通过 **ISO9001:2000**
质量管理体系认证

HARDWARE®

JINTAI
SLIDE BEARING

湖南锦泰五金机电有限公司

Hunan Jintai Hardware and Machinery Co., LTD

JINTAI
SLIDE BEARING
INTRODUCTION

COMPANY & CERTIFICATES

Hunan Jintai Hardware and Machinery Co.,Ltd is a professional manufacturer on various kind of bearings in China for over 15 years.We are making all kinds of slide bearings including DU PTFE composit bushing, DX POM composite bushing,bimetal bushing,wrapped bronze bushing, cast sliding bushings and wear plate bearing pad, sintered bronze bushing and sintering parts, graphite bearing, etc.

The shapes of bearings can be in sleeve, flanged, spherical, plate, washer, pad, ring, square，etc.

Base materials in carbon steel, harden steel, iron, stainless steel, bronze, brass, copper, bronze-steel alloy.Lubricant materials in PTFE, teflon, POM, nylon, plastic, oil, graphite, grease, MoS2,etc.

◇ SF-1

◇ SF-1F

◇ SF-WD

◇ SF-2

◇ JF-800

◇ FB090

◇ FB092

◇ FB08G

◇ FB09G

◇ JDB

◇ FZ

◇ FD

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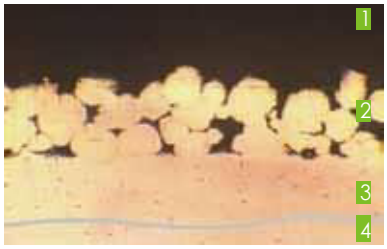
SF-1 自润滑卷制轴承
SF-1 Self-Lubricatin Bearin s

1. 聚四氟乙烯与铅 PTFE with Iead
2. 球形青铜粉 Porous bronze sintere
3. 钢背 Steel backing
4. 镀铜/锡层 Copper-plating/tin-plating



注：SF-1 系列产品还可根据不同工况条件选择不同的基体材料，如：青铜基板
（SF-1B）、不锈钢基板（SF-1S）、以及无铅（SF-1W）等配方产品。

Note: Various materials are suitable for SF-1 Series products according to different working conditions, such as bronze backing (SF-1B), stainless steel backing (SF-1S) and lead-free material (SF-1W)...

技术参数 Tech.Data

最大荷载 Max.Load	静承载 Static	250N/mm^2
	动承载 Dynamic	140N/mm^2
	摇摆运动 Oscillating	60N/mm^2
最大PV值 PV limit	干摩擦 Dry	3.6N/mm^2·m/s
	油润滑 Oil	50N/mm^2·m/s
使用温度 Temp.limit		-195℃~+280℃

摩擦系数 Friction Coeff.		0.03~0.20 μ
最大速率 Speed limit	干摩擦 Dry	2mm^2
	油润滑 Oil	5mm^2
导热系数 Thermal conductivity		2.41Kcal/M.br.c
热膨胀系数 Coeff. of linear expansion		27×10^{-6}per℃

SF-I 应用特点 Product characteristics

◎无油润滑或少油润滑，适用于无法加油或很难加油的场所，可在使用时不保养或少保养。

◎耐磨性能好，摩擦系数小，使用寿命长。

◎有适量的弹塑性，能将应力分布在较宽的接触面上，提高轴承的承载能力。

◎静动摩擦系数相近，能消除低速下的爬行，从而保证机械的工作精度。

◎能使机械减少振动、降低噪音，防止污染，改善劳动条件。

◎在运转过程中能形成转移膜，起到保护对磨轴的使用，无咬轴现象。

◎对磨轴的硬度要求低，未经调质处理的轴都可使用，从而降低了相关零件的加工难度。

◎薄壁结构、质量轻，可减小机械体积。

◎钢背面可电镀多种金属，可在腐蚀介质中使用；目前已广泛应用于各种机械的滑动部分，例如：印刷机、纺织机、烟草机械、微电机，汽车、摩托车与农林机械等等。

◎It may be used where no oil can be applied or oil is difficult to be applied.

◎It has the advantage of low wear, low friction and with long life.

Load will spread over a wider area due to the bearing material’ s elastic nature.

◎Low stick slip properties ensuring accuracy of machine operation under low sliding speeds.

◎Low vibration, low noise and non-pollution in operation.

◎PTFE and Lead film is transferred to the mating shaft to improve running properties.

◎It can be used in low harness of mating shaft, so the shafts processing is easy.

◎The machine will be compact because of the thin thickness and low weight of the bush.

◎Electro plating is possible to prevent corrosion. It is widely used in various sliding motions of different kind of machines such as textile machine, tobacco machines, hydraulic vehicles Automobiles, agriculture machines and so on.

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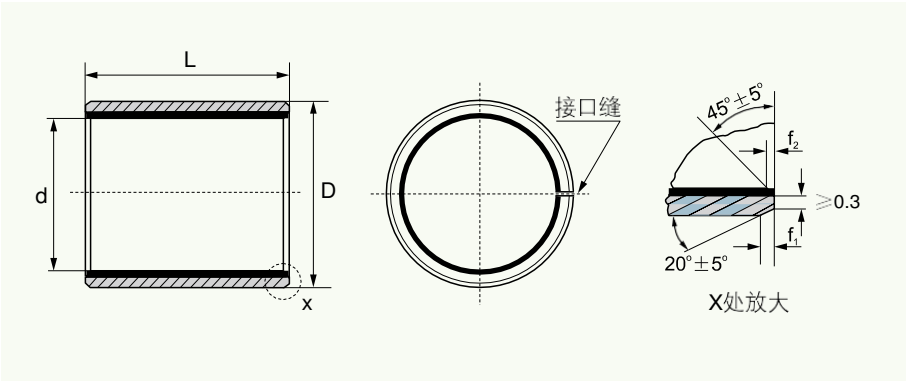
SF-1 自润滑卷制轴承标准公制尺寸
SF-1 Self-Lubricating Bearings Standard Metric Size



单位 Unit: mm

d	D	相配轴径 Shaft Dia. f_7	座孔 Housing H7	壁厚 Wall Thickness 最小 Min.	壁厚 Wall Thickness 最大 Max.	f_1	f_2	L $^{0}_{-0.40}$ 6	8	10	12	15	20	25	30	40	50
6	8	6 $^{-0.013}_{-0.028}$	8 $^{+0.015}$					0606	0608	0610							
8	10	8 $^{-0.013}_{-0.028}$	10 $^{+0.015}$					0806	0808	0810	0812	0815					
10	12	10 $^{-0.016}_{-0.034}$	12 $^{+0.018}$					1006	1008	1010	1012	1015	1020				
12	14	12 $^{-0.016}_{-0.034}$	14 $^{+0.018}$					1206	1208	1210	1212	1215	1220	1225			
13	15	13 $^{-0.016}_{-0.034}$	15 $^{+0.018}$	0.980	1.005	0.6	0.3			1310			1320				
14	16	14 $^{-0.016}_{-0.034}$	16 $^{+0.018}$							1410	1412	1415	1420	1425			
15	17	15 $^{-0.016}_{-0.034}$	17 $^{+0.018}$							1510	1512	1515	1520	1525			
16	18	16 $^{-0.016}_{-0.034}$	18 $^{+0.018}$							1610	1612	1615	1620	1625			
17	19	17 $^{-0.016}_{-0.034}$	19 $^{+0.021}$							1710	1712		1720				
18	20	18 $^{-0.016}_{-0.034}$	20 $^{+0.021}$							1810	1812	1815	1820	1825			
20	23	20 $^{-0.020}_{-0.041}$	23 $^{+0.021}$							2010	2012	2015	2020	2025	2030		
22	25	22 $^{-0.020}_{-0.041}$	25 $^{+0.021}$	1.475	1.505	0.6	0.4			2210	2212	2215	2220	2225	2230		
24	27	24 $^{-0.020}_{-0.041}$	27 $^{+0.021}$									2415	2420	2425	2430		
25	28	25 $^{-0.020}_{-0.041}$	28 $^{+0.021}$							2510	2512	2515	2520	2525	2530	2540	2550
28	32	28 $^{-0.020}_{-0.041}$	32 $^{+0.025}$									2815	2820	2825	2830	2840	
30	34	30 $^{-0.020}_{-0.041}$	34 $^{+0.025}$								3012	3015	3020	3025	3030	3040	
32	36	32 $^{-0.025}_{-0.050}$	36 $^{+0.025}$	1.970	2.005	1.2	0.4						3220		3230	3240	
35	39	35 $^{-0.025}_{-0.050}$	39 $^{+0.025}$								3512	3515	3520	3525	3530	3540	3550
38	42	38 $^{-0.025}_{-0.050}$	42 $^{+0.025}$									3815			3830	3840	
40	44	40 $^{-0.025}_{-0.050}$	44 $^{+0.025}$								4012		4020	4025	4030	4040	4050

注：孔径壁厚符合样本，宽度尺寸不在样本范围内客户提出要求，制造厂可定制加工。

Note: Bearing size besides above mentioned sizes, can be customized and produced. Customer please offer us the dimensions.

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SF-1 自润滑卷制轴承标准公制尺寸
SF-1 Self-Lubricating Bearings Standard Metric Size

单位Unit: mm

d	D	相配轴径 Shaft Dia. f_7	座孔 Housing H7	壁厚 Wall Thickness 最小 Min.	壁厚 Wall Thickness 最大 Max.	f_1	f_2	L $^{0}_{-0.40}$ 20	25	30	40	50	60	70	80	100	115
45	50	45 $^{-0.025}_{-0.050}$	50 $^{+0.025}$					4520	4525	4530	4540	4550					
50	55	50 $^{-0.025}_{-0.050}$	55 $^{+0.030}$					5020		5030	5040	5050	5060				
55	60	55 $^{-0.030}_{-0.060}$	60 $^{+0.030}$							5530	5540	5550	5560				
60	65	60 $^{-0.030}_{-0.060}$	65 $^{+0.030}$	2.460	2.505	1.8	0.6			6030	6040	6050	6060	6070			
65	70	65 $^{-0.030}_{-0.060}$	70 $^{+0.030}$							6530	6540	6550	6560	6570			
70	75	70 $^{-0.030}_{-0.060}$	75 $^{+0.030}$								7040	7050	7060	7070	7080		
75	80	75 $^{-0.030}$	80 $^{+0.030}$							7530	7540	7550	7560	7570	7580		
80	85	80 $^{-0.035}$	85 $^{+0.035}$								8040	8050	8060	8070	8080	80100	
85	90	85 $^{-0.035}$	90 $^{+0.035}$								8540		8560		8580	85100	
90	95	90 $^{-0.035}$	95 $^{+0.035}$								9040	9050	9060		9080	90100	
95	100	95 $^{-0.035}$	100 $^{+0.035}$	2.440	2.490	1.8	0.6					9550	9560		9580	95100	
100	105	100 $^{-0.035}$	105 $^{+0.035}$									10050	10060		10080		100115
105	110	105 $^{-0.035}$	110 $^{+0.035}$										10560		10580		105115
110	115	110 $^{-0.035}$	115 $^{+0.035}$										11060		11080		110115
120	125	120 $^{-0.035}$	125 $^{+0.040}$										12060		12080	120100	
125	130	125 $^{-0.040}$	130 $^{+0.040}$										12560			125100	125115
130	135	130 $^{-0.040}$	135 $^{+0.040}$	2.415	2.465	1.8	0.6						13060		13080	130100	
140	145	140 $^{-0.040}$	145 $^{+0.040}$										14060		14080	140100	
150	155	150 $^{-0.040}$	155 $^{+0.040}$										15060		15080	150100	
160	165	160 $^{-0.040}$	165 $^{+0.040}$										16060		16080	160100	160115
180	185	180 $^{-0.040}$	185 $^{+0.046}$												18080	180100	
190	195	190 $^{-0.046}$	195 $^{+0.046}$	2.415	2.465	1.8	0.6								19080	190100	
200	205	200 $^{-0.046}$	205 $^{+0.046}$												20080	200100	
220	225	220 $^{-0.046}$	225 $^{+0.046}$										20060		22080	220100	
250	255	250 $^{-0.046}$	255 $^{+0.052}$												25080	250100	
260	265	260 $^{-0.052}$	265 $^{+0.052}$	2.415	2.465	1.8	0.6								26080	260100	
280	285	280 $^{-0.052}$	285 $^{+0.052}$												28080	280100	
300	305	300 $^{-0.052}$	305 $^{+0.052}$														

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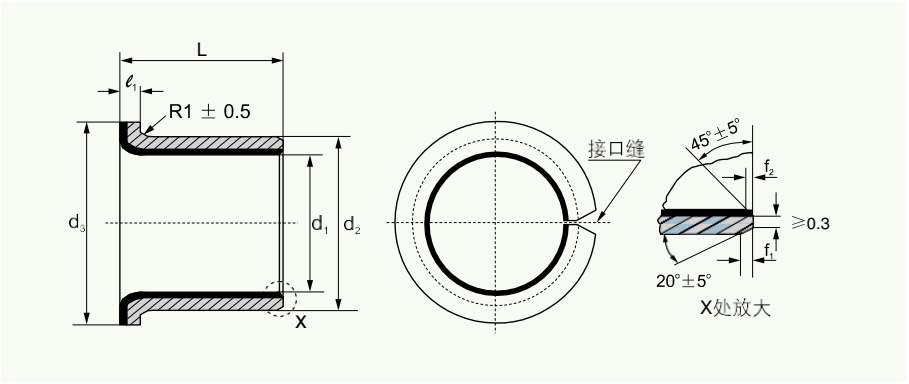
SF-1F 自润滑卷制翻边轴承标准公制尺寸
SF-1F Self-Lubricating Flanged Bearings Standard Metric Size



单位 Unit: mm

相配轴径 Shaft Dia. f_7	座孔 Housing H7	代号 Code number	尺寸 Size					f_1	f_2
			d_1	d_2	$d_3 \pm 0.5$	L ± 0.25	ℓ_1-0.2		
6 -0.013 -0.028	8 +0.015	06040	6	8	12	4	1	0.6	0.3
		06070				7			
8 -0.013 -0.028	10 +0.015	08055	8	10	15	5.5			
		08075				7.5			
10 -0.016 -0.034	12 +0.018	10070	10	12	18	7			
		10090				9			
		10120				12			
12 -0.016 -0.034	14 +0.018	12070	12	14	20	7			
		12090				9			
		12120				12			
14 -0.016 -0.043	16 +0.018	14120	14	16	22	12			
		14170				17			
15 -0.016 -0.034	17 +0.018	15090	15	17	23	9			
		15120				12			
		15170				17			
16 -0.016 -0.034	18 +0.018	16120	16	18	24	12			
		16170				17			
18 -0.016 -0.034	20 +0.021	18120	18	20	26	12			
		18170				17			
		18200				20			
20 -0.020 -0.041	23 +0.021	20115	20	23	30	11.5			
		20165				16.5			
		20215				21.5			
22 -0.020 -0.041	25 +0.021	22150	22	25	32	15	1.5	0.6	0.4
		22200				20			
25 -0.020 -0.041	28 +0.021	25115	25	28	35	11.5			
		25165				16.5			
		25215				21.5			
30 -0.025 -0.050	34 +0.025	30160	30	34	42	16			
		30260				26			
35 -0.025 -0.050	39 +0.025	35160	35	39	47	16	2	1.2	0.4
		35260				26			
40 -0.025 -0.050	44 +0.025	40260	40	44	53	26			
		40400				40			

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JINTAI SF-1 similar as KONTIMA AB Glidlager bussningar Smörjfria glidlager typ STEEL FRIMET stålstomme TFP - BRONZE FRIMET-B bronsstomme TFP-B - stainless steel rostfri stomme DRINOX,Washer Smörjfria brickor typ TFW, TFW-B DRIONX TFE

JINTAI SF-1 Bearing and KONTIMA Bearing Standard Metric Size

单位 Unit: mm

JINTAI CODE	d*D*L(mm)	KONTIMA CODE	JINTAI CODE	d*D*L(mm)	KONTIMA CODE
SF-1 0203	2x3.5x3	TFP 0203	SF-1 9530	95x100x30	TFP 9530
SF-1 0205	2x3.5x5	TFP 0205	SF-1 9540	95x100x40	TFP 9540
SF-1 0303	3x4.5x3	TFP 0303	SF-1 9550	95x100x50	TFP 9550
SF-1 0304	3x4.5x4	TFP 0304	SF-1 9560	95x100x60	TFP 9560
SF-1 0305	3x4.5x5	TFP 0305	SF-1 9570	95x100x70	TFP 9570
SF-1 0306	3x4.5x6	TFP 0306	SF-1 9580	95x100x80	TFP 9580
SF-1 0403	4x5.5x3	TFP 0403	SF-1 9590	95x100x90	TFP 9590
SF-1 0404	4x5.5x4	TFP 0404	SF-1 95100	95x100x100	TFP 95100
SF-1 0405	4x5.5x5	TFP 0405	SF-1 10030	100x105x30	TFP 10030
SF-1 0406	4x5.5x6	TFP 0406	SF-1 10040	100x105x40	TFP 10040
SF-1 0410	4x5.5x10	TFP 0410	SF-1 10050	100x105x50	TFP 10050
SF-1 0505	5x7x5	TFP 0505	SF-1 10060	100x105x60	TFP 10060
SF-1 0506	5x7x6	TFP 0506	SF-1 10070	100x105x70	TFP 10070
SF-1 0507	5x7x7	TFP 0507	SF-1 10080	100x105x80	TFP 10080
SF-1 0508	5x7x8	TFP 0508	SF-1 10090	100x105x90	TFP 10090
SF-1 0510	5x7x10	TFP 0510	SF-1 100100	100x105x100	TFP 100100
SF-1 0604	6x8x4	TFP 0604	SF-1 100115	100x105x115	TFP 100115
SF-1 0605	6x8x5	TFP 0605	SF-1 10550	105x110x50	TFP 10550
SF-1 0606	6x8x6	TFP 0606	SF-1 10560	105x110x60	TFP 10560
SF-1 0608	6x8x8	TFP 0608	SF-1 10570	105x110x70	TFP 10570
SF-1 0610	6x8x10	TFP 0610	SF-1 10580	105x110x80	TFP 10580
SF-1 0705	7x9x5	TFP 0705	SF-1 10590	105x110x90	TFP 10590
SF-1 0706	7x9x6	TFP 0706	SF-1 105100	105x110x100	TFP 105100
SF-1 0708	7x9x8	TFP 0708	SF-1 105115	105x110x115	TFP 105115
SF-1 0710	7x9x10	TFP 0710	SF-1 11050	110x115x50	TFP 11050
SF-1 0715	7x9x15	TFP 0715	SF-1 11060	110x115x60	TFP 11060
SF-1 0805	8x10x5	TFP 0805	SF-1 11070	110x115x70	TFP 11070
SF-1 0806	8x10x6	TFP 0806	SF-1 11080	110x115x80	TFP 11080
SF-1 0808	8x10x8	TFP 0808	SF-1 11090	110x115x90	TFP 11090
SF-1 0810	8x10x10	TFP 0810	SF-1 110100	110x115x100	TFP 110100
SF-1 0812	8x10x12	TFP 0812	SF-1 110115	110x115x115	TFP 110115
SF-1 0815	8x10x15	TFP 0815	SF-1 11550	115x120x50	TFP 11550
SF-1 0820	8x10x20	TFP 0820	SF-1 11560	115x120x60	TFP 11560
SF-1 0908	9x11x8	TFP 0908	SF-1 11570	115x120x70	TFP 11570
SF-1 0909	9x11x9	TFP 0909	SF-1 11580	115x120x80	TFP 11580
SF-1 0910	9x11x10	TFP 0910	SF-1 11590	115x120x90	TFP 11590
SF-1 1005	10x12x5	TFP 1005	SF-1 115100	115x120x100	TFP 115100
SF-1 1006	10x12x6	TFP 1006	SF-1 115115	115x120x115	TFP 115115
SF-1 1008	10x12x8	TFP 1008	SF-1 12050	120x125x50	TFP 12050
SF-1 1009	10x12x9	TFP 1009	SF-1 12060	120x125x60	TFP 12060
SF-1 1010	10x12x10	TFP 1010	SF-1 12070	120x125x70	TFP 12070
SF-1 1012	10x12x12	TFP 1012	SF-1 12080	120x125x80	TFP 12080
SF-1 1015	10x12x15	TFP 1015	SF-1 12090	120x125x90	TFP 12090
SF-1 1020	10x12x20	TFP 1020	SF-1 120100	120x125x100	TFP 120100
SF-1 1108	11x13x8	TFP 1108	SF-1 120120	120x125x120	TFP 120120
SF-1 1109	11x13x9	TFP 1109	SF-1 12550	125x130x50	TFP 12550
SF-1 1110	11x13x10	TFP 1110	SF-1 12560	125x130x60	TFP 12560
SF-1 1112	11x13x12	TFP 1112	SF-1 12570	125x130x70	TFP 12570
SF-1 1206	12x14x6	TFP 1206	SF-1 12580	125x130x80	TFP 12580
SF-1 1208	12x14x8	TFP 1208	SF-1 12590	125x130x90	TFP 12590
SF-1 1210	12x14x10	TFP 1210	SF-1 125100	125x130x100	TFP 125100
SF-1 1212	12x14x12	TFP 1212	SF-1 125115	125x130x115	TFP 125115
SF-1 1214	12x14x14	TFP 1214	SF-1 13060	130x135x60	TFP 13060
SF-1 1215	12x14x15	TFP 1215	SF-1 13070	130x135x70	TFP 13070
SF-1 1216	12x14x16	TFP 1216	SF-1 13080	130x135x80	TFP 13080
SF-1 1220	12x14x20	TFP 1220	SF-1 13090	130x135x90	TFP 13090
SF-1 1225	12x14x25	TFP 1225	SF-1 130100	130x135x100	TFP 130100
SF-1 1308	13x15x8	TFP 1308	SF-1 130120	130x135x120	TFP 130120
SF-1 1309	13x15x9	TFP 1309	SF-1 13560	135x140x60	TFP 13560
SF-1 1310	13x15x10	TFP 1310	SF-1 13570	135x140x70	TFP 13570
SF-1 1312	13x15x12	TFP 1312	SF-1 13580	135x140x80	TFP 13580
SF-1 1315	13x15x15	TFP 1315	SF-1 13590	135x140x90	TFP 13590
SF-1 1320	13x15x20	TFP 1320	SF-1 135100	135x140x100	TFP 135100
SF-1 1325	13x15x25	TFP 1325	SF-1 135120	135x140x120	TFP 135120
SF-1 1408	14x16x08	TFP 1408	SF-1 14060	140x145x60	TFP 14060
SF-1 1410	14x16x10	TFP 1410	SF-1 14070	140x145x70	TFP 14070
SF-1 1412	14x16x12	TFP 1412	SF-1 14080	140x145x80	TFP 14080
SF-1 1415	14x16x15	TFP 1415	SF-1 14090	140x145x90	TFP 14090
SF-1 1420	14x16x20	TFP 1420	SF-1 140100	140x145x100	TFP 140100

