

Drystar SO#936FR(Lead Free Type) Outline

SO#936FR

RoHS Lead Free

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 μmR_{max}.
- 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 ×10 ⁻⁶ /°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)

$$F \doteq 0.8tL \delta_{max}$$

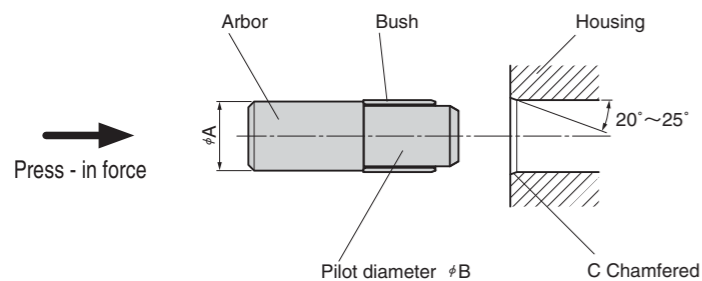
even t : Bush thickness(mm)

L : Bush length(mm)

δ_{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)

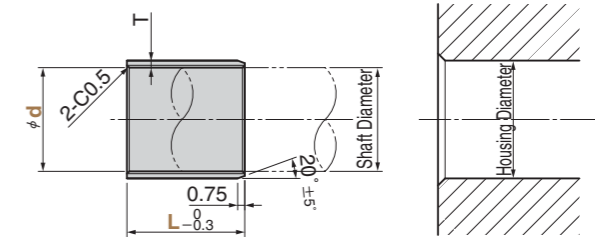
Housing dia	C value
φ 30 or less	0.8mm
30 < φ ≤ 50	1.2mm
50 < φ	1.6mm

Oilless Bush Drystar Lead Free · Straight Type

SO#936FR

RoHS Lead Free

LBM



● Sliding Direction



Material SO#936FR

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

Order Catalog No. LBM d - L 05 - 08

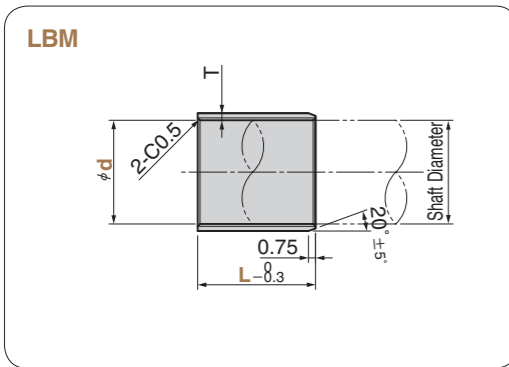
⚠ Tolerance I.D. after press-fit is applicable to used as reference.

Oilless Bush

Drystar Lead Free · Straight Type

SO#936FR

RoHS Lead Free



Order **Catalog No.** **LBM** **d** 20 **L** 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.	Shaft H7	Dimension of Bushing				Catalog No.	d	L
		O.D.	Tolerance	Tolerance I.D. after press-fit	O.D.			
11	9	9		9	11		09	06 10
								06 07 08
12	10	10	-0.025 -0.040	10	12		10	10 12 15 20
								06 08 10 15 20
14	12	12		12	14		12	12 15 20 25
								08 10 15 20
								06 08 10 15 20
								08 10 15 20
								08 10 15 20
15	13	13		13	15		13	12 15 20
								08 10 15 20
16	14	14		14	16		14	12 15 20 25
								08 10 15 20
17	15	15		15	17		15	12 15 20 25

Tolerance I.D. after press-fit is applicable to used as reference.

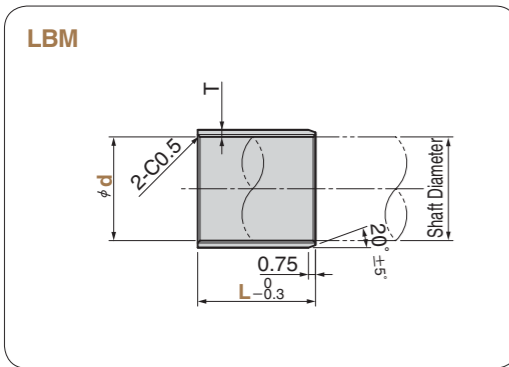
Housing I.D.	Shaft H7	O.D.	Tolerance	Dimension of Bushing				Catalog No.	d	L
				Tolerance I.D. after press-fit	O.D.	Tolerance	Thickness T			
18	+0.018 0	16		16	18	+0.073 +0.038		16	10 12 15 20 25	
19		17	-0.025 -0.043	17	+0.071 0	19	1.0 0 -0.025	17	10 15 20 25	
20		18		18	20			18	10 15 20 25 30	
22		19		19	22	+0.081 +0.046		19	10 15 20 25	
23		20		20	23			20	10 12 15 20 25 30	
25	+0.021 0	22		22	25	+0.086 +0.051	1.5	22	10 12 15 20 25 30	
27		24		24	+0.081 0	27		LBM 24	15 20 25 30 35	
28		25	-0.025 -0.046	25	28	+0.093 +0.056	0 -0.030	25	20 25 30 35 40 50	
30		26		26	30			26	15 20 25 30	
32		28		28	32			28	10 12 15 20 25 30	
									10 12 15 20 25 30	
									10 12 15 20 25 30	
34	+0.025 0	30		30	+0.085 0	34	+0.115 +0.075	30	10 12 15 20 25 30 35 40 50	

