



● 标准产品规格表 Standard specifications: P124

### 产品特性 Product features

- 低吸水率和中高承载性能。可被用于潮湿环境而耐磨性能同样出色的材料，特种金属粉末的植入使得此轴承成为可被探测的材料
- 连续使用温度: -40°C/+110°C
- 适合多数中高载荷场合
- 适合干运行、免维护
- 特殊材料优异的热传导性
- 适合低速运动
- This material is with low water absorb characteristic and high load capacity. It is widely used for the humidity condition and wear resistance requirement. The embedded special metal powder enables this material to be a detective one
- Continuous working temperature: -40°C/+110°C
- Suitable for medium and high load operation
- Maintenance-free dry operation
- Excellent thermal conductivity
- Good for low speed operation

### 材料数据表 Material properties data table

材料性能 Material properties	测试标准 Standard	单位 Unit	CSB-EPB1
颜色 Color	-	-	棕色 Brown
密度 Density	ISO1183	g/cm <sup>3</sup>	1.53
最大吸湿率 Max. moisture absorption, 50%RH	ISO62	%	0.2
最大吸水率 Max. water absorption	ISO62	%	0.5
对钢动摩擦系数 Coefficient of sliding friction(steel)	ITS025	μ	0.08-0.20
极限PV值 Max. PV value	ITS026	N/mm <sup>2</sup> × m/s	0.50
弯曲模量 Flexural modulus	ISO178	MPa	2600
弯曲强度 Flexural strength	ISO178	MPa	65
最大静载荷 Max. static load	ITS027	MPa	55
最大动载荷 Max. dynamic load	ITS028	MPa	21
邵氏硬度 Shore hardness	ISO868	D	72
连续运行温度 Long-term application temperature	ITS029	°C	+110
短时运行温度 Short-term application temperature	ITS029	°C	+160
最低运行温度 Lowest application temperature	ITS029	°C	-40
导热性 Thermal conductivity	ISO22007	W/m/K	0.26
线性热膨胀系数 Coefficient of thermal expansion	ISO11359	K <sup>-1</sup> × 10 <sup>-5</sup>	8
阻燃等级 Flammability	UL94	Class	HB
体电阻率 Volume resistance	IEC60093	Ω · cm	>10 <sup>11</sup>
面电阻率 Surface resistance	IEC60093	Ω	>10 <sup>10</sup>

\*ITS: CSB内部测试标准 CSB company's internal test standards.

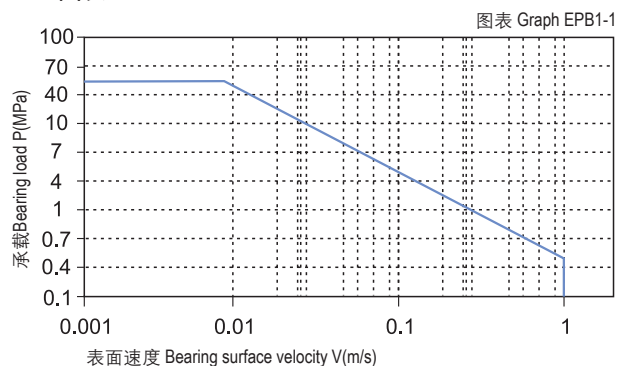
\*\*除非特殊说明测试温度为23°C Test temperatures are 23°C unless otherwise stated.

### 轴承PV值 PV value

CSB-EPB1塑料轴承最大运行PV值为0.5N/mm<sup>2</sup> × m/s; 由此决定轴承所承受的载荷与速度成反比, 详细查阅图表EPB1-1。

The max PV value of the CSB-EPB1 plastic bearings is 0.5N/mm<sup>2</sup> × m/s which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPB1-1).

■ PV图表 Permissible PV value for CSB-EPB1



## 轴承的载荷、速度、温度 Load, speed and temperature

CSB-EPB1塑料轴承可承受最大静载荷为55Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB1-2，轴承实际工作载荷略小于55Mpa，载荷还受到运行速度以及温度的影响，速度越快（Vmax: 1.0m/s）会导致摩擦温度上升，而温度上升（Tmax: 110℃）会导致轴承的承载能力逐渐减弱，载荷随轴承工作温度变化情况参考图表EPB1-3。

CSB-EPB1 allows the Max static load of 55Mpa, The max compressive deformation rate under the max load is listed in Graph EPB1-2, The actual load capacity of bearing is slightly less than 55Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 110℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB1-3 for such variation.