SF-1 1422	14x16x22	TFP 1422	SF-1 14560	145x150x60	TFP 14560
SF-1 1425	14x16x25	TFP 1425	SF-1 14570	145x150x70	TFP 14570
SF-1 1508	15x17x8	TFP 1508	SF-1 14580	145x150x80	TFP 14580
SF-1 1510	15x17x10	TFP 1510	SF-1 14590	145x150x90	TFP 14590
SF-1 1512	15x17x12	TFP 1512	SF-1 145100	145x150x100	TFP 145100
SF-1 1515	15x17x15	TFP 1515	SF-1 145120	145x150x120	TFP 145120
SF-1 1518	15x17x18	TFP 1518	SF-1 15060	150x155x60	TFP 15060
SF-1 1520	15x17x20	TFP 1520	SF-1 15070	150x155x70	TFP 15070
SF-1 1525	15x17x25	TFP 1525	SF-1 15080	150x155x80	TFP 15080
SF-1 1608	16x18x8	TFP 1608	SF-1 15090	150x155x90	TFP 15090
SF-1 1610	16x18x10	TFP 1610	SF-1 150100	150x155x100	TFP 150100
SF-1 1612	16x18x12	TFP 1612	SF-1 15550	155x160x50	TFP 15550
SF-1 1615	16x18x15	TFP 1615	SF-1 15560	155x160x60	TFP 15560
SF-1 1618	16x18x18	TFP 1618	SF-1 15570	155x160x70	TFP 15570
SF-1 1620	16x18x20	TFP 1620	SF-1 15580	155x160x80	TFP 15580
SF-1 1625	16x18x25	TFP 1625	SF-1 15590	155x160x90	TFP 15590
SF-1 1630	16x18x30	TFP 1630	SF-1 155100	155x160x100	TFP 155100
SF-1 1708	17x19x8	TFP 1708	SF-1 16050	160x165x50	TFP 16050
SF-1 1710	17x19x10	TFP 1710	SF-1 16060	160x165x60	TFP 16060
SF-1 1712	17x19x12	TFP 1712	SF-1 16070	160x165x70	TFP 16070
SF-1 1715	17x19x15	TFP 1715	SF-1 16080	160x165x80	TFP 16080
SF-1 1718	17x19x18	TFP 1718	SF-1 16090	160x165x90	TFP 16090
SF-1 1720	17x19x20	TFP 1720	SF-1 160100	160x165x100	TFP 160100
SF-1 1725	17x19x25	TFP 1725	SF-1 160110	160x165x110	TFP 160110
SF-1 1808	18x20x8	TFP 1808	SF-1 160120	160x165x120	TFP 160120
SF-1 1810	18x20x10	TFP 1810	SF-1 160130	160x165x130	TFP 160130
SF-1 1812	18x20x12	TFP 1812	SF-1 160140	160x165x140	TFP 160140
SF-1 1815	18x20x15	TFP 1815	SF-1 160150	160x165x150	TFP 160150
SF-1 1820	18x20x20	TFP 1820	SF-1 16560	165x170x60	TFP 16560
SF-1 1825	18x20x25	TFP 1825	SF-1 16570	165x170x70	TFP 16570
SF-1 1830	18x20x30	TFP 1830	SF-1 16580	165x170x80	TFP 16580
SF-1 2010a	20x22x10	TFP 2010a	SF-1 16590	165x170x90	TFP 16590
SF-1 2012a	20x22x12	TFP 2012a	SF-1 165100	165x170x100	TFP 165100
SF-1 2015a	20x22x15	TFP 2015a	SF-1 165110	165x170x110	TFP 165110
SF-1 2020a	20x22x20	TFP 2020a	SF-1 165120	165x170x120	TFP 165120
SF-1 2025a	20x22x25	TFP 2025a	SF-1 165130	165x170x130	TFP 165130
SF-1 2030a	20x22x30	TFP 2030a	SF-1 165140	165x170x140	TFP 165140
SF-1 2035a	20x22x35	TFP 2035a	SF-1 165150	165x170x150	TFP 165150
SF-1 2040a	20x22x40	TFP 2040a	SF-1 17060	170x175x60	TFP 17060
SF-1 2008	20x23x8	TFP 2008b	SF-1 17070	170x175x70	TFP 17070
SF-1 2010	20x23x10	TFP 2010b	SF-1 17080	170x175x80	TFP 17080
SF-1 2012	20x23x12	TFP 2012b	SF-1 17090	170x175x90	TFP 17090
SF-1 2015	20x23x15	TFP 2015b	SF-1 170100	170x175x100	TFP 170100
SF-1 2020	20x23x20	TFP 2020b	SF-1 170110	170x175x110	TFP 170110
SF-1 2025	20x23x25	TFP 2025b	SF-1 170120	170x175x120	TFP 170120
SF-1 2030	20x23x30	TFP 2030b	SF-1 170130	170x175x130	TFP 170130
SF-1 2035	20x23x35	TFP 2035b	SF-1 170140	170x175x140	TFP 170140
SF-1 2040	20x23x40	TFP 2040b	SF-1 170150	170x175x150	TFP 170150
SF-1 2210	22x25x10	TFP 2210	SF-1 17560	175x180x60	TFP 17560
SF-1 2212	22x25x12	TFP 2212	SF-1 17570	175x180x70	TFP 17570
SF-1 2215	22x25x15	TFP 2215	SF-1 17580	175x180x80	TFP 17580
SF-1 2220	22x25x20	TFP 2220	SF-1 17590	175x180x90	TFP 17590
SF-1 2225	22x25x25	TFP 2225	SF-1 175100	175x180x100	TFP 175100
SF-1 2230	22x25x30	TFP 2230	SF-1 175110	175x180x110	TFP 175110
SF-1 2235	22x25x35	TFP 2235	SF-1 175120	175x180x120	TFP 175120
SF-1 2238	22x25x38	TFP 2238	SF-1 175130	175x180x130	TFP 175130
SF-1 2240	22x25x40	TFP 2240	SF-1 175140	175x180x140	TFP 175140
SF-1 2245	22x25x45	TFP 2245	SF-1 175150	175x180x150	TFP 175150
SF-1 2250	22x25x50	TFP 2250	SF-1 18060	180x185x60	TFP 18060
SF-1 2410	24x27x10	TFP 2410a	SF-1 18070	180x185x70	TFP 18070
SF-1 2412	24x27x12	TFP 2412a	SF-1 18080	180x185x80	TFP 18080
SF-1 2415	24x27x15	TFP 2415a	SF-1 18090	180x185x90	TFP 18090
SF-1 2420	24x27x20	TFP 2420a	SF-1 180100	180x185x100	TFP 180100
SF-1 2425	24x27x25	TFP 2425a	SF-1 180110	180x185x110	TFP 180110
SF-1 2428	24x27x28	TFP 2428a	SF-1 180120	180x185x120	TFP 180120
SF-1 2430	24x27x30	TFP 2430a	SF-1 180130	180x185x130	TFP 180130
SF-1 2432	24x27x32	TFP 2432a	SF-1 180140	180x185x140	TFP 180140
SF-1 2435	24x27x35	TFP 2435a	SF-1 180150	180x185x150	TFP 180150
SF-1 2438	24x27x38	TFP 2438a	SF-1 18560	185x190x60	TFP 18560
SF-1 2440	24x27x40	TFP 2440a	SF-1 18570	185x190x70	TFP 18570
SF-1 2450	24x27x50	TFP 2450a	SF-1 18580	185x190x80	TFP 18580
SF-1 2410b	24x28x10	TFP 2410b	SF-1 18590	185x190x90	TFP 18590
SF-1 2412b	24x28x12	TFP 2412b	SF-1 185100	185x190x100	TFP 185100
SF-1 2415b	24x28x15	TFP 2415b	SF-1 185110	185x190x110	TFP 185110
SF-1 2420b	24x28x20	TFP 2420b	SF-1 185120	185x190x120	TFP 185120
SF-1 2425b	24x28x25	TFP 2425b	SF-1 185130	185x190x130	TFP 185130
SF-1 2428b	24x28x28	TFP 2428b	SF-1 185140	185x190x140	TFP 185140
SF-1 2430b	24x28x30	TFP 2430b	SF-1 185150	185x190x150	TFP 185150
SF-1 2432b	24x28x32	TFP 2432b	SF-1 19060	190x195x60	TFP 19060
SF-1 2435b	24x28x35	TFP 2435b	SF-1 19070	190x195x70	TFP 19070
SF-1 2438b	24x28x38	TFP 2438b	SF-1 19080	190x195x80	TFP 19080
SF-1 2440b	24x28x40	TFP 2440b	SF-1 19090	190x195x90	TFP 19090
SF-1 2450b	24x28x50	TFP 2450b	SF-1 190100	190x195x100	TFP 190100
SF-1 2510	25x28x10	TFP 2510	SF-1 190110	190x195x110	TFP 190110
SF-1 2512	25x28x12	TFP 2512	SF-1 190120	190x195x120	TFP 190120

SF-1 2515	25x28x15	TFP 2515	SF-1 190130	190x195x130	TFP 190130
SF-1 2520	25x28x20	TFP 2520	SF-1 190140	190x195x140	TFP 190140
SF-1 2525	25x28x25	TFP 2525	SF-1 190150	190x195x150	TFP 190150
SF-1 2528	25x28x28	TFP 2528	SF-1 19560	195x200x60	TFP 19560
SF-1 2530	25x28x30	TFP 2530	SF-1 19570	195x200x70	TFP 19570
SF-1 2532	25x28x32	TFP 2532	SF-1 19580	195x200x80	TFP 19580
SF-1 2535	25x28x35	TFP 2535	SF-1 19590	195x200x90	TFP 19590
SF-1 2540	25x28x40	TFP 2540	SF-1 195100	195x200x100	TFP 195100
SF-1 2550	25x28x50	TFP 2550	SF-1 195110	195x200x110	TFP 195110
SF-1 2560	25x28x60	TFP 2560	SF-1 195120	195x200x120	TFP 195120
SF-1 2610	26x30x10	TFP 2610	SF-1 195130	195x200x130	TFP 195130
SF-1 2612	26x30x12	TFP 2612	SF-1 195140	195x200x140	TFP 195140
SF-1 2615	26x30x15	TFP 2615	SF-1 195150	195x200x150	TFP 195150
SF-1 2620	26x30x20	TFP 2620	SF-1 20060	200x205x60	TFP 20060
SF-1 2625	26x30x25	TFP 2625	SF-1 20070	200x205x70	TFP 20070
SF-1 2630	26x30x30	TFP 2630	SF-1 20080	200x205x80	TFP 20080
SF-1 2635	26x30x35	TFP 2635	SF-1 20090	200x205x90	TFP 20090
SF-1 2640	26x30x40	TFP 2640	SF-1 200100	200x205x100	TFP 200100
SF-1 2650	26x30x50	TFP 2650	SF-1 200110	200x205x110	TFP 200110
SF-1 2810	28x32x10	TFP 2810	SF-1 200120	200x205x120	TFP 200120
SF-1 2812	28x32x12	TFP 2812	SF-1 200130	200x205x130	TFP 200130
SF-1 2815	28x32x15	TFP 2815	SF-1 200140	200x205x140	TFP 200140
SF-1 2820	28x32x20	TFP 2820	SF-1 200150	200x205x150	TFP 200150
SF-1 2825	28x32x25	TFP 2825	SF-1 20560	205x210x60	TFP 20560
SF-1 2830	28x32x30	TFP 2830	SF-1 20570	205x210x70	TFP 20570
SF-1 2832	28x32x32	TFP 2832	SF-1 20580	205x210x80	TFP 20580
SF-1 2835	28x32x35	TFP 2835	SF-1 20590	205x210x90	TFP 20590
SF-1 2840	28x32x40	TFP 2840	SF-1 205100	205x210x100	TFP 205100
SF-1 3010	30x34x10	TFP 3010	SF-1 205110	205x210x110	TFP 205110
SF-1 3012	30x34x12	TFP 3012	SF-1 205120	205x210x120	TFP 205120
SF-1 3015	30x34x15	TFP 3015	SF-1 205130	205x210x130	TFP 205130
SF-1 3020	30x34x20	TFP 3020	SF-1 205140	205x210x140	TFP 205140
SF-1 3025	30x34x25	TFP 3025	SF-1 205150	205x210x150	TFP 205150
SF-1 3028	30x34x28	TFP 3028	SF-1 21060	210x215x60	TFP 21060
SF-1 3030	30x34x30	TFP 3030	SF-1 21070	210x215x70	TFP 21070
SF-1 3032	30x34x32	TFP 3032	SF-1 21080	210x215x80	TFP 21080
SF-1 3035	30x34x35	TFP 3035	SF-1 21090	210x215x90	TFP 21090
SF-1 3038	30x34x38	TFP 3038	SF-1 210100	210x215x100	TFP 210100
SF-1 3040	30x34x40	TFP 3040	SF-1 210110	210x215x110	TFP 210110
SF-1 3045	30x34x45	TFP 3045	SF-1 210120	210x215x120	TFP 210120
SF-1 3050	30x34x50	TFP 3050	SF-1 210130	210x215x130	TFP 210130
SF-1 3210	32x36x10	TFP 3210	SF-1 210140	210x215x140	TFP 210140
SF-1 3212	32x36x12	TFP 3212	SF-1 210150	210x215x150	TFP 210150
SF-1 3215	32x36x15	TFP 3215	SF-1 21560	215x220x60	TFP 21560
SF-1 3218	32x36x18	TFP 3218	SF-1 21570	215x220x70	TFP 21570
SF-1 3220	32x36x20	TFP 3220	SF-1 21580	215x220x80	TFP 21580
SF-1 3225	32x36x25	TFP 3225	SF-1 21590	215x220x90	TFP 21590
SF-1 3230	32x36x30	TFP 3230	SF-1 215100	215x220x100	TFP 215100
SF-1 3235	32x36x35	TFP 3235	SF-1 215110	215x220x110	TFP 215110
SF-1 3240	32x36x40	TFP 3240	SF-1 215120	215x220x120	TFP 215120
SF-1 3245	32x36x45	TFP 3245	SF-1 215130	215x220x130	TFP 215130
SF-1 3250	32x36x50	TFP 3250	SF-1 215140	215x220x140	TFP 215140
SF-1 3410	34x38x10	TFP 3410	SF-1 215150	215x220x150	TFP 215150
SF-1 3412	34x38x12	TFP 3412	SF-1 22060	220x225x60	TFP 22060
SF-1 3415	34x38x15	TFP 3415	SF-1 22070	220x225x70	TFP 22070
SF-1 3420	34x38x20	TFP 3420	SF-1 22080	220x225x80	TFP 22080
SF-1 3425	34x38x25	TFP 3425	SF-1 22090	220x225x90	TFP 22090
SF-1 3430	34x38x30	TFP 3430	SF-1 220100	220x225x100	TFP 220100
SF-1 3435	34x38x35	TFP 3435	SF-1 220110	220x225x110	TFP 220110
SF-1 3440	34x38x40	TFP 3440	SF-1 220120	220x225x120	TFP 220120
SF-1 3445	34x38x45	TFP 3445	SF-1 220130	220x225x130	TFP 220130
SF-1 3510	35x39x10	TFP 3510	SF-1 220140	220x225x140	TFP 220140
SF-1 3512	35x39x12	TFP 3512	SF-1 220150	220x225x150	TFP 220150
SF-1 3515	35x39x15	TFP 3515	SF-1 22560	225x230x60	TFP 22560
SF-1 3520	35x39x20	TFP 3520	SF-1 22570	225x230x70	TFP 22570
SF-1 3525	35x39x25	TFP 3525	SF-1 22580	225x230x80	TFP 22580
SF-1 3530	35x39x30	TFP 3530	SF-1 22590	225x230x90	TFP 22590
SF-1 3535	35x39x35	TFP 3535	SF-1 225100	225x230x100	TFP 225100
SF-1 3540	35x39x40	TFP 3540	SF-1 225110	225x230x110	TFP 225110
SF-1 3545	35x39x45	TFP 3545	SF-1 225120	225x230x120	TFP 225120
SF-1 3550	35x39x50	TFP 3550	SF-1 225130	225x230x130	TFP 225130
SF-1 3610	36x40x10	TFP 3610	SF-1 225140	225x230x140	TFP 225140
SF-1 3612	36x40x12	TFP 3612	SF-1 23060	230x235x60	TFP 23060
SF-1 3615	36x40x15	TFP 3615	SF-1 23070	230x235x70	TFP 23070
SF-1 3620	36x40x20	TFP 3620	SF-1 23080	230x235x80	TFP 23080
SF-1 3625	36x40x25	TFP 3625	SF-1 23090	230x235x90	TFP 23090
SF-1 3630	36x40x30	TFP 3630	SF-1 230100	230x235x100	TFP 230100
SF-1 3635	36x40x35	TFP 3635	SF-1 230110	230x235x110	TFP 230110
SF-1 3640	36x40x40	TFP 3640	SF-1 230120	230x235x120	TFP 230120
SF-1 3645	36x40x45	TFP 3645	SF-1 230130	230x235x130	TFP 230130
SF-1 3650	36x40x50	TFP 3650	SF-1 230140	230x235x140	TFP 230140
SF-1 3812	38x42x12	TFP 3812	SF-1 230150	230x235x150	TFP 230150
SF-1 3815	38x42x15	TFP 3815	SF-1 23560	235x240x60	TFP 23560
SF-1 3820	38x42x20	TFP 3820	SF-1 23570	235x240x70	TFP 23570
SF-1 3825	38x42x25	TFP 3825	SF-1 23580	235x240x80	TFP 23580

