



### 产品特性 Product features

- 一种专门为水下应用而开发的材料。在水下耐磨性尤为出色，可在200度的化学液体中连续运动
- 连续使用温度: -40℃/+200℃
- 重载下耐磨性较好
- 适合水下运行、免维护
- 化学抗性好
- A special material for the application in water. The wear resistance could even be improved in water. It is able to be continuously operated in a chemical liquid with temperature of 200 °C
- Continuous working temperature: -40℃/+200℃
- Good wear resistance under high load
- Suitable for underwater operation
- Good chemical resistance

● 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-EPB8
颜色 Color	-	-	深灰 Dark grey
密度 Density	ISO1183	g/cm <sup>3</sup>	1.55
最大吸湿率 Max. moisture absorption, 50%RH	ISO62	%	0.1
最大吸水率 Max. water absorption	ISO62	%	0.1
对钢动摩擦系数 Coefficient of sliding friction(steel)	ITS025	μ	0.07-0.18
极限PV值 Max. PV value	ITS026	N/mm <sup>2</sup> × m/s	0.80
弯曲模量 Flexural modulus	ISO178	MPa	8000
弯曲强度 Flexural strength	ISO178	MPa	150
最大静载荷 Max. static load	ITS027	MPa	85
最大动载荷 Max. dynamic load	ITS028	MPa	47
邵氏硬度 Shore hardness	ISO868	D	82
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	0.50
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>5</sup>
面电阻率 Surface resistance	IEC60093	Ω	>10 <sup>5</sup>

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

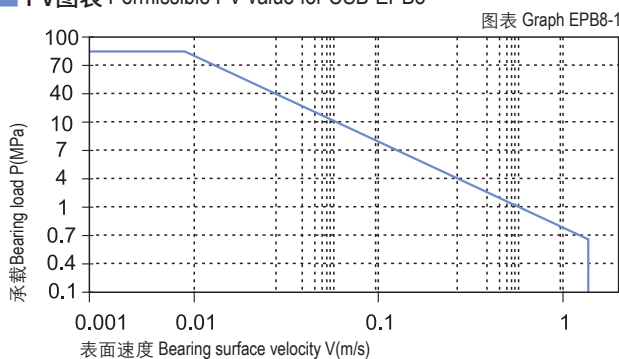
\*\*除非特殊说明测试温度为23℃ Test temperatures are 23℃ unless otherwise stated.

### 轴承PV值 PV value

CSB-EPB8塑料轴承最大运行PV值为0.8N/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EPB8-1。

The max PV value of the CSB-EPB8 plastic bearings is 0.8N/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 EPB8-1).

■ PV图表 Permissible PV value for CSB-EPB8



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

CSB-EPB8塑料轴承可承受最大静载荷为85Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB8-2，轴承实际工作载荷略小于85Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax: 1.2m/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EPB8-3。

CSB-EPB8 allows the Max static load of 85Mpa, The max compressive deformation rate under the max load is listed in Graph EPB8-2, The actual load capacity of bearing is slightly less than 85Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.2m/s) results into higher temperature (Tmax: 200℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB8-3 for such variation.

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

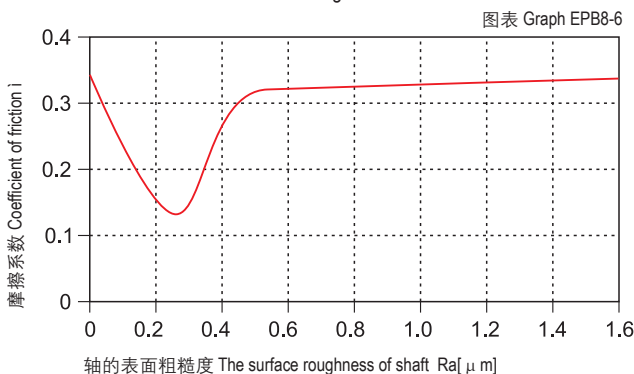
#### 摩擦系数 Friction factor

图表EPB8-4表明CSB-EPB8塑料轴承的摩擦系数在载荷保持不变时随着运行速度的增加影响较小；专用润滑剂的植入使得此轴承更适合用于水下。图表EPB8-5表明CSB-EPB8塑料轴承在速度保持不变的情况下载荷超过20Mpa摩擦系数随着载荷的变化相对较小。图表EPB8-6表明轴表面粗糙度对CSB-EPB8塑料轴承的摩擦系数影响较大，在轴表面粗糙度超过Ra0.7时趋于平稳。我们推荐使用轴的表面粗糙度为Ra0.2 ~ 0.3um。

