Bushings for Locating Pins

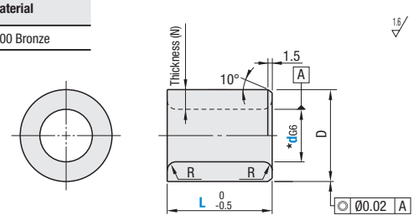
Copper Alloy Straight / Copper Alloy with Flanged

Features: Suitable for preventing pin abrasion and rust since it is softer than steel.

Copper Alloy Straight

RoHS10

Type		Material
Dp6	Dm6	
JBAD	JBADM	C86300 Bronze



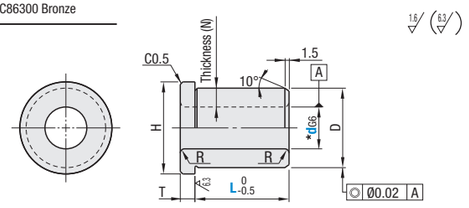
*For hole machining, please note that inner diameter shrinkage of p6 Type is more than that of m6 Type.
(See "Variance of Inner Diameter after Press-fitting Bushings for Locating Pins" below.)

Part Number Type	d	d Tolerance	L	Thickness (N)	R	D	D Tolerance p6	D Tolerance m6
(Dp6) JBAD	5	+0.012	5 6 8 10 12 15	2.5	0.5	10	+0.024 +0.015	+0.015 +0.006
	6	+0.004	5 6 8 10 12 15 16	2				
	8	+0.014	5 6 8 10 12 15 16 20	2		12	+0.029 +0.018	+0.018 +0.007
	10	+0.005	6 8 10 12 15 16 20 25	2.5		15		
	12		8 10 12 15 16 20 25 30	3	1	18		
(Dm6) JBADM	13	+0.017	10 12 15 16 20 25 30	4.5		22	+0.035 +0.022	+0.021 +0.008
	15	+0.006	12 15 16 20 25 30	5		25		
	16		12 15 16 20 25 30	5		26		
	20	+0.020	12 15 16 20 25 30	5	2	30		
	25	+0.007	16 20 25 30 35	5		35	+0.042 +0.026	+0.025 +0.009

Copper Alloy with Flanged

RoHS10

Type		Material
Dp6	Dm6	
JBHD	JBHDM	C86300 Bronze



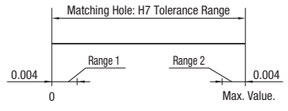
*For hole machining, please note that inner diameter shrinkage of p6 Type is more than that of m6 Type.
(See "Variance of Inner Diameter after Press-fitting Bushings for Locating Pins" below.)

Part Number Type	d	D Tolerance	L	Thickness (N)	R	H	T	D	D Tolerance p6	D Tolerance m6
(Dp6) JBHD	5	+0.012	5 6 8 10 12	2.5	0.5	14	3	10	+0.024 +0.015	+0.015 +0.006
	6	+0.004	5 6 8 10 12 15	2						
	8	+0.014	5 6 8 10 12 15 16 20	2		16	4	12	+0.029 +0.018	+0.018 +0.007
	10	+0.005	6 8 10 12 15 16 20 25	2.5		19		15		
	12		8 10 12 15 16 20 25 30	3	1	22		18		
(Dm6) JBHDM	13	+0.017	10 12 15 16 20 25 30	4.5		26	5	22		
	15	+0.006	12 15 16 20 25 30	5		30		25	+0.035 +0.022	+0.021 +0.008
	16		12 15 16 20 25 30	5				26		
	20	+0.020	12 15 16 20 25 30	5	2	35	6	30		
	25	+0.007	16 20 25 30 35	5		40		35	+0.042 +0.026	+0.025 +0.009

Part Number Example

Part Number		L
JBAD6	-	10
JBHDM10	-	20

Variance of I.D. after Press-fitting Bushings for Locating Pins (Reference)



Housing Bore Diameter Tolerance: In Range 1

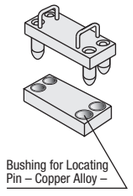
D Tolerance	
m6	p6
99.90%	99.83%

Housing Bore Diameter Tolerance: In Range 2

D Tolerance	
m6	p6
99.99%	99.92%

Data values above are not guaranteed but experimental values.

Application Example



Bushings for Locating Pins

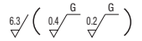
Straight / Shouldered / Ceramics

Straight

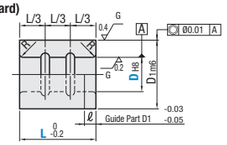
Shouldered

RoHS10

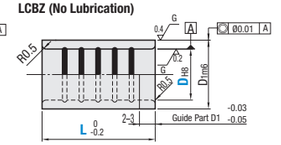
Type Straight	Type Flanged	Material	Hardness
LCB	LCH	52100 Bearing Steel	58 HRC min.
LCBZ	LCHZ	Cast Iron Class No.35 (Special Solid Lubricant)	—



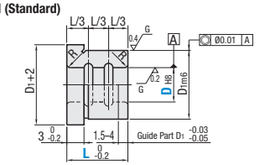
LCB (Standard)



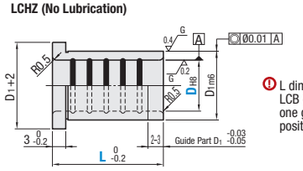
LCBZ (No Lubrication)



LCH (Standard)



LCHZ (No Lubrication)



L dimensions 5, 6 of LCB (standard) have one groove at L/2 position.

