

浙江顶创精密工业有限公司
ZHEJIANG ACME PRECISION
INDUSTRY CO. LTD.



自润滑多层复合轴承
Self-lubricating Multilayer
Composite Bearings





浙江阿科精密工业有限公司
ZHEJIANG ACME PRECISION
INDUSTRY CO., LTD.



镶嵌型固体润滑轴承
Embedded Solid Lubrication Bearings

acme KENT

浙江阿科精密工业有限公司
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自润滑多层复合轴承
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滚针轴承
Needle Roller Bearings

acme KENT

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ZHEJIANG ACME PRECISION
INDUSTRY CO., LTD.



直线轴承
Linear Motion Ball Bearings

acme KENT

彰显活力 憧憬未来

Highlight the vitality
of longing for the future











浙江顶创精密工业有限公司，成立于2010年。坐落于浙江省嘉善县城西开发区内，总占地面积2227平方米，总建筑面积7882平方米；我司为外资独资企业，由台湾贞维有限公司投资。为追求更好的服务品质，我司决定于2014年转型为工贸一体企业，集研发、生产和销售于一体。专业生产无油自润滑轴承，广泛应用于各种机械行业、水利工程、航天领域、汽车制造、重型工业、国家建设项目，例如：桥梁、水坝工程及船舶工业。

其余如滚针、直线、及滚珠类轴承我司为追求品质控制及其稳定性，均投资于战略合作夥伴，详细内容将分列于专业样本里，欢迎广大海内外客户对我的支持与指教，诚挚邀请各尊敬的客户莅临指教。


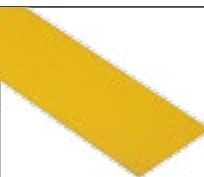
Zhejiang Acme Precision Industry Co. Ltd., founded in 2010. Zhejiang province is located in the west of Jiashan County Development Zone, covers an area of 2227 square meters, total construction area of 7882 square meters; Acme Precision is a foreign - owned enterprises, invested by Jenn Weir Co, Ltd. For the pursuit of better quality of service, our company decided in 2014 transformed into one industry and trade enterprises, combined RD, production and international sales in one. Specializing in the production of self-lubricated bearings, which widely used in all kinds of machinery industry, hydraulic engineering, aerospace, automobile manufacturing, heavy industry, the national construction projects, such as: bridge, dam engineering and shipbuilding industry.

For the rest of the needle roller bearing, ball bearings and linear bearings. In order to reach our pursuit of quality control and stability, we invest in several strategic partners, the details will be listed in seperated catalogs. We are pleased to have all customers pay a visit to our company and wish you can give us your suggestions and advises. Your visiting would be our honour.

SF-1 无油润滑轴承 Oilless Bushing

	SF-1 P2		SF-1T P2		SF-1P P3		SF-1W P3		SF-1B P3
	SF-1D P4		SF-1S P4		SF-TEX P4		SF-1F P7		SF-1WC P8

SF-2 边界润滑轴套 Marginal Lubricating Bushing

	SF-2 P10		SF-2Y P10		SF-2WC P13		SF-2SP P13		SF-1SP P8
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JF-800 双金属轴套 Bimetel Bushing

	JF-800 P15		JF-720 P15		JF-700 P16		JF-20 P16		JF-20 P24
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FB090 青铜卷制轴套 Bronze Wrapped Bushing

	FB090 P22		FB091 P22		FB092 P23		FB094 P23		FB09G P23
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SF-1 无油润滑轴承
SF-1 Oilless Bushing



SF-1 无油润滑轴承 SF-1 Oilless Bushing

钢 + 球形青铜粉 + 聚四氟乙烯 (PTFE)
Steel+Porous bronze sinter+PTFE



SF-1 无油润滑轴承，是以钢板为基体，中间烧结球形青铜粉，表面轧制聚四氟乙烯和混合物卷制而成。它具有摩擦系数小、耐磨、抗腐蚀性好和无油润滑的特点。能降低成本、缩小机械体积、避免咬轴现象和降低噪音等优点。产品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、汽车、摩托车与农林机械等。

SF-1 is wall wrapped bushing made of triple layer composites material which be consisted of a steel backing, a sintered porous bronze particles interlayer and calendared and mixture as surface layer, It is of low friction coefficient, anti-wear, anti-corrosion and can be used without oil, or only a trace of oil if needed. Moreover, it is of low cost, low vibration and low noise, compacted and light. It is widely applied in various sliding articles of different kind of machines, such as textile machines, tobacco machines, hydraulic vehicles, automobiles, agriculture and forests machines and so on.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	5.0
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	℃	-195 ~ +270
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.04 ~ 0.20
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	22	导热系数 Thermal conductivity	W/m·K	13
	干摩擦 Dry	N/mm ² ·m/s	3.6	线胀系数 Linear expansion	11 × 10 ⁻⁶ /K	

SF-1T 齿轮泵专用轴承 SF-1T Gear Pump Bushing

钢 + 球形青铜粉 + 聚四氟乙烯 (PTFE)
Steel+Porous bronze sinter+PTFE



SF-1T 齿轮油泵的高 PV 值工况条件而设计推出的特殊配方产品。产品具有特殊的抗疲劳冲击优点。适应的油泵压力：16-25Mpa，线速度为 3.5-5m/s。产品具有特殊的抗疲劳、抗冲击的优点，在流体润滑境界下 PV 值可达到 120N/mm²·m/s 是各种齿轮油泵、柱塞泵、叶片泵的最佳选择。

SF-1T is composed of a specially designed surface layer of PTFE formulations and is specifically applied for the high PV bushes of gear oil pumps. It is to be used in hydrodynamic or boundary lubricating condition of medium or high pressure gear oil pumps such as P=16-25 Mpa, V=3.5-5m/s. it shows the benefits of low friction coefficient, wear resistant and anti-impact properties. At hydrodynamic lubrication, the PV limit reaches to 120N/mm²·m/s. It is a best choice for the bushes of various kinds of gear pumps as well as plunger pumps, vane pumps and so on.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	10
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	℃	-195 ~ +270
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.03 ~ 0.18
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	60	导热系数 Thermal conductivity	W/m·K	13
	干摩擦 Dry	N/mm ² ·m/s	4.3	线胀系数 Linear expansion	11 × 10 ⁻⁶ /K	

SF-1P 往复运动轴承 SF-1P Reciprocating Motion Bushing

钢 + 球形青铜粉 + 聚四氟乙烯 (PTFE)
Steel+Porous bronze+PTFE



SF-1P 往复运动轴承, 是在 SF-1 材料的结构基础上, 根据往复运动的特殊工况条件而设计的新颖配方产品, 其性能与国外 DD2 相似。因其不含铅, 故符合了环保要求。

SF-1P is particularly suitable for bushes in reciprocating motion, and the properties are similar to that of the foreign product designated as DD2. It is wear resistant, and so can keep the lubricating oil clear after long period of working. Meanwhile it can protect the mating surface from wearing. It is used widely as oil damping vibrating absorber of automobiles, motorcycles and various hydraulic cylinders, hydraulic motors and pneumatic elements.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	2.5
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	°C	-195 ~ +270
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.04 ~ 0.20
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	22	导热系数 Thermal conductivity	W/m-K	13
	干摩擦 Dry	N/mm ² ·m/s	1.8	线胀系数 Linear expansion	11 × 10 ⁻⁶ /K	

SF-1W 无铅轴承 SF-1W Lead-Free Bushing

钢 + 球形青铜粉 + 聚四氟乙烯 (PTFE)
Steel+Porous bronze+PTFE



SF-1W 无铅轴承, 是以钢板为基体, 中间烧结球形青铜粉, 表面轧制聚四氟乙烯 (PTFE) 和其它的混合物, 是卷制而成的滑动轴承。它具有摩擦系数小、耐磨、抗腐蚀性好和无油润滑的特点。使用该产品能降低成本、缩小机械体积、避免咬轴现象和降低噪音等优点。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。

SF-1 is wall wrapped bushing made of triple layer composites material which is consisted of a steel backing, a sintered porous bronze particles interlayer and calendared with PTFE and mixture as surface layer. It is of low friction coefficient, anti-wear, anti-corrosion and can be used without oil, or only a trace of oil if needed. Moreover, it is of low cost, low vibration and low noise, compacted and light, SF-1 is widely applied in various sliding articles of different kind of machines, such as textile machines, tobacco machines, hydraulic vehicles, automobiles, agriculture and forests machine and so on.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	50
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	°C	-195 ~ +300
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.04 ~ 0.20
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	50	导热系数 Thermal conductivity	W/m-K	13
	干摩擦 Dry	N/mm ² ·m/s	3.6	线胀系数 Linear expansion	11 × 10 ⁻⁶ /K	

SF-1B 青铜基轴承 SF-1B Bronze-Based Bushing

铜 + 球形青铜粉 + 聚四氟乙烯 (PTFE)
Bronze+Porous bronze+PTFE



SF-1B 青铜基轴承, 是以锡青铜为基体, 中间烧结球形青铜粉, 表面轧制 PTFE 和耐高温填充材料而成。它具有很高的安全系数, 在连续工作不能停机修理的场所和高温不能加油的场所特别适用。广泛应用在冶金钢铁工业, 连铸机方坯连铸、高温炉前设备, 水泥灌浆泵和螺旋式输送机上。它可以在外部组合钢套, 也可以制成翻边, 达到端面、内孔同时摩擦使用的效果。

SF-1B is of high safety factor, and is particularly appropriate for high temperature environment where no oil is efficient and where the machine must be under successive long period working condition. This is widely used in steel metallurgy industry such as bushes for roller grooves of successive casting machines, cement grouting pumps and screw conveyers for cement. It can also be composed in steel housing or fabricated into flanged bushes which can move both in radial and in axial directions.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	50
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	°C	-195 ~ +300
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.04 ~ 0.18
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	60	导热系数 Thermal conductivity	W/m-K	13
	干摩擦 Dry	N/mm ² ·m/s	4.3	线胀系数 Linear expansion	11 × 10 ⁻⁶ /K	

SF-1D 液压专用轴承 SF-1D Hydraulic Bushing

钢 + 球形青铜粉 + 聚四氟乙烯和亲油性纤维混合物 (PTFE)
Steel + Porous bronze + PTFE with fibre



SF-1D 液压专用轴承, 是在 SF-1P 的基础上结合油缸及减震器工作原理而设计的一种新型材料, 在无油的条件下显得更耐磨, 该产品除具有 SF-1P 的优点外, 特别适用于往复频繁的大侧向力场合。其性能与国外 DP4 相似, 目前该产品逐步替代 SF-1P 产品, 适用于汽车、摩托车减震器以及各种液压缸等领域。

SF-1D Hydraulic bushing is developed on the basis of SF-1P and meanwhile considering the motion way of oil pump and damper. It is the substitute of and parallels in performance with abroad DP4. In addition to covering the same usage of SF-1P, SF-1D in particular fits frequently reciprocating motion with a high side force. It is a tendency to gradually replace SF-1P with SF-1D, the latter will cover a wide application in auto mobile, motor damper and oil pumps, etc.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	3.0
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	°C	-195 ~ +270
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.04 ~ 0.18
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	50	导热系数 Thermal conductivity	W/m·K	16
	干摩擦 Dry	N/mm ² ·m/s	3.8	线胀系数 Linear expansion	15 × 10 ⁻⁶ /K	

SF-1S 不锈钢耐腐蚀轴承 SF-1S Stainless Steel Bushing

钢 + 球形青铜粉 + 聚四氟乙烯 (PTFE)
Steel + Porous bronze + PTFE with fibre



SF-1S 不锈钢耐腐蚀轴承, 是以不锈钢材料为基体, 中间烧结耐腐蚀合金粉末, 表面轧制以聚四氟乙烯为主的低摩擦材料, 经过卷制成型的一种十分有效的耐腐蚀材料。它具有耐油、耐酸、耐碱、耐海水和耐磨损的特点, 表面的 PTFE 材料不含铅成份。在食品饮料机械、印染机械、化工机械、海洋工业耐腐蚀滑动部位最适合使用。

SF-1S is of oil resistant, acid resistant, alkali resistant and seawater resistant. more over, there is no lead in the PTFE surface layer and so is particularly fit for bushings in food stuff machines, alkali flow meters, pumps motion elements in pharmaceutical machines, printing machines chemical engineering machines and other ocean industry.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	4.5
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	°C	-195 ~ +270
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.04 ~ 0.20
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	50	导热系数 Thermal conductivity	W/m·K	16
	干摩擦 Dry	N/mm ² ·m/s	3.6	线胀系数 Linear expansion	15 × 10 ⁻⁶ /K	

SF-TEX 弹钢基PTFE织物自润滑轴承 SF-TEX Stainless Steel Textile Bushing

钢 + 聚四氟乙烯 (PTFE) 和耐磨编织物
Steel + PTFE fibre fabric



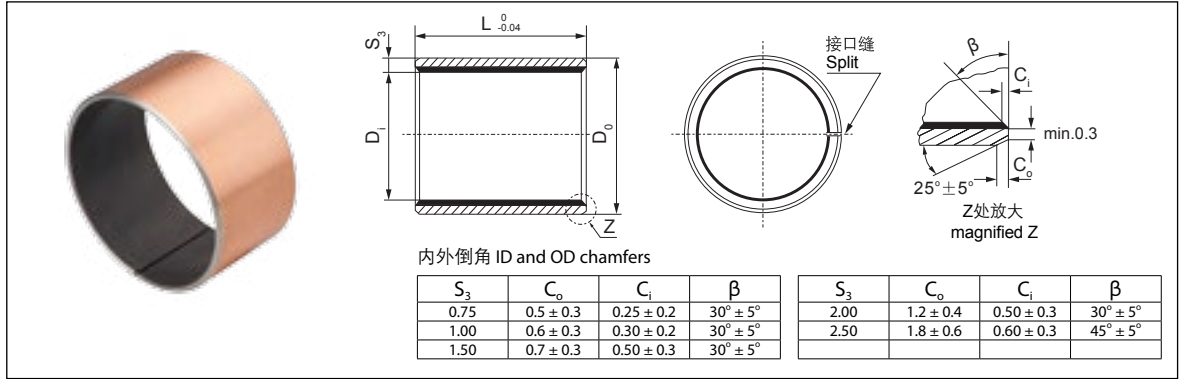
该材料以各种优质金属为基体, 表面覆着以 PTFE 和其它添加剂为主的低摩擦耐磨编织物材料。这种材料结构相比一般三层复合材料具有更高的承载能力和更长的使用寿命。基材为低碳钢 (SF-TEX)、不锈钢 (SF-TEX3)、铜 (SF-TEXB) 等。主要运用于农用机械、建筑机械、汽车底盘零部件、球阀、蝶阀各种阀门, 水泵及化工工业等重载低速而无法加油的场合。

