

# Oiles 300 Oil-impregnated expanded cast iron bearings



## Feature

- Reduces much less lubrication than copper alloy bearings.
- Maintains oil film well and features superior wear resistance and seizure resistance.
- Places no restrictions on sliding surface shapes or motion forms.
- Available in larger dimensions than oil-impregnated sintered bearings.
- Standard products and materials for machining are available in various sizes.

## Service range

Lubrication condition	periodic lubrication	oil lubrication
Service temperature range °C	-40~+100	-40~+150
Allowable max. pressure P N/mm <sup>2</sup> [kgf/cm <sup>2</sup> ]	10 {102}	
Allowable max. velocity V m/s {m/min}	1.00 {60}	3.35 {201}
Allowable max. PV value N/mm <sup>2</sup> · m/s [kgf/cm <sup>2</sup> · m/min]	1.25 {765}	3.25 {1,990}

## Mechanical properties

Density	—	g/cm <sup>3</sup>	6.8
Tensile strength	JIS Z 2241	N/mm <sup>2</sup> [kgf/mm <sup>2</sup> ]	98 {10}
Compressive strength	—	N/mm <sup>2</sup> [kgf/mm <sup>2</sup> ]	294 {30}
Impact strength	JIS Z 2242	J/cm <sup>2</sup> [kgf/cm <sup>2</sup> ]	2 {0.2}
Hardness	JIS Z 2246	HS	20
Modulus of longitudinal elasticity	—	N/mm <sup>2</sup> [kgf/mm <sup>2</sup> ]	58,000 {6,000}
Co-efficient of linear expansion	—	×10 <sup>-5</sup> °C <sup>-1</sup>	1.1
Thermal conductivity	—	W/m°C [cal/sec°Ccm]	50.2 {0.12}

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

## Lathe turning

carbide tool (JIS)		
Cutting tool	Relief angle	5~10°
	Rake angle	2~5°
	Nose radius (mm)	0.40~0.80
Condition	Speed (m/min)	100~200
	Cut depth (mm)	0.05~0.30
	Feed (mm/rev)	0.08~0.30

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

### Thrust rotation test

(Comparison with various copper alloy)

<Testing conditions>

Bearing dimension : φ25×φ48×t9

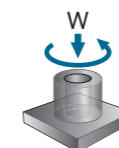
Mating material : S55C (surface roughness Rz1.5μm)

Pressure : initial contact pressure  
0.99N/mm<sup>2</sup> {10.1kgf/cm<sup>2</sup>}  
0.87N/mm<sup>2</sup> {8.9kgf/cm<sup>2</sup>} is  
incrementally loaded every 5 minutes

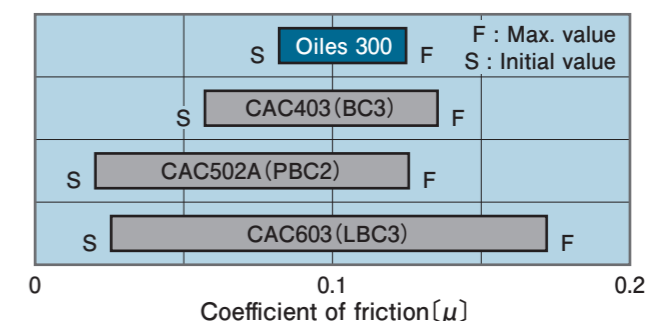
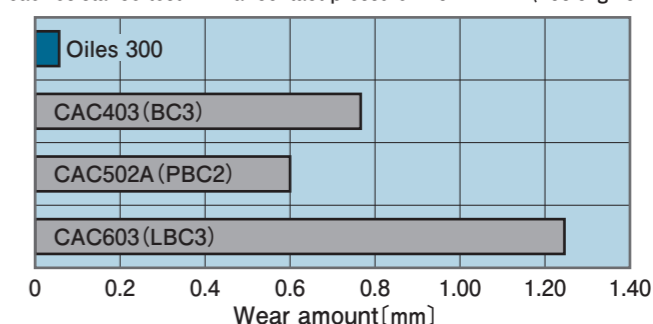
Final contact pressure : 20.2N/mm<sup>2</sup> {206.0kgf/cm<sup>2</sup>}

