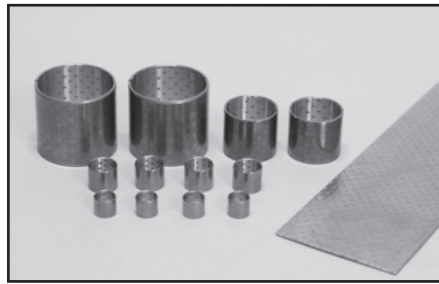


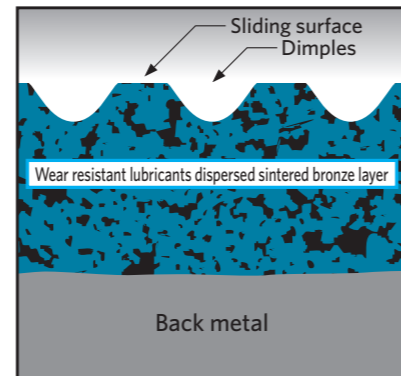
Oiles Toughmet D

Sintered bronze bearings consisting of a steel back and uniformly dispersed wear resistant lubricants.



Features

- Superior durability and stable low coefficient of friction where lubrication is present.
- Able to handle reciprocating, oscillating, and intermittent motion where oil film is difficult to be formed.
- Thin walled configuration for compact design.
- Dramatically reduces lubrication intervals.
- Possesses high load carrying capacity, wear resistance, and seize resistance.
- Electric conductivity.
- Available in various standard and custom sizes.



image

Service range

| Lubrication condition | Periodical lubrication | Oil lubrication |
|---|------------------------|-----------------|
| Service temperature range °C | -40~+150 | |
| Allowable max. pressure P N/mm ² {kgf/cm ² } | 50 (100) {510 (1,020)} | |
| Allowable max. velocity V m/s {m/min} | 1.00 {60} | 5.00 {300} |
| Allowable max. PV value N/mm ² · m/s {kgf/cm ² · m/min} | 3.26 {2,000} | 4.89 {3,000} |

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

Mechanical properties

| | | | |
|------------------|------------|--|-------------|
| Tensile strength | JIS Z 2241 | N/mm ² {kgf/cm ² } | 380 {3,875} |
| Elongation | JIS Z 2241 | % | 27 |
| Hardness | JIS Z 2244 | HV | 107 |

※Value here is typical value, not standard.

※Above value indicates the value of back metal.

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

Test data

Journal rotation test

<Testing conditions>

Bearing material : ○CAC603(LBC3)
○CAC406(BC6)
○Toughmet D

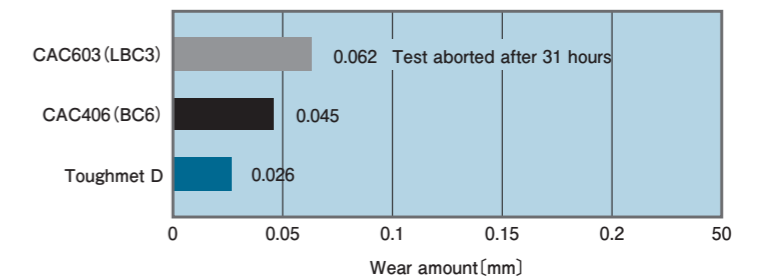
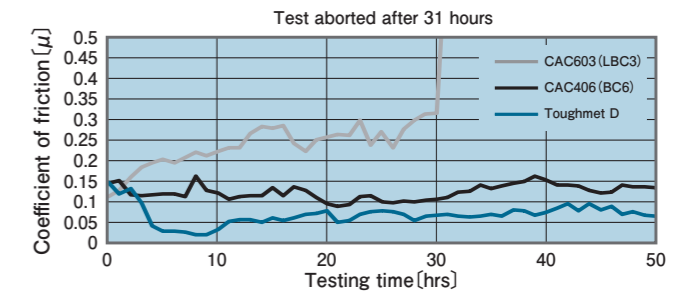
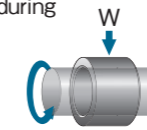
Mating material : S45C

