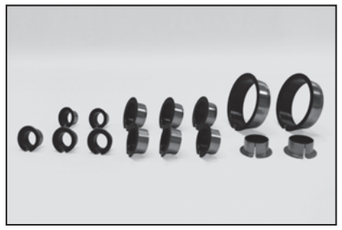
# Oiles Techmet E

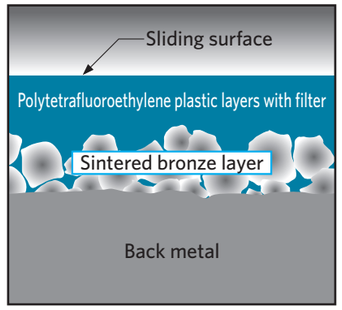
## Polytetrafluoroethylene plastic multi-layer bearings with back metals



RoHS2 ELV

## Feature

- Serviceable without the need for lubrication. Features superior dimensional stability, mechanical strength, and thermal conductivity with a thin, lightweight, and compact design.
  (Available from Thickness 0.5 mm)
- Features low coefficient of friction and superior wear resistance.
- Electrically conductive



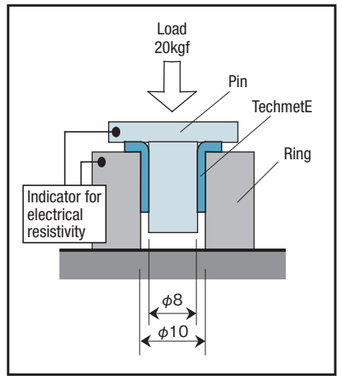

image

### Service range

| | |
|---|---|
| Lubrication condition | Dry |
| Service temperature range ℃ | −50～+250 |
| Allowable max. pressure P N/mm² {kgf/cm²} | 49 (137) {500 (1,400)} |
| Allowable max. velocity V m/s {m/min} | 0.5 {30} |
| Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min} | 3.27 {2,000} |

The values in parentheses are static bearing pressures, which are the bearing pressures in applications with no motion or very small motion (≦0.0017m/s[0.1m/min]).

Electrical resistivity
1000Ω or less with below measurement method




### Mechanical properties

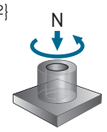
| | | | |
|---|---|---|---|
| Tensile strength | JIS Z 2241 | N/mm² {kgf/cm²} | 380 {3,875} |
| Elongation | JIS Z 2241 | % | 27 |
| Hardness | JIS Z 2244 | HV | 107 |

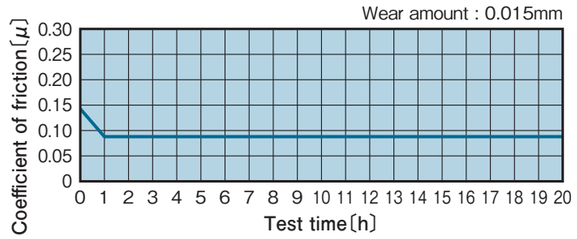
※The values shown above are typical values, not the standard values.
※The values shown above are values of back metal.

### Test data

Thrust rotation test

<Testing conditions>
Mating material : S45C-N
(surface roughness Rz1.6μm)
Pressure : 9.8N/mm²{100kgf/cm²}
Velocity : 0.167m/s{10.0m/min}
Test time : 20h
Lubrication : dry

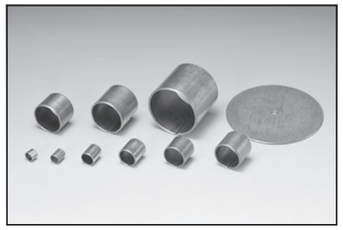



◉Please refer to the fitting method of Drymet LF. (P.153, 154)

# Oiles Toughmet

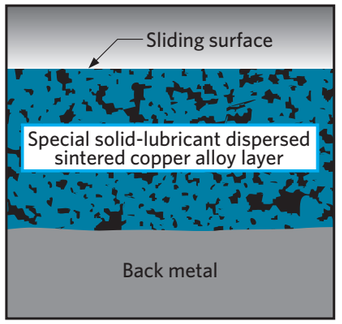
## Solid-lubricant dispersed sintered bearings with back metals