Velocity : 0.162m/s {9.7m/min}

Lubrication : in oil



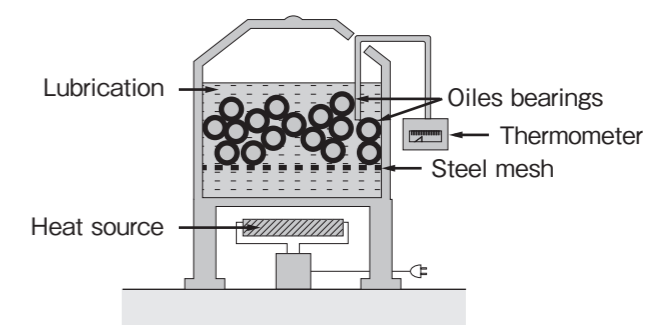
Load resistance test / Final contact pressure : 20.2N/mm<sup>2</sup> {206.0kgf/cm<sup>2</sup>}



## Oil impregnation method

Oil impregnation is required for oil-containing OILES bearings such as Oiles 300. 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 °C to 110 °C. 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.

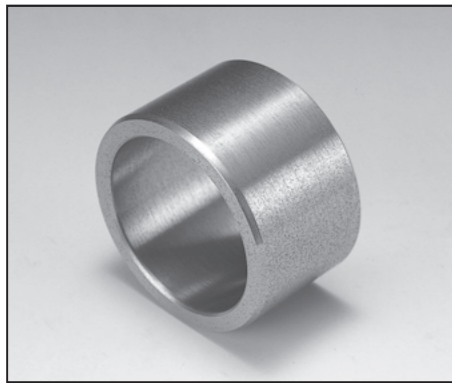


## Selectoin of lubrication oil

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

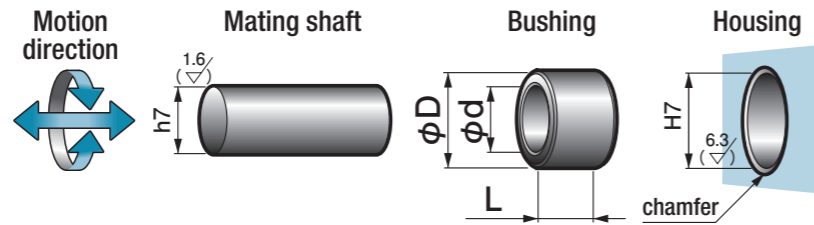
# 30B

## Oiles 300 Bushings (Thin wall)

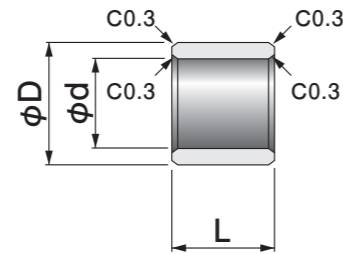


Specify Part No. by required I.D., O.D., and Length.  
(e.g.) I.D. is 8mm, O.D. is 10mm, and length is 12mm.

**30B - 081012 T**  
Part No.



- Use Oiles 300 in lubrication oil or with periodic lubrication.



I.D.		O.D.		Length L							I.D. tolerance after press fitting (reference)	
φd	Tolerance	φD	Tolerance	5	6	8	10	12	15	20		30
5	+0.058 +0.040	7	+0.034 +0.019	050705T	050706T	050708T						+0.030 +0.012
6	+0.058 +0.040	8	+0.034 +0.019	060805T	060806T	060808T	060810T					+0.030 +0.012
8	+0.062 +0.040	10	+0.034 +0.019		081006T	081008T	081010T	081012T				+0.034 +0.012
10	+0.068 +0.046	12	+0.041 +0.023			101208T	101210T	101212T	101215T			+0.034 +0.012
12	+0.081 +0.054	14	+0.041 +0.023			121408T	121410T	121412T	121415T	121420T		+0.047 +0.020
12	+0.081 +0.054	16	+0.041 +0.023			121608T	121610T	121612T	121615T	121620T		+0.047 +0.020
14	+0.081 +0.054	16	+0.041 +0.023				141610T	141612T	141615T	141620T		+0.047 +0.020
14	+0.081 +0.054	18	+0.041 +0.023				141810T	141812T	141815T	141820T		+0.047 +0.020
16	+0.081 +0.054	18	+0.041 +0.023				161810T		161815T	161820T		+0.047 +0.020
16	+0.089 +0.062	20	+0.049 +0.028				T162010		162015T	162020T		+0.047 +0.020
18	+0.089 +0.062	22	+0.049 +0.028							182220T	182230T	+0.047 +0.020
20	+0.105 +0.072	24	+0.049 +0.028							202420T	202430T	+0.063 +0.030

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

▲ The dimensional tolerances are the values measured at +25°C.

