SINCE 1992

FANRONG COMPOSITE BEARING

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嘉善繁荣复合轴承厂

JIASHAN FANRONG BEARING FACTORY

公司简介
INTRODUCTION

嘉善繁荣复合轴承厂创建于1999年，地处浙江嘉兴市嘉善县城西工业园区金秀路68号，环境优美，交通便捷，靠近320国道。工厂占地7000多平方米。

我厂是专业研究，开发与制造自润滑轴承的企业。我们的产品主要用于重载机器，液压设备，自动化机床等，简单的说，只要是能转动的地方，都有我们能生产的产品。

主要产品有: FRB-50 PTFE复合自润滑轴承，FRB-20 PTFE复合自润滑轴承，FRB-090/092青铜轴承，FRB-FZ钢球保持架，FRB-800双金属轴承，FRB-650(500#)固体润滑轴承，FRB-FD填充四氟带，FRB-FR四氟软带轴承和滑动轴承与座孔的装配。

FRB有50%产品出口欧洲，南非，中东等地，具有良好的国际信誉。

时代赋予发展的空间，科技给予成长的力量。富于挑战，锐意进取的繁荣人不断追求至善品质，永不放弃精益求精。以ISO9002.QS9000和VDA6.1为质量标准，繁荣为你提供一流的产品和服务。

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JIASHAN FANRONG COMPOSITE BEARING

JIASHAN FANRONG BEARING FACTORY is specialied in studying, exploring and making oilless bearings. The products mainly include FRB-50 PTFE Steel bronze powder with PTFE, FRB-20 POM Steel Bronze Powder with POM Marginal Bearings, FRB-800 Bimetal Wrapped Bearings, FRB-FZ Ball Retainer Bearings, FRB-650(500#)Graphite Bearings, FRB-FD Filled Ptfe Soft Strips, FRB-FR Ptfe Soft Stripe Bushes, FRB-090/092 Bronze Wrapped Bearings, installation of slide bushing and the housing. New ear provides space to develop and science provides power to grow. Members of FANRONG are ready to face dhallenge, competition and are eager to make progresss. Under the quality standards of ISO9002, QS9000 and VDA6.1, FANRONG promises to offer you high quality products and superior services.

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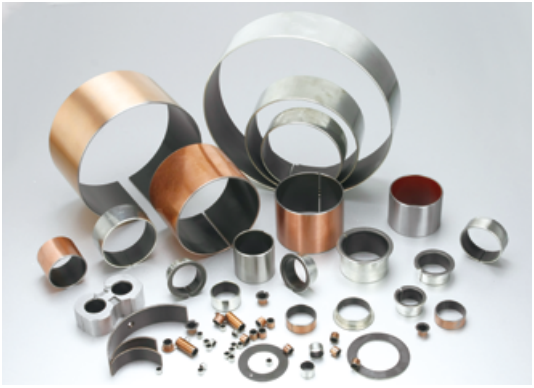
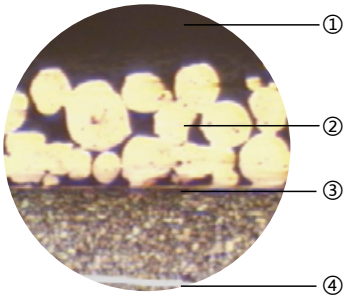
目录 Contents

FRB-50 PTFE 钢基塑料复合自润滑轴承
FRB-50 PTFE Steel bronze powder with PTFE





应用特点 Features

适用于低速重载、断续运转和摇摆等条件下无法加油或不允许加油的场合；
简化供油设计，减少维修和保养费用和时间；
耐磨性能好，摩擦系数低，延长产品适用寿命；
可在高温 +280℃或低温 -195℃场合下适用；
薄壁结构，质量轻，缩小机械体积；
粘 - 滑性很小，运行平稳；
在大多数溶剂和许多工业液体（包括水和油）与蒸汽场合中都可以适用。

Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, the transfer film created can protect the mating metal surface, suitable for rotary and oscillating movement. Very high chemical resistance, low absorption of water and swelling, also performs very good lubrication feature, the bronze backing provides the improved corrosion resistance comparing with FRB-50.

技术数据 Tech. Data		
最大承载 Max. load	静承载 Static	250N/mm^2
	低速运转 Very low speed	140N/mm^2
	旋转、摇摆运动 Rotating oscillating	60N/mm^2
最大 PV 值（干摩擦）Max. PV dryrunning	间断性运作 Short-term operation	3.6N/mm^2*M/3
	长期运作 Continuous operation	1.8N/mm^2*M/3
使用温度 Temp. limit		-195℃ ~+280℃
摩擦系数 Friction coefficient		0.03~0.20
最大线速度 Max. speed	干摩擦 Dry running	2m/s
	流体润滑 Hydrodynamic operation	>2m/s
导热系数 Thermal conductivity		42W(m*K)$^{-1}$
线胀系数 Coefficient of thermal expansion		11*10^{-6}*K^{-1}

材料组织 Structure

1. PTFE 和纤维的混合物 0.01~0.03mm，可形成一层很好的转移膜保护对磨轴，提供了轴承的自润滑性能。
2. 铜粉层 0.20~0.35mm，具有很好的承载能力和耐磨性，良好的导热性能可及时转移轴承运作过程中产生的热量。复合材料可渗入到铜粉球的间隙中，提高了结合强度。
3. 低炭钢，提供了很好的承载性能和热传递作用。
4. 铜 / 锡电镀层 0.002mm，使其有更好的耐腐蚀性能。

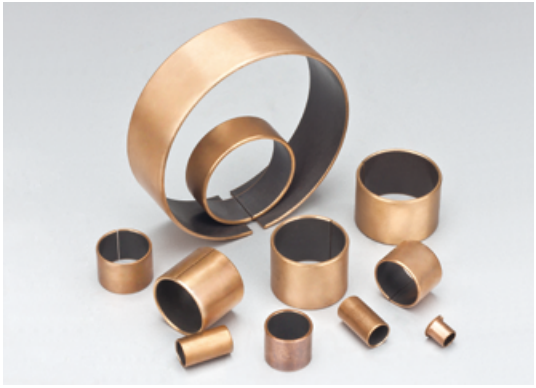
1. PTFE/Fibre mixture thickness 0.01~0.03mm, provides an excellent initial transfer film, which effectively coats the mating surfaces of the bearing assembly, forming an oxidetype solid lubricant film.
2. Sintered bronze powder thickness 0.20-0.35mm,provides Max. thermal conductivity away from the bearingsurface,also serves as a reservoir for the PTFE-Fibremixture.
3. Low-carbon steel,gives exceptionally high load carrying capacity, excellent heat dissipation.
4. Copper/Tin plating thickness 0.002mm, provides good corrosion resistance.

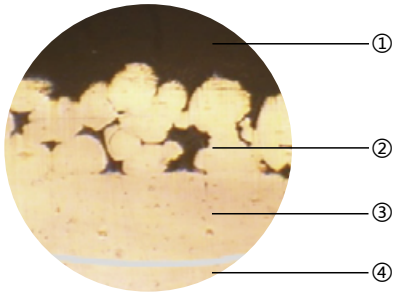
典型运用 Typical Applications

FRB-50 材料可以在干摩擦和润滑条件下满足长期使用而不需要更多的维护；
汽机车：拖拉机，联合收割机，农作物喷雾器，推土机，平地机等其他建筑机械；在汽车行业适用于动力转向泵，转向器推力垫片，盘式制动器，减震器，门铰链，雨刮器，椅子调角器，空气阀以及电磁阀等；
办公商务机械：复印机、传真机、打印机、邮件处理机等；
液压元件和阀门：齿轮泵、柱塞泵、叶片泵以及其他液压元件等；
家用电器：冰箱、空调、吸尘器、缝纫机、清洗机、微波炉和健身器材等；
以及其它物流机械、包装机械、纺织机械、港口机械、矿产机械和森林机械等等。

This material meets the demanding criteria for long life and trouble-free performance with or without lubrication.
Automotive: tractors, combines, crop sprayers, earthmovers, graders and other construction, auto machines, windshield wiper motor, tilt gear assemblies...
Business machines: photocopy machines, typewriters, mail sorters, postage meter systems, computer terminal printers and peripheral equipment, automatic printing devices, and other valves and valve trunnions...
Home appliances: tape recorders, refrigerators, air conditioners, cleaners, textile equipment, tools...etc.

FRB-1B 铜基塑料复合自润滑轴承
FRB-1B Bronze backed with bronze powder PTFE





材料组织 Structure

1. PTFE/ 纤维混合物 0.01-0.03mm，一种耐磨材料，运作过程中可形成转移膜以保护对磨轴，提供了轴承的自润滑性能。
2. 铜粉层，0.20-0.35mm，提高 PTFE 混合物与铜板层的结合强度，具有很好的承载能力和耐磨性。较高的导热系数可迅速转移运作过程产生的热量。
3. 铜基板，提高轴承的承载能力和热传递，且有更好的耐腐蚀能力。

1. PTFE/fibre mixture thickness 0.01~0.03mm, provides an excellent initial transfer film, which effectively coats the mating surfaces of the bearing assembly, forming an oxide type solid lubricant film.
2. Sintered bronze powder thickness 0.20-0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE/Fibre mixture.
3. Bronze backing, provides exceptionally high load carrying capacity, excellent heat dissipation and very good corrosion resistance.

应用特点 Features

与 FRB-50 具有相同的材料特性，同时由于轴承基体以青铜替代了碳钢基板，相比 FRB-50 更具有耐腐蚀能力和导热系数，另外铜基板也具有良好的抗磁能力。在设计时需要考虑 FRB-1B 产品不能与铝基座孔配合使用，因为当使用场所有水或者湿度较高时会引起电化学腐蚀风险。

Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, the transfer film created can protect the mating metal surface, suitable for rotary and oscillating movement. Very high chemical resistance, low absorption of water and swelling, also performs very good lubrication feature, the bronze backing provides the improved corrosion resistance comparing with FRB-50.

技术数据 Tech. Data		
最大承载 Max. load	静承载 Static	250N/mm^2
	低速运转 Very low speed	140N/mm^2
	旋转、摇摆运动 Rotating oscillating	60N/mm^2
最大 PV 值（干摩擦） Max. PV dryrunning	间断性运作 Short-term operation	3.6N/mm^2*M/3
	长期运作 Continuous operation	1.8N/mm^2*M/3
使用温度 Temp. limit		-195℃ ~+280℃
摩擦系数 Friction coefficient		0.03~0.20
最大线速度 Max. speed	干摩擦 Dry running	2m/s
	流体润滑 Hydrodynamic operation	>2m/s
导热系数 Thermal conductivity		70W(m*K)$^{-1}$
线胀系数 Coefficient of thermal expansion		11*10^{-6}*K^{-1}

典型运用 Typical Applications

FRB-1B 由于其很好的耐腐蚀能力，可以适用于汽车门铰链、行李箱铰链、发动机铰链、雨刮器、手刹车装置、挂车连接头，户外升降机、船用绞车、船用链条、水坝传动部位轴套，干燥炉、纺织机械、冶金机械、油缸耳轴套以及办公设备等需要防腐蚀的场合。

This material meets the demanding criteria for long life and trouble-free performance with or without lubricant, of high safety factor even. The bronze backing provides a high corrosion resistance, anti magnetic properties and a good thermal conductivity, The bearings are particularly appropriate for high temperature environment where no oil is efficient and the machine must be under successive long period working condition. The typical applications covered Steel metallurgy industry such as bushes for roller grooves of successive casting machines, cement grouting pumps and screw conveyers for cement and so on.

FRB-40 PTFE 钢基塑料复合自润滑轴承
FRB-40 PTFE Steel Bronze Powder with PTFE/Fibre Dry Bearings

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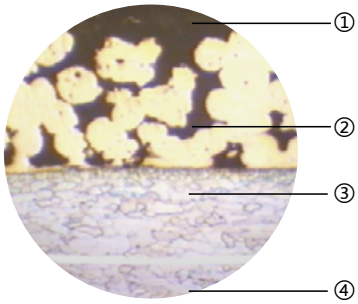


材料组织 Structure

1. PTFE/ 亲油性纤维混合物 0.01~0.0 粉球的间隙中，提高了结合强度。
2. 铜粉层 0.20~0.35mm，具有很好的承载能力和耐磨性，良好的导热性能可及时转移轴承运作过程中产生的热量。复合材料可渗入到铜粉球的间隙中，提高了结合强度。
3. 低炭钢，提供了很好的承载性能和热传递作用。
4. 铜 / 锡电镀层 0.002mm，使其有更好的耐腐蚀性能。

1. PTFE/Polymer fibres mixture thickness 0.01~0.03mm. Lead-free bearing layer provides an excellent initial transfer film, which effectively coats the mating surfaces of the bearing assembly, forming an oxide type solid lubricant film.
2. Sintered bronze powder thickness 0.20-0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE mixture.
3. Steel backing, provides high load carrying capacity, excellent heat dissipation.
4. Copper/Tin plating thickness 0.002mm, provides good corrosion resistance.

应用特点 Features

FRB-40 材料的开发是为了满足高负荷、流体润滑液压邻域的使用，由于 FRB-40 的 PTFE 耐磨材料中添加了特殊亲油性纤维，使得这种材料在耐气穴腐蚀和耐流体腐蚀性能比一般 PTFE 轴承更为优秀；同时在流体润滑条件下，这种材料的摩擦系数极低而耐磨性能更好，在设计时可以达到更高的 PV 值。

Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, the transfer film created can protect the mating metal surfaces, suitable for rotating and oscillating movement, high chemical resistance, low absorption of water and swelling. The FRB-40 improved the friction and much good wear resistance over the common FRB-50 range under lubricated operation.

