# SF-1 自润滑多层复合轴承
## Self-Lubricated Multilayer Compound Bearing

### 应用领域 / Application

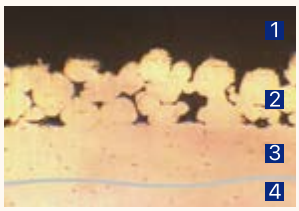







# SF-1 自润滑多层复合轴承
## Self-Lubricated Multilayer Compound Bearing

### 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体材料，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，表面扎制以 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。ZYB 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。

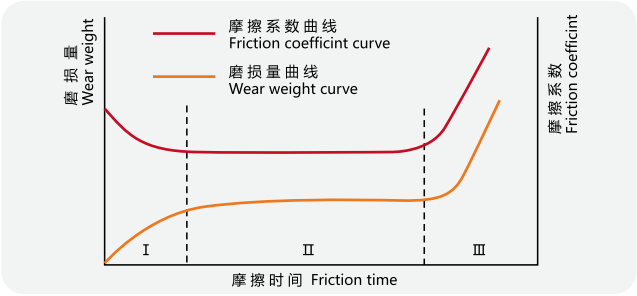
Agricultural machinery: tractors, combine harvesters, crop sprayers, bulldozers, graders, etc.
Automotive industry: power steering pump, steering gear thrust washers, disc brakes, shock absorbers, hinges, wiper, chair recliners, air valves and solenoid valves, etc.;
Business machines: duplicator, fax 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
## Self-Lubricated Multilayer Compound Bearing

### 耐磨性能 Anti-abrasion Performance

SF-1 具有优异的耐磨性，这主要是由于 PTFE 的特殊分子结构。SF-1 磨损大致可分为三个阶段，相对应的摩擦系数亦有三种情况，见右图：

SF-1 is of excellent anti-abrasion performance,mainly due to the particular molecule structure of PTFE. The abrasion process can be generally divided into three phases, so there kinds of friction coefficient. See the right graph:




SF-1 磨损曲线
Wear curve of SF-1

1) “跑合” 阶段：表面层 PTFE 混合物向对偶面转移填补对偶面凹坑，并形成转移膜，此时，摩擦系数较大，材料的磨损速度较快。如图中 Ⅰ 曲线所示。
2) “稳定”磨损阶段: 经跑合后的摩擦变成了 PTFE 之间的摩擦，其摩擦系数低而稳定，材料的磨损率低而平稳。如图中 II 区曲线所示。
3) “急剧” 磨损阶段：多孔层孔隙中的 PTFE 润滑剂消耗，无法使摩擦界面间获得足够量的润滑剂。摩擦面之间润滑不良，摩擦系数迅速上升，材料的磨损率亦急剧加快，直至 70% 青铜裸露时，SF-1 寿命接近终止。如图中III曲线所示。

1. "Running-in" phrase: PTFE compound on the bushing is transferred to its mating surface and forms a lubricating film. At this phase,the friction coefficient is bigger, thus the abrasion pace is very quick. See the curve showed in area I of the graph.
2. "Stabilization" abrasion phrase: After the "Running-in phase", the friction happens between PTFE and PTFE,thus the friction coefficient is smaller and keeps steady. As a result,the wear rate is low and steady. See the curve showed in area II of the graph.
3. "Sharp" abrasion phrase: As PTFE in the porous layer is slowly consumed up, not enough lubricant can be supplied to the gliding media. Friction coefficient and wear rate will rapidly rise. When 70% of the bronze surface is exposed, service life of SF-1 closes to its end. See the curve showed in area IIIof the graph.

### 影响寿命的主要因素
### Main Factors that Influence the Service life of the Bearing

1)PV 值的影响

PV 值是确定 SF-1 磨损寿命的有效指标。如果要求寿命延长，PV 值必须降低。

2) 环境温度的影响

环境温度越高，SF-1 使用寿命愈短。

3) 对偶件的影响

对偶件采用合金钢或镀硬铬的轴，表面的粗糙度 Ra=0.4~0.63 范围内时，SF-1 轴承使用寿命可以显著提高。

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。

1). PV Value

PV value is an effective criterion to calculate the service life of SF-1. If there is need to prolong the service Life, PV value must be reduced.

