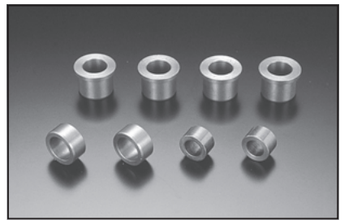
# Oiles Cermet M

## Sintered bearings with dispersed solid lubricant



RoHS2 ELV

## Feature

- Serviceable without the need for lubrication. Demonstrates higher performance when lubricated.
- Demonstrates superior wear resistance in applications where oil film is seldom produced such as reciprocating motions, oscillation, frequent starts and stops, etc.
- Standard products and materials for machining are available in various sizes.

## Service range

| Lubrication condition | Dry | periodic lubrication |
|---|---|---|
| Service temperature range ℃ | −40～+200 | −40～+150 |
| Allowable max. pressure P N/mm² {kgf/cm²} | 10 {102} | |
| Allowable max. velocity V m/s {m/min} | 0.85 {51} | 1.65 {99} |
| Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min} | 1.65 {1,010} | 2.45 {1,500} |

## Mechanical properties

| | | | |
|---|---|---|---|
| Density | —— | g/cm³ | 6.4 |
| Radial crushing strength | JIS Z 2507 | N/mm² {kgf/mm²} | 137 {14} |
| Hardness | JIS Z 2245 | HRM | 73 |
| Oil impregnation rate | —— | vol% | 3 |
| Co-efficient of linear expansion | —— | ×10⁻⁵ ℃⁻¹ | 1.9 |

※The value shown above are for sintered layer.

## Lathe turning

| | | |
|---|---|---|
| Cutting tool | carbide tool (JIS) | |
| | Relief angle | 2～5° |
| | Rake angle | 10～20° |
| | Nose radius (mm) | 0.40～0.80 |
| Condition | Speed (m/min) | 100～120 |
| | Cut depth (mm) | 0.20～0.30 |
| | Feed (mm/rev) | 0.03～0.10 |

Apply grease or oil impregnation after machining.

## Machining accuracy (bushing)

| I.D. | O.D. | Length |
|---|---|---|
| class 7 to 8 | class 6 to 7 | class 8 to 9 |

Classes here are in JIS standard.

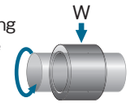
This product demonstrates satisfactory performance at the slide surface roughness of Rz6.3 to 12.5μm.

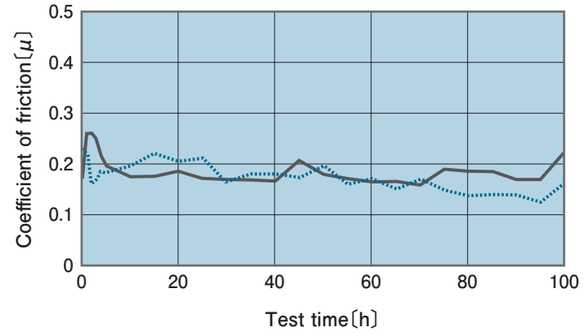
## Test data

### Journal rotation test

<Testing conditions>
Mating material : S45C
Pressure : 1.96N/mm²{20.0kgf/cm²}
Velocity : 0.17m/s{10.0m/min}
Test time : 100h
Finishing method

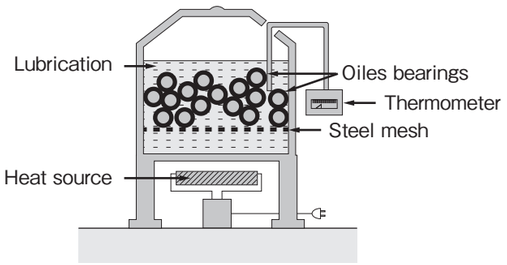
Test piece after sizing
Machined test piece




## Oil impregnation method

Oil impregnation is required for oil-containing OILES bearings such as Oiles Cermet M. If you purchase tube or bar stocks, please follow the procedure below to impregnate finished products with lubrication oil before installation.
If these bearings are stored for a long time or if the bearings are washed, re-impregnate before installation.
Immerse the products into an oil bath. Heat the bath up to 100 ℃ to 110 ℃. Keep the temperature for 30 to 60 minutes until no more air bubbles come up.
Cut the heat source and let it cool down to the room temperature.
Take products out of the bath to install. If oil impregnation by heating is not possible, leave the products in the oil bath for 24 hours or more.




