OILES 500SP5
New Series SP5B

Long Life
Bearing Life
10 times longer
Compared to (competitive product)

Space-Saving
Bearing Thickness
33-50% thinner
Compared to (conventional product)

Reduced Assembly Steps
4→1

Ultrathin Thickness available from 1mm

OILES CORPORATION
http://www.oilesglobal.com

The information contained in this catalog is current as of September 2017. Specifications are subject to change without notice for product improvement.
Reliable OILES Quality assuring high strength and high durability with thin walls.

The use of original metal featuring high strength and high wear resistance leads to reliable performance and longer life with thin walls.

**OILES 500SP5-SL1**

Bush Thin Wall

Reliable OILES Quality assuring high strength and high durability with thin walls. (chucking mechanism, lifting mechanism, various types of guides and links, etc.)

**Bearing service range**

- **Temperature Range**: ~40~+150°C
- **Allowable max. pressure**: 94[MPa] (4900[kgf/cm²])
- **Allowable max. velocity**: V (m/min) 0.05 0.10 0.15 0.20

**Allowable max. PV value**

- **N/mm² {m/min} 0.25 0.50**

**Pressure**: 49N/mm² {500kgf/cm²} | **Velocity**: 0.017m/s (1.02m/min)

**SP5B Dimension Table**

<table>
<thead>
<tr>
<th>I.D.</th>
<th>O.D.</th>
<th>Length</th>
<th>Tolerance (D, E, F)</th>
<th>Tolerance (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>±0.035 ±0.035</td>
<td>8</td>
<td>±0.026 ±0.026</td>
<td>±0.009 ±0.009</td>
</tr>
<tr>
<td>8</td>
<td>±0.040 ±0.040</td>
<td>8</td>
<td>±0.026 ±0.026</td>
<td>±0.009 ±0.009</td>
</tr>
<tr>
<td>10</td>
<td>±0.040 ±0.040</td>
<td>12</td>
<td>±0.026 ±0.026</td>
<td>±0.012 ±0.012</td>
</tr>
<tr>
<td>12</td>
<td>±0.050 ±0.050</td>
<td>16</td>
<td>±0.034 ±0.034</td>
<td>±0.013 ±0.013</td>
</tr>
<tr>
<td>15</td>
<td>±0.060 ±0.060</td>
<td>18</td>
<td>±0.034 ±0.034</td>
<td>±0.013 ±0.013</td>
</tr>
<tr>
<td>16</td>
<td>±0.060 ±0.060</td>
<td>20</td>
<td>±0.041 ±0.041</td>
<td>±0.016 ±0.016</td>
</tr>
<tr>
<td>18</td>
<td>±0.060 ±0.060</td>
<td>24</td>
<td>±0.041 ±0.041</td>
<td>±0.016 ±0.016</td>
</tr>
<tr>
<td>20</td>
<td>±0.060 ±0.060</td>
<td>26</td>
<td>±0.041 ±0.041</td>
<td>±0.016 ±0.016</td>
</tr>
</tbody>
</table>

- **I.D. tolerance after press-fitting is for reference which is applied when press-fitting is performed based on the recommended housing bore tolerance (H7).**

**Mechanical properties**

- **Density**: 7.8 g/cm³
- **Tensile strength**: JIS Z 2241 N/mm² (kgf/mm²) 785[80]
- **Tensile elongation at break**: JIS Z 2241 % 10
- **Compressive strength**: JIS Z 2241 N/mm² (kgf/mm²) 98,000[10,000]
- **Modulus of longitudinal elasticity**: JIS Z 2241 N/mm² (kgf/mm²) 98,000[10,000]
- **Coefficient of linear expansion**: x10⁻⁵°C⁻¹ 2.13

**Sliding Test Data**

**Test A: High load / low speed**

- **Pressure**: 49N/mm² (500kgf/cm²) | **Velocity**: 0.017m/s (1.02m/min)

**Test B: Medium load / medium speed**

- **Pressure**: 18N/mm² (184kgf/cm²) | **Velocity**: 0.046m/s (2.76m/min)

**Application Examples**

- **Automobile production plants** (e.g. Hangers for painting and assembly conveyor lines)
- **Food, medical supplies and cosmetics machinery** (labeling machines, filling machines, capping machines, wrapping machines, testing machines, weighing machines)
- **Plant equipment** (parts feeders, cutting machines, processing machines, assembly machines)
- **Others** (chucking mechanism, lifting mechanism, various types of guides and links, etc.)
**SP5B Features**

