



● 标准产品规格表 Standard specifications: P124

### 产品特性 Product features

- 低吸水性下的自润滑材料。在软轴和硬轴配合下耐磨性能同样出色
- 连续使用温度: -40°C/+100°C
- 适合干运行、免维护
- 适合高载荷运动
- 适合在潮湿环境中运行
- A self-lubricating material with low water absorption. Good wear resistance will be maintained when used with soft shaft and hard shaft combined
- Continuous working temperature: -40°C/+100°C
- Maintenance-free dry operation
- High load requirement
- Suitable for working in humid environment

### 材料数据表 Material properties data table

材料性能 Material properties	测试标准 Standard	单位 Unit	CSB-EPB18
颜色 Color	-	-	黄色 Yellow
密度 Density	ISO1183	g/cm <sup>3</sup>	1.40
最大吸湿率 Max. moisture absorption, 50%RH	ISO62	%	0.3
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	0.05-0.18
极限PV值 Max. PV value	ITS026	N/mm <sup>2</sup> × m/s	0.40
弯曲模量 Flexural modulus	ISO178	MPa	2700
弯曲强度 Flexural strength	ISO178	MPa	65
最大静载荷 Max. static load	ITS027	MPa	50
最大动载荷 Max. dynamic load	ITS028	MPa	21
邵氏硬度 Shore hardness	ISO868	D	75
连续运行温度 Long-term application temperature	ITS029	°C	+100
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	0.25
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>12</sup>
面电阻率 Surface resistance	IEC60093	Ω	>10 <sup>11</sup>

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

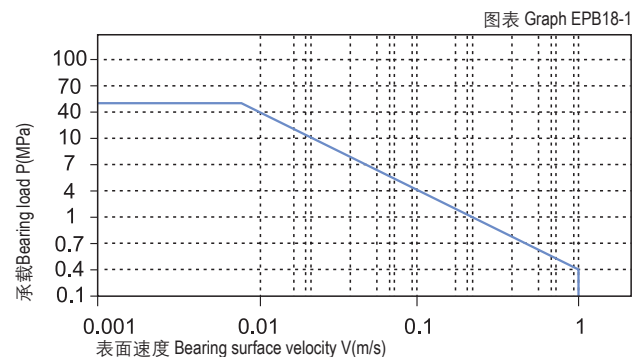
\*\*除非特殊说明测试温度为23°C Test temperatures are 23°C unless otherwise stated.

### 轴承PV值 PV value

CSB-EPB18塑料轴承最大运行PV值为0.4N/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EPB18-1。

The max PV value of the CSB-EPB18 plastic bearings is 0.4N/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 EPB18-1).

■ PV图表 Permissible PV value for CSB-EPB18



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

CSB-EPB18塑料轴承可承受最大静载荷为50Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB18-2，轴承实际工作载荷略小于50Mpa，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: 100℃) 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EPB18-3。

CSB-EPB18 allows the Max static load of 50Mpa, The max compressive deformation rate under the max load is listed in Graph EPB18-2, The actual load capacity of bearing is slightly less than 50Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 100℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB18-3 for such variation.

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

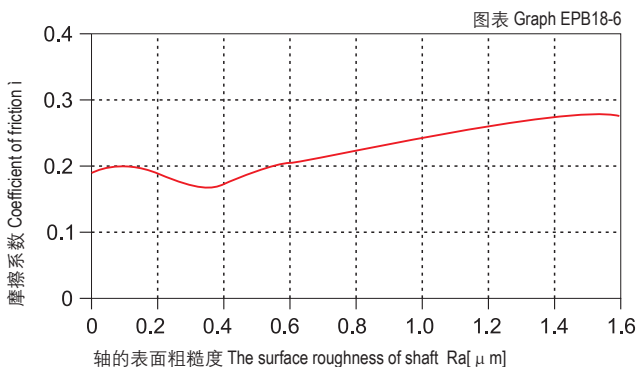
#### 摩擦系数 Friction factor

图EPB18-4表明CSB-EPB18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EPB18-5表明CSB-EPB18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EPB18-6表明CSB-EPB18塑料轴承最适合的轴表面粗糙度为Ra0.2 ~ 0.6um，轴过于光滑或者过于粗糙都会导致摩擦系数升高。

