CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB14A

◉ 标准产品规格表 Standard specifications: P153

产品特性 Product Features

- 符合FDA标准的高速高温材料。极低的摩擦系数，适用于低载荷下的高速运动。抗化学液体腐蚀性能同样出色。环境温度高于135度需考虑额外限位装置
- 连续使用温度：-200℃/+260℃
- 适合中等载荷与高速运动
- 软轴许可
- 高化学抗性
- 适合在液体运行
- FDA等级允许食品和药品接触

- High speed and high temperature material comforms to FDA regulations. With low friction, it is suitable for low load high speed applications. It has excellent chemical resistance feature. When the temperature is higher than 135℃, additional location ring is neccessary.
- Continuous working temperature: -200℃/+260℃
- Middle load and high surface speed
- Soft material shaft can be used
- High chemical resistance
- Suitable for working in liquid
- Meet FDA standards for contact with food

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB14A
密度 Density	ISO1183	g/cm^3	2.02
颜色 Color			黄色Yellow
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.15
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.4
最大旋转速度值 Max. roatating velocity		m/s	2.0
最大摇摆速度值 Max. oscillating velocity		m/s	3.5
最大直线速度值 Max. linear velocity		m/s	7
抗拉强度 Tensile strength	ISO527	MPa	18
抗压强度 (轴向) Compressive strength (Axial)		MPa	10
弹性模量 E-module	ISO527	MPa	830
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	10
邵氏硬度 Shore hardness	ISO 868	D	67
连续工作温度 Continuous work temperature		℃	-200/+260
短时运行温度 Short-time work temperature		℃	-200/+310
导热性 Thermal conductivity	ASTME1461	W / m × k	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	13
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	＜0.1
最大吸水率23℃ Max. water absorption, 23℃		%	＜0.1
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{15}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$

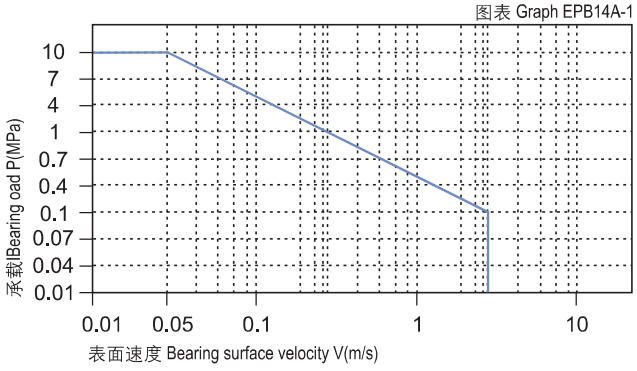
轴承PV值 PV Value

CSB-EPB14A塑料轴承最大运行PV值为0.4N/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EPB14A-1。

The max PV value of the CSB-EPB14A plastic bearings is 0.4N/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 EPB14A-1).

PV图表 Permissible PV value for CSB-EPB14A

图表 Graph EPB14A-1



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轴承的载荷、速度、温度
Load, Speed and Temperature

CSB-EPB14A塑料轴承可承受最大静载荷为10Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB14A-2，轴承实际工作载荷略小于10Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：5.0m/s) 会导致摩擦温度上升，而温度上升 (Tmax：260℃) 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EPB14A-3。

CSB-EPB14A allows the Max static load of 10Mpa, The max compressive deformation rate under the max load is listed in Graph EPB14A-2, The actual load capacity of bearing is slightly less than 10Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 5.0m/s) results into higher temperature (Tmax: 260℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB14A-3 for such variation.

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

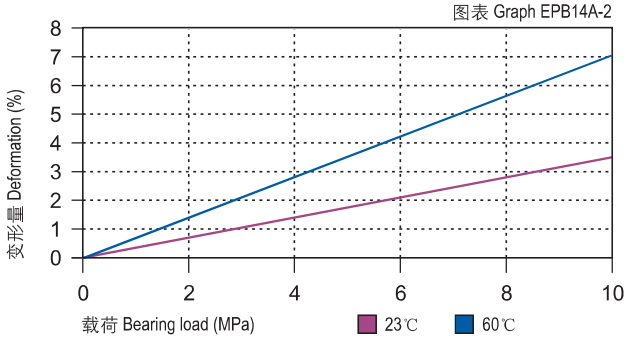
摩擦系数 Friction Factor

CSB-EPB14A轴承的摩擦系数会随着载荷的增加而快速降低；而高速对此轴承产生的变化影响也相对较小（见图EPB14A-4与图EPB14A-5）；此轴承适合用于高速而非高载情况下的高PV值情况；根据图EPB14A-6显示CSB-EPB14A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Ra0.2 ~ 0.5um。