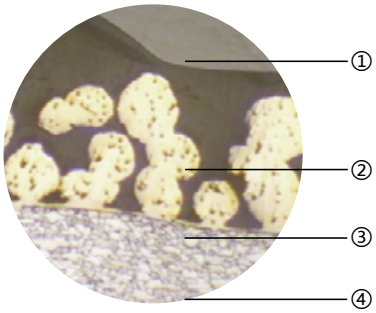
技术数据 Tech. Data		
最大承载 Max. load	静承载 Static	250N/mm^2
	低速运转 Very low speed	140N/mm^2
	旋转、摇罢运动 Rotating oscillating	60N/mm^2
最大 PV 值（干摩擦） Max. PV dryrunning	间断性运作 Short-term operation	3.6N/mm^2*M/3
	长期运作 Continuous operation	1.8N/mm^2*M/3
使用温度 Temp. limit		-195℃ ~+280℃
摩擦系数 Friction coefficient	干摩擦 Dry running	0.08~0.20
	流体润滑 Hydrodynamic operation	0.02~0.08
最大线速度 Max. speed	干摩擦 Dry running	2m/s
	流体润滑 Hydrodynamic operation	>2m/s
导热系数 Thermal conductivity		42W(m*K)$^{-1}$
线胀系数 Coefficient of thermal expansion		11*10^{-6}*K^{-1}

典型运用 Typical Applications

汽车工业：踏板总成、平衡轴套、制动钳、转向主销轴套和卡车尾板轴套等；物流机械：搬运车、起重机、车载吊车、森林机械、包装机械等；以及液压马达、液压油缸、气动元件、农用机械等。

FRB-40 is developed for high duty, oil lubricated, hydraulic applications...Automotive suspension struts, shock absorbers guide bushing, hydraulic cylinders, gear pumps, motors, axial and radial piston pumps & motors. FRB-40 is designed mainly for using under lubricated conditions and it performs excellent wear resistance and low static/dynamic friction coefficient.

FRB-20 POM 铜粉钢板复合边界润滑轴承
FRB-20 POM Steel Bronze Powder with POM Marginal Bearings



应用特点　Features

适用于边界润滑下长期使用而无需维护；
建议初始油脂润滑，轴承表面的储油穴可以保证最佳的油脂分布，而过程加油可以大大提高产品的使用寿命；
适用于重载低速下的旋转运动和摇摆运动；
优秀的承载能力，较低的摩擦系数和很低的耐磨率；
无吸水性和吸油性，尺寸稳定；
轴承在压装后可以进行再次加工以得到更好的公差。

Suitable for rotating and oscillating movement, less 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.

技术数据 Tech. Data		
最大承载 Max. load	静承载 Static	250N/mm^2
	低速运转 Very low speed	140N/mm^2
	旋转、摇摆运动 Rotating oscillating	70N/mm^2
最大 PV 值（干摩擦） Max. PVdryrunning		3N/mm^2*m/3
使用温度 Temp. limit		-40℃ ~+110℃
摩擦系数 Friction coefficient		0.05~0.20
最大线速度 Max. speed	干摩擦 Dry running	2m/s
	流体润滑 Hydrodynamic operation	>2m/s
导热系数 Thermal conductivity		4W(m*K)$^{-1}$
线胀系数 Coefficient of thermal expansion		11*10^{-6}*K^{-1}

材料组织　Structure

1. POM 0.30-0.50mm 改性聚甲醛，具有很好的耐磨性能，甚至在瞬间缺油的情况下也具有较低的磨擦系数。轴承表面有排布规律的带有螺旋角度的储油坑，装配时，必须涂满润滑油脂。
2. 铜粉层 0.20~0.35mm，具有很好的承载能力和耐磨性，良好的导热性能可及时转移轴承运作过程中产生的热量。复合材料可渗入到铜粉球的间隙中，提高了结合强度。
3. 低炭钢，提供轴承的承载能力和热转移作用。
4. 铜 / 锡电镀层 0.002mm，使轴承有很好的耐腐蚀功能。

1.POM thickness 0.30~0.50 mm, it provides high wear resistance and low friction even with only minute volume of lubricant are supplied, this bearing surface carries a pattern of circular indents which should be filled with grease on assembly of the bearing.
2. Sintered bronze powder thickness 0.20-0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the resin mixture.
3. Low-carbon steel, provides exceptionally high load carrying capacity, excellent heat dissipation.
4. Copper/Tin plating thickness 0.002mm, provides good corrosion resistance.

典型运用　Typical Applications

汽车工业：踏板总成、平衡轴套、制动钳、转向主销轴套和卡车尾板轴套等；物流机械：搬运车、起重机、车载吊车、森林机械、包装机械等；以及液压马达、液压油缸、气动元件、农用机械等。

Recommended for applications involving intermittent operation or boundary lubrication... Automotive: suspension joints, kingpin assemblies and stub axles of tucks, automobile driving joint hinges, steering and other linkages, articulation joints, rear chassis hinges, fair leader rollers...

FRB-50 PTFE & FRB-40 PTFE 轴承规格及公差
FRB-50 PTFE & FRB-50 PTFE Specification & Tolerance

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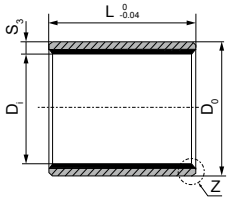

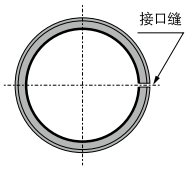

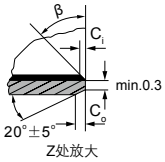

内外倒角

S_3	C_o	C_i	β
0.75	0.5±0.3	0.25±0.2	30°±5°
1.00	0.6±0.3	0.30±0.2	30°±5°
1.50	0.7±0.3	0.50±0.3	30°±5°

S_3	C_o	C_i	β
2.00	1.2±0.4	0.50±0.3	30°±5°
2.50	1.8±0.6	0.60±0.3	45°±5°

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 thickness S_3	长度 L 0 -0.40 (d≤Φ28 L-0.30 d>Φ30 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	1.005 0.980	0606	0608	0610							
8 -0.013 -0.028	10 +0.015	10 +0.055 +0.025	8.055 7.990	0.083 0.003		0806	0808	0810	0812	0815					
10 -0.013 -0.028	12 +0.018	12 +0.065 +0.030	10.058 9.990	0.086 0.003		1006	1008	1010	1012	1015	1020				
12 -0.016 -0.034	14 +0.018	14 +0.065 +0.030	12.058 11.990	0.092 0.006		1206	1208	1210	1212	1215	1220	1225			
13 -0.016 -0.034	15 +0.018	15 +0.065 +0.030	13.058 12.990					1310	1312	1315	1320	1325			
14 -0.016 -0.034	16 +0.018	16 +0.065 +0.030	14.058 13.990					1410	1412	1415	1420	1425			
15 -0.016 -0.034	17 +0.018	17 +0.065 +0.030	15.058 14.990					1510	1512	1515	1520	1525			
16 -0.016 -0.034	18 +0.018	18 +0.065 +0.030	16.058 15.990					1610	1612	1615	1620	1625			
17 -0.016 -0.034	19 +0.021	19 +0.075 +0.035	17.061 16.990	0.095 0.006				1710	1712	1715	1720	1725			
18 -0.016 -0.034	20 +0.021	20 +0.075 +0.035	18.061 17.990					1810	1812	1815	1820	1825			
20 -0.020 -0.041	23 +0.021	23 +0.075 +0.035	20.071 19.990	0.112 0.010	1.505 1.475			2010	2012	2015	2020	2025	2030		
22 -0.020 -0.041	25 +0.021	25 +0.075 +0.035	22.071 21.990					2210	2212	2215	2220	2225	2230		
24 -0.020 -0.041	27 +0.021	27 +0.075 +0.035	24.071 23.990					2410	2412	2415	2420	2425	2430		
25 -0.020 -0.041	28 +0.021	28 +0.075 +0.035	25.071 24.990					2510	2512	2515	2520	2525	2530	2540	2550
28 -0.020 -0.041	32 +0.025	32 +0.085 +0.045	28.085 27.990	0.126 0.010	2.005 1.970				2812	2815	2820	2825	2830	2840	2850
30 -0.020 -0.041	34 +0.025	34 +0.085 +0.045	30.085 29.990						3012	3015	3020	3025	3030	3040	3050
32 -0.025 -0.050	36 +0.025	36 +0.085 +0.045	32.085 31.990	0.135 0.015					3212	3215	3220	3225	3230	3240	3250
35 -0.025 -0.050	39 +0.025	39 +0.085 +0.045	35.085 34.990						3512	3515	3520	3525	3530	3540	3550
38 -0.025 -0.050	42 +0.025	42 +0.085 +0.045	38.085 37.990						3812	3815	3820	3825	3830	3840	3850
40 -0.025 -0.050	44 +0.025	44 +0.085 +0.045	40.085 39.990						4012	4015	4020	4025	4030	4040	4050

FRB-50 PTFE & FRB-40 PTFE 轴承规格及公差

FRB-50 PTFE & FRB-40 PTFE PTFE Specification & Tolerance

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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 thickness 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	0.170 0.020				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					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	0.209 0.020					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							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	0.273 0.070							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								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	2.465 2.415						18060	18070	18080	180100	
190 $^{-0.072}$	195 $^{+0.046}$	195 $^{+0.210}_{+0.130}$	190.216 190.070	0.288 0.070							19060	19070	19080	190100	
200 $^{-0.072}$	205 $^{+0.046}$	205 $^{+0.210}_{+0.130}$	200.016 200.070								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	0.303 0.070									26080	260100	
280 $^{-0.081}$	285 $^{+0.052}$	285 $^{+0.260}_{+0.170}$	280.222 280.070										28080	280100	
300 $^{-0.081}$	305 $^{+0.052}$	305 $^{+0.260}_{+0.170}$	300.222 300.070										30080	300100	

FRB-50F PTFE & FRB-40F PTFE 翻边规格及公差
FRB-50F PTFE & FRB-40F PTFE Specification & Tolerance

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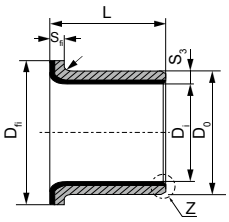

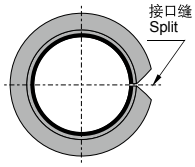

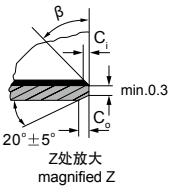

内外倒角 ID and OD chamfers

S_3	1.0	1.5	2.0	2.5
r	$1^{-0.5}$	1±0.5	1.5±0.5	2±0.5

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 C_o	Wall thickness 壁厚 S_3	尺寸 Dimension				
						D_i	D_o	D_{fi}±0.5	L±0.25	S_{fi}-0.2
6 -0.013 -0.028	8 +0.015	8 +0.055 +0.025	6.055 5.990	0.077 0.000	1.005 0.980	6	8	12	4	1
									7	
8 -0.013 -0.028	10 +0.015	10 +0.055 +0.025	8.055 7.990	0.083 0.003		8	10	15	5.5	
									7.5	
10 -0.016 -0.034	12 +0.018	12 +0.055 +0.025	10.058 9.990	0.086 0.003		10	12	18	7	
									9	
									12	
12 -0.016 -0.034	14 +0.018	14 +0.065 +0.030	12.058 11.990	0.092 0.006		12	14	20	7	
									9	
									12	
14 -0.016 -0.034	16 +0.018	16 +0.065 +0.030	14.058 13.990			14	16	22	12	
									17	
15 -0.016 -0.034	17 +0.018	17 +0.065 +0.030	15.058 14.990			15	17	23	9	
									12	
									17	
16 -0.016 -0.034	18 +0.018	18 +0.065 +0.030	16.058 15.990			16	18	24	12	
									17	
18 -0.016 -0.034	20 +0.021	20 +0.075 +0.035	18.061 17.990	0.095 0.006		18	20	26	12	
									17	
									20	
20 -0.020 -0.041	23 +0.021	23 +0.075 +0.035	20.071 19.990	0.112 0.010	1.505 1.475	20	23	30	11.5	1.5
									16.5	
									21.5	
22 -0.020 -0.041	25 +0.021	25 +0.075 +0.035	22.071 21.990			22	25	32	15	
									20	
25 -0.020 -0.041	28 +0.021	28 +0.075 +0.035	25.071 24.990			25	28	35	11.5	
									16.5	
									21.5	
30 -0.025 -0.050	34 +0.025	34 +0.075 +0.035	30.085 29.990	0.126 0.010	2.005 1.970	30	34	42	16	2
									26	
35 -0.025 -0.050	39 +0.025	39 +0.085 +0.045	35.085 34.990	0.135 0.015		35	39	47	16	
									26	
40 -0.025 -0.050	44 +0.025	44 +0.085 +0.045	40.085 39.990			40	44	53	26	
									40	

FRB-20 POM 轴承规格及公差
FRB-20 POM Sleeve Bushing Specification & Tolerance

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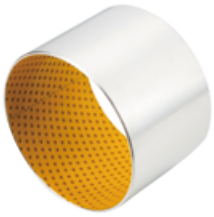
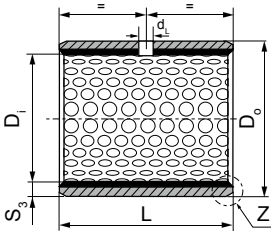
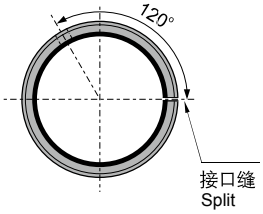
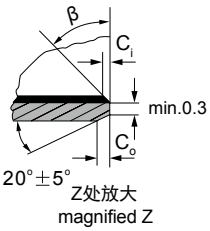