2). Ambient Temperature

The higher the working temperature is, the shorter the life of the products would be.

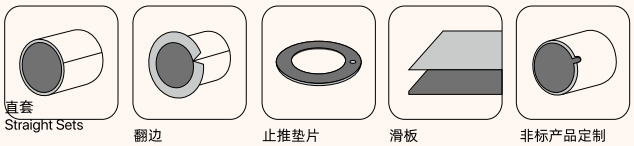
3). Quality of the Mating Surface

Service life SF-1 can be obviously prolonged if its mating axis is made by alloy steel or is plated by hard chrome and with surface Roughness Ra=0.4~0.63

Besides the standard products displayed in the list of this catalogue. We can also supply non-standard products or develop according to customer design.

# SF-1 自润滑多层复合轴承
## 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。

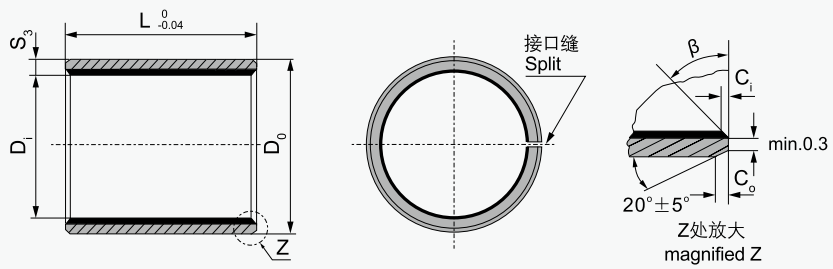
| 有关数据 Date | 代号 Grade | SF-1 | SF-1T | |
|---|---|---|---|---|
| | 材料 Materiai | 碳钢/Steel+铜粉/Bronze+(PTFE+Pb+填料/Filler) | 碳钢/Steel+铜粉/Bronze+(PTFE+Pb+填料/Filler) | |
| 除了目录中显示的标准产品外，还可以提供非标产品或根据客户要求订购。<br>We can also develop according to customers special request while out of this table<br>  <br>直套 Straight 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 Typicai applicaton | | 产品应用于印刷机械、纺织机械、烟草机械、健身器等。<br>Application:<br>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。<br>Application:<br>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 $N/mm^2$ Static load | 250 | 250 | |
| | 动载 $N/mm^2$ Dynamic load | 140 | 140 | |
| | 摇摆 $N/mm^2$ Oscoillation 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 $N/mm^2 \cdot m/s$ Dry friction | 1.8 | 1.0 | |
| | 油润滑 $N/mm^2 \cdot m/s$ 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 ℃ 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 | | $11\times10^{-6}/K$ | $11\times10^{-6}/K$ | |
| 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
## 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。<br>Application:<br>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。<br>Application:<br>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。<br>Application:<br>medium, high-pressure gear pump, ram pump, vane pumps, etc. | 该产品主要于汽车减震器、摩托车减震器、液压油缸等。<br>Application:<br>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 |
| | $11\times10^{-6}$/K | $18\times10^{-6}$/K | $11\times10^{-6}$/K | $11\times10^{-6}$/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

| $S_3$ | $C_o$ | $C_i$ | 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 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 | 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 |

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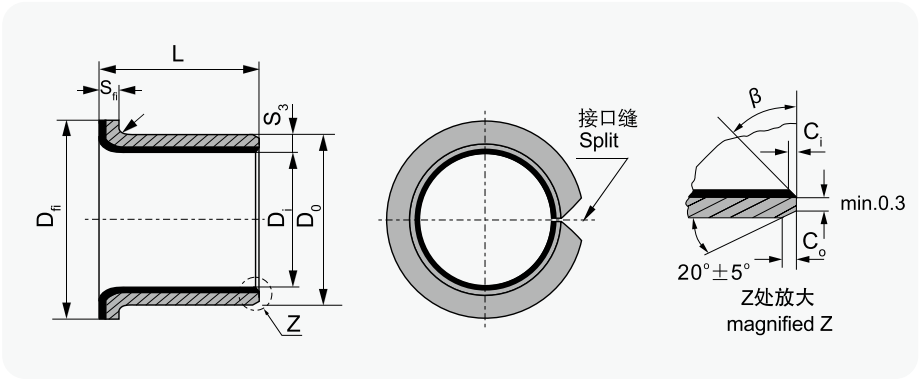
# SF-1 Self-Lubricated Multilayer Compound Bearing Specification & Tolerance

