

SF-2 金属塑料边界润滑轴承

SF-2 Metal-polymer marginal lubricating bearings



结构特性 Structure Characteristics

SF-2 金属复合边界润滑材料以优质低碳钢为基板，中间烧结球形多孔铜粉层，表面轧制以改性聚甲醛(POM)或聚醚醚酮(PEEK)为主的耐磨润滑材料作为轴承工作层，表面规则的油穴不但可以储存油脂，而且可以有效埋没外部入侵的粉尘，提高了轴承的使用寿命。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。以 POM 或 PEEK 为主的表面耐磨材料设计适用于油脂润滑工况，轴承表面有规律地排列着用于储存油脂的油穴以保证润滑剂在整个轴承表面的最佳分布。

SF-2 Metal-polymer marginal lubricating composite materials consist of metal backing sintered porous bronze with POM or PEEK polymer as working layer. Steel backing provides exceptionally high load carrying capacity, excellent heat dissipation. Sintered bronze powder provides thermal conductivity away from the bearing surface, also serves as a reservoir for the resin mixture. And the POM or PEEK polymer layer 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.

产品应用 Application

产品广泛应用于：

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: Pedal assembly, Balance shaft sleeve, Steering king pin shaft sleeve...

Logistics machine: carrier, chain block, Car crane, packaging machine....And hydraulic motor,Hydraulic cylinders, pneumatic element, agricultural machine...

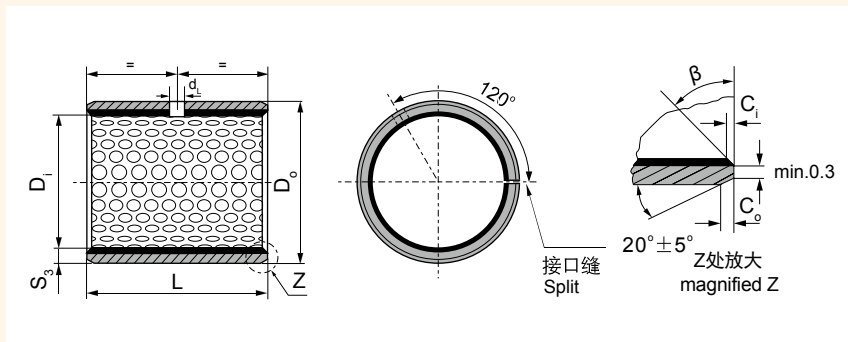
实际运用中根据使用环境、工况和环保要求的不同，表面塑料层 POM/PEEK 里可以添加不同的填充材料。产品范围包括：SF-2（黑）、SF-2Y（黄）、SF-2H（红）、SF-2L（蓝）、SF-2P（PEEK）。

According to the different working conditions and environmental protection, the POM or PEEK layer with different polymer filler, Surface tin or copper plating, product range includes SF-2(Black)、SF-2Y(Yellow)、SF-2H(Red)、SF-2L(Blue)、SF-2P(PEEK)。

有关数据 Data	代号 Grade	SF-2（黑） (Lead free)	SF-2Y（黄） (Lead free)	SF-2H（红） (Lead free)	SF-2L（蓝） (Lead free)	SF-2P（黑） (Without lead)
	材料 Material	碳钢/Steel+铜粉/ Bronze+(POM+Pb)	碳钢/Steel+铜粉/ Bronze+POM	碳钢/Steel+铜粉/ Bronze+POM	碳钢/Steel+铜粉/ Bronze+POM	碳钢/Steel+铜粉/ Bronze +(PTFE+PEEK)
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 Max load capacity P	静载 N/mm ² Static load	140	140	110	140	140
	动载 N/mm ² Dynamic load	70	70	45	70	100
最大线速度 V m/s Max line speed V	脂润滑 Greases lubrication	2.5	2.5	2.5	2.5	2.5
最高PV值 N/mm ² ·m/s PV value limit		2.8	2.8	2.8	2.8	2.5
摩擦系数u Friction coef u		0.06~0.12	0.06~0.12	0.05~0.1	0.06~0.12	0.08~0.12
相配轴径 Mating Axis	硬度 HB Hardness	>270	>270	>270	>270	>270
	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		-40~+120	-40~+120	-60~+120	-60~+120	-150~+250
导热系数 W/mk Thermal conductivity		52	52	52	52	52
线膨胀系数（轴向） Coefficient of linear xpansion		11×10 ⁻⁶ /K	11×10 ⁻⁶ /K	11×10 ⁻⁶ /K	11×10 ⁻⁶ /K	11×10 ⁻⁶ /K
针对性运用领域 Pertinence applicaton		产品应用于汽车底盘、锻压机床、冶金机械、矿山机械、水利行业、轧钢行业等。 It's used in vehicle chassis, forming machine tools, steel metallurgical machinery, mineral mountain machinery, hydraulic industry and rolling steel industry, etc.				产品应用于锻压机床、冶金机械、矿山机械、液压马达等高端应用。 The product is applied in forging press, metallurgy machine, mine machine, irrigation industry, hydraulic moto high-end application, etc.