Steel with PTFE fibre fabric. This new material use the PTFE fibres fabric overlay on metal backings, the fabric have very high load capacity and much longer operating life compare with conventional 3-layer bushes. the metal can be carbon steel (SF-TEX), stainless steel (SF-TEX3), bronze (SF-TEXB) etc. Suitable for rotary and oscillating movement, lower maintenance requirements due to the long re-lubrication intervals, lower wear, lower susceptibility to edge loading, no absorption of water and therefore no swelling, good damping behaviours, good resistance to shock loads. much long service life under lower speed with high load.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	360	最大 (PV) 干 PVlimit	短时间 Short-term	N/mm ² ·m/s	3.6
	动承载 Dynamic	N/mm ²	180		连续 Continuous	N/mm ² ·m/s	-195 ~ +300
最快速度 Max line speed V	干运动 Dry	N/mm ²	0.5	使用温度 Temp.limit	°C	0.04 ~ 0.18	
	带油运行 Oil	M/s	1		摩擦系数 Friction Coef.	μ	18
线膨胀系数 Coefficient of Linear Expansion			21 × 10 ⁻⁶ /K	导热系数 Thermal conductivity		W/m·K	

SF-1 标准公制轴套

SF-1 Normal Metric Bushing



单位 (Unit): mm

轴径 (F7) Shaft D_s	座孔 (H7) Housing D_H	(OD) 外径公差 Tolerance D_o	(ID)压装后 内孔公差 After fixed $D_{i.a}$	配合间隙 Clearance D_D	壁厚 Wall thick- ness S_3	长度 $L \begin{smallmatrix} 0 \\ -0.40 \end{smallmatrix}$ ($d \leq \Phi 28 \ L: 0.30$ $d > \Phi 30 \ L: 0.40$)									
						6	8	10	12	15	20	25	30	40	50
6	-0.010 -0.022	8	$+0.015$	8	$+0.055$ $+0.025$	6.055 5.990	0.077 0.000								
8	-0.013 -0.028	10	$+0.015$	10	$+0.055$ $+0.025$	8.055 7.990	0.083 0.003								
10	-0.013 -0.028	12	$+0.018$	12	$+0.065$ $+0.030$	10.058 9.990	0.086 0.003								
12	-0.016 -0.034	14	$+0.018$	14	$+0.065$ $+0.030$	12.058 11.990									
13	-0.016 -0.034	15	$+0.018$	15	$+0.065$ $+0.030$	13.058 12.990									
14	-0.016 -0.034	16	$+0.018$	16	$+0.065$ $+0.030$	14.058 13.990	0.092 0.006								
15	-0.016 -0.034	17	$+0.018$	17	$+0.065$ $+0.030$	15.058 14.990									
16	-0.016 -0.034	18	$+0.018$	18	$+0.065$ $+0.030$	16.058 15.990									
17	-0.016 -0.034	19	$+0.021$	19	$+0.075$ $+0.035$	17.061 16.990	0.095 0.006								
18	-0.016 -0.034	20	$+0.021$	20	$+0.075$ $+0.035$	18.061 17.990									
20	-0.020 -0.041	23	$+0.021$	23	$+0.075$ $+0.035$	20.071 19.990									
22	-0.020 -0.041	25	$+0.021$	25	$+0.075$ $+0.035$	22.071 21.990	0.112 0.010								
24	-0.020 -0.041	27	$+0.021$	27	$+0.075$ $+0.035$	24.071 23.990									
25	-0.020 -0.041	28	$+0.021$	28	$+0.075$ $+0.035$	25.071 24.990									
28	-0.020 -0.041	32	$+0.025$	32	$+0.085$ $+0.045$	28.085 27.990	0.126 0.010								
30	-0.020 -0.041	34	$+0.025$	34	$+0.085$ $+0.045$	30.085 29.990									
32	-0.025 -0.050	36	$+0.025$	36	$+0.085$ $+0.045$	32.085 31.990									
35	-0.025 -0.050	39	$+0.025$	39	$+0.085$ $+0.045$	35.085 34.990	0.135 0.015								
38	-0.025 -0.050	42	$+0.025$	42	$+0.085$ $+0.045$	38.085 37.990									
40	-0.025 -0.050	44	$+0.025$	44	$+0.085$ $+0.045$	40.085 39.990									

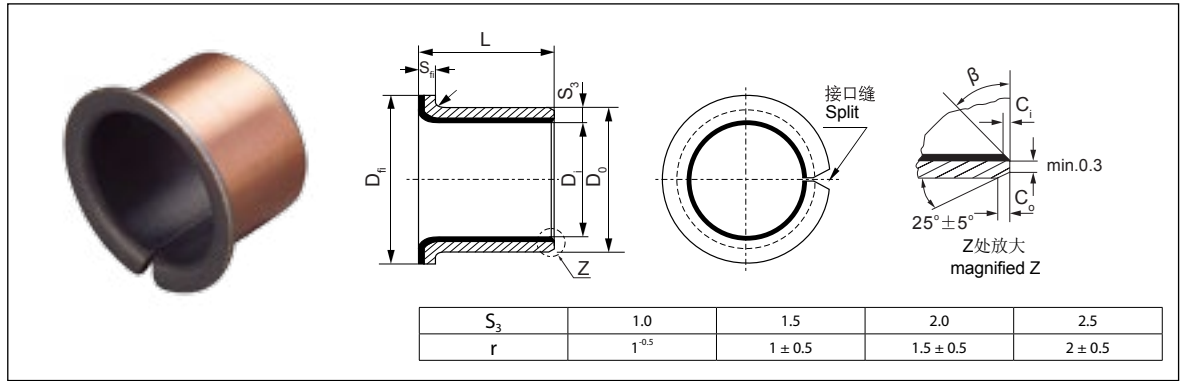
SF-1 标准公制轴套

SF-1 Normal Metric Bushing

轴径(f7) Shaft D _s	座孔(H7) Housing D _H	(OD) 外径公差 Tolerance D _O	(ID)压装后 内孔公差 After fixed D _{la}	配合间隙 Clearance D _O	壁厚 Wall thick- ness S ₃	长度 L ⁰ -0.40									
						20	25	30	40	50	60	70	80	100	115
45 -0.050 -0.025	50 +0.025	50 +0.085 +0.045	45.105 44.990	0.155 0.015	2.505 2.460	4520	4525	4530	4540	4550					
50 -0.050 -0.025	55 +0.030	55 +0.100 +0.055	50.110 49.990	0.160 0.015		5020	5025	5030	5040	5050	5060				
55 -0.060 -0.030	60 +0.030	60 +0.100 +0.055	55.110 54.990					5530	5540	5550	5560				
60 -0.060 -0.030	65 +0.030	65 +0.100 +0.055	60.110 59.990					6030	6040	6050	6060	6070			
65 -0.060 -0.030	70 +0.030	70 +0.100 +0.055	65.110 64.990	0.170 0.020				6530	6540	6550	6560	6570			
70 -0.060 -0.030	75 +0.030	75 +0.100 +0.055	70.110 69.990					7030	7040	7050	7060	7070	7080		
75 -0.060 -0.030	80 +0.030	80 +0.100 +0.055	75.110 74.990					7530	7540	7550	7560	7570	7580		
80 -0.045	85 +0.035	85 +0.120 +0.070	80.155 80.020	0.201 0.020	2.490 2.440				8040	8050	8060	8070	8080	80100	
85 -0.054	90 +0.035	90 +0.120 +0.070	85.155 85.020						8540	8550	8560	8570	8580	85100	
90 -0.054	95 +0.035	95 +0.120 +0.070	90.155 90.020						9040	9050	9060	9070	9080	90100	
95 -0.054	100 +0.035	100 +0.120 +0.070	95.155 95.020	0.209 0.020						9550	9560	9570	9580	95100	
100 -0.054	105 +0.035	105 +0.120 +0.070	100.155 100.020							10050	10060	10070	10080	100100	100115
105 -0.054	110 +0.035	110 +0.120 +0.070	105.155 105.020								10560	10570	10580	105100	105115
110 -0.054	115 +0.035	115 +0.120 +0.070	110.115 110.020								11060	11070	11080	110100	110115
120 -0.054	125 +0.040	125 +0.170 +0.100	120.210 120.070	0.264 0.070	2.465 2.415						12060	12070	12080	120100	120115
125 -0.063	130 +0.040	130 +0.170 +0.100	125.210 125.070								12560	12570	12580	125100	125115
130 -0.063	135 +0.040	135 +0.170 +0.100	130.210 130.070								13060	13070	13080	130100	130115
140 -0.063	145 +0.040	145 +0.170 +0.100	140.210 140.070	0.273 0.070							14060	14070	14080	140100	140115
150 -0.063	155 +0.040	155 +0.170 +0.100	150.210 150.070								15060	15070	15080	150100	150115
160 -0.063	165 +0.040	165 +0.170 +0.100	160.210 160.070								16060	16070	16080	160100	160115
180 -0.063	185 +0.046	185 +0.210 +0.130	180.216 180.070	0.279 0.070							18060	18070	18080	180100	
190 -0.072	195 +0.046	195 +0.210 +0.130	190.216 190.070		2.465 2.415						19060	19070	19080	190100	
200 -0.072	205 +0.046	205 +0.210 +0.130	200.016 200.070	0.288 0.070							20060	20070	20080	200100	
220 -0.072	225 +0.046	225 +0.210 +0.130	220.216 220.070								22060	22070	22080	220100	
250 -0.072	255 +0.052	255 +0.260 +0.170	250.222 250.070	0.294 0.070	2.465 2.415								25080	250100	
260 -0.081	265 +0.052	265 +0.260 +0.170	260.222 260.070										26080	260100	
280 -0.081	285 +0.052	285 +0.260 +0.170	280.222 280.070	0.303 0.070									28080	280100	
300 -0.081	305 +0.052	305 +0.260 +0.170	300.222 300.070										30080	300100	

SF-1F 标准公制翻边轴套

SF-1F Normal Metric Flange Bushing

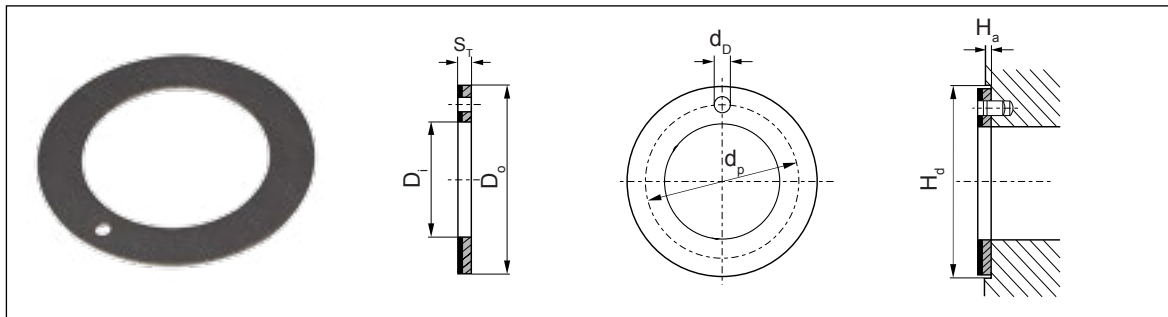


单位 (Unit): mm

轴径(f7) Shaft D _s	座孔(H7) Housing D _H	(OD) 外径公差 Tolerance D _O	(ID)压装后 内孔公差 After fixed D _{ia}	配合间隙 Clearance C _O	型号规格 Designation	壁厚 Wall thickness S ₃	尺寸 Dimension				
							D _i	D _O	D _f ± 0.5	L ± 0.25	S _f -0.2
6 -0.013 -0.028	8 +0.015	8 +0.055 +0.025	6.055 5.990	0.077 0.000	SF-10F06040	1.005 0.980	6	8	12	4	1
					SF-10F06070					7	
8 -0.013 -0.028	10 +0.015	10 +0.055 +0.025	8.055 7.990	0.083 0.003	SF-10F08055		8	10	15	5.5	
					SF-10F08075					7.5	
10 -0.016 -0.034	12 +0.018	12 +0.055 +0.025	10.058 9.990	0.086 0.003	SF-10F10070		10	12	18	7	
					SF-10F10090					9	
					SF-10F10120					12	
12 -0.016 -0.034	14 +0.018	14 +0.065 +0.030	12.058 11.990	0.092 0.006	SF-10F12070		12	14	20	7	
					SF-10F12090					9	
					SF-10F12120					12	
14 -0.016 -0.034	16 +0.018	16 +0.065 +0.030	14.058 13.990		SF-10F14120		14	16	22	12	
					SF-10F14170					17	
					SF-10F15090					9	
15 -0.016 -0.034	17 +0.018	17 +0.065 +0.030	15.058 14.990		SF-10F15120		15	17	23	12	
					SF-10F15170					17	
					16 -0.016 -0.034		18 +0.018	18 +0.065 +0.030	16.058 15.990	SF-10F16120	
SF-10F16170	17										
18 -0.016 -0.034	20 +0.021	20 +0.075 +0.035	18.061 17.990							SF-10F18120	
				SF-10F18170	17						
				SF-10F18200	20						
20 -0.020 -0.041	23 +0.021	23 +0.075 +0.035	20.071 19.990	SF-10F20115	20		23	30	11.5		
				SF-10F20165					16.5		
				SF-10F20215					21.5		
22 -0.020 -0.041	25 +0.021	25 +0.075 +0.035	22.071 21.990	SF-10F22150	22	25	32	15			
				SF-10F22200				20			
				SF-10F25115				11.5			
25 -0.020 -0.041	28 +0.021	28 +0.075 +0.035	25.071 24.990	SF-10F25165	25	28	35	16.5			
				SF-10F25215				21.5			
				30 -0.025 -0.050	34 +0.025	34 +0.075 +0.035	30.085 29.990	SF-10F30160	30	34	42
SF-10F30260	26										
35 -0.025 -0.050	39 +0.025	39 +0.085 +0.045	35.085 34.990	SF-10F35160	35	39	47	16			
				SF-10F35260				26			
40 -0.025 -0.050	44 +0.025	44 +0.085 +0.045	40.085 39.990	SF-10F40260	40	44	53	26			
				SF-10F40400				40			