A rapid decrease in friction can be observed as load increases for CSB-EPB14A bearings. A higher surface speed has less impact on the coefficient of friction of this bearing. (EPB14A-4 and EPB14A-5) CSB-EPB14A is suitable for applications in which high pv values are given mainly through the high surface speed and not as much through the surface pressure. From the figure EPB14A-6, we could see that the friction factor is variable against the changing of shaft roughness. The recommended shaft roughness is Ra0.2 ~ 0.5um.

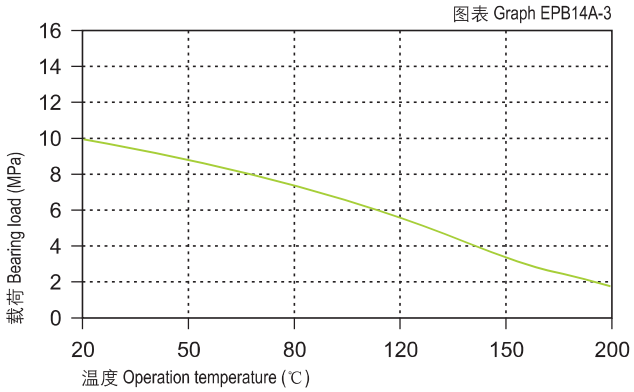
载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB14A-2



载荷-温度图表 Load-Temperature diagrams

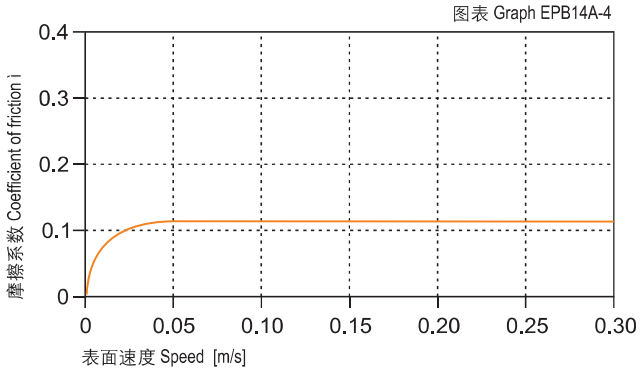
图表 Graph EPB14A-3



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

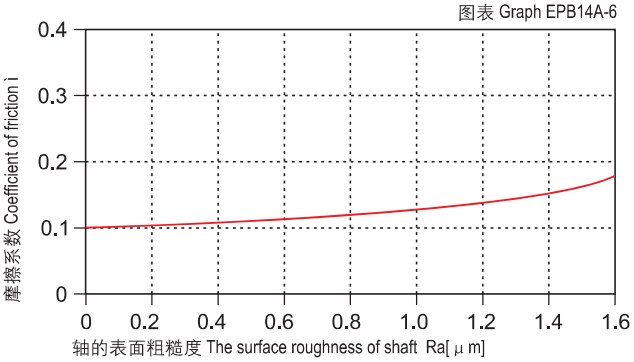
图表 Graph EPB14A-4



摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

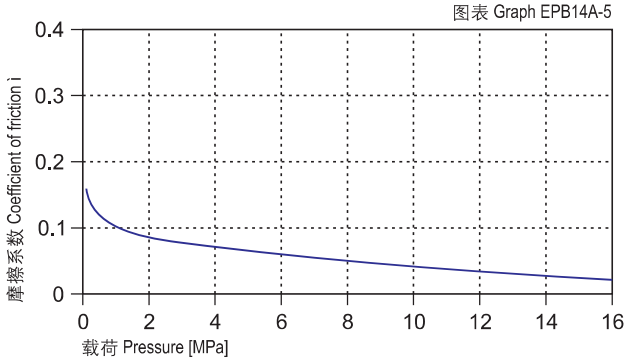
图表 Graph EPB14A-6



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 EPB14A-5



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CSB-EPB14A	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.03~0.15	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

CSB-EPB14A轴承适合几乎所有的轴材料；通过图EPB14A-7可以看出当使用不锈钢轴或硬化铝轴以及硬铬轴等时CSB-EPB14A轴承的磨损特性都非常出色。图EPB14A-7显示CSB-EPB14A轴承适合用于旋转运动场合，由于一开始运动就具有极低的摩擦系数，所以CSB-EPB14A也适合用于摆动和间隙性旋转运动场合。

CSB-EPB14A is suitable for almost all kinds of shaft materials. Graph EPB14-7 shows that the wearing feature of CSB-EPB14A is excellent when the shaft material are stainless steel、hardened Aluminum or hardened chrome steel. Graph EPB14-7 shows that the material CSB-EPB14 is most suitable for the rotation operation. Since start-up friction is extremely low, this makes CSB-EPB14A bearings the ideal choice for oscillating or start-stop applications.

