Polymer-tech Solution™

PLASTIC BEARINGS TECHNOLOGY

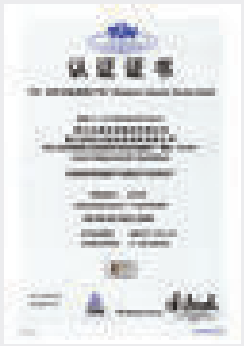
工程塑料轴承

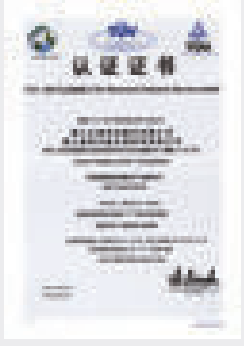
2017

CSB®

- 成立于1995年，总注册资本7500万人民币；
- 2016年销售额超过4亿元人民币，员工800名；
- 拥有两个生产基地，占地130000m^2；
- 国家级高新技术企业，51项专利；
- ISO9001:2008、IATF16949:2016质量认证。

- CSB was established in 1995 and its legal registered capital is 11.5 million US Dollars.
- CSB turnover in 2016 was more than USD 62 million. Currently there are 800 employees working at CSB.
- There are 2 facilities covering over 130000m^2 with extendable area for future enlargement.
- China National Hi-Tech Enterprise has been granted, 51 patents obtained till now.
- ISO9001: 2008 and IATF16949:2016 quality management system were certificated.





新型自润滑材料适应环境保护要求
Concern for Environment Requirement

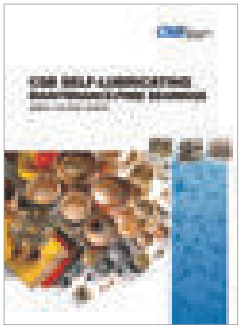
CSB积极应对环境保护的要求，通过多年的努力在各个应用领域都已成功开发了满足RoHS要求的不同材料。

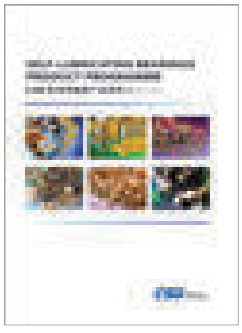
Concern for environmental requirement, CSB has developed various kinds of self-lubricating materials to conform to environment requirement.

RoHS指令限制的六种有害物质
EC Directive 2011/65/EU (the RoHS Directive)

汞Hg、六价铬Cr^{+6}、铅Pb、镉Cd、多溴联苯醚PBDE、多溴联苯PBB。

This directive restricts the use of hazardous substances. Listed below are CSB products which are all RoHS compliant.





Your Partner for Self-lubricating Bearing Application

为所有工业提供各种自润滑轴承解决方案

CSB-EPB™工程塑料轴承 Plastic Plain Bearings

自润滑免维护、耐腐蚀、长服务寿命、轻量化；可选：极低摩擦系数、高载荷、抗静电、高温250℃、FDA食品安全等级。

Maintenance-free dry operation, Absolute corrosion resistance, Long service time and light; Multiple choices: Lowest friction coefficient, High load, Anti-static, High temperature 250℃, FDA food safety grade.

P12

CSB-BAL™塑料关节轴承 Plastic Spherical Bearings

自润滑免维护、耐腐蚀、抗污垢、轻量化；可选：多种结构设计满足不同安装需求。

Self-lubricating and maintenance-free, Corrosion-resistant, Anti-fouling, lightweight; Multiple structural design to meet different installation requirements.

P168

CSB-LIN™塑料直线轴承 Plastic Linear Bearings

干运行无需供油、抗粉尘、无噪音、耐腐蚀、长服务寿命、轻量化；可选：高温250℃、多种安装方式。

Dry operation without oil, Anti-dust, No noise, Corrosion resistance, Longer service time and light; Multiple Assemble types, Highest operation temperature 250℃.

P186

CSB-LMS™直线驱动系统 Linear Motion Systems

自润滑免维护直线驱动系统，直线滑动原件及丝杆螺母均采用高耐磨EPB13材料制成，实现永久性干摩擦，低噪音，长服务寿命，适合在粉尘或污水下运行。

Self-lubricating and maintenance-free linear motion system, Linear slider and screw nuts are made of high wear-resistant material EPB13, Dry operation for longer time, lower noise, longer service time and suitable for operation in dust or dirty water.

P223

CSB-SFP™耐磨半成品 Semi-finished Products

采用CSB-EPB高耐磨材料制成，可实现非标轴承的快速加工、小批量制作降低成本；可选：棒材、板材、片材。

The semi-finished products are made of anti-wear and high performance materials CSB-EPB, It can be machined non-standard bearings in short time, saving cost for small quantity; Multiple choices: Bar, sheet and tribo-tape.

P281

CSB-PRB™塑料滚动轴承 Plastic Rolling Bearings

自润滑免维护、耐腐蚀、轻量化；可选：内外圈、保持架、滚珠多种材料可选。

Maintenance-free, corrosion-resistant, lightweight; Multiple choices: inner and outer ring, cage and ball can be designed different materials freely.

P291

CSB-SRB™回转支承轴承 Slewing Ring Bearings

免维护干运行、低噪音、轻量化；滑动原件可选耐磨材料EPB13、高载荷金属与特氟龙复合材料CSB-11。

Maintenance-free and dry operation, lower noise, lightweight; The slider can be made of wearresistant material EPB13 or metal and teflon composite material CSB-11 for higher load.

P299

CSB-FWB™纤维缠绕轴承 Filament-wound Bearings

连续长纤维复合材料、干摩擦性能最优越、极高的承载能力、最高静载荷240MPa，特别适合用于高载低速下的摆动。

Long fiber composite material, The best performance for dry operation, High load capacity and max. static load 240MPa, Especially suitable for swing with high load and low speed.

P303

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CSB Product Family

CSB产品 Polymer-tech Solution™

CSB-EPB™工程塑料轴承 Plastic Plain Bearings

P 12-167


EPB

PCB

PYB

PEW

FLB

PPR

CPB

CSB-LIN™塑料直线轴承 Plastic Linear Bearings

P 186-222


LIN-11

LIN-11R

LIN-11G

LIN-12B

LIN-01

ELB

LINP

CSB-PRB™塑料滚动轴承 Plastic Rolling Bearings

P 291-294


PRB10

PRB15

PRB20

PRB25

PRB30

PRB40

PRTB10

CSB-BAL™塑料关节轴承 Plastic Spherical Bearings

P 168-185


BAL

GLB

GIB

GFB

GBB

GDB

GSB-OP

CSB-LMS™直线驱动系统 Linear Motion Systems

P 223-280


TLS

SNF

AS

ASS

WR

NR

LMS

CSB-SRB™回转支撑轴承 Slewing Ring Bearings

P 299-302


SRB-01

SRB-02

SRB-03

CSB-RPM™转向器支撑套 Steering Rack Bearings


RPM5

P 295-296

KER转角轴承 Knife edge rollers


KER

P 290

CSB-PEC™扶梯自润滑回转链 Self-lubricated Rotary Chains

P 297-298

PEC03

CSB-SFP™耐磨半成品 Semi-finished Products

P 281-289

M80

M81

EPB

EPB5

EPB5A

EPB6

EPB7

EPB10

EPB13

EPB18

EPB26

MN70

M80

M81

EPB13

TAP

CSB-FWB™纤维缠绕轴承 Filament-wound Bearings

P 303-315

CRM

CRB

CRG

CRP

CRW

CRF

金属自润滑轴承 Metal Sliding Bearings

P 316-317

CSB-50

CSB-40

CSB-11

CSB-20

CSB-800

CSB-650

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CSB塑料轴承应用设计系统 Application Design System For Plastic Bearings

设计Designing ▶▶▶·····

·····◀◀◀ 设计结论Results

▶▶▶····· 请登录我们的网站下载please download: www.csb-ep.com

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CSB Bearing R&D

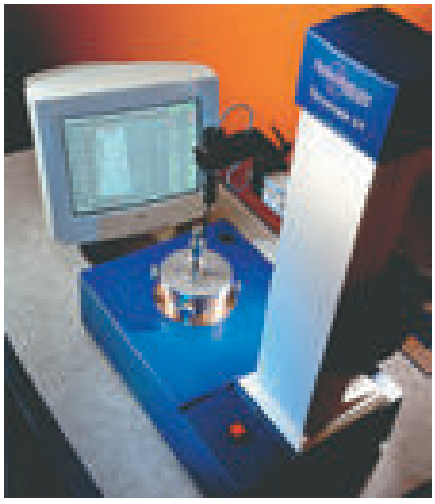
CSB产品研发

CSB始终坚持以自润滑材料科学为核心，充分利用先进的研发检测设备，并与科研院所和国外科技联合创新。CSB拥有先进的材料性能检测设备和最全面的自润滑轴承摩擦磨损性能专业检测设备，CSB新产品开发工程师每年通过各种检测设备进行材料性能检测和研发试验近万次。CSB每年自主研发以及为特殊客户研发的新产品近百种，并通过新材料新技术的不断探索提升现有产品性能，满足了各种行业对自润滑轴承性能提出的新要求。

CSB insists on the theory of going on creation and pursuing excellence and established the system concentrating on the self-lubricating material technology, making full use of the advanced research and testing equipment, joint innovation with research institutes and foreign technology. CSB has advanced performance testing equipments for materials and the most comprehensive tribological properties professional testing equipments for lubricating bearings. There are thousands of tests on the materials and equipments that CSB engineers will execute each year. Hundreds of new materials and products are developed by CSB to meet the continuously changing requests from the market.

CSB检测中心
CSB inspection center

光谱仪（德国）
Optical spectrometer (German)



圆度仪（英国）
Roundness measurement instrument (UK)

原子吸收分光分度计（中国）
Atomic absorption spectrophotometer (China)

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电子万能材料试验机（美国）
Instron 5567 material testing system(USA)

能谱仪（美国）
Energy dispersive spectrometry (EDS)

热机械分析仪（德国）
Thermo-mechanical analysis (German)

摆锤式冲击测试机（美国）
Dynatup pendulum impact machine (USA)

摇摆摩擦磨损试验机（CSB）
Oscillation test machine

PV摩擦磨损试验机（CSB）
High load PV testing

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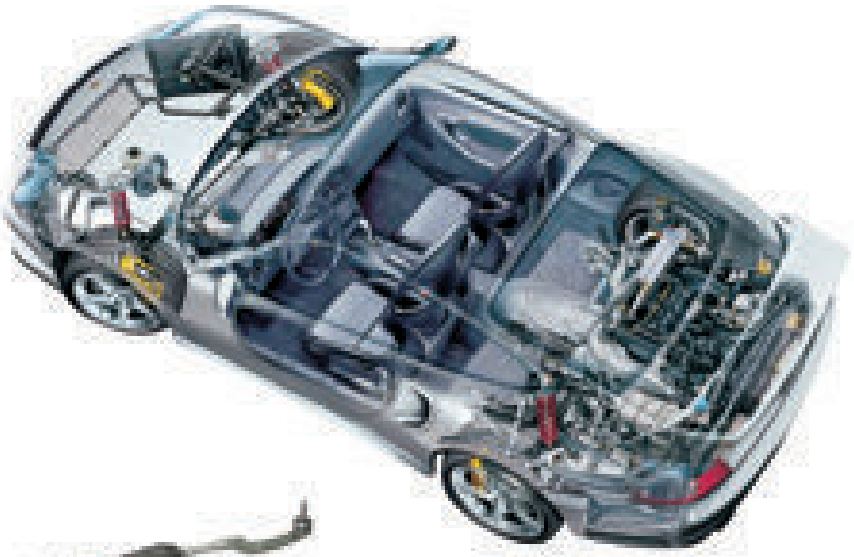
CSB-EPB™ Typical Applications

CSB-EPB™ 工程塑料轴承应用

汽机车上的应用 For Auto Industries



CSB-RPM/EPB19 应用于汽车转向系统
CSB-RPM/EPB19 for steering system

CSB-EPB13/EPB18 应用于汽车踏板
CSB-EPB13/EPB18 for foot pedals

CSB-EPB3 应用于汽车座椅调节结构
CSB-EPB3 for seating adjustment system

CSB-EPB24 应用于汽车变速机构
CSB-EPB24 for gear box

CSB-EPB4 应用于汽车盘式制动器
CSB-EPB4 for auto disk brake caliper

CSB-EPB24 应用于汽车节气阀
CSB-EPB24 for auto throttle vaves

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自行车上的应用 For Bicycle Industries

CSB-EPB 应用于自行车手刹
CSB-EPB for brake handles

CSB-EPB7/EPB13 应用于自行车脚踏
CSB-EPB7/EPB13 for bike pedals

CSB-EPB18 应用于自行车后悬挂臂
CSB-EPB18 for rear suspension arm

CSB-EPB13 应用于前叉避震系统
CSB-EPB13 for front shock absorbers

CSB-EPB3 应用于自行车变速器
CSB-EPB3 for rear derailleurs

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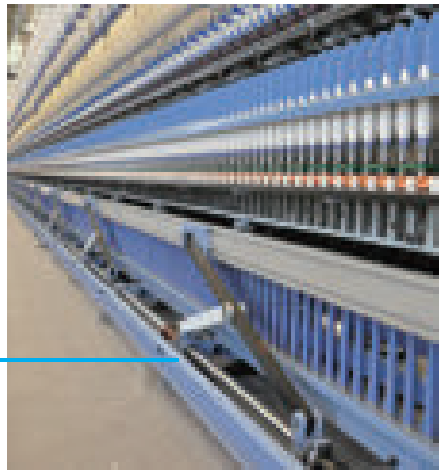
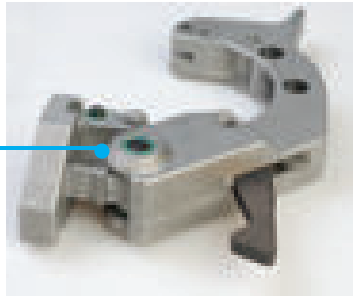
CSB-EPB™ Typical Applications

CSB-EPB™ 工程塑料轴承应用

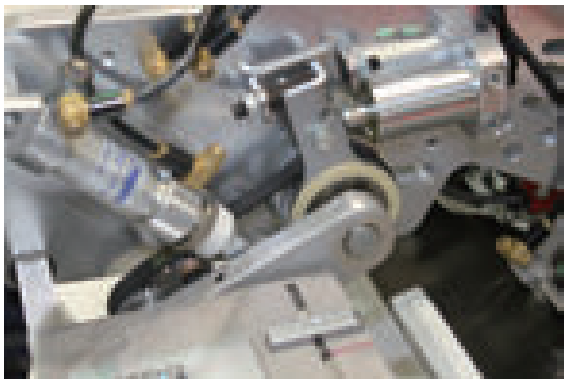
纺织工业上的应用 For Textile industries



CSB-LIN 应用于细纱机集体落纱装置
CSB-LIN for spinning machinery



CSB-EPB2 应用于假捻机皮圈架与筒管架
CSB-EPB2 for false twisting machine



CSB-EPB7 应用于自动缝纫机
CSB-EPB7 for automatic sewing machine

CSB-EPB 应用于自动络筒机
CSB-EPB for automatic winder

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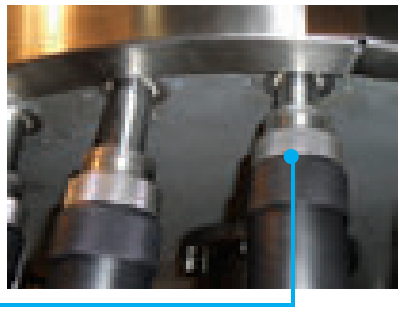
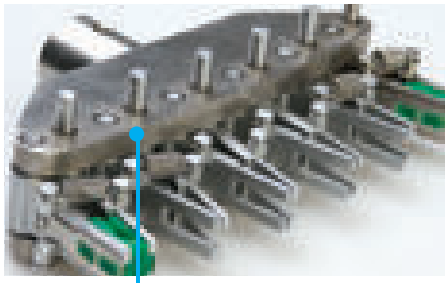
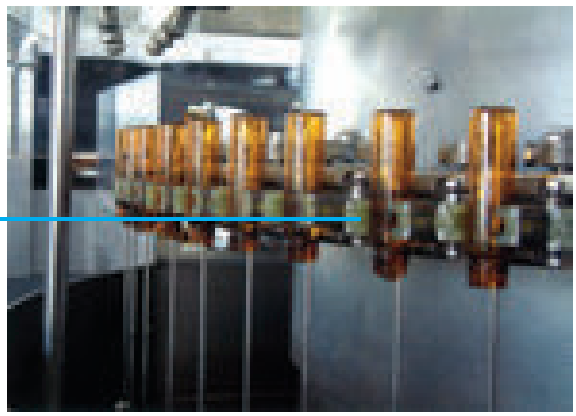
饮料和药品包装工业上的应用 Beverage and medicinal liquid packing industries

CSB-EPB5/LIN应用于饮料灌装机械
CSB-EPB5/LIN for beverage machinery

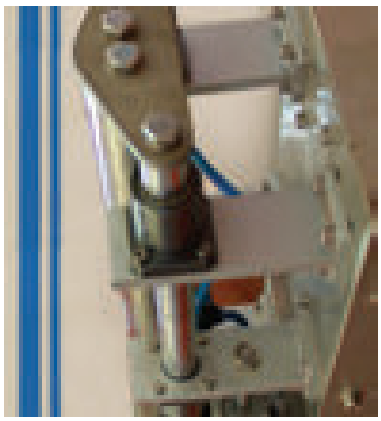


CSB-EPB应用于包装组合秤
CSB-EPB for packing multihead weigher





CSB-EPB4/LIN应用于洗烘灌联动机
CSB-EPB4/LIN for medicinal liquid packing machinery



CSB-LIN应用于包装机械
CSB-LIN for packing machinery

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CSB-EPB™ Typical Applications

CSB-EPB™ 工程塑料轴承应用

医疗工业上的应用 For Medical Industries

CSB-EPB11 应用诊断系统调节机构
CSB-EPB11 for adjustment system

CSB-EPB 应用于注射泵
CSB-EPB for syringe pump

CSB-EPB1 应用于医疗轮椅
CSB-EPB1 for medical wheelchair

CSB-EPB3M 应用于牙科座椅系统
CSB-EPB3M for dental seat system

CSB-EPB6 应用于电动医疗床
CSB-EPB6 for electric medical bed

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其它工业上的应用 For other Industries

CSB-EPB13/EPB16 应用于太阳能追踪系统
CSB-EPB13/EPB16 for solar system

CSB-EPB3 应用于高压隔离开关
CSB-EPB3 for high-voltage isolation switch

CSB-EPB15 应用于飞行器调节机构
CSB-EPB15 for aircraft adjustment system

CSB-EPB3 应用于碎纸机
CSB-EPB3 for shredder

CSB-CRM 应用于升降平台
CSB-CRM for scissor lifts

CSB-CRB/EPB12 应用于物流机械
CSB-CRB/EPB12 for handling equipment

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CSB-EPB™ Technical Reference

CSB-EPB™ 工程塑料轴承技术

CSB-EPB™ 材料结构特点 Material Features

CSB-EPB™ 材料之所以具有优秀的自润滑性和耐磨性主要是CSB工程师们充分利用了自润滑材料改性技术，在高性能工程塑料中采用高强度纤维提高了材料的承载和特种润滑脂降低了材料的摩擦系数（图表1），从而提高了材料的综合耐磨性能延长了轴承的使用寿命。

高性能工程塑料作为基料主要作为耐磨载体;

增强纤维提高了轴承在承载和抗冲击性能;

特种润滑脂降低了轴承的摩擦系数起自润滑作用。

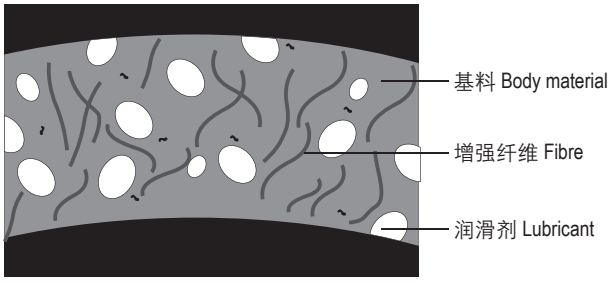
CSB engineers are dedicated on the performance improvement on the self-lubricating materials derives the result that CSB-EPB™ Materials are with excellent self-lubricating features and wear resistance Features. High-strength fibers used in the engineering plastics fantastically improve the material load (Graph 1). Special grease immersion in the plastic can decrease the friction coefficient of the material therefore to prolong the bearing service life.

High-performance engineering plastics body material mainly service as wear-resistant vector.

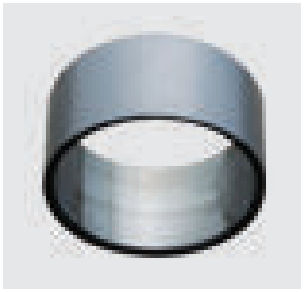
The reinforced fiber improves the load and impact resistant capacity of the bearing.

Special grease decreases the friction coefficient for a better self-lubricating performance.

图表1 CSB-EPB™ 材料内部结构示意图
Graph 1 CSB-EPB™ materials structure



图表2 塑料轴承与传统含油轴承的磨损
Graph 2 Surface wear (Plastic bearings and metal bearings)



CSB-EPB™ 塑料轴承整体润滑材料使用寿命长
Plastic bearings has longer service life.

传统含油轴承内部润滑油极易耗尽而失效
Metal bearings lubricating oil is easy to be failed.

CSB-EPB™ 塑料轴承与传统含油轴承 Plastic Bearings and Metal Bearings

由于CSB-EPB™塑料轴承润滑脂包含在整体材料中，所以无论轴承工作时间多长润滑脂都会不断的从摩擦面渗出起到长期润滑作用，而传统粉末冶金含油轴承在使用过程中利用微孔隙中的润滑油起自润滑作用，当这些润滑油耗尽或挥发完后轴承磨损将急速加剧，此时就宣告轴承的有效使用寿命结束（图表2）。

Because the grease immersed in the solid plastic material, the lubricating will be valid continuously no matter how long the bearings are working. Therefore, the traditional sintered oilless bearings provide the lubricating function by utilizing the impregnated oil in the tiny porosities of the material. When the impregnated oil would have been run out of dried, the bearing wear will be increased sharply and the bearing life will be terminated at the same time. (Graph 2).

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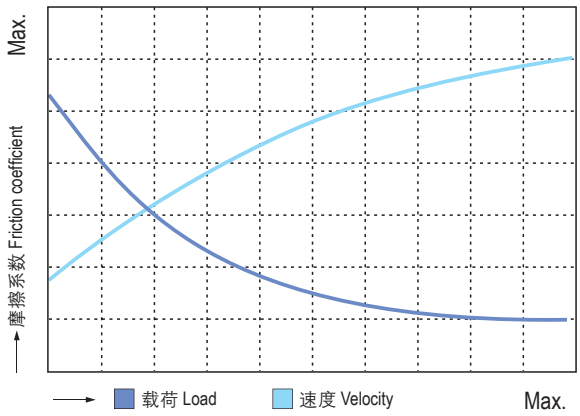
CSB-EPB™ 塑料轴承摩擦系数 Bearing Friction Coefficient

CSB-EPB™塑料轴承的自润滑性能通过改性技术在基料中添加固体润滑脂和功能纤维实现，摩擦系数通过固体润滑脂降低，同时摩擦系数还受到工作载荷、运行速度以及轴表面粗糙度的影响。摩擦系数一般都会随着工作载荷的逐步增加而降低，随着运行速度的加快而升高（见图表3）。摩擦系数与轴表面粗糙度的关系见图表3。

The self-lubricating feature of the CSB-EPB™ plastic bearing is achieved by adding solid lubricants and functional fibers into the body material and the friction coefficient is decreased by the solid lubricate grease immersion. The friction coefficient is affected by the load, operating speed and shaft roughness. The friction coefficient is generally decreased along the load increasing and increased along the operating speed (see Graph3). Please refer to Graph 3 for the relation between the friction coefficient and shaft roughness.

图表3：摩擦系数-载荷-速度
Graph 3: Friction coefficient, Load and Velocity

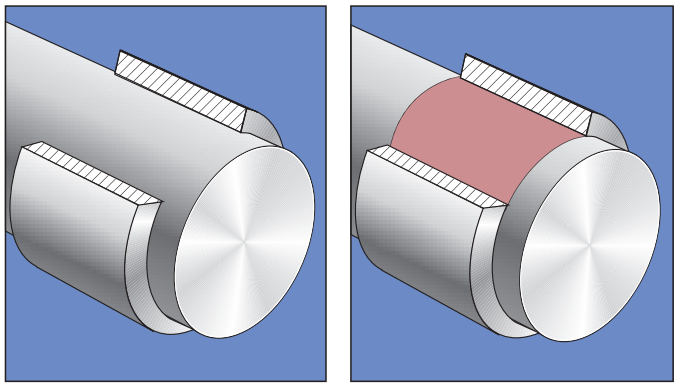


CSB-EPB™ 塑料轴承磨损 Plastic Bearing Wear

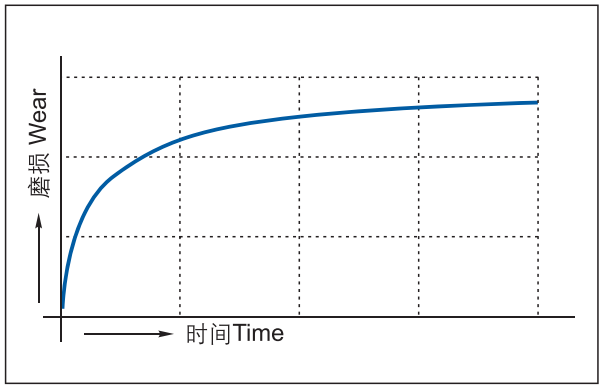
任何自润滑轴承在载荷下工作初始阶段，轴承就会产生细微磨损。CSB-EPB™ 塑料轴承同样如此，在启动阶段，当细微磨损发生时润滑脂就会渗出逐渐填满摩擦面和转移到对磨轴表面（图表4），当对磨轴工作区域被润滑脂布满后便形成一层很薄的润滑隔离膜，此时轴承的起始磨损几乎结束，在后期长时间的工作中轴承的磨损速率大大降低且较稳定（图表5）。

Slightly wear off will occur as soon as the self-lubricating bearing is applied with a certain load. It is the same to the CSB-EPB™ plastic bearings, when the slightly wear occurs, the immersed oil (grease) will infiltrate out from the bearing filling the wear off area of the bearing as well as the mating material to form the lubricating film (Graph 4) and therefore interrupt the wear process. In this way, the aforementioned working method of the plastic bearings improves the wear resistance feature of the bearings and maintains the further operation stable (Graph 5).

图表4　运行后，润滑膜形成
Graph 4　After operation, lubricating oil film formed



图表5　轴承磨损随工作时间变化曲线图
Graph 5　Wear against operation time



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CSB-EPB™ Technical Reference

CSB-EPB™ 工程塑料轴承技术

轴承的载荷 Bearing Load

载荷计算方法 Load capacity calculation

◇ 直套、翻边产品 Cylidrncal bushes, flange bushes

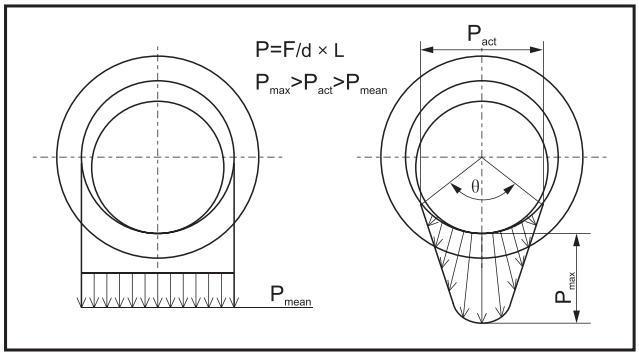
$$P=\frac{F}{d\times L}(N/mm^2)$$

F=轴承承载值 Load （N）
d=轴径 Shaft （mm）
L=轴承长度 Bearing Length （mm）

◇ 止推垫片 Thrust washer

$$P=\frac{4F}{\pi (D^2-d^2)}(N/mm^2)$$

F=垫片承载值 Load （N）
D=垫片外径 Washer OD （mm）
d=垫片内径 Washer ID （mm）



由于受配合间隙、材料强度、内部油槽等原因的影响，轴承的真正承载面压（P_{act}）会大于理论计算值（P_{mean}）。

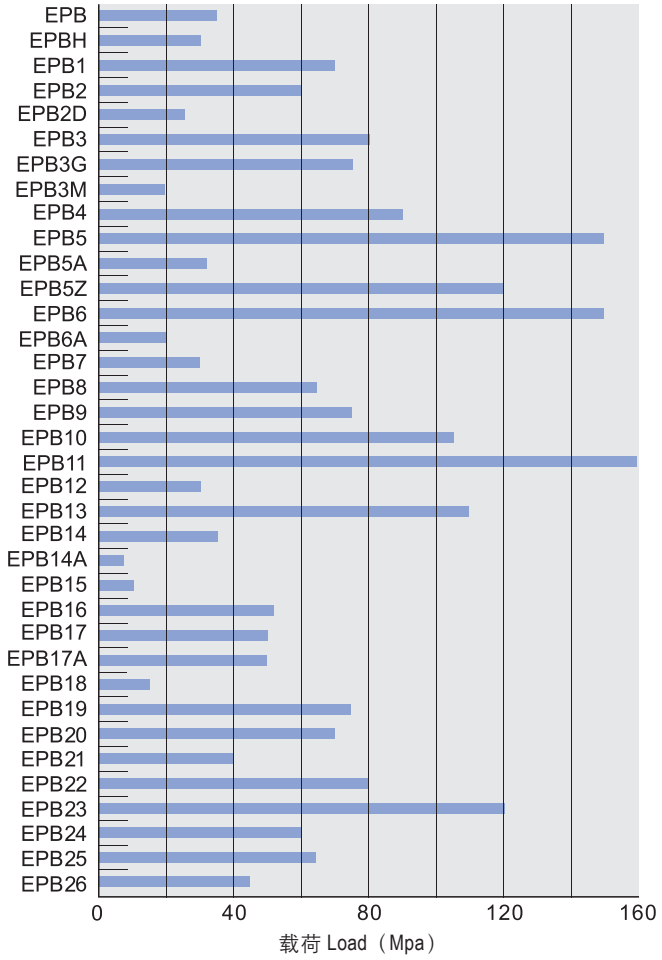
As the factor of clearance, bushes chamfer, oil groove ect., The actually load (P_{act}) is higher than theory of calculation (P_{mean}).

最大表面静载荷 Maximum surface static load

轴承实际工作动载荷（图表6）往往略小于数据表中推荐最大表面静载荷，由于轴与轴承配合总是存在间隙，所以轴承实际工作承载面积并不是轴承的投影面积，此面积的大小由配合轴公差尺寸所决定。此值适用于轴静止不动或运行速度低于0.01m/s，更高的载荷在运行时间很短也是可能的（短时间指3分钟以内）。

The actual dynamic load (Graph 6) is usually less than the maximum surface static load recommended in the data sheet. Due to the clearance exists between the shaft and bearings, the actual working surface area are not the same as the projected area of the bearing. The working area is depended on the clearance between the shaft and the bearing. The value in the datasheet is valid when the shaft is not moving or the operating speed is less than 0.01m/s. The value could also be applicable for a short run (shorter than 3 minutes) condition.

图表6: CSB-EPB™ 塑料轴承最大静载荷分布图
Graph 6: Max. static load of plastic bearings



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载荷与温度、速度的关系 Load, temperature and speed

轴承的载荷会随着轴承工作温度的升高而逐步降低，当运行温度超过最大使用温度后轴承的承载能力会急剧下降（图表7）。

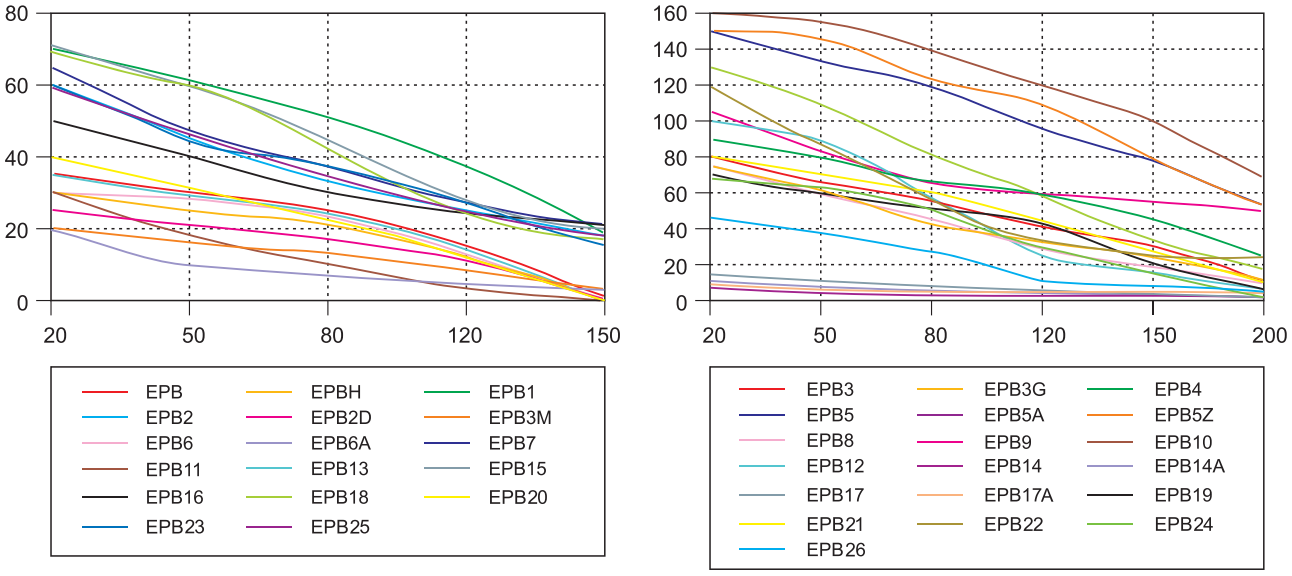
轴承的载荷会随着轴承运行速度的加快而逐步降低，当运行速度加快后会导致轴承的摩擦温度逐步上升，而载荷会随着轴承温度的不断上升而逐渐降低。

The load capacity will be decreased along with the temperature increase. Load capacity may sharply decrease when the operating temperature is higher than the recommended maximum temperature (Graph 7).

The load capacity will be decreased along with the speed increase. Speed increase will result into a temperature increase that decreases the load capacity.

图表7：载荷随温度变化曲线图

Graph 7: Load and Temperature



对于滑动轴承来说，运行速度是个关键性参数，由于滑动轴承工作时与轴之间发生的是相对滑动摩擦而不是滚动摩擦，所以最大运行速度滑动轴承要远低于滚动轴承。这里所说的速度是指轴与轴承之间运行的相对线速度而不是转速。

The operating speed is one of the key parameters for the sliding bearings. The friction between the sliding bearing and the shaft is a linear friction. So the operating speed of sliding bearing is much less than that of a rolling bearing where the friction is a rotation method. The speed here is the relative linear speed between the bearing and the shaft but not a rotation speed.

线速度计算公式 Speed calculation

◇ 旋转运动 Rotating motion

$$V=\frac{\pi \times d \times n}{1000 \times 60}\ (m/s)$$

d=轴径 Shaft（mm）
n=转数/分 Rpm

◇ 往复运动 Linear motion

$$V=\frac{2s \times c}{60}\ (m/s)$$

s=行程长度 Stoke distance（m）
c=往复频率（次数/分） frequency

◇ 摇摆运动 Oscillating motion

$$V=\frac{\pi \times d \times C \times \theta}{1000 \times 360 \times 60}\ (m/s)$$

d=轴径 Shaft （mm）
C=摇摆频率（次数/分） frequency
θ=摇摆角度 Oscillating angle

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轴承的速度 Bearing Speed

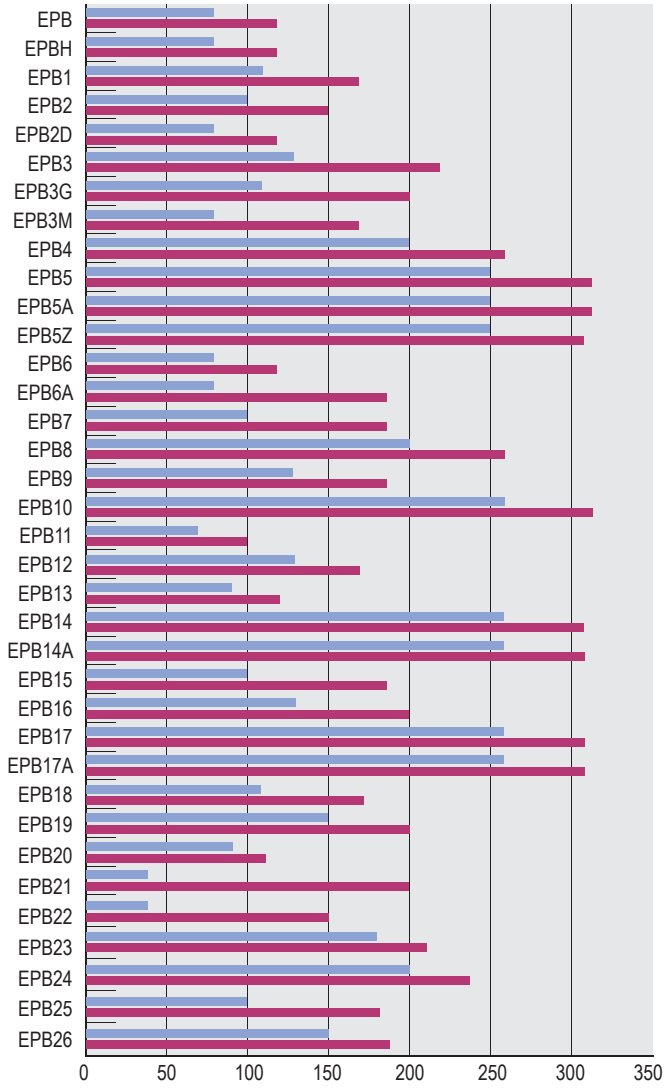
CSB-EPB™ 塑料轴承所允许的最大速度见图表8。这些数值是在轴承载荷极小时取得的极限速度，实际运用中这些速度是很难达到的，因为轴承在工作中不可避免的要承受工作载荷，当轴承载荷加大时所允许的运行速度就会减小。由于轴承的速度与轴承的运行温度成反比关系，所以轴承不同的运行方式所允许的最大速度也不同。

The maximum operating speed: Rotation, Oscillating, Linear indicates the maximum allowable speed (Graph 8).
The value in the datasheet is calculated under the condition of a very low load. So the actual allowable speed will be limited against different load and other conditions. The higher the load, the lower the speed will be. The speed and the temperature is in a inverse proportion relation, the maximum speed allowable will be different depending on different operation method of the bearings.

图表8：轴承最大运行速度
Graph 8: Max. operation speed

材料 Material	旋转 Rotation	摆动 Oscillating	直线 Linear
EPB	1.0	0.7	3.0
EPBH	0.8	0.6	2.5
EPB1	1.0	0.7	3.0
EPB2	1.0	0.7	3.0
EPB2D	1.2	0.8	3.0
EPB3	1.0	0.7	4.0
EPB3G	0.8	0.6	3.5
EPB3M	0.8	0.6	2.5
EPB4	1.0	0.7	3.0
EPB5	1.5	1.1	5.0
EPB5A	0.6	0.4	1.0
EPB5Z	1.5	1.1	5.0
EPB6	1.0	0.7	3.0
EPB6A	0.6	0.4	1.0
EPB7	1.0	0.7	4.0
EPB8	1.2	0.8	4.0
EPB9	0.8	0.6	3.0
EPB10	1.5	1.1	5.0
EPB11	0.5	0.4	1.0
EPB12	1.0	0.7	5.0
EPB13	1.5	1.1	8.0
EPB14	2.0	1.4	5.0
EPB14A	5.0	3.5	7.0
EPB15	1.5	1.1	8.0
EPB16	1.0	0.7	3.0
EPB17	3.0	2.1	5.0
EPB17A	2.0	1.4	5.0
EPB18	1.2	0.8	3.0
EPB19	1.2	0.8	4.0
EPB20	0.5	0.4	2.0
EPB21	2.0	1.0	5.0
EPB22	1.0	0.7	4.0
EPB23	1.0	0.8	2.5
EPB24	1.0	0.7	1.0
EPB25	1.3	1.0	4.0
EPB26	0.9	0.6	2.0

图表9：轴承最高运行温度
Graph 9: Max. operation temperature



轴承的温度 Bearing Temperature

CSB-EPB™ 塑料轴承都限定了最低和最高使用温度。最低使用温度是指轴承材料会变脆的临界温度（图表10），最高使用温度是指轴承耐磨性能不会改变的临界温度，短期运行最高温度是指轴承材料会变软的临界温度(图表9)。如轴承经常在高温和低温下交替使用，轴承有可能发生脱落现象，所以此时必须借助于辅助装置确保轴承正常运行。

There is a limited temperature range that CSB-EPB™ plastic bearings could be used. The lowest temperature is the one the material will become brittle under that value (Graph 10) and the highest temperature is the one the bearing material wear resistance feature will start to change (Graph 9). If the bearings are used under the conditions of alternatively changing high and low temperature, the bearing feature will be considerably affected and thus shorten the bearing service life.

图表10： 轴承最低运行温度 Graph 10: Min. operation temperatures

材料 Materials	最低温度 Min. Temperature	材料 Materials	最低温度 Min. Temperature	材料 Materials	最低温度 Min. Temperature
EPB	-40	EPB6	-40	EPB16	-40
EPBH	-40	EPB6A	-40	EPB17	-200
EPB1	-50	EPB7	-40	EPB17A	-200
EPB2	-50	EPB8	-40	EPB18	-50
EPB2D	-40	EPB9	-40	EPB19	-40
EPB3	-40	EPB10	-100	EPB20	-50
EPB3G	-40	EPB11	-40	EPB21	-40
EPB3M	-40	EPB12	-40	EPB22	-40
EPB4	-40	EPB13	-50	EPB23	-100
EPB5	-100	EPB14	-200	EPB24	-40
EPB5A	-100	EPB14A	-200	EPB25	-100
EPB5Z	-100	EPB15	-40	EPB26	-50

图表11： 提供定位机构的起始温度表 Graph11: Temperatue at which additional securing of the bearing is required

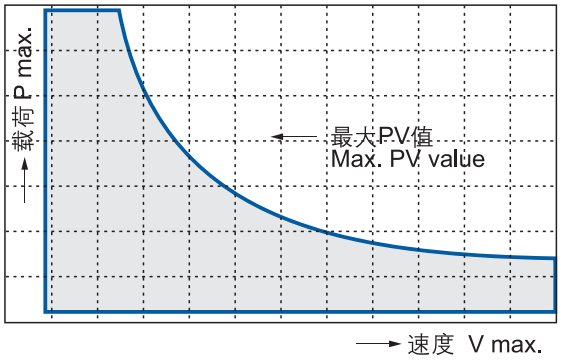
材料 Materials	起始温度 Min. Temperature	材料 Materials	起始温度 Min. Temperature	材料 Materials	起始温度 Min. Temperature
EPB	50	EPB6	50	EPB16	90
EPBH	50	EPB6A	50	EPB17	135
EPB1	60	EPB7	60	EPB17A	135
EPB2	55	EPB8	100	EPB18	90
EPB2D	50	EPB9	105	EPB19	65
EPB3	100	EPB10	145	EPB20	80
EPB3G	90	EPB11	50	EPB21	80
EPB3M	60	EPB12	50	EPB22	100
EPB4	120	EPB13	60	EPB23	140
EPB5	135	EPB14	135	EPB24	110
EPB5A	130	EPB14A	135	EPB25	140
EPB5Z	145	EPB15	65	EPB26	100

轴承PV值 PV Value

PV值是指轴承在一定的载荷和线速度条件下的乘积值，轴承的PV值是评价滑动轴承综合性能的一个重要指标。实际PV值与轴承的使用寿命成反比关系（图表12），因此建议设计时尽可能使用比较低的PV值，以确保轴承会有更长的使用寿命。

PV is the product of the specific bearing load P and the sliding speed V. It is a very important design data for the bearing application. The PV value is inverse proportional to the bearing service life (Graph 12). So it is recommended to consider a lower design PV value during the bearing selection.

图表12： 轴承PV Graph 12: PV Value



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轴承PV值 PV Value

$$PV_{Perm.} = \left(\frac{(K1 \times \pi \times \lambda k \times \Delta T)}{\mu \times s} + \frac{(K2 \times \pi \times \lambda s \times \Delta T)}{\mu \times b1 \times 2} \right) \times y_1 \times y_2 \times 10^{-3}$$

这里 There:

K1，K2 =散热系数
constant for heat dissipation
（K1=0.5，K2=0.042）

s =轴承的壁厚（单位：毫米）
bearing wall thickness [mm]

b1 =轴承的长度（单位：毫米）
bearing length [mm]

μ =摩擦系数
coefficient of friction

λs =轴的热传导性
thermal coductivity of the shaft

λk =轴承的热传导性
thermal coductivity of the bearing

ΔT =(Ta - Tu)
(Ta - Tu)

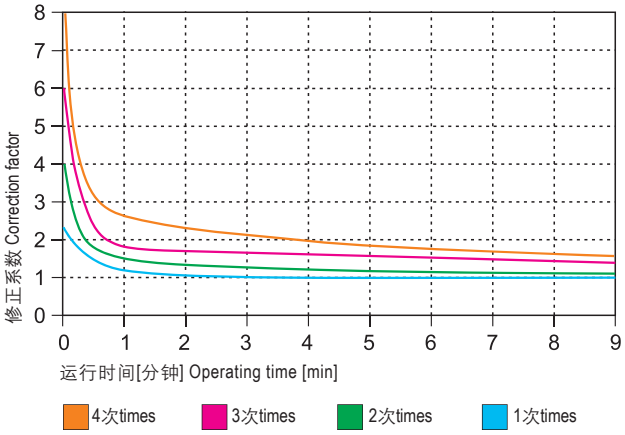
Tu =环境温度
ambient temperature [℃]

Ta =最高运行温度
max. application temperature [℃]

Y_1 =间歇操作的校正因子
Intermittent operation correction factor

Y_2 =润滑操作校正因子
Lubricating operation correction factor

图表13：PV值在间断运行下的修正系数y_1
Graph 13: Correction factor of PV value by Intermittent Operation



图表14：PV值在不同润滑方式时的修正系数y_2
Graph 14: Correction factor of PV value by means of lubrication

润滑 Lubrication	修正系数 Correction factor
干运行 Dry	1
脂润滑 Grease	2
水润滑 Water	3
油润滑 Oil	4

图表15：轴或基座材料的导热性
Graph 15: Heat conductivity values of shaft or housing materials

材料 Material	导热性 Thermal conductivity [W/m x k]
碳钢 Carbon steels	46
硬化钢 Hardenes steel	46
硬格轴 Hard chrome shaft	46
不锈钢 Stainless steel	16
铝合金 Hardened aluminum	204
塑料 Plastic	0.24

间断运行修正系数y_1 Correction factor y_1 for intermittent operation

在很多场合轴承运行并不是连续工作，由于轴承短期工作（运行时间10分钟以内）而永远达不到最高允许温度，那么轴承允许的PV值就会增加，因为在停止运行时间内轴承因摩擦产生的摩擦热得到了充分的散发。图表13说明了轴承停止时间与运行时间不同比例下的轴承PV值修正系数y_1。

Commonly the bearings are not continuously running during most of the applications. The short time operation period (less than 10 minutes) does not allow the bearing reach the highest limited operation temperature so that the limited PV value will increase because during the stop period, the heat generated by the friction will be reduced. Graph 13 shows the intermittent operation correction factor y_1 for different stop and operate period.

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润滑运行修正系数y_2 Correction factor y_2 for lubricating operation

虽然CSB-EPB™ 塑料轴承是专为干摩擦应用所设计，但是其对通用油脂等大部分润滑介质均具有良好的兼容性；在轴承启动阶段加入润滑介质可以提高轴承的启动性能，从而缩短轴承的磨合期。而且轴承在有润滑介质存在时其承载能力会大幅度提高，因为有外界润滑干预的情况下轴承摩擦生热值大幅度降低，轴承温度降低后承载能力也就随之提高。图表14说明在各种润滑介质下PV值修正系数y_2。

Although CSB-EPB™ plastic bearings are normally designed for the dry operation, it has good the general lubricant such as oil or grease. The initial oil or grease lubricating will improve the starting performance of the bearings and therefore achieves a shorter run-in time. At the same time, the using of lubricants considerably improves the loading capability of the bearings because the lubricants will reduce the temperature increasing during the operation so that the loading capability of the bearings is improved. Graph 14 shows the PV correction factor y_2 for different lubricants are used.

