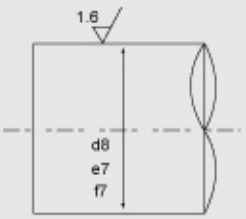
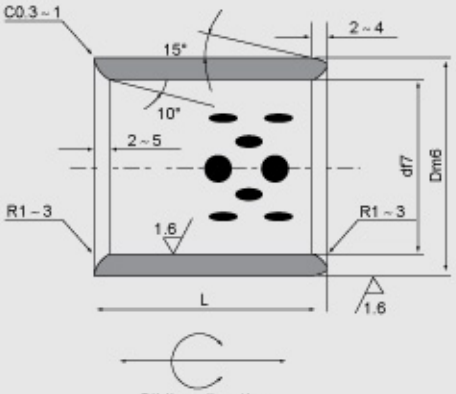
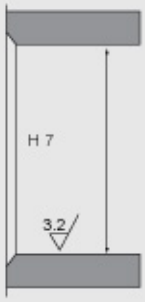
JDB标准轴承套尺寸
JDB BEARING



Mating shaft
相配轴径



Sliding direction
运动方向



Mating housing
相配座孔

D	dF7		Dm6		L -0.10 -0.30													
					8	10	12	15	16	20	25	30	35	40	50	60	70	80
12	8	+0.028 +0.013	12	+0.018 +0.007	●	●	●	●										
14	10		14		●	●	●	●		●								
18	12	+0.034 +0.016	18	+0.021 +0.008		●	●	●	●	●	●	●						
19	13		19			●	●	●	●									
20	14		20			●	●	●		●	●	●						
21	15		21			●	●	●	●	●	●							
22	16		22			●	●	●	●	●	●	●	●	●				
24	18		24			●	●	●	●	●	●	●	●	●				
28	20	+0.041 +0.020	28	+0.025 +0.009		●	●	●	●	●	●	●	●	●	●			
32	22		32			●	●	●		●	●							
33	25		33			●	●	●	●	●	●	●	●	●	●	●		
38	30		38			●	●	●	●	●	●	●	●	●	●	●		
45	35	+0.050 +0.025	45							●	●	●	●	●	●	●		
50	40		50							●	●	●	●	●	●	●	●	●
55	45		55	+0.030 +0.011								●	●	●	●	●		
60	50		60									●	●	●	●	●	●	●

Oil Free Bushings
Copper Alloy Straight, Standard

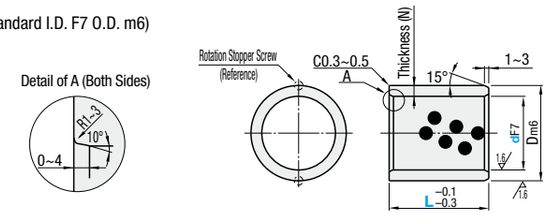
Points on Comparing Similar Products | If you use it for high-precision positioning, high load weight, and high frequency movement, consider from the existing product series.

Features: Copper Alloy Bushings in general use.

Standard

RoHS

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



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

Part Number Type	dF7		L	Dm6		Thickness (N)	Housing Dia. (Recommended Dimension) Standard Dimension	Tolerance (H7)	Rotation Stopper Screw (Reference)*
MPBZ	5	+0.022 +0.010	8 9 10 12 15	9	+0.015 +0.006	2	9	+0.015 0	M4x8
	6		8 9 10 12 15 16 19 20	10			10		
	8	+0.028 +0.013	8 9 10 12 15 16 19 20 25	12	+0.018 +0.007		12	+0.018 0	
	10		8 9 10 12 15 16 19 20 25 30	14			14		
	12	+0.034 +0.016	8 9 10 12 15 16 19 20 25 30 35	18		3	18		
	13		9 10 12 15 16 19 20 25 30 35	19	+0.021 +0.008		19	+0.021 0	
	15		9 10 12 15 16 19 20 25 30 35 40	21			21		
	16		9 10 12 15 16 19 20 25 30 35 40	22			22		
	18		9 10 12 15 16 19 20 25 30 35 40	24			24		M5x8
	20	+0.041 +0.020	9 10 12 15 16 19 20 25 30 35 40 50 60	28		4	28		
	20A		9 10 12 15 16 19 20 25 30 35 40 50	30		5	30		
	25		12 15 16 19 20 25 30 35 40 50 60	33	+0.025 +0.009	4	33	+0.025 0	
	25A		12 15 16 19 20 25 30 35 40 50 60	35		5	35		M6x16
	30		12 15 16 19 20 25 30 35 40 50 60 70	38		4	38		
	35	+0.050 +0.025	20 25 30 35 40 50 60 70	44		4.5	44		
	40		20 25 30 35 40 50 60 70 80	50		5	50		
	50		30 35 40 50 60 70 80	62	+0.030 +0.011	6	62	+0.030 0	M8x16
	60	+0.060 +0.030	50 60 70 80	75		7.5	75		
	80		60 70 80	96	+0.035 +0.013	8	96	+0.035 0	
	100	+0.071 +0.036	80 100	120		10	120		

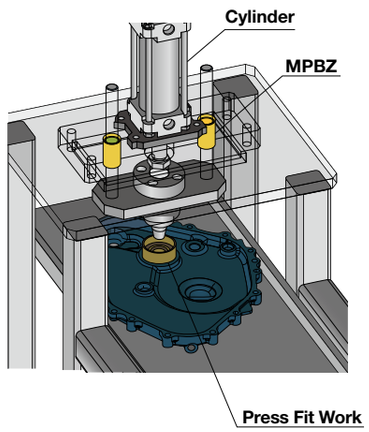
	Existing Products Copper Alloy		C-VALUE Products Copper Alloy	
Lubrication	Regular	Unlubricated	Regular	Unlubricated
Maximum Allowable Load	29.0 (98.0) N/mm²		20.3 (68.6) N/mm²	
	296 (1000) kgf/cm²		207.2 (700) kgf/cm²	
Maximum Allowable Velocity	1.00m/s	0.5m/s	0.7m/s	0.35m/s
	60m/min	30m/min	42m/min	21m/min

Value in ( ) is the allowable static surface pressure.

Part Number Type	d	Unit Price L8	L9	L10	L12	L15	L16	L19	L20	L25	L30	L35	L40	L50	L60	L70	L80	L100
MPBZ	5						-	-	-	-	-	-	-	-	-	-	-	-
	6									-	-	-	-	-	-	-	-	-
	8										-	-	-	-	-	-	-	-
	10											-	-	-	-	-	-	-
	12												-	-	-	-	-	-
	13	-											-	-	-	-	-	-
	15	-												-	-	-	-	-
	16	-												-	-	-	-	-
	18	-												-	-	-	-	-
	20	-														-	-	-
	20A	-													-	-	-	-
	25	-	-	-												-	-	-
	25A	-	-	-												-	-	-
	30	-	-	-													-	-
	35	-	-	-	-	-	-	-									-	-
	40	-	-	-	-	-	-	-										-
	50	-	-	-	-	-	-	-	-	-								-
	60	-	-	-	-	-	-	-	-	-	-	-	-					-
	80	-	-	-	-	-	-	-	-	-	-	-	-	-				-
	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Ordering Example: Part Number - L → MPBZ10 - 15

Example



Note that, for some of the types shown here, order might be unable to be received by the MISUMI Indonesia offices.

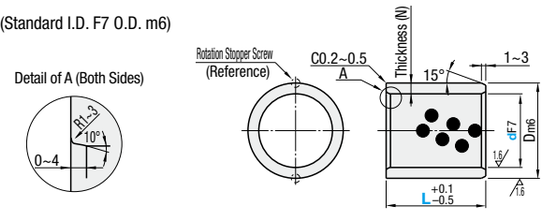
MISUMI C-VALUE Oil Free Bushings
C-VALUE Products - Copper Alloy Straight, Standard

Points on Comparing Similar Products | If you use it for medium-precision positioning, mid-to-low load weight, and mid-to-low frequency movement, consider from the C-VALUE Product series.

Features: Copper Alloy Bushings in general use.

Standard

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



Recommended Mating Shaft for I.D. F7 Type
Use of Rotation Stopper Screws is recommended to affix bushings.
d8: General Use (Medium Load)
e7: General Use (Light Load)
f8: Medium Precision Use
g6: Medium Precision Use (Intermittent Operation)
M: Material: High Tensile Brass Alloy
Solid Lubricant Embedded

Part Number Type	dF7		L	Dm6		Thickness (N)	Housing Dia. (Recommended Dimension) Standard Dimension	Tolerance (H7)	Rotation Stopper Screw (Reference)*
C-MPBZ	8	+0.033 +0.008	8 10 12 15	12	+0.024 +0.003	2	12	+0.018 0	M4x8
	10		8 10 12 15 16 20	14			14		
	12	+0.039 +0.011	10 12 15 16 20 25 30	18	+0.027 +0.004	3	18	+0.021 0	
	13		10 12 15 20 25 30	19			19		
	15		10 12 15 16 20 25 30 35	21			21		
	16		10 12 15 16 20 25 30 35 40	22			22		
	18		12 15 20 25 30 35 40	24			24		M5x8
	20	+0.046 +0.015	10 12 15 16 20 25 30 35 40 50	28		4	28		
	25		12 15 16 20 25 30 35 40 50 60	33			33		
	30		12 15 20 25 30 35 40 50 60	38	+0.025 +0.009		38	+0.025 0	M6x16
	35	+0.055 +0.020	20 25 30 35 40 50 60 70	44		4.5	44		
	40		20 25 30 35 40 50 60 70 80	50		5	50		
	50		30 40 50 60 70 80	62	+0.036 +0.007	6	62	+0.030 0	M8x16

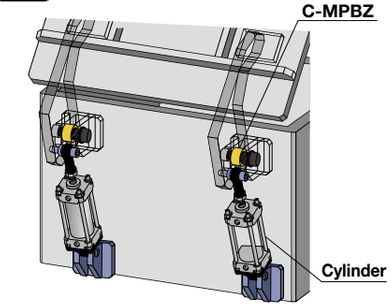
	Existing Products Copper Alloy		C-VALUE Products Copper Alloy	
Lubrication	Regular	Unlubricated	Regular	Unlubricated
Maximum Allowable Load	29.0 (98.0) N/mm²		20.3 (68.6) N/mm²	
	296 (1000) kgf/cm²		207.2 (700) kgf/cm²	
Maximum Allowable Velocity	1.00m/s	0.5m/s	0.7m/s	0.35m/s
	60m/min	30m/min	42m/min	21m/min

Value in ( ) is the allowable static surface pressure.

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L35	L40	L50	L60	L70	L80
C-MPBZ	8					-	-	-	-	-	-	-	-	-	-
	10							-	-	-	-	-	-	-	-
	12	-								-	-	-	-	-	-
	13	-				-				-	-	-	-	-	-
	15	-									-	-	-	-	-
	16	-										-	-	-	-
	18	-	-			-						-	-	-	-
	20	-											-	-	-
	25	-	-											-	-
	30	-	-			-								-	-
	35	-	-	-	-	-									-
	40	-	-	-	-	-									
	50	-	-	-	-	-	-	-		-					

Ordering Example: Part Number - L → C-MPBZ10 - 15

Example



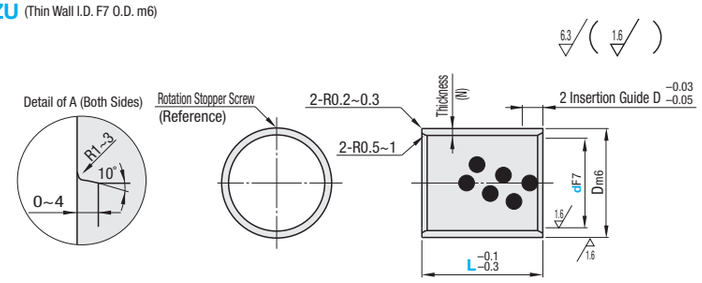
Oil Free Bushings

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

■**Features:** Suitable for use in limited space.