化学抗性 Chemical Resistance

CSB-EPB14A塑料轴承具有极好的化学抗性，能抵抗大部分强酸强碱以及各类润滑剂。

CSB-EPB14A is good at chemical resistance against weak acidic medium and various kinds of lubricants.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB14A塑料轴承的吸水率极低小于0.1%，浸泡水中最大平衡吸水率小于0.1%；因此材料不会吸水而发生性能和尺寸变化，适合用于潮湿环境或水下。

The water absorb rate of CSB-EPB14A is less than 0.1% under the atmospheric pressure while it is less than 0.1% when the material is immerged into water. The material performance and dimensions of the material is stabilized for the applications under humid environment or even in the water.

抗UV性能 UV Resistance

CSB-EPB14A长久暴露在紫外线下材料性能不会发生变化。

CSB-EPB14A can maintain its performance to be stable even exposed in the UV ray for long period.

安装公差 Installation Tolerances

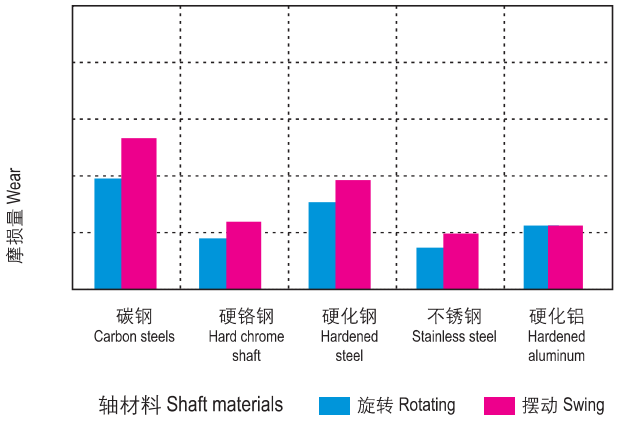
CSB-EPB14A塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB14A D11 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>0 ~ 3	+0.020 ~ +0.080	0 ~ +0.010	0 ~ -0.025
>3 ~ 6	+0.030 ~ +0.105	0 ~ +0.012	0 ~ -0.030
>6 ~ 10	+0.040 ~ +0.130	0 ~ +0.015	0 ~ -0.036
>10 ~ 18	+0.050 ~ +0.160	0 ~ +0.018	0 ~ -0.043
>18 ~ 30	+0.065 ~ +0.195	0 ~ +0.021	0 ~ -0.052
>30 ~ 50	+0.080 ~ +0.240	0 ~ +0.025	0 ~ -0.062
>50 ~ 80	+0.100 ~ +0.290	0 ~ +0.030	0 ~ -0.074

在不同轴材料上旋转时的磨损量 p=2MPa, v=0.2m/s

Wear under rotating with different shaft materials, p = 2 MPa, v = 0.2 m/s

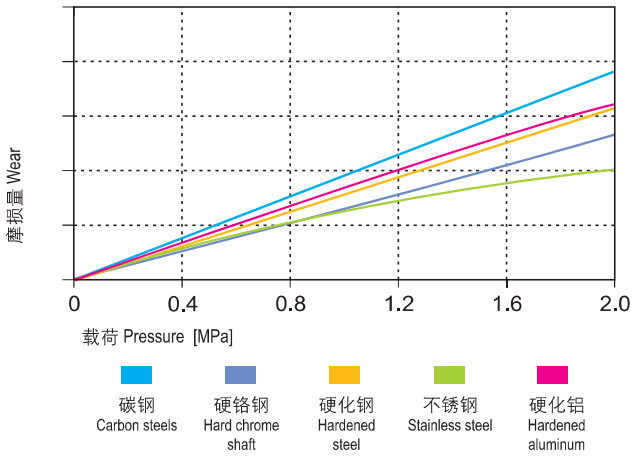
图表 Graph EPB14A-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB14A-8



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