SF-1WC 标准公制垫片

SF-1WC Normal Metric Washer

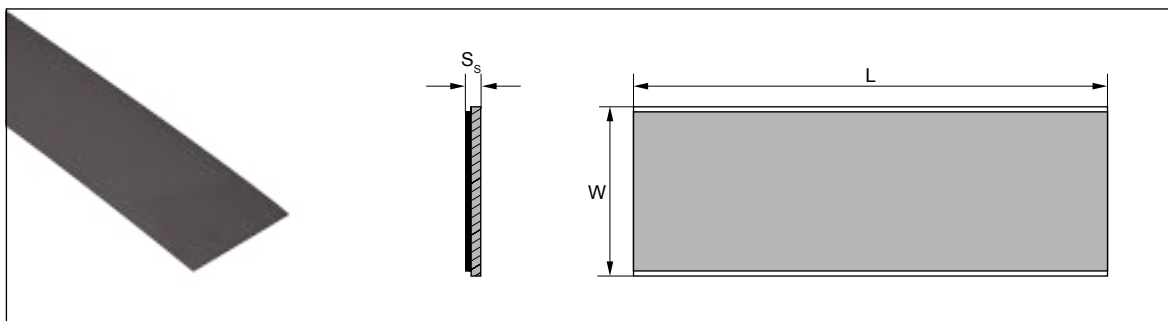


单位 (Unit): mm

轴径 Shaft D _s	型号规格 Standard No.	垫片尺寸 SF-1WCasher size				安装尺寸 Assemble size		H _d +0.12
		D _i +0.25	D _o -0.25	S _r -0.05	d _p ± 0.125	d _D ^{+0.4} / _{+0.1}	H _a ± 0.2	
8	SF-1WC 10	10	20	1.5	15	1.5	1	20
10	SF-1WC 12	12	24		18			24
12	SF-1WC 14	14	26		20	2		26
14	SF-1WC 16	16	30		23			30
16	SF-1WC 18	18	32		25	3		32
18	SF-1WC 20	20	36		28			36
20	SF-1WC 22	22	38		30			38
22	SF-1WC 24	24	42		33			42
24	SF-1WC 26	26	44		35	44		
26	SF-1WC 28	28	48		38	4		48
30	SF-1WC 32	32	54		43			54
36	SF-1WC 38	38	62		50			62
40	SF-1WC 42	42	66		54			66
46	SF-1WC 48	48	74	2	61	1.5	74	
50	SF-1WC 52	52	78		65		78	
60	SF-1WC 62	62	90		76		90	

SF-1SP 板材规格及公差

SF-1SP Strip Specification & Tolerance

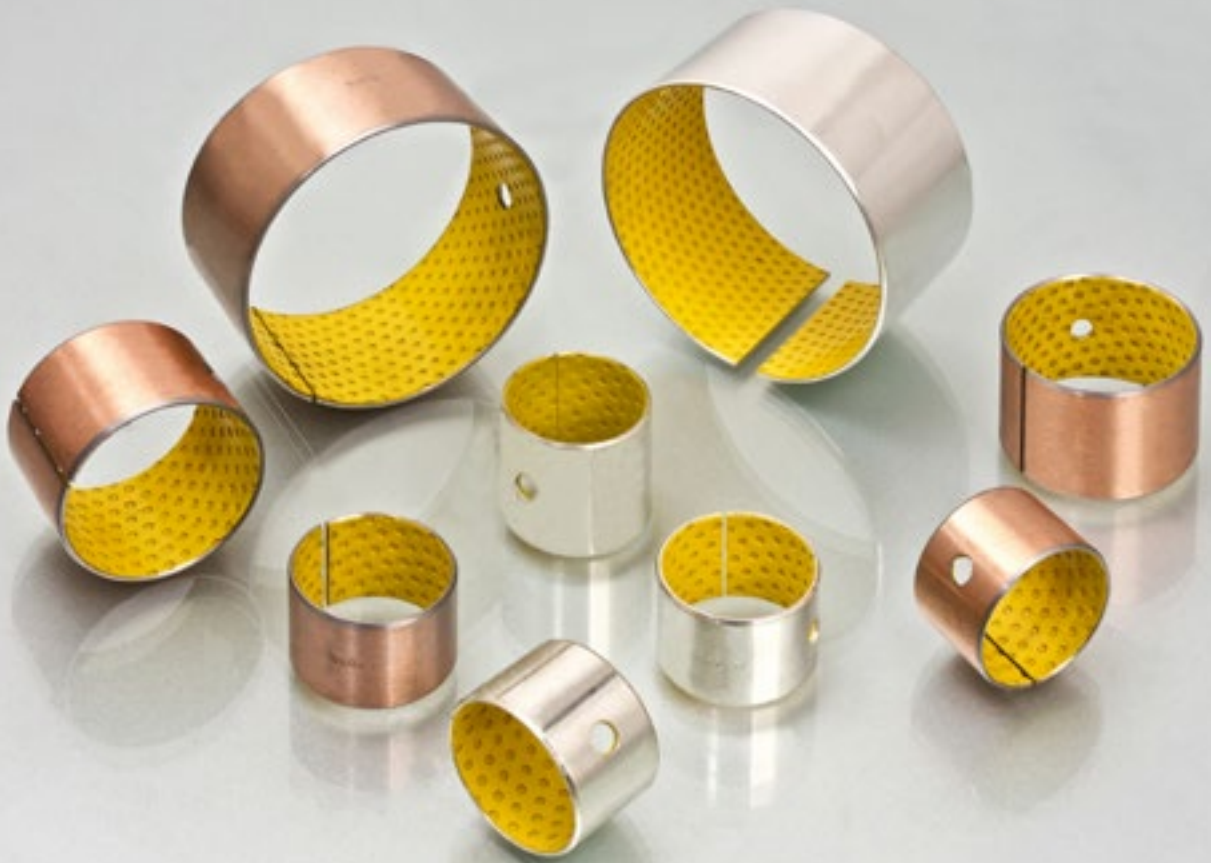


单位 (Unit): mm

型号规格 Standard No.	长度 $L \pm 1$	宽度 $W \pm 1$	厚壁 Wall thickness $S_s-0.05$
SF-1SP	500	150	1.0
SF-1SP	500	150	1.5
SF-1SP	500	150	2.0
SF-1SP	500	150	2.5

SF-2 边界润滑轴套

SF-2 Marginal Lubricating Bushing



SF-2 碳钢基边界无铅自润滑轴承 SF-2 Marginal Pb-free self-lubricating bearing

钢 + 球形青铜粉 + 聚甲醛 (POM)
Steel+Porous bronze+POM



SF-2 边界润滑轴承，该产品以优质低碳钢为基体，中间烧结球形青铜层，表面轧制改性聚甲醛 (POM)。在边界润滑条件下可长期使用而不加油，耐磨层表面有储油坑。产品广泛应用于冶金机械、矿山机械、水利机械、汽机车、建筑机械、农用机械、轧钢行业等。

SF-2 Marginal Pb-free self-lubricating bearing is used steel-backing as its structure, sintered porous bronze as its interlayer, surface inlaid the modified POM. Suitable for marginally lubricated and dry operation on the conditions of lubrication indents grease. It has been widely applied to metallurgical machinery, Mine machinery, water conservancy machinery, vapor locomotive, building machinery, agriculture machinery, steel rolling industry etc.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	2.5
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	℃	-40 ~ +130
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.05 ~ 0.25
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	22	导热系数 Thermal conductivity	W/m·K	13
	干摩擦 Dry	N/mm ² ·m/s	2.8	线胀系数 Linear expansion	11 × 10 ⁻⁶ /K	

SF-2Y 碳钢基边界无铅自润滑轴承 SF-2Y Marginal Pb-free self-lubricating bearing

钢 + 球形青铜粉 + 聚甲醛 (POM)
Steel+Porous bronze+POM



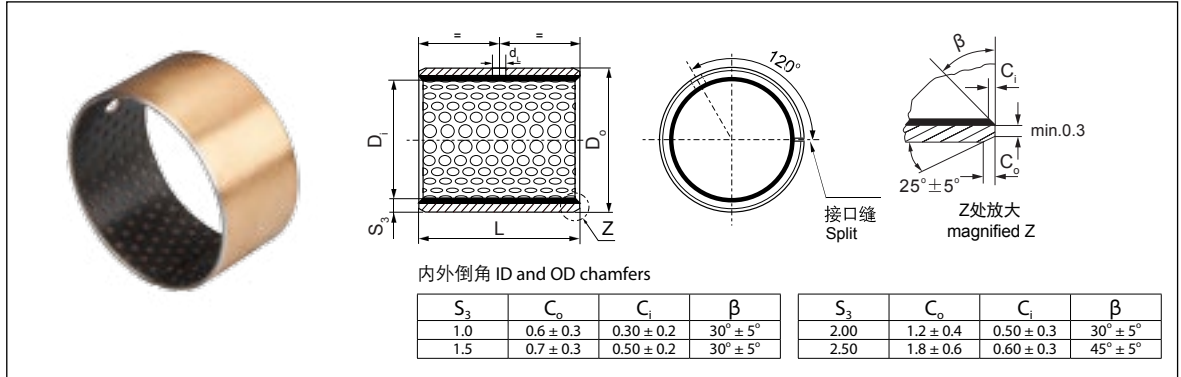
SF-2Y 碳钢基边界无铅自润滑轴承，该产品与 SF-2 具有相同结构和使用性能，在边界润滑条件下可长期使用而不加油，耐磨层表面有储油坑。产品广泛应用于冶金机械、矿山机械、水利机械、汽机车、建筑机械、农用机械、轧钢行业等。

SF-2Y has the same structure and functional performance with SF-2. It can work long time without oil in the condition of prelubricated with lubrication indents. Widely applied to metallurgy machinery, Mining machinery, water conservancy machinery, automobile, building machinery, agriculture machinery, rolling steel industry etc.

最大承载压力 Load capacity P	静承载 Static	N/mm ²	250	最高滑动速度 (油润滑) Max line speed V	m/s	2.5
	动承载 Dynamic	N/mm ²	140	使用温度 Temp.limit	℃	-40 ~ +130
	摇摆运动 Oscillating	N/mm ²	60	摩擦系数 Friction Coef.	μ	0.05 ~ 0.2
最大 PV 值 PVlimit	油润滑 Oil	N/mm ² ·m/s	22	导热系数 Thermal conductivity	W/m·K	13
	干摩擦 Dry	N/mm ² ·m/s	2.8	线胀系数 Linear expansion	11 × 10 ⁻⁶ /K	

SF-2 边界润滑轴套

SF-2 Marginal Lubricating Bushing



单位 (Unit): mm

轴径 Shaft D _s h8	座孔 Housing H7 D _H	(OD) 外径公差 Tolerance D _O	(ID)压装后 内孔公差 After fixed D _{ia}	配合间隙 Clearance D _D	壁厚 Wall thick- ness S ₃	油孔 Oil hole d _L	长度 L ⁰ _{-0.40}									
							10	15	20	25	30	35	40	45	50	60
10 _{-0.022}	12 ^{+0.018}	12 ^{+0.065} +0.030	10.108 10.040	0.130 0.040	0.980 0.955	4	1010	1015	1020							
12 _{-0.027}	14 ^{+0.018}	14 ^{+0.065} +0.030	12.108 12.040	0.135 0.040			1210	1215	1220							
14 _{-0.027}	16 ^{+0.018}	16 ^{+0.065} +0.030	14.108 14.040					1415	1420							
15 _{-0.027}	17 ^{+0.018}	17 ^{+0.065} +0.030	15.108 15.040					1515	1520	1525						
16 _{-0.027}	18 ^{+0.018}	18 ^{+0.065} +0.030	16.108 16.040					1615	1620	1625						
18 _{-0.027}	20 ^{+0.021}	20 ^{+0.075} +0.035	18.111 18.040	0.138 0.040				1815	1820	1825						
20 _{-0.033}	23 ^{+0.021}	23 ^{+0.075} +0.035	20.131 20.050	0.164 0.050	1.475 1.445	6		2015	2020	2025	2030					
22 _{-0.033}	25 ^{+0.021}	25 ^{+0.075} +0.035	22.131 22.050					2215	2220	2225	2230					
25 _{-0.033}	28 ^{+0.021}	28 ^{+0.075} +0.035	25.131 25.050					2515	2520	2525	2530					
28 _{-0.033}	32 ^{+0.025}	32 ^{+0.085} +0.045	28.155 28.060	0.188 0.060				2820	2825	2830						
30 _{-0.033}	34 ^{+0.025}	34 ^{+0.085} +0.045	30.155 30.060		1.970 1.935				3020	3025	3030	3035	3040			
35 _{-0.039}	39 ^{+0.025}	39 ^{+0.085} +0.045	35.155 35.060	0.194 0.060					3520	3525	3530	3535	3540			
40 _{-0.039}	44 ^{+0.025}	44 ^{+0.085} +0.045	40.155 40.060	2.460 2.415	8			4020	4025	4030	4035	4040	4045	4050		
45 _{-0.039}	50 ^{+0.025}	50 ^{+0.085} +0.045	45.195 45.080			0.234 0.080			4520	4525	4530	4535	4540	4545	4550	
50 _{-0.039}	55 ^{+0.030}	55 ^{+0.100} +0.055	50.200 50.080			0.239 0.080					5030	5035	5040	5045	5050	5060
55 _{-0.046}	60 ^{+0.030}	60 ^{+0.100} +0.055	55.200 55.080			0.246 0.080					5530	5535	5540	5545	5550	5560
60 _{-0.046}	65 ^{+0.030}	65 ^{+0.100} +0.055	60.200 60.080								6030	6035	6040	6045	6050	6060