# Oiles 300 Bushings Thin wall

## Press-fitting

### Press-fitting jig

Generally, as shown in the figure 1, a mandrel is used for the press-fitting. However use of a guide ring facilitates easier press-fitting. Use of a guide ring prevents damage of a bushing at the time of press-fitting. The dimension of a guide ring should be calculated from the table below.

Inner diameter of the guide ring should be the size so that the bushing can be inserted by hands. Length of the guide ring should be more than one-third of the bushing, or if possible, it should be the same length as the bushing.

The dimension of mandrel should be calculated from table below.

Dimension of bushing	Dimension of mandrel
I.D. D <sub>0</sub>	d <sub>0</sub> =D <sub>0</sub> -(0.05 to 0.10)
O.D. D <sub>1</sub>	d <sub>1</sub> =D <sub>1</sub> -(0.20 to 0.30)
Length L	ℓ ≥ L

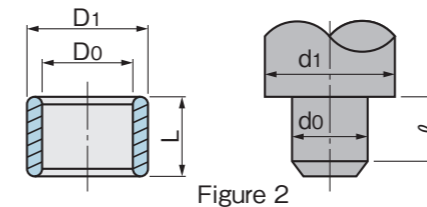


Figure 2

### Regular press-fitting Press-fitting with guide ring

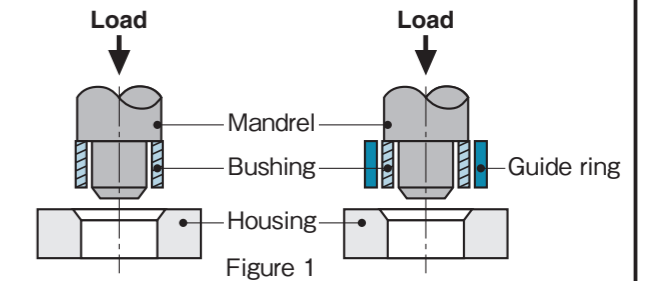
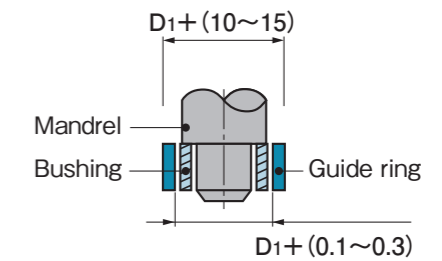


Figure 1

The dimension of guide ring should be calculated from table below.

Bushing I.D.	Guide ring I.D.	Guide ring O.D.
Up to φ20	D <sub>1</sub> +(0.1 to 0.3)	D <sub>1</sub> +(10 to 15)



### Housing chamfer

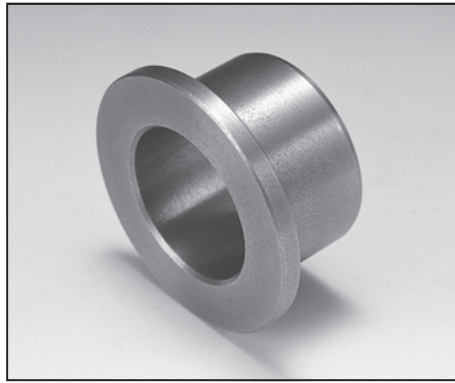
For the housing chamfer, either a round chamfer or a tapered chamfer is recommended. In case of a C-surface chamfer, (more than C1.0) make sure there is no burr. Smoother press-fitting is possible by applying small amount of grease or lubricant.

### Press-fit force

Press-fit smoothly with hydraulic (pressure), pneumatic pressure, or a vice. Avoid press-fit by use of impact such as use of a hammer. It might induce damage of the bushing, or change the size of the inner diameter after press-fit.