1. **Space-Saving**  
   Thin walls help your design fit into a limited space.
   - **Requests**  
     ● Want to use bearings in a limited narrow space in design.  
     ● Want to downsize the equipment
   - **Solution**  
     ● Having thin walls, SP5B reduces the bearing O.D.  
     → The thin wall bearing leads to downsizing of the housing.
     ● Since SP5B is highly wear resistant even under high load conditions, the durability can be maintained even with smaller bearing I.D. or shorter bearing length.  
     → The shaft can be made thinner and the housing can be made smaller.

2. **Long Life**  
   Contributes to higher durability and maintenance-free operation of machinery and equipment.
   - **Requests**  
     ● Want higher durability than the plastic bearings currently in use.  
     ● Want to minimize the maintenance or realize maintenance-free operation
   - **Solution**  
     ● SP5B is stronger, more accurate, and more resistant to wear than plastic bearings.  
     → Prevention of rattling, deformation and wear leads to significant improvement in durability.
     ● SP5B is more resistant to wear than competitive self-lubricating bushes.  
     → The extended maintenance interval and maintenance-free operation lead to reduction in total cost.

3. **High Accuracy**  
   Maintains high accuracy by achieving high processing accuracy and high resistance to wear.
   - **Requests**  
     ● Want to reduce the initial clearance to achieve higher accuracy.
   - **Solution**  
     ● SP5B offers high accuracy through cutting work.  
     → Initial clearance is reduced so that rattling can be prevented.

4. **Reduced Assembly Steps**  
   Press-fitting eliminates the need for screwing, realizing reduction of assembly steps.
   - **Requests**  
     ● Want to omit the locking/retaining steps in the bearing assembly process.
   - **Solution**  
     ● SP5B requires no screwing because it is fitted to the housing with an “interference fit”.

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### Initial Clearance [example]

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Bearing processing method</th>
<th>Nominal I.D.</th>
<th>Housing</th>
<th>Shaft</th>
<th>Initial clearance (median)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP5B</td>
<td>Cutting work</td>
<td>10</td>
<td>H7</td>
<td>e7</td>
<td>46 μm</td>
</tr>
<tr>
<td>Multi-layer</td>
<td>Press molding</td>
<td>10</td>
<td>H7</td>
<td>e7</td>
<td>67 μm</td>
</tr>
<tr>
<td>Plastic bearing</td>
<td>Injection molding</td>
<td>10</td>
<td>H7</td>
<td>h7</td>
<td>10 μm</td>
</tr>
</tbody>
</table>

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(Note 1) Use within the service range of the bearing. Contact our sales office for estimated life.

(Note 2) The value was calculated by comparing the bearing wear amount observed in the internal sliding test. Refer to page 3 for the test data.
About Press-Fitting Methods

Press-fitting methods

- Press-fit the bush hydraulically, pneumatically or with a vise.
- Press-fitting with a hammer or other item that causes a shock may lead to damage or changes in I.D.

About press-fitting jigs

Generally, use a mandrel as shown in Figure 1 to press-fit a bush into an insertion section of the housing. Using a guide ring as shown in Figure 2 will facilitate the press-fitting. The use of a guide ring is effective in terms of I.D. circularity and centering after press-fitting, for prevention of damage to the bush during press-fitting, and so on.

Housing

- Chamfer the housing. (Round chamfering or tapered chamfering is preferable.)
- Apply oil or grease for smooth press-fitting.

Determine the mandrel size based on the table below.

<table>
<thead>
<tr>
<th>Bush size (nominal)</th>
<th>Mandrel size</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D. (d0)</td>
<td>d0 = D0 − (0.05−0.10)</td>
</tr>
<tr>
<td>O.D. (d1)</td>
<td>d1 = D1 − (0.20−0.30)</td>
</tr>
<tr>
<td>Length (ℓ)</td>
<td>ℓ ≥ L</td>
</tr>
</tbody>
</table>

Determine the guide ring size based on the table below.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>~ φ 25</td>
<td>D1 +(0.1−0.3)</td>
<td>D1 +(10−15)</td>
</tr>
</tbody>
</table>

3D CAD DATA

You can download 3D CAD data for free from PART Community (operated by CADENAS WEB2CAD INC.), which is also accessible from our product information web page.