内外倒角 ID and OD chamfers

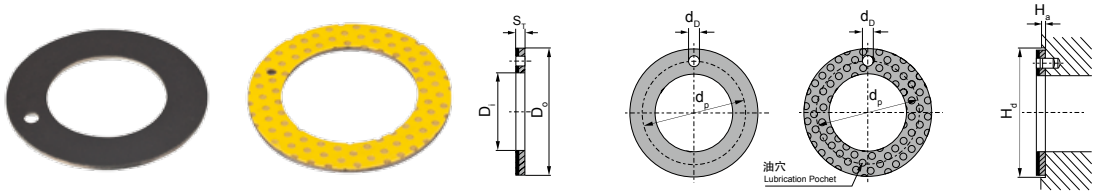
S_3	C_o	C_i	β
1.0	0.6±0.3	0.30±0.2	30°±5°
1.5	0.7±0.3	0.50±0.2	30°±5°

S_3	C_o	C_i	β
2.00	1.2±0.4	0.50±0.3	30°±5°
2.50	1.8±0.6	0.80±0.3	45°±5°

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 $D_{i,a}$	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			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			6		2515	2520	2525	2530					
28 -0.033	32 +0.025	32 +0.085 +0.045	28.155 28.060	0.188 0.060	1.970 1.935				2820	2825	2830					
30 -0.033	34 +0.025	34 +0.085 +0.045	30.155 30.060						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			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	2.460 2.415				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

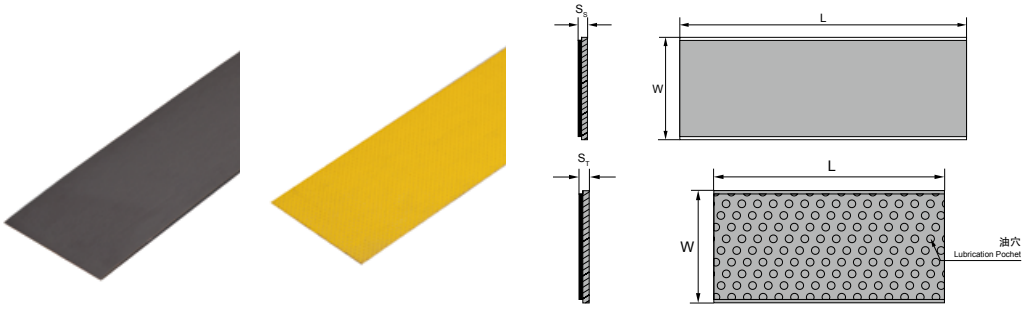
FRB-50W PTFE & FRB-20W POM 垫片规格及公差
FRB-50W PTFE & FRB-20W POM Specification & Tolerance



单位Unit: mm

轴径 Shaft D_s	型号规格 Standard No.	垫片尺寸 Washer 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	W10	10	20	1.5	15	1.5	1	20
10	W12	12	24		18			24
12	W14	14	26		20	2		26
14	W16	16	30		23			30
16	W18	18	32		25			32
18	W20	20	36		28	3		36
20	W22	22	38		30			38
22	W24	24	42		33			42
24	W26	26	44		35			44
26	W28	28	48		38	4		48
30	W32	32	54		43			54
36	W38	38	62		50			62
40	W42	42	66		54			66
46	W48	48	74	2	61		1.5	74
50	W52	52	78		65			78
60	W62	62	90		76			90

FRB-50SP PTFE & FRB-20SP POM 板材规格及公差
FRB-50SP PTFE & FRB-20SP POM Specification & Tolerance



单位Unit: mm

型号规格 Standard No.	长度 L±1	宽度 W±1	厚壁 Wall thickness S_S-0.05
SP	500	150	1.0
SP	500	150	1.5
SP	500	150	2.0
SP	500	150	2.5

FRB-090 & FRB-092 铜基卷制轴承
FRB-090 & FRB-092 Bronze Wrapped Bearings

基材特征 Structure

该轴套以 CuSn8 青铜为基材卷制而成的一种具有承载高，耐磨性能好的经济型轴承。标准的 FRB-090 产品工作表面布满规则的菱形油穴，起到储油的作用；标准的 FRB-092 产品工作表面布满规则的油孔，在起始运动时能较容易的形成油膜从而降低起始摩擦系数。主要运用于农用机械、建筑机械等高载低速场合。

The bearings are wrapped from a cold formed homogenous bronze (CuSn8) with exceptional material properties. The standard sizes of FRB-090 are fitted with diamond shaped lubrication indents in the bearing surface. The standard sizes of FRB-092 incorporate holes, which are dispersed in a special way over the whole bearing surface.These indents serve as lubricant reservoirs to rapidly build up a lubrication film at the start of movement and thereafter reduce the running friction. The material is suitable for construction and agricultural machinery applications.

技术参数 Tech. Data				
最大承载 Max. load	静承载 Static	120N/mm^2	硬度 HB	HB 110-150
	动承载 Dynamic	40N/mm^2	延伸率 Elongation	40%
最大线速度 Max. speed (Lubrication)		2m/s	使用温度 Temp.	-100℃ ~+200℃
最大 PV 值 Max. PV		2.8N/mm^2*m/s	摩擦系数 Friction coefficient	0.08~0.25
抗拉强度 Tensile strength		450N/mm^2	导热系数 Thermal conductivity	60W(mk)$^{-1}$
屈服强度 Alloy hardness		250N/mm^2	热膨胀系数 Coef. of thermal expansion	15x10^{-6}k^{-1}

可供形式 Available in the form	公差 Tolerance
直套、翻边、止推垫片、滑板及其它非标品部件等 Straight sets, flange, thrust washers, skateboards and other non-standard parts and other products	一般推荐座孔公差为 H7, 轴径公差为 f7 Generally recommended housing bore tolerance H7, shaft tolerance f7

FRB-090 & FRB-092 青铜轴套规格及公差
FRB-090 & FRB-092 Bronze Sleeve Bushing Specification & Tolerance

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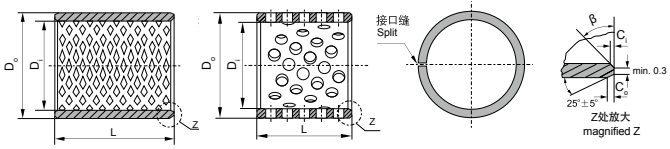

内外倒角 ID and OD chamfers

S_3	C_o	C_i	β
0.75	0.5±0.3	0.25±0.2	35°±5°
1.00	0.6±0.3	0.30±0.2	35°±5°
1.50	0.7±0.3	0.50±0.3	35°±5°

S_3	C_o	C_i	β
2.00	1.2±0.4	0.50±0.3	35°±5°
2.50	1.8±0.6	0.60±0.3	45°±5°

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

FRB-090 & FRB-092 青铜轴套规格及公差

FRB-090 & FRB-092 Bronze Sleeve Bushing Specification & Tolerance

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单位Unit: mm

内径 D_i φd	外径 D_0 φD	长度 L $^{0}_{-0.40}$									
		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

FRB-090F & FRB-092F 青铜翻边轴套规格及公差
FRB-090F & FRB-092F Bronze Flange Bushing Specification & Tolerance

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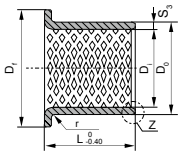
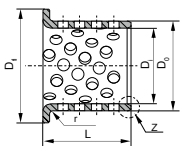
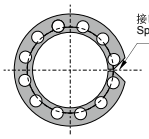
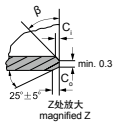








S_3	1.0	1.5	2.0	2.5
r	$1^{-0.5}$	1±0.5	1.5±0.5	2±0.5

单位Unit: mm

内径 D_i φd	外径 D_0 φD	法兰外径 D_fl	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

FRB-09G 铜基含固体润滑剂卷制轴承
FRB-09G Bronze Wrapped Bearings with Graphite

应用特点 Features

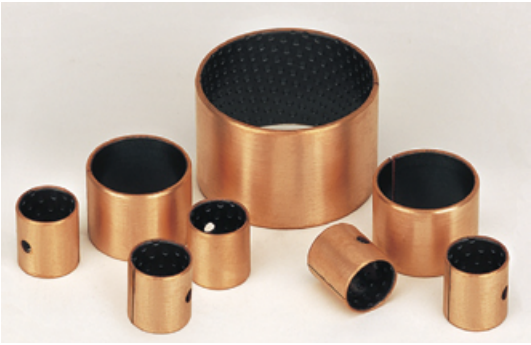
与 FRB-090 具有相同的生产工艺及使用场合，但在其菱形油穴内填充了以石墨为主的固体润滑剂，使产品在起始运用阶段及过程中能有更低的摩擦系数，在短时间断油的情况下任能保持良好的工作状态。因此被广泛使用在工程机械、齿轮箱传动部件、汽机车离合器等高载中速部位。

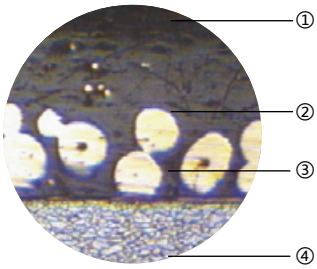
These are similar to the FRB-090 range, except there are solid lubricants embedded into the diamond shaped lubrication indents on the bearing surface, which provide good lubrication conditions at the start up stage, even with a lack of oil. It can be used in construction machinery, gear boxes, automotive clutch parts etc.

技术数据 Tech. Data				
最大承载 Max. load	静承载 Static	120N/mm^2	硬度 Hardness	HB 110-150
	动承载 Dynamic	40N/mm^2	延伸率 Elongation	40%
最大线速度 Max. speed (Lubrication)		2.5m/s	使用温度 Temp.	-100℃ ~+200℃
最大 PV 值 Max. PV		2.8N/mm^2*m/s	摩擦系数 Friction coefficient	0.08~0.25
抗拉强度 Tensile strength		450N/mm^2	导热系数 Thermal conductivity	60W(mk)$^{-1}$
屈服强度 Yeild strength		250N/mm^2	热膨胀系数 Coef. of thermal expansion	15x10^{-6}k^{-1}

可供形式 Available in the form	公差 Tolerance
直套、翻边、止推垫片、滑板及其它非标品部件等 Straight sets, flange, thrust washers, skateboards and other non-standard parts and other products	一般推荐座孔公差为 H7，轴径公差为 f7 Generally recommended housing bore tolerance H7, shaft tolerance f7

FRB-80 PEEK 铜粉钢板复合边界润滑轴承
FRB-80 PEEK Steel Bronze Powder with PTFE





材料组织 Structure

1. PEEK+PTFE 0.30~0.50mm 聚醚醚酮与 PTFE 的混合物，具有很好的耐磨性能和较低的摩擦系数，表面有规律的储油穴排布可以确保油脂的最佳分布。
2. 铜粉层 0.20~0.35mm，具有很好的承载能力和耐磨性，良好的导热性能可及时转移轴承运作过程中产生的热量。复合材料可渗入到铜粉球的间隙中，提高了结合强度。
3. 低炭钢，提高轴承的承载能力和热转移作用。
4. 铜 / 锡电镀层 0.002mm，使轴承有很好的耐腐蚀功能。

1.PTFE 0.30~0.50mm, gives high wear resistance and low friction even only minute quantities of lubricant are supplied. This bearing surface carries a pattern of circular indents which should be filled with grease on assembly of the bearing.
2.Bronze layer 0.20~0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE/ PEEK mixture.
3 . Steelbacking , provides mechanical strength and high load carrying capacity.
4 . Copper / Tin plating 0.002mm, provides good corrosion resistance.

应用特点 Features

适用于边界润滑下长期使用而无需维护；
建议初始油脂润滑，轴承表面的储油穴可以保证最佳的油脂分布，而过程加油可以大大提高产品的使用寿命；
适用于重载低速下的旋转运动和摇摆运动；
优秀的承载能力，较低的摩擦系数和很低的耐磨率；
无吸水性和吸油性，尺寸稳定；
轴承在压装后可以进行再次加工以得到更好的公差；
可适合于 -150℃ ~+250℃温度范围内使用。

Under boundary lubrication for long-term use without maintenance;
Recommended initial grease lubrication, the bearing surface of the oil hole can guarantee the best fat distribution, and refueling can greatly improve the process of product life;
Suitable for heavy low speed of rotation and oscillating motion;
Excellent carrying capacity, low friction coefficient and low wear rate;
Non-absorbent and oil absorption, dimensional stability;
After the press-fit bearings can be re-processed to better tolerance;
May be suitable for -150 ℃ ~ +250 ℃ temperature range.

技术数据 Tech. Data		
最大承载 Max. load	静承载 Static	250N/mm^2
	低速运转 Very low speed	140N/mm^2
	旋转、摇摆运动 Rotating oscillating	60N/mm^2
最大 PV 值（干摩擦） Max. PV dryrunning	间断性运作 Short-term operation	3.6N/mm^2*M/3
	长期运作 Continuous operation	1.8N/mm^2*M/3
使用温度 Temp. limit		-195℃ ~+280℃
摩擦系数 Friction coefficient		0.03~0.20
最大线速度 Max. speed	干摩擦 Dry running	2m/s
	流体润滑 Hydrodynamic operation	>2m/s
导热系数 Thermal conductivity		50W(m*K)$^{-1}$
线胀系数 Coefficient of thermal expansion		11*10^{-6}*K^{-1}

典型运用 Typical Applications

汽车：避震器、转向助力泵、转向系统、变速箱等；
一般工业：液压马达、齿轮泵、柱塞泵、叶片泵、油缸导向套以及物流机械等。

FRB-80 bearings application covered gear pump, ABS system, piston pump, gear motor, machine tools,agricultural machinery and so on. The materials is recommended with initial pre-lubrication at assembly.