| 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 $D_{i,a}$ | 配合间隙 Clearance $D_D$ | 壁厚 Wall thick-ness $S_3$ | 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<br>44.990 | 0.155<br>0.015 | | 4520 | 4525 | 4530 | 4540 | 4550 | | | | | |
| 50 $^{-0.050}_{-0.025}$ | 55 $^{+0.030}$ | 55 $^{+0.100}_{+0.055}$ | 50.110<br>49.990 | 0.160<br>0.015 | | 5020 | 5025 | 5030 | 5040 | 5050 | 5060 | | | | |
| 55 $^{-0.060}_{-0.030}$ | 60 $^{+0.030}$ | 60 $^{+0.100}_{+0.055}$ | 55.110<br>54.990 | | | | | 5530 | 5540 | 5550 | 5560 | | | | |
| 60 $^{-0.060}_{-0.030}$ | 65 $^{+0.030}$ | 65 $^{+0.100}_{+0.055}$ | 60.110<br>59.990 | | 2.505<br>2.460 | | | 6030 | 6040 | 6050 | 6060 | 6070 | | | |
| 65 $^{-0.060}_{-0.030}$ | 70 $^{+0.030}$ | 70 $^{+0.100}_{+0.055}$ | 65.110<br>64.990 | 0.170<br>0.020 | | | | 6530 | 6540 | 6550 | 6560 | 6570 | | | |
| 70 $^{-0.060}_{-0.030}$ | 75 $^{+0.030}$ | 75 $^{+0.100}_{+0.055}$ | 70.110<br>69.990 | | | | | 7030 | 7040 | 7050 | 7060 | 7070 | 7080 | | |
| 75 $^{-0.060}_{-0.030}$ | 80 $^{+0.030}$ | 80 $^{+0.100}_{+0.055}$ | 75.110<br>74.990 | | | | | 7530 | 7540 | 7550 | 7560 | 7570 | 7580 | | |
| 80 $^{}_{-0.045}$ | 85 $^{+0.035}$ | 85 $^{+0.120}_{+0.070}$ | 80.155<br>80.020 | 0.201<br>0.020 | | | | | 8040 | 8050 | 8060 | 8070 | 8080 | 80100 | |
| 85 $^{}_{-0.054}$ | 90 $^{+0.035}$ | 90 $^{+0.120}_{+0.070}$ | 85.155<br>85.020 | | | | | | 8540 | 8550 | 8560 | 8570 | 8580 | 85100 | |
| 90 $^{}_{-0.054}$ | 95 $^{+0.035}$ | 95 $^{+0.120}_{+0.070}$ | 90.155<br>90.020 | | | | | | 9040 | 9050 | 9060 | 9070 | 9080 | 90100 | |
| 95 $^{}_{-0.054}$ | 100 $^{+0.035}$ | 100 $^{+0.120}_{+0.070}$ | 95.155<br>95.020 | 0.209<br>0.020 | 2.490<br>2.440 | | | | | 9550 | 9560 | 9570 | 9580 | 95100 | |
| 100 $^{}_{-0.054}$ | 105 $^{+0.035}$ | 105 $^{+0.120}_{+0.070}$ | 100.155<br>100.020 | | | | | | | 10050 | 10060 | 10070 | 10080 | 100100 | 100115 |
| 105 $^{}_{-0.054}$ | 110 $^{+0.035}$ | 110 $^{+0.120}_{+0.070}$ | 105.155<br>105.020 | | | | | | | | 10560 | 10570 | 10580 | 105100 | 105115 |
| 110 $^{}_{-0.054}$ | 115 $^{+0.035}$ | 115 $^{+0.120}_{+0.070}$ | 110.115<br>110.020 | | | | | | | | 11060 | 11070 | 11080 | 110100 | 110115 |