■**Thin Wall I.D. F7 O.D. m6**

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



Recommended Mating Shaft for I.D. F7 Type
Use of Rotation Stopper Screws is recommended to affix bushings.
d8: General Use (High-Load)
e7: General Use (Light Load),
f8: High Precision Use
g6: High Precision Use (Intermittent Operation)
M Material: High Tensile Brass Alloy
Solid Lubricant Embedded

RoHS

Part Number Type	dF7		L								Dm6		Thickness (N)	Housing Dia. (Recommended Dimension) Ref. Dim.	Housing Dia. (Recommended Dimension) Tolerance (H7)	Rotation Stopper Screw (Reference)
MPBZU	5	+0.022 +0.010	8	10	12						7	+0.015 +0.006	1	7	+0.015 0	M4x8
	6		8	10	12	15	16				8			8		
	8	+0.028 +0.013	8	10	12	15	16	20			10			10		
	10		8	10	12	15	16	20	25		12	+0.018 +0.007		12	+0.018 0	
	12	+0.034 +0.016		10	12	15	16	20	25		15		1.5	15		
	13			10	12	15	16	20	25		16			16		
	15			10	12	15	16	20	25	30	18			18		
	16			10	12	15	16	20	25	30	20	+0.021 +0.008	2	20	+0.021 0	
	18				12	15	16	20	25	30	22			22		M5x8
	20	+0.041 +0.020				15	16	20	25	30	24			24		
	25					15	16	20	25	30	29			29		
	30					15	16	20	25	30	34	+0.025 +0.009	2.5	34	+0.025 0	M6x16
	35	+0.050 +0.025						20	25	30	40			40		
	40							20	25	30	40	45		45		
	50									30	40	50	55	+0.030 +0.011	55	+0.030 0	M8x16

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L40	L50
MPBZU	5				-	-	-	-	-	-	-
	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12	-							-	-	-
	13	-							-	-	-
	15	-								-	-
	16	-								-	-
	18	-	-							-	-
	20	-	-	-							-
	25	-	-	-							-
	30	-	-	-							-
	35	-	-	-	-	-					-
	40	-	-	-	-	-					
	50	-	-	-	-	-	-	-			

■**O.D. Dimension Comparison Table**

d	Dimension Variation O.D. Dm6	Dimension Variation Thickness (N)	Thin Wall MPBZU O.D. Dm6	Thin Wall MPBZU Thickness (N)	Standard Type MPBZ O.D. Dm6	Standard Type MPBZ Thickness (N)
5	-2	-1	7	1	9	2
6	-2	-1	8		10	
8	-2	-1	10		12	
10	-2	-1	12		14	
12	-3	-1.5	15	1.5	18	3
13	-3	-1.5	16		19	
15	-3	-1.5	18		21	
16	-2	-1	20	2	22	
18	-2	-1	22		24	
20	-4	-2	24		28	4
25	-4	-2	29		33	
30	-4	-2	34		38	
35	-4	-2	40	2.5	44	4.5
40	-5	-2.5	45		50	5
50	-7	-3.5	55		62	6

Ordering Example: Part Number - L → MPBZU16 - 20

Oil Free Bushings

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

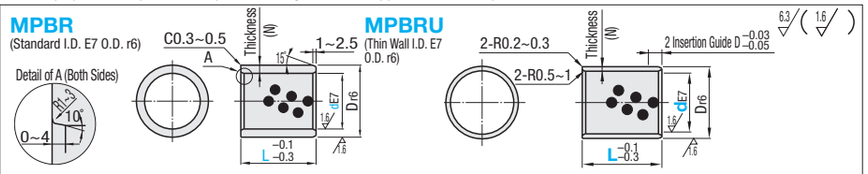
■**Features:** Bushings can be affixed only by Press-fit process. No process using Rotation Stopper Screws is required.

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

RoHS

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

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



Recommended Mating Shafts for I.D. E7 O.D. r6 Type
Press fitting is recommended to affix bushings.
d8: General Use (High-Load)
e7: General Use (Light Load)
f8: High Precision Use
g6: High Precision Use (Intermittent Operation)
M Material: High Tensile Brass Alloy
Solid Lubricant Embedded

Part Number Type	dE7		L								MPBR Dr6 (*1)	MPBR Thickness (N)	MPBRU Dr6 (*1)	MPBRU Thickness (N)
MPBR MPBRU	5	+0.032	8	10	(12)	(15)					9	2	7	1
	6	+0.020	8	10	12	15	16	(20)			10		8	
	8	+0.040	8	10	12	15	16	(20)			12		10	
	10	+0.025	(8)	10	12	15	16	(20)	(25)		14		12	
	12	+0.050		(10)	12	15	16	20	(25)		18	3	15	1.5
	15	+0.032			12	15	16	20	(25)		21		18	
	16				12	15	16	20	25	(30) (40)	22		20	2
	20	+0.061				15	16	20	25	30 (40) (50)	28	4	24	
	25	+0.040					16	20	25	30 (40) (50)	33		29	
	30						16	20	25	30 (40) (50)	38		34	

* L dimensions in ( ) are only available for MPBR.

Tolerance H7 (* 2) to D dimensions (* 1) is recommended for housing diameter.

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-Fitted (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.

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L40	L50
MPBR	5				-	-	-	-	-	-	-
	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12	-							-	-	-
	15	-	-						-	-	-
	16	-	-								-
	20	-	-	-							
	25	-	-	-	-						
	30	-	-	-	-						

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30
MPBRU	5			-	-	-	-	-	-
	6						-	-	-
	8						-	-	-
	10							-	-
	12	-	-					-	-
	15	-	-					-	-
	16	-	-						-
	20	-	-	-					
	25	-	-	-	-				
	30	-	-	-	-				

■**Features:** 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.

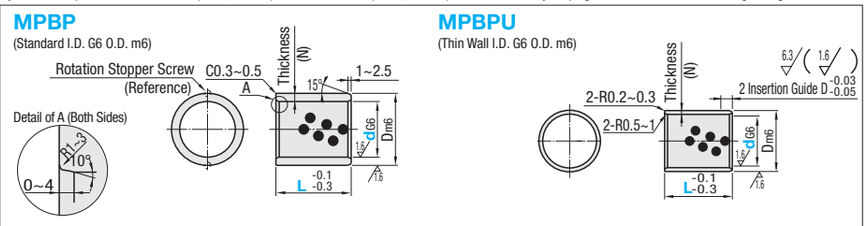
■**Standard / Thin Wall, I.D. G6 O.D. m6**

■**Standard I.D. G6 O.D. h6**

RoHS

MPBP (Standard I.D. G6 O.D. m6)

MPBPU (Thin Wall I.D. G6 O.D. m6)



■**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

M Material: High Tensile Brass Alloy
Solid Lubricant Embedded

Part Number Type	dG6		L								MPBP Dm6 (*1)	MPBP Thickness (N)	MPBP * Rotation Stopper Screw (Reference)	MPBPU Dm6 (*1)	MPBPU Thickness (N)
MPBP MPBPU	5	+0.012	8	10	12	(15)					9	2	M4X8	7	1
	6	+0.004	8	10	12	15	16				10			8	
	8	+0.014		10	12	15	16	20			12			10	
	10	+0.005		10	12	15	16	20	25		14			12	
	12	+0.017			12	15	16	20	25		18	3		15	1.5
	13	+0.006			12	15	16	20	25		19			16	
	15				12	15	16	20	25		21			18	
	16				12	15	16	20	25		22			20	2
	20	+0.020				15	16	20	25	30	28	4	M5X8	24	
	25	+0.007					16	20	25	30 40	33			29	
	30						16	20	25	30 40	38			34	

* L dimensions in ( ) are only available for MPBP.

Tolerance G7 (*2) to D dimensions (*1) for housing diameter

* Indicated dimensions of Rotation Stopper Screws are recommended dimensions.

D	MPBP O.D. m6 (* 1)	MPBPU Housing Dia. G7 (* 2)
7~10	+0.015 +0.006	+0.020 +0.005
11~18	+0.018 +0.007	+0.024 +0.006
19~30	+0.021 +0.008	+0.028 +0.007
31~50	+0.025 +0.009	+0.034 +0.009

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L40
MPBP	5					-	-	-	-	-
	6						-	-	-	-
	8	-						-	-	-
	10	-							-	-
	12	-	-						-	-
	13	-	-						-	-
	15	-	-						-	-
	16	-	-						-	-
	20	-	-	-						-
	25	-	-	-	-					
	30	-	-	-	-					

Part Number Type	d	Unit Price L8	L10	L12	L15	L16	L20	L25	L30	L40
MPBPU	5				-	-	-	-	-	-
	6						-	-	-	-
	8	-						-	-	-
	10	-							-	-
	12	-	-						-	-
	13	-	-						-	-
	15	-	-						-	-
	16	-	-						-	-
	20	-	-	-						-
	25	-	-	-	-					
	30	-	-	-	-					

Ordering Example: Part Number - L → MPBR12 - 12, MPBP20 - 15

Oil Free Bushings

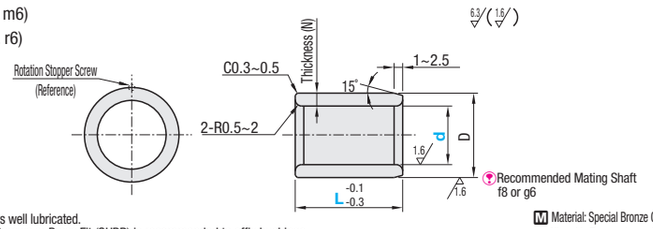
Bronze, Straight, I.D. F7 O.D. m6 / I.D. E7 O.D. r6 / Bronze, Flanged

Features: Minute sliding motion can be achieved. Excels in baking resistance. Alterations on Overall Length are available.

Straight

RoHS

SHBZ (I.D. F7 O.D. m6)
SHBR (I.D. E7 O.D. r6)



Recommended Mating Shaft f8 or g6

Ensure the bushing remains well lubricated.
Use of Rotation Stopper Screws or Press Fit (SHBR) is recommended to affix bushings.

M Material: Special Bronze Casting
Allowable Temperature: -40 ~ 150°C

Part Number Type	d	F7	E7	L	D	m6	r6	Thickness (N)	* Housing Dia. Ref. Dim.	* Housing Dia. Tolerance (H7)	* Rotation Stopper Screw (Reference)
SHBZ SHBR	5	+0.022 +0.010	+0.032 +0.020	8 10 12 15	9	+0.015 +0.006	+0.028 +0.019	2	9	+0.015 0	M4x8
	6			8 10 12 15 20	10				10		
	8	+0.028 +0.013	+0.040 +0.025	8 10 12 15 20 25	12	+0.018 +0.007	+0.034 +0.023		12	+0.018 0	
	10			8 10 12 15 20 25	14				14		
	12			10 12 15 20 25	18			3	18		
	13	+0.034 +0.016	+0.050 +0.032	15 20	19	+0.021 +0.008	+0.041 +0.028		19	+0.021 0	
	15			10 12 15 20 25	21				21		
	16			10 12 15 20 25 30 40	22				22		
	20	+0.041 +0.020	+0.061 +0.040	15 20 25 30 40 50	28			4	28		M5x8
	25			20 25 30 40 50	33	+0.025 +0.009	+0.050 +0.034		33	+0.025 0	M6x16
	30			25 30 40 50 60	38				38		

* Indicated dimensions of Housing Dia. and Rotation Stopper Screws are recommended dimensions. For working on SHBZ, the use of Rotation Stopper Screws is recommended.

