

Drystar Outline

SO#936FR

Lead Free RoHS

Drystar

Straight Type

SO#936FR

Lead Free RoHS

Features

It is the bearing which has sintered porosity of bronze powder on the steel back plate, with improved self-lubrication and wear resistance by adding polytetrafluoro-ethylene (PTFE), which has small friction coefficient, and special filler through impregnation.

- Lead-free bearing which can be used without lubrication.
- Excellent sliding performance under high load and impact load.
- Excellent in wear resistance and long life.
- Suitable for sliding motion and continued motion Stick-slip hardly occurs. Silent operation can be achieved.

Precautions for use

- Do not grind the bushing inner surface or the outer diameter to change the size.
- Polish the surface of the mating surface to the value better than $3 \mu \text{mRmax}$.
- Offset the joint of the bushing as far as possible from the maximum load point.
- To press fit the bushing, press fit it vertically into the housing.
- Special lock is not required for Drystar.
- Initial lubrication can make the product life longer.

Operation Range

Lubricating Condition	Max. Allowable Load P N/mm ²				Operation Range Temperature °C
	Very Slow Movement	Rotation, Oscillation or Sliding	Change of Load 100,000 Times or Less	Change of Load 10 million Times or More	
No lubrication	147	59	29	15	-200 ~ +280

Physical Properties

Compression Strength Mpa	Linear Expansion Coefficient $\times 10^{-6}/^{\circ}\text{C}$		Thermal Conductivity W / (m · K)
	Parallel to Bearing Surface	Vertical to Bearing Surface	
304	11	30	42

Dimensions and tolerance for press-fit of bushing and how to obtain maximum press-fit force F (general formula)

$$F \approx 0.8tL \delta \text{ max}$$

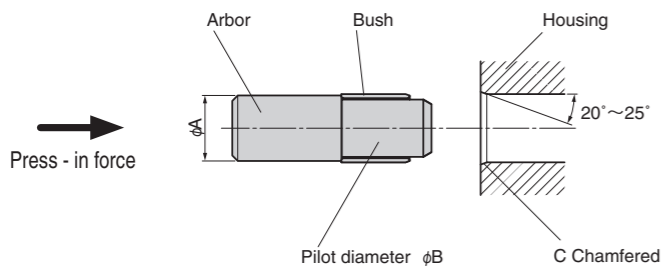
even t : Bush thickness(mm)

L : Bush length(mm)

$\delta \text{ max}$: Circumferential maximum stress (N)

$$= 18.6 \times 10^4 \times \frac{\text{Max. Bush Dia} - \text{Housing Dia}}{\text{Max. Bush Dia}}$$

For max bush dia., use the value measured with "GO ring gauge"



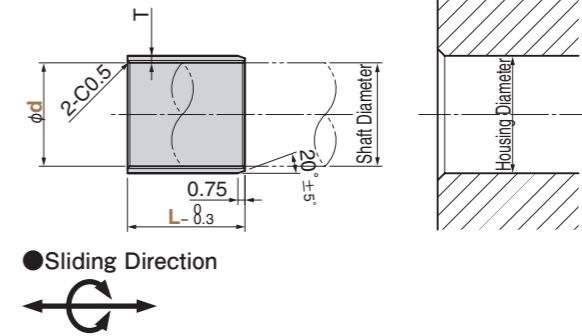
Arbor dia = Housing I.D. - (0.2 ~ 0.4 mm)

Pilot dia = Bush I.D. - (0.2 ~ 0.3 mm)

Housing chamfering procedures (C value)

Housing dia	C value
$\phi 30$ or less	0.8mm
$\phi 30 \leq \phi 50$	1.2mm
$\leq \phi 50$	1.6mm