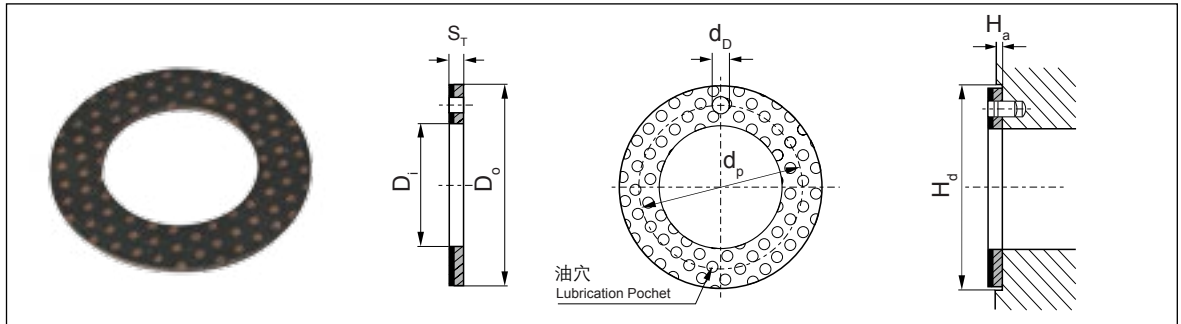
SF-2 边界润滑轴套

SF-2 Marginal Lubricating Bushing

轴径 Shaft D _s h8	座孔 Housing H7 D _H	(OD) 外径公差 Tolerance D _O	(ID)压装后 内孔公差 After fixed D _{i,a}	配合间隙 Clearance D _O	壁厚 Wall thick- ness S ₃	油孔 Oil hole d _L	长度 L ⁰ _{-0.40}									
							40	50	60	80	90	95	100	110	120	
65 _{-0.046}	70 ^{+0.030}	70 ^{+0.100} _{+0.055}	65.200 65.080	0.246 0.080	2.460 2.415	8	6540	6550	6560							
70 _{-0.046}	75 ^{+0.030}	75 ^{+0.100} _{+0.055}	70.200 70.080				7040	7050	7060	7080						
75 _{-0.046}	80 ^{+0.030}	80 ^{+0.100} _{+0.055}	75.200 75.080				7540	7550	7560	7580						
80 _{-0.046}	85 ^{+0.035}	85 ^{+0.120} _{+0.070}	80.265 80.100	0.313 0.100	2.450 2.385	9.5	8040	8050	8060	8080						
85 _{-0.054}	90 ^{+0.035}	90 ^{+0.120} _{+0.070}	85.265 85.100	0.321 0.100			8540	8550	8560	8580						
90 _{-0.054}	95 ^{+0.035}	95 ^{+0.120} _{+0.070}	90.265 90.100				9040	9050	9060	9080	9090					
100 _{-0.054}	105 ^{+0.035}	105 ^{+0.120} _{+0.070}	100.265 100.100					10050	10060	10080	10090	10095				
105 _{-0.054}	110 ^{+0.035}	110 ^{+0.120} _{+0.070}	105.265 105.100					10550	10560	10580	10590	10595	105100	105110		
110 _{-0.054}	115 ^{+0.035}	115 ^{+0.120} _{+0.070}	110.265 110.110					11050	11060	11080	11090	11095	110100	110110		
120 _{-0.054}	125 ^{+0.040}	125 ^{+0.170} _{+0.100}	120.270 120.110	0.324 0.100				12050	12060	12080	12090	12095	120100	120110		
125 _{-0.063}	130 ^{+0.040}	130 ^{+0.170} _{+0.100}	125.270 125.110					12550	12560	12580	12590	12595	125100	125110		
130 _{-0.063}	135 ^{+0.040}	135 ^{+0.170} _{+0.100}	130.270 130.110					13050	13060	13080	13090	13095	130100	130110		
140 _{-0.063}	145 ^{+0.040}	145 ^{+0.170} _{+0.100}	140.270 140.110					14050	14060	14080	14090	14095	140100	140110		
150 _{-0.063}	155 ^{+0.040}	155 ^{+0.170} _{+0.100}	150.270 150.110					15050	15060	15080	15090	15095	150100	150110		
160 _{-0.063}	165 ^{+0.040}	165 ^{+0.170} _{+0.100}	160.270 160.110				0.339 0.110		16050	16060	16080	16090	16095	160100	160110	
170 _{-0.063}	175 ^{+0.040}	175 ^{+0.170} _{+0.100}	170.270 170.110						17050	17060	17080	17090	17095	170100	170110	
180 _{-0.063}	185 ^{+0.046}	185 ^{+0.210} _{+0.130}	180.276 180.110	9.5				18050	18060	18080	18090	18095	180100	180110		
190 _{-0.072}	195 ^{+0.046}	195 ^{+0.210} _{+0.130}	190.276 190.110					19050	19060	19080	19090	19095	190100	190110	190120	
200 _{-0.072}	205 ^{+0.046}	205 ^{+0.210} _{+0.130}	200.276 200.110					20050	20060	20080	20090	20095	200100	200110	200120	
220 _{-0.072}	225 ^{+0.046}	225 ^{+0.210} _{+0.130}	220.276 220.110	0.354 0.110		9.5			22050	22060	22080	22090	22095	220100	220110	220120
240 _{-0.072}	245 ^{+0.046}	245 ^{+0.210} _{+0.130}	240.276 240.110						24050	24060	24080	24090	24095	240100	240110	240120
250 _{-0.072}	255 ^{+0.052}	255 ^{+0.260} _{+0.170}	250.282 250.110					25050	25060	25080	25090	25095	250100	250110	250120	
260 _{-0.081}	265 ^{+0.052}	265 ^{+0.260} _{+0.170}	260.282 260.110					26050	26060	26080	26090	26095	260100	260110	260120	
280 _{-0.081}	285 ^{+0.052}	285 ^{+0.260} _{+0.170}	280.282 280.110					28050	28060	28080	28090	28095	280100	280110	280120	
300 _{-0.081}	305 ^{+0.052}	305 ^{+0.260} _{+0.170}	300.282 300.110					30050	30060	30080	30090	30095	300100	300110	300120	

SF-2WC 标准公制垫片

SF-2WC Normal Metric Washer

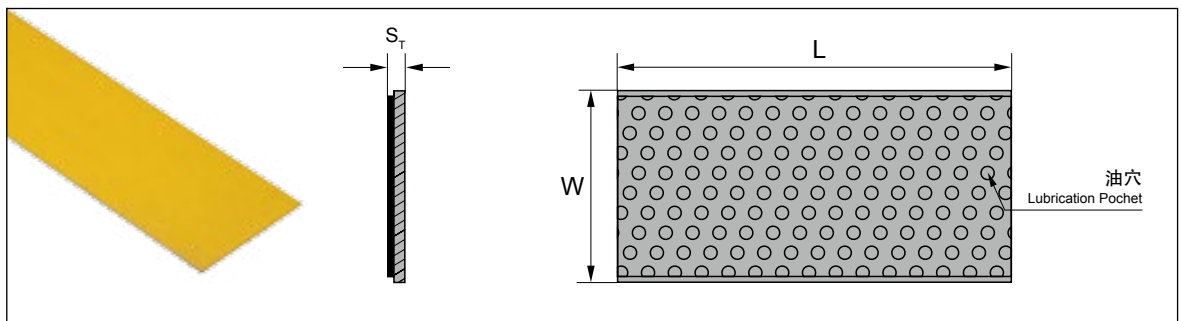


单位 (Unit): mm

轴径 Shaft D _s	型号规格 Standard No.	垫片尺寸 SF-1WCasher size				安装尺寸 Assemble size		H _d +0.12
		D _i +0.25	D _o -0.25	S _T -0.05	d _p ±0.125	d _D ^{+0.4} _{+0.1}	H _a ±0.2	
8	SF-2 WC10	10	20	1.5	15	1.5	1	20
10	SF-2 WC12	12	24		18			24
12	SF-2 WC14	14	26		20			26
14	SF-2 WC16	16	30		23			30
16	SF-2 WC18	18	32		25	32		
18	SF-2 WC20	20	36		28	36		
20	SF-2 WC22	22	38		30	38		
22	SF-2 WC24	24	42		33	42		
24	SF-2 WC26	26	44		35	44		
26	SF-2 WC28	28	48		38	48		
30	SF-2 WC32	32	54		43	54		
36	SF-2 WC38	38	62		50	62		
40	SF-2 WC42	42	66	54	4	1.5	66	
46	SF-2 WC48	48	74	61			74	
50	SF-2 WC52	52	78	65			78	
60	SF-2 WC62	62	90	76			90	

SF-2SP 板材标准公制尺寸

SF-2SP Strip Standard Metric Size



单位 (Unit): mm

型号规格 Standard No.	长度 $L \pm 1$	宽度 $W \pm 1$	壁厚 Wall thickness $S_c-0.05$
SF-2SP	500	150	1.0
SF-2SP	500	150	1.5
SF-2SP	500	150	2.0
SF-2SP	500	150	2.5

JF 双金属轴套 JF Bimetal Bushing



JF-800 双金属轴套 JF-800 Bimetal Bushing

钢 + CuPb10Sn10
Steel + CuPb10Sn10



JF-800 双金属轴承，是以低碳钢板为基体材料，表面烧结了 CuPb10Sn10 或者 CuSn6Zn6Pb3 材料的钢铜合金产品。该产品是双合金轴承中承载能力最强的一种，重型车的平衡桥衬套，均使用该产品。它是一种用途很广的高载低速运动轴承。

JF-800 bimetal bushing is based on steel and sintered with CuPb10Sn10 or CuSn6Zn6Pb3 as a lining layer. The strongest type of bimetal bushings and widely applied in so many fields. This type has the best performance within the range of Cu-Pb alloy constructed bushing. Therefore it has a wide application and is mostly suitable for where is middle speed and high impact etc.

材料型号 Material type	CuPb10Sn10/CuSn6Zn6Pb3	对磨轴硬度 Hardness of mating surface	53HRC
合金层硬度 Hardness of bronze alloy	70~100HB	最高使用温度 Max. temperature	260°C
最大荷载 Max. dynamic Load	65N/mm ²	最高静承载压力 Load limit	150N/mm ²
拉伸强度 Tensile strength	150N/mm ²	最高速度 Speed limit v max.	5m/s
摩擦系数 (油) Friction coef(Oil)	0.06~0.14	允许 PV 值 PV limit	脂 Grease 2.8N/mm ² .m/s 油 oil 10N/mm ² .m/s
“蓝宝石”疲劳级 Mpa Sapphire Fatigue Calss	125		

JF-720 双金属轴套 JF-720 Bimetal Bushing

钢 + CuPb24Sn4
Steel + CuPb24Sn4



JF720 双金属轴承，是以钢板为基体，表面烧结 CuPb24Sn4 材料的产品。该产品具有较好的疲劳强度和承载能力。适用于中速中载，有油润滑的场合表面镀软合金时，可用作高速内燃机轴承、连杆衬套，达到良好的耐磨、耐疲劳效果。

JF-720 is a bimetal bushing with steel as backing and sintered CuPb24Sn24 as lining layer. This type has fairly good performance in anti-fatigue and load capacity. It is suitable for middle speed and middle load. When over plated certain soft alloy, it can be applied in high-speed internal combustion engine and as connect rod.

材料型号 Material type	CuPb24Sn4	对磨轴硬度 Hardness of mating surface	50HRC
合金层硬度 Hardness of bronze alloy	45~70HB	最高使用温度 Max. temperature	200°C
最大荷载 Max. dynamic Load	38N/mm ²	最高静承载压力 Load limit	130N/mm ²
拉伸强度 Tensile strength	150N/mm ²	最高速度 Speed limit v max.	10m/s
摩擦系数 (油) Friction coef(Oil)	0.06~0.16	允许 PV 值 PV limit	脂 Grease 2.8N/mm ² .m/s 油 oil 10N/mm ² .m/s
“蓝宝石”疲劳级 Mpa Sapphire Fatigue Calss	115		

JF-700 双金属轴套 JF-700 Bimetal Bushing

钢 + CuPb30
Steel + CuPb30



JF-700 双金属轴承,是以钢板为基体,表面烧结 CuPb30 材料的产品。该产品由于含铅量高,所以具有良好的抗咬轴性和异物埋没性。工作表面需镀软合金材料,可用作高速、中低载的内燃机主轴瓦、连杆衬套、摇臂衬套;油泵侧摩擦片。

JF-700 is a bimetal bushing with steel as backing and sintered CuPb30 as lining layer. It has good performance in anti-seizing, alien substance contamination. It is necessary to be overplated certain soft alloy and mostly applied in internal combustion engine under high speed and middle to low load, e.g. main bushing of inner-combustion engine and connect-rod bushing.

