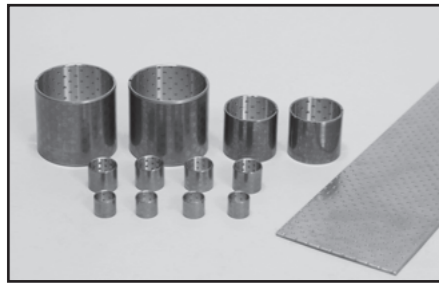


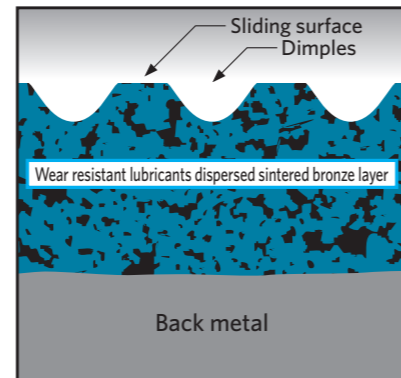
Oiles Toughmet D

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.
- Standard products and plate materials are available in a various range of 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

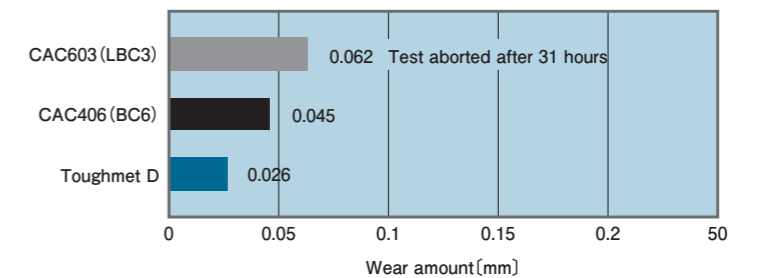
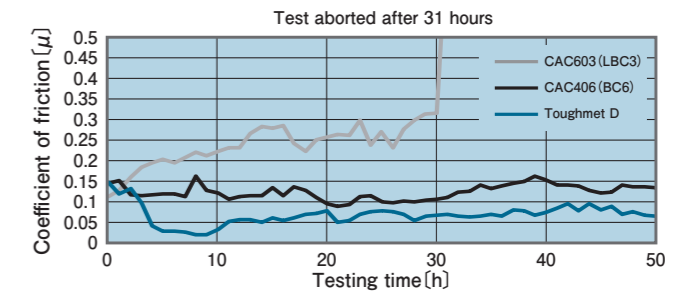
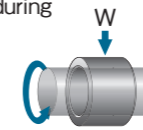
Mating material : S45C

Pressure : 20N/mm² {203.9kgf/cm²}

Velocity : 0.84×10⁻²m/s {0.5m/min}

Testing time : 50h

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}

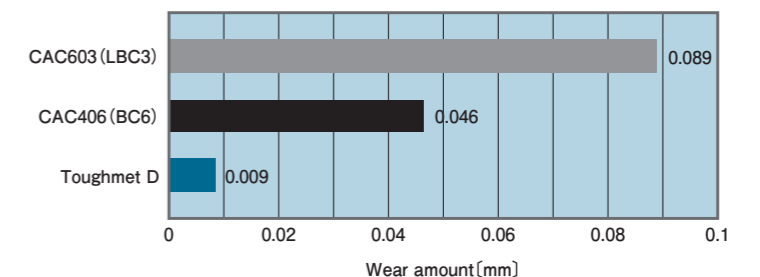
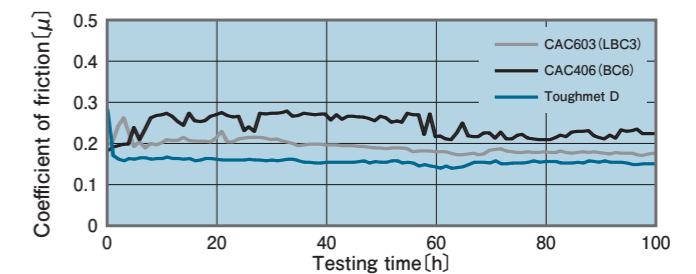
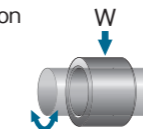
Velocity : 1.68×10⁻²m/s {1.0m/min}

Oscillation cycles : 16cpm

Oscillation angle : 90°

Testing time : 100h

Lubrication : Periodical lubrication {3cc/h}



Journal oscillation test

<Testing conditions>

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

Mating material : S45C

Pressure : 30N/mm² {305.9kgf/cm²}

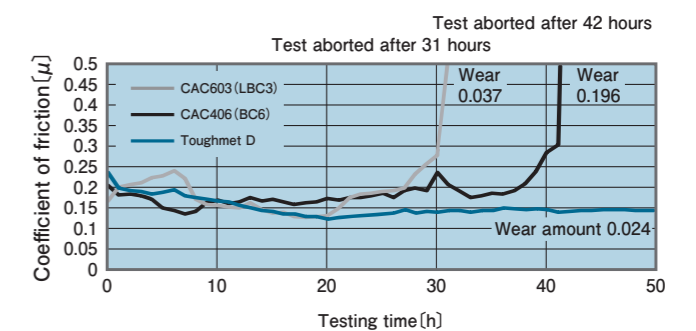
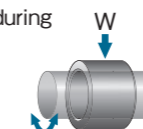
Velocity : 0.841×10⁻²m/s {0.5m/min}

