



### 产品特性 Product features

- 汽车行业标准材料。高温应用良好的性价比。在燃油中能保持极好的耐磨性能
- 连续使用温度: -40°C/+200°C
- 高温低成本解决方案
- 应用燃油中
- 良好的化学抗性
- 适合潮湿环境中使用
- Standard material for automotive industrial. Best and economic material for high temperature application. Excellent wear resistance is available in the vehicle fuels.
- Continuous working temperature: -40°C/+200°C
- High temperature and lower cost
- High wear resistance under fuel oil
- Good chemical resistance
- Suitable for humid environment

● 标准产品规格表 Standard specifications: P132

### 材料数据表 Material properties data table

材料性能 Material properties	测试标准 Standard	单位 Unit	CSB-EPB24
颜色 Color	-	-	棕色 Brown
密度 Density	ISO1183	g/cm <sup>3</sup>	1.72
最大吸湿率 Max. moisture absorption, 50%RH	ISO62	%	0.1
最大吸水率 Max. water absorption	ISO62	%	0.2
对钢动摩擦系数 Coefficient of sliding friction(steel)	ITS025	μ	0.08-0.25
极限PV值 Max. PV value	ITS026	N/mm <sup>2</sup> × m/s	0.60
弯曲模量 Flexural modulus	ISO178	MPa	10000
弯曲强度 Flexural strength	ISO178	MPa	210
最大静载荷 Max. static load	ITS027	MPa	110
最大动载荷 Max. dynamic load	ITS028	MPa	58
邵氏硬度 Shore hardness	ISO868	D	81
连续运行温度 Long-term application temperature	ITS029	°C	+200
短时运行温度 Short-term application temperature	ITS029	°C	+240
最低运行温度 Lowest application temperature	ITS029	°C	-40
导热性 Thermal conductivity	ISO22007	W/m/K	0.24
线性热膨胀系数 Coefficient of thermal expansion	ISO11359	K <sup>-1</sup> × 10 <sup>-5</sup>	5
阻燃等级 Flammability	UL94	Class	V0
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.

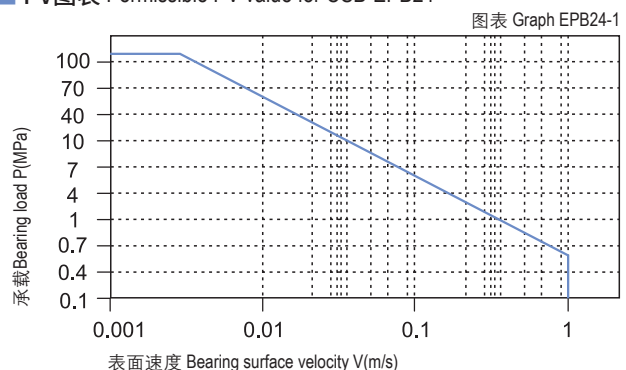
\*\*除非特殊说明测试温度为23°C Test temperatures are 23°C unless otherwise stated.

### 轴承PV值 PV value

CSB-EPB24塑料轴承最大运行PV值0.6N/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EPB24-1。

The max PV value of the CSB-EPB24 plastic bearings is 0.6N/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 EPB24-1).

■ PV图表 Permissible PV value for CSB-EPB24



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

CSB-EPB24塑料轴承可承受最大静载荷为110Mpa, 在此载荷下轴承的最大压缩变形量参考图表EPB24-2, 轴承实际工作载荷略小于110Mpa, 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: 200℃) 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EPB24-3。

CSB-EPB24 allows the Max static load of 110Mpa, The max compressive deformation rate under the max load is listed in Graph EPB24-1, The actual load capacity of bearing is slightly less than 110Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 200℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB24-3 for such variation.

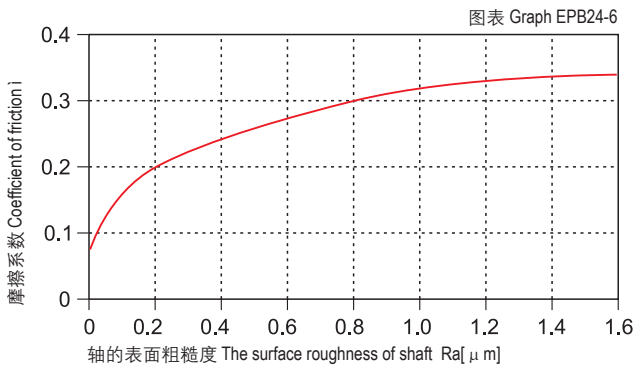
### 轴承的摩擦系数、磨损、轴材料 Friction factor, wear and shaft material

