CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB

◉ 标准产品规格表 Standard specifications: P136

产品特性 Product Features

- 通用性最强的CSB塑料轴承。可满足工作温度80度以下的大部分应用场合，出色的耐磨性能和合理的价格往往是设计工程师的首选材料。
- 连续使用温度：-40℃/+80℃
- 通用性强适合多数中低载荷场合
- 适合干运行、免维护
- 不同轴材料磨损很小
- 较低的摩擦系数

- The most common CSB plastic bearing material. It is suitbale for the applications with working temperature not higher than 80℃. It is the prefereable material with good wear resistance and economic efficient for a new designation
- Continuous working temperature: -40℃/+80℃
- Very common; suitable for most of average and low load
- Maintenance-free dry operation
- Light wear against different shaft materials
- Low friction

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB
密度 Density	ISO1183	g/cm^3	1.46
颜色 Color			深灰Dark Grey
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	1.0
最大摇摆速度值 Max. oscillating velocity		m/s	0.7
最大直线速度值 Max. linear velocity		m/s	3.0
抗拉强度 Tensile strength	ISO527	MPa	80
抗压强度 (轴向) Compressive strength (Axial)		MPa	65
弹性模量 E-module	ISO527	MPa	2300
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	35
邵氏硬度 Shore hardness	ISO 868	D	75
连续工作温度 Continuous work temperature		℃	-40/+80
短时运行温度 Short-time work temperature		℃	-40/+120
导热性 Thermal conductivity	ASTME1461	W / m × k	0.2
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	10
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2
最大吸水率23℃ Max. water absorption, 23℃		%	1.2
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{12}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$

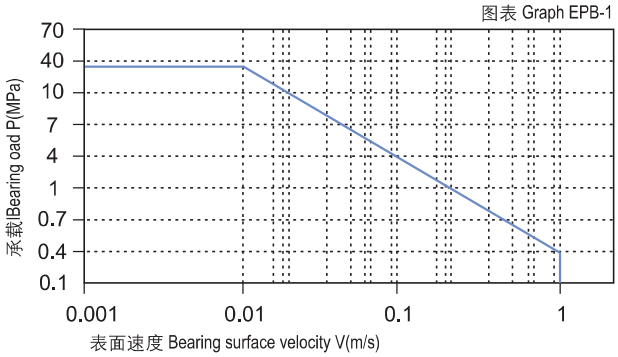
轴承PV值 PV Value

CSB-EPB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EPB-1。

The max PV value of the CSB-EPB 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 EPB-1).

PV图表 Permissible PV value for CSB-EPB

图表 Graph EPB-1



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

CSB-EPB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EPB-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: 1.0m/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EPB-3。

CSB-EPB allows the Max static load of 35Mpa, The max compressive deformation rate under the max load is listed in Graph EPB-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: 1.0m/s) results into higher temperature (Tmax: 80℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB-3 for such variation.

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

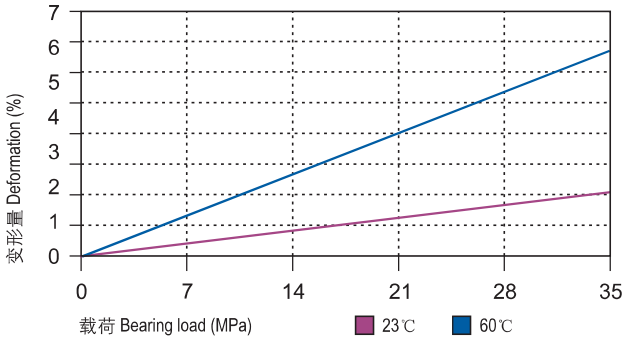
摩擦系数 Friction Factor

CSB-EPB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EPB-4与图表EPB-5），这也是CSB-EPB作为塑料轴承通用型号选择的因素；此轴承可以保持一直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EPB-6显示CSB-EPB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-EPB friction factor is not sensitive to the operation speed and bearing loading (see Graph EPB-4 and Graph EPB-5). The above features are the most common considerations for the bearing material selection. The friction of CSB-EPB could be maintained at a relatively lower level so that the good wearing features are guaranteed. From the Graph EPB-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.

