

产品特性 Product features

- 不含PTFE和Silicon材料。应用于食品加工和包装工业
- 连续使用温度: -40℃/+80℃
- 对轴表面粗糙度要求低
- 较低的摩擦系数
- 适用于软轴
- FDA等级食品安全认证
- It is a PTFE and Silicon free material widely used in the food and packing machineries.
- Continuous working temperature: -40℃/+80℃
- No special requirement on the surface roughness
- Low friction coefficient
- Applicable for flexible shaft
- FDA grade

● 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-EPB6A
颜色 Color	-	-	白色 White
密度 Density	ISO1183	g/cm ³	1.10
最大吸湿率 Max. moisture absorption, 50%RH	ISO62	%	1.5
最大吸水率 Max. water absorption	ISO62	%	7.6
对钢动摩擦系数 Coefficient of sliding friction(steel)	ITS025	μ	0.10-0.40
极限PV值 Max. PV value	ITS026	N/mm ² × m/s	0.10
弯曲模量 Flexural modulus	ISO178	MPa	1300
弯曲强度 Flexural strength	ISO178	MPa	55
最大静载荷 Max. static load	ITS027	MPa	35
最大动载荷 Max. dynamic load	ITS028	MPa	12
邵氏硬度 Shore hardness	ISO868	D	70
连续运行温度 Long-term application temperature	ITS029	℃	+80
短时运行温度 Short-term application temperature	ITS029	℃	+170
最低运行温度 Lowest application temperature	ITS029	℃	-40
导热性 Thermal conductivity	ISO22007	W/m/K	0.23
线性热膨胀系数 Coefficient of thermal expansion	ISO11359	K ⁻¹ × 10 ⁻⁵	11
阻燃等级 Flammability	UL94	Class	HB
体电阻率 Volume resistance	IEC60093	Ω · cm	>10 ¹³
面电阻率 Surface resistance	IEC60093	Ω	>10 ¹²

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

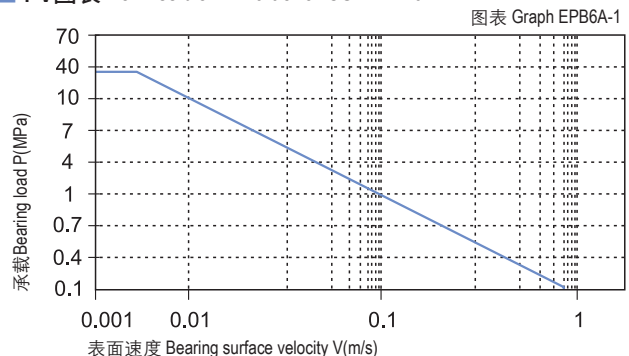
**除非特殊说明测试温度为23℃ Test temperatures are 23℃ unless otherwise stated.

轴承PV值 PV value

CSB-EPB6A塑料轴承最大运行PV值为0.1N/mm² × 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EPB6A-1。

The max PV value of the CSB-EPB6A plastic bearings is 0.1N/mm² × 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 EPB6A-1).

■ PV图表 Permissible PV value for CSB-EPB6A



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

CSB-EP6A塑料轴承可承受最大静载荷为35Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB6A-2，轴承实际工作载荷略小于35Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax: 0.6m/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EPB6A-3。

CSB-EP6A allows the Max static load of 35Mpa, The max compressive deformation rate under the max load is listed in Graph EPB6A-2, The actual load capacity of bearing is slightly less than 35Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.6m/s) results into higher temperature (Tmax: 80℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB6A-3 for such variation.