材料型号 Material type	CuPb30	对摩擦硬度 Hardness of mating surface	270HRC
合金层硬度 Hardness of bronze alloy	30~45HB	最高使用温度 Max. temperature	170℃
最大荷载 Max. dynamic Load	25N/mm ²	最高静承载压力 Load limit	120N/mm ²
拉伸强度 Tensile strength	200N/mm ²	最高速度 Speed limit v max.	15m/s
摩擦系数 (油) Friction coef(Oil)	0.08~0.16	脂 Grease	2.5N/mm ² .m/s
“蓝宝石”疲劳级 Mpa Sapphire Fatigue Calss	105	油 oil	8N/mm ² .m/s

JF-20 双金属轴套 JF-20 Bimetal Bushing

钢 + AlSn20Cu
Steel + AlSn20Cu

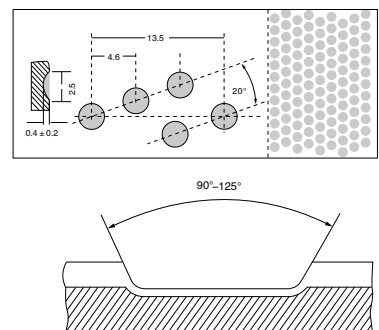
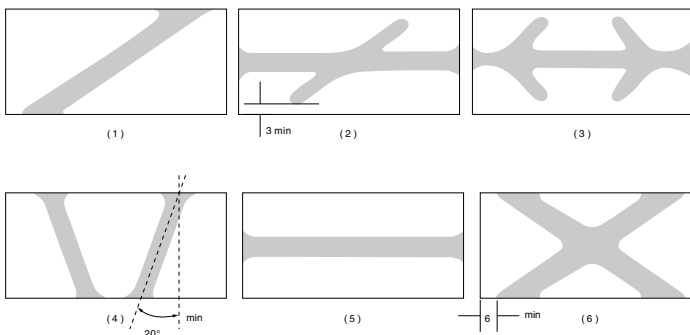


JF-20 高锡铝基轴承是以钢板为基体,表面辊压 AlSn20Cu 材料的产品。该产品具有中等疲劳强度和承载能力,良好抗腐蚀性能,较好的轴承滑动性能等特点,常用作中小功率的内燃机轴瓦、火车发动机轴瓦、空气压力机轴套、制冷机轴承,是取代巴氏合金的新颖产品。

JF-20 is a high tin and aluminum based bushing, which adopts steel as backing and is coated a lining of AlSn20Cu through rolling treatment. It is a fairly good fatigue resistance, load capacity and good anti-corrosion and also performs well in Bushing's sliding properties. It is widely applied under high speed and low load such as in internal combustion engine, air compressor and cooling machine.

材料型号 Material type	AlSn20Cu	对摩擦硬度 Hardness of mating surface	250HRC
合金层硬度 Hardness of bronze alloy	30~40HB	最高使用温度 Max. temperature	150℃
最大荷载 Max. dynamic Load	30N/mm ²	最高静承载压力 Load limit	100N/mm ²
拉伸强度 Tensile strength	200N/mm ²	最高速度 Speed limit v max.	25m/s
摩擦系数 (油) Friction coef(Oil)	0.08~0.17	脂 Grease	—
“蓝宝石”疲劳级 Mpa Sapphire Fatigue Calss	105	油 oil	6N/mm ² .m/s

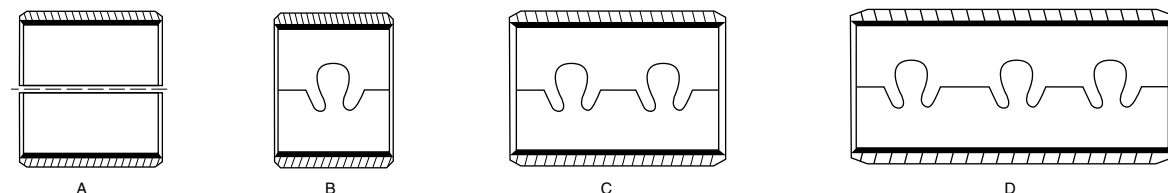
双金属自润滑轴承的油槽油穴形式 Type for Bi-Metallic Bushing Grooves and Indents



JF双金属轴套合金化学成分 Composition analysis of alloy

化学元素 chemical elements	JF-800 CuPb10Sn10	JF-800 CuPb24Sn4	JF-700 CuPb30	JF-20 AlSn20Cu
Cu	余量 Remainder	余量 Remainder	余量 Remainder	1.7~1.3
Pb	9.0~11.0	21.0~27.0	26.0~33.0	—
Sn	9.0~11.0	3.0~4.5	0.5	17.5~22.5
Zn	0.5	0.5	0.5	—
P	0.1	0.1	0.1	—
Fe	0.7	0.7	0.7	0.7
Ni	0.5	0.5	0.5	0.1
Sb	0.2	0.2	0.2	—
Al	—	—	—	余量 Remainder
Si	—	—	—	0.7
Mn	—	—	—	0.7
Ti	—	—	—	0.2
其他 Other	0.5	0.5	0.5	0.5

双金属自润滑轴承的搭扣形式 Lock Types for Bi-Metallic Bushing



JF型双金属轴套的油孔设计 The designing of oil indentations

为了使 JF 双金属轴套在使用中，能得到充分的油润滑，因此推荐如下尺寸油孔，客户需油孔而无特殊要求的，都按此油孔标准制作。
In order to fully lubricate the bush when in the performance, the indentations with size as follow are recommended. They should be manufactured according to the standard below if without special requirements.

轴套外径 Bush O.D	12~23	25~39	42~80	85~155
油孔直径 Lubricating hole	4	6	8	9.5

油孔的位置应避开接缝处和承载区域，这有利于进油。
the lubricating hole should be away from butt joint and loading area and designed to be easy-oil-feding as well.

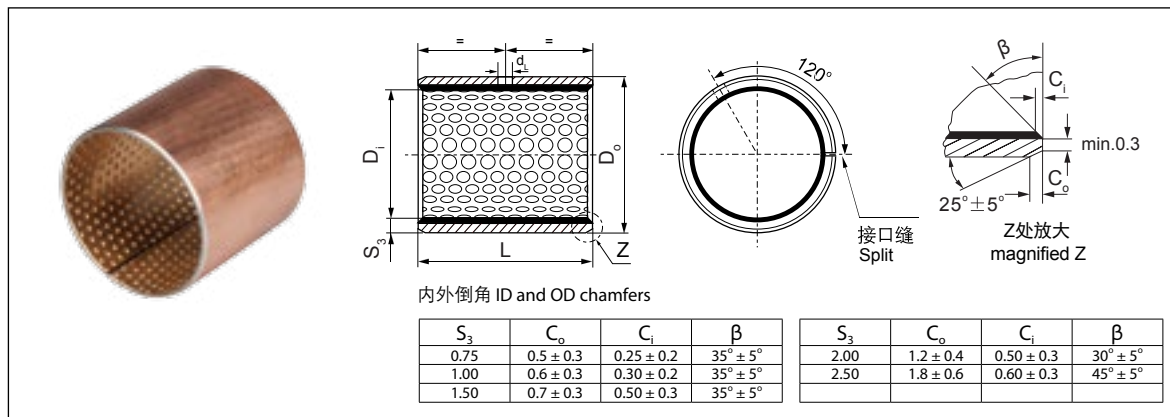
JF双金属板材厚度尺寸及公差 Normal thickness of the JF bimetal and their tolerances

公差厚度 Tolerance Thickness	1	1.5	2	2.5	3	3.5	4	5
钢基厚度 Thickness of steel backing	0.6	1	1.4	1.9	2.3	2.8	3.2	4
有效合金厚度 Thickness of bronze layer	0.4	0.5	0.6	0.6	0.7	0.7	0.8	1.0
可加工轴承壁厚 Manufacturable wall thickness	1 ^{+0.25} _{+0.15}	1.5 ^{+0.25} _{+0.15}	2 ^{+0.25} _{+0.15}	2.5 ^{+0.25} _{+0.15}	3 ^{+0.25} _{+0.15}	1 ^{+0.25} _{+0.15}	1 ^{+0.25} _{+0.15}	1 ^{+0.25} _{+0.15}
已加工轴承壁厚 Manufactured wall thickness	1 ^{-0.25}	1.5 ^{-0.03}	2 ^{-0.035}	2.5 ^{-0.04}	2.5 ^{-0.04}	3.5 ^{-0.05}	4 ^{-0.055}	5 ^{-0.06}

板材合金厚度可以根据要求定制。
The thickness of the plate alloy should be according to customer's request.

JF-800 标准公制轴套

JF-800 Normal Metric Bushing



单位 (Unit): mm

内径 D _i φ d	外径 D _o φ D	轴径(h8) Shaft D _s	座孔(H7) Housing D _H	压装后 内孔公差 Arter fixed D _{ia}	配合间隙 Clearance C _D	壁厚 Wall thickness S ₃	油孔 Oil hole d _L	长度 L _{0-0.40}						
								10	15	20	25	30	40	50
10	12	10 _{-0.022}	12 ^{+0.018}	+ 0.148 + 0.010	0.170 0.010	0.995 0.935	4	1010	1015	1020				
12	14	12 _{-0.027}	14 ^{+0.018}		0.175 0.010			1210	1215	1220				
14	16	14 _{-0.027}	16 ^{+0.018}					1410	1415	1420				
15	17	15 _{-0.027}	17 ^{+0.018}					1510	1515	1520				
16	18	16 _{-0.027}	18 ^{+0.018}					1610	1615	1620				
18	20	18 _{-0.027}	20 ^{+0.021}	+ 0.151 + 0.010	0.178 0.010	1.490 1.430	6	1810	1815	1820	1825			
20	23	20 _{-0.033}	23 ^{+0.021}	+ 0.161 + 0.020	0.194 0.020			2010	2015	2020	2025			
22	25	22 _{-0.033}	25 ^{+0.021}					2210	2215	2220	2225			
24	27	24 _{-0.033}	27 ^{+0.021}					2410	2415	2420	2425	2430		
25	28	25 _{-0.033}	28 ^{+0.021}						2515	2520	2525	2530		
26	30	26 _{-0.033}	30 ^{+0.021}	+ 0.181 + 0.040	0.214 0.040	1.980 1.920	6		2615	2620	2625	2630		
28	32	28 _{-0.033}	32 ^{+0.025}	+0.185 +0.040	0.218 0.040				2815	2820	2825	2830	2840	
30	34	30 _{-0.033}	34 ^{+0.025}						3015	3020	3025	3030	3040	
32	36	32 _{-0.039}	36 ^{+0.025}						3215	3220	3225	3230	3240	
35	39	35 _{-0.039}	39 ^{+0.025}							3520	3525	3530	3540	3550
38	42	38 _{-0.039}	42 ^{+0.025}		0.224 0.040	8			3820	3825	3830	3840	3850	
40	44	40 _{-0.039}	44 ^{+0.025}						4020	4025	4030	4040	4050	

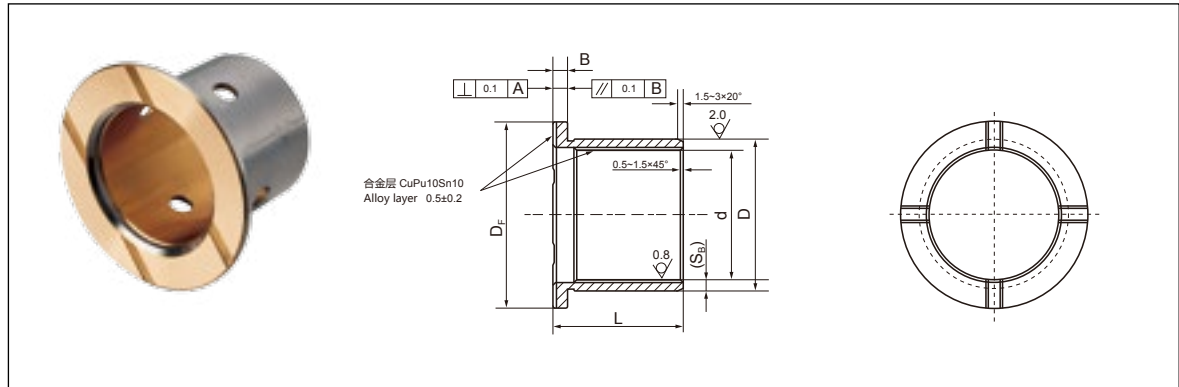
JF 标准公制轴套

JF Normal Metric Bushing

内径 D _i φ d	外径 D _o φ D	轴径(h8) Shaft D _s	座孔(H7) Housing D _H	压装后 内孔公差 Arter fixed D _{l,a}	配合间隙 Clearance C _D	壁厚 Wall thickness S ₃	油孔 Oil hole d _L	长度 L ⁰ _{-0.40}									
								25	30	40	50	60	80	90	100		
45	50	45 _{-0.039}	50 ^{+0.025}	+ 0.225 + 0.080	0.264 0.080	2.460 2.400	8	4525	4530	4540	4550						
50	55	50 _{-0.039}	55 ^{+0.030}	+ 0.230 + 0.080	0.269 0.080				5030	5040	5050	5060					
55	60	55 _{-0.046}	60 ^{+0.030}		0.276 0.080				5530	5540	5550	5560					
60	65	60 _{-0.046}	65 ^{+0.030}						6030	6040	6050	6060					
65	70	65 _{-0.046}	70 ^{+0.030}						6530	6540	6550	6560					
70	75	70 _{-0.046}	75 ^{+0.030}						7030	7040	7050	7060	7080				
75	80	75 _{-0.046}	80 ^{+0.030}						7530	7540	7550	7560	7580				
80	85	80 _{-0.046}	85 ^{+0.035}	+ 0.235 + 0.080	0.281 0.080		9.5		8030	8040	8050	8060	8080	8090			
85	90	85 _{-0.054}	90 ^{+0.035}		0.289 0.080				8530	8540	8550	8560	8580	8590	85100		
90	95	90 _{-0.054}	95 ^{+0.035}							9040	9050	9060	9080	9090	90100		
95	100	95 _{-0.054}	100 ^{+0.035}								9550	9560	9580	9590	95100		
100	105	100 _{-0.054}	105 ^{+0.035}								10050	10060	10080	10090	100100		
105	110	105 _{-0.054}	110 ^{+0.035}								10550	10560	10580	10590	105100		
110	115	110 _{-0.054}	115 ^{+0.035}					+ 0.240 + 0.080	0.303 0.080				11050	11060	11080	11090	110100
115	120	115 _{-0.054}	120 ^{+0.035}											11550	11560	11580	11590
120	125	120 _{-0.054}	125 ^{+0.040}									12050	12060	12080	12090	120100	
125	130	125 _{-0.063}	130 ^{+0.040}										12560	12580	12590	125100	
130	135	130 _{-0.063}	135 ^{+0.040}										13060	13080	13090	130100	
135	140	135 _{-0.063}	140 ^{+0.040}										13560	13580	13590	135100	
140	145	140 _{-0.063}	145 ^{+0.040}										14060	14080	14090	140100	
150	155	150 _{-0.063}	155 ^{+0.040}								15060	15080	15090	150100			