Ordering Example

Part Number	-	L
SHBZ12	-	15
SHBR16	-	20
SHFZ16	-	20

Type	d	Unit Price L8	L10	L12	L15	L20	L25	L30	L40	L50	L60
SHBZ	5					-	-	-	-	-	-
	6						-	-	-	-	-
	8							-	-	-	-
	10							-	-	-	-
	12	-						-	-	-	-
	13	-	-	-			-	-	-	-	-
	15	-						-	-	-	-
	16	-								-	-
	20	-	-	-							-
	25	-	-	-	-						-
	30	-	-	-	-	-					

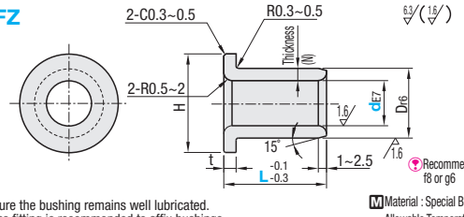
Type	d	Unit Price L8	L10	L12	L15	L20	L25	L30	L40	L50	L60
SHBR	5					-	-	-	-	-	-
	6						-	-	-	-	-
	8							-	-	-	-
	10							-	-	-	-
	12	-						-	-	-	-
	13	-	-	-			-	-	-	-	-
	15	-						-	-	-	-
	16	-								-	-
	20	-	-	-							-
	25	-	-	-	-						-
	30	-	-	-	-	-					

Features: Flanged, less likely to pull-out.

Flanged

RoHS

SHFZ



Recommended Mating Shaft f8 or g6

Ensure the bushing remains well lubricated.
Press fitting is recommended to affix bushings.

M Material : Special Bronze Casting
Allowable Temperature: -40 ~ 150°C

Features of I.D. E7 O.D. r6 Type

- Less likely to pull-out than I.D. F7 O.D. m6 Type.
- Inner Diameter after press fitting is almost equal to I.D. F7 O.D. m6 Type.

Bronze Bushings: I.D. Variations after Press Fitting (Reference)

Housing Diameter Tolerance: H7

I.D. E7 O.D. r6	I.D. F7 O.D. m6
99.82%	99.94%

Data above are obtained by test, not guaranteed.

Part Number Type	dE7		L	D r6		Thickness (N)	H	0 t -0.1	* Housing Dia. Ref. Dim.	* Housing Dia. Tolerance (H7)	Unit Price L10	L12	L15	L20	L25	L30	L40	L50
SHFZ	5	+0.032 +0.020	10 12	9	+0.028 +0.019	2	14	2	9	+0.015 0								
	6			10			16		10					-	-	-	-	-
	8	+0.040 +0.025	10 12 15	12	+0.034 +0.023		20		12	+0.018 0						-	-	-
	10		10 12 15 20	14			22		14							-	-	-
	12	+0.050 +0.032	10 12 15 20 25 30	18		3	25	3	18								-	-
	13		12 15 20	19			26		19		-					-	-	-
	15		10 12 15 20 25	21	+0.041 +0.028		28		21	+0.021 0						-	-	-
	16		12 15 20 25 30	22			29		22		-						-	-
	20	+0.061 +0.040	15 20 25 30 40	30		5	40	5	30		-	-						-
	25		30 40 50	35	+0.050 +0.034		45		35	+0.025 0	-	-	-	-	-			
	30		30 40 50	40			50		40		-	-	-	-	-			

* Housing diameters listed here are recommended dimensions.

Ordering Example

Part Number	-	L
SHBZ12	-	15
SHBR16	-	20
SHFZ16	-	20

Oil Free Bushings

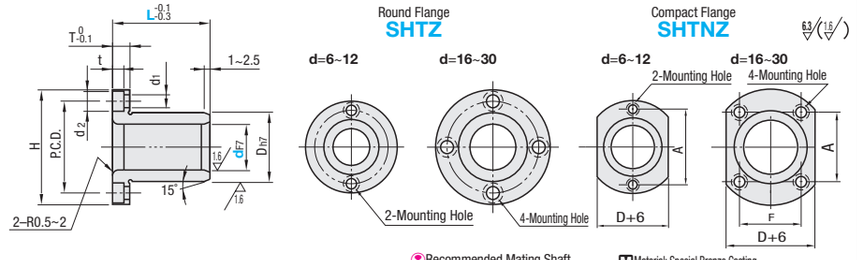
Bronze, Standard Flanged Housing Units / Center Flanged Housing Units (Built-In Copper Alloy Bushings)

Features: Flange Integrated Oil Free Bushings can reduce the time of assembling.

Standard Flanged

RoHS

Round Flange **SHTZ**
Compact Flange **SHTNZ**



Recommended Mating Shaft f8 or g6

Ensure the bushing remains well lubricated.

M Material: Special Bronze Casting
Allowable Temperature: -40 ~ 150°C
A Accessory: Hex Socket Low Head Cap Screws 2 ~ 4 pcs.

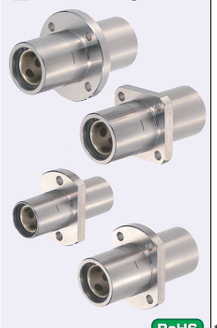
Part Number Type	dF7		L	Dh7		H	T	t	d1	d2	P.C.D.	F	A	Accessory: Hex Socket Low Head Cap Screw
SHTZ SHTNZ	6	+0.022 +0.010	15	10	0 -0.015	25	4	2.2	3.5	6	17	-	17	M3-10x2
	8	+0.028	20 25	12	0 -0.018	27					19		19	
	10	+0.013	25 30	14		29					21		21	
	12	+0.034	25 30	18		36	5	3	4.5	7.5	26		26	M4-12x2
	16	+0.016	25 30 35 40	22	0 -0.021	40					30	18	24	M4-12x4
	20	+0.041 +0.020	30 35 40 50	28		49	6	3.7	5.5	9	38	22	31	M5-16x4
	25		30 35 40 50 60	33	0 -0.025	54					43	25	35	
	30		35 40 50 60 70	38		63	8	4.2	6.6	11	50	30	40	M6-20x4

Type	d	Unit Price L15	L20	L25	L30	L35	L40	L50	L60	L70
SHTZ	6		-	-	-	-	-	-	-	-
	8	-	-		-	-	-	-	-	-
	10	-	-			-	-	-	-	-
	12	-	-			-	-	-	-	-
	16	-	-				-	-	-	-
	20	-	-	-				-	-	-
	25	-	-	-					-	-
	30	-	-	-	-					

Type	d	Unit Price L15	L20	L25	L30	L35	L40	L50	L60	L70
SHTNZ	6		-	-	-	-	-	-	-	-
	8	-	-		-	-	-	-	-	-
	10	-	-			-	-	-	-	-
	12	-	-			-	-	-	-	-
	16	-	-				-	-	-	-
	20	-	-	-				-	-	-
	25	-	-	-					-	-
	30	-	-	-	-					

Features: Suitable for vertical use. Reduces the time of manufacturing and assembling the housing.
Workpiece located near the center of the bushing provides balanced load and clearance on both sides of the flange.

Center Flanged

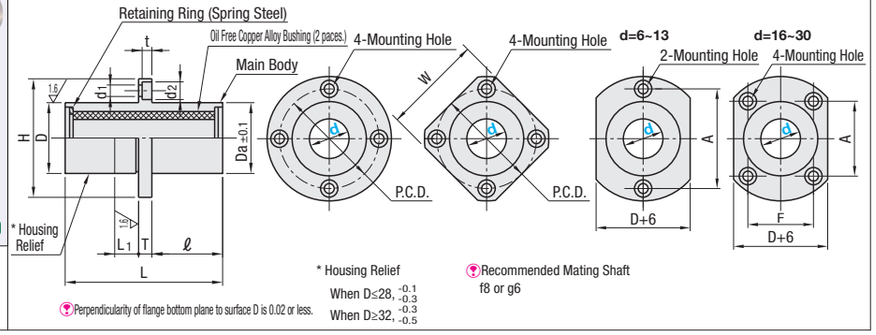


RoHS

With Non-Contact Seals
Teflon seal of 0.3mm thick is attached on the inner side of each retaining ring.

Type Round Flange	Type Square Flange	Type Compact Flange	Seal	Housing M Material	Housing S Surface Treatment	Bushing M Material
MFCMW	MFCKW	MFCNW	No Seal	SS400	Electroless Nickel Plating	High Tensile Brass Alloy, Solid Lubricant Embedded
MFCMW-S	MFCKW-S	MFCNW-S	With Non-Contact Seals			

Round Flange Square Flange Compact Flange



Perpendicularity of flange bottom plane to surface D is 0.02 or less.

* Housing Relief
When D≤28, -0.1 -0.3
When D>32, -0.3 -0.5

Recommended Mating Shaft f8 or g6

Part Number Type	d	Tolerance	D	Tolerance	Da	L	L1	ℓ	H	T	d1	d2	t	P.C.D.	W	F	A	(No Seal) Unit Price Round Flange	Square Flange	Compact Flange	(With Non-Contact Seals) Unit Price Round Flange	Square Flange	Compact Flange
																		MFCMW	MFCKW	MFCNW	MFCMW-S	MFCKW-S	MFCNW-S
Round Flange	6	+0.022 0	12	0	11.8	37	5	16	28	5	3.5	6	3.1	20	22	-	20						
(No Seal) MFCMW	8	+0.028 0	15	-0.018	14.8	47		21	32					24	25	-	24						
(With Non-Contact Seals) MFCMW-S	10		19		18.8				40					29	30	-	29						
Square Flange	12	+0.034 0	21	0	20.8	57		25.5	42	6	4.5	7.5	4.1	32	32	-	32						
(No Seal) MFCKW	13		23	-0.021	22.8				43					33	34	-	33						
(With Non-Contact Seals) MFCKW-S	16		28		27.8	67	10	30.5	48					38	37	22	31						
Compact Flange	20		32		31.6	77		34.5	54	8	5.5	9	5.1	43	42	24	36						
(No Seal) MFCNW	25	+0.041 0	40	0	39.6	108		50	62					51	50	32	40						
(With Non-Contact Seals) MFCNW-S	30		45	-0.025	44.6	128		59	74	10	6.6	11	6.1	60	58	35	49						

For Features of Non-Contact Seal Type, refer to **P.393.** Flanged Height-Adjusting Spacers are selectable from **P. 330**.

