



SF-2 边界润滑轴承

Marginal Lubricating Bearing

应用领域 / Application

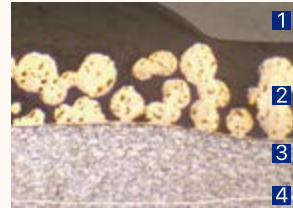


SF-2 边界润滑轴承

Marginal Lubricating Bearing



金相图片 Metallography



1. 改性聚甲醛
POM with lead 0.3-0.5mm
2. 球形青铜粉
Porous bronze sintere
3. 钢背
Steel backing
4. 镀铜/锡层
Copper-plating/tin-plating

注：SF-2 系列产品还可根据不同工况条件选择不同的基材材料，如：青铜基板、不锈钢基板、以及“无铅”等配方产品。SF-2Y 属环保无铅产品，颜色为桔黄色、橙色、蓝色。

Note: Various materials are suitable for SF-2 series products according to different working conditions, such as bronze-backing, stainless steel backing and lead-free material. SF-2Y is an environmental friendly lead-free product and its color is yellow.

结构特性 Structure Characteristics

SF-2 型材料是以填充四氟改性的聚甲醛塑料为表面层三层复合自润滑材料，它是一种良性的边界润滑材料，因此特别适用与高载低速下的旋转运动，摇摆运动以及经常在载荷下启闭而不易形成流体动力润滑的轴承，止推垫片、滑块、球座等磨擦零件。SF-2 能够充分地利用微量润滑脂，在边界润滑条件下可以长期的不用加油保养。在完全无油润滑条件下，SF-2 磨擦性能及允许 PV 值较低，因此通常在塑料表面轧出储油坑，装配时涂上锂基润滑油脂或硅脂等。

SF-2 is triple-layer self lubricating material that can fill modified POM plastic as surface layer; it is benignant Marginal lubrication material, therefore, it is particularly applicable high-load low-speed rotating and wing movement, as well as in the condition that frequent loaded start-stop is the requirement while hydrodynamic lubrication membrane is difficult to form, in the parts such as bearing, thrust washer, sliding block, ball socket and so on. SF-2 can take full advantage of less grease to work long time without lubrication maintenance under Marginal lubrication condition. But under oil-free condition, SF-2 the frictional behavior and permissible PV value is relatively low, so generally storage pit can be formed on the plastic surface, where lithiumbased lubricant grease or silicone grease and so on should be applied when being installed.

产品应用 Application

产品广泛应用于：

踏板总成、平衡轴套、制动钳、转向主销轴套和卡车尾板轴套、搬运车、起重机、车载吊车、森林机械、包装机械、建筑机械、液压马达、农用机械矿山机械、冶金机械、水利机械、汽机车、轧钢行业等。

Products are widely used in:


Pedal assembly, balance bushings, brake calipers, steering main pin sets and truck tailgate bushings, truck, crane, car cranes, forest machinery, packaging machinery, construction machinery, hydraulic motors, agricultural machinery mining machinery, metallurgical machinery, irrigation machinery, automobiles, and steel rolling industries.

SF-2 边界润滑轴承

Marginal Lubricating Bearing

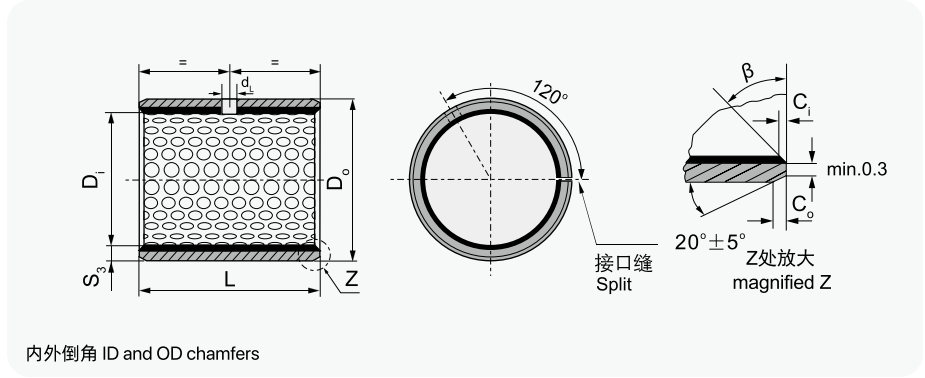
实际运用中根据使用环境、工况和环保要求的不同，表面塑料层POM/PEEK里可以添加不同的填充材料。产品范围包括：SF-2（黑）、SF-2Y（黄）、SF-2S（橙）、SF-2L（蓝）、SF-2P（PEEK）。

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-2S (orange)、SF-2L (blue)、SF-2P (PEEK) .

有关数据 Data	代号 Grade	SF-2 (黑)	SF-2Y (黄) (lead free)	SF-2S (橙) (lead free)	SF-2L (蓝) (lead free)	SF-2P(PEEK)
	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	140	110	140
	动载 N/mm ² Dynamic load	70	70	70	45	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	0.06~0.12	0.05~0.1	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		-60~+120	-40~+120	-40~+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 边界润滑轴承规格及公差

SF-2 Boundary Lubricating Bearing Specification & Tolerance



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 _{-0.40} ⁰														
							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				1210	1215	1220												
14 _{-0.027}	16 ^{+0.018}	16 ^{+0.065} _{+0.030}	14.108 14.040	0.135 0.040			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		1.475 1.445	6	2015	2020	2025	2030											
22 _{-0.033}	25 ^{+0.021}	25 ^{+0.075} _{+0.035}	22.131 22.050	0.164 0.050			2215	2220	2225	2230											
25 _{-0.033}	28 ^{+0.021}	28 ^{+0.075} _{+0.035}	25.131 25.050				2515	2520	2525	2530											
28 _{-0.033}	32 ^{+0.025}	32 ^{+0.085} _{+0.045}	28.155 28.060	0.188 0.060	1.970 1.935	8		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		2.460 2.415	8		4020	4025	4030	4035	4040	4045	4050							
45 _{-0.039}	50 ^{+0.025}	50 ^{+0.085} _{+0.045}	45.195 45.080	0.234 0.080			4520	4525	4530	4535	4540	4545	4550								
50 _{-0.039}	55 ^{+0.030}	55 ^{+0.100} _{+0.055}	50.200 50.080	0.239 0.080			5030	5035	5040	5045	5050	5060									
55 _{-0.046}	60 ^{+0.030}	60 ^{+0.100} _{+0.055}	55.200 55.080	0.246 0.080			5530	5535	5540	5545	5550	5560									
60 _{-0.046}	65 ^{+0.030}	65 ^{+0.100} _{+0.055}	60.200 60.080				6030	6035	6040	6045	6050	6060									

SF-2 边界润滑轴承规格及公差

SF-2 Marginal Lubricating Bearing 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 _{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}												
							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	0.321 0.100			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	0.324 0.100			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	0.339 0.110	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	0.354 0.110	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								