Straight

Part Number Type	D_{h8}		L Selection	D_{1m6}		ℓ	R
Standard LCB / No Lubrication LCBZ	5	+0.018 0	*5 *6 *8 *10 *12 *16	10	+0.015 +0.006	1.5	0.5
	6		6 8 10 *12 *16	12	+0.018 +0.007	2	
	8	+0.022 0	8 10 12 16 20	14		3	1
	10			16			
	12	+0.027 0	10 12 16 20 25	18			1.2
	13			22			
	15		16 *20 25 30	25	+0.021 +0.008	4	1.5
	16		16 20 25 30	26			
	20	+0.033 0		30			2
	25		20 25 30 35	35	+0.025 +0.009		

L Dimensions marked by * are available for LCB only.
D5 unavailable for LCBZ part type.

Shouldered

Part Number Type	D_{h8}		L Selection	D_{1m6}		ℓ	R
Standard LCH / No Lubrication LCHZ	5	+0.018 0	*8 *10 *12 *16	10	+0.015 +0.006	1.5	0.5
	6		8 10 *12 *16	12	+0.018 +0.007	2	
	8	+0.022 0	8 10 12 16 20	14		3	1
	10			16			
	12	+0.027 0	10 12 16 20 25	18			1.2
	13			22			
	15		16 20 25 30	25	+0.021 +0.008	4	1.5
	16		16 20 25 30	26			
	20	+0.033 0		30			2
	25		20 25 30 35	35	+0.025 +0.009		

L Dimensions marked by * are available for LCH only.
D5 unavailable for LCHZ part type.

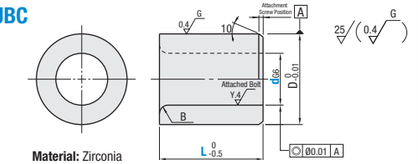
Part Number Example

Part Number		L
LCB10	-	12
LCBZ12	-	20
LCH25	-	30
LCHZ25	-	35

Ceramics

RoHS10

JBC



Material: Zirconia

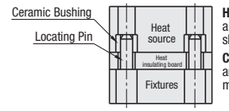
Part Number Type	d_{g6}		L Selection	R	D
JBC	6	+0.012 +0.004	8 10	1	10
	8	+0.014 +0.005	10 12	2	12
	10				15
	12	+0.017 +0.006	10 12 16		18
	13				22
	15		16 20		25
	16				26
	20	+0.020 +0.007	20	3	30

Testing Results
Ceramics excel in abrasion resistance compared to steel. Suitable for long-term use with locating pins insertion and extraction, maintaining an excellent abrasion resistance.

Bushings for Locating Pins – Ceramic Abrasion Data

Sample	I.D. (Before Test)	I.D. (After Test)	Difference
Ceramic JBC10-10	10.0T	10.012	0.001
Steel JBA10-10-	10.008	10.037	0.029

Automotive Parts Welding Machine



How to Mount: Set a plastic board. Using a plastic hammer, press Ceramic Bushing slightly in.

Circumstance: Set it between heat source and fixtures with high accuracy but transfer minimum heat to fixtures.

Part Number Example

Part Number		L
JBC16	-	20

Avoid pressing Ceramic Bushing in. It may crack when struck hard. Use of Loctite is recommended.
Strength may degrade when used at the temperature over 100°C for extended durations, or when operating temperature varies from normal to high repeatedly.

Properties

Item	Unit	Part Number: JBC
Specific Gravity	g/cm²	6.0
Moisture Absorption Ratio	%	0
Vickers Hardness	HV	1300
Flexural Strength	kg/mm²	100
Linear Expansion Coefficient	x 10⁻⁶/°C	10.0
Thermal Conductivity	cal/cm・sec・°C	0.007
Volume Inherent Resistivity	Ωcm	3 x 10¹²

Test Conditions
Measuring Method: Apply load on the bushing by reciporcating Ø10 round shaft with 40mm stroke with a 2 kg weight on the end in the crank mechanism (left diagram).

Measuring Instrument Overview:
– Cranking Speed: 150 rpm
– Round Shaft Stroke: 40 mm
– Temperature: 25~27°C
– Operation Hours: 60 hours each
– Lubricant: JIS Machine Oil (Tellus 32) *drip-feed every 2 hours
– Ø10 Round Shaft Material: W1-10 Tool Steel (No Heat Treatment)