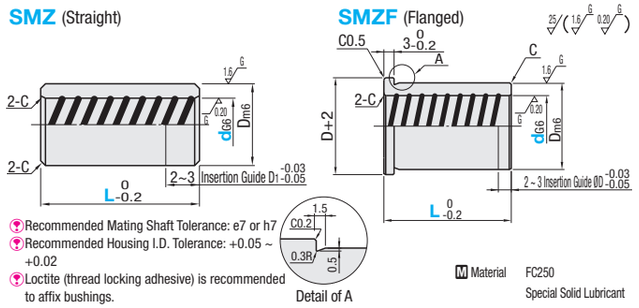
Ordering Example: Part Number **MFCMW6**

■**Features:** Optimal for use in medium load and low speed applications.

■Straight / Flanged

RoHS

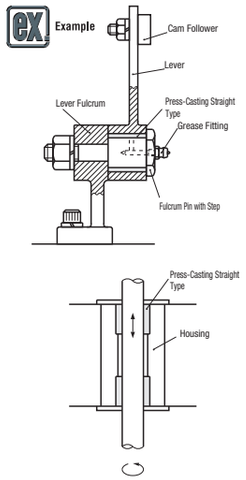
SMZ (Straight)　SMZF (Flanged)



- Recommended Mating Shaft Tolerance: e7 or h7
- Recommended Housing I.D. Tolerance: +0.05 ~ +0.02
- Loctite (thread locking adhesive) is recommended to affix bushings.

M Material　FC250
Special Solid Lubricant

Example



Part Number Type	dG6		L	Dm6		C	SMZ Unit Price 1 ~ 9 pc(s).	SMZ Volume Discount Rate 10 ~ 50 pcs.	SMZF Unit Price 1 ~ 9 pc(s).	SMZF Volume Discount Rate 10 ~ 20 pcs.
Straight SMZ / Flanged SMZF	6	+0.014 +0.005	*6 8 10 12	10	+0.018 +0.007	0.3				
	8		8 10 12 15	12						
	10		10 12 15 20	16						
	12	+0.017 +0.006	10 12 15 20 25	18						
	15		15 20 25 30	22						
	16		15 20 25 30	23	+0.021 +0.008					
	20	+0.020 +0.007	20 25 30 40	28						
	25		25 30 40 50	32	+0.025 +0.009	0.5				
	30		30 40 50 60	38						

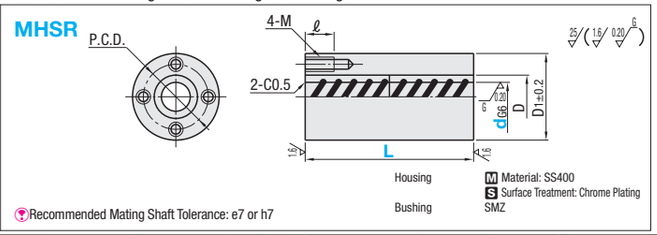
*marked L dimension is available for SMZ only.　For orders larger than indicated quantity, please request a quotation.

■**Features:** Reduces the time of manufacturing and assembling the housing.

■Housing Units

RoHS

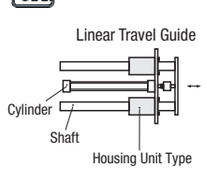
MHSR



M Material: SS400
S Surface Treatment: Chrome Plating SMZ

- Recommended Mating Shaft Tolerance: e7 or h7

Example



Part Number Type	d	L (1 Bushing) Short	L (2 Bushings) Long	D	D1	Mxℓ	P.C.D.	Mass (g) Short	Mass (g) Long	Short Unit Price 1 ~ 9 pc(s).	Short Volume Discount Rate 10 ~ 20 pcs.	Long Unit Price 1 ~ 9 pc(s).	Long Volume Discount Rate 10 ~ 20 pcs.
MHSR	8	15	30	12	30	4x8	21	77	154				
	10	20	40	16	34		25	130	260				
	12	25	40	18	36		27	177	284				
	15	30	50	22	42	5x10	32	284	474				
	20	40	60	28	48		38	469	939				
	25	50	80	32	52		42	641	1025				
	30	60	100	38	60	6x12	49	999	1665				

For orders larger than indicated quantity, please request a quotation.

Ordering Example

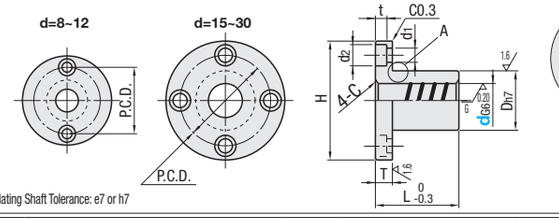
Part Number	-	L
SMZ12	-	20
MHSR15	-	50

■**Features:** Flange Integrated Oil Free Bushings can reduce the time of assembling.

■Flanged

RoHS

SMZH



- Recommended Mating Shaft Tolerance: e7 or h7

M Material: FC250
Special Solid Lubricant

Part Number Type	dG6	Tolerance	Dh7	Tolerance	L	H	T	d1	d2	t	P.C.D.	Mass (g)	Unit Price 1 ~ 9 pc(s).	Volume Discount Rate 10 ~ 20 pcs.
SMZH	8	+0.014 +0.005	15	0 -0.013	20	32	5	3.5	6	3.1	24	45		
	10		19		25	40					29	85		
	12	+0.017 +0.006	21	0 -0.016	30	42	6	4.5	7.5	4.1	32	103		
	15		28		40	48					38	180		
	20	+0.020 +0.007	32	0 -0.019	50	54	8	5.5	9	5.1	43	280		
	25		40		60	62					51	270		
	30		45		70	74	10	6.6	11	6.1	60	670		

For orders larger than indicated quantity, please request a quotation.

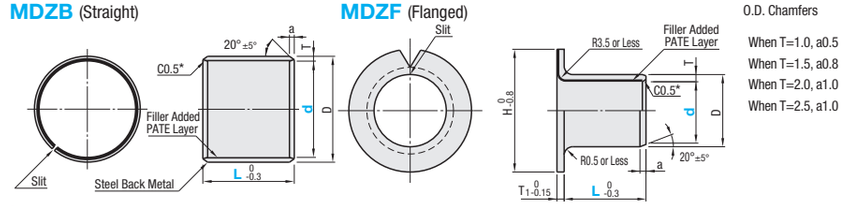
Ordering Example　Part Number　SMZH10

■**Features:** Thin wall and compact.　The bulk-purchase is a better deal.

■Straight / Flanged

RoHS

MDZB (Straight)　MDZF (Flanged)



O.D. Chamfers
When T=1.0, a0.5
When T=1.5, a0.8
When T=2.0, a1.0
When T=2.5, a1.0

- **Applicable to linear and rotary motion.**
- Press fitting is recommended to affix bushings.

*1) Bushings with I.D. d<10 are only de-burred lightly instead of full chamfering.
2) Chamfering is C0.3 when the I.D. is d≥10 and the plate thickness is 1.0.

M Material: Filler Added PTFE Layer
Sintered Bronze Layer
Steel-backed Metal Layer (SPCC: Tin Plating)
Allowable Temperature: -195 ~ 280°C

- There may be some color variations.

Part Number Type	d	L	D	Tolerance	T	Tolerance	D	H	T, T1	Tolerance	* Shaft Diameter Ref. Dim.	Tolerance
Straight Type MDZB Flanged MDZF	3	3 (4) 5 (6)	5	+0.047 +0.017	1.0	0 -0.025	4.6	7	0.8	0 -0.025	3	-0.025 -0.034
	4	(3) 4 (5) 6 (8)	6				5.6	9			4	0
	5	(3) 4 5 6 (8)	7	+0.055 +0.025			7	10	1.0		5	-0.025 -0.037
	6	(3) (4) 5 6 8 (10) (12)	8				8	12			6	0
	8	(5) 6 8 10 12 (15)	10				10	15			8	-0.025 -0.040
	10	6 8 10 12 15 (20)	12	+0.060 +0.030			12	18			10	
	12	6 8 10 12 15 (20)	14				14	20			12	
	13	(8) 10 (12) 15 (20)	15				15	21			13	-0.025 -0.043
	15	(8) 10 12 15 20 (25)	17	+0.085 +0.035			17	23			15	
	16	10 (12) 15 20 (25)	18	+0.070 +0.035			18	24			16	
	18	10 12 15 20 (25) (30)	20	+0.075 +0.040			20	26			18	
	20	10 12 15 20 25 (30)	23	+0.080			23	31			20	
	22	10 12 15 20 (25) (30)	25	+0.045	1.5	0 -0.030	25	33	1.5	0 -0.030	22	-0.025 -0.046
	25	10 12 15 20 25 (30) (35)	28	+0.085 +0.050			28	36			25	
	30	12 15 20 25 30 (35) (40) (50)	34	+0.090 +0.050			34	42			30	
	35	12* 20 25 30 (35) 40 (50)	39	+0.095	2.0		39	49	2.0		35	-0.025 -0.050
	40	12 (15) 20 25 30 (35) 40 (50)	44	+0.055			44	54			40	
	50	20 (25) 30 (35) 40 (50) (60)	55	+0.105 +0.060	2.5	0 -0.040	55	65	2.5	0 -0.040	50	

* Housing diameters and shaft diameters listed here are recommended dimensions.　MDZB is a rolled bushing with a slit. Indicated values of D tolerance are reference after press fitted into ring gauge (±0.002).

D	* Housing Dia. H7	I.D. Tolerance after press fit (Reference Value)
3~6	+0.012 0	+0.062 0
7~10	+0.015 0	+0.065 0
11~18	+0.018 0	+0.068 0
19~20	+0.021 0	+0.071 0
21~30		+0.081 0
31~50	+0.025 0	+0.085 0
51~80	+0.030 0	+0.110 0

I.D. Tolerance is a value after press fit, not a guaranteed value but a reference value.

Part Number Type	d	Unit Price L3	L4	L5	L6	L8	L10	L12	L15	L20	L25	L30	L35	L40	L50	L60
MDZB	3					-	-	-	-	-	-	-	-	-	-	-
	4						-	-	-	-	-	-	-	-	-	-
	5						-	-	-	-	-	-	-	-	-	-
	6							-	-	-	-	-	-	-	-	-
	8	-	-						-	-	-	-	-	-	-	-
	10	-	-	-						-	-	-	-	-	-	-
	12	-	-	-							-	-	-	-	-	-
	13	-	-	-	-						-	-	-	-	-	-
	15	-	-	-	-							-	-	-	-	-
	16	-	-	-	-	-						-	-	-	-	-
	18	-	-	-	-	-							-	-	-	-
	20	-	-	-	-	-							-	-	-	-
	22	-	-	-	-	-								-	-	-
	25	-	-	-	-	-								-	-	-
	30	-	-	-	-	-	-									-
	35	-	-	-	-	-	-	-	-							
	40	-	-	-	-	-	-									
	50	-	-	-	-	-	-	-	-							

Part Number Type	d	Unit Price L3	L4	L5	L6	L8	L10	L12	L15	L20	L25	L30	L40
MDZF	3		-		-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-		-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-		-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-
	13	-	-	-	-	-	-	-	-	-	-	-	-
	15	-	-	-	-	-	-	-	-	-	-	-	-
	16	-	-	-	-	-	-	-		-	-	-	-
	18	-	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-	-
	22	-	-	-	-	-	-	-	-	-	-	-	-
	25	-	-	-	-	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-	-	-	-	-
	35	-	-	-	-	-	-	-	-	-	-	-	-
	40	-	-	-	-	-	-	-	-	-	-	-	-
	50	-	-	-	-	-	-	-	-	-	-	-	-

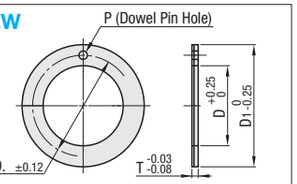
Housing Units with built-in MDZB are also available. P.399, 400

■**Features:** Thin wall and compact. Supports a thrust load.　The bulk-purchase is a better deal.

