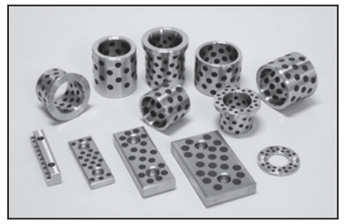
Metallic Bearings

Oiles 500SP1 High-strength brass bearings with embedded solid lubricant



RoHS2 ELV Lead Free

Feature

- Serviceable without the need for lubrication.
- Demonstrates high performance under high-load and low-speed operations.
- Demonstrates superior wear resistance in applications where oil film is seldom produced such as reciprocating motions, oscillation, frequent starts and stops, etc.
- Superior chemical resistance and corrosion resistance.
- Standard products are available in various sizes.

Service range	500SP1 SL1		500SP1 SL4
Lubrication condition	Dry	periodic lubrication	Dry
Service temperature range ℃	−40～+300	−40～+150	−40～+80
Allowable max. pressure P N/mm² {kgf/cm²}	29 (150) {296 (1,530)}		49 (150) {500 (1,530)}
Allowable max. velocity V m/s {m/min}	0.50 {30}	1.00 {60}	0.25 {15}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.65 {1,010}	3.25 {1,990}	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

Density	——	g/cm³	7.8
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	755 {77}
Tensile elongation at break	JIS Z 2241	%	12
Compressive strength	——	N/mm² {kgf/mm²}	345 {35} (Note)
Impact strength	JIS Z 2242	J/cm² {kgfm/cm²}	19 {1.9}
Hardness	JIS Z 2243	HBW	210
Modulus of longitudinal elasticity	——	N/mm² {kgf/mm²}	105,000 {10,700}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	2.12
Thermal conductivity	——	W/m℃ {cal/sec℃cm}	87.8 {0.21}

※The values shown above are typical values, not the standard values.
(Note) Compressive strength is 0.1%

⚠ When you use standard 500SP1 seires in the temperature of 150℃ and over, contact us for more information.

⚠ Refer to page 36 for the suitable solid lubricant for made-to-order bearings.

⚠ Please indicate the type of motion (rotation, reciprocating, rotation & reciprocating) for custom-made products.

⚠ Solid lubricant, SL401 and SL403 are not lead-free.

Lathe turning

Cutting tool	carbide tool (JIS)	
	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

Some products require application of solid lubricants on the sliding surface after processing.
※Contact us for grinding and milling information.

Machining accuracy (bushing)

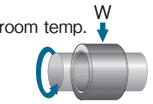
I.D.	O.D.	Length
class 7 to 8	class 6 to 7	class 8 to 9

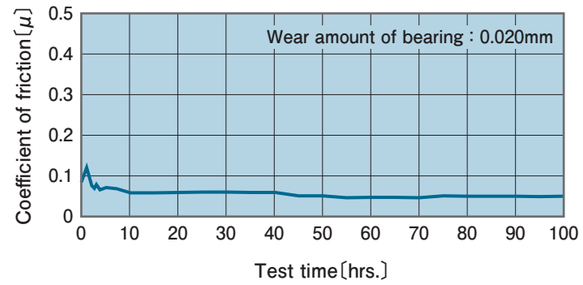
Classes here are in JIS standard.
This product demonstrates satisfactory performance at the slide surface roughness of Rz6.3 to 12.5μm.

Test data

Journal rotation test 500SP1-SL1

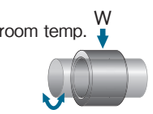
<Testing conditions>
Bearing dimension : φ40×φ50× ℓ 30
Mating material : S45C high frequency quenched
Pressure : 24.5N/mm² {250.0kgf/cm²}
Velocity : 0.033m/s {2.0m/min}
Test time : 100hrs.
Ambience : in the atmosphere, room temp.
Lubrication : dry

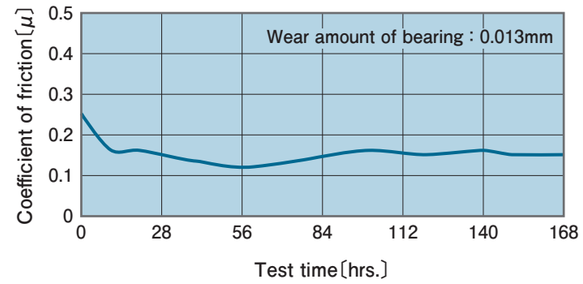




Journal oscillation test 500SP1-SL1

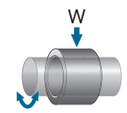
<Testing conditions>
Bearing dimension : φ40×φ50× ℓ 30
Mating material : S45C
Pressure : 19.6N/mm² {200.0kgf/cm²}
Velocity : 0.025m/s {1.5m/min}
Oscillating cycle : 24cpm
Oscillating angle : ±45°
Test time : 168hrs.
Ambience : in the atmosphere, room temp.
Lubrication : dry

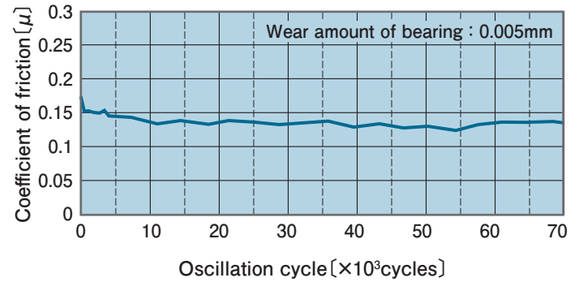




Journal oscillation test 500SP1-SL4

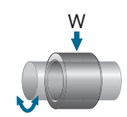
<Testing conditions>
Bearing dimension : φ40×φ50×ℓ30
Mating material : SUS304
Pressure : 29.4N/mm² {300kgf/cm²}
Velocity : 0.012m/s {0.75m/min}
Oscillating cycle :12cpm
Oscillating angle : ±45°
Test cycle : 70,000cycle (97.2h)
Ambience : in the atmosphere, room temp.
Lubrication : initial grease SL464g coating

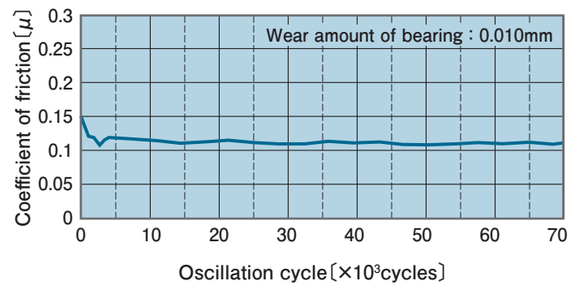




Journal oscillation test 500SP1-SL4

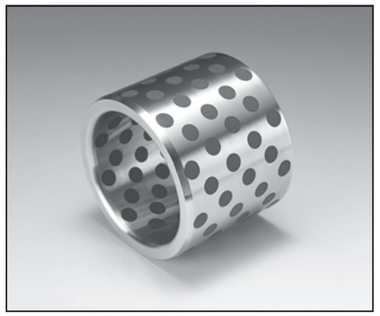
<Testing conditions>
Bearing dimension : φ60×φ75×ℓ50
Mating material : SUS403
Pressure : 24.5N/mm² {250kgf/cm²}
Velocity : 0.018m/s {1.13m/min}
Oscillating cycle :12cpm
Oscillating angle : ±45°
Test cycle : 70,000cycle (97.2h)
Ambience : in the purified water
Lubrication : initial grease SL464g coating





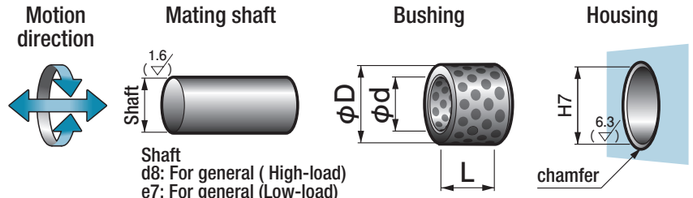
SPB Oiles 500SP1 SL1 Bushings (I.D. φ6~φ45)

RoHS2 ELV Lead Free

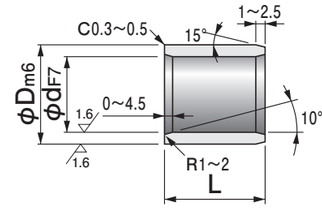


Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 25mm, O.D. is 33mm, and length is 20mm.

SPB - 253320
Part No.

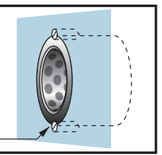


Shaft
d8: For general (High-load)
e7: For general (Low-load)
f7: For high accuracy

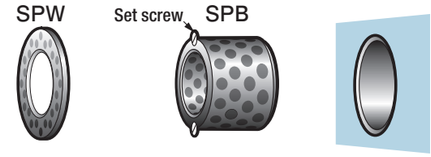


- Applicable to rotation, oscillation, and reciprocating motion.
- Do not use this under water.
- 31.5mm I.D bushing can be used as an intermediate trunnion bushing for hydraulic cylinders.

It is recommended to use a set screw to prevent dislocation.



Use this product together with the Oiles #500SP washer (SPW shown on page 197) in a position where thrust loads are applied.



※Be sure to determine the position with a countersunk head screw and fix when the SPW with ★ shown in the table below is used, since the inner diameter is larger than the shaft diameter.

All SPB bushings have engraved OILES mark.

I.D.		O.D.		Length L Tolerance $^{-0.1}_{-0.3}$							
φd	Tolerance	φD	Tolerance	8	10	12	15	16	19	20	25
6	+0.022 +0.010	10	+0.015 +0.006	061008	061010	061012					
8	+0.028 +0.013	12	+0.018 +0.007	081208	081210	081212	081215				
10	+0.028 +0.013	14	+0.018 +0.007	101408	101410	101412	101415			101420	
12	+0.034 +0.016	18	+0.018 +0.007	121808	121810	121812	121815	121816	121819	121820	121825
13	+0.034 +0.016	19	+0.021 +0.008		131910	131912	131915			131920	131925
14	+0.034 +0.016	20	+0.021 +0.008		142010	142012	142015			142020	142025
15	+0.034 +0.016	21	+0.021 +0.008		152110	152112	152115	152116		152120	152125
16	+0.034 +0.016	22	+0.021 +0.008		162210	162212	162215	162216	162219	162220	162225
17	+0.034 +0.016	23	+0.021 +0.008				172315				
18	+0.034 +0.016	24	+0.021 +0.008		182410	182412	182415	182416		182420	182425
19	+0.041 +0.020	26	+0.021 +0.008				192615			192620	
20	+0.041 +0.020	28	+0.021 +0.008		202810	202812	202815	202816	202819	202820	202825
20	+0.041 +0.020	30	+0.021 +0.008		203010	203012	203015	203016		203020	203025
22	+0.041 +0.020	32	+0.025 +0.009			223212	223215			223220	223225
25	+0.041 +0.020	33	+0.025 +0.009			253312	253315	253316		253320	253325
25	+0.041 +0.020	35	+0.025 +0.009			253512	253515	253516		253520	253525
28	+0.041 +0.020	38	+0.025 +0.009							283820	283825
30	+0.041 +0.020	38	+0.025 +0.009			303812	303815			303820	303825
30	+0.041 +0.020	40	+0.025 +0.009			304012	304015			304020	304025
31.5	+0.050 +0.025	40	+0.025 +0.009								
32	+0.050 +0.025	42	+0.025 +0.009							324220	
35	+0.050 +0.025	44	+0.025 +0.009							354420	354425
35	+0.050 +0.025	45	+0.025 +0.009							354520	354525
38	+0.050 +0.025	48	+0.025 +0.009								
40	+0.050 +0.025	50	+0.025 +0.009				405015			405020	405025
40	+0.050 +0.025	55	+0.030 +0.011				405515				
45	+0.050 +0.025	55	+0.030 +0.011								
45	+0.050 +0.025	56	+0.030 +0.011								
45	+0.050 +0.025	60	+0.030 +0.011								

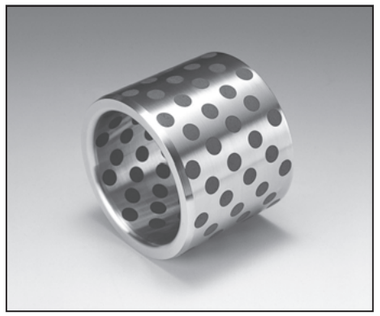
Length L Tolerance $^{-0.1}_{-0.3}$							I.D. tolerance after press fitting (reference)	Washer	I.D.
30	35	40	50	60	70	80		SPW	φd
							+0.019 +0.007	0603	6
							+0.025 +0.010	0803	8
							+0.025 +0.010	1003	10
121830							+0.031 +0.013	1203	12
131930							+0.030 +0.012	1303	13
142030							+0.030 +0.012	1403	14
152130	152135	152140					+0.030 +0.012	1503	15
162230	162235	162240					+0.030 +0.012	1603	16
							+0.030 +0.012	1803★	17
182430	182435	182440					+0.030 +0.012	1803	18
							+0.037 +0.016	2005★	19
202830	202835	202840	202850				+0.037 +0.016	2005	20
203030	203035	203040	203050				+0.037 +0.016	2505★	20
							+0.037 +0.016	2505★	22
253330	253335	253340	253350	253360			+0.037 +0.016	2505	25
253530	253535	253540	253550	253560			+0.037 +0.016	3005★	25
283830		283840					+0.037 +0.016	3005★	28
303830	303835	303840	303850	303860			+0.037 +0.016	3005	30
304030	304035	304040	304050	304060			+0.037 +0.016	3505★	30
314030		314040					+0.046 +0.021	3505★	31.5
324230		324240					+0.046 +0.021	3505★	32
354430	354435	354440	354450	354460			+0.046 +0.021	3505	35
354530	354535	354540	354550	354560			+0.046 +0.021	4007★	35
		384840					+0.046 +0.021	4007★	38
405030	405035	405040	405050	405060	405070	405080	+0.046 +0.021	4007	40
405530	405535	405540	405550	405560			+0.045 +0.020	4507★	40
455530	455535	455540	455550	455560			+0.045 +0.020	4507	45
455630	455635	455640	455650	455660			+0.045 +0.020	4507	45
456030	456035	456040	456050	456060	456070	456080	+0.045 +0.020	4507	45

※The I.D. tolerance after press fitting is for reference only.
※I.D. φ50~φ200 are shown on pages 189 to 190.

⚠ The dimensional tolerances are the values measured at +25℃.

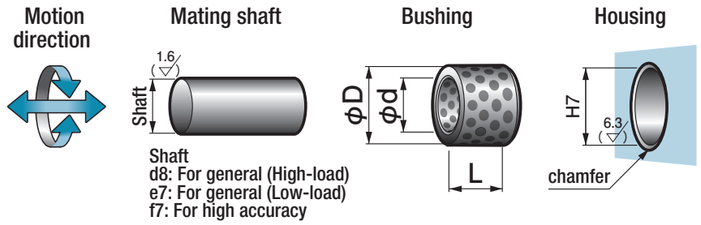
SPB Oiles 500SP1 SL1 Bushings (I.D. ϕ50~ϕ200)

RoHS2 ELV Lead Free

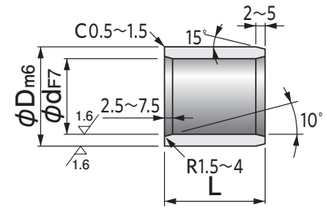


Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 80mm, O.D. is 96mm, and length is 70mm.

SPB - 809670
Part No.

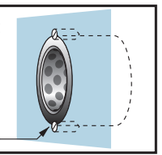


Shaft
d8: For general (High-load)
e7: For general (Low-load)
f7: For high accuracy

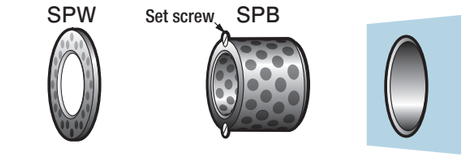


- Applicable to rotation, oscillation, and reciprocating motion.
- Do not use this under water.
- 63mm I.D bushing can be used as an intermediate trunnion bushing for hydraulic cylinders.

It is recommended to use a set screw to prevent dislocation.



Use this product together with the Oiles #500SP washer (SPW shown on page 197) in a position where thrust loads are applied.



※Be sure to determine the position with a countersunk head screw and fix when the SPW with ★ shown in the table below is used, since the inner diameter is larger than the shaft diameter.

All SPB bushings have engraved OILES mark.

I.D.		O.D.		Length L Tolerance $^{-0.1}_{-0.3}$								Length L Tolerance $^{-0.1}_{-0.3}$							I.D. tolerance after press fitting (reference)	Washer	I.D.
ϕd	Tolerance	ϕD	Tolerance	20	30	35	40	50	60	70	80	90	100	120	130	140	150	200		SPW	ϕd
50	+0.050 +0.025	60	+0.030 +0.011	506020	506030	506035	506040	506050	506060	506070	506080								+0.045 +0.020	5008	50
50	+0.050 +0.025	62	+0.030 +0.011		506230	506235	506240	506250	506260	506270	506280								+0.045 +0.020	5008	50
50	+0.050 +0.025	65	+0.030 +0.011		506530		506540	506550	506560	506570	506580		5065100						+0.045 +0.020	5008	50
55	+0.060 +0.030	70	+0.030 +0.011		557030	557035	557040	557050	557060	557070									+0.055 +0.025	5508	55
60	+0.060 +0.030	74	+0.030 +0.011		607430	607435	607440	607450	607460	607470	607480								+0.055 +0.025	6008	60
60	+0.060 +0.030	75	+0.030 +0.011		607530	607535	607540	607550	607560	607570	607580		6075100						+0.055 +0.025	6008	60
63	+0.060 +0.030	75	+0.030 +0.011						637560	637570	637580								+0.055 +0.025	6508★	63
65	+0.060 +0.030	80	+0.030 +0.011				658040	658050	658060	658070	658080								+0.055 +0.025	6508	65
70	+0.060 +0.030	85	+0.035 +0.013		708530	708535	708540	708550	708560	708570	708580		7085100						+0.054 +0.024	7010	70
70	+0.060 +0.030	90	+0.035 +0.013					709050	709060	709070	709080								+0.054 +0.024	7010	70
75	+0.060 +0.030	90	+0.035 +0.013					759050	759060	759070	759080		7590100						+0.054 +0.024	7510	75
75	+0.060 +0.030	95	+0.035 +0.013						759560	759570	759580		7595100						+0.054 +0.024	7510	75
80	+0.060 +0.030	96	+0.035 +0.013				809640	809650	809660	809670	809680		8096100	8096120					+0.054 +0.024	8010	80
80	+0.060 +0.030	100	+0.035 +0.013				8010040	8010050	8010060	8010070	8010080		80100100	80100120		80100140			+0.054 +0.024	8010	80
85	+0.071 +0.036	100	+0.035 +0.013						8510060		8510080								+0.065 +0.030	9010★	85
90	+0.071 +0.036	110	+0.035 +0.013					9011050	9011060		9011080	9011090	90110100	90110120					+0.065 +0.030	9010	90
100	+0.071 +0.036	120	+0.035 +0.013					10012050	10012060	10012070	10012080	10012090	100120100	100120120		100120140			+0.065 +0.030	10010	100
110	+0.071 +0.036	130	+0.040 +0.015					11013050		11013070	11013080		110130100	110130120					+0.064 +0.029	12010★	110
120	+0.071 +0.036	140	+0.040 +0.015							12014070	12014080	12014090	120140100	120140120		120140140			+0.064 +0.029	12010	120
125	+0.083 +0.043	145	+0.040 +0.015										125145100	125145120					+0.076 +0.036	—	125
130	+0.083 +0.043	150	+0.040 +0.015								13015080		130150100		130150130				+0.076 +0.036	—	130
140	+0.083 +0.043	160	+0.040 +0.015										140160100			140160140			+0.076 +0.036	—	140
150	+0.083 +0.043	170	+0.040 +0.015								15017080		150170100				150170150		+0.076 +0.036	—	150
160	+0.083 +0.043	180	+0.040 +0.015								16018080		160180100				160180150		+0.076 +0.036	—	160
170	+0.083 +0.043	190	+0.046 +0.017										∗170190100				∗170190150		+0.076 +0.036	—	170
180	+0.083 +0.043	200	+0.046 +0.017										∗180200100				∗180200150		+0.076 +0.036	—	180
190	+0.096 +0.050	210	+0.046 +0.017										∗190210100				∗190210150		+0.088 +0.042	—	190
200	+0.096 +0.050	230	+0.046 +0.017														∗200230150	∗200230200	+0.088 +0.042	—	200

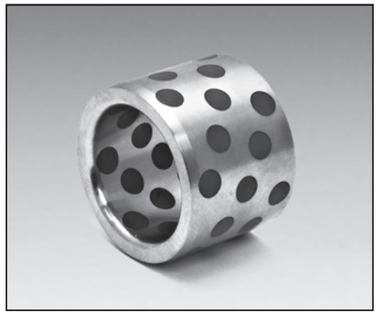
※Part No. with ∗ are custom-made.
※The I.D. tolerance after press fitting is for reference only.
※I.D. ϕ6~ϕ45 are shown on pages 187 to 188.

⚠ The dimensional tolerances are the values measured at +25℃.

SPBL Oiles 500SP1 SL4 Bushings

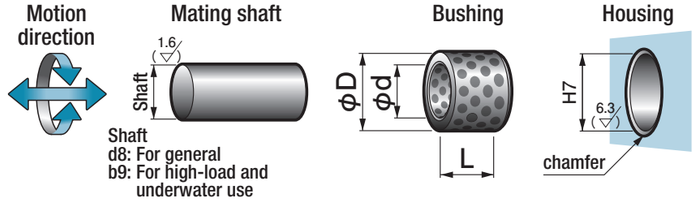
General • Underwater

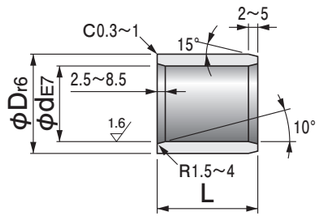
RoHS2 ELV Lead Free



Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 60mm, O.D. is 75mm, and length is 80mm.

SPBL - 607580
Part No.





- Applicable to rotational, oscillating, and reciprocating motion.
- Be sure to apply grease supplied with the product to the inner sliding surface before assembling the bearing. Run in the bearing.
- May be used over the maximum allowable speed or maximum allowable PV value in short-time intermittent operations. Inquire us in such a case.
- Use a stainless steel or chrome-plated (30μm or more) mating shaft when using the product in water, in a water-splashed place, etc.
- Use a mating shaft made of high-grade stainless steel with higher corrosion resistance or plated with thicker chrome when using the product in severe corrosive conditions. Supply grease for rust prevention.
- Provide the bushing with a set screw when using the product for high loads.
- Usable without the need for lubrication in the air and water. Use lithium grease with extreme pressure additive if greasing is required.

※Operating Temperature Range: −40～ +80℃ (−40～ +176℉)

Solid Lubricant : SL464 (refer to page 36)

I.D.		O.D.		Length L Tolerance $^{-0.1}_{-0.3}$								
φd	Tolerance	φD	Tolerance	20	25	30	35	40	50	60	70	80
12	+0.050 +0.032	18	+0.034 +0.023	121820								
15	+0.050 +0.032	21	+0.041 +0.028	152120								
16	+0.050 +0.032	22	+0.041 +0.028	162220		162230						
18	+0.050 +0.032	24	+0.041 +0.028	182420								
20	+0.061 +0.040	30	+0.041 +0.028	203020		203030		203040				
25	+0.061 +0.040	35	+0.050 +0.034	253520	253525	253530		253540	253550			
30	+0.061 +0.040	40	+0.050 +0.034	304020	304025	304030		304040	304050			
35	+0.075 +0.050	45	+0.050 +0.034	354520		354530	354535	354540	354550	354560		
40	+0.075 +0.050	50	+0.050 +0.034			405030		405040	405050	405060		
40	+0.075 +0.050	55	+0.060 +0.041					405540	405550	405560		
45	+0.075 +0.050	60	+0.060 +0.041			456030			456050	456060		
50	+0.075 +0.050	60	+0.060 +0.041					506040	506050	506060		
50	+0.075 +0.050	65	+0.060 +0.041					506540	506550	506560	506570	
55	+0.090 +0.060	70	+0.062 +0.043					557040		557060	557070	
60	+0.090 +0.060	75	+0.062 +0.043						607550	607560	607570	607580
65	+0.090 +0.060	80	+0.062 +0.043							658060	658070	658080
70	+0.090 +0.060	90	+0.073 +0.051							709060	709070	709080
75	+0.090 +0.060	95	+0.073 +0.051								759570	
80	+0.090 +0.060	100	+0.073 +0.051							8010060		8010080
90	+0.107 +0.072	110	+0.076 +0.054							9011060		9011080
100	+0.107 +0.072	120	+0.076 +0.054							10012060		10012080
110	+0.107 +0.072	130	+0.088 +0.063									
120	+0.107 +0.072	140	+0.088 +0.063									12014080
130	+0.125 +0.085	150	+0.090 +0.065									
140	+0.125 +0.085	160	+0.090 +0.065									
150	+0.125 +0.085	170	+0.093 +0.068									
160	+0.125 +0.085	180	+0.093 +0.068									
170	+0.125 +0.085	190	+0.106 +0.077									
180	+0.125 +0.085	200	+0.106 +0.077									
190	+0.146 +0.100	210	+0.109 +0.080									
200	+0.146 +0.100	230	+0.113 +0.084									

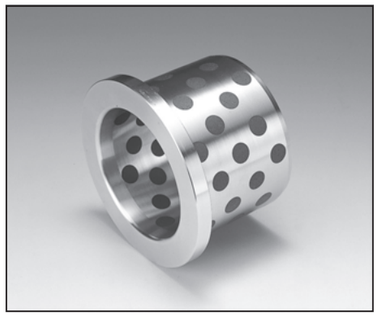
Length L Tolerance $^{-0.1}_{-0.3}$								I.D. tolerance after press fitting (reference)	I.D.
90	100	110	120	130	140	150	200		φd
								+0.031 +0.013	12
								+0.026 +0.008	15
								+0.026 +0.008	16
								+0.026 +0.008	18
								+0.037 +0.016	20
								+0.032 +0.011	25
								+0.032 +0.011	30
								+0.046 +0.021	35
								+0.046 +0.021	40
								+0.040 +0.015	40
								+0.040 +0.015	45
								+0.040 +0.015	50
								+0.040 +0.015	50
								+0.053 +0.023	55
								+0.053 +0.023	60
								+0.053 +0.023	65
709090	7090100							+0.046 +0.016	70
	7595100							+0.046 +0.016	75
8010090	80100100	80100110						+0.046 +0.016	80
9011090	90110100							+0.060 +0.025	90
	100120100		100120120					+0.060 +0.025	100
	110130100	110130110						+0.052 +0.017	110
	120140100		120140120					+0.052 +0.017	120
	130150100			130150130		130150150		+0.068 +0.028	130
	140160100				140160140			+0.068 +0.028	140
	150170100					150170150		+0.065 +0.025	150
	160180100					160180150		+0.065 +0.025	160
	∗170190100					∗170190150		+0.065 +0.025	170
	∗180200100					∗180200150		+0.065 +0.025	180
	∗190210100					∗190210150		+0.078 +0.032	190
						∗200230150	∗200230200	+0.078 +0.032	200

※Part No. with ∗ are made-to-order.
※The I.D. tolerance after press fitting is for reference only.

⚠ The dimensional tolerances are the values measured at +25℃.