轴承的磨损 Bearing Wear

由于轴承的耐磨性能受到很多因素的影响，所以很难准确描述轴承的磨损或寿命。通过无数次的试验表明影响轴承耐磨性或寿命的因素有：载荷、速度、运动方式、轴材料与粗糙度、环境温度与灰尘、外界润滑介质类别等等。
轴承的耐磨性一般随着载荷、速度、温度的增加而逐渐降低，当有外界润滑介质存在时轴承的耐磨性会成倍提高。
CSB推荐使用轴的粗糙度为Ra0.2 ~ Ra0.8，轴过于粗糙或太光滑都会导致磨损加剧，轴过于粗糙就像刮刀一样刮伤轴承的摩擦面，轴太光滑会在摩擦面与轴承表面发生胶合导致磨损增大。
对于轴的材料CSB-EPB塑料轴承没有特别限定，但由于各种轴材料对轴承的磨损影响程度不同，故CSB推荐使用较为通用的表面镀硬铬轴材料，对轴的硬度同样没有限定，但CSB推荐使用HRC35以上的轴材料，以避免轴承起始工作阶段轴的磨损。

As the bearings wear resistance affected by many factors, it is difficult to accurately describe bearing wear and life span. Through numerous experiments we can conclude that the main factors affect the anti-wear property are the load, moving method, speed, roughness of mating surfaces, ambient temperature and dust and type of the outside lubricating medium, etc.
When the load, speed and temperature increase, the wear resistance of bearings gradually reduced; when there is outside lubrication medium, the wear resistance could be doubled; CSB recommend the roughness of axis to be Ra0.2 ~ Ra0.8. If the shaft is too rough or too smooth, it might increase the wear. Although there is no special restriction on the using of shaft material for the CSB-EPB plastic bearings, CSB recommend the use of hard chrome plated shaft material. The recommended shaft hardness is over HRC35 in order to avoid the initial wear off on the shaft.

轴承抗UV性能 Bearing UV- resistance Performance

滑动轴承用于户外设备时就会经常暴露在各种恶劣的环境中。抗UV性能是各种轴承材料抵抗UV射线破坏能力的一个重要指标。CSB-EPB™ 塑料轴承抗UV性能对照表见图表16。

Bearings used for outdoor equipments are constantly exposed to different critical environment. Anti-UV property is one of the most important indexes of a variety of bearing materials to resist UV-ray damage.
CSB-EPB™ plastic bearings UV-resistance reference (Graph 16).

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轴承化学抗性 Chemical Resistibility

CSB-EPB™ 塑料轴承常常被用于有化学介质接触的场合，此时轴承的抗化学腐蚀性能就显得尤为重要。由于化学介质可能会导致轴承材料在结构成份上发生变化，这种变化主要取决于化学介质的种类、温度、暴露时间以及轴承的载荷与运动方式，有时化学介质充当了有效的润滑剂从而会延长轴承的使用寿命。在所有的塑料轴承产品中，CSB-EPB5、EPB10、EPB14、EPB14A 、EPB17和EPB17A的化学抗性最突出，几乎能抵抗所有化学介质。详细见图表16。

CSB-EPB™ plastic bearings are usually used under the conditions where chemical media exist. Therefore the chemical resistance feature is very important for such a critical application. The existing chemical media may cause deep changes to the performance of the bearing material depending on the different conditions such as the chemical kinds, temperature, and the contacting period to the bearing materials as well as the load and operation speed. Sometimes chemical medium act as an effective lubricant and thus will extend the service life of bearings. Plastic bearings in all products, CSB-EPB5, EPB10, EPB14, EPB14A, EPB17 and EPB17A of the most striking Features of chemical-resistant, resistant to virtually all chemical media (Graph 16).

图表16: CSB-EPB™ 塑料轴承抗UV性能和化学抗性　　Graph 16: CSB-EPB™ Plastic bearings UV- resistance and Chemical resistance

型号 Type	油、油脂 Oil&Grease	弱酸 Thin Acid	弱碱 Thin Alkal	强酸 Strong Acid	强碱 Alkali	抗UV性能 UV Resistibility	抗辐射 Radiation resistance
EPB	●	●	●	●	●	●●●●●	3×10^2Gy
EPBH	●	●	●	●	●	●●●●●	3×10^2Gy
EPB1	●	●	●	●	●	●●●●●	5×10^2Gy
EPB2	●	●	●	●	●	●●●●●	5×10^2Gy
EPB2D	●	●	●	●	●	●●●	3×10^2Gy
EPB3	●	●	●	●	●	●●●●●	3×10^2Gy
EPB3G	●	●	●	●	●	●●●●●	3×10^2Gy
EPB3M	●	●	●	●	●	●●●●	1×10^4Gy
EPB4	●	●	●	●	●	●●	2×10^2Gy
EPB5	●	●	●	●	●	●●●●●	1×10^5Gy
EPB5A	●	●	●	●	●	●●●●●	1×10^5Gy
EPB5Z	●	●	●	●	●	●●●	1×10^5Gy
EPB6	●	●	●	●	●	●●●●●	3×10^2Gy
EPB6A	●	●	●	●	●	●●●	1×10^4Gy
EPB7	●	●	●	●	●	●●●	3×10^2Gy
EPB8	●	●	●	●	●	●●●●●	2×10^2Gy
EPB9	●	●	●	●	●	●●●●●	3×10^2Gy
EPB10	●	●	●	●	●	●●●●●	1×10^5Gy
EPB11	●	●	●	●	●	●●	2×10^4Gy
EPB12	●	●	●	●	●	●●	3×10^2Gy
EPB13	●	●	●	●	●	●●●	3×10^2Gy
EPB14	●	●	●	●	●	●●●●●	1×10^5Gy
EPB14A	●	●	●	●	●	●●●●●	1×10^5Gy
EPB15	●	●	●	●	●	●●●	3×10^2Gy
EPB16	●	●	●	●	●	●●●●●	5×10^2Gy
EPB17	●	●	●	●	●	●●●●●	1×10^5Gy
EPB17A	●	●	●	●	●	●●●●●	1×10^5Gy
EPB18	●	●	●	●	●	●●●●●	3×10^2Gy
EPB19	●	●	●	●	●	●●●●	3×10^2Gy
EPB20	●	●	●	●	●	●●●	3×10^2Gy
EPB21	●	●	●	●	●	●●	2×10^2Gy
EPB22	●	●	●	●	●	●●●●●	3×10^2Gy
EPB23	●	●	●	●	●	●●●●	2×10^2Gy
EPB24	●	●	●	●	●	●	2×10^2Gy
EPB25	●	●	●	●	●	●●	2×10^2Gy
EPB26	●	●	●	●	●	●●●	2×10^4Gy

● 完全抵抗 Resistant　● 部分抵抗 Limited Resistant　● 没有抵抗 Not Resistant
●●●●● 非常好 Very Good　● 一般 Generality

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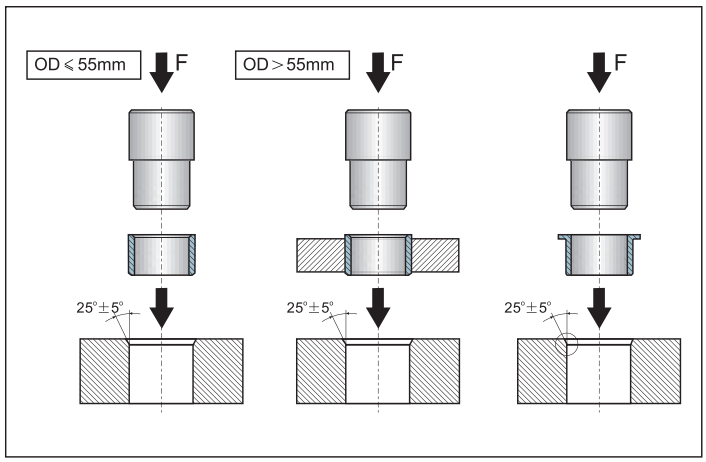
轴承安装 Bearing Installation

- 座孔：CSB-EPB™ 塑料轴承配合座孔的材料无特别限定，但座孔一端必须倒角25° 以避免轴承压入时刮伤外径，压装时应该采用阶梯芯轴缓慢压入，禁止直接击打端面，以免变形影响轴承尺寸，CSB-EPB系列产品内径公差均是压入H7标准孔后所得到。
- 轴：CSB-EPB™ 塑料轴承配合轴的材料无特别限定，但CSB推荐使用镀铬硬轴。为了使轴在装配过程中更简单且不损伤轴承内摩擦面，轴的端面必须有倒角圆滑过渡。另外轴表面粗糙度对轴承的摩擦系数有较大影响，轴太光滑摩擦面会产生爬行现象或产生尖叫声，轴表面太粗糙会加快轴承磨损。CSB推荐使用轴表面粗糙度为Ra0.2~0.8，轴承摩擦系数与表面粗糙度关系见图表19。

  CSB-EPB™ 塑料轴承配合公差按照ISO 3547-1标准设计制造见图表18。虽然CSB-EPB™ 塑料轴承产品设计为自润滑产品，但在装配时在摩擦面上涂上适量的外部润滑剂（比如油脂）会缩短轴承的磨合期从而延长轴承的使用寿命。
- 粘接剂：CSB-EPB™ 塑料轴承装配时一般不需要使用粘接剂，但是如果需要使用粘接剂轴承在高温下工作，要选用同等耐高温的胶粘剂，CSB建议对这种情况进行必要的测试。

图表17：压装图　Graph 17: Assembly example



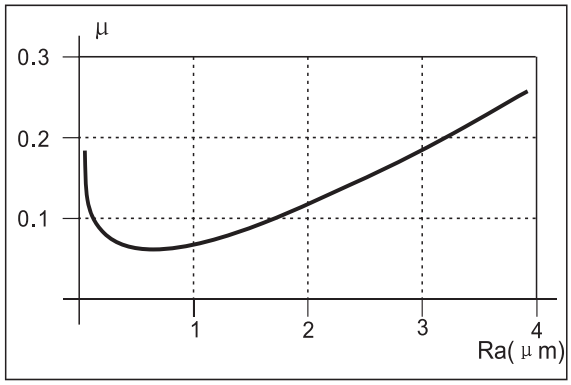
- Housing: The bearing housing and the fitting tools must be kept clean during the assembling. A chamfer of 25° on the housing should be ensured for an easy assembling. A stepped press pin is recommended to be used for the assembling. The inner diameter of the CSB-EPB™ plastic bearings is measured after the bushing is fitted into the H7 housing.
- Shaft: There is no critical requirement for the shaft material but chrome plated shaft is recommended for better operation. Rounded chamfer is required on the shaft for easy assembling. CSB recommend the shaft roughness to be in the range of Ra0.2~0.8. Please refer to Graph 15 for the relation between the surface roughness and bearing friction coefficient (Graph:19).

  CSB-EPB™ plastic bearings are designed according to ISO 3547 Standard (Graph 18). Although the CSB-EPB™ plastic bearings are designed for self-lubricating purpose, but the initial lubricating helps the assembling and the future operation of the bearings.
- Adhesive agent: CSB-EPB™ plastic bearings assembly generally needn't use glue, in case the glue is necessary, please consider the used glue can also work properly at the required temperature. Relative testing is recommended in this case.

图表18：CSB-EPB™ 塑料轴承配合公差[mm]
Graph 18: Plastic plain bearings tolerance

直径 Diameter d	压装后公差 Tolerance after being assembled			孔径 Housing H7	轴径 Shaft h9
	E10	F10	D11		
>0 ~ 3	+0.014 +0.054	+0.006 +0.046	+0.020 +0.080	0 +0.010	0 -0.025
>3 ~ 6	+0.020 +0.068	+0.010 +0.058	+0.030 +0.105	0 +0.012	0 -0.030
>6 ~ 10	+0.025 +0.083	+0.013 +0.071	+0.040 +0.130	0 +0.015	0 -0.036
>10 ~ 18	+0.032 +0.102	+0.016 +0.086	+0.050 +0.160	0 +0.018	0 -0.043
>18 ~ 30	+0.040 +0.124	+0.020 +0.104	+0.065 +0.195	0 +0.021	0 -0.052
>30 ~ 50	+0.050 +0.150	+0.025 +0.125	+0.080 +0.240	0 +0.025	0 -0.062
>50 ~ 80	+0.060 +0.180	+0.030 +0.150	+0.100 +0.290	0 +0.030	0 -0.074
>80 ~ 120	+0.072 +0.212	+0.036 +0.176	+0.120 +0.340	0 +0.035	0 -0.087
>120 ~ 180	+0.085+0.245	+0.043 +0.203	+0.145 +0.395	0 +0.040	0 -0.100

图表19：摩擦系数 μ 与轴表面粗糙度Ra的关系
Graph 19: Friction coefficient μ & surface roughness Ra



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CSB-EPB™ Plastic Plain Bearings

CSB-EPB™ 工程塑料轴承

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基本功能 Basic Function			
通用型 Normal Type	 CSB-EPB 通用性最强 The most common material P 28-30	 CSB-EPB1 特别适合用于卡车尾箱铰链 Especially suitable for truck hinges P 34-36	 CSB-EPB3 **增强型** **高承载** Enhanced type P 43-45
高载型 High load	 CSB-EPB12 特别适合高载下摇摆运动 Especially suitable for oscillation P 85-87	 CSB-EPB22 极高载荷耐磨材料 Good wear resistance under extremely high load P 121-123	 CSB-EPB5 耐高温 抗化学性极佳 High temperature Excellent chemical resistance P 55-57
耐高温 High temperature	 CSB-EPB4 耐温200℃ Work consecutively at 200℃ P 52-54	 CSB-EPB24 耐温200℃ 适用于燃油系统 Temperature up to 200℃ For use in fuel oil P 127-129	 CSB-EPB5 耐温250℃ 高化学抗性 Work consecutively at 250℃, Good chemical resistance P 55-57
低摩擦系数 Low friction coefficient	 CSB-EPB13 快慢速下保持较低的摩擦系数 Maintain low friction coefficient either at high or low speed P 88-90	 CSB-EPB7 适合高速运动 高耐磨性 Suitable for high speed High wear resistance P 70-72	 CSB-EPB11 不含PTFE和硅，轻载耐磨性极好，高抗冲击性，适合软轴 Not PTFE and Silicon. Good wear resistance for low load. Suitable for soft shaft P 82-84
耐腐蚀 Anti-corrosion	 CSB-EPB4 耐温200℃ Work consecutively at 200℃ P 52-54	 CSB-EPB5 耐温250℃ 耐腐蚀最强 Work consecutively at 250℃ Highest corrosion resistance P 55-57	 CSB-EPB8 耐温200℃ 水下运行专用 Work consecutively at 200℃, Specialized underwater operation P 73-75
潮湿环境 Humid environment	 CSB-EPB2 高性价比 High performance-cost ratio P 37-39	 CSB-EPB4 高强度，耐化学腐蚀 High strength Good chemical resistance P 52-54	 CSB-EPB8 适合水下运行 Underwater operation P 73-75
食品安全等级FDA grade	 CSB-EPB5A 耐温250℃ FDA食品等级认可 High temperature 250℃ FDA grade P 58-60	 CSB-EPB6 适合软轴 允许接触食品 Soft shaft avaliable Food-classic P 64-66	 CSB-EPB6A 用于食品或烟草行业，适合低速运动 For the food and tobacco industry, Low speed P 67-69
经济型 Economic	 CSB-EPBH 经济通用 General Type P 31-33	 CSB-EPB2 适合潮湿环境 Good for Humidity condition P 37-39	 CSB-EPB2D 低摩擦系数，最经济 Low Friction coefficient Low cost P 40-42

CSB-EPB7
高耐磨性，电梯行业应用，适合软轴
High wear resistance, Used in lift industry, Suitable for soft shaft
P 70-72

CSB-EPB13
适合快慢速、适合软轴
Suitable for high and low speed with soft shaft
P 88-90

CSB-EPB15
高耐磨
长寿命
High wear resistance
Long service life
P 97-99

CSB-EPB18
低吸水率，高耐磨
Low water absorbtion, Good wear resistance
P 109-111

CSB-EPB5Z
特别适合摇摆运动
Especially suitable for oscillation
P 61-63

CSB-EPB10
耐高温，高强度
抗化学性极好
High temperature
Excellent chemica
l resistance
P 79-81

CSB-EPB10
耐温250℃，高强度
Work consecutively at 250℃
High strength
P 79-81

CSB-EPB14
耐高低温、低摩擦系数、适合液体中运行
High and low temp.
Low friction
Application in liquid
P 91-93

CSB-EPB14A
高速、低摩擦系数
FDA食品等级认可
High speed and low friction; FDA
P 94-96

CSB-EPB17
特殊高速高温材料
High speed and high temperature special material
P 103-105

CSB-EPB18
低吸水率，高耐磨
Low water absorbtion, Good wear resistance
P 109-111

CSB-EPB14
耐高低温、低摩擦系数、适合液体中运行
High and low temp.
Low friction
Application in liquid
P 91-93

CSB-EPB14A
高速、低摩擦系数
FDA食品等级认可
High speed and low friction; FDA
P 94-96

CSB-EPB10
耐温250℃
高抗压强度
Work consecutively at 250℃, High compressive strength
P 79-81

CSB-EPB14
耐高低温、低摩擦系数、适合液体中运行
High and low temp.
Low friction
Application in liquid
P 91-93

CSB-EPB26
适合高温和软轴应用
For soft shafts and high temperatures
P 133-135

CSB-EPB14
耐高低温、低摩擦系数、适合液体中运行
High and low temp.
Low friction
Application in liquid
P 91-93

CSB-EPB16
适合高载荷
Suitable for high load
P 100-102

CSB-EPB20
水下的自润滑材料
A self-lubricating material for applications in water
P 115-117

CSB-EPB21
高温耐磨材料
Good wear resistance for high temperature
P 118-120

CSB-EPB11
不含PTFE和硅，轻载耐磨性极好，高抗冲击性，适合软轴
Not PTFE and Silicon. Good wear resistance for low load. Suitable for soft shaft
P 82-84

CSB-EPB14A
高速、低摩擦系数
FDA食品等级认可
High speed and low friction; FDA
P 94-96

CSB-EPB23
高温180℃食品行业应用
For use with temperatures up to 180℃
P 124-126

CSB-EPB3G
高强度
High strength
P 46-48

CSB-EPB3M
边缘载荷，耐冲压，适合低速运动
Marginal Load, Impact resistance, Low speed
P 49-51

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CSB-EPB™ Standard Material Technical Data

CSB-EPB™ 标准材料性能数据表

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	EPB	EPB1	EPB2	EPB3	EPB4	EPB5
密度 Density	ISO1183	g/cm^3	1.46	1.51	1.29	1.46	1.70	1.44
颜色 Color			深灰 Dark Grey	红棕 Red Brown	橄榄绿 Olive	深灰 Dark Grey	黑色 Black	黑色 Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.15	0.08-0.20	0.07-0.20	0.08-0.18	0.07-0.20	0.09-0.25
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.4	0.6	0.5	0.5	1.4	1.5
最大旋转速度值 Max. rotating velocity		m/s	1.0	1.0	1.0	1.0	1.0	1.5
最大摇摆速度值 Max. oscillating velocity		m/s	0.7	0.7	0.7	0.7	0.7	1.1
最大直线速度值 Max. linear velocity		m/s	3.0	3.0	3.0	4.0	3.0	5.0
抗拉强度 Tensile strength	ISO527	MPa	80	80	80	200	180	170
抗压强度(轴向) Compressive strength(Axial)		MPa	65	75	70	80	80	100
弹性模量 E-module	ISO527	MPa	2300	2500	2400	7700	12000	7900
允许最大表面静压力 Max. static pressure of the surface, 20℃		MPa	35	70	60	80	90	150
邵氏硬度 Shore hardness	ISO 868	D	75	77	75	81	87	85
连续工作温度 Continuous work temperature		℃	-40/+80	-50/+110	-50/+100	-40/+130	-40/+200	-100/+250
短时运行温度 Short-time work temperature		℃	-40/+120	-50/+170	-50/+150	-40/+220	-40/+260	-100/+315
导热性 Thermal conductivity	ASTME1461	W / m × k	0.2	0.3	0.25	0.25	0.6	0.6
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	10	8	10	9	4	5
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2	0.2	0.2	0.7	0.1	0.1
最大吸水率23℃ Max. water absorption, 23℃		%	1.2	0.5	0.4	4.0	0.3	0.5
燃烧性能 Flammability	UL94		HB	HB	HB	HB	HB	V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{12}$	$>10^{14}$	$>10^{14}$	$>10^{13}$	$>10^{4}$	$>10^{8}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$	$>10^{15}$	$>10^{15}$	$>10^{11}$	$>10^{5}$	$>10^{7}$
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	EPB6	EPB7	EPB10	EPB12	EPB13	EPB15	EPB16	EPB18	EPB19	EPB21	EPB22	EPB25
	1.45	1.25	1.40	1.40	1.48	1.35	1.58	1.45	1.32	1.53	1.46	1.44
	白色 White	米黄色 Cream	黑色 Black	黑色 Black	黄色 Yellow	黄色 Yellow	黑色 Black	黄色 Yellow	深灰 Dark Grey	浅黄色 Buff	深黄色 Dark Yellow	黄色 Yellow
	0.05-0.18	0.09-0.20	0.10-0.25	0.05-0.20	0.05-0.15	0.05-0.15	0.06-0.20	0.05-0.18	0.05-0.20	0.05-0.20	0.15-0.35	0.08-0.20
	0.3	0.5	1.8	0.6	0.4	0.9	0.4	0.4	0.7	0.80	0.70	0.45
	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.2	1.2	2.00	1.00	1.30
	0.7	0.7	1.1	0.7	1.1	1.1	0.7	0.8	0.8	1.00	0.70	1.00
	3.0	4.0	5.0	5.0	8.0	8.0	3.0	3.0	4.0	5.00	4.00	4.00
	75	120	240	115	75	130	120	90	100	55	240	55
	65	60	105	95	60	70	65	70	60	78	130	60
	2300	3500	12000	4300	2400	4000	5300	2500	3500	2800	9000	2200
	30	60	160	100	35	70	50	50	60	80	120	60
	74	77	86	83	74	77	76	75	77	77	80	80
	-40/+80	-40/+100	-100/+260	-40/+130	-50/+90	-40/+100	-40/+130	-50/+110	-40/+150	-40/+200	-40/+150	-100/+180
	-40/+120	-40/+180	-100/+315	-40/+170	-50/+120	-40/+180	-40/+200	-50/+170	-40/+200	-40/+240	-40/+220	-100/+210
	0.2	0.2	0.7	0.25	0.25	0.25	0.25	0.3	0.25	0.5	0.24	0.24
	10	9	2	5	9	7	4	8	5	5	8	7
	0.2	1.3	0.1	0.9	0.2	1.3	0.2	0.2	1.3	0.1	1.1	0.3
	1.1	6.5	0.5	4.9	1.2	6.5	0.4	0.5	2.5	0.3	4.6	1.6
	HB	HB	V0	HB	HB	HB	HB	HB	HB	V0	HB	V0
	$>10^{12}$	$>10^{12}$	$>10^{5}$	$>10^{15}$	$>10^{13}$	$>10^{15}$	$>10^{13}$	$>10^{15}$	$>10^{15}$	$>10^{12}$	$>10^{13}$	$>10^{13}$
	$>10^{15}$	$>10^{12}$	$>10^{5}$	$>10^{12}$	$>10^{12}$	$>10^{12}$	$>10^{12}$	$>10^{15}$	$>10^{12}$	$>10^{11}$	$>10^{11}$	$>10^{10}$
	P 64-66	P 70-72	P 79-81	P 85-87	P 88-90	P 97-99	P 100-102	P 109-111	P 112-114	P 118-120	P 121-123	P 130-132

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CSB-EPB™ Special Material Technical Data

CSB-EPB™ 特殊材料性能数据表

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	EPBH	EPB2D	EPB3G	EPB3M	EPB5A	EPB5Z
密度 Density	ISO1183	g/cm^3	1.45	1.40	1.37	1.15	1.28	1.40
颜色 Color			黑色 Black	绿色 Green	黑色 Black	深灰 Dark Grey	米色 Beige	棕色 Brown
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.20	0.05-0.25	0.05-0.15	0.09-0.30	0.25-0.40	0.05-0.15
最大P.V值 Max. PV (dry)		N/mm^2 × m/s	0.3	0.3	0.3	0.2	0.28	1.0
最大旋转速度值 Max. rotating velocity		m/s	0.8	1.2	0.8	0.8	0.6	1.5
最大摇摆速度值 Max. oscillating velocity		m/s	0.6	0.8	0.6	0.6	0.4	1.1
最大直线速度值(20℃) Max. linear velocity		m/s	2.5	3.0	3.5	2.5	1.0	5.0
抗拉强度 Tensile strength	ISO527	MPa	75	75	190	110	140	90
抗压强度(轴向) Compressive strength(Axial)		MPa	60	60	75	50	118	65
弹性模量 E-module	ISO527	MPa	2200	2000	7500	2500	3600	2500
允许最大表面静压力 Max. static pressure of the surface, 20℃		MPa	30	25	75	20	120	150
邵氏硬度 Shore hardness	ISO 868	D	74	74	78	79	83	81
连续工作温度 Continuous work temperature		℃	-40/+80	-40/+80	-40/+100	-40/+80	-100/+250	-100/+250
短时运行温度 Short-time work temperature		℃	-40/+120	-40/+120	-40/+200	-40/+170	-100/+315	-100/+310
导热性 Thermal conductivity	ASTME1461	W / m × k	0.2	0.25	0.25	0.25	0.24	0.6
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	K^{-1} × 10^{-5}	10	11	11	10	9	4
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2	0.2	1.3	1.4	0.3	0.3
最大吸水率23℃ Max. water absorption, 23℃		%	1.2	1.1	5.5	7.6	0.5	1.1
燃烧性能 Flammability	UL94		HB	HB	HB	HB	V0	V0
体电阻率 Volume resistivity	IEC60093	Ω cm	>10^{12}	>10^{13}	>10^{13}	>10^{12}	>10^{14}	>10^{11}
面电阻率 Surface resistivity	IEC60093	Ω	>10^{15}	>10^{12}	>10^{11}	>10^{11}	>10^{13}	>10^{11}
页码 Page			P 31-33	P 40-42	P 46-48	P 49-51	P 58-60	P 61-63

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	EPB6A	EPB8	EPB9	EPB11	EPB14	EPB14A	EPB17	EPB17A	EPB20	EPB23	EPB24	EPB26
	1.14	1.60	1.24	0.96	2.13	2.02	3.9	1.98	1.52	1.42	1.79	1.51
	白色 White	灰色 Grey	黑色 Black	白色 White	黑色 Black	黄色 Yellow	深绿色 Dark Green	黄色 Yellow	黑色 Black	蓝色 Blue	棕色 Brown	米色 Beige
	0.10-0.40	0.07-0.18	0.10-0.40	0.05-0.15	0.08-0.18	0.05-0.15	0.15-0.30	0.10-0.20	0.15-0.35	0.10-0.20	0.08-0.25	0.15-0.20
	0.1	0.8	0.3	0.2	0.3	0.4	0.7	0.3	0.15	0.4	0.7	0.5
	0.6	1.2	0.8	0.5	2.0	5.0	3.0	2.0	0.5	1.0	1.0	1.0
	0.4	0.8	0.6	0.4	1.4	3.5	2.1	1.4	0.4	0.8	0.7	0.7
	1.0	4.0	3.0	1.0	5.0	7.0	5.0	5.0	2.0	2.5	1.0	1.0
	83	135	250	45	13	18	16	12	90	110	210	47
	50	80	100	35	8	10	20	8	70	78	110	105
	2800	11000	11000	1000	790	830	950	800	9500	2000	10000	4500
	20	75	105	30	8	10	20	5	40	60	110	45
	76	82	84	70	65	67	68	65	78	76	80	74
	-40/+80	-40/+200	-40/+130	-40/+70	-200/+260	-200/+260	-200/+260	-200/+260	-50/+90	-100/+180	-40/+200	-50/+200
	-40/+170	-40/+260	-40/+180	-40/+100	-200/+310	-200/+310	-200/+310	-200/+310	-50/+110	-100/+210	-40/+240	-50/+250
	0.2	0.5	0.6	0.3	0.25	0.25	0.45	0.25	0.6	0.24	0.24	0.24
	10	5	11	12	12	13	12	10	6	8	5	3
	1.5	<0.1	1.8	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.6	0.1	＜0.1
	7.6	<0.1	8.4	<0.1	<0.1	<0.1	<0.1	<0.1	0.8	1.9	0.2	0.2
	V0	V0	HB	HB	V0	V0	V0	V0	HB	V0	V0	V0
	$>10^{12}$	$>10^{5}$	$>10^{3}$	$>10^{15}$	$>10^{4}$	$>10^{15}$	$>10^{12}$	$>10^{15}$	$<10^{5}$	$>10^{11}$	$>10^{13}$	$>10^{12}$
	$>10^{15}$	$>10^{5}$	$>10^{3}$	$>10^{15}$	$>10^{3}$	$>10^{15}$	$>10^{12}$	$>10^{15}$	$<10^{5}$	$>10^{11}$	$>10^{12}$	$>10^{12}$
	P 67-69	P 73-75	P 76-78	P 82-84	P 91-93	P 94-96	P 103-105	P 106-108	P 115-117	P 124-126	P 127-129	P 133-135

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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 × 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} × 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}

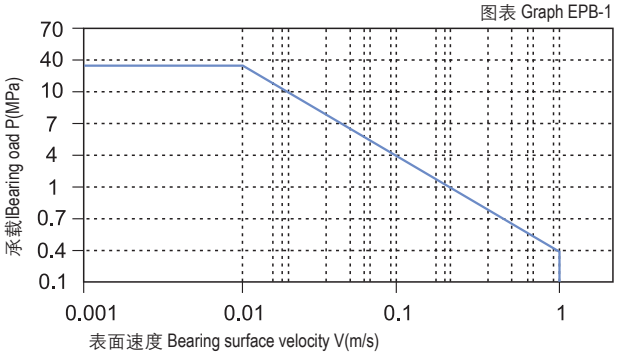
轴承PV值 PV Value

CSB-EPB塑料轴承最大运行PV值为0.4N/mm^2 × 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/mm^2 × 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

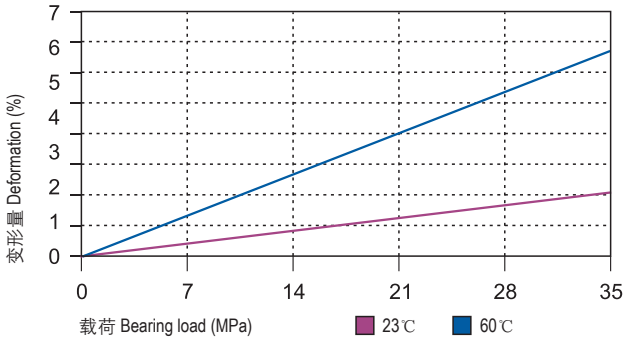
摩擦系数 Friction Factor

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.

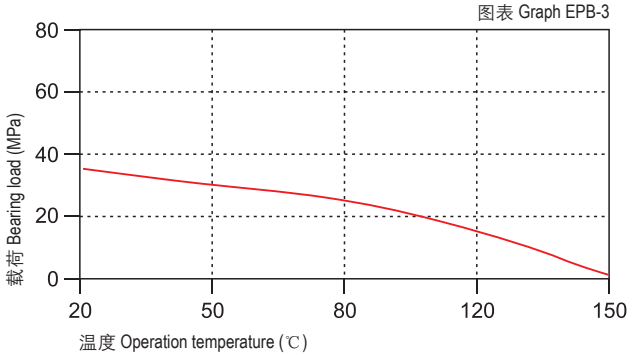
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB-2



■ 载荷-温度图表 Load-Temperature diagrams

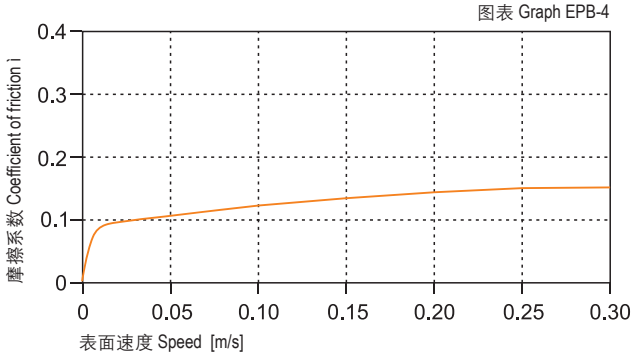
图表 Graph EPB-3



■ 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

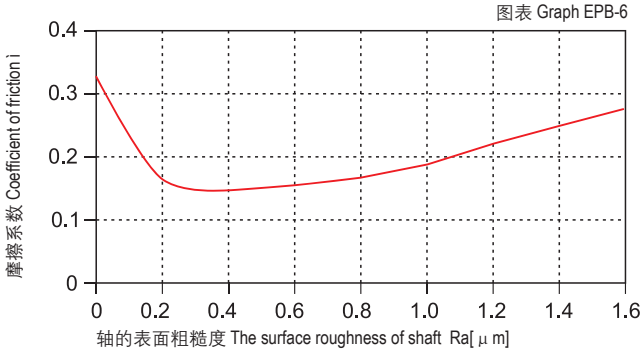
图表 Graph EPB-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

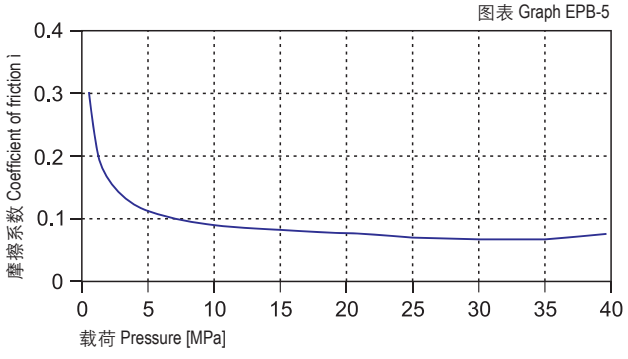
图表 Graph EPB-6



■ 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

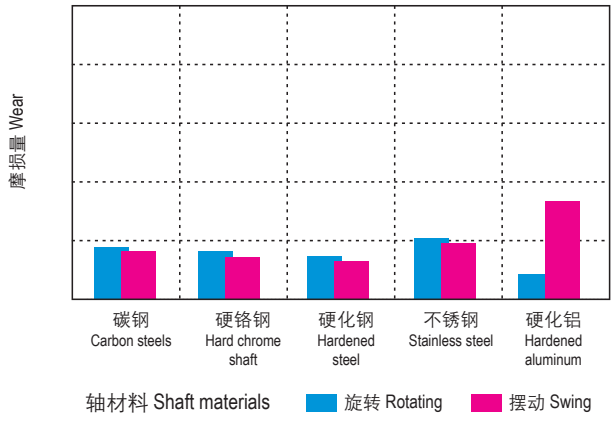
CSB-EPB塑料轴承压装后公差 Tolerances after pressfit

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

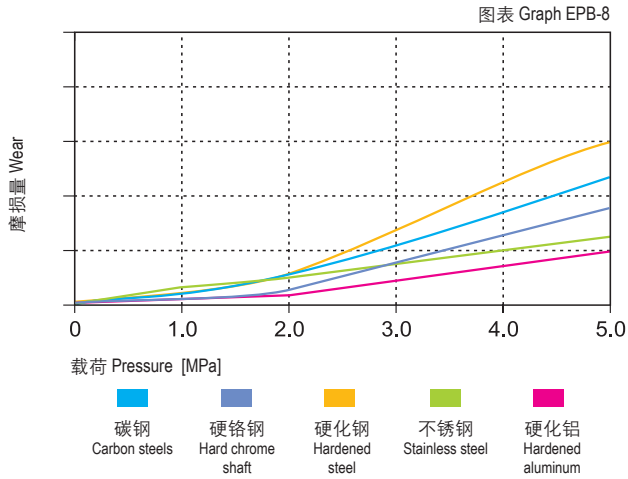
图表 Graph EPB-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

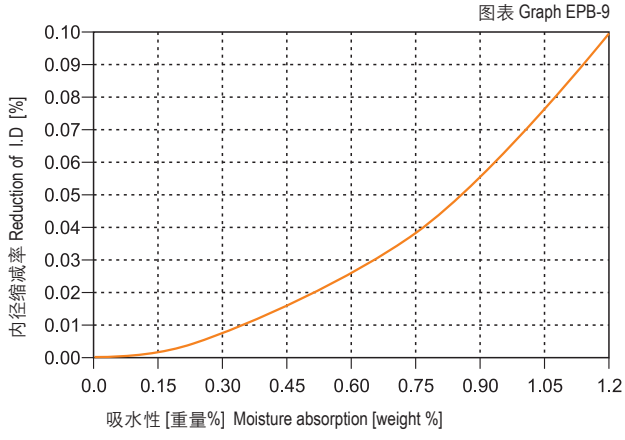
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

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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◉ 标准产品规格表 Standard specifications: P136

产品特性 Product Features

- 作为兼顾耐磨性能和低廉的价格被开发的材料。适用于大批量低成本需求
- 连续使用温度：-40℃/+80℃
- 适合多数中低载荷场合
- 适合干运行、免维护
- 大批量、低成本要求

- This material is developed against the requirement of wear resistance and economic cost for cost effective and big quantity comsuming applications
- Continuous working temperature: -40℃/+80℃
- Suitable for most of average and low load
- Maintenance-free dry operation
- Low cost for high quantities

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPBH
密度 Density	ISO1183	g/cm^3	1.45
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.20
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.3
最大旋转速度值 Max. roatating velocity		m/s	0.8
最大摇摆速度值 Max. oscillating velocity		m/s	0.6
最大直线速度值 Max. linear velocity		m/s	2.5
抗拉强度 Tensile strength	ISO527	MPa	75
抗压强度 (轴向) Compressive strength (Axial)		MPa	60
弹性模量 E-module	ISO527	MPa	2200
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	30
邵氏硬度 Shore hardness	ISO 868	D	74
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	$W / m \times k$	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	Ωcm	$>10^{12}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$

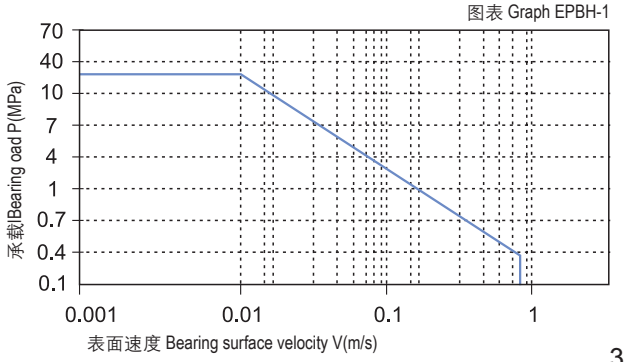
轴承PV值 PV Value

CSB-EPBH塑料轴承最大运行PV值为$0.3N/mm^2 \times m/s$；由此决定轴承所承受的载荷与速度成反比，详细查阅图表EPBH-1。

The max PV value of the CSB-EPBH plastic bearings is $0.3N/mm^2 \times m/s$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPBH-1).

PV图表 Permissible PV value for CSB-EPBH

图表 Graph EPBH-1



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

CSB-EPBH塑料轴承可承受最大静载荷为30Mpa，在此载荷下轴承的最大压缩变形量参考图表EPBH-2，轴承实际工作载荷略小于30Mpa，载荷还受到运行速度以及温度的影响，速度越快（Vmax：0.8m/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EPBH-3。

CSB-EPBH allows the Max static load of 30Mpa, The max compressive deformation rate under the max load is listed in Graph EPBH-2, The actual load capacity of bearing is slightly less than 30Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.8m/s) results into higher temperature (Tmax: 80℃) which decreases the load capacity of the bearing. Please refer to the Graph EPBH-3 for such variation.

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

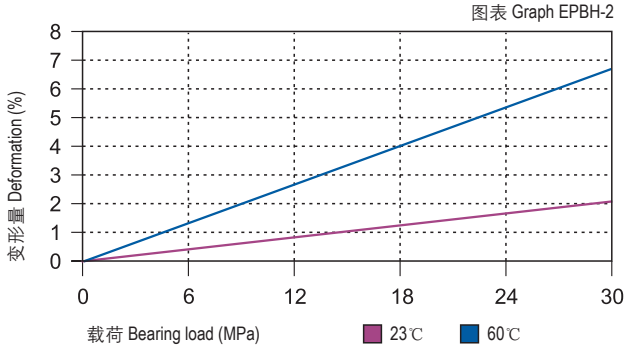
摩擦系数 Friction Factor

CSB-EPBH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EPBH-4与图表EPBH-5），这也是CSB-EPBH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EPBH-6显示CSB-EPBH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-EPBH friction factor is not sensitive to the operation speed and bearing loading (see Graph EPBH-4 and Graph EPBH-5). The above features are the most common considerations for the bearing material selection. The friction of CSB-EPBH could be maintained at a relatively lower level so that the good wearing features are guaranteed. From the Graph EPBH-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.

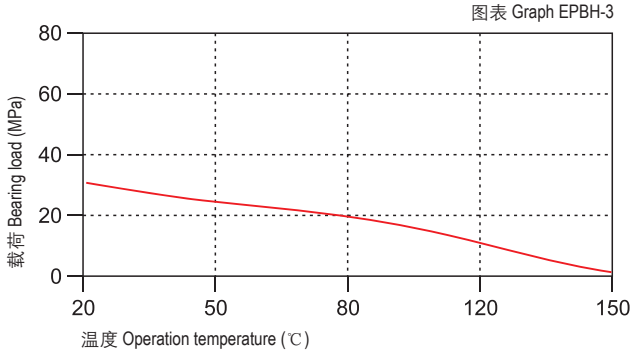
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPBH-2



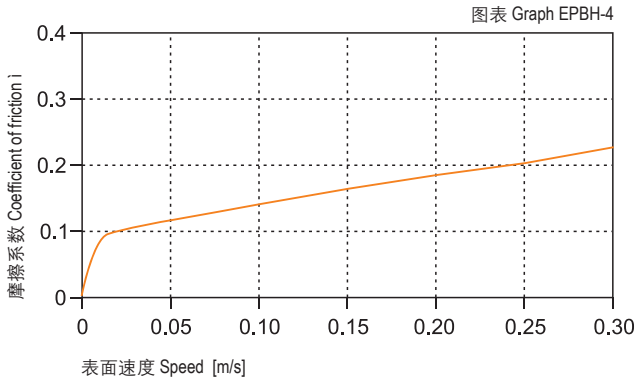
■ 载荷-温度图表 Load-Temperature diagrams

图表 Graph EPBH-3



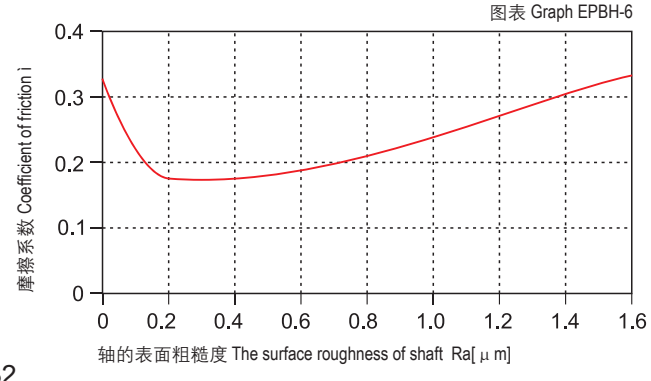
■ 摩擦系数与速度变化关系图表 P=2MPa
Coefficient of friction & the speed of bearing, p = 2 MPa

图表 Graph EPBH-4



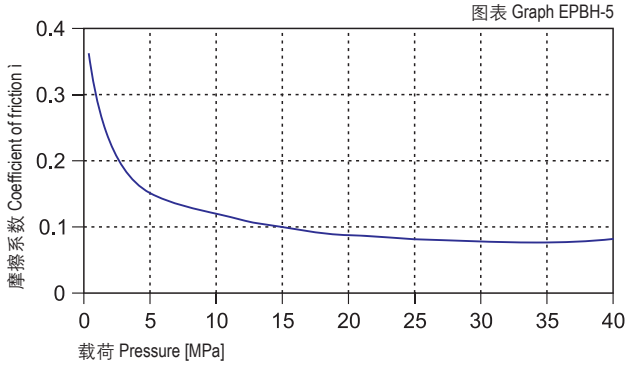
■ 摩擦系数与轴表面粗糙度关系图表
Coefficient of friction & the surface roughness of shaft

图表 Graph EPBH-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 EPBH-5



CSB-EPBH	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05~0.20	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-EPBH轴承适合几乎所有的轴材料；通过图表EPBH-7与图表EPBH-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-EPBH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-EPBH is suitable for almost all kinds of shaft materials. Graph EPBH-7 and Graph EPBH-8 show that the wearing feature of CSB-EPBH is excellent when the shaft material are hardened chrome steel or hardened steel or hardened Aluminum.

化学抗性 Chemical Resistance

CSB-EPBH塑料轴承能抵抗弱碱、弱酸以及各类润滑油的腐蚀。

CSB-EPBH 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-EPBH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-EPBH 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-EPBH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-EPBH 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

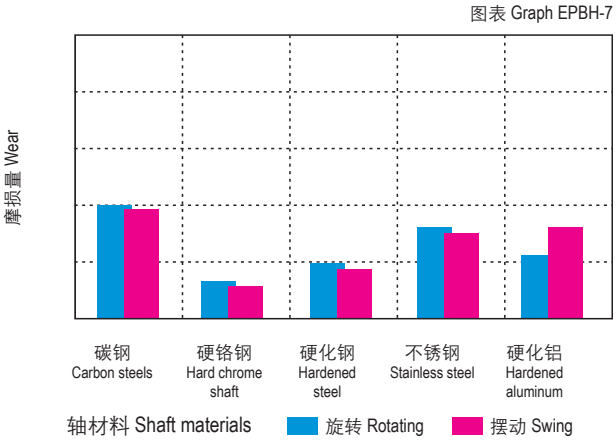
CSB-EPBH塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPBH 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

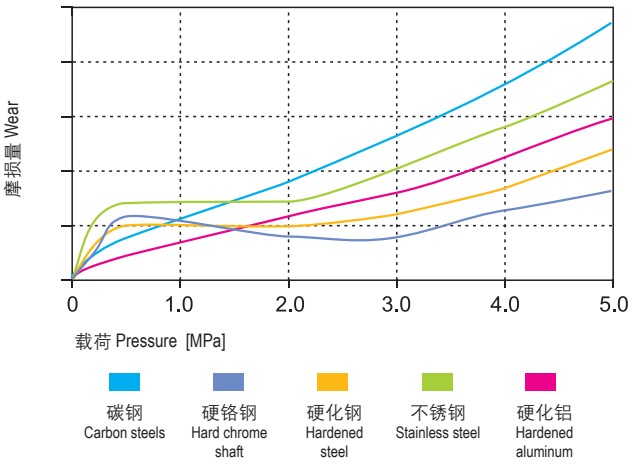
图表 Graph EPBH-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

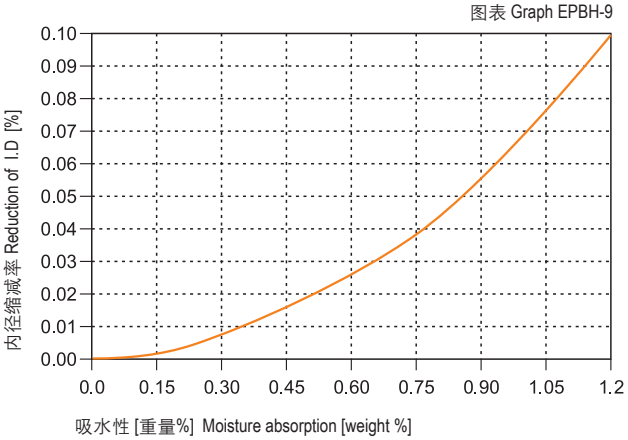
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPBH-8



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

图表 Graph EPBH-9



标准产品规格表 Standard specifications: P136

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB1

标准产品规格表 Standard specifications: P136

产品特性 Product Features

- 低吸水率和中高承载性能。可被用于潮湿环境而耐磨性能同样出色的材料，特种金属粉末的植入使得此轴承成为可被探测的材料
- 连续使用温度：-50℃/+110℃
- 适合多数中高载荷场合
- 适合干运行、免维护
- 特殊材料优异的热传导性
- 适合低速运动
- This material is with low water absorb characteristic and high load capacity. It is widely used for the humidity condition and wear resistance requirement. The embedded special metal powder enables this material to be a detective one
- Continuous working temperature: -50℃/+110℃
- Suitable for medium and high load operation
- Maintenance-free dry operation
- Excellent thermol conductivity
- Good for low speed operation

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB1
密度 Density	ISO1183	g/cm^3	1.51
颜色 Color			红棕Red Brown
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.08-0.20
最大P.V值 Max. PV (dry)		N/mm^2 × m/s	0.6
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	75
弹性模量 E-module	ISO527	MPa	2500
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	70
邵氏硬度 Shore hardness	ISO 868	D	77
连续工作温度 Continuous work temperature		℃	-50/+110
短时运行温度 Short-time work temperature		℃	-50/+170
导热性 Thermal conductivity	ASTME1461	W / m × k	0.3
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	K^{-1} × 10^{-5}	8
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2
最大吸水率23℃ Max. water absorption, 23℃		%	0.5
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	>10^{14}
面电阻率 Surface resistivity	IEC60093	Ω	>10^{15}

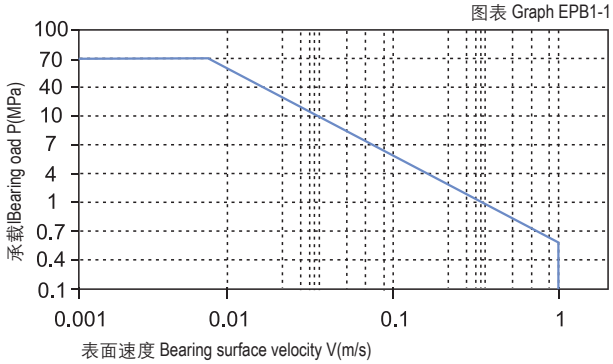
轴承PV值 PV Value

CSB-EPB1塑料轴承最大运行PV值为0.6N/mm^2 × 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EPB1-1。

The max PV value of the CSB-EPB1 plastic bearings is 0.6N/mm^2 × 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 EPB1-1).