#### 摩擦系数 Friction factor

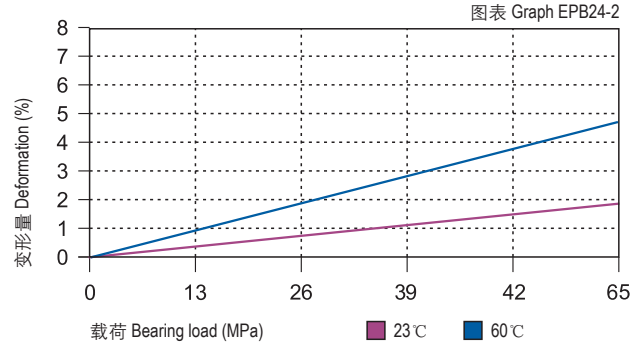
图表EPB24-4表明CSB-EPB24塑料轴承的摩擦系数在载荷保持不变的情况下受运行速度的增加影响相对较小; 图表EPB24-5表明CSB-EPB24塑料轴承在保持速度不变的情况下, 载荷从0增加到20Mpa过程中摩擦系数会逐步降低, 而当载荷高于20Mpa时摩擦系数随着载荷的增加影响较小。图表EPB24-6表明CSB-EPB24塑料轴承的摩擦系数会随着轴表面粗糙度的增大而逐渐升高, 我们推荐合适的轴粗糙度为Ra0.1 ~ 0.6 $\mu$ m。

Graph EPB24-4 shows the friction factor of CSB-EPB24 is not obviously effected by the operation speed when the loading is stable and Graph EPB24-5 shows it will be decreasing along with the loading is increased from 0 to 20 Mpa when the operation speed is unchanged, furthermore the friction factor will not be changed when the loading reaches 20Mpa upward. The friction factor of CSB-EPB24 is increased along with the increasing of the shaft roughness. The recommended shaft roughness is Ra0.1 to Ra0.6.

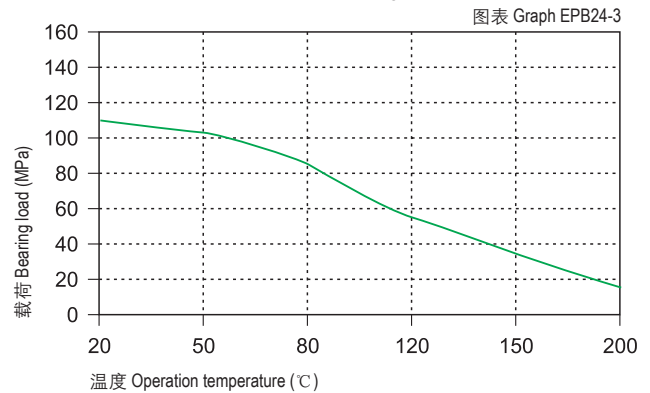
#### 摩擦系数与轴表面粗糙度关系图表 Coefficient of friction & the surface roughness of shaft



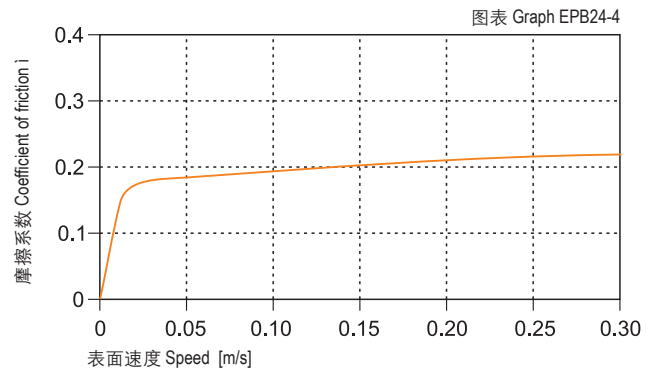
#### 载荷-温度-变形量图表 Load-Temperature deformation



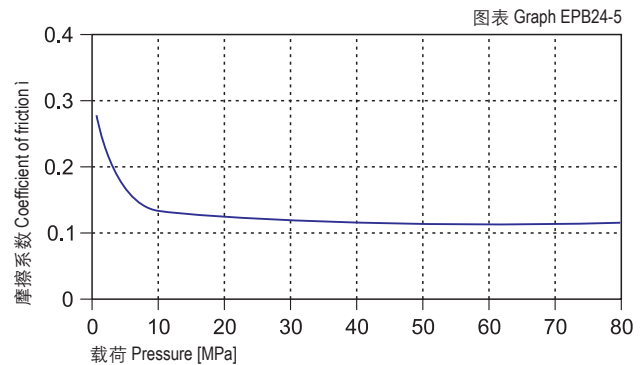
#### 载荷-温度图表 Load-Temperature diagrams



#### 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-EPB24	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 $\mu$ Friction coef.	0.08~0.25	0.09	0.04	0.04

### 磨损与轴材料 Wearing and shaft material

图表EPB24-7与图表EPB24-8表明CSB-EPB24塑料轴承适用于硬质轴，在硬化钢轴和碳钢轴上运行同样出色；但是硬铬钢轴不适合用于CSB-EPB24塑料轴承。CSB-EPB24塑料轴承在做摆动运动下的磨损要略好于旋转运动下的磨损，且当载荷超过10Mpa时轴承的磨损会很快增加。

Graph EPB24-7 and Graph EPB24-8 tells that the CSB-EPB24 is very good for Hardened shaft and soft shaft and it features excellent both on hardened steel shaft and carbon steel shaft but the hardened chrome steel shaft is not good for CSB-EPB24 bearings. The wearing of CSB-EPB24 is better on oscillation operation than on rotation operation. The wearing will be increased when the loading is over 10Mpa.