SPF Oiles 500SP1 SL1 Flange Bushings

RoHS2 ELV Lead Free

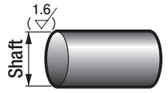


Specify Part No. by required I.D. and Length.
(e.g.) I.D. is 50mm and length is 30mm.

SPF - 5030
Part No.

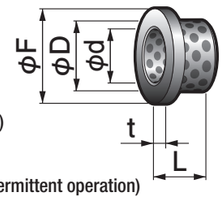
Motion direction

Mating shaft

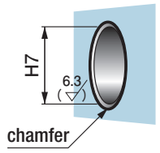


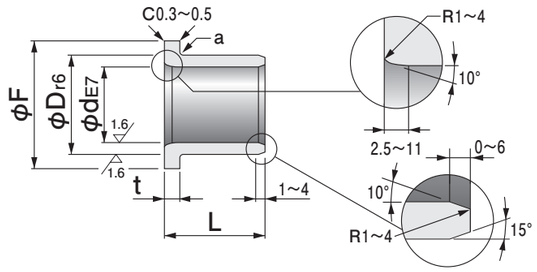
Shaft
d8: For general (high-load)
e7: For general (low-load)
f7: For high accuracy
g6: For high accuracy (intermittent operation)

Flange bushing



Housing





a: Chamfering for under flange

φd	~18	~65	~160
a	R0.3	R0.5	R1

(mm)

★ 4 model number of SPF-6040/6050/6080/6367 is R1.

- Applicable to rotational, oscillating, and reciprocating motion.
- Flange surface is not subject to a thrust load as no lubricant is embedded.
- Do not use this under water.
- 31.5mm I.D. and 63mm I.D bushing can be used as an intermediate trunnion bushing for hydraulic cylinders.

I.D.		O.D.		Flange				Length L Tolerance $^{-0.1}_{-0.3}$								I.D. tolerance after press fitting (reference)	I.D.
φd	Tolerance	φD	Tolerance	φF	Tolerance	t	Tolerance	10	12	15	17	18	20	23	25		φd
6	+0.032 +0.020	10	+0.028 +0.019	16	0 −0.3	2	0 −0.1	0610	0612							+0.016 +0.004	6
8	+0.040 +0.025	12	+0.034 +0.023	20	0 −0.3	2	0 −0.1	0810	0812	0815						+0.021 +0.006	8
10	+0.040 +0.025	14	+0.034 +0.023	22	0 −0.3	2	0 −0.1	1010	1012	1015	1017		1020			+0.021 +0.006	10
12	+0.050 +0.032	18	+0.034 +0.023	25	0 −0.3	3	0 −0.1	1210	1212	1215			1220		1225		12
13	+0.050 +0.032	19	+0.041 +0.028	26	0 −0.3	3	0 −0.1	1310	1312	1315			1320		1325	+0.026 +0.008	13
14	+0.050 +0.032	20	+0.041 +0.028	27	0 −0.3	3	0 −0.1			1415			1420		1425	+0.026 +0.008	14
15	+0.050 +0.032	21	+0.041 +0.028	28	0 −0.3	3	0 −0.1	1510	1512	1515			1520		1525	+0.026 +0.008	15
16	+0.050 +0.032	22	+0.041 +0.028	29	0 −0.3	3	0 −0.1		1612	1615		1618	1620	1623	1625	+0.026 +0.008	16
18	+0.050 +0.032	24	+0.041 +0.028	32	0 −0.3	3	0 −0.1			1815			1820		1825	+0.026 +0.008	18
20	+0.061 +0.040	30	+0.041 +0.028	40	0 −0.3	5	0 −0.1			2015			2020		2025	+0.037 +0.016	20
25	+0.061 +0.040	35	+0.050 +0.034	45	0 −0.3	5	0 −0.1			2515			2520		2525	+0.032 +0.011	25
30	+0.061 +0.040	40	+0.050 +0.034	50	0 −0.3	5	0 −0.1						3020		3025	+0.032 +0.011	30
31.5	+0.075 +0.050	40	+0.050 +0.034	50	0 −0.3	5	0 −0.1						3120			+0.046 +0.021	31.5
35	+0.075 +0.050	45	+0.050 +0.034	60	0 −0.3	5	0 −0.1						3520		3525	+0.046 +0.021	35
40	+0.075 +0.050	50	+0.050 +0.034	65	0 −0.3	5	0 −0.1						4020		4025	+0.046 +0.021	40
45	+0.075 +0.050	55	+0.060 +0.041	70	0 −0.3	5	0 −0.1									+0.040 +0.015	45
50	+0.075 +0.050	60	+0.060 +0.041	75	0 −0.3	5	0 −0.1									+0.040 +0.015	50
55	+0.090 +0.060	65	+0.060 +0.041	80	0 −0.3	5	0 −0.1									+0.055 +0.025	55
60	+0.090 +0.060	75	+0.062 +0.043	90	0 −0.3	7.5	0 −0.1									+0.053 +0.023	60
63	+0.090 +0.060	75	+0.062 +0.043	85	0 −0.3	7.5	0 −0.1									+0.053 +0.023	63
65	+0.090 +0.060	80	+0.062 +0.043	95	0 −0.3	7.5	0 −0.1									+0.053 +0.023	65
70	+0.090 +0.060	85	+0.073 +0.051	105	0 −0.3	7.5	0 −0.1									+0.046 +0.016	70
75	+0.090 +0.060	90	+0.073 +0.051	110	0 −0.3	7.5	0 −0.1									+0.046 +0.016	75
80	+0.090 +0.060	100	+0.073 +0.051	120	0 −0.3	10	0 −0.1									+0.046 +0.016	80
90	+0.107 +0.072	110	+0.076 +0.054	130	0 −0.3	10	0 −0.1									+0.060 +0.025	90
100	+0.107 +0.072	120	+0.076 +0.054	150	0 −0.3	10	0 −0.1									+0.060 +0.025	100
120	+0.107 +0.072	140	+0.088 +0.063	170	0 −0.3	10	0 −0.1									+0.052 +0.017	120
130	+0.125 +0.085	150	+0.090 +0.065	180	0 −0.3	10	0 −0.1									+0.068 +0.028	130
140	+0.125 +0.085	160	+0.090 +0.065	190	0 −0.3	10	0 −0.1									+0.068 +0.028	140
150	+0.125 +0.085	170	+0.093 +0.068	200	0 −0.3	10	0 −0.1									+0.065 +0.025	150
160	+0.125 +0.085	180	+0.093 +0.068	210	0 −0.3	10	0 −0.1									+0.065 +0.025	160

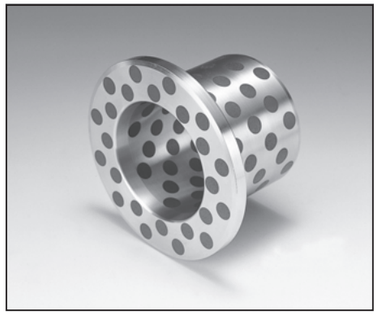
Length L Tolerance $^{-0.1}_{-0.3}$									I.D. tolerance after press fitting (reference)	I.D.
30	35	40	50	60	67.5	80	100	120		φd
									+0.016 +0.004	6
									+0.021 +0.006	8
									+0.021 +0.006	10
1230									+0.031 +0.013	12
1330									+0.026 +0.008	13
									+0.026 +0.008	14
1530									+0.026 +0.008	15
1630	1635	1640							+0.026 +0.008	16
1830	1835	1840							+0.026 +0.008	18
2030	2035	2040							+0.037 +0.016	20
2530	2535	2540	2550						+0.032 +0.011	25
3030	3035	3040	3050						+0.032 +0.011	30
3130	3135	3140							+0.046 +0.021	31.5
3530	3535	3540	3550						+0.046 +0.021	35
4030	4035	4040	4050						+0.046 +0.021	40
4530	4535	4540	4550	4560					+0.040 +0.015	45
5030	5035	5040	5050	5060					+0.040 +0.015	50
		5540		5560					+0.055 +0.025	55
		★6040	★6050	6060		★6080			+0.053 +0.023	60
					★6367				+0.053 +0.023	63
				6560					+0.053 +0.023	65
			7050			7080			+0.046 +0.016	70
				7560					+0.046 +0.016	75
				8060		8080	80100		+0.046 +0.016	80
				9060		9080			+0.060 +0.025	90
						10080	100100		+0.060 +0.025	100
						12080	120100		+0.052 +0.017	120
						∗13080	∗130100		+0.068 +0.028	130
						∗14080	∗140100		+0.068 +0.028	140
							∗150100	∗150120	+0.065 +0.025	150
							∗160100	∗160120	+0.065 +0.025	160

※Part No. with ∗ are made-to-order.
※The I.D. tolerance after press fitting is for reference only.

⚠ The dimensional tolerances are the values measured at +25℃.

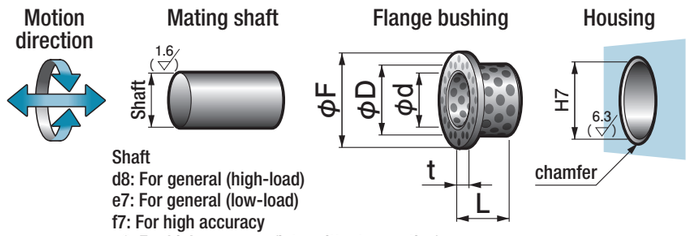
SPFG Oiles 500SP1 SL1 Thrust Bushings

RoHS2 ELV Lead Free

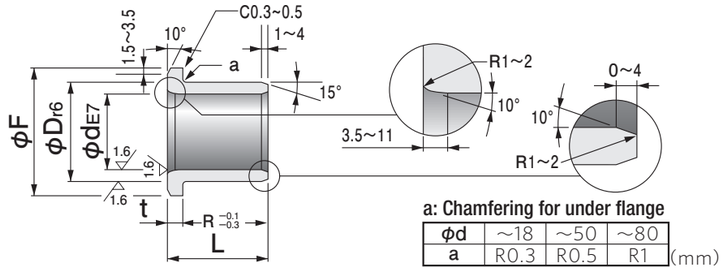


Specify Part No. by required I.D. and Length.
(e.g.) I.D. is 35mm and length is 25mm.

SPFG - 3525
Part No.



Shaft
d8: For general (high-load)
e7: For general (low-load)
f7: For high accuracy
g6: For high accuracy (intermittent operation)



a: Chamfering for under flange

ϕd	~18	~50	~80
a	R0.3	R0.5	R1

(mm)

- Applicable to rotational, oscillating, and reciprocating motion.
- This bushing can be subject to both radial-journal and thrust load.
- Improve machining by more accurate flange thickness.

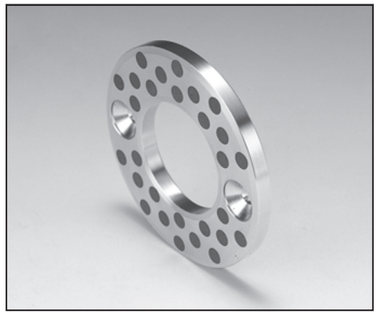
I.D.		O.D.		Flange				Length L												I.D. tolerance after press fitting (reference)	I.D.
ϕd	Tolerance	ϕD	Tolerance	ϕF	Tolerance	t	Tolerance	11	13	18	20	23	25	27	35	37	38	47	48	50	58	60	68	80	90		ϕd
6	+0.032 +0.020	10	+0.028 +0.019	20	0 −0.3	3	0 −0.03	**0611**																		+0.016 +0.004	6
8	+0.040 +0.025	12	+0.034 +0.023	25	0 −0.3	3	0 −0.03		**0813**																	+0.021 +0.006	8
10	+0.040 +0.025	14	+0.034 +0.023	25	0 −0.3	3	0 −0.03		**1013**	**1018**																+0.021 +0.006	10
12	+0.050 +0.032	18	+0.034 +0.023	30	0 −0.3	3	0 −0.03	**1211**		**1218**		**1223**														+0.031 +0.013	12
13	+0.050 +0.032	19	+0.041 +0.028	30	0 −0.3	3	0 −0.03		**1313**	**1318**		**1323**														+0.026 +0.008	13
15	+0.050 +0.032	21	+0.041 +0.028	35	0 −0.3	3	0 −0.03		**1513**	**1518**		**1523**														+0.026 +0.008	15
16	+0.050 +0.032	22	+0.041 +0.028	35	0 −0.3	3	0 −0.03		**1613**	**1618**		**1623**														+0.026 +0.008	16
18	+0.050 +0.032	24	+0.041 +0.028	40	0 −0.3	3	0 −0.03			**1818**		**1823**														+0.026 +0.008	18
20	+0.061 +0.040	28	+0.041 +0.028	45	0 −0.3	5	0 −0.03				**2020**		**2025**													+0.037 +0.016	20
25	+0.061 +0.040	33	+0.050 +0.034	50	0 −0.3	5	0 −0.03				**2520**		**2525**													+0.032 +0.011	25
30	+0.061 +0.040	38	+0.050 +0.034	55	0 −0.3	5	0 −0.03				**3020**		**3025**		**3035**											+0.032 +0.011	30
35	+0.075 +0.050	44	+0.050 +0.034	65	0 −0.3	5	0 −0.03				**3520**		**3525**		**3535**											+0.046 +0.021	35
40	+0.075 +0.050	50	+0.050 +0.034	70	0 −0.3	7	0 −0.03							**4027**		**4037**		**4047**								+0.046 +0.021	40
50	+0.075 +0.050	62	+0.060 +0.041	90	0 −0.3	8	0 −0.04										**5038**		**5048**		**5058**					+0.040 +0.015	50
60	+0.090 +0.060	74	+0.062 +0.043	110	0 −0.3	8	0 −0.04										**6038**		**6048**		**6058**		**6068**			+0.053 +0.023	60
70	+0.090 +0.060	85	+0.073 +0.051	120	0 −0.3	10	0 −0.04													**7050**				**7080**		+0.046 +0.016	70
80	+0.090 +0.060	96	+0.073 +0.051	140	0 −0.3	10	0 −0.04															**8060**			**8090**	+0.046 +0.016	80

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

⚠ The dimensional tolerances are the values measured at +25℃.

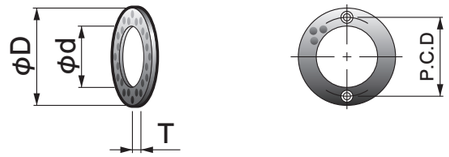
SPW Oiles 500SP1 SL1 Thrust Washers

RoHS2 ELV Lead Free



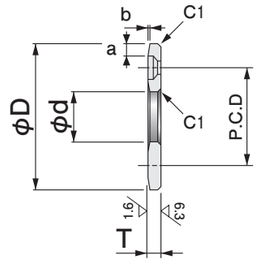
Specify Part No. by required I.D. and thickness.
(e.g.) I.D. is 30.2mm and thickness is 5mm.

SPW - 3005
Part No.

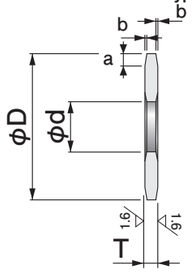


- May be combined with the SPB.
- See the description of the SPB for combination. (Pages 187 to 190)
- The products with the N marks at the end of the part numbers have no mounting holes.

Countersink type



No hole type



a b: Chamfering for I.D. and O.D.

ϕd	~10.2	~18.2	~35.2	~45.2	~55.3	~100.5	120.5
a	1.5	2	2.5	3	4	5	4
b	0.3	0.4	0.4	0.5	0.6	0.8	0.8

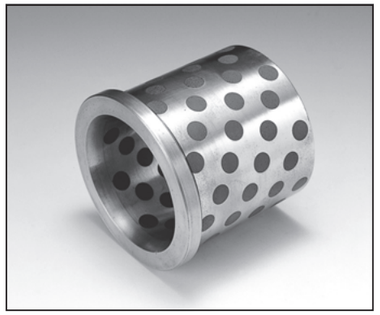
(mm)

Part No.	I.D.		O.D.	Thickness		Mounting hole		
	ϕd	Tolerance	ϕD	T	Tolerance	P.C.D	No. of holes	Countersink screw size
SPW-0603	6.2	+0.2 +0.1	25	3	0 −0.1	15	2	M3
SPW-0803	8.2	+0.2 +0.1	28	3	0 −0.1	18	2	M3
SPW-1003	10.2	+0.2 +0.1	30	3	0 −0.1	20	2	M3
SPW-1203	12.2	+0.2 +0.1	40	3	0 −0.1	28	2	M3
SPW-1203N	12.2	+0.2 +0.1	40	3	0 −0.1	no hole		
SPW-1303	13.2	+0.2 +0.1	40	3	0 −0.1	28	2	M3
SPW-1403	14.2	+0.2 +0.1	40	3	0 −0.1	28	2	M3
SPW-1503	15.2	+0.2 +0.1	50	3	0 −0.1	35	2	M3
SPW-1603	16.2	+0.2 +0.1	50	3	0 −0.1	35	2	M3
SPW-1603N	16.2	+0.2 +0.1	50	3	0 −0.1	no hole		
SPW-1803	18.2	+0.2 +0.1	50	3	0 −0.1	35	2	M3
SPW-2005	20.2	+0.2 +0.1	50	5	0 −0.1	35	2	M5
SPW-2505	25.2	+0.2 +0.1	55	5	0 −0.1	40	2	M5
SPW-2505N	25.2	+0.2 +0.1	55	5	0 −0.1	no hole		
SPW-3005	30.2	+0.2 +0.1	60	5	0 −0.1	45	2	M5
SPW-3005N	30.2	+0.2 +0.1	60	5	0 −0.1	no hole		
SPW-3505	35.2	+0.2 +0.1	70	5	0 −0.1	50	2	M5

Part No.	I.D.		O.D.	Thickness		Mounting hole		
	ϕd	Tolerance	ϕD	T	Tolerance	P.C.D	No. of holes	Countersink screw size
SPW-4007	40.2	+0.2 +0.1	80	7	0 −0.1	60	2	M6
SPW-4507	45.2	+0.2 +0.1	90	7	0 −0.1	70	2	M6
SPW-5008	50.3	+0.3 +0.1	100	8	0 −0.1	75	4	M6
SPW-5508	55.3	+0.3 +0.1	110	8	0 −0.1	85	4	M6
SPW-6008	60.3	+0.3 +0.1	120	8	0 −0.1	90	4	M8
SPW-6508	65.3	+0.3 +0.1	125	8	0 −0.1	95	4	M8
SPW-7010	70.3	+0.3 +0.1	130	10	0 −0.1	100	4	M8
SPW-7510	75.3	+0.3 +0.1	140	10	0 −0.1	110	4	M8
SPW-8010	80.3	+0.3 +0.1	150	10	0 −0.1	120	4	M8
SPW-9010	90.5	+0.3 +0.1	170	10	0 −0.1	140	4	M10
SPW-10010	100.5	+0.3 +0.1	190	10	0 −0.1	160	4	M10
SPW-12010	120.5	+0.3 +0.1	200	10	0 −0.1	175	4	M10

SGF Oiles 500SP1 SL1 Flange Guide Bushings

RoHS2 ELV Lead Free

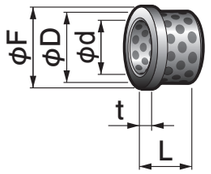


Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 65mm, O.D. is 80mm, and length is 80mm.

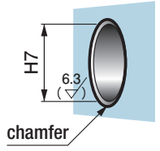
SGF - 658080
Part No.

Motion direction

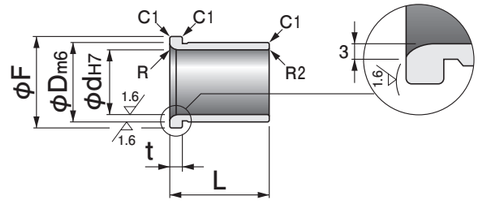
Flange bushing



Housing



- Applicable to rotation, oscillation, and reciprocating motion.
- It is recommended to use a set screw to prevent dislocation.

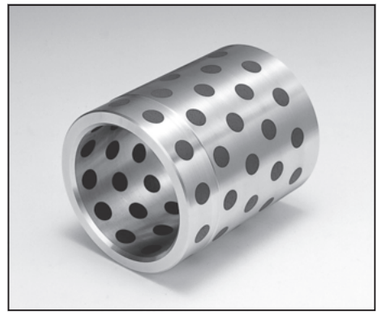


Part No.	I.D.		O.D.		Flnage		Length		R
	φd	Tolerance	φD	Tolerance	φF	t	L	Tolerance	
SGF-253540	25	+0.021 0	35	+0.025 +0.009	45	7	40	0 −0.3	10
SGF-304050	30	+0.021 0	40	+0.025 +0.009	50	10	50	0 −0.3	20
SGF-405570	40	+0.025 0	55	+0.030 +0.011	65	10	70	0 −0.3	20
SGF-506580	50	+0.025 0	65	+0.030 +0.011	75	10	80	0 −0.3	20
SGF-607580	60	+0.030 0	75	+0.030 +0.011	85	10	80	0 −0.3	20
SGF-658080	65	+0.030 0	80	+0.030 +0.011	90	10	80	0 −0.3	20
SGF-6580120	65	+0.030 0	80	+0.030 +0.011	90	10	120	0 −0.3	20
SGF-80100100	80	+0.030 0	100	+0.035 +0.013	110	10	100	0 −0.3	20
SGF-80100140	80	+0.030 0	100	+0.035 +0.013	110	10	140	0 −0.3	20
SGF-100120100	100	+0.035 0	120	+0.035 +0.013	130	10	100	0 −0.3	20
SGF-100120140	100	+0.035 0	120	+0.035 +0.013	130	10	140	0 −0.3	20

⚠ The dimensional tolerances are the values measured at +25℃.

SGB Oiles 500SP1 SL1 Guide Bushings

RoHS2 ELV Lead Free

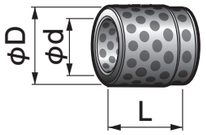


Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 60mm, O.D. is 80mm, and length is 90mm.

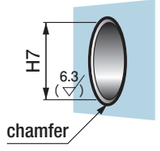
SGB - 608090
Part No.

Motion direction

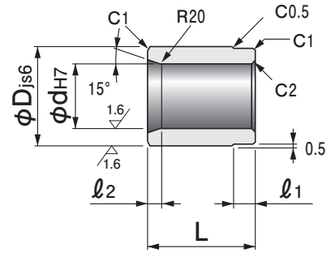
Bushing



Housing



- Applicable to reciprocating motion.
- It is recommended to use a set screw to prevent dislocation.

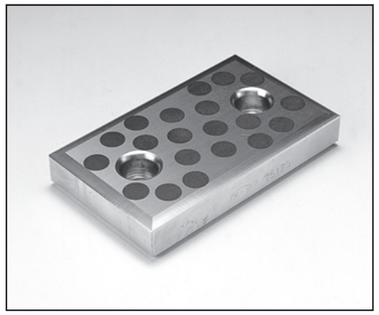


Part No.	I.D.		O.D.		Length		ℓ1	ℓ2
	φd	Tolerance	φD	Tolerance	L	Tolerance		
SGB-254040	25	+0.021 0	40	±0.008	40	0 −0.2	10	5
SGB-305050	30	+0.021 0	50	±0.008	50	0 −0.2	10	5
SGB-356055	35	+0.025 0	60	±0.0095	55	0 −0.2	15	5
SGB-406060	40	+0.025 0	60	±0.0095	60	0 −0.2	10	5
SGB-507075	50	+0.025 0	70	±0.0095	75	0 −0.2	15	10
SGB-608090	60	+0.030 0	80	±0.0095	90	0 −0.2	20	10
SGB-80100120	80	+0.030 0	100	±0.011	120	0 −0.2	25	10
SGB-100120150	100	+0.035 0	120	±0.011	150	0 −0.2	25	10
SGB-120140180	120	+0.035 0	140	±0.0125	180	0 −0.2	25	10

⚠ The dimensional tolerances are the values measured at +25℃.

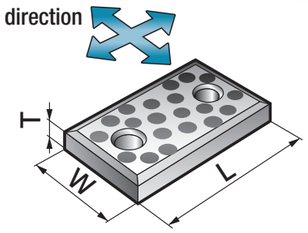
SWP Oiles 500SP1 SL1 Wear Plates

RoHS2 ELV Lead Free

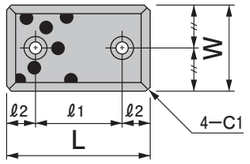


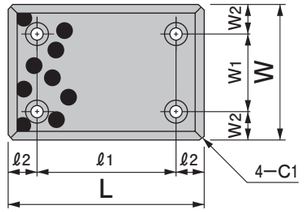
Specify Part No. by required width and length.
(e.g.) Width is 75mm and length is 200mm. **SWP - 75200**
Part No.

Motion direction

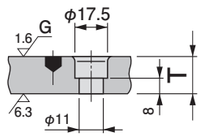


● Motion direction: width and length direction



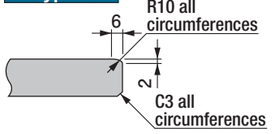


Cross-section

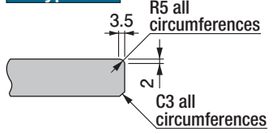


Chamfering

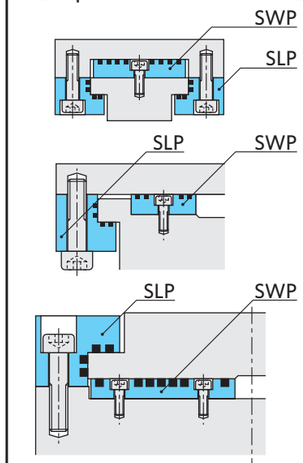
Type A



Type B



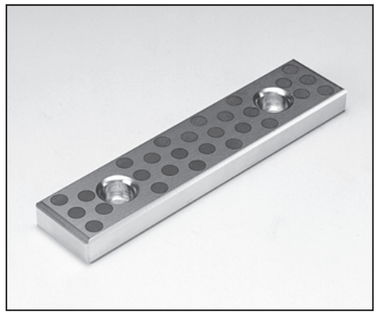
■ Example of combination use with SLP.