FRB-80 双金属轴承规格及公差
FRB-80 Bimetal Sleeve Bushing Specification & Tolerance

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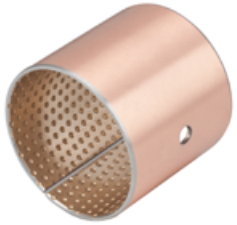

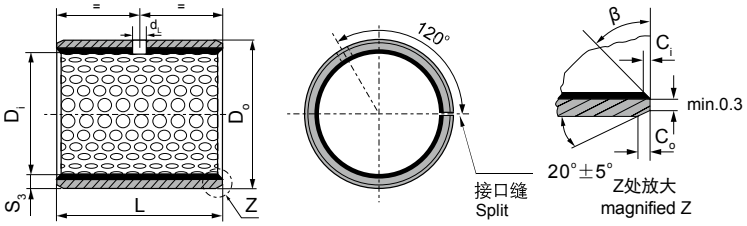

内外倒角 ID and OD chamfers

S_3	C_o	C_i	β
0.75	0.5±0.3	0.25±0.2	35°±5°
1.00	0.6±0.3	0.30±0.2	35°±5°
1.50	0.7±0.3	0.50±0.3	35°±5°

S_3	C_o	C_i	β
2.00	1.2±0.4	0.50±0.3	35°±5°
2.50	1.8±0.6	0.60±0.3	45°±5°

单位unit:mm

内径 D_i φd	外径 D_o φD	轴径(h8) Shaft D_s	座孔(H7) Housing D_H	压装后内孔公差 Arter fixed $D_{i,a}$	配合间隙 Clearance C_D	壁厚 Wall thickness S_3	油孔 Oil hole d_L	长度 L $^{0}_{-0.40}$ 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			1810	1815	1820	1825			
20	23	$20^{-0.033}$	$23^{+0.021}$	+0.161 +0.020	0.194 0.020	1.490 1.430		2010	2015	2020	2025			
22	25	$22^{-0.033}$	$25^{+0.021}$				6	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			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	$32^{-0.039}$	$36^{+0.025}$		0.224 0.040				3215	3220	3225	3230	3240	
35	39	$35^{-0.039}$	$39^{+0.025}$							3520	3525	3530	3540	3550
38	42	$38^{-0.039}$	$42^{+0.025}$				8			3820	3825	3830	3840	3850
40	44	$40^{-0.039}$	$44^{+0.025}$							4020	4025	4030	4040	4050

FRB-80 双金属轴承规格及公差
FRB-80 Bimetal Sleeve Bushing Specification & Tolerance

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单位unit:mm

内径 D_i φd	外径 D_0 φD	轴径(h8) Shaft D_s	座孔(H7) Housing D_H	压装后内孔公差 Arter fixed $D_{i,a}$	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	$75^{-0.046}$	$80^{+0.030}$				9.5		7530	7540	7550	7560	7580		
80	85	$80^{-0.046}$	$85^{+0.035}$	+0.235 +0.080	0.281 0.080				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	$110^{-0.054}$	$115^{+0.035}$								11050	11060	11080	11090	110100
115	120	$115^{-0.054}$	$120^{+0.035}$								11550	11560	11580	11590	115100
120	125	$120^{-0.054}$	$125^{+0.040}$	+0.240 +0.080	0.303 0.080						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

FRB-80F 双金属翻边轴承规格及公差
FRB-80F Bimetal Flange Bushing Specification & Tolerance

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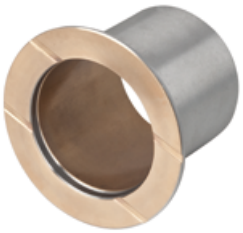
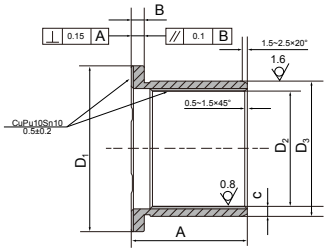
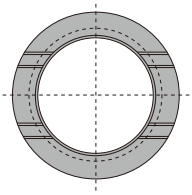






单位unit:mm

法兰外径 D_1	法兰外径 B	外径 D_3	内径 D_2	长度 A	壁厚 C
42	3.5	37	30	30	3.5
43	2	34	30	28	2
44	3.5	39	32	35	3.5
47	3.5	39	32	50	3.5
48	2	39	35	37	2
52	3	41	35	35	3
55	3.5	42	35	35	3.5
55	3.5	45	38	35	3.5
55	3.5	45	38	40	3.5
60	3	41	35	42	3
60	3	46	40	62	3
63	3.5	47	40	40	3.5
65	3.5	52	45	40	3.5
68	3.5	54	47	35	3.5
70	3.5	54	47	40	3.5
70	3.5	57	50	48	3.5
72	3.5	57	50	45	3.5
72	3.5	57	50	50	3.5
75	3.5	57	50	50	3.5
77	3	60	54	55	3
83	3.5	66	59	53	3.5
85	3.5	65	58	60	3.5
87	3.5	67	60	53	3.5
87	3.5	67	60	60	3.5

法兰外径 D_1	法兰外径 B	外径 D_3	内径 D_2	长度 A	壁厚 C
87	3.5	67	60	65	3.5
87	4	68	60	60	4
94	3.5	72	65	60	3.5
87	3.5	72	65	65	3.5
87.5	1.95	69.12	65.22	64.5	2
88	3.5	67	60	60	3.5
88	3.5	72	65	65	3.5
92	3.5	77	70	67	3.5
93	3.5	75	68	60	3.5
94	3.5	77	70	70	3.5
95	3.5	77	70	65	3.5
95	4	78	70	70	4
97	3.48	77.14	70.18	62	3.5
97	3.5	82	75	74	3.5
100	5	85	75	70	5
103	3.525	70.8	63.75	73	3.5
105	3.5	82	75	75	3.5
105	3.5	87	80	70	3.5
107	4	83	75	74	4
115	5	100	90	75	5
128	3.8	92.6	85	103	4
108	3.5	72	65	75	3.5
108	3.5	77	70	98	3.5
108	5	80	70	90	5

FRB-800 钢板铜锡合金双合金高承载轴承
FRB-800 Bimetal Wrapped Bearings

基材特征 Features

以优质碳钢为基体，表面烧结青铜粉；适用于高载低速下的摇摆运动、旋转运动，具有摩擦系数低、耐磨性能好、使用寿命长、抗咬合性能好等特点；铜合金层表面可以根据工况需要加工出各种类型的油槽、储油坑、油穴等，以适合于无法加油或难以加油的场合。

产品广泛用于工程机械用支重轮轴套、托带轮轴套、张紧轮轴套，汽车用平衡轴衬套、钢板肖衬套、转向节主肖轴套、连杆轴套、气门摇臂轴套、凸轮轴轴套、差速器用轴套、止推垫片、柱塞泵侧片、齿轮泵侧片等。

Steel shell backed with a lead bronze lining bearing material for oil lubricated applications. This material has high load capacity and good fatigue properties. It is widely used in automotive applications such as compressors, steering gear, power steering, pedal bearings, king-pin bushes, tailgate pivots, mechanical handling and lifting equipment, hydraulic motors, agricultural machinery etc.

材料特性 Chemical Compositions

材料牌号 Material	相当牌号 美国 / 日本 Alloy composition	合金成份 International standard	合金硬度 Alloy hardness
FRB-800	JIS-LBC3/SAE-797	CuPb10Sn10	HB70-100
FRB-720	JIS-LBC6/SAE-799	CuPb24Sn4	HB45-70
FRB-700	JIS-KJ3/SAE-48	CuPb30	HB30-45
FRB-20	JIS-AJL/SAE-783	AlSn20Cu	HB30-40

机械特性 Tech. Data

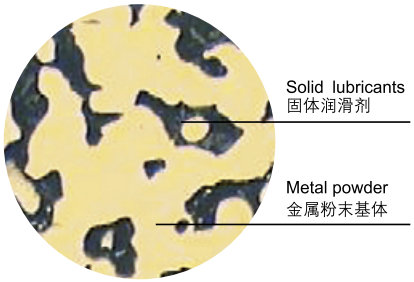
最大承载 Max. load	静承载 Static	120N/mm^2	屈服强度 Alloy hardness	240N/mm^2
	动承载 Dynamic	60N/mm^2	使用温度 Temp.	-40℃ ~+250℃
最大线速度 Max. speed (Lubricated)		2m/s	磨擦系数 Friction coefficient	0.08~0.20
最大 PV 值 Max. PV		2.8N/mm^2*m/s	导热系数 Thermal conductivity	60W(m*k)$^{-1}$
抗剪切强度 Breaking Load		350N/mm^2	线膨胀系数 Coef. of thermal expansion	14*10^{-6}*k^{-1}

FRB-85H 粉末烧结弥散型固体润滑轴承
FRB-85H Sintering of solid lubricant bearing diffuse

应用特点 Features

FRB85H 金属自润滑轴承采用粉末烧结技术加工而成，适合于高载低速无法加油或需要干摩擦工况条件下工作；主体材料包括铜基、铁基和不锈钢基，同时根据轴承的使用工况、运用温度、载荷、线速度和环境要求可以选择如石墨、二硫化钼等不同比例的固体润滑剂，这些固体润滑剂均匀的分布在材料组织内可以源源不断地为轴承表面提供低摩擦材料，降低了摩擦系数从而大大提高了轴承的使用寿命，相比传统的粉末冶金更具有耐磨性和耐高温性能。

FRB85H metal self-lubricating bearings made by powder sintering process, suitable for high load or fuel can dry friction conditions required under the conditions of work; the main materials include copper, iron base and stainless steel base, but also with the use of the bearing condition, the use of temperature, load, speed, and environmental requirements can choose, such as graphite, molybdenum disulfide solid lubricant such as different proportions, the solid lubricant materials uniformly distributed in the organization can continuously provide low friction bearing surface for the material, reducing the the friction coefficient and thus greatly improve bearing life, compared to more conventional powder metallurgy wear resistance and high temperature performance.



材料特点 Structure

- 满足于干摩擦工况，可以免于维护；
- 具有较高的承载能力；
- 使用温度范围广 -200℃ ~ +600℃；
- 可以再放射性环境和真空环境下使用；
- 材料具有良好的导电性能，不会产生静电现象；
- 可以在粉尘条件和腐蚀环境下使用；
- 材料可以根据需要进行再次加工。

- Meet in dry friction conditions, can be maintenance-free;
- Has a high carrying capacity;
- Wide temperature range -200 ℃ ~ +600 ℃;
- You can re-radiation environment and vacuum environment;
- Material has good electrical properties, without the static phenomenon;
- You can dust conditions and corrosive environments;
- Materials as needed for re-processing.

金属基材料 Metal-based materials		
铜基 Copper	铁基 Iron-based	镍基 nickel-based
CuSn, 锡青铜 CuSnPb, 铜铅合金	Fe 铁基 FeCu 铁铜合金 FeNiCu 铁镍合金 FeCrNi 不锈钢基	Ni 镍基 NiCuFe 镍铜合金

FRB-85H 粉末烧结弥散型固体润滑轴承
FRB-85H Sintering of solid lubricant bearing diffuse

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固体润滑剂 Solid lubricant

Material	Graphite	MoS2	WS2
结晶体结构 Crystal structure	六边形 Hexagon	六边形 Hexagon	六边形 Hexagon
比重 Proportion	2.25	4.7	7.5
在空气中的摩擦因数 Friction factor in the air	0.1~0.18	0.08~0.12	0.09~0.17
使用温度℃ Temperature℃	-120℃ ~+600℃	-100℃ ~+400℃	-180℃ ~+600℃
耐化学性 Chemical resistance	很好 Well	好 Well	好 Well
耐腐蚀性 Corrosion resistance	好 Well	差 Difference	差 Difference
耐核辐射 Resistant to nuclear radiation	很好 Well	好 Well	好 Well
在空气中使用 Use in the air	很好 Well	好 Well	很好 Well
在水中使用 In water use	很好 Well	差 Difference	差 Difference
在真空中使用 Use in a vacuum	差 Difference	好 Well	很好 Well

干摩擦机理 Dry friction mechanism

由于固体润滑剂都属于层结构晶体物质，很容易在金属基体材料内邻近的分子间形成低剪切强度的界面，在起始摩擦时由于金属发生磨损，固体润滑剂很容易被释放到轴承表面形成与对磨件的机械结合；这层转移膜具有很高的承载能力和极低的摩擦系数并且可以连续供应从而大大降低了磨损延长了使用寿命，另外一旦发生对转移膜的破坏可以在很短的时间内进行自我修复，从而起到了免维护的作用。

As the solid lubricant layer structure of crystalline materials are all easily within the metal matrix material between adjacent molecules to form a low shear strength of the interface, the initial friction occurs due to metal wear, solid lubricant can easily be released into the bearing surface formed with the combination of mechanical grinding parts; this layer transfer film has a high carrying capacity and low friction coefficient and can thus greatly reducing the supply of continuous extended wear life, the other in the event of damage to the transfer film can be very short period of time to repair itself, which played a maintenance role.