RoHS2 ELV

## Feature

- Has superior load resistance and heat resistance. Also conductive.
- Demonstrates superior performance even in reciprocating, oscillating, and intermittent operations.
- Demonstrates much superior performances by the action of oil retaining power of the sintered copper alloy layer and solid lubricant if lubricating oil is used together.
- Thin bearing allows compact design.
- Electrically conductive.
- The standard products are available in various sizes.




image

### Service range

| | |
|---|---|
| Lubrication condition | Dry |
| Service temperature range ℃ | −40～+350 |
| Allowable max. pressure P N/mm² {kgf/cm²} | 24.5 (49) {250 (500)} |
| Allowable max. velocity V m/s {m/min} | 0.40 {24} |
| Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min} | 1.65 {1,010} |

The values in parentheses are static bearing pressures, which are the bearing pressures in applications with no motion or very small motion (≦0.0017m/s [0.1m/min]).

### Mechanical properties

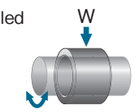
| | | | |
|---|---|---|---|
| Tensile strength | JIS Z 2241 | N/mm² {kgf/cm²} | 380 {3,875} |
| Elongation | JIS Z 2241 | % | 27 |
| Hardness | JIS Z 2244 | HV | 107 |

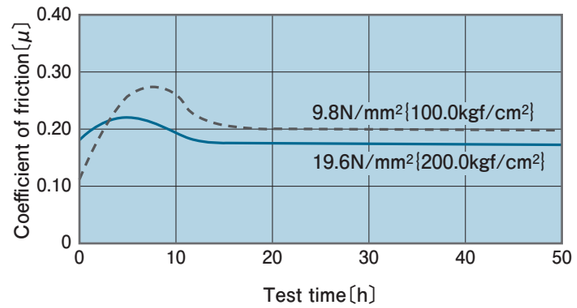
※The values shown above are typical values, not the standard values.
※The values shown above are values of back metal.

### Test data

Journal oscillation test

<Testing conditions>
Bearing dimension : φ 40×φ44×ℓ30
Pressure : 9.8N/mm²{100.0kgf/cm²}
19.6N/mm²{200.0kgf/cm²}
Velocity : 0.014m/s{0.84m/min}
Oscillating angle : ±20°
Oscillating cycle : 30cpm
Test time : 50h
Lubrication : grease is applied at assembly.

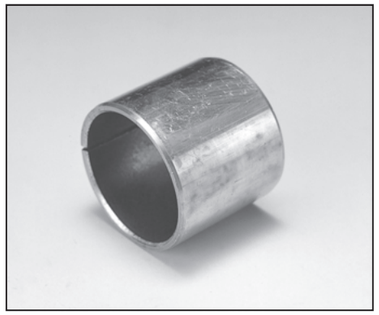


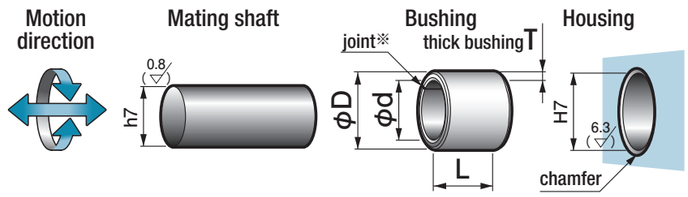

◉Please refer to the fitting method of Drymet LF. (P.153, 154)

# TMB Oiles Toughmet Bushings

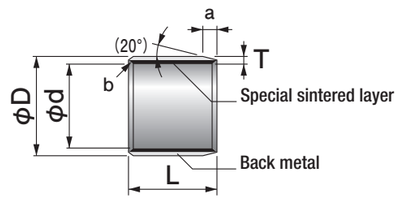
RoHS2 ELV



Specify Part No. by required I.D. and length.
(e.g.) I.D. is 25mm and length is 20mm. **TMB - 2520**
**Part No.**




※The joint causes no influences upon rotation of the shaft. Be careful when press-fitting so that the joint is not at the position to which the maximum load is applied.