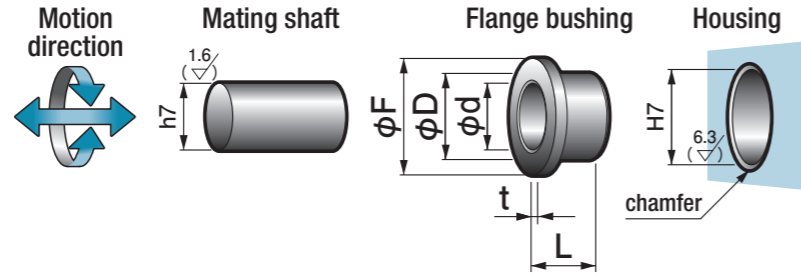


# 30F Oiles 300 Flange Bushings

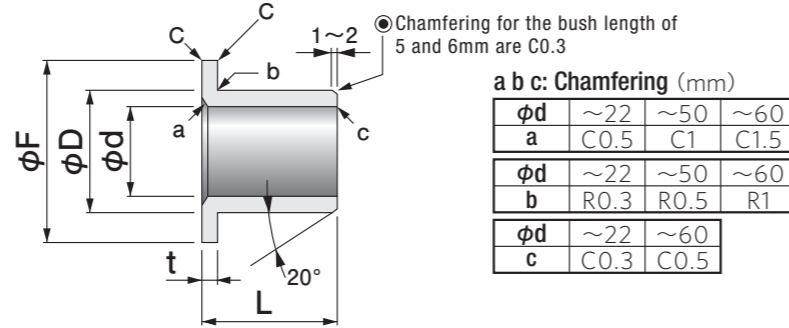


Specify Part No. by required I.D. and length.  
(e.g.) I.D. is 30mm and length is 40mm.

**30F - 3040**  
Part No.



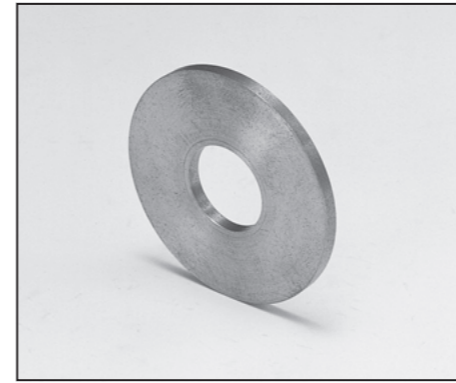
● Use Oiles 300 in lubrication oil or with periodic lubrication.



I.D.	O.D.	Flange		Length L														I.D. tolerance after press fitting (reference)
		$\phi F$	t	Tolerance $-0.3$														
$\phi d$	Tolerance	$\phi D$	Tolerance	5	8	10	12	15	20	25	30	40	50	60	80			
5	+0.058 +0.040	8	+0.034 +0.019	11	0 -0.3	1.5	0 -0.1	0505	0508							+0.030 +0.012		
6	+0.058 +0.040	10	+0.034 +0.019	14	0 -0.3	2	0 -0.1		0608	0610						+0.030 +0.012		
8	+0.068 +0.046	12	+0.041 +0.023	20	0 -0.3	2	0 -0.1			0810	0812	0815				+0.034 +0.012		
10	+0.068 +0.046	16	+0.041 +0.023	23	0 -0.3	3	0 -0.1			1010	1012	1015	1020			+0.045 +0.023		
12	+0.068 +0.041	18	+0.041 +0.023	25	0 -0.3	3	0 -0.1			1210	1212	1215	1220	1225		+0.045 +0.018		
14	+0.068 +0.041	20	+0.049 +0.028	27	0 -0.3	3	0 -0.1			1410	1412	1415	1420	1425		+0.040 +0.013		
15	+0.068 +0.041	21	+0.049 +0.028	28	0 -0.3	3	0 -0.1			1510	1512	1515	1520	1525	1530	+0.040 +0.013		
16	+0.068 +0.041	22	+0.049 +0.028	29	0 -0.3	3	0 -0.1				1612	1615	1620	1625	1630	+0.040 +0.013		
18	+0.068 +0.041	25	+0.049 +0.028	33	0 -0.3	3.5	0 -0.1				1815	1820	1825	1830		+0.040 +0.013		
20	+0.088 +0.055	28	+0.049 +0.028	38	0 -0.3	4	0 -0.1				2015	2020	2025	2030	2040	+0.060 +0.027		
22	+0.088 +0.055	30	+0.049 +0.028	40	0 -0.3	4	0 -0.1				2215	2220	2225	2230	2240	+0.060 +0.027		
25	+0.088 +0.055	35	+0.059 +0.034	45	0 -0.3	5	0 -0.1				2515	2520	2525	2530	2540	+0.054 +0.021		
28	+0.088 +0.055	38	+0.059 +0.034	48	0 -0.3	5	0 -0.1					2825	2830			+0.054 +0.021		
30	+0.088 +0.055	40	+0.059 +0.034	50	0 -0.3	5	0 -0.1						3030	3040		+0.054 +0.021		
32	+0.112 +0.073	42	+0.059 +0.034	52	0 -0.3	5	0 -0.1						3230	3240		+0.078 +0.039		
35	+0.112 +0.073	45	+0.059 +0.034	60	0 -0.3	5	0 -0.1						3530	3540		+0.078 +0.039		
40	+0.112 +0.073	50	+0.059 +0.034	65	0 -0.3	5	0 -0.1							4040	4050	+0.078 +0.039		
45	+0.112 +0.073	55	+0.073 +0.041	70	0 -0.3	5	0 -0.1							4540	4550	+0.070 +0.031		
50	+0.112 +0.073	60	+0.073 +0.041	75	0 -0.3	5	0 -0.1							5050	5060	+0.070 +0.031		
55	+0.144 +0.098	70	+0.073 +0.041	85	0 -0.3	7.5	0 -0.1							5550	5560	+0.102 +0.056		
60	+0.144 +0.098	75	+0.073 +0.041	90	0 -0.3	7.5	0 -0.1							6060	6080	+0.102 +0.056		

