

沃科为全球工业提供优质的零部件  
Voke for global industry to provide quality parts



嘉善沃科汽车部件有限公司  
JIASHAN VOKE AUTO PARTS CO., LTD.

## SF-1 自润滑多层复合轴承



## JIASHAN VOKE AUTO PARTS



# COMPANY PROFILE

## 公司简介

嘉善沃科汽车部件有限公司是一家研究和生产各种自润滑轴承、无油轴承、滑动轴承等系列产品的专业厂家。公司拥有专业化的团队，先进齐全的设备，科学完善的管理，产品销售遍布全球各地，深受广大国内外客户的信任与好评。

公司主要产品有：JDB系列自润滑轴承、SF系列无油轴承、JF系列双金属滑动轴承、FB系列单金属滑动轴承、FZ系列钢球保持架、垫片、滑板、轴瓦等十多种系列，上万种规格。产品质量与性能均已达到国内领先水平，广泛配套于各种机械设备的转动和滑动部位。

我们不断致力于新产品和新领域的开发和推广，为客户提供有价值的产品，用心打造完美的品质，更好的回报客户。我们始终本着：以信为本、以质取胜、开拓创新、做强做大的宗旨目标，欢迎广大客户莅临我公司参观指导，一起携手共创美好未来！

JIASHAN VOKE AUTO PARTS CO., LTD., specializes in research and production of a variety of self-lubricating bearings, oil-free bearings, sliding bearings. The company has professional teams, advanced equipments, scientific management. Products are sold throughout the world and popular by the domestic and overseas customers.

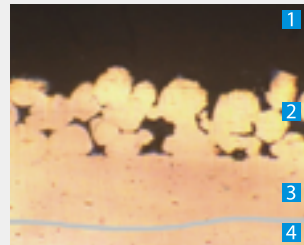
Main products are: JDB series self-lubricating bearings, SF, oil-free bearings, JF series bimetal sliding bearing, FB series single metal sliding bearings, FZ series steel ball cage, gaskets, skateboard, bearings, dozens of series, thousands of specifications. Products have taken lead in quality and performance domestically and widely used as a complete set of rotating and sliding parts in all kinds of mechanical equipments.

We are constantly committed to new products and new areas of development and promotion, to provide customers with valuable products, build perfect quality attentively, high returns. We are always in line with faith, quality, innovation, and pursue a big goals, welcome customers to visit our company for guidance, to join hands in creating a better future together!

## SF-1 自润滑多层复合轴承

## SF-1 Self-Lubricated Multilayer Compound Bearing

## 金相图片 Metallography



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

注：图中产品还可根据不同工况条件选择不同的基板材料，如：青铜基板（SF-1B）、不锈钢基板（SF-1S）、以及无铅（SF-1W）等配方产品。（详见 P07-08）

Note: Various materials are suitable for SF-1 Series products according to different working conditions, such as bronze backing (SF-1B), stainless steel backing (SF-1S) and lead-free material (SF-1W). (Detailed see P07-08)

## 结构特性 Structure Characteristics

金属复合自润滑材料以优质低碳钢为基板，中间烧结球形多孔铜粉层，表面轧制以 PTFE 为主的耐磨润滑材料作为轴承工作层，这种材料具有优异的机械承载能力，中间铜粉层不但可以及时传递轴承运行过程中产生的热量，同时也提高了塑料层与基板的结合强度。PTFE 设计适用于完全干摩擦状态，并根据润滑情况、摩擦系数和耐久性要求开发了多种材料。BKL 的 PTFE 金属复合材料在外部润滑或者不润滑的情况下，都能在最广泛的载荷、速度以及温度范围内提供最好的表现。

Metal-polymer self-lubricating composite materials consist of metal backing sintered porous bronze with PTFE polymer as working layer. The metal backing provides mechanical strength, while the bronze sintered layer provides a strong mechanical bonding between the backing and the bearing lining, the PTFE polymer offers exceptional low friction even under dry condition and the thermoplastic polymer is generally designed to operate with marginal lubrication. The construction promotes dimensional stability and improves the thermal conductivity. This material meets the demands for longevity, speed and temperature criteria with or without lubrication.

## 产品应用 Application

农业机械：拖拉机、联合收割机、农作物喷雾器、推土机、平地机等；  
汽车行业：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，球阀、蝶阀，气缸、油缸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、森林机械和各类工程机械设备。

Agricultural machinery: tractors, combine harvesters, crop sprayers, bulldozers, graders, etc.