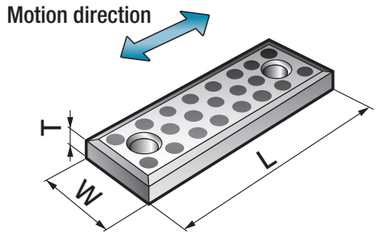
Part No.	Width		Length		Thickness		Mounting hole intervals						Attach bolts		Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	W_1	Tolerance	W_2	ℓ_1	Tolerance	ℓ_2	Type	Qty	
SWP-4875	48	−0.1 −0.3	75	−0.1 −0.3	20	±0.025	—	—	—	45	±0.2	15	M10 Hexagon socket head	2	B
SWP-48100	48	−0.1 −0.3	100	−0.1 −0.3	20	±0.025	—	—	—	50	±0.2	25	M10 Hexagon socket head	2	B
SWP-48125	48	−0.1 −0.3	125	−0.1 −0.3	20	±0.025	—	—	—	75	±0.2	25	M10 Hexagon socket head	2	B
SWP-48150	48	−0.1 −0.3	150	−0.1 −0.3	20	±0.025	—	—	—	100	±0.2	25	M10 Hexagon socket head	2	B
SWP-7575B	75	−0.1 −0.3	75	−0.1 −0.3	20	±0.025	—	—	—	25	±0.2	25	M10 Hexagon socket head	2	A
SWP-75100B	75	−0.1 −0.3	100	−0.1 −0.3	20	±0.025	—	—	—	50	±0.2	25	M10 Hexagon socket head	2	A
SWP-75125	75	−0.1 −0.3	125	−0.1 −0.3	20	±0.025	—	—	—	75	±0.2	25	M10 Hexagon socket head	2	A
SWP-75150	75	−0.1 −0.3	150	−0.1 −0.3	20	±0.025	—	—	—	100	±0.2	25	M10 Hexagon socket head	2	A
SWP-75200	75	−0.1 −0.3	200	−0.1 −0.3	20	±0.025	—	—	—	150	±0.2	25	M10 Hexagon socket head	2	A
SWP-100100	100	−0.1 −0.3	100	−0.1 −0.3	20	±0.025	50	±0.2	25	50	±0.2	25	M10 Hexagon socket head	4	A
SWP-100125	100	−0.1 −0.3	125	−0.1 −0.3	20	±0.025	50	±0.2	25	75	±0.2	25	M10 Hexagon socket head	4	A
SWP-100150	100	−0.1 −0.3	150	−0.1 −0.3	20	±0.025	50	±0.2	25	100	±0.2	25	M10 Hexagon socket head	4	A
SWP-100200	100	−0.1 −0.3	200	−0.1 −0.3	20	±0.025	50	±0.2	25	150	±0.2	25	M10 Hexagon socket head	4	A
SWP-100250	100	−0.1 −0.3	250	−0.1 −0.3	20	±0.025	50	±0.2	25	200	±0.2	25	M10 Hexagon socket head	4	A
SWP-125150	125	−0.1 −0.3	150	−0.1 −0.3	20	±0.025	50	±0.2	37.5	100	±0.2	25	M10 Hexagon socket head	4	A
SWP-125200	125	−0.1 −0.3	200	−0.1 −0.3	20	±0.025	50	±0.2	37.5	150	±0.2	25	M10 Hexagon socket head	4	A
SWP-125250	125	−0.1 −0.3	250	−0.1 −0.3	20	±0.025	50	±0.2	37.5	200	±0.2	25	M10 Hexagon socket head	4	A
SWP-150150	150	−0.1 −0.3	150	−0.1 −0.3	20	±0.025	100	±0.2	25	100	±0.2	25	M10 Hexagon socket head	4	A
SWP-150200	150	−0.1 −0.3	200	−0.1 −0.3	20	±0.025	100	±0.2	25	150	±0.2	25	M10 Hexagon socket head	4	A
SWP-150250	150	−0.1 −0.3	250	−0.1 −0.3	20	±0.025	100	±0.2	25	200	±0.2	25	M10 Hexagon socket head	4	A

SFP Oiles 500SP1 SL1 Flat Plates

RoHS2 ELV Lead Free

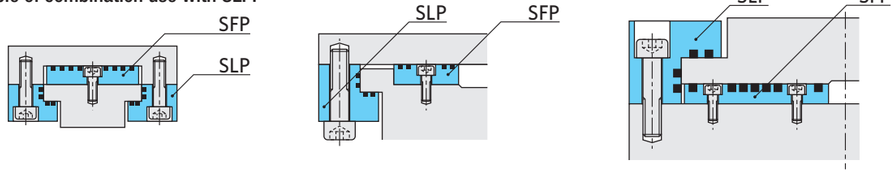


Specify Part No. by required width and length.
(e.g.) Width is 28mm and length is 150mm. **SFP - 28150**
Part No.

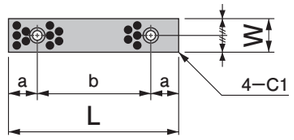


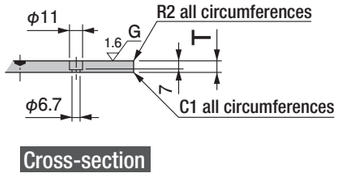
● Motion direction: length direction

■ Example of combination use with SLP.



W=18、28、38、48

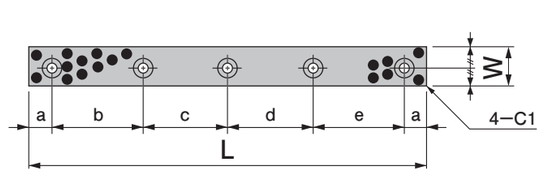


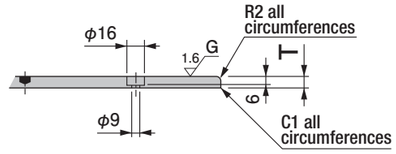


Cross-section

Part No.	Width	Length	Thickness		Hole intervals		Attach bolts	
	W	L	T	Toleramce	a	b	Type	Qty
SFP-1875	18	75	10	+0.04 +0.01	15	45	M6 Hexagon socket head	2
SFP-18100	18	100	10	+0.04 +0.01	25	50	M6 Hexagon socket head	2
SFP-18125	18	125	10	+0.04 +0.01	25	75	M6 Hexagon socket head	2
SFP-18150	18	150	10	+0.04 +0.01	25	100	M6 Hexagon socket head	2
SFP-2875	28	75	10	+0.04 +0.01	15	45	M6 Hexagon socket head	2
SFP-28100	28	100	10	+0.04 +0.01	25	50	M6 Hexagon socket head	2
SFP-28125	28	125	10	+0.04 +0.01	25	75	M6 Hexagon socket head	2
SFP-28150	28	150	10	+0.04 +0.01	25	100	M6 Hexagon socket head	2
SFP-3875	38	75	10	+0.04 +0.01	15	45	M6 Hexagon socket head	2
SFP-38100	38	100	10	+0.04 +0.01	25	50	M6 Hexagon socket head	2
SFP-38125	38	125	10	+0.04 +0.01	25	75	M6 Hexagon socket head	2
SFP-38150	38	150	10	+0.04 +0.01	25	100	M6 Hexagon socket head	2
SFP-4875	48	75	10	+0.04 +0.01	15	45	M6 Hexagon socket head	2
SFP-48100	48	100	10	+0.04 +0.01	25	50	M6 Hexagon socket head	2
SFP-48125	48	125	10	+0.04 +0.01	25	75	M6 Hexagon socket head	2
SFP-48150	48	150	10	+0.04 +0.01	25	100	M6 Hexagon socket head	2

W=35、50

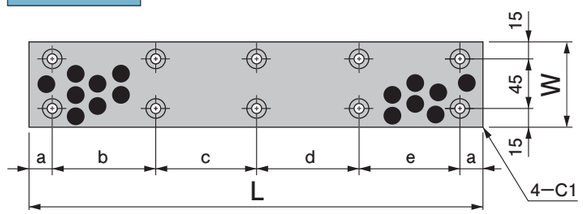


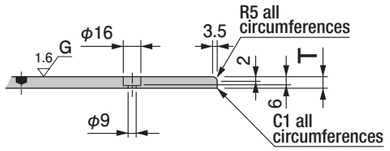


Cross-section

Part No.	Width	Length	Thickness		Hole intervals					Attach bolts	
	W	L	T	Toleramce	a	b	c	d	e	Type	Qty
SFP-35100	35	100	10	±0.025	20	60	—	—	—	M8 Flat head	2
SFP-35150	35	150	10	±0.025	20	55	55	—	—	M8 Flat head	3
SFP-35200	35	200	10	±0.025	20	55	50	55	—	M8 Flat head	4
SFP-35250	35	250	10	±0.025	20	70	70	70	—	M8 Flat head	4
SFP-35300	35	300	10	±0.025	20	65	65	65	65	M8 Flat head	5
SFP-35350	35	350	10	±0.025	20	80	75	75	80	M8 Flat head	5
SFP-50100	50	100	10	±0.025	20	60	—	—	—	M8 Flat head	2
SFP-50150	50	150	10	±0.025	20	55	55	—	—	M8 Flat head	3
SFP-50200	50	200	10	±0.025	20	55	50	55	—	M8 Flat head	4
SFP-50250	50	250	10	±0.025	20	70	70	70	—	M8 Flat head	4
SFP-50300	50	300	10	±0.025	20	65	65	65	65	M8 Flat head	5
SFP-50400	50	400	10	±0.025	20	90	90	90	90	M8 Flat head	5

W=75



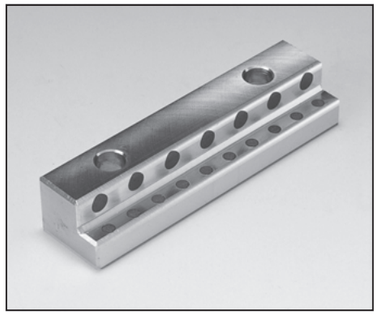


Cross-section

Part No.	Width	Length	Thickness		Hole intervals					Attach bolts	
	W	L	T	Toleramce	a	b	c	d	e	Type	Qty
SFP-75150	75	150	10	±0.025	20	110	—	—	—	M8 Flat head	4
SFP-75200	75	200	10	±0.025	20	80	80	—	—	M8 Flat head	6
SFP-75250	75	250	10	±0.025	20	105	105	—	—	M8 Flat head	6
SFP-75300	75	300	10	±0.025	20	85	90	85	—	M8 Flat head	8
SFP-75400	75	400	10	±0.025	20	120	120	120	—	M8 Flat head	8
SFP-75500	75	500	10	±0.025	20	115	115	115	115	M8 Flat head	10

SLP Oiles 500SP1 SL1 L Type Plates

RoHS2 ELV Lead Free

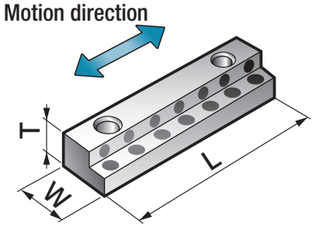


● Motion direction: length direction

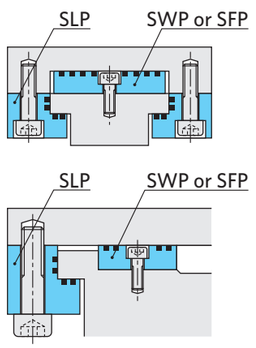
Specify Part No. by required width and length.
(e.g.) Width is 50mm and length is 300mm.

SLP - 50300A
Part No.

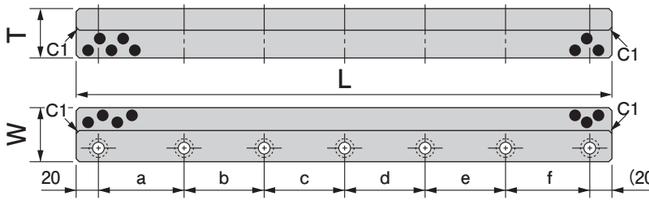
Motion direction

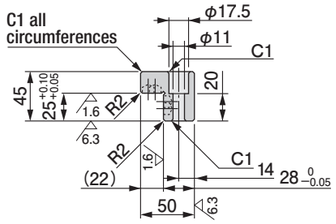


■ Example of combination use with SWP or SFP.



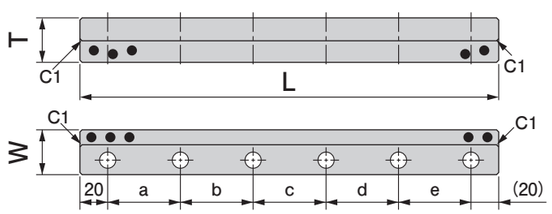
● Hexagonal socket head bolts are fitted.

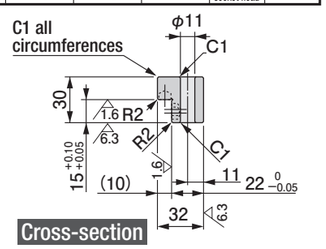




Cross-section

Part No.	Width	Length	Thickness	Hole intervals						Attach bolts	
	W	L	T	a	b	c	d	e	f	Type	Qty
SLP-50200A	50	200	45	55	50	55	—	—	—	M10 Hexagon socket head	4
SLP-50250A	50	250	45	70	70	70	—	—	—	M10 Hexagon socket head	4
SLP-50300A	50	300	45	65	65	65	65	—	—	M10 Hexagon socket head	5
SLP-50350A	50	350	45	80	75	75	80	—	—	M10 Hexagon socket head	5
SLP-50500A	50	500	45	80	75	75	75	75	80	M10 Hexagon socket head	7

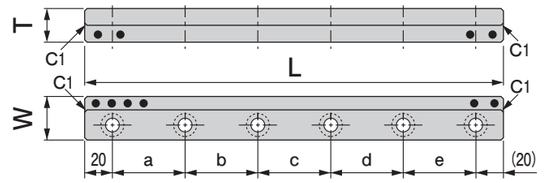


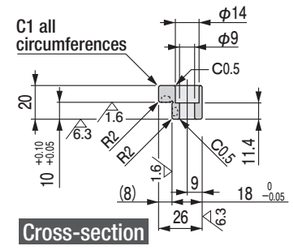


Cross-section

Part No.	Width	Length	Thickness	Hole intervals					Attach bolts	
	W	L	T	a	b	c	d	e	Type	Qty
SLP-32100B	32	100	30	60	—	—	—	—	M10	2
SLP-32150B	32	150	30	55	55	—	—	—	M10	3
SLP-32200B	32	200	30	55	50	55	—	—	M10	4
SLP-32250B	32	250	30	70	70	70	—	—	M10	4
SLP-32400B	32	400	30	75	70	70	70	75	M10	6

● Hexagonal socket head bolts are fitted.





Cross-section

Part No.	Width	Length	Thickness	Hole intervals						Attach bolts	
	W	L	T	a	b	c	d	e	(20)	Type	Qty
SLP-26100C	26	100	20	60	—	—	—	—		M8 Hexagon socket head	2
SLP-26150C	26	150	20	55	55	—	—	—		M8 Hexagon socket head	3
SLP-26200C	26	200	20	55	50	55	—	—		M8 Hexagon socket head	4
SLP-26400C	26	400	20	75	70	70	70	75		M8 Hexagon socket head	6

Cross-section

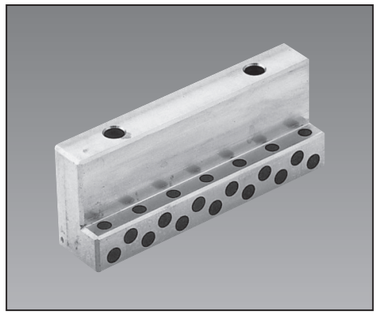
Part No.	Width	Length	Thickness	Hole intervals				Attach bolts	
	W	L	T	a	b	c	d	Type	Qty
SLP-2050	20	50	20	10	30	—	—	M8 Hexagon socket head	2
SLP-20100	20	100	20	20	60	—	—	M8 Hexagon socket head	2
SLP-20150	20	150	20	20	55	55	—	M8 Hexagon socket head	3
SLP-20200	20	200	20	20	55	50	55	M8 Hexagon socket head	4

Cross-section

Part No.	Width	Length	Thickness	Hole intervals				Attach bolts	
	W	L	T	a	b	c	d	Type	Qty
SLP-1550	15	50	15	10	30	—	—	M6 Hexagon socket head	2
SLP-15100	15	100	15	20	60	—	—	M6 Hexagon socket head	2
SLP-15150	15	150	15	20	55	55	—	M6 Hexagon socket head	3
SLP-15200	15	200	15	20	55	50	55	M6 Hexagon socket head	4

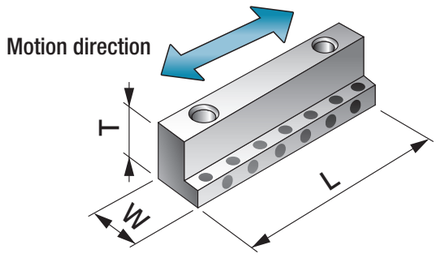
SLC Oiles 500SP$_1$ SL1 Slide Guide Rails

RoHS2 ELV Lead Free



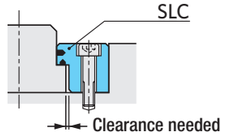
Specify Part No. by required thickness and length.
(e.g.) Thickness is 20mm and length is 100mm.

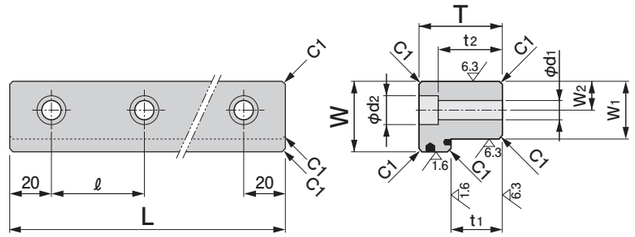
SLC - 41100
Part No.



● Motion direction: length direction

■ Example of attachment.

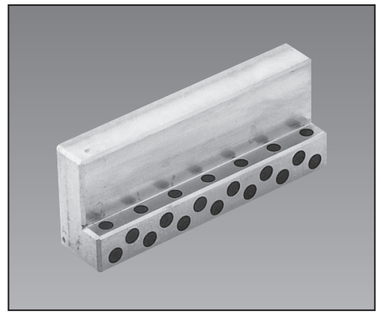




Part No.	Thickness	Length	Width											Attach bolts	
	T	L	W	Tolerance	t_1	Tolerance	W_1	Tolerance	ℓ	W_2	ϕd_1	ϕd_2	t_2	Type	Qty
SLC-30100	30	100	23	$^{-0.01}_{-0.05}$	15	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	60	7.5	7	11	23	M6 Hexagon socket head	2
SLC-30130	30	130	23	$^{-0.01}_{-0.05}$	15	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	90	7.5	7	11	23	M6 Hexagon socket head	2
SLC-30160	30	160	23	$^{-0.01}_{-0.05}$	15	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	60	7.5	7	11	23	M6 Hexagon socket head	3
SLC-30220	30	220	23	$^{-0.01}_{-0.05}$	15	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	60	7.5	7	11	23	M6 Hexagon socket head	4
SLC-41100	41	100	23	$^{-0.01}_{-0.05}$	26	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	60	7.5	7	11	34	M6 Hexagon socket head	2
SLC-41130	41	130	23	$^{-0.01}_{-0.05}$	26	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	90	7.5	7	11	34	M6 Hexagon socket head	2
SLC-41160	41	160	23	$^{-0.01}_{-0.05}$	26	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	60	7.5	7	11	34	M6 Hexagon socket head	3
SLC-41220	41	220	23	$^{-0.01}_{-0.05}$	26	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	60	7.5	7	11	34	M6 Hexagon socket head	4
SLC-56100	56	100	28	$^{-0.01}_{-0.05}$	26	$^{+0.05}_{+0.02}$	20	$^{0}_{-0.05}$	60	10	9	14	47	M8 Hexagon socket head	2
SLC-56160	56	160	28	$^{-0.01}_{-0.05}$	26	$^{+0.05}_{+0.02}$	20	$^{0}_{-0.05}$	60	10	9	14	47	M8 Hexagon socket head	3
SLC-56220	56	220	28	$^{-0.01}_{-0.05}$	26	$^{+0.05}_{+0.02}$	20	$^{0}_{-0.05}$	60	10	9	14	47	M8 Hexagon socket head	4

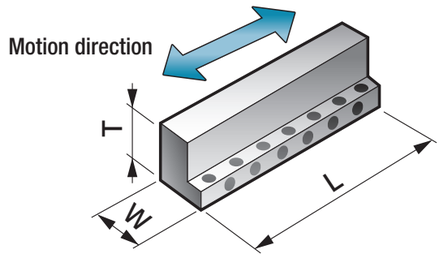
SLI Oiles 500SP$_1$ SL1 Slide Guide Rails for Additional Machining

RoHS2 ELV Lead Free

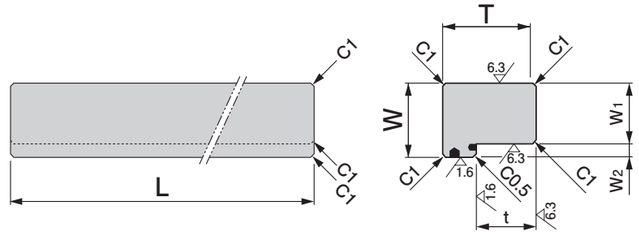


Specify Part No. by required thickness and length.
(e.g.) Thickness is 20mm.

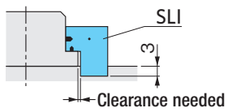
SLI - 20300
Part No.



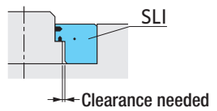
● This slide guide rail may be cut to the necessary dimension or bored for bolts.
● The movement direction is lengthwise.



■ Attachment type A

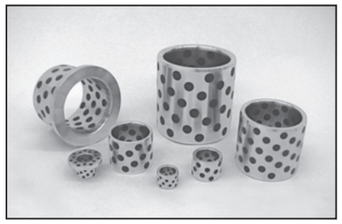


■ Attachment type B



Part No.	Thickness	Length	Width							Attachment type
	T	L	W	Tolerance	t	Tolerance	W_1	Tolerance	W_2	
SLI-20300	20	300	15	$^{-0.01}_{-0.05}$	11	$^{+0.05}_{+0.02}$	10	$^{0}_{-0.05}$	5	A
SLI-25300	25	300	23	$^{-0.01}_{-0.05}$	10	$^{+0.05}_{+0.02}$	15	$^{0}_{-0.05}$	8	B

Oiles 500SP4 High-strength brass bearings with embedded solid lubricant



RoHS2 ELV Lead Free

Feature

- 500SP4 is a self-lubricating bearing with embedded solid lubricant and metal base that conforms to the universally-acknowledged ASTM Standards (C86300).
- Serviceable without the need for lubrication.
- Demonstrates high performance under high-load and low-speed operations.
- Demonstrates superior wear resistance in applications where oil film is seldom produced such as reciprocating motions, oscillation, frequent starts and stops, etc.
- Superior chemical resistance and corrosion resistance.

Service range	500SP4 SL1	
Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−40～+300	−40～+150
Allowable max. pressure P N/mm² {kgf/cm²}	29 (150) {296 (1,530)}	
Allowable max. velocity V m/s {m/min}	0.50 {30}	1.00 {60}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.65 {1,010}	3.25 {1,990}

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]).

※Above values are applicable when solid lubricants SL1 are used.

※Use the solid lubricant SL464 (lead-free) in water or in environments where the bearings are always exposed to water splashes. The operating temperature range is from -40˚C to +80˚C (-40˚F to 176˚F).

Lathe turning		
Cutting tool	carbide tool (JIS)	
	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

Some products require application of solid lubricants on the sliding surface after processing.

※Contact us for grinding and milling information.

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.

Mechanical properties			
Density	——	g/cm³	7.8
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	755 {77}
Tensile elongation at break	JIS Z 2241	%	12
Compressive strength	——	N/mm² {kgf/mm²}	345 {35} (Note)
Impact strength	JIS Z 2242	J/cm² {kgfm/cm²}	19 {1.9}
Hardness	JIS Z 2243	HBW	223
Modulus of longitudinal elasticity	——	N/mm² {kgf/mm²}	105,000 {10,700}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	2.2
Thermal conductivity	——	W/m℃ {cal/sec℃cm}	87.8 {0.21}

※The values shown above are typical values, not the standard values.
(Note) Compressive strength is 0.1%

⚠Please indicate the type of motion (rotation, reciprocating, rotation & reciprocating) for custom-made products.
⚠Solid lubricant, SL401 and SL403 are not lead-free.

Oiles 500SPR Hard special copper alloy bearings with embedded solid lubricant

RoHS2 ELV Lead Free

Features

- Applicable to higher pressure than 500HP.
- Help realize a long-life operation or a compact design.

Service range	500SPR SL1	
Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−40～+150	
Allowable max. pressure P N/mm² {kgf/cm²}	90 (200) {918 (2,041)}	
Allowable max. velocity V m/s {m/min}	0.25 {15}	0.50 {30}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.65 {1,010}	3.25 {1,990}

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]).

※Above values are applicable when solid lubricants SL1 are used.

Mechanical properties							
Density	——	g/cm³	7.49	Hardness	JIS Z 2243	HBW	280
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	780 {79}	Modulus of longitudinal elasticity.	——	N/mm² {kgf/mm²}	105,000 {10,720}
Tensile elongation at break	JIS Z 2241	%	1.0	Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	1.97
Compressive strength	——	N/mm² {kgf/mm²}	460 {47} (Note)				

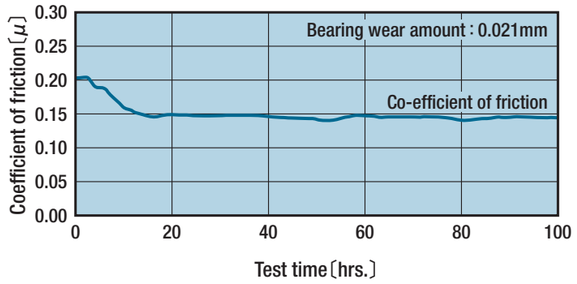
※The values shown above are typical values, not the standard values.
(Note) Compressive strength is 0.1%

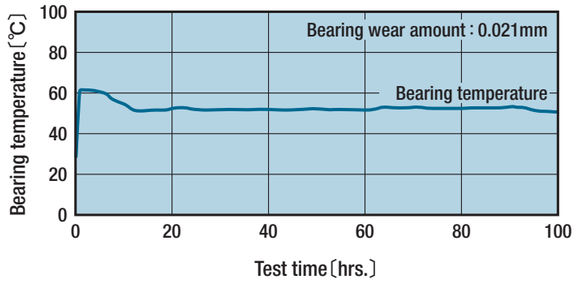
⚠Please indicate the type of motion (rotation, reciprocating, rotation & reciprocating) for custom-made products.
⚠Solid lubricant, SL401 and SL403 are not lead-free.

Test data

Journal oscillation test 500SPR-SL1

<Testing conditions>
Bearing dimension : φ60×φ75×ℓ42
Mating material : SCM440 quenched by high frequency induction hardening
Pressure : 90N/mm² {918kgf/cm²}
Volocity : 0.008m/s {0.47m/min}
Oscillation cycle : 5cpm
Oscillation angle : ±45˚
Test time : 100hrs.
Ambience : in the atmosphere, room temp.
Lubricataion : initially-greased only





Oiles 500SP5 Special high-strength brass bearings with embedded solid lubricant

RoHS2 ELV Lead Free

Feature

- Bears higher loads than the 500SP1.
- Demonstrates superior wear resistance under high-load and low-speed applications.

Service range	500SP5 SL1	
Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−40～+150	
Allowable max. pressure P N/mm² {kgf/cm²}	49 (170) {500 (1,735)}	
Allowable max. velocity V m/s {m/min}	0.25 {15}	0.50 {30}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.65 {1,010}	3.25 {1,990}

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]).

※Above values are applicable when solid lubricants SL1 are used.

Mechanical properties			
Density	——	g/cm³	7.8
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	785 {80}
Tensile elongation at break	JIS Z 2241	%	10
Compressive strength	——	N/mm² {kgf/mm²}	392 {40} (Note)
Hardness	JIS Z 2243	HBW	235
Modulus of longitudinal elasticity.	——	N/mm² {kgf/mm²}	98,000 {10,000}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	2.13

※The values shown above are typical values, not the standard values.
(Note) Compressive strength is 0.1%

⚠ Please indicate the type of motion (rotation, reciprocating, rotation & reciprocating) for custom-made products.

⚠ Solid lubricant, SL401 and SL403 are not lead-free.

SP5B Oiles 500SP5 SL1 Ultrathin Bushings

RoHS2 ELV Lead Free

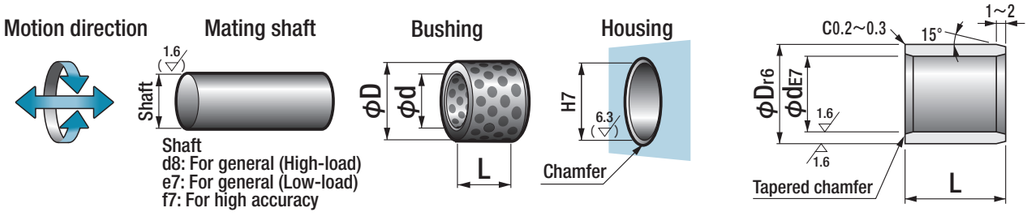
A long-life bearing with compact design and high durability.

