



### 产品特性 Product features

- 作为兼顾耐磨性能和低廉的价格被开发的材料。适用于大批量低成本需求
- 连续使用温度: -40℃/+80℃
- 适合多数中低载荷场合
- 适合干运行、免维护
- 大批量、低成本要求
- This material is developed against the requirement of wear resistance and economic cost for cost effective and big quantity consuming applications
- Continuous working temperature: -40℃/+80℃
- Suitable for most of average and low load
- Maintenance-free dry operation
- Low cost for high quantities

● 标准产品规格表 Standard specifications: P124

### 材料数据表 Material properties data table

材料性能 Material properties	测试标准 Standard	单位 Unit	CSB-EPBH
颜色 Color	-	-	黑色 Black
密度 Density	ISO1183	g/cm <sup>3</sup>	1.43
最大吸湿率 Max. moisture absorption, 50%RH	ISO62	%	0.3
最大吸水率 Max. water absorption	ISO62	%	1.2
对钢动摩擦系数 Coefficient of sliding friction(steel)	ITS025	μ	0.05-0.20
极限PV值 Max. PV value	ITS026	N/mm <sup>2</sup> × m/s	0.30
弯曲模量 Flexural modulus	ISO178	MPa	2000
弯曲强度 Flexural strength	ISO178	MPa	60
最大静载荷 Max. static load	ITS027	MPa	30
最大动载荷 Max. dynamic load	ITS028	MPa	12
邵氏硬度 Shore hardness	ISO868	D	74
连续运行温度 Long-term application temperature	ITS029	℃	+80
短时运行温度 Short-term application temperature	ITS029	℃	+120
最低运行温度 Lowest application temperature	ITS029	℃	-40
导热性 Thermal conductivity	ISO22007	W/m/K	0.20
线性热膨胀系数 Coefficient of thermal expansion	ISO11359	K <sup>-1</sup> × 10 <sup>-5</sup>	10
阻燃等级 Flammability	UL94	Class	HB
体电阻率 Volume resistance	IEC60093	Ω · cm	>10 <sup>13</sup>
面电阻率 Surface resistance	IEC60093	Ω	>10 <sup>12</sup>

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

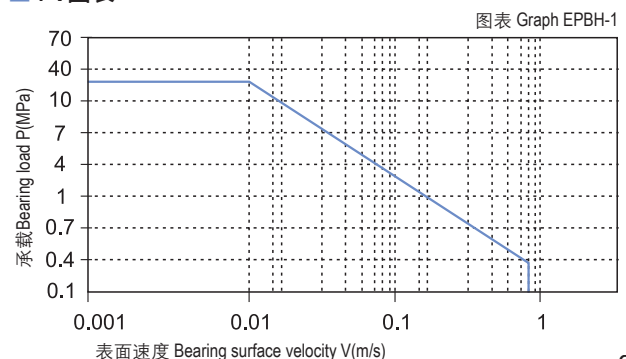
\*\*除非特殊说明测试温度为23℃ Test temperatures are 23℃ unless otherwise stated.

### 轴承PV值 PV value

CSB-EPBH塑料轴承最大运行PV值为0.3N/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EPBH-1。

The max PV value of the CSB-EPBH plastic bearings is 0.3N/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 EPBH-1).

■ PV图表 Permissible PV value for CSB-EPBH



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

CSB-EPBH塑料轴承可承受最大静载荷为30Mpa, 在此载荷下轴承的最大压缩变形量参考图表EPBH-2, 轴承实际工作载荷略小于30Mpa, 载荷还受到运行速度以及温度的影响, 速度越快 (Vmax: 0.8m/s) 会导致摩擦温度上升, 而温度上升 (Tmax: 80℃) 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EPBH-3。

CSB-EPBH allows the Max static load of 30Mpa, The max compressive deformation rate under the max load is listed in Graph EPBH-2, The actual load capacity of bearing is slightly less than 30Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.8m/s) results into higher temperature (Tmax: 80℃) which decreases the load capacity of the bearing. Please refer to the Graph EPBH-3 for such variation.