Oscillation cycles : 8cpm

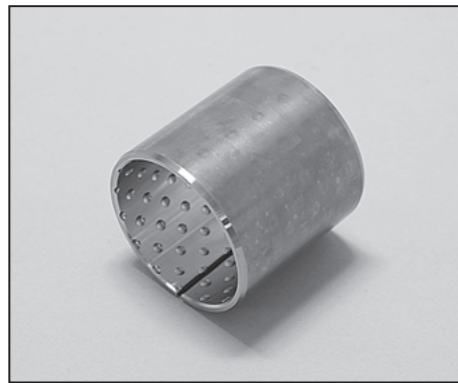
Oscillation angle : ±45° [90°]

Testing time : 50h

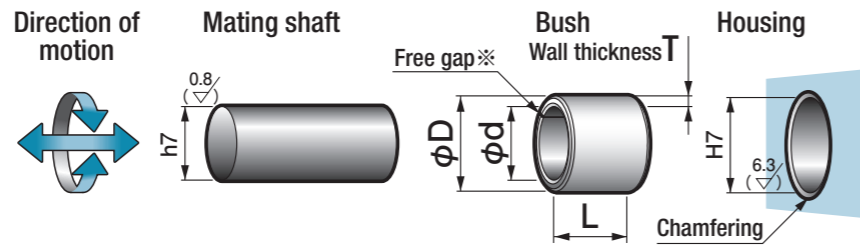
Lubrication : Grease is applied during assembling



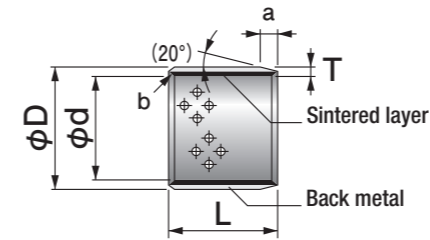
TMDB OILES Toughmet D Bushings



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

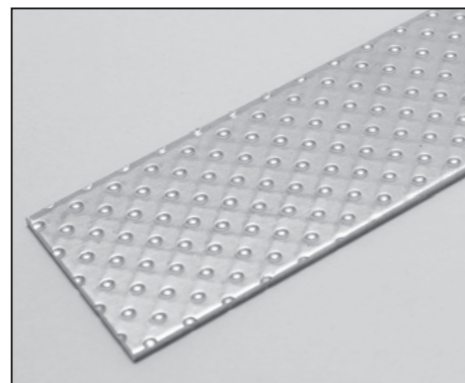
T	1.0	1.5	2.0	2.5
b	0.3	0.5	0.5	0.5

(mm)

Mating Shaft Size	Mating Hole Size	I.D. ϕd	O.D. ϕD	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

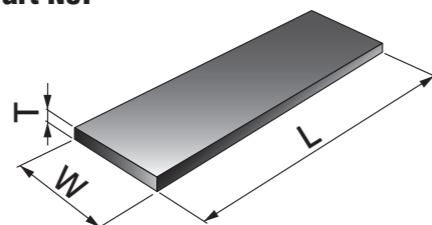
※Outer diameter is measured by exclusive gauge.

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

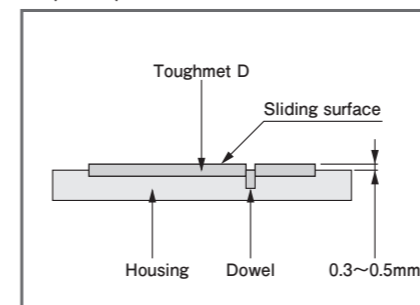
TMDP - 20100
Part No.



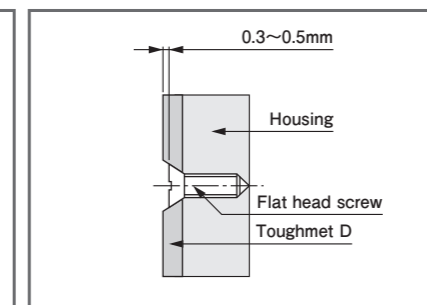
Part No.	Thickness		Width	Length
	T	Tolerance	W	L
TMDP-1080	1.0	-0.03 -0.13	80	500
TMDP-1590	1.5	-0.03 -0.13	90	500
TMDP-20100	2.0	-0.03 -0.13	100	500
TMDP-25100	2.5	-0.03 -0.13	100	500

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.