| 120 $^{}_{-0.054}$ | 125 $^{+0.040}$ | 125 $^{+0.170}_{+0.100}$ | 120.210<br>120.070 | 0.264<br>0.070 | | | | | | | 12060 | 12070 | 12080 | 120100 | 120115 |
| 125 $^{}_{-0.063}$ | 130 $^{+0.040}$ | 130 $^{+0.170}_{+0.100}$ | 125.210<br>125.070 | | | | | | | | 12560 | 12570 | 12580 | 125100 | 125115 |
| 130 $^{}_{-0.063}$ | 135 $^{+0.040}$ | 135 $^{+0.170}_{+0.100}$ | 130.210<br>130.070 | | | | | | | | 13060 | 13070 | 13080 | 130100 | 130115 |
| 140 $^{}_{-0.063}$ | 145 $^{+0.040}$ | 145 $^{+0.170}_{+0.100}$ | 140.210<br>140.070 | 0.273<br>0.070 | 2.465<br>2.415 | | | | | | 14060 | 14070 | 14080 | 140100 | 140115 |
| 150 $^{}_{-0.063}$ | 155 $^{+0.040}$ | 155 $^{+0.170}_{+0.100}$ | 150.210<br>150.070 | | | | | | | | 15060 | 15070 | 15080 | 150100 | 150115 |
| 160 $^{}_{-0.063}$ | 165 $^{+0.040}$ | 165 $^{+0.170}_{+0.100}$ | 160.210<br>160.070 | | | | | | | | 16060 | 16070 | 16080 | 160100 | 160115 |
| 180 $^{}_{-0.063}$ | 185 $^{+0.046}$ | 185 $^{+0.210}_{+0.130}$ | 180.216<br>180.070 | 0.279<br>0.070 | | | | | | | 18060 | 18070 | 18080 | 180100 | |
| 190 $^{}_{-0.072}$ | 195 $^{+0.046}$ | 195 $^{+0.210}_{+0.130}$ | 190.216<br>190.070 | | | | | | | | 19060 | 19070 | 19080 | 190100 | |
| 200 $^{}_{-0.072}$ | 205 $^{+0.046}$ | 205 $^{+0.210}_{+0.130}$ | 200.016<br>200.070 | 0.288<br>0.070 | 2.465<br>2.415 | | | | | | 20060 | 20070 | 20080 | 200100 | |
| 220 $^{}_{-0.072}$ | 225 $^{+0.046}$ | 225 $^{+0.210}_{+0.130}$ | 220.216<br>220.070 | | | | | | | | 22060 | 22070 | 22080 | 220100 | |
| 250 $^{}_{-0.072}$ | 255 $^{+0.052}$ | 255 $^{+0.260}_{+0.170}$ | 250.222<br>250.070 | 0.294<br>0.070 | | | | | | | | | 25080 | 250100 | |
| 260 $^{}_{-0.081}$ | 265 $^{+0.052}$ | 265 $^{+0.260}_{+0.170}$ | 260.222<br>260.070 | | | | | | | | | | 26080 | 260100 | |
| 280 $^{}_{-0.081}$ | 285 $^{+0.052}$ | 285 $^{+0.260}_{+0.170}$ | 280.222<br>280.070 | 0.303<br>0.070 | 2.465<br>2.415 | | | | | | | | 28080 | 280100 | |
| 300 $^{}_{-0.081}$ | 305 $^{+0.052}$ | 305 $^{+0.260}_{+0.170}$ | 300.222<br>300.070 | | | | | | | | | | 30080 | 300100 | |