Graph EPB8-4 shows that the friction factor of CSB-EPB8 is not considerably affected by the operation speed when the loading is stable. The special embedded lubricant helps the material to be suitable for the underwater operation. When the operation speed keeps stable and the loading is over 20Mpa, the friction factor of CSB-EPB8 is not variable along with the loading change (See Graph EPB8-5). The shaft roughness highly affects the friction factor but this affecting will be stable when the shaft roughness is better than Ra0.7 (See Graph EPB8-6). The recommended shaft roughness is Ra0.2 to Ra0.3.

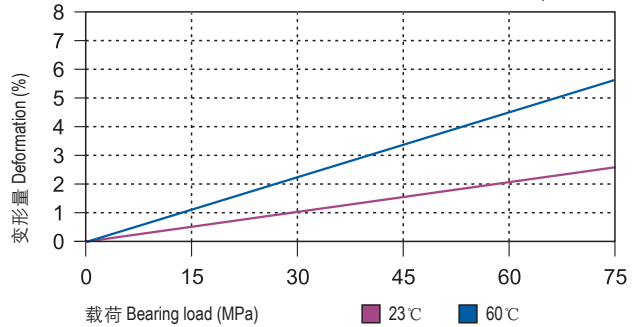
#### 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft



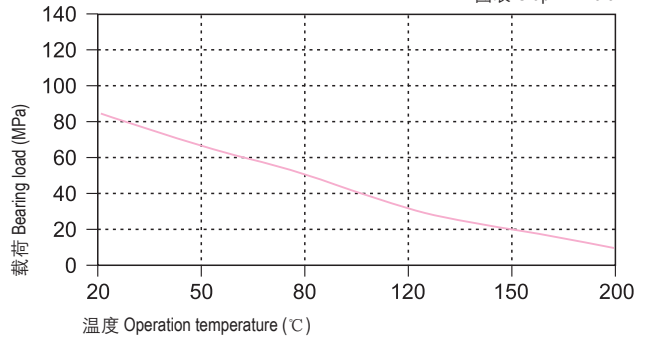
#### 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB8-2



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

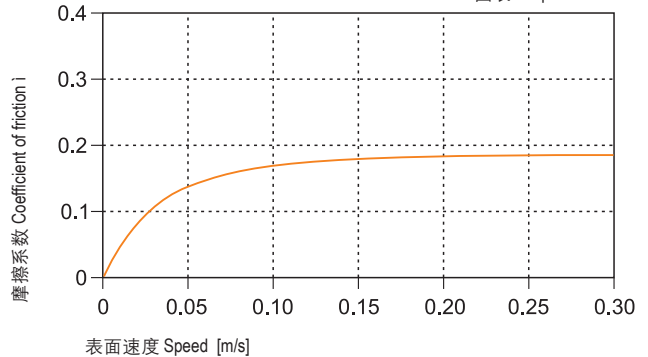
图表 Graph EPB8-3



#### 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

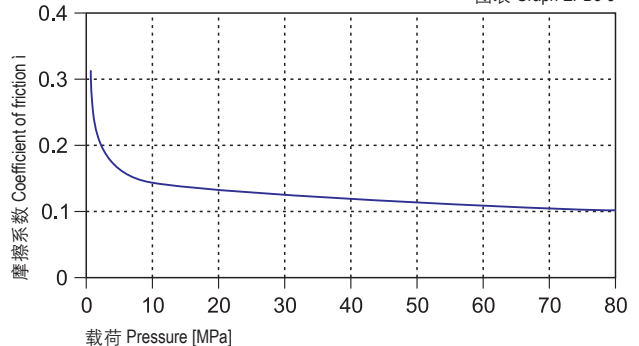
图表 Graph EPB8-4



#### 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 EPB8-5



CSB-EPB8	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 $\mu$ Friction coef.	0.07~0.18	0.09	0.04	0.04