SF-1 3830	38x42x30	TFP 3830	SF-1 23590	235x240x90	TFP 23590
SF-1 3835	38x42x35	TFP 3835	SF-1 235100	235x240x100	TFP 235100
SF-1 3840	38x42x40	TFP 3840	SF-1 235110	235x240x110	TFP 235110
SF-1 3845	38x42x45	TFP 3845	SF-1 235120	235x240x120	TFP 235120
SF-1 3850	38x42x50	TFP 3850	SF-1 235130	235x240x130	TFP 235130
SF-1 3855	38x42x55	TFP 3855	SF-1 235140	235x240x140	TFP 235140
SF-1 3860	38x42x60	TFP 3860	SF-1 235150	235x240x150	TFP 235150
SF-1 4012	40x44x12	TFP 4012	SF-1 24060	240x245x60	TFP 24060
SF-1 4015	40x44x15	TFP 4015	SF-1 24070	240x245x70	TFP 24070
SF-1 4020	40x44x20	TFP 4020	SF-1 24080	240x245x80	TFP 24080
SF-1 4025	40x44x25	TFP 4025	SF-1 24090	240x245x90	TFP 24090
SF-1 4030	40x44x30	TFP 4030	SF-1 240100	240x245x100	TFP 240100
SF-1 4035	40x44x35	TFP 4035	SF-1 240110	240x245x110	TFP 240110
SF-1 4040	40x44x40	TFP 4040	SF-1 240120	240x245x120	TFP 240120
SF-1 4045	40x44x45	TFP 4045	SF-1 240130	240x245x130	TFP 240130
SF-1 4050	40x44x50	TFP 4050	SF-1 240140	240x245x140	TFP 240140
SF-1 4055	40x44x55	TFP 4055	SF-1 240150	240x245x150	TFP 240150
SF-1 4060	40x44x60	TFP 4060	SF-1 24560	245x250x60	TFP 24560
SF-1 4212	42x46x12	TFP 4212	SF-1 24570	245x250x70	TFP 24570
SF-1 4215	42x46x15	TFP 4215	SF-1 24580	245x250x80	TFP 24580
SF-1 4220	42x46x20	TFP 4220	SF-1 24590	245x250x90	TFP 24590
SF-1 4225	42x46x25	TFP 4225	SF-1 245100	245x250x100	TFP 245100
SF-1 4230	42x46x30	TFP 4230	SF-1 245110	245x250x110	TFP 245110
SF-1 4235	42x46x35	TFP 4235	SF-1 245120	245x250x120	TFP 245120
SF-1 4240	42x46x40	TFP 4240	SF-1 245130	245x250x130	TFP 245130
SF-1 4245	42x46x45	TFP 4245	SF-1 245140	245x250x140	TFP 245140
SF-1 4250	42x46x50	TFP 4250	SF-1 245150	245x250x150	TFP 245150
SF-1 4255	42x46x55	TFP 4255	SF-1 25060	250x255x60	TFP 25060
SF-1 4260	42x46x60	TFP 4260	SF-1 25070	250x255x70	TFP 25070
SF-1 4412	44x48x12	TFP 4412	SF-1 25080	250x255x80	TFP 25080
SF-1 4415	44x48x15	TFP 4415	SF-1 25090	250x255x90	TFP 25090
SF-1 4420	44x48x20	TFP 4420	SF-1 250100	250x255x100	TFP 250100
SF-1 4425	44x48x25	TFP 4425	SF-1 250110	250x255x110	TFP 250110
SF-1 4430	44x48x30	TFP 4430	SF-1 250120	250x255x120	TFP 250120
SF-1 4435	44x48x35	TFP 4435	SF-1 250130	250x255x130	TFP 250130
SF-1 4440	44x48x40	TFP 4440	SF-1 250140	250x255x140	TFP 250140
SF-1 4445	44x48x45	TFP 4445	SF-1 250150	250x255x150	TFP 250150
SF-1 4450	44x48x50	TFP 4450	SF-1 25560	255x260x60	TFP 25560
SF-1 4455	44x48x55	TFP 4455	SF-1 25570	255x260x70	TFP 25570
SF-1 4460	44x48x60	TFP 4460	SF-1 25580	255x260x80	TFP 25580
SF-1 4515	45x50x15	TFP 4515	SF-1 25590	255x260x90	TFP 25590
SF-1 4520	45x50x20	TFP 4520	SF-1 255100	255x260x100	TFP 255100
SF-1 4525	45x50x25	TFP 4525	SF-1 255110	255x260x110	TFP 255110
SF-1 4530	45x50x30	TFP 4530	SF-1 255120	255x260x120	TFP 255120
SF-1 4535	45x50x35	TFP 4535	SF-1 255130	255x260x130	TFP 255130
SF-1 4540	45x50x40	TFP 4540	SF-1 255140	255x260x140	TFP 255140
SF-1 4545	45x50x45	TFP 4545	SF-1 255150	255x260x150	TFP 255150
SF-1 4550	45x50x50	TFP 4550	SF-1 26060	260x265x60	TFP 26060
SF-1 4555	45x50x55	TFP 4555	SF-1 26070	260x265x70	TFP 26070
SF-1 4560	45x50x60	TFP 4560	SF-1 26080	260x265x80	TFP 26080
SF-1 5015	50x55x15	TFP 5015	SF-1 26090	260x265x90	TFP 26090
SF-1 5020	50x55x20	TFP 5020	SF-1 260100	260x265x100	TFP 260100
SF-1 5025	50x55x25	TFP 5025	SF-1 260110	260x265x110	TFP 260110
SF-1 5030	50x55x30	TFP 5030	SF-1 260120	260x265x120	TFP 260120
SF-1 5035	50x55x35	TFP 5035	SF-1 260130	260x265x130	TFP 260130
SF-1 5040	50x55x40	TFP 5040	SF-1 260140	260x265x140	TFP 260140
SF-1 5045	50x55x45	TFP 5045	SF-1 260150	260x265x150	TFP 260150
SF-1 5050	50x55x50	TFP 5050	SF-1 26560	265x270x60	TFP 26560
SF-1 5055	50x55x55	TFP 5055	SF-1 26570	265x270x70	TFP 26570
SF-1 5060	50x55x60	TFP 5060	SF-1 26580	265x270x80	TFP 26580
SF-1 5065	50x55x65	TFP 5065	SF-1 26590	265x270x90	TFP 26590
SF-1 5070	50x55x70	TFP 5070	SF-1 265100	265x270x100	TFP 265100
SF-1 5515	55x60x15	TFP 5515	SF-1 265110	265x270x110	TFP 265110
SF-1 5520	55x60x20	TFP 5520	SF-1 265120	265x270x120	TFP 265120
SF-1 5525	55x60x25	TFP 5525	SF-1 265130	265x270x130	TFP 265130
SF-1 5530	55x60x30	TFP 5530	SF-1 265140	265x270x140	TFP 265140
SF-1 5535	55x60x35	TFP 5535	SF-1 265150	265x270x150	TFP 265150
SF-1 5540	55x60x40	TFP 5540	SF-1 27060	270x275x60	TFP 27060
SF-1 5545	55x60x45	TFP 5545	SF-1 27070	270x275x70	TFP 27070
SF-1 5550	55x60x50	TFP 5550	SF-1 27080	270x275x80	TFP 27080
SF-1 5555	55x60x55	TFP 5555	SF-1 27090	270x275x90	TFP 27090
SF-1 5560	55x60x60	TFP 5560	SF-1 270100	270x275x100	TFP 270100
SF-1 5565	55x60x65	TFP 5565	SF-1 270110	270x275x110	TFP 270110
SF-1 5570	55x60x70	TFP 5570	SF-1 270120	270x275x120	TFP 270120
SF-1 6015	60x65x15	TFP 6015	SF-1 270130	270x275x130	TFP 270130
SF-1 6020	60x65x20	TFP 6020	SF-1 270140	270x275x140	TFP 270140
SF-1 6025	60x65x25	TFP 6025	SF-1 270150	270x275x150	TFP 270150
SF-1 6030	60x65x30	TFP 6030	SF-1 27560	275x280x60	TFP 27560
SF-1 6035	60x65x35	TFP 6035	SF-1 27570	275x280x70	TFP 27570
SF-1 6040	60x65x40	TFP 6040	SF-1 27580	275x280x80	TFP 27580
SF-1 6045	60x65x45	TFP 6045	SF-1 27590	275x280x90	TFP 27590
SF-1 6050	60x65x50	TFP 6050	SF-1 275100	275x280x100	TFP 275100
SF-1 6055	60x65x55	TFP 6055	SF-1 275110	275x280x110	TFP 275110
SF-1 6060	60x65x60	TFP 6060	SF-1 275120	275x280x120	TFP 275120
SF-1 6065	60x65x65	TFP 6065	SF-1 275130	275x280x130	TFP 275130

SF-1 6070	60x65x70	TFP 6070	SF-1 275140	275x280x140	TFP 275140
SF-1 6075	60x65x75	TFP 6075	SF-1 275150	275x280x150	TFP 275150
SF-1 6080	60x65x80	TFP 6080	SF-1 28060	280x285x60	TFP 28060
SF-1 6085	60x65x85	TFP 6085	SF-1 28070	280x285x70	TFP 28070
SF-1 6090	60x65x90	TFP 6090	SF-1 28080	280x285x80	TFP 28080
SF-1 6515	65x70x15	TFP 6515	SF-1 28090	280x285x90	TFP 28090
SF-1 6520	65x70x20	TFP 6520	SF-1 280100	280x285x100	TFP 280100
SF-1 6530	65x70x30	TFP 6530	SF-1 280110	280x285x110	TFP 280110
SF-1 6535	65x70x35	TFP 6535	SF-1 280120	280x285x120	TFP 280120
SF-1 6540	65x70x40	TFP 6540	SF-1 280130	280x285x130	TFP 280130
SF-1 6550	65x70x50	TFP 6550	SF-1 280140	280x285x140	TFP 280140
SF-1 6560	65x70x60	TFP 6560	SF-1 280150	280x285x150	TFP 280150
SF-1 6570	65x70x70	TFP 6570	SF-1 28560	285x290x60	TFP 28560
SF-1 6580	65x70x80	TFP 6580	SF-1 28570	285x290x70	TFP 28570
SF-1 6590	65x70x90	TFP 6590	SF-1 28580	285x290x80	TFP 28580
SF-1 7020	70x75x20	TFP 7020	SF-1 28590	285x290x90	TFP 28590
SF-1 7030	70x75x30	TFP 7030	SF-1 285100	285x290x100	TFP 285100
SF-1 7040	70x75x40	TFP 7040	SF-1 285110	285x290x110	TFP 285110
SF-1 7050	70x75x50	TFP 7050	SF-1 285120	285x290x120	TFP 285120
SF-1 7060	70x75x60	TFP 7060	SF-1 285130	285x290x130	TFP 285130
SF-1 7070	70x75x70	TFP 7070	SF-1 285140	285x290x140	TFP 285140
SF-1 7080	70x75x80	TFP 7080	SF-1 285150	285x290x150	TFP 285150
SF-1 7090	70x75x90	TFP 7090	SF-1 29060	290x295x60	TFP 29060
SF-1 7530	75x80x30	TFP 7530	SF-1 29070	290x295x70	TFP 29070
SF-1 7540	75x80x40	TFP 7540	SF-1 29080	290x295x80	TFP 29080
SF-1 7550	75x80x50	TFP 7550	SF-1 29090	290x295x90	TFP 29090
SF-1 7560	75x80x60	TFP 7560	SF-1 290100	290x295x100	TFP 290100
SF-1 7570	75x80x70	TFP 7570	SF-1 290110	290x295x110	TFP 290110
SF-1 7580	75x80x80	TFP 7580	SF-1 290120	290x295x120	TFP 290120
SF-1 7590	75x80x90	TFP 7590	SF-1 290130	290x295x130	TFP 290130
SF-1 8030	80x85x30	TFP 8030	SF-1 290140	290x295x140	TFP 290140
SF-1 8040	80x85x40	TFP 8040	SF-1 290150	290x295x150	TFP 290150
SF-1 8050	80x85x50	TFP 8050	SF-1 29560	295x300x60	TFP 29560
SF-1 8060	80x85x60	TFP 8060	SF-1 29570	295x300x70	TFP 29570
SF-1 8070	80x85x70	TFP 8070	SF-1 29580	295x300x80	TFP 29580
SF-1 8080	80x85x80	TFP 8080	SF-1 29590	295x300x90	TFP 29590
SF-1 8090	80x85x90	TFP 8090	SF-1 295100	295x300x100	TFP 295100
SF-1 80100	80x85x100	TFP 80100	SF-1 295110	295x300x110	TFP 295110
SF-1 8530	85x90x30	TFP 8530	SF-1 295120	295x300x120	TFP 295120
SF-1 8540	85x90x40	TFP 8540	SF-1 295130	295x300x130	TFP 295130
SF-1 8550	85x90x50	TFP 8550	SF-1 295140	295x300x140	TFP 295140
SF-1 8560	85x90x60	TFP 8560	SF-1 295150	295x300x150	TFP 295150
SF-1 8570	85x90x70	TFP 8570	SF-1 30060	300x305x60	TFP 30060
SF-1 8580	85x90x80	TFP 8580	SF-1 30070	300x305x70	TFP 30070
SF-1 8590	85x90x90	TFP 8590	SF-1 30080	300x305x80	TFP 30080
SF-1 85100	85x90x100	TFP 85100	SF-1 30090	300x305x90	TFP 30090
SF-1 9030	90x95x30	TFP 9030	SF-1 300100	300x305x100	TFP 300100
SF-1 9040	90x95x40	TFP 9040	SF-1 300110	300x305x110	TFP 300110
SF-1 9050	90x95x50	TFP 9050	SF-1 300120	300x305x120	TFP 300120
SF-1 9060	90x95x60	TFP 9060	SF-1 300130	300x305x130	TFP 300130
SF-1 9070	90x95x70	TFP 9070	SF-1 300140	300x305x140	TFP 300140
SF-1 9080	90x95x80	TFP 9080	SF-1 300150	300x305x150	TFP 300150
SF-1 9090	90x95x90	TFP 9090			
SF-1 90100	90x95x100	TFP 90100			

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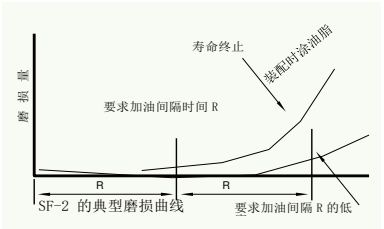
SF-2 边界润滑轴承
SF-2 Marginal-Lubrication Bearings

1. 改性聚甲醛 POM with lead 0.3-0.5mm
2. 球形青铜粉 Porous bronze sintere
3. 钢背 Steel bacaking
4. 镀铜层 Copper plating

注：SF-2 系列产品还可根据不同工况条件选择不同的基体材料，如：青铜基板、不锈钢基板、以及“无铅”等配方产品。SF-2Y 属环保无铅产品，颜色为桔黄色。

Note: Various materials are suitable for SF- 2 series products according to different working conditions, such as bronze-backing, stainless steel backing and lead-free material. SF-2Y is an environmental friendly lead-free product and its color is orange.



技术参数 Tech.Data

最大荷载 Max Load	静承载 Static	250N/mm^2
	动承载 Dynamic	140N/mm^2
	摇摆运动 Oscillating	60N/mm^2
最大 PV 值 PV limit	干摩擦 Dry	2.8N/mm^2·m/s
	油润滑 Oil	22N/mm^2·m/s
使用温度 Temp.limit		-40℃~+130℃
摩擦系数 Friction Coeff.		0.05~0.25 μ
最大速率 Speed limit		0.25m/s
导热系数 Thermal conductivity		2.03Kcal/M.br.C
热膨胀系数 Coeff. of linear expansion		51×10^{-6}per℃
装配时内孔涂润滑油脂 Initial pre-lubrication at assembly required		

SF-2 应用特点 Characteristic of preformance

◎SF-2 型材料是以填充四氟改性的聚甲醛塑料为表面层三层复合自润滑材料，它是一种良性的边界润滑材料，因此特别适用与高载低速下的旋转运动，摇摆运动以及经常在载荷下启闭而不易形成流体动力润滑的轴承，止推垫片、滑块、球座等磨擦零件。SF-2 能够充分地利用微量润滑脂，在边界润滑润滑条件下可以长期的不用加油保养。在完全无油润滑条件下，SF-2 磨擦性能及允许 PV 值较低，因此通常在塑料表面轧出储油 坑，装配时涂上锂基润滑油脂或硅脂等。

◎SF-2 is triple-layer self lubricating material that can filI modified POM plastic as su rface layer; it is benignant boundary Iubrication materiaI, therefore, it is particularly applicable high-load low-speed rotating and wing movement, as well as in the condition that frequent loaded start-stop is the requirement while hydrodynamic lubrication membrane is difficult to form, in the parts such as bearing, thrust washer, sliding block, ball socket and so on. SF-2 can take full advantage of less grease to work long time without lubrication maintenance under boundary Iubrication condition. But under oil-free condition, SF-2 the frictional behavior and permissible PV value Is relatively low, so generally storage pit can be formed on the plastic surface, where lithiumbased lubricant grease or silicone grease and so on should be applied when being installed.

SF-2 磨损规律 Wear and tear a law

◎SF-2 型材料有其特殊的磨损规律，如图 4 所示在安装时涂油脂的情况下，能在 R 阶段内极微量的磨损。经过 R 阶段时间后失去边界油润滑条件，磨损就开始加剧。如果在此时重新加油，可保持无显著磨损，其寿命亦可以大大地延长。所以 SF-2 材料的优点就在于需要间融 R 阶段时间加油一次，其间隔时间 R 较其它些材料特别是金属材料的间隔时间显著地 长。约为五倍左右。

◎SF-2 material follows special wearing rule as shown in Fig. 4, infinitesimal abrasion can occur in R phase when being applied with grease and then being installed. But after the R phase, the boundary lubrication condition will disappear and wearing will be exaggerated. If you do refill with oil, the product can be drastically held by non-remarkable wearing and its life will also be greatly extended. Therefore the advantage of SF-2 material is that oil shaII be added with an interval of R, which is remarkably longer that that of R other metal materials. It is approximately five times as long.

◎当装配时涂以润滑脂(如锂基脂或硅脂等)，SF-2 衬套的使用寿命，随工作时所处的 PV 值而上下，如当 PV 值在 2.5MPam/s 左右时，其使用寿命约为 200 小时，而当 PV 值在 0.1MPa-m/s 时，其使用寿命可在 10000 小时以上(详见表)
SF-2 衬套的加油保养同期R约为寿命的一半左右。例如当 PV=2.5MPam/s 时，要求每隔 100 小时必须加油保养一次。

◎When SF-2 bush is installed with application of grease such as lithium-based or silicone grease, its service life varies from the PV value under working condition, for instance, when PV value is about 2.5MPam/s, its service life will be about 200hr; when PV value is 0.1Mpa-m/s, its service life can be above 10,000hr (see the table for details)
The cycle R of lubrication maintenance of SF-2 bush is about the half of its service life. For instance, when PV=25Mpam/s, it is required to be oil-lubricated every 100hr.