### Selectoin of lubrication oil

| Operation conditions | Types of oil | Viscosity | i.e. |
|---|---|---|---|
| Low load / high speed | Lubrication oil of low viscosity | 8 to 17cst(30℃) | Spindle oil |
| Mid load / mid velocity | Lubrication oil with limited viscosity change by temp. | 8 to 15cst(98.9℃) | Motor oil |
| High load / low velocity | Lubrication oil with high viscosity | 100 to 1000cst(37℃) | Gear oil |

# 54B Oiles Cermet M Bushings

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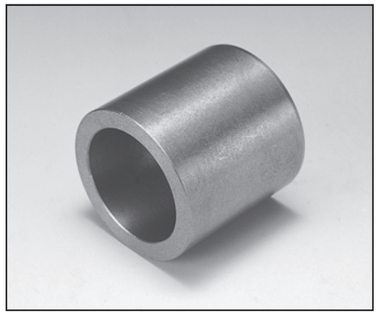
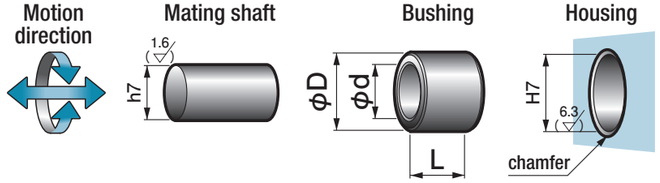
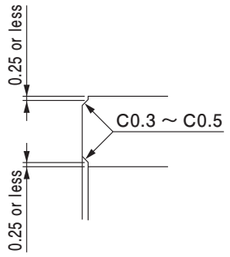


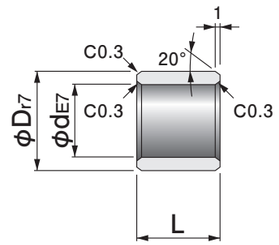
Specify Part No. by required I.D., O.D., and Length.
(e.g.) I.D. is 12mm, O.D. is 18mm, and length is 10mm.

**54B - 121810**
**Part No.**




● Some chamfering dimensions may differ from the shown dimension.