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

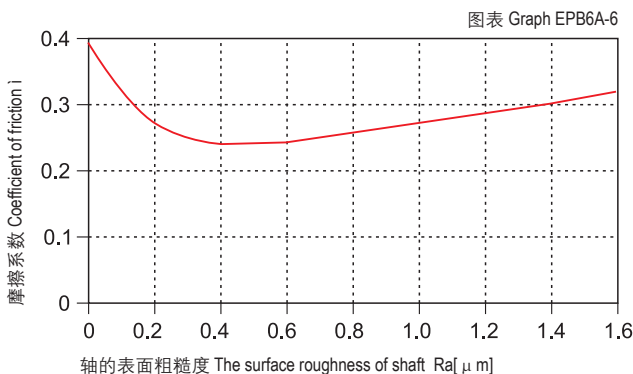
摩擦系数 Friction factor

图表EPB6A-4表明CSB-EP6A塑料轴承的摩擦系数在载荷一定的情况下随着运行速度的增加而快速升高；图表EPB6A-5表明CSB-EP6A塑料轴承在速度一定的情况下载荷低于10Mpa时摩擦系数随着载荷的增加而逐步降低，而当载荷高于10Mpa时摩擦系数的变化相对比较平缓。图表EPB6A-6表明CSB-EP6A塑料轴承的摩擦系数受轴表面粗糙度影响比较大，我们推荐使用轴表面粗糙度为Ra0.3 ~ 0.6um。

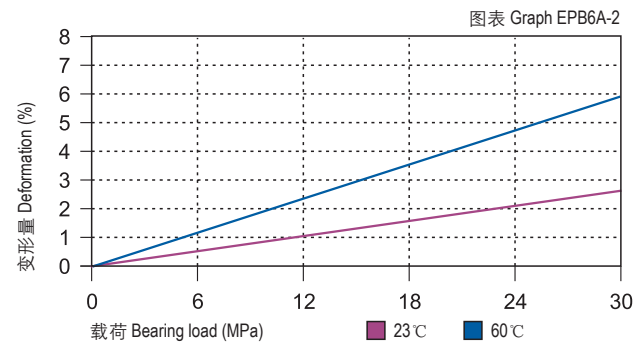
CSB-EP6A Bearing Friction factor is increased along with the increasing of the operation speed under certain loading (See Graph EPB6A-4). The friction factor of CSB-EP3M is decreased along with the loading increasing not over 10Mpa (see Graph EPB6A-5). The friction factor will not change much along with the speed when the loading is over 10Mpa. The Graph EPB6A-6 shows that the bearing could achieve its best performance when the counter shaft surface roughness is around Ra0.3 to Ra0.6.

摩擦系数与轴表面粗糙度关系图表

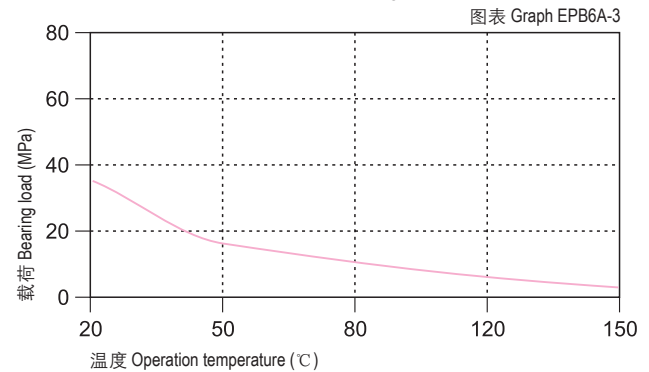
Coefficient of friction & the surface roughness of shaft