Its wall thickness is 33-50% thinner comparing to #500SP1-SL1 "SPB series (P187)".

As it is made of OILES original metal material that has high strength and wear resistance, it has a long operating life inspite of possessing a thin wall.

Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 10mm, O.D. is 12mm, and length is 15mm.

SP5B - 101215
Part No.



I.D.		O.D.		Thickness	Length L Tolerance −0.1 −0.3								I.D. tolerance after press fitting (reference)
φd	Tolerance	φD	Tolerance	mm	8	10	12	15	16	20	25	30	
6	+0.032 +0.020	8	+0.028 +0.019	1.0	060808	060810	060812	060815	060816				+0.016 +0.004
8	+0.040 +0.025	10	+0.028 +0.019	1.0	081008	081010	081012	081015	081016				+0.024 +0.009
10	+0.040 +0.025	12	+0.034 +0.023	1.0		101210	101212	101215	101216				+0.021 +0.006
12	+0.050 +0.032	15	+0.034 +0.023	1.5			121512	121515	121516	121520			+0.031 +0.013
15	+0.050 +0.032	18	+0.034 +0.023	1.5			151812	151815	151816	151820			+0.031 +0.013
16	+0.050 +0.032	20	+0.041 +0.028	2.0			162012	162015	162016	162020	162025		+0.026 +0.008
20	+0.061 +0.040	24	+0.041 +0.028	2.0				202415	202416	202420	202425	202430	+0.037 +0.016
25	+0.061 +0.040	29	+0.041 +0.028	2.0					252916	252920	252925	252930	+0.037 +0.016

※The I.D. tolerance is reference value as press fitting into H7 housing.

Oiles 500HP Hard special copper alloy bearings with embedded solid lubricant

RoHS2 ELV Lead Free

Features

- Bears higher loads than the 500SPs.
- Demonstrates superior wear resistance under high-load and low-speed applications.

Service range	500HP SL1	
Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−40～+150	
Allowable max. pressure P N/mm² {kgf/cm²}	73 (180) {745 (1,837)}	
Allowable max. velocity V m/s {m/min}	0.10 {6}	0.25 {15}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.65 {1,010}	3.25 {1,990}

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]).

※Above values are applicable when solid lubricants SL1 are used.

Mechanical properties			
Density	——	g/cm³	7.6
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	540 {55}
Tensile elongation at break	JIS Z 2241	%	0.3
Compressive strength	——	N/mm² {kgf/mm²}	490 {50} (Note)
Hardness	JIS Z 2243	HBW	245
Modulus of longitudinal elasticity.	——	N/mm² {kgf/mm²}	127,000 {13,000}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	1.8

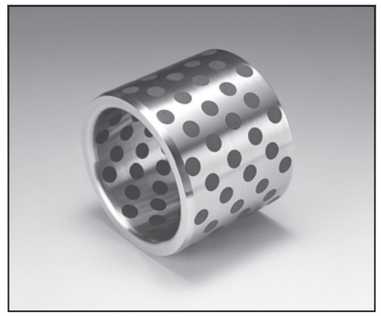
※The values shown above are typical values, not the standard values.
(Note) Compressive strength is 0.2%

⚠ Please indicate the type of motion (rotation, reciprocating, rotation & reciprocating) for custom-made products.

⚠ Solid lubricant, SL401 and SL403 are not lead-free.

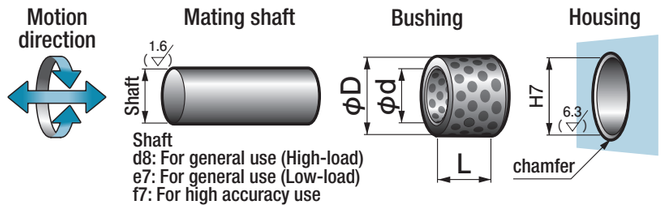
HPB Oiles 500HP SL1 Bushings

RoHS2 ELV Lead Free



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

HPB - 304040
Part No.



Part No.	I.D.		O.D.		Length		I.D. tolerance after press fitting (reference)
	φd	Tolerance	φD	Tolerance	L	Tolerance	
HPB-203020	20	+0.061 +0.040	30	+0.041 +0.028	20	−0.1 −0.3	+0.037 +0.016
HPB-203025	20	+0.061 +0.040	30	+0.041 +0.028	25	−0.1 −0.3	+0.037 +0.016
HPB-203030	20	+0.061 +0.040	30	+0.041 +0.028	30	−0.1 −0.3	+0.037 +0.016
HPB-253520	25	+0.061 +0.040	35	+0.050 +0.034	20	−0.1 −0.3	+0.030 +0.009
HPB-253530	25	+0.061 +0.040	35	+0.050 +0.034	30	−0.1 −0.3	+0.030 +0.009
HPB-304030	30	+0.061 +0.040	40	+0.050 +0.034	30	−0.1 −0.3	+0.032 +0.011
HPB-304040	30	+0.061 +0.040	40	+0.050 +0.034	40	−0.1 −0.3	+0.032 +0.011
HPB-405040	40	+0.075 +0.050	50	+0.050 +0.034	40	−0.1 −0.3	+0.046 +0.021
HPB-405050	40	+0.075 +0.050	50	+0.050 +0.034	50	−0.1 −0.3	+0.046 +0.021
HPB-506050	50	+0.075 +0.050	60	+0.060 +0.041	50	−0.1 −0.3	+0.045 +0.020
HPB-506060	50	+0.075 +0.050	60	+0.060 +0.041	60	−0.1 −0.3	+0.045 +0.020
HPB-607550	60	+0.090 +0.060	75	+0.062 +0.043	50	−0.1 −0.3	+0.053 +0.023
HPB-607560	60	+0.090 +0.060	75	+0.062 +0.043	60	−0.1 −0.3	+0.053 +0.023

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

⚠ The dimensional tolerances are the values measured at +25℃.

Oiles 500AB Aluminum bronze bearings with embedded solid lubricant

RoHS2 ELV Lead Free

Features

- Usable in seawater.
- Has superior heat resistance.
- Not brittle at low temperatures and may be used at very low temperatures.

Service range	500AB SL1	
Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−250～+400	−40～+150
Allowable max. pressure P N/mm² {kgf/cm²}	24 (100) {245 (1,020)}	
Allowable max. velocity V m/s {m/min}	0.25 {15}	0.50 {30}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.25 {765}	2.45 {1,500}

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]).

※Above values are applicable when solid lubricants SL1 are used.
When you use standard #500AB series in the temperature and over, contact us for more information.

Mechanical properties			
Density	——	g/cm³	7.6
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	590 {60}
Tensile elongation at break	JIS Z 2241	%	15
Compressive strength	——	N/mm² {kgf/mm²}	240 {24} (Note)
Impact strength	JIS Z 2242	J/cm² {kgfm/cm²}	25 {2.5}
Hardness	JIS Z 2243	HBW	160
Modulus of longitudinal elasticity	——	N/mm² {kgf/mm²}	108,000 {11,000}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	1.6
Thermal conductivity	——	W/m℃ {cal/sec℃cm}	58.6 {0.14}

※The values shown above are typical values, not the standard values.
(Note) Compressive strength is 0.2%

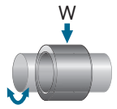
⚠Please indicate the type of motion (rotation, reciprocating, rotation & reciprocating) for custom-made products.

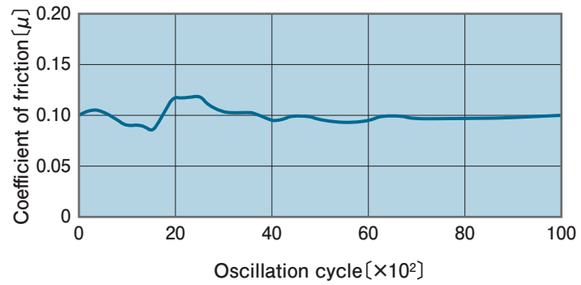
⚠Solid lubricant, SL401 and SL403 are not lead-free.

Test data

Journal oscillation test in sea water

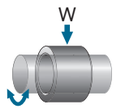
<Testing conditions>
Mating material : SUS304
Pressure : 15.7N/mm² {160.0kgf/cm²}
Oscillating cycle : 60cpm
Oscillating angle : ±10°
Test cycle (time) : 100,000cycle (27.8hrs.)
Ambience : in artificial sea water
temperature 20±5°
*SL4 is used for this test data.

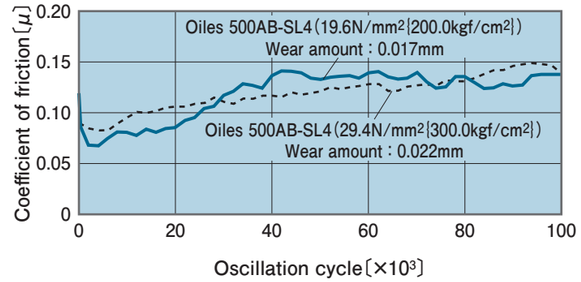




Journal oscillation test in water

<Testing conditions>
Bearing dimension : φ80×φ100×ℓ60
Mating material : S45C hard chrome plating
Pressure : 19.6N/mm² {200.0kgf/cm²}
29.4N/mm² {300.0kgf/cm²}
Velocity : 0.004m/s {0.25m/min}
Oscillating cycle : 6cpm
Oscillating angle : ±15°
Test cycle (time) : 100,000cycle (278hrs.)
Ambience : in the purified water
Lubrication : SL4L coating





Oiles 500B Bronze bearings with embedded solid lubricant

Feature

- Serviceable without the need for lubrication.
- Demonstrates high performance under middle-load and middle-speed operations.
- Usable at high temperatures.
- Has superior chemical and corrosion resistances.
- Standard products are available in various sizes.

Service range	500B1 SL2	
Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−40～+250	−40～+150
Allowable max. pressure P N/mm² {kgf/cm²}	15 (49.0) {153 (500)}	
Allowable max. velocity V m/s {m/min}	0.40 {24}	0.85 {51}
Allowable max. PV value N/mm² • m/s {kgf/cm² • m/min}	1.00 {612}	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]).

※Above values are applicable when solid lubricants SL2 are used.

Mechanical properties			500B1	500B2
Density	——	g/cm³	8.8	8.7
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	195 {20}	245 {25}
Tensile elongation at break	JIS Z 2241	%	15	15
Compressive strength	——	N/mm² {kgf/mm²}	95 {9.5} (Note1)	130 {13} (Note)
Impact strength	JIS Z 2242	J/cm² {kgfm/cm²}	10 {1}	——
Hardness	JIS Z 2243	HBW	60	70
Modulus of longitudinal elasticity	——	N/mm² {kgf/mm²}	83,000 {8,500}	103,000 {10,500}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	1.8	2.0
Thermal conductivity	——	W/m℃ {cal/sec℃cm}	71.1 {0.17}	75.3 {0.18}

※The values shown above are typical values, not the standard values.
(Note) Compressive strength is 0.2%

⚠Please indicate the type of motion (rotation, reciprocating, rotation & reciprocating) for custom-made products.

⚠Base metal contains lead.

Lathe turning

Cutting tool	carbide tool (JIS)	
	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 solid lubricant or grease to the sliding surface 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.

500B1 Test data

Journal rotational load resistance test

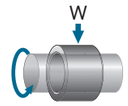
<Testing conditions>

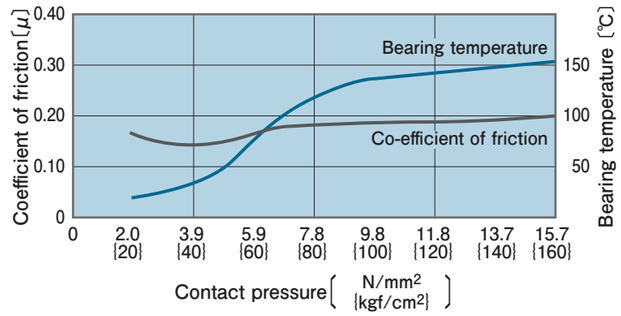
Mating material : S45C

Pressure : 0.98N/mm² {10.0kgf/cm²} is loaded incrementally per 10minutes

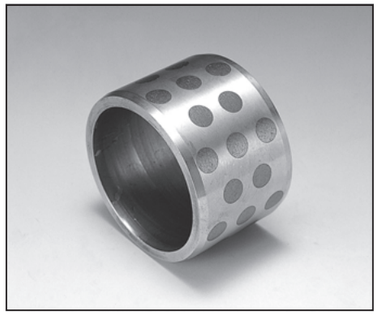
Velocity : 0.083m/s {5.0m/min}

Lubrication : dry



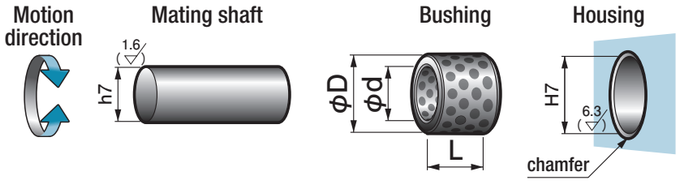


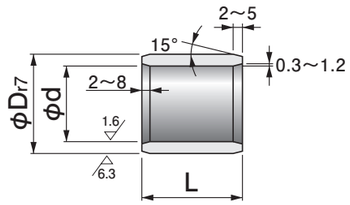
BCB Oiles 500B$_1$ SL2 Bushings



Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 60mm, O.D. is 75mm, and length is 50mm.

BCB - 607550
Part No.





- Both ends have the same chamfering.
- Applicable to rotation and oscillating motion.
- Do not remove lubricant applied to the inner surface of the product. Otherwise, the product will not demonstrate its performance.

I.D.		O.D.		Length L Tolerance $^{0}_{-0.2}$						Length L Tolerance $^{0}_{-0.2}$			I.D. tolerance after press fitting (reference)	I.D.
ϕd	Tolerance	ϕD	Tolerance	20	25	30	40	50	60	80	100	120		ϕd
20	+0.105 +0.072	30	+0.049 +0.028	203020	203025	203030							+0.077 +0.044	20
25	+0.105 +0.072	35	+0.059 +0.034	253520		253530	253540						+0.071 +0.038	25
30	+0.105 +0.072	40	+0.059 +0.034		304025	304030	304040						+0.071 +0.038	30
30	+0.105 +0.072	42	+0.059 +0.034		304225	304230	304240						+0.071 +0.038	30
32	+0.144 +0.105	42	+0.059 +0.034			324230	324240						+0.110 +0.071	32
32	+0.144 +0.105	45	+0.059 +0.034			324530	324540						+0.110 +0.071	32
35	+0.144 +0.105	45	+0.059 +0.034			354530	354540	354550					+0.110 +0.071	35
35	+0.144 +0.105	48	+0.059 +0.034			354830	354840	354850					+0.110 +0.071	35
40	+0.144 +0.105	50	+0.059 +0.034			405030	405040	405050					+0.110 +0.071	40
40	+0.144 +0.105	55	+0.071 +0.041			405530	405540	405550					+0.103 +0.064	40
45	+0.144 +0.105	55	+0.071 +0.041				455540	455550					+0.103 +0.064	45
45	+0.144 +0.105	60	+0.071 +0.041				456040	456050					+0.103 +0.064	45
50	+0.144 +0.105	60	+0.071 +0.041				506040	506050	506060				+0.103 +0.064	50
50	+0.144 +0.105	65	+0.071 +0.041				506540	506550	506560				+0.103 +0.064	50
55	+0.190 +0.144	70	+0.073 +0.043					557050	557060				+0.147 +0.101	55
55	+0.190 +0.144	75	+0.073 +0.043					557550	557560				+0.147 +0.101	55
60	+0.190 +0.144	75	+0.073 +0.043					607550	607560	607580			+0.147 +0.101	60
60	+0.190 +0.144	80	+0.073 +0.043					608050	608060	608080			+0.147 +0.101	60
65	+0.190 +0.144	80	+0.073 +0.043						658060	658080			+0.147 +0.101	65
65	+0.190 +0.144	85	+0.086 +0.051						658560	658580			+0.139 +0.093	65
70	+0.190 +0.144	85	+0.086 +0.051						708560	708580			+0.139 +0.093	70
70	+0.190 +0.144	90	+0.086 +0.051						709060	709080			+0.139 +0.093	70
75	+0.190 +0.144	90	+0.086 +0.051						759060	759080			+0.139 +0.093	75
75	+0.190 +0.144	95	+0.086 +0.051						759560	759580			+0.139 +0.093	75
80	+0.190 +0.144	95	+0.086 +0.051						809560	809580	8095100		+0.139 +0.093	80
80	+0.190 +0.144	100	+0.086 +0.051						8010060	8010080	80100100		+0.139 +0.093	80
85	+0.242 +0.188	100	+0.086 +0.051							8510080	85100100		+0.191 +0.137	85
85	+0.242 +0.188	105	+0.089 +0.054							8510580	85105100		+0.188 +0.134	85
90	+0.242 +0.188	110	+0.089 +0.054							9011080	90110100		+0.188 +0.134	90
90	+0.242 +0.188	115	+0.089 +0.054							9011580	90115100		+0.188 +0.134	90
95	+0.242 +0.188	115	+0.089 +0.054							9511580	95115100		+0.188 +0.134	95
95	+0.242 +0.188	120	+0.089 +0.054							9512080	95120100		+0.188 +0.134	95
100	+0.242 +0.188	120	+0.089 +0.054							10012080	100120100	100120120	+0.188 +0.134	100
100	+0.242 +0.188	125	+0.103 +0.063							10012580	100125100	100125120	+0.179 +0.125	100

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

⚠ The dimensional tolerances are the values measured at +25℃.

Oiles 500F Cast iron bearings with embedded solid lubricant

RoHS2 ELV Lead Free

Feature

- Serviceable without the need for lubrication.
- Demonstrates high performance under low- and middle-load, low-speed operations.
- Demonstrates superior wear resistance in applications where oil film is seldom produced such as reciprocating motions, oscillation, frequent starts and stops, etc.
- Lower prices than the bearings with copper alloy bases.
- Standard products are available in various sizes.

Test data

Reciprocation test

<Testing conditions>

Bearing dimension : □40×□40×t20

Mating material : FC250 ground

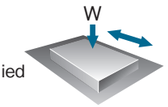
Pressure : 5.9N/mm²{60.0kgf/cm²}

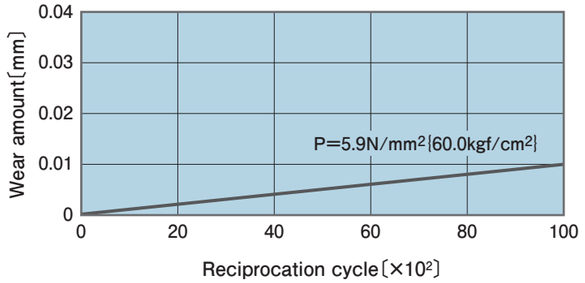
Velocity : 0.12m/s{7.0m/min}

Stroke : 80mm

Test cycle : 100,000cycle

Lubrication : initial grease applied





Service range

Service range	500F SL1	
Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−40～+400	−40～+150
Allowable max. pressure P N/mm² {kgf/cm²}	5 (73.5) {51 (750)}	8 (73.5) {82 (750)}
Allowable max. velocity V m/s {m/min}	0.15 {9}	0.25 {15}
Allowable max. PV value N/mm²・m/s {kgf/cm²・m/min}	0.50 {306}	0.80 {490}

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]).

Lathe turning

Cutting tool	carbide tool (JIS)	
	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 solid lubricant or grease to the sliding surface after machining.

※Contact us for grinding and milling information.

Mechanical properties

Mechanical properties			500F₁	500F₂
Density	——	g/cm³	7.3	7.1
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	250 {26}	150 {15}
Compressive strength	——	N/mm² {kgf/mm²}	740 {75}	440 {45}
Impact strength	JIS Z 2242	J/cm² {kgfm/cm²}	4 {0.4}	1 {0.1}
Hardness	JIS Z 2243	HBW	190	160
Modulus of longitudinal elasticity	——	N/mm² {kgf/mm²}	107,800 {11,000}	78,000 {8,000}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	1.2	1.2
Thermal conductivity	——	W/m℃ {cal/sec℃cm}	50.2 {0.12}	50.2 {0.12}

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

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.

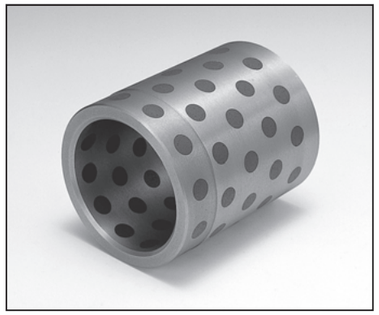
⚠When you use standard 500F series in the temperature of 150℃ and over, contact us for more information.

⚠Please indicate the type of motion (rotation, reciprocating, rotation & reciprocating) for custom-made products.

⚠Solid lubricant, SL401 and SL403 are not lead-free.

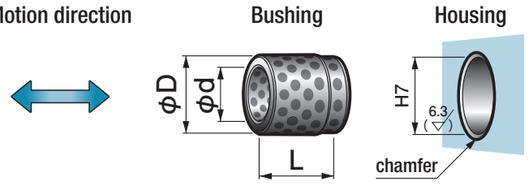
FGB Oiles 500F SL1 Guide Bushings

RoHS2 ELV Lead Free

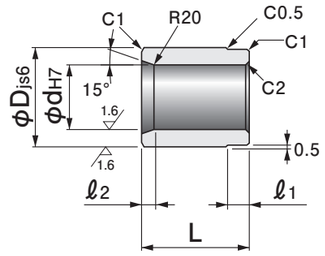


Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 60mm, O.D. is 80mm, and length is 90mm.

FGB - 608090
Part No.



- 500F, is used as base steel.
- Applicable to reciprocating motion.
- It is recommended to use a set screw to prevent dislocation.

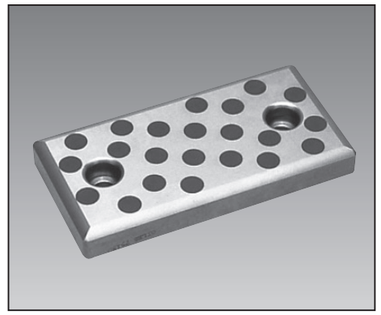


Part No.	I.D.		O.D.		Length		ℓ1	ℓ2
	φd	Tolerance	φD	Tolerance	L	Tolerance		
FGB-254040	25	+0.021 0	40	±0.008	40	0 −0.2	10	5
FGB-305050	30	+0.021 0	50	±0.008	50	0 −0.2	10	5
FGB-356055	35	+0.025 0	60	±0.0095	55	0 −0.2	15	5
FGB-406055	40	+0.025 0	60	±0.0095	55	0 −0.2	15	5
FGB-406060	40	+0.025 0	60	±0.0095	60	0 −0.2	10	5
FGB-507075	50	+0.025 0	70	±0.0095	75	0 −0.2	15	10
FGB-608090	60	+0.030 0	80	±0.0095	90	0 −0.2	20	10
FGB-80100120	80	+0.030 0	100	±0.011	120	0 −0.2	25	10
FGB-100120150	100	+0.035 0	120	±0.011	150	0 −0.2	25	10
FGB-120140180	120	+0.035 0	140	±0.0125	180	0 −0.2	25	10

⚠ The dimensional tolerances are the values measured at +25℃.

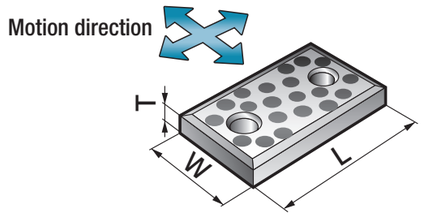
FWPT Oiles 500F SL1 Wear Plates

RoHS2 ELV Lead Free



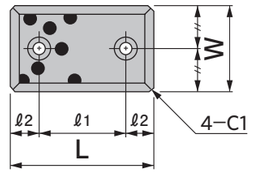
Specify Part No. by required width and length.
(e.g.) Width is 100mm and length is 100mm.

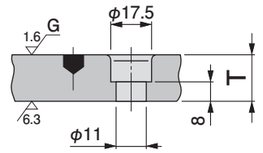
FWPT - 100100
Part No.



- 500F, is used as base steel.

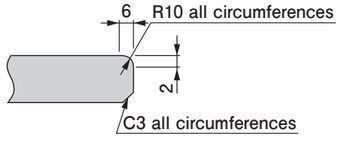
Cross-section





Chamfering

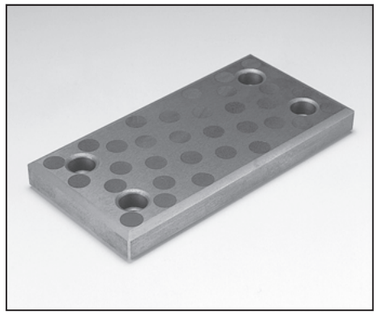
Type A



Part No.	Width		Length		Thickness		Mounting hole intervals			Attach bolts		Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	ℓ1	Tolerance	ℓ2	Type	Qty	
FWPT-100100	100	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	A
FWPT-100125	100	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	A
FWPT-100150	100	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	A
FWPT-100200	100	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	A
FWPT-100250	100	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	200	±0.2	25	M10 Hexagon socket head	2	A
FWPT-125125	125	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	A
FWPT-125150	125	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	A
FWPT-125200	125	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	A
FWPT-125250	125	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	200	±0.2	25	M10 Hexagon socket head	2	A
FWPT-150150	150	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	A
FWPT-150200	150	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	A
FWPT-150250	150	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	200	±0.2	25	M10 Hexagon socket head	2	A
FWPT-150300	150	−0.1 −0.3	300	−0.1 −0.3	20	±0.01	250	±0.2	25	M10 Hexagon socket head	2	A

FWP Oiles 500F SL1 Wear Plates

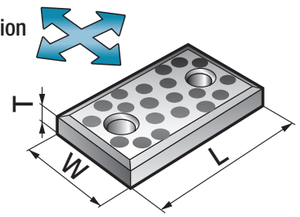
RoHS2 ELV Lead Free



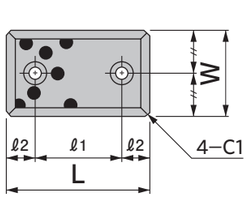
Specify Part No. by required width and length.
(e.g.) Width is 58mm and length is 100mm.

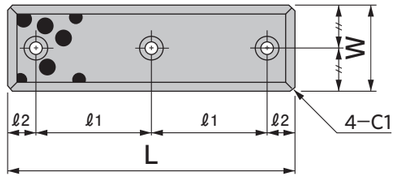
FWP - 58100
Part No.

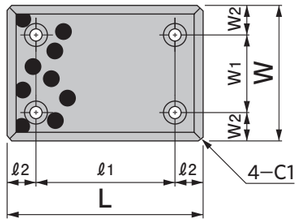
Motion direction



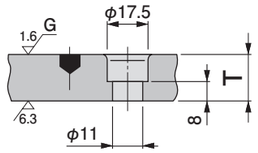
- 500F, is used as base steel.
- Motion directions for FWP-4875 to FWP-200300 are width and length.
- Motion directions for FWP-2875 to FWP-38200 are length direction only.