### 磨损与轴材料 Wearing and shaft material

图表EPB8-7与图表EPB8-8对CSB-EPB8塑料轴承在不同轴材料旋转运动下的测试结果表明，CSB-EPB8塑料轴承最理想的轴材料是硬铬钢轴，而不锈钢轴不适合用于此轴承。CSB-EPB8塑料轴承在摆动运动中采用不锈钢轴或硬铬钢轴比较适合，而在旋转运动中硬铬钢轴依然是更佳的选择。

The rotation test against different shaft material showing in Graph EPB8-7 and Graph EPB8-8 induces that the best mating shaft material for the material CSB-EPB8 is hardened chrome steel shaft but not stainless steel shaft. CSB-EPB8 is best for stainless steel and hardened chrome steel shaft in oscillation operation and especially the hardened chrome steel shaft is the best choice in rotation operation.

### 化学抗性 Chemical resistance

CSB-EPB8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-EPB8 is fairly good against most of Acid and Alkalis.

### 吸水性 Water absorption

CSB-EPB8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0.1%。极低吸水率不会导致轴承发生性能和尺寸变化，非常适合用于水下。

The moisture absorption of CSB-EPB8 plastic plain bearings is 0.1% in standard atmosphere. The max. water absorption is 0.1% in water. These values are very low, CSB-EPB8 plastic plain bearings is very well suited for used in water.

### 抗UV性能 UV resistance

CSB-EPB8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-EPB8 after long period of exposing under the UV ray and therefore the compressive strength will be reduced.

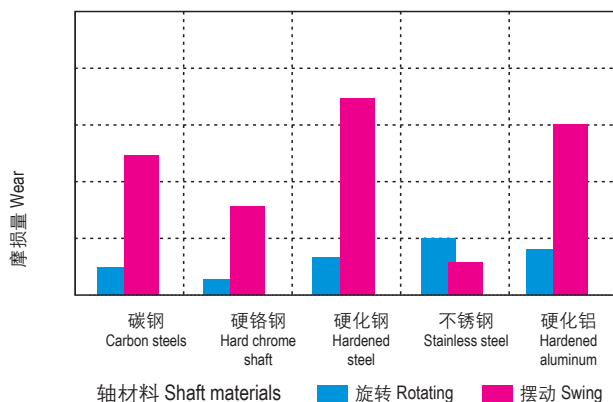
### 安装公差 Installation tolerances

CSB-EPB8塑料轴承压装后公差 Tolerances after pressfit

直径 Di [mm]	CSB-EPB8 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
>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

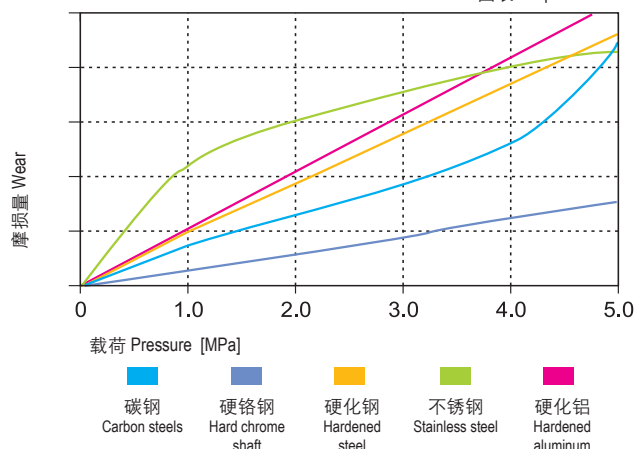
### 在不同轴材料上旋转时的磨损量 $p=2\text{MPa}$ , $v=0.2\text{m/s}$ Wear under rotating with different shaft materials, $p = 2 \text{ MPa}$ , $v = 0.2 \text{ m/s}$

图表 Graph EPB8-7



### 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 EPB8-8



### 吸水性的影响 Effect of moisture absorption on EPB8 bearings

图表 Graph EPB8-9