■Thrust Washer

RoHS

MDZW



M Material: Filler Added PTFE Layer
Sintered Bronze Layer
Steel-backed Metal Layer (SPCC: Tin Plating)
Allowable Temperature: -195~280°C

- There may be some color variations.

Ordering Example

Part Number	-	L
MDZB8	-	5
MDZF12	-	15
MDZW6		

Part Number Type	No.	T	D	D1	Mounting Hole P	Mounting Hole Tolerance	Mounting Hole P.C.D.	Bushing I.D.	Unit Price
MDZW	6	1.5	8	16	1.0	+0.30 +0.10	12	6	
	8		10	18			14	8	
	10		12	24	1.5	+0.375 +0.125	18	10	
	12		14	26	2.0		20	12	
	14		16	30			23	13	
	16		18	32			25	15,16	
	18		20	36	3.0		28	18	
	20		22	38			30	20	
	22		24	42			33	22	
	25		28	48	4.0		38	25	
	30		32	54			43	30	
	35		38	62			50	35	
	40		42	66			54	40	
	50	2.0	52	78			65	50	

Oil Free Bushings / Oil Free Bushing Housing Units - Standard Flanged

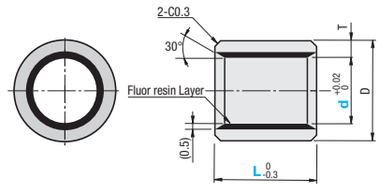
High Precision　Built-In Multi-Layer LF Bushings

Features: More precise linear and rotary motion compared to Multi-Layer LF Bushings - Straight (MDZB) can be achieved by keeping the clearance between bushings and g6 shafts small.

High Precision

RoHS

BFLB



- BFLB is specifically effective if the mating material is soft such as stainless steel, aluminum, brass, etc. (Soft mating material is hardly damaged.)
- Excels in relative wear amount: $1.6\times10^{-7}mm^3/N\cdot m$ and abrasion resistance. (It varies depending on condition of use.)

- **Applicable to linear and rotary motion.**
- Loctite (thread locking adhesive) is recommended to affix bushings.

M Material: Base Material: A2017
Sliding Material: Fluororesin
* Base and sliding materials are bonded.

Allowable Temperature: -50~140°C

Part Number Type	d	L	D	Tolerance	T	Unit Price L5~8	L10~15	L20~25
BFLB	4	5 6	7	0 -0.015	1.5		-	-
	5	5 6 8	8				-	-
	6	5 6 8 10 12	9					-
	8	6 8 10 12 15	11					-
	10	6 8 10 12 15 20	13					
	12	10 12 15 20	15			-		
	16	15 20 25	19	0 -0.020		-		

Ordering Example: Part Number - L → BFLB10 - 10

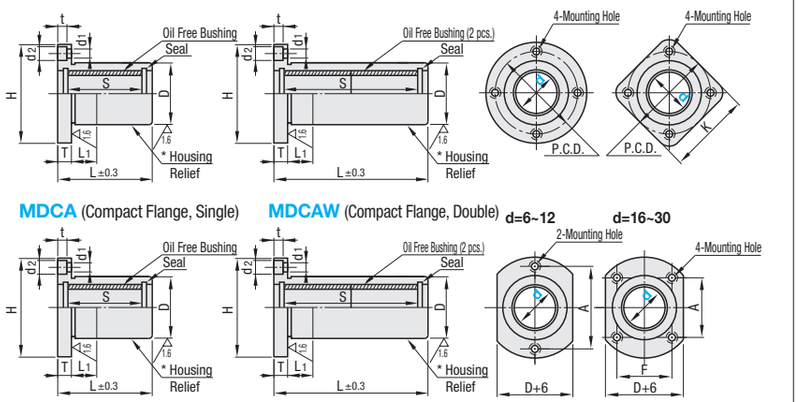
Features: Suitable for vertical use. Reduces the time of manufacturing and assembling the housing.

Flanged

RoHS

MDRA (Round Flange, Single)　MDRAW (Round Flange, Double)
MDSA (Square Flange, Single)　MDSAW (Square Flange, Double)

6.3 (1.6)



MDCA (Compact Flange, Single)　MDCAW (Compact Flange, Double)

d=6~12　d=16~30

Bushing: MDZB (**P.398**)
Seals: NBR (O-Ring)

* Housing Relief　When D≤28, D $^{-0.1}_{-0.3}$　When D≥32, D $^{-0.3}_{-0.5}$

- Perpendicularity of flange bottom plane to surface D is 0.02 or less.
- Effective length of D Tolerance below is L1.
- 2 Oil Free Bushings are included in Single Type d25, d30.

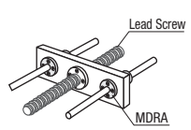
M Material: Aluminum Alloy (Housing)
S Surface Treatment: Clear Anodize

Part Number Type	d	Tolerance	D	Tolerance	L Single	L Double	L1	S Single	S Double	H	T	d1	d2	t	P.C.D.	K	F	A	Unit Price MDRA	MDRAW	MDSA	MDSAW	MDCA	MDCAW
MDRA MDRAW (Round Flange)	6	+0.065 0	12	0 -0.013	19	32	5	13	26	28	5	3.5	6	3.1	20	22	-	20						
	8		15		24	38		18	32	32					24	25		24						
	10	+0.068 0	19	0 -0.016	29	50		21	42	40	6	4.5	7.5	4.1	29	30		29						
MDSA MDSAW (Square Flange)	12		21		30	51		21.6	42.6	42					32	32		32						
	16		28		37	63		26.6	52.6	48					38	37	22	31						
MDCA MDCAW (Compact Flange)	20	+0.081 0	32	0 -0.019	42	73	10	31.6	62.6	54	8	5.5	9	5.1	43	42	24	36						
	25		40		59	103		48.6	92.6	62					51	50	32	40						
	30	+0.085 0	45		64	115		51.6	102.6	74	10	6.6	11	6.1	60	58	35	49						

Flanged Height-Adjusting Spacers are selectable from P.330.

Ordering Example: Part Number → MDRA10

Example



Oil Free Bushing Housing Units - Blocks

Built-In Multi-Layer LF Bushings - Tall Blocks / Tall Blocks Compact / Wide Blocks

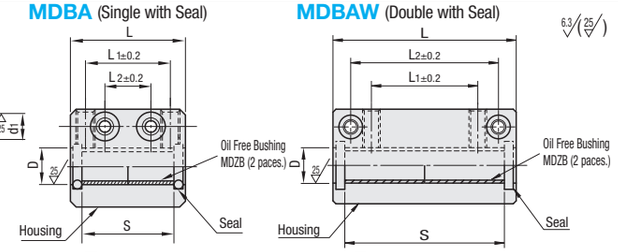
Features: Best suitable for horizontal use. Reduces the time of manufacturing and assembling the housing. Compact in width (W Dimension) compared to Wide Blocks Type.

Tall Blocks Standard Type

RoHS

MDBA (Single with Seal)　MDBAW (Double with Seal)

6.3 (25)



Bushing: MDZB(**P.398**)
Seals: NBR (O-Ring)

M Material: Aluminum Alloy (Housing)
S Surface Treatment: Clear Anodize

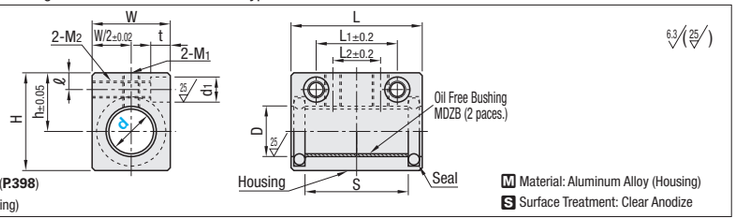
Part Number Type	d	Tolerance	h	W	H	D	Single L	Single L1	Single L2	Single S	Double L	Double L1	Double L2	Double S	ℓ	M1	M2	d1xt	Unit Price MDBA	MDBAW
MDBA MDBAW	6	+0.065 0	14	16	22	8.1	27	18	9	21	-	-	-	-	5	M4	M4	6x5 (for M3 Screws)		-
	8		16	20	26	10.1	32	20	10	26	-	-	-	-		M5				-
	10	+0.068 0	19	26	32	12.2	39	27	15	31	62	36	50	54	6	M6	M5	8x6 (for M4 Screws)		
	12		20	28	34	14.3	40			32				54						
	16		27	36	49	18.3	47	32	18	37	78	52	65	68	7		M6	9x7 (for M5 Screws)		
	20	+0.081 0	31	42	54	23.4	52	36		42	85	58	70	75	8	M8	M8	11x8 (for M6 Screws)		
	25		37	52	65	28.4	69	42	22	59	120	80	100	110	9	M10	M10	14x10 (for M8 Screws)		
	30	+0.085 0	40	58	71	34.4	74	44		62	128	90	110	116						

Features: Best suitable for horizontal use. Reduces the time of manufacturing and assembling the housing. More compact housing compared to Housing Unit - Tall Blocks - Standard Type.

Tall Blocks Compact Type

RoHS

MDBAC



Bushing: MDZB (**P.398**)
Seals: NBR (O-Ring)

M Material: Aluminum Alloy (Housing)
S Surface Treatment: Clear Anodize

Part Number Type	d	Tolerance	h	W	H	D	L	L1	L2	S	ℓ	M1	M2	d1xt	Unit Price
MDBAC	10	+0.068 0	17	20	26	12.2	39	25	13	31	5	M6	M5	8x6 (for M4 Screws)	
	12		18	22	28	14.3	40	26	14	32	5				
	16		21	28	35	18.3	47	28	15	37	5.5		M6	9x7 (for M5 Screws)	
	20	+0.081 0	24	34	40	23.4	52	34	21	42	5.5				
	25		30	42	50	28.4	69	42	25	59	8	M8	M8	11x8 (for M6 Screws)	
	30	+0.085 0	33	48	57	34.4	74	54	37	62	8				

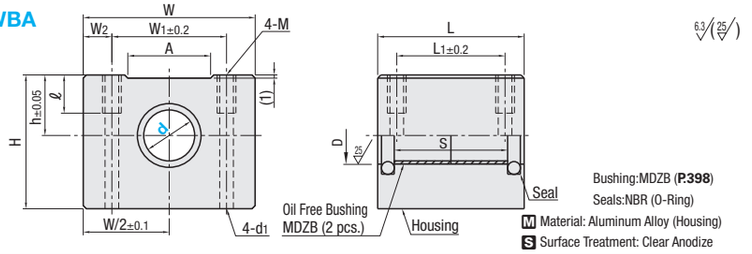
Features: Best suitable for horizontal use. Reduces the time of manufacturing and assembling the housing. Sufficient clamping strength can be obtained with 4 Mounting Holes.