PV图表 Permissible PV value for CSB-EPB1

图表 Graph EPB1-1



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

CSB-EPB1塑料轴承可承受最大静载荷为70Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB1-2，轴承实际工作载荷略小于70Mpa，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：110℃）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EPB1-3。

CSB-EPB1 allows the Max static load of 70Mpa, The max compressive deformation rate under the max load is listed in Graph EPB1-2, The actual load capacity of bearing is slightly less than 70Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 110℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB1-3 for such variation.

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

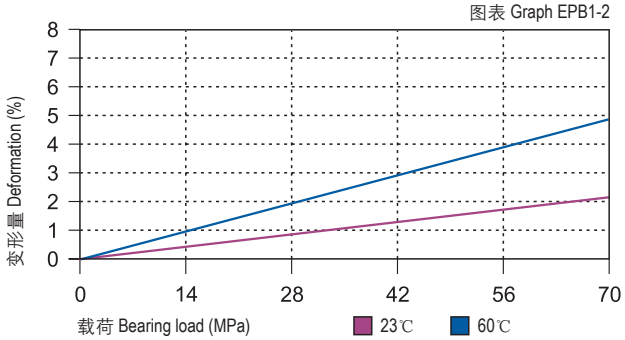
摩擦系数 Friction Factor

图EPB1-4表明CSB-EPB1轴承和大多数滑动轴承一样在载荷保持不变的情况下摩擦系数会随着旋转速度的增加略有升高；图EPB1-5表明CSB-EPB1轴承摩擦系数在速度保持不变的情况下随着载荷的增加而逐步降低；图EPB1-6表明CSB-EPB1轴承最适合的轴表面粗糙度为Ra0.2 ~ 0.6um，轴过于光滑或者过于粗糙都会导致摩擦系数升高。

Graph EPB1-4 shows that as the same as most of the slide bearing materials, the friction factor of CSB-EPB1 is increasing along with the rotation speed under a certain loading while as shown in figure EPB1-5, it is decreased along with the increasing of loading when the operation speed is stable. From figure EPB1-6, it is found that the most suitable shaft roughness is Ra0.2 to Ra0.6. Smoother shaft or rougher shaft may result into friction factor increasing.

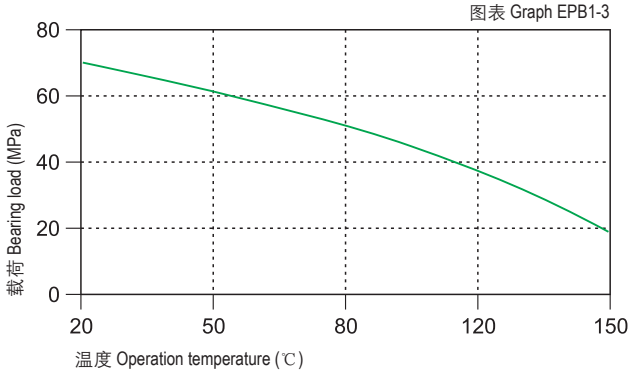
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB1-2



■ 载荷-温度图表 Load-Temperature diagrams

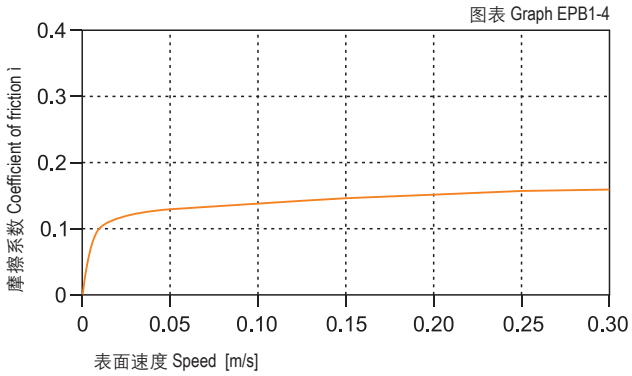
图表 Graph EPB1-3



■ 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

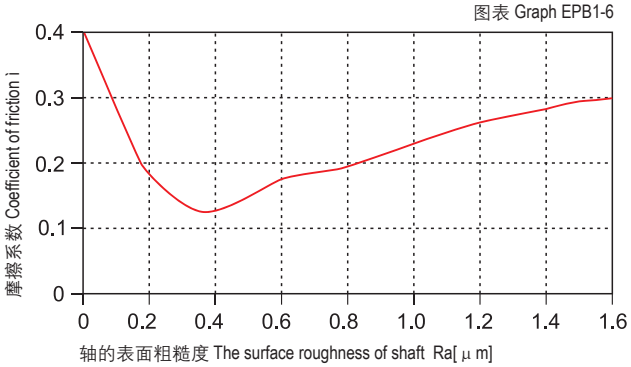
图表 Graph EPB1-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

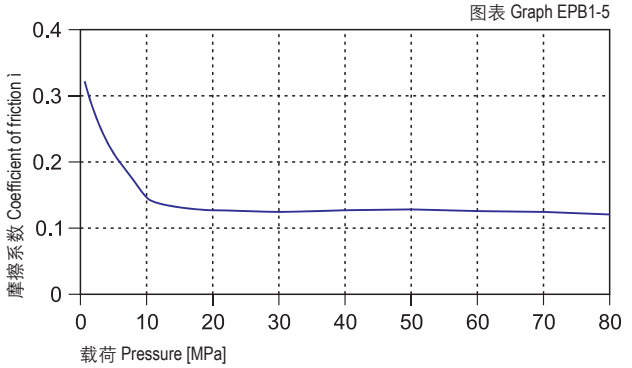
图表 Graph EPB1-6



■ 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 EPB1-5



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CSB-EPB1	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.08~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图EPB1-7都表明CSB-EPB1轴承的磨损受轴材料影响比较大，硬化钢轴和碳钢轴比较适合此轴承。CSB-EPB1在摆动运动时选择硬铬钢轴和硬化钢轴比较适合，在旋转运动中也是选择硬铬钢轴和硬化钢轴比较理想。

Graph EPB1-7 shows the wearing is considerably affected by the shaft materials. Heat-treated steel shaft and carbon steel shaft is good for this bearing material. CSB-EPB1 is suitable for hardened chrome steel and hardened steel shaft in oscillation operation and is suitable for hardened chrome steel and hardened steel shaft in rotation operation.

化学抗性 Chemical Resistance

CSB-EPB1塑料轴承能抵抗部分弱酸以及各类润滑油的腐蚀。

CSB-EPB1 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-EPB1塑料轴承的吸水率为0.2%，浸泡水中最大平衡吸水率为0.5%；由于此吸水率的特性，此轴承可以应用于一般潮湿环境。

The water absorb rate of CSB-EPB1 is 0.2% under the atmospheric pressure while it is 0.5% 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-EPB1长久暴露在紫外线下颜色会发生褪变。材料性能会有所下降。

Disintegration could be possible for the material CSB-EPB1 after long period of exposing under the UV ray and therefore the performance of the material will be reduced.

安装公差 Installation Tolerances

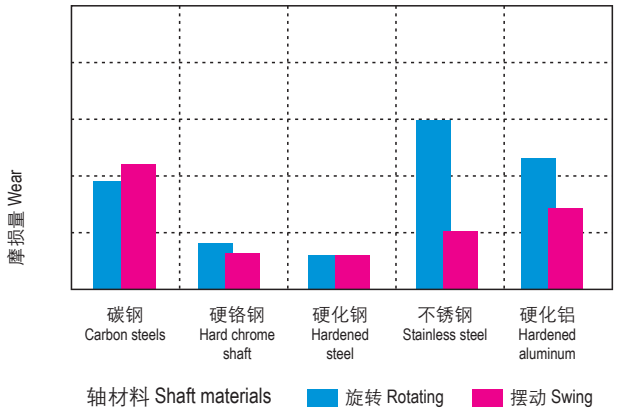
CSB-EPB1塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB1 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

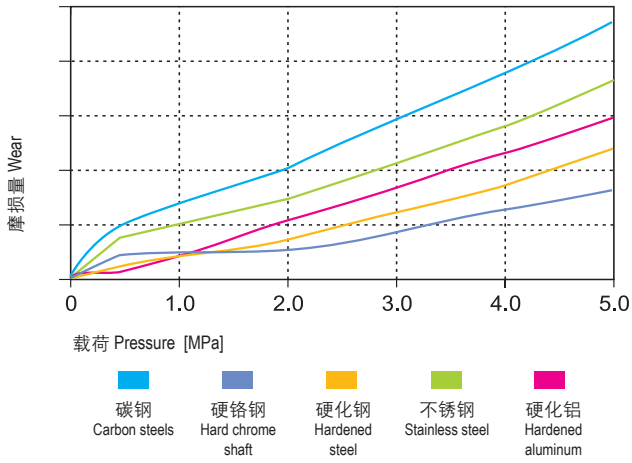
图表 Graph EPB1-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

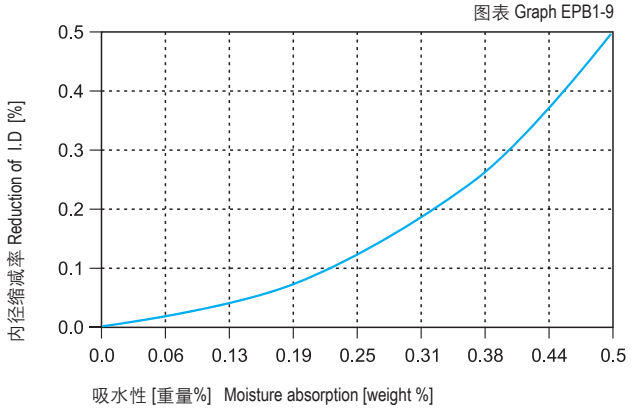
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB1-8



吸水性的影响 Effect of moisture absorption on EPB1 bearings

图表 Graph EPB1-9



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◉ 标准产品规格表 Standard specifications: P136

产品特性 Product Features

- 中低载荷应用的低成本解决方案，同时此材料具有低吸水率的特性
- 连续使用温度：-50℃/+100℃
- 适用于中低载荷
- 适合干运行免维护
- 潮湿环境应用
- 大批量、低成本

- The solution of middle to low load application and economic effective requirement. It is also one of the low water absorbing materials
- Continuous working temperature: -50℃/+100℃
- Suitable for medium load operation
- Maintenance-free dry operation
- For wet conditions
- Low cost material for high quantities

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB2
密度 Density	ISO1183	g/cm^3	1.29
颜色 Color			橄榄绿Olive
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.07-0.20
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.5
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	70
弹性模量 E-module	ISO527	MPa	2400
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	60
邵氏硬度 Shore hardness	ISO 868	D	75
连续工作温度 Continuous work temperature		℃	-50/+100
短时运行温度 Short-time work temperature		℃	-50/+150
导热性 Thermal conductivity	ASTME1461	W / m × k	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	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℃		%	0.4
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{14}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$

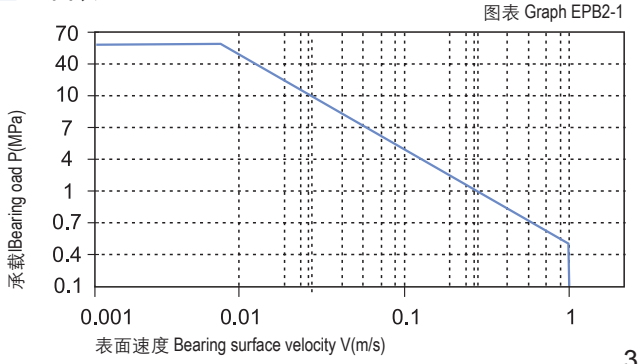
轴承PV值 PV Value

CSB-EPB2塑料轴承最大运行PV值为0.5N/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EPB2-1。

The max PV value of the CSB-EPB2 plastic bearings is 0.5N/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 EPB2-1).

■ PV图表 Permissible PV value for CSB-EPB2

图表 Graph EPB2-1



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

CSB-EPB2塑料轴承可承受最大静载荷为60Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB2-2，轴承实际工作载荷略小于60Mpa，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：100℃）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EPB2-3。

CSB-EPB2 allows the Max static load of 60Mpa, The max compressive deformation rate under the max load is listed in Graph EPB2-2, The actual load capacity of bearing is slightly less than 60Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 100℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB2-3 for such variation.

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

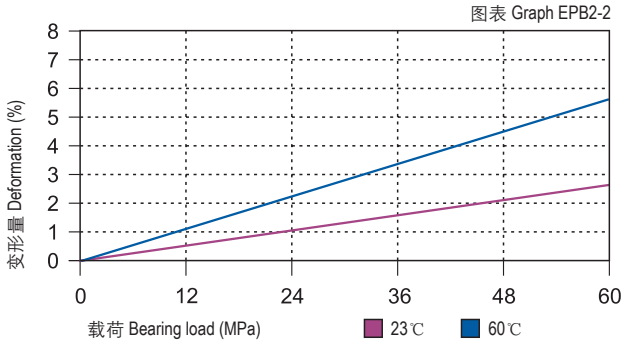
摩擦系数 Friction Factor

与其它塑料轴承基本一样，图EPB2-4表明CSB-EPB2轴承在载荷保持不变的情况下摩擦系数随着运行速度的增加而升高；图EPB2-5表明CSB-EPB2轴承在保持速度不变时摩擦系数随着载荷的增加而逐步减低。根据图EPB2-6表明CSB-EPB2轴承的摩擦系数会随着轴表面粗糙度的变化而不同，我们推荐使用轴粗糙度为Ra0.3 ~ 0.6um;

Similar with most of the plastic bearings, the friction factor of CSB-EPB2 is increased along with the operation speed when the loading is stable (see Graph EPB2-4) and is decreased along with the loading increasing when the operation speed is stable (see Graph EPB2-5). From Graph EPB2-6, it shows the friction factor of CSB-EPB2 is variable against different shaft surface roughness. The recommended shaft surface roughness is Ra0.3~0.6.

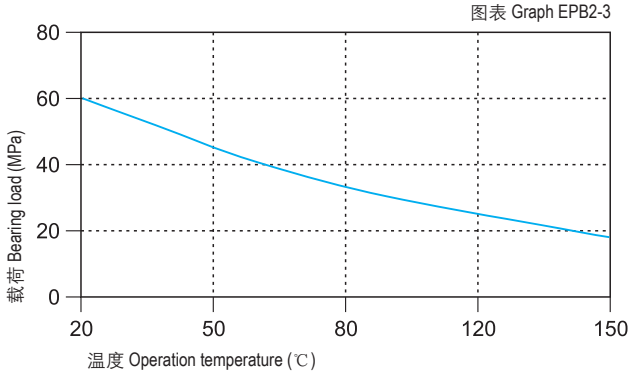
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB2-2



■ 载荷-温度图表 Load-Temperature diagrams

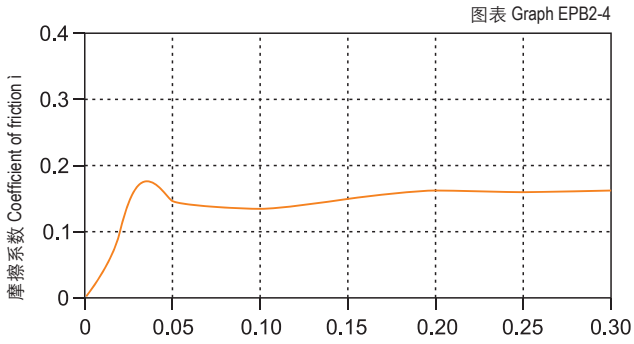
图表 Graph EPB2-3



■ 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

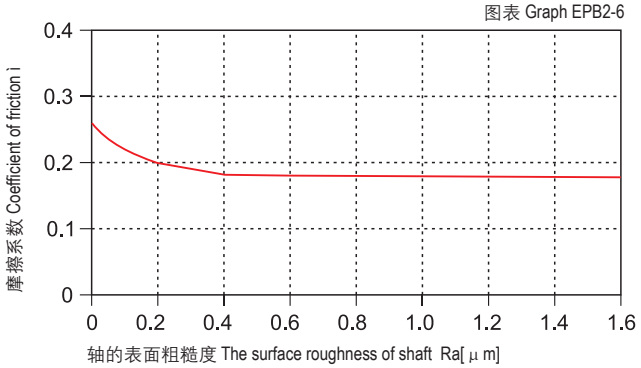
图表 Graph EPB2-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

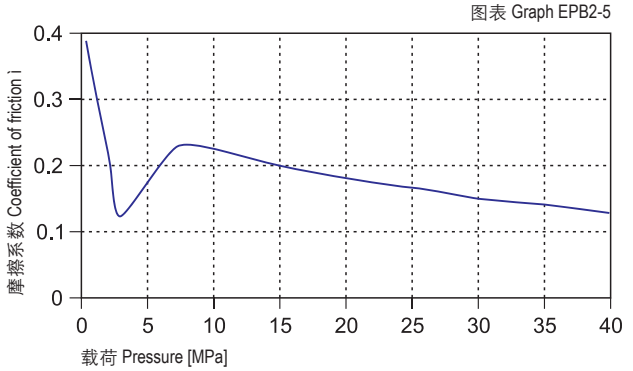
图表 Graph EPB2-6



■ 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 EPB2-5



CSB-EPB2	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.07~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图EPB2-7表明低载时硬化钢轴与硬铬钢轴比较适合用于CSB-EPB2轴承。CSB-EPB2在用于摆动运动时磨损值明显要优越于用于旋转运动。

Graph EPB2-7 shows that CSB-EPB2 is rather suitable for hardened steel shaft and hardened chrome steel shaft under lower loading andGraph EPB2-7 shows that CSB-EPB2 wearing feature is better for oscillation operation than of rotation operation.

化学抗性 Chemical Resistance

CSB-EPB2塑料轴承能抵抗部分弱酸以及各类润滑油的腐蚀。

CSB-EPB2 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-EPB2塑料轴承的吸水率为0.2%，浸泡水中最大平衡吸水率为0.4%；由于此吸水率的特性，此轴承可以应用于一般潮湿环境。

The water absorb rate of CSB-EPB2 is 0.2% under the atmospheric pressure while it is 0.4% 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-EPB2长久暴露在紫外线下颜色会发生褪变。材料性能会有所下降。

Disintegration could be possible for the material CSB-EPB2 after long period of exposing under the UV ray and therefore the performance of the material will be reduced.

安装公差 Installation Tolerances

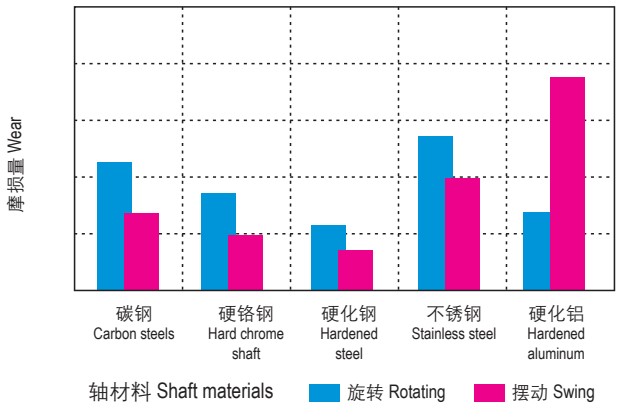
CSB-EPB2塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB2 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

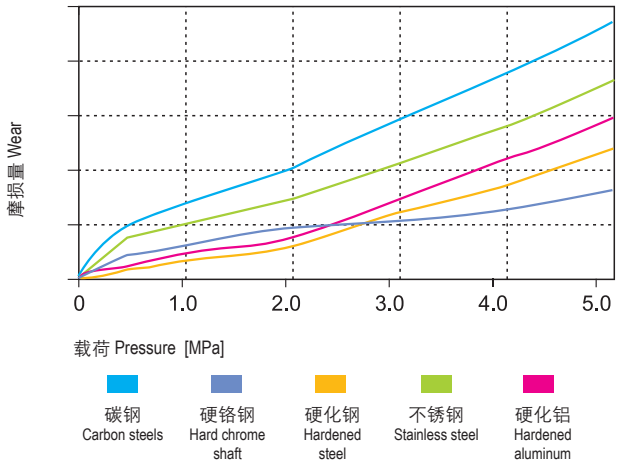
图表 Graph EPB2-7



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

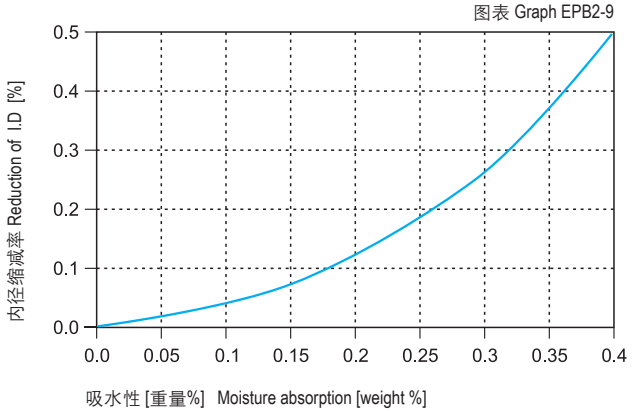
图表 Graph EPB2-8



吸水性的影响

Effect of moisture absorption on EPB2 bearings

图表 Graph EPB2-9



标准产品规格表 Standard specifications: P136

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB2D

◉ 标准产品规格表 Standard specifications: P136

产品特性 Product Features

- 中低载荷和速度的优化组合，不含PTFE；大批量低成本需求
- 连续使用温度：-40℃/+80℃
- 适合多数低载荷场合
- 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 combination of middle to low load and low speed application requirement. It is a meterial without PTFE embedded for the low cost and big quantity demanding
- 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-EPB2D
密度 Density	ISO1183	g/cm^3	1.40
颜色 Color			绿色Green
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.25
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.3
最大旋转速度值 Max. roatating velocity		m/s	1.2
最大摇摆速度值 Max. oscillating velocity		m/s	0.8
最大直线速度值 Max. linear velocity		m/s	3.0
抗拉强度 Tensile strength	ISO527	MPa	75
抗压强度 (轴向) Compressive strength (Axial)		MPa	60
弹性模量 E-module	ISO527	MPa	2000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	25
邵氏硬度 Shore hardness	ISO 868	D	74
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	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	11
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2
最大吸水率23℃ Max. water absorption, 23℃		%	1.1
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{13}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{12}$

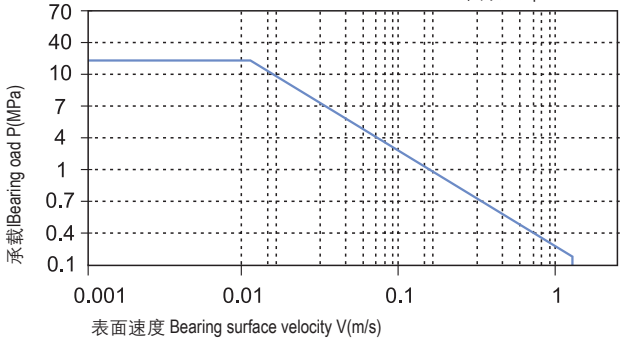
轴承PV值 PV Value

CSB-EPB2D塑料轴承最大运行PV值为0.3N/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EPB2D-1。

The max PV value of the CSB-EPB2D plastic bearings is 0.3N/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 EPB2D-1).

■ PV图表 Permissible PV value for CSB-EPB2D

图表 Graph EPB2D-1



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

CSB-EPB2D塑料轴承可承受最大静载荷为25Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB2D-2，轴承实际工作载荷略小于25Mpa，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: 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EPB2D-3。

CSB-EPB2D allows the Max static load of 25Mpa, The max compressive deformation rate under the max load is listed in Graph EPB2D-2, The actual load capacity of bearing is slightly less than 25Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.2m/s) results into higher temperature (Tmax: 80℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB2D-3 for such variation.

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

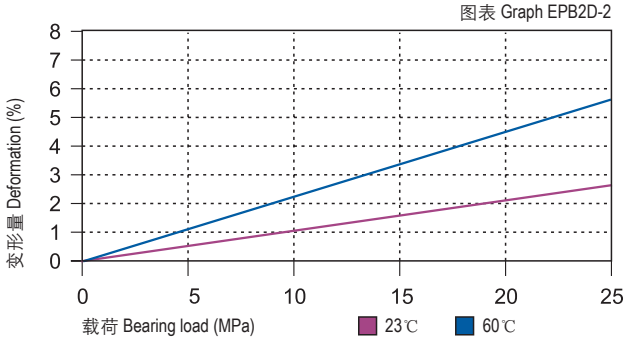
摩擦系数 Friction Factor

图表EPB2D-4表明CSB-EPB2D轴承在载荷保持不变的情况下摩擦系数先是随着运行速度的增加而升高，当运行速度超过0.25m/s后摩擦系数反而会随着运动速度的增加而降低；图表EPB2D-5表明CSB-EPB2D轴承在保持速度不变时摩擦系数随着载荷的增加而逐步减低。根据图表EPB2D-6表明CSB-EPB2D轴承的摩擦系数会随着轴表面粗糙度的变化而不同，我们推荐使用轴粗糙度为Ra0.3 ~ 0.6um;

Graph EPB2D-4 shows that the friction factor of CSB-EPB2D is initially increased along with the operation speed increasing when the loading is stable but when the speed reaches over 0.25m/s, it is decreased along with the operation speed increasing. Graph EPB2D-5 shows that the friction factor of CSB-EPB2D is decreasing along with the loading increasing when the operation speed is stable. Graph EPB2D-6 shows the friction factor of CSB-EPB2D is sensitive to the shaft roughness. The best shaft roughness for this material is Ra0.3~0.6.

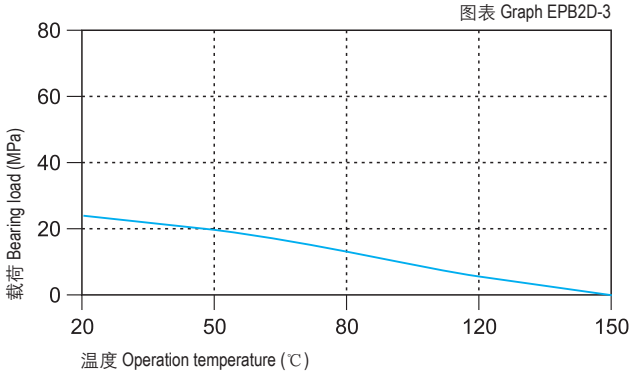
载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB2D-2



载荷-温度图表 Load-Temperature diagrams

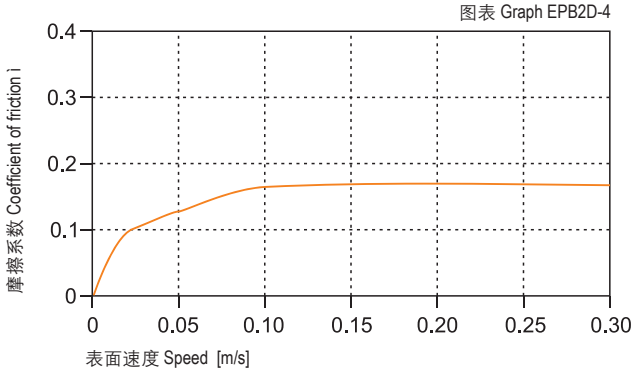
图表 Graph EPB2D-3



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

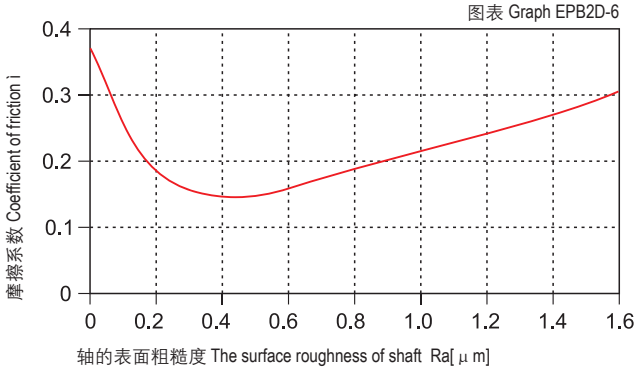
图表 Graph EPB2D-4



摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

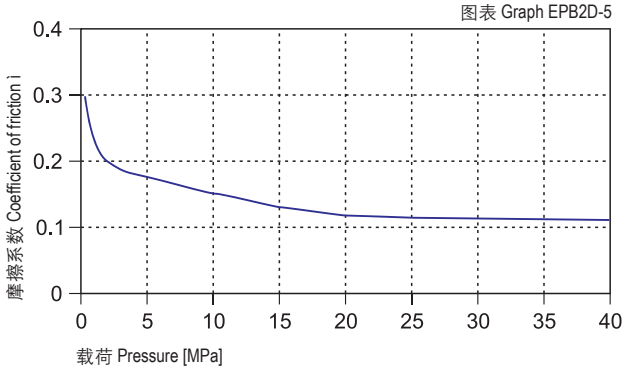
图表 Graph EPB2D-6



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 EPB2D-5



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CSB-EPB2D	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05~0.25	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB2D-7与图表EPB2D-8表明低载时硬铬钢轴比较适合用于CSB-EPB2D轴承，当载荷逐渐增大到1.0Mpa以上时不锈钢轴相对比较合适。图表EPB2D-8表明CSB-EPB2D在用于旋转运动时采用硬化钢轴比较理想，而在用于摆动运动中采用硬铬钢轴相对比较合适。

Graph EPB2D-7 and Graph EPB2D-8 shows that the hardened chrome steel shaft is good for CSB-EPB2D bearings under lower loading and stainless steel shaft is better when the loading is over 1.0Mpa. Graph EPB2D-8 shows hardened steel shaft is recommended in rotation operation but hardened chrome steel shaft is recommended in oscillation operation.

化学抗性 Chemical Resistance

CSB-EPB2D塑料轴承能抵抗弱碱、弱酸以及各类润滑油的腐蚀。

CSB-EPB2D 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-EPB2D塑料轴承的吸水率为0.2%，浸泡水中最大平衡吸水率为1.1%；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-EPB2D is 0.2% under the atmospheric pressure while it is 1.1% 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-EPB2D长久暴露在紫外线下颜色会变浅。材料的硬度，抗压强度和耐磨性都不会改变。

The color of CSB-EPB2D will become lighter 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

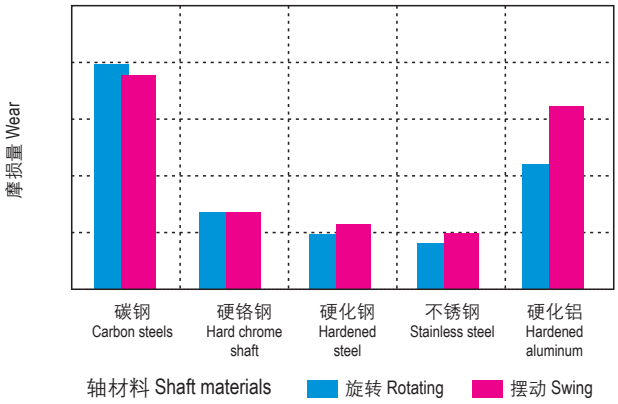
CSB-EPB2D塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB2D 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

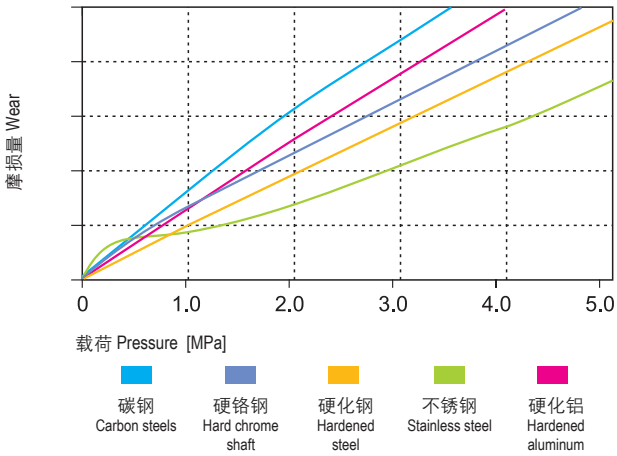
图表 Graph EPB2D-7



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

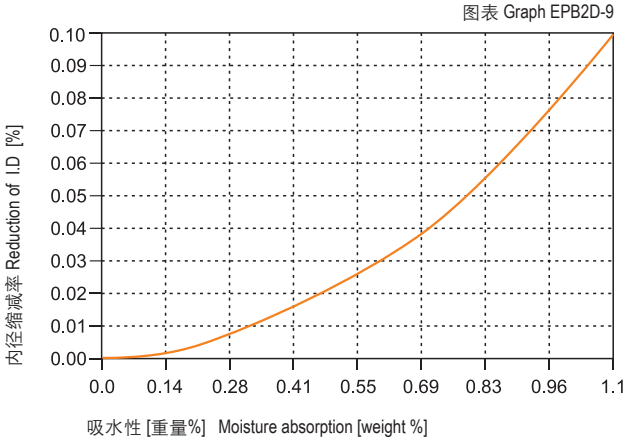
图表 Graph EPB2D-8



吸水性的影响

Effect of moisture absorption on EPB2D bearings

图表 Graph EPB2D-9



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标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 中高载荷下的应用能手。作为纤维增强和润滑的完美结合材料，可在130度下广泛被应用
- 连续使用温度：-40℃/+130℃
- 适合中高载荷，通用性好
- 适合干运行、免维护
- 适用于不同轴材料
- 用于旋转、摆动运动
- 抗灰尘能力强

- Best for middle to high load applications. With the perfect combination of reinforced fibre and good lubrication feature, this material is suitbale to be used under the temperature of 130℃
- Continuous working temperature: -40℃/+130℃
- Suitable for medium and high load operation
- Maintenance-free dry operation
- Applicable for various shaft materials
- Good for rotation and oscillating operation
- Excellent dust resistance

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB3
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)			0.08-0.18
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.5
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	4.0
抗拉强度 Tensile strength	ISO527	MPa	200
抗压强度 (轴向) Compressive strength (Axial)		MPa	80
弹性模量 E-module	ISO527	MPa	7700
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	80
邵氏硬度 Shore hardness	ISO 868	D	81
连续工作温度 Continuous work temperature		℃	-40/+130
短时运行温度 Short-time work temperature		℃	-40/+220
导热性 Thermal conductivity	ASTME1461	$W / m \times k$	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	9
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.7
最大吸水率23℃ Max. water absorption, 23℃		%	4.0
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{13}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{11}$

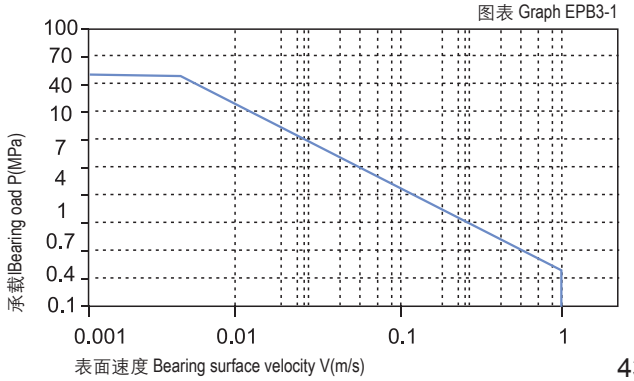
轴承PV值 PV Value

CSB-EPB3塑料轴承最大运行PV值为$0.5N/mm^2 \times m/s$；由此决定轴承所承受的载荷与速度成反比，详细查阅图表EPB3-1。

The max PV value of the CSB-EPB3 plastic bearings is $0.5N/mm^2 \times m/s$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPB3-1).

PV图表 Permissible PV value for CSB-EPB3

图表 Graph EPB3-1



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

CSB-EPB3塑料轴承可承受最大静载荷为80Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB3-2，轴承实际工作载荷略小于80Mpa，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: 130℃）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EPB3-3。

CSB-EPB3 allows the Max static load of 80Mpa, The max compressive deformation rate under the max load is listed in Graph EPB3-2, The actual load capacity of bearing is slightly less than 80Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 130℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB3-3 for such variation.

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

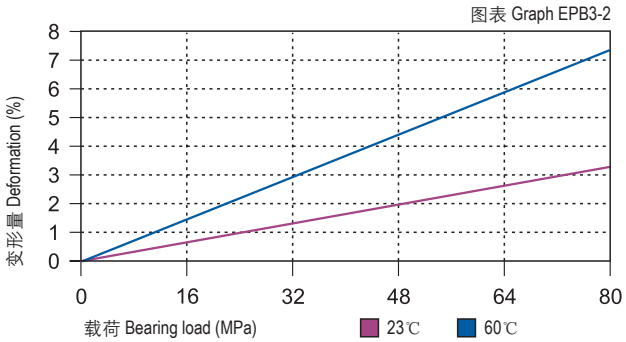
摩擦系数 Friction Factor

滑动轴承的摩擦系数与轴承的载荷、运行速度以及轴材料表面粗糙度都息息相关；CSB-EPB3轴承的摩擦系数随着载荷的增加而降低（图表EPB3-5），随着运行速度的增加而升高（图表EPB3-4）；这就表明EPB3轴承适合用于高载低速的应用场合；而轴表面粗糙度越光滑或者越粗糙都会导致轴承的摩擦系数增加，CSB-EPB3推荐的表面粗糙度是在Ra0.5 ~ Ra0.8（图表EPB3-6）；

The friction factor of the sliding bearings is relative to the bearing load, operation speed and the roughness of the shaft material.CSB-EPB3 Bearing Friction factor decreased along with the increasing of the loading (See Graph EPB3-5) and increased along with the increasing of the operation speed(See Graph EPB3-4). The above feature induces the CSB-EPB3 material is applicable for the high load and low speed operation while too smooth and too rough surface may result into the increasing of friction factor. The recommended surface roughness of CSB-EPB3 is Ra0.5~Ra0.8 (See Graph EPB3-6).

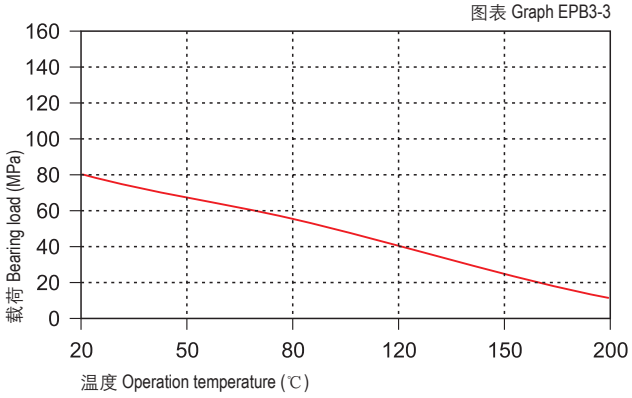
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB3-2



■ 载荷-温度图表 Load-Temperature diagrams

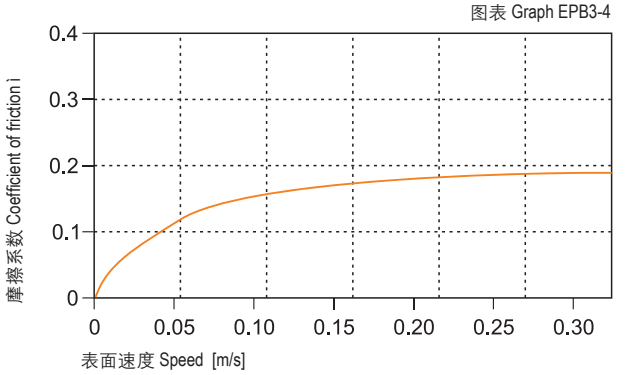
图表 Graph EPB3-3



■ 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

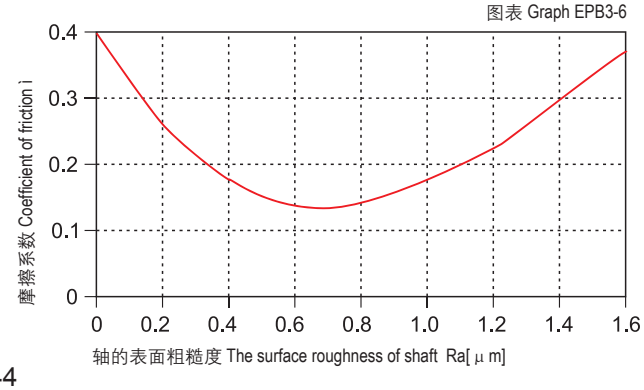
图表 Graph EPB3-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

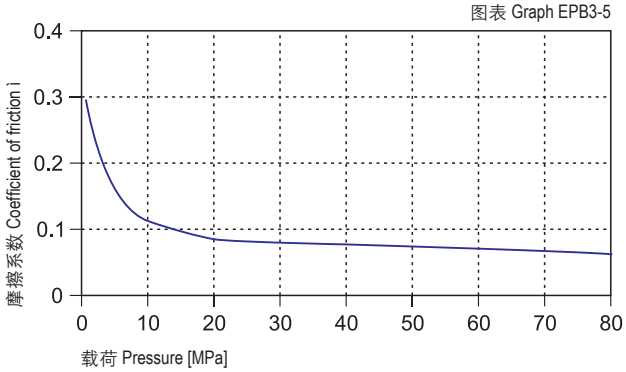
图表 Graph EPB3-6



■ 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 EPB3-5



CSB-EPB3	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.08~0.18	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

通过轴承在不同轴上的测试表明CSB-EPB3低载时在碳钢轴和硬铬轴运行性能最好（见图表EPB3-7和图表EPB3-8）；当然，随着轴承承受载荷的增加，对轴硬度要求也越高；较软的轴容易先产生磨损，导致轴承磨损也随之加大。当轴承的载荷超过2Mpa时，轴承的磨损会随着轴硬度的增加而随之减少。
图表EPB3-8表明CSB-EPB3在摆动运动下的效果要好于旋转运动，在同等的工况条件下摆动运动下的磨损要小于旋转运动，特别是在高载荷下这种趋势就越明显。

Test of the bearing against various shaft materials shows that the material CSB-EPB3 features the best performance where the shaft material is carbon steel and hard chrome steel under low loading. (See Graph EPB3-7 and Graph EPB3-8). Therefore, the higher the load is, the more critical the hardness of the shaft will have to be. The softer shaft will be worn off sooner and as a result, the bearing wearing will be increased. But when the loading is increased over 2Mpa, the wearing of the bearing will be better along with the increasing of the shaft hardness.
Refer to Graph EPB3-8. It shows that the material CSB-EPB3 is better under the oscillation operation comparing with the rotation operation. Under the same condition, the wearing feature of the oscillation operation is much better than that of the rotation operation. This feature is sharply improved under higher loading.

化学抗性 Chemical Resistance

CSB-EPB3塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。
CSB-EPB3 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-EPB3塑料轴承的吸水率为0.7%，浸泡水中最大平衡吸水率为4.0%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。
The water absorb rate of CSB-EPB3 is 0.7% under the atmospheric pressure while it is 4.0% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

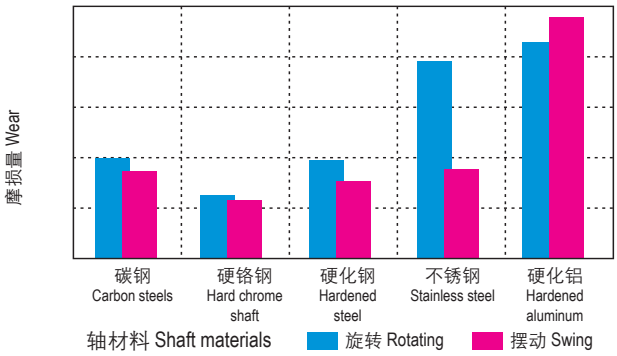
CSB-EPB3长久暴露在紫外线下颜色基本不会改变。材料性能基本都不会发生改变。
CSB-EPB3 can maintain its color unchanged when it is exposed into the UV ray. The material performance stays stable.

安装公差 Installation Tolerances

CSB-EPB3塑料轴承压装后公差 Tolerances after pressfit

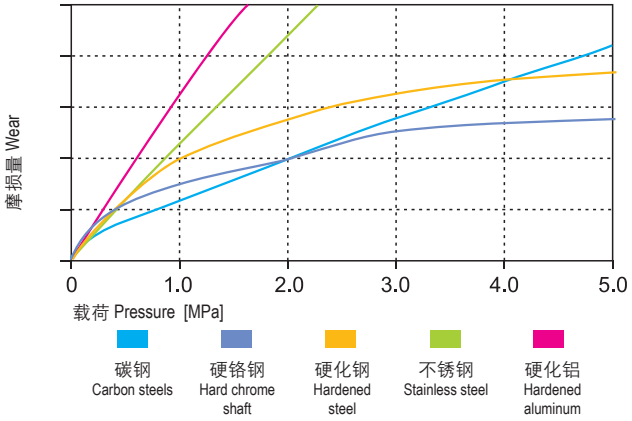
在不同轴材料上旋转时的磨损量 p=2MPa, v=0.2m/s
Wear under rotating with different shaft materials, p = 2 MPa, v = 0.2 m/s

图表 Graph EPB3-7



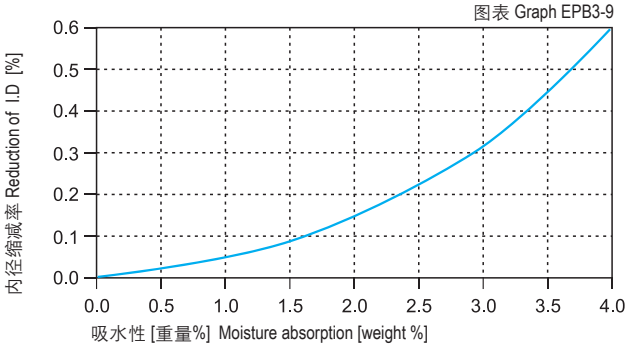
旋转磨损随轴材料与压力变化关系 v=0.2m/s
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB3-8



吸水性的影响 Effect of moisture absorption on EPB3 bearings

图表 Graph EPB3-9



直径 Di. [mm]	CSB-EPB3 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

标准产品规格表 Standard specifications: P140

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB3G

◉ 标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 中等载荷的优化材料。适用于运动频率较低和低成本需求
- 连续使用温度：-40℃/+110℃
- 承受较高的载荷
- 经济性强
- 干运行、免维护
- 适用于不同轴材料

- Optimized for middle load applications. It is suitable for low frequency motion and low cost requirement
- Continuous working temperature: -40℃/+110℃
- High load capacity
- Good economic ratio
- Dry operation and maintenance free
- Applicable for various shaft materials

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB3G
密度 Density	ISO1183	g/cm^3	1.37
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.15
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.3
最大旋转速度值 Max. roatating velocity		m/s	0.8
最大摇摆速度值 Max. oscillating velocity		m/s	0.6
最大直线速度值 Max. linear velocity		m/s	3.5
抗拉强度 Tensile strength	ISO527	MPa	190
抗压强度 (轴向) Compressive strength (Axial)		MPa	75
弹性模量 E-module	ISO527	MPa	7500
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	75
邵氏硬度 Shore hardness	ISO 868	D	78
连续工作温度 Continuous work temperature		℃	-40/+110
短时运行温度 Short-time work temperature		℃	-40/+200
导热性 Thermal conductivity	ASTME1461	W / m × k	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	11
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	1.3
最大吸水率23℃ Max. water absorption, 23℃		%	5.5
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{13}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{11}$

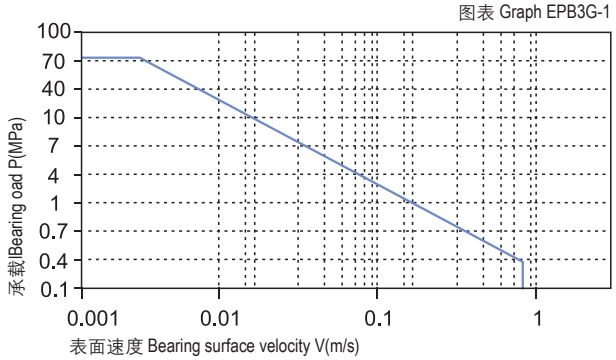
轴承PV值 PV Value

CSB-EPB3G塑料轴承最大运行PV值为0.3N/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EPB3G-1。

The max PV value of the CSB-EPB3G plastic bearings is 0.3N/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 EPB3G-1).