**a: O.D. chamfering for the bushing I.D. of ϕ10 or more**

| T | 1.0 | 1.5 | 2.0 | 2.5 |
|---|---|---|---|---|
| a | 0.5 | 0.8 | 1.0 | 1.0 |

(mm)

**b: I.D. chamfering for the bushing I.D. of ϕ10 or more**

| T | 1.0 | 1.5 | 2.0 | 2.5 |
|---|---|---|---|---|
| b | 0.3 | 0.5 | 0.5 | 0.5 |

(mm)

※Chamfering of inner or outer diameters less than ϕ10 mm is done only to remove burrs.

| Shaft Size | Shaft h7 Tolerance | Housing Size | Housing H7 Tolerance | I.D. ϕd | O.D. ϕD | O.D. Tolerance | Wall thickness T | Wall thickness Tolerance | Length L Tolerance 0 −0.3 | | | | | | I.D. tolerance after press fitting (reference) | I.D. ϕd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 5 | 6 | 8 | 10 | 12 | 15 | | |
| 5 | 0 −0.012 | 7 | +0.015 0 | 5 | 7 | +0.055 +0.025 | 1.0 | −0.030 −0.075 | 0505 | | 0508 | | | | +0.165 +0.060 | 5 |
| 6 | 0 −0.012 | 8 | +0.015 0 | 6 | 8 | +0.055 +0.025 | 1.0 | −0.030 −0.075 | | 0606 | | 0610 | | | +0.165 +0.060 | 6 |
| 7 | 0 −0.015 | 9 | +0.015 0 | 7 | 9 | +0.055 +0.025 | 1.0 | −0.030 −0.075 | | | | | 0712 | | +0.165 +0.060 | 7 |
| 8 | 0 −0.015 | 10 | +0.015 0 | 8 | 10 | +0.055 +0.025 | 1.0 | −0.030 −0.075 | | | 0808 | 0810 | 0812 | 0815 | +0.165 +0.060 | 8 |
| 9 | 0 −0.015 | 11 | +0.018 0 | 9 | 11 | +0.060 +0.030 | 1.0 | −0.030 −0.075 | | | | 0910 | | | +0.168 +0.060 | 9 |
| 10 | 0 −0.015 | 12 | +0.018 0 | 10 | 12 | +0.060 +0.030 | 1.0 | −0.030 −0.075 | | | | 1010 | | 1015 | +0.168 +0.060 | 10 |
| 12 | 0 −0.018 | 14 | +0.018 0 | 12 | 14 | +0.060 +0.030 | 1.0 | −0.030 −0.075 | | | | 1210 | | 1215 | +0.168 +0.060 | 12 |
| 14 | 0 −0.018 | 16 | +0.018 0 | 14 | 16 | +0.065 +0.035 | 1.0 | −0.035 −0.085 | | 1406 | | 1410 | | 1415 | +0.188 +0.070 | 14 |
| 15 | 0 −0.018 | 17 | +0.018 0 | 15 | 17 | +0.065 +0.035 | 1.0 | −0.035 −0.085 | | | | 1510 | | 1515 | +0.188 +0.070 | 15 |
| 16 | 0 −0.018 | 18 | +0.018 0 | 16 | 18 | +0.070 +0.035 | 1.0 | −0.035 −0.085 | | | | | | 1615 | +0.188 +0.070 | 16 |
| 18 | 0 −0.018 | 20 | +0.021 0 | 18 | 20 | +0.075 +0.040 | 1.0 | −0.035 −0.085 | | | | | | 1815 | +0.191 +0.070 | 18 |
| 20 | 0 −0.021 | 23 | +0.021 0 | 20 | 23 | +0.080 +0.045 | 1.5 | −0.030 −0.090 | | | | | 2012 | 2015 | +0.201 +0.060 | 20 |
| 22 | 0 −0.021 | 25 | +0.021 0 | 22 | 25 | +0.080 +0.045 | 1.5 | −0.030 −0.090 | | | | 2210 | | | +0.201 +0.060 | 22 |
| 24 | 0 −0.021 | 27 | +0.021 0 | 24 | 27 | +0.080 +0.045 | 1.5 | −0.030 −0.090 | | | | | | | +0.201 +0.060 | 24 |