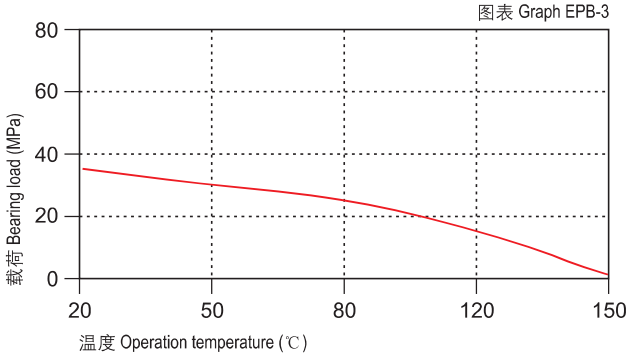
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB-2



■ 载荷-温度图表 Load-Temperature diagrams

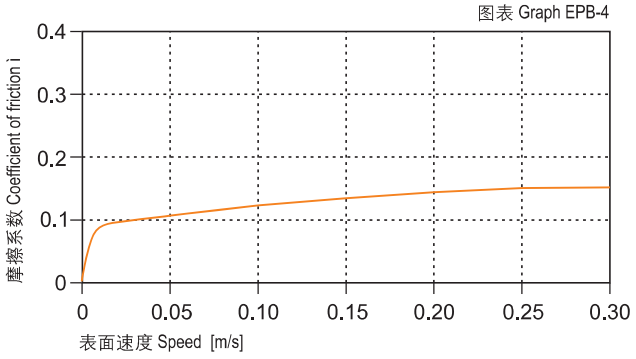
图表 Graph EPB-3



■ 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

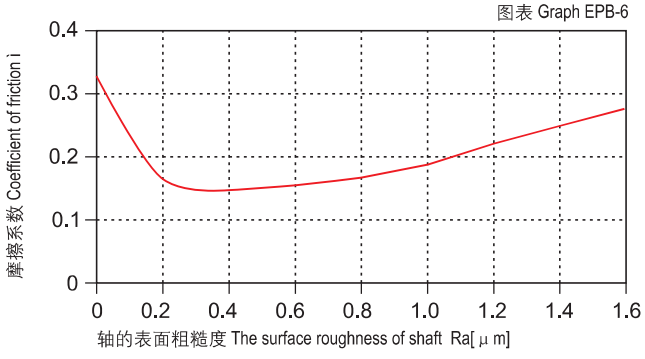
图表 Graph EPB-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

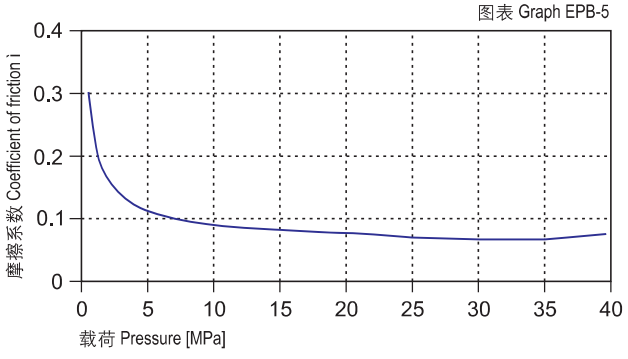
图表 Graph EPB-6



■ 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 EPB-5



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CSB-EPB	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05~0.15	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-EPB轴承适合几乎所有的轴材料；通过图表EPB-7与图表EPB-8可以看出当使用硬铬钢轴或硬化钢轴以及硬化铝轴时CSB-EPB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-EPB is suitable for almost all kinds of shaft materials. Graph EPB-7 and Graph EPB-8 show that the wearing feature of CSB-EPB is excellent when the shaft material are hardened chrome steel or hardened steel or hardened Aluminum.