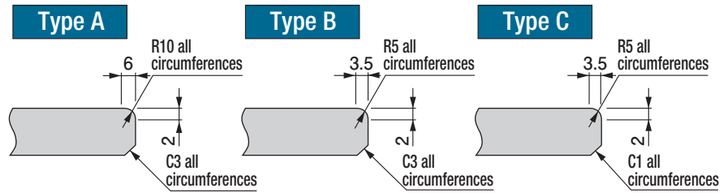




Cross-section



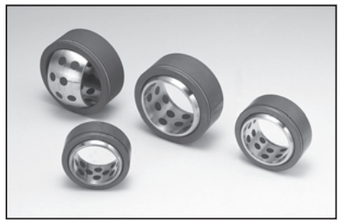
Chamfering



Part No.	Width		Length		Thickness		Mounting hole intervals			Attach bolts		Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	ℓ1	Tolerance	ℓ2	Type	Qty	
FWP-2875	28	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	45	±0.2	15	M10 Hexagon socket head	2	C
FWP-28100	28	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	C
FWP-28125	28	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	C
FWP-28150	28	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	C
FWP-28200	28	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	C
FWP-3875	38	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	45	±0.2	15	M10 Hexagon socket head	2	C
FWP-38100	38	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	C
FWP-38125	38	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	C
FWP-38150	38	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	C
FWP-38200	38	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	C
FWP-4875	48	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	45	±0.2	15	M10 Hexagon socket head	2	B
FWP-48100	48	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	B
FWP-48125	48	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	B
FWP-48150	48	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	B
FWP-48200	48	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	100	±0.2	50	M10 Hexagon socket head	2	B
FWP-48200A	48	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	B
FWP-48250	48	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	3	B
FWP-5875	58	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	45	±0.2	15	M10 Hexagon socket head	2	B
FWP-58100	58	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	B
FWP-58125	58	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	B
FWP-58150	58	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	B

Part No.	Width		Length		Thickness		Mounting hole intervals						Attach bolts		Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	W1	Tolerance	W2	ℓ1	Tolerance	ℓ2	Type	Qty	
FWP-7575B	75	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	—	—	—	25	±0.2	25	M10 Hexagon socket head	2	A
FWP-75100B	75	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	—	—	—	50	±0.2	25	M10 Hexagon socket head	2	A
FWP-75125	75	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	—	—	—	75	±0.2	25	M10 Hexagon socket head	2	A
FWP-75150	75	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	—	—	—	100	±0.2	25	M10 Hexagon socket head	2	A
FWP-75200	75	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	—	—	—	150	±0.2	25	M10 Hexagon socket head	2	A
FWP-100100	100	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	50	±0.2	25	M10 Hexagon socket head	4	A
FWP-100125	100	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	50	±0.2	25	75	±0.2	25	M10 Hexagon socket head	4	A
FWP-100150	100	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	50	±0.2	25	100	±0.2	25	M10 Hexagon socket head	4	A
FWP-100200	100	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	50	±0.2	25	150	±0.2	25	M10 Hexagon socket head	4	A
FWP-100250	100	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	50	±0.2	25	200	±0.2	25	M10 Hexagon socket head	4	A
FWP-125125	125	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	75	±0.2	25	M10 Hexagon socket head	4	A
FWP-125125A	125	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	50	±0.2	37.5	75	±0.2	25	M10 Hexagon socket head	4	A
FWP-125150	125	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	50	±0.2	37.5	100	±0.2	25	M10 Hexagon socket head	4	A
FWP-125200	125	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	50	±0.2	37.5	150	±0.2	25	M10 Hexagon socket head	4	A
FWP-125250	125	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	50	±0.2	37.5	200	±0.2	25	M10 Hexagon socket head	4	A
FWP-150150	150	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	100	±0.2	25	M10 Hexagon socket head	4	A
FWP-150200	150	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	100	±0.2	25	150	±0.2	25	M10 Hexagon socket head	4	A
FWP-150250	150	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	100	±0.2	25	200	±0.2	25	M10 Hexagon socket head	4	A
FWP-200200	200	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	150	±0.2	25	M10 Hexagon socket head	4	A
FWP-200250	200	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	150	±0.2	25	200	±0.2	25	M10 Hexagon socket head	4	A
FWP-200300	200	−0.1 −0.3	300	−0.1 −0.3	20	±0.01	150	±0.2	25	250	±0.2	25	M10 Hexagon socket head	4	A

Oiles 500SP1 Spherical Bearings Unit bearings



RoHS2 ELV Lead Free

Feature

- Conforms to the ISO Standard E type bearings. Compatible with them dimensionally. High precision.
- The inner surface of the inner race is subject to sliding. The outer surface of the inner race bears self-aligning.
- Applicable to higher loads than other self-lubricating spherical bearings.
- Applicable to large oscillating angles in circumferential oscillating motion.
- Serviceable without the need for lubrication. Features quite long service life.

Service range

Lubrication condition	Dry
Service temperature range ℃	−40～+150
Allowable max. pressure P N/mm² {kgf/cm²}	39.2 {400}
Allowable max. velocity V m/s {m/min}	0.15 {9}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	0.80 {490}

※Above is the value when applying SL1 as solid lubricant.

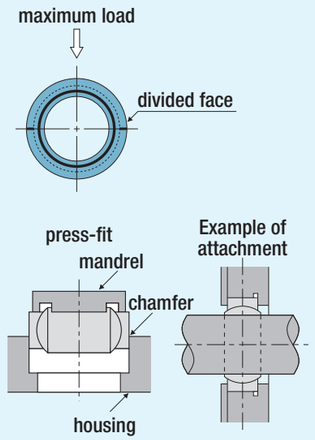
Part No.	Allowable dynamic load (Note 1) N {kgf}	Allowable static load (Note 2) N {kgf}
SPS-2035E	9,410 { 960}	23,500 { 2,400}
SPS-2542E	15,600 { 1,600}	39,200 { 4,000}
SPS-3047E	21,100 { 2,160}	52,900 { 5,400}
SPS-3555E	27,400 { 2,800}	68,600 { 7,000}
SPS-4062E	34,500 { 3,520}	86,200 { 8,800}
SPS-4568E	44,100 { 4,500}	109,000 {11,200}
SPS-5075E	54,900 { 5,600}	137,000 {14,000}
SPS-6090E	84,700 { 8,640}	211,000 {21,600}
SPS-70105E	109,000 {11,200}	274,000 {28,000}
SPS-80120E	141,000 {14,400}	353,000 {36,000}
SPS-90130E	176,000 {18,000}	441,000 {45,000}
SPS-100150E	215,000 {22,000}	539,000 {55,000}
SPS-110160E	237,000 {24,200}	593,000 {60,500}
SPS-120180E	329,000 {33,600}	823,000 {84,000}

(Note 1) The allowable dynamic loads are calculated based on the allowable bearing pressure in oscillating motion, which is 39.2 N/mm² [400 kgf/cm²]. They apply to the long-term loads under normal conditions.

(Note 2) The allowable static loads are calculated based on the allowable static bearing pressure 98.0 N/mm² [1,000 kgf/cm²] (i.e., allowable bearing pressure when accompanied with no sliding or accompanied with sliding at quite low speed not more than 0.0017 m/s [0.1 m/min.]. They apply to the accidental short-term loads under abnormal conditions.

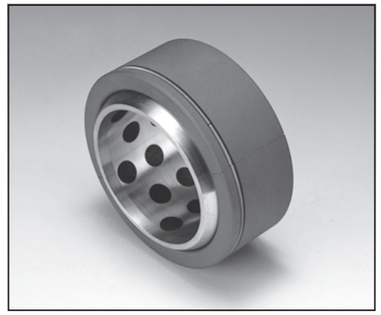
Bearing Fixing Method

The outer race is split into two parts. Assemble them as shown below so that the split parts are not located at the maximum load point. the bearing to fix it. Press it slowly with a vice or press by the intermediation of a as shown below. Chamfering the housing end is more effective.



SPS Oiles 500SP1 SL1 Spherical Bearings

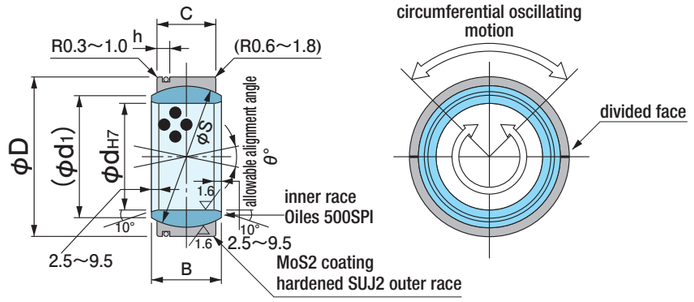
RoHS2 ELV Lead Free



Specify Part No. by required I.D. and O.D.
(e.g.) I.D. is 50mm and O.D. is 75mm.

SPS - 5075 E
Part No.

- Mating shaft
  For general: e7 (Recommended housing K7)
  For high load: d8 (Recommended housing N7)

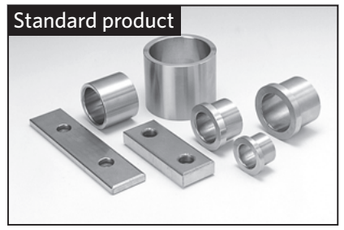


Part No.	I.D. φd	Tolerance	O.D. φD	Tolerance	φd1	B	C	Tolerance	φS	h	θ°
SPS-2035E	20	+0.021 0	35	0 −0.011	24	16	12	0 −0.24	29	3.5	9
SPS-2542E	25	+0.021 0	42	0 −0.011	29	20	16	0 −0.24	35.5	5.0	7
SPS-3047E	30	+0.021 0	47	0 −0.011	34	22	18	0 −0.24	40.7	5.0	6
SPS-3555E	35	+0.025 0	55	0 −0.013	40	25	20	0 −0.3	47	6.0	6
SPS-4062E	40	+0.025 0	62	0 −0.013	45	28	22	0 −0.3	53	6.0	7
SPS-4568E	45	+0.025 0	68	0 −0.013	51	32	25	0 −0.3	60	6.0	7
SPS-5075E	50	+0.025 0	75	0 −0.013	56	35	28	0 −0.3	66	6.0	6
SPS-6090E	60	+0.030 0	90	0 −0.015	67	44	36	0 −0.4	80	6.0	6
SPS-70105E	70	+0.030 0	105	0 −0.015	78	49	40	0 −0.4	92	7.0	6
SPS-80120E	80	+0.030 0	120	0 −0.015	89	55	45	0 −0.4	105	7.0	6
SPS-90130E	90	+0.035 0	130	0 −0.018	98	60	50	0 −0.5	115	7.0	5
SPS-100150E	100	+0.035 0	150	0 −0.018	110	70	55	0 −0.5	130	7.0	7
SPS-110160E	110	+0.035 0	160	0 −0.018	121	70	55	0 −0.5	140	8.0	6
SPS-120180E	120	+0.035 0	180	0 −0.018	136	85	70	0 −0.5	160	8.0	6

※φD toherance is nominal.

⚠ The dimensional tolerances are the values measured at +25℃.

Oiles 2000 Sintered multi-layer bearings with dispersed solid lubricant


Standard product

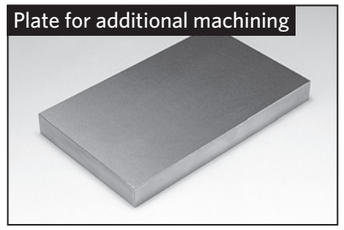


Plate for additional machining


Custom-made product

RoHS2 ELV Lead Free

Feature

- Dispersed solid lubricant allows motions in any direction and offers superior performance for minute movements.
- Serviceable without the need for lubrication.
- Features superior load resistance, speed characteristics, and wear resistance.
- Standard products and plates for additional machining are available in various sizes.

Service range

Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−40～+120	
Allowable max. pressure P N/mm² {kgf/cm²}	24.5 (73.5) {250 (750)}	49 (73.5) {500 (750)}
Allowable max. velocity V m/s {m/min}	0.50 {30}	1.00 {60}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.63 {1,000}	2.45 {1,500}

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]).

Lathe turning

Cutting tool	carbide tool (JIS)	
	Relief angle	5～10°
	Rake angle	2～5°
	Nose radius (mm)	0.40～0.80
Condition	Speed (m/min)	150～300
	Cut depth (mm)	0.10～0.20
	Feed (mm/rev)	0.05～0.15

Machining conditions here indicate conditions for machining back metal or length. Do not machine sliding surface.

※Contact us for grinding and milling information.

Mechanical properties

Density	——	g/cm³	6.3
Hardness	JIS K 7202-2	HRM	60～95
Oil impregnation rate	——	vol%	12

※The value shown above are for sintered layer.
※The values shown above are typical values, not the standard values.

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.

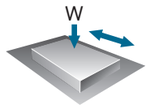
Oil Impregnation Method

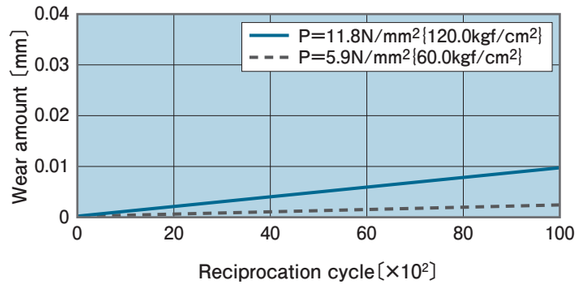
If the Oiles 2000 material is purchased and used by finishing it, it should be oil-impregnated after machining and then assembled in the housing. When the bearing is stored for long or washed, it should be oil-impregnated again and then assembled in the housing.
For the method, see the description about the oil impregnation method shown on page 250.
Dip the machined bearing in lubricating oil for 24 hours or more before using it, if oil impregnation (by heating) is disabled.

Test data

Horizontal reciprocation test

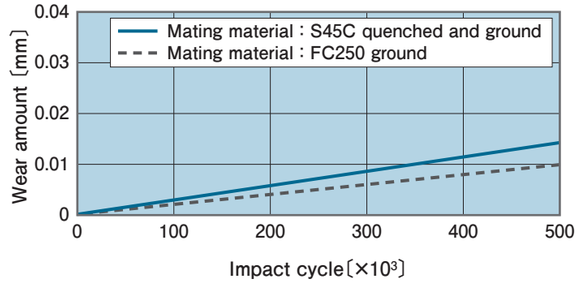
<Testing conditions>
Bearing dimension : □40×□40×t20
Mating material : FC250 ground
Pressure : 5.9、11.8N/mm² {60.0、120.0kgf/cm²}
Velocity : 0.12m/s {7.0m/min}
Reciprocation cycle : 44cpm
Stroke : 80mm
Test cycle : 100,000cycle
Lubrication : initial greasing at installation





Cam impact test

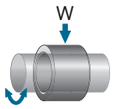
<Testing conditions>
Bearing dimension : □63×□95×t15
Mating material : FC250 ground、
S45C quenched and ground
Pressure : 19.6N/mm² {200.0kgf/cm²}
Velocity : 0.16m/s {9.6m/min}
Impact frequency : 60cpm
Stroke : 80mm
Test cycle : 500,000cycle
Lubrication : initial greasing at installation

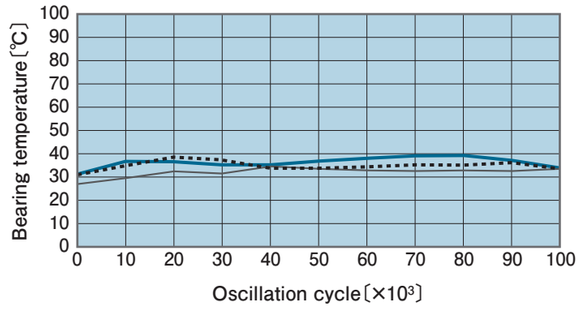


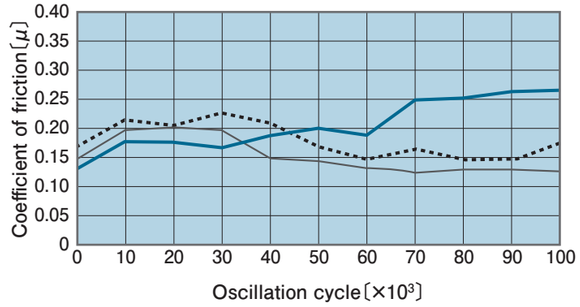
Journal oscillation test

<Testing conditions>
Mating material : S35cw/gas nitriding SUS403
S35C/hard-chrme plating
Pressure : 24.5N/mm² {250.0kgf/cm²}
Velocity : 0.002m/s {0.105m/min}
Oscillating cycle : 10cpm
Oscillaing angle : ±5°
Test cycle (time) : 100,000cycle (166.7hrs.)
Lubrication : initial greasing at installation

S35C gas nitriding
SUS403
S35C hard-chrome plating

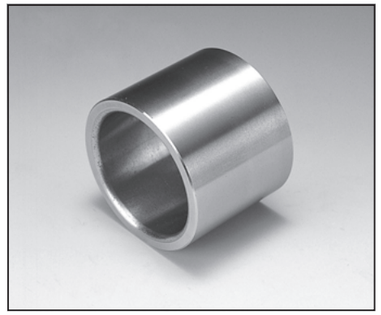






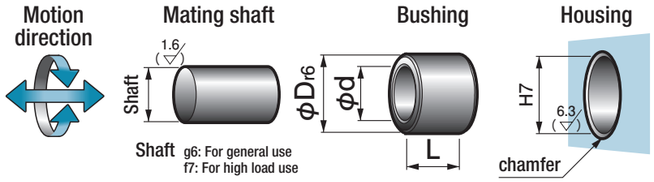
CBB Oiles 2000 Bushings

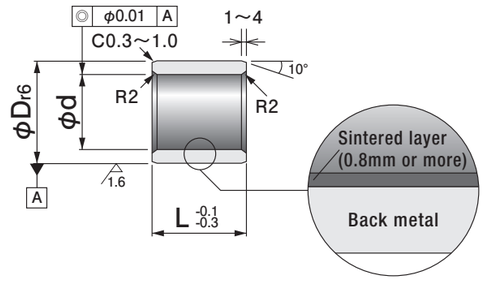
RoHS2 ELV Lead Free



Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 35mm, O.D. is 44mm, and length is 50mm.

CBB - 354450
Part No.





- Press fitting is possible.
- Falling out or dislocation prevention is not required.

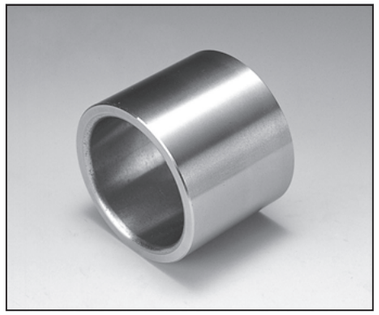
I.D.		O.D.		Length L Tolerance −0.1 −0.3									
φd	Tolerance	φD	Tolerance	8	10	12	15	16	19	20	25	30	35
12	+0.049 +0.038	18	+0.034 +0.023	121808	121810	121812	121815	121816	121819	121820	121825	121830	
13	+0.053 +0.042	19	+0.041 +0.028		131910	131912	131915			131920	131925	131930	
14	+0.053 +0.042	20	+0.041 +0.028		142010	142012	142015			142020	142025	142030	
15	+0.053 +0.042	21	+0.041 +0.028		152110	152112	152115	152116		152120	152125	152130	
16	+0.053 +0.042	22	+0.041 +0.028		162210	162212	162215	162216	162219	162220	162225	162230	162235
18	+0.053 +0.042	24	+0.041 +0.028		182410	182412	182415	182416		182420	182425	182430	
20	+0.060 +0.047	28	+0.041 +0.028		202810	202812	202815	202816	202819	202820	202825	202830	202835
20	+0.060 +0.047	30	+0.041 +0.028				203015	203016		203020	203025	203030	203035
25	+0.065 +0.052	33	+0.050 +0.034			253312	253315	253316		253320	253325	253330	253335
25	+0.065 +0.052	35	+0.050 +0.034				253515	253516		253520	253525	253530	253535
28	+0.065 +0.052	38	+0.050 +0.034							283820	283825	283830	
30	+0.065 +0.052	38	+0.050 +0.034			303812	303815			303820	303825	303830	303835
30	+0.065 +0.052	40	+0.050 +0.034				304015			304020	304025	304030	304035
35	+0.076 +0.060	44	+0.050 +0.034							354420	354425	354430	354435
35	+0.076 +0.060	45	+0.050 +0.034							354520	354525	354530	354535
40	+0.076 +0.060	50	+0.050 +0.034				405015			405020	405025	405030	405035
45	+0.081 +0.065	55	+0.060 +0.041									455530	455535
45	+0.081 +0.065	60	+0.060 +0.041									456030	
50	+0.081 +0.065	60	+0.060 +0.041							506020		506030	506035
50	+0.081 +0.065	62	+0.060 +0.041									506230	
50	+0.081 +0.065	65	+0.060 +0.041									506530	
55	+0.091 +0.072	70	+0.062 +0.043									557030	
60	+0.091 +0.072	74	+0.062 +0.043									607430	607435
60	+0.091 +0.072	75	+0.062 +0.043									607530	607535
65	+0.091 +0.072	80	+0.062 +0.043										
70	+0.096 +0.077	85	+0.073 +0.051									708530	708535
70	+0.096 +0.077	90	+0.073 +0.051										
75	+0.096 +0.077	90	+0.073 +0.051										
75	+0.096 +0.077	95	+0.073 +0.051										
80	+0.096 +0.077	96	+0.073 +0.051										
80	+0.096 +0.077	100	+0.073 +0.051										
90	+0.107 +0.085	110	+0.076 +0.054										
100	+0.107 +0.085	120	+0.076 +0.054										

Length L Tolerance −0.1 −0.3									I.D. tolerance after press fitting (reference)
40	50	60	70	80	90	100	120		
								+0.034 +0.023
								+0.034 +0.023
								+0.034 +0.023
								+0.034 +0.023
162240								+0.034 +0.023
182440								+0.033 +0.022
202840	202850							+0.042 +0.029
203040	203050							+0.042 +0.029
253340	253350	253360						+0.042 +0.029
253540	253550	253560						+0.042 +0.029
283840								+0.042 +0.029
303840	303850	303860						+0.042 +0.029
304040	304050	304060						+0.042 +0.029
354440	354450	354460						+0.053 +0.037
354540	354550	354560						+0.053 +0.037
405040	405050	405060	405070	405080				+0.053 +0.037
455540	455550	455560						+0.053 +0.037
456040	456050	456060	456070	456080				+0.056 +0.040
506040	506050	506060	506070	506080				+0.053 +0.037
506240	506250	506260	506270					+0.055 +0.039
506540	506550	506560	506570	506580		5065100		+0.057 +0.041
557040	557050	557060	557070					+0.064 +0.045
607440	607450	607460	607470	607480				+0.064 +0.045
607540	607550	607560	607570	607580		6075100		+0.064 +0.045
658040	658050	658060	658070	658080				+0.064 +0.045
708540	708550	708560	708570	708580		7085100		+0.064 +0.045
	709050	709060	709070	709080				+0.067 +0.048
	759050	759060	759070	759080		7590100		+0.064 +0.045
				759580		7595100		+0.067 +0.048
809640	809650	809660	809670	809680		8096100	8096120	+0.065 +0.046
8010040	8010050	8010060	8010070	8010080		80100100	80100120	+0.067 +0.048
	9011050	9011060		9011080	9011090	90110100	90110120	+0.076 +0.054
	10012050	10012060	10012070	10012080	10012090	100120100	100120120	+0.076 +0.054

⚠ The dimensional tolerances are the values measured at +25℃.

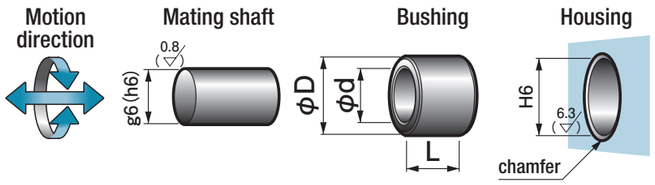
CLB Oiles 2000 Bushings (High Precision type)

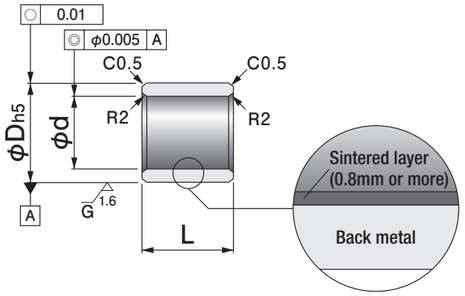
RoHS2 ELV Lead Free



Specify Part No. by required I.D., O.D. and Length.
(e.g.) I.D. is 35mm, O.D. is 44mm, and length is 50mm.

CLB - 354450
Part No.



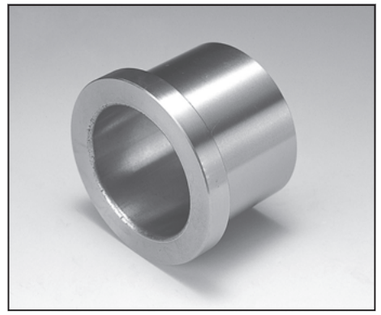


I.D.		O.D.		Length L Tolerance $^{0}_{-0.3}$									
φd	Tolerance	φD	Tolerance	16	20	25	30	40	50	60	80	100	120
12	$^{+0.011}_{+0.003}$	18	$^{0}_{-0.008}$	121816		121825							
16	$^{+0.011}_{+0.003}$	22	$^{0}_{-0.009}$	162216	162220		162230						
20	$^{+0.013}_{+0.004}$	28	$^{0}_{-0.009}$		202820		202830	202840					
25	$^{+0.013}_{+0.004}$	33	$^{0}_{-0.011}$			253325	253330	253340	253350				
30	$^{+0.013}_{+0.004}$	38	$^{0}_{-0.011}$				303830	303840	303850	303860			
35	$^{+0.016}_{+0.005}$	44	$^{0}_{-0.011}$					354440	354450	354460			
40	$^{+0.016}_{+0.005}$	50	$^{0}_{-0.011}$					405040	405050	405060			
50	$^{+0.016}_{+0.005}$	62	$^{0}_{-0.013}$						506250		506280		
60	$^{+0.019}_{+0.006}$	74	$^{0}_{-0.013}$						607450	607460	607480		
70	$^{+0.019}_{+0.006}$	85	$^{0}_{-0.015}$						708550			7085100	
80	$^{+0.019}_{+0.006}$	96	$^{0}_{-0.015}$						809650		809680		8096120
100	$^{+0.022}_{+0.007}$	120	$^{0}_{-0.015}$						10012050			100120100	100120120

⚠ By the combination of the highly precise article, clearance of a mating shaft and the bearings become smaller than normal combination. When use under the foreign matter environment ,or operating frequency are high, please contact us.
⚠ The dimensional tolerances are the values measured at +25℃.