# SF-1F 自润滑翻边轴承规格及公差
# SF-1F Self-Lubricated Flange Bearing Specification & Tolerance

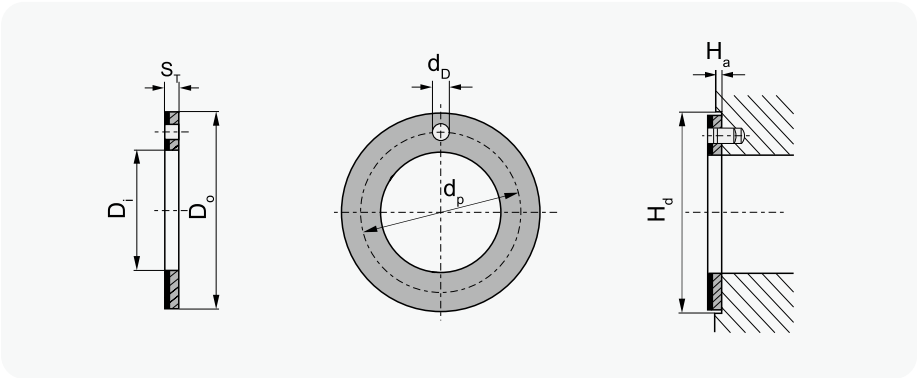



| $S_3$ | 1.0 | 1.5 | 2.0 | 2.5 |
|---|---|---|---|---|
| r | $1^{-0.5}$ | 1±0.5 | 1.5±0.5 | 2±0.5 |

单位Unit: mm

| 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 $C_O$ | Designation 型号规格 | 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 | 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 | | 8 | 10 | 15 | 5.5 | |
| | | | | | 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 | | 10 | 12 | 18 | 7 | |
| | | | | | SF-1F10090 | | | | | 9 | |
| | | | | | SF-1F10120 | | | | | 12 | |
| 12 -0.016 -0.034 | 14 +0.018 | 14 +0.065 +0.030 | 12.058 11.990 | 0.092 0.006 | SF-1F12070 | | 12 | 14 | 20 | 7 | |
| | | | | | SF-1F12090 | | | | | 9 | |
| | | | | | SF-1F12120 | | | | | 12 | |
| 14 -0.016 -0.034 | 16 +0.018 | 16 +0.065 +0.030 | 14.058 13.990 | | SF-1F14120 | | 14 | 16 | 22 | 12 | |
| | | | | | SF-1F14170 | | | | | 17 | |
| 15 -0.016 -0.034 | 17 +0.018 | 17 +0.065 +0.030 | 15.058 14.990 | | SF-1F15090 | | 15 | 17 | 23 | 9 | |
| | | | | | SF-1F15120 | | | | | 12 | |
| | | | | | SF-1F15170 | | | | | 17 | |
| 16 -0.016 -0.034 | 18 +0.018 | 18 +0.065 +0.030 | 16.058 15.990 | | SF-1F16120 | | 16 | 18 | 24 | 12 | |
| | | | | | 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 | | 18 | 20 | 26 | 12 | |
| | | | | | SF-1F18170 | | | | | 17 | |
| | | | | | SF-1F18200 | | | | | 20 | |
| 20 -0.020 -0.041 | 23 +0.021 | 23 +0.075 +0.035 | 20.071 19.990 | 0.112 0.010 | SF-1F20115 | 1.505 1.475 | 20 | 23 | 30 | 11.5 | 1.5 |
| | | | | | SF-1F20165 | | | | | 16.5 | |
| | | | | | SF-1F20215 | | | | | 21.5 | |
| 22 -0.020 -0.041 | 25 +0.021 | 25 +0.075 +0.035 | 22.071 21.990 | | SF-1F22150 | | 22 | 25 | 32 | 15 | |
| | | | | | SF-1F22200 | | | | | 20 | |
| 25 -0.020 -0.041 | 28 +0.021 | 28 +0.075 +0.035 | 25.071 24.990 | | SF-1F25115 | | 25 | 28 | 35 | 11.5 | |
| | | | | | SF-1F25165 | | | | | 16.5 | |
| | | | | | SF-1F25215 | | | | | 21.5 | |
| 30 -0.025 -0.050 | 34 +0.025 | 34 +0.075 +0.035 | 30.085 29.990 | 0.126 0.010 | SF-1F30160 | 2.005 1.970 | 30 | 34 | 42 | 16 | 2 |
| | | | | | SF-1F30260 | | | | | 26 | |
| 35 -0.025 -0.050 | 39 +0.025 | 39 +0.085 +0.045 | 35.085 34.990 | 0.135 0.015 | SF-1F35160 | | 35 | 39 | 47 | 16 | |
| | | | | | SF-1F35260 | | | | | 26 | |
| 40 -0.025 -0.050 | 44 +0.025 | 44 +0.085 +0.045 | 40.085 39.990 | | SF-1F40260 | | 40 | 44 | 53 | 26 | |
| | | | | | SF-1F40400 | | | | | 40 | |