Automotive industry: power steering pump, steering gear thrust washers, disc brakes, shock absorbers, hinges, wiper, chair recliners, air valves and solenoid valves, etc.;

Business machines: duplicator, fax machine, automatic printing devices, mail processing machinery...

Hydraulics and valves: pumps including gear, rotary, water, axial piston, and other types, ball, butterfly, poppet steam, and other valves and valve trunnions...



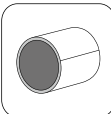
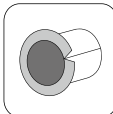
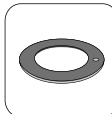
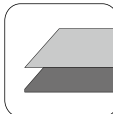
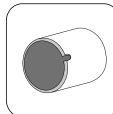
Home appliances: tape recorders, refrigerators, air conditioners, cleaners, polishers, sewing machines, ovens, dishwashers, clothes washing machines...

And materials handling, marine engine, packaging, textile equipment, tools...etc.

## SF-1 自润滑多层复合轴承

## SF-1 Self-Lubricated Multilayer Compound Bearing




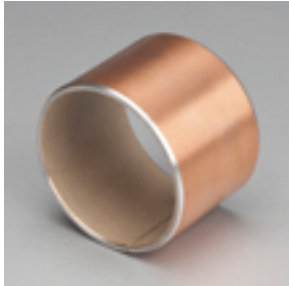
实际运用中根据使用环境、工况和环保要求的不同，低碳钢板可以改为铜板或不锈钢板，内表面塑料层可以选择 PTFE 含铅或者不含铅材料以及其他高分子填充物，外表可以镀锡或者镀铜。产品范围包括：SF-1、SF-1T、SF-1S、SF-1B、SF-1W、SF-1P。

有关数据 Date	代号 Grade	SF-1	SF-1T
	材料 Material	碳钢/Steel+铜粉/Bronze +(PTFE+Pb+填料/Filler)	碳钢/Steel+铜粉/Bronze +(PTFE+Pb+填料/Filler)
除了目录中显示的标准产品外，还可以提供非标产品或根据客户要求订购。 We can also develop according to customers special request while out of this table			
	 直套 Straight Sets  翻边 Flange  止推垫片 Thrust Pads  滑板 Skateboards  非标产品定制 Custom-made Special Products		
主要运用领域 Typical application		产品应用于印刷机械、纺织机械、烟草机械、健身器等。 Application: the printing, woven, tobacco and gymnastic machinery, etc.	产品主要应用于中、高压齿轮油泵、柱塞泵、叶片泵等。 Application: medium, high-pressure gear pump, ram pump, vane pumps, etc.
最大承载压力P Load capacity P (Dry friction) (干摩擦)	静载 N/mm <sup>2</sup> Static load	250	250
	动载 N/mm <sup>2</sup> Dynamic load	140	140
	摇摆 N/mm <sup>2</sup> Oscillation Load	60	60
最大线速度V Max line speed V	干摩擦 m/s Dry friction	2.5	2.5
	油润滑 m/s Oil lubrication	> 5	> 5
最高PV值 PV value limit	干摩擦 N/mm <sup>2</sup> ·m/s Dry friction	1.8	1.0
	油润滑 N/mm <sup>2</sup> ·m/s Oil lubrication	3.6	10
摩擦系数u Friction coef u	干摩擦 Dry friction	0.08~0.20	0.08~0.25
	油润滑 Oil lubrication	0.02~0.12	0.02~0.08
相配轴径 Mating shaft	硬度 HB Hardness	> 220	> 220
	粗糙度 Ra Roughness	0.4~1.25	0.4~1.25
工作温度 °C Working temperature		-200~+280	-200~+280
导热系数 W/mk Thermal conductivity		40	40
线膨胀系数 (轴向) Coefficient of linear expansion		11 × 10 <sup>-6</sup> /K	11 × 10 <sup>-6</sup> /K
外表面镀层 Outside surface Plating		铜或锡 copper/tin	铜或锡 copper/tin

SF-1 自润滑多层复合轴承

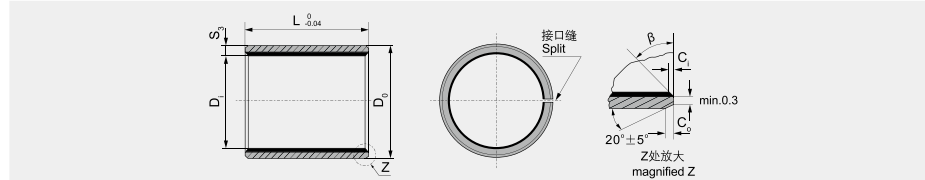
SF-1 Self-Lubricated Multilayer Compound Bearing

According to the different working conditions and environmental protection, there are steel backing, bronze backing, stainless steel backing can be chosen, different type of alloy can be chosen, the PTFE layer with polymer filler and it is lead free, the Surface tin or copper plating. product range includes SF-1、SF-1T、SF-1S、SF-1B、SF-1W、SF-1P.