化学抗性 Chemical Resistance

CSB-EPB塑料轴承能抵抗弱碱、弱酸以及各类润滑油的腐蚀。
CSB-EPB is good at chemical resistance against mild base, weak acidic medium and various kinds of lubricants.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB塑料轴承的吸水率为0.2%，浸泡水中最大平衡吸水率为1.2%；由于其具有低吸水率的特性，故此轴承可以用于一般潮湿环境中。

The water absorb rate of CSB-EPB is 0.2% under the atmospheric pressure while it is 1.2% when the material is immerged into water. With its low water absorbability, the material is suitable for humid environment applications.

抗UV性能 UV Resistance

CSB-EPB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-EPB 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

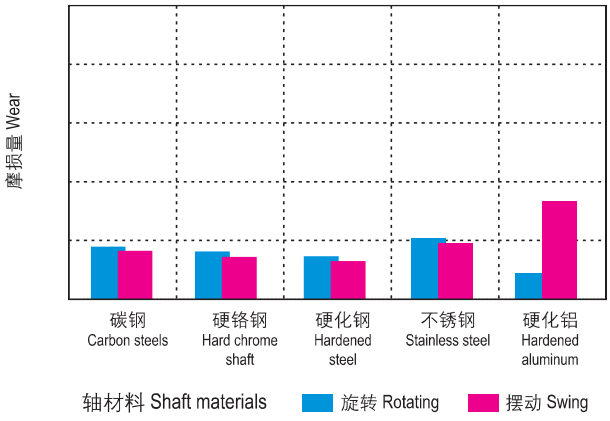
CSB-EPB塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB 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=2MPa,v=0.2m/s

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

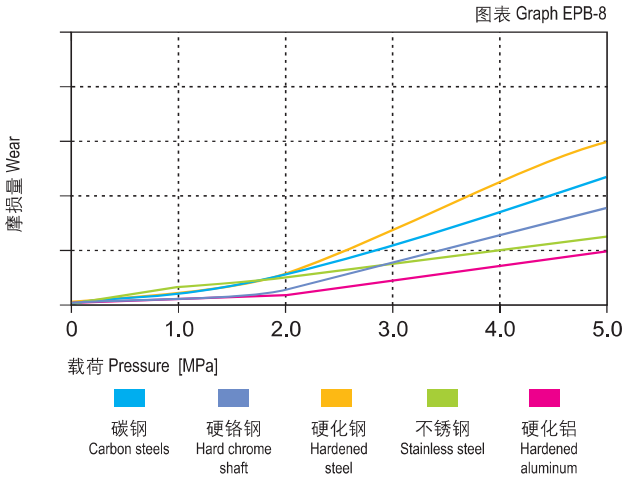
图表 Graph EPB-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

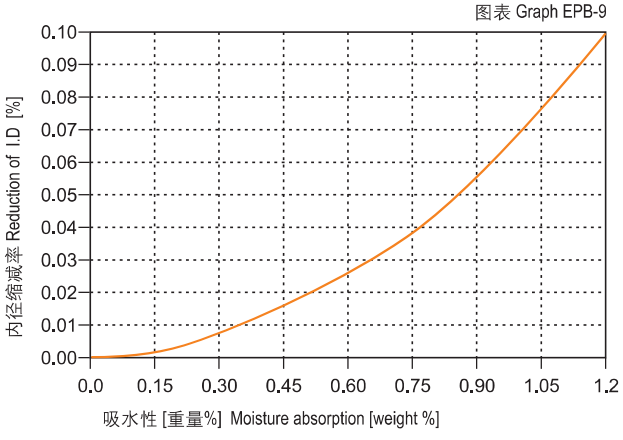
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB-8



吸水性的影响 Effect of moisture absorption on EPB bearings

图表 Graph EPB-9



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