# SF-1WC / SF-2WC 复合止推垫片规格及公差
# SF-1WC / SF-2WC Compound Thrust Washer Specification & Tolerance




单位Unit: mm

| 轴径 Shaft $D_s$ | 型号规格 Standard No. | 垫片尺寸 WCasher 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 | WC10 | 10 | 20 | 1.5 | 15 | 1.5 | 1 | 20 |
| 10 | WC12 | 12 | 24 | | 18 | | | 24 |
| 12 | WC14 | 14 | 26 | | 20 | 2 | | 26 |
| 14 | WC16 | 16 | 30 | | 23 | | | 30 |
| 16 | WC18 | 18 | 32 | | 25 | | | 32 |
| 18 | WC20 | 20 | 36 | | 28 | 3 | | 36 |
| 20 | WC22 | 22 | 38 | | 30 | | | 38 |
| 22 | WC24 | 24 | 42 | | 33 | | | 42 |
| 24 | WC26 | 26 | 44 | | 35 | | | 44 |
| 26 | WC28 | 28 | 48 | | 38 | 4 | | 48 |
| 30 | WC32 | 32 | 54 | | 43 | | | 54 |
| 36 | WC38 | 38 | 62 | | 50 | | | 62 |
| 40 | WC42 | 42 | 66 | | 54 | | | 66 |
| 46 | WC48 | 48 | 74 | 2 | 61 | | 1.5 | 74 |
| 50 | WC52 | 52 | 78 | | 65 | | | 78 |
| 60 | WC62 | 62 | 90 | | 76 | | | 90 |

# FR 系列增强四氟软带
# FR Bronze Wesh With PTFE Bearing

## 产品简介

软带材料是以青铜丝网为基础，通过表面轧制PTFE等相关的增强减摩材料烧结后制成。这种材料结构使产品的重量更轻，安装更方便。该产品具有较低的磨擦系数和较好的耐磨特性。由于它的柔软性能特别好，可以加工成钢与钢金属之间的隔离膜，实现无间隙，无噪音，无油润滑，无需保养，无污染的理想状态。

## 适用范围

汽车门窗铰链，纺织机械，关节轴承，化工行业，食品工业，阀门控制机构，办公机械，仪器仪表等，轻载低速但需要自润滑的不同场合。

## 产品特点

1、能在无油自润滑状态下稳定工作。 2、适合低速往复运动，摆动及断续运动等工作情况下。 3、良好的抗磨、减摩特性。 4、良好的耐腐蚀性。

| 金属承载力 | 厚度 | 自润 |
|---|---|---|
| 锡青铜 | $0.48^{\pm0.02}$ | PTFE这主体和相关的减磨擦材料 |
| 黄铜 | $0.48^{\pm0.02}$ | |
| 不锈钢 | $0.48^{\pm0.02}$ | |

厚度公差可按要求定制

## 技术参数

| 最大承载力 | | 30N/mm² |
|---|---|---|
| 适用温度 | | - 20℃~ + 250℃ |
| 最高滑动速度 | 干摩擦 | 0.5m/s |
| | 油润滑 | 2m/s |
| 允许最高PV值 | | 1.65/mm²·m/s |
| 摩擦系数μ | | 0.05~0.20 |