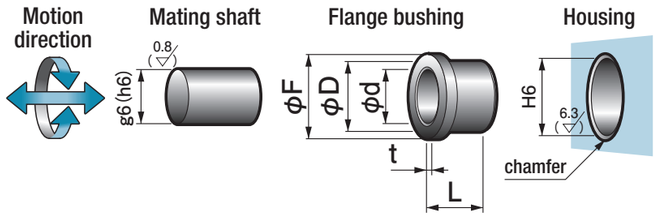
CLF Oiles 2000 Flange Bushings (High Precision type)

RoHS2 ELV Lead Free

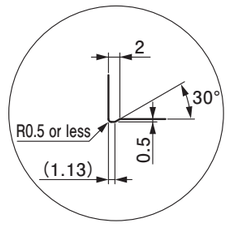


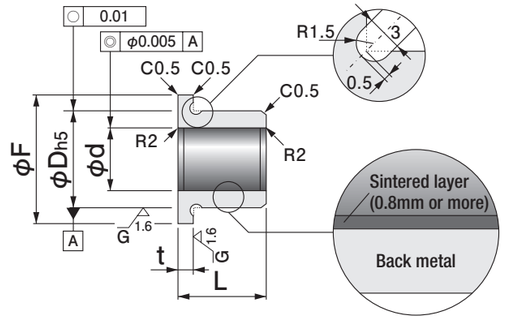
Specify Part No. by required I.D. and Length.
(e.g.) I.D. is 30mm and length is 60mm.

CLF - 3060
Part No.



● As for the flange root undercut shape, the shape shown below is also available in addition to that shown in the dimensional drawing on the right.



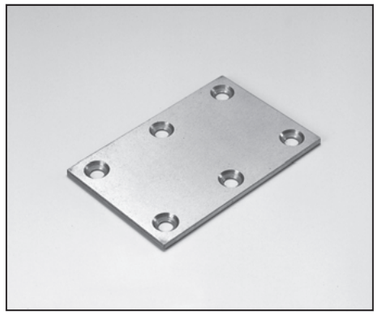


I.D.		O.D.		Flange				Length L Tolerance $^{0}_{-0.3}$						
φd	Tolerance	φD	Tolerance	φF	Tolerance	t	Tolerance	30	40	50	60	80	100	120
20	$^{+0.013}_{+0.004}$	28	$^{0}_{-0.009}$	38	$^{-0.2}_{-0.3}$	7	$^{+0.05}_{0}$	2030	2040					
25	$^{+0.013}_{+0.004}$	33	$^{0}_{-0.011}$	43	$^{-0.2}_{-0.3}$	7	$^{+0.05}_{0}$	2530		2550				
30	$^{+0.013}_{+0.004}$	38	$^{0}_{-0.011}$	48	$^{-0.2}_{-0.3}$	7	$^{+0.05}_{0}$	3030			3060			
35	$^{+0.016}_{+0.005}$	44	$^{0}_{-0.011}$	54	$^{-0.2}_{-0.3}$	10	$^{+0.05}_{0}$		3540			3580		
40	$^{+0.016}_{+0.005}$	50	$^{0}_{-0.011}$	60	$^{-0.2}_{-0.3}$	10	$^{+0.05}_{0}$		4040			4080		
50	$^{+0.016}_{+0.005}$	62	$^{0}_{-0.013}$	72	$^{-0.2}_{-0.3}$	10	$^{+0.05}_{0}$			5050			50100	
60	$^{+0.019}_{+0.006}$	74	$^{0}_{-0.013}$	84	$^{-0.2}_{-0.3}$	10	$^{+0.05}_{0}$				6060			60120

⚠ By the combination of the highly precise article, clearance of a mating shaft and the bearings become smaller than normal combination. When use under the foreign matter environment ,or operating frequency are high, please contact us.
⚠ The dimensional tolerances are the values measured at +25℃.

CWT Oiles 2000 Wear Plates 5mm Thickness

RoHS2 ELV Lead Free

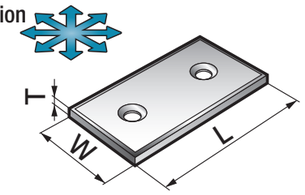


● Dedicated hexagon socket flat head bolts are attached.

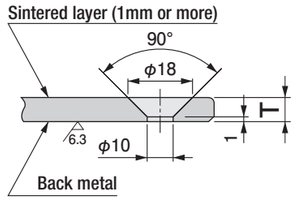
Specify Part No. by required width and length.
(e.g.) Width is 38mm and length is 150mm.

CWT - 38150
Part No.

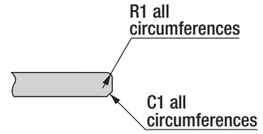
Motion direction



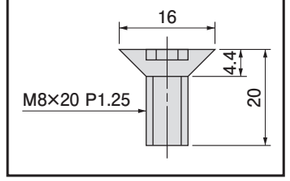
Cross-section

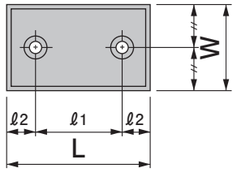


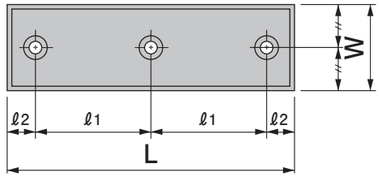
Chamfering

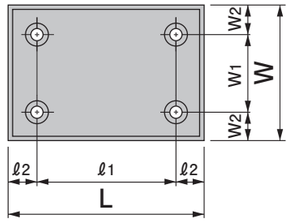


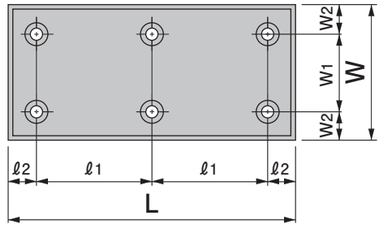
● Mounting bolts







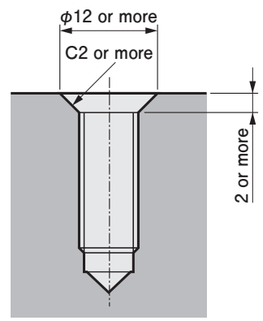




Part No.	Width		Length		Thickness		Mounting hole intervals			No. of holes
	W	Tolerance	L	Tolerance	T	Tolerance	ℓ1	Tolerance	ℓ2	
CWT-2250	22	−0.1 −0.3	50	−0.1 −0.3	5	±0.015	20	±0.2	15	2
CWT-2275	22	−0.1 −0.3	75	−0.1 −0.3	5	±0.015	45	±0.2	15	2
CWT-22100	22	−0.1 −0.3	100	−0.1 −0.3	5	±0.015	70	±0.2	15	2
CWT-22150	22	−0.1 −0.3	150	−0.1 −0.3	5	±0.015	60	±0.2	15	3
CWT-2850	28	−0.1 −0.3	50	−0.1 −0.3	5	±0.015	20	±0.2	15	2
CWT-2875	28	−0.1 −0.3	75	−0.1 −0.3	5	±0.015	45	±0.2	15	2
CWT-28100	28	−0.1 −0.3	100	−0.1 −0.3	5	±0.015	70	±0.2	15	2
CWT-28150	28	−0.1 −0.3	150	−0.1 −0.3	5	±0.015	60	±0.2	15	3
CWT-3850	38	−0.1 −0.3	50	−0.1 −0.3	5	±0.015	20	±0.2	15	2
CWT-3875	38	−0.1 −0.3	75	−0.1 −0.3	5	±0.015	45	±0.2	15	2
CWT-38100	38	−0.1 −0.3	100	−0.1 −0.3	5	±0.015	70	±0.2	15	2
CWT-38150	38	−0.1 −0.3	150	−0.1 −0.3	5	±0.015	60	±0.2	15	3
CWT-4850	48	−0.1 −0.3	50	−0.1 −0.3	5	±0.015	20	±0.2	15	2
CWT-4875	48	−0.1 −0.3	75	−0.1 −0.3	5	±0.015	45	±0.2	15	2
CWT-48100	48	−0.1 −0.3	100	−0.1 −0.3	5	±0.015	70	±0.2	15	2
CWT-48150	48	−0.1 −0.3	150	−0.1 −0.3	5	±0.015	60	±0.2	15	3

Part No.	Width		Length		Thickness		Mounting hole intervals						No. of holes
	W	Tolerance	L	Tolerance	T	Tolerance	W1	Tolerance	W2	ℓ1	Tolerance	ℓ2	
CWT-7575	75	−0.1 −0.3	75	−0.1 −0.3	5	±0.015	45	±0.2	15	45	±0.2	15	4
CWT-75100	75	−0.1 −0.3	100	−0.1 −0.3	5	±0.015	45	±0.2	15	70	±0.2	15	4
CWT-75125	75	−0.1 −0.3	125	−0.1 −0.3	5	±0.015	45	±0.2	15	95	±0.2	15	4
CWT-75150	75	−0.1 −0.3	150	−0.1 −0.3	5	±0.015	45	±0.2	15	60	±0.2	15	6
CWT-100100	100	−0.1 −0.3	100	−0.1 −0.3	5	±0.015	70	±0.2	15	70	±0.2	15	4
CWT-100125	100	−0.1 −0.3	125	−0.1 −0.3	5	±0.015	70	±0.2	15	95	±0.2	15	4
CWT-100150	100	−0.1 −0.3	150	−0.1 −0.3	5	±0.015	70	±0.2	15	60	±0.2	15	6

Provide the mating part with C2 or larger chamfering if it is tapped for mounting.



CWX Oiles 2000 Wear Plates 10mm Thickness

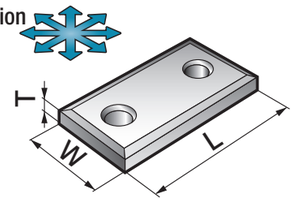
RoHS2 ELV Lead Free

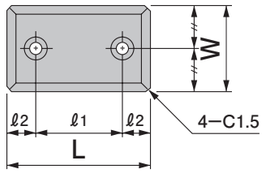
● Use the exclusive low-head bolt for mounting.
(LHS-M1020 is attached to CWX series)

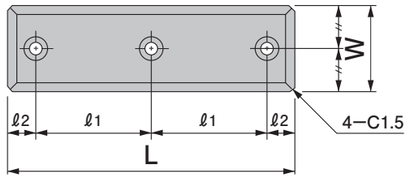
Specify Part No. by required width and length.
(e.g.) Width is 75mm and length is 125mm.

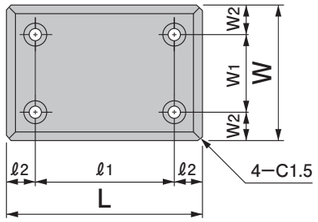
CWX - 75125
Part No.

Motion direction

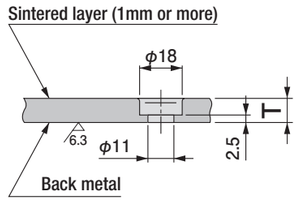






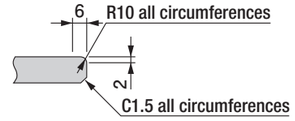


Cross-section

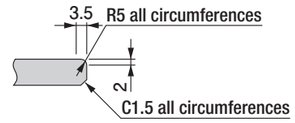


Chamfering

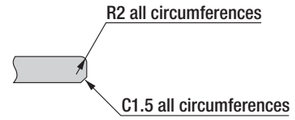
Type A



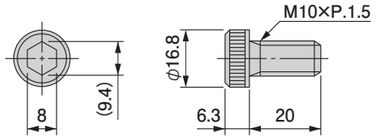
Type B



Type C



● LHS Exclusive Bolt for CWX
〔Part No. : **LHS-M1020**〕



● Exclusive bolt LHS-M1020 is attached to CWX plate.
● The Exclusive bolt has approximate breaking toque of JIS standard M10 socket head cap screw.

N・m {kgf・m}

Part No.	LHS-M1020
Recommended tightening torque	67.3 {6.86}
Breaking torque	118 {12.0}

※Bolt itself is on sale.

Part No.	Width		Length		Thickness		Mounting hole intervals			No. of holes	Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	ℓ1	Tolerance	ℓ2		
CWX-2875	28	−0.1 −0.3	75	−0.1 −0.3	10	±0.01	45	±0.2	15	2	C
CWX-28100	28	−0.1 −0.3	100	−0.1 −0.3	10	±0.01	50	±0.2	25	2	C
CWX-28125	28	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	75	±0.2	25	2	C
CWX-28150	28	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	2	C
CWX-3875	38	−0.1 −0.3	75	−0.1 −0.3	10	±0.01	45	±0.2	15	2	B
CWX-38100	38	−0.1 −0.3	100	−0.1 −0.3	10	±0.01	50	±0.2	25	2	B
CWX-38125	38	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	75	±0.2	25	2	B
CWX-38150	38	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	2	B
CWX-4875	48	−0.1 −0.3	75	−0.1 −0.3	10	±0.01	45	±0.2	15	2	B
CWX-48100	48	−0.1 −0.3	100	−0.1 −0.3	10	±0.01	50	±0.2	25	2	B
CWX-48125	48	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	75	±0.2	25	2	B
CWX-48150	48	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	2	B
CWX-48200	48	−0.1 −0.3	200	−0.1 −0.3	10	±0.01	100	±0.2	50	2	B
CWX-48250	48	−0.1 −0.3	250	−0.1 −0.3	10	±0.01	100	±0.2	25	3	B
CWX-5875	58	−0.1 −0.3	75	−0.1 −0.3	10	±0.01	45	±0.2	15	2	B
CWX-58100	58	−0.1 −0.3	100	−0.1 −0.3	10	±0.01	50	±0.2	25	2	B
CWX-58150	58	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	2	B
CWX-7575	75	−0.1 −0.3	75	−0.1 −0.3	10	±0.01	25	±0.2	25	2	A
CWX-75100	75	−0.1 −0.3	100	−0.1 −0.3	10	±0.01	50	±0.2	25	2	A
CWX-75125	75	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	75	±0.2	25	2	A

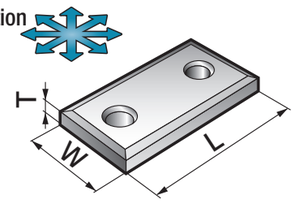
Part No.	Width		Length		Thickness		Mounting hole intervals						No. of holes	Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	W1	Tolerance	W2	ℓ1	Tolerance	ℓ2		
CWX-75150	75	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	—	—	—	100	±0.2	25	2	A
CWX-75200	75	−0.1 −0.3	200	−0.1 −0.3	10	±0.01	—	—	—	150	±0.2	25	2	A
CWX-75250	75	−0.1 −0.3	250	−0.1 −0.3	10	±0.01	—	—	—	100	±0.2	25	3	A
CWX-75300	75	−0.1 −0.3	300	−0.1 −0.3	10	±0.01	—	—	—	100	±0.2	50	3	A
CWX-100100	100	−0.1 −0.3	100	−0.1 −0.3	10	±0.01	50	±0.2	25	50	±0.2	25	4	A
CWX-100125	100	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	50	±0.2	25	75	±0.2	25	4	A
CWX-100150	100	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	50	±0.2	25	100	±0.2	25	4	A
CWX-100200	100	−0.1 −0.3	200	−0.1 −0.3	10	±0.01	50	±0.2	25	150	±0.2	25	4	A
CWX-100250	100	−0.1 −0.3	250	−0.1 −0.3	10	±0.01	50	±0.2	25	200	±0.2	25	4	A
CWX-100300	100	−0.1 −0.3	300	−0.1 −0.3	10	±0.01	50	±0.2	25	200	±0.2	50	4	A
CWX-125125	125	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	75	±0.2	25	75	±0.2	25	4	A
CWX-125150	125	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	50	±0.2	37.5	100	±0.2	25	4	A
CWX-125200	125	−0.1 −0.3	200	−0.1 −0.3	10	±0.01	50	±0.2	37.5	150	±0.2	25	4	A
CWX-125250	125	−0.1 −0.3	250	−0.1 −0.3	10	±0.01	50	±0.2	37.5	200	±0.2	25	4	A
CWX-125300	125	−0.1 −0.3	300	−0.1 −0.3	10	±0.01	50	±0.2	37.5	200	±0.2	50	4	A
CWX-150150	150	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	100	±0.2	25	4	A
CWX-150200	150	−0.1 −0.3	200	−0.1 −0.3	10	±0.01	100	±0.2	25	150	±0.2	25	4	A
CWX-150250	150	−0.1 −0.3	250	−0.1 −0.3	10	±0.01	100	±0.2	25	200	±0.2	25	4	A

CWXT Oiles 2000 Wear Plates 10mm Thickness (2 hole type)

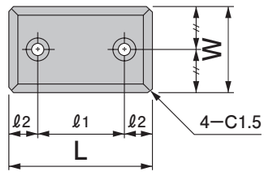
Specify Part No. by required width and length.
(e.g.) Width is 100mm and length is 200mm.

CWXT - 100200
Part No.

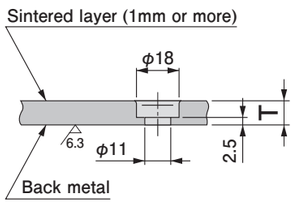
Motion direction



● Use the exclusive low-head bolt for mounting.
(LHS-M1020 is attached to CWXT series)

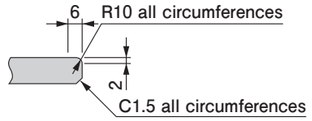


Cross-section



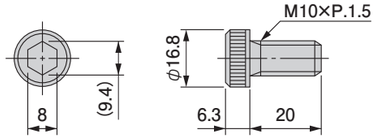
Chamfering

Type A



Part No.	Width		Length		Thickness		Mounting hole intervals			No. of holes	Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	ℓ1	Tolerance	ℓ2		
CWXT-100100	100	−0.1 −0.3	100	−0.1 −0.3	10	±0.01	50	±0.2	25	2	A
CWXT-100125	100	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	75	±0.2	25	2	A
CWXT-100150	100	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	2	A
CWXT-100200	100	−0.1 −0.3	200	−0.1 −0.3	10	±0.01	150	±0.2	25	2	A
CWXT-100250	100	−0.1 −0.3	250	−0.1 −0.3	10	±0.01	200	±0.2	25	2	A
CWXT-100300	100	−0.1 −0.3	300	−0.1 −0.3	10	±0.01	200	±0.2	50	2	A
CWXT-125125	125	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	75	±0.2	25	2	A
CWXT-125150	125	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	2	A
CWXT-125200	125	−0.1 −0.3	200	−0.1 −0.3	10	±0.01	150	±0.2	25	2	A
CWXT-125250	125	−0.1 −0.3	250	−0.1 −0.3	10	±0.01	200	±0.2	25	2	A
CWXT-125300	125	−0.1 −0.3	300	−0.1 −0.3	10	±0.01	200	±0.2	50	2	A
CWXT-150150	150	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	2	A
CWXT-150200	150	−0.1 −0.3	200	−0.1 −0.3	10	±0.01	150	±0.2	25	2	A
CWXT-150250	150	−0.1 −0.3	250	−0.1 −0.3	10	±0.01	200	±0.2	25	2	A

● LHS Exclusive Bolt for CWXT
〔Part No. : **LHS-M1020**〕



● Exclusive bolt LHS-M1020 is attached to CWXT plate.
● The Exclusive bolt has approximate breaking toque of JIS standard M10 socket head cap screw.
N・m {kgf・m}

Part No.	LHS-M1020
Recommended tightening torque	67.3 {6.86}
Breaking torque	118 {12.0}

※Bolt itself is on sale.

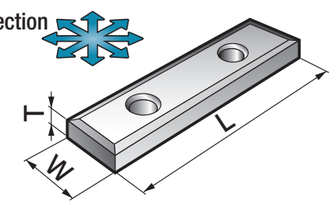
CWA Oiles 2000 Wear Plates 10mm Thickness

RoHS2 ELV Lead Free

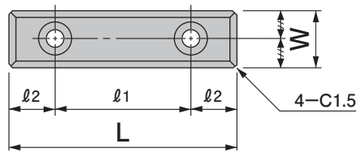
Specify Part No. by required width and length.
(e.g.) Width is 18mm and length is 100mm.

CWA - 18100 N
Part No.

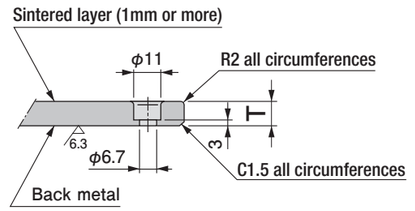
Motion direction



● Use M6×20 hexagon socket head bolt for mounting.



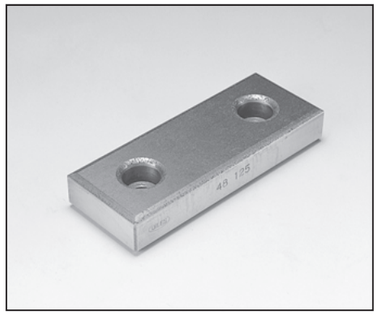
Cross-section



Part No.	Width		Length		Thickness		Mounting hole intervals			No. of holes
	W	Toleramce	L	Toleramce	T	Toleramce	ℓ1	Toleramce	ℓ2	
CWA-1875N	18	−0.1 −0.3	75	−0.1 −0.3	10	±0.01	45	±0.2	15	2
CWA-18100N	18	−0.1 −0.3	100	−0.1 −0.3	10	±0.01	50	±0.2	25	2
CWA-18125N	18	−0.1 −0.3	125	−0.1 −0.3	10	±0.01	75	±0.2	25	2
CWA-18150N	18	−0.1 −0.3	150	−0.1 −0.3	10	±0.01	100	±0.2	25	2

CWP Oiles 2000 Wear Plates

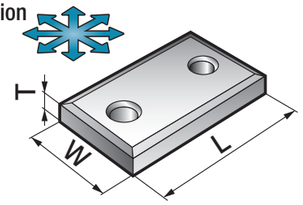
RoHS2 ELV Lead Free

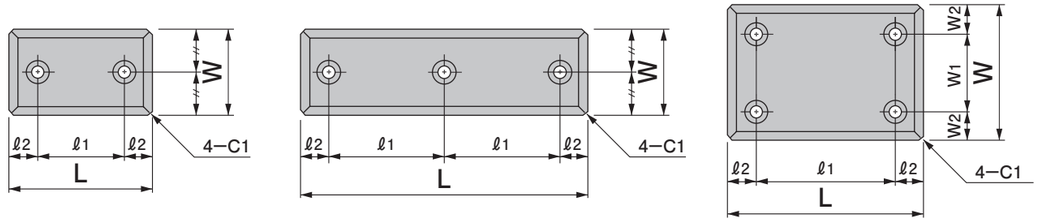


Specify Part No. by required width and length.
(e.g.) Width is 58mm and length is 150mm.

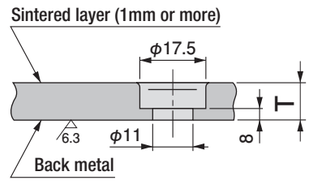
CWP - 58150
Part No.

Motion direction

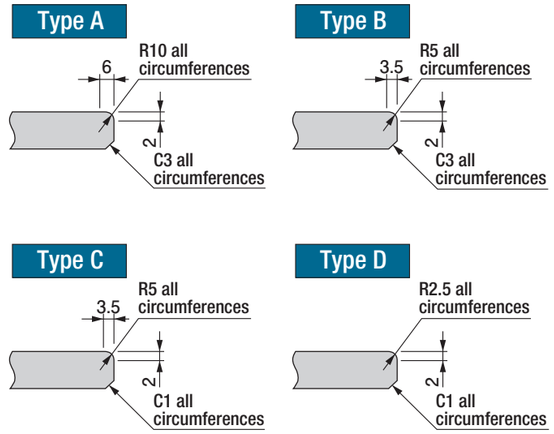




Cross-section



Chamfering



Part No.	Width		Length		Thickness		Mounting hole intervals			Attach bolts		Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	ℓ1	Tolerance	ℓ2	Type	Qty	
CWP-2875	28	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	45	±0.2	15	M10 Hexagon socket head	2	D
CWP-28100	28	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	D
CWP-28150	28	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	D
CWP-3875	38	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	45	±0.2	15	M10 Hexagon socket head	2	C
CWP-38100	38	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	C
CWP-38150	38	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	C
CWP-4875	48	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	45	±0.2	15	M10 Hexagon socket head	2	B
CWP-48100	48	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	B
CWP-48125	48	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	B
CWP-48150	48	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	B
CWP-48200	48	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	100	±0.2	50	M10 Hexagon socket head	2	B
CWP-48250	48	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	3	B
CWP-5875	58	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	45	±0.2	15	M10 Hexagon socket head	2	B
CWP-58100	58	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	B
CWP-58150	58	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	B

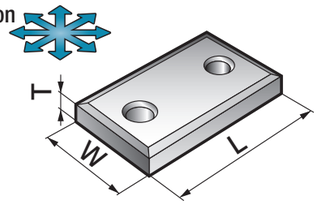
Part No.	Width		Length		Thickness		Mounting hole intervals						Attach bolts		Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	W1	Tolerance	W2	ℓ1	Tolerance	ℓ2	Type	Qty	
CWP-7575B	75	−0.1 −0.3	75	−0.1 −0.3	20	±0.01	—	—	—	25	±0.2	25	M10 Hexagon socket head	2	A
CWP-75100B	75	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	—	—	—	50	±0.2	25	M10 Hexagon socket head	2	A
CWP-75125	75	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	—	—	—	75	±0.2	25	M10 Hexagon socket head	2	A
CWP-75150	75	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	—	—	—	100	±0.2	25	M10 Hexagon socket head	2	A
CWP-75200	75	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	—	—	—	150	±0.2	25	M10 Hexagon socket head	2	A
CWP-75250	75	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	—	—	—	100	±0.2	25	M10 Hexagon socket head	3	A
CWP-75300	75	−0.1 −0.3	300	−0.1 −0.3	20	±0.01	—	—	—	100	±0.2	50	M10 Hexagon socket head	3	A
CWP-100100	100	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	50	±0.2	25	M10 Hexagon socket head	4	A
CWP-100125	100	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	50	±0.2	25	75	±0.2	25	M10 Hexagon socket head	4	A
CWP-100150	100	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	50	±0.2	25	100	±0.2	25	M10 Hexagon socket head	4	A
CWP-100200	100	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	50	±0.2	25	150	±0.2	25	M10 Hexagon socket head	4	A
CWP-100250	100	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	50	±0.2	25	200	±0.2	25	M10 Hexagon socket head	4	A
CWP-100300	100	−0.1 −0.3	300	−0.1 −0.3	20	±0.01	50	±0.2	25	200	±0.2	50	M10 Hexagon socket head	4	A
CWP-125125	125	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	50	±0.2	37.5	75	±0.2	25	M10 Hexagon socket head	4	A
CWP-125150	125	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	50	±0.2	37.5	100	±0.2	25	M10 Hexagon socket head	4	A
CWP-125200	125	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	50	±0.2	37.5	150	±0.2	25	M10 Hexagon socket head	4	A
CWP-125250	125	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	50	±0.2	37.5	200	±0.2	25	M10 Hexagon socket head	4	A
CWP-125300	125	−0.1 −0.3	300	−0.1 −0.3	20	±0.01	50	±0.2	37.5	200	±0.2	50	M10 Hexagon socket head	4	A
CWP-150150	150	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	100	±0.2	25	M10 Hexagon socket head	4	A
CWP-150200	150	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	100	±0.2	25	150	±0.2	25	M10 Hexagon socket head	4	A
CWP-150250	150	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	100	±0.2	25	200	±0.2	25	M10 Hexagon socket head	4	A

CWPT Oiles 2000 Wear Plates 20mm Thickness (2 hole type)

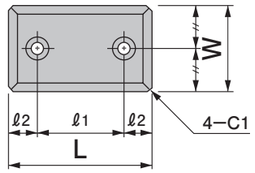
Specify Part No. by required width and length.
(e.g.) Width is 125mm and length is 150mm.

CWPT - 125150
Part No.

