

SF-1 金属塑料自润滑复合轴承 SF-1 Metal-polymer self-lubricating composite bearings



结构特性 Structure Characteristics

SF-1 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。华承的 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。

SF-1 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 sinter 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 demanding criteria for long life and trouble-free performance 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、矿产机械和森林机械等等。

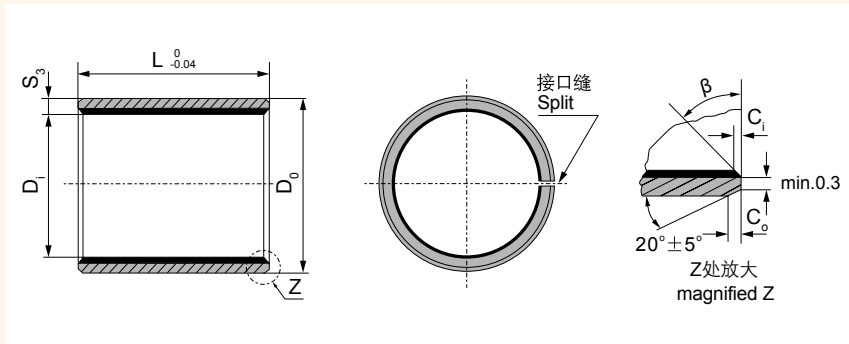
Automotive: tractors, crop sprayers, earthmovers, auto machines, specific uses in power steering cylinders, steering gear thrust washers, disc brakes, shock absorbers, windshield wiper motor...
Business machines: duplicator, fax machine, automatic printing devices, mail processing machinery...
Hydraulics 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.

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-1B、SF-1D、SF-1S、SF-1SS。

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-1B、SF-1D、SF-1S、SF-1SS.

有关数据 Date	代号 Grade	SF-1	SF-1B	SF-1D	SF-1S	SF-1SS
	材料 Material	碳钢/Steel+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+Pb+ 填料/Filler)	不锈钢Stainless+铜粉 /Bronze+(PTFE+Pb+填 料/Filler)	不锈钢Stainless+ (PTFE+Pb+填料/ Filler)喷涂
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.						
最大承载压力 P Load capacity P (干摩擦) (Dry friction)	静载 N/mm ² Static load	250	250	250	250	250
	动载 N/mm ² Dynamic load	140	140	140	140	140
	摇摆 N/mm ² Oscillation Load	60	60	60	60	60
最大线速度V Max line speed V	干摩擦 m/s Dry friction	2.5	2.5	2.5	2.5	2
	油润滑 m/s Oil lubrication	>5	>5	>5	>5	>5
最高PV值 PV value limit (干摩擦) (Dry friction)	干摩擦 N/mm ² ·m/s Dry friction	1.8	1.8	1.8	1.8	1.8
	油润滑 N/mm ² ·m/s Oil lubrication	3.6	3.6	3.6	3.6	3.6
摩擦系数u Friction coef u	干摩擦 Dry friction	0.08~0.20	0.08~0.20	0.08~0.20	0.08~0.20	0.08~0.20
	油润滑 Oil lubrication	0.02~0.12	0.02~0.12	0.02~0.12	0.02~0.12	0.02~0.08
相配轴径 Mating Axis	硬度 HB Hardness	>220	>220	>220	>220	>220
	粗糙度 Ra Roughness	0.4~1.25	0.4~1.25	0.4~1.25	0.4~1.25	0.4~1.25
工作温度 °C Working temperature		-200~+280	-200~+280	-200~+280	-200~+280	-200~+280
导热系数 W/mk Thermal conductivity		40	60	40	40	40
线膨胀系数 (轴向) Coefficient of linear expansion		11 × 10 ⁻⁶ /K	18 × 10 ⁻⁶ /K	11 × 10 ⁻⁶ /K	11 × 10 ⁻⁶ /K	11 × 10 ⁻⁶ /K
表面镀层 Surface Plating		铜或锡 copper/tin	无 /No	铜或锡 copper/tin	无 /No	无 /No
针对性运用领域 Pertinence applicaton		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.	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.	该产品适用于食品饮料机械、化工泵阀、特药机械、印染机械、化工机械、海洋工业滑动部位等。 The product is suitable for food and beverage machinery, chemical pump valve, special medicine machinery, printing and dyeing machinery, chemical machinery, sliding parts of Marine industry, etc.	该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.

SF-1 轴套规格及公差 SF-1 Sleeve Bushing Specification & Tolerance



内外倒角 ID and OD chamfers

S ₃	C ₀	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 ₀	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°

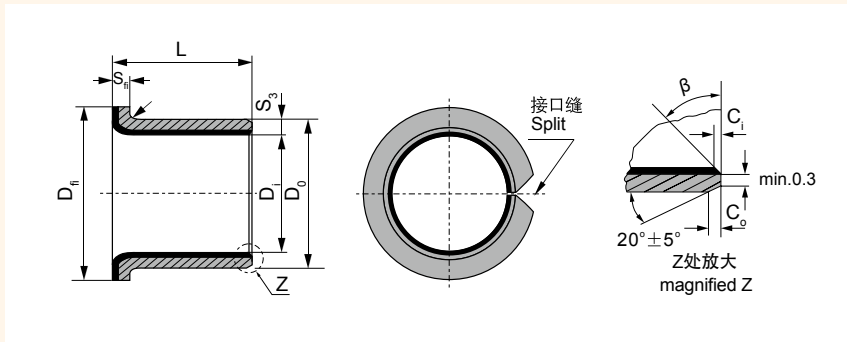
单位Unit: mm

轴径(f7) Shaft D _s	座孔(H7) Housing D _H	(OD) 外径公差 Tolerance D ₀	(ID)压装后 内孔公差 After fixed D _{i,a}	配合间隙 Clearance D _D	壁厚 Wall thick- ness S ₃	长度 L 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				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	0.092 0.006						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																		
22 -0.020 -0.041	25 +0.021	25 +0.075 +0.035	22.071 21.990	0.112 0.010					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						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																		
35 -0.025 -0.050	39 +0.025	39 +0.085 +0.045	35.085 34.990	0.135 0.015						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					