Pressure : 20N/mm² {203.9kgf/cm²}

Velocity : 0.84×10⁻²m/s {0.5m/min}

Testing time : 50hrs

Lubrication : Grease is applied during assembling



Journal oscillation test

<Testing conditions>

Bearing material : ○CAC603(LBC3)
○CAC406(BC6)
○Toughmet D

Mating material : S45C

Pressure : 20N/mm² {203.9kgf/cm²}

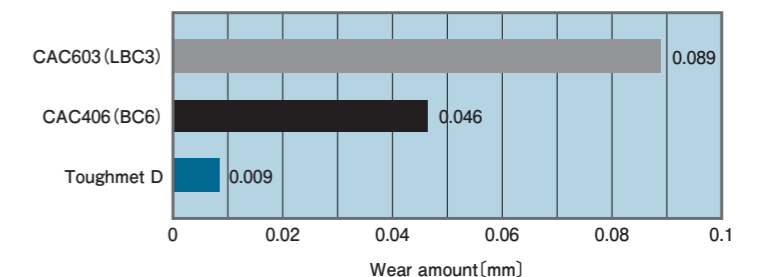
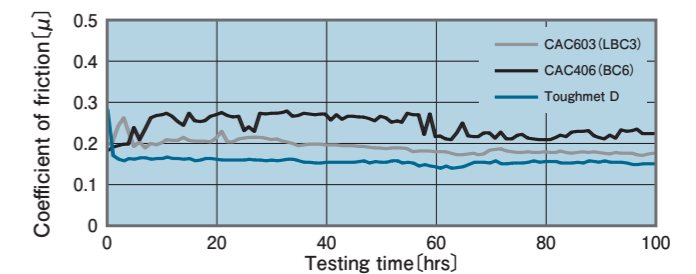
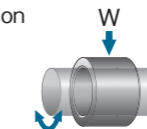
Velocity : 1.68×10⁻²m/s {1.0m/min}

Oscillation cycles : 16cpm

Oscillation angle : 90°

Testing time : 100hrs

Lubrication : Periodical lubrication {3cc/hr}



Journal oscillation test

<Testing conditions>

Bearing material : ○CAC603(LBC3)
○CAC406(BC6)
○Toughmet D

Mating material : S45C

Pressure : 30N/mm² {305.9kgf/cm²}

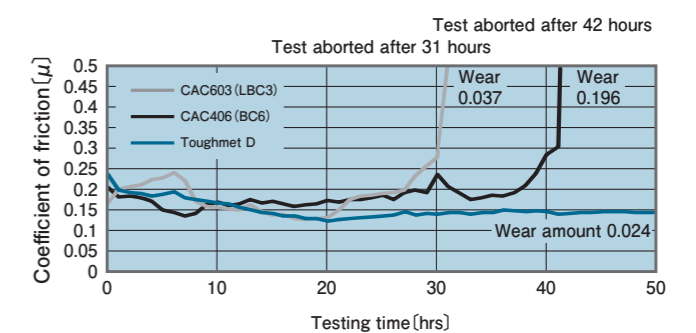
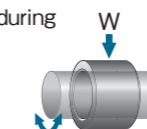
Velocity : 0.841×10⁻²m/s {0.5m/min}

Oscillation cycles : 8cpm

Oscillation angle : ±45° [90°]

Testing time : 50hrs

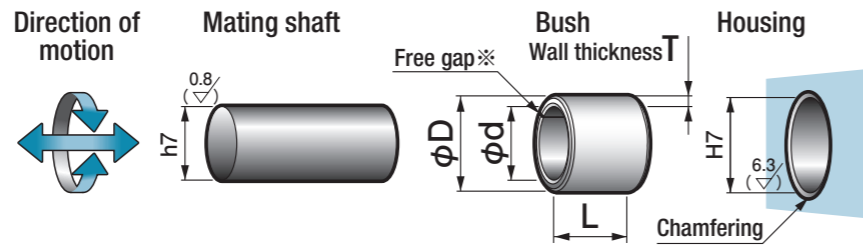
Lubrication : Grease is applied during assembling