## 轴承的摩擦系数、磨损、轴材料 Friction factor, wear and shaft material

### 摩擦系数 Friction factor

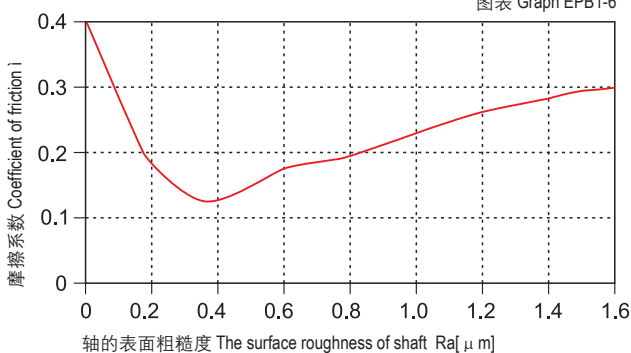
图EPB1-4表明CSB-EPB1塑料轴承和大多数滑动轴承一样在载荷保持不变的情况下摩擦系数会随着旋转速度的增加略有升高；图EPB1-5表明CSB-EPB1塑料轴承摩擦系数在速度保持不变的情况下随着载荷的增加而逐步降低；图EPB1-6表明CSB-EPB1塑料轴承最适合的轴表面粗糙度为Ra0.2~0.6 $\mu$ m，轴过于光滑或者过于粗糙都会导致摩擦系数升高。

Graph EPB1-4 shows that as the same as most of the slide bearing materials, the friction factor of CSB-EPB1 is increasing along with the rotation speed under a certain loading while as shown in figure EPB1-5, it is decreased along with the increasing of loading when the operation speed is stable. From figure EPB1-6, it is found that the most suitable shaft roughness is Ra0.2 to Ra0.6. Smoother shaft or rougher shaft may result into friction factor increasing.

### 摩擦系数与轴表面粗糙度关系图表

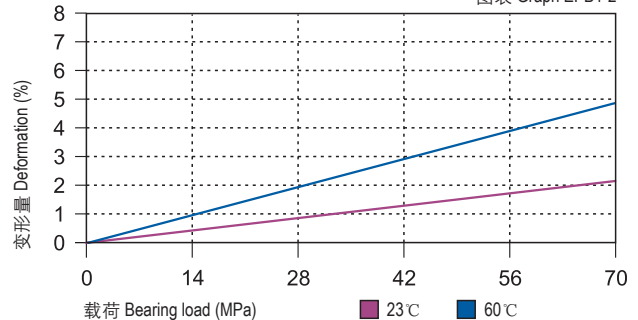
Coefficient of friction & the surface roughness of shaft

图表 Graph EPB1-6



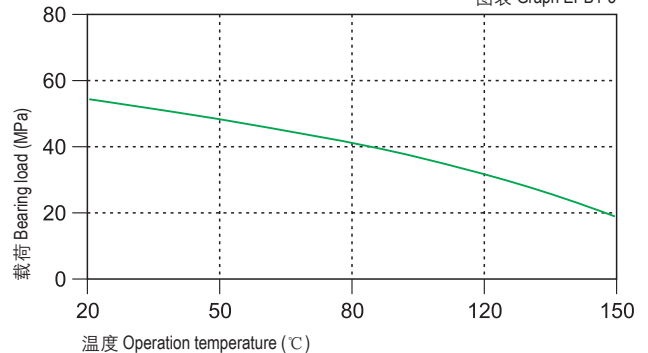
### 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB1-2



### 载荷-温度图表 Load-Temperature diagrams

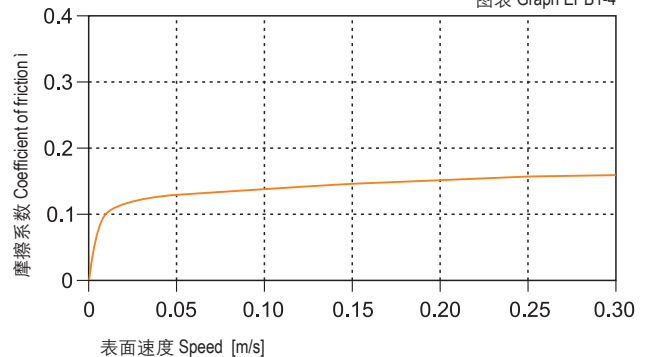
图表 Graph EPB1-3



### 摩擦系数与速度变化关系图表 P=2MPa

Coefficient of friction & the speed of bearing, p = 2 MPa

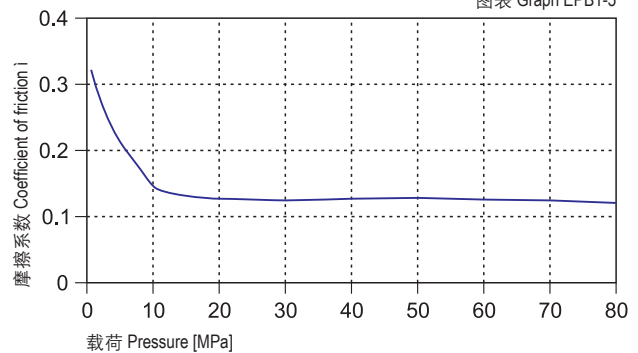
图表 Graph EPB1-4



### 摩擦系数与载荷变化关系图表 v=0.2m/s

Coefficient of friction & the pressure of bearing, v = 0.2 m/s

图表 Graph EPB1-5



CSB-EPB1	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 $\mu$ Friction coef.	0.08~0.20	0.09	0.04	0.04

### 磨损与轴材料 Wearing and shaft material

图EPB1-8都表明CSB-EPB1塑料轴承的磨损受轴材料影响比较大，硬化钢轴和碳钢轴比较适合此轴承。CSB-EPB1塑料轴承在摆动运动时选择硬铬钢轴和硬化钢轴比较适合，在旋转运动中也是选择硬铬钢轴和硬化钢轴比较理想。

Graph EPB1-8 shows the wearing is considerably affected by the shaft materials. Heat-treated steel shaft and carbon steel shaft is good for this bearing material. CSB-EPB1 is suitable for hardened chrome steel and hardened steel shaft in oscillation operation and is suitable for hardened chrome steel and hardened steel shaft in rotation operation.