Wide Blocks Standard Type

RoHS

MDWBA

6.3 (25)



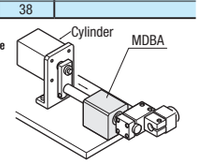
Bushing:MDZB (**P.398**)
Seals:NBR (O-Ring)

M Material: Aluminum Alloy (Housing)
S Surface Treatment: Clear Anodize

Part Number Type	d	Tolerance	h	W	H	D	L	L1	S	W1	W2	M	d1	ℓ	A	Unit Price
MDWBA	6	+0.065 0	9	34	20	8.1	27	15	21	20	7	M4	3.4	8	10	
	8		11	34	20	10.1	32	18	26	24	5	M4	3.4	8	10	
	10	+0.068 0	13	44	30	12.2	39	21	31	28	8	M5	4.3	12	20	
	12		15	44	30	14.3	40	26	32	30.5	6.75	M5	4.3	12	20	
	16		19	54	42	18.3	47	34	37	36	9	M5	4.3	12	26	
	20	+0.081 0	21	54	42	23.4	52	40	42	40	7	M6	5.2	12	26	
	25		26	78	60	28.4	67	50	59	54	12	M8	7	18	38	
	30	+0.085 0	30	78	60	34.4	74	58	62	58	10	M8	7	18	38	

Ordering Example: Part Number → MDBA10, MDBAC12, MDWBA16

Example

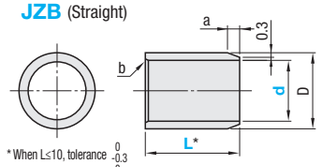


■Straight / Flanged (Polyacetal Resin)

RoHS

■Features: Conforms to Food Sanitation Law. The bulk-purchase is a better deal.

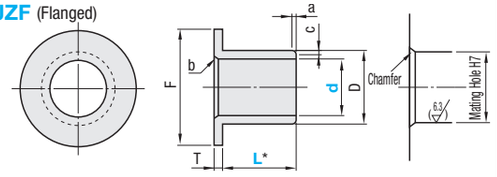
JZB (Straight)



* When L≤10, tolerance $^{0}_{-0.3}$
When L≥12, tolerance $^{0}_{-0.5}$

Press fitting is recommended to affix bushings.

JZF (Flanged)



M Material: Polyacetal Resin
Lubricating Oil and Special Filler Added Allowable Temperature: -40 ~ 80°C

Part Number Type	d (Tolerance after press fitting)		L	D		F	T		Chamfer a	Chamfer b	Chamfer c	*1 Housing Dia. Ref. Dim.	*1 Housing Dia. Tolerance (H7)	*1 Shaft Diameter Ref. Dim.	*1 Shaft Diameter Tolerance (H7)
Straight JZB / Flanged JZF	3	$^{-0.008}_{-0.020}$	3 4 5	5	+0.107	8	1	0 -0.10	1*	C0.3	0.3	5	+0.012 0	3	$^{-0.010}_{-0.028}$
	4	+0.095 +0.045	3 4 5 6	6	+0.032	9						6		4	0 -0.012
	5		3 4 5 6 *8	7	+0.157 +0.045	10						7	+0.015 0	5	
	6		(3) *4 5 6 8 10	8		12						8		6	
	8		5 6 8 10 12 15	10		15			1			10		8	0 -0.015
	10		6 8 10 12 15 20	12		18						12		10	
	12	+0.120 +0.060	8 10 12 15 20	14	+0.193 +0.058	20				R0.4		14	+0.018 0	12	
	15		10 12 15 20 25	17		23						17		15	0 -0.018
	16		10 12 15 20 25	18		24						18		16	
	18		12 15 20 25 30	20	+0.221 +0.071	26						20		18	
	20	+0.145 +0.075	(12) 15 20 25 30	23		31	1.5	0 -0.15				23	+0.021 0	20	
	22		20 30	25	+0.231 +0.081	33						25		22	0 -0.021
	25	+0.170 +0.090	20 25 30	28		36						28		25	
	30		20 25 30 40	34	+0.290 +0.095	42	2					34	+0.025 0	30	
	35	+0.215 +0.115	25 30 40	39		49						39		35	0 -0.025
	40		30 40 50	44	$^{+0.340}_{+0.115}$	54			2	R0.6	0.5	44		40	
	50	$^{+0.235}_{+0.135}$	30 40 50	55	$^{+0.430}_{+0.135}$	65	2.5			R0.8		55	$^{-0.030}_{-0.076}$	50	

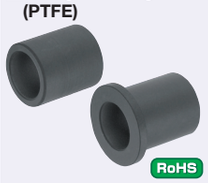
* When selecting 3-3, 3-4, 4-3, 4-4, 4-6, 5-3, 5-4, 6-4 and 6-5 of Straight Type, a=0.5. d tolerance is the value after press fitting into ring gauge of d±0.002. *1 Housing diameters and shaft diameters listed here are recommended dimensions.
* marked L dimension is applicable to JZB only. L dimension in ( ) is applicable to JZF only. I.D. Tolerance is guaranteed value after press fit.

Part Number Type	d	Unit Price L3	L4	L5	L6	L8	L10	L12	L15	L20	L25	L30	L40	L50
JZB	3				-	-	-	-	-	-	-	-	-	-
	4					-	-	-	-	-	-	-	-	-
	5						-	-	-	-	-	-	-	-
	6	-						-	-	-	-	-	-	-
	8	-	-							-	-	-	-	-
	10	-	-	-							-	-	-	-
	12	-	-	-	-							-	-	-
	15	-	-	-	-	-							-	-
	16	-	-	-	-	-							-	-
	18	-	-	-	-	-	-							-
	20	-	-	-	-	-	-	-						-
	22	-	-	-	-	-	-	-	-		-			-
	25	-	-	-	-	-	-	-	-					-
	30	-	-	-	-	-	-	-	-					-
	35	-	-	-	-	-	-	-	-	-				-
	40	-	-	-	-	-	-	-	-	-	-			
	50	-	-	-	-	-	-	-	-	-	-			

Part Number Type	d	Unit Price L3	L4	L5	L6	L8	L10	L12	L15	L20	L25	L30	L40	L50
JZF	3					-	-	-	-	-	-	-	-	-
	4						-	-	-	-	-	-	-	-
	5						-	-	-	-	-	-	-	-
	6		-						-	-	-	-	-	-
	8	-	-							-	-	-	-	-
	10	-	-	-							-	-	-	-
	12	-	-	-	-							-	-	-
	15	-	-	-	-	-							-	-
	16	-	-	-	-	-							-	-
	18	-	-	-	-	-	-							-
	20	-	-	-	-	-	-							-
	22	-	-	-	-	-	-	-	-		-			-
	25	-	-	-	-	-	-	-	-					-
	30	-	-	-	-	-	-	-	-					-
	35	-	-	-	-	-	-	-	-	-				-
	40	-	-	-	-	-	-	-	-	-	-			
	50	-	-	-	-	-	-	-	-	-	-			

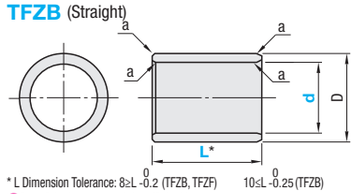
■Features: Conforms to Food Sanitation Law and excels in chemical resistance.

■Straight / Flanged (PTFE)



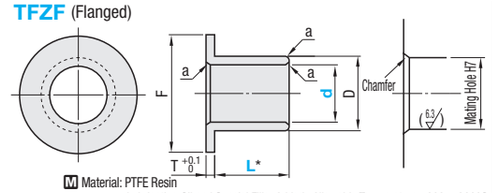
RoHS

TFZB (Straight)



* L Dimension Tolerance: 8≥L $^{0}_{-0.2}$ (TFZB, TFZF) 10≤L $^{0}_{-0.25}$ (TFZB)
Press fitting is recommended to affix bushings.

TFZF (Flanged)



M Material: PTFE Resin
Lubricating Oil and Special Filler Added Allowable Temperature: -200 ~ 200°C

Part Number Type	d (Tolerance before press fitting)		L	D		* Housing Dia. Ref. Dim.	* Housing Dia. Tolerance (H7)	I.D. after press fitting Tolerance (Ref. Value)	* Shaft Diameter Ref. Dim.	* Shaft Diameter Tolerance (g6)	F	T	Chamfer a
Straight TFZB / Flanged TFZF	3	+0.179 +0.129	3 5	6	+0.090 +0.040	6	+0.012 0	$^{+0.178}_{+0.078}$	3	$^{-0.008}_{-0.020}$	9	1.5	C0.3
	4		3 5 8	7		7	+0.015 0	+0.122 +0.072	4	-0.004 -0.012			
	5		5 8 10	8		8			5		11		
	6	$^{+0.183}_{+0.133}$	5 8 10	9		9		$^{+0.226}_{+0.175}$	6		12		
	8	$^{+0.197}_{+0.147}$	8 10 12 15	12	+0.100 +0.050	12	+0.018 0	$^{+0.231}_{+0.081}$	8	-0.005 -0.014	16	2	C0.5
	10	$^{+0.210}_{+0.160}$	8 10 12 15	14		14		$^{+0.244}_{+0.094}$	10		18		
	12	$^{+0.215}_{+0.165}$	10 12 15 20	16		16		$^{+0.246}_{+0.096}$	12	-0.006 -0.017	20		
	16	$^{+0.239}_{+0.169}$	12 15 20 25	22	+0.021 0			$^{+0.275}_{+0.125}$	16		28	3	C0.8
	20	$^{+0.303}_{+0.183}$	15 20 25 30	26	$^{+0.110}_{+0.065}$	26		$^{+0.359}_{+0.109}$	20	$^{-0.007}_{-0.028}$	32		

Dimension tolerance is measured at +25°C. d tolerance is the value before press fitting into housing. * Housing diameters and shaft diameters listed here are recommended dimensions.

Part Number Type	d	Unit Price L3	L5	L8	L10	L12	L15	L20	L25	L30
TFZB	3			-	-	-	-	-	-	-
	4				-	-	-	-	-	-
	5	-				-	-	-	-	-
	6	-					-	-	-	-
	8	-	-					-	-	-
	10	-	-						-	-
	12	-	-	-						-
	16	-	-	-	-					
	20	-	-	-	-	-				

Part Number Type	d	Unit Price L3	L5	L8	L10	L12	L15	L20	L25	L30
TFZF	3			-	-	-	-	-	-	-
	4				-	-	-	-	-	-
	5	-				-	-	-	-	-
	6	-					-	-	-	-
	8	-	-					-	-	-
	10	-	-						-	-
	12	-	-	-						-
	16	-	-	-	-					
	20	-	-	-	-	-				

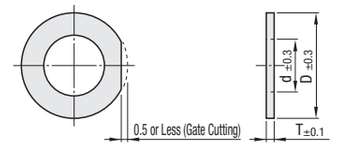
Ordering Example: Part Number - L
JZB10 - 12
TFZF12 - 15

■Features: Supports a thrust load. The bulk-purchase is a better deal.

■Oil Free Resin Washers

RoHS

JZW



M Material: Polyacetal Resin Lubricant and Special Filler Added Allowable Temperature: -40 ~ 80°C

Part Number Type	No.	T	d	D	Unit Price
JZW	8	1.5	8.5	17	
	10	2	10.5	24	
	12		12.5	28	
	17		17	30	
	21		21	37	
	23		23	39	

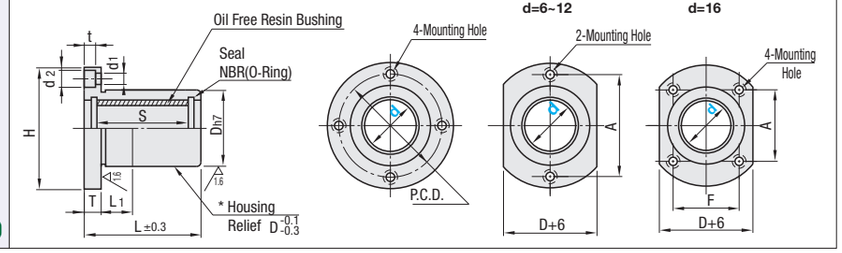
■Features: Suitable for vertical use. Reduces the time of manufacturing and assembling the housing.