SF-1 轴套规格及公差 SF-1 Sleeve Bushing Specification & Tolerance

轴径(f7) Shaft D _s	座孔(H7) Housing D _H	(OD) 外径公差 Tolerance D _O	(ID)压装后 内孔公差 After fixed D _{ia}	配合间隙 Clearance D _O	壁厚 Wall thick- ness S ₃	长度 L ⁰ _{-0.40} (d≤Φ28 L-0.30 d>Φ30 L-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				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					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					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								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												

SF-1F 翻边轴套规格及公差 SF-1F Flange Bushing Specification & Tolerance

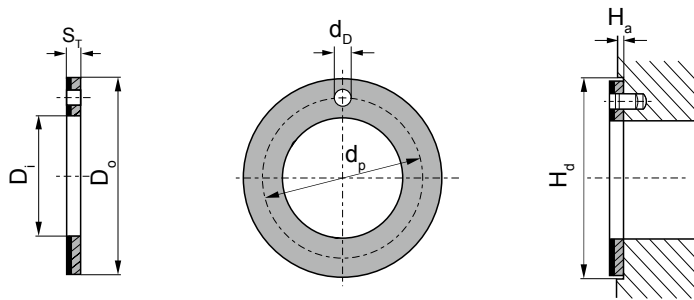


S ₃	1.0	1.5	2.0	2.5
r	1 ^{+0.5}	1±0.5	1.5±0.5	2±0.5

单位Unit: mm

Designation 型号规格	轴径(f7) Shaft D _s	座孔(H7) Housing D _H	(OD) 外径公差 Tolerance D _o	(ID)压装后 内孔公差 After fixed D _{ia}	配合间隙 Clearance C _o	Wall thickness 壁厚 S ₃	尺寸 Dimension				
							D _i	D _o	D _i ±0.5	L±0.25	S _{ii} -0.2
SF-1F06040	6	8	8	6.055	0.077	1.005 0.980	6	8	12	4	1
SF-1F06070										7	
SF-1F08055	8	10	10	8.055	0.083		8	10	15	5.5	
SF-1F08075										7.5	
SF-1F10070	10	12	12	10.058	0.086		10	12	18	7	
SF-1F10090										9	
SF-1F10120										12	
SF-1F12070										7	
SF-1F12090	12	14	14	12.058	0.092		12	14	20	9	
SF-1F12120										12	
SF-1F14120										12	
SF-1F14170										17	
SF-1F15090	15	17	17	15.058	0.006		15	17	23	9	
SF-1F15120										12	
SF-1F15170										17	
SF-1F16120										12	
SF-1F16170	16	18	18	16.058	0.095		16	18	24	12	
SF-1F18120										12	
SF-1F18170										17	
SF-1F18200										20	
SF-1F20115	20	23	23	20.071	0.112	20	23	30	11.5		
SF-1F20165									16.5		
SF-1F20215									21.5		
SF-1F22150									15		
SF-1F22200	22	25	25	22.071	0.1010	22	25	32	20		
SF-1F25115									11.5		
SF-1F25165									16.5		
SF-1F25215									21.5		
SF-1F30160	30	34	34	30.085	0.126	30	34	42	16		
SF-1F30260									26		
SF-1F35160	35	39	39	35.085	0.135	35	39	47	16		
SF-1F35260									26		
SF-1F40260									26		
SF-1F40400									40		

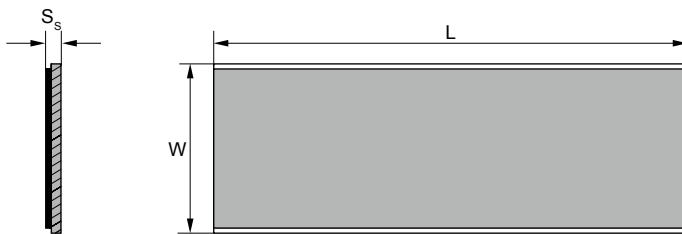
SF-1WC 垫片规格及公差 SF-1WC Thrust Washer Specification & Tolerance



单位Unit: mm

型号规格 Standard No.	轴径 Shaft D_s	垫片尺寸 Washer size				安装尺寸 Assemble size		
		$D_i+0.25$	$D_o-0.25$	$S_T-0.05$	$d_p \pm 0.125$	$d_D^{+0.4}_{+0.1}$	$H_a \pm 0.2$	$H_d + 0.12$
W10	8	10	20	1.5	15	1.5	1	20
W12	10	12	24		18			24
W14	12	14	26		20			26
W16	14	16	30		23	30		
W18	16	18	32		25	32		
W20	18	20	36		28	36		
W22	20	22	38		30	38		
W24	22	24	42		33	42		
W26	24	26	44		35	44		
W28	26	28	48		38	48		
W32	30	32	54	43	54			
W38	36	38	62	50	62			
W42	40	42	66	54	4	1.5	66	
W48	46	48	74	61			74	
W52	50	52	78	65	2	1.5	78	
W62	60	62	90	76			90	

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



单位Unit: mm

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