### 化学抗性 Chemical resistance

CSB-EPB1塑料轴承能抵抗部分弱酸以及各类润滑油的腐蚀。CSB-EPB1 is good at chemical resistance against weak acidic medium and various kinds of lubricants.

### 吸水性 Water absorption

CSB-EPB1塑料轴承在标准大气中的吸湿率为0.2%。浸泡在水中的最高吸水率为0.5%。极低吸水率不会导致轴承发生性能和尺寸变化，非常适合用于潮湿环境。

The moisture absorption of CSB-EPB1 plastic plain bearings is 0.2% in standard atmosphere. The max. water absorption is 0.5% in water. These values are very low, CSB-EPB1 plastic plain bearings is very well suited for used in wet applications.

### 抗UV性能 UV resistance

CSB-EPB1塑料轴承长久暴露在紫外线下颜色会发生褪变。材料性能会有所下降。

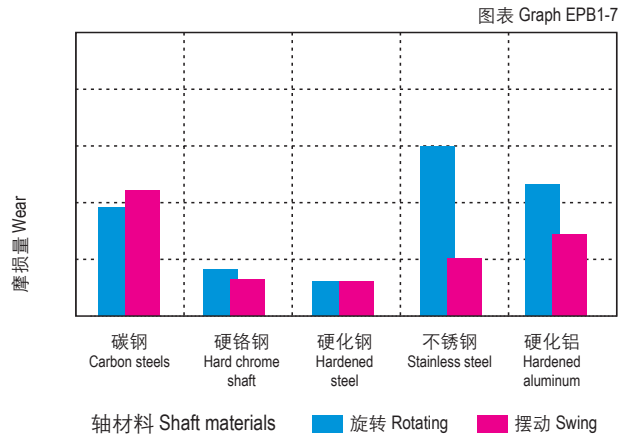
Disintegration could be possible for the material CSB-EPB1 after long period of exposing under the UV ray and therefore the performance of the material will be reduced.

### 安装公差 Installation tolerances

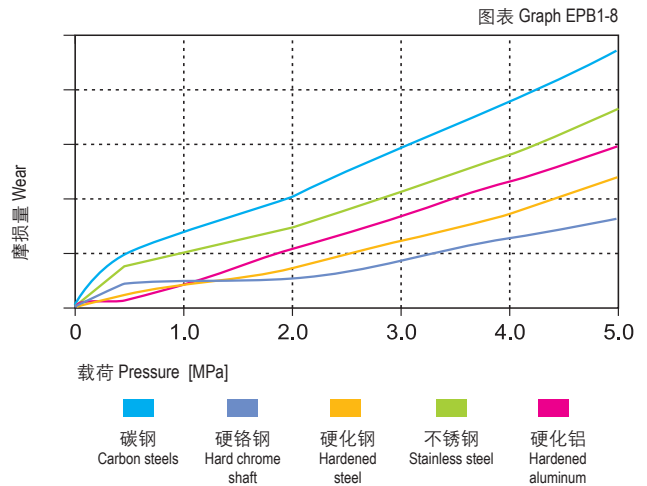
CSB-EPB1塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB1 E10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>0 ~ 3	+0.014 ~ +0.054	0 ~ +0.010	0 ~ -0.025
>3 ~ 6	+0.020 ~ +0.068	0 ~ +0.012	0 ~ -0.030
>6 ~ 10	+0.025 ~ +0.083	0 ~ +0.015	0 ~ -0.036
>10 ~ 18	+0.032 ~ +0.102	0 ~ +0.018	0 ~ -0.043
>18 ~ 30	+0.040 ~ +0.124	0 ~ +0.021	0 ~ -0.052
>30 ~ 50	+0.050 ~ +0.150	0 ~ +0.025	0 ~ -0.062
>50 ~ 80	+0.060 ~ +0.180	0 ~ +0.030	0 ~ -0.074
>80 ~ 120	+0.072 ~ +0.212	0 ~ +0.035	0 ~ -0.087
>120 ~ 180	+0.085 ~ +0.245	0 ~ +0.040	0 ~ -0.100

■ 在不同轴材料上旋转时的磨损量  $p=2\text{MPa}$ ,  $v=0.2\text{m/s}$   
Wear under rotating with different shaft materials,  $p = 2 \text{ MPa}$ ,  $v = 0.2 \text{ m/s}$



■ 旋转磨损随轴材料与压力变化关系  $v=0.2\text{m/s}$   
Wear & pressure under rotating with different shaft materials,  $v = 0.2 \text{ m/s}$



■ 吸水性的影响 Effect of moisture absorption on EPB1 bearings