材料成份和性能表 Material composition and properties of the table

材料牌号 Material grades	铜基 Copper				铁基 Iron-based		镍基 Nickel-based	
	FRB85HB1	FRB85HB2	FRB85HB11	FRB85HB12	FRB85HF14	FRB85HF18	FRB85HN22	FRB85HN23
	CuSn 8613/6-1	CuSn 8613/12-1	CuSnPb 8313/6-1	CuSnPb 8413/8-1	FeNiCu 8310/8-3	FeCu 9404/8-2	NiFeCu 6033/10-2	FeCrNi 7218/20
密度 Density g/cm^3	6.8	6	7.2	5.8	6	5.9	6	5.8
硬度 Hardness HB	≥40	≥50	≥50	≥50	≥80	≥50	≥45	≥55
抗压强度 Compressive trength Mpa	300	180	380	250	550	180	240	180
最大静承载 Maximum static load Mpa	100	50	100	50	100	80	100	100
最大动承载 Maximum dynamic load Mpa	50	25	50	25	50	40	50	50
最大线速度 Maximum line speed m/min	15	20	15	15	10	10	20	10
最大 PV 值 Max PV N/mm^2*m/min	60	60	60	60	48	48	36	30
使用温度℃ Temperature℃	-50~+150	-50~+150	-50~+150	-50~+150	0~+600	0~+450	-200~+650	-100~+750
摩擦因数 μ Friction factor μ	0.12~0.18	0.10~0.15	0.15~0.22	0.12~0.18	0.30~0.45	0.30~0.45	0.25~0.40	0.35~0.50
线膨胀系数 Coefficient of linear expansion 10^{-6}/K	18	18	18	18	13	13	12	18

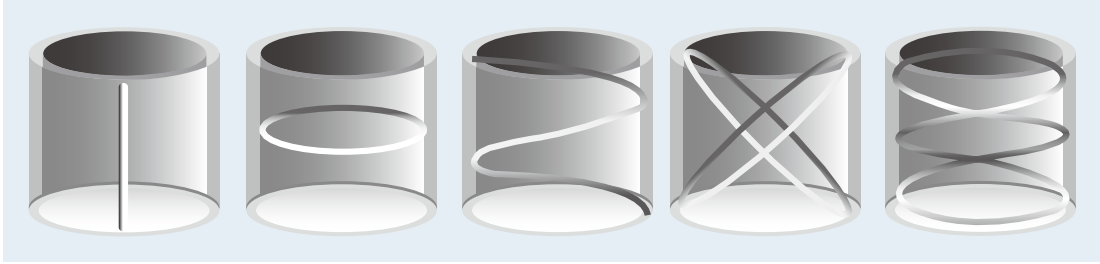
FRB-600 铜基精加工轴承
FRB-600 Solid Bronze Turned Bearings

基材特征 Structure

精加工铜合金轴套提供了简单、经济的轴承运用方式，具有承载高，耐腐蚀性好，尺寸加工任意性等特点。同时 FRB 可以根据不同的使用工况提供不同牌号的铜合金，并按照要求加工出不同的形式，它比卷制类铜轴承具有更高尺寸精度。

Machined cast bronze bearings offer technically and economically favorable bearings solutions. It is with high load capability, low weight and good corrosion resistance.FRB can offer different types of bronze alloys according to the required life time, service etc. The tolerance is much tighter than wrapped bronze bushes.

油槽 Oil Groove



技术参数 Tech. Data						
材料牌号 Material	600	600S1	600S2	600S3	600S4	600S5
	CuZn25Al6Mn4Fe3	CuSn5Pb5Zn5	CuAl10Ni5Fe5	CuSn12	CuSn10Pb10	CuZn25Al6Mn4Fe3
密度 Density	8.0	8.9	7.8	8.9	8.9	8.0
屈服强度 Yield point N/mm^2	> 450	> 90	> 260	> 150	> 100	> 450
抗拉强度 Tensile strengthN/mm^2	> 750	> 200	> 600	> 260	> 210	> 800
延伸率 Elongation %	> 12	> 15	> 10	> 8	> 8	> 8
硬度 Hardness HB	> 210	> 70	> 150	> 95	> 75	> 250

FRB250 铸铁镶嵌型固体润滑轴承
FRB250 Cast Iron with Graphite Plug

基材特征 Features

FRB250 铸铁镶嵌轴承 ,是以 HT250 为基材嵌入固体润滑剂的新产品，是一种典型的省材产品。若在压力 <14.5N/mm^2 或机械性能要求的场合 ,可作 JDB-650 材料的取代品。能大大降低成本 ,满足使用要求。

FRB250 is made of casting iron HT250 and embedded with solid lubricant. It is a typical cost saving product. It can be substitute of JDB-650 if requirement in mechanical performance is not High including guide post of mould, mold-frame of plastic injection machine etc.

材料特性 Features

FRB250 材料提供了自我润滑的解决方案，结合了铸铁的耐磨性和机械强以及固体润滑剂的自润滑性能，使其在使用过程中无需或少油维护；特别适合于高载低速和间歇性摆动工况条件下使如汽车覆盖模、五金冲压模具、射出成型机械以及冶金设备等。

This material provides a maintenance free bearing solution, particularly for high load and intermittent oscillating motion. Solid lubricants within the cast iron, combines the high load characteristics of cast iron with the wear resistance and low friction of graphite. Applications covered are automotive production line equipment, moulds & dies, plastic machinery industry etc.

技术数据 Tech. Data

最大承载 Max. load	静承载 Static	70N/mm^2	硬度 Hardness	HB>160
	动承载 Dynamic	10N/mm^2	抗拉强度 Tensile strength	150N/mm^2
最大线速度 Max. speed	干摩擦 Dry	0.15m/s	使用温度 Temp.	-40℃ ~+400℃
	流体润滑 Hydrodynamic	1m/s		
最大 PV 值 Max. PV		0.8N/mm^2*m/s	摩擦系数 Friction coefficient	0.08~0.20

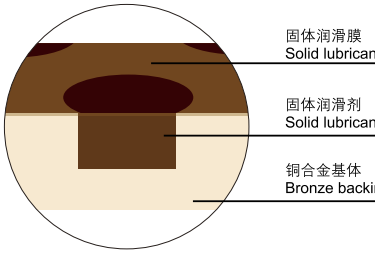
FRB TEX 碳钢基 PTFE 织物无铅自润滑轴承
FRB TEX Carbon steel PTFE fabric Pb-free self-lubricating bearings

基材特征 Features

该产品以优质低碳钢为基体，表面覆着以聚四氟乙烯织物。它具有更高承载力、更长的使用寿命。产品广泛应用于农用机械、球阀、蝶阀、水泵以及化工工业等重载低速而无法加油的领域。

TEX is based on steel backing as its structure, the surface is laid with PTFE fabric. It performs well with heavy load and long lifetime.It is widely applies to agriculture machinery, sphere valve, butterfly valve , pumps, chemical industry in the conditions of heavy load, low velocity but unable oiling conditions.

FRB-650 铜基镶嵌型固体润滑轴承
FRB-650 Cast Bronze Bearings with Graphite



应用特点 Structure

FRB-650 以高强度铜合金作为基础材料，根据使用工况按一定比例在其工作面加工出孔穴并填入固体润滑剂，高强度的铜合金提供了很高的承载能力而固体润滑剂则可以形成较低的摩擦副。在干摩擦条件下我们在轴承表面设计一层预润滑膜可以确保在最短的时间内将固体润滑剂转移到对偶件上并形成有效的固体润滑膜。

FRB-650 material is made of strong cast bronze based metal with special solid lubricants embedded. The base metal withstands high load and the solid lubricants provide self-lubrication. The bearing shows excellent performance without pre-lubrication under conditions of extreme high/low temperature with low speed. This material provides a maintenance-free bearing solution, particularly for high load, intermittent of oscillating motion.

材料特点 Features

- 可以长期使用而无需维护；
- 设计用于很高的静承载和动承载；
- 具有很低的且平稳的摩擦系数，无“粘着”现象；
- 具有耐粉尘、耐腐蚀、耐冲击和耐边缘负载能力；
- 金属基材具有很好的吸震能力；
- 能够在很宽的温度范围内使用；
- 适合于往复、旋转和摆动等启动频繁又难以形成油膜的场合；
- 具有极低的磨损率，使用寿命长。

- Long-term use without maintenance;
- Designed for high static load and dynamic load;
- Has a low coefficient of friction and smooth, no "sticky" phenomenon;
- Resistant to dust, corrosion resistance, impact resistance and resistance to edge load capacity;
- Metal substrate has good shock absorption;
- Be able in a wide temperature range;
- Suitable for reciprocating, rotary and oscillating so frequent and difficult to form a film starts the occasion;
- Has a very low wear rate, long service life.

FRB650 铜基镶嵌型固体润滑轴承
FRB650 Cast Bronze Bearings with Graphite

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材料成份和性能表 Main Metal Type						
材料牌号 Grade	650	650S1	650S2	650S3	650S5	650HP
化学成份 Material	CuZn25Al5Mn4Fe3	CuSn5Pb5Zn5	CuAl10Ni5Fe5	CuSn12	CuZn25Al5Mn4Fe3	CuZn32Al5Ni3
密度 Density	8	8.9	7.8	8.9	8	8
硬度 hardness HB	>210	>70	>150	>95	>250	>280
抗拉强度 Yeild strength N/mm^2	>750	>200	>600	>260	>800	>540
屈服强度 Yeild strength N/mm^2	>450	>90	>260	>150	>450	>450
延伸率 Elongation %	>12	>15	>10	>8	>8	>0.3
线膨胀系数 Coefficient of linear expansion	$1.9x10^{-5}$/℃	$1.8x10^{-5}$/℃	$1.6x10^{-5}$/℃	$1.8x10^{-5}$/℃	$1.9x10^{-5}$/℃	$1.8x10^{-5}$/℃
使用温度 Max. temp. ℃	-40~+300	-40~+400	-40~+400	-40~+400	-40~+150	-40~+150
最大动承载 Max. load N/mm^2	100	60	50	70	120	150
最大线速度 Max. speed (Dry m/min	15	10	20	10	15	15
最大PV值(润滑) Max. PV(Lubrication) N/mm^2*m/min	200	60	60	80	200	200
永久压缩变形量 Compression deformation 300N/mm^2	<0.01mm	<0.05mm	<0.04mm	<0.05mm	<0.005mm	<0.005mm

固体润滑剂 Lubricant	特性 Features	典型用途 Typical application
高纯石墨 + 添加剂 High purity graphite + additives	很好的耐磨性和化学稳定性，使用温度 <400℃ Good wear resistance and chemical stability, temperature<400℃	适用于一般机械，在大气中使用。 Suite for general machines and under atmosphere
PTFE+ 添加剂 PTFE+Additive	极低的摩擦系数和很好的水润性，<300℃ Extremely low friction coefficient and good moist nature<300℃	适用于水、海水润滑，如船舶，水工弧门，水轮机，制药饮料机械等。 Suite for water/sea lubrication, like ship, hydraulic turbine, gas turbine etc.

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化学性能表 Chemical properties

化学物质 chemical	浓度 Concentration %	温度 Temperature ℃	650#	650S1	650S2	650S3
强酸 Strong acid	5	20	×	×	×	×
盐酸 Hydrochloric acid	5	20	×	△	△	△
氢氟酸 Hydrofluoric acid	5	20	×	×	×	×
硝酸 Nitric acid	5	20	×	△	○	○
硫酸 Sulfuric acid	5	20	×	△	○	○
磷酸 Phosphate						
弱酸 Weak acid	5	20	×	×	○	○
醋酸 Acetic acid	5	20	×	×	○	○
甲酸 Formic acid	5	20	×	×	○	○
硼酸 Boric acid	5	20	×	×	○	○
柠檬酸 Citric acid						
碱 Alkali	10	20	×	×	×	×
氨 Ammonia	5	20	△	△	○	○
氢氧化钠 Sodium hydroxide	5	20	△	△	○	○
氢氧化钾 Potassium hydroxide		20	△	△	○	○
溶剂 Solvent						
丙酮 Acetone		20	△	△	○	○
四氯化碳 Carbon tetrachloride		20	△	△	○	○
乙醇 Ethanol		20	△	△	○	○
醋酸乙酯 Ethyl acetate		20	△	△	○	○
乙基氯 Ethyl chloride		20	△	△	○	○
甘油 Glycerin						
盐 Salt			×	×	×	×
硝酸氨 Of ammonium nitrate			○	○	○	○
氯化钙 Calcium chloride			○	○	○	○
氯化镁 Magnesium chloride			○	○	○	○
硫酸镁 Magnesium sulfate			○	○	○	○
氯化钠 Sodium chloride			○	○	○	○
硝酸钠 Sodium nitrate			×	×	○	○
氯化锌 Zinc chloride			○	△	○	○
硫酸锌 Zinc sulfate						
气体 Gas			×	△	△	△
氨 Ammonia			△	○	×	×
氯 Chlorine			×	×	○	○
二氧化碳 Carbon dioxide			×	△	×	×
烟道气 Flue gas			△	△	○	○
二氧化硫 Sulfur dioxide			×	△	△	△
硫化氢 Hydrogen sulfide			×	△	○	○
氮 Nitrogen			○	○	○	○
氢 Hydrogen			○	○	○	○
润滑剂和燃油			○	○	○	○
石蜡 Lubricants and fuel			○	○	○	○
汽油 Gasoline			○	○	○	○
煤油 Kerosene			○	○	○	○
柴油 Diesel fuel			○	○	○	○
矿物油 Mineral oil			○	○	○	○
其它 Other						
水 Water			△	○	○	○
海水 Seawater			×	△	○	○
树脂 Resin			△	○	○	○
碳氢化合物 Hydrocarbons			△	○	○	○

