

Oil Free Bushings / Oil Free Bushing Housing Units - Blocks

Casting Built-in Cast Bushings

Oil Free Bushings / Thrust Washers

Multi-Layer LF Bushings - Straight / Flanged

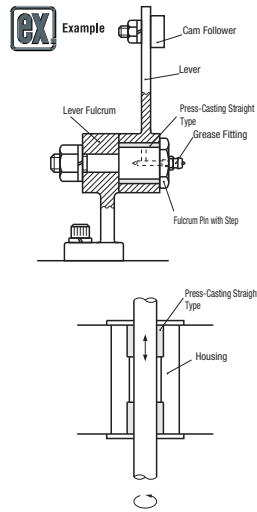
■ **Features:** Optimal for use in medium load and low speed applications.

■ **Straight / Flanged**

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.

Material: FC250
 Special Solid Lubricant



| Part Number | Type | d ₆ | L | D _{m6} | C | SMZ | | SMZF | |
|---|-----------------|----------------|----------------|-----------------|-----|------------|----------------------|------------|----------------------|
| | | | | | | Unit Price | Volume Discount Rate | Unit Price | Volume Discount Rate |
| 1 ~ 9 pc(s), 10 ~ 50 pcs, 1 ~ 9 pc(s), 10 ~ 20 pcs. | | | | | | | | | |
| Straight SMZ | 6 | +0.014 | 6 8 10 12 | 10 | 0.3 | | | | |
| | 8 | +0.005 | 8 10 12 15 | 12 | | | | | |
| | 10 | | 10 12 15 20 | 16 | | | | | |
| | 12 | | 10 12 15 20 25 | 18 | | | | | |
| | 15 | +0.017 | 15 20 25 30 | 22 | | | | | |
| | 16 | +0.006 | 15 20 25 30 | 23 | | | | | |
| | 20 | | 20 25 30 40 | 28 | | | | | |
| | 25 | +0.020 | 25 30 40 50 | 32 | | | | | |
| | 30 | +0.007 | 30 40 50 60 | 38 | | | | | |
| | Flanged SMZF | 6 | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |

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

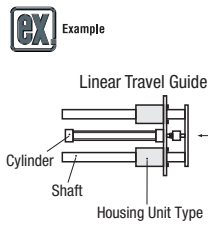
■ **Features:** Reduces the time of manufacturing and assembling the housing.

■ **Housing Units**

MHSR

Recommended Mating Shaft Tolerance: e7 or h7

Material: SS400
 Surface Treatment: Chrome Plating
 SMZ



| Part Number | Type | d | L (1 Bushing) / L (2 Bushings) | | D | D1 | MxL | P.C.D. | Mass (g) | | Short | | Long | |
|---|------|-----|--------------------------------|------|----|-----|------|--------|----------|------|------------|----------------------|------------|----------------------|
| | | | Short | Long | | | | | Short | Long | Unit Price | Volume Discount Rate | Unit Price | Volume Discount Rate |
| 1 ~ 9 pc(s), 10 ~ 20 pcs, 1 ~ 9 pc(s), 10 ~ 20 pcs. | | | | | | | | | | | | | | |
| MHSR | 8 | 15 | 30 | 12 | 30 | 4x8 | 21 | 77 | 154 | | | | | |
| | 10 | 20 | 40 | 16 | 34 | | | | | | | | | |
| | 12 | 25 | 40 | 18 | 36 | | | | | | | | | |
| | 15 | 30 | 50 | 22 | 42 | | | | | | | | | |
| | 20 | 40 | 60 | 28 | 48 | | | | | | | | | |
| | 25 | 50 | 80 | 32 | 52 | | | | | | | | | |
| 30 | 60 | 100 | 38 | 60 | 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**

