



New!

# OILES 500SP5

## New Series SP5B

**OILES OILES CORPORATION**

<http://www.oilesglobal.com>

**Ultrathin**  
Thickness  
available  
from 1mm



**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**

# OILES 500SP5-SL1

## Thin Wall Bush



Thickness available from 1mm



Standard model: SP5B

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.

### Bearing service range

Lubrication condition	Dry	Periodic lubrication
Temperature Range	- 40 ~ + 150°C	
Allowable max. pressure: P N/mm <sup>2</sup> {kgf/cm <sup>2</sup> }	49{500}	
Allowable max. velocity: V m/s {m/min}	0.25{15}	0.50{30}
Allowable max. PV value	1.65{1,010}	3.25{1,990}

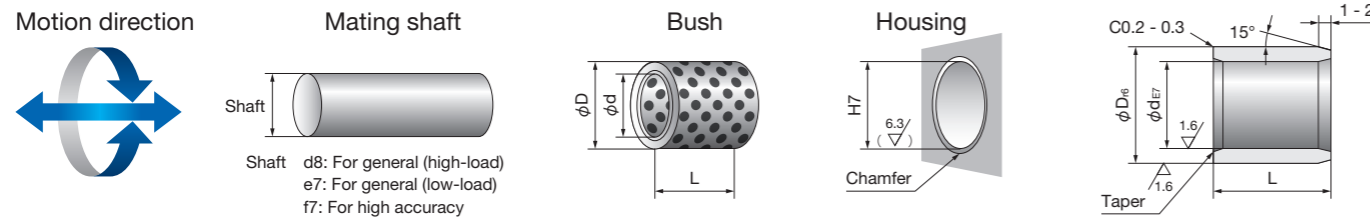
### Mechanical properties

Density	—	g/cm <sup>3</sup>	7.8
Tensile strength	JIS Z 2241	N/mm <sup>2</sup> {kgf/mm <sup>2</sup> }	785{80}
Tensile elongation at break	JIS Z 2241	%	10
Compressive strength	—	N/mm <sup>2</sup> {kgf/mm <sup>2</sup> }	390{40} <sup>(Note 1)</sup>
Hardness	JIS Z 2243	—	HB235
Modulus of longitudinal elasticity	JIS Z 2241	N/mm <sup>2</sup> {kgf/mm <sup>2</sup> }	98,000{10,000}
Co-efficient of linear expansion	—	×10 <sup>-5</sup> °C <sup>-1</sup>	2.13

The values shown above are typical values, not the standard values.  
(Note 1) Compressive strength is 0.1%.

### SP5B Dimension Table

How to order: SP5B---- e.g. I.D. 8 mm, O.D. 10 mm, Length 15 mm → SP5B-081015



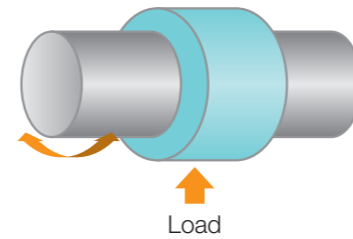
φ d	I.D.		Thickness	Length L Tolerance (-0.1/-0.3)								I.D. tolerance after press-fitting (reference)	
	Tolerance	φ D		Tolerance	mm	8	10	12	15	16	20		25
6	+0.032 +0.020	8	+0.028 +0.019	1.0	060808	060810	060812	060815	060816				+0.016 +0.004
8	+0.040 +0.025	10	+0.028 +0.019	1.0	081008	081010	081012	081015	081016				+0.024 +0.009
10	+0.040 +0.025	12	+0.034 +0.023	1.0		101210	101212	101215	101216				+0.021 +0.006
12	+0.050 +0.032	15	+0.034 +0.023	1.5			121512	121515	121516	121520			+0.031 +0.013
15	+0.050 +0.032	18	+0.034 +0.023	1.5			151812	151815	151816	151820			+0.031 +0.013
16	+0.050 +0.032	20	+0.041 +0.028	2.0			162012	162015	162016	162020	162025		+0.026 +0.008
20	+0.061 +0.040	24	+0.041 +0.028	2.0				202415	202416	202420	202425	202430	+0.037 +0.016
25	+0.061 +0.040	29	+0.041 +0.028	2.0					252916	252920	252925	252930	+0.037 +0.016

\* 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).