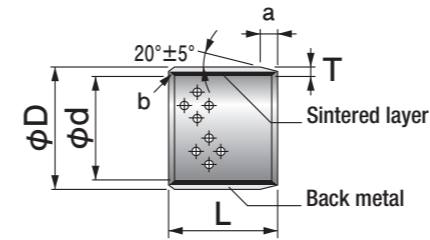
TMDB OILES Toughmet D Bushings



Choose Part No. by required inner diameter and length.
 (e.g.) For the inner diameter of **TMDB - 3020**
 30mm with 20mm length, choose **Part No.**



※Although free gap does not affect bearing rotation, please avoid maximum load point for free gap.



a: Chamfering on outer diameter

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

(mm)

b: Chamfering on inner diameter

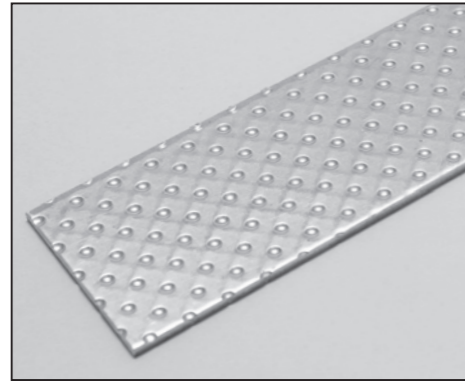
| | | | | |
|---|-----|-----|-----|-----|
| T | 1.0 | 1.5 | 2.0 | 2.5 |
| b | 0.3 | 0.5 | 0.5 | 0.5 |

(mm)

| Mating Shaft Size | Mating Hole Size | I.D. | O.D. | Thickness T | Length L Tolerance -0.3 | | | | | |
|-------------------|------------------|------|------|-------------|---------------------------|------|------|------|------|------|
| | | | | | 10 | 15 | 20 | 25 | 30 | 40 |
| 12 | 14 | 12 | 14 | 1.0 | 1210 | 1215 | 1220 | | | |
| 14 | 16 | 14 | 16 | 1.0 | 1410 | 1415 | 1420 | | | |
| 15 | 17 | 15 | 17 | 1.0 | 1510 | 1515 | 1520 | 1525 | | |
| 16 | 18 | 16 | 18 | 1.0 | | 1615 | 1620 | 1625 | | |
| 18 | 20 | 18 | 20 | 1.0 | | 1815 | 1820 | 1825 | | |
| 20 | 23 | 20 | 23 | 1.5 | | 2015 | 2020 | 2025 | 2030 | |
| 22 | 25 | 22 | 25 | 1.5 | | 2215 | 2220 | 2225 | 2230 | |
| 24 | 27 | 24 | 27 | 1.5 | | 2415 | 2420 | 2425 | 2430 | |
| 25 | 28 | 25 | 28 | 1.5 | | 2515 | 2520 | 2525 | 2530 | |
| 26 | 30 | 26 | 30 | 2.0 | | | 2620 | | 2630 | 2640 |
| 28 | 32 | 28 | 32 | 2.0 | | | 2820 | | 2830 | 2840 |
| 30 | 34 | 30 | 34 | 2.0 | | | 3020 | | 3030 | 3040 |
| 31 | 35 | 31 | 35 | 2.0 | | | 3120 | | 3130 | 3140 |
| 32 | 36 | 32 | 36 | 2.0 | | | 3220 | | 3230 | 3240 |
| 35 | 39 | 35 | 39 | 2.0 | | | 3520 | | 3530 | 3540 |
| 38 | 42 | 38 | 42 | 2.0 | | | | | 3830 | 3840 |
| 40 | 44 | 40 | 44 | 2.0 | | | | | 4030 | 4040 |
| 42 | 47 | 42 | 47 | 2.5 | | | | | 4230 | 4240 |
| 45 | 50 | 45 | 50 | 2.5 | | | | | 4530 | 4540 |
| 50 | 55 | 50 | 55 | 2.5 | | | | | 5030 | 5040 |
| 55 | 60 | 55 | 60 | 2.5 | | | | | | 5540 |
| 60 | 65 | 60 | 65 | 2.5 | | | | | | 6040 |
| 65 | 70 | 65 | 70 | 2.5 | | | | | | 6540 |
| 70 | 75 | 70 | 75 | 2.5 | | | | | | 7040 |
| 75 | 80 | 75 | 80 | 2.5 | | | | | | 7540 |