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

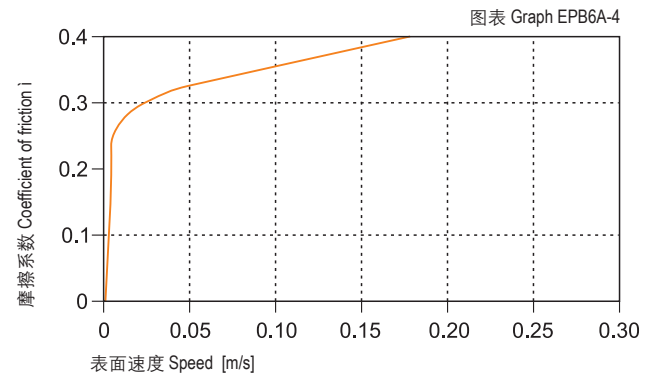


载荷-温度图表 Load-Temperature diagrams



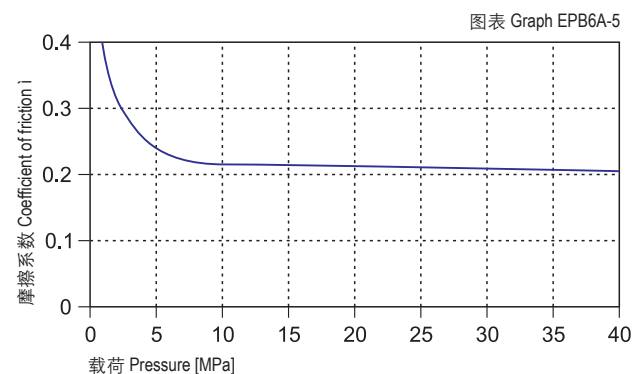
摩擦系数与速度变化关系图表 P=2MPa

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-EPB6A	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.10~0.40	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB6A-7与图表EPB6A-8为CSB-EPB6A塑料轴承在不同轴材料下旋转运动的结果，由此表明CSB-EPB6A塑料轴承磨损受轴材料影响比较大，通过试验结果我们推荐使用硬铬轴。图表EPB6A-7表明CSB-EPB6A塑料轴承在大多数情况下比较适合用于摆动，但当轴材料为硬铬钢时旋转运动效果是最佳的，而在做摆动运动时硬铬碳轴效果是更好的。

Graph EPB6A-7 and Graph EPB6A-8 show the test results of the material CSB-EPB6A running against different shaft materials. The test result induces that the wearing is considerably affected by the different shaft materials. It is recommended to use hard chrome steel shaft for this material. Graph EPB6A-7 shows CSB-EPB6A is commonly suitable for oscillation operation but it features well for the rotation operation when the shaft material is hard chrome and it is good for oscillation operation when the shaft material is carbon steel steel.

化学抗性 Chemical resistance

CSB-EPB6A塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。CSB-EPB6A is good at chemical resistance against weak acidic medium and various kinds of lubricants.

吸水性 Water absorption

CSB-EPB6A塑料轴承在标准大气中的吸湿率为1.5%。浸泡在水中最高吸水率为7.6%。由于高吸水率的特性，我们必须考虑此轴承的应用环境。

The moisture absorption of CSB-EPB6A plastic plain bearings is 1.5% in standard atmosphere. The max. water absorption is 7.6% in water. The application environment has to be considered due to the high water absorption properties.

抗UV性能 UV resistance

CSB-EPB6A塑料轴承长久暴露在紫外线下材料性能基本都不会发生改变。

When CSB-EPB6A is exposed into the UV ray, the material performance stays stable.

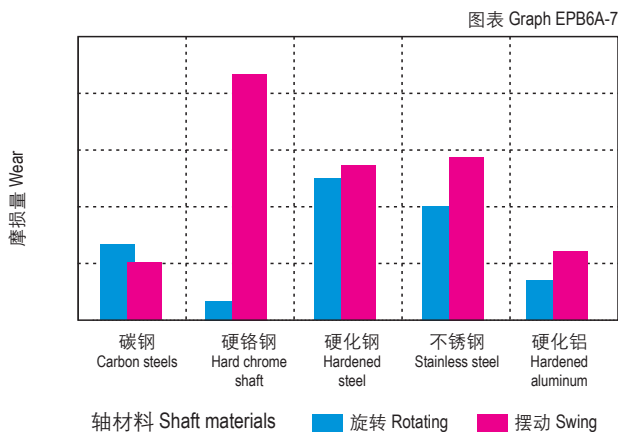
安装公差 Installation tolerances

CSB-EPB6A塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB6A 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

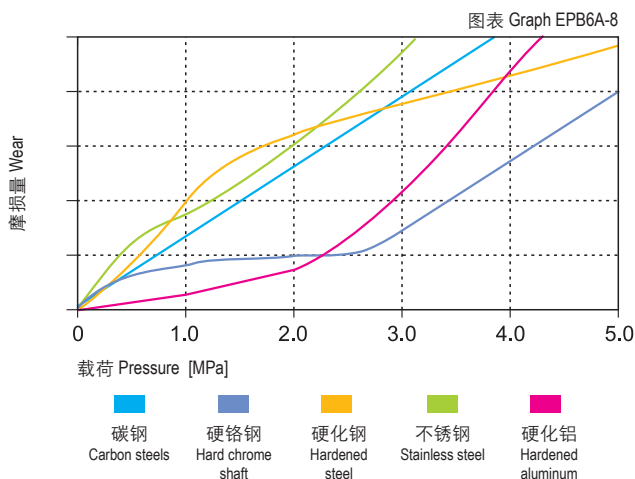
在不同轴材料上旋转时的磨损量 $p=2\text{MPa}$, $v=0.2\text{m/s}$

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 EPB6A bearings