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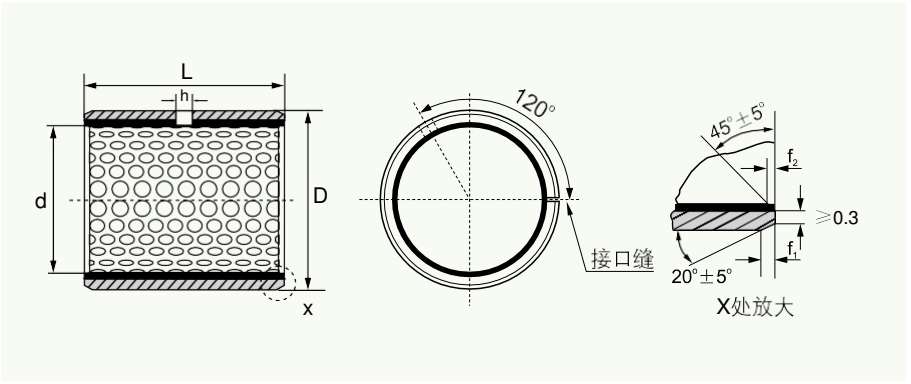
SF-2 边界润滑轴承标准公制尺寸
SF-2 Marginal-Lubrication Bearings Standard Metric Size



单位 Unit: mm

d	D	相配轴径 Shaft Dia. f_7	座孔 Housing H7	壁厚 Wall Thickness 最小 Min.	壁厚 Wall Thickness 最大 Max.	油孔 Oil bore H	f_1	f_2	$L^{0}_{-0.40}$ 10	15	20	25	30	35	40	45	50	60
10	12	$10_{-0.022}$	$12^{+0.018}$			4			1010	1015	1020							
12	14	$12_{-0.027}$	$14^{+0.018}$			4			1210	1215	1220							
14	16	$14_{-0.027}$	$16^{+0.018}$	0.955	0.980	4	0.6	0.3		1415	1420							
15	17	$15_{-0.027}$	$17^{+0.018}$			4				1515	1520	1525						
16	18	$16_{-0.027}$	$18^{+0.018}$			4				1615	1620	1625						
18	20	$18_{-0.027}$	$20^{+0.021}$			4				1815	1820	1825						
20	23	$20_{-0.033}$	$23^{+0.021}$			4				2015	2020	2025	2030					
22	25	$22_{-0.033}$	$25^{+0.021}$	1.445	1.475	6	0.6	0.4		2215		2225						
25	28	$25_{-0.033}$	$28^{+0.021}$			6				2515	2520	2525	2530					
28	32	$28_{-0.033}$	$32^{+0.025}$			6					2820		2830					
30	34	$30_{-0.033}$	$34^{+0.025}$	1.935	1.970	6	1.2	0.4			3020	3025	3030		3040			
35	39	$35_{-0.039}$	$39^{+0.025}$			6					3520		3530	3535	3540			
40	44	$40_{-0.039}$	$44^{+0.025}$			8					4020		4030		4040		4050	
45	50	$45_{-0.039}$	$50^{+0.025}$			8					4520		4530		4540	4545	4550	
50	55	$50_{-0.039}$	$55^{+0.030}$	2.415	2.460	8	1.8	0.6					5030		5040		5050	5060
55	60	$55_{-0.046}$	$60^{+0.030}$			8							5530		5540		5550	5560
60	65	$60_{-0.046}$	$65^{+0.030}$			8							6030		6040		6050	6060

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SF-2 边界润滑轴承标准公制尺寸
SF-2 Marginal-Lubrication Bearing Standard Metric Size

单位Unit: mm

d	D	相配轴径 Shaft Dia. f_7	座孔 Housing H7	壁厚 Wall Thickness 最小 Min.	壁厚 Wall Thickness 最大 Max.	油孔 Oil bore H	f_1	f_2	L $^{0}_{-0.40}$ 40	50	60	80	90	95	100	110	120
65	70	65 $^{-0.046}$	70 $^{+0.030}$			8			6540		6560						
70	75	70 $^{-0.046}$	75 $^{+0.030}$	2.415	2.460	8	1.8	0.6	7040	7050		7080					
75	80	75 $^{-0.046}$	80 $^{+0.030}$			8			7540		7560	7580					
80	85	80 $^{-0.046}$	85 $^{+0.035}$			9.5			8040		8060	8080					
85	90	85 $^{-0.054}$	90 $^{+0.035}$			9.5			8540		8560	8580					
90	95	90 $^{-0.054}$	95 $^{+0.035}$			9.5	1.8	0.6	9040		9060	9080	9090				
100	105	100 $^{-0.054}$	105 $^{+0.035}$			9.5				10050		10080		10095			
105	110	105 $^{-0.054}$	110 $^{+0.035}$			9.5					10560	10580		10595		105110	
110	115	110 $^{-0.054}$	115 $^{+0.035}$			9.5					11060	11080		11095		110110	
120	125	120 $^{-0.054}$	125 $^{+0.040}$			9.5					12060	12080				120110	
125	130	125 $^{-0.063}$	130 $^{+0.040}$			9.5					12560					125110	
130	135	130 $^{-0.063}$	135 $^{+0.040}$			9.5				13050	13060	13080			130100		
140	145	140 $^{-0.063}$	145 $^{+0.040}$			9.5				14050	14060	14080			140100		
150	155	150 $^{-0.063}$	155 $^{+0.040}$	2.385	2.450	9.5				15050	15060	15080			150100		
160	165	160 $^{-0.063}$	165 $^{+0.040}$			9.5				16050	16060	16080			160100		
170	175	170 $^{-0.063}$	175 $^{+0.040}$			9.5				17050		17080			170100		
180	185	180 $^{-0.063}$	185 $^{+0.046}$			9.5	1.8	0.6		18050	18060	18080			180100		
190	195	190 $^{-0.072}$	195 $^{+0.046}$			9.5				19050	19060	19080			190100		190120
200	205	200 $^{-0.072}$	205 $^{+0.046}$			9.5				20050	20060	20080			200100		200120
220	225	220 $^{-0.072}$	225 $^{+0.046}$			9.5				22050	22060	22080			220100		220120
240	245	240 $^{-0.072}$	245 $^{+0.046}$			9.5				24050	24060	24080			240100		240120
250	255	250 $^{-0.072}$	255 $^{+0.052}$			9.5				25050	25060	25080			250100		250120
260	265	260 $^{-0.081}$	265 $^{+0.052}$			9.5				26050	26060	26080			260100		260120
280	285	280 $^{-0.081}$	285 $^{+0.052}$			9.5				28050	28060	28080			280100		280120
300	305	300 $^{-0.081}$	305 $^{+0.052}$			9.5				30050	30060	30080			300100		300120

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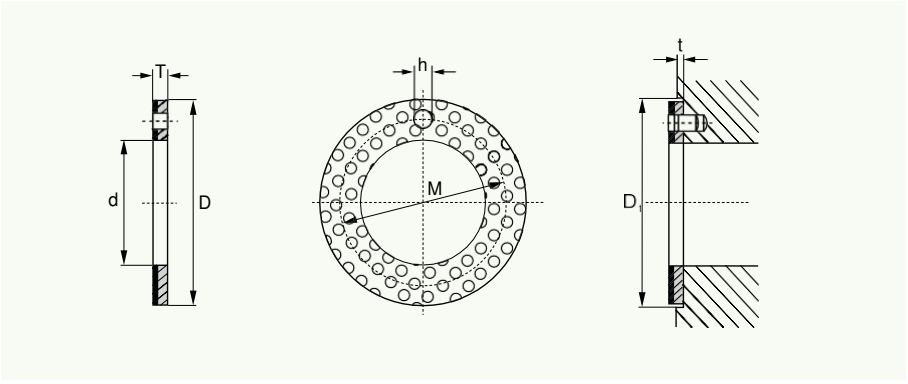
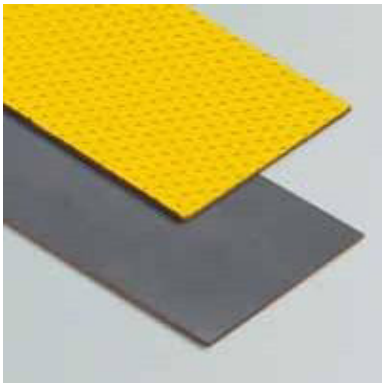
SF-1WD/SF-2WD 止推垫片标准公制尺寸
SF-1WD/SF-2WD Thrust Washer Standard Metric Size

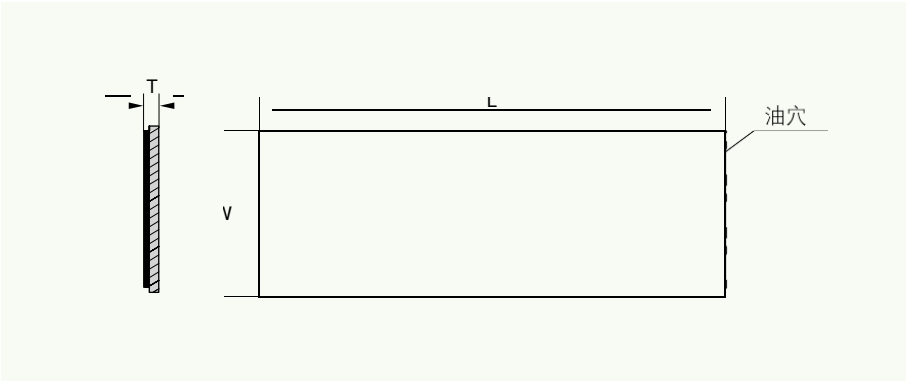


单位 Unit: mm

轴径 Axle	型号规格 Designation	垫片尺寸 Washer Dimension				安装尺寸 Installation Size		
		d +0.25	D -0.25	T -0.05	M ± 0.125	$h^{+0.40}_{+0.10}$	t ± 0.20	D_1+0.12
8	WD 10	10	20		15	1.5		20
10	WD 12	12	24	1.5	18			24
12	WD 14	14	26		20			26
14	WD 16	16	30		23	2.0		30
16	WD 18	18	32		25			32
18	WD 20	20	36		28			36
20	WD 22	22	38		30	3.0	1.0	38
22	WD 24	24	42		33			42
24	WD 26	26	44		35			44
26	WD 28	28	48	2.0	38			48
30	WD 32	32	54		43			54
36	WD 38	38	62		50			62
40	WD 42	42	66		54	4.0		66
46	WD 48	48	74		61			74
50	WD 52	52	78		65		1.5	78
60	WD 62	62	90		76			90

SF-1/SF-2 板材标准公制尺寸
SF-1/SF-2 Strip Standard Metric Size





单位 Unit: mm

代号 Code number	长度(L) ± 1	宽度(W) ± 1	壁厚(T)-0.05
SF-1/SF-2	500	150	1.0
SF-1/SF-2	500	150	1.5
SF-1/SF-2	500	150	2.0
SF-1/SF-2	500	150	2.5

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JF-800 系列双金属轴承
JF-800 Bimetal Bearings

◎JF-800 以碳钢为基体，表面烧结铜粉，适用于高载低速下的旋 转、摇摆运动，铜粉面可根据要求加工出各种油孔、油槽。目前已 广泛使用于矿山机械、汽车、摩托车、建筑机械、农用机械、轧钢 机械等。

◎SteeI backed Iead bronze Iined bearing materiaI for Iubricated applications, high load capacity and good fatigue properties, have been widely used in automotive, common industriaIIike steering gear, power steering, pedal bushes, king-pin bushes, tailgate pivots, mechanical handling, lifting equipment, hydraulic motors, agricultural machines etc.

成分、特性、用途
Chemical Compositions, Characteristics and Application

材料型号 Types of Material	铜合金牌号 Specifications of Bronze alloy	化学成分% Chemical Compositions	合金层硬度 Alloy Hrdness	特性与用途 Characteristics and Application
JF-930	CuSn6.5P0.1	铜锡锌磷 Cu Sn P 93 6.0~7.0 0.1~0.25	HB(60-90)	无铅 Lead Free
JF-850	CuSn6Zn6Pb3	铜锡锌铅 Cu Sn Zn Pb 85 6 6 3	HB(40-80)	启动电机 Staring Motor
JF-800	CuPb10Sn10	铜铅锡锌 Cu Pb Sn Zn 80 10 10	HB(60-90)	在铜合金中是最强的一种，应用范围广 The strongest material type, wide application scope.
JF-750	CuPb24Sn1	铜铅锡 Cu Pb Sn 75 24 1	HB(45-70)	连杆摇臂 Link Arm
JF-720	CuPb24Sn4	铜铅锡 Cu Pb Sn 72 24 4	HB(45-70)	连杆摇臂 Link Arm

技术参数 Tech.Data

最大荷载 Max.Load	静承载 Static	250N/mm^2
	动承载 Dynamic	140N/mm^2
最高线速度 Max. linear speed		2m/s
最大PV值 PV limit		2.8N/mm^2·m/s
抗剪切强度 Shear resistance strength		350N/mm^2

屈服强度 Yield strength	240N/mm^2
使用温度 Temp.limit	-40℃~+250℃
摩擦系数 Friction Coeff.	0.08~0.20
导热系数 Thermal conductivity	60W(m·k)-1
导热系数 Thermal conductivity	14·10^{-6}K^1

JF-800 双金属内孔加工与不可加工厚度公差
Wall Thickness of The Machinable and Non-machinable Bore of JF-800 Bearings and Their Tolerances

公称厚度 Norminal Thiickness	内孔不可加工厚度公差 Tolerances of Series B (non-machinable)	内孔可加工厚度公差 Tolerances of Series C (non-machinable)
1	-0.025	+0.25 +0.15
1.5	-0.030	+0.25 +0.15
2	-0.035	+0.25 +0.15
2.5	-0.040	+0.30 +0.15
3	-0.045	+0.30 +0.15
3.5	-0.050	+0.30 +0.15

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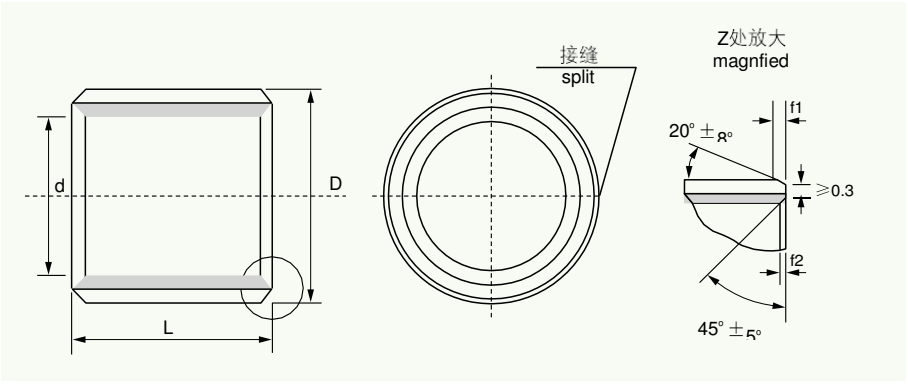
JF-800 双金属轴承标准公制尺寸
JF-800 Bimetal Bearings Standard Metric Size



单位 unit:mm

d	D	壁厚 Wall Thickness	外径 O.D Tolerance	内径公差 I.D.(H8) Tolerance	配合座孔 H7 Housing Bore	轴径 f_7 Journal Diameter	f_1	f_2	L -0.40										
									10	15	20	25	30	40	50	60	80	90	100
10	12		12 +0.065 +0.030	10 +0.022 +0.000	10 -0.013 -0.028	12 +0.018	0.5	0.3	1010	1015	1020								
12	14		14 +0.065 +0.030	12 +0.027 +0.000	12 -0.016 -0.034	14 +0.018	0.5	0.3	1210	1215	1220								
14	16	1 -0.025	16 +0.065 +0.030	14 +0.027 +0.000	14 -0.016 -0.034	16 +0.018	0.5	0.3	1410	1415	1420								
15	17		17 +0.065 +0.030	15 +0.027 +0.000	15 -0.016 -0.034	17 +0.018	0.5	0.3	1510	1515	1520								
16	18		18 +0.075 +0.035	16 +0.027 +0.000	16 -0.016 -0.034	18 +0.018	0.8	0.4	1610	1615	1620								
18	20		20 +0.075 +0.035	18 +0.033 +0.000	18 -0.016 -0.034	20 +0.021	0.8	0.4	1810	1815	1820	1825							
20	23		23 +0.075 +0.035	20 +0.033 +0.000	20 -0.020 -0.041	23 +0.021	0.8	0.4	2010	2015	2020	2025							
22	25	1.5 -0.030	25 +0.075 +0.035	22 +0.033 +0.000	22 -0.020 -0.041	25 +0.021	0.8	0.4	2210	2215	2220	2225							
24	27		27 +0.075 +0.035	24 +0.033 +0.000	24 -0.020 -0.041	27 +0.021	1.0	0.5	2410	2415	2420		2430						
25	28		28 +0.075 +0.035	25 +0.033 +0.000	25 -0.020 -0.041	28 +0.021	1.0	0.5		2515	2520	2525	2530						
26	30		30 +0.075 +0.035	26 +0.033 +0.000	26 -0.020 -0.041	30 +0.021	1.0	0.5		2615	2620	2625	2630						
28	32		32 +0.085 +0.045	28 +0.033 +0.000	28 -0.020 -0.041	32 +0.025	1.0	0.5		2815	2820	2825	2830	2840					
30	34		34 +0.085 +0.045	30 +0.039 +0.000	30 -0.020 -0.041	34 +0.025	1.2	0.6		3015	3020	3025	3030	3040					
32	36	2 -0.035	36 +0.085 +0.045	32 +0.039 +0.000	32 -0.025 -0.050	36 +0.025	1.2	0.6		3215	3220	3225	3230	3240					
35	39		39 +0.085 +0.045	35 +0.039 +0.000	35 -0.025 -0.050	39 +0.025	1.2	0.6			3520	3525	3530	3540	3550				
38	42		42 +0.085 +0.045	38 +0.039 +0.000	38 -0.025 -0.050	42 +0.025	1.2	0.6			3825	3825	3830	3840	3850				
40	44		44 +0.085 +0.045	40 +0.039 +0.000	40 -0.025 -0.050	44 +0.025	1.2	0.6			4020	4025	4030	4040	4050				
45	50		50 +0.085 +0.045	45 +0.039 +0.000	45 -0.025 -0.050	50 +0.025	1.5	1.0			4520	4525	4530	4540	4550				
50	55		55 +0.100 +0.050	50 +0.039 +0.000	50 -0.025 -0.050	55 +0.030	1.5	1.0					5030	5040	5050	5060			
55	60		60 +0.100 +0.050	55 +0.046 +0.000	55 -0.030 -0.060	60 +0.030	1.5	1.0					5530	5540	5550	5560			
60	65	2.5 -0.040	65 +0.100 +0.050	60 +0.046 +0.000	60 -0.030 -0.060	65 +0.030	1.5	1.0					6030	6040	6050	6060			
65	70		70 +0.100 +0.050	65 +0.046 +0.000	65 -0.030 -0.060	70 +0.030	1.5	1.0					6530	6540	6550	6560			
70	75		75 +0.100 +0.050	70 +0.046 +0.000	70 -0.030 -0.060	75 +0.030	1.5	1.0					7030	7040	7050	7060	7080		
75	80		80 +0.100 +0.050	75 +0.046 +0.000	75 -0.030 -0.060	80 +0.035	1.5	1.0					7530	7540	7550	7560			
80	85		85 +0.120 +0.070	80 +0.054 +0.000	80 -0.030 -0.060	85 +0.035	1.5	1.0						8040	8050	8060	8080		

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FB090 系列青铜卷制轴承
FB090 Bronze-Wrapped Bearings

产品概述

◎FB090 系列青铜卷制轴承套是我公司在钢-铜铅双金属轴套产品基础上开发设计的新一代轴套。该产品在国外应用十分普遍，随着我国引进机械的设备新机种的日益增多，设计师们寻找新型摩擦材料、轴套的要求也日益需要，因此该产品在我们机械制造中有着宽广应用领域和实用价值。

◎FB090 系列轴套最大特点是薄壁结构，不占据很大的装配空间。轴套材料采用特殊配方高密度铜合金带材。它与传统的铺型铜套 相比，具有密度高，无气缩孔、承载能力大，又有耐磨耐疲劳等优 点。轴套制造采用先进的工装模具，可在带材摩擦面上加工出适用 各种工程条件的油穴、油坑、油槽，从而使轴套在使用可储存大量 润滑油脂，延长加油间隔时间，有效的提高了使用寿命。

◎FB090 系列轴承广泛应用与农业机械、建筑机械、工程机械、汽车行业等。

Product Overview

◎FB090 series bronze rolled bushing is our new generation bushing based upon steel-bronze lead double metal bushings. This product is widely applied overseas. With the increase of our country’s introduction of foreign machineries, designer’s requirements on new abrasive materials and bushings are accordingly increasing. Therefore, our products see a wide application scope and practical value in machinery production.