■ PV图表 Permissible PV value for CSB-EPB3G

图表 Graph EPB3G-1



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

CSB-EPB3G塑料轴承可承受最大静载荷为75Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB3G-2，轴承实际工作载荷略小于75Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：0.8m/s) 会导致摩擦温度上升，而温度上升 (Tmax: 110℃) 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EPB3G-3。

CSB-EPB3G allows the Max static load of 75Mpa, The max compressive deformation rate under the max load is listed in Graph EPB3G-2, The actual load capacity of bearing is slightly less than 75Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.8m/s) results into higher temperature (Tmax: 110℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB3G-3 for such variation.

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

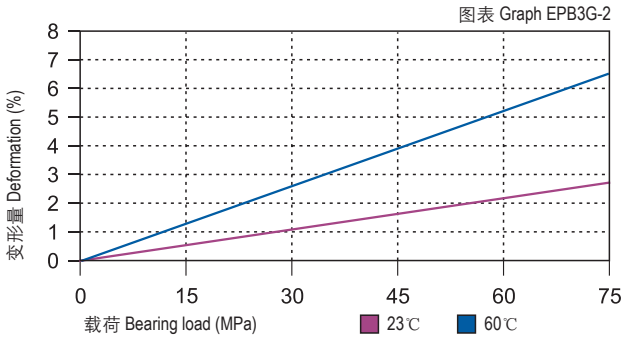
摩擦系数 Friction Factor

图表EPB3G-4与图表EPB3G-5表明CSB-EPB3G轴承的摩擦系数会受到运行速度以及轴承载荷影响而发生变化，当轴承载荷在20Mpa以内时，这种表现特别明显。同时图表EPB3G-6显示CSB-EPB3G轴承的摩擦系数还会受到对磨轴表面粗糙度的影响，轴表面太光滑或者太粗糙都会导致轴承的摩擦系数和磨损值增大，我们推荐轴表面粗糙度为Ra0.1 ~ 0.3mm最为合适。

Graph EPB3G-4 and Graph EPB3G-5 show that the friction factor of CSB-EPB3G is variable along with the changing of the operation speed and bearing loading especially when the bearing loading is within 20Mpa. In the mean while the Graph EPB3G-6 shows that the friction factor of CSB-EPB3G is also affected by the shaft surface roughness. Too rough shaft surface or too fine shaft surface will increase the wearing and friction factor. The recommended shaft surface roughness is Ra0.1~0.3.

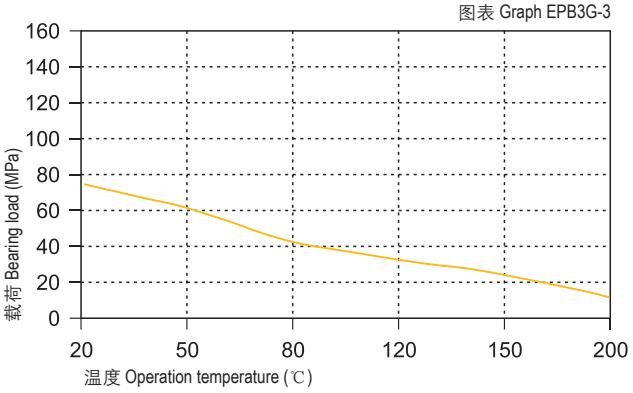
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB3G-2



■ 载荷-温度图表 Load-Temperature diagrams

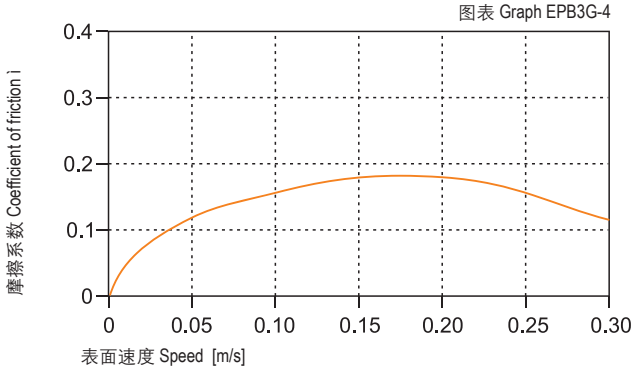
图表 Graph EPB3G-3



■ 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

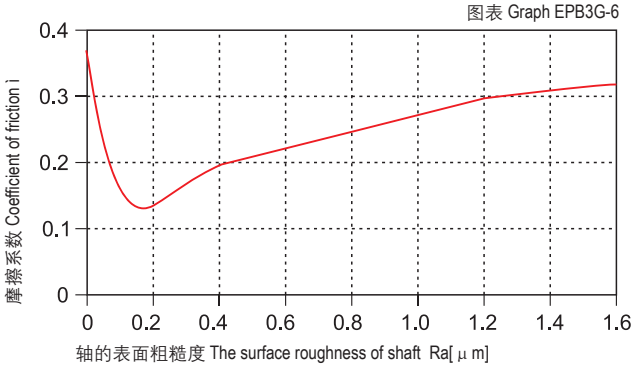
图表 Graph EPB3G-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

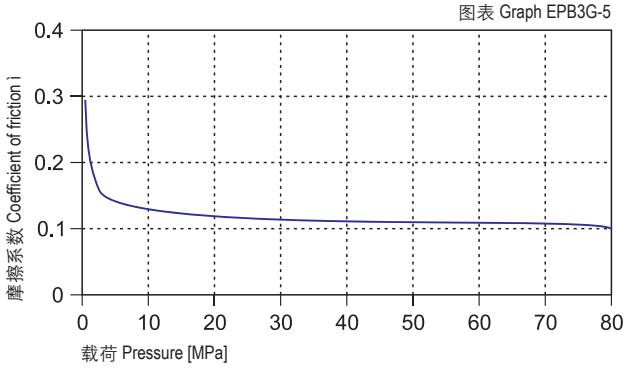
图表 Graph EPB3G-6



■ 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 EPB3G-5



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CSB-EPB3G	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

图表EPB3G-7与图表EPB3G-8表明CSB-EPB3G无论是在普通轴上运行还是在硬质轴上运行磨损值基本相当，根据图表显示CSB-EPB3G最适合的轴材料为硬化轴和硬铬钢轴；根据图表EPB3G-8显示CSB-EPB3G在摆动运动下的磨损值会略优越于旋转运动下的磨损值。

Graph EPB3G-7 and Graph EPB3G-8 show that the wearing of CSB-EPB3G is similar either against the normal shaft or hardened shaft. The most suitable shaft materials for CSB-EPB3G are hardened steel and hardened chrome steel. Graph EPB3G-8 shows that the wearing feature is better in oscillation operation than in rotation operation.

化学抗性 Chemical Resistance

CSB-EPB3G塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。

CSB-EPB3G 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-EPB3G塑料轴承的吸水率为1.3%，浸泡水中最大平衡吸水率为5.5%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB3G is 1.3% under the atmospheric pressure while it is 5.5% when the material is immerged into water. The application environment has to be considered because of its water absorb properties

抗UV性能 UV Resistance

CSB-EPB3G长久暴露在紫外线下颜色基本不会改变。材料性能基本都不会发生改变。

CSB-EPB3G can maintain its color unchanged when it is exposed into the UV ray. The material performance stays stable.

安装公差 Installation Tolerances

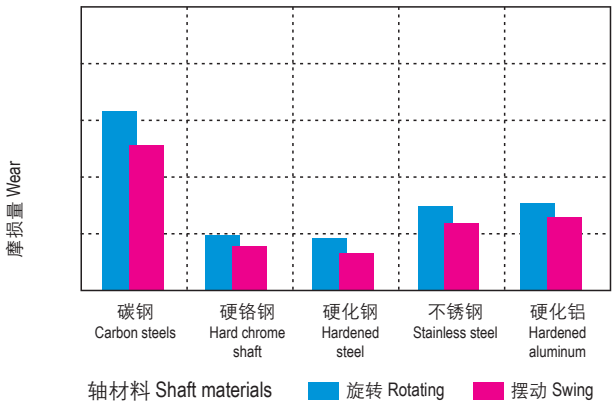
CSB-EPB3G塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB3G 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

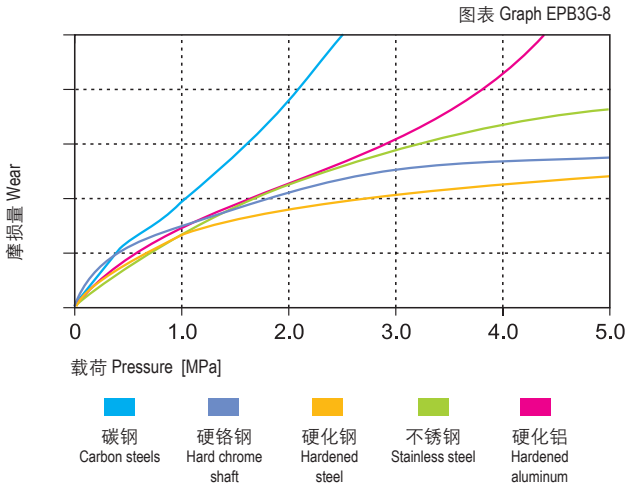
图表 Graph EPB3G-7



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

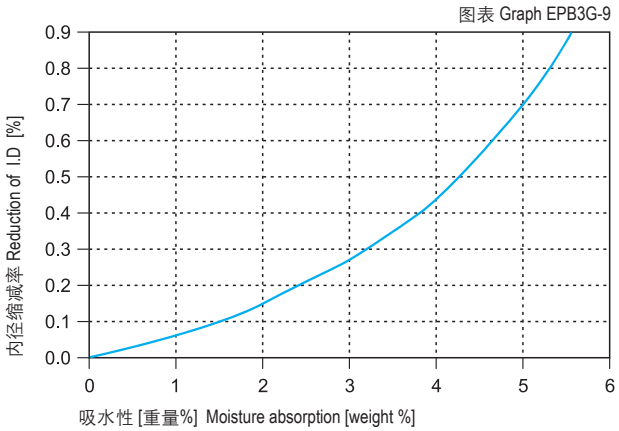
图表 Graph EPB3G-8



吸水性的影响

Effect of moisture absorption on EPB3G bearings

图表 Graph EPB3G-9



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◉ 标准产品规格表 Standard specifications: P144

产品特性 Product Features

- 抗冲击性能出色的自润滑材料。作为一种耐冲击的材料被用于需要吸震和耐磨的场合
- 连续使用温度：-40℃/+80℃
- 承受较高的载荷，耐冲压
- 经济性强
- 干运行、免维护
- 承受边缘载荷
- 适合低速运动
- An excellent self-lubricated material suitable for impact resistance applications which is widedly used under the evironment of impact absorbing and weare resistance requirement
- Continuous working temperature: -40℃/+80℃
- High load capacity, Impact resistance
- Low cost
- Dry operation and maintenance free
- Good for Marginal Load
- Suitable for low speed operation

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB3M
密度 Density	ISO1183	g/cm^3	1.15
颜色 Color			深灰Dark Grey
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.09-0.30
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.2
最大旋转速度值 Max. roatating velocity		m/s	0.8
最大摇摆速度值 Max. oscillating velocity		m/s	0.6
最大直线速度值 Max. linear velocity		m/s	2.5
抗拉强度 Tensile strength	ISO527	MPa	110
抗压强度 (轴向) Compressive strength (Axial)		MPa	50
弹性模量 E-module	ISO527	MPa	2500
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	20
邵氏硬度 Shore hardness	ISO 868	D	79
连续工作温度 Continuous work temperature		℃	-40/+80
短时运行温度 Short-time work temperature		℃	-40/+170
导热性 Thermal conductivity	ASTME1461	$W/m \times k$	0.25
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	%	1.4
最大吸水率23℃ Max. water absorption, 23℃		%	7.6
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	$>10^{11}$

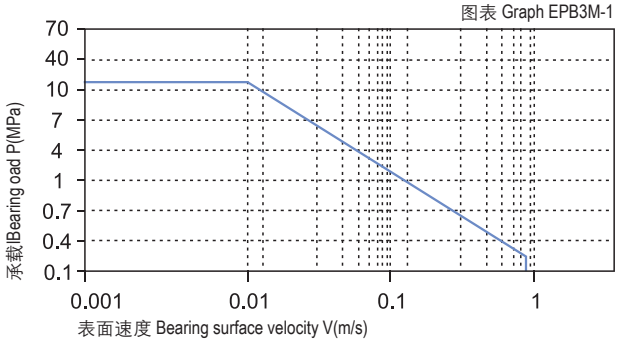
轴承PV值 PV Value

CSB-EPB3M塑料轴承最大运行PV值为$0.2N/mm^2 \times m/s$；由此决定轴承所承受的载荷与速度成反比，详细查阅图表EPB3M-1。

The max PV value of the CSB-EPB3M plastic bearings is $0.2N/mm^2 \times m/s$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPB3M-1).

■ PV图表 Permissible PV value for CSB-EPB3M

图表 Graph EPB3M-1



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

CSB-EPB3M塑料轴承可承受最大静载荷为20Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB3M-2，轴承实际工作载荷略小于20Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：0.8m/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EPB3M-3。

CSB-EPB3M allows the Max static load of 20Mpa, The max compressive deformation rate under the max load is listed in Graph EPB3M-2, The actual load capacity of bearing is slightly less than 20Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.8m/s) results into higher temperature (Tmax: 80℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB3M-3 for such variation.

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

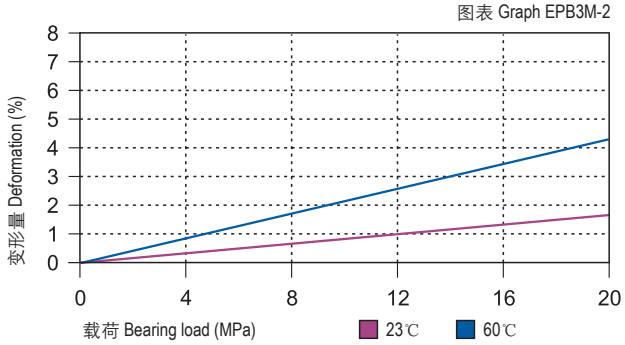
摩擦系数 Friction Factor

图表EPB3M-4表明CSB-EPB3M轴承的摩擦系数在载荷一定的情况下随着速度的增加而快速升高，这就说明此轴承比较适合用于低速场合；图表EPB3M-5表明CSB-EPB3M轴承在速度一定的情况下摩擦系数随着载荷的增加而逐渐降低。滑动轴承的摩擦系数和磨损受对磨轴表面粗糙度影响比较大，图表EPB3M-6表明CSB-EPB3M轴承在表面粗糙度为Ra=0.6um轴上运行时可以获得最佳运行效果。

CSB-EPB3M Bearing Friction factor is increased along with the increasing of the operation speed (See Graph EPB3M-4) therefore it is suitable for the application under low speed operation. The friction factor of CSB-EP3M is decreased along with the loading increasing (see Graph EPB3M-5). The friction factor and wearing of the bearing is considerably affected by the counter shaft roughness. The Graph EPB3M-6 shows that the bearing could achieve its best performance when the counter shaft surface roughness is around Ra0.6.

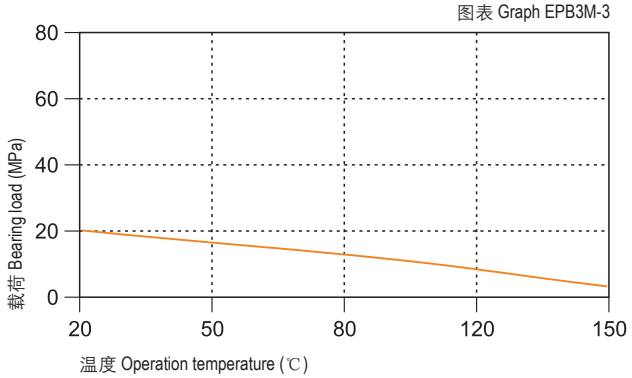
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB3M-2



■ 载荷-温度图表 Load-Temperature diagrams

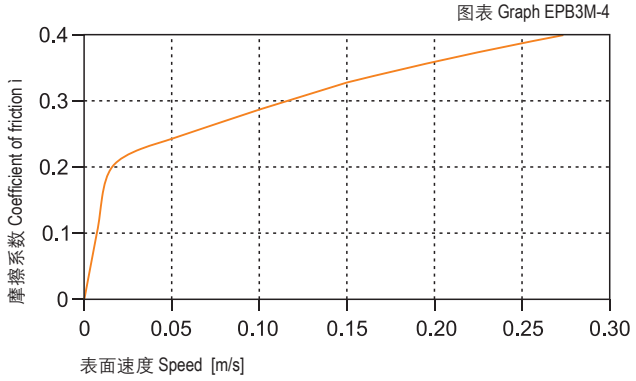
图表 Graph EPB3M-3



■ 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

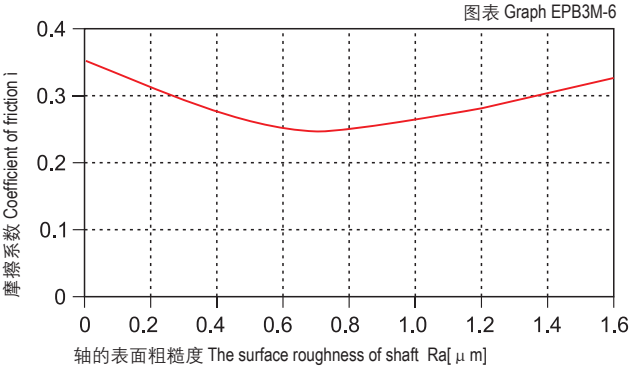
图表 Graph EPB3M-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

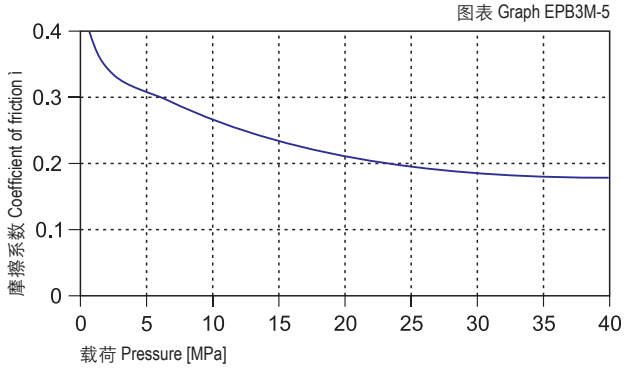
图表 Graph EPB3M-6



■ 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 EPB3M-5



CSB-EPB3M	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.10~0.30	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB3M-7表明CSB-EPB3M轴承在不同轴材料上的运行效果表明此轴承在载荷超过2Mpa且做旋转运动时与轴材料的关系相对较小，由此图可以看出在低载荷时CSB-EPB3M轴承运行效果较好。当轴承的载荷增加时，轴承的磨损会快速上升；由图表EPB3M-8可以看出在高载荷时CSB-EPB3M比较适合用于硬铬轴上运行。图表EPB3M-8表明CSB-EPB3M轴承在用于旋转运动时的性能要明显优越于摆动运动。

Test of the bearing against various shaft materials shows that the material CSB-EPB3M features the wearing performance of the material is not sensitive with different materials where the loading is over 2Mpa. (See Graph EPB3M-7). The bearing performance remains the best when the loading is in the lower range. When the loading is increased, the wearing will be sharply increased. From the Graph EPB3M-8, the CSB-EPB3M material is better for the application with the counter shaft material of hard chrome steel. Graph EPB3M-8 shows that the material is better for rotation operation than oscillation operation.

化学抗性 Chemical Resistance

CSB-EPB3M塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。

CSB-EPB3M 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-EPB3M塑料轴承的吸水率为1.4%，浸泡水中最大平衡吸水率为7.6%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB3M is 1.4% under the atmospheric pressure while it is 7.6% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB3M长久暴露在紫外线下颜色基本不会改变。材料性能基本都不会发生改变。

CSB-EPB3M can maintain its color unchanged when it is exposed into the UV ray. The material performance stays stable.

安装公差 Installation Tolerances

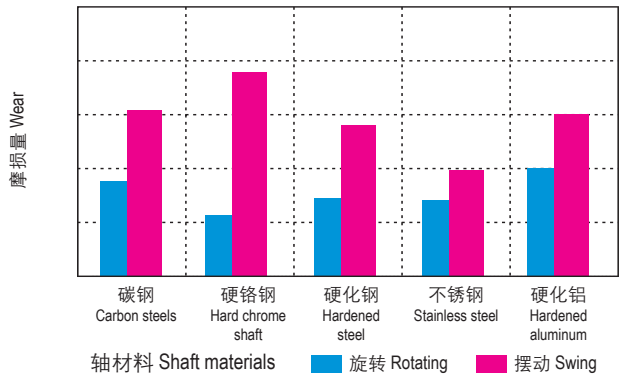
CSB-EPB3M塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB3M 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

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

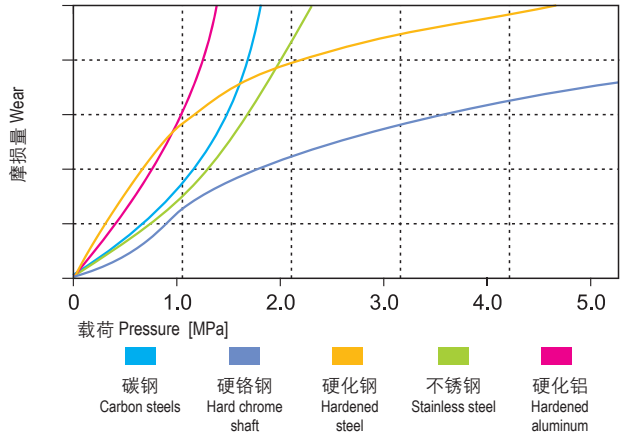
图表 Graph EPB3M-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

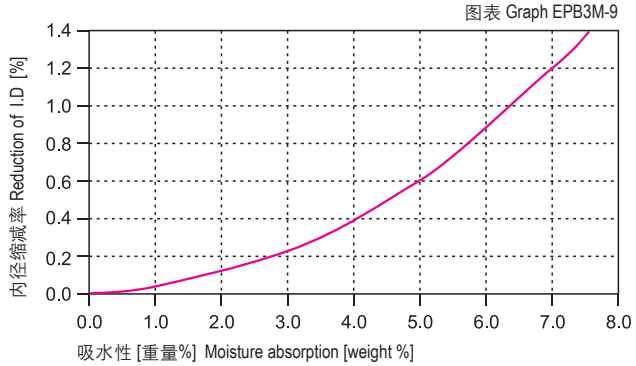
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB3M-8



吸水性的影响 Effect of moisture absorption on EPB3M bearings

图表 Graph EPB3M-9



直径 Di. [mm]	CSB-EPB3M D11 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>30 ~ 50	+0.080 +0.240	0 ~ +0.025	0 ~ -0.062
>50 ~ 80	+0.100 +0.290	0 ~ +0.030	0 ~ -0.074
>80 ~ 120	+0.120 +0.340	0 ~ +0.035	0 ~ -0.087
>120 ~ 180	+0.145 +0.395	0 ~ +0.040	0 ~ -0.100

标准产品规格表 Standard specifications: P144

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB4

◉ 标准产品规格表 Standard specifications: P147

产品特性 Product Features

- 高温和良好的化学抗性材料。可在200度下连续使用，也适合用于潮湿环境甚至化学液体中。硬质轴材料与之配合使用较好
- 连续使用温度：-40℃/+200℃
- 适合多数中高载荷场合
- 适合干运行、免维护
- 良好的化学抗性
- 适合潮湿环境中使用

- High temperature material with good chemical resistance feature. It could be continously used under the temperature of 200 ℃, it is also suitable to be used in the humid environment and even inside the chemical liquids. It is best to be used against hard materials
- Continuous working temperature: -40℃/+200℃
- Suitable for medium and high load operation
- Maintenance-free dry operation
- Good chemical resistance
- Suitable for humid environment

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB4
密度 Density	ISO1183	g/cm^3	1.70
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.07-0.20
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	1.4
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	180
抗压强度 (轴向) Compressive strength (Axial)		MPa	80
弹性模量 E-module	ISO527	MPa	12000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	90
邵氏硬度 Shore hardness	ISO 868	D	87
连续工作温度 Continuous work temperature		℃	-40/+200
短时运行温度 Short-time work temperature		℃	-40/+260
导热性 Thermal conductivity	ASTME1461	$W/m \times k$	0.6
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	4
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	＜0.1
最大吸水率23℃ Max. water absorption, 23℃		%	0.3
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^4$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^5$

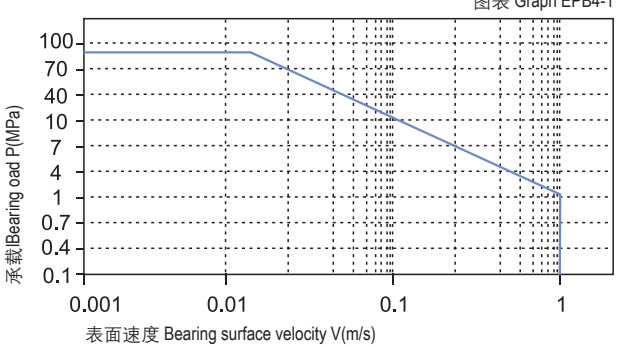
轴承PV值 PV Value

CSB-EPB4塑料轴承最大运行PV值1.4N/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EPB4-1。

The max PV value of the CSB-EPB4 plastic bearings is 1.4N/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 EPB4-1).

■ PV图表 Permissible PV value for CSB-EPB4

图表 Graph EPB4-1



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

CSB-EPB4塑料轴承可承受最大静载荷为90Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB4-2，轴承实际工作载荷略小于90Mpa，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EPB4-3。

CSB-EPB4 allows the Max static load of 90Mpa, The max compressive deformation rate under the max load is listed in Graph EPB4-2, The actual load capacity of bearing is slightly less than 90Mpa, 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 EPB4-3 for such variation.

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

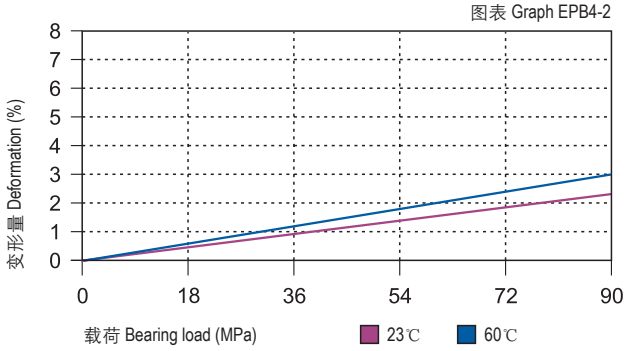
摩擦系数 Friction Factor

图表EPB4-4表明CSB-EPB4轴承在载荷保持不变时旋转下的摩擦系数会随着速度的增加而略有减低；图表EPB4-5表明CSB-EPB4轴承在速度保持不变时旋转下的摩擦系数会随着载荷的增加而逐步降低，特别是在载荷小于30Mpa的情况下。图表EPB4-6表明CSB-EPB4轴承的对磨轴粗糙度在Ra0.1 ~ 0.4um时摩擦系数几乎没有变化，但当轴表面粗糙度大于Ra0.4时摩擦系数会快速上升；我们推荐使用轴的粗糙度为Ra0.1 ~ 0.4um。

Friction factor will be slightly decreased along with the speed increasing under certain loading of the rotation operation (see Graph EPB4-4) and it will be slightly decreased along with the loading increasing under certain speed of the rotation operation especially when the loading is less than 30Mpa. Graph EPB4-5 tells that the friction of the CSB-EPB4 is not changed at all when the shaft roughness is between Ra0.1 to Ra0.4 and will be considerably increased when the shaft roughness is over Ra0.4. So the recommended shaft roughness is Ra0.1-Ra0.4.

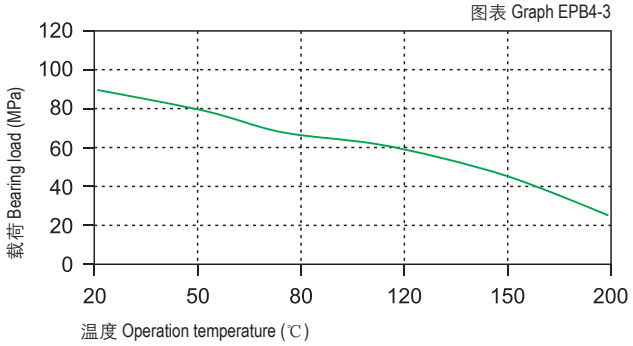
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB4-2



■ 载荷-温度图表 Load-Temperature diagrams

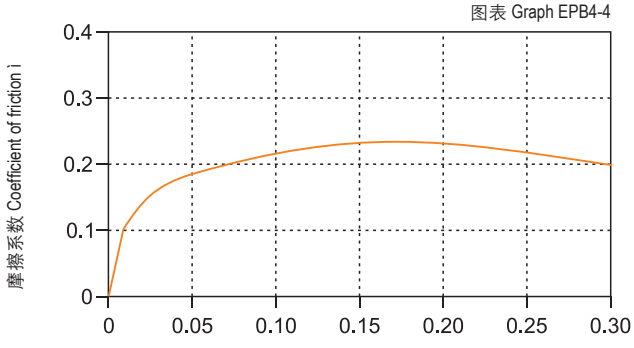
图表 Graph EPB4-3



■ 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

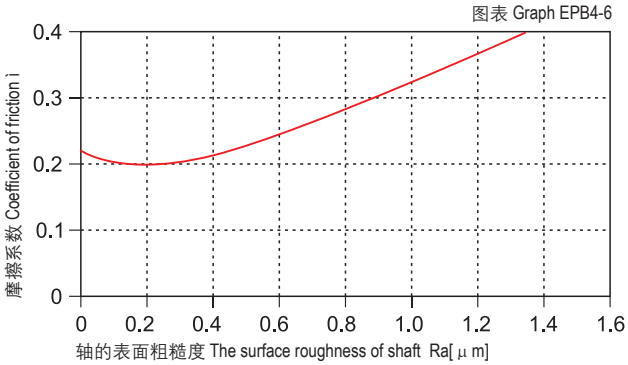
图表 Graph EPB4-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

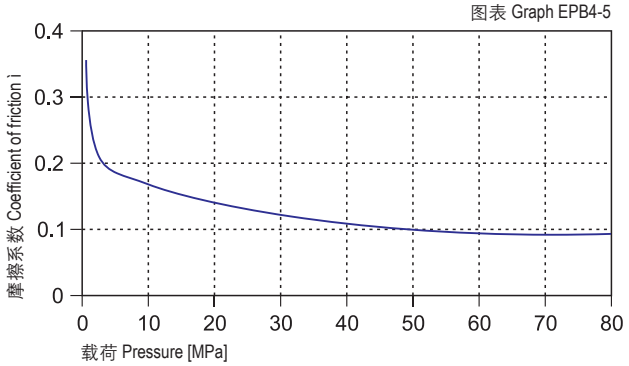
图表 Graph EPB4-6



■ 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 EPB4-5



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CSB-EPB4	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.07~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB4-7表明CSB-EPB4轴承在低载荷旋转运动时适合大都数轴材料，而在高载旋转下硬化钢轴表现尤为特出（见图表EPB4-7）；图表EPB4-8显示CSB-EPB4轴承在采用不锈钢轴摆动运动下较为合适，而在旋转运动中碳钢轴和硬化钢轴效果比较好。

Graph EPB4-7 shows that CSB-EPB4 is suitable for most of the shaft materials under low loading rotation operation and it is good for hardened carbon steel shaft under high loading rotation operation (see Graph EPB4-7). From Graph EPB4-8, we can also read that CSB-EPB4 is suitable for stainless steel shaft under oscillation operation and good for hot rolled carbon steel and hardened carbon steel shaft under rotation operation.

化学抗性 Chemical Resistance

CSB-EPB4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-EPB4 is fairly good against most of Acid and Alkalis.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB4塑料轴承的吸水率极低0.1%，浸泡水中最大平衡吸水率为0.3%；因此材料不会吸水而发生性能和尺寸变化，适合用于潮湿环境甚至水下。

The water absorb rate of CSB-EPB4 is 0.1% under the atmospheric pressure while it is 0.3% when the material is immerged into water. The material performance and dimensions of the material is stabilized for the applications under humid environment.

抗UV性能 UV Resistance

CSB-EPB4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-EPB4 after long period of exposing under the UV ray and therefore the compressive strength will be reduced.

安装公差 Installation Tolerances

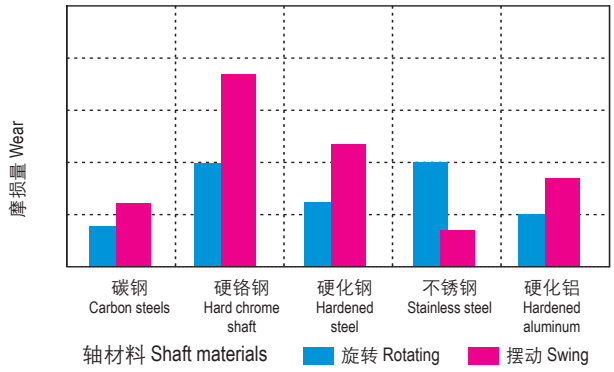
CSB-EPB4塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB4 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

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

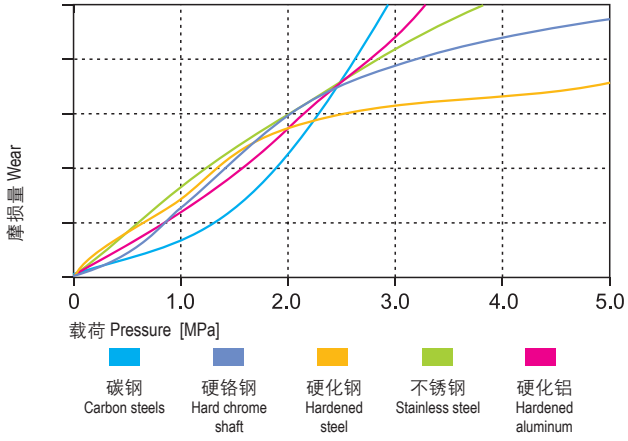
图表 Graph EPB4-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

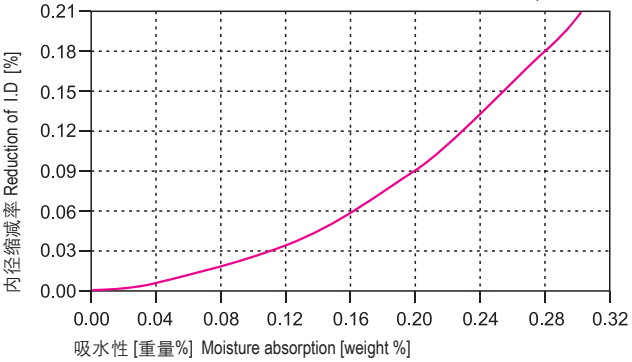
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB4-8



吸水性的影响 Effect of moisture absorption on EPB4 bearings

图表 Graph EPB4-9



直径 Di. [mm]	CSB-EPB4 F10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>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

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◉ 标准产品规格表 Standard specifications: P147

产品特性 Product Features

- 高温250度自润滑材料。高化学抗性可被用于多数腐蚀性液体中。高承载能力，一般用于高温或高化学腐蚀场合
- 连续使用温度：-100℃/+250℃
- 适合高载荷运用
- 高温下保持较高的承载能力
- 较广泛的化学抗性
- 非常低的吸水率
- 较高的抗压强度

- Self-lubricated material for high temperature up to 250 ℃. With its high chemical resistance feature, it coul be used inside most common chemical liquids. It is a high load material for the applications of high temperature and critical chemical environments
- Continuous working temperature: -100℃/+250℃
- Suitable for high load operation
- High load capacity at higher temperature
- Good chemical resistance
- Low water absorption
- High pressure resistance

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB5
密度 Density	ISO1183	g/cm^3	1.44
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.09-0.25
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	1.5
最大旋转速度值 Max. roatating velocity		m/s	1.5
最大摇摆速度值 Max. oscillating velocity		m/s	1.1
最大直线速度值 Max. linear velocity		m/s	5.0
抗拉强度 Tensile strength	ISO527	MPa	170
抗压强度 (轴向) Compressive strength (Axial)		MPa	100
弹性模量 E-module	ISO527	MPa	7900
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	150
邵氏硬度 Shore hardness	ISO 868	D	85
连续工作温度 Continuous work temperature		℃	-100/+250
短时运行温度 Short-time work temperature		℃	-100/+315
导热性 Thermal conductivity	ASTME1461	W / m × k	0.6
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	5
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.1
最大吸水率23℃ Max. water absorption, 23℃		%	0.5
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^8$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^7$

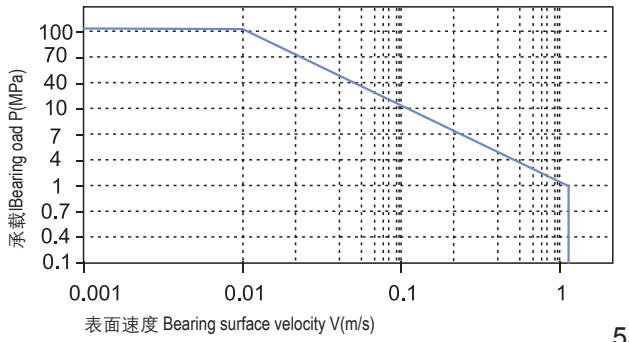
轴承PV值 PV Value

CSB-EPB5塑料轴承最大运行PV值为1.5N/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EPB5-1。

The max PV value of the CSB-EPB5 plastic bearings is 1.5N/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 EPB5-1).

■ PV图表 Permissible PV value for CSB-EPB5

图表 Graph EPB5-1



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

CSB-EPB5塑料轴承可承受最大静载荷为150Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB5-2，轴承实际工作载荷略小于150Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：1.5m/s) 会导致摩擦温度上升，而温度上升 (Tmax: 250℃) 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EPB5-3。

CSB-EPB5 allows the Max static load of 150Mpa, The max compressive deformation rate under the max load is listed in Graph EPB5-2, The actual load capacity of bearing is slightly less than 150Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.5m/s) results into higher temperature (Tmax: 250℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB5-3 for such variation.

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

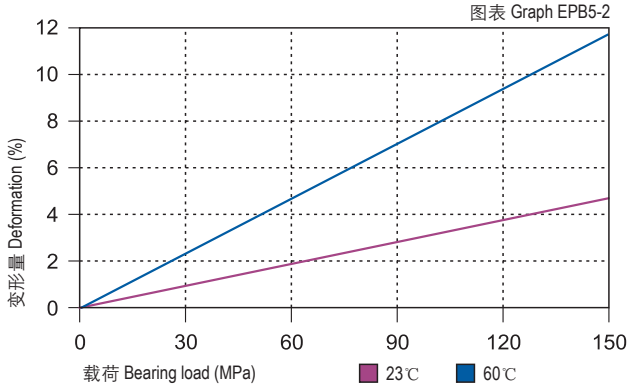
摩擦系数 Friction Factor

图表EPB5-4表明CSB-EPB5轴承的摩擦系数数在载荷一定时随着运行速度的增加而逐渐升高；图表EPB5-5表明CSB-EPB5轴承在速度一定载荷在20Mpa以内时摩擦系数会随着载荷的逐步增加而快速降低，而当载荷高于20Mpa时摩擦系数的变化却比较平缓。图表EPB5-6表明CSB-EPB5轴承比较适合的轴表面粗糙度为Ra0.6 ~ 0.8um。

CSB-EPB5 Bearing Friction factor is increased along with the increasing of the operation speed under certain loading (See Graph EPB5-4). The friction factor of CSB-EP5 is decreased along with the loading increasing not over 20Mpa (see Graph EPB5-5). The friction factor will not change much along with the speed when the loading is over 20Mpa. The Graph EPB5-6 shows that the bearing could achieve its best performance when the counter shaft surface roughness is around Ra0.6 to Ra0.8.

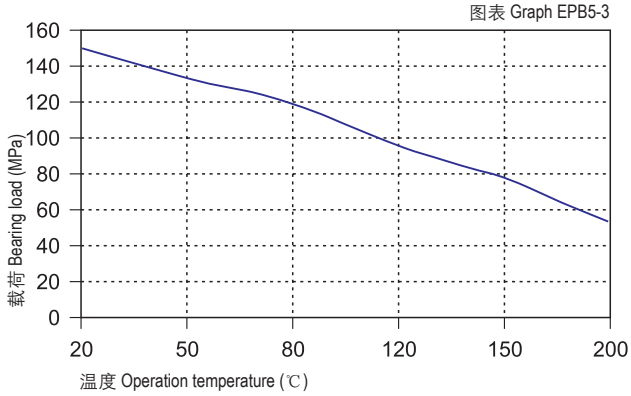
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB5-2



■ 载荷-温度图表 Load-Temperature diagrams

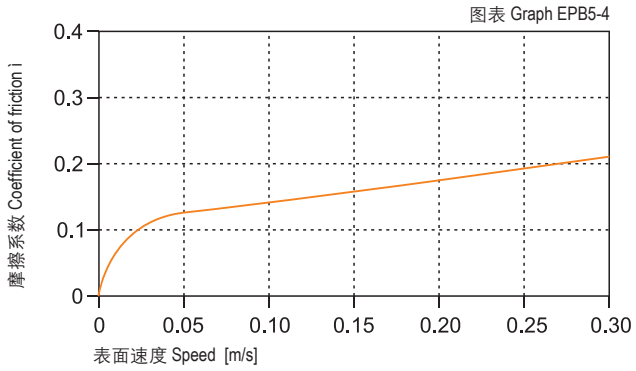
图表 Graph EPB5-3



■ 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

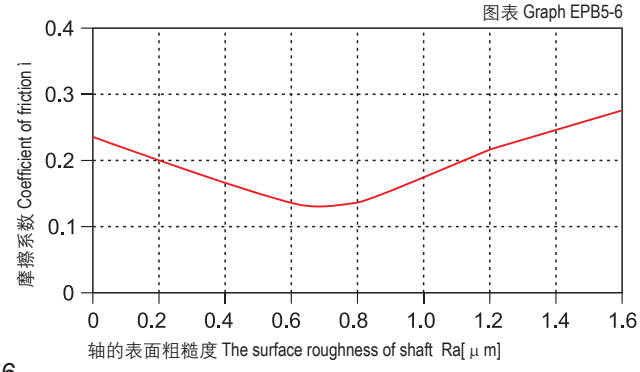
图表 Graph EPB5-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

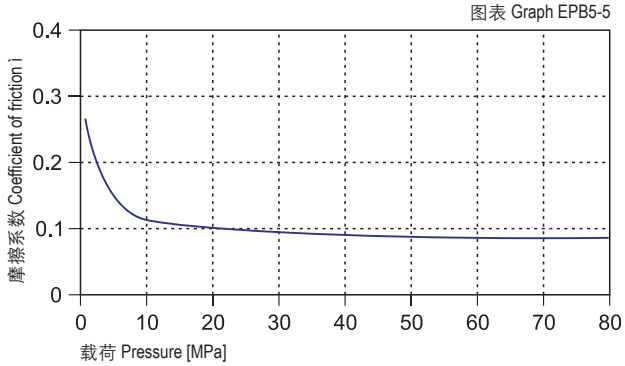
图表 Graph EPB5-6



■ 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 EPB5-5



CSB-EPB10	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.09~0.25	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB5-7和图表EPB5-8测试表明了CSB-EPB5轴承在不同轴材料上的运行磨损对比，在载荷2Mpa以下旋转运动时不锈钢轴和碳钢轴比较适合，而当载荷超过2Mpa时在硬化钢轴和碳轴上的运行效果较好。图表EPB5-7表明CSB-EPB5轴承比较适合用于旋转运动；特别值得注意的是图表EPB5-9表明CSB-EPB5轴承在常温23℃下的摩擦磨损性能并没有在高温150℃下优秀。

Graph EPB5-7 and Graph EPB5-8 show the test results of the material CSB-EPB5 running against different shaft materials. It is suitable for stainless steel and hot rolled carbon steel shaft when the loading is less than 2Mpa and it will be more suitable for heat treated steel and carbon steel shaft when the loading is over 2Mpa. Graph EPB5-7 shows CSB-EPB5 is good for rotation operation. Specially, from the Graph EPB5-9, it is read that CSB-EPB5 is with better performance under high temperature around 150℃ comparing with under the ambient temperature of 23℃.

化学抗性 Chemical Resistance

CSB-EPB5塑料轴承具有极好的化学抗性，能抵抗浓度65%的强酸。

Chemical Resistance of CSB-EPB5 is very good. It can work well in the heavy acid of 65%.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB5塑料轴承的吸水率极低0.1%，浸泡水中最大平衡吸水率为0.5%；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。

The water absorb rate of CSB-EPB5 is less than 0.1% under the atmospheric pressure while it is 0.5% when the material is immerged into water. The material performance and dimensions of the material is stabilized for the material is stabilized for the applications under humid environment.

抗UV性能 UV Resistance

CSB-EPB5长久暴露在紫外线下材料性能不会发生变化。

CSB-EPB5 can maintain its performance to be stable even exposed in the UV ray for long period.