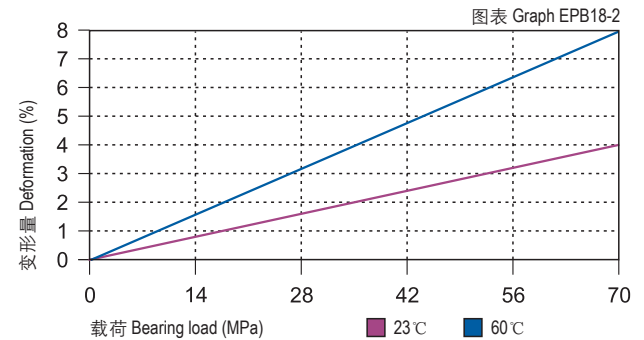
Graph EPB18-4 shows that as the same as most of the slide bearing materials, the friction factor of CSB-EPB18 is increasing along with the rotation speed under a certain loading while as shown in figure EPB18-5, it is decreased along with the increasing of loading when the operation speed is stable. From figure EPB18-6, 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

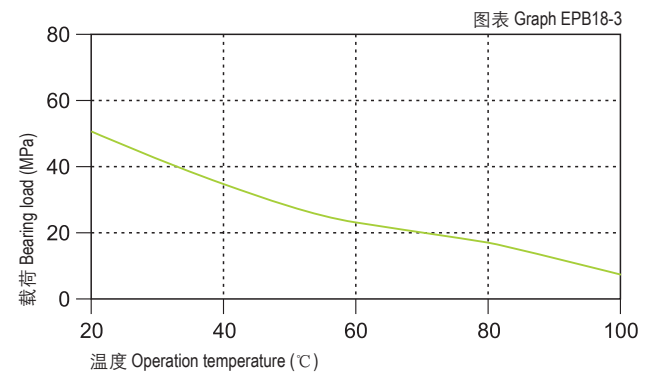
Coefficient of friction & the surface roughness of shaft



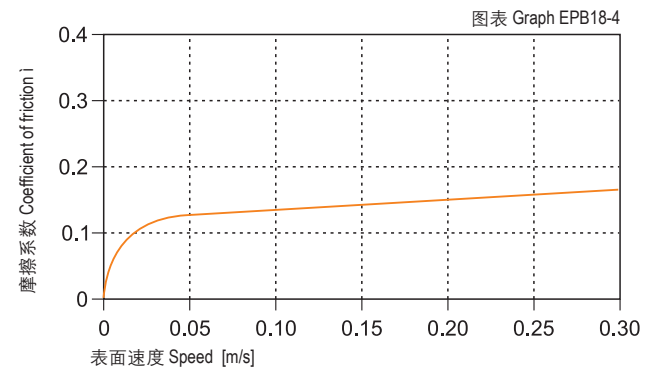
#### 载荷-温度-变形量图表 Load-Temperature deformation



#### 载荷-温度图表 Load-Temperature diagrams

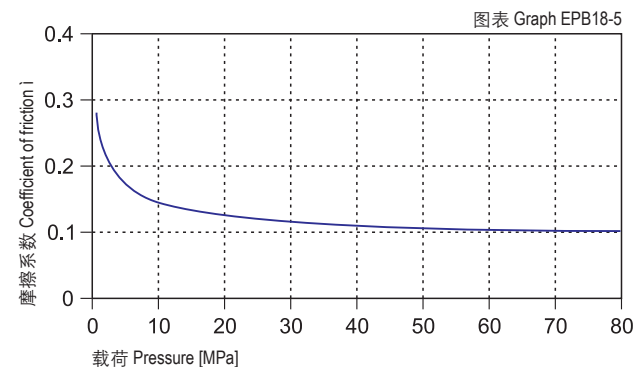


#### 摩擦系数与速度变化关系图表 P=2MPa Coefficient of friction & the speed of bearing, p = 2 MPa



#### 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



CSB-EPB18	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 $\mu$ Friction coef.	0.05-0.18	0.09	0.04	0.04