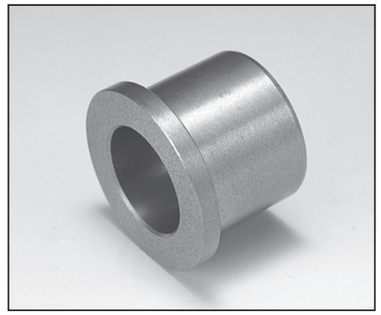

| I.D. | | O.D. | | Length L Tolerance $^{-0.1}_{-0.3}$ | | | | | | | | | | | I.D. tolerance after press fitting (reference) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| φd | Tolerance | φD | Tolerance | 3 | 4 | 5 | 6 | 8 | 10 | 15 | 20 | 25 | 30 | 40 | |
| 3 | $^{+0.024}_{+0.014}$ | 6 | $^{+0.027}_{+0.015}$ | 030603 | | 030605 | | | | | | | | | $^{+0.017}_{+0.007}$ |
| 4 | $^{+0.032}_{+0.020}$ | 7 | $^{+0.034}_{+0.019}$ | | 040704 | 040705 | 040706 | | | | | | | | $^{+0.023}_{+0.011}$ |
| 5 | $^{+0.032}_{+0.020}$ | 8 | $^{+0.034}_{+0.019}$ | | | 050805 | 050806 | 050808 | | | | | | | $^{+0.023}_{+0.011}$ |
| 6 | $^{+0.032}_{+0.020}$ | 10 | $^{+0.034}_{+0.019}$ | | | 061005 | 061006 | 061008 | 061010 | | | | | | $^{+0.023}_{+0.011}$ |
| 8 | $^{+0.040}_{+0.025}$ | 12 | $^{+0.041}_{+0.023}$ | | | | 081206 | 081208 | 081210 | 081215 | | | | | $^{+0.029}_{+0.014}$ |
| 10 | $^{+0.040}_{+0.025}$ | 16 | $^{+0.041}_{+0.023}$ | | | | 101606 | 101608 | 101610 | 101615 | 101620 | | | | $^{+0.029}_{+0.014}$ |
| 12 | $^{+0.050}_{+0.032}$ | 18 | $^{+0.041}_{+0.023}$ | | | | | 121808 | 121810 | 121815 | 121820 | | | | $^{+0.039}_{+0.021}$ |
| 14 | $^{+0.050}_{+0.032}$ | 20 | $^{+0.049}_{+0.028}$ | | | | | | 142010 | 142015 | 142020 | | | | $^{+0.036}_{+0.018}$ |
| 15 | $^{+0.050}_{+0.032}$ | 21 | $^{+0.049}_{+0.028}$ | | | | | | 152110 | 152115 | 152120 | 152125 | | | $^{+0.036}_{+0.018}$ |
| 16 | $^{+0.050}_{+0.032}$ | 22 | $^{+0.049}_{+0.028}$ | | | | | | 162210 | 162215 | 162220 | 162225 | | | $^{+0.036}_{+0.018}$ |
| 18 | $^{+0.050}_{+0.032}$ | 24 | $^{+0.049}_{+0.028}$ | | | | | | 182410 | 182415 | 182420 | 182425 | 182430 | | $^{+0.036}_{+0.018}$ |
| 20 | $^{+0.061}_{+0.040}$ | 28 | $^{+0.049}_{+0.028}$ | | | | | | | 202815 | 202820 | | 202830 | | $^{+0.047}_{+0.026}$ |
| 25 | $^{+0.061}_{+0.040}$ | 35 | $^{+0.059}_{+0.034}$ | | | | | | | | 253520 | 253525 | 253530 | | $^{+0.044}_{+0.018}$ |
| 30 | $^{+0.061}_{+0.040}$ | 40 | $^{+0.059}_{+0.034}$ | | | | | | | | 304020 | 304025 | 304030 | 304040 | $^{+0.044}_{+0.018}$ |

※The I.D. tolerance after press fitting is for reference only.



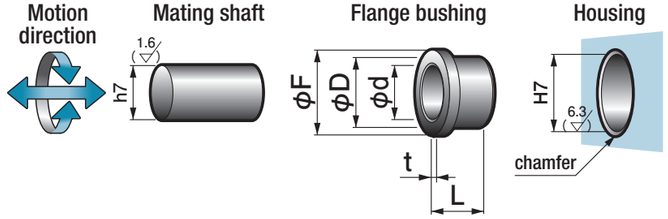
# 54F Oiles Cermet M Flange Bushings

RoHS2 ELV

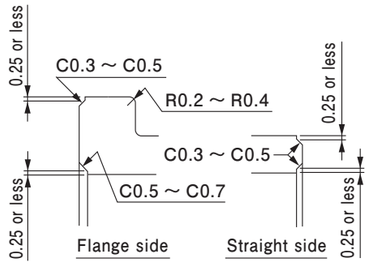


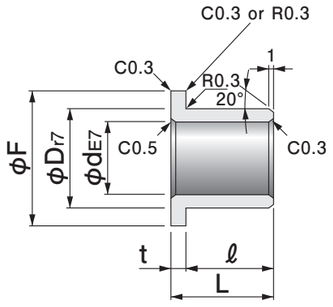
Specify Part No. by required I.D. and Length.
(e.g.) I.D. is 12mm and length is 12mm.

**54F - 1212**
**Part No.**




● Some chamfering dimensions may differ from the shown dimension.