JF 标准公制翻边轴套

JF Normal Metric Flange Bushing



单位 (Unit): mm

$\varnothing D_F \pm 0.5$	$B \begin{smallmatrix} 0 \\ -0.08 \end{smallmatrix}$	$\varnothing D \begin{smallmatrix} +0.17 \\ +0.12 \end{smallmatrix}$	$\varnothing d \begin{smallmatrix} +0.25 \\ +0.20 \end{smallmatrix}$	$L \pm 0.8$	参考壁厚 $S_B \begin{smallmatrix} +0.05 \\ -0.10 \end{smallmatrix}$	$\varnothing D_F \pm 0.5$	$B \begin{smallmatrix} 0 \\ -0.08 \end{smallmatrix}$	$\varnothing D \begin{smallmatrix} +0.17 \\ +0.12 \end{smallmatrix}$	$\varnothing d \begin{smallmatrix} +0.25 \\ +0.20 \end{smallmatrix}$	$L \pm 0.8$	参考壁厚 $S_B \begin{smallmatrix} +0.05 \\ -0.10 \end{smallmatrix}$
42	3.5	37	30	30	3.5	87	3.5	67	60	65	3.5
43	2	34	30	28	2	87	4	68	60	60	4
44	3.5	39	32	35	3.5	94	3.5	72	65	60	3.5
47	3.5	39	32	50	3.5	87	3.5	72	65	65	3.5
48	2	39	35	37	2	87.5	1.95	69.12	65.22	64.5	2
52	3	41	35	35	3	88	3.5	67	60	60	3.5
55	3.5	42	35	35	3.5	88	3.5	72	65	65	3.5
55	3.5	45	38	35	3.5	92	3.5	77	70	67	3.5
55	3.5	45	38	40	3.5	93	3.5	75	68	60	3.5
60	3	41	35	42	3	94	3.5	77	70	70	3.5
60	3	46	40	62	3	95	3.5	77	70	65	3.5
63	3.5	47	40	40	3.5	95	4	78	70	70	4
65	3.5	52	45	40	3.5	97	3.48	77.14	70.18	62	3.5
68	3.5	54	47	35	3.5	97	3.5	82	75	74	3.5
70	3.5	54	47	40	3.5	100	5	85	75	70	5
70	3.5	57	50	48	3.5	103	3.525	70.8	63.75	73	3.5
72	3.5	57	50	45	3.5	105	3.5	82	75	75	3.5
72	3.5	57	50	50	3.5	105	3.5	87	80	70	3.5
75	3.5	57	50	50	3.5	107	4	83	75	74	4
77	3	60	54	55	3	115	5	100	90	75	5
83	3.5	66	59	53	3.5	128	3.8	92.6	85	103	4
85	3.5	65	58	60	3.5	108	3.5	72	65	75	3.5
87	3.5	67	60	53	3.5	108	3.5	77	70	98	3.5
87	3.5	67	60	60	3.5	108	5	80	70	90	5

FB 青铜卷制轴套
FB Bronze Wrapped Bushing



FB090 青铜卷制轴套 FB090 Bronze Wrapped Bushing

青铜
CuSn8P



FB090 青铜轴承，采用特殊配方的高密度铜合金带材为基体，表面可以按用户要求轧制菱形或半球形油穴和油槽。具有密度高、承载压力大、耐磨性能好、使用寿命长等优点，以取代传统的铸造铜套，可以缩小机械体积，降低成本。FB090 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、止推垫片和球碗等形式。

FB090 is a kind of bushes wrapped by bronze strip. The bronze is made as the particular formulation with high specific and gravity, and on its surface may be incorporated with spherical or diamond shaped indentations or/and oil grooves as required by customers. It is of high load capacity and long life, in place of traditional casting bronze bush. It is more cheap and more compact. It is widely applied in hoisting machines and other construction machines, automobiles, tractors, trucks, machine tools and some mineral engines.

密度 Density	8.9 g/cm ³	硬度 Hardness	90~120 HB
抗压强度 Pressure resistance strength	470 N/mm ²	延伸率 Elongation	55%
导热系数 Coefficient of heat conduction	60 W/m.K	材料名称 Alloy material	CuSn8P
线膨胀系数 Linear expansion coefficient	18.5 x 10 ⁻⁶ /K	其它可选材料 Other material	CuSn6.5P

FB091 黄铜卷制轴套 FB091 Copper Wrapped Bushing

黄铜
CuZn31Si



FB091 黄铜卷制轴套，是以特殊配方的高密度合金为基体，表面可根据客户要求轧制油穴或油槽等，它有较高的承载压力，很好的耐磨性，产品运用于汽车工业、建筑机械、机床工业等。

FB091 is based in high density copper alloy of special formula. The alloy surface is rolled to oil holes and grooves according to client requires. It has good load capacity and wear-resistant. The product is applied to construction machinery and machine tool, etc.

密度 Density	8.9 g/cm ³	硬度 Hardness	80~110 HB
抗压强度 Pressure resistance strength	440 N/mm ²	延伸率 Elongation	30%
导热系数 Coefficient of heat conduction	71 W/m.K	材料名称 Alloy material	CuZn31Si
线膨胀系数 Linear expansion coefficient	19.2 x 10 ⁻⁶ /K		

FB092 青铜布孔轴套 FB092 Bronze Wrapped Bushing

青铜
CuSn8P



FB092 青铜轴承，以青铜材料为基体，加工均匀有序的注油孔，经卷制而成的薄壁轴承，在装配后注入润滑油脂。该轴承具有存油量大、安装方便、设计机子小的优点，而且可以取代铜套使用，能大大地降低成本。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。

FB092 bronze bushing is based on bronze of CuSn8.0P0.3 and evenly distributed drilling oil holes on the body. When in assembly, oil or grease should be stored in the holes before bushing is sealed from both ends. FB092 has the advantages of abundant oil storage, easy-to-assembly, machine compactness etc. It can replace the conventional whole copper sleeves, thus to save much cost. It is mostly applied under middle load, low speed such as in convey machine, hoisting machine, windlass, aligning machine etc.

密度 Density	8.9 g/cm ³	硬度 Hardness	90~120 HB
抗压强度 Pressure resistance strength	470 N/mm ²	延伸率 Elongation	55%
导热系数 Coefficient of heat conduction	60 W/m.K	材料名称 Alloy material	CuSn8P
线膨胀系数 Linear expansion coefficient	18.5 x 10 ⁻⁶ /K	其它可选材料 Other material	CuSn6.5P

FB094 青铜布孔轴套带密封圈 FB094 Bronze Wrapped Bushing with Seals

青铜
CuSn8P



该产品是在 FB092 为基础上，在轴套高度两端配置密封圈而成。它具有防止油脂倒漏，延长润滑时间，防止灰尘、沙等物质的渗透等优点。

The product is improved from FB092. It is configured airproof ring in the bushing height. It can prevent grease leaking and dirt penetrating, so as to delay lubricating time.

密度 Density	8.9 g/cm ³	硬度 Hardness	90~120 HB
抗压强度 Pressure resistance strength	470 N/mm ²	延伸率 Elongation	55%
导热系数 Coefficient of heat conduction	60 W/m.K	材料名称 Alloy material	CuSn8P
线膨胀系数 Linear expansion coefficient	18.5 x 10 ⁻⁶ /K	其它可选材料 Other material	CuSn6.5P

FB09G 青铜嵌石墨卷制轴套 FB09G Bronze Wrapped Bushing

青铜 + 石墨
CuSn8P+Graphite



FB09G 青铜固体润滑轴承，是以青铜材料为基体，表面埋入固体润滑剂制作而成。由于以延伸率较高的铜合金材料作为基体，所以可以制成特薄的卷制轴套，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，也可以在无油润滑的其它场合使用。

FB09G is based bronze material and embedded with solid lubricants in its diamond or round shape pockets which are evenly distributed on its inside layers. Due to the higher elongation of the copper alloy material as the substrate, can be made extra thin wrapped bushes, plus on the ideal filler material for anti-wear agent for automotive transmission as a wear-resistant sleeve use can also be other occasions in the oil-free lubrication.

密度 Density	8.3 g/cm ³	硬度 Hardness	90~120 HB
抗压强度 Pressure resistance strength	470 N/mm ²	延伸率 Elongation	55%
导热系数 Coefficient of heat conduction	58 W/m.K	材料名称 Alloy material	CuSn8P
线膨胀系数 Linear expansion coefficient	18.5 x 10 ⁻⁶ /K	其它可选材料 Other material	CuSn6.5P

FB08G 钢基嵌石墨轴套 FB08G Steel+Graphite Wrapped Bushing

钢 + 烧结铜合金 + 石墨
Steel+Porous bronze sinter+Graphite



FB08G 固体润滑轴承，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轴承。由于采用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，润滑面积达 25% 以上，因此，能发挥良好的润滑性和抗磨损性能。

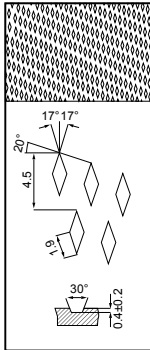
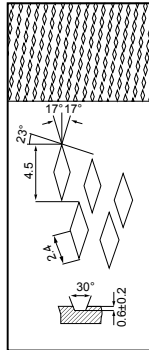
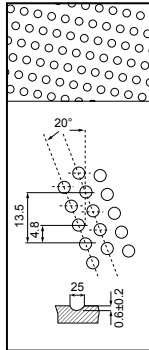
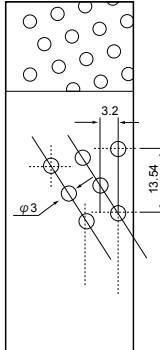
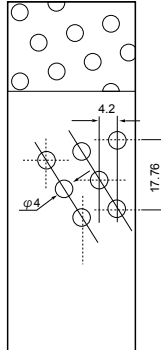
FB08G embedded with solid lubricating bushing, it is based on JF-800 bi-metal material, embedding special solid lubricant in the alloy layer. Owing to the high strength, high load capacity and the spirally distributed diamond embedded with solid lubricant, with a lubrication area of 25% on the bushing surface, the bushing shows good performance in lubricating property and anti-wear.

最大承载压力 P Load capacity P	90N/mm ²	摩擦系数 Friction coef μ	干摩擦 Dry friction	<0.22
合金硬度 Alloy hardness	60~90HB	脂润滑 Grease lubrication	脂润滑 Grease lubrication	<0.08
最大线速度 V Max line speed	干摩擦 Dry friction	0.4m/s	最高 PV 值 Maximum PV value	干摩擦 Dry friction
	脂润滑 Grease lubrication	2m/s		1.8N/mm ² .m/s

油穴形式(根据DIN1494/ISO3547) Type of oil pockets (according to DIN1494/ISO3547)

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 specially integrated into the inner surface to reduce the wearing and prolong the service hours. Besides, it has excellent anti-corrosion functions.

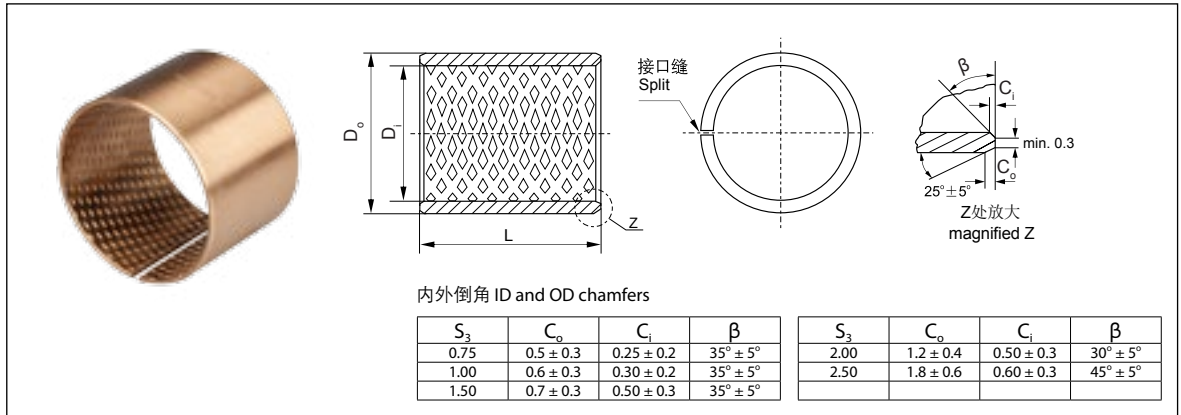
 <p>轴衬套内 Inside the bush of the shaft 菱形油穴 $r \leq \varnothing 22$ Rhomb oil holes $r \leq \varnothing 22$</p> <p>FB090 油穴 FB09G 油穴 FB08G 油穴</p>	 <p>轴衬套内 Inside the bush of the shaft 菱形油穴 $r > \varnothing 22$ Rhomb oil holes $r > \varnothing 22$</p> <p>FB090 油穴</p>	 <p>形成圆形 Forming a circle</p> <p>FB090 油穴</p>	 <p>轴承内径 $r \leq \varnothing 25$ Inside Dia $r \leq \varnothing 25$</p> <p>FB090 油穴</p>	 <p>轴承内径 $r > \varnothing 25$ Inside Dia $r > \varnothing 25$</p> <p>FB090 油穴</p>
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化学成分 Chemical composition

材料 Material	Cu	Sn	P	Pb	Zn
CuSn8	91.3%	8.0%	0.3%		

FB 标准公制轴套

FB Normal Metric Bushing



单位 (Unit): mm

内径 D_i ϕd	外径 D_o ϕD	长度 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	1410	1415	1420	1425									
15	17	1510	1515	1520	1525									
16	18	1610	1615	1620	1625									
18	20	1810	1815	1820	1825									
20	23	2010	2015	2020	2025									
22	25	2210	2215	2220	2225	2230								
24	27		2415	2420	2425	2430								
25	28		2515	2520	2525	2530								
28	31		2815	2820	2825	2830								
30	34		3015	3020	3025	3030	3035	3040						
32	36		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				6025	6030	6035	6040	6050	6060	6070			
65	70					6530	6535	6540	6550	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					8530	8535	8540	8550	8560	8570	8580	8590	
90	95					9030	9035	9040	9050	9060	9070	9080	9090	
95	100							9540	9550	9560	9570	9580	9590	95100