### Application Examples

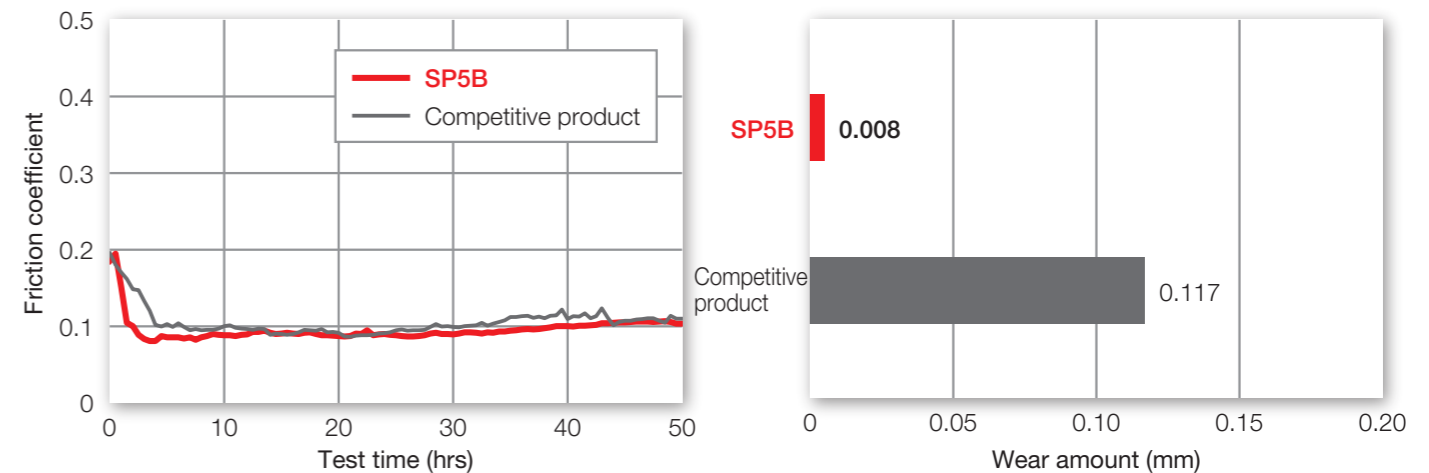
- Automobile production plants (e.g. Hangers for painting and assembly conveyor lines)
- Food, medical supplies and cosmetics machinery (labeling machines, filling machines, capping machines, wrapping machines, testing machines, weighing machines)
- Plant equipment (parts feeders, cutting machines, processing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