	SF-1S	SF-1B	SF-1W	SF-1P
	不锈钢/Stainless+铜粉/ Bronze+(PTFE+Pb+填料/Filler)	铜板/Bronze+铜粉/ Bronze+(PTFE+Pb+填料/Filler)	碳钢/Steel+铜粉/Bronze +(PTFE+填料/Filler)	碳钢/Steel+铜粉/Bronze +(PTFE+填料/Filler)
				
	产品适用于印染机械、海洋工业耐 腐蚀部位等。 Application: the corrosion resistant part in dyeing machinery and ocean industry, etc.	产品应用于冶金机械、连铸机械、 水泥机械等。 Application: metallurgical industry, continuous casting and rolling mill, concrete machinery and spiral conveyers, etc.	产品主要应用于中、高压齿轮油 泵、柱塞泵、叶片泵等。 Application: medium, high-pressure gear pump, ram pump, vane pumps, etc.	该产品主要用于汽车减震器、摩托车 减震器、液压油缸等。 Application: shock absorber of automobiles, motorcycles and pneumatic cylinder. etc
	250	250	250	250
	140	140	140	140
	60	60	60	60
	2.5	2.5	2.5	2
	>5	>5	>5	>5
	1.8	1.8	1.0	1.8
	3.6	3.6	10	3.6
	0.08~0.20	0.08~0.20	0.08~0.25	0.08~0.20
	0.02~0.12	0.02~0.12	0.02~0.08	0.02~0.08
	> 220	> 220	> 220	> 220
	0.4~1.25	0.4~1.25	0.4~1.25	0.4~1.25
	-200~+280	-200~+280	-200~+280	-200~+280
	40	60	40	40
	$11 \times 10^{-6}/K$	$18 \times 10^{-6}/K$	$11 \times 10^{-6}/K$	$11 \times 10^{-6}/K$
	无/No	无/No	铜或锡 copper/tin	铜或锡 copper/tin

## SF-1 自润滑多层复合轴承规格及公差

## SF-1 Self-Lubricated Multilayer Compound Bearing Specification & Tolerance



内外倒角 ID and OD chamfers

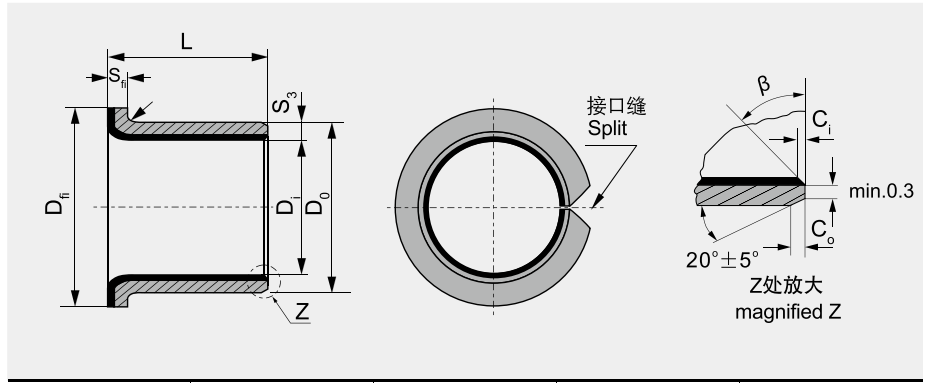
S <sub>3</sub>	C <sub>o</sub>	C <sub>i</sub>	β	S <sub>3</sub>	C <sub>o</sub>	C <sub>i</sub>	β
0.75	0.5 ± 0.3	0.25 ± 0.2	30° ± 5°	2.00	1.2 ± 0.4	0.50 ± 0.3	30° ± 5°
1.00	0.6 ± 0.3	0.30 ± 0.2	30° ± 5°	2.50	1.8 ± 0.6	0.60 ± 0.3	45° ± 5°
1.50	0.7 ± 0.3	0.50 ± 0.3	30° ± 5°				