| 25 | 0 −0.021 | 28 | +0.021 0 | 25 | 28 | +0.085 +0.050 | 1.5 | −0.030 −0.090 | | | | 2510 | | 2515 | +0.201 +0.060 | 25 |
| 26 | 0 −0.021 | 30 | +0.021 0 | 26 | 30 | +0.085 +0.050 | 2.0 | −0.030 −0.090 | | | | | | | +0.201 +0.060 | 26 |
| 28 | 0 −0.021 | 32 | +0.025 0 | 28 | 32 | +0.090 +0.050 | 2.0 | −0.030 −0.090 | | | | | | | +0.205 +0.060 | 28 |
| 30 | 0 −0.021 | 34 | +0.025 0 | 30 | 34 | +0.090 +0.050 | 2.0 | −0.030 −0.090 | | | | | | 3015 | +0.205 +0.060 | 30 |
| 31 | 0 −0.025 | 35 | +0.025 0 | 31 | 35 | +0.090 +0.050 | 2.0 | −0.030 −0.090 | | | | | | | +0.205 +0.060 | 31 |
| 32 | 0 −0.025 | 36 | +0.025 0 | 32 | 36 | +0.090 +0.050 | 2.0 | −0.030 −0.090 | | | | | | | +0.205 +0.060 | 32 |
| 35 | 0 −0.025 | 39 | +0.025 0 | 35 | 39 | +0.095 +0.055 | 2.0 | −0.030 −0.090 | | | | | | 3515 | +0.205 +0.060 | 35 |
| 38 | 0 −0.025 | 42 | +0.025 0 | 38 | 42 | +0.095 +0.055 | 2.0 | −0.030 −0.090 | | | | | | | +0.205 +0.060 | 38 |
| 40 | 0 −0.025 | 44 | +0.025 0 | 40 | 44 | +0.095 +0.055 | 2.0 | −0.030 −0.090 | | | | | | | +0.205 +0.060 | 40 |
| 42 | 0 −0.025 | 47 | +0.025 0 | 42 | 47 | +0.095 +0.055 | 2.5 | −0.035 −0.095 | | | | | | | +0.215 +0.070 | 42 |
| 45 | 0 −0.025 | 50 | +0.025 0 | 45 | 50 | +0.100 +0.060 | 2.5 | −0.035 −0.095 | | | | | | | +0.215 +0.070 | 45 |
| 50 | 0 −0.025 | 55 | +0.030 0 | 50 | 55 | +0.105 +0.060 | 2.5 | −0.035 −0.095 | | | | | | | +0.220 +0.070 | 50 |
| 55 | 0 −0.030 | 60 | +0.030 0 | 55 | 60 | +0.110 +0.065 | 2.5 | −0.035 −0.095 | | | | | | | +0.220 +0.070 | 55 |
| 60 | 0 −0.030 | 65 | +0.030 0 | 60 | 65 | +0.120 +0.070 | 2.5 | −0.035 −0.095 | | | | | | | +0.220 +0.070 | 60 |
| 65 | 0 −0.030 | 70 | +0.030 0 | 65 | 70 | +0.125 +0.075 | 2.5 | −0.035 −0.095 | | | | | | | +0.220 +0.070 | 65 |
| 70 | 0 −0.030 | 75 | +0.030 0 | 70 | 75 | +0.125 +0.075 | 2.5 | −0.035 −0.095 | | | | | | | +0.220 +0.070 | 70 |
| 75 | 0 −0.030 | 80 | +0.030 0 | 75 | 80 | +0.130 +0.075 | 2.5 | −0.035 −0.095 | | | | | | | +0.220 +0.070 | 75 |
| 80 | 0 −0.030 | 85 | +0.035 0 | 80 | 85 | +0.130 +0.075 | 2.5 | −0.035 −0.095 | | | | | | | +0.225 +0.070 | 80 |
| 85 | 0 −0.035 | 90 | +0.035 0 | 85 | 90 | +0.130 +0.075 | 2.5 | −0.035 −0.095 | | | | | | | +0.225 +0.070 | 85 |
| 90 | 0 −0.035 | 95 | +0.035 0 | 90 | 95 | +0.130 +0.075 | 2.5 | −0.035 −0.095 | | | | | | | +0.225 +0.070 | 90 |
| 100 | 0 −0.035 | 105 | +0.035 0 | 100 | 105 | +0.140 +0.080 | 2.5 | −0.055 −0.115 | | | | | | | +0.265 +0.110 | 100 |