安装公差 Installation Tolerances

CSB-EPB5 塑料轴承压装后公差 Tolerances after pressfit

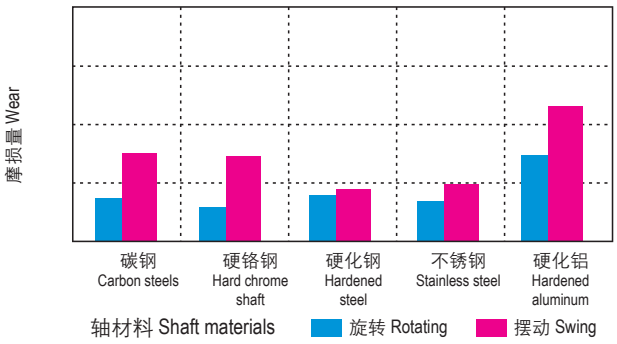
直径 Di. [mm]	CSB-EPB5 F10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>0 ~ 3	+0.006 +0.046	0 ~ +0.010	0 ~ -0.025
>3 ~ 6	+0.010 +0.058	0 ~ +0.012	0 ~ -0.030
>6 ~ 10	+0.013 +0.071	0 ~ +0.015	0 ~ -0.036
>10 ~ 18	+0.016 +0.086	0 ~ +0.018	0 ~ -0.043
>18 ~ 30	+0.020 +0.104	0 ~ +0.021	0 ~ -0.052
>30 ~ 50	+0.025 +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

标准产品规格表 Standard specifications: P147

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

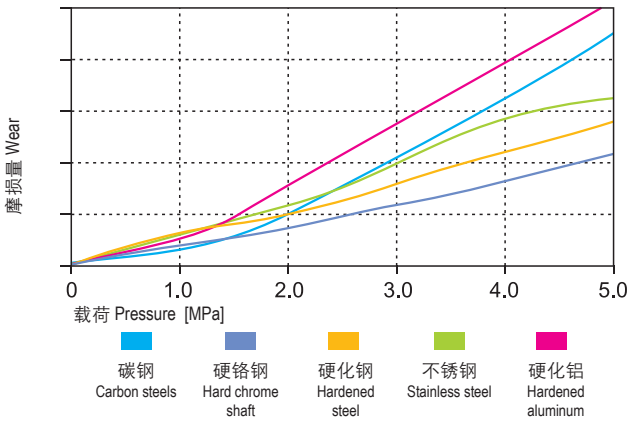
图表 Graph EPB5-7



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

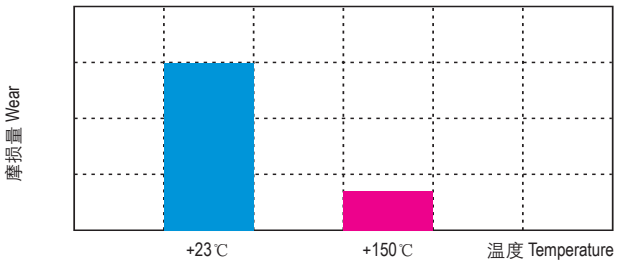
图表 Graph EPB5-8



在不同温度下的磨损量 p=2MPa v=0.2m/s

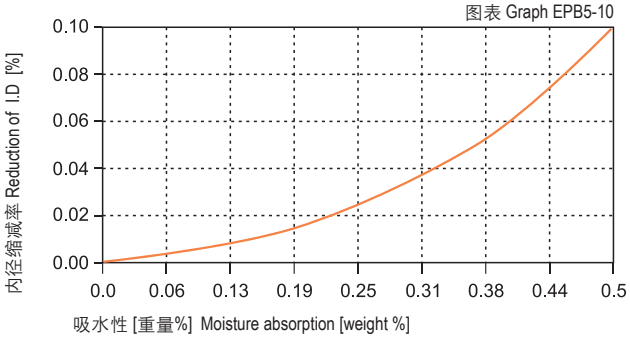
The bearing wear under rotating with different temperature p= 2MPa v= 0.2m/s

图表 Graph EPB5-9



吸水性的影响 Effect of moisture absorption on EPB5 bearings

图表 Graph EPB5-10



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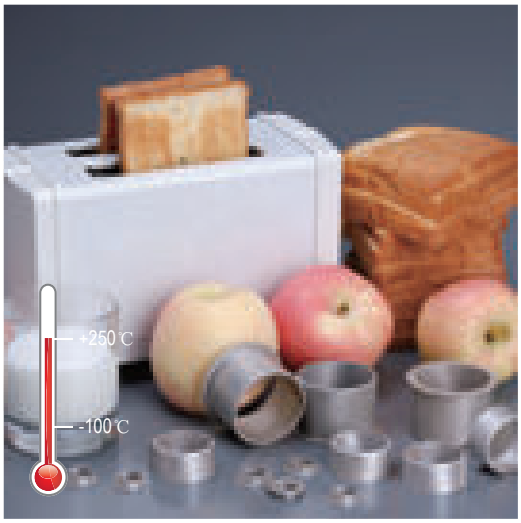
工程塑料轴承 Plastic Plain Bearings EPB5A



◉ 标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 连续使用温度：-100℃/+250℃
- 适合高载荷低速运用
- 高温下保持较高的承载能力
- 较广泛的化学抗性
- 符合FDA标准

- Continuous working temperature: -100℃/+250℃
- Suitable for high load and lovo speed operation
- High load capacity at higher temperature
- Good chemical resistance
- FDA grade

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB5A
密度 Density	ISO1183	g/cm^3	1.28
颜色 Color			米色 Beige
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.25-0.40
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.28
最大旋转速度值 Max. roatating velocity		m/s	0.6
最大摇摆速度值 Max. oscillating velocity		m/s	0.4
最大直线速度值 Max. linear velocity		m/s	1.0
抗拉强度 Tensile strength	ISO527	MPa	140
抗压强度 (轴向) Compressive strength (Axial)		MPa	118
弹性模量 E-module	ISO527	MPa	3600
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	120
邵氏硬度 Shore hardness	ISO 868	D	83
连续工作温度 Continuous work temperature		℃	-100/+250
短时运行温度 Short-time work temperature		℃	-100/+315
导热性 Thermal conductivity	ASTME1461	W / m × k	0.24
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	9
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.3
最大吸水率23℃ Max. water absorption, 23℃		%	0.5
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{14}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{13}$

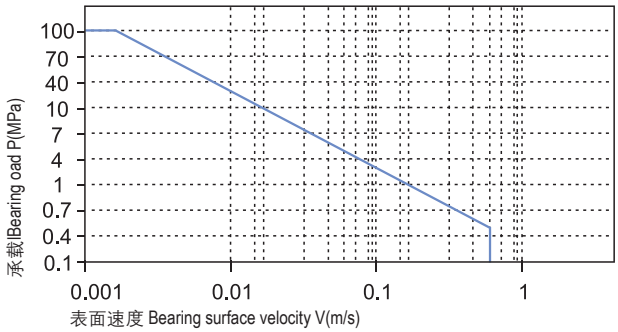
轴承PV值 PV Value

CSB-EPB5A塑料轴承最大运行PV值为0.28N/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EPB5A-1。

The max PV value of the CSB-EPB5A plastic bearings is 0.28N/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 EPB5A-1).

■ PV图表 Permissible PV value for CSB-EPB5A

图表 Graph EPB5A-1



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

CSB-EPB5A塑料轴承可承受最大静载荷为120Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB5A-2，轴承实际工作载荷略小于120Mpa，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：250℃) 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EPB5A-3。

CSB-EPB5A allows the Max static load of 120Mpa, The max compressive deformation rate under the max load is listed in Graph EPB5A-2, The actual load capacity of bearing is slightly less than 120Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.6m/s) results into higher temperature (Tmax: 250℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB5A-3 for such variation.

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

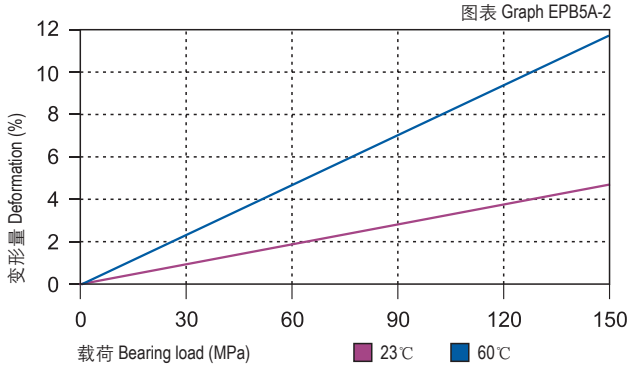
摩擦系数 Friction Factor

图表EPB5A-4表明CSB-EPB5A轴承在载荷一定时摩擦系数随着运动速度的增加而逐渐升高；图表EPB5A-5表明CSB-EPB5A轴承在速度一定载荷在20Mpa以内时摩擦系数会随着载荷的逐步增加而快速降低，而当载荷高于20Mpa时摩擦系数的变化却比较平缓。图表EPB5A-6表明CSB-EPB5A轴承比较适合的轴表面粗糙度为Ra0.4 ~ 0.9um。

CSB-EPB5A Bearing Friction factor is increased along with the increasing of the operation speed under certain loading (See Graph EPB5A-4). The friction factor of CSB-EP5A is decreased along with the loading increasing not over 20Mpa (see Graph EPB5A-5). The friction factor will not change much along with the speed when the loading is over 20Mpa. The Graph EPB5A-6 shows that the bearing could achieve its best performance when the counter shaft surface roughness is around Ra0.4 to Ra0.9.

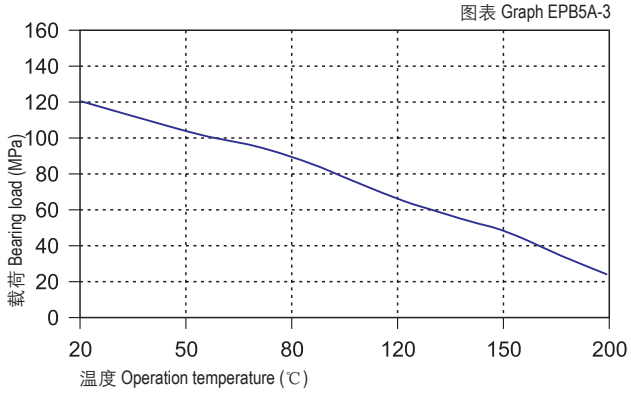
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB5A-2



■ 载荷-温度图表 Load-Temperature diagrams

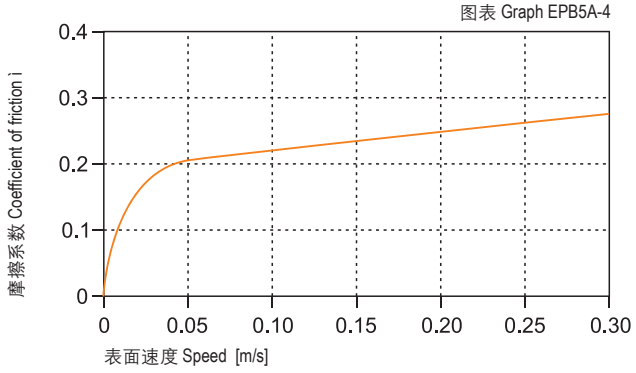
图表 Graph EPB5A-3



■ 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

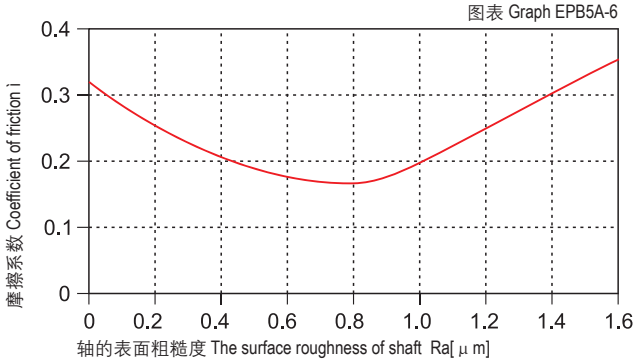
图表 Graph EPB5A-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

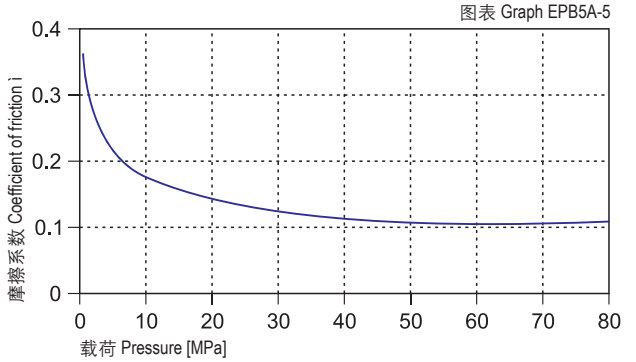
图表 Graph EPB5A-6



■ 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 EPB5A-5



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CSB-EPB5A	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.25-0.40	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB5A-7和图表EPB5A-8测试表明了CSB-EPB5A轴承在不同轴材料上的运行磨损情况，这表明此轴承在轻载下使用硬化铝轴和硬铬轴比较适合，而随着载荷的增加硬铬轴的优势尤为突出。图表EPB5A-7表明CSB-EPB5A轴承比较适合用于摆动运动；同样值得注意的是图表EPB5A-8表明CSB-EPB5A轴承在常温23℃下的摩擦磨损性能并没有在高温150℃下优秀。

Graph EPB5A-7 and Graph EPB5A-8 show the test results of the material CSB-EPB5A running against different shaft materials. It is suitable for hard Aluminum and hard chrome steel shaft. The hard chrome steel shaft will be better when the loading is getting heavier. Graph EPB5A-7 shows CSB-EPB5A is good for oscillation operation. Specially, from the Graph EPB5A-8, it is read that CSB-EPB5A is with better performance under high temperature around 150℃ comparing with under the ambient temperature of 23℃.

化学抗性 Chemical Resistance

CSB-EPB5A塑料轴承具有极好的化学抗性，能抵抗浓度65%的强酸。

Chemical Resistance of CSB-EPB5A is very good. It can work well in the heavy acid of 65%.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB5A塑料轴承的吸水率极低0.1%，浸泡水中最大平衡吸水率为0.5%；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。

The water absorb rate of CSB-EPB5A is less than 0.1% under the atmospheric pressure while it is 0.5% when the material is immerged into water. The material performance and dimensions of the material is stabilized for the applications under humid environment.

抗UV性能 UV Resistance

CSB-EPB5A长久暴露在紫外线下材料性能不会发生变化。

CSB-EPB5A can maintain its performance to be stable even exposed in the UV ray for long period.

安装公差 Installation Tolerances

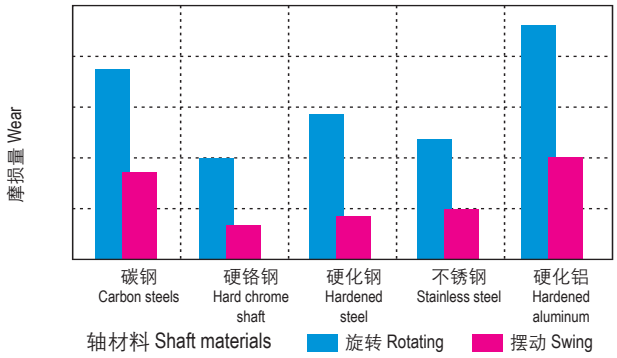
CSB-EPB5A塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB5A 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

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

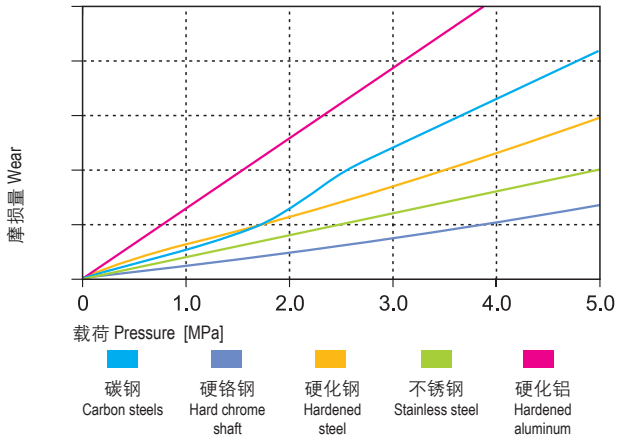
图表 Graph EPB5A-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

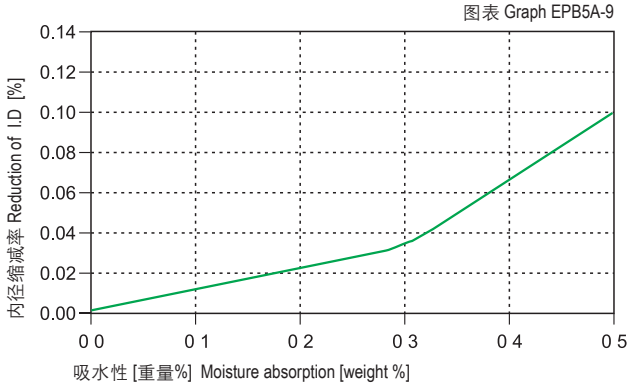
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB5A-8



吸水性的影响 Effect of moisture absorption on EPB5A bearings

图表 Graph EPB5A-9



直径 Di. [mm]	CSB-EPB5A E10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>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

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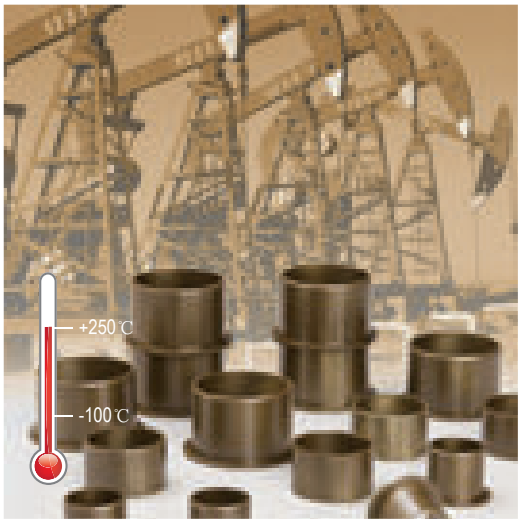


◉ 标准产品规格表 Standard specifications: P150

产品特性 Product Features

- 高载荷和低摩擦系数出色的材料。可承受边缘载荷。软轴或硬轴配合使用同样耐磨
- 连续使用温度：-100℃/+250℃
- 适合高载荷运动
- 允许较高的运行速度
- 允许边界压力
- 摆动运行性能尤为出色
- It is a high load material with excellent low friction factor. Marginal load application is acceptable and it is with good wear resistance both for hard and soft shafts
- Continuous working temperature: -100℃/+250℃
- High load capacity
- Higher speed is permissible
- Marginal pressure is permissible
- Best performance for oscillating movement

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB5Z
密度 Density	ISO1183	g/cm^3	1.40
颜色 Color			棕色Brown
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.15
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	1.0
最大旋转速度值 Max. roatating velocity		m/s	1.5
最大摇摆速度值 Max. oscillating velocity		m/s	1.1
最大直线速度值 Max. linear velocity		m/s	5.0
抗拉强度 Tensile strength	ISO527	MPa	90
抗压强度 (轴向) Compressive strength (Axial)		MPa	65
弹性模量 E-module	ISO527	MPa	2500
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	150
邵氏硬度 Shore hardness	ISO 868	D	81
连续工作温度 Continuous work temperature		℃	-100/+250
短时运行温度 Short-time work temperature		℃	-100/+310
导热性 Thermal conductivity	ASTME1461	$W / m \times k$	0.6
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	4
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.3
最大吸水率23℃ Max. water absorption, 23℃		%	1.1
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{11}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{11}$

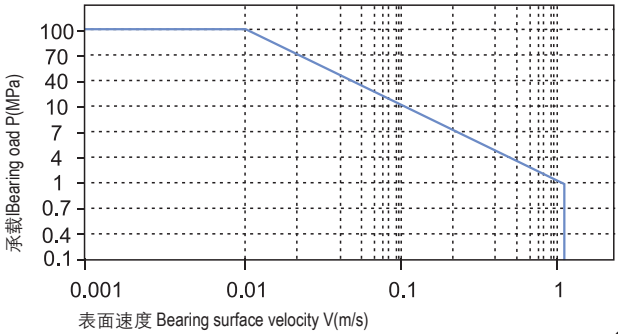
轴承PV值 PV Value

CSB-EPB5Z塑料轴承最大运行PV值为1.0N/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EPB5Z-1。

The max PV value of the CSB-EPB5Z plastic bearings is 1.0N/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 EPB5Z-1).

PV图表 Permissible PV value for CSB-EPB5Z

图表 Graph EPB5Z-1



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

CSB-EPB5Z塑料轴承可承受最大静载荷为150Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB5Z-2，轴承实际工作载荷略小于150Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：1.5m/s) 会导致摩擦温度上升，而温度上升 (Tmax: 250℃) 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EPB5Z-3。

CSB-EPB5Z allows the Max static load of 150Mpa, The max compressive deformation rate under the max load is listed in Graph EPB5Z-2, The actual load capacity of bearing is slightly less than 150Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.5m/s) results into higher temperature (Tmax: 250℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB5Z-3 for such variation.

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

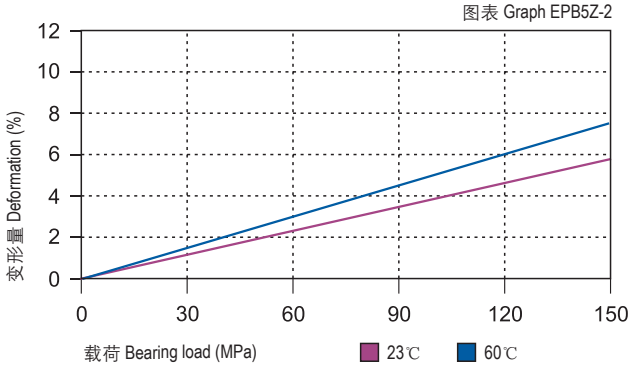
摩擦系数 Friction Factor

图表EPB5Z-4表明CSB-EPB5Z轴承在载荷保持不变的情况下轴承的摩擦系数随着旋转速度的增加而先随之升高，当速度值达到0.2m/s后则又随着速度的增加而降低；图表EPB5Z-5表明CSB-EPB5Z轴承的摩擦系数在旋转速度保持不变的情况下随着载荷的不断上升而逐渐降低。图表EPB5Z-6表明CSB-EPB5Z轴承对磨轴的粗糙度在Ra0.4 ~ 0.7um时最适合的。

Graph EPB5Z-4 shows that the friction factor of CSB-EPB5Z is initially increased along with the operation speed increasing when the loading is stable but when the speed reaches over 0.2m/s, it is decreased along with the operation speed increasing. Graph EPB5Z-5 shows that the friction factor of CSB-EPB5Z is decreasing along with the loading increasing when the operation speed is stable. The best shaft roughness for this material is Ra0.4~0.7.

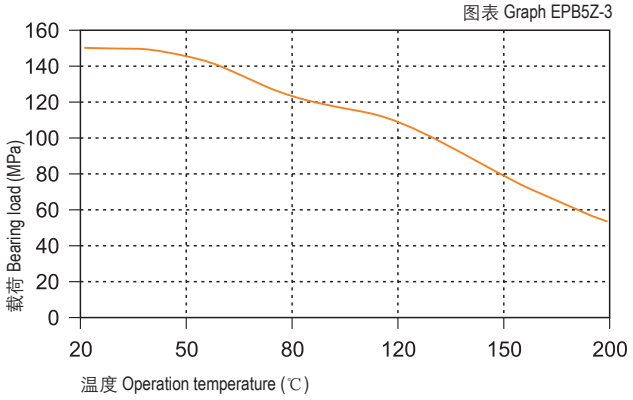
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB5Z-2



■ 载荷-温度图表 Load-Temperature diagrams

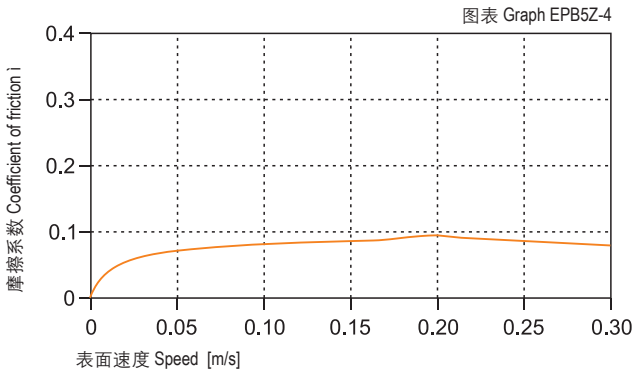
图表 Graph EPB5Z-3



■ 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

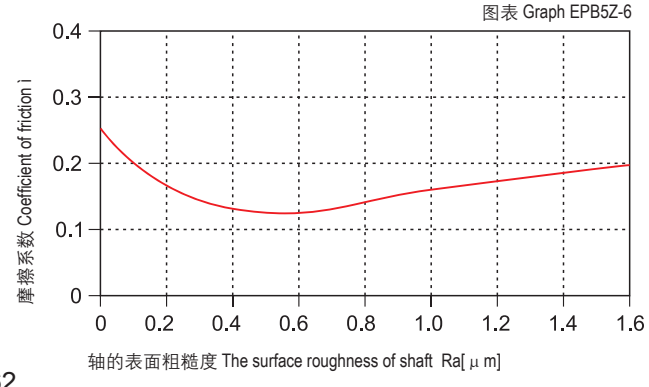
图表 Graph EPB5Z-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

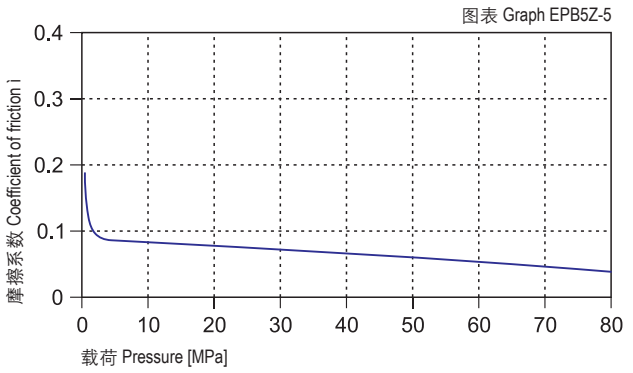
图表 Graph EPB5Z-6



■ 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 EPB5Z-5



CSB-EPB5Z	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

图表EPB5Z-7与图表EPB5Z-8表明CSB-EPB5Z轴承在低载下的磨损速率和其它轴承类似，而在中高载荷时此轴承的耐磨性要比其它轴承都要好；同时我们可以看出硬化轴比较适合用于CSB-EPB5Z轴承。图表EPB5Z-8表明CSB-EPB5Z轴承在摆动下的磨损要比旋转下的要小，当载荷超过2Mpa时这种现象尤为明显。在旋转运动下我们推荐使用硬化钢轴比较适合，而在摆动运动下我们建议采用不锈钢轴或硬铬钢轴比较理想。

Graph EPB5Z-7 and Graph EPB5Z-8 shows that the wearing speed of CSB-EPB5Z is similar with most of the other materials under lower loading but it will be much better when the loading is higher. It also tells that the hardened steel shaft is good for CSB-EPB5Z bearings.Graph EPB5Z-8 shows the wearing rate is less in oscillation operation than in rotation operation especially when the loading is over 20Mpa. Heat-treated steel shaft is recommended in rotation operation and stainless steel and hardened chrome steel shaft is recommended in oscillation operation.

化学抗性 Chemical Resistance

CSB-EPB5Z塑料轴承可以抵抗弱酸、弱碱以及各类润滑油的腐蚀。

CSB-EPB5Z 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-EPB5Z塑料轴承的吸水率极低0.3%，浸泡水中最大平衡吸水率为1.1%；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。

The water absorb rate of CSB-EPB5Z is less than 0.3% under the atmospheric pressure while it is 1.1% when the material is immerged into water. The material performance and dimensions of the material is stabilized for the applications under humid environment.

抗UV性能 UV Resistance

CSB-EPB5Z长久暴露在紫外线下材料性能会逐渐下降。

The material performance of CSB-EP5Z will be lowered if it is exposed in the UV ray for long period.

安装公差 Installation Tolerances

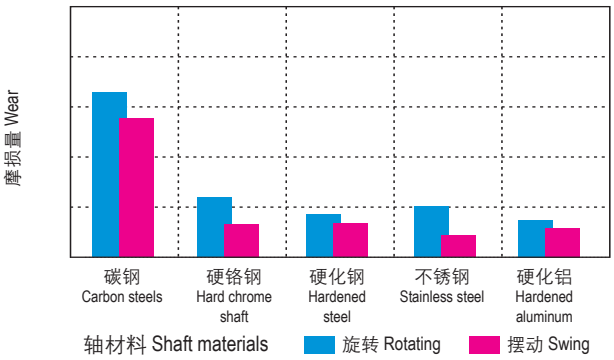
CSB-EPB5Z塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB5Z 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

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

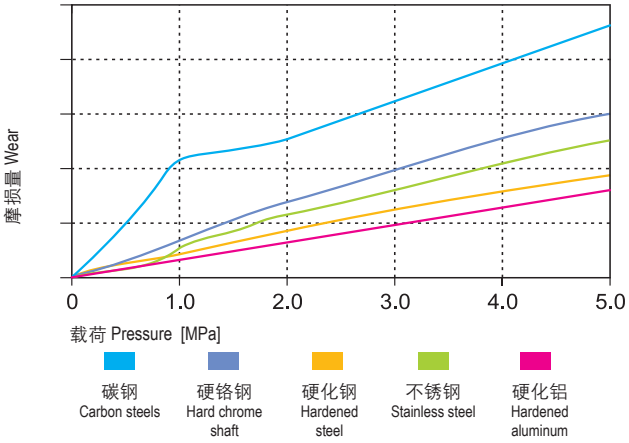
图表 Graph EPB5Z-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

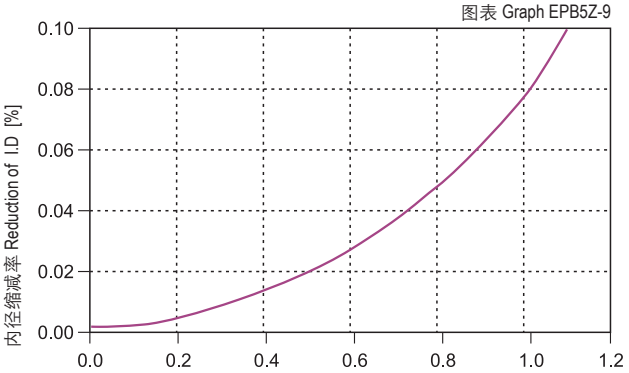
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB5Z-8



吸水性的影响 Effect of moisture absorption on EPB5Z bearings

图表 Graph EPB5Z-9



直径 Di. [mm]	CSB-EPB5Z E10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>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

标准产品规格表 Standard specifications: P150

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB6

◉ 标准产品规格表 Standard specifications: P136

产品特性 Product Features

- 80度下较好的耐磨材料。被应用于对轴硬度要求不高的场合。白色也
- 是较多清洁设备和包装机械的考虑因素
- 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

- It is a wear resistance material for working temperature lower than 80℃. The application is for the condition where the shaft hardness is not critical. The white color of the material is also commonly used for most of the clearing and packing machineries
- Continuous working temperature: -40℃/+80℃
- No special requirement on the surface roughness
- Low friction coefficient
- Applicable for soft shaft

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB6
密度 Density	ISO1183	g/cm^3	1.45
颜色 Color			白色White
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.18
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.3
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	75
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	30
邵氏硬度 Shore hardness	ISO 868	D	74
连续工作温度 Continuous work temperature		℃	-40/+80
短时运行温度 Short-time work temperature		℃	-70/+120
导热性 Thermal conductivity	ASTME1461	$W / m \times k$	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℃		%	1.1
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ωcm	$>10^{12}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$

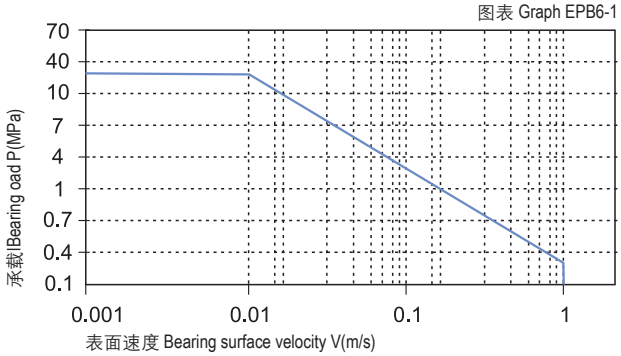
轴承PV值 PV Value

CSB-EPB6塑料轴承最大运行PV值为$0.3N/mm^2 \times m/s$; 由此决定轴承所承受的载荷与速度成反比，详细查阅图表EPB6-1。

The max PV value of the CSB-EPB6 plastic bearings is $0.3N/mm^2 \times m/s$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPB6-1).

■ PV图表 Permissible PV value for CSB-EPB6

图表 Graph EPB6-1



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

CSB-EP6塑料轴承可承受最大静载荷为30Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB6-2，轴承实际工作载荷略小于30Mpa，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EPB6-3。

CSB-EPB6 allows the Max static load of 30Mpa, The max compressive deformation rate under the max load is listed in Graph EPB6-2, The actual load capacity of bearing is slightly less than 30Mpa, 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 EPB6-3 for such variation.

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

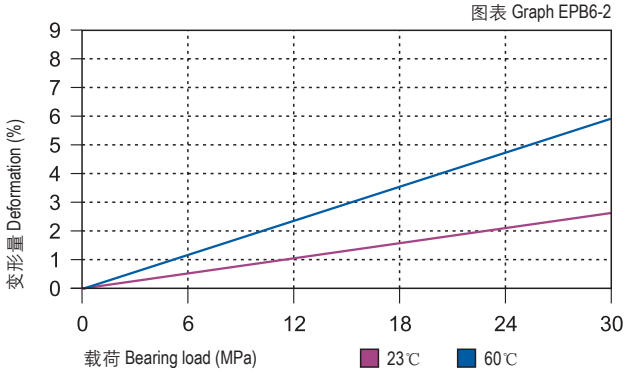
摩擦系数 Friction Factor

图表EPB6-4表明CSB-EPB6轴承在载荷保持不变的情况下摩擦系数随着运行速度的增加而略有小幅度的升高；图表EPB6-5表明CSB-EPB6轴承在保持速度不变时摩擦系数随着载荷的增加而逐步减低。根据图表EPB6-6表明CSB-EPB6轴承的摩擦系数会随着轴表面粗糙度的变化而不同，我们推荐使用轴粗糙度为Ra0.3 ~ 0.6um;

Graph EPB6-4 shows the CSB-EPB6 friction factor is slightly increased as long as the operation speed increasing when the loading is relatively stable. Graph EPB6-5 shows the friction factor of CSB-EPB6 is continuing decreasing along with the loading increasing when the operation speed is relatively stable. From Graph EPB6-6, it is found that the friction factor is also variable against the shaft surface roughness. The recommended shaft surface roughness is Ra0.3~0.6.

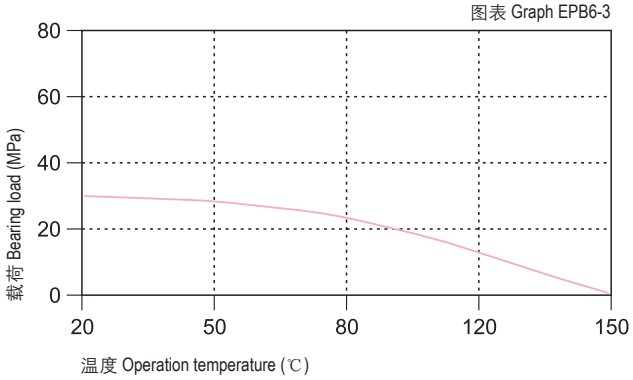
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB6-2



■ 载荷-温度图表 Load-Temperature diagrams

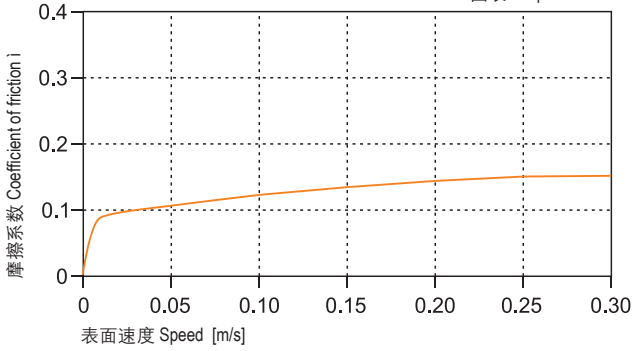
图表 Graph EPB6-3



■ 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

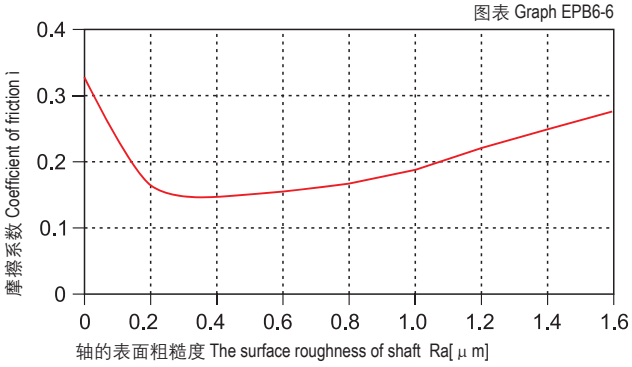
图表 Graph EPB6-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

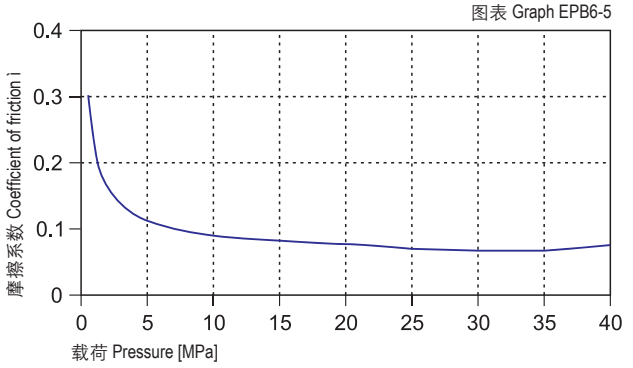
图表 Graph EPB6-6



■ 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 EPB6-5



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CSB-EPB6	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05~0.18	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB6-7与图表EPB6-8明硬化钢轴或硬铬钢轴比较适合用于CSB-EPB6轴承。图表EPB6-8表明CSB-EPB6轴承在用于旋转运动或摆动运动时的磨损性能基本相同，这就决定了此轴承可以用于多种场合。

Graph EPB6-7 and Graph EPB6-8 describes CSB-EPB6 bearing is suitable for hardened steel and hardened chrome steel shaft. Graph EPB6-8 shows the wearing features of CSB-EPB6 is very similar during its rotation operation and oscillation operation so that this material is suitable for most of the applications.

化学抗性 Chemical Resistance

CSB-EPB6塑料轴承能抵抗弱碱、弱酸以及各类润滑油的腐蚀。

CSB-EPB6 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-EPB6塑料轴承的吸水率为0.2%，浸泡水中最大平衡吸水率为1.1%；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-EPB6 is 0.2% under the atmospheric pressure while it is 1.1% 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-EPB6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-EPB6 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

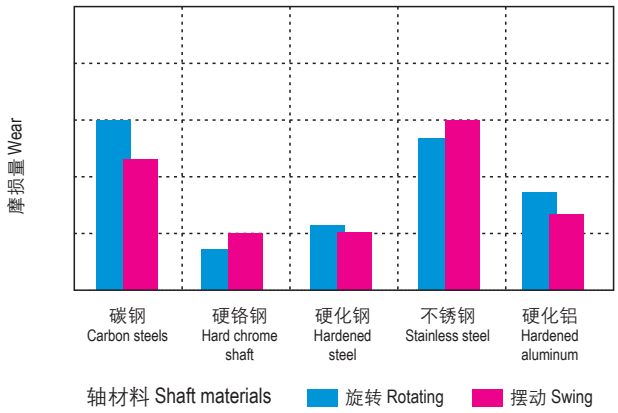
CSB-EPB6塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB6 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

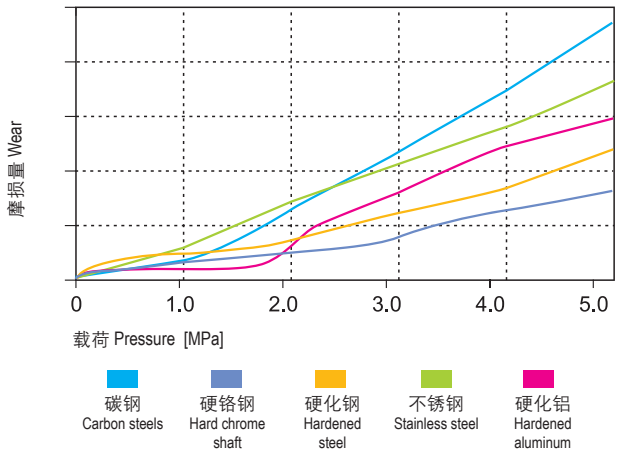
图表 Graph EPB6-7



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

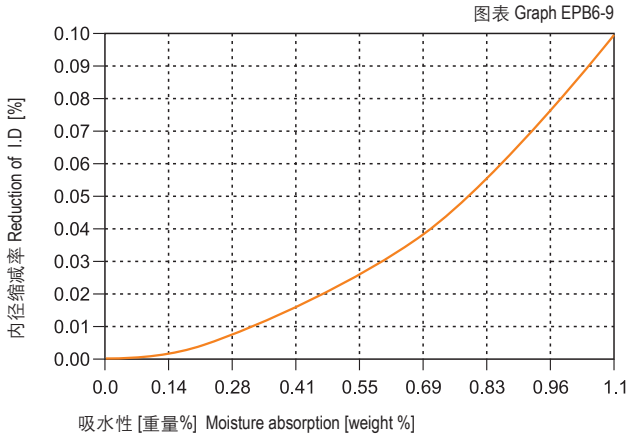
图表 Graph EPB6-8



吸水性的影响

Effect of moisture absorption on EPB6 bearings

图表 Graph EPB6-9



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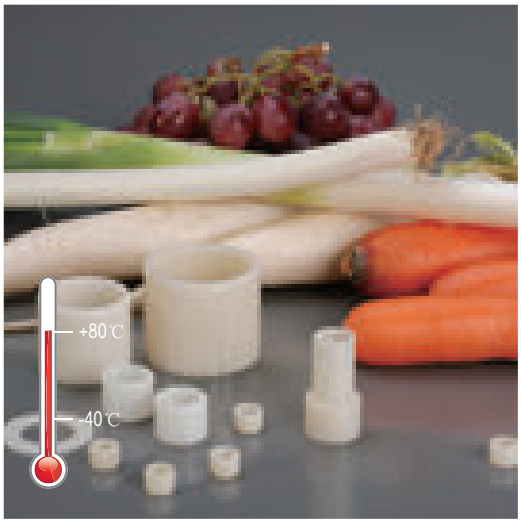


◉ 标准产品规格表 Standard specifications: P150

产品特性 Product Features

- 不含PTFE和Sillcon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

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB6A
密度 Density	ISO1183	g/cm^3	1.14
颜色 Color			白色White
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.10-0.40
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.1
最大旋转速度值 Max. roatating velocity		m/s	0.6
最大摇摆速度值 Max. oscillating velocity		m/s	0.4
最大直线速度值 Max. linear velocity		m/s	1.0
抗拉强度 Tensile strength	ISO527	MPa	83
抗压强度 (轴向) Compressive strength (Axial)		MPa	50
弹性模量 E-module	ISO527	MPa	2800
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	20
邵氏硬度 Shore hardness	ISO 868	D	76
连续工作温度 Continuous work temperature		℃	-40/+80
短时运行温度 Short-time work temperature		℃	-40/+170
导热性 Thermal conductivity	ASTME1461	$W / m \times k$	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	%	1.5
最大吸水率23℃ Max. water absorption, 23℃		%	7.6
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	$>10^{15}$

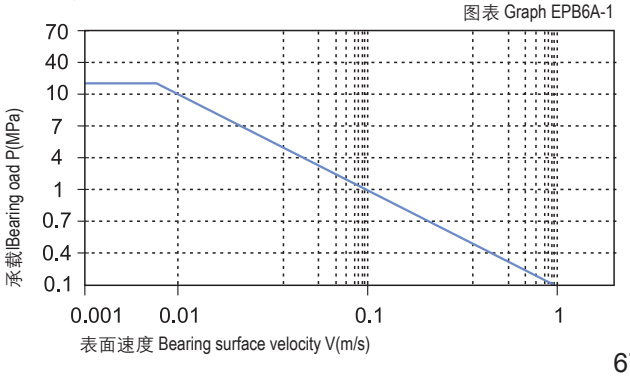
轴承PV值 PV Value

CSB-EPB6A塑料轴承最大运行PV值为$0.1N/mm^2 \times m/s$；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 $0.1N/mm^2 \times m/s$ 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

图表 Graph EPB6A-1



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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20Mpa，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20Mpa，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-EPB6A allows the Max static load of 20Mpa, 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 20Mpa, 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

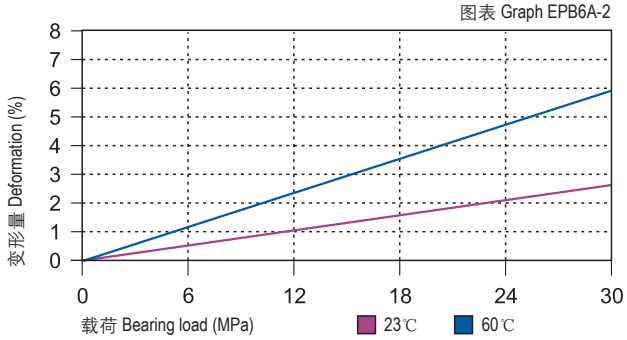
摩擦系数 Friction Factor

图表EPB6A-4表明CSB-EPB6A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-EPB6A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-EPB6A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-EPB6A 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.

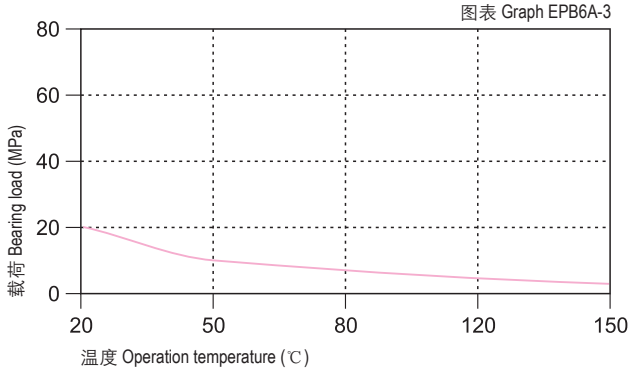
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB6A-2



■ 载荷-温度图表 Load-Temperature diagrams

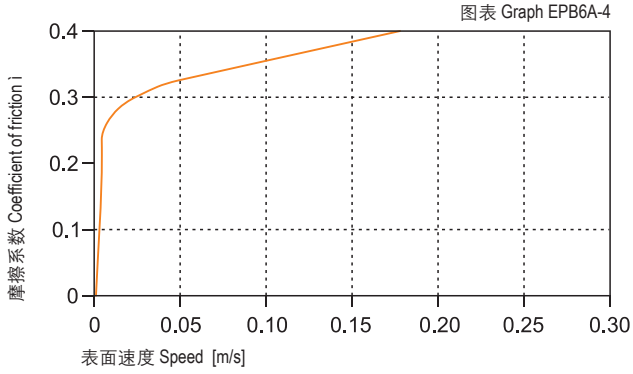
图表 Graph EPB6A-3



■ 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

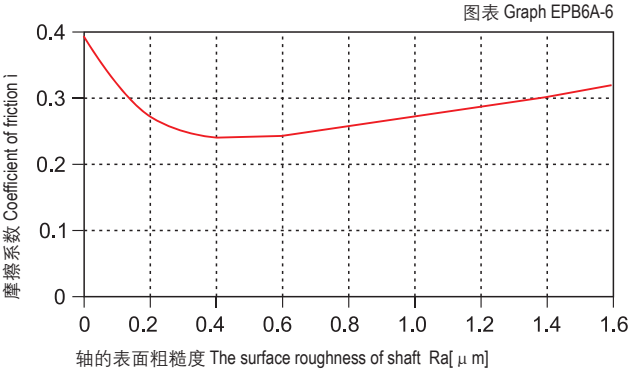
图表 Graph EPB6A-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

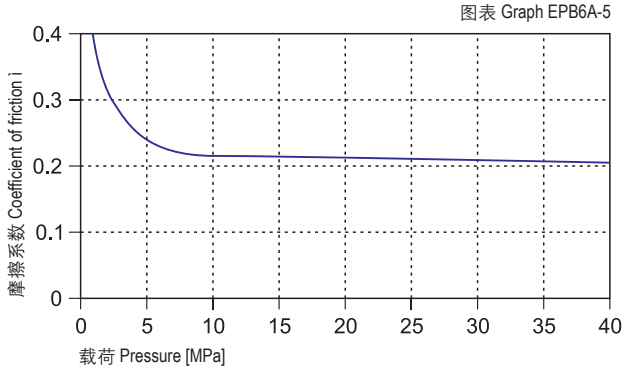
图表 Graph EPB6A-6



■ 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 EPB6A-5



CSB-EPB6A	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05~0.18	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轴承在不同轴材料下旋转运动的结果，由此表明CSB-EPB6A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-8表明CSB-EPB6A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钢轴效果是最好的。

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-8 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 Absorbability

在标准大气压中，CSB-EPB6A塑料轴承的吸水率为1.5%，浸泡水中最大平衡吸水率为7.6%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB6A is 1.5% under the atmospheric pressure while it is 7.6% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB6A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

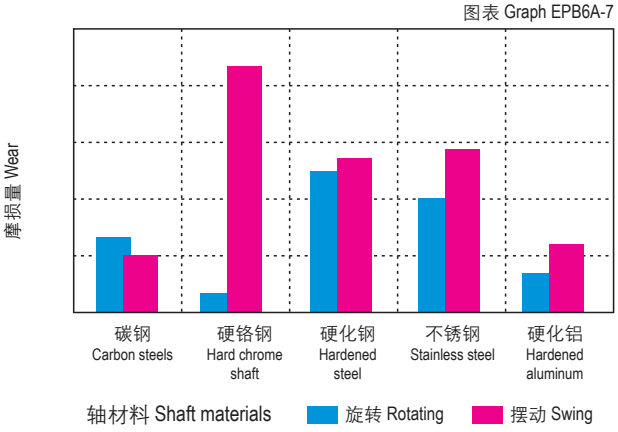
CSB-EPB6A塑料轴承压装后公差 Tolerances after pressfit

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=2MPa, v=0.2m/s

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

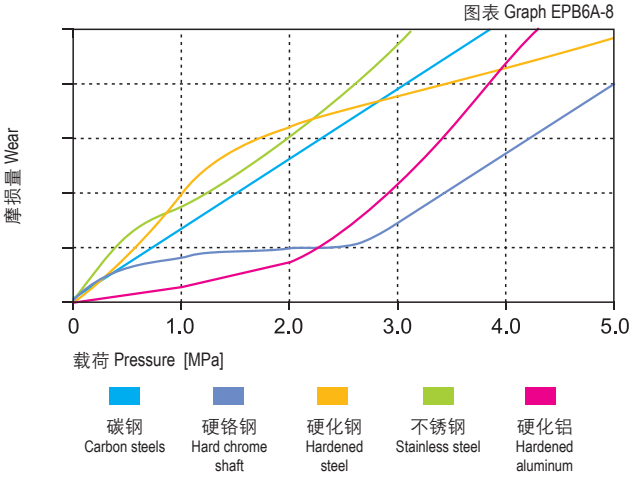
图表 Graph EPB6A-7



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

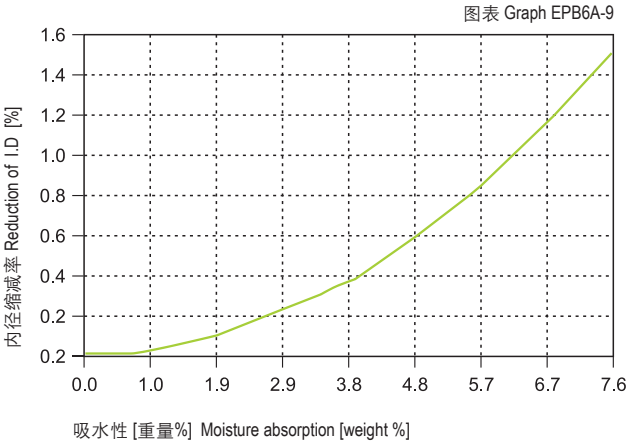
图表 Graph EPB6A-8



吸水性的影响

Effect of moisture absorption on EPB6A bearings

图表 Graph EPB6A-9



标准产品规格表 Standard specifications: P150

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB7

◉ 标准产品规格表 Standard specifications: P150

产品特性 Product Features

- 低摩擦系数和高耐磨性的材料。出色的耐磨性能被应用于CSB其它塑料轴承不能胜任的场合。适合软轴和硬轴材料配合使用
- 连续使用温度：-40℃/+100℃
- 非常耐磨长寿命
- 适合在灰尘中运行
- 对轴表面粗糙度要求低
- 较低的摩擦系数
- 适用于软轴

- A material with low friction factor and good wear resistance. The outstanding wear resistance feature of it ensures the applications where the other plastic bearings are not suitable. It is good for both hard and soft shaft
- Continuous working temperature: -40℃/+100℃
- Good wear resistance with long service life
- Suitable for operation in dusty environment
- No special requirement on the surface roughness
- Low friction coefficient
- Applicable for flexible shaft

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB7
密度 Density	ISO1183	g/cm^3	1.25
颜色 Color			米黄色Cream
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.09-0.20
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.5
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	4.0
抗拉强度 Tensile strength	ISO527	MPa	120
抗压强度 (轴向) Compressive strength (Axial)		MPa	60
弹性模量 E-module	ISO527	MPa	3500
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	60
邵氏硬度 Shore hardness	ISO 868	D	77
连续工作温度 Continuous work temperature		℃	-40/+100
短时运行温度 Short-time work temperature		℃	-40/+180
导热性 Thermal conductivity	ASTME1461	W / m × k	0.2
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	9
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	1.3
最大吸水率23℃ Max. water absorption, 23℃		%	6.5
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	$>10^{12}$

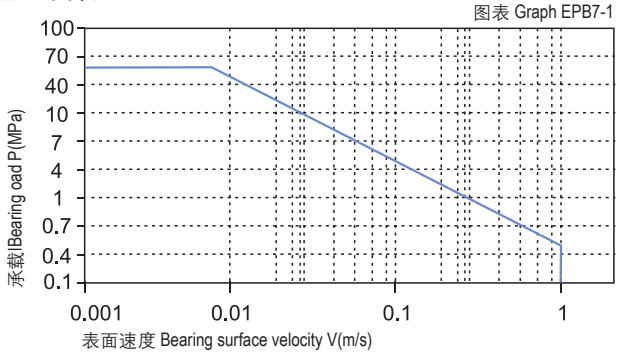
轴承PV值 PV Value

CSB-EPB7塑料轴承最大运行PV值为0.5N/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EPB7-1。

The max PV value of the CSB-EPB7 plastic bearings is 0.5N/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 EPB7-1).