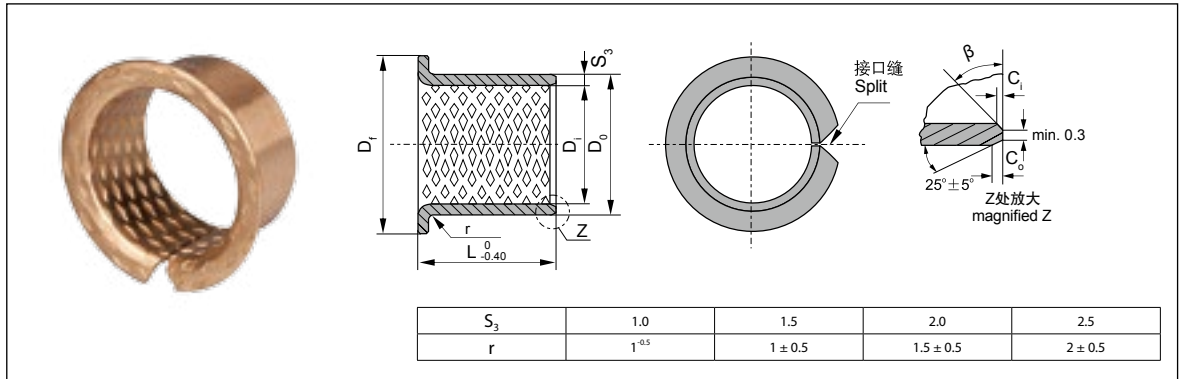
FB 标准公制轴套

FB Normal Metric Bushing

内径 D_i ϕd	外径 D_o ϕD	长度 L $\begin{smallmatrix} 0 \\ -0.40 \end{smallmatrix}$									
		25	30	35	40	50	60	70	80	90	100
100	105					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						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
165	170						16560	16570	16580	16590	165100
170	175						17060	17070	17080	17090	170100
175	180						17560	17570	17580	17590	175100
180	185						18060	18070	18080	18090	180100
185	190						18560	18570	18580	18590	185100
190	195						19060	19070	19080	19090	190100
195	200						19560	19570	19580	19590	195100
200	205						20060	20070	20080	20090	200100
205	210						20560	20570	20580	20590	205100
215	220						21560	21570	21580	21590	215100
225	230						22560	22570	22580	22590	225100
230	235						23060	23070	23080	23090	230100
240	245						24060	24070	24080	24090	240100
250	255						25060	25070	25080	25090	250100
260	265						26060	26070	26080	26090	260100
270	275						27060	27070	27080	27090	270100
280	285						28060	28070	28080	28090	280100
290	295						29060	29070	29080	29090	290100
300	305						30060	30070	30080	30090	300100

FB 标准公制翻边轴套

FB Normal Metric Flange Bushing



单位 (Unit): mm

内径 D_i ϕd	外径 D_o ϕD	法兰外径 D_f	长度 L $^{0}_{-0.40}$										
			15	20	25	30	35	40	50	60	70	80	90
25	28	35	25150	25200	25250								
30	34	45		30200	30250	30300							
35	39	50		35200	35250	35300	35350						
40	44	55			40250	40300	40350	40400					
45	50	60				45300	45350	45400	45500				
50	55	65				50300	50350	50400	50500				
55	60	70				55300	55350	55400	55500				
60	65	75				60300	60350	60400	60500	60600			
65	70	80				65300	65350	65400	65500	65600			
70	75	85					70350	70400	70500	70600	70700		
75	80	90					75350	75400	75500	75600	75700		
80	85	100					80350	80400	80500	80600	80700	80800	
90	95	110							90500	90600	90700	90800	90900
100	105	120							100500	100600	100700	100800	100900
110	115	130							110500	110600	110700	110800	110900
120	125	140							120500	120600	120700	120800	120900
130	135	155								130600	130700	130800	130900
140	145	165								140600	140700	140800	140900
150	155	180								150600	150700	150800	150900
160	165	190								160600	160700	160800	160900
170	175	200								170600	170700	170800	170900
180	185	215								180600	180700	180800	180900
190	195	225								190600	190700	190800	190900
200	205	235								200600	200700	200800	200900
225	230	260								225600	225700	225800	225900
250	255	290								250600	250700	250800	250900
265	270	305								265600	265700	265800	265900
285	290	325								285600	285700	285800	285900
300	305	340								300600	300700	300800	300900

复层类轴承的安装 Composite Bushing Installation

复层类轴承尺寸公差检测方法 Wrapped Bushing Dimensional Inspection

卷制类产品的制造工艺决定了开口缝的存在，使得产品在自由状态下没有很好的圆整度，同时轴套外径和座孔之间为过盈配合，轴套要最大限度地适应座孔的形状，因此不能在自由状态下直接测量产品的内外径而必须使用特殊的测量仪和设备才能检测；ISO3547 标准第 2 部分中对卷制类产品的公差检验作了明确的规定，包括：

检验方法 A：哈夫规检验外径；

检验方法 B：止通规检验外径；

检验方法 C：止通规检验内径；

检验方法 D：测量尺检验大规格产品外径

以及替代检验方法 C 的壁厚检验方法，壁厚检验方法和检验方法 C 不能同时使用。

Rolled products in the manufacturing process determine the existence of open joints, making products in the free state not have a good whole circle shape, while sleeve diameter and the seat for the interference fit between the holes, sleeve adapted to maximize Block hole shape can not be directly measured in the free state the inner/outside diameter of the product only can be by a special measuring instrument; In ISO3547 standards measured Part 2 of the rolled products made clear tolerance test requirements, including :

Test Method A: Huff regulatory test outside diameter;

Test method B: use stop-pass gauge to test the outside diameter;

Test method C: use stop-pass gauge to test the inside diameter;

Test method D: Measure the outer diameter of large scale product and use wall-thickness test to replace test method C. (Wall-thickness test and test method C can not be used at the same time.)

外径检验方法 External diameter test methods

检验方法 A (ISO3547-2: Test A) Test A of ISO 3547 Part 2

采用如右视图的上下两哈夫规对外径进行检验，检验时产品的开口缝朝上哈夫规相向施加检验载荷 F_{ch} ，该载荷使卷制轴套能够按符合要求的方式就位于检验模。检验中，由于弹性变形卷制轴套外径会变小但不会产生永久变形。产品的外径可以通过检验模之间的距离 Z 的变化量 ΔZ 来计算。

Check the outside diameter of a wrapped bush using measuring equipment as shown to the right, with a checking block consisting of upper and lower halves and setting plugs, at a determined checking load of F_{ch} , during the test the outside diameter of the bush is made smaller by the elastic reduction, however it is not a permanent deformation. The bushes outside diameter can be calculated from the difference in the value of z (ΔZ)

检验方法 B (ISO3547-2: Test B) Test B of ISO 3547 Part 2

检验采用两个环规即通规和止规，用手以最大力 250N 可将轴套推入并通过通规；在相同情况下无法进入和通过止规。在某些情况下检验精度可能受到影响，比如轴套不圆或闭合开口缝的力本身已超过 250N，此时建议采用检验方法 A 或测压入力或壁厚相结合的检验方法。

The test is carried out with two ring gaugs, a Go gauge and a No Go gauge whose diameter Shall be chosen empirically from with Table 6 of ISO3547-1:1999 and agreed upon. It shall be possible to press the bushes into the GO gauge and then push them through with hand pressure (maximum force 250N). On the other hand with the same force, it shall not be possible for them to go into and through the NO GO gauge (See ISO 12307-1)

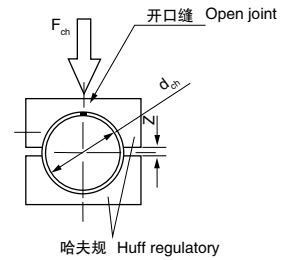
检验方法 D (ISO3547-2: Test D)

采用精确的测量尺来测量外径，一般针对大规格的轴套外径检测。

Test D (ISO 3547-2)

The test is carried out by means of a precision measuring tape.

检验方法 A Test A of ISO



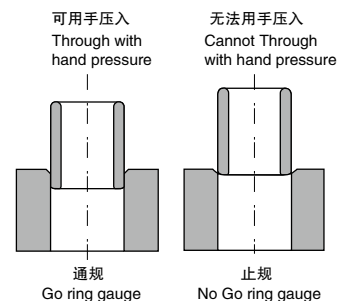
哈夫规和芯棒 $d_{ch} = \text{---mm}$
Checking block and setting mandrel

检验压力 $F_{ch} = \text{---N}$
Torque test

极限值 $\Delta z = \text{---and---mm}$
Limiting value

外径公差 $D_o = \text{---to---mm}$
OD tolerance

检验方法 B Test B of ISO



复层类轴承的安装 Composite Bushing Installation

内径检验方法 Internal diameter test methods

检验方法 C (ISO3547-2: Test C)

将轴套压入基准环规后检查轴套的内径，内径的检测可以采用三点测量装置或通、止塞规检验。从实际使用考虑一般建议采用通、止塞规检验，此时在用手最大推力不超过 250N 时通端塞规可以通过轴套内孔，在相同情况下止端塞规应当无法通过轴套内孔。当轴套压入基准环规后，轴套外径可能会引起永久变形而无法正常使用。

Test C (ISO3547-2: Test C)

To check the inside diameter, the bush is to be pressed into a ring gauge, whose nominal diameter corresponds to the dimension specified in ISO3547-1:1999. The inside diameter shall be measured with a 3-point measuring instrument or checked with a GO and NO GO plug gauge. The GO plug gauge shall be inserted by a minimum effort; the NO GO plug gauge shall not be inserted by manual pressure(maximum force 250N). In order to enable the manufacturer and the customer to compare results of this test it should be agreed whether results should be obtained by measuring or by gauging.

止推片检验方法 Thrust washer test method

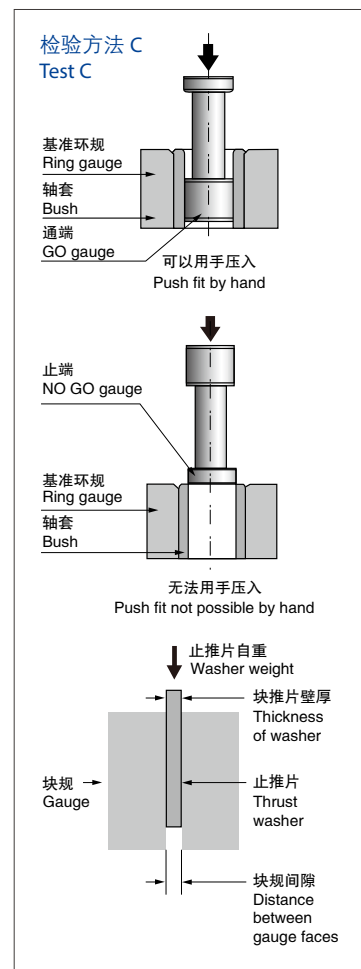
除了厚度公差以外，垫片的平行度对于垫片和对磨件的使用寿命同样重要。我们使用比较有效的检验方法来检测垫片的平行度，让垫片依靠自重来通过两个平行块；当然平行块必须大于垫片本身的规格。

Beside the thickness, the flatness of washer is also important for washer and grinding parts' usage age. We use very helpful test in which the washer falls through the gap between two plain parallel plates of a gauge under its dead weight. The plates must be big enough to cover the whole washer.

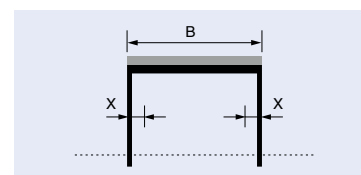
壁厚检测方法 Wall Thickness test method

作为检验方法 C 的替代方案两则不能同时使用，壁厚根据轴套尺寸在轴向进行测量。

The wall thickness is measured at once,two or three positions axially according to the bearing dimensions.The wall thickness and the inside diameter shall not be specified together on the same drawing.