SMZH

Recommended Mating Shaft Tolerance: e7 or h7

Material: FC250
 Special Solid Lubricant

| Part Number | Type | d ₆ | Tolerance | D _{h7} | Tolerance | L | H | T | d ₁ | d ₂ | t | P.C.D. | Mass (g) | Unit Price | Volume Discount Rate |
|-------------|------|----------------|-----------|-----------------|-----------|----|----|-----|----------------|----------------|----|--------|----------|------------|----------------------|
| | | | | | | | | | | | | | | | |
| SMZH | 8 | +0.014 | 15 | -0.013 | 20 | 32 | 5 | 3.1 | 24 | 45 | | | | | |
| | 10 | +0.005 | 19 | 0 | 25 | 40 | 5 | 3.5 | 6 | 29 | 85 | | | | |
| | 12 | +0.017 | 21 | -0.016 | 30 | 42 | 6 | 4.5 | 7.5 | 4.1 | 32 | 103 | | | |
| | 15 | +0.006 | 28 | 0 | 40 | 48 | 6 | 4.5 | 7.5 | 4.1 | 38 | 180 | | | |
| | 20 | | 32 | 0 | 50 | 54 | 8 | 5.5 | 9 | 5.1 | 43 | 280 | | | |
| | 25 | +0.020 | 40 | -0.019 | 60 | 62 | 8 | 5.5 | 9 | 5.1 | 51 | 270 | | | |
| | 30 | +0.007 | 45 | 0 | 70 | 74 | 10 | 6.6 | 11 | 6.1 | 60 | 670 | | | |

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

Ordering Example: Part Number - L
 SMZH10

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

■ **Straight / Flanged**

MDZB (Straight) **MDZF (Flanged)**

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.

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 | | | | | | | | | | MDZB | | MDZF | | | * Shaft Diameter | * Housing Dia. H7 | I.D. Tolerance after press fit (Reference Value) |
|---|------|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|------------------|-------------------|--|
| | | | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | Tolerance | | | | |
| 1 ~ 9 pc(s), 10 ~ 20 pcs, 1 ~ 9 pc(s), 10 ~ 20 pcs. | | | | | | | | | | | | | | | | | | | | |
| Straight Type MDZB | 3 | 3 | (4) | 5 | (6) | 5 | +0.047 | 1.0 | 0 | -0.025 | 1.0 | 0 | -0.025 | 1.0 | 0 | -0.025 | 0 | 0 | | |
| | 4 | (3) | 4 | (5) | 6 | (8) | 6 | | | | | | | | | | | | +0.017 | |
| | 5 | (3) | 4 | 5 | 6 | (8) | 7 | | | | | | | | | | | | +0.055 | |
| | 6 | (3) | (4) | 5 | 6 | (8) | (10) | | | | | | | | | | | | +0.025 | |
| | 8 | (5) | 6 | 8 | 10 | (12) | (15) | | | | | | | | | | | | +0.060 | |
| | 10 | (6) | 8 | 10 | 12 | (15) | (20) | | | | | | | | | | | | +0.060 | |
| | 12 | (6) | 8 | 10 | 12 | (15) | (20) | | | | | | | | | | | | +0.030 | |
| | 13 | (8) | 10 | (12) | 15 | (20) | 15 | | | | | | | | | | | | +0.030 | |
| | 15 | (8) | 10 | (12) | 15 | (20) | (25) | | | | | | | | | | | | +0.030 | |
| | 16 | (10) | (12) | 15 | 20 | (25) | (30) | | | | | | | | | | | | +0.030 | |
| Flanged MDZF | 6 | (3) | (4) | 5 | 6 | (8) | +0.055 | 1.5 | 0 | -0.030 | 1.5 | 0 | -0.030 | 1.5 | 0 | -0.025 | 0 | | | |
| | 8 | (3) | (4) | 5 | 6 | (8) | (10) | | | | | | | | | | | +0.060 | | |
| | 10 | (5) | 6 | 8 | 10 | (12) | (15) | | | | | | | | | | | +0.060 | | |
| | 12 | (6) | 8 | 10 | 12 | (15) | (20) | | | | | | | | | | | +0.060 | | |
| | 15 | (8) | 10 | (12) | 15 | (20) | (25) | | | | | | | | | | | +0.060 | | |
| | 16 | (10) | (12) | 15 | 20 | (25) | (30) | | | | | | | | | | | +0.060 | | |
| | 18 | (10) | (12) | 15 | 20 | (25) | (30) | | | | | | | | | | | +0.060 | | |
| | 20 | (12) | 15 | 20 | 25 | (30) | (35) | | | | | | | | | | | +0.060 | | |
| | 22 | (12) | 15 | 20 | 25 | (30) | (35) | | | | | | | | | | | +0.060 | | |
| | 25 | (12) | 15 | 20 | 25 | (30) | (35) | | | | | | | | | | | +0.060 | | |
| Housing Unit Type | 3 | 3 | (4) | 5 | (6) | 5 | +0.047 | 2.5 | 0 | -0.040 | 2.5 | 0 | -0.040 | 2.5 | 0 | -0.050 | 0 | | | |
| | 4 | (3) | 4 | (5) | 6 | (8) | 6 | | | | | | | | | | | +0.017 | | |
| | 5 | (3) | 4 | 5 | 6 | (8) | 7 | | | | | | | | | | | +0.055 | | |
| | 6 | (3) | (4) | 5 | 6 | (8) | (10) | | | | | | | | | | | +0.025 | | |
| | 8 | (5) | 6 | 8 | 10 | (12) | (15) | | | | | | | | | | | +0.060 | | |
| | 10 | (6) | 8 | 10 | 12 | (15) | (20) | | | | | | | | | | | +0.060 | | |
| | 12 | (6) | 8 | 10 | 12 | (15) | (20) | | | | | | | | | | | +0.030 | | |
| | 13 | (8) | 10 | (12) | 15 | (20) | 15 | | | | | | | | | | | +0.030 | | |
| | 15 | (8) | 10 | (12) | 15 | (20) | (25) | | | | | | | | | | | +0.030 | | |
| | 16 | (10) | (12) | 15 | 20 | (25) | (30) | | | | | | | | | | | +0.030 | | |