FRB650 自润滑直套轴承标准公制尺寸
FRB650 Self-lubricating Straight Bearings Standard Metric Size

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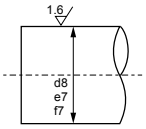
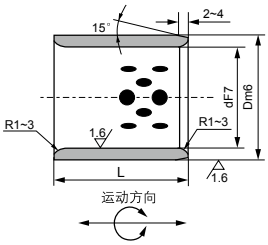
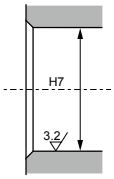


相配轴
Mating Shaft



Sliding direction



相配座孔
Mating Housing

单位Unit: mm

内径 d	外径 D	内径公差 d F7		外径公差 D m6		长度 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	+0.018 +0.007	081208	081210	081212	081215										
10	14	10		14		101408	101410	101412	101415	101416	101420								
12	18	12	+0.034 +0.016	18			121810	121812	121815	121816	121820	121825	121830						
13	19	13		19	+0.021 +0.008		131910	131912	131915	131916	131920	131925	131930						
14	20	14		20			142010	142012	142015	142016	142020	142025	142030						
15	21	15		21			152110	152112	152115	152116	152120	152125	152130	152135					
16	22	16		22			162210	162212	162215	162216	162220	162225	162230	162235	162240				
18	24	18		24			182410	182412	182415	182416	182420	182425	182430	182435	182440				
20	28	20	+0.041 +0.020	28			202810	202812	202815	202816	202820	202825	202830	202835	202840	202850			
22	32	22		32				223212	223215	223216	223220	223225	223230	223235	223240	223250			
25	33	25		33				253312	253315	253316	253320	253325	253330	253335	253340	253350	253360		
30	38	30		38				303812	303815	303816	303820	303825	303830	303835	303840	303850	303860		
35	45	35	+0.050 +0.025	45	+0.025 +0.009						354520	354525	354530	354535	354540	354550	354560	354570	
40	50	40		50							405020	405025	405030	405035	405040	405050	405060	405070	405080
45	55	45		55									455530	455535	455540	455550	455560	455570	455580
50	60	50		60									506030	506035	506040	506050	506060	506070	506080

FRB650 自润滑直套轴承标准公制尺寸

FRB650 Self-lubricating Straight Bearings Standard Metric Size

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单位Unit: mm

内径 d	外径 D	内径公差 dF7		外径公差 Dm6		长度 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	506535	506540	506550	506560	506570	506580	5065100				
55	70	55		70		557030	557035	557040	557050	557060	557070	557080	5570100				
60	74	60		75	+0.030 +0.011	607430	607435	607440	607450	607460	607470	607480	6074100				
60	75	60		75		607530	607535	607540	607550	607560	607570	607580	6075100				
63	75	63		75			637535	637540	637550	637560	637570	637580	6375100				
65	80	65		80			658035	658040	658050	658060	658070	658080	6580100				
70	85	70	+0.060 +0.030	85			708535	708540	708550	708560	708570	708580	7085100				
70	90	70		90			709035	709040	709050	709060	709070	709080	7090100				
75	90	75		90				759040	759050	759060	759070	759080	7590100				
75	95	75		95	+0.035 +0.013			759540	759550	759560	759570	759580	7595100	7595120			
80	96	80		96				809640	809650	809660	809670	809680	8096100	8096120	8096130		
80	100	80		100				8010040	8010050	8010060	8010070	8010080	80100100	80100120	80100130	80100140	
90	110	90		110					9011050	9011060	9011070	9011080	90110100	90110120	90110130	90110140	
100	120	100	+0.071 +0.036	120						10012060	10012070	10012080	100120100	100120120	100120130	100120140	
110	130	110		130								11013080	110130100	110130120	110130130	110130140	
120	140	120		140								12014080	120140100	120140120	120140130	120140140	
125	145	125		145									125145100	125145120	125145130	125145140	
130	150	130		150	+0.040 +0.015								130150100	130150120	130150130	130150140	130150150
140	160	140	+0.083 +0.043	160									140160100	140160120	140160130	140160140	140160150
150	170	150		170									150170100	150170120	150170130	150170140	150170150
160	180	160		180									160180100	160180120	160180130	160180140	160180150

FRB-JFB 自润滑翻边轴承标准公制尺寸
FRB-JFB Self-lubricating Flange Bearings Standard Metric Size

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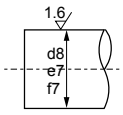
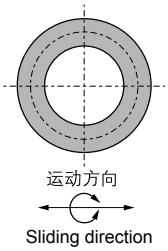
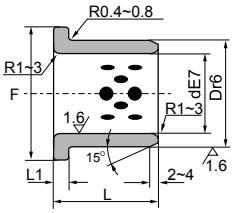
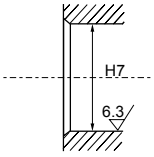


相配轴
Mating Shaft



运动方向
Sliding direction



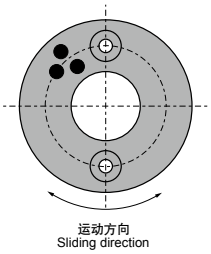


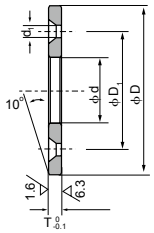
相配座孔
Mating Housing

单位Unit: mm

内径 d	外径 D	内径公差 d E7		外径公差 D r6		法兰外径 F	法兰厚度 L_1	长度 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	1425							
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	2540				
30	40	30		40	+0.050 +0.034	50			3020	3025	3030	3035	3040	3050			
35	45	35		45		60				3525	3530	3535	3540	3550			
40	50	40	+0.075 +0.050	50		65	5				4030	4035	4040	4050			
45	55	45		55		70					4530	4535	4540	4550	4560		
50	60	50		60	+0.060 +0.041	75						5035	5040	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	7580	75100
80	100	80		100		120									8060	8080	80100
90	110	90		110	+0.076 +0.054	130	10								9060	9080	90100
100	120	100	+0.107 +0.072	120		150									10060	10080	100100
120	140	120		140	+0.088 +0.063	170									12060	12080	120100

FRB-JTW 自润滑止推垫片标准公制尺寸
FRB-JTW Self-lubricating Thrust Washer Standard Metric Size

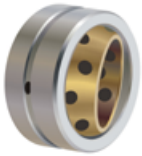


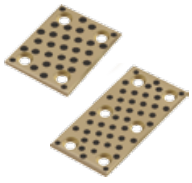


单位Unit: mm

型号规格 Standard No.	内径 φd	外径 φD	厚度 T	螺孔 Bolt Hole			
				φD_1	平头螺钉 Crop Bolt	φd_1	孔数 Bore Number
FRB-JTW-10	10.2	30	3	20	M3	3.5	2
FRB-JTW-12	12.2	40		28			
FRB-JTW-13	13.2						
FRB-JTW-14	14.2						
FRB-JTW-15	15.2	50		35			
FRB-JTW-16	16.2						
FRB-JTW-18	18.2						
FRB-JTW-20	20.2		5		M5	6	
FRB-JTW-25	25.2	55		40			
FRB-JTW-30	30.2	60		45			
FRB-JTW-35	35.2	70		50	M6	7	
FRB-JTW-40	40.2	80	7	60			
FRB-JTW-45	45.3	90		70			
FRB-JTW-50	50.3	100	8	75			4
FRB-JTW-55	55.3	110		85			
FRB-JTW-60	60.3	120		90	M8	9	
FRB-JTW-65	65.3	125		95			
FRB-JTW-70	70.3	130	10	100			
FRB-JTW-75	75.3	140		110			
FRB-JTW-80	80.3	150		120			
FRB-JTW-90	90.5	170		140	M10	11	
FRB-JTW-100	100.5	190		160			
FRB-JTW-120	120.5	200		175			

标准部件 Standard Components

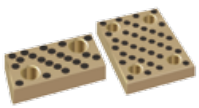
				
JDB	JFB	JDBB	JTW	JDBS

				
JESW	JTWP	JUWP	JOLP	JOML

				
JTLP	JGLDW	JTGLW	JGLXS	JGLX

			
JSOL	JFRP	JESF	JSP

塑胶模具用部品 Standard Components for Plastic Moulds

				
JUWP	JOLP	JTLP	JGLDW	JTGLW
				
JGLXS	JSOL	JFRP	JSP	JGB/JGBF
				
JOST	DIN9834	JEGB/JEGBK	JOSG	JOVL
				
JGBX	JGL	JCGBF,JCGBW	JVSOL	JCUW,JCUF,JCUS
				
JCSRG,JCSRW	JVG2	JSOD	JSOVP	JOCU
				

FRB-EPB 塑料轴承
FRB-EPB Plastic Compound Bearings

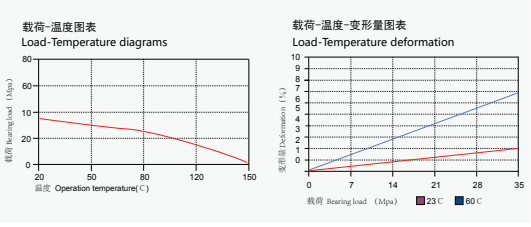
轴承PV值

FRB-EPB 系列轴承最大运行 PV 值为 0.4N/mm^2*m/s；由此决定轴承所承受的载荷与速度成反比。
连续使用温度：-40℃～ 80℃；通用性强适合多数中低载荷场合；适合干运行、免维护；不同轴材料磨损很小；较低的摩擦系数。

FRB-EPB series bearing the largest running PV value 0.4N/mm^2 * m/s; thus decided to bear the load bearing and speed is inversely proportional.
Continuous use temperature: -40 ℃ ~80 ℃ ; versatility for most of the low-load situations; suitable for dry running, maintenance-free; different shaft materials, wear a small; low friction coefficient.

主要性能数据表 The main performance data tables			
一般性能 General performance	试验方法 Test methods	单位 Unit	FRB-EPB
密度 Density	ISO1183	g/cm^3	1.46
颜色 Color			深灰
对钢的动摩擦系数 Dynamic friction coefficient of steel			0.05-0.15
最大 P.V 值 Maximum P.V value		N/mm^2*m/s	0.4
最大旋转速度值 Maximum rotation velocity		m/s	1.0
最大摇摆速度值 Maximum linear velocity		m/s	0.7
最大直线速度值 Maximum linear velocity		m/s	3.0
抗拉强度 Tensile strength	ISO527	HRa	80
抗压强度 (轴向) Compressive strength (axial)	ISO527	HRa	65
弹性模量 Modulus of elasticity	ISO527	HRa	2300
允许最大表面静压力 (20℃) Allows the maximum surface static pressure (20 ℃)		HRa	35
洛氏硬度 Rockwell hardness	ISO2039-2	HRR	108
连续工作温度 Continuous operating temperature		℃	-40/80
短时运行温度 Short-term operating temperature		℃	-40/120
导热性 Thermal conductivity	ASTME1461	W / m*k	0.2
线性热膨胀系数 Coefficient of linear thermal expansion	ASTMD696	K^{-1}*10^{-5}	10
RH50/23℃时的吸湿性 RH50/23 ℃ when the moisture	ASTMD570	%	0.2
燃烧性能 Combustion performance	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ωcm	>1012
面电阻率 Surface resistivity	IEC60093	Ω	>1015

轴承的载荷、速度、温度
Bearing load, speed, temperature



FRB-EPB 系列轴承可承受最大静载荷为 35Mpa，在此载荷下轴承的最大压缩变形量参考图表 17，轴承实际工作载荷略小于 35Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：1.0m/s) 会导致摩擦温度上升，而温度上升 (Tmax：80℃) 会导致轴承的承载能力逐渐减弱，载荷随轴承工作温度变化情况参考图表 18。

FRB-EPB series material is a thermal mould character plastic processed by crystal engineering plastic as basic material with proper intensifier and lubricant. The rigidity and high temperature engineer capability is greatly improved because of the use of intensifier, at the same time, the coefficient of thermal expansion, moulding shrinking rate and wriggle capability decreases, consequently, the size stability is improved, and EPB series material range is enlarged and keeps the intrinsic anti-wear capability and anti-drug capability.

FRB-200 钢基精加工轴承
FRB-200 Steel Base Finishing Bearings

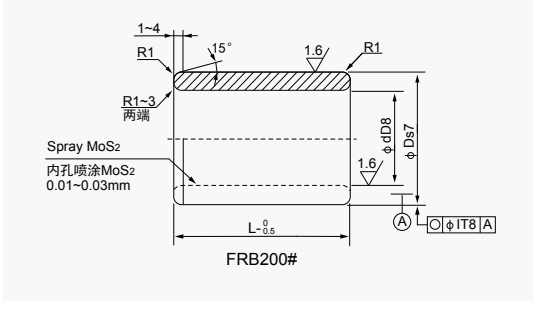
基材特征 Structure

FRB200 以优质碳素钢为基体，通过合理的油路设计，在装配时涂上油脂使得其在工作时能较长时间的储存所需要的足够油脂，并且能均匀的分布在轴承及轴的表面上，从而达到了延长使用寿命缩短加油频率的目的；同时由于特殊的油路系统能够存入工作时侵入轴承的灰尘和其它异物，从而最大限度的降低对轴承使用过程中的影响。FRB200 另外一个特殊性是在轴承的工作表面经过一种特殊工艺的处理，使其表面覆盖了一层特殊的固体润滑剂，这层特殊的润滑剂在起始动作时能很快的转移到对磨轴的表面上，从而较快的降低了起始摩擦系数，提高了轴承的耐磨性。

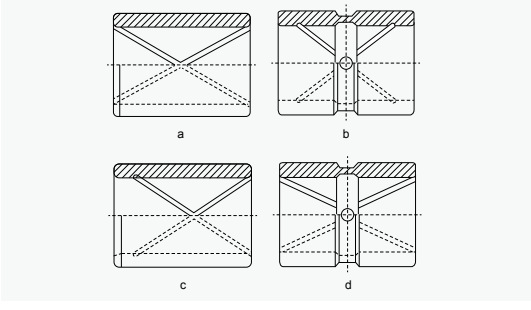
FRB200 high quality carbon steel as the base, through the rational design of oil, coated with grease during assembly makes it a long time at work when needed enough storage oil and can be evenly distributed in the surface of the bearing and shaft on, so as to achieve a long life the purpose of reducing the frequency of refueling; the same time because of the special oil system can work intrusion into the dust and other foreign matter bearing, thus reducing the maximum use of the bearing during the impact. FRB200 Another particularity is the bearing surface of the work handled through a special process, so that the surface covered by a layer of special solid lubricant, this layer of a special lubricant in the initial action quickly shifted to grinding the surface of the shaft, thereby rapidly reducing the coefficient of starting friction, improve wear resistance of the bearing.