| Length L Tolerance 0 −0.3 | | | | | | | | | | | I.D. tolerance after press fitting (reference) | I.D. ϕd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 25 | 30 | 35 | 40 | 50 | 60 | 70 | 80 | 95 | | | |
| | | | | | | | | | | | +0.165 +0.060 | 5 |
| | | | | | | | | | | | +0.165 +0.060 | 6 |
| | | | | | | | | | | | +0.165 +0.060 | 7 |
| | | | | | | | | | | | +0.165 +0.060 | 8 |
| | | | | | | | | | | | +0.168 +0.060 | 9 |
| 1020 | | | | | | | | | | | +0.168 +0.060 | 10 |
| 1220 | | | | | | | | | | | +0.168 +0.060 | 12 |
| 1420 | | | | | | | | | | | +0.188 +0.070 | 14 |
| 1520 | 1525 | | | | | | | | | | +0.188 +0.070 | 15 |
| 1620 | 1625 | | | | | | | | | | +0.188 +0.070 | 16 |
| | 1825 | | | | | | | | | | +0.191 +0.070 | 18 |
| 2020 | 2025 | 2030 | | | | | | | | | +0.201 +0.060 | 20 |
| 2220 | | 2230 | | | | | | | | | +0.201 +0.060 | 22 |
| | | 2430 | | | | | | | | | +0.201 +0.060 | 24 |
| 2520 | 2525 | 2530 | 2535 | | | | | | | | +0.201 +0.060 | 25 |
| | | 2630 | | | | | | | | | +0.201 +0.060 | 26 |
| 2820 | | 2830 | | 2840 | | | | | | | +0.205 +0.060 | 28 |
| 3020 | 3025 | 3030 | 3035 | 3040 | | | | | | | +0.205 +0.060 | 30 |
| | | | | 3140 | | | | | | | +0.205 +0.060 | 31 |
| 3220 | | | | 3240 | | | | | | | +0.205 +0.060 | 32 |
| | 3525 | 3530 | | 3540 | 3550 | | | | | | +0.205 +0.060 | 35 |
| | | 3830 | | | 3850 | | | | | | +0.205 +0.060 | 38 |
| | 4025 | 4030 | | 4040 | 4050 | | | | | | +0.205 +0.060 | 40 |
| | | | | | 4250 | | | | | | +0.215 +0.070 | 42 |
| | | 4530 | | | 4550 | | | | | | +0.215 +0.070 | 45 |
| | 5025 | 5030 | | 5040 | 5050 | 5060 | | | | | +0.220 +0.070 | 50 |
| | 5525 | | | 5540 | | | 5570 | | | | +0.220 +0.070 | 55 |
| | | 6030 | | 6040 | | 6060 | | | | | +0.220 +0.070 | 60 |
| | | 6530 | | 6540 | | 6560 | | | | | +0.220 +0.070 | 65 |
| | | 7030 | | 7040 | | | | 7080 | | | +0.220 +0.070 | 70 |
| | | | | 7540 | | | | 7580 | | | +0.220 +0.070 | 75 |
| | | | | 8040 | | | | 8080 | | | +0.225 +0.070 | 80 |
| | | | | 8540 | | | | 8580 | | | +0.225 +0.070 | 85 |
| | | | | 9040 | | 9060 | | | | | +0.225 +0.070 | 90 |
| | | | | | 10050 | | | | 10095 | | +0.265 +0.110 | 100 |

※Outer diameter is measrued by exclusive gauge.
※The I.D. tolerance after press fitting is for reference only.