* 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).

| Part Number | Type | d | Unit Price | | | | | | | | | | | | | | | |
|---|------|---|------------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | | | L3 | L4 | L5 | L6 | L8 | L10 | L12 | L15 | L20 | L25 | L30 | L35 | L40 | L50 | L60 | |
| 1 ~ 9 pc(s), 10 ~ 20 pcs, 1 ~ 9 pc(s), 10 ~ 20 pcs. | | | | | | | | | | | | | | | | | | |
| MDZB | 3 | | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | |
| | 12 | | | | | | | | | | | | | | | | | |
| | 15 | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | |
| | 18 | | | | | | | | | | | | | | | | | |
| MDZF | 6 | | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | |
| | 12 | | | | | | | | | | | | | | | | | |
| | 15 | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | |
| | 18 | | | | | | | | | | | | | | | | | |
| | 20 | | | | | | | | | | | | | | | | | |
| | 22 | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | |

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**

MDZW

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 | | Bushing I.D. | Unit Price |
|---|------|-----|-----|-----|-------|---------------|--------|--------------|------------|
| | | | | | | P | P.C.D. | | |
| 1 ~ 9 pc(s), 10 ~ 20 pcs, 1 ~ 9 pc(s), 10 ~ 20 pcs. | | | | | | | | | |
| MDZW | 6 | 8 | 16 | 1.0 | +0.30 | +0.10 | 12 | 6 | |
| | 8 | 10 | 18 | 1.5 | 14 | 8 | | | |
| | 10 | 12 | 24 | 2.0 | 18 | 10 | | | |
| | 12 | 14 | 26 | 2.0 | 20 | 12 | | | |
| | 14 | 16 | 30 | 2.0 | 23 | 13 | | | |
| | 16 | 18 | 32 | 2.0 | 25 | 15, 16 | | | |
| | 18 | 20 | 36 | 3.0 | 28 | 18 | | | |
| | 20 | 22 | 38 | 3.0 | 30 | 20 | | | |
| | 22 | 24 | 42 | 3.0 | 33 | 22 | | | |
| | 25 | 28 | 48 | 4.0 | 38 | 25 | | | |
| 30 | 32 | 54 | 4.0 | 43 | 30 | | | | |
| 35 | 38 | 62 | 4.0 | 50 | 35 | | | | |
| 40 | 42 | 66 | 4.0 | 54 | 40 | | | | |
| 50 | 52 | 78 | 4.0 | 65 | 50 | | | | |

Ordering Example: Part Number - L
 MDZB8 - 5
 MDZF12 - 15
 MDZW6