◎The major feature of FB090 series bushing is their thin-wall structure, which doesn’t take up too large assembly space. Specially formulated high-density bronze alloy bands are used for the building of the bushing, which, compared with traditional bushings, is featured in the high density, no shrinkage blowholes, high load sustainability and anti-wearing and anti-fatigue. The production of the bushing is by means of advanced fixture and molds, able to make oil holes, hole dents and grooves on the frication surfaces of the bands to suit various engineering applications, making it possible for the bushing to store large amount of lubricating grease when working. Therefore, the lubrication interval is prolonged and the service hours are effectively lengthened.

◎FB090 series bearings are widely used in applications such as agricultural machineries, construction machineries, engineering machineries and automobile industry.

FB090 系列产品的优点

1. 节约大量铜材、节省车制铜套工时；
2. 与车制轴套、滚动轴承相比其重量轻、成本低；
3. 可在摩擦面加工出各种有穴、有坑、储存一定油脂，延长加油的时间是铜套的 5 倍
4. 极高的承载能力，特别是适用于粗糙的摩擦面； 可供产品：直套、止推垫片、翻边衬套、轴瓦、滑板、钢套组合件。

FB090 Product Benefits

1. Saving large amount of bronze material and save the working hours normally spent for lathing the bronze bushing.
2. Compared with lathed bushings and roller bearings, it is lights and more cost-effective.
3. Various holes and dents can be made on the frication surface for grease storage, prolonging the lubrication interval to 5 times as long as required by the bronze bushing.
4. Extremely high load sustainability, especially suitable for coarse abrasion surfaces.

Standard products available: straight bushings, thrust plates and pressure bearings.

Non-standard products available: straight bushings, thrust plates, planks, bearing bushings, slide plates and steel bushing assembly.

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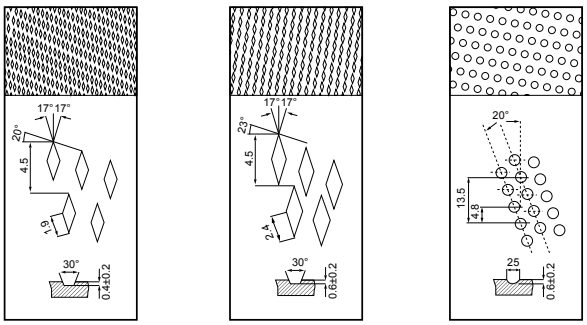
FB090 轴承简介
FB090 Bearing Introduction

材料结构 Material Structure

◎采用高密度青铜卷制成形或球形油袋、油穴特殊合成内部表面以减少磨损延长使用时间并且很好的做到防腐功能。

◎High-density bronze is rolled into shape or oil bags and oil holes are specially integrated into the inner surface to reduce the wearing and prolong the service hours. Besides, it has excellent anti-corrosion functions.



轴衬套内
Inside the bush of the shaft
菱形油穴r≤φ22
Rhomb oil holes r≤φ22

轴衬套内
Inside the bush of the shaft
菱形油穴r>φ22
Rhomb oil holes r>φ22

形成菱形
Forming a rhomb

化学成分 Chemical Composition

材料Material	铜 Cu	锡 Sn	磷 P	铅 Pb	锌 Zn
CuSn8	91.3%	8.5%	0.2%	-	-

物理特性 Physical Property

型号 Type	密度 Density	散热热涨 Heat Emission and Expansion	热传导 Heat Conducting	硬度 Hardness	抗压强度 Extensile	延伸率 Extensile
FB090	8.8g/cm^3	18.5×10^{-2}×K^{-1}	58W(m·k)	90~120HB	470N/mm^2	40%

应用范围 Application scope

此系列轴承广泛应用与农用、建设机械以及工程机械等。

This series of bearing is widely applied to agricultural, construction and engineering machineries, etc.

油穴类别(依据 DIW1494/ISO3457)。

Categories of oil holes (As per to DIW1494/ISO3457)。

标准衬套公差（依据 DIW W91/1503547) Standard tolerance for bushes (As per to DIW W91/1503547)

标准直径 Standard Dia.	衬套外径尺寸 O.D.Size	相配座孔 Housing Bore	衬套内径尺寸 I.D.Size	相配轴径 Matching Shaft Diameter
10~18	+0.065 +0.030	+0.018 0	+0.046 0	- 0.016 - 0.043
18~30	+0.075 +0.035	+0.021 0	+0.052 0	- 0.020 - 0.020
30~50	+0.085 +0.045	+0.025 0	+0.062 0	- 0.025 - 0.064
50~80	+0.100 +0.055	+0.030 0	+0.074 0	- 0.030 - 0.076
80~120	+0.120 +0.070	+0.035 0	+0.087 0	- 0.036 - 0.090
120~180	+0.170 +0.100	+0.400 0	+0.100 0	- 0.043 - 0.106
180~250	+0.210 +0.130	+0.046 0	+0.115 0	- 0.050 - 0.122
250~315	+0.260 +0.170	+0.052 0	+0.130 0	- 0.056 - 0.137

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FB092 系列青铜卷制轴承
FB092 Bronze-Wrapped Bearings

产品概述

◎FB092系列青铜卷制轴承是与FB090材料结构相同，我单位根据国外同类产品基础上开发出的新一代产品轴套，能改良产品设计、替代原有铜套,能降低采购成本，因此产品在我们机械制造中有着广泛实用价值和应用领域。

◎FB092系列轴套最大特点是薄壁结构，不占据很大的装配空间。轴套材料采用特殊配方高密度铜合金带材。它与传统的铺型铜套相比，可在带材摩擦面上加工出适用各种工程条件的油穴、油坑、油槽，排列润滑通孔，从而使轴套在使用可储存大量润滑油脂，延长加油间隔时间，有效的提高了使用寿命。

◎FB092系列轴承广泛应用与农业机械、建筑机械、工程机械、高载低速场合等。

Product Overview

◎FB092 series bronze rolled bushing is our new generation bushing based upon steel-bronze lead double metal bushings. This product is widely applied overseas. With the increase of our country’ s introduction of foreign machineries, designer’ s requirements on new abrasive materials and bushings are accordingly increasing. Therefore, our products see a wide application scope and practical value in machinery production.

◎The major feature of FB092 series bushing is their thin-wall structure, which doesn’ t take up too large assembly space. Specially formulated high-density bronze alloy bands are used for the building of the bushing, which, compared with traditional bushings, is featured in the high density, no shrinkage blowholes, high load sustainability and anti-wearing and anti-fatigue. The production of the bushing is by means of advanced fixture and molds, able to make oil holes, hole dents and grooves on the frication surfaces of the bands to suit various engineering applications, making it possible for the bushing to store large amount of lubricating grease when working. Therefore, the lubrication interval is prolonged and the service hours are effectively lengthened.

◎FB092 series bearings are widely used in applications such as agricultural machineries, construction machineries, engineering machineries and automobile industry.

FB092 系列产品的优点

1. 节约大量铜材、节省车制铜套工时；
2. 与车制轴套、滚动轴承相比其重量轻、成本低；
3. 可在摩擦面加工出各种有穴、有坑、储存一定油脂，延长加油的时间是铜套的5倍
4. 极高的承载能力，特别是适用于粗糙的摩擦面；

可供标准产品：直套、翻边衬套、组合钢套。

FB092 Product Benefits

1. Saving large amount of bronze material and save the working hours normally spent for lathing the bronze bushing.
2. Compared with lathed bushings and roller bearings, it is lights and more cost-effective.
3. Various holes and dents can be made on the frication surface for grease storage, prolonging the lubrication interval to 5 times as long as required by the bronze bushing.
4. Extremely high load sustainability, especially suitable for coarse abrasion surfaces.

Standard products available: straight bushings, thrust plates and pressure bearings.

Non-standard products available: straight bushings, thrust plates, planks, bearing bushings, slide plates and steel bushing assembly.

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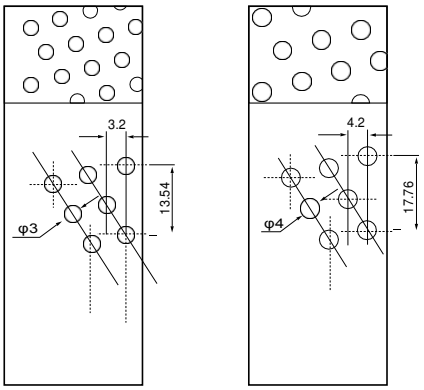
FB092 轴承简介
FB092 Bearing Introduction



轴承内部 球形
内径 r≤φ25

轴承球形 内径
r>φ25

化学成分 Chemical Composition

材料Material	铜 Cu	锡 Sn	磷 P	铅 Pb	锌 Zn
CuSn8	91.3%	8.5%	0.2%	-	-

物理特性 Physical Property

型号 Type	密度 Density	散热热涨 Heat Emission and Expansion	热传导 Heat Conducting	硬度 Hardness	抗压强度 Extensile	延伸率 Extensile
FB092	8.8g/cm^3	$18.5\times10^{-2}\times K^1$	58W(m·k)	90~120HB	470N/mm^2	40%

应用范围 Application scope

此系列轴承广泛应用与农用、建设机械以及工程机械等。

This series of bearing is widely applied to agricultural, construction and engineering machineries, etc.

标准衬套公差（依据 DIW W91/1503547) Standard tolerance for bushes (As per to DIW W91/1503547)

标准直径 Standard Dia.	衬套外径尺寸 O.D.Size	相配座孔 Housing Bore	衬套内径尺寸 I.D.Size	相配轴径 Matching Shaft Diameter
10~18	+0.065 +0.030	+0.018 0	+0.046 0	- 0.016 - 0.043
18~30	+0.075 +0.035	+0.021 0	+0.052 0	- 0.020 - 0.020
30~50	+0.085 +0.045	+0.025 0	+0.062 0	- 0.025 - 0.064
50~80	+0.100 +0.055	+0.030 0	+0.074 0	- 0.030 - 0.076
80~120	+0.120 +0.070	+0.035 0	+0.087 0	- 0.036 - 0.090
120~180	+0.170 +0.100	+0.400 0	+0.100 0	- 0.043 - 0.106
180~250	+0.210 +0.130	+0.046 0	+0.115 0	- 0.050 - 0.122
250~315	+0.260 +0.170	+0.052 0	+0.130 0	- 0.056 - 0.137

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FB09G 系列青铜卷制轴承
FB09G Bronze-Wrapped Bearings

材料结构 Material Structure

◎与FB090具有相同的生产工艺及使用场合，其基体为青铜基板，在其菱形油穴内填充了以石墨为主的固体润滑剂，使产品在起始运用阶段及过程中能有更低的摩擦系数，在短时间断油的情况下任能保持良好的工作状态。因此被广泛使用在工程机械、齿轮箱传动部件、汽机车离合器等高载中速部位、户外高空设备的转动部位。

◎The same produce process and application except overlay the solid lubricants into the diamond shaped lubrication indents on the bearing surface, which will offer good friction at the start and process works and keep good condition even no oil giving at short time. So can be used in construction machines, gears, automotive clutch pads etc.

技术参数 Tech.Data

最大承载压力	Load capacity	140N/mm^2
适应温度范围	Temperature limit	-100℃~+250℃
最高滑动速度	Speed limit	1.5M/s
摩擦系数	Friction clef	0.06~0.25
允许最高PV值(干)	PV limit (dry)	2.6N/mm^2·m/s
允许最高PV值(油)	PV limit (oil)	15N/mm^2·m/s

可供形式 Availability

直套、止推垫片、滑板及其它非标品部件等。
Cylindrical bushes, thrust washers, strip and non-standard parts as the clients supplied drawing etc.

公差 Tolerance

一般推荐座孔公差为H7，轴径公差为f7。
Recommend housing tolerance H7 and the shaft as f7.

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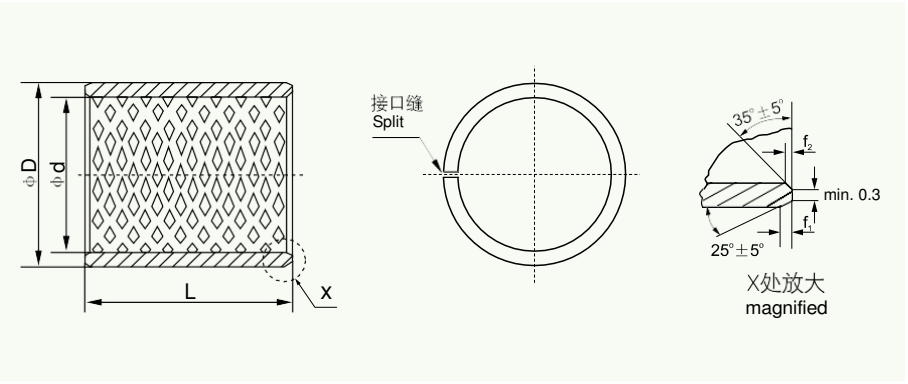
FB090/FB092/FB09G 青铜卷制轴承标准公制尺寸
FB090/FB092/FB09G Bronze-Wrapped Bearings Standard Metric Size



单位 Unit: mm

d	D	相配轴径 Shaft Dia. f_7	座孔 Housing H7	壁厚 Wall Thickness 最小 Min.	壁厚 Wall Thickness 最大 Max.	f_1	f_2	L $^{0}_{-0.40}$ 6	8	10	12	15	20	25	30	40	50
6	8	6 $^{-0.013}_{-0.028}$	8 $^{+0.015}$					0606	0608	0610							
8	10	8 $^{-0.013}_{-0.028}$	10 $^{+0.015}$					0806	0808	0810	0812	0815					
10	12	10 $^{-0.016}_{-0.034}$	12 $^{+0.018}$					1006	1008	1010	1012	1015	1020				
12	14	12 $^{-0.016}_{-0.034}$	14 $^{+0.018}$					1206	1208	1210	1212	1215	1220	1225			
13	15	13 $^{-0.016}_{-0.034}$	15 $^{+0.018}$	0.980	1.005	0.6	0.3			1310			1320				
14	16	14 $^{-0.016}_{-0.034}$	16 $^{+0.018}$							1410	1412	1415	1420	1425			
15	17	15 $^{-0.016}_{-0.034}$	17 $^{+0.018}$							1510	1512	1515	1520	1525			
16	18	16 $^{-0.016}_{-0.034}$	18 $^{+0.018}$							1610	1612	1615	1620	1625			
17	19	17 $^{-0.016}_{-0.034}$	19 $^{+0.021}$							1710	1712		1720				
18	20	18 $^{-0.016}_{-0.034}$	20 $^{+0.021}$							1810	1812	1815	1820	1825			
20	23	20 $^{-0.020}_{-0.041}$	23 $^{+0.021}$							2010	2012	2015	2020	2025	2030		
22	25	22 $^{-0.020}_{-0.041}$	25 $^{+0.021}$	1.475	1.505	0.6	0.4			2210	2212	2215	2220	2225	2230		
24	27	24 $^{-0.020}_{-0.041}$	27 $^{+0.021}$									2415	2420	2425	2430		
25	28	25 $^{-0.020}_{-0.041}$	28 $^{+0.021}$							2510	2512	2515	2520	2525	2530	2540	2550
28	32	28 $^{-0.020}_{-0.041}$	32 $^{+0.025}$									2815	2820	2825	2830	2840	
30	34	30 $^{-0.020}_{-0.041}$	34 $^{+0.025}$								3012	3015	3020	3025	3030	3040	
32	36	32 $^{-0.025}_{-0.050}$	36 $^{+0.025}$	1.970	2.005	1.2	0.4						3220		3230	3240	
35	39	35 $^{-0.025}_{-0.050}$	39 $^{+0.025}$								3512	3515	3520	3525	3530	3540	3550
38	42	38 $^{-0.025}_{-0.050}$	42 $^{+0.025}$									3815			3830	3840	
40	44	40 $^{-0.025}_{-0.050}$	44 $^{+0.025}$								4012		4020	4025	4030	4040	4050

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FB090/FB092/FB09G 青铜卷制轴承标准公制尺寸
FB090/FB092/FB09G Bronze-Wrapped Bearings Standard Metric Size

单位Unit: mm

d	D	相配轴径 Shaft Dia. f_7	座孔 Housing H7	壁厚 Wall Thickness 最小 Min.	壁厚 Wall Thickness 最大 Max.	f_1	f_2	L $^{0}_{-0.40}$ 20	25	30	40	50	60	70	80	100	115
45	50	45 $^{-0.025}_{-0.050}$	50 $^{+0.025}$					4520	4525	4530	4540	4550					
50	55	50 $^{-0.025}_{-0.050}$	55 $^{+0.030}$					5020		5030	5040	5050	5060				
55	60	55 $^{-0.030}_{-0.060}$	60 $^{+0.030}$							5530	5540	5550	5560				
60	65	60 $^{-0.030}_{-0.060}$	65 $^{+0.030}$	2.460	2.505	1.8	0.6			6030	6040	6050	6060	6070			
65	70	65 $^{-0.030}_{-0.060}$	70 $^{+0.030}$							6530	6540	6550	6560	6570			
70	75	70 $^{-0.030}_{-0.060}$	75 $^{+0.030}$								7040	7050	7060	7070	7080		
75	80	75 $^{-0.030}$	80 $^{+0.030}$							7530	7540	7550	7560	7570	7580		
80	85	80 $^{-0.035}$	85 $^{+0.035}$								8040	8050	8060	8070	8080	80100	
85	90	85 $^{-0.035}$	90 $^{+0.035}$								8540		8560		8580	85100	
90	95	90 $^{-0.035}$	95 $^{+0.035}$								9040	9050	9060		9080	90100	
95	100	95 $^{-0.035}$	100 $^{+0.035}$	2.440	2.490	1.8	0.6					9550	9560		9580	95100	
100	105	100 $^{-0.035}$	105 $^{+0.035}$									10050	10060		10080		100115
105	110	105 $^{-0.035}$	110 $^{+0.035}$										10560		10580		105115
110	115	110 $^{-0.035}$	115 $^{+0.035}$										11060		11080		110115
120	125	120 $^{-0.035}$	125 $^{+0.040}$										12060		12080	120100	
125	130	125 $^{-0.040}$	130 $^{+0.040}$										12560			125100	125115
130	135	130 $^{-0.040}$	135 $^{+0.040}$	2.415	2.465	1.8	0.6						13060		13080	130100	
140	145	140 $^{-0.040}$	145 $^{+0.040}$										14060		14080	140100	
150	155	150 $^{-0.040}$	155 $^{+0.040}$										15060		15080	150100	
160	165	160 $^{-0.040}$	165 $^{+0.040}$										16060		16080	160100	160115
180	185	180 $^{-0.040}$	185 $^{+0.046}$												18080	180100	
190	195	190 $^{-0.046}$	195 $^{+0.046}$	2.415	2.465	1.8	0.6								19080	190100	
200	205	200 $^{-0.046}$	205 $^{+0.046}$												20080	200100	
220	225	220 $^{-0.046}$	225 $^{+0.046}$										20060		22080	220100	
250	255	250 $^{-0.046}$	255 $^{+0.052}$												25080	250100	
260	265	260 $^{-0.052}$	265 $^{+0.052}$	2.415	2.465	1.8	0.6								26080	260100	
280	285	280 $^{-0.052}$	285 $^{+0.052}$												28080	280100	
300	305	300 $^{-0.052}$	305 $^{+0.052}$														

注：要求相配轴孔H7，轴径f7，衬套压入座孔后内孔值为H8。

Note: Shaft hole is required to be H7. Shaft diameter is f7. Affer bearing is installed, the inner hole should be H8.