LBM

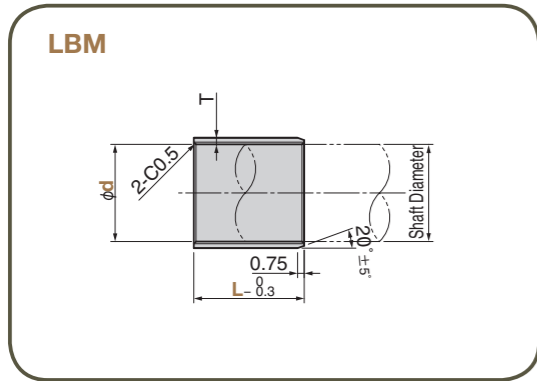


Material SO#936 FR

Housing I.D.	H7	Shaft		Dimension of Bushing				Catalog No.	d	L
		O.D.	Tolerance	Tolerance I.D. after press-fit	O.D.	Tolerance	Thickness T			
5		3	-0.025 -0.034	3		5				03 04 05 06
	+0.012 0				+0.062 0		+0.047 +0.017			03 04 05 06
6		4		4		6				03 04 05 06 08
7		5	-0.025 -0.037	5		7				03 04 05 06 08
8		6		6		8	+0.053 +0.023	1.0	0 -0.025	LBM 06 07 08 10 12
	+0.015 0				+0.065 0					05 06 07 08 10 12
9		7	-0.025 -0.040	7		9				05 06 07 08 10 12
10		8		8		10	+0.055 +0.025			04 05 06 07 08 10 12 15

* Tolerance I.D. after press-fit is for reference only.

Order **Catalog No.** **LBM** **d** - **L**
05 - 08



Order **Catalog No.** **LBM** **d** — **L**
20 — 25

Operation Range

Lubricating Condition	Max. Allowable Load P N/mm ²				Operation Range Temperature °C
	Very Slow Movement	Rotation, Oscillation or Sliding	Change of Load 100,000 Times or Less	Change of Load 10 million Times or More	
No lubrication	147	59	29	15	-200 ~ +280

Physical Properties

Compression Strength Mpa	Linear Expansion Coefficient ×10 ⁻⁶ /°C		Thermal Conductivity W/ (m · K)
	Parallel to Bearing Surface	Vertical to Bearing Surface	
304	11	30	42

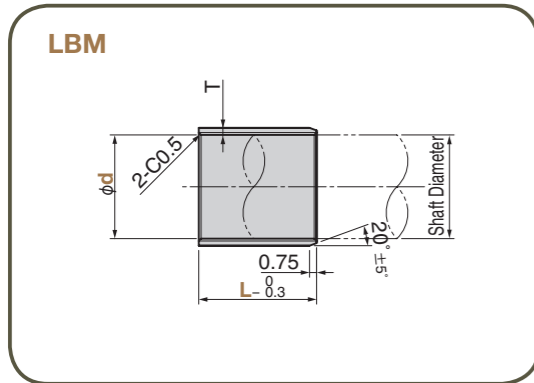
Housing I.D.	H7	Shaft O.D.	Tolerance	Dimension of Bushing				Catalog No.	d	L
				Tolerance I.D. after press-fit	O.D.	Tolerance	Thickness T			
11		9		9	11				09	06 10
12		10	-0.025 -0.040	10	12				10	06
										07
										08
										10 12 15 20 06 08 10 20
14		12		12	14				12	12 15 20 25
										08
										10
										12 15 20 25
15	+0.018 0	13		13	15				13	08 10 12 15 20 25
										15
										20
										25
16		14	-0.025 -0.043	14	16				14	12 15 20 25
										08
										10
										12 15 20 25
17		15		15	17				15	12 15 20 25
										08
										10
										12 15 20 25

* Tolerance I.D. after press-fit is for reference only.

Housing I.D.	H7	Shaft O.D.	Tolerance	Dimension of Bushing				Catalog No.	d	L
				Tolerance I.D. after press-fit	O.D.	Tolerance	Thickness T			
18	+0.018 0	16		16	18				16	10 12 15 20 25
										10
										15
										20 25
19		17	-0.025 -0.043	17	19		1.0	0 -0.025	17	10 15 20 25
										10
										12
										15 20 25
20		18		18	20				18	15 20 25 30
										10
										15
										20 25 30
22		19		19	22				19	10 15 20 25
										10
										12
										15 20 25
23		20		20	23				20	15 20 25 30
										10
										12
										15 20 25
25	+0.021 0	22		22	25				22	12 15 20 25 30
										10
										15
										20 25 30
27		24		24	27				LBM	15 20 25 30 35 40 45
										10
										12
										15 20 25 30 35 40 45
28		25	-0.025 -0.046	25	28			0 -0.030	25	10 12 15 20 25 30 35 40 45
										10
										12
										15 20 25 30 35 40 45
30		26		26	30				26	10 12 15 20 25 30 35 40 45
										10
										12
										15 20 25 30 35 40 45
32		28		28	32				28	10 12 15 20 25 30 35 40 45
										10
										12
										15 20 25 30 35 40 45
34	+0.025 0	30		30	34				30	10 12 15 20 25 30 35 40 45 50
										10
										12
										15 20 25 30 35 40 45 50

* Tolerance I.D. after press-fit is for reference only.