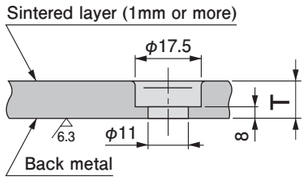
Motion direction



● CTP series were renamed CWPT series.

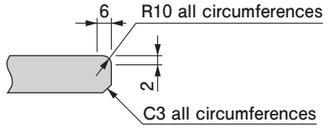


Cross-section



Chamfering

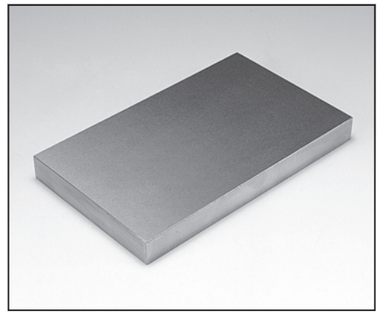
Type A



Part No.	Width		Length		Thickness		Mounting hole intervals			Attach bolts		Chamfering
	W	Tolerance	L	Tolerance	T	Tolerance	ℓ1	Tolerance	ℓ2	Type	Qty	
CWPT-100100	100	−0.1 −0.3	100	−0.1 −0.3	20	±0.01	50	±0.2	25	M10 Hexagon socket head	2	A
CWPT-100125	100	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	A
CWPT-100150	100	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	A
CWPT-100200	100	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	A
CWPT-100250	100	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	200	±0.2	25	M10 Hexagon socket head	2	A
CWPT-100300	100	−0.1 −0.3	300	−0.1 −0.3	20	±0.01	200	±0.2	50	M10 Hexagon socket head	2	A
CWPT-125125	125	−0.1 −0.3	125	−0.1 −0.3	20	±0.01	75	±0.2	25	M10 Hexagon socket head	2	A
CWPT-125150	125	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	A
CWPT-125200	125	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	A
CWPT-125250	125	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	200	±0.2	25	M10 Hexagon socket head	2	A
CWPT-125300	125	−0.1 −0.3	300	−0.1 −0.3	20	±0.01	200	±0.2	50	M10 Hexagon socket head	2	A
CWPT-150150	150	−0.1 −0.3	150	−0.1 −0.3	20	±0.01	100	±0.2	25	M10 Hexagon socket head	2	A
CWPT-150200	150	−0.1 −0.3	200	−0.1 −0.3	20	±0.01	150	±0.2	25	M10 Hexagon socket head	2	A
CWPT-150250	150	−0.1 −0.3	250	−0.1 −0.3	20	±0.01	200	±0.2	25	M10 Hexagon socket head	2	A

CWI Oiles 2000 Plates for Additional Machining

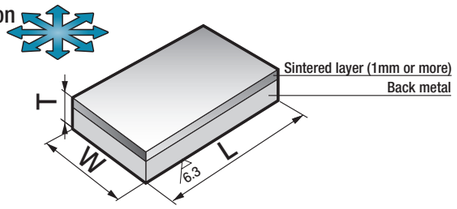
RoHS2 ELV Lead Free



Specify Part No. by required width, length, and thickness.
(e.g.) With is 100mm, length is 200mm, and thickness is 15mm.

CWI - 10020015
Part No.

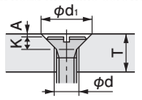
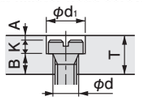
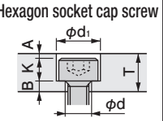
Motion direction



- For additional machining, cutting or drilling to your required dimension.
- Machine the back metal side to adjust the thickness.
- Oil impregnation is necessary by referring to the oil impregnation method, page 250 when you machined the plate.

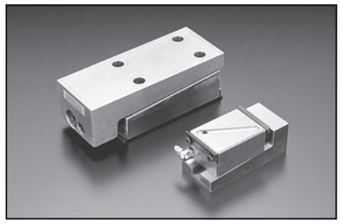
Part No.	Width	Length	Thickness	
	W	L	T	Tolerance
CWI-504806	50	480	6	±0.02
CWI-504808	50	480	8	±0.02
CWI-10020010	100	200	10	±0.02
CWI-4048010	40	480	10	±0.02
CWI-15048010	150	480	10	±0.02
CWI-10020012	100	200	12	±0.02
CWI-15048012	150	480	12	±0.02
CWI-10020015	100	200	15	±0.02
CWI-15048015	150	480	15	±0.02
CWI-12020020	120	200	20	±0.02
CWI-15025020	150	250	20	±0.02
CWI-15042020	150	420	20	±0.02
CWI-10015025	100	150	25	±0.02
CWI-15025025	150	250	25	±0.02
CWI-15025030	150	250	30	±0.02

● Following table indicates mating dimensions used for application of general screws and bolts.

Type		Plate thickness T							
		6	8	10	12	15	20	25	30
Flat head machine screws 	M	M8	M10	M10	—	—	—	—	—
	A	1	1	1.5	—	—	—	—	—
	d	10	12	12	—	—	—	—	—
	d1	19.3	22	23	—	—	—	—	—
	K	4.65	5.0	5.0	—	—	—	—	—
Flat fillister head screw 	M	M5	M6	M8	—	—	—	—	—
	A	0.7	1.6	1.8	—	—	—	—	—
	d	5.5	6.6	9	—	—	—	—	—
	d1	10	12	16	—	—	—	—	—
	B	2	2.5	3	—	—	—	—	—
Hexagon socket cap screw 	M	—	M5	M6(10)	M8(10)	M10	M12	M16	M20
	A	—	1	1.5(1.2)	1(2.7)	1.5	1.5	1.5	1.5
	d	—	5.5	6.7(11)	9(11)	11	14	18	22
	d1	—	9.5	11 (18)	15(18)	17.5	20	26	32
	B	—	2	2.5(2.5)	3(3)	3.5	6.5	7.5	8.5

※The values in parentheses are applicable when exclusive low-head bolt LHS-M1020 are used.
※The sink dimension (A) does not conform to JIS Standard, since these are sliding materials.

Oiles Shoe Units Unit bearings



The Oiles Shoe Units are unit bearings developed as shoe units of movable platens for injection molding machines.

RoHS2 ELV Lead Free

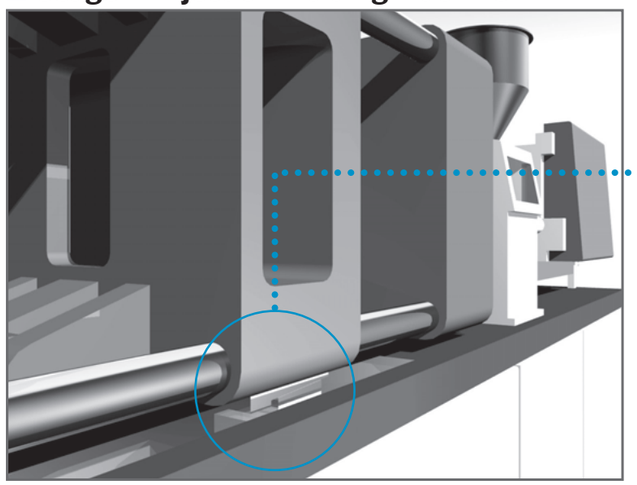
Feature

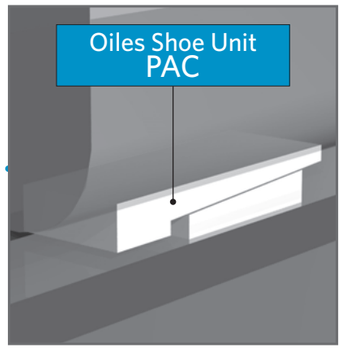
- Usable as not only movable platens but also various types of shims and spacers.
- The sliding material is made of Oiles 2000 featuring superior wear resistance.
- The slide seals are attached to the slide plates, eliminating troublesome adjustment of the slide seals after height adjustment.
- The height is adjustable in ±0.25 to ±0.7 mm range.

Part No.	Height-adjustable range (mm)	Sliding surface length (mm)	Sliding area (cm²)	Load (Note) (N/2pc) {kgf/2pc}	Assumed mold clamping force (kN) {ton}
PAC30-90	±0.25	55	16.5	6,470 { 660}	830 or less { 85 or less}
PAC40-100	±0.35	55	22	8,630 { 880}	830～ 980 { 85～ 100}
PAC50-150	±0.35	100	50	19,600 { 2,000}	980～ 2,450 {100～ 250}
PAC60-160	±0.35	110	66	25,900 { 2,640}	2,450～ 3,920 {250～ 400}
PAC75-180	±0.35	130	97.5	38,200 { 3,900}	3,920～ 5,880 {400～ 600}
PAC100-250	±0.7	250	250	98,100 {10,000}	5,880～ 7,850 {600～ 800}
PAC125-250	±0.7	250	312.5	122,600 {12,500}	7,840～12,750 {800～1,300}
PAC150-300	±0.7	300	450	176,500 {18,000}	15,690 or less {1,600 or less}

(Note) Load is based on the design surface pressure of 1.96N/mm² {20kgf/cm²}.

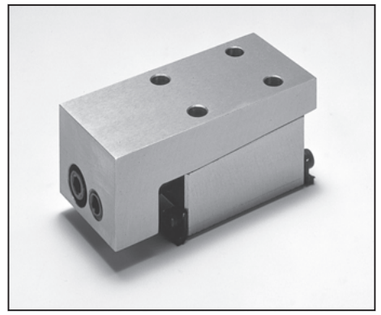
Usage in Injection molding machine.





PAC Oiles Shoe Units

RoHS2 ELV Lead Free



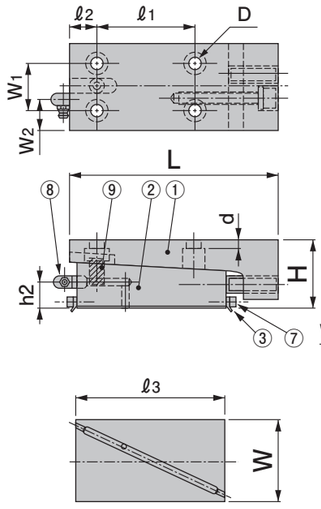
Specify Part No. by required size.
(e.g.) Width is 50mm.

PAC 50 - 150
Part No.

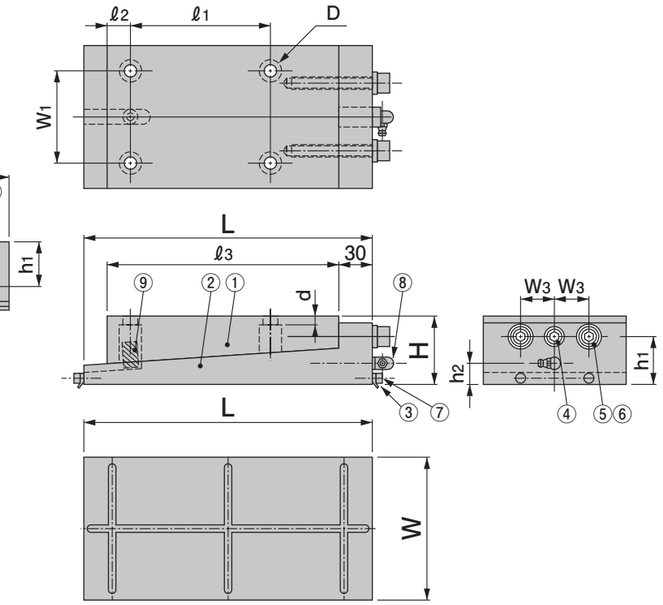
	Part name	Material
①	Table	SS400
②	Slide plate	2000
③	Slide seal*	NBR+SPCC
④	Adjustable push bolt	SCM435
⑤	Adjustable pull bolt	SCM435
⑥	Spring washers	SCM435
⑦	Set screw for seal*	SCM435
⑧	Grease nipple	S15C(C-PT1/8)
⑨	Spring pin	S60CM

※PAC30-90 does not have a slide seal and set screw for seal.

W=30、40、50、60、75



W=100、125、150



Part No.	Width W	Length L	Height H	D	W1	W2	W3	ℓ1	ℓ2	ℓ3	h1	h2	d	Adjustable bolts ④	Adjustable bolts ⑤
PAC30-90	30	80	30	(M6)	15	6.5	13	25	30	55	20.5	7.5	4.5	M 8×25	M 6×35
PAC40-100	40	90	40	(M6)	25	8	13	35	15	55	23.5	18	5	M10×30	M 6×40
PAC50-150	50	140	45	(M8)	30	15	16	65	20	100	28	20	5	M12×35	M 8×50
PAC60-160	60	150	50	(M10)	35	20	17	70	20	110	32	20	6	M12×35	M 8×50
PAC75-180	75	170	50	(M10)	45	25	17	85	25	130	33	20	6	M12×35	M 8×50
PAC100-250	100	250	60	(M12)	60	—	25	120	20	200	43	20	10	M16×40	M10×70
PAC125-250	125	250	60	(M12)	80	—	30	120	20	200	43	20	10	M16×40	M10×70
PAC150-300	150	300	70	(M16)	100	—	40	120	40	250	50	20	10	M20×40	M12×70

Oiles 2000S

Sintered oil-impregnated bearings with dispersed solid lubricant

RoHS2 ELV Lead Free

Feature

- Serviceable without the need for lubrication. Demonstrates higher performance when greased.
- Distributed solid lubricant allows motions in any direction.
- Features low coefficient of friction and quite superior wear resistance.
- Lower prices than bearings with copper alloy bases.

Service range

Lubrication condition	Dry (initial greasing recommended)
Service temperature range ℃	−40～+120
Allowable max. pressure P N/mm² {kgf/cm²}	29 (49) {296 (500)}
Allowable max. velocity V m/s {m/min}	1.00 {60}
Allowable max. PV value N/mm²・m/s {kgf/cm²・m/min}	1.63 {1,000}

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]).

Mechanical properties

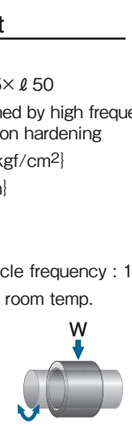
Density	——	g/cm³	5.7
Radial crushing strength	JIS Z 2507	N/mm² {kgf/mm²}	350 {36}
Hardness	JIS K 7202-2	HRM	90
Oil impregnation rate	——	vol%	16
Co-efficient of thermal expansion	——	×10⁻⁵ ℃⁻¹	1.2

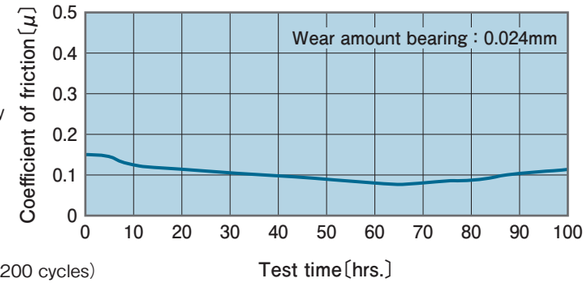
※The value shown above are for sintered layer.

Test data

Journal oscillation test

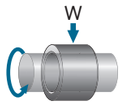
<Testing conditions>
Bearing dimension : φ60×φ75× ℓ 50
Mating material : S45C quenched by high frequency induction hardening
Pressure : 24.5N/mm² {250.0kgf/cm²}
Velocity : 0.033m/s {2.0m/min}
Oscillating cycle : 21.2cpm
Oscillating angle : ±45°
Test time : 100hrs. (durable cycle frequency : 127,200 cycles)
Ambience : in the atmosphere, room temp.
Lubrication : initial greasing

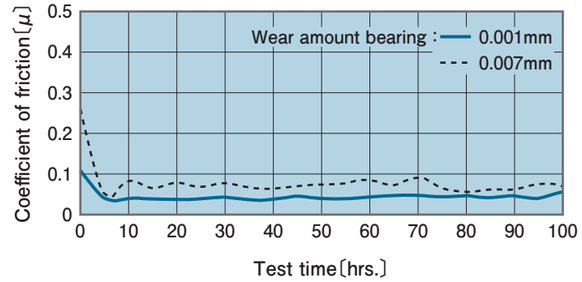




Journal rotation test

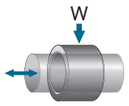
<Testing conditions>
Bearing dimension : φ40×φ50× ℓ 30
Mating material : S45C quenched by high frequency induction hardening
Test time : 100hrs.
Ambience : in the atmosphere, room temp.
Pressure : —— 9.8N/mm² {100.0kgf/cm²}
Velocity 0.167m/s {10.0m/min}
Lubrication Initial greasing
---- 19.6N/mm² {200.0kgf/cm²}
0.083m/s {5.0m/min}
Dry

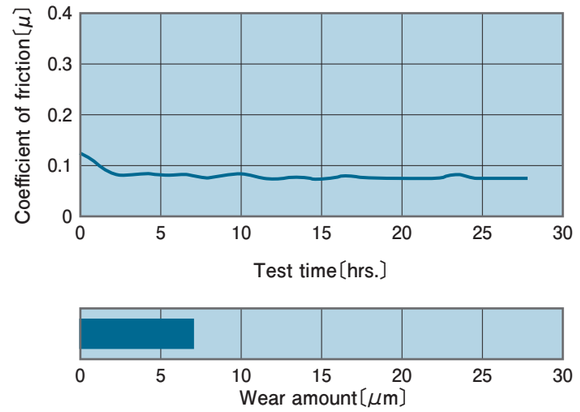




Receprocation test

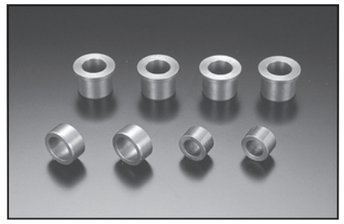
<Testing conditions>
Mating material : SCM440 hard-chrome plating
Pressure : 1.18N/mm² {12.0kgf/cm²}
Velocity : 1m/s {60m/min}
Test time : 27.8hrs.
Lubrication : Initial greasing





Oiles Cermet M

Sintered bearings with dispersed solid lubricant



RoHS2 ELV Lead Free

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 K 7202-2	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}

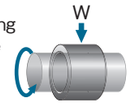
Velocity : 0.17m/s{10.0m/min}

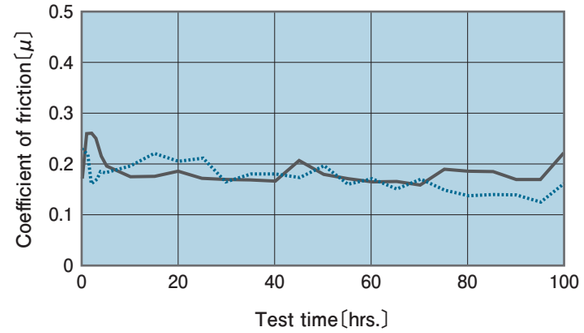
Test time : 100hrs.

Finishing method

Test piece after sizing

Machined test piece





Oil impregnation method

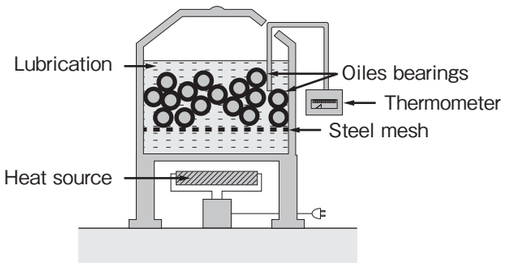
Oil impregnation is required for oil-containing OILES bearings such as Oiles Cermet M. If you purchase tube or bar stocks, please follow the procedure below to impregnate finished products with lubrication oil before installation.

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.

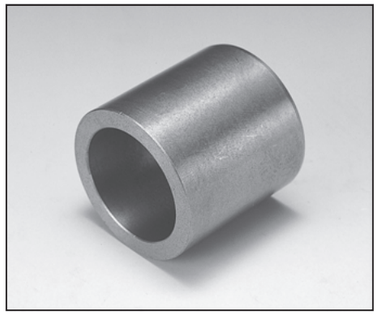


Selectoin of lubrication oil

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

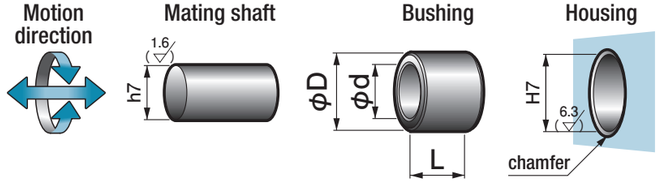
54B Oiles Cermet M Bushings

RoHS2 ELV Lead Free

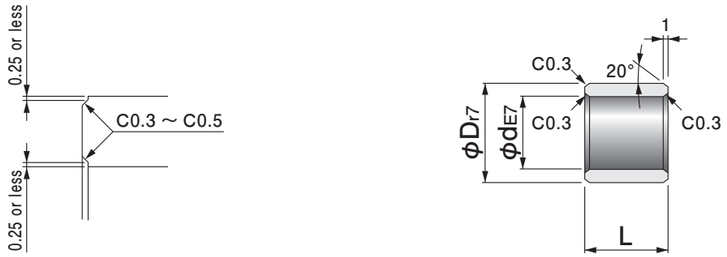


Specify Part No. by required I.D., O.D., and Length.
(e.g.) I.D. is 12mm, O.D. is 18mm, and length is 10mm.

54B - 121810
Part No.



● Some chamfering dimensions may differ from the shown dimension.



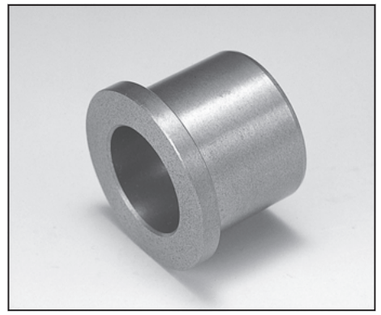
I.D.		O.D.		Length L Tolerance $^{-0.1}_{-0.3}$											I.D. tolerance after press fitting (reference)
φd	Tolerance	φD	Tolerance	3	4	5	6	8	10	15	20	25	30	40	
3	+0.024 +0.014	6	+0.027 +0.015	030603		030605									+0.017 +0.007
4	+0.032 +0.020	7	+0.034 +0.019		040704	040705	040706								+0.023 +0.011
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.

⚠ The dimensional tolerances are the values measured at +25℃.

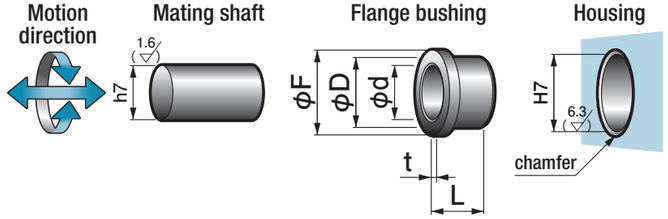
54F Oiles Cermet M Flange Bushings

RoHS2 ELV Lead Free

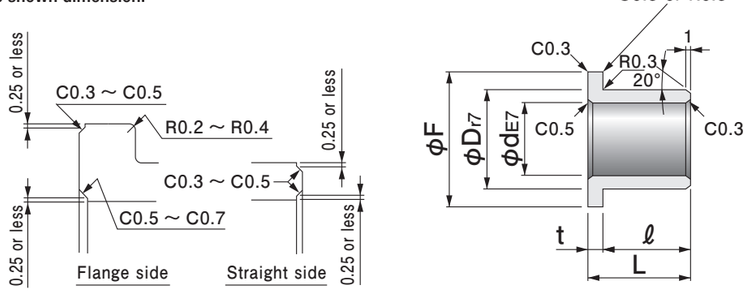


Specify Part No. by required I.D. and Length.
(e.g.) I.D. is 12mm and length is 12mm.

54F - 1212
Part No.



● Some chamfering dimensions may differ from the shown dimension.



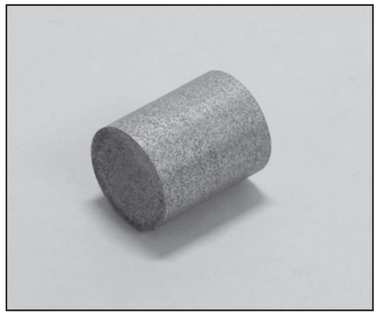
Part No.	I.D.		O.D.		Flange				Length			I.D. tolerance after press fitting (reference)
	φd	Tolerance	φD	Tolerance	φF	Tolerance	t	Tolerance	L	Tolerance	ℓ	
54F-0303	3	+0.024 +0.014	6	+0.027 +0.015	9	0 −0.2	1.5	0 −0.2	4.5	0 −0.4	3	+0.017 +0.007
54F-0404	4	+0.032 +0.020	7	+0.034 +0.019	10	0 −0.2	1.5	0 −0.2	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.

⚠ The dimensional tolerances are the values measured at +25℃.

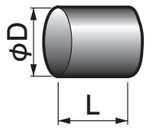
54M Oiles Cermet M Bar Stock

RoHS2 ELV Lead Free



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

54M - 2126
Part No.

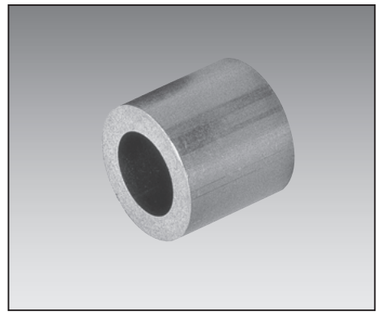


● Oil impregnation is necessary by referring to the oil impregnation method, page 250 when you machined the plate.

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

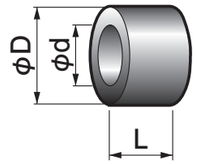
54S Oiles Cermet M Bushing Material

RoHS2 ELV Lead Free



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.

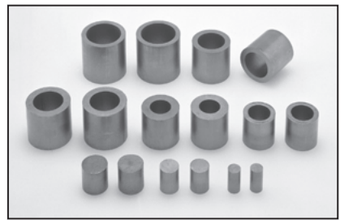


● Oil impregnation is necessary by referring to the oil impregnation method, page 250 when you machined the plate.

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

Oiles Cermet G

Sintered bearings with dispersed solid lubricant



RoHS2 ELV Lead Free

Feature

- Serviceable without the need for lubrication.
- Features superior heat resistance.
- Demonstrates superior performance in hot and hard-to-lubricate positions.
- Materials for machining are available.

Service range

Lubrication condition	Dry	periodic lubrication
Service temperature range ℃	−40～+250	−40～+150
Allowable max. pressure P N/mm² {kgf/cm²}	10 {102}	
Allowable max. velocity V m/s {m/min}	0.50 {30}	0.85 {51}
Allowable max. PV value N/mm²・m/s {kgf/cm²・m/min}	0.86 {490}	1.65 {1,010}

Mechanical properties

Density	——	g/cm³	6.4
Radial crushing strength	JIS Z 2507	N/mm² {kgf/mm²}	137 {14}
Hardness	JIS K 7202-2	HRM	43
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	2.0

※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

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.

●About the material for machining

Although it is not oil-bearing material, it can be used as-is without lubrication.

By applying an oil-bearing process or grease after machining, the reduction of wear and extension of life can be achieved.

Test data

Thrast test

<Testing conditions>

Bearing dimension : φ16×φ28×ℓ15

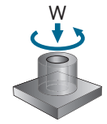
Mating material : 0.49N/mm²{5.0kgf/cm²}

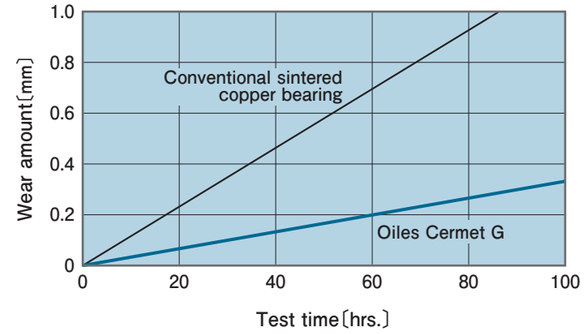
Velocity : 0.033m/s{2.0m/min}

Ambience : 300℃

Test time : 100hrs.