SF-2 轴承规格及公差

SF-2 Sleeve Bushing Specification & Tolerance



内外倒角 ID and OD chamfers

S_3	C_0	C_1	β
1.0	0.6 ± 0.3	0.30 ± 0.2	$30^\circ \pm 5^\circ$
1.5	0.7 ± 0.3	0.50 ± 0.2	$30^\circ \pm 5^\circ$

S_3	C_0	C_1	β
2.00	1.2 ± 0.4	0.50 ± 0.3	$30^\circ \pm 5^\circ$
2.50	1.8 ± 0.6	0.80 ± 0.3	$45^\circ \pm 5^\circ$

单位Unit: mm

轴径 Shaft D _s h8	座孔 Housing H7 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 ₀	壁厚 Wall thick- ness S ₃	油孔 Oil hole d _L	长度 L ⁰ _{-0.40}										
							10	15	20	25	30	35	40	45	50	60	
10 -0.022	12 ^{+0.018}	12 ^{+0.065} ^{+0.030}	10.108 10.040	0.130 0.040	0.980 0.955	4	1010	1015	1020								
12 -0.027	14 ^{+0.018}	14 ^{+0.065} ^{+0.030}	12.108 12.040	0.135 0.040			1210	1215	1220								
14 -0.027	16 ^{+0.018}	16 ^{+0.065} ^{+0.030}	14.108 14.040					1415	1420								
15 -0.027	17 ^{+0.018}	17 ^{+0.065} ^{+0.030}	15.108 15.040					1515	1520	1525							
16 -0.027	18 ^{+0.018}	18 ^{+0.065} ^{+0.030}	16.108 16.040					1615	1620	1625							
18 -0.027	20 ^{+0.021}	20 ^{+0.075} ^{+0.035}	18.111 18.040				0.138 0.040	1815	1820	1825							
20 -0.033	23 ^{+0.021}	23 ^{+0.075} ^{+0.035}	20.131 20.050	0.164 0.050	1.475 1.445	6		2015	2020	2025	2030						
22 -0.033	25 ^{+0.021}	25 ^{+0.075} ^{+0.035}	22.131 22.050					2215	2220	2225	2230						
25 -0.033	28 ^{+0.021}	28 ^{+0.075} ^{+0.035}	25.131 25.050	0.188 0.060	1.970 1.935			2515	2520	2525	2530						
28 -0.033	32 ^{+0.025}	32 ^{+0.085} ^{+0.045}	28.155 28.060						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						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	8			4520	4525	4530	4535	4540	4545	4550		
50 -0.039	55 ^{+0.030}	55 ^{+0.100} ^{+0.055}	50.200 50.080	0.239 0.080							5030	5035	5040	5045	5050	5060	
55 -0.046	60 ^{+0.030}	60 ^{+0.100} ^{+0.055}	55.200 55.080	0.246 0.080							5530	5535	5540	5545	5550	5560	
60 -0.046	65 ^{+0.030}	65 ^{+0.100} ^{+0.055}	60.200 60.080								6030	6035	6040	6045	6050	6060	

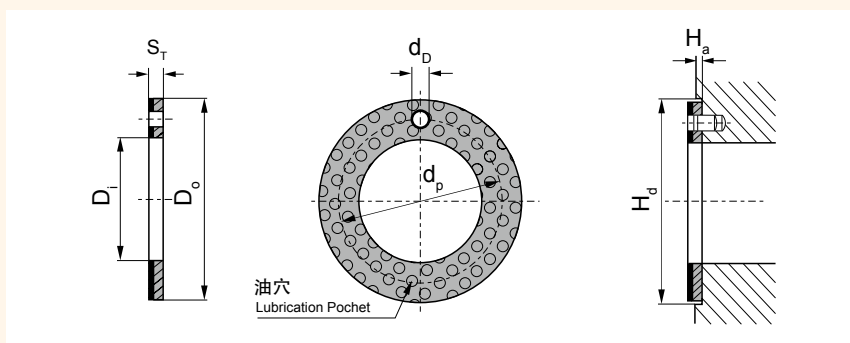
SF-2 轴承规格及公差

SF-2 Sleeve Bushing Specification & Tolerance

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

SF-2WC 垫片规格及公差

SF-2WC Thrust Washer Specification & Tolerance

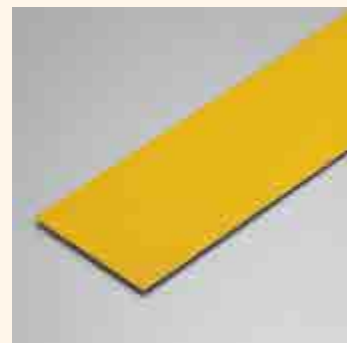
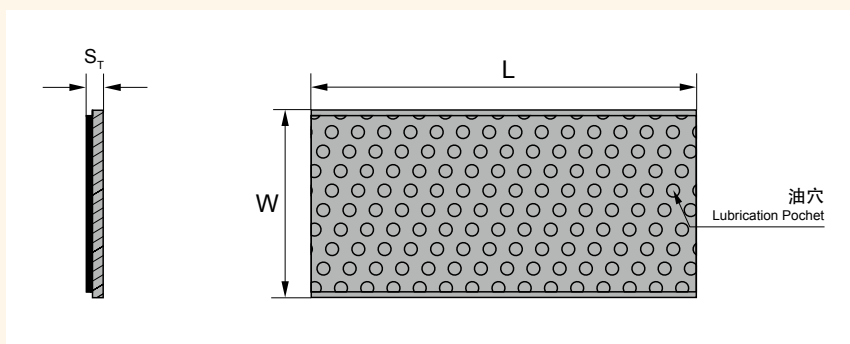


单位Unit: mm

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 ±0.125	d _b ^{+0.4} _{+0.1}	H _a ±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	2		30
W18	16	18	32		25			32
W20	18	20	36		28			36
W22	20	22	38		30			38
W24	22	24	42		33	3		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	66		
W48	46	48	74	61		1.5	74	
W52	50	52	78	65			78	
W62	60	62	90	76			90	

SF-2SP 板材标准公制尺寸

SF-2SP Strip Standard Metric Size



单位Unit: mm

型号规格 Standard No.	长度 $L \pm 1$	宽度 $W \pm 1$	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