B[mm]	X[mm]	测量点 measurement position
$B \leq 15$	$B/2$	1
$15 < B \leq 50$	4	2
$50 < B \leq 90$	6 and $B/2$	3
$B > 90$	8 and $B/2$	3

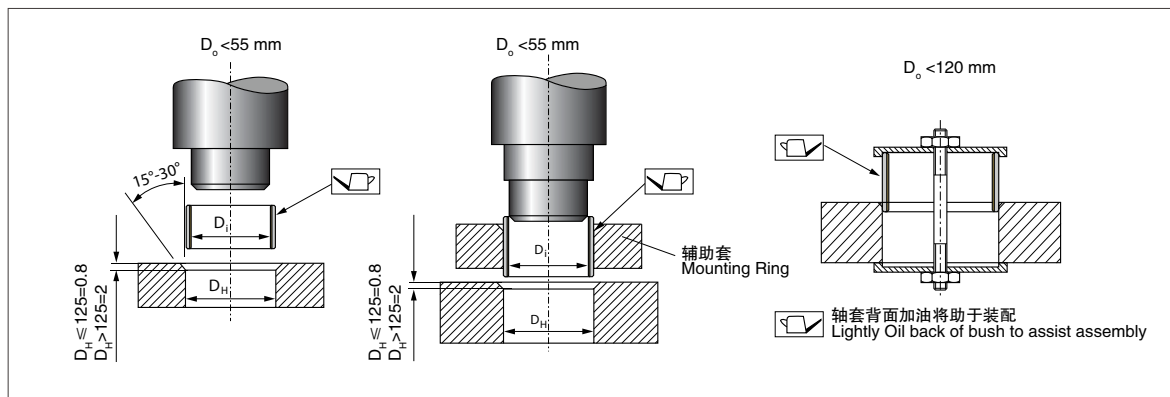


测量点
Measurement position

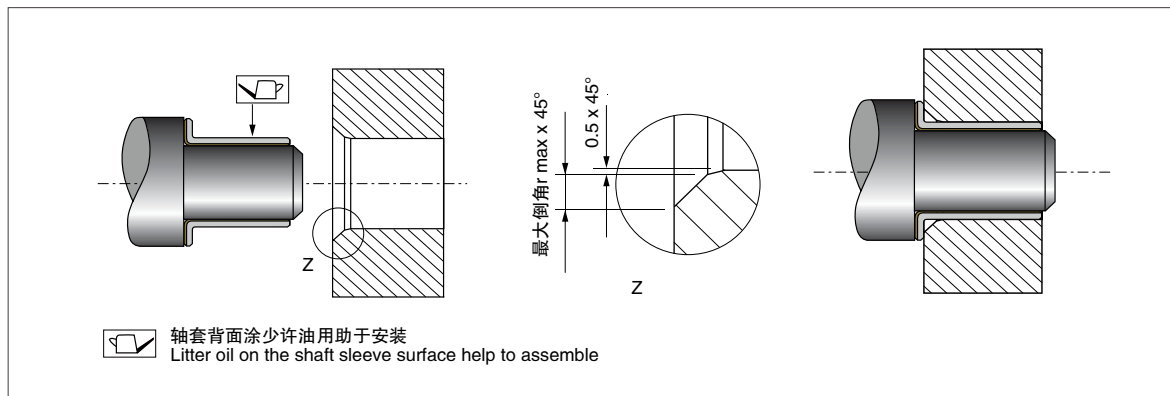
复层类轴承的安装

Composite Bushing Installation

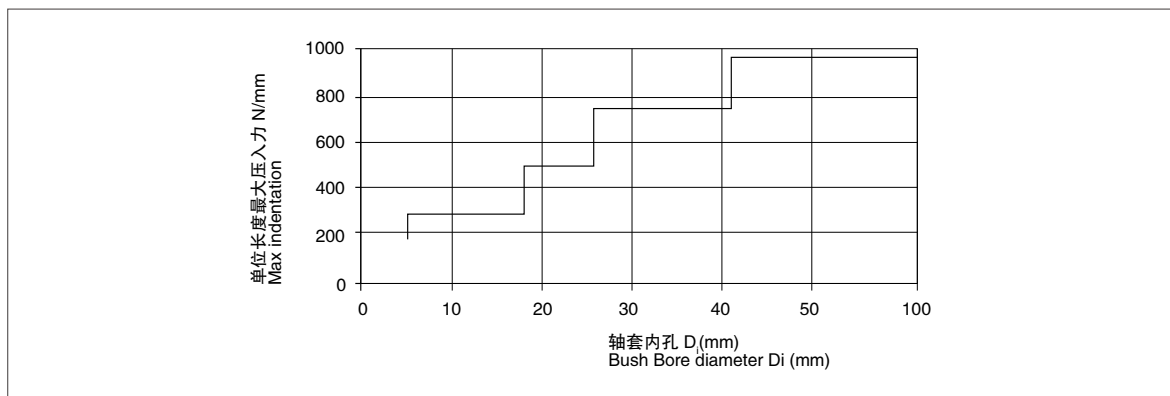
直套安装 Straight set of installation



翻边套安装 Flange set of installation



压入力计算 Indentation Calculation



复层类轴承的安装

Composite Bushing Installation

同轴度 Concentricity

精确的同轴度对于轴承的正常使用非常重要，要求轴套在一个或者两个长度内的不同轴度以及在翻边或止推片直径内的不同轴度控制在 0.02mm 内。

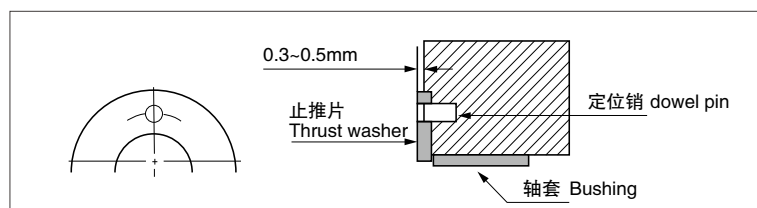
Degree of precision coaxial bearing the normal use for a very important requirement sleeve length in one or two degrees of the different axes and in the flange or thrust washer diameter of the different degree of control shaft within 0.02mm.

垫片和滑板的安装 Thrust washers and sliding plates installation

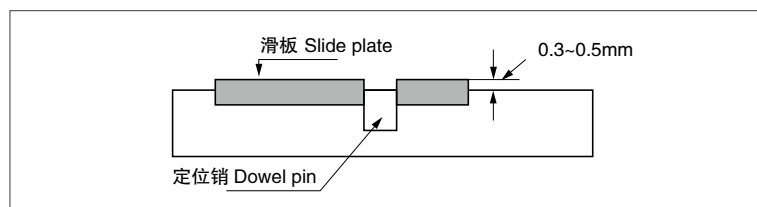
建议垫片和滑板安装在凹陷的座孔内，为了避免移动，同时建议采用定位销加以固定。

It is recommended to install the thrust washers and sliding plates with the hollow indented housing. To avoid the moving of such parts, a Dowel pins is recommended to be installed.

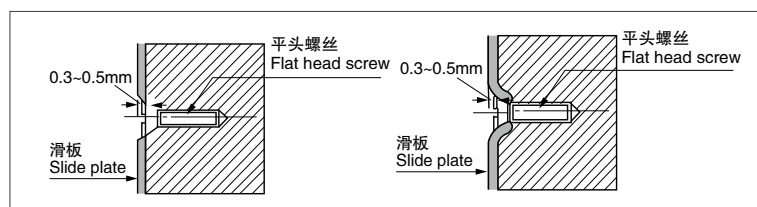
1. 定位销在垫片上的使用 Dowel pin application (thrust washer)



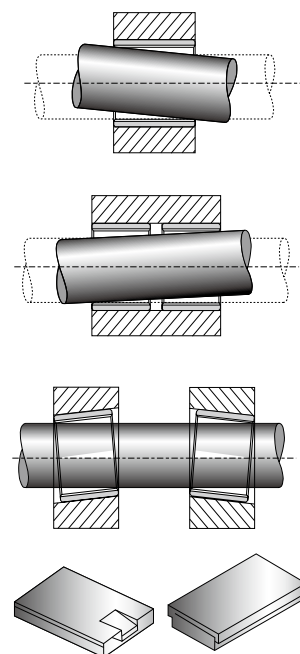
2. 定位销在滑板上的使用 Dowel pin used on slide plate



3. 平头螺丝的使用 Flat head screw application



同轴度要求 Concentricity requirements



其他固定方法 Other fixation methods

当无法使用定位销时，可以采用激光焊接，粘结剂和钎焊（温度 < 320℃）的方法加以固定；此时必须注意使用的温度不能超过轴承材料本身能够承受的范围，轴套工作面防止与粘合剂等接触。

When the pin is not available, you can use laser welding, adhesives and brazing (temperature < 320 °C) method to be fixed; while do in this way, temperature used must not higher then the bearing material itself can be standed, the clevee face should be prevent from contacting with adhesives.

复层类轴承的安装 Composite Bushing Installation

PTFE基轴承的加工和安装注意事项

Processing and installation considerations of PTFE-based bearing

PTFE 基轴承一般都是成品零件，组装后内孔不再进行铰、镗等加工，若座孔按推荐的尺寸加工时，卷制类轴承内径的真圆度完全能满足使用要求；

如果客户可以接受干摩擦性能大幅度降低，可以对 PTFE 基轴承在安装后进行内孔挤压以达到更高的精度，强烈建议对挤压芯棒表面进行热处理（深度 0.6mm，HRC > 55）并抛光处理至 Rz1；

当轴承的比压力小或摆动小而要求运行平稳时，可以增大工作间隙，在高温下使用时，每升高 100℃时建议轴径减少 0.008mm；若轴承座材质是青铜、铝或锌合金时，建议减少轴承座孔以增加轴承装配过盈量；为保证轴承座的刚性，轴承座外径通常为轴承外径的 1.5 倍，薄壁座孔使用时需要考虑压装和使用过程的产生的变形；

PTFE 轴承需要加工时，为了避免毛刺的产生建议从 PTFE 一侧进行加工或钻孔，在钻孔过程中轴套应当有足够的支撑已确保不会由于钻孔压力导致变形；带材的加工方法可以通过剪切、水切割、激光切割等方法。

PTFE-based bearings are generally finished parts, assembled in the hole without the hinge, and other processing, if the bore size of the recommended process, the rolling type bearings with bore roundness can meet the requirements;

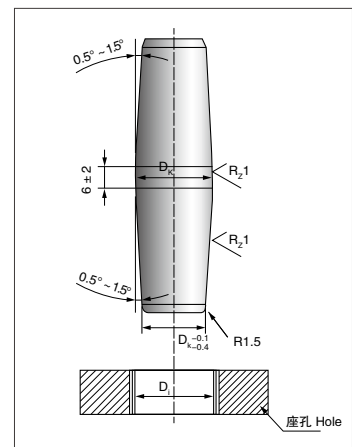
If the client can accept a significant reduction of dry friction, extruding the inner holes on the PTFE-based bearing after the compression to achieve higher accuracy, we strongly recommend the extrusion mandrel surface treatment (depth of 0.6mm, HRC > 55) and polished to Rz1;

When the bearing's specific pressure is small and required to run a smooth swing, you can increase the working space, when used at high temperatures, it is increased by 100 °C , the proposed reduction of shaft diameter 0.008mm;

If the material of bearing is bronze, aluminum or zinc alloy, it is recommended to reduce the bearing hole to increase the amount of interference bearing assembly; to ensure the bearing rigidity, The base of bearing's diameter is usually 1.5 times to the bearing's diameter, thin-walled bore with pressure to consider when installed and used in the process of the deformation;

PTFE bearings need processing, in order to avoid the generation of burrs from the PTFE side of the proposed processing or drilling in the drilling process should have sufficient support sleeve has been to ensure that no pressure leads to deformation of the borehole; processing methods strip can cut, water jet cutting, laser cutting and other methods.

轴承内径 Dia of the axis d	要求内径 Required ID dE	整形工具直径 Diameter of the shaping tools dk
d	d	d+0.03
	d+0.02	d+0.06
	d+0.03	d+0.08
	d+0.04	d+0.10

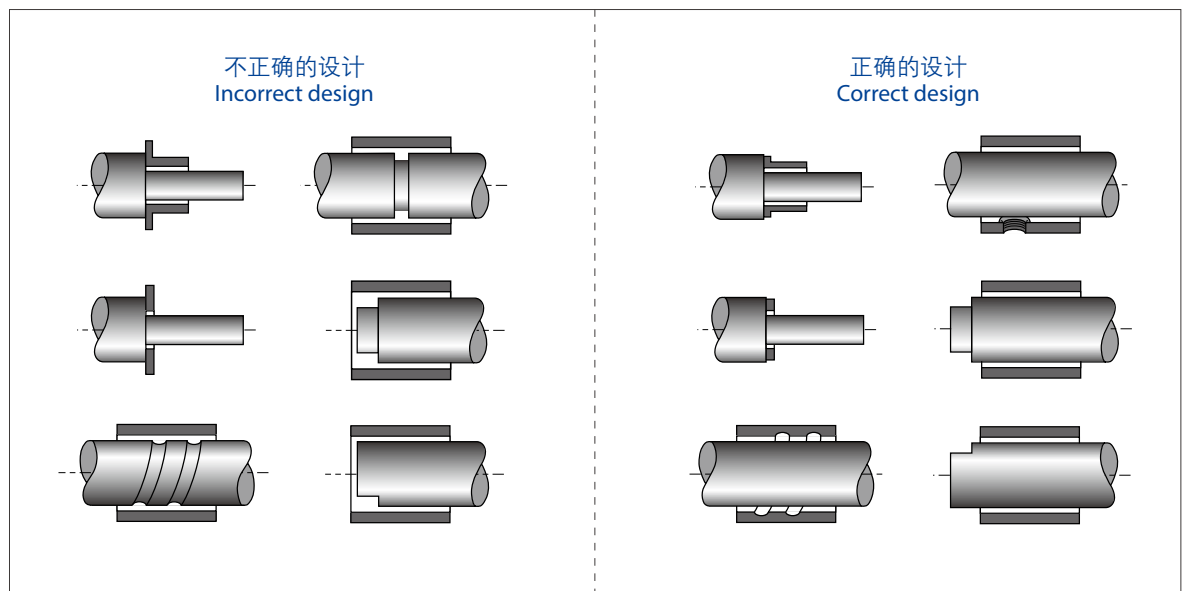


复层类轴承的安装 Composite Bushing Installation

对磨轴 The Shaft

对磨件的材料、表面硬度、表面粗糙度以及表面处理方式对于轴承的使用寿命的影响很大，一般情况下我们建议轴的硬度在 $HRC > 50$ ，表面粗糙度 $Ra0.4$ 以下；在潮湿或易腐蚀的场合建议使用不锈钢、硬质铬镀层。

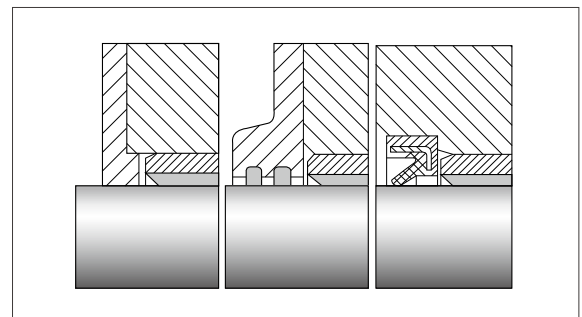
Grinding pieces of material, surface hardness, surface roughness and surface treatments have a great impact on the life of bearing, in general, we recommend that the hardness of the shaft $HRC > 50$, surface roughness below $Ra0.4$; We suggest using stainless steel, hard chrome plating in the wet or corrosive place.



轴承的密封 Seal

金属塑料基自润滑轴承允许一些不会损害轴承表面材料的异物进入，但当异物的侵入增加或高磨损型物质进入时应当安装核实的密封圈以提高轴承的使用寿命。

If increased levels of contamination occur or the bearing is used in an aggressive environment, the bearing section should be protected from dust and containment. The normal solution is to re-design the surrounding structure so that the contamination cannot reach the bearing section. If the contamination is critical, a collar of grease or a shaft seal is recommended.





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