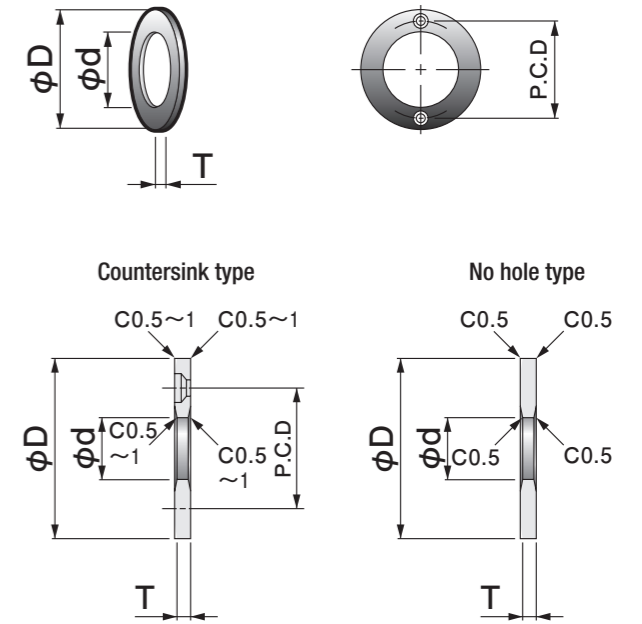
※The I.D. tolerance after press fitting is for reference only.  
▲The dimensional tolerances are the values measured at +25°C.

# 30W Oiles 300 Washers



Specify Part No. by required I.D. and thickness.  
(e.g.) I.D. is 18.2mm and thickness is 3mm.

**30W - 1803**  
Part No.



● Use Oiles 300 in lubrication oil or with periodic lubrication.  
● Part no. with N at the end is no-hole type.