■ PV图表 Permissible PV value for CSB-EPB7

图表 Graph EPB7-1



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

CSB-EPB7塑料轴承可承受最大静载荷为65Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB7-2，轴承实际工作载荷略小于65Mpa，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：100℃) 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EPB7-3。

CSB-EPB7 allows the Max static load of 65Mpa, The max compressive deformation rate under the max load is listed in Graph EPB7-2, The actual load capacity of bearing is slightly less than 65Mpa, The bearing load is variable against the speed and temperature, Fast speed(Vmax: 1.0m/s) results into higher temperature (Tmax: 100℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB7-3 for such variation.

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

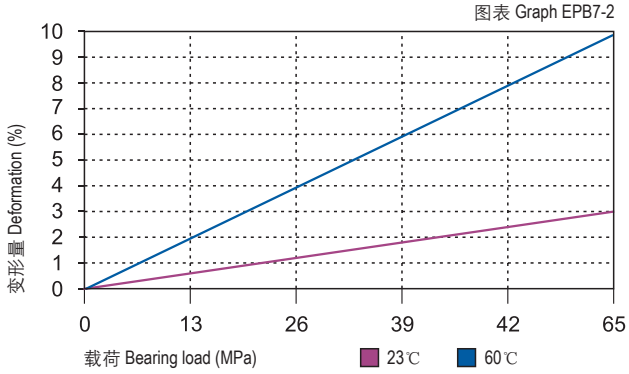
摩擦系数 Friction Factor

图表EPB7-4表明CSB-EPB7轴承的摩擦系数随着运动速度的变化影响较小，而图表EPB7-5表明CSB-EPB7轴承的摩擦系数随着载荷的增加明显减小，在载荷超过20Mpa是逐渐趋于平稳；图表EPB7-6表明CSB-EPB7轴承的摩擦系数受轴粗糙度的影响也相对比较小；虽然如此，我们还是建议轴的表面不能太光滑，也不能过于出差，推荐使用轴的粗糙度为Ra0.3 ~ 0.6um;

CSB-EPB7 Bearing Friction factor is not so sensitive to the operation speed (see Graph EPB7-4). The friction factor is considerably decreased along with the loading increasing and it will be turned to be stable when the loading reaches 20Mpa. Graph EPB7-5 shows the friction factor of the bearing is also not sensitive to the shaft roughness but we still recommend that the roughness of the shaft should be neither too smooth nor too rough. It is recommended to keep the roughness of the shaft to be within the range of Ra0.3 to Ra0.6.

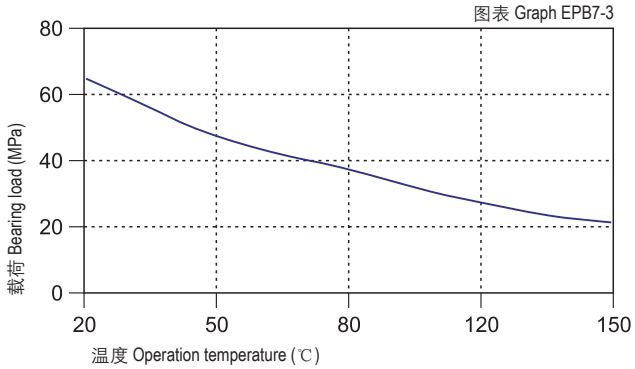
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB7-2



■ 载荷-温度图表 Load-Temperature diagrams

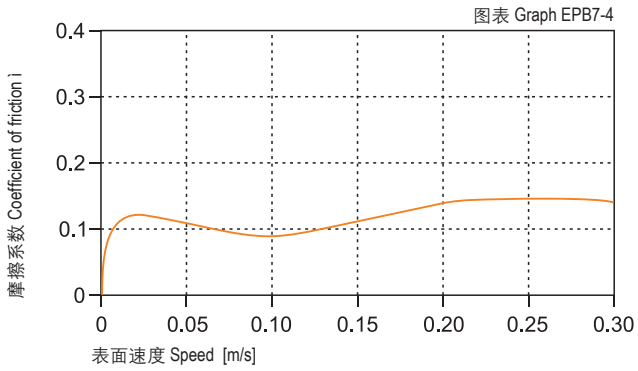
图表 Graph EPB7-3



■ 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

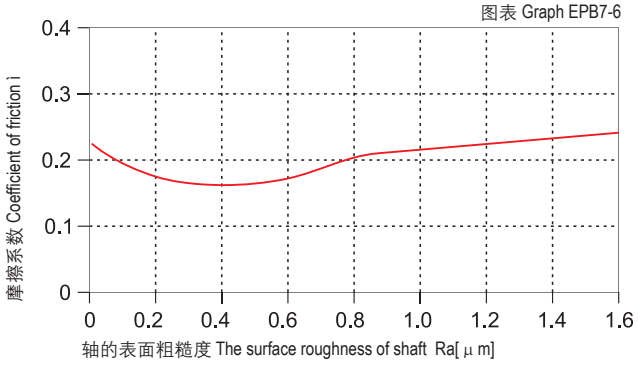
图表 Graph EPB7-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

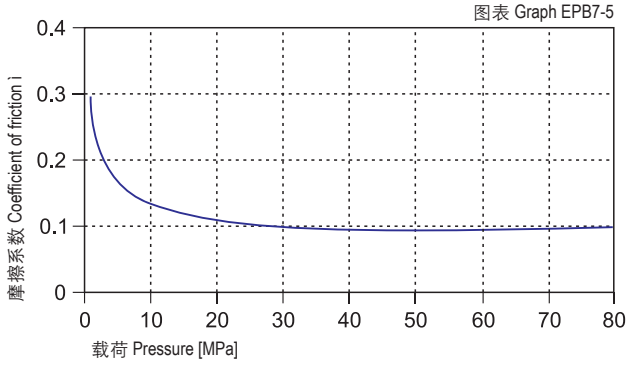
图表 Graph EPB7-6



■ 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 EPB7-5



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CSB-EPB7	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.09~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB7-7表明CSB-EPB7轴承在2Mpa下做旋转运动时，磨损随着轴材料的变化较大；通过实验表明CSB-EPB7轴承在做旋转运动时比较适合用于硬铬轴，硬化钢轴和硬铬轴上用于CSB-EPB7能获得良好的运行效果。图表EPB7-8表明硬铬轴更适合用于高载荷下的CSB-EPB7轴承，随着载荷的不断增加，轴承的磨损速率却变化较小，图表EPB7-8表明CSB-EPB7轴承在不同载荷下的差异。

Graph EPB7-7 shows that the CSB-EPB7 material is not sensitive with different materials under the rotating operation. It is suitable for hard shaft and high speed steel shaft as well as hard chrome steel shaft. Graph EPB7-8 shows that the hard chrome steel shaft is most suitable for using CSB-EPB7 bearing because the wearing speed is not sensitive when the loading is increased. From the Graph EPB7-8, it shows that CSB-EP7 features different performance.

化学抗性 Chemical Resistance

CSB-EPB7塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。

CSB-EPB7 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-EPB7塑料轴承的吸水率为1.3%，浸泡水中最大平衡吸水率为6.5%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB7 is 1.3% under the atmospheric pressure while it is 6.5% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB7长久暴露在紫外线下颜色会发生褪变。材料性能基本都不会发生改变。

The color of CSB-EPB7 could be dimmed when it is exposed into the UV ray. The material performance stays stable.

安装公差 Installation Tolerances

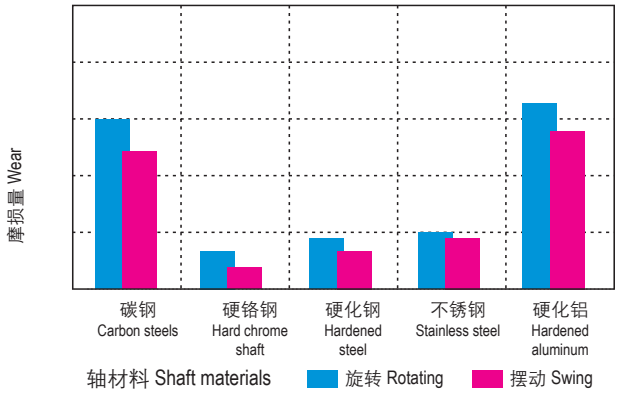
CSB-EPB7塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB7 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

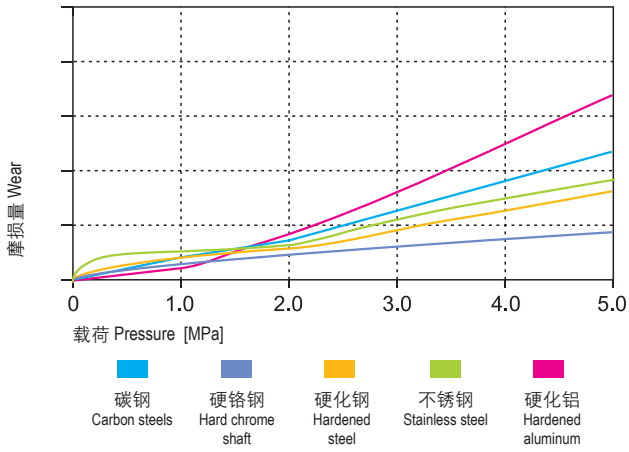
图表 Graph EPB7-7



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

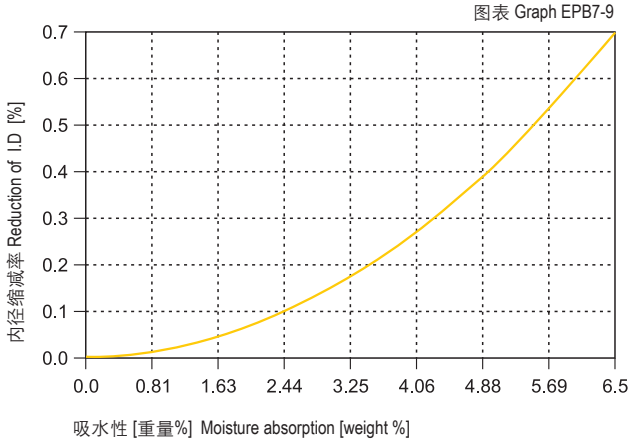
图表 Graph EPB7-8



吸水性的影响

Effect of moisture absorption on EPB7 bearings

图表 Graph EPB7-9



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◉ 标准产品规格表 Standard specifications: P147

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 continously operated in a chemical liquid with temperature of 200 ℃
- Continuous working temperature: -40℃/+200℃
- Good wear resistance under high load
- Suitable for underwater operation
- Good chemical resistance

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB8
密度 Density	ISO1183	g/cm^3	1.60
颜色 Color			灰色Grey
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.07-0.18
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.8
最大旋转速度值 Max. roatating velocity		m/s	1.2
最大摇摆速度值 Max. oscillating velocity		m/s	0.8
最大直线速度值 Max. linear velocity		m/s	4.0
抗拉强度 Tensile strength	ISO527	MPa	135
抗压强度 (轴向) Compressive strength (Axial)		MPa	80
弹性模量 E-module	ISO527	MPa	11000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	75
邵氏硬度 Shore hardness	ISO 868	D	82
连续工作温度 Continuous work temperature		℃	-40/+200
短时运行温度 Short-time work temperature		℃	-40/+260
导热性 Thermal conductivity	ASTME1461	$W / m \times k$	0.5
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	5
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	Ωcm	$>10^5$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^5$

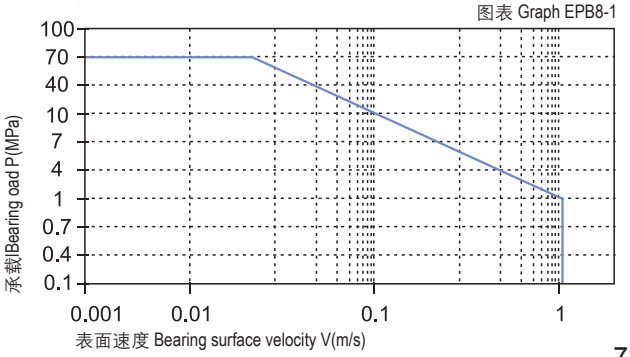
轴承PV值 PV Value

CSB-EPB8塑料轴承最大运行PV值为$0.8N/mm^2 \times m/s$；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 $0.8N/mm^2 \times m/s$ 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

图表 Graph EPB8-1



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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75Mpa，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75Mpa，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 75Mpa, 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 75Mpa, 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

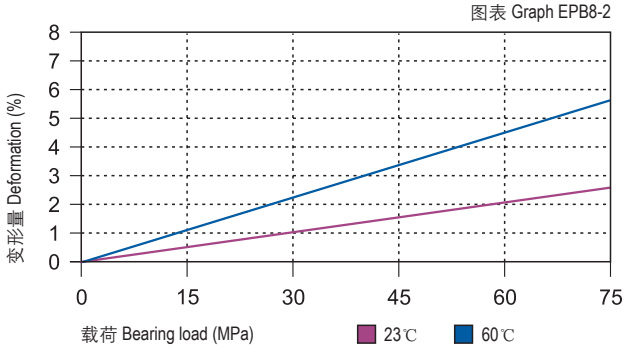
摩擦系数 Friction Factor

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.

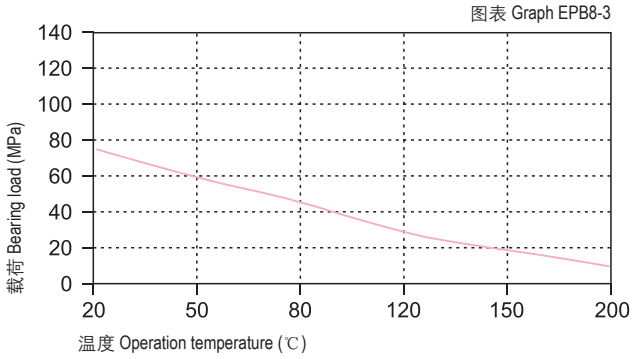
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB8-2



■ 载荷-温度图表 Load-Temperature diagrams

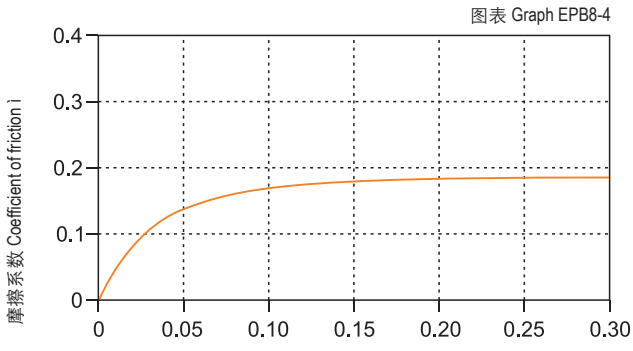
图表 Graph EPB8-3



■ 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

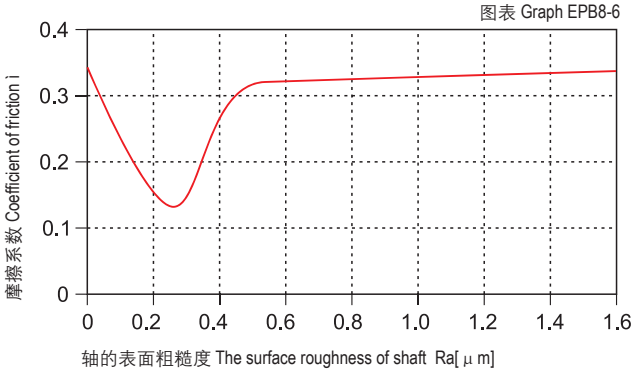
图表 Graph EPB8-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

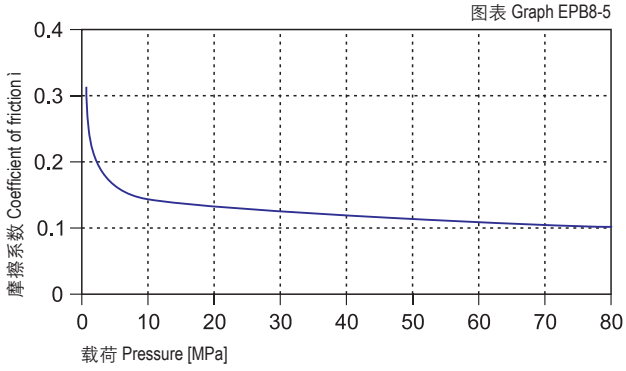
图表 Graph EPB8-6



■ 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 EPB8-5



CSB-EPB8	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ 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轴承在不同轴材料旋转运动下的测试结果表明，CSB-EPB8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。图表EPB8-8表明CSB-EPB8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最佳的选择。

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. Graph EPB8-8 tells that 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 Absorbability

在标准大气压中，CSB-EPB8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，适合在水下长期运行。

The water absorb rate of CSB-EPB8 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-EPB8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

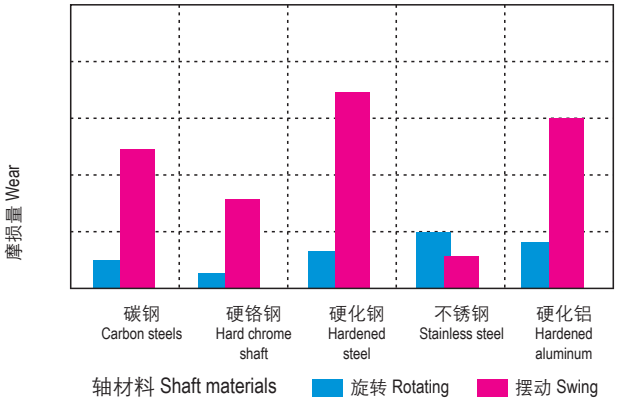
CSB-EPB8塑料轴承压装后公差 Tolerances after pressfit

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=2MPa, v=0.2m/s

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

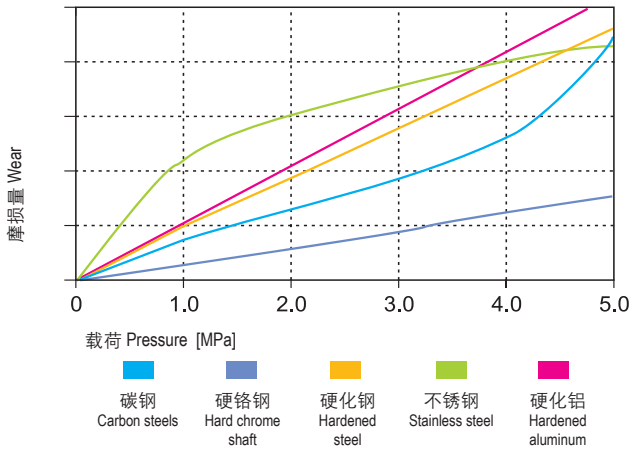
图表 Graph EPB8-7



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

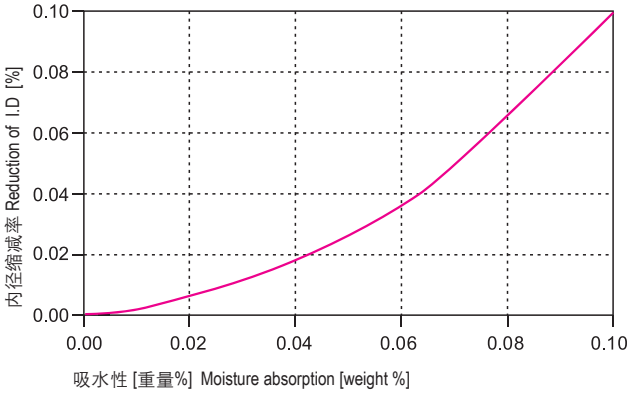
图表 Graph EPB8-8



吸水性的影响

Effect of moisture absorption on EPB8 bearings

图表 Graph EPB8-9



标准产品规格表 Standard specifications: P147

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB9

◉ 标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 导电性优良的自润滑材料。主要因用于高载荷下导电性需求
- 连续使用温度：-40℃/+130℃
- 专用于要求抗静电场合
- 适合低速运动
- 较高的承载能力

- Self-lubricated material with good elctricity conductivity. Mainly used with the high load and electricity conductive evironment
- Continuous working temperature: -40℃/+130℃
- Specially use for static electricity existing environment
- Suitable for low speed operation
- Higher load capacity

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB9
密度 Density	ISO1183	g/cm^3	1.24
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.10-0.40
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.3
最大旋转速度值 Max. roatating velocity		m/s	0.8
最大摇摆速度值 Max. oscillating velocity		m/s	0.6
最大直线速度值 Max. linear velocity		m/s	3.0
抗拉强度 Tensile strength	ISO527	MPa	250
抗压强度 (轴向) Compressive strength (Axial)		MPa	100
弹性模量 E-module	ISO527	MPa	11000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	105
邵氏硬度 Shore hardness	ISO 868	D	84
连续工作温度 Continuous work temperature		℃	-40/+130
短时运行温度 Short-time work temperature		℃	-40/+180
导热性 Thermal conductivity	ASTME1461	W / m × k	0.6
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	11
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	1.8
最大吸水率23℃ Max. water absorption, 23℃		%	8.4
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^3$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^3$

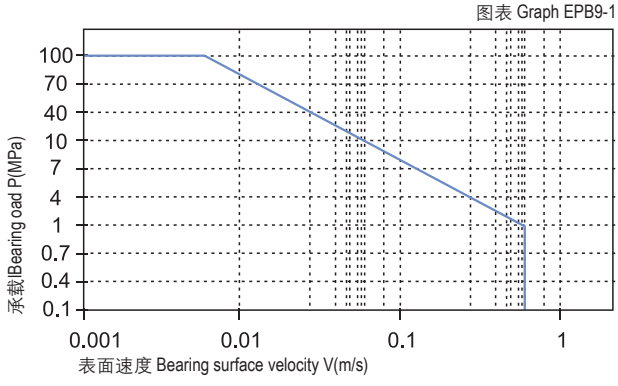
轴承PV值 PV Value

CSB-EPB9塑料轴承最大运行PV值为0.3N/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EPB9-1。

The max PV value of the CSB-EPB9 plastic bearings is 0.3N/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 EPB9-1).

■ PV图表 Permissible PV value for CSB-EPB9

图表 Graph EPB9-1



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

CSB-EPB9塑料轴承可承受最大静载荷为105Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB9-2，轴承实际工作载荷略小于105Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：0.8m/s) 会导致摩擦温度上升，而温度上升 (Tmax：130℃) 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EPB9-3。

CSB-EPB9 allows the Max static load of 105Mpa, The max compressive deformation rate under the max load is listed in Graph EPB9-2, The actual load capacity of bearing is slightly less than 105Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.8m/s) results into higher temperature (Tmax: 130℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB9-3 for such variation.

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

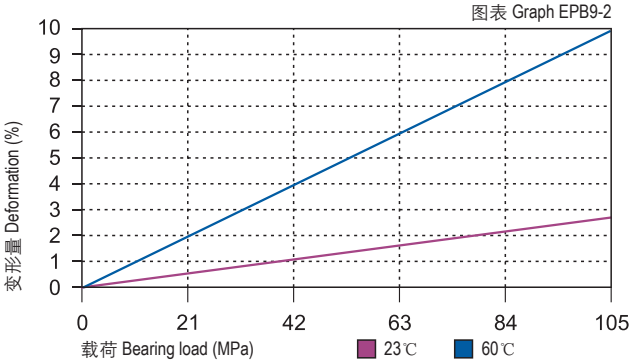
摩擦系数 Friction Factor

图表EPB9-4表明CSB-EPB9轴承的摩擦系数相对其它塑料轴承较高，这主要是由于此轴承材料内部植入了导电纤维的原因；这就决定了此轴承在有润滑的情况下摩擦系数更好。图表EPB9-5表明CSB-EPB9轴承的摩擦系数同样会随着载荷的增加而逐步降低；图表EPB9-6表明CSB-EPB9轴承的摩擦系数在轴粗糙度为Ra0.1 ~ 0.5之间时随着轴粗糙度的增大而逐步减低，而当轴表面粗糙度在Ra0.5 ~ 1.6之间时却影响较小。

Graph EPB9-4 shows that the friction factor of CSB-EPB9 is much higher than those of other materials because the electronic conductive fiber is embedded into the bearing material. It is induced that the friction performance will be better when the bearing is lubricated. Graph EPB9-5 shows that the friction factory is decreasing along with the loading increasing and Graph EPB9-6 shows that the friction factor is increasing along with the shaft roughness increasing when the shaft roughness is between Ra0.1 to Ra0.5. This effecting will be less when the shaft roughness is between Ra0.5 to Ra1.6.

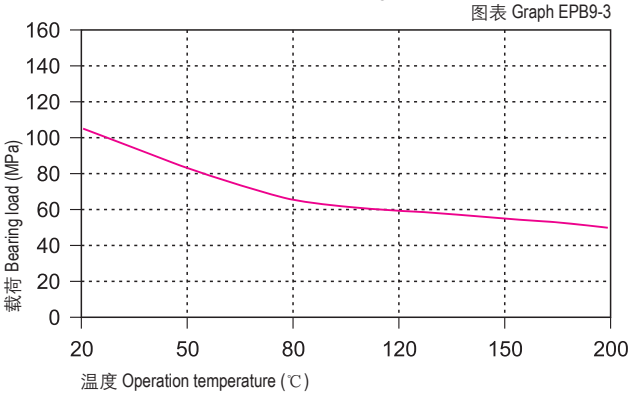
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB9-2



■ 载荷-温度图表 Load-Temperature diagrams

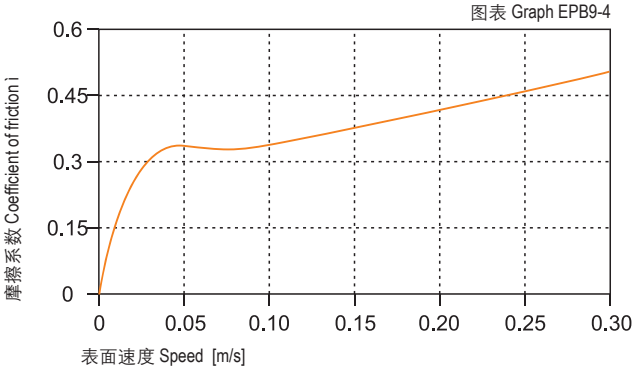
图表 Graph EPB9-3



■ 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

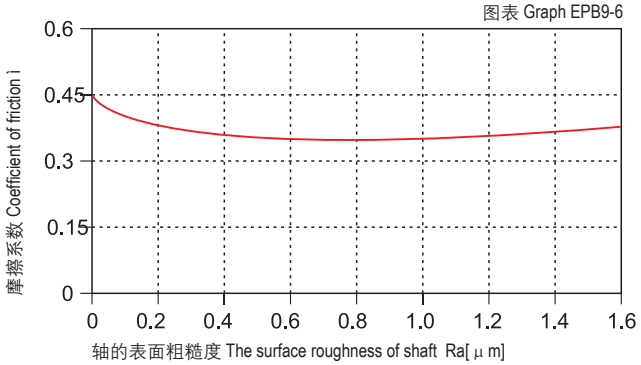
图表 Graph EPB9-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

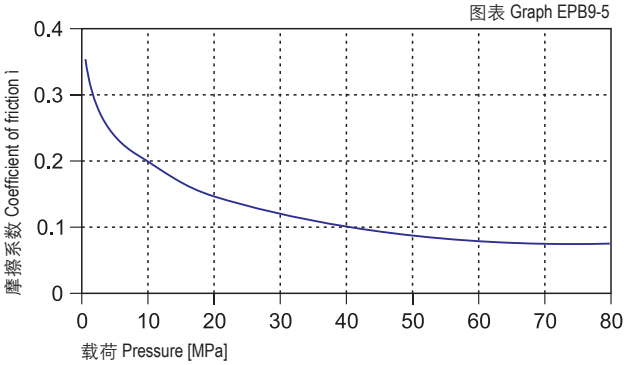
图表 Graph EPB9-6



■ 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 EPB9-5



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CSB-EPB9	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EPB9-7与图图表EPB9-8表明了CSB-EPB9轴承在不同轴材料上旋转运动磨损情况。由此可以看出在低载荷旋转运动时，硬铬钢轴比较适合，而在高载旋转运动时，硬化钢轴比较适合。

Graph EPB9-7 shows the different results of the material against different shaft materials. It induces that the bearing material is good for hard chrome steel shaft under low loading operation condition and good for hardened carbon steel shaft under high loading rotation operation.

化学抗性 Chemical Resistance

CSB-EPB9塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。

CSB-EPB9 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-EPB9塑料轴承的吸水率为1.5%，浸泡水中最大平衡吸水率为7.6%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB9 is 1.5% under the atmospheric pressure while it is 7.6% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB9长久暴露在紫外线下材料性能基本都不会发生改变。

When CSB-EPB9 is exposed into the UV ray, the material performance stays stable.

安装公差 Installation Tolerances

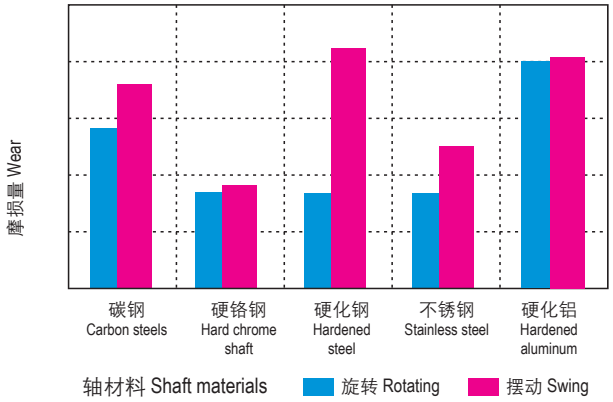
CSB-EPB9塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB9 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

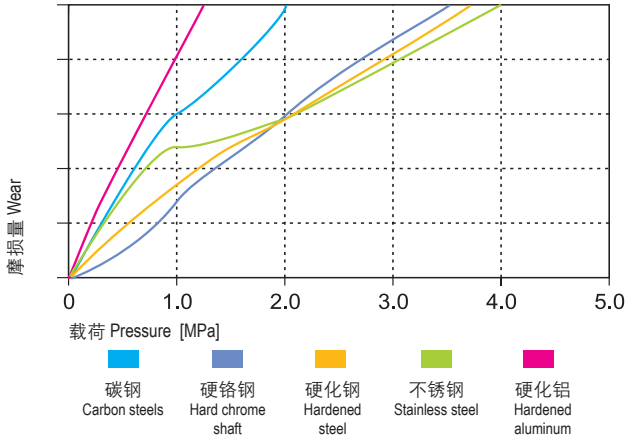
图表 Graph EPB9-7



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

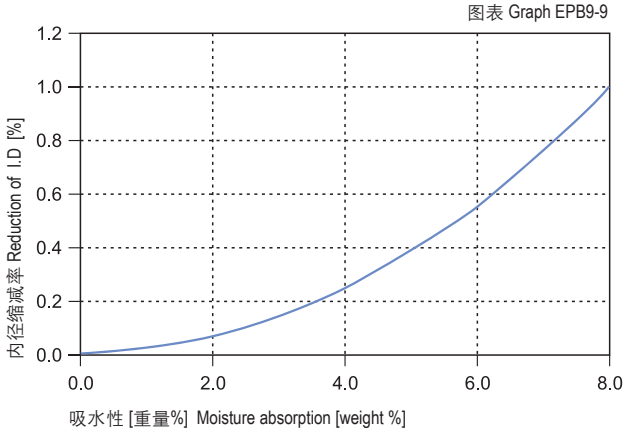
图表 Graph EPB9-8



吸水性的影响

Effect of moisture absorption on EPB9 bearings

图表 Graph EPB9-9



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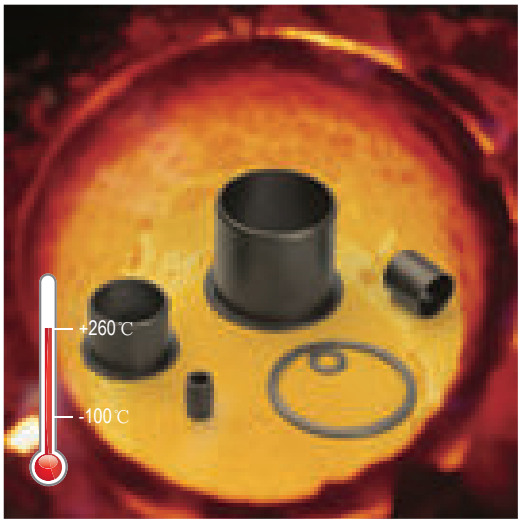


◉ 标准产品规格表 Standard specifications: P147

产品特性 Product Features

- 高温250度、高化学抗性和高载荷的良好结合。同样适用于水下或大部分化学液体下做高速运动
- 连续使用温度：-100℃/+260℃
- 非常耐磨长寿命
- 适合在灰尘中运行
- 对轴表面粗糙度要求低
- 较低的摩擦系数

- It is a material with good high temperature upto 250 ℃, high chemical resistance and high load application. It is suitable for the applications in water or most of chemical liquids.
- Continuous working temperature: -100℃/+260℃
- Good wear resistance with long service life
- Suitable for operation in dusty environment
- No special requirement on the surface roughness
- Low friction coefficient

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB10
密度 Density	ISO1183	g/cm^3	1.40
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.10-0.25
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	1.8
最大旋转速度值 Max. roatating velocity		m/s	1.5
最大摇摆速度值 Max. oscillating velocity		m/s	1.1
最大直线速度值 Max. linear velocity		m/s	5.0
抗拉强度 Tensile strength	ISO527	MPa	240
抗压强度 (轴向) Compressive strength (Axial)		MPa	105
弹性模量 E-module	ISO527	MPa	12000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	160
邵氏硬度 Shore hardness	ISO 868	D	86
连续工作温度 Continuous work temperature		℃	-100/+260
短时运行温度 Short-time work temperature		℃	-100/+315
导热性 Thermal conductivity	ASTME1461	$W/m \times k$	0.7
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	2
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.1
最大吸水率23℃ Max. water absorption, 23℃		%	0.5
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ωcm	$>10^5$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^5$

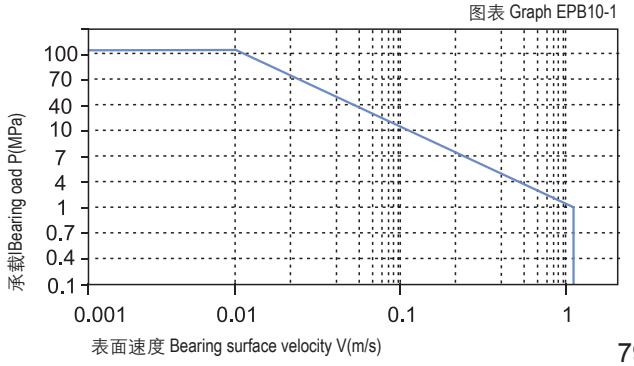
轴承PV值 PV Value

CSB-EPB10塑料轴承最大运行PV值为$1.8N/mm^2 \times m/s$；由此决定轴承所承受的载荷与速度成反比，详细查阅图表EPB10-1。

The max PV value of the CSB-EPB10 plastic bearings is $1.8N/mm^2 \times m/s$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPB10-1).

■ PV图表 Permissible PV value for CSB-EPB10

图表 Graph EPB10-1



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

CSB-EPB10塑料轴承可承受最大静载荷为160Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB10-2，轴承实际工作载荷略小于160Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax: 1.5m/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EPB10-3。

CSB-EPB10 allows the Max static load of 160Mpa, The max compressive deformation rate under the max load is listed in Graph EPB10-2, The actual load capacity of bearing is slightly less than 160Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.5m/s) results into higher temperature (Tmax: 260℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB10-3 for such variation.

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

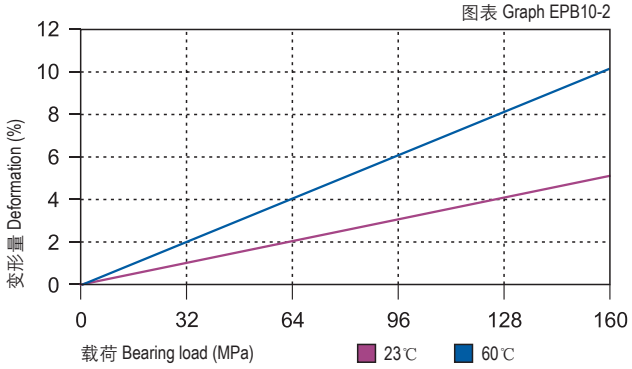
摩擦系数 Friction Factor

图表EPB10-4表明CSB-EPB10轴承的摩擦系数数在载荷一定时随着运行速度的增加而逐渐升高；图表EPB10-5表明CSB-EPB10轴承在速度一定载荷在30Mpa以内时摩擦系数会随着载荷的逐步增加而快速降低，而当载荷高于30Mpa时摩擦系数的变化却比较平缓。图表EPB10-6表明CSB-EPB10轴承比较适合的轴表面粗糙度为Ra0.6 ~ 0.8um。

Graph EPB10-4 shows that the friction factor of CSB-EPB10 is increasing along with the operation speed when the loading is stable within 30 Mpa. When the loading is higher than 30Mpa, the friction factor variation will not be detectable. Graph EPB10-6 describes that CSB-EPB10 is featured best within the shaft surface roughness of Ra0.6~0.8.

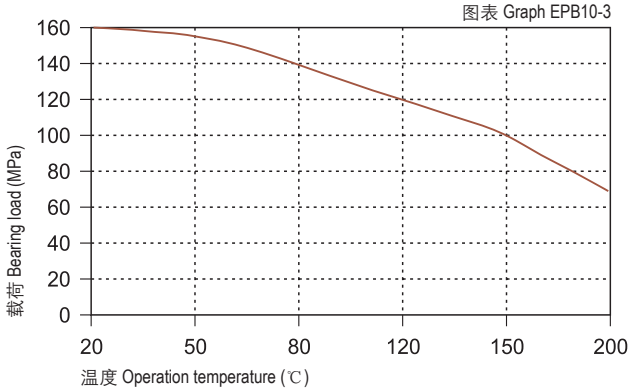
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB10-2



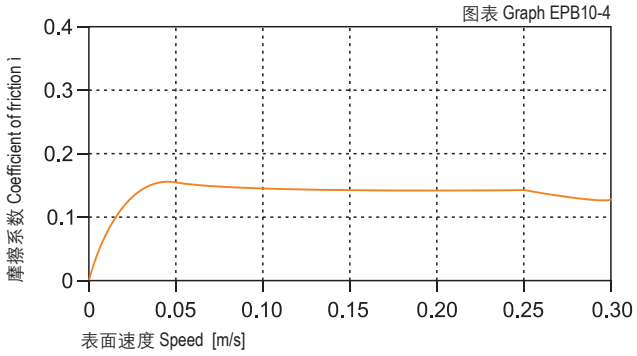
■ 载荷-温度图表 Load-Temperature diagrams

图表 Graph EPB10-3



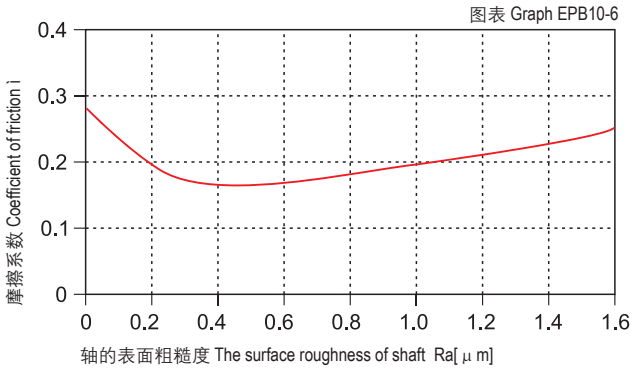
■ 摩擦系数与速度变化关系图表 P=2MPa
Coefficient of friction & the speed of bearing, p = 2 MPa

图表 Graph EPB10-4



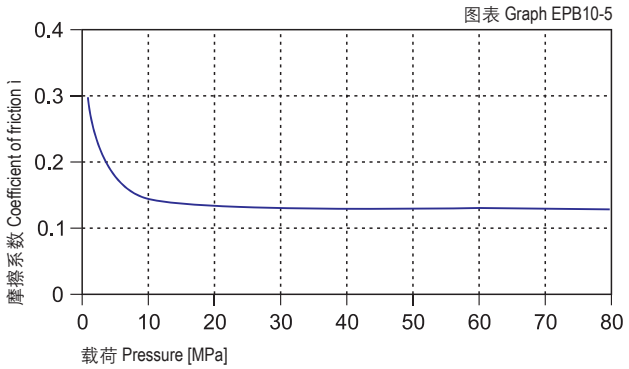
■ 摩擦系数与轴表面粗糙度关系图表
Coefficient of friction & the surface roughness of shaft

图表 Graph EPB10-6



■ 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 EPB10-5



CSB-EPB10	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.10~0.25	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

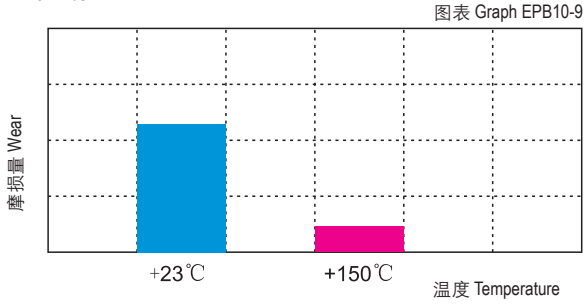
图表EPB10-7和图表EPB10-8测试表明了CSB-EPB10轴承在不同轴材料上的运行磨损对比，在载荷2Mpa以下旋转运动时不锈钢轴和碳钢轴比较适合，而当载荷超过2Mpa时在硬化钢轴和硬铬轴上的运行效果较好。图表EPB10-7表明CSB-EPB10轴承比较适合用于旋转运动；特别值得注意的是图表EPB10-9表明CSB-EPB10轴承在常温23℃下的摩擦磨损性能并没有在高温150℃下优秀。

Graph EPB10-7 and Graph EPB10-8 is the comparing test for the CSB-EPB10 wearing against different shaft materials. Stainless steel and hot-rolled steel shaft is the best shaft material for CSB-EPB10 when the loading is lower than 2Mpa. Graph EPB10-7 shows that CSB-EPB10 is most suitable for rotation operation. Graph EPB10-9 shows a very special feature of CSB-EPB10 that the wearing Features of CSB-EPB10 is much better when the temperature is 150 ℃ than that of the temperature of 23℃.

在不同温度下的磨损量 p=2MPa v=0.2m/s

The bearing wear under rotating with different temperature p=2MPa v=0.2m/s

图表 Graph EPB10-9



化学抗性 Chemical Resistance

CSB-EPB10塑料轴承具有极好的化学抗性，能抵抗浓度65%的强酸。

Chemical Resistance of CSB-EPB10 is very good. It can work well in the heavy acid of 65%.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB10塑料轴承的吸水率极低0.1%，浸泡水中最大平衡吸水率为0.5%；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。

The water absorb rate of CSB-EPB10 is less than 0.1% under the atmospheric pressure while it is 0.5% when the material is immerged into water. The material performance and dimensions of the material is stabilized for the applications under humid environment.

抗UV性能 UV Resistance

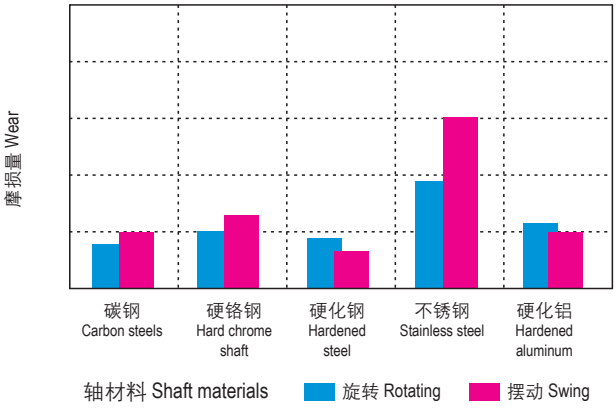
CSB-EPB10长久暴露在紫外线下材料性能不会发生变化。

CSB-EPB10 can maintain its performance to be stable even exposed in the UV ray for long period.