材料特性 Tech. Data				
FRB 标准 standards	FRB200C	FRB200G	FRB250S	FRB250S5
基材 Substrate	S45C	GCr15	S45C	GCr15
线胀系数 Linear expansion coefficient	1.1×10^{-5}/℃	1.1×10^{-5}/℃	1.1×10^{-5}/℃	1.1×10^{-5}/℃
使用温度 Temperature	-100～+300	-100～+300	-100～+300	-100～+300
硬度 Hardness	HRC≥40	HRC≥50	HRC≥40	HRC≥50
最大承载 Maximum load (Mpa)	150Mpa	200Mpa	150Mpa	200Mpa
最大线速度 Maximum line speed (m/min)	10	10	15	15
润滑剂形式 Lubricant in the form	With film 表面覆盖 Surface coverage	镶嵌于基体 Embedded in the matrix Solid plug embedded		
	0.01-0.03mm			
公差配合 :Mating Housing 装配座孔： H7 Mating shaft 相配轴：e7/f7 Tolerance with: Mating Housing Block assembly hole: H7 Mating shaft axis to match：e7/f7				

轴套示意图 Sleeve diagram



典型油槽形式 Typical tank in the form



FRB-FR PTFE 铜网复合自润滑轴承
FRB-FR PTFE Bronze Mesh with PTFE Layer Bearings

应用特点 Structure

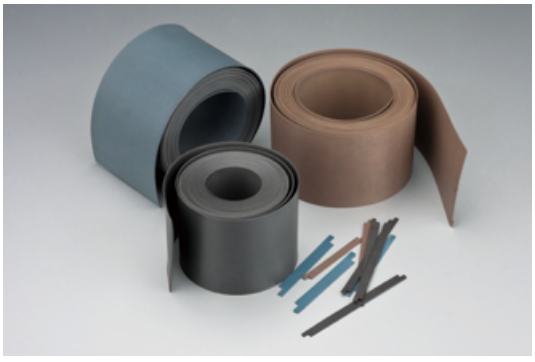
FRB-FR 以金属铜网为基材，表面附着以 PTFE 为主的耐磨材料，这种材料结构使产品的重量更轻，安装更方便。目前被广泛运用于化工行业、食品工业、阀门控制机构、办公事物机械、纺织机械、汽车门窗铰链等轻载低速但需要自润滑的场合。

FRB-FR consists of a bronze mesh shell, laminated with compounded PTFE tape. This material structure enables the final parts to be lighter and easier for installation. It is widely used in chemical industries, medical industries, food industries, textile machines, OA machines, and door/window hinges etc.

技术数据 Tech. Data					
最大承载 Max. load	静承载 Static	80N/mm^2	摩擦系数 Friction coefficient		0.03~0.20
	低速运转 Dynamic	40N/mm^2	最大线速度 Max. speed	干摩擦 Dry	1m/s
				流体润滑 Oil	>1m/s
使用温度 Temp. limit		-195℃ ~+260℃			

标准公差 Available
标准壁厚公差：0.48 ±0.02mm, 尺寸可以按照图纸加工。 Standard wall thickness: 0.48 ± 0.02mm, dimensions could be supplied against customer designation.

FRB-FD 四氟软带
FRB-FD Soft Strip



应用特点 Structure

该产品是以聚四氟乙烯为主要原料，填充铜粉等耐磨材料，经模具压制烧结而成，具有良好的耐磨性，摩擦系数低，在有润滑油和无油润滑条件下都能正常使用。产品被广泛应用于汽车减震器，汽车活塞环。

FD Copper PTFE soft strip as main material is made of filling copper powder and wear resistance material pressing and agglomeration, it has low wear resistance and low friction, it can work with or without oil. The products have been widely used in automobile shake absorber and piston rings.

技术数据 Tech. Data		
最大承载 Max. load	静承载 Static	80N/mm^2
	动载 Dynamic load	40N/mm^2
最高线速度 V Max Sliding Speed		1.5m/s
抗拉强度 Tensile Strength		18N/mm^2
延伸率 Extension Rate		100%
摩擦系数μ Friction coefficient		≤0.25m/s
使用温度 Working temperature		-100℃ ~ +250℃
线胀系数 Coefficient of thermal expansion		8×10^{-5}/K

FRB-SNF 粉末冶金轴承
FRB-SNF Powder Sintered Bearings

应用特点 Structure

粉末冶金轴承作为一种经济而理想的自润滑轴承被广泛用于无法加油、高载高速、耐腐蚀等场合，如汽机车行业、办公机械、电动工具等。

The base material for sintered parts such as sliding bearings or other formed parts are iron, bronze, iron with bronze and other metal in powder form. This powder is formed under high pressure in dies into a temperature which is just below the melting point. According to the work condition, the bearings can impregnate with different oil or solid lubricants for the self-lubricating. Sintered selflubricating bearings are the ideal and economical solution for applications where lubrication is difficult or lubrication could not be applied.

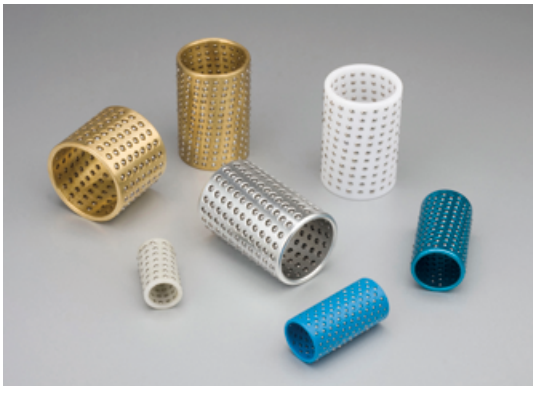
基材特征 Features

◇铜基粉末冶金轴承
◇铜基含 MoS2 粉末冶金轴承
◇铜铁合金粉末冶金轴承
◇铁基粉末冶金轴承
◇其它特殊基材粉末冶金轴承

◇ Good wear resistance with lower friction
◇ Lower the material cost for large production
◇ Can be machined again after installation if possible
◇ Lower maintenance requirement
◇ High speed with lower noise
◇ Different structures could be available against special

可供形式 Available in the form	公差 Tolerance
直套、翻边、止推垫片及其它非标品部件等 Straight sets, flange, thrust washers, and other non-standard parts and other products	标准外径公差为 r7, 内径公差为 F7 Standard outside diameter tolerance for r7, diameter tolerance F7

FRB60(FZ) 系列钢球保持架
FRB60(FZ) Ball Retainer



装配要求

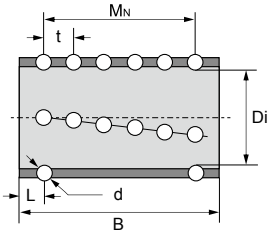
1、导套
材料 GCR15、YB9 热处理，硬度 HRC62-66，表面粗糙为 0.05
2、轴
材料处理 GCR15，YB9，热处理，硬度 HRC62-66，表面粗糙为 0.05
3、装配尺寸
Dmax+2d-Dmin=0.01～0.02mm

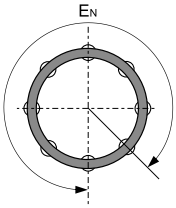
优点与用途

传统的具有相对运动的孔与轴是有一定间隙的，并孔与轴之间的运动磨擦系数较大，使用钢球保持架后，使轴与孔不直接接触，而是中间通过由微量盈的钢球，因而运动精度高，滚动磨擦代替了滑动磨擦，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，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，而钢球保持架，则上述二个条件均能满足，目前已广泛应用于冷冲模架，高精度机床，机床附件，数控磨床，机床尾架，独立导柱，纺织机械以及要求高精度轴向径相同时运动场合。

Having relative motion of the hole and shaft there is a certain gap, and the motion between the bore and the shaft friction coefficient is large, using a ball retainer, so that the shaft and the hole does not directly contact, but rather through the middle by the trace Yingof the ball, and thus movement of high precision, rolling friction instead of sliding friction, rolling flexible, low coefficient of friction, long service life in both rotating and moving occasion, with no oil or fuel sleeve and the shaft to matchAlthough able to meet, but the motion accuracy, with rolling bearings, can only meet the axis of relative rotation of the occasion, and the steel ball cage, can meet the above two conditions, has been widely used in Die frame, high-precision machine tools,machine tool accessories, CNC grinding machine tailstock, independent guide column, textile machinery and require high-precision axial diameter of the same sports occasions.

FRB60(FZ) 系列钢球保持架
FRB60(FZ) Ball Retainer





单位unit:mm

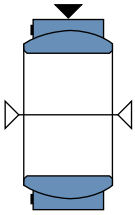
代号 No.	轴径 Di	长度 B	钢球直径 d	导分数 En	钢球数量 Mn	钢球数 Number of steel balls	钢球间距 T	钢球边距 L
FRB-1950T60	19	50	3	12	8	96	5.5	5.75
FRB-1960T60		60			10	120		5.25
FRB-2050T60	20	50			8	96		5.75
FRB-2060T60		60			10	120		5.25
FRB-2250T60	22	50		14	8	112		5.75
FRB-2260T60		60			10	140		5.25
FRB-2360T60	23	60			10	208		5.25
FRB-2475T60	24	75		16	13	128		4.50
FRB-2550T60	25	50			8	112		5.75
FRB-2560T60		60			10	160		5.25
FRB-2575T60		75			13	208		4.50
FRB-2775T60	27	75			13	208		4.50
FRB-2860T60	28	60	4	14	8	112	6.5	7.25
FRB-2875T60		75			11	154		5.00
FRB-3060T60	30	60			8	112		7.25
FRB-3075T60		75			11	154		5.00
FRB-3260T60	32	60		16	8	128		7.25
FRB-3275T60		75			11	192		5.00
FRB-3390T60		90			13	208		6.00
FRB-3685T60	36	85			12	192		6.75
FRB-3690T60		90	5		13	208	8.0	6.00
FRB-3870T60	38	70			8	128		7.00
FRB-3890T60		90			11	176		5.00
FRB-4090T60	40	90			11	176		5.00
FRB-4590T60	45	90		18	11	198		5.00
FRB-45110T60		110			13	234		7.00
FRB-5090T60	50	90		20	11	220		5.00
FRB-50110T60		110			13	260		7.00
FRB-6090T60	60	90		22	11	242		5.00
FRB-60110T60		110			13	286		7.00
FRB-80130T60	80	130		28	15	420		9.00

关节轴承类型的选择
The choice of bearing type joints

选择合适的轴承类型（径向轴承、角接触轴承或推力轴承）是由作用于轴承的负荷方向决定的，而选择合适的滑动接触面组合则主要取决于负荷的作用方式（恒定负荷或变动负荷）。

Select the appropriate bearing type (radial bearings, angular contact bearings or thrust bearings) is the load acting on the bearing direction of the decision, and select the appropriate combination of the sliding contact surface depends mainly on the mode of action of the load (constant load or variable load .)

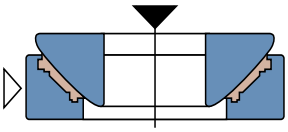
径向负荷　Radial load



选择合适的轴承类型（径向轴承、角接触轴承或推力轴承）是由作用于轴承的负荷方向决定的，而选择合适的滑动接触面组合则主要取决于负荷的作用方式（恒定负荷或变动负荷）。

When the load is mainly pure radial load or radial load, radial spherical plain bearings should be selected, in addition to radial loads, the type of bearing can withstand a certain degree of axial load.

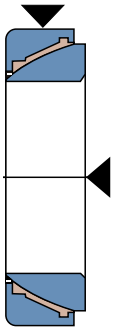
轴向负荷　Axial load



当负荷是纯轴向负荷或主要是轴向负荷时，应选择球面滑动推力轴承，除轴向负荷外，此类轴承还能承受一定的径向负荷。

When the load is mainly a pure axial load or axial load, spherical plain thrust bearings should be selected, in addition to axial load, the type of radial bearing can withstand a certain load.