### 磨损与轴材料 Wearing and shaft material

图EPB18-7与图EPB18-8都表明CSB-EPB18塑料轴承的磨损受轴材料影响比较大，硬化钢轴和硬铬钢轴比较适合此轴承。图EPB18-7表明CSB-EPB18塑料轴承在旋转和摆动运动时选择硬铬钢轴和硬化钢轴比较适合。

Graph EPB18-7 and EPB18-8 shows the wearing is considerably affected by the shaft materials. Heat-treated steel shaft and carbon steel shaft is good for this bearing material. Graph EPB18-7 tells that CSB-EPB18 is suitable for hardened chrome steel and hardened steel shaft in rotation operation or oscillation operation.

### 化学抗性 Chemical resistance

CSB-EPB18塑料轴承能抵抗部分弱酸以及各类润滑油的腐蚀。

CSB-EPB18 is good at chemical resistance against weak acidic medium and various kinds of lubricants.

### 吸水性 Water absorption

CSB-EPB18塑料轴承在标准大气中的吸湿率为0.3%。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变化和尺寸变化，非常适合用于潮湿环境。

The moisture absorption of CSB-EPB18 plastic plain bearings is 0.3% in standard atmosphere. The max. water absorption is 0.5% in water. These values are very low, CSB-EPB18 plastic plain bearings is very well suited for used in wet applications.

### 抗UV性能 UV resistance

CSB-EPB18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-EPB18 after long period of exposing under the UV ray and therefore the performance of the material will be reduced.

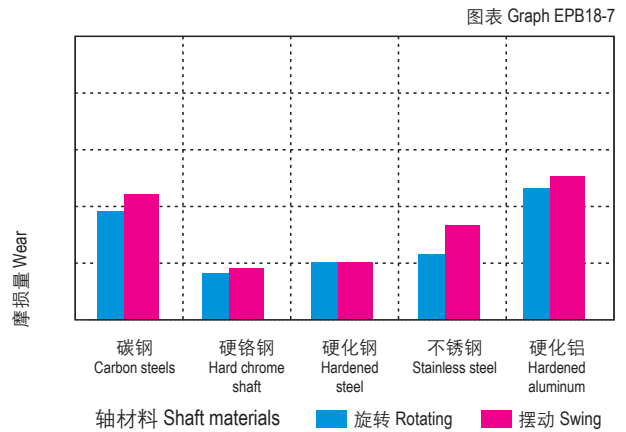
### 安装公差 Installation tolerances

CSB-EPB18塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB18 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

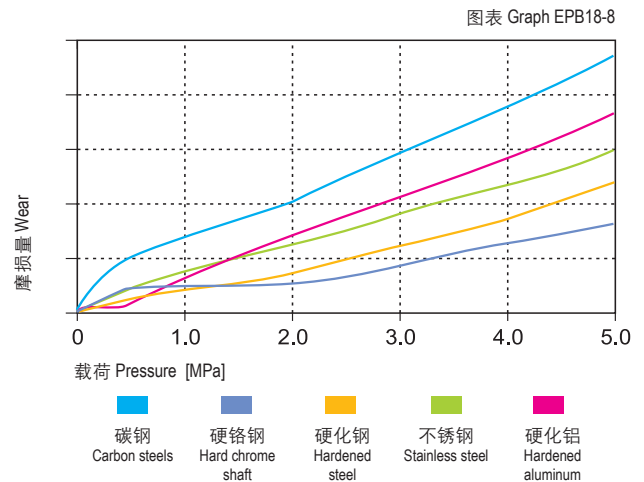
### 在不同轴材料上旋转时的磨损量 $p=2\text{MPa}$ , $v=0.2\text{m/s}$

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 EPB18 bearings