单位Unit: mm

轴径(7) Shaft D <sub>s</sub>	座孔(H7) Housing D <sub>H</sub>	(OD) 外径公差 Tolerance D <sub>o</sub>	(ID)压装后 内孔公差 After fixed D <sub>i</sub>	配合间隙 Clearance D <sub>D</sub>	壁厚 Wall thick-ness S <sub>3</sub>	长度L <sup>0</sup> ( d ≤ Φ 28 L-0.30 -0.40 d > Φ 30 L-0.40 )																	
						10	12	15	20	25	30	40	50	60	70	80	100	115					
15	-0.016 -0.034	17	+0.018	17	+0.065 +0.030	15.058 14.990	0.092		1510	1512	1515	1520	1525										
16	-0.016 -0.034	18	+0.018	18	+0.065 +0.030	16.058 15.990	0.006	1.005	1610	1612	1615	1620	1625										
17	-0.016 -0.034	19	+0.021	19	+0.075 +0.035	17.061 16.990	0.095	0.980	1710	1712	1715	1720	1725										
18	-0.016 -0.034	20	+0.021	20	+0.075 +0.035	18.061 17.990	0.006		1810	1812	1815	1820	1825										
20	-0.020 -0.041	23	+0.021	23	+0.075 +0.035	20.071 19.990			2010	2012	2015	2020	2025	2030									
22	-0.020 -0.041	25	+0.021	25	+0.075 +0.035	22.071 21.990	0.112	1.505	2210	2212	2215	2220	2225	2230									
24	-0.020 -0.041	27	+0.021	27	+0.075 +0.035	24.071 23.990	0.010	1.475	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			2812	2815	2820	2825	2830	2840	2850							
30	-0.020 -0.041	34	+0.025	34	+0.085 +0.045	30.085 29.990	0.010			3012	3015	3020	3025	3030	3040	3050							
32	-0.025 -0.050	36	+0.025	36	+0.085 +0.045	32.085 31.990		2.005		3212	3215	3220	3225	3230	3240	3250							
35	-0.025 -0.050	39	+0.025	39	+0.085 +0.045	35.085 34.990	0.135	1.970		3512	3515	3520	3525	3530	3540	3550							
38	-0.025 -0.050	42	+0.025	42	+0.085 +0.045	38.085 37.990	0.015			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							
45	-0.050 -0.025	50	+0.025	50	+0.085 +0.045	45.105 44.990	0.155					4520	4525	4530	4540	4550							
50	-0.050 -0.025	55	+0.030	55	+0.100 +0.055	50.110 49.990	0.160					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		2.505						6030	6040	6050	6060	6070					
65	-0.060 -0.030	70	+0.030	70	+0.100 +0.055	65.110 64.990	0.170	2.460						6530	6540	6550	6560	6570					
70	-0.060 -0.030	75	+0.030	75	+0.100 +0.055	70.110 69.990	0.020							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								8040	8050	8060	8070	8080	80100			
85	-0.054	90	+0.035	90	+0.120 +0.070	85.155 85.020	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	0.209	2.490								9550	9560	9570	9580	95100			
100	-0.054	105	+0.035	105	+0.120 +0.070	100.155 100.020	0.020	2.440								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										12060	12070	12080	120100	120115		
125	-0.063	130	+0.040	130	+0.170 +0.100	125.210 125.070	0.070										12560	12570	12580	125100	125115		
130	-0.063	135	+0.040	135	+0.170 +0.100	130.210 130.070		2.465									13060	13070	13080	130100	130115		
140	-0.063	145	+0.040	145	+0.170 +0.100	140.210 140.070	0.273	2.415									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										18060	18070	18080	180100			
190	-0.072	195	+0.046	195	+0.210 +0.130	190.216 190.070	0.070	2.465									19060	19070	19080	190100			
200	-0.072	205	+0.046	205	+0.210 +0.130	200.016 200.070	0.070	2.415									20060	20070	20080	200100			