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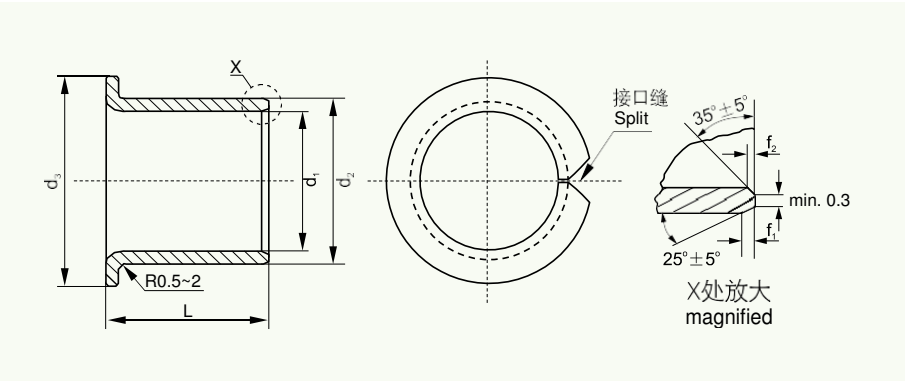
FB090/FB092 青铜卷制翻边轴承标准公制尺寸
FB090/FB092 Bronze-Wrapped Flange Bearing Standard Metric Size



单位Unit: mm

d_1	d_2	d_3	f_1	f_2	L $^{0}_{-0.40}$										
					15	20	25	30	35	40	50	60	70	80	90
25	28	35	0.8	0.4	2515	2520	2525								
30	34	45				3020	3025	3030							
35	39	50	1.0	0.6		3520	3525	3530	3535						
40	44	55					4025	4030	4035	4040					
45	50	60						4530	4535	4540	4550				
50	55	65						5030	5035	5040	5050				
55	60	70						5530	5535	5540	5550				
60	65	75	1.2	0.8				6030	6035	6040	6050	6060			
65	70	80						6530	6535	6540	6550	6560			
70	75	85							7035	7040	7050	7060	7070		
75	80	90							7535	7540	7550	7560	7570		
80	85	100							8035	8040	8050	8060	8070	8080	
90	95	110									9050	9060	9070	9080	9090
100	105	120									10050	10060	10070	10080	10090
110	115	130									11050	11060	11070	11080	11090
120	125	140									12050	12060	12070	12080	12090
130	135	155										13060	13070	13080	13090
140	145	165										14060	14070	14080	14090
150	155	180										15060	15070	15080	15090
160	165	190	1.4	0.8								16060	16070	16080	16090
170	175	200										17060	17070	17080	17090
180	185	215										18060	18070	18080	18090
190	195	225										19060	19070	19080	19090
200	205	235										20060	20070	20080	20090
225	230	260										22560	22570	22580	22590
250	255	290										25060	25070	25080	25090
265	270	305										26560	26570	26580	26590
285	290	325										28560	28570	28580	28590
300	305	340										30060	30070	30080	30090

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FB08G 固体润滑卷制轴承
FB08G Solid-Lubricant-Embedded Wrapped Bearings

材料结构 Material Structure

◎FB08G固体润滑轴承是以JF-800双金属材料为基体，再埋入特殊固体润滑剂制作成的新型滑动轴承。由于高强度承载的合金材料作基体，并经过严格选择的高分子填充材料为耐磨剂，合理的螺旋角度菱形块状均布的润滑面，润滑面积达25%，因此，能发挥超群的低摩擦，良好的润滑性和抗磨耗性免除加油。该产品已广泛应用于起重起、微型电机、升降机、吊车及冶金机械等行业。

◎FB08G is a kind of steel-lead bronze alloys based bearing, which is embedded with particular formulation of solid lubricants. Owing to the high strength, high load capacity and the spirally distributed diamond type of the embedded solid lubricant, the high temperature resistant action as extraordinary exploited. The lubrication area of the bearing surface is being about 25%. This type of bearing is particularly applied in starting motor for automobiles, generators cranes and those machines inmetallurgical industry.

技术参数 Tech.Data

最大承载压力	Load capacity	150N/mm^2
适应温度范围	Temperature limit	-100℃~+200℃
最高滑动速度	Speed limit	1.5M/s
摩擦系数	Friction clef	0.06~0.25
允许最高PV值(干)	PV limit (dry)	2.5N/mm^2·m/s
允许最高PV值(油)	PV limit (oil)	15N/mm^2·m/s

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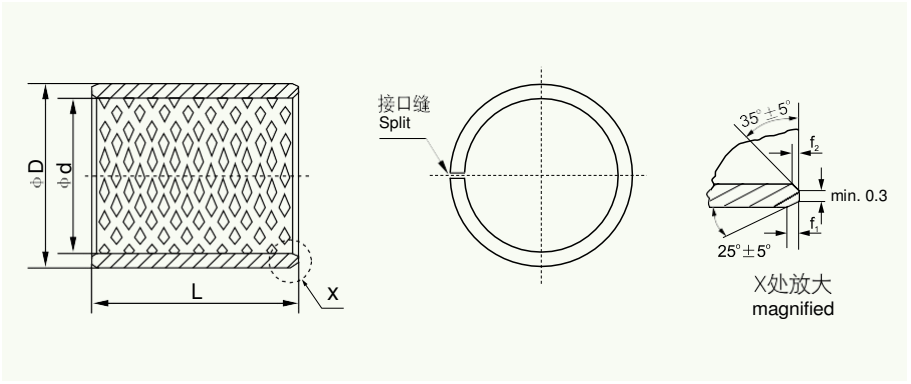
FB08G 固体润滑卷制轴承标准公制尺寸
FB08G Solid-Lubricant-Embedded Wrapped Bearings Standard Metric Size



单位Unit: mm

d	D	f_1	f_2	L $^{0}_{-0.40}$												
				10	15	20	25	30	35	40	50	60	70	80	90	100
10	12			1010	1015	1020										
12	14			1210	1215	1220										
14	16	0.3	0.5	1410	1415	1420	1425									
15	17			1510	1515	1520	1525									
16	18			1610	1615	1620	1625									
18	20			1810	1815	1820	1825									
20	23			2210	2015	2020	2025									
22	25	0.8	0.4	2010	2215	2220	2225	2230								
24	27				2415	2420	2425	2430								
25	28				2515	2520	2525	2530								
28	32				2815	2820	2825	2830								
30	34				3015	3020	3025	3030	3035	3040						
32	36	1.0	0.6		3215	3220	3225	3230	3235	3240						
35	39				3515	3520	3525	3530	3535	3540						
40	44					4020	4025	4030	4035	4040	4050					
45	50					4520	4525	4530	4535	4540	4550					
50	55					5020	5025	5030	5035	5040	5050	5060				
55	60					5520	5525	5530	5535	5540	5550	5560				
60	65	1.2					6025	6030	6035	6040	6050	6060	6070			
65	70							6530	6535	6540	6560	6560	6570			
70	75							7030	7035	7040	7050	7060	7070	7080		
75	80							7530	7535	7540	7550	7560	7570	7580		
80	85							8030	8035	8040	8050	8060	8070	8080		
85	90										7550	8560	8570	8580	9590	
90	95										9050	9060	9070	9080	9090	
95	100										9550	9560	9570	9580	9590	951000
100	105		0.8								10050	10060	10070	10080	10090	100100
105	110										10550	10560	10570	10580	10590	105100
110	115										11050	11060	11070	11080	11090	110100
115	120										11550	11560	11570	11580	11590	115100
120	125	1.4										12060	12070	12080	12090	120100
125	130											12560	12570	12580	12590	125100
130	135											13060	13070	13080	13090	130100
135	140											13560	13570	13580	13590	135100
140	145											14060	14070	14080	14090	140100
145	150											14560	14570	14580	14590	145100
150	155											15060	15070	15080	15090	150100
155	160											15560	15570	15580	15590	155100
160	165											16060	16070	16080	16090	160100

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JDB 固体镶嵌轴承
JDB Solid-lubricant-Inlaid Bearings

材料结构 Material Structure

铜合金镶嵌式固体润滑剂自润滑轴承，结合了铜合金的耐磨性及固体润滑剂的自润滑性能，使其在使用过程中无需加油维护。产品被广泛应用于高载、间歇性或摇摆运动，如汽机车生产流水线、水轮机、水库工作/事故门、塑胶机械、冲床周边设备等。根据使用的工况，可以提供各种类型的铜合金。

This material provides a maintenance-free bearing solution, particularly for high load, intermittent of oscillating motion. Solid lubricants within a bronze combines the strength of the bronze with the wear resistance and low friction. The application including automotive products line, water engineering, dam gate, plastic industries etc. Different bronze alloy type can be available accordingto the work cond ition.

技术参数 Tech.Data

最大承载 Max. Load	静承载 Static Load	250N/mm^2
	动承载 Dynamic Load	100N/mm^2
最高线速度 Max linear speed	干摩擦 Dry Friction	0.3m/s
	油摩擦 Oil Friction	1.0m/s
最大PV值 PV limit		1.65N/mm^2·m/s
抗拉强度 Tensile strength		750N/mm^2

使用温度 Working temperature	-100℃~+300℃
摩擦系数 Abrasion coefficient	0.03~0.20
导热系数 Heat conducting coefficient	60W(m·K)$^{-1}$
热膨胀系数 Heat expansion coefficient	19·10^{-6}K^{-1}
延伸率 Extensile rate	12%
硬度 Hardness	HB＜210

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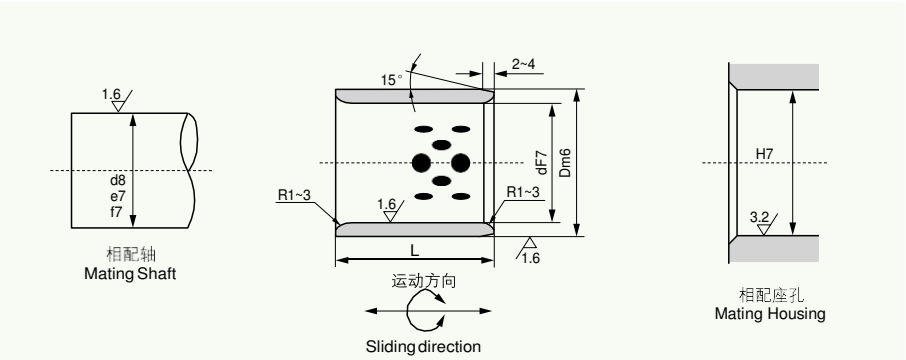
JDB 直固体镶嵌轴承标准公制尺寸
JDB Solid-lubricant-Inlaid Bearings Standard Metric Size



单位Unit: mm

d	D	内径 I.D. F7		外径 O.D. m6		L -0.10 -0.30												
						8	10	12	15	16	20	25	30	35	40	50	60	70	80
8	12	8	+0.028 +0.013	12		081208	081210	081212	081215										
10	14	10		14	+0.018 +0.007	101408	101410	101412	101415		101420								
12	18	12		18			121810	121812	121815	121816	121820	121825	121830						
13	19	13		19			131910		131915	131916									
14	20	14	+0.034 +0.016	20			142010	142012	142015		142020	142025	142030						
15	21	15		21			152110	152112	152115	152116	152120	152125	152130						
16	22	16		22	+0.021 +0.008		162210	162212	162215	162216	162220	162225	162230	162235	162240				
18	24	18		24				182412	182415	182416	182420	182425	182430	182435	182440				
20	28	20		28			202810	202812	202815	202816	202820	202825	202830	202835	202840	202850			
22	32	22		32				223212	223215		223220	223225							
25	33	25		33				253312	253315	253316	253220	253325	253330	253335	253340	253350	253360		
30	38	30	+0.041 +0.020	38				303812	303815		303820	303825	303830	303835	303840	303850	303860		
35	45	35		45	+0.025 +0.009						354520	354525	354530	354535	354540	354550	354560		
40	50	40		50							405020	405025	405030	405035	405040	405050	405060	405070	405080
45	55	45		55									455530	455535	455540	455550	455560		
50	60	50		60									506030	506035	506040	506050	506060	506070	506080

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JDB 直固体镶嵌轴承标准公制尺寸
JDB Solid-lubricant-Inlaid Bearings Standard Metric Size

单位Unit: mm

d	D	内径 I.D. F7		外径 O.D. m6		L $^{-0.10}_{-0.30}$											
						30	35	40	50	60	70	80	100	120	130	140	150
50	62	50	+0.050 +0.025	62		506230	506235	506240	506250	506260	506270						
50	65	50		65		506530		506540	506550	506560	506570	506580	5065100				
55	70	55		70				557040	557050	557060	557070						
60	75	60		75	+0.030 +0.011	607430	607435	607440	607540	607460	607470	607480					
60	75	60		75		607530	607535	607540	607550	607560	607570	607580	6075100				
63	75	63		75						637560	637570	637580					
65	80	65		80					658050	658060	658070	658080					
70	85	70	+0.060 +0.030	85			708535	708540	708550	708560	708570	708580	7085100				
70	90	70		90					709050	709060	709070	709080					
75	90	75		90						759060	759070	759080	7590100				
75	95	75		95	+0.035 +0.013					759560	759570	759580	7595100				
80	96	80		96				809640	809560	809660	809670	809680	8096100	8096120			
80	100	80		100				8010040	8010050	8010060	8010070	8010080	80100100	80100120		80100140	
90	110	90		110		9011030			9011050	9011060	9011070	9011080	90110100	90110120			
100	120	100	+0.071 +0.036	120						10012060	10012070	10012080	100120100	100120120		100120140	
110	130	110		130								11013080	110130100	110130120			
120	140	120		140								12014080	120140100	120140120		120140140	
125	145	125		145									125145100	125145120			
130	150	130		150	+0.040 +0.015								130150100		130150130		
140	160	140	+0.083 +0.043	160									140160100			140160140	
150	170	150		170									150170100				150170150
160	180	160		180									160180100				160180150

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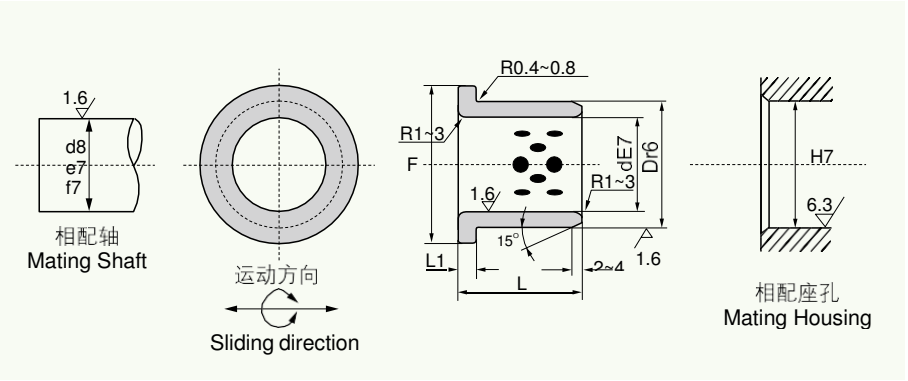
JFB 翻边轴承标准公制尺寸
JFB Flange Bearings Standard Metric Size



单位Unit: mm

d	D	内径 I.D. F7		外径 O.D. m6		F	L_1	L -0.10 -0.30									
								15	20	25	30	35	40	50	60	80	100
10	14	10	+0.040 +0.025	14	+0.034 +0.023	22	2	1015	1020								
12	18	12		18		25		1215	1220								
13	19	13		19		26		1315	1320								
14	20	14	+0.050 +0.032	20		27	3	1415	1420								
15	21	15		21	+0.041 +0.028	28		1515	1520	1525	1530						
16	22	16		22		29		1615	1620	1625	1630						
20	30	20		30		40			2020	2025	2030	2035					
25	35	25	+0.061 +0.040	35		45			2520	2525	2530	2535					
30	40	30		40		50			3020	3025	3030	3035	3040	3050			
35	45	35		45	+0.050 +0.034	60				3525	3530	3535	3540	3550			
40	50	40		50		65	5				4030	4035	4040	4050			
45	55	45	+0.075 +0.050	55		70					4530	4535	4540	4550	4560		
50	60	50		60	+0.060 +0.041	75							5050	5050	5060		
55	65	55		65		80							5540	5550	5560		
60	75	60		75	+0.062 +0.043	90							6040	6050	6060	6080	
70	85	70	+0.090 +0.060	85		105	7.5							7050	7060	7080	
75	90	75		90	+0.073 +0.051	110								7550	7560		
80	100	80		100		120									8060	8080	80100
100	120	100	+0.107 +0.072	120	+0.076 +0.054	150	10								10060	10080	100100
120	140	120		140	+0.088 +0.063	170									12060	12080	120100

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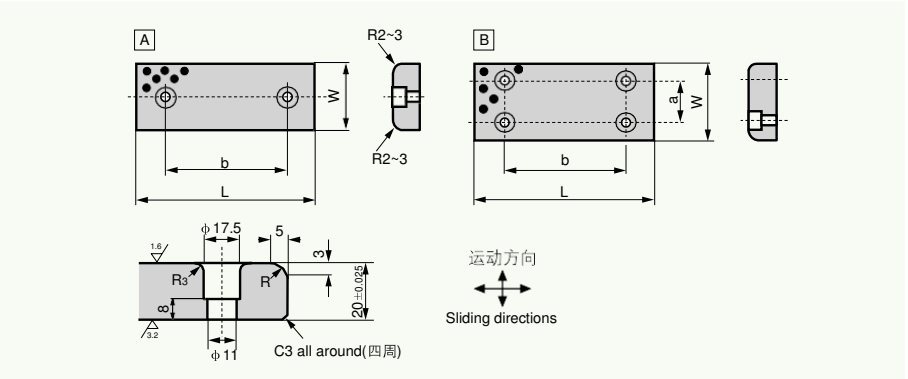
JSP 滑块标准公制尺寸
JSP Sliding Plate Standard Metric Size



单位Unit: mm

型号规格 Designation	W	L	a	b	Sketch 图示
JSP 28×75		75		45	
JSP 28×100	28	100	-	50	
JSP 28×150		150		100	
JSP 38×75		75		45	
JSP 38×100	38	100	-	50	
JSP 38×150		150		100	
JSP 48×75		75		45	
JSP 48×100		100		50	
JSP 48×125	48	125	-	75	
JSP 48×150		150	-	100	A
JSP 48×200		200		150	
JSP 58×75		75		45	
JSP 58×100	58	100	-	50	
JSP 58×150		150		100	
JSP 75×75		75		25	
JSP 75×100		100		50	
JSP 75×125	75	125	-	75	
JSP 75×150		150		100	
JSP 75×200		200		150	
JSP 100×100		100		50	
JSP 100×125		125		75	
JSP 100×150	100	150	50	100	
JSP 100×200		200		150	
JSP 100×250		250		200	
JSP 100×300		300		200	
JSP 125×125		125		75	
JSP 125×150		150		100	B
JSP 125×200	125	200	50	150	
JSP 125×250		250		200	
JSP 125×300		300		200	
JSP 125×350		350		200	
JSP 150×150		150		100	
JSP 150×200	150	200	100	150	
JSP 150×250		250		200	

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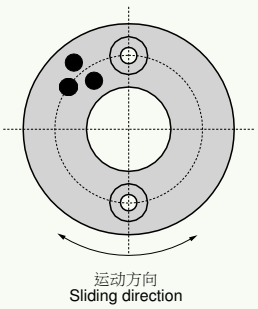
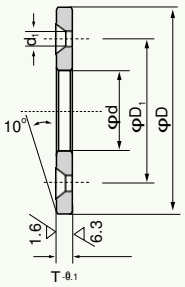
JTW 止推垫片标准公制尺寸
JTW Thrust Washer Standard Metric Size





单位Unit: mm

型号规格 Designation	ϕ d	ϕ D	T $^{0}_{-0.10}$	螺孔 Bolt Hole			
				ϕ D_1	平头螺钉 Crop Bolt	ϕ d_1	孔数 Bore Number
JTW 10	10.2	30		20			
JTW 12	12.2						
JTW 13	13.2	40		28			
JTW 14	14.2		3		M3	3.5	
JTW 15	15.2						
JTW 16	16.2	50		35			
JTW 18	18.2						2
JTW 20	20.2						
JTW 25	25.2	55	5	40	M5	6	
JTW 30	30.2	60		45			
JTW 35	35.2	70		50			
JTW 40	40.2	80	7	60			
JTW 45	45.3	90		70	M6	7	
JTW 50	50.3	100		75			
JTW 55	55.3	110	8	85			
JTW 60	60.3	120		90			
JTW 70	70.3	130		100	M8	9	
JTW 75	75.3	140		110			4
JTW 80	80.3	150	10	120			
JTW 90	90.5	170		140			
JTW 100	100.5	190		160	M10	11	
JTW 120	120.5	200		175			

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FZ 直线轴承
FZ Ball Retainer Bearings

产品简介 Intruduction

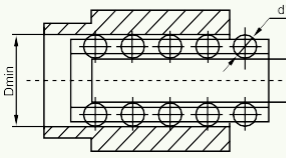
◎FZH（铜基）、FZL（铝基）、FZP（树脂基）钢球保持固，分别以铜合金、硬铝合 金、POM 树脂为基体，并在其外圆表面上，加工出排列有序、大小适当，形状特殊的孔 穴，在其孔穴中镶入滚动轴承钢球。口采用最新的沟槽圆周锁球工艺，有效地解决了传统 式锁球和压痕式锁球不能完全防止钢球脱落的难题。孔底加工出 90° 止口使钢球在孔内自 由转动而不脱落。由于钢球的直径大于保持圈的壁厚，所以在使用时钢球高出保持圈内、 外圆表面，直接与相配的孔与轴接触，使基体(保持圈)浮于中间，并且相配的孔与轴半径 之差小于钢球直径，即钢球与之配合为过盈配合，配合精度高，轴与孔相对运动灵活。是 保持圈的更新换代产品。

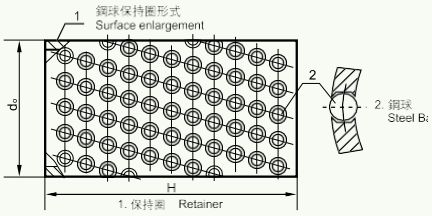
◎FZH. FZL. FZP. ball retainer are as copper, aluminium, POM base. they are machined some regular holes and embedded the steel-ball into. The new work-craft will prevent the ball getting out of as old. as the ball diameter is larger than the retainer s thickness, so it will face to face directly with 90° guide bushing, that will bring high precision match now the ball retainer series items are designed to rotate on the post, as well as maintainits vertical motion. we believe this will give you the benefit of increasing accijracy.