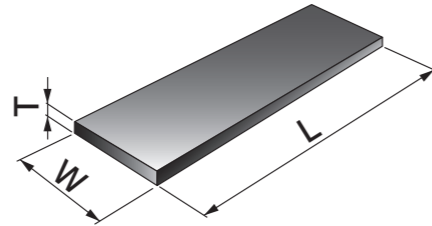
※Outer diameter is measured by exclusive gauge.

| Length L Tolerance -0.3 | | | | I.D. Tolerance after press fitting (Reference Value) | I.D. ϕd |
|---------------------------|------|----|------|--|---------------|
| 50 | 60 | 70 | 80 | | |
| | | | | +0.098 +0.030 | 12 |
| | | | | +0.098 +0.030 | 14 |
| | | | | +0.098 +0.030 | 15 |
| | | | | +0.098 +0.030 | 16 |
| | | | | +0.111 +0.030 | 18 |
| | | | | +0.129 +0.048 | 20 |
| | | | | +0.129 +0.048 | 22 |
| | | | | +0.129 +0.048 | 24 |
| | | | | +0.129 +0.048 | 25 |
| | | | | +0.129 +0.048 | 26 |
| | | | | +0.133 +0.048 | 28 |
| | | | | +0.133 +0.048 | 30 |
| | | | | +0.169 +0.074 | 31 |
| | | | | +0.169 +0.074 | 32 |
| 3550 | | | | +0.169 +0.074 | 35 |
| 3850 | | | | +0.169 +0.074 | 38 |
| 4050 | | | | +0.169 +0.074 | 40 |
| 4250 | | | | +0.169 +0.074 | 42 |
| 4550 | | | | +0.169 +0.074 | 45 |
| 5050 | 5060 | | | +0.174 +0.074 | 50 |
| 5550 | 5560 | | | +0.226 +0.106 | 55 |
| 6050 | 6060 | | | +0.226 +0.106 | 60 |
| | 6560 | | 6580 | +0.226 +0.106 | 65 |
| | 7060 | | 7080 | +0.226 +0.106 | 70 |
| | 7560 | | 7580 | +0.226 +0.106 | 75 |



Choose Part No. by required inner diameter and length.
(e.g.) For the thickness of 2.0mm with 100mm width, choose

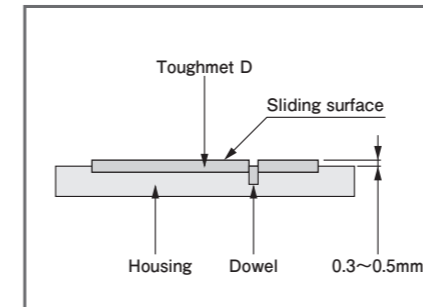
TMDP - 20100
Part No.



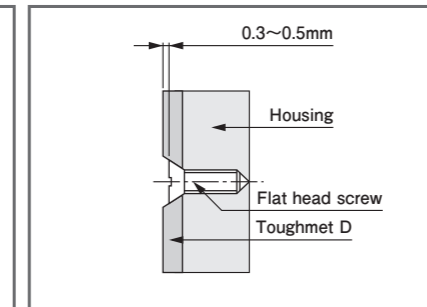
| Part No. | Thickness | | Width | Length |
|-------------------|-----------|----------------|-------|--------|
| | T | Tolerance | W | L |
| TMDP-1080 | 1.0 | -0.03 -0.13 | 80 | 500 |
| TMDP-1590 | 1.5 | -0.03 -0.13 | 90 | 500 |
| TMDP-20100 | 2.0 | -0.03 -0.13 | 100 | 500 |
| TMDP-25100 | 2.5 | -0.03 -0.13 | 100 | 500 |

How to attach plates

① Inlay method (Plate)



② Flat head screw method



③ Method for bonding

You can use adhesive instead of dowel for inlay method. Epoxide-based adhesive is recommended. Please note that the plate may Separate if adhesive is used only.