### Sliding Test Data

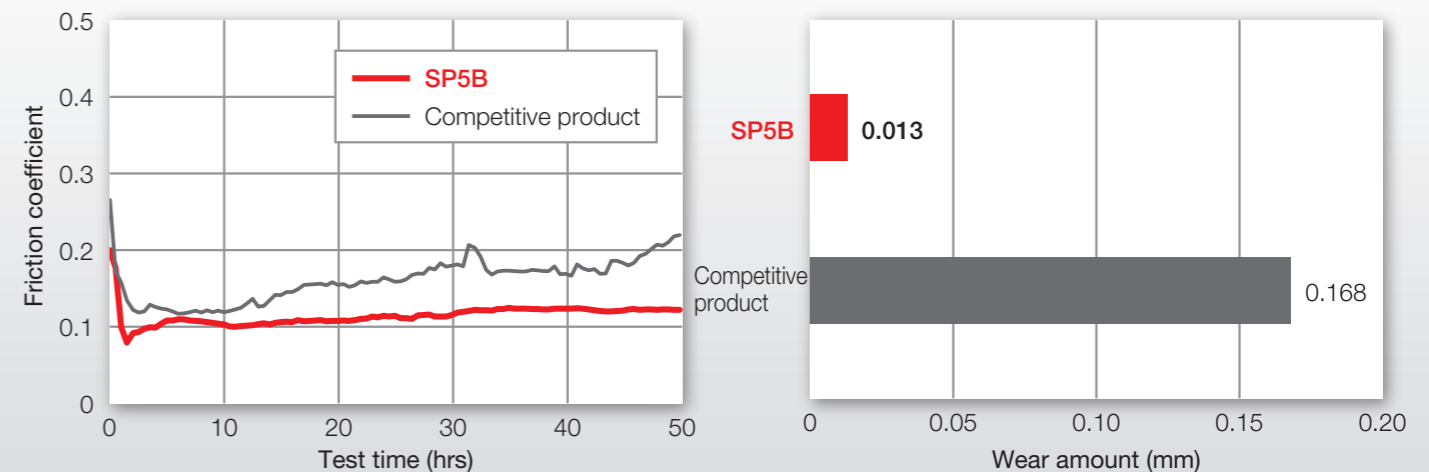


Bearing material	OILES SP5B Competitive copper alloy self-lubricating bush
Mating shaft	SCM440 induction hardening
Sliding angle	±45°
Test time	50 hours
Lubrication	Dry (no initial grease application)

#### Test A: High load / low speed ■ Pressure: 49N/mm<sup>2</sup> {500kgf/cm<sup>2</sup>} ■ Velocity: 0.017m/s {1.02m/min}



#### Test B: Medium load / medium speed ■ Pressure: 18N/mm<sup>2</sup> {184kgf/cm<sup>2</sup>} ■ Velocity: 0.046m/s {2.76m/min}

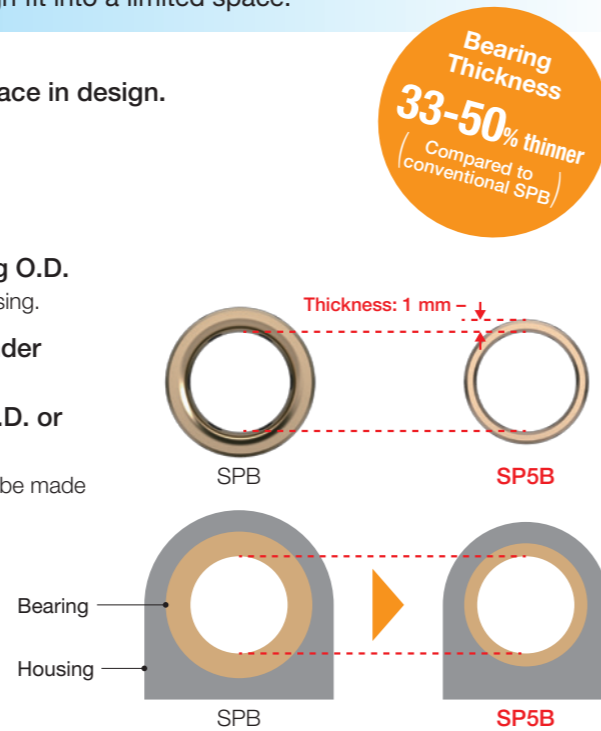


## SP5B Features

### 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 <sup>(Note 1)</sup> even with smaller bearing I.D. or shorter bearing length. →The shaft can be made thinner and the housing can be made smaller.



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

### 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.



(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.