### 化学抗性 Chemical resistance

CSB-EPB24塑料轴承具有很好的化学抗性，能抵抗绝大多数酸碱。  
The Chemical Resistance of CSB-EPB24 is fairly good against most of Acid and Alkalis.

### 吸水性 Water absorption

CSB-EPB24塑料轴承在标准大气中的吸湿率为0.1%。浸泡在水中的最高吸水率为0.2%。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-EPB24 plastic plain bearings is 0.1% in standard atmosphere. The max. water absorption is 0.2% in water. These values are very low, CSB-EPB24 plastic plain bearings is very well suited for used in wet applications.

### 抗UV性能 UV resistance

CSB-EPB24塑料轴承长久暴露在紫外线下材料表面会发生蜕变，抗压强度会下降。

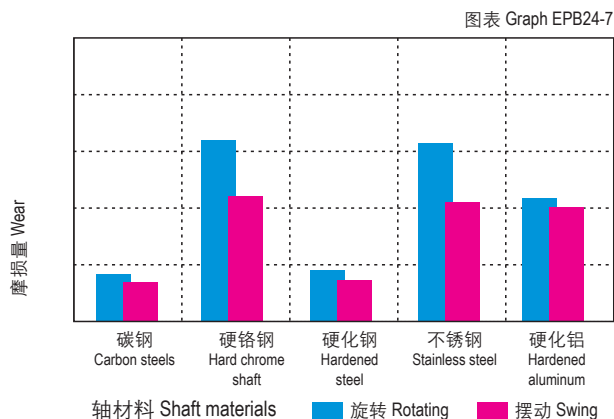
Disintegration could be possible for the material CSB-EPB24 after long period of exposing under the UV ray and therefore the compressive strength will be reduced.

### 安装公差 Installation tolerances

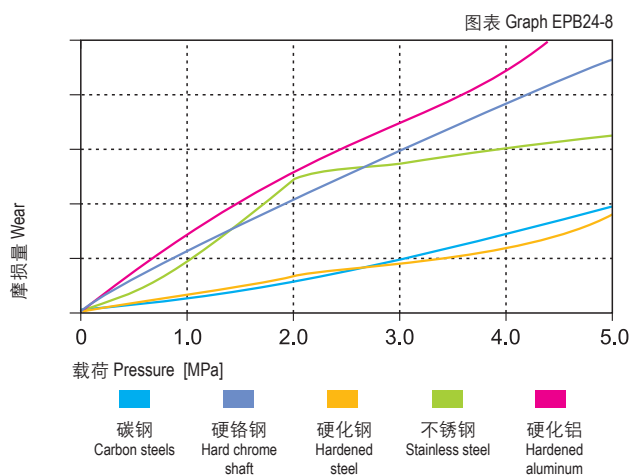
CSB-EPB24塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB24 F10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>0 ~ 3	+0.006 ~ +0.046	0 ~ +0.010	0 ~ -0.025
>3 ~ 6	+0.010 ~ +0.058	0 ~ +0.012	0 ~ -0.030
>6 ~ 10	+0.013 ~ +0.071	0 ~ +0.015	0 ~ -0.036
>10 ~ 18	+0.016 ~ +0.086	0 ~ +0.018	0 ~ -0.043
>18 ~ 30	+0.020 ~ +0.104	0 ~ +0.021	0 ~ -0.052
>30 ~ 50	+0.025 ~ +0.125	0 ~ +0.025	0 ~ -0.062

### 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, $p = 2 \text{ MPa}$ , $v = 0.2 \text{ m/s}$

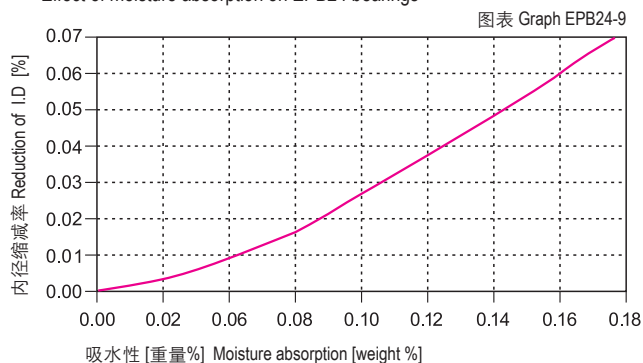


### 旋转磨损随轴材料与压力变化关系 $v=0.2\text{m/s}$ Wear & pressure under rotating with different shaft materials, $v = 0.2 \text{ m/s}$



### 吸水性的影响

Effect of moisture absorption on EPB24 bearings



直径 Di. [mm]	CSB-EPB24 F10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>50 ~ 80	+0.030 ~ +0.150	0 ~ +0.030	0 ~ -0.074
>80 ~ 120	+0.036 ~ +0.176	0 ~ +0.035	0 ~ -0.087
>120 ~ 180	+0.043 ~ +0.203	0 ~ +0.040	0 ~ -0.100