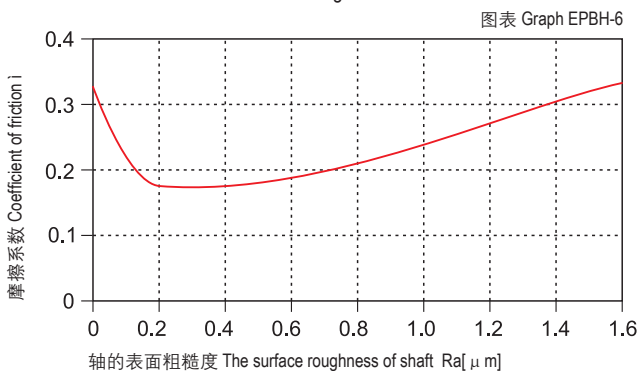
### 轴承的摩擦系数、磨损、轴材料 Friction factor, wear and shaft material

#### 摩擦系数 Friction factor

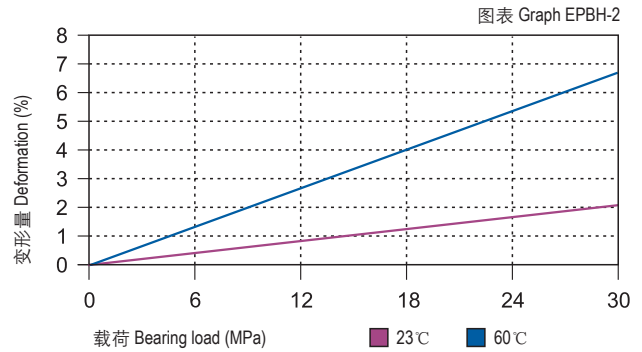
CSB-EPBH塑料轴承摩擦系数受运行速度以及轴承载荷变化影响相对较小 (见图表EPBH-4与图表EPBH-5), 这也是CSB-EPBH作为塑料轴承通用型号选择的因素; 此轴承可以一直保持比较低的摩擦系数从而确保了整个摩擦磨损性能的优越性。根据图表EPBH-6显示CSB-EPBH塑料轴承的摩擦系数还会受到对磨轴表面粗糙度的影响而发生变化, 我们推荐此轴承使用轴表面粗糙度值为Ra0.3~0.5um。

CSB-EPBH friction factor is not sensitive to the operation speed and bearing loading (see Graph EPBH-4 and Graph EPBH-5). The above features are the most common considerations for the bearing material selection. The friction of CSB-EPBH could be maintained at a relatively lower level so that the good wearing features are guaranteed. From the Graph EPBH-6, we could see that the friction factor is variable against the changing of shaft roughness. The recommended shaft roughness is Ra0.3~0.5.

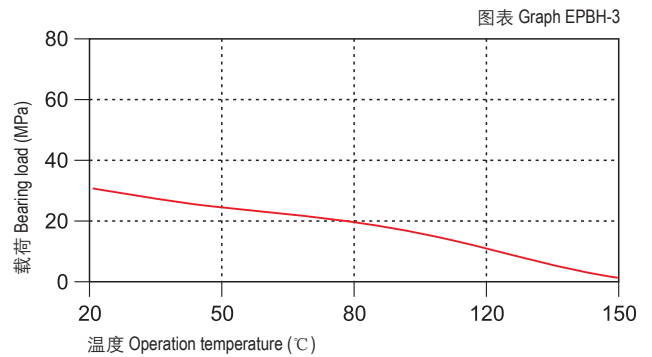
#### 摩擦系数与轴表面粗糙度关系图表 Coefficient of friction & the surface roughness of shaft



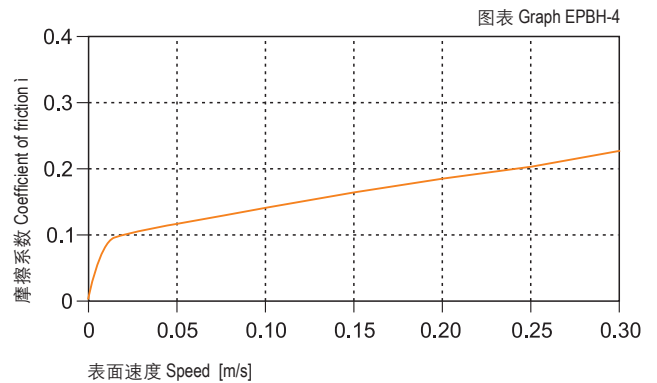
#### 载荷-温度-变形量图表 Load-Temperature deformation