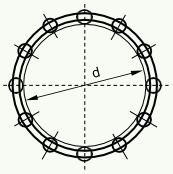
优点与用途 Advantage And Use

◎传统的具有相对运动的孔与轴是有一定间隙的，并孔与轴之间运动磨擦系数较大，使用钢球保持圈后，使轴与孔不直接接触，而是通过中间微量过盈的钢球，因而运动精度高，滚动摩擦代替动摩擦，滚动灵活，摩擦系数小，使用寿命长，在既有转动、又有移动的场合，用无油或加油的轴套与轴相配合，虽然能满足，但运动精度较低，用滚动轴承，只能满足轴相对转动的场合，而钢球保持圈，则上述二个条件均得到满足，目前已广泛应用于冷冲模滚动模架、高精度机床、机床附件以及要求高精度轴向或轴径向同时运动场合。

◎As the traditional work-craft has some grudge between bushing with posts, and the coefficient of friction is larger. now we have changed the work-ways to steel-ball directly face to face guide bushing, so the precision is improved. it composes of both active roll and lower friction coefficient, now they have been widely used in punching machine, die machine, high precision machine which need rotation and verticaI motion.







相配零件的要求 Installed Spares Requested

1.导套：材料 GCrl5、YB9，热处理，硬度 HRC62~66，技术条件按 GB/T12446 与轴配合应具有 0.01-0.02 径向过盈量，表面粗糙度为 $^{0.05}$ 2.轴：材料 GCrl5、YB9，热处理，硬度 HRC62~66，技术条件按 GB/T12446，轴的公 差采用 h5，表面粗糙度为 $^{0.05}$ 3.测量：用通用的测量手段（气动量仪、外径千分尺、内径千分表等）测量轴导套和钢球 的尺寸偏差值，即可求出配合后的过盈量，即 Ymax=dmax+2d’ -DmIn,要求过盈量为 0.01-0.02mm

1. GUIDE BUSHING: MATERIAL GCrl5, YB9, HEAT TREAMENT HRC62-66, TECHNIQUE CONDITION ACCORDING TO GB/T1 2446. REQUEST 0.01-0.02mm THE SURFACE ROUGHNESS IS $^{0.05}$
2. GUIDIE POSTS: MATRIAL GCrl5, YB9, HEAT TREAMENT HRC62-66, THE TOLERANCE OF SHAFT IS h5, THE SURFACE ROUGHNESS IS $^{0.05}$
3. SIZE TEST: IT IS TESTED BY OUTSIDE MICROMETER &DIAL GAUGE AS USUAL. THE Ymax (Ymax+2d’-Dmin) REQUEST 0.01-0.02mm

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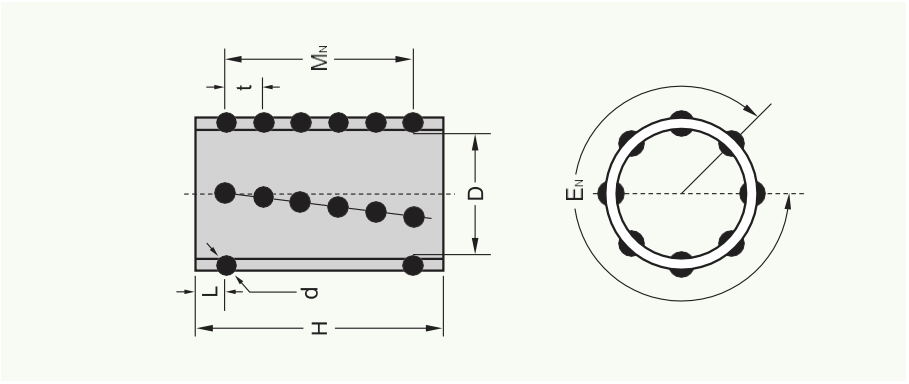
FZ 钢球保持圈标准公制尺寸
FZ Ball Retainers Standard Metric Size



单位unit:mm

型号规格 Designation	D	H	d	E_N	M_N	球 BALLS	t	L
FZ(*)1950	19	50	3	12	8	96	5.5	5.75
FZ(*)1960		60			10	120		5.25
FZ(*)2050	20	50			8	96		5.75
FZ(*)2060		60			10	120		5.25
FZ(*) 2250	22	50		14	8	112		5.75
FZ(*) 2260		60			10	140		5.25
FZ(*)2360	23	60			10	208		5.25
FZ(*)2475	24	75			13	128		4.50
FZ(*)2550	25	50		16	8	112		5.75
FZ(*)2560		60			10	160		5.25
FZ(*)2575		75			13	208		4.50
FZ(*)2775	27	75			13	208		4.50
FZ(*)2860	28	60	4	14	8	112	6.5	7.25
FZ(*)2875		75			11	154		5.00
FZ(*)3060	30	60			8	112		7.25
FZ(*)3075		75			11	154		5.00
FZ(*)3260	32	60		16	8	128		7.25
FZ(*)3275		75			11	192		5.00
FZ(*)3390		90			13	208		6.00
FZ(*)3685	36	85			12	192		6.75
FZ(*)3690		90			13	208		6.00
FZ(*)3870	38	70			8	128		7.00
FZ(*)3890		90			11	176		5.00
FZ(*)4090	40	90			11	176		5.00
FZ(*)4590	45	90	5	18	11	198	8.0	5.00
FZ(*)45110		110			13	234		7.00
FZ(*)5090	50	90		20	11	220		5.00
FZ(*)50110		110			13	260		7.00
FZ(*)6090	60	90		22	11	242		5.00
FZ(*)60110		110			13	286		7.00
FZ(*)80130	80	130		28	15	420		9.00

注：FZ(*)为: FZH(铜基)、FZL(铝基)、FZP(树脂基)
Notes: FZ(*): FZH (Bronze based) FZL (Aluminum based) FZP (Resin based)

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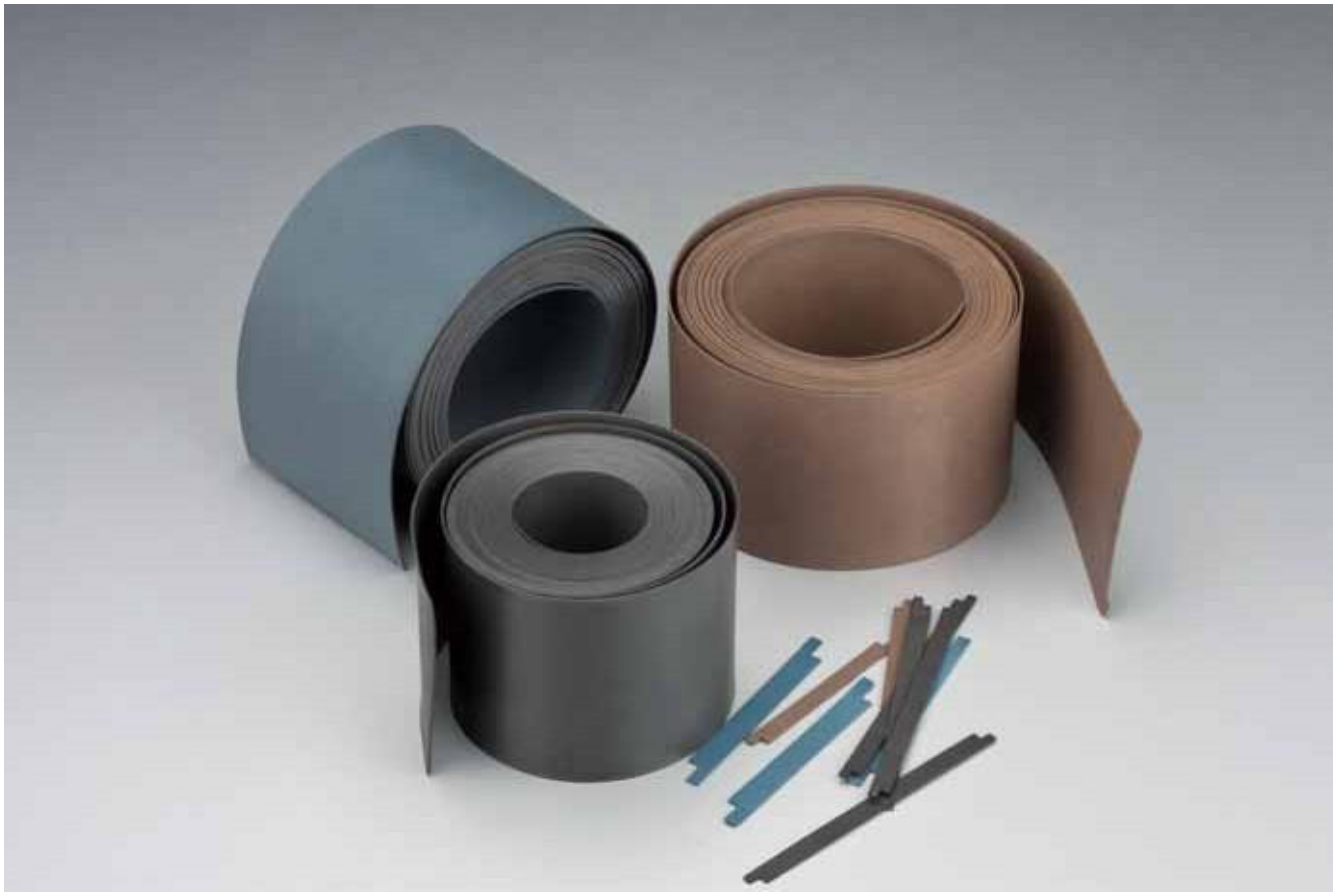
FD 四氟软带
FD PTFE Soft Strips



材料结构 Material Structure

◎FD以PTFE为主材，以铜粉及其它高分子添加剂为辅的耐磨性材料。产品广泛运用化工行业、油压、油缸、汽摩减振器、机床导轨、印刷机械、纺织机械等轻载但需要自润滑的场合。产品如经过特殊处理，可粘帖于钢质或者橡胶面上，产品在使用过程中无爬行现象。

◎FD consist of PTFE with bronze powder and additive material, This material structure enables the final goods have more light and easy for install. It is widely been used in chemica lindustries, medicalindustries, fluid hydraulic industries, textile machines, OA machines, Door/window hinges etc.

技术参数 Tech.Data

最大承载	静承载 Static Load	30N/mm^2
Max. Load	动承载 Dynamic Load	20N/mm^2
使用温度 Temp. Limit		-40℃~+250℃
最高滑动速度	干摩擦 Dry Friction	0.5m/s
Tiptop Sliding Velocity	油摩擦 Oil Friction	2m/s
摩擦系数 Friction Coeff.		0.10-0.20
允许最高PV值 PV limit	干摩擦 Dry Friction	1.65N/mm^2·m/s

FD 产品活塞环尺寸 Size of The Products

20×18×2	25×23.2×8	30×38.2×8
20×18×3	25×23×8	30×28×8
5×22.2×2.5	27×25×8	30×38.2×11.4
25×22×2.5	30×28×9	32×30.2×8

FD 产品带材尺寸
Strip Measurement of The Products

100×1.5	100×1	200×0.5
8×2.5	12×2.5	25×2.5
6.1×2.5	7.9×2.5	14.8×2.5
19.5×2.5	24.5×2.5	29.5×2.5

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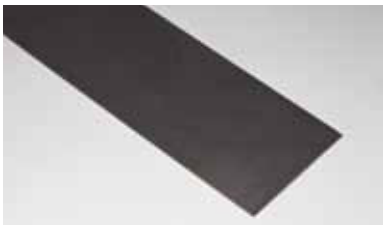
SF-1X 无油润滑材料



材料组织结构：

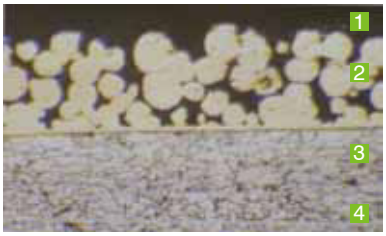
1、聚四氟乙烯与铅的混合物 0.01~0.03mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.5~303mm
4、电镀层：镀锡层厚 0.005mm 或镀铜层厚 0.008mm

- 摩擦系数：0.04~0.20
- 导热系数：13W/MK
- 使用温度范围：-195℃ ~270℃
- 线膨胀系数：$11*10^{-6}K^{1}$

应用特点：

1、无油润滑或少油润滑场合，耐磨性能好，摩擦系数小，使用寿命长。
2、有适量的弹塑性，能将应力分布在较宽的接触面上。
3、静动摩擦系数相近，能消除低速下的爬行。
4、对于对磨轴的硬度要求低，未经调质处理的轴都可使用，在运转构成中能形成转移膜，起到保护对磨轴的作用，无咬轴现象。
5、钢背可电镀多种金属，可在腐蚀介质中使用，目前已广泛应用于各种机械的滑动部位，例如：印刷机、纺织机、烟草机械、微电机、汽车、摩托车与农林机械等等。

SF-1T 齿轮石泵专用材料



材料组织结构：

1、聚四氟乙烯与铅及其他填充混合物 0.01~0.03mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.5~3.3mm
4、电镀层：镀锡层厚 0.005mm 或镀铜层厚 0.008mm

- 摩擦系数：0.03~0.18
- 导热系数：13W/MK
- 使用温度范围：-195℃ ~260℃
- 线膨胀系数：$11*10^{-6}K^{1}$

应用特点：

1、在有油润滑条件下摩擦系数小而稳定。
2、耐磨性能好，抗冲击性能好。
3、由此材料制作的衬套，在流体润滑条件下 PV 值可达到 120N/mm2*m/s
4、目前已广泛运用于各种齿轮油泵、柱塞泵、叶片泵等场合，对流体润滑或境界润滑条件下的中高压齿轮泵尤其使用。

SF-1P 往复运动材料

材料组织结构：

1、聚四氟乙烯与铜混合物 0.02~0.04mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.5~3.3mm
4、电镀层：镀锡层厚 0.005mm 或镀铜层厚 0.008mm

- 摩擦系数：0.04~0.20
- 导热系数：13W/MK
- 使用温度范围：-195℃ ~270℃
- 线膨胀系数：$11*10^{-6}K^{1}$

应用特点：

1、具有在沾油情况下润滑能力强、耐磨性能好、保护油膜清晰的特点。
2、能较好的保护对轴表面不受磨损，对往复运动场合较能适用。
3、应其含铅量很少，故迎合了环保要求。
4、适用于摩托车减震器、各种液压油缸、液压马达、气动元件等领域。

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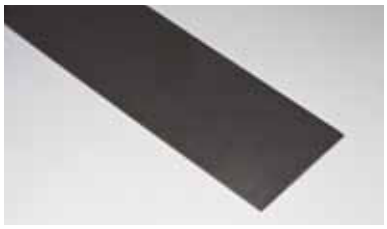
SF-1W 无铅材料



材料组织结构：

1、聚四氟乙烯与纤维混合物 0.01~0.03mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.5~3.3mm
4、电镀层：镀锡层厚 0.005mm 或镀铜层厚 0.008mm

- 摩擦系数：0.04~0.20
- 导热系数：13W/MK
- 使用温度范围：-195℃ ~270℃
- 线膨胀系数：11*10^{-6}K^{1}

应用特点：

1、PTEE、纤维的混合物在运动时可形成很好的转移膜保护对磨轴。
2、因其不含铅，故对于人体无害。铜和钢板具有良好的导热性能，表面的电镀层具有较好的耐腐蚀性。
3、已广泛运用于食品机械、医疗机械、烟草机械、饮料机械及其他绿色机械上。随着国际环保的逐步发展，SF-1W 将是 SF-1 产品的替代品。

SF-1B 青铜基材料

材料组织结构：

1、聚四氟乙烯与铅的混合物 0.01~0.03mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.5~3.3mm

- 摩擦系数：0.04~0.18
- 导热系数：18W/MK
- 使用温度范围：-195℃ ~300℃
- 线膨胀系数：21*10-6K-1

应用特点：

1、PTFE、铅的混合物在运动时可形成很好的转移膜保护对磨轴。
2、烧结层和铜基板具有良好的导热性，可迅速转移运作过程中产生的热量。
3、铜具有自润滑性能，可运用于长期运作而无法停机检修的部位。
4、基体铜具有良好的抗腐蚀能力，可运用于弱酸、强碱场合。
5、已广泛运用于冶金钢铁工业、高温炉钢环部位、水泥灌浆泵、螺旋式输送机、港口机械及船舶机械上等。
6、可在外部组合钢套，或制成翻边，达到内孔、端面同时使用的效果。

SF-1D 液压专用材料

材料组织结构：

1、聚四氟乙烯与亲油性纤维混合物 0.01~0.03mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.5~3.3mm
4、电镀层：镀锡层厚 0.005mm 或镀铜层厚 0.008mm

- 摩擦系数：0.04~0.18
- 导热系数：16W/MK
- 使用温度范围：-195℃ ~270℃
- 线膨胀系数：15*10-6K-1

应用特点：

1、PTFE、亲油性纤维的混合物在运动时可形成很好的转移膜保护对磨轴。
2、抗冲击能力强，耐磨性能好，摩擦系数低，走合性能好，无咬轴现象。
3、可用于旋转、摇摆、往复运动之中。
4、由于不含铅，故可用于食品机械、医疗机械等绿色环保设备。
5、除具有 SF-1P 的特点小，特别适合于往复运动频繁、大侧向力的场合，适用于液压马达、汽车、摩托车减震器及各类液压油缸等领域。