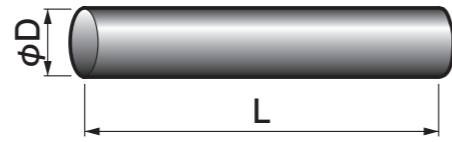
Part No.	I.D.		O.D.	Thickness		Mounting hole		
	$\phi d$	Tolerance	$\phi D$	T	Tolerance	P.C.D.	No. of holes	Countersink screw size
<b>30W-1003N</b>	10.2	+0.2 +0.1	30	3	0 -0.1			no attach hole
<b>30W-1203N</b>	12.2	+0.2 +0.1	40	3	0 -0.1			no attach hole
<b>30W-1303N</b>	13.2	+0.2 +0.1	40	3	0 -0.1			no attach hole
<b>30W-1403N</b>	14.2	+0.2 +0.1	40	3	0 -0.1			no attach hole
<b>30W-1603N</b>	16.2	+0.2 +0.1	50	3	0 -0.1			no attach hole
<b>30W-1803</b>	18.2	+0.2 +0.1	50	3	0 -0.1	35	2	M3
<b>30W-2005</b>	20.2	+0.2 +0.1	50	5	0 -0.1	35	2	M5
<b>30W-2505</b>	25.2	+0.2 +0.1	55	5	0 -0.1	40	2	M5
<b>30W-3005</b>	30.2	+0.2 +0.1	60	5	0 -0.1	45	2	M5
<b>30W-3505</b>	35.2	+0.2 +0.1	70	5	0 -0.1	50	2	M5
<b>30W-4007</b>	40.2	+0.2 +0.1	80	7	0 -0.1	60	2	M6
<b>30W-4507</b>	45.2	+0.2 +0.1	90	7	0 -0.1	70	2	M6
<b>30W-5008</b>	50.3	+0.3 +0.1	100	8	0 -0.1	75	4	M6

# 30M Oiles 300 Bar Stock



Specify Part No. by required diameter.  
(e.g.) Diameter is 40mm.

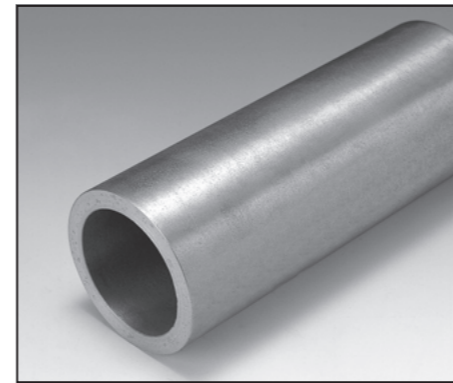
**30M - 40**  
Part No.



- Length and diameter shown here are rough finished dimensions.
- Oil impregnation is necessary by referring to the oil impregnation method, page 260 when you machined the plate.

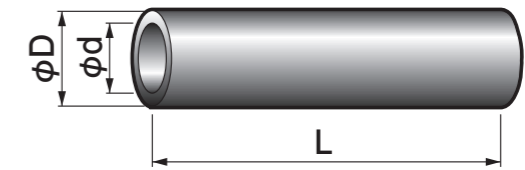
Part No.	Diameter		Length	
	φD	Tolerance	L	Tolerance
30M-15	15	+1.0 0	150	+3.0 0
30M-21	21	+1.0 0	200	+3.0 0
30M-23	23	+1.0 0	200	+3.0 0
30M-25	25	+1.0 0	200	+3.0 0
30M-27	27	+1.0 0	200	+3.0 0
30M-31	31	+1.0 0	200	+3.0 0
30M-33	33	+1.0 0	200	+3.0 0
30M-35	35	+1.0 0	200	+3.0 0
30M-37	37	+1.0 0	200	+3.0 0
30M-40	40	+1.0 0	200	+3.0 0
30M-43	43	+1.0 0	200	+3.0 0
30M-45	45	+1.0 0	200	+3.0 0
30M-47	47	+1.0 0	200	+3.0 0
30M-50	50	+1.0 0	200	+3.0 0
30M-55	55	+1.0 0	200	+3.0 0
30M-60	60	+1.0 0	200	+3.0 0
30M-65	65	+1.0 0	200	+3.0 0
30M-70	70	+1.0 0	200	+3.0 0
30M-80	80	+1.0 0	250	+3.0 0
30M-90	90	+1.0 0	250	+3.0 0
30M-100	100	+1.0 0	250	+3.0 0

# 30S Oiles 300 Bushing Material



Specify Part No. by required I.D. and O.D.  
(e.g.) I.D. is 69mm and O.D. is 86mm.