■Oil Free Bushing Housing Units - Flanged

RoHS

Type: Round Flange	Type: Compact Flange	Housing: M Material	Housing: S Surface Treatment	Bushing: M Material	
JFMA	JFRA	Aluminum Alloy	Clear Anodize	Polyacetal Resin	JZB

6.3 (1.6)



Part Number Type	d	Tolerance	Dh7	Tolerance	L	L1	S	H	T	d1	d2	t	P.C.D.	F	A	Unit Price JFMA	Unit Price JFRA
JFMA JFRA	6	+0.095 +0.045	12	0 -0.018	19	5	13	28	5	3.5	6	3.1	20	-	20		
	8	+0.120 +0.060	15		24		18	32					24		24		
	10		19	0 -0.021	29		21	40	6	4.5	7.5	4.1	29		29		
	12		21		30	10	21.6	42					32		32		
	16		28		37		26.6	48					38	22	31		

Flanged Height-Adjusting Spacers are selectable from **P. 330**.

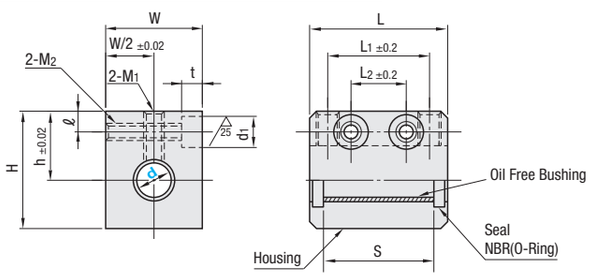
■Features: Best suitable for horizontal use. Reduces the time of manufacturing and assembling the housing.

■Oil Free Bushing Housing Units - Blocks

RoHS

Type	Housing: M Material	Housing: S Surface Treatment	Bushing: M Material	
JFBA	Aluminum Alloy	Clear Anodize	Polyacetal Resin	JZB

6.3 (25)



Part Number Type	d	Tolerance	h	W	H	L	L1	L2	S	ℓ	M1	M2	d1xt	Unit Price
JFBA	6	+0.095 +0.045	14	16	22	27	18	9	21	5	M4	M4	6x5 (for M3 Screws)	
	8	+0.120 +0.060	16	20	26	32	20	10	26		M5			
	10		19	26	32	39	27	15	31	6	M6	M5	8x6 (for M4 Screws)	
	12		20	28	34	40			31.6			M6		
	16		27	36	49	47	32	18	36.6	7			9x7 (for M5 Screws)	

Ordering Example: Part Number
JZW10
JFRA10
JFBA8

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 ❶~❸.

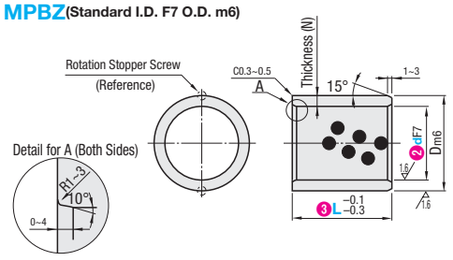
Ordering Example

Part number(❶Type·❷d)	-	❸L
MPBZ10	-	15
MPBZU16	-	20

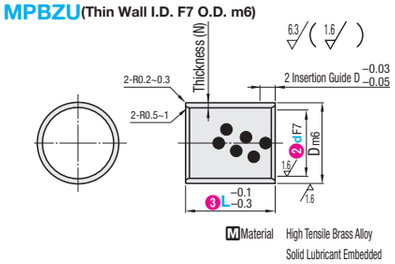
■Standard / Thin Wall
I.D. F7 O.D. m6

CAD 2D 3D RoHS

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



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



M Material: High Tensile Brass Alloy, Solid Lubricant Embedded

Part Number ❶Type	❷dF7		❸L	MPBZ Dm6 (*1)	MPBZ Thickness (N)	MPBZ * Rotation Stopper Screw (Reference)	MPBZU Dm6 (*1)	MPBZU Thickness (N)
MPBZ MPBZU * L dimensions in ( ) are available only for MPBZ.	5	+0.022	8 10 12 (15)	9	2	M4x8	7	1
	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	+0.034	(8) 10 12 15 16 20 25 (30) (35)	18	3		15	1.5
	13	+0.016	10 12 15 16 20 25 (30) (35)	19			16	
	15		10 12 15 16 20 25 30 (35) (40)	21			18	
	16		10 12 15 16 (19) 20 25 30 (35) (40)	22			20	2
	18		(10) 12 15 16 (19) 20 25 30 (35) (40)	24		M5x8	22	
	20	+0.041	(10) (12) 15 16 20 25 30 (35) 40 (50) (60)	28	4		24	
	20A	+0.020	(10) (12) (15) (16) (20) (25) (30) (35) (40) (50)	30	5		-	2
	25		(12) 15 16 20 25 30 (35) 40 (50) (60)	33	4		29	
	25A		(12) (15) (16) (20) (25) (30) (35) (40) (50) (60)	35	5		-	
	30		(12) 15 16 20 25 30 (35) 40 (50) (60) (70)	38	4	M6x16	34	
	35	+0.050	20 25 30 (35) 40 (50) (60) (70)	44	4.5		40	2.5
	40	+0.025	20 25 30 (35) 40 50 (60) (70) (80)	50	5		45	
	50		30 (35) 40 50 (60) (70) (80)	62	6	M8x16	55	
	60	+0.060	(50) (60) (70) (80)	75	7.5		-	-
	80	+0.030	(60) (70) (80)	96	8		-	-
	100	+0.071 +0.036	(80) (100)	120	10		-	-

■Table 1

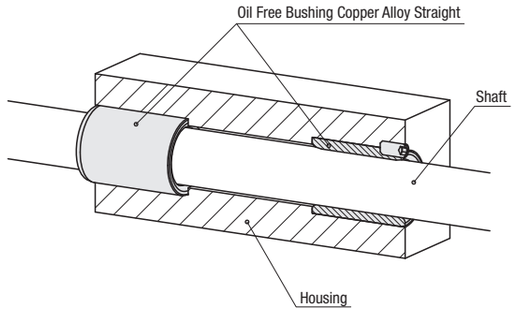
D	O.D. m6 (*1)	Housing Dia. H7 (*2)
7~10	+0.015 +0.006	+0.015 0
11~18	+0.018 +0.007	+0.018 0
19~30	+0.021 +0.008	+0.021 0
31~50	+0.025 +0.009	+0.025 0
51~80	+0.030 +0.011	+0.030 0
81~120	+0.035 +0.013	+0.035 0

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 ❶~❸.

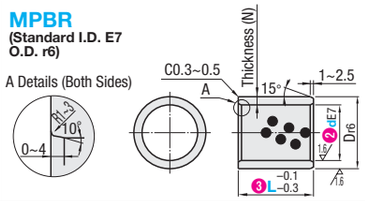
Ordering Example

Part number(❶Type·❷d)	-	❸L
MPBR12	-	12
MPBP20	-	15

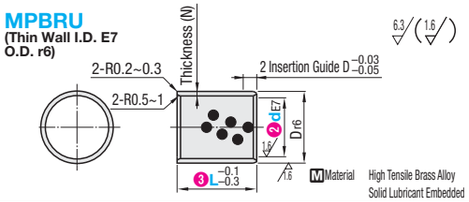
■Standard / Thin Wall
I.D. E7 O.D. r6

CAD 2D 3D RoHS

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



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



M Material: High Tensile Brass Alloy, Solid Lubricant Embedded

Part Number ❶Type	❷dE7		❸L	MPBR Dr6 (*1)	MPBR Thickness (N)	MPBRU Dr6 (*1)	MPBRU Thickness (N)
MPBR MPBRU * L dimensions in ( ) are only available for MPBR.	5	+0.032 +0.020	8 10 (12) (15)	9	2	7	1
	6		8 10 12 15 16 (20)	10		8	
	8	+0.040 +0.025	8 10 12 15 16 (20)	12		10	
	10		(8) 10 12 15 16 (20) (25)	14		12	
	12	+0.050 +0.032	(10) 12 15 16 20 (25)	18	3	15	1.5
	15		12 15 16 20 (25)	21		18	
	16		12 15 16 20 25 (30) (40)	22		20	2
	20	+0.061 +0.040	15 16 20 25 30 (40) (50)	28	4	24	
	25		16 20 25 30 (40) (50)	33		29	
	30		16 20 25 30 (40) (50)	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

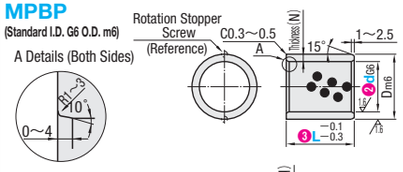
·Recommended Mating Shaft for I.D. F7 Type d8: General Use (High-Load) f8: High Precision Use e7: General Use (Light Load) g6: High Precision Use (Intermittent Operation)

■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.

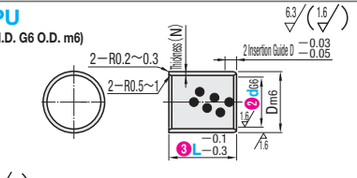
■Standard
I.D. G6 O.D. h6

CAD 2D 3D RoHS

MPBP (Standard I.D. G6 O.D. m6)

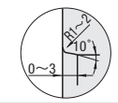


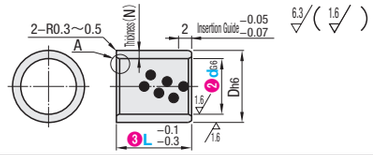
MPBPU (Thin Wall I.G6 O.D. m6)



MPBZP

A Details (Both Sides)





M Material: High Tensile Brass Alloy, Solid Lubricant Embedded

Part Number ❶Type	❷dG6		❸L	MPBP Dm6 (*1)	MPBP Thickness (N)	MPBP * Rotation Stopper Screw (Reference)	MPBPU Dm6 (*1)	MPBPU Thickness (N)	MPBZP Dm6 (*1)	MPBZP Thickness (N)
MPBP MPBPU MPBZP * L dimensions in ( ) are only available for MPBP and MPBPU. * d-L dimensions 5-15 are available for MPBP only.	5	+0.012 +0.004	(8) (10) (12) (15)	9	2	M4x8	7	1	-	2
	6		8 10 (12) (15) (16)	10			8		10	
	8	+0.014 +0.005	10 (12) (15) (16) (20)	12			10		12	
	10		10 12 15 16 (20) (25)	14			12		14	
	12	+0.017 +0.006	12 15 16 20 (25)	18	3		15	1.5	18	3
	13		12 15 16 20 (25)	19			16		19	
	15		12 15 16 20 (25)	21			18		21	
	16		12 15 16 20 25	22			20	2	22	
	20	+0.020 +0.007	15 16 20 25 30	28	4	M5x8	24		28	4
	25		16 20 25 30 40	33			29		33	
	30		16 20 25 30 40	38			34		38	

D	MPBP O.D. m6 (*1)	MPBPU * Housing Dia. G7(*2)	MPBZP O.D. h6 (* 3)	MPBZP 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.