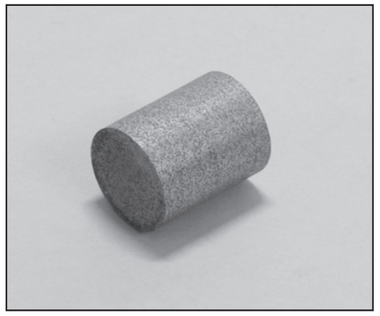




| Part No. | I.D. | | O.D. | | Flange | | | | Length | | | I.D. tolerance after press fitting (reference) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | φd | Tolerance | φD | Tolerance | φF | Tolerance | t | Tolerance | L | Tolerance | ℓ | |
| 54F-0303 | 3 | $^{+0.024}_{+0.014}$ | 6 | $^{+0.027}_{+0.015}$ | 9 | $^{0}_{-0.2}$ | 1.5 | $^{0}_{-0.2}$ | 4.5 | $^{0}_{-0.4}$ | 3 | $^{+0.017}_{+0.007}$ |
| 54F-0404 | 4 | $^{+0.032}_{+0.020}$ | 7 | $^{+0.034}_{+0.019}$ | 10 | $^{0}_{-0.2}$ | 1.5 | $^{0}_{-0.2}$ | 5.5 | $^{0}_{-0.4}$ | 4 | $^{+0.023}_{+0.011}$ |
| 54F-0505 | 5 | $^{+0.032}_{+0.020}$ | 8 | $^{+0.034}_{+0.019}$ | 11 | $^{0}_{-0.2}$ | 1.5 | $^{0}_{-0.2}$ | 6.5 | $^{0}_{-0.4}$ | 5 | $^{+0.023}_{+0.011}$ |
| 54F-0606 | 6 | $^{+0.032}_{+0.020}$ | 10 | $^{+0.034}_{+0.019}$ | 14 | $^{0}_{-0.2}$ | 2 | $^{0}_{-0.2}$ | 8 | $^{0}_{-0.4}$ | 6 | $^{+0.023}_{+0.011}$ |
| 54F-0808 | 8 | $^{+0.040}_{+0.025}$ | 12 | $^{+0.041}_{+0.023}$ | 16 | $^{0}_{-0.2}$ | 2 | $^{0}_{-0.2}$ | 10 | $^{0}_{-0.4}$ | 8 | $^{+0.029}_{+0.014}$ |
| 54F-1010 | 10 | $^{+0.040}_{+0.025}$ | 16 | $^{+0.041}_{+0.023}$ | 20 | $^{0}_{-0.2}$ | 2 | $^{0}_{-0.2}$ | 12 | $^{0}_{-0.4}$ | 10 | $^{+0.029}_{+0.014}$ |
| 54F-1212 | 12 | $^{+0.050}_{+0.032}$ | 18 | $^{+0.041}_{+0.023}$ | 22 | $^{0}_{-0.2}$ | 2 | $^{0}_{-0.2}$ | 14 | $^{0}_{-0.4}$ | 12 | $^{+0.039}_{+0.021}$ |
| 54F-1414 | 14 | $^{+0.050}_{+0.032}$ | 20 | $^{+0.049}_{+0.028}$ | 24 | $^{0}_{-0.2}$ | 3 | $^{0}_{-0.2}$ | 17 | $^{0}_{-0.4}$ | 14 | $^{+0.036}_{+0.018}$ |
| 54F-1515 | 15 | $^{+0.050}_{+0.032}$ | 21 | $^{+0.049}_{+0.028}$ | 27 | $^{0}_{-0.2}$ | 3 | $^{0}_{-0.2}$ | 18 | $^{0}_{-0.4}$ | 15 | $^{+0.036}_{+0.018}$ |
| 54F-1616 | 16 | $^{+0.050}_{+0.032}$ | 22 | $^{+0.049}_{+0.028}$ | 28 | $^{0}_{-0.2}$ | 3 | $^{0}_{-0.2}$ | 19 | $^{0}_{-0.4}$ | 16 | $^{+0.036}_{+0.018}$ |
| 54F-1817 | 18 | $^{+0.050}_{+0.032}$ | 24 | $^{+0.049}_{+0.028}$ | 30 | $^{0}_{-0.2}$ | 3 | $^{0}_{-0.2}$ | 20 | $^{0}_{-0.4}$ | 17 | $^{+0.036}_{+0.018}$ |
| 54F-2021 | 20 | $^{+0.061}_{+0.040}$ | 28 | $^{+0.049}_{+0.028}$ | 34 | $^{0}_{-0.2}$ | 4 | $^{0}_{-0.2}$ | 25 | $^{0}_{-0.4}$ | 21 | $^{+0.047}_{+0.026}$ |
| 54F-2521 | 25 | $^{+0.061}_{+0.040}$ | 35 | $^{+0.059}_{+0.034}$ | 42 | $^{0}_{-0.2}$ | 4 | $^{0}_{-0.2}$ | 25 | $^{0}_{-0.4}$ | 21 | $^{+0.044}_{+0.023}$ |
| 54F-3026 | 30 | $^{+0.061}_{+0.040}$ | 40 | $^{+0.059}_{+0.034}$ | 48 | $^{0}_{-0.2}$ | 4 | $^{0}_{-0.2}$ | 30 | $^{0}_{-0.4}$ | 26 | $^{+0.044}_{+0.023}$ |

※The I.D. tolerance after press fitting is for reference only.