Lubrication : dry





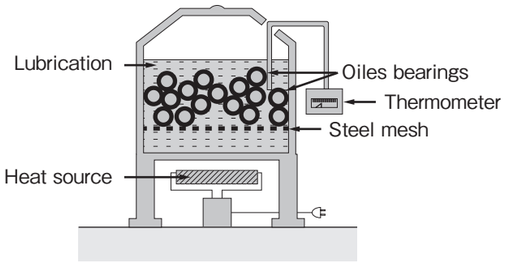
Oil impregnation method

When you oil-impregnate Cemet G, 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.

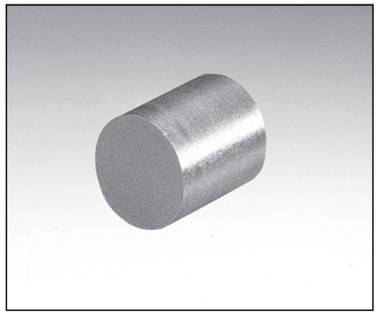


Selectoin of lubrication oil

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

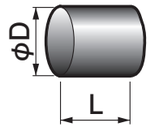
55M Oiles Cermet G Bar Stock

RoHS2 ELV Lead Free



Specify Part No. by required diameter.
(e.g.) Diameter is 18mm.

55M - 18
Part No.

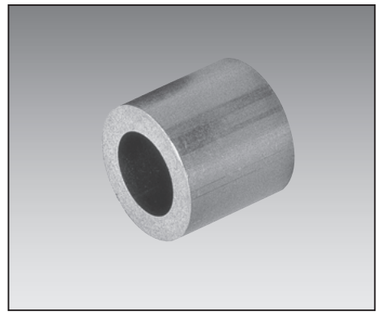


● Please refer to page 256 for the method for oil-bearing treatment.

Part No.	Diameter		Length	
	φD	Tolerance	L	Tolerance
55M-11	11	+0.8 0	21	+3.0 0
55M-15	15	+0.8 0	31	+3.0 0
55M-18	18	+0.8 0	21	+3.0 0
55M-23	23	+0.8 0	31	+3.0 0
55M-31	31	+0.8 0	31	+3.0 0

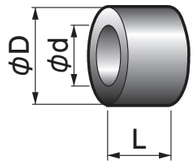
55S Oiles Cermet G Bushing Material

RoHS2 ELV Lead Free



Specify Part No. by required I.D., O.D., and Length.
(e.g.) I.D. is 44mm, O.D. is 56mm, and length is 51mm.

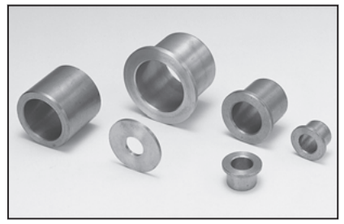
55S - 445651
Part No.



● Please refer to page 256 for the method for oil-bearing treatment.

Part No.	I.D.		O.D.		Length	
	φd	Tolerance	φD	Tolerance	L	Tolerance
55S-193126	19	+0.3 −0.5	31	+0.3 −0.5	26	+3.0 0
55S-243631	24	+0.3 −0.5	36	+0.3 −0.5	31	+3.0 0
55S-284846	28	0 −1.2	48	+1.2 0	46	+3.0 0
55S-294141	29	+0.3 −0.5	41	+0.3 −0.5	41	+4.0 0
55S-344641	34	+0.3 −0.5	46	+0.3 −0.5	41	+4.0 0
55S-345151	34	0 −1.2	51	+1.2 0	51	+4.0 0
55S-395651	39	+0.3 −0.5	56	+1.2 0	51	+4.0 0
55S-445651	44	+0.3 −0.5	56	+1.2 0	51	+4.0 0
55S-496661	49	0 −1.2	66	+1.2 0	61	+4.0 0
55S-517361	51	0 −1.2	73	+1.2 0	61	+4.0 0
55S-547661	54	0 −1.2	76	+1.2 0	61	+4.0 0
55S-568161	56	0 −1.2	81	+1.2 0	61	+4.0 0

Oiles 300 Oil-impregnated expanded cast iron bearings



RoHS2 ELV Lead Free

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 ℃	−40～+100	−40～+150
Allowable max. pressure P N/mm² {kgf/cm²}	10 {102}	
Allowable max. velocity V m/s {m/min}	1.00 {60}	3.35 {201}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.25 {765}	3.25 {1,990}

Mechanical properties

Density	——	g/cm³	6.8
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	98 {10}
Compressive strength	——	N/mm² {kgf/mm²}	294 {30}
Impact strength	JIS Z 2242	J/cm² {kgfm/cm²}	2 {0.2}
Hardness	JIS Z 2246	HS	20
Modulus of longitudinal elasticity	——	N/mm² {kgf/mm²}	58,000 {6,000}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	1.1
Thermal conductivity	——	W/m℃ {cal/sec℃cm}	50.2 {0.12}

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

Lathe turning

Cutting tool	carbide tool (JIS)	
	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

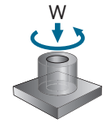
Mating material : S55C (surface roughness Rz1.5μm)

Pressure : initial contact pressure
0.99N/mm² {10.1kgf/cm²}
0.87N/mm² {8.9kgf/cm²} is
inclementally loaded every 5 minutes

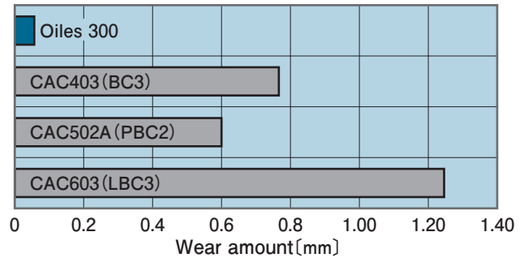
Final contact pressure : 20.2N/mm² {206.0kgf/cm²}

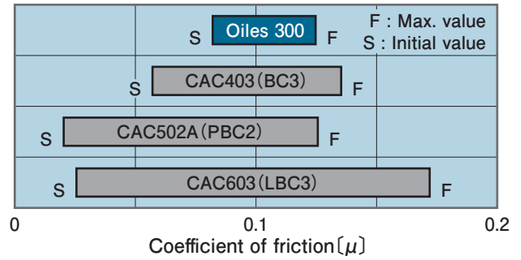
Velocity : 0.162m/s {9.7m/min}

Lubrication : in oil



Load resistance test / Final contact pressure : 20.2N/mm² {206.0kgf/cm²}





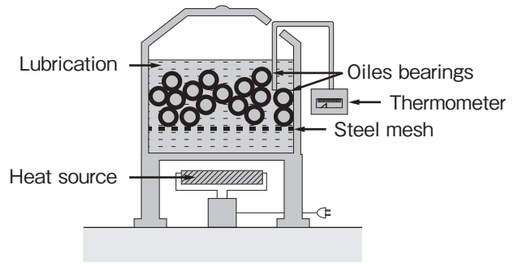
Oil impregnation method

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 ℃ 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.

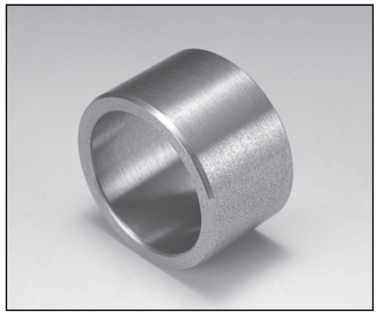


Selectoin of lubrication oil

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

30B Oiles 300 Bushings (Thin wall)

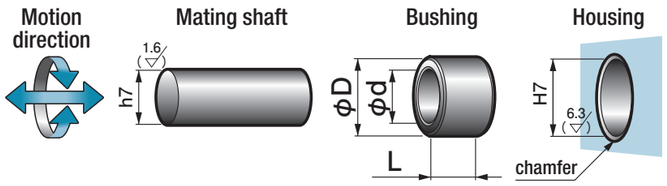
RoHS2 ELV Lead Free

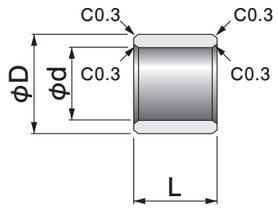


● Use Oiles 300 in lubrication oil or with periodic lubrication.

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.





I.D.		O.D.		Length L Tolerance $^{0}_{-0.2}$								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℃.

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.

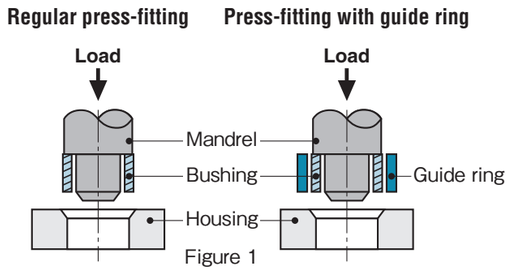


Figure 1

The dimension of mandrel should be calculated from table below.

Dimension of bushing		Dimension of mandrel
I.D.	D0	d0=D0−(0.05 to 0.10)
O.D.	D1	d1=D1−(0.20 to 0.30)
Length	L	ℓ ≧L

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	D1+(0.1 to 0.3)	D1+(10 to 15)

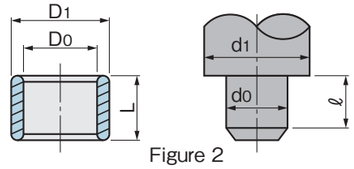
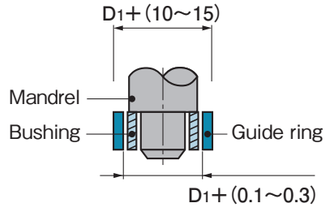


Figure 2



Housing chamfer

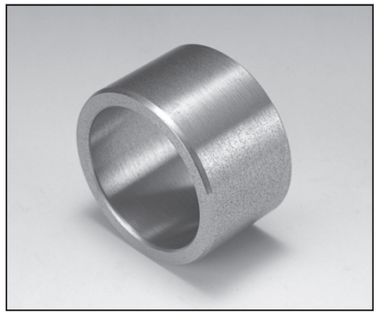
For the housing chamfer, either a round chamfer or a tapered chamfer is recommended. In case of a C-surface chamfer, (more than C1.0) make sure there is no burr. Smoother press-fitting is possible by applying small amount of grease or lubricant.

Press-fit force

Press-fit smoothly with hydralic (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.

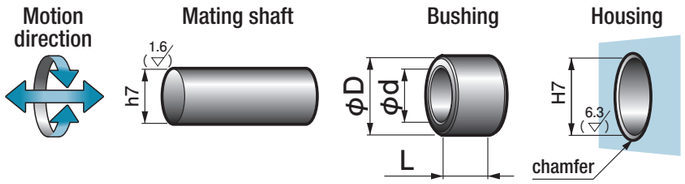
30B Oiles 300 Bushings

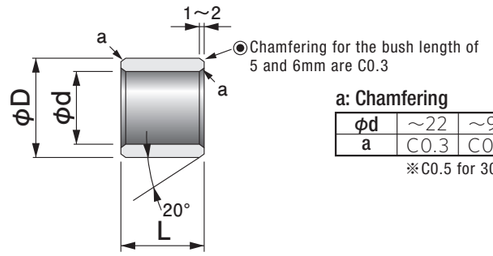
RoHS2 ELV Lead Free



Specify Part No. by required I.D., O.D., and Length.
(e.g.) I.D. is 25mm, O.D. is 37mm, and length is 20mm.

30B - 253720
Part No.





◉Chamfering for the bush length of 5 and 6mm are C0.3

a: Chamfering

φd	~22	~95	100
a	C0.3	C0.5	C1※ (mm)

※C0.5 for 30B-10012080

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

I.D. φd	Tolerance	O.D. φD	Tolerance	Length L Tolerance $^{0}_{-0.2}$ 5	6	8	10	12	15	16	20	25	30	35	40	50	I.D. tolerance after press fitting (reference)
5	+0.058 +0.040	8	+0.034 +0.019	050805	050806	050808											+0.030 +0.012
6	+0.058 +0.040	10	+0.034 +0.019	061005	061006	061008	061010										+0.030 +0.012
8	+0.068 +0.046	12	+0.041 +0.023		081206	081208	081210	081212	081215								+0.034 +0.012
10	+0.068 +0.046	14	+0.041 +0.023		101406	101408	101410	101412	101415		101420						+0.034 +0.012
10	+0.068 +0.046	16	+0.041 +0.023		101606	101608	101610	101612	101615		101620						+0.045 +0.023
10	+0.068 +0.046	18	+0.041 +0.023			101808	101810	101812	101815		101820						+0.045 +0.023
12	+0.068 +0.041	18	+0.041 +0.023			121808	121810	121812	121815	121816	121820	121825					+0.045 +0.018
12	+0.068 +0.041	20	+0.049 +0.028				122010	122012	122015		122020	122025					+0.040 +0.013
14	+0.068 +0.041	20	+0.049 +0.028				142010	142012	142015		142020	142025					+0.040 +0.013
14	+0.068 +0.041	22	+0.049 +0.028				142210	142212	142215		142220	142225					+0.040 +0.013
15	+0.068 +0.041	22	+0.049 +0.028						152215	152216	152220	152225					+0.040 +0.013
16	+0.068 +0.041	22	+0.049 +0.028						162215	162216	162220	162225	162230	162235			+0.040 +0.013
16	+0.068 +0.041	25	+0.049 +0.028						162515		162520	162525	162530				+0.040 +0.013
18	+0.068 +0.041	25	+0.049 +0.028						182515		182520	182525	182530				+0.040 +0.013
18	+0.068 +0.041	28	+0.049 +0.028						182815		182820	182825	182830				+0.040 +0.013
20	+0.088 +0.055	28	+0.049 +0.028						202815	202816	202820	202825	202830	202835	202840		+0.060 +0.027
20	+0.088 +0.055	30	+0.049 +0.028								203020	203025	203030	203035	203040		+0.060 +0.027
22	+0.088 +0.055	30	+0.049 +0.028								223020	223025	223030		223040		+0.060 +0.027
22	+0.088 +0.055	32	+0.059 +0.034								223220	223225	223230		223240		+0.054 +0.021
25	+0.088 +0.055	33	+0.059 +0.034							253316	253320	253325	253330		253340	253350	+0.054 +0.021
25	+0.088 +0.055	35	+0.059 +0.034								253520	253525	253530	253535	253540	253550	+0.054 +0.021
25	+0.088 +0.055	37	+0.059 +0.034								253720		253730		253740		+0.054 +0.021
28	+0.088 +0.055	38	+0.059 +0.034									283825			283840		+0.054 +0.021
28	+0.088 +0.055	40	+0.059 +0.034									284025			284040		+0.054 +0.021
30	+0.088 +0.055	38	+0.059 +0.034								303820	303825	303830		303840	303850	+0.054 +0.021
30	+0.088 +0.055	40	+0.059 +0.034								304020	304025	304030	304035	304040	304050	+0.054 +0.021
30	+0.088 +0.055	42	+0.059 +0.034									304225	304230		304240		+0.054 +0.021
32	+0.112 +0.073	42	+0.059 +0.034										324230		324240		+0.078 +0.039
32	+0.112 +0.073	45	+0.059 +0.034										324530		324540		+0.078 +0.039

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

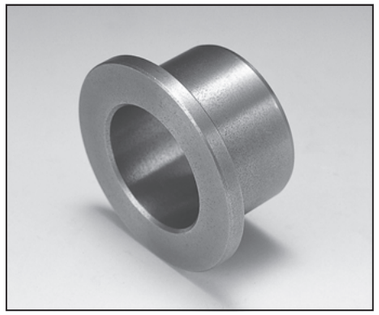
⚠ The dimensional tolerances are the values measured at +25℃.

I.D. φd	Tolerance	O.D. φD	Tolerance	Length L $^{0}_{-0.2}$ 30	40	50	60	Length L $^{0}_{-0.4}$ 80	100	120	I.D. tolerance after press fitting (reference)
35	+0.112 +0.073	45	+0.059 +0.034	354530	354540	354550					+0.078 +0.039
35	+0.112 +0.073	48	+0.059 +0.034	354830	354840	354850					+0.078 +0.039
40	+0.112 +0.073	50	+0.059 +0.034	405030	405040	405050					+0.078 +0.039
40	+0.112 +0.073	55	+0.073 +0.041	405530	405540	405550					+0.070 +0.031
45	+0.112 +0.073	55	+0.073 +0.041		455540	455550					+0.070 +0.031
45	+0.112 +0.073	60	+0.073 +0.041		456040	456050					+0.070 +0.031
50	+0.112 +0.073	60	+0.073 +0.041		506040	506050	506060				+0.070 +0.031
50	+0.112 +0.073	65	+0.073 +0.041		506540	506550	506560				+0.070 +0.031
55	+0.144 +0.098	70	+0.073 +0.041			557050	557060				+0.102 +0.056
55	+0.144 +0.098	75	+0.073 +0.041			557550	557560				+0.102 +0.056
60	+0.144 +0.098	75	+0.073 +0.041			607550	607560	607580			+0.102 +0.056
60	+0.144 +0.098	80	+0.073 +0.041			608050	608060	608080			+0.102 +0.056
65	+0.144 +0.098	80	+0.073 +0.041				658060	658080			+0.102 +0.056
65	+0.144 +0.098	85	+0.089 +0.051				658560	658580			+0.092 +0.046
70	+0.144 +0.098	85	+0.089 +0.051				708560	708580			+0.092 +0.046
70	+0.144 +0.098	90	+0.089 +0.051				709060	709080			+0.092 +0.046
75	+0.144 +0.098	90	+0.089 +0.051				759060	759080			+0.092 +0.046
75	+0.144 +0.098	95	+0.089 +0.051				759560	759580			+0.092 +0.046
80	+0.144 +0.098	95	+0.089 +0.051				809560	809580	8095100		+0.092 +0.046
80	+0.144 +0.098	100	+0.089 +0.051				8010060	8010080	80100100		+0.092 +0.046
85	+0.188 +0.134	100	+0.089 +0.051					8510080	85100100		+0.136 +0.082
85	+0.188 +0.134	105	+0.089 +0.051					8510580	85105100		+0.136 +0.082
90	+0.188 +0.134	110	+0.089 +0.051					9011080	90110100		+0.136 +0.082
90	+0.188 +0.134	115	+0.089 +0.051					9011580	90115100		+0.136 +0.082
95	+0.188 +0.134	115	+0.089 +0.051					9511580	95115100		+0.136 +0.082
95	+0.188 +0.134	120	+0.089 +0.051					9512080	95120100		+0.136 +0.082
100	+0.188 +0.134	120	+0.089 +0.051					10012080	100120100	100120120	+0.136 +0.082
100	+0.188 +0.134	125	+0.108 +0.063					10012580	100125100	100125120	+0.123 +0.069

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

30F Oiles 300 Flange Bushings

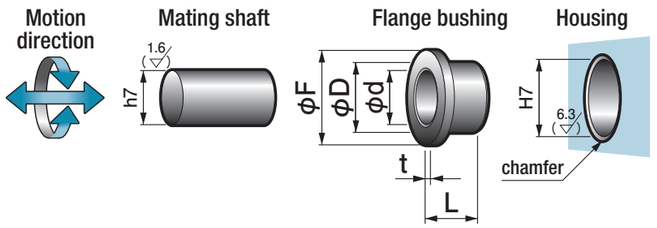
RoHS2 ELV Lead Free

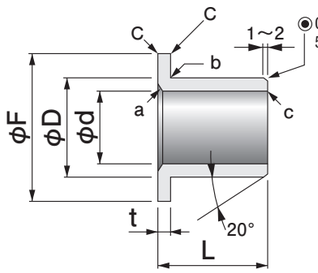


- Use Oiles 300 in lubrication oil or with periodic lubrication.

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

30F - 3040
Part No.





◉Chamfering for the bush length of 5 and 6mm are C0.3

a b c: Chamfering (mm)

ϕd	~22	~50	~60
a	C0.5	C1	C1.5

ϕd	~22	~50	~60
b	R0.3	R0.5	R1

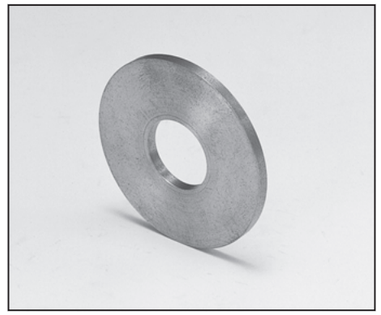
ϕd	~22	~60
c	C0.3	C0.5

I.D.		O.D.		Flange				Length L Tolerance $_{-0.3}^{0}$											I.D. tolerance after press fitting (reference)
ϕd	Tolerance	ϕD	Tolerance	ϕF	Tolerance	t	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℃.

30W Oiles 300 Washers

RoHS2 ELV Lead Free

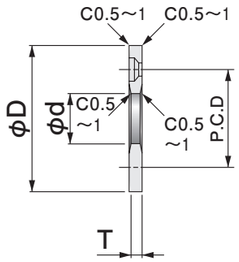


- Use Oiles 300 in lubrication oil or with periodic lubrication.
- Part no. with N at the end is no-hole type.

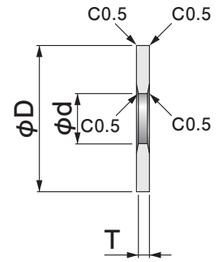
Specify Part No. by required I.D. and thickness.
(e.g.) I.D. is 18.2mm and thickness is 3mm.

30W - 1803
Part No.

Countersink type



No hole type



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

30M Oiles 300 Bar Stock

RoHS2 ELV Lead Free

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

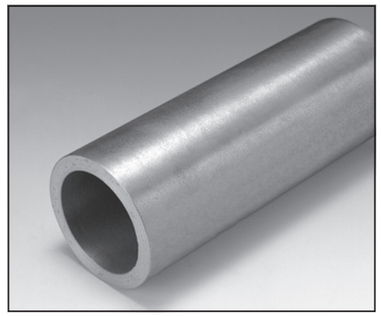
30M - 40
Part No.

- 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

RoHS2 ELV Lead Free



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〉

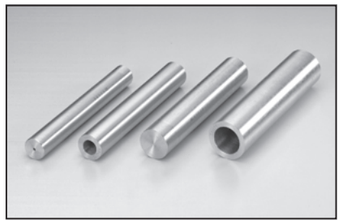
Part No.	I.D.		O.D.		Length	
	φd	Tolerance	φD	Tolerance	L	Tolerance
30S-3570	35	0 −1.0	70	+1.0 0	200	+3.0 0
30S-4075	40	0 −1.0	75	+1.0 0	200	+3.0 0
30S-4580	45	0 −1.0	80	+1.0 0	200	+3.0 0
30S-5090	50	0 −1.0	90	+1.0 0	200	+3.0 0
30S-55100	55	0 −1.0	100	+1.0 0	200	+3.0 0

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.

Oiles 600 Wear-resistant copper alloy bearings

RoHS2 ELV



Feature

- Demonstrates wear resistance and seizure resistance in lubricated conditions.
- Reduces the frequency of lubrication.
- Demonstrates especially high running-in characteristics.
- Materials for machining are available.

Service range

Lubrication condition	periodic lubrication	oil lubrication
Service temperature range ℃	−40～+150	
Allowable max. pressure P N/mm² {kgf/cm²}	15 {153}	
Allowable max. velocity V m/s {m/min}	1.65 {99}	5.00 {300}
Allowable max. PV value N/mm² · m/s {kgf/cm² · m/min}	1.65 {1,010}	3.25 {1,990}

Lathe turning

Cutting tool	carbide tool (JIS)	
	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

Mechanical properties

Density	——	g/cm³	8.5
Tensile strength	JIS Z 2241	N/mm² {kgf/mm²}	150 {15}
Impact strength	JIS Z 2242	J/cm² {kgfm/cm²}	10 {1}
Hardness	JIS Z 2243	HBW	60
Modulus of longitudinal elasticity	——	N/mm² {kgf/mm²}	83,000 {8,500}
Co-efficient of linear expansion	——	×10⁻⁵ ℃⁻¹	1.8
Thermal conductivity	——	W/m℃ {cal/sec℃cm}	71.1 {0.17}

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

Machining accuracy (bushing)

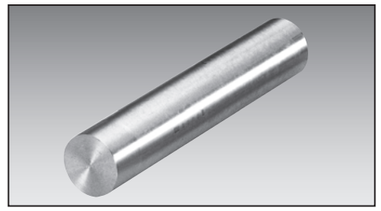
I.D.	O.D.	Length
class 7 to 8	class 6 to 7	class 8 to 9

Classes here are in JIS standard.

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

36M Oiles 600 Bar Stock

RoHS2 ELV



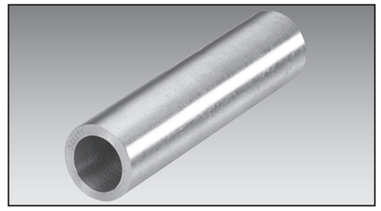
- Length and diameter shown here are rough finished dimensions.
- Need to be oil-impregnated before use.

Specify Part No. by required diameter.
(e.g.) Diameter is 36mm. **36M - 36** (Part No.)

Part No.	Diameter φD	Tolerance	Length L	Tolerance
36M-16	16	+0.5 0	202	+1.0 0
36M-21	21	+0.5 0	202	+1.0 0
36M-26	26	+0.5 0	202	+1.0 0
36M-31	31	+0.5 0	202	+1.0 0
36M-36	36	+0.5 0	202	+1.0 0
36M-41	41	+0.5 0	202	+1.0 0
36M-46	46	+0.5 0	202	+1.0 0
36M-51	51	+0.5 0	202	+1.0 0
36M-56	56	+0.5 0	202	+1.0 0
36M-61	61	+0.5 0	202	+1.0 0

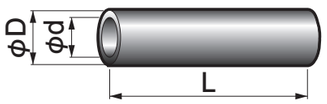
36S Oiles 600 Bushing Material

RoHS2 ELV



- Inner and outer diameter and Length shown here are rough finished dimensions.
- Need to be oil-impregnated before use.

Specify Part No. by required I.D. and O.D.
(e.g.) I.D. is 34mm and O.D. is 51mm. **36S - 3451** (Part No.)



Part No.	I.D. φd	Tolerance	O.D. φD	Tolerance	Length L	Tolerance
36S-1931	19	0 −0.5	31	+0.5 0	202	+1.0 0
36S-1936	19	0 −0.5	36	+0.5 0	202	+1.0 0
36S-2436	24	0 −0.5	36	+0.5 0	202	+1.0 0
36S-2941	29	0 −0.5	41	+0.5 0	202	+1.0 0
36S-2946	29	0 −0.5	46	+0.5 0	202	+1.0 0
36S-3446	34	0 −0.5	46	+0.5 0	202	+1.0 0
36S-3451	34	0 −0.5	51	+0.5 0	202	+1.0 0
36S-3951	39	0 −0.5	51	+0.5 0	202	+1.0 0
36S-3966	39	0 −0.5	66	+0.5 0	202	+1.0 0
36S-4456	44	0 −0.5	56	+0.5 0	202	+1.0 0
36S-4961	49	0 −0.5	61	+0.5 0	202	+1.0 0
36S-4971	49	0 −0.5	71	+0.5 0	202	+1.0 0
36S-5981	59	0 −0.5	81	+0.5 0	202	+1.0 0
36S-6986	69	0 −0.5	86	+0.5 0	202	+1.0 0