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

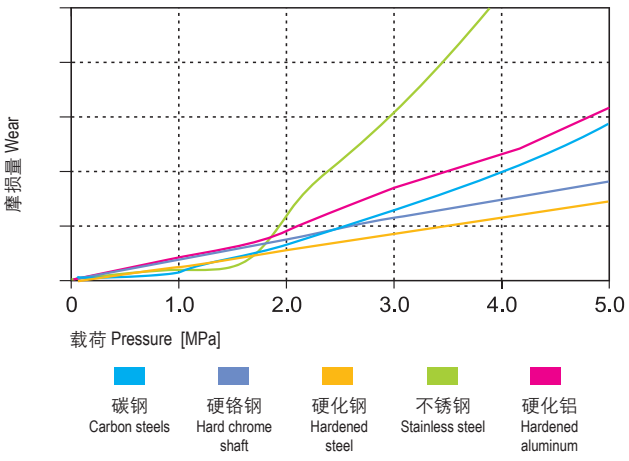
图表 Graph EPB10-7



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

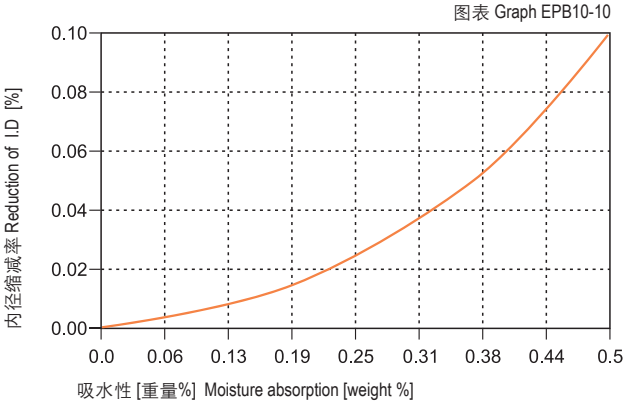
图表 Graph EPB10-8



吸水性的影响

Effect of moisture absorption on EPB10 bearings

图表 Graph EPB10-10



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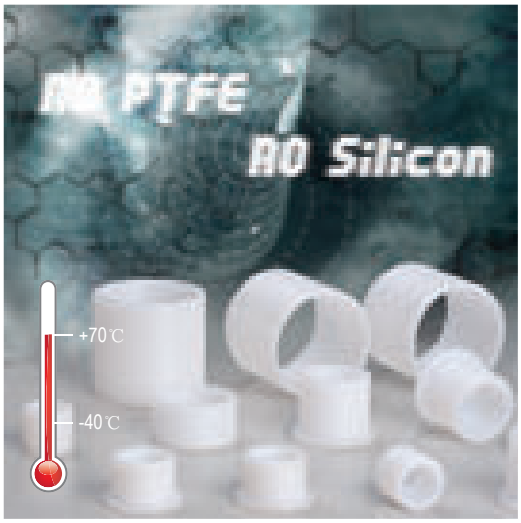
标准产品规格表 Standard specifications: P147

CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB11



◉ 标准产品规格表 Standard specifications: P153

产品特性 Product Features

- 低摩擦系数不含PTFE和Sillcon的耐磨材料。符合FDA标准可直接与食品接触。可被用于水下或零下100度场合。环境温度高于50度时需要
- 考虑额外限位装置
- 连续使用温度：-40℃/+70℃
- 适合多数低载荷场合
- 适合低速运行，低噪音要求
- 不含氟和硅，符合FDA

- Wear resistance material with low friction factor without PTFE and Silicon. It comforms to the FDA standard and could be contacted with food directly. It is suitable for the applications in water or with the temperature under -100℃. If the working temperature is higher than 50℃, additional locating ring is neccessary
- Continuous working temperature: -40℃/+70℃
- Suitable for low load
- Low operation speed and low noise
- No PTFE and silicon, FDA grade

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB11
密度 Density	ISO1183	g/cm^3	0.96
颜色 Color			白色White
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.15
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.2
最大旋转速度值 Max. roatating velocity		m/s	0.5
最大摇摆速度值 Max. oscillating velocity		m/s	0.4
最大直线速度值 Max. linear velocity		m/s	1.0
抗拉强度 Tensile strength	ISO527	MPa	45
抗压强度 (轴向) Compressive strength (Axial)		MPa	35
弹性模量 E-module	ISO527	MPa	1000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	30
邵氏硬度 Shore hardness	ISO 868	D	70
连续工作温度 Continuous work temperature		℃	-40/+70
短时运行温度 Short-time work temperature		℃	-40/+100
导热性 Thermal conductivity	ASTME1461	W / m × k	0.3
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	12
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		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{15}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$

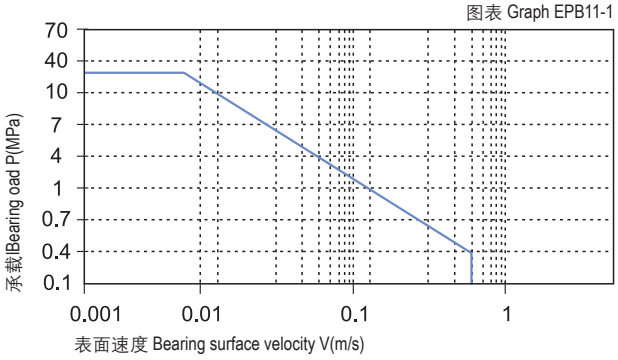
轴承PV值 PV Value

CSB-EPB11塑料轴承最大运行PV值为$0.2N/mm^2 \times m/s$；由此决定轴承所承受的载荷与速度成反比，详细查阅图表EPB11-1。

The max PV value of the CSB-EPB11 plastic bearings is $0.2N/mm^2 \times m/s$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPB11-1).

■ PV图表 Permissible PV value for CSB-EPB11

图表 Graph EPB11-1



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

CSB-EPB11塑料轴承可承受最大静载荷为30Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB11-2，轴承实际工作载荷略小于30Mpa，载荷还受到运行速度以及温度的影响，速度越快(Vmax: 0.5m/s) 会导致摩擦温度上升，而温度上升 (Tmax: 70℃) 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EPB11-3。

CSB-EPB11 allows the Max static load of 30Mpa, The max compressive deformation rate under the max load is listed in Graph EPB11-2, The actual load capacity of bearing is slightly less than 30Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.5m/s) results into higher temperature (Tmax: 70℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB11-3 for such variation.

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

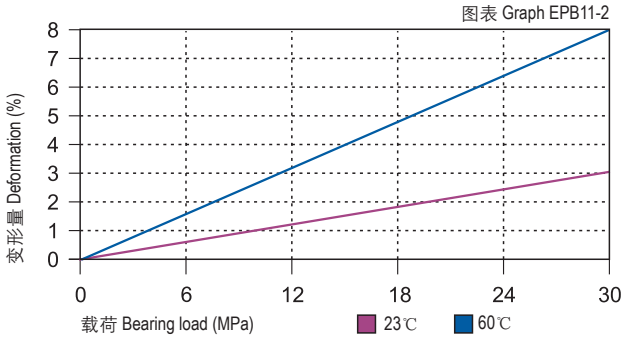
摩擦系数 Friction Factor

EPB11-4和EPB11-5表明CSB-EPB11轴承的摩擦系数受运动载荷以及速度的变化非常小，这主要是由于此轴承材料中不含有氟和硅，其低摩擦润滑完全依赖于自身材料特性。EPB11-6表明CSB-EPB11轴承的摩擦系数与轴表面粗糙度有着密切的关联性，我们推荐使用粗糙度为Ra0.2 ~ 0.6um轴与CSB-EPB11轴承配合使用。

Graph EPB11-4 and Graph EPB11-5 shows that the friction factor of CSB-EPB11 is not considerably variable against the changing of the loading and operation speed because there is no Fluorine and Silicon in this material and therefore its low friction feature is completely depended on the material Features. Graph EPB11-6 shows that the friction factor of CSB-EPB11 is sensitive to the shaft roughness. The shaft roughness of Ra0.2~0.6 is recommended for the best performance of CSB-EPB11 bearings.

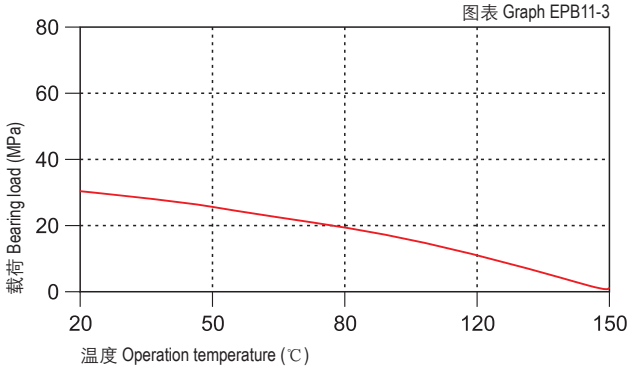
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB11-2



■ 载荷-温度图表 Load-Temperature diagrams

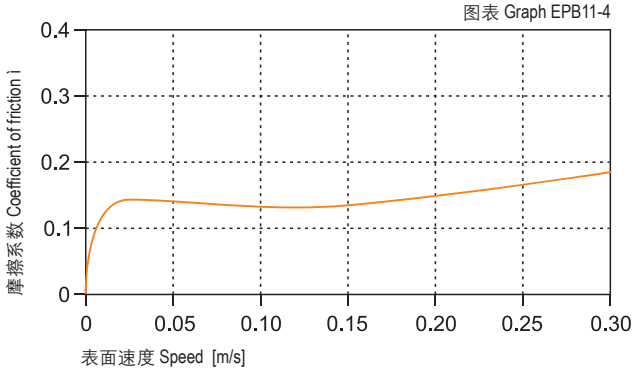
图表 Graph EPB11-3



■ 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

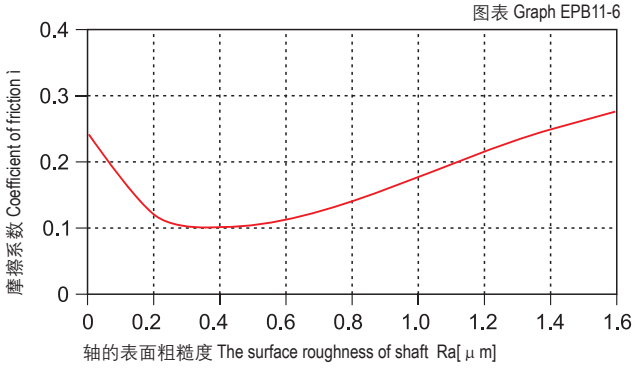
图表 Graph EPB11-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

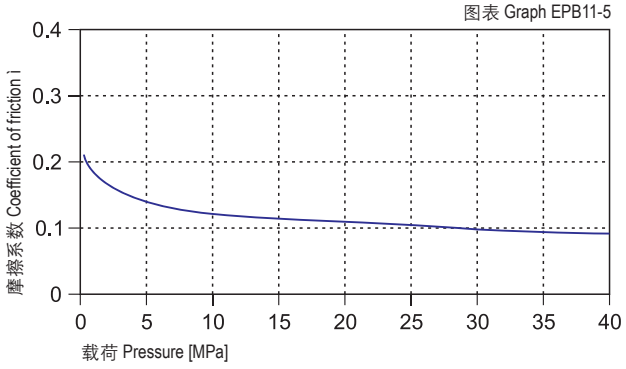
图表 Graph EPB11-6



■ 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 EPB11-5



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CSB-EPB11	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

图表EPB11-7和图表EPB11-8表明了CSB-EPB11轴承在不同轴材料上的运行结果；由此可以看出，硬铬钢轴最适合与CSB-EPB11轴承配合使用。图表EPB11-8表明CSB-EPB11轴承在载荷低于6Mpa时旋转运动比摆动运动更适合，而一旦载荷超过6Mpa则轴承的磨损性能摆动要略优越于旋转运动。

From the testing result to different materials shows in Graph EPB11-7 and Graph EPB11-8, it is found CSB-EPB11 is the best choice for hardened chrome steel shaft. Graph EPB11-8 tells that CSB-EPB11 is with better feature in rotation operation than in oscillation operation when the loading is lower than 6Mpa and the wearing feature of oscillation operation is better than of rotation operation when loading is higher than 6Mpa.

化学抗性 Chemical Resistance

CSB-EPB11塑料轴承能抵抗弱酸、弱碱以及各类润滑油的腐蚀。

CSB-EPB11 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-EPB11塑料轴承的吸水率小于0.1%，浸泡水中最大平衡吸水率小于0.1%；由于此吸水率的特性，此轴承可以应用于一般潮湿环境甚至水下。

The water absorb rate of CSB-EPB11 is less than 0.1% under the atmospheric pressure while it is less than 0.1% when the material is immerged into water. With its low water absorbability, the material is suitable for humid environment applications or even under water.

抗UV性能 UV Resistance

CSB-EPB11长久暴露在紫外线下材料性能逐渐下降。

The material performance of CSB-EPB11 will be lowered if it is exposed in the UV ray for long period.

安装公差 Installation Tolerances

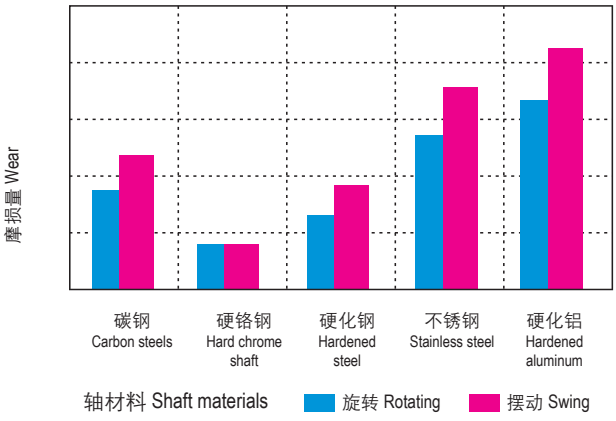
CSB-EPB11塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB11 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

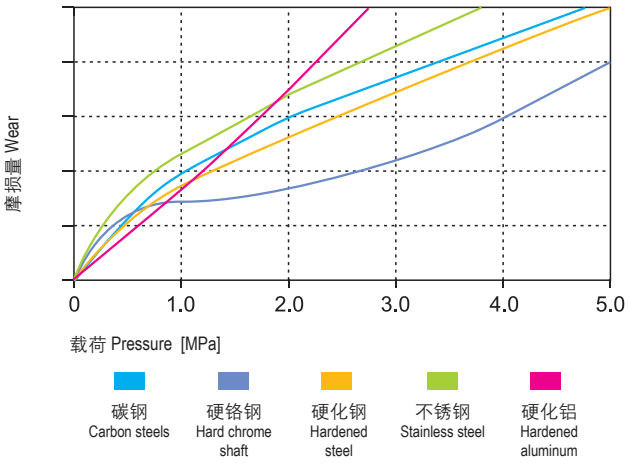
图表 Graph EPB11-7



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 EPB11-8



CSB-EPB™ EPB11
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◉ 标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 高载荷下摇摆运动出色的耐磨材料。高负荷下的低成本解决方案
- 连续使用温度：-40℃/+130℃
- 承受较高载荷
- 适合用于摆动场合
- 抗冲击性能较好
- 抗污垢能力强

- Good wear resistance material suitable for high load and oscilation motions. It is an economic solution for high load applications
- Continuous working temperature: -40℃/+130℃
- Suitable for high load operation
- Good for oscillating operation
- Good impact resistance
- Comtainment prevention ability

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB12
密度 Density	ISO1183	g/cm^3	1.40
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.20
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.6
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	5.0
抗拉强度 Tensile strength	ISO527	MPa	115
抗压强度 (轴向) Compressive strength (Axial)		MPa	95
弹性模量 E-module	ISO527	MPa	4300
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	100
邵氏硬度 Shore hardness	ISO 868	D	83
连续工作温度 Continuous work temperature		℃	-40/+130
短时运行温度 Short-time work temperature		℃	-40/+170
导热性 Thermal conductivity	ASTME1461	$W/m \times k$	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	5
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.9
最大吸水率23℃ Max. water absorption, 23℃		%	4.9
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ωcm	$>10^{15}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{12}$

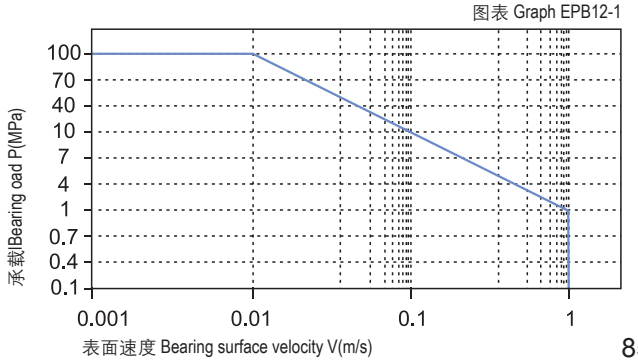
轴承PV值 PV Value

CSB-EPB12塑料轴承最大运行PV值为$0.6N/mm^2 \times m/s$；由此决定轴承所承受的载荷与速度成反比，详细查阅图表EPB12-1。

The max PV value of the CSB-EPB12 plastic bearings is $0.6N/mm^2 \times m/s$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPB12-1).

■ PV图表 Permissible PV value for CSB-EPB12

图表 Graph EPB12-1



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

CSB-EPB12塑料轴承可承受最大静载荷为100Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB12-2，轴承实际工作载荷略小于100Mpa，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：130℃) 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EPB12-3。

CSB-EPB12 allows the Max static load of 100Mpa, The max compressive deformation rate under the max load is listed in Graph EPB12-2, The actual load capacity of bearing is slightly less than 100Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 130℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB12-3 for such variation.

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

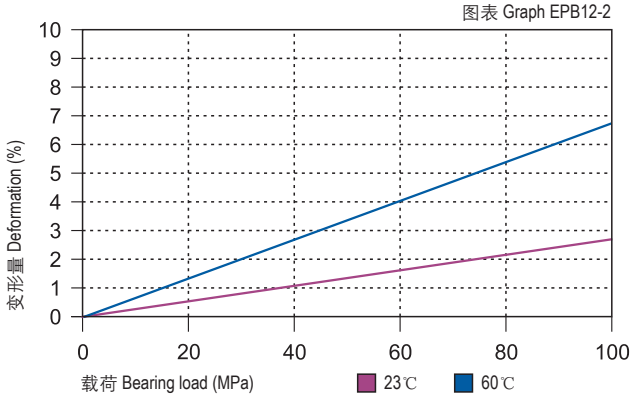
摩擦系数 Friction Factor

图表EPB12-4表明CSB-EPB12轴承的摩擦系数在载荷保持不变的情况下受速度变化影响比较小；同样在图表EPB12-5表明CSB-EPB12轴承在速度保持不变的情况下受载荷变化的影响相对也比较小；此轴承为所有滑动轴承中摩擦系数不受运行速度以及载荷影响较大的典型轴承。根据图表EPB12-6显示CSB-EPB12轴承的摩擦系数在超过Ra0.4后轴表面粗糙度几乎对轴承的摩擦系数没有任何影响，我们推荐使用轴表面粗糙度为Ra0.1 ~ 0.4um。

Graph EPB12-4 shows that the friction factor of CSB-EPB12 is not considerably affected by the operation speed when the loading is stable. At the meantime, Graph EPB12-5 shows that the friction factor of CSB-EPB12 is not considerably affected by the loading when the operation speed is stable. This bearing is the only typical material whose friction factor is not sensitive to the operation speed and loading. Graph EPB12-6 tells that the fiction factor of CSB-EPB12 will not be affected by the shaft roughness when the shaft roughness is better than Ra0.4. The recommended Shaft roughness is Ra0.1~0.4.

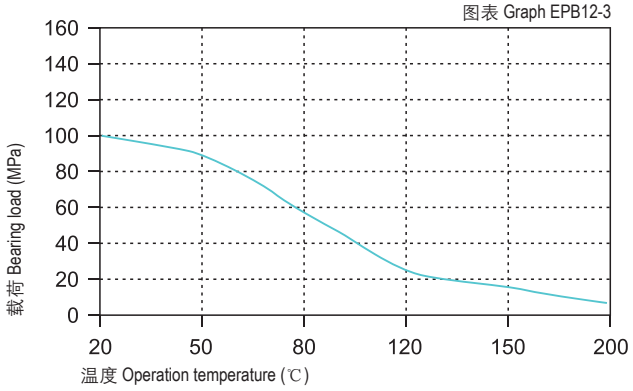
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB12-2



■ 载荷-温度图表 Load-Temperature diagrams

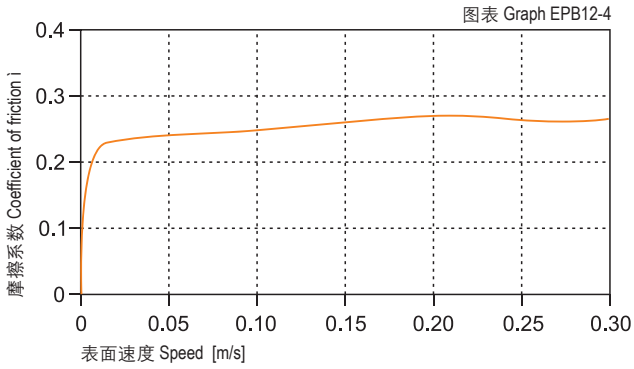
图表 Graph EPB12-3



■ 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

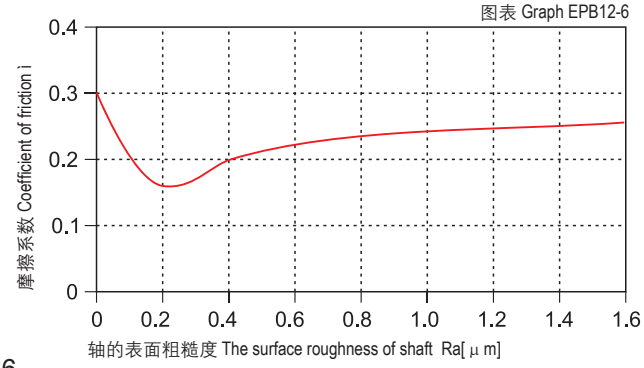
图表 Graph EPB12-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

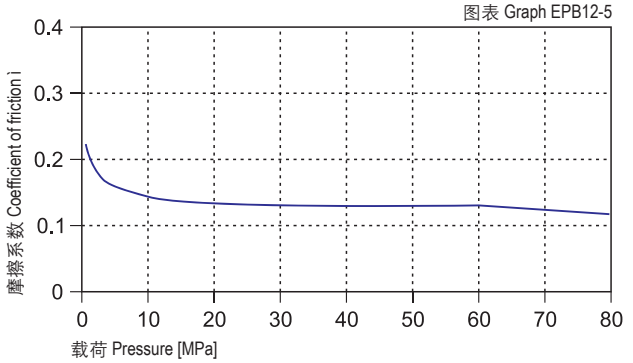
图表 Graph EPB12-6



■ 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 EPB12-5



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CSB-EPB12	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB12-7与图表EPB12-8表明CSB-EPB16轴承比较适合采用硬铬钢轴或硬化钢轴；图表EPB12-7表明CSB-EPB12轴承在做摆动运动下的磨损性能要优越于在旋转运动下的磨损性能。图表EPB12-8表明CSB-EPB12在摆动运动时选择硬铬钢轴和硬化钢轴比较适合，在旋转运动中也是选择硬铬钢轴和硬化钢轴比较理想。

Graph EPB12-7 and Graph EPB12-8 tells that CSB-EPB16 is suitable for both hard chrome steel shaft and hardened steel shaft. Graph EPB12-8 shows that the wearing feature of CSB-EPB16 is better in oscillation operation than in rotation operation. Hardened chrome steel shaft and hardened steel shaft is the better choice under oscillation operation and hardened steel shaft and hardened chrome steel shaft is the better choice under rotation operation.

化学抗性 Chemical Resistance

CSB-EPB12塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。

CSB-EPB12 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-EPB12塑料轴承的吸水率为0.9%，浸泡水中最大平衡吸水率为4.9%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB12 is 0.9% under the atmospheric pressure while it is 4.9% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB12长久暴露在紫外线下长久后材料可能会变脆，不能承受冲击力。

CSB-EPB12 can become brittle and lost its impact resistance when it is exposed into UV ray for a certain period of time.

安装公差 Installation Tolerances

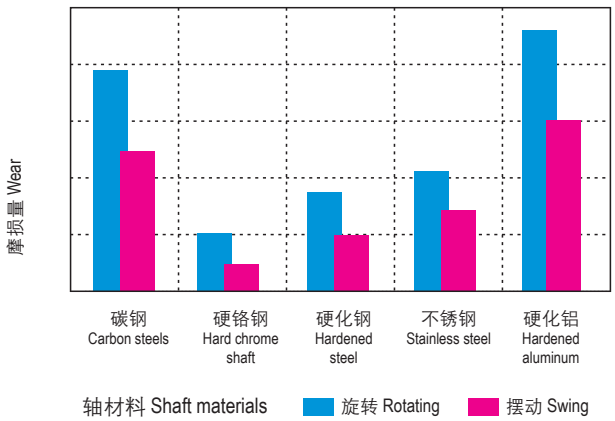
CSB-EPB12塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB12 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

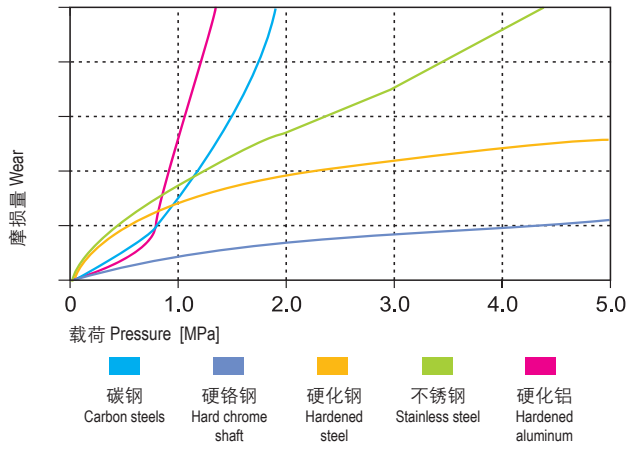
图表 Graph EPB12-7



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

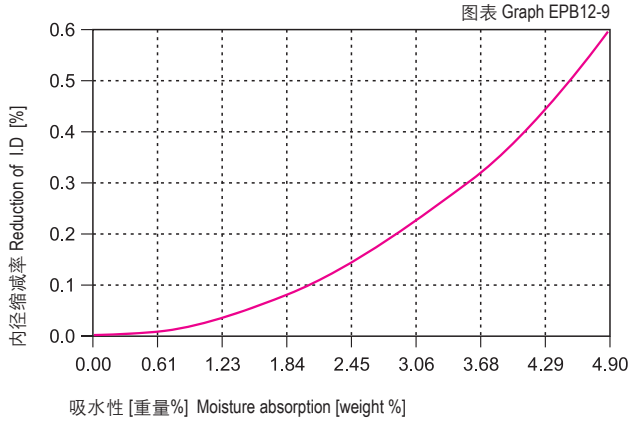
图表 Graph EPB12-8



吸水性的影响

Effect of moisture absorption on EPB12 bearings

图表 Graph EPB12-9



◉ 标准产品规格表 Standard specifications: P140

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings　EPB13

◉ 标准产品规格表 Standard specifications: P136

产品特性 Product Features

- 低摩擦系数和高耐磨性完美结合。旋转、直线和摆动应用中耐磨性和摩擦系数几乎保持一致。对轴材料硬度要求较低。不适合极高载荷。
- 连续使用温度：-50℃/+90℃
- 适合干运行、免维护
- 不同轴材料磨损很小
- 较低的摩擦系数
- 适用于软轴
- 吸水性较低
- Low friction and high wear resistance. It could maintain a good stable wear resistance and friction factor for the rotation, linear and oscilation movement. It has no critical hardness requirement to the shaft
- Continuous working temperature: -50℃/+90℃
- Maintenance-free dry operation
- Small wear off amount against various shaft materials
- Lower friction
- Suitable for soft shaft
- Low water absorption

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB13
密度 Density	ISO1183	g/cm^3	1.48
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	1.5
最大摇摆速度值 Max. oscillating velocity		m/s	1.1
最大直线速度值 Max. linear velocity		m/s	8.0
抗拉强度 Tensile strength	ISO527	MPa	75
抗压强度 (轴向) Compressive strength (Axial)		MPa	60
弹性模量 E-module	ISO527	MPa	2400
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	74
连续工作温度 Continuous work temperature		℃	-50/+90
短时运行温度 Short-time work temperature		℃	-50/+120
导热性 Thermal conductivity	ASTME1461	W / m × k	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	9
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	$>10^{13}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{12}$

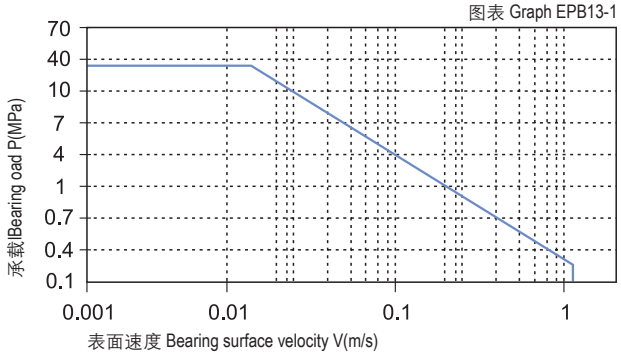
轴承PV值 PV Value

CSB-EPB13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EPB13-1。

The max PV value of the CSB-EPB13 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 EPB13-1).

■ PV图表 Permissible PV value for CSB-EPB13

图表 Graph EPB13-1



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

CSB-EPB13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EPB13-2，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：1.5m/s) 会导致摩擦温度上升，而温度上升 (Tmax: 90℃) 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EPB13-3。

CSB-EPB13 allows the Max static load of 35Mpa, The max compressive deformation rate under the max load is listed in Graph EPB13-2, The actual load capacity of bearing is slightly less than 35Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.5m/s) results into higher temperature (Tmax: 90℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB13-3 for such variation.

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

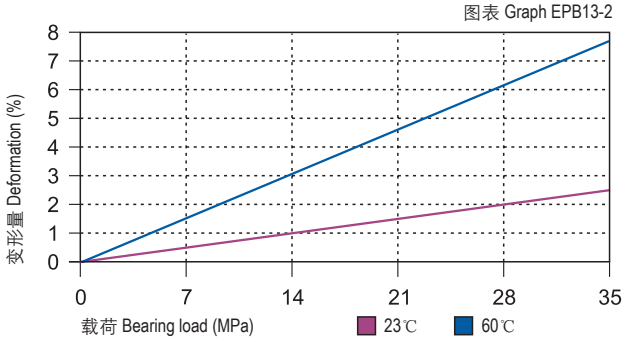
摩擦系数 Friction Factor

图表EPB13-4表明CSB-EPB13轴承摩擦系数在载荷一定随着运动速度的变化率比较小；图表EPB13-5在运动速度一定摩擦系数在载荷小于10Mpa时变化率较大，而在载荷大于10Mpa是变化率也逐渐减小；图表EPB13-6表明CSB-EPB13轴材料的粗糙度越大摩擦系数也随之越大，但当粗糙度大于Ra0.5时摩擦系数也趋于平稳；此轴承适合用于轴粗糙度为Ra=0.1 ~ 0.4um;

CSB-EPB13 Bearing friction factor varies only little amount along with the operation speed changing (See Graph EPB13-4). When the operation speed is relatively stable, the friction factor varies a lot while the load is less than 10Mpa (see Graph EPB13-5). At the same time, it does not vary much when the loading is greater than 10Mpa. Rough surface may result into the increasing of friction factor of the CSB-EPB13 material but when the roughness of the surface is greater than Ra0.5, the friction factor will remain relatively stable again. The recommended shaft surface roughness is Ra0.1~Ra0.4 for the CSB-EPB13 material.

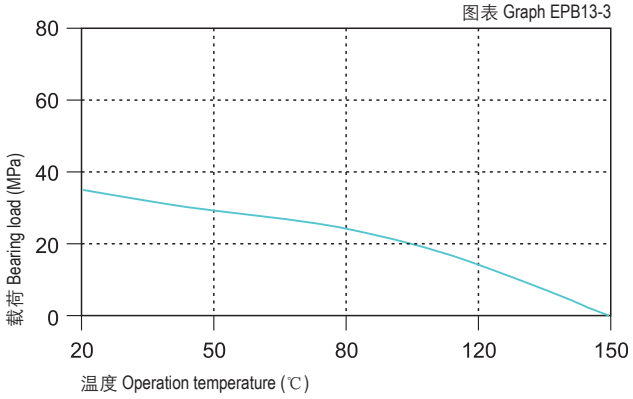
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB13-2



■ 载荷-温度图表 Load-Temperature diagrams

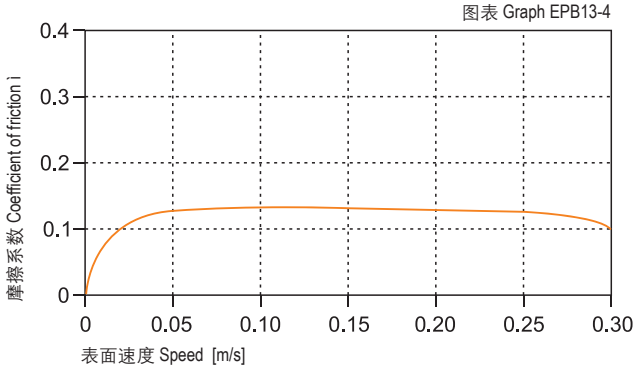
图表 Graph EPB13-3



■ 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

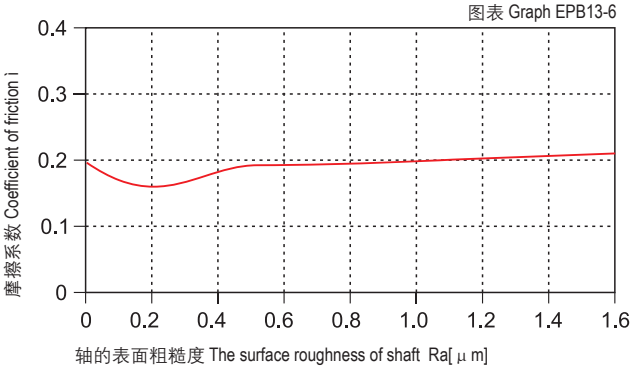
图表 Graph EPB13-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

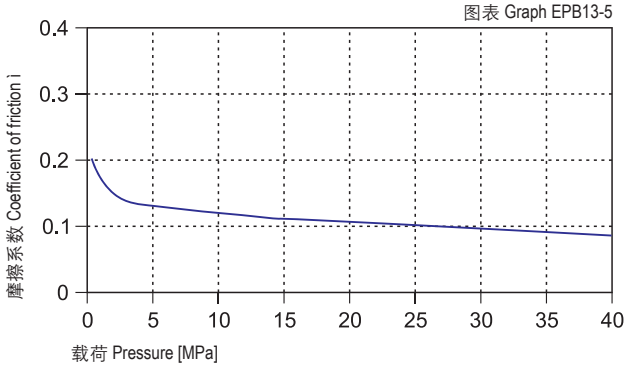
图表 Graph EPB13-6



■ 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 EPB13-5



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CSB-EPB13	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

图表EPB13-7是CSB-EPB13轴承在不同轴上运行磨损测试结果；图表EPB13-8表明当CSB-EPB13在载荷低于2Mpa下运行时适合不同的轴材料，但在硬铬轴上的摩擦磨损最小；当载荷继续增大时，此轴承在不锈钢轴的耐磨性能尤为特出。图表EPB13-8表明CSB-EPB13轴承比较适合用于旋转运动，但无论是在旋转运动还是摆动运动此轴承在硬铬轴上的运用效果是最好的。

Test of the bearing against various shaft materials shows that the material CSB-EPB13 features the best performance where the shaft material is hard chrome steel with loading less than 2Mpa. (See Graph EPB13-7). Therefore, the higher the load is increased, the wear-resistance of the bearing will be better against the stainless steel shaft. Refer to Graph EPB13-8, the material CSB-EPB13 is suitable for rotation operation. Ether to be used under rotation operation or the oscillation operation, it is the best suitable material for the application against hard chrome steel shaft.

化学抗性 Chemical Resistance

CSB-EPB13塑料轴承能抵抗弱碱、弱酸以及各类润滑油的腐蚀。

CSB-EPB13 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-EPB13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-EPB13 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-EPB13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-EPB13 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

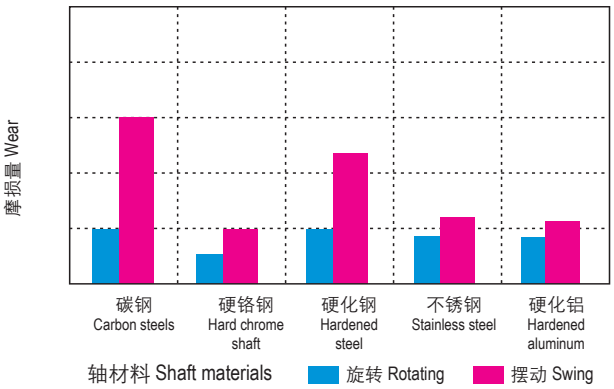
CSB-EPB13塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB13 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

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

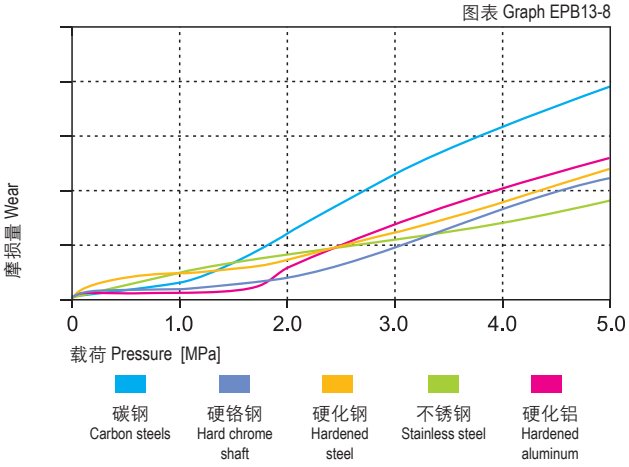
图表 Graph EPB13-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

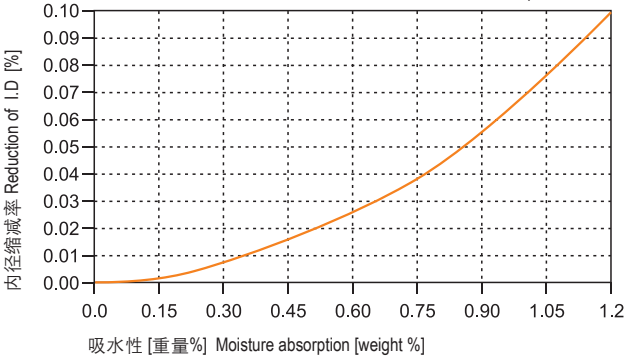
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB13-8



吸水性的影响 Effect of moisture absorption on EPB13 bearings

图表 Graph EPB13-9



直径 Di. [mm]	CSB-EPB13 E10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>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

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◉ 标准产品规格表 Standard specifications: P153

产品特性 Product Features

- 高速低成本解决方案。耐温260度下几乎能抵抗所有的化学液体腐蚀。不适合极高载荷。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℃
- 适合干运行、免维护
- 低摩擦系数要求
- 适合轻载高速运动
- 高化学抗性
- 适合在液体运行
- Econimic solution for high speed application. Under the temperature of 260℃, the material can still have good chemical resistance feature. It is not suitable for high load application. When the temperature is higher than 135℃, additional location ring is neccessary
- Continuous working temperature: -200℃/+260℃
- Maintenance-free dry operation
- Low friction requirement
- High surface speed under low load
- High chemical resistance
- Suitable for working in liquid

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB14
密度 Density	ISO1183	g/cm^3	2.13
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.08-0.18
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.3
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	1.4
最大直线速度值 Max. linear velocity		m/s	5
抗拉强度 Tensile strength	ISO527	MPa	13
抗压强度 (轴向) Compressive strength (Axial)		MPa	8
弹性模量 E-module	ISO527	MPa	790
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	8
邵氏硬度 Shore hardness	ISO 868	D	65
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	$K^{-1} \times 10^{-5}$	12
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	$>10^4$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^3$

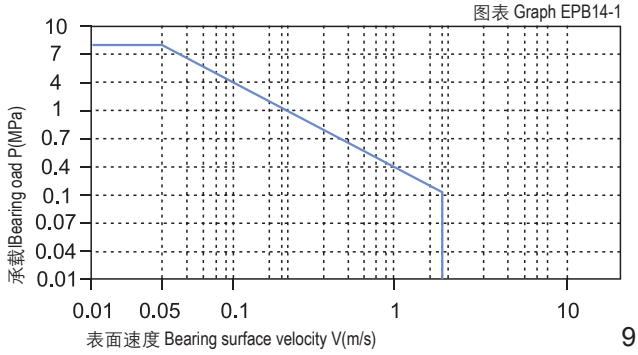
轴承PV值 PV Value

CSB-EPB14塑料轴承最大运行PV值为0.3N/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EPB14-1。

The max PV value of the CSB-EPB14 plastic bearings is 0.3N/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 EPB14-1).

PV图表 Permissible PV value for CSB-EPB14

图表 Graph EPB14-1



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

CSB-EPB14塑料轴承可承受最大静载荷为8Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB14-2，轴承实际工作载荷略小于8Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：2.0m/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EPB14-3。

CSB-EPB14 allows the Max static load of 8Mpa, The max compressive deformation rate under the max load is listed in Graph EPB14-2, The actual load capacity of bearing is slightly less than 8Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 2.0m/s) results into higher temperature (Tmax: 260℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB14-3 for such variation.

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

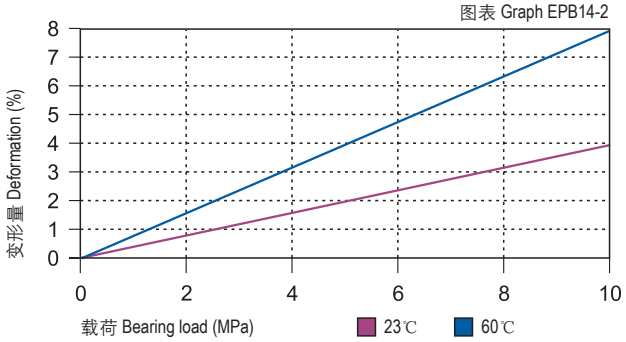
摩擦系数 Friction Factor

通常情况下，塑料轴承随着速度的增加，它的耐磨性能和摩擦系数都会下降，但CSB-EPB14轴承由于高速产生的变化影响相对较小（见图EPB14-4与图EPB14-5）；根据图EPB14-6显示CSB-EPB14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。

The coefficient of friction decreases like the wear resistance with increasing surface speed. In contrast, a higher surface speed has less impact on the coefficient of friction of CSB-EPB14 bearing (Graph EPB14-4 and EPB14-5). From the figure EPB14-6, we could see that the friction factor is variable against the changing of shaft roughness. The recommended shaft roughness is Ra0.2~0.5um.

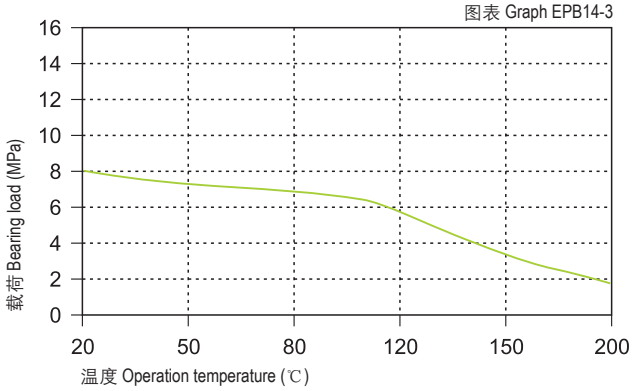
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB14-2



■ 载荷-温度图表 Load-Temperature diagrams

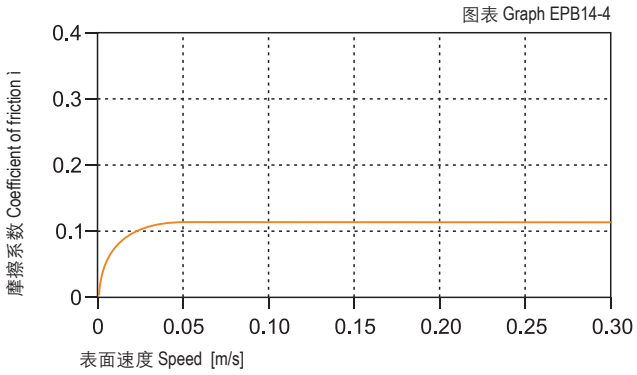
图表 Graph EPB14-3



■ 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

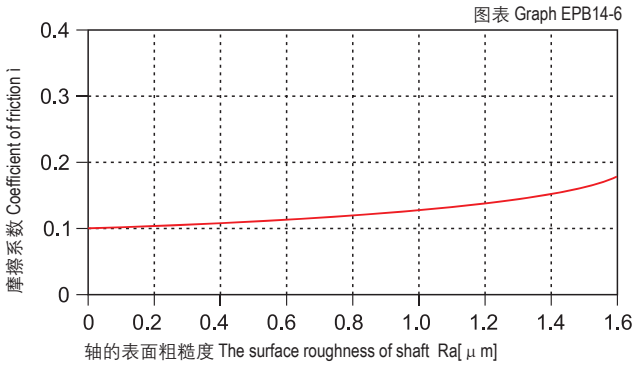
图表 Graph EPB14-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

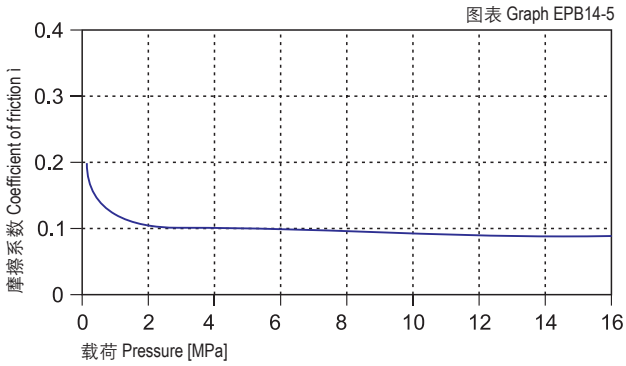
图表 Graph EPB14-6



■ 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 EPB14-5



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CSB-EPB14	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

轴材料对轴承的磨损有很大影响，但CSB-EPB14轴承适合几乎所有的轴材料；通过图EPB14-7可以看出当使用硬铬钢轴或硬化钢轴时CSB-EPB14轴承的磨损特性都非常出色。图EPB14-7显示CSB-EPB14轴承更适合用于旋转运动场合。

The shaft material is an important media for the bearing wearing but CSB-EPB14 is suitable for almost all kinds of shaft materials. Graph EPB14-7 shows that the wearing feature of CSB-EPB14 is excellent when the shaft material are hardened chrome steel or hardened steel. Graph EPB14-7 shows that the material CSB-EPB14 is most suitable for the rotation operation.

化学抗性 Chemical Resistance

CSB-EPB14塑料轴承具有极好的化学抗性，能抵抗浓度65%的强酸。

Chemical Resistance of CSB-EPB14 is very good. It can work well in the heavy acid of 65%.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB14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，适合用于潮湿环境和水下。

The water absorb rate of CSB-EPB14 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-EPB14长久暴露在紫外线下材料性能不会发生变化。

CSB-EPB14 can maintain its performance to be stable even exposed in the UV ray for long period.

安装公差 Installation Tolerances

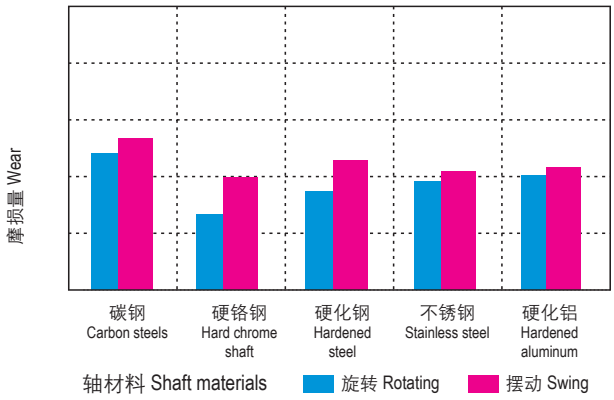
CSB-EPB14塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB14 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

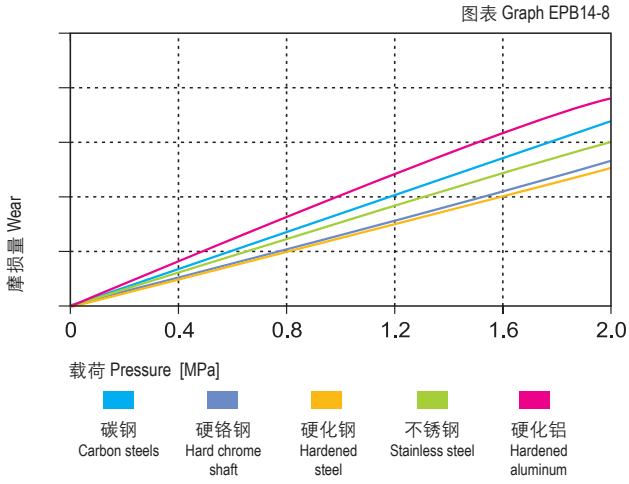
图表 Graph EPB14-7



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 EPB14-8



◉ 标准产品规格表 Standard specifications: P153

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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	$W/m \times k$	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	Ωcm	$>10^{15}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$

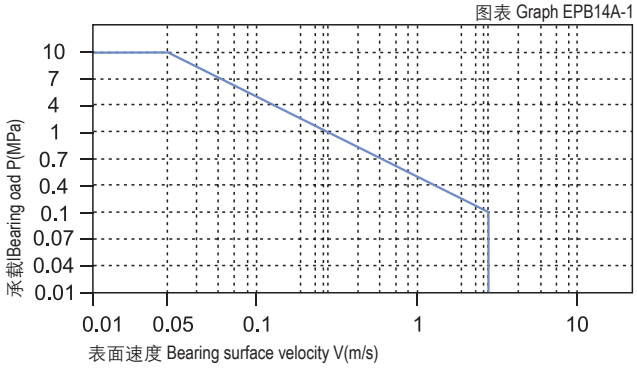
轴承PV值 PV Value

CSB-EPB14A塑料轴承最大运行PV值为$0.4N/mm^2 \times m/s$；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 $0.4N/mm^2 \times m/s$ 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

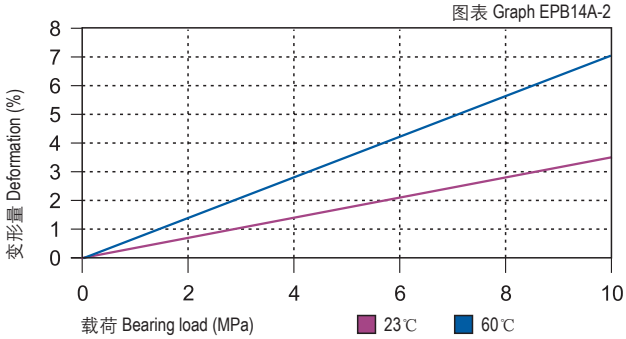
摩擦系数 Friction Factor

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.