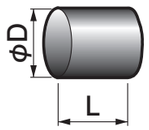
# 54M Oiles Cermet M Bar Stock

RoHS2 ELV



Specify Part No. by required diameter and length.
(e.g.) Diameter is 21mm and length is 26mm.

**54M - 2126**
**Part No.**



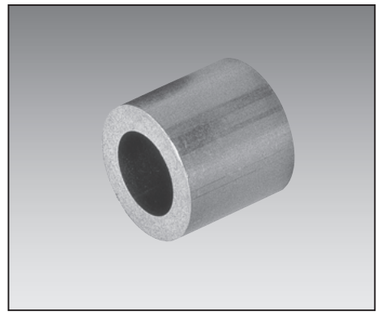

● Oil impregnation is necessary by referring to the oil impregnation method, page 246 when you machined the plate.

| Part No. | Diameter | | Length | |
|---|---|---|---|---|
| | φD | Tolerance | L | Tolerance |
| 54M-0910 | 9 | $^{+0.6}_{-0.2}$ | 10 | $^{+3.0}_{0}$ |
| 54M-1316 | 13 | $^{+0.6}_{-0.2}$ | 16 | $^{+3.0}_{0}$ |
| 54M-1821 | 18 | $^{+0.6}_{-0.2}$ | 21 | $^{+3.0}_{0}$ |
| 54M-2126 | 21 | $^{+0.8}_{0}$ | 26 | $^{+3.0}_{0}$ |
| 54M-2631 | 26 | $^{+0.8}_{0}$ | 31 | $^{+3.0}_{0}$ |
| 54M-3341 | 33 | $^{+0.8}_{0}$ | 41 | $^{+3.0}_{0}$ |
| 54M-4146 | 41 | $^{+0.8}_{0}$ | 46 | $^{+3.0}_{0}$ |
| 54M-6049 | 60 | $^{+2.0}_{+1.0}$ | 49 | $^{+3.0}_{0}$ |



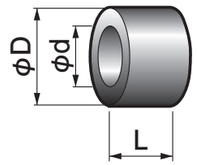
# 54S Oiles Cermet M Bushing Material

RoHS2 ELV



Specify Part No. by required I.D., O.D., and Length.
(e.g.) I.D. is 12mm, O.D. is 18mm, and length is 10mm.

**54S - 153131**
**Part No.**




● Oil impregnation is necessary by referring to the oil impregnation method, page 246 when you machined the plate.

| Part No. | I.D. | | O.D. | | Length | |
|---|---|---|---|---|---|---|
| | φd | Tolerance | φD | Tolerance | L | Tolerance |
| 54S-092333 | 9 | $^{+0.5}_{-0.3}$ | 23 | $^{+0.6}_{-0.2}$ | 33 | $^{+3.0}_{0}$ |
| 54S-142631 | 14 | $^{+0.5}_{-0.3}$ | 26 | $^{+0.8}_{0}$ | 31 | $^{+3.0}_{0}$ |
| 54S-153131 | 15 | $^{+0.5}_{-0.3}$ | 31 | $^{+0.6}_{-0.2}$ | 31 | $^{+3.0}_{0}$ |
| 54S-244133 | 24 | $^{+0.5}_{-0.3}$ | 41 | $^{+0.8}_{0}$ | 33 | $^{+3.0}_{0}$ |
| 54S-294136 | 29 | $^{+0.5}_{-0.3}$ | 41 | $^{+0.8}_{0}$ | 36 | $^{+3.0}_{0}$ |
| 54S-294933 | 29 | $^{+0.5}_{-0.3}$ | 49 | $^{+0.6}_{-0.2}$ | 33 | $^{+3.0}_{0}$ |