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SF-1S 不锈钢耐蚀材料

材料组织结构：

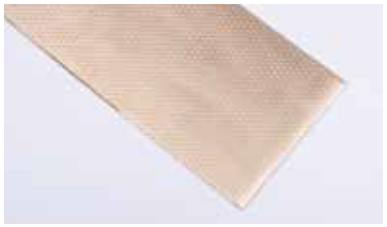
1、聚四氟乙烯与亲油性纤维混合物 0.01~0.03mm
2、球形青铜粉 :0.2~0.3mm
3、钢背：0.5~3.3mm

- 摩擦系数：0.04~0.20
- 导热系数：16W/MK
- 使用温度范围：-195℃ ~270℃
- 线膨胀系数：$15*10^{-6}K^{1}$

应用特点：

1、PTEE、亲油性纤维的混合物在运动时可形成很好的转移膜保护对磨轴。
2、耐磨性能好，摩擦系数低，走合性能好，无咬轴现象。
3、可用于旋转、摇摆、往复运动之中。
4、耐腐蚀性能好。
5、由于不含铅，故适用于食品饮料机械、医疗机械等绿色环保设备。
6、典型用途：主要运用于中酸、强碱场合、例如：化工中酸碱流量计、泵、阀、印染机械、海洋工业耐腐蚀滑动部位。

JF-800 双金属材料



材料组织结构：

1、合金层：CuPb10Sn10
2、钢背：0.6~5mm

- 合金层材质：CuPb10Sn10
- 摩擦系数：≤ 0.12
- 最高使用温度：260℃
- 合金层硬度：（60~90）HB

应用特点：

1、双金属合金材料中承载能力最强的一种。
2、适用于低速高载场合。
3、可在摩擦面加工各种油槽、油穴及油孔，满足不同工况条件的需要。
4、产品性能稳定，已通过“蓝宝石实验”，疲劳强度达 125MPa 以上。
5、广泛运用于重型车的平衡桥衬套、垫片；推土机的重动轮、支动轮、汽车钢板衬套等。

JF-850 双金属材料

材料组织结构：

1、合 t 金层：CuSn6Zn6Pb3
2、钢背：0.6~5mm

- 合金层材质：CuSn6Zn6Pb3
- 摩擦系数：≤ 0.13
- 最高使用温度：170℃
- 合金层硬度：（40~80）HB

应用特点：

1、双金属合金材料中承载能力较强的一种。
2、适用于低速高载场合。
3、可在摩擦面加工各种油槽、油穴及油孔。
4、广泛运用于汽车发动机、底盘、摩托车离合器、齿轮摩擦板和起重设备领域。

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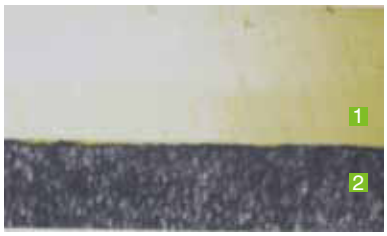
JF-930 双金属材料



材料组织结构：

1、合金层：CuSn6.5P0.1
2、钢背：0.6~5mm

- 合金层材质：CuSn6.5P0.1
- 摩擦系数：≤ 0.13
- 最高使用温度：260℃
- 合金层硬度：（60~90）HB

应用特点：

1、结合强度高，承载能力大，耐磨性能好。
2、适用于低速高载场合。
3、可在摩擦面加工各种油槽、油穴及油孔。
4、具有无铅特点，可以是其他有铅产品的替代产品。
5、广泛运用于矿山机械、汽机车、建筑机械、农用机械、轧钢机械等。

SF-2X 边界润滑材料

材料组织结构：

1、聚四氟乙烯与铅混合物 0.3~0.5mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.4~2.7mm
4、电镀层：镀铜层 0.008mm

- 摩擦系数：0.05~0.25
- 导热系数：13W/MK
- 使用温度范围：-40℃ ~130℃
- 线膨胀系数：11*10-6K-1

应用特点：

1、承载好，耐磨性能好。
2、适用于高载低速下的旋转运动，摇摆运动及经常在载荷下启闭频繁而不易形成流体动力润滑的场合。
3、表面的塑料层在加工成型时可留一定的余量，装配压入座孔后可自行加工，以达到更好的装配尺寸。
4、主要运用于汽车底盘、冶金机械、矿山机械、水利机械、建筑机械、农用机械、轧钢设备等。

SF-2Y 边界润滑材料

材料组织结构：

1、缩醛树脂与亲油性纤维混合物 0.3~0.5mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.4~2.7mm
4、电镀层：镀锡层厚 0.005mm 或镀铜层厚 0.008mm

- 摩擦系数：0.05~0.25
- 导热系数：13W/MK
- 使用温度范围：-40℃ ~130℃
- 线膨胀系数：11*10-6K-1

应用特点：

1、承载好，耐磨性能好。
2、适用于高载低速下的旋转运动，摇摆运动及经常在载荷下启闭频繁而不易形成流体动力润滑的场合。
3、表面的塑料层在加工成型时可留一定的余量，装配压入座孔后可自行加工，以达到更好的装配尺寸。
4、主要运用于进口纺织设备、柱塞泵摆动部位、汽车操纵杆部位等。
5、因其不含铅，故可广泛运用于无铅领域。

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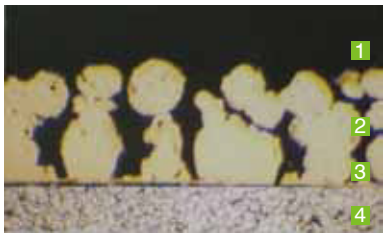
SF-2S 边界润滑材料



材料组织结构：

1、缩醛树脂与亲油性纤维混合物 0.3~0.5mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.4~2.7mm
4、电镀层：镀锡层厚 0.005mm 或镀铜层厚 0.008mm

- 摩擦系数：0.05~0.20
- 导热系数：13W/MK
- 使用温度范围：-40℃ ~130℃
- 线膨胀系数：11*10-6K-1

应用特点：

1、承载好，耐磨性能好。
2、适用于干摩擦和少油润滑的场合。
3、目前产品已应用在摇摆运动、易磨损、易腐蚀的场合，如卷扬机、推土机、印染机、采煤机及吊车、行车高空作业机等场合。

FB090 无油润滑材料

FB090 无油润滑材料是采用高密度铜合金带材为基体，表面轧制菱形或半球形油穴。具有密度高、承载能力大、耐磨性能好、使用寿命长等优点，该材料已广泛应用于起重机械、建筑机械、汽车拖拉机底盘、机床工业及采矿机械中，还可以制成轴瓦、翻边轴套、止推垫片和球碗等。

- 基体材质：CuSn8P0.3 或 CuSn6.5P0.1
- 硬度：HB110~140
- 使用温度范围：-80℃ ~200℃
- 摩擦系数：≤ 0.15
- 磨损量：≤ 0.008

FB092 无油润滑材料

FB092 无油润滑材料是以青铜材料为基体。具有耐磨性能好，使用寿命长等优点，该产品在卷制成轴承前，应布置 ϕ4mm~ϕ6mm 的油孔，面积达到 25%，使油脂润滑充足。目前该产品已应用于输送机、升降机、卷扬机、校平机等中载、低速的场合。

- 基体材质：CuSn8P0.3 或 CuSn6.5P0.1
- 硬度：HB90~120
- 使用温度范围：-100℃ ~200℃
- 摩擦系数：≤ 0.12
- 磨损量：≤ 0.008

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FB09G 青铜固体润滑材料

FB09G 青铜固体润滑材料是以青铜材料为基体，表面埋入固体润滑剂制作而成。由于此材料是以延伸率较高的铜合金材料为基体，所以可以制作特薄的卷制轴套，再加上理想的填充材料为耐磨剂，因此适用于汽车传动轴内作为耐磨的轴套使用，也可在无油润滑的场合使用。

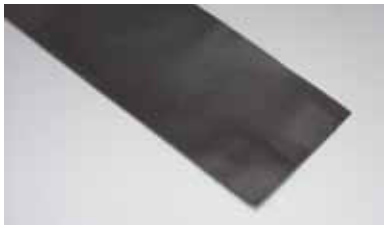
- 基体材质：CuSn10P10+ 石墨
- 硬度：HB80~110
- 使用温度范围：-100℃ ~260℃
- 摩擦系数：≤ 0.12
- 磨损量：≤ 0.008

FB08G 固体润滑材料

FB08G 固体润滑材料是以 JF-800 双金属材料为基体，合金层埋入特殊固体润滑剂制作而成的新颖薄壁固体润滑材料。由于高强度承载的合金材料作基体，理想的填充材料为耐磨剂，合理的菱形块状润滑设计，使润滑面积达 25% 以上，因此，能发挥良好的润滑性和抗磨耗性能。该材料主要应用于汽车变速齿轮箱、发电机、升降机、起重机及冶金机械行业。

- 基体材质：CuSn10P10+ 石墨
- 硬度：HB60~90
- 使用温度范围：-100℃ ~260℃
- 摩擦系数：≤ 0.15
- 磨损量：≤ 0.01

FR 四氟软带材料



FR 四氟软带材料是以青铜丝网为基体，通过特殊烧结工艺，表面轧制聚四氟乙烯（PTFE）和其他填充减摩材料的混合物。它具有较低的摩擦系数，较好的耐磨特性。由于它的柔软性能好，所以可作为钢与钢对磨的隔离膜，实现无间隙、无噪音、无油润滑、无需保养、无污染的理想目的。目前该材料广泛于纺织机械、关节轴承、汽车门铰链等场合。

- 使用温度范围：-40℃ ~280℃
- 摩擦系数：0.05~0.20

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SF-2S 边界润滑材料

材料组织结构：

1、缩醛树脂与亲油性纤维混合物 0.3~0.5mm
2、球形青铜粉：0.2~0.3mm
3、钢背：0.4~2.7mm
4、电镀层：镀锡层厚 0.005mm 或镀铜层厚 0.008mm

- 摩擦系数：0.05~0.20
- 导热系数：13W/MK
- 使用温度范围：-40℃ ~130℃
- 线膨胀系数：11*10-6K-1

应用特点：

1、承载好，耐磨性能好。
2、适用于干摩擦和少油润滑的场合。
3、目前产品已应用在摇摆运动、易磨损、易腐蚀的场合，如卷扬机、推土机、印染机、采煤机及吊车、行车高空作业机等场合。

FB090 无油润滑材料

FB090 无油润滑材料是采用高密度铜合金带材为基体，表面轧制菱形或半球形油穴。具有密度高、承载能力大、耐磨性能好、使用寿命长等优点，该材料已广泛应用于起重机械、建筑机械、汽车拖拉机底盘、机床工业及采矿机械中，还可以制成轴瓦、翻边轴套、止推垫片和球碗等。

- 基体材质：CuSn8P0.3 或 CuSn6.5P0.1
- 硬度：HB110~140
- 使用温度范围：-80℃ ~200℃
- 摩擦系数：≤ 0.15
- 磨损量：≤ 0.008

FB092 无油润滑材料

FB092 无油润滑材料是以青铜材料为基体。具有耐磨性能好，使用寿命长等优点，该产品在卷制成轴承前，应布置 ϕ4mm~ϕ6mm 的油孔，面积达到 25%，使油脂润滑充足。目前该产品已应用于输送机、升降机、卷扬机、校平机等中载、低速的场合。

- 基体材质：CuSn8P0.3 或 CuSn6.5P0.1
- 硬度：HB90~120
- 使用温度范围：-100℃ ~200℃
- 摩擦系数：≤ 0.12
- 磨损量：≤ 0.008

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轴承的选择与计算

轴承的选型 Bearing Selection

杰盛无油轴承根据不同的工况条件设计了不少的轴承材料。用户在使用和设计时应当根据轴承的使用温度、轴承的承载面压、线速度、耐磨性能要求、运动类型、安装情况、轴承成本等各方面因素综合考虑。

SF bush have developed kinds of bearing material according to difference work condition,the user can select the material base on bearing work environment, load, speed, wear, resistance request, moving method, installation, the cost of the material etc.

面压计算 Bearing Load

直套、翻边轴承 Cylidrncal bushes、flange bushes

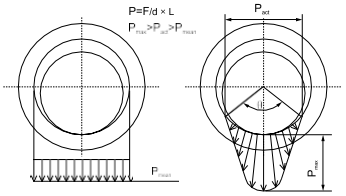
$$P = \frac{F}{dL} \quad (N/mm^2)$$

F = 轴承载值 Load (N)
d = 轴径 Shaft (mm)
L = 轴承长度 Bearing Leagth (mm)

止推垫片 Thrust Washer

$$P = \frac{4F}{(D^2-d^2)\,\pi} \quad (N/mm^2)$$

F = 垫片承载值 Load (N)
d = 垫片外径 Washer OD (mm)
L = 垫片内径 Washer ID (mm)



由于受配合间隙、材料强度、轴承倒角、内部 油槽等原因的影响，轴承的真正承载面压（P_{act}）会大于理论计算值（P_{mean}）。
As the factor of clearance, bushes chamfer, oil groove etc. The actually load (Pact) is higher than theory of calculation(P_{mean}).

线速度计算 Velocity

旋转运动 Rotating motion

$$V = \frac{dn\,\pi}{1000\times 60} \quad (m/s)$$

D = 轴径 Shaft (mm)
n = 转数/分 Rpm

摇摆运动 Oscillating motion

$$V = \frac{Dc\,\theta\,\pi}{1000\times 360\times 60} \quad (m/s)$$

d = 轴径 Shaft (mm)
c = 摇摆频率 Frepuency（次数/分）
θ = 摇摆角度 Oscillating angle

往复运动 Reciprocating motion

$$V = \frac{2sc}{60} \quad (m/s)$$

s = 行程长度 (m)
c = 往复频率 Frepuency（次数/分）

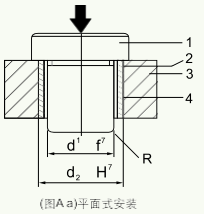
PV 值计算 PV=PXV ($N/mm^2 \times m/s$)

PV 是指轴承在一定的承载和线速度条件下的乘积之和。设备的 PV 值与轴承的使用寿命承反比关系，因此建议设计时设备的 PV 取值尽量使用比较低的安全 PV 值，以确保轴承会有更长的使用寿命。同时也要考虑设备上轴承实际的承载、线速度、使用温度等不能超过所选择材料的极限值，并尽可能地小。

PV is the product ot the specific bearing load P and the sliding speed V which is very important design data. We recommend design lower PV value will lead to longer serive life. Also don't exceed the max. Of material load, speed, temp. And lower if possible.

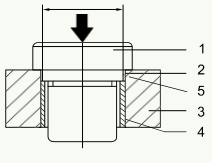
滑动轴承与座孔的装配 The Installation of The Sliding Bushing And The Housing

◎SF 系列轴承在装配前宜先用煤油或柴油清洗干净，然后在机油内浸油、沥干。轴承与座孔装配时，即要保证轴承在座孔中不发生转动和轴向移动，要使轴承外表面与座孔充分接触，一般应保证接触面积大于 70%以上，以利于承受载荷和传导摩擦热，SF 系列轴承内表面是自润滑塑料，外表面是铜背，钢对钢的摩擦系数比钢对塑料的摩擦系数大，因此采用较轻盈配合，既保证使用时衬衫套不会在座孔内发生相对移动，又不会使衬套外径过大致使衬套内孔变形较大。
◎对于工作压力较高的场合为避免轴套走外圆，推荐用以下二方法：
1、加大轴套外径尺寸，内孔变形用较正芯棒校正。
2、安装时，座孔涂 ZY801 厌氧胶，增强轴套与座孔的结合强度。
◎对于外＜55cm 的轴承可按图 A 所示，利用一个带有手柄的压头轴芯，小心操作，轻轻压力座孔中。
◎当轴承外径＞55cm 时可按图 B 所示，利用带台肩的手柄以及一个“O”形圈和一个辅助圈小心操作，将轴承压入座孔中。
◎The Installation of SF Bush
◎SF bushes should de cleaned in kerosene or diesel oil first, immersed in engine oil and then dried up. When the bush is installed into housing, make sure the bush not rotating in the housing or moving in the axial direction and at the same time make the outer surface surface fully contact to the base hole, generally guarantee the contact area over 70%, thus to improve load capacity and transmission of friction heat. The inner surface of SF bush is made of self-lubricating plastic, the outer surface steel backing, The friction coefficient of steel to steel is bigger that of steel to plastic, So we should choose the light-graded tight fit, preventing the axle sleeve from moving in the base when working, and also preventing the inner holes from getting deformed and too big because of the large tight fit of the outer diameter.
◎Out circle of the axle sleeve should be avoided in the high-pressure working conditions. Two methods are recommended here:
1. Increase the outer dia meter of the axle sleeve, and the deformation of inner holes can be calibrated with calibrating core stick.
2. When installing, apply ZY 801 Oxygen-hatred glue in the housing to streng then the combination strength between the axle sleeve and base hole.
◎For bush (outer diameter<55mm), press the bush into the housing gently and carefully using an core axle with a handle. Fig A.
◎For bush (outer diameter >55mm), press the bush into the housing gently and carefully using a handle with a shoulder, an “O” ring and an assisting circle. Fig B.



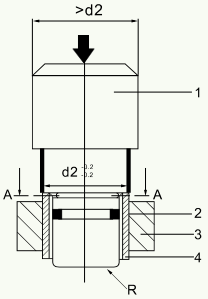
(图A a)平面式安装
(Fig A a)Plane Installation

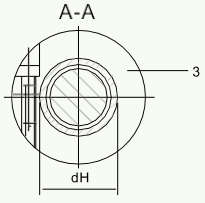
1、压入芯轴
2、轴承座孔倒角0.8 × 15°
3、轴承座
4、JS-F轴承
5、嵌入肩直径
R、芯轴端圆角半径



(b)嵌入式安装
(B)Inset Installation

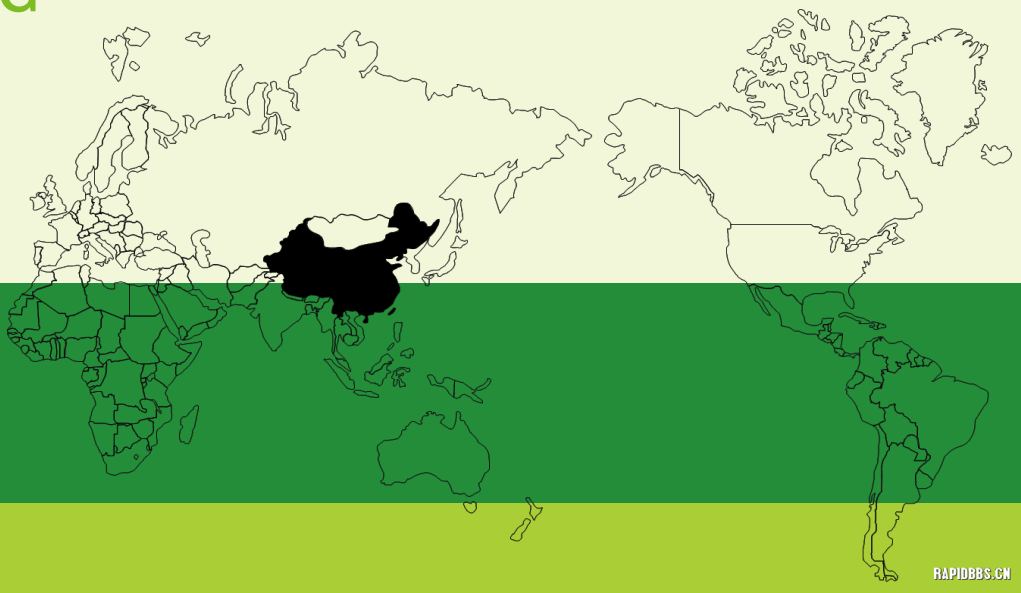
1、Press the core axle into bushing
2、Housing chamfer at end: 0.8 × 15°
3、Housing
4、JS-F bush
5、Diameter of inset shoulder
R、Radius of the round angle of the core axle end





d2	dH
>55到100	$d2^{+0.25}_{+0.25}$
>100到200	$d2^{+0.40}_{+0.36}$
>200到305	$d2^{+0.50}_{+0.40}$

JINTAI
BEARING
HARDWARE



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