### 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.

**Initial Clearance 55% smaller**  
(Compared to plastic bearings)

#### Initial clearance [example]

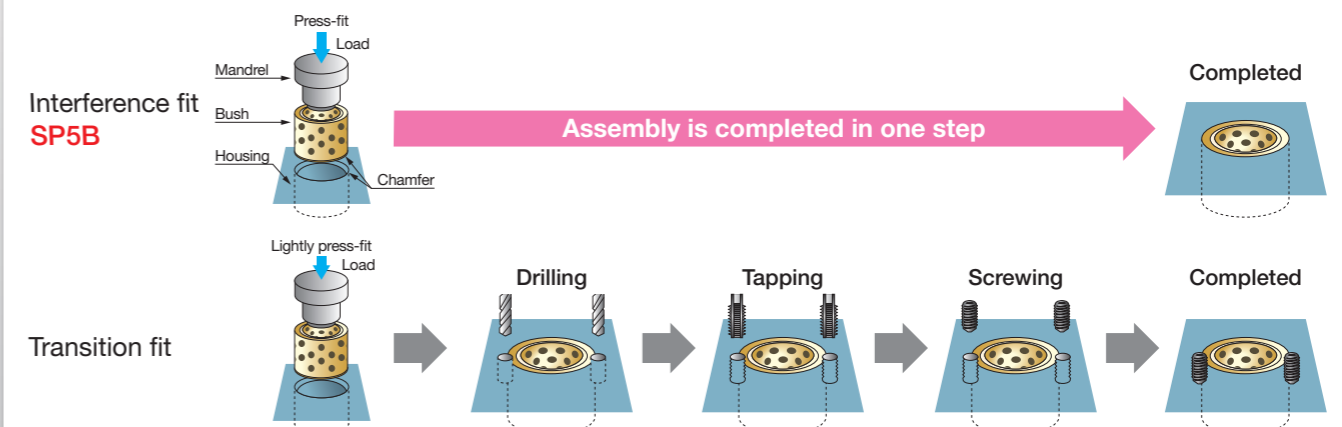
Bearing	Bearing processing method	Nominal I.D.	Housing	Shaft	Initial clearance (median)
<b>SP5B</b>	Cutting work	10	H7	e7	<b>46μm</b>
Multi-layer bearing	Press molding	10	H7	e7	67μm
Plastic bearing	Injection molding	10	H7	h7	107μm

### 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”.

**Workload Largely Reduced**



## 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.

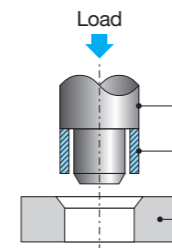
### Housing

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

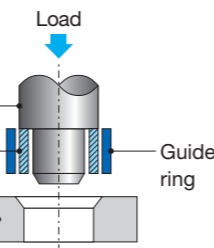
### About press-fitting jigs

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.

**Figure 1** General press-fitting method

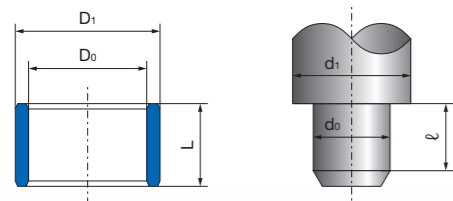


**Figure 2** Press-fitting method using a guide ring



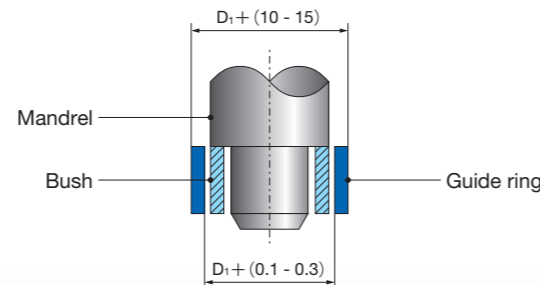
Determine the mandrel size based on the table below.

Bush size (nominal)	Mandrel size
I.D. ( $D_0$ )	$d_0 = D_0 - (0.05 - 0.10)$
O.D. ( $D_1$ )	$d_1 = D_1 - (0.20 - 0.30)$
Length (L)	$l \geq L$



Determine the guide ring size based on the table below.

Bush I.D.	Guide ring I.D.	Guide ring O.D.
$\sim \phi 25$	$D_1 + (0.1 - 0.3)$	$D_1 + (10 - 15)$



## OILES bearing products

Besides SP5B, OILES offers a variety of bearings for a wide range of applications.

- Plastic OILES bearings
- Multi-layer OILES bearings
- Metallic OILES bearings
- OILES air bearings
- OILES slide shifters (reciprocating guide units)



The product information is available on our web site.

## 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.