**30S - 6986**  
Part No.



Part No.	I.D.		O.D.		Length	
	φd	Tolerance	φD	Tolerance	L	Tolerance
30S-2941	29	0 -1.0	41	+1.0 0	100	+3.0 0
30S-3143	31	0 -1.0	43	+1.0 0	100	+3.0 0
30S-3446	34	0 -1.0	46	+1.0 0	150	+3.0 0
30S-3449	34	0 -1.0	49	+1.0 0	150	+3.0 0
30S-3753	37	0 -1.0	53	+1.0 0	150	+3.0 0
30S-3951	39	0 -1.0	51	+1.0 0	200	+3.0 0
30S-3956	39	0 -1.0	56	+1.0 0	200	+3.0 0
30S-4456	44	0 -1.0	56	+1.0 0	200	+3.0 0
30S-4461	44	0 -1.0	61	+1.0 0	200	+3.0 0
30S-4961	49	0 -1.0	61	+1.0 0	200	+3.0 0
30S-4966	49	0 -1.0	66	+1.0 0	200	+3.0 0
30S-5471	54	0 -1.0	71	+1.0 0	200	+3.0 0
30S-5971	59	0 -1.0	71	+1.0 0	200	+3.0 0
30S-5976	59	0 -1.0	76	+1.0 0	200	+3.0 0
30S-6481	64	0 -1.0	81	+1.0 0	200	+3.0 0
30S-6486	64	0 -1.0	86	+1.0 0	200	+3.0 0
30S-6986	69	0 -1.0	86	+1.0 0	200	+3.0 0
30S-6991	69	0 -1.0	91	+1.0 0	200	+3.0 0

Part No.	I.D.		O.D.		Length	
	φd	Tolerance	φD	Tolerance	L	Tolerance
30S-7491	74	0 -1.0	91	+1.0 0	200	+3.0 0
30S-7496	74	0 -1.0	96	+1.0 0	200	+3.0 0
30S-7996	79	0 -1.0	96	+1.0 0	200	+3.0 0
30S-79101	79	0 -1.0	101	+1.0 0	200	+3.0 0
30S-84106	84	0 -1.0	106	+1.0 0	200	+3.0 0
30S-89111	89	0 -1.0	111	+1.0 0	200	+3.0 0
30S-94121	94	0 -1.0	121	+1.0 0	200	+3.0 0
30S-99126	99	0 -1.0	126	+1.0 0	200	+3.0 0
30S-103132	103	0 -1.0	132	+1.0 0	250	+3.0 0
30S-103142	103	0 -1.0	142	+1.0 0	250	+3.0 0
30S-108137	108	0 -1.0	137	+1.0 0	250	+3.0 0
30S-108147	108	0 -1.0	147	+1.0 0	250	+3.0 0
30S-113142	113	0 -1.0	142	+1.0 0	250	+3.0 0
30S-113152	113	0 -1.0	152	+1.0 0	250	+3.0 0
30S-118147	118	0 -1.0	147	+1.0 0	250	+3.0 0
30S-118157	118	0 -1.0	157	+1.0 0	250	+3.0 0
30S-123152	123	0 -1.0	152	+1.0 0	250	+3.0 0
30S-123162	123	0 -1.0	162	+1.0 0	250	+3.0 0

- Length and diameter shown here are rough finished dimensions.
- Oil impregnation is necessary by referring to the oil impregnation method, page 260 when you machined the plate.

## <Thick wall>

Part No.	I.D.		O.D.		Length	
	φd	Tolerance	φD	Tolerance	L	Tolerance
30S-3570	35	0 -1.0	70	+1.0 0	200	+3.0 0
30S-4075	40	0 -1.0	75	+1.0 0	200	+3.0 0
30S-4580	45	0 -1.0	80	+1.0 0	200	+3.0 0
30S-5090	50	0 -1.0	90	+1.0 0	200	+3.0 0
30S-55100	55	0 -1.0	100	+1.0 0	200	+3.0 0

Part No.	I.D.		O.D.		Length	
	φd	Tolerance	φD	Tolerance	L	Tolerance
30S-60110	60	0 -1.0	110	+1.0 0	200	+3.0 0
30S-65120	65	0 -1.0	120	+1.0 0	250	+3.0 0
30S-70130	70	0 -1.0	130	+1.0 0	250	+3.0 0
30S-80140	80	0 -1.0	140	+1.0 0	250	+3.0 0

- Length and diameter shown here are rough finished dimensions.
- Oil impregnation is necessary by referring to the oil impregnation method, page 260 when you machined the plate.