Oilless Bush

Drystar Lead Free · Straight Type

SO#936FR

RoHS Lead Free



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 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			
35		31		31	35			LBM	15	
									25	
									30	
									40	
36		32		32	36			LBM	15	
									20	
									25	
									30	
39	+0.025 0	35	-0.025 -0.050	35	39	+0.085 0	+0.115 +0.075	2.0	0	
									-0.030	
									30	
									35	
42		38		38	42			LBM	20	
									25	
									30	
									35	
44		40		40	44			LBM	12	
									15	
									20	
									25	
44		40		40	44			LBM	30	
									35	
									40	
									50	

▲ Tolerance I.D. after press-fit is applicable to used as reference.

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			
50	+0.025 0	45		45	50	+0.105 0	+0.115 +0.075		20	
									25	
									30	
									35	
55		50		50	55			LBM	12	
									15	
									20	
									25	
60		55		55	60	+0.110 0	+0.145 +0.095		30	
									35	
									40	
									50	
65	+0.030 0	60		60	65			LBM	15	
									30	
									35	
									40	
70		65		65	70			LBM	30	
									40	
									50	
									60	
75		70		70	75	+0.190 +0.060		LBM	30	
									35	
									40	
									50	
80		75		75	80	+0.160 +0.095	2.47	0 -0.050	30	
									35	
									40	
									50	
85		80		80	85			LBM	40	
									50	
									60	
									80	
90	+0.035 0	85		85	90	+0.195 +0.060	+0.165 +0.100		40	
									50	
									60	
									80	
95		90		90	95	+0.035 0		LBM	40	
									50	
									60	
									90	
100		95		95	100	+0.180 +0.115		LBM	30	
									50	

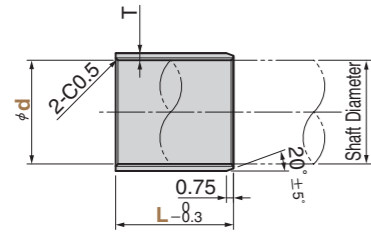
Oilless Bush

Drystar Lead Free · Straight Type

SO#936FR

RoHS Lead Free

LBM



Order

Catalog No.	d	L
LBM	100	30

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			
105		100		100	105			LBM	100	30
										50
										70
										80
										95
110	+0.035 0	105		105	110			LBM	105	50
										90
										100
115		110		110	115			LBM	110	30
										50
										70
125		120		120	125	2.47	0 -0.050	LBM	120	30
										50
										70
										95
										100
135		130		130	135			LBM	130	50
										80
										100
145	+0.040 0	140		140	145			LBM	140	50
										80
										100
155		150		150	155			LBM	150	80
										100
										100
165		160		160	165			LBM	160	80
										100
										100

⚠ Tolerance I.D. after press-fit is applicable to used as reference.

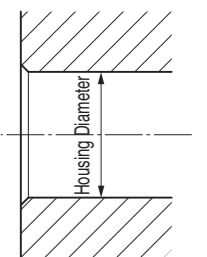
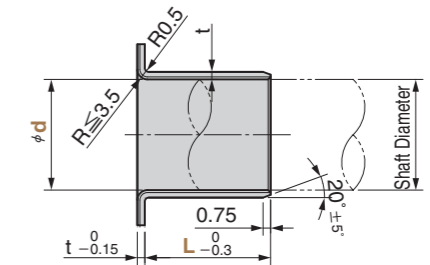
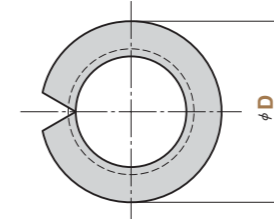
Oilless Bush

Drystar Lead Free · Flange Type

SO#936FR

RoHS Lead Free

LBMF



● Sliding Direction



Material SO#936FR

Operation Range

Lubricating Condition	Max. Allowable Load P N/mm ²				Operation Range Temperature °C
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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

📖 Refer to page 131 for caution in using



Order

Catalog No.	d	D	L
LBMF	06	12	08

Housing I.D.	H7	Shaft		Dimension of Bushing				Catalog No.	d	D	L
		O.D.	Tolerance	Tolerance I.D. after press-fit	O.D.	Tolerance	Thickness t				
4.6	+0.012 0	3	-0.025 -0.034	3	+0.062 0	5	+0.047 +0.017	0.8			03
											07
5.6		4		4		6					04
											09
7		5		5		7					05
											10
8		6		6		8	+0.053 +0.023	1.0	0 -0.025		06
											12
9		7		7		9					07
											13
10		8	-0.025 -0.040	8		10	+0.055 +0.025				08
											15
											10
											12

⚠ Tolerance I.D. after press-fit is applicable to used as reference.