Oil Free Bushings
- Copper Alloy, Oil Groove / Flanged, Standard / Thin Wall-

■Features: Lubrication frequency can be reduced by gathering initial grease in oil groove.

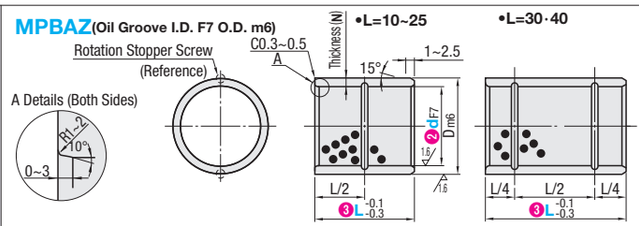
When ordering, select Part Number and Values from Selection Steps ❶~❸.

Ordering Example	Part Number(❶Type・❷d)	-	❸L
	MPBAZ10	-	15
	MPFZ20	-	30
	MPFZU12	-	15

■Oil Groove

CAD 2D 3D RoHS

MPBAZ(Oil Groove I.D. F7 O.D. m6)

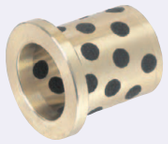


Material High Tensile Brass Alloy Solid Lubricant Embedded

Part Number ❶Type	❷dF7		❸L One Groove (Center)						Two Grooves		Dm6		Thickness (N)	* Rotation Stopper Screw (Reference)	Housing Dia. (Recommended Dimension) Ref. Dim.	Tolerance (H7)
MPBAZ	10	+0.028 +0.013	10	12	15	16					14	+0.018 +0.007	2	M4x8	14	+0.018 0
	12			12	15	16	20				18		3		18	
	13	+0.034		12	15		20				19	+0.021 +0.008			19	+0.021 0
	15	+0.016		12	15		20				21				21	
	16			12	15	16	20	25			22				22	
	20				15	16	20	25	30		28		4	M5x8	28	
	25	+0.041					20	25	30	40	33	+0.025 +0.009			33	+0.025 0
	30	+0.020					20	25	30	40	38				38	

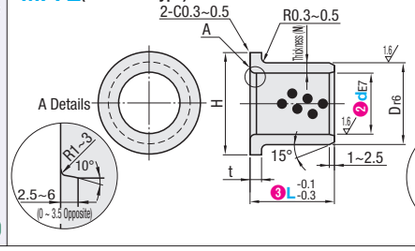
■Features: Flanged, less likely to pull-out.

■Flanged, Standard / Thin Wall Type

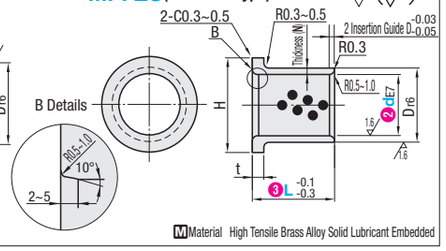


CAD 2D 3D RoHS

MPFZ(Standard Type)



MPFZU(Thin Wall Type)



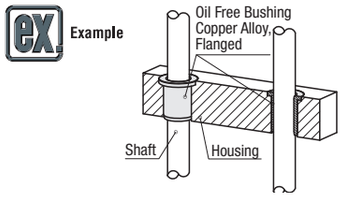
6.3 (1.6)

Material High Tensile Brass Alloy Solid Lubricant Embedded

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.

Part Number ❶Type	❷dE7		❸L	MPFZ Dr6		MPFZ Thickness (N)	MPFZ H	MPFZ 0 t-0.1	MPFZU Dr6		MPFZU Thickness (N)	MPFZU H	MPFZU 0 t-0.1	Housing Dia. (Recommended Dimension) MPFZ Ref. Dim.	MPFZ Tolerance (H7)	MPFZU Ref. Dim.	MPFZU Tolerance (H7)
MPFZ MPFZU * L dimensions in ( ) are available for MPFZ only.	5	+0.032	10 12	9	+0.028 +0.019	2	14	2	7	+0.028 +0.019	1	11	2	9	+0.015 0	7	+0.015 0
	6	+0.020	10 12 15	10			16		8			12		10		8	
	8	+0.040	10 12 15 20	12	+0.034 +0.023		20		10			14		12	+0.018 0	10	+0.018 0
	10	+0.025	10 12 15 20 (25) (30)	14			22		12			16		14		12	
	12		10 12 15 20 25 30	18		3	25	3	15	+0.034 +0.023	1.5	21	3	18		15	+0.018 0
	13	+0.050	(10) 12 15 20 (25) (30)	19	+0.041 +0.028		26		16			22		19		16	
	15	+0.032	10 12 15 20 25 (30)	21			28		18			24		21		18	
	16		12 15 20 25 30 (35) (40)	22			29		20	+0.041 +0.028	2	26		22	+0.021 0	20	
	18		(15) (20) (25) (30) (35) (40)	24			32		-	-	-	-	-	24		-	+0.021 0
	20		15 20 25 30 (35) 40	30		5	40	5	24	+0.041 +0.028	2	32	4	30		24	
	25	+0.061	(15) (20) (25) 30 (35) 40 50	35	+0.050 +0.034		45		29			37		35		29	
	30	+0.040	(20) (25) 30 (35) 40 50	40			50		34	+0.050 +0.034		42		40	+0.025 0	34	+0.025 0
	35		(20) (25) (30) (35) (40) (50)	45			60		-	-	-	-	-	45		-	-
	40	+0.075	(20) (25) (30) (35) (40) (50)	50			65		-	-	-	-	-	50		-	-
	50	+0.050	(30) (35) (40) (50) (60)	60	+0.060 +0.041		75		-	-	-	-	-	60	+0.030 0	-	-



Oil Free Bushings
-Copper Alloy, Thrust-

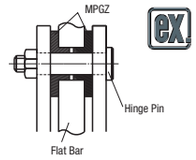
■Features: Lubricant is embedded in the flange so that one bushing can bear radial journal load and thrust load at the same time.

When ordering, select Part Number and Values from Selection Steps ❶~❸.

Ordering Example	Part number(❶Type・❷d)	-	❸L
	MPGZ10	-	15
	MPSZ12	-	15
	MPKZ16	-	20

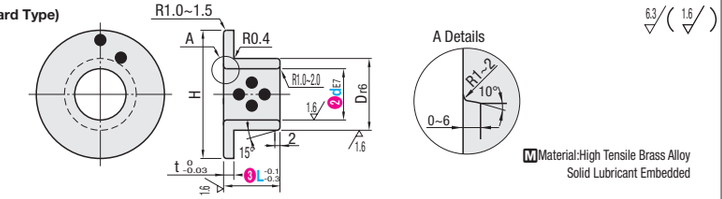
■Thrust Type

CAD 2D 3D RoHS



EX

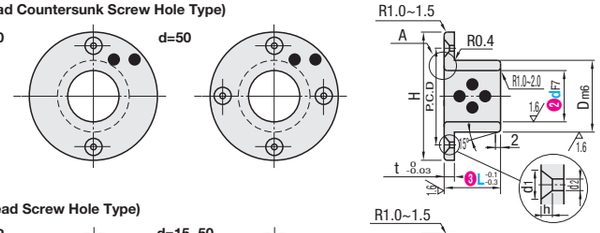
MPGZ(Standard Type)



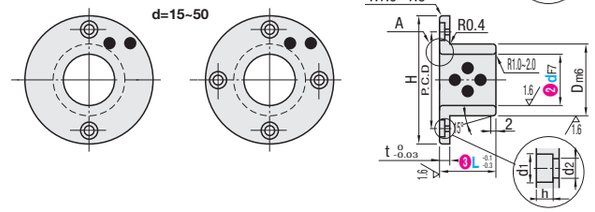
6.3 (1.6)

Material:High Tensile Brass Alloy Solid Lubricant Embedded

MPSZ(Flat-head Countersunk Screw Hole Type)



MPKZ(Low Head Screw Hole Type)



Part Number ❶Type	❷dH7		❸L	Dr6		H	t	Housing Dia. (Recommended Dimension) Ref. Dim.	Tolerance (H7)
MPGZ (Standard)	6	+0.032 +0.020	10 12	12	+0.034 +0.023	22	3	12	+ 0.018 0
	8	+0.040	10 12 15	14		25		14	
	10	+0.025	10 12 15 20	16				16	
	12	+0.050 +0.032	10 12 15 20 25	18		30		18	+ 0.021 0
	13		12 15 20 25	19	+0.041 +0.028			19	
	15		12 15 20 25	21		35		21	
	16		12 15 20 25 30	22				22	
	18		14 20 25 30 35	24		40		24	
	20	+0.061 +0.040	14 20 25 30 35 40	28		45	5	28	+ 0.025 0
	25		14 20 25 30 35 40	33		50		33	
	30		20 25 30 35 40	38	+0.050 +0.034	55		38	
	35	+0.075 +0.050	20 25 30 35 40	44		65		44	
	40		25 30 35 40 45 50	50		70	7	50	
	50		30 35 40 45 50 60	62	+0.060 +0.041	90	8	62	+ 8.030

Part Number ❶Type	❷dF7		❸L	Dm6		MPSZ H	MPSZ Mounting Hole P.C.D	MPSZ Mounting Hole d1	MPSZ Mounting Hole d2	MPSZ Mounting Hole h	MPSZ Flat-head Countersunk Screw	MPSZ t	MPKZ H	MPKZ Mounting Hole P.C.D	MPKZ Mounting Hole d1	MPKZ Mounting Hole d2	MPKZ Mounting Hole h	MPKZ Accessory Hex Socket Low Head Cap Screw	MPKZ t	Housing Dia. (Recommended Dimension) Ref. Dim.	Housing Dia. (Recommended Dimension) Tolerance (H7)
MPSZ (Flat-head Countersunk Screw Hole) MPKZ (Low Head Screw Hole)	6	+0.022 +0.010	10 12	10	+0.015 +0.006	25	15	8.5	3.5	2.5	M3	3	25	17	6	3.5	2.2	M3-10 x 2 pcs.	4	10	+ 0.015 0
	8	+0.028	12 15	12	+0.018 +0.007	28	18						27	19						12	+ 0.018 0
	10	+0.013	12 15 20	14		30	20						29	21						14	
	12		12 15 20	18		40	28						36	26				M4-12 x 2 pcs.	5	18	
	15	+0.034	12 15 20	21		50	35						39	29	7.5	4.5	3	M4-12 x 4 pcs.		21	+ 0.021 0
	16	+0.016	12 15 20 25 30	22	+0.021 +0.008								40	30						22	
	18		20 25 30	24									42	32						24	
	20	+0.041	20 25 30 35 40	28									49	38	9	5.5	3.7	M5-16 x 4 pcs.	6	28	
	25	+0.020	20 25 30 35 40	33		55	40	13	6	3.5	M5	5	54	43						33	+ 0.025 0
	30		20 25 30 35 40	38	+0.025 +0.009	60	45						63	50	11	6.6	4.2	M6-20 x 4 pcs.	8	38	
	35	+0.050	20 25 30 35 40	44		70	52						69	56						44	
	40	+0.025	25 30 35 40 45	50		80	60	16	7	4.5	M6	7	82	66	14	9	5.2	M8-25 x 4 pcs.	10	50	
	50		30 35 40 45	62	+0.030 +0.011	100	75					8	94	78						62	+ 8.030

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.