Resin Sliding Materials



Order **Catalog No.** **LBM** **d** **60** **L** **60**

Operation Range

Lubricating Condition	Max. Allowable Load P N/mm ²				Operation Range Temperature °C
	Very Slow Movement	Rotation, Oscillation or Sliding	Change of Load 100,000 Times or Less	Change of Load 10 million Times or More	
No lubrication	147	59	29	15	-200 ~ +280

Physical Properties

Compression Strength Mpa	Linear Expansion Coefficient ×10 ⁻⁶ /°C		Thermal Conductivity W / (m · K)
	Parallel to Bearing Surface	Vertical to Bearing Surface	
304	11	30	42

Housing		Shaft		Dimension of Bushing				Catalog No.	d	L
I.D.	H7	O.D.	Tolerance	Tolerance I.D. after press-fit	O.D.	Tolerance	Thickness T			
35		31		31		35			31	15 25 30 40
36		32		32		36			32	15 20 25 30 40 50
39		35		35		39			35	10 12 15 20 25 30 35 40 50
42		38		38		42			38	20 25 30 35 40 40 12 15 20
44		40		40		44			40	25 30 35 40 40 50

* Tolerance I.D. after press-fit is for reference only.

Housing		Shaft		Dimension of Bushing				Catalog No.	d	L
I.D.	H7	O.D.	Tolerance	Tolerance I.D. after press-fit	O.D.	Tolerance	Thickness T			
50		45		45		50			45	20 25 30 35 40 50 12 15 20 25 30 35 40 50
55		50		50		55		2.5	50	25 30 35 40 50 60 25 30 35 40 50 60
60		55		55		60			55	60 60 15 30 35 40 50 60 70
65		60		60		65			60	30 35 40 50 60 70 30 40 50 60
70		65		65		70			LBM	40 50 60 60 70 80 80 30 35 40 50 60
75		70		70		75			70	60 70 80 80 30 35 40 50 60 70
80		75		75		80		2.47	75	40 50 60 80 40 50 60 80 40 50 60
85		80		80		85			80	50 60 80 80 30 40 50 60
90		85		85		90			85	40 50 60 40 50 60
95		90		90		95			90	40 50 60 90 90
100		95		95		100			95	30 40 50

* Tolerance I.D. after press-fit is for reference only.

LBM



Order

Catalog No.

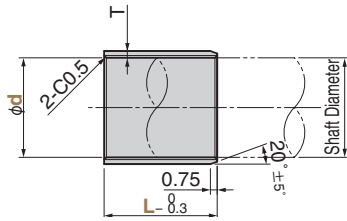
LBM

d

100

L

30



Housing		Shaft		Dimension of Bushing				Catalog No.	d	L
I.D.	H7	O.D.	Tolerance	Tolerance I.D. after press-fit	O.D.	Tolerance	Thickness T			
										30
										50
105		100		100	105				LBM	70
										80
										95
										100
110	$\begin{matrix} +0.035 \\ 0 \end{matrix}$	105		$\begin{matrix} +0.195 \\ +0.060 \end{matrix}$	110	$\begin{matrix} +0.180 \\ +0.115 \end{matrix}$				50
			$\begin{matrix} +0.035 \\ 0 \end{matrix}$							90
										100
										30
115		110			115					50
										70
										100
										30
125		120			125		2.47	$\begin{matrix} 0 \\ -0.050 \end{matrix}$	LBM	50
										70
										95
										100
135		130			135	$\begin{matrix} +0.185 \\ +0.120 \end{matrix}$				50
										80
										100
145	$\begin{matrix} +0.040 \\ 0 \end{matrix}$	140		$\begin{matrix} +0.200 \\ +0.060 \end{matrix}$	145					50
			$\begin{matrix} +0.035 \\ -0.005 \end{matrix}$							80
										100
155		150			155					50
						$\begin{matrix} +0.205 \\ +0.140 \end{matrix}$				80
										100
165		160			165					50
										80
										100

* Tolerance I.D. after press-fit is for reference only.