SF-1F 自润滑翻边轴承规格及公差

SF-1F Self-Lubricated Flange Bearing Specification & Tolerance



S <sub>3</sub>	1.0	1.5	2.0	2.5
r	1 <sup>-0.5</sup>	1 ± 0.5	1.5 ± 0.5	2 ± 0.5

单位Unit: mm

轴径(f7) Shaft D <sub>s</sub>	座孔(H7) Housing D <sub>H</sub>	(OD) 外径公差 Tolerance D <sub>O</sub>	(ID)压装后 内孔公差 After fixed D <sub>ia</sub>	配合间隙 Clearance C <sub>O</sub>	Designation 型号规格	Wall thickness 壁厚 S <sub>3</sub>	尺寸 Dimension				
							D <sub>i</sub>	D <sub>O</sub>	D <sub>i</sub> ± 0.5	L ± 0.25	S <sub>i</sub> -0.2
6 -0.013 -0.028	8 +0.015	8 +0.055 +0.025	6.055 5.990	0.077 0.000	SF-1F06040	1.005 0.980	6	8	12	4	1
					SF-1F06070					7	
8 -0.013 -0.028	10 +0.015	10 +0.055 +0.025	8.055 7.990	0.083 0.003	SF-1F08055	1.005 0.980	8	10	15	5.5	1
					SF-1F08075					7.5	
10 -0.016 -0.034	12 +0.018	12 +0.055 +0.025	10.058 9.990	0.086 0.003	SF-1F10070	1.005 0.980	10	12	18	7	1
					SF-1F10090					9	
					SF-1F10120					12	
					SF-1F12070					7	
12 -0.016 -0.034	14 +0.018	14 +0.065 +0.030	12.058 11.990	0.092 0.006	SF-1F12090	1.005 0.980	12	14	20	9	1
					SF-1F12120					12	
					SF-1F14120					12	
					SF-1F14170					17	
14 -0.016 -0.034	16 +0.018	16 +0.065 +0.030	14.058 13.990	0.092 0.006	SF-1F15090	1.005 0.980	14	16	22	12	1
					SF-1F15170					17	
15 -0.016 -0.034	17 +0.018	17 +0.065 +0.030	15.058 14.990	0.092 0.006	SF-1F15120	1.005 0.980	15	17	23	9	1
					SF-1F15170					17	
16 -0.016 -0.034	18 +0.018	18 +0.065 +0.030	16.058 15.990	0.092 0.006	SF-1F16120	1.005 0.980	16	18	24	12	1
					SF-1F16170					17	
18 -0.016 -0.034	20 +0.021	20 +0.075 +0.035	18.061 17.990	0.095 0.006	SF-1F18120	1.005 0.980	18	20	26	12	1
					SF-1F18170					17	
					SF-1F18200					20	
					SF-1F20115					11.5	
20 -0.020 -0.041	23 +0.021	23 +0.075 +0.035	20.071 19.990	0.112 0.010	SF-1F20165	1.505 1.475	20	23	30	16.5	1.5
					SF-1F20215					21.5	
					SF-1F22150					15	
22 -0.020 -0.041	25 +0.021	25 +0.075 +0.035	22.071 21.990	0.112 0.010	SF-1F22200	1.505 1.475	22	25	32	20	1.5
					SF-1F25115					11.5	
25 -0.020 -0.041	28 +0.021	28 +0.075 +0.035	25.071 24.990	0.112 0.010	SF-1F25165	1.505 1.475	25	28	35	16.5	1.5
					SF-1F25215					21.5	
					SF-1F30160					16	
30 -0.025 -0.050	34 +0.025	34 +0.075 +0.035	30.085 29.990	0.126 0.010	SF-1F30260	2.005 1.970	30	34	42	26	2
					SF-1F35160					16	
35 -0.025 -0.050	39 +0.025	39 +0.085 +0.045	35.085 34.990	0.135 0.015	SF-1F35260	2.005 1.970	35	39	47	26	2
					SF-1F40260					26	
40 -0.025 -0.050	44 +0.025	44 +0.085 +0.045	40.085 39.990	0.135 0.015	SF-1F40400	2.005 1.970	40	44	53	40	2
					SF-1F40400					40	







嘉善沃科汽车部件有限公司

地址: 浙江省嘉善县干窑镇窑兴路102号一楼

电话: 0573-84615338

传真: 0573-84615338

网址: [www.zjvoke.com](http://www.zjvoke.com)

邮箱: [info@zjvoke.com](mailto:info@zjvoke.com)

JIASHAN VOKE AUTO PARTS CO., LTD.

Add: No. 102, Yaoxing Road, Ganyao,

Jiashan, Zhejiang, China

Tel: 0573-84615338

Fax: 0573-84615338

Website: [www.zjvoke.com](http://www.zjvoke.com)

E-mail: [info@zjvoke.com](mailto:info@zjvoke.com)

