

# Linear Bushings

## Features / Antirust Performance Comparison Test

### Features

When these linear bushings are used in combination with linear shafts, a linear system is created with a range of motion limited only by the lengths of the shaft due to the recirculating ball bearings in the bushing body. By enabling linear motion with low friction and high accuracy, this system is widely applicable to semiconductor processing equipment, electrical device manufacturing equipment, food packaging machines and others.

### Lubrication

At the time of delivery, MISUMI linear bushings, except for Lubrication Unit MX type, are coated with rust protection oil only. Although the rust protection oil will hardly affect the performance of lubricants, it is recommended to grease the bushing after cleaning and drying the bushing. Before initial use, apply grease to the rows of balls on the inner surface of linear bushing and reapply accordingly. In addition to Lubrication Unit MX type, MISUMI provides Filled Grease type with L, G and H greases supplied in the bushing.

### Fitting

For MISUMI linear bushings, it is recommended to use in combination with MISUMI shafts (hardened with g6 tolerance).

\*Shaft P.202

### Reference: Tolerance Tange of Linear Bushing and Shafts Made by MISUMI

Dimension (mm)	Linear Bushings Single Type (LMU) Inner Diameter Tolerance				Shaft (SFJ) Outer Diameter Tolerance (g6)					
	φ3-5	φ6-16	φ20-30	φ35-50	φ3	φ4-6	φ8-10	φ12-18	φ20-30	φ35-50
0										
-0.001										
-0.002										
-0.003										
-0.004										
-0.005										
-0.006										
-0.007										
-0.008										
-0.009										
-0.010										
-0.011										
-0.012										
-0.013										
-0.014										
-0.015										
-0.016										
-0.017										
-0.018										
-0.019										
-0.020										
-0.021										
-0.022										
-0.023										
-0.024										
-0.025										

### Allowable Load

#### Basic Dynamic Load Rating (C)

Basic Dynamic Load rating is a constant load applied in a constant direction and ran under equal conditions on a group of linear system test samples where 90% of test samples will reach 50km without experiencing any flaking of rolling surfaces due to rolling fatigues.

#### Basic Static Load Rating (Co)

Basic static load rating is the static load exerted on contacting parts under maximum stress, at which the sum of the permanent deformation in the rolling element and rolling contact surface equals 0.0001 times the diameter of the rolling element.

#### Life Span

Rated Life can be obtained from the Basic Dynamic Load Rating and the actual load applied on the linear bushings, as shown below.

$$L = \left( \frac{fH \cdot fT \cdot fC}{f_w} \cdot \frac{C}{P} \right)^3 \cdot 50 \text{ km}$$

L : Rated Life (km) f<sub>w</sub> : Load Factor (Refer to Table 4) P.3949  
 C : Basic Dynamic Load Rating (N) fH : Hardness Factor (Refer to Figure 1)  
 P : Applied Load (N) fT : Temperature Factor (Refer to Figure 2)  
fC : Contact Factor (Refer to Table 3)

$$Lh = \frac{L \cdot 10^3}{2 \cdot l_s \cdot n_1 \cdot 60}$$

Life span in hours can be obtained by calculating travel distance per hour. When stroke length and stroke cycles are fixed, see the equation below.

\*Fig. 1 & 2, Table 3 & 4 P.3949

L<sub>h</sub>: Life span in hours (hr); L<sub>s</sub>: Stroke Length (m) L: Rated Life (km)  
 N<sub>1</sub>: Reciprocating cycles per Minute (cpm)

### Antirust Performance Comparison Test (Reference)

#### Testing Method

Salt water spray testing method conforms to JIS H8502. (Spray 35°C, 5% NaCl Solution)

#### Testing Sample

Round Flanged Linear Bushings – Single Type

#### Appearance of Test Piece 72 hr, 168 hr Before Test

	52100 Bearing Steel	440C Stainless Steel	Electroless Nickel Plating	Low Temperature Black Chrome Plating
Before Test				
72 hr				
168 hr				