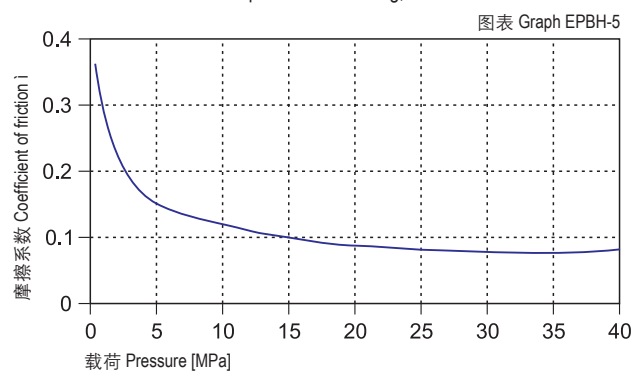
#### 载荷-温度图表 Load-Temperature diagrams



#### 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-EPBH	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 $\mu$ Friction coef.	0.05~0.20	0.09	0.04	0.04

## 磨损与轴材料 Wearing and shaft material

轴材料对轴承的磨损有很大影响，但CSB-EPBH轴承适合几乎所有的轴材料；通过图表EPBH-7与图表EPBH-8可以看出当使用硬铬钢轴或硬化钢轴时CSB-EPBH轴承的磨损特性都非常出色。

The shaft material is an important media for the bearing wearing but CSB-EPBH is suitable for almost all kinds of shaft materials. Graph EPBH-7 and Graph EPBH-8 show that the wearing feature of CSB-EPBH is excellent when the shaft material are hardened chrome steel or hardened steel.

## 化学抗性 Chemical resistance

CSB-EPBH塑料轴承能抵抗弱碱、弱酸以及各类润滑油的腐蚀。

CSB-EPBH is good at chemical resistance against mild base, weak acidic medium and various kinds of lubricants.

## 吸水性 Water absorption

CSB-EPBH塑料轴承在标准大气中的吸湿率为0.3%。浸泡在水中最高吸水率为1.2%。较低的吸水率只有在极端应用中才需要更改轴承设计。

The moisture absorption of CSB-EPBH plastic bearings is 0.3% in standard atmosphere. The max. water absorption is 1.2% in water. These values are so low that design changes due to absorption are only necessary in extreme applications.

## 抗UV性能 UV resistance

CSB-EPBH塑料轴承长久暴露在紫外线下颜色基本不会改变。材料的硬度、抗压强度和耐磨性都不会改变。

CSB-EPBH can maintain its color unchanged when it is exposed into the UV ray. The hardness, Compressive strength and wear resistance of the material is also stable under such condition.

## 安装公差 Installation tolerances

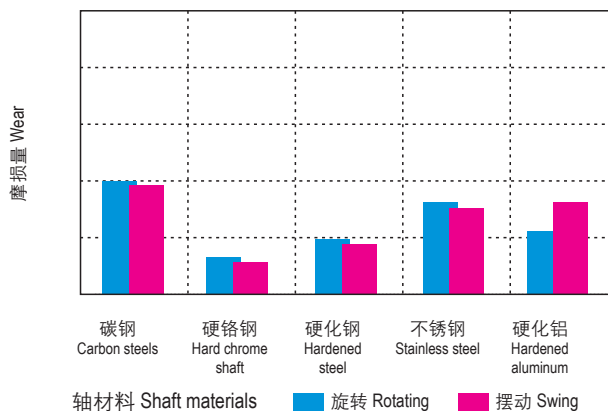
CSB-EPBH塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPBH 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,  $p = 2 \text{ MPa}$ ,  $v = 0.2 \text{ m/s}$

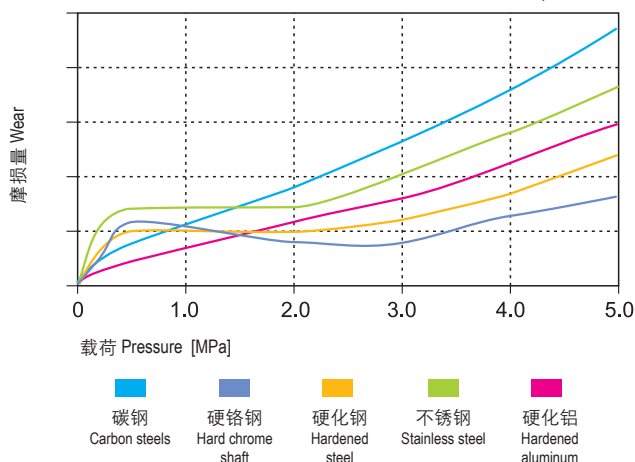
图表 Graph EPBH-7



### 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,  $v = 0.2 \text{ m/s}$

图表 Graph EPBH-8



### 吸水性的影响 Effect of moisture absorption on EPBH bearings

图表 Graph EPBH-9