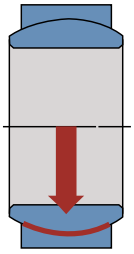
联合负荷　Joint load



当负荷由大小几乎相等的径向和轴向分力组成时，应选择角接触球面滑动轴承，此类轴承只能承受来自一个方向的轴向负荷，一般要靠第二个轴承的调节，承受来自相反方向的轴向负荷。对于轴向负荷分力小于径向负荷的联合负荷，可以使用径向轴承和另一个推力轴承，为了使该推力轴承仅承受轴向负荷，安装时轴承座中必须留有径向自由空间。

When the load is almost equal to the size of the radial and axial thrust component should be selected angular contact spherical plain bearings, these bearings can only bear axial loads from one direction, generally rely on the second bearing adjustment, withstand the axial load from the opposite direction. Contribute less than the axial load for radial load of the joint load, you can use another radial bearings and thrust bearings, thrust bearings in order so that the axial load only, the installation must be left when the radial bearing free space.

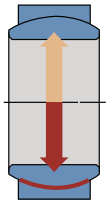
恒定负荷　Constant load



如负荷的作用方向始终不变，滑动接触面在动态条件下有较大的相对运动，那么免维护轴承就是最佳选择。 但是，如轻微摆动运动很少发生（准静态条件），或在轴承发生不常见的摆动运动时会承受很重的负荷并会发生冲击负荷，则应使用钢对钢轴承。

Such as the role of the load direction remains unchanged, sliding contact surfaces under dynamic conditions have a greater relative motion, then the maintenance-free bearings is the best choice. However, if a slight swinging motion rare (quasi-static conditions), or unusual occurrence in the swing bearing exercise will bear a heavy load and shock loading occurs, you should use a steel on steel bearings.

变动负荷　Changes in load



如负荷会改变方向，则采用钢对钢轴承更合适。免维护轴承仅具有有限的适用范围。

If the load will change direction, then the use of steel on steel bearing more appropriate. Maintenance-free bearings with only limited scope.

润滑型　Lubricated

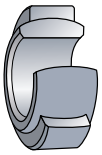
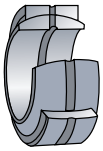
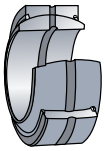
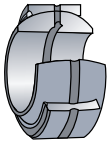
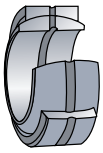
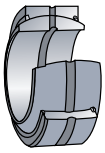
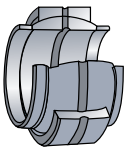
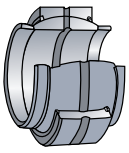
一般滑动摩擦副为钢对钢，内外圈有润滑油槽和油孔，轴承在工作时需要定期补充润滑剂。此类滑动表面具有很高的耐磨性，特别适合必须承受变动重负荷、冲击负荷或重静荷的工况条件。 内圈两侧带有柱体延伸段的轴承可用于取代在轴承两侧设置常规隔离套筒的轴承配置，或专用于液压缸特殊设计的轴承配置。

General sliding friction of steel on steel, inside and outside the ring with lubrication groove and hole, bearing a regular basis at work to add lubricant. Such sliding surface with high wear resistance, especially suitable to withstand the heavy change, shock loads or heavy static load operating conditions. Extension of the inner cylinder with a bearing on both sides can be used to replace conventional isolation bearings set on both sides of the bearing sleeve, or dedicated to a specially designed hydraulic cylinders bearing configuration.

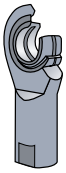
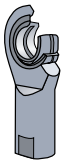
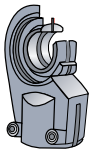
关节轴承类型的选择
The choice of bearing type joints

FANRONG
www.jsfrzc.com

典型的润滑型向心关节轴承 Typical lubricating type spherical plain bearings

			
GE..E	GE..ES	GE..ES-2RS	GEG..ES-2RS
			
GEZ..ES	GEZ..ES-2RS	GE..LO	GEM..HO-2RS

典型的润滑型杆端关节轴承 Typical lubricating rod end type

			
SI..E	SI..ES	SI..ES-2RS	GIHR-K..DO
			
GIHN-K..LO	SA..E	SA..ES/-2RS	GK..DO

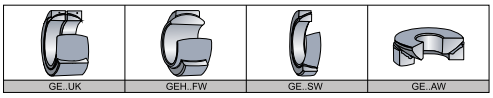
自润滑型 Self-lubricating type

采用摩擦系数很低的自润滑轴承材料作为滑动摩擦副，在运行中无需维护。适用于下列应用场合：要求轴承具有很长的使用寿命而无需进行维护，或工作条件（如润滑不足或完全无润滑）不允许使用钢对钢的轴承，自润滑型轴承主要用于恒定重荷的场合，但此类轴承吸收变动负荷的能力有限。
The use of self-lubricating low friction coefficient as sliding friction bearing materials, in operation without maintenance. Applies to the following applications: requirements bearings have a long life without maintenance, or working conditions (such as lack of lubrication or completely without lubrication) does not allow the use of steel on steel bearings, self-lubricating bearing is mainly used for constant heavy load of occasions, but such changes in load bearing capacity of absorption is limited.

通用的摩擦副材料包括 Friction material includes general

摩擦副材料 Friction Materials	结构特点 Structural features	性能 Performance	适用场合 For occasions
钢 / 铜网 +PTFE 自润滑材料 Steel / copper net + PTFE self-lubricating materials	外圈内表面粘贴 PTFE 铜网复合材料，内圈轴承钢热处理表面镀硬铬 Outer circle surface of the copper mesh PTFE composite paste, heat treatment of steel inner bearing surface hard chromium plating	自润滑特性，静承载和动承载能力高，摩擦系数低 Self-lubricating properties, static and dynamic load carrying capacity is high, low coefficient of friction	无法加油或难以形成油膜的部位 Can not form a film of oil or difficult parts of
钢 /PTFE 纤维织布自润滑材料 Steel / PTFE fiber woven self-lubricating materials	外圈内表面粘贴 PTFE 纤维织物复合材料，内圈轴承钢热处理表面镀硬铬 Outer circle surface of the PTFE fabric composite paste, heat treatment of steel inner bearing surface hard chromium plating	自润滑特性，承载能力高摩擦系数低，耐磨性能优越 Self-lubricating properties, low coefficient of friction high load capacity, excellent abrasion resistance	适合更高的 PV 值和使用寿命长的要求 For higher PV value and long life requirements
钢 / 铜合金含固体润滑剂 Steel / copper alloy with solid lubricants	外圈钢基热处理，内圈为高强度铜合金并镶嵌固体润滑剂 Outer steel substrate heat treatment, the inner ring of high-strength copper alloys and solid lubricants inlaid	自润滑特性，承载能力强，耐磨性能好 Self-lubricating properties, high load capacity, good wear resistance	适用于水工等需要耐腐蚀的工况 Such as the need for corrosion-resistant hydraulic conditions

典型的自润滑型向心关节轴承
A typical self-lubricating type spherical plain bearings



典型的自润滑型向心关节轴承
A typical self-lubricating type spherical plain bearings

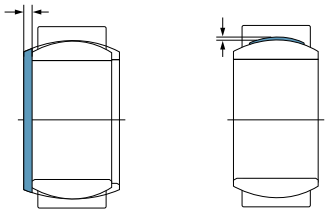
工作温度 Operating Temperature

选择轴承类型时，必须考虑工作温度对轴承材料的影响特别是对滑动层材料的影响。对于一般的关节轴承均可在 -30℃ ~+120℃范围内使用，超过此温度时其负荷能力会降低。对于带密封圈的关节轴承其容许温度还受到密封圈材料的限制。
Choose the type of bearing must be considered when the operating temperature on bearing material impact particularly on the impact of the sliding layer material. Bearing joints in general can be found in -30 ℃ ~ +120 ℃ range, over this temperature will reduce its load capacity. For the joint with a seal bearing its seal to allow the temperature but also by material constraints.

关节轴承的尺寸公差 Joint bearings Tolerance

此公差适用于非对开式或非开裂式的未经处理的套圈，表面经过处理的套圈的公差可能与标准值略有差异。 开裂式或对开式外圈自由状态下可能稍有失圆，但是一旦轴承压入座孔后，外圈本来的圆度即可恢复，此类外圈在安装前不对尺寸进行测量。
This tolerance applies to non-off or non-cracking style of untreated rings, the rings of the surface treated with the standard values of tolerance may be slightly different. Cracking off the outer ring type or the free state may be a little lost round, but once the pressure bearing seat hole, the original roundness of the outer ring can be restored, not before installation of such outer dimensions measured.

关节轴承的径向游隙 Joint bearing radial clearance



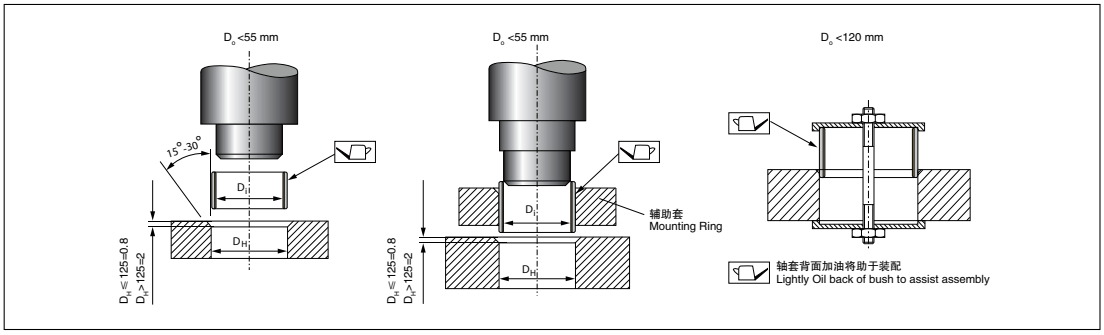
轴向内部游隙
axial internal clearance

径向内部游隙
radial internal clearance

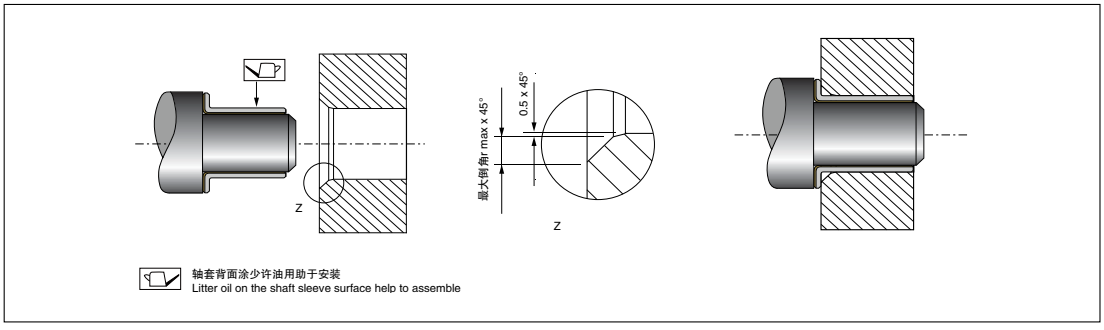
内部游隙是指在规定的负荷下测量，一个轴承套圈相对于另一套圈从一个极限位置移动到另一极限位置的径向距离（径向内部游隙）或轴向距离（轴向内部游隙），未安装轴承的游隙一般大于已安装轴承的游隙（工作游隙）。标准内部游隙是指在正常工作条件下，轴承采用推荐的配合方式所得到的内部工作游隙。
Internal clearance is measured under the specified load, a bearing ring relative to the other ring from one extreme position to another extreme position of the radial distance (radial internal clearance) or axial distance (axial internal clearance), install the bearing clearance is not generally greater than the installed bearing clearance (clearance work). Standard internal clearance refers to the normal operating conditions, bearing with the recommended way to get the internal work of the clearance.

卷制类轴承的安装
Wrapped Bushing Installation

直套安装 Straight set of installation



翻边套安装 Flange set of installation

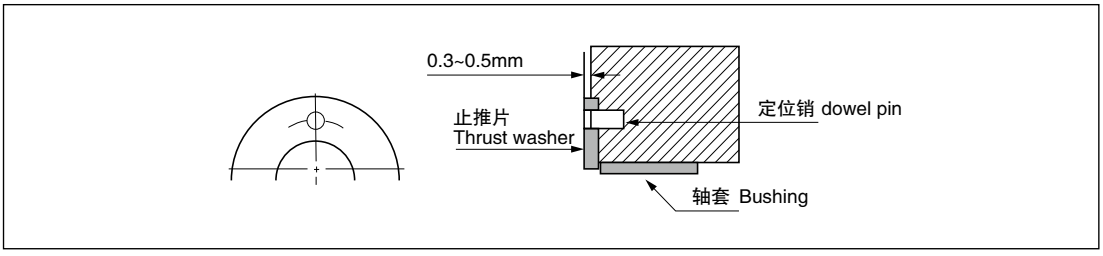


垫片和滑板的安装 Thrust washers and sliding plates installation

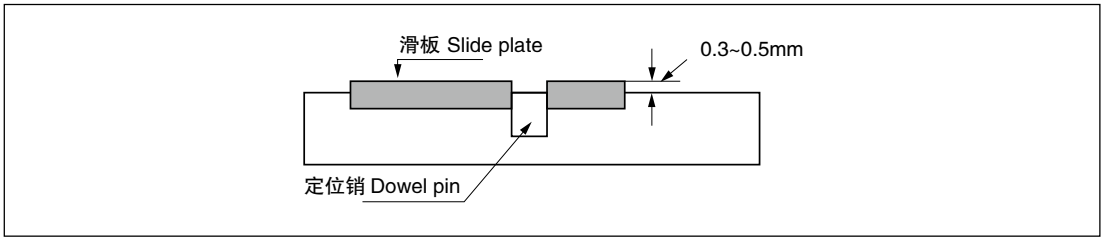
建议垫片和滑板安装在凹陷的座孔内， 为了避免移动，同时建议采用定位销加以固定。

It is reconmmended 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 waher)



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



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