30	+0.041 +0.028	+0.021 0
31~50	+0.050 +0.034	+0.025 0

■ Copper Alloy Bushings: I.D. Variations after Press-Fit (Reference) Inner Diameter after press-fit is almost equal to I.D. F7 O.D. m6 Type. (See below for I.D. Variations after press-fitted)
 Housing Diameter Tolerance: H7

Type	I.D. E7 O.D. r6	I.D. F7 O.D. m6
Standard	99.84%	99.95%
Thin Wall	99.83%	99.94%

 ⚠ Data above are obtained by test, not guaranteed.

⚠ Precautions for use

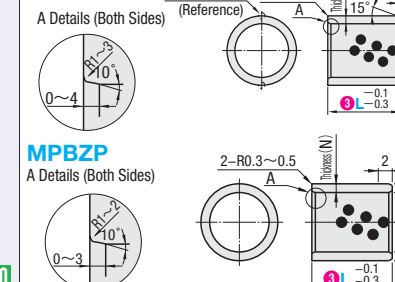
Recommended Mating Shaft for I.D. F7 Type d8: General Use (High-Load) f8: High Precision Use e7: General Use (Light Load) g6: High Precision Use (Intermittent Operation)

■ Features: Capable of more precise linear and rotary motion compared to I.D. F7 O.D. m6 (MPBZ, MPBZU) and I.D. E7 O.D. r6 (MPBR, MPBRU) can be achieved by keeping the clearance between bushings and g6 shafts small.

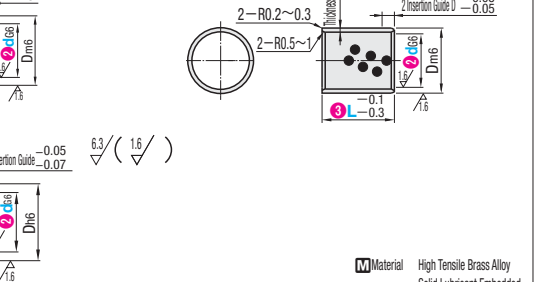
■ Standard I.D. G6 O.D. h6



MPBP (Standard I.D. G6 O.D. h6)



MPBPU (Thin Wall I.D. G6 O.D. h6)



Material High Tensile Brass Alloy Solid Lubricant Embedded

Part Number	①Type	②dG6	MPBP		MPBPU		MPBZP	
			Dm6 (*1)	Thickness (N)	Dm6 (*1)	Thickness (N)	Dm6 (*1)	Thickness (N)
5		+0.012	9	7				
6		+0.004	10	8				
8		+0.014	12	10				
10		+0.005	14	12				
12			18	15	1.5			
13		+0.017	19	16				
15		+0.006	21	18				
16			22	20				
20		+0.020	28	24				
25		+0.007	33	29				
30			38	34				

D	MPBP O.D. m6 (*1)	MPBPU Housing Dia. G7 (*2)	MPBZP O.D. h6 (*3)	Housing Dia. H7 (*4)
7~10	+0.015 +0.006	+0.020 +0.005	0 -0.009	+0.015 0
11~18	+0.018 +0.007	+0.024 +0.006	0 -0.011	+0.018 0
19~30	+0.021 +0.008	+0.028 +0.007	0 -0.013	+0.021 0
31~50	+0.025 +0.009	+0.034 +0.009	0 -0.016	+0.025 0

■ How to use MPBP, MPBPU

Use of Rotation Stopper Screws is recommended to affix bushings. ⚠ Recommended Mating Shaft for I.D. G6 Type g6: High Precision Use

■ How to use MPBZP

⚠ Keeps the clearance with shafts to a minimum, then use with highly precise linear or rotary motion.
 ⚠ Housing Bore Diameter Tolerance H7 and Play are caused by O.D. h6 Tolerance. Loctite (thread locking adhesive) is recommended to affix bushings.