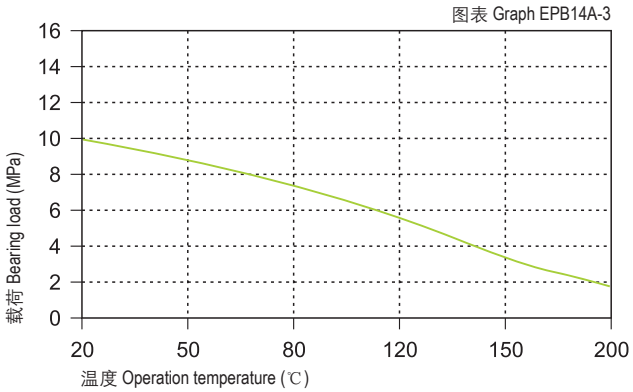
载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB14A-2



载荷-温度图表 Load-Temperature diagrams

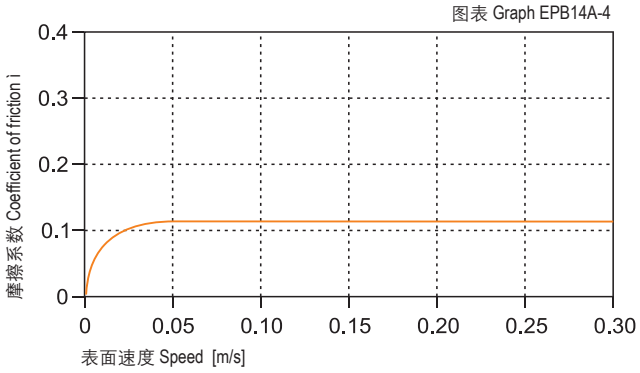
图表 Graph EPB14A-3



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

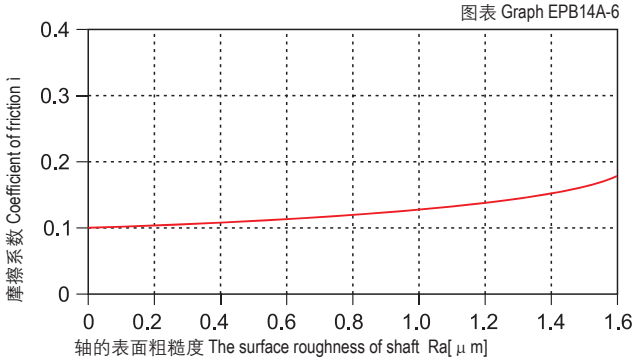
图表 Graph EPB14A-4



摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

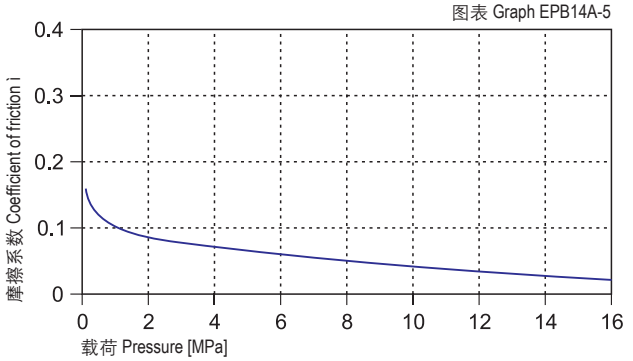
图表 Graph EPB14A-6



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

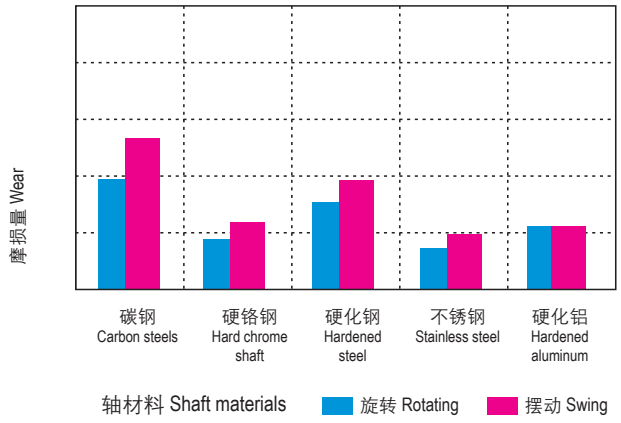
CSB-EPB14A塑料轴承压装后公差 Tolerances after pressfit

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

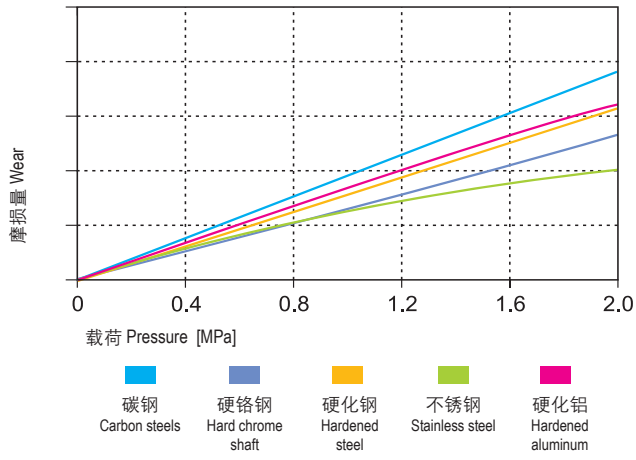
图表 Graph EPB14A-7



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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标准产品规格表 Standard specifications: P150

产品特性 Product Features

- 极好的耐磨性材料。对轴材料和粗糙度要求较低。在粉尘恶劣环境中同样保持良好的耐磨性能
- 连续使用温度：-40℃/+100℃
- 适合干运行、免维护
- 不同轴材料磨损很小
- 较低的摩擦系数
- 适用于软轴
- 吸水性较低
- Good wear resistance and with low hardness and roughness requirement for the shaft material. The wear resistance of the material will not be weekend even under the dust environment
- Continuous working temperature: -40℃/+100℃
- Maintenance-free dry operation
- Small wear off amount against various shaft materials
- Lower friction
- Low water absorption

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB15
密度 Density	ISO1183	g/cm^3	1.35
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)		$N/mm^2 \times m/s$	0.9
最大旋转速度值 Max. roatating velocity		m/s	1.5
最大摇摆速度值 Max. oscillating velocity		m/s	1.1
最大直线速度值 Max. linear velocity		m/s	8.0
抗拉强度 Tensile strength	ISO527	MPa	130
抗压强度 (轴向) Compressive strength (Axial)		MPa	70
弹性模量 E-module	ISO527	MPa	4000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	70
邵氏硬度 Shore hardness	ISO 868	D	77
连续工作温度 Continuous work temperature		℃	-40/+100
短时运行温度 Short-time work temperature		℃	-40/+180
导热性 Thermal conductivity	ASTME1461	W / m × k	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	7
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	1.3
最大吸水率23℃ Max. water absorption, 23℃		%	6.5
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{15}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{12}$

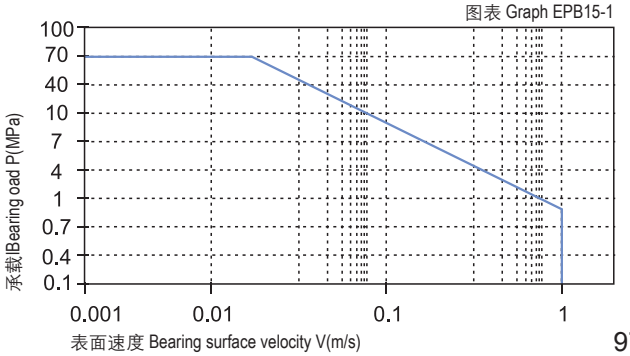
轴承PV值 PV Value

CSB-EPB15塑料轴承最大运行PV值为0.9N/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EPB15-1。

The max PV value of the CSB-EPB15 plastic bearings is 0.9N/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 EPB15-1).

PV图表 Permissible PV value for CSB-EPB15

图表 Graph EPB15-1



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

CSB-EPB15塑料轴承可承受最大静载荷为70Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB15-2，轴承实际工作载荷略小于70Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：1.5m/s) 会导致摩擦温度上升，而温度上升 (Tmax: 100℃) 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EPB15-3。

CSB-EPB15 allows the Max static load of 70Mpa, The max compressive deformation rate under the max load is listed in Graph EPB15-2, The actual load capacity of bearing is slightly less than 70Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.5m/s) results into higher temperature (Tmax: 100℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB15-3 for such variation.

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

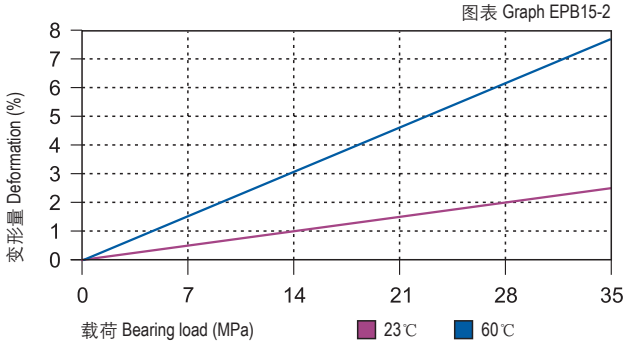
摩擦系数 Friction Factor

图表EPB15-4表明CSB-EPB15轴承的摩擦系数随着运动速度的变化影响较小，而图表EPB15-5表明CSB-EPB15轴承的摩擦系数随着载荷的增加明显减小，在载荷超过20Mpa是逐渐趋于平稳；图表EPB15-6表明CSB-EPB15轴承的摩擦系数受轴粗糙度的影响也相对比较小；虽然如此，我们还是建议轴的表面不能太光滑，也不能过于出差，推荐使用轴的粗糙度为Ra0.3 ~ 0.6um。

Graph EPB15-4 shows that the friction factor of CSB-EPB15 is not sensitive to the operation speed and Graph EPB15-5 shows that the friction factor is CSB-EPB15 is decreased along with the loading increasing and become stable when the loading is over 20Mpa. Graph EPB15-6 tells that the friction factor of CSB-EPB15 is also not sensitive to the shaft roughness but we still recommend the shaft roughness to be Ra0.3~0.6.

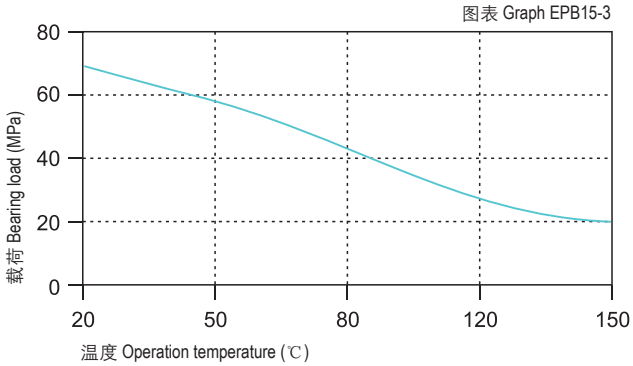
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB15-2



■ 载荷-温度图表 Load-Temperature diagrams

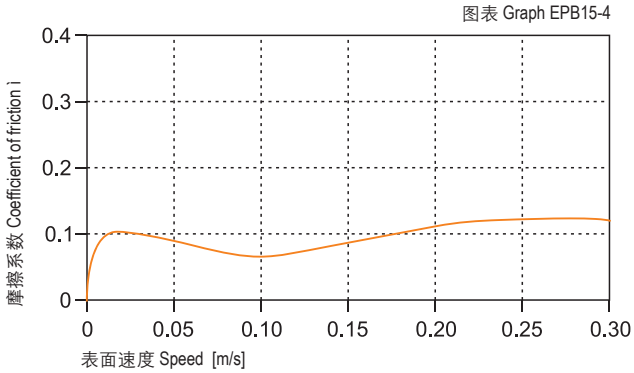
图表 Graph EPB15-3



■ 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

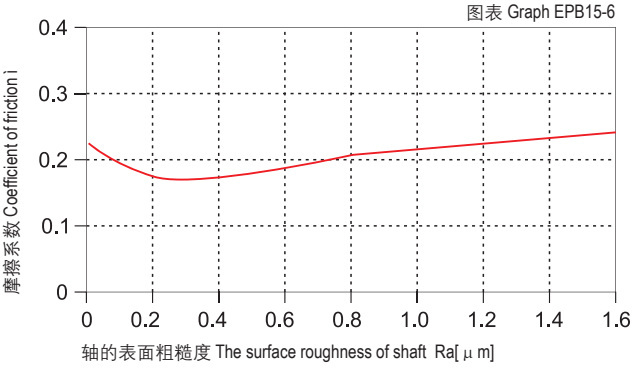
图表 Graph EPB15-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

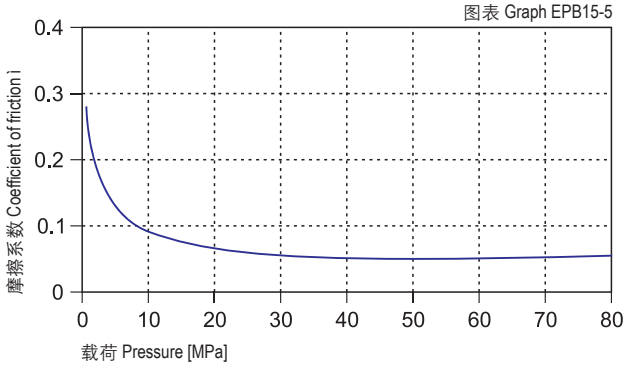
图表 Graph EPB15-6



■ 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 EPB15-5



CSB-EPB15	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

图表EPB15-7表明CSB-EPB15轴承在2Mpa下做旋转运动时，磨损随着轴材料的变化较大；通过实验表明CSB-EPB15轴承在做旋转运动时比较适合用于硬轴，高速钢轴和硬铬轴上用于CSB-EPB15能获得良好的运行效果。图表EPB15-8表明硬铬轴更适合用于高载荷下的CSB-EPB15轴承，随着载荷的不断增加，轴承的磨损速率却变化较小。

Graph EPB15-7 shows that the wearing of CSB-EPB15 is sensitive to different materials under rotation operation with the loading of 2Mpa. It is suitable for hardened shaft, high speed steel shaft and hardened chrome steel shaft in the rotation operation. Hardened chrome steel shaft is the best choice for CSB-EPB15 (Graph EPB15-8). The wearing will be decreased as long as the loading increasing.

化学抗性 Chemical Resistance

CSB-EPB15塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。

CSB-EPB15 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-EPB15塑料轴承的吸水率为1.3%，浸泡水中最大平衡吸水率为6.5%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB15 is 1.3% under the atmospheric pressure while it is 6.5% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB15长久暴露在紫外线下颜色基本不会改变。材料性能基本都不会发生改变。

CSB-EPB15 can maintain its color unchanged when it is exposed into the UV ray. The material performance stays stable.

安装公差 Installation Tolerances

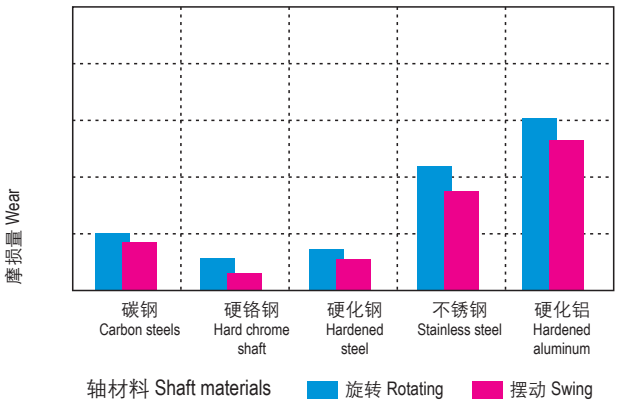
CSB-EPB15塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB15 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

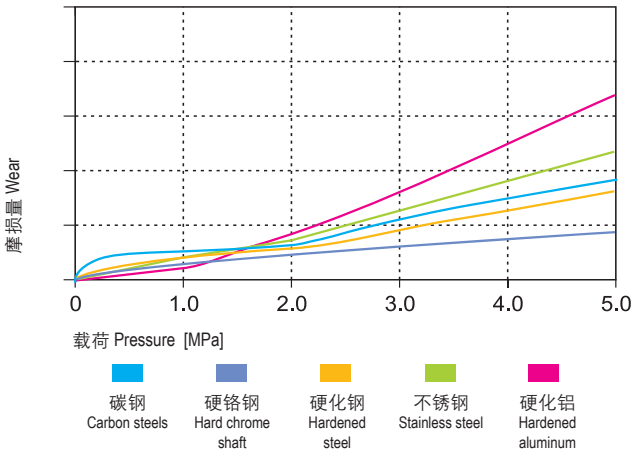
图表 Graph EPB15-7



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

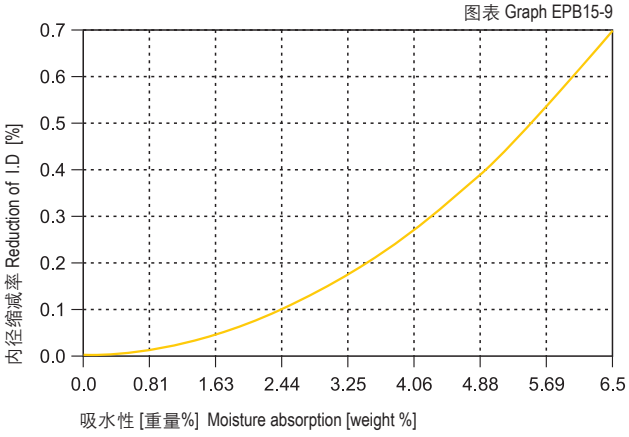
图表 Graph EPB15-8



吸水性的影响

Effect of moisture absorption on EPB15 bearings

图表 Graph EPB15-9



标准产品规格表 Standard specifications: P150

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB16

标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 高强度和低吸水率的耐磨材料。在潮湿环境中仍能保持良好的尺寸稳定性
- 连续使用温度：-40℃/+130℃
- 较高的载荷
- 适合干运行、免维护
- 吸水率较低
- 高载下性价比好

- Wear resistance material with high strength and low water absorbtion feature. The dimensions will be remain stable even in humidity environment
- Continuous working temperature: -40℃/+130℃
- Higher load capacity
- Maintenance-free dry operation
- Low water absorption
- Good performance cost ratio under high load

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法	单位 Unit	CSB-EPB16
密度 Density	ISO1183	g/cm^3	1.58
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.06-0.20
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	120
抗压强度 (轴向) Compressive strength (Axial)		MPa	65
弹性模量 E-module	ISO527	MPa	5300
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	50
邵氏硬度 Shore hardness	ISO 868	D	76
连续工作温度 Continuous work temperature		℃	-40/+130
短时运行温度 Short-time work temperature		℃	-40/+200
导热性 Thermal conductivity	ASTME1461	W / m × k	0.25
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	4
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2
最大吸水率23℃ Max. water absorption, 23℃		%	0.4
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{13}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{12}$

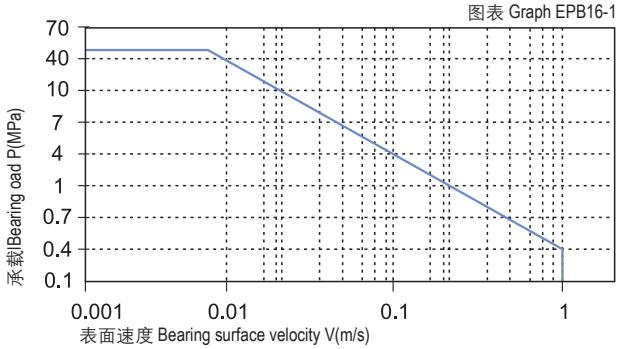
轴承PV值 PV Value

CSB-EPB16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EPB16-1。

The max PV value of the CSB-EPB16 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 EPB16-1).

PV图表 Permissible PV value for CSB-EPB16

图表 Graph EPB16-1



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

CSB-EPB16塑料轴承可承受最大静载荷为50Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB16-2，轴承实际工作载荷略小于50Mpa，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：130℃) 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EPB16-3。

CSB-EPB16 allows the Max static load of 50Mpa, The max compressive deformation rate under the max load is listed in Graph EPB16-2, The actual load capacity of bearing is slightly less than 50Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 130℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB16-3 for such variation.

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

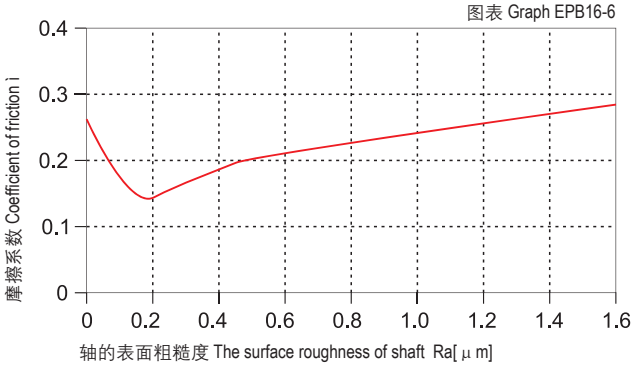
摩擦系数 Friction Factor

图表EPB16-4表明CSB-EPB16轴承和大多数滑动轴承一样在载荷保持不变的情况下摩擦系数会随着旋转速度的增加略有升高；图表EPB16-5表明CSB-EPB16轴承摩擦系数在速度保持不变的情况下随着载荷的增加而逐步降低；图表EPB16-6表明CSB-EPB16轴承最适合的轴表面粗糙度为Ra0.1 ~ 0.2um，轴过于光滑或者过于粗糙都会导致摩擦系数升高。

Graph EPB16-4 shows that as the same as most of the slide bearing materials, the friction factor of CSB-EPB16 is increasing along with the rotation speed under a certain loading while as shown in Graph EPB16-5, it is decreased along with the increasing of loading when the operation speed is stable. From Graph EPB16-6, it is found that the most suitable shaft roughness is Ra0.1 to Ra0.2. Smoother shaft or rougher shaft may result into friction factor increasing.

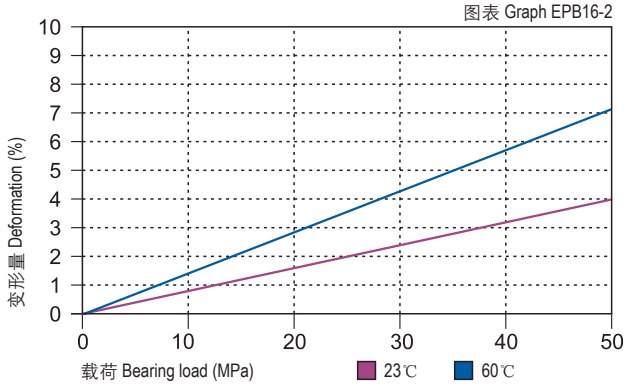
摩擦系数与轴表面粗糙度关系图表
Coefficient of friction & the surface roughness of shaft

图表 Graph EPB16-6



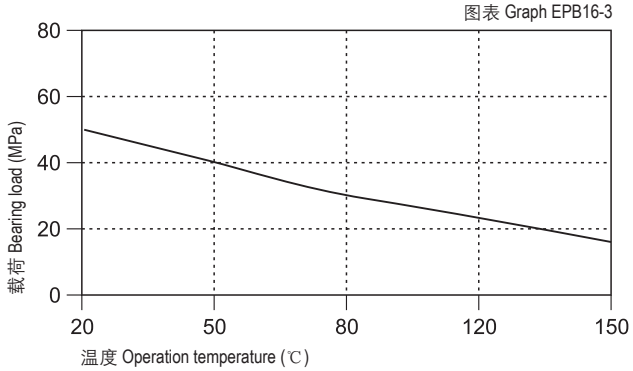
载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB16-2



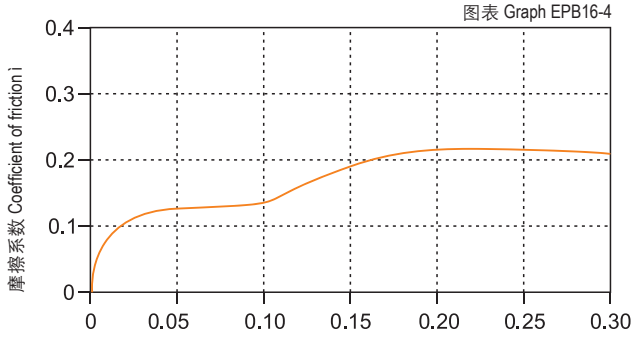
载荷-温度图表 Load-Temperature diagrams

图表 Graph EPB16-3



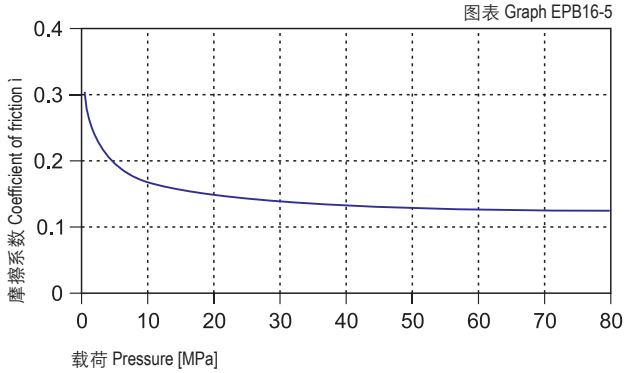
摩擦系数与速度变化关系图表 P=2MPa
Coefficient of friction & the speed of bearing, p = 2 MPa

图表 Graph EPB16-4



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 EPB16-5



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CSB-EPB16	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.06~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB16-7与图表EPB16-8都表明CSB-EPB16轴承的磨损受轴材料影响比较大，硬化钢轴和碳钢轴比较适合此轴承。图表EPB16-8表明CSB-EPB16在摆动运动时选择硬铬钢轴和硬化钢轴比较适合，而在旋转运动中则选择碳钢轴和硬化钢轴表交理想。

Graph EPB16-7 and Graph EPB16-8 shows the wearing is considerably affected by the shaft materials. Heat-treated steel shaft and carbon steel shaft is good for this bearing material. Graph EPB16-8 tells that CSB-EPB16 is suitable for hardened chrome steel and hardened steel shaft in oscillation operation and is suitable for carbon steel and hardened steel shaft in rotation operation.

化学抗性 Chemical Resistance

CSB-EPB16塑料轴承能抵抗部分弱酸以及各类润滑油的腐蚀。

CSB-EPB16 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-EPB16塑料轴承的吸水率为0.2%，浸泡水中最大平衡吸水率为0.4%；由于此吸水率的特性，此轴承可以应用于一般潮湿环境。

The water absorb rate of CSB-EPB16 is 0.2% under the atmospheric pressure while it is 0.4% 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-EPB16长久暴露在紫外线下颜色会发生褪变。材料性能会有所下降。

Disintegration could be possible for the material CSB-EPB16 after long period of exposing under the UV ray and therefore the performance of the material will be reduced.

安装公差 Installation Tolerances

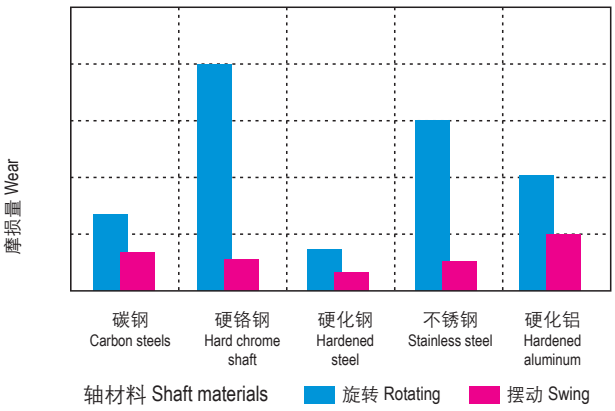
CSB-EPB16塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB16 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

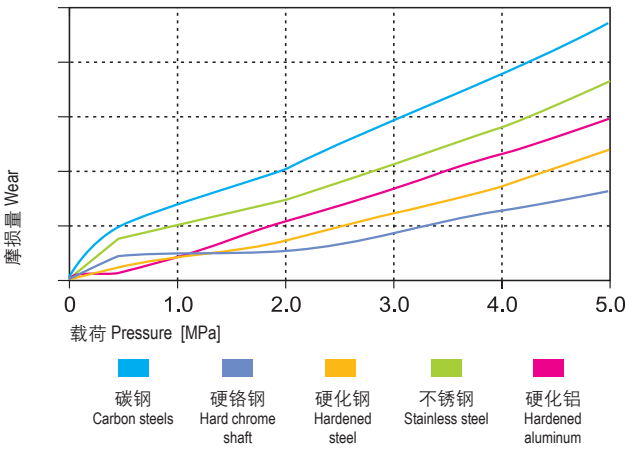
图表 Graph EPB16-7



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

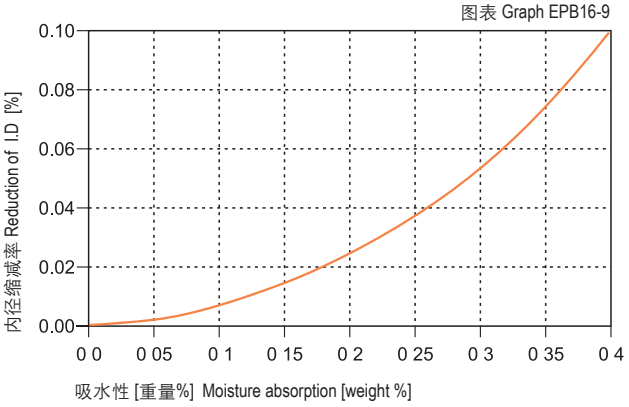
图表 Graph EPB16-8



吸水性的影响

Effect of moisture absorption on EPB16 bearings

图表 Graph EPB16-9



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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB17

◉ 标准产品规格表 Standard specifications: P153

产品特性 Product Features

- 特殊高速高温材料。适用于中等载荷下的高速运动。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
- 适用于硬轴
- 良好的化学抗性
- 高压密封要求

- High speed and high temperature special material . It is suitable for middle load and high speed applications. It has good 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
- Suitable for hard material shaft
- High chemical resistance
- High load seal requirement

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB17
密度 Density	ISO1183	g/cm^3	3.9
颜色 Color			深绿色Dark Green
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.15-0.30
最大P.V值 Max. PV (dry)		N/mm^2 × m/s	0.7
最大旋转速度值 Max. roatating velocity		m/s	3.0
最大摇摆速度值 Max. oscillating velocity		m/s	2.1
最大直线速度值 Max. linear velocity		m/s	5.0
抗拉强度 Tensile strength	ISO527	MPa	16
抗压强度 (轴向) Compressive strength (Axial)		MPa	20
弹性模量 E-module	ISO527	MPa	950
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	20
邵氏硬度 Shore hardness	ISO 868	D	68
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	0.45
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	K^{-1} × 10^{-5}	12
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^{12}
面电阻率 Surface resistivity	IEC60093	Ω	>10^{12}

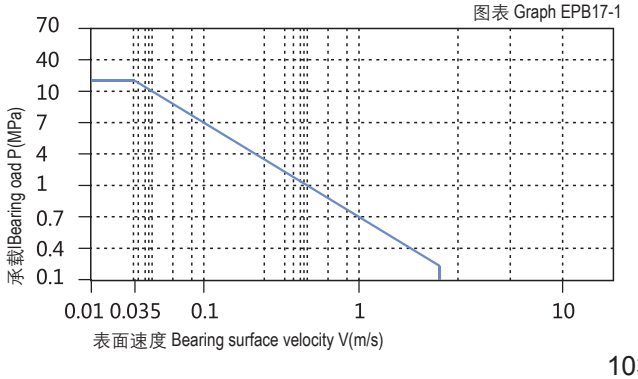
轴承PV值 PV Value

CSB-EPB17塑料轴承最大运行PV值为0.7N/mm^2 × 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EPB17-1。

The max PV value of the CSB-EPB17 plastic bearings is 0.7N/mm^2 × 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 EPB17-1).

■ PV图表 Permissible PV value for CSB-EPB17

图表 Graph EPB17-1



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

CSB-EPB17塑料轴承可承受最大静载荷为20Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB17-2，轴承实际工作载荷略小于20Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：3.0m/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EPB17-3。

CSB-EPB17 allows the Max static load of 20Mpa, The max compressive deformation rate under the max load is listed in Graph EPB17-2, The actual load capacity of bearing is slightly less than 20Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 3.0m/s) results into higher temperature (Tmax:260℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB17-3 for such variation.

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

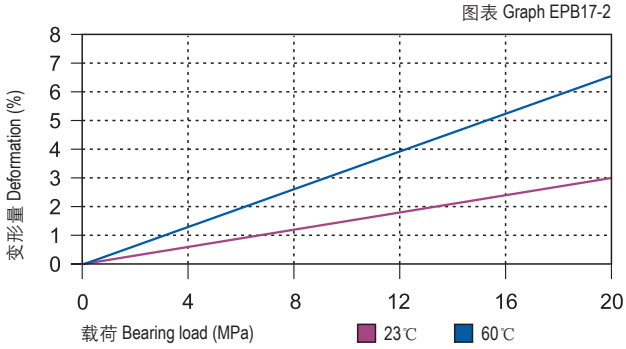
摩擦系数 Friction Factor

CSB-EPB17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EPB17-4与图EPB17-5）；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EPB17-6显示CSB-EPB17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-EPB17 bearings. A higher surface speed has less impact on the coefficient of friction of this bearing.(EPB17-4 and EPB17-5) CSB-EPB17 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 EPB17-6, we could see that the friction factor is variable against the changing of shaft roughness. The recommended shaft roughness is Ra0.3~0.5.

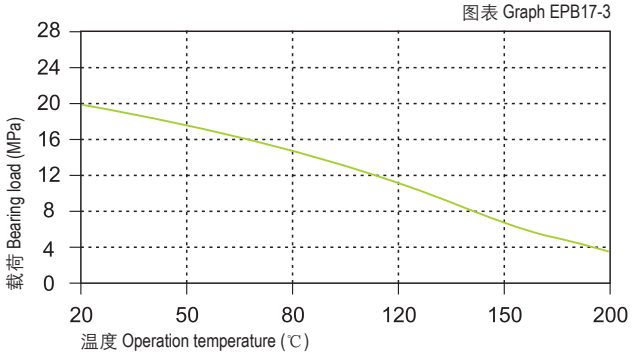
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB17-2



■ 载荷-温度图表 Load-Temperature diagrams

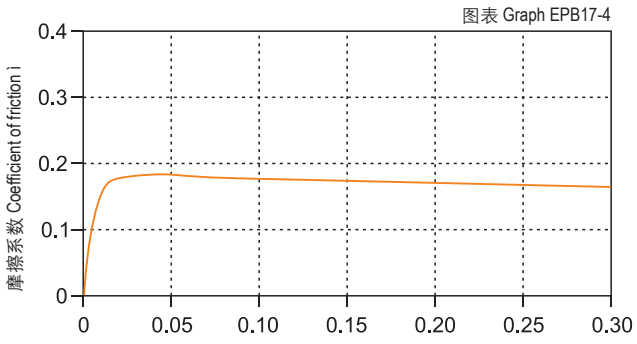
图表 Graph EPB17-3



■ 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

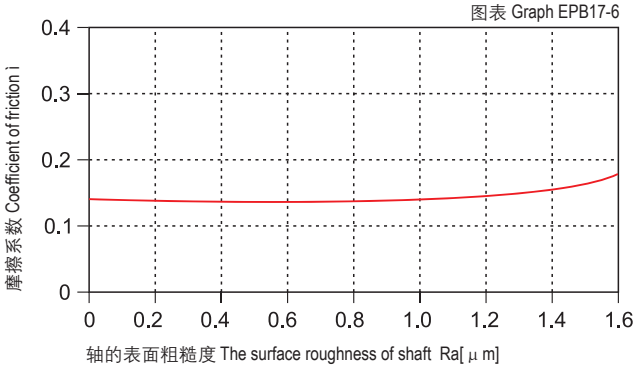
图表 Graph EPB17-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

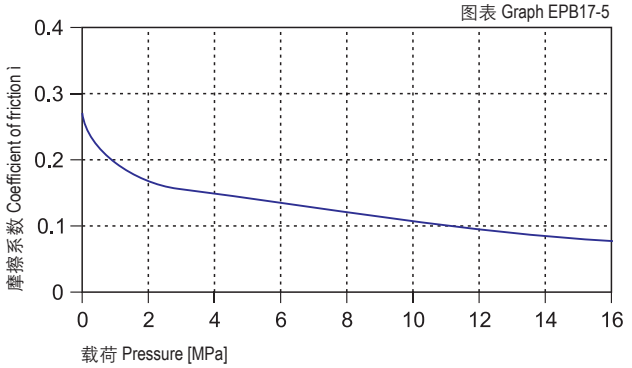
图表 Graph EPB17-6



■ 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 EPB17-5



CSB-EPB17	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.15~0.30	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

CSB-EPB17轴承适合几乎所有的轴材料；通过图EPB17-7可以看出当使用不锈钢轴或硬化铝轴以及硬铬轴等时CSB-EPB17轴承的磨损特性都非常出色。图EPB17-7显示CSB-EPB17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-EPB17也适合用于摆动和间隙性旋转运动场合。

CSB-EPB17 is suitable for almost all kinds of shaft materials. Graph EPB17-7 shows that the wearing feature of CSB-EPB17 is excellent when the shaft material are stainless steel、hardened Aluminum or hardened chrome steel. Graph EPB17-7 shows that the material CSB-EPB17 is most suitable for the rotation operation. Since start-up friction is extremely low, this makes CSB-EPB17 bearings the ideal choice for oscillating or start-stop applications.

化学抗性 Chemical Resistance

CSB-EPB17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-EPB17 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-EPB17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-EPB17 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-EPB17长久暴露在紫外线下材料性能不会发生变化。

CSB-EPB17 can maintain its performance to be stable even exposed in the UV ray for long period.

安装公差 Installation Tolerances

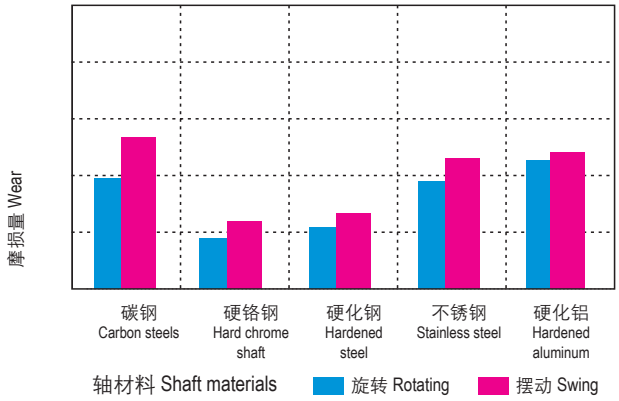
CSB-EPB17塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB17 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

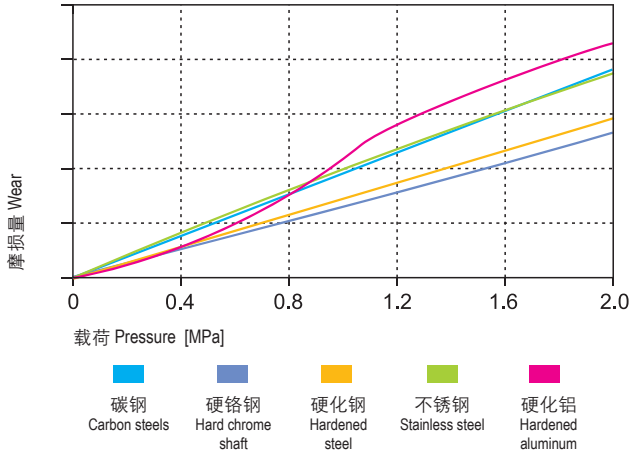
图表 Graph EPB17-7



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 EPB17-8



标准产品规格表 Standard specifications: P153

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB17A

标准产品规格表 Standard specifications: P153

产品特性 Product Features

- 高速低载荷解决方案。在低载荷下高速运动保持良好的耐磨性能。良好的化学抗性。可被用于260度的高温，但需要考虑额外限位装置。
- 连续使用温度：-200℃/+260℃
- 适合干运行、免维护
- 适合低载荷与高速运动
- 高化学抗性

- The application solution for high speed and middle to low load. The wear resistance will be stable under the aforementioned application condition and good chemical resistance. When the temperature is higher than 260℃, additional location ring is neccessary
- Continuous working temperature: -200℃/+260℃
- Maintenance-free dry operation
- High surface speed and middle load
- High chemical resistance

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB17A
密度 Density	ISO1183	g/cm^3	1.98
颜色 Color			黄色 Yellow
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.10-0.20
最大P.V值 Max. PV (dry)		N/mm^2 × m/s	0.3
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	1.4
最大直线速度值 Max. linear velocity		m/s	5.0
抗拉强度 Tensile strength	ISO527	MPa	12
抗压强度 (轴向) Compressive strength (Axial)		MPa	8
弹性模量 E-module	ISO527	MPa	800
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	5
邵氏硬度 Shore hardness	ISO 868	D	65
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} × 10^{-5}	10
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}

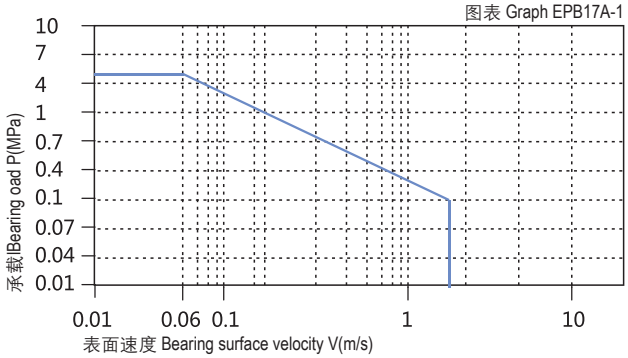
轴承PV值 PV Value

CSB-EPB17A塑料轴承最大运行PV值为0.3N/mm^2 × 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EPB17A-1。

The max PV value of the CSB-EPB17A plastic bearings is 0.3N/mm^2 × 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 EPB17A-1).

PV图表 Permissible PV value for CSB-EPB17A

图表 Graph EPB17A-1



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

CSB-EPB17A塑料轴承可承受最大静载荷为8Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB17A-2，轴承实际工作载荷略小于8Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：3.0m/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EPB17A-3。

CSB-EPB17A allows the Max static load of 8Mpa, The max compressive deformation rate under the max load is listed in Graph EPB17A-2, The actual load capacity of bearing is slightly less than 8Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 3.0m/s) results into higher temperature (Tmax: 260℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB17A-3 for such variation.

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

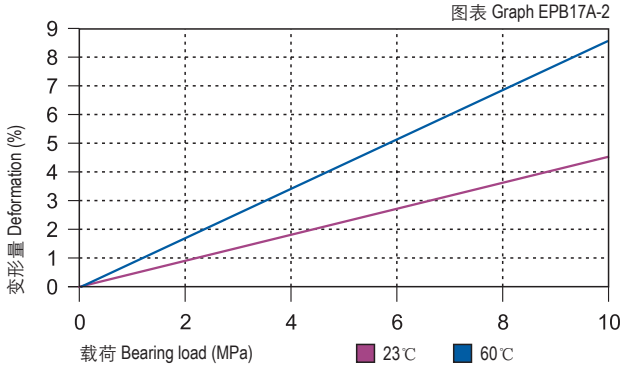
摩擦系数 Friction Factor

图EPB17A-4表明CSB-EPB17A轴承在载荷保持不变的情况下轴承的摩擦系数随着旋转速度的增加而先随之升高，当速度值达到0.25m/s后则又随着速度的增加而降低；图EPB17A-5表明CSB-EPB17A轴承的摩擦系数在旋转速度保持不变的情况下随着载荷的不断上升而快速降低。图EPB17A-6表明CSB-EPB17A轴承对磨轴的粗糙度在Ra0.4 ~ 0.6um时最适合的。

Graph EPB17A-4 shows that the friction factor of CSB-EPB17A is initially increased along with the operation speed increasing when the loading is stable but when the speed reaches over 0.25m/s, it is decreased along with the operation speed increasing. Graph EPB17A-5 shows that the friction factor of CSB-EPB17A is decreasing along with the loading increasing when the operation speed is stable. The best shaft roughness for this material is Ra0.4~0.6(Graph EPB17A-6).

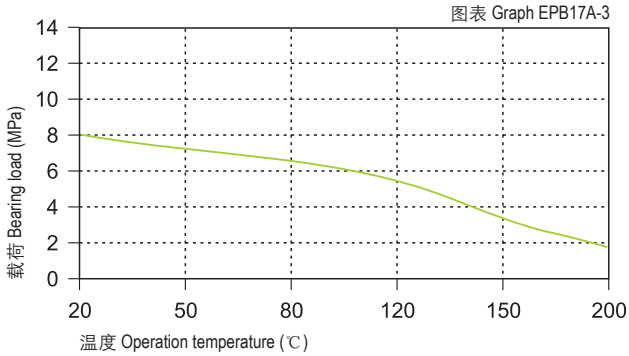
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB17A-2



■ 载荷-温度图表 Load-Temperature diagrams

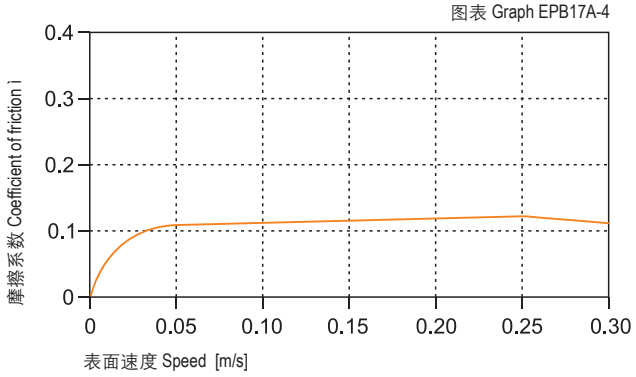
图表 Graph EPB17A-3



■ 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

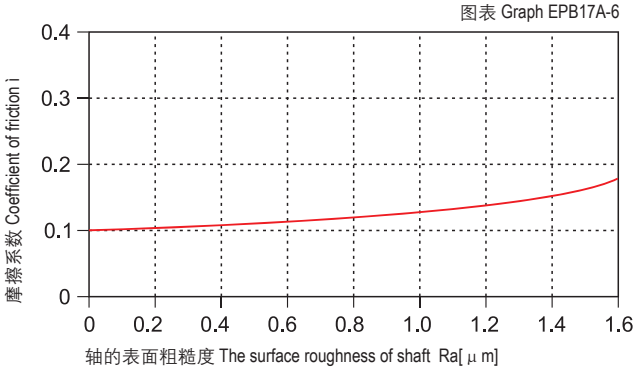
图表 Graph EPB17A-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

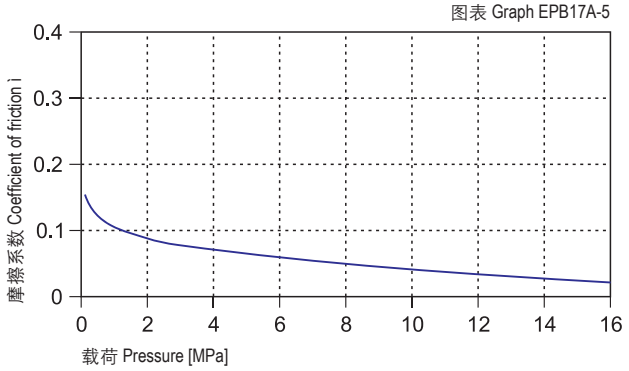
图表 Graph EPB17A-6



■ 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 EPB17A-5



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CSB-EPB17A	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.10~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图EPB17A-7表明CSB-EPB17A轴承在低载下的磨损速率和其它轴承类似，而在中高载荷时此轴承的耐磨性要比其它轴承都要好；同时我们可以看出硬铬轴和硬化钢以及不锈钢轴比较适合用于CSB-EPB17A轴承。图EPB17-7A表明CSB-EPB17A轴承在旋转要比摆动下的磨损好。

Graph EPB17A-7 shows that the wearing speed of CSB-EPB17A is similar with most of the other materials under lower loading but it will be much better when the loading is higher. It also tells that the hardened steel, hardened chrome steel or stainless steel shaft is good for CSB-EPB17A bearings. Graph EPB17A-7 shows the wearing rate is less in oscillation operation than in rotation operation.

化学抗性 Chemical Resistance

CSB-EPB17A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-EPB17A 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-EPB17A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-EPB17A 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-EPB17A长久暴露在紫外线下材料性能不会发生变化。

CSB-EPB17A can maintain its performance to be stable even exposed in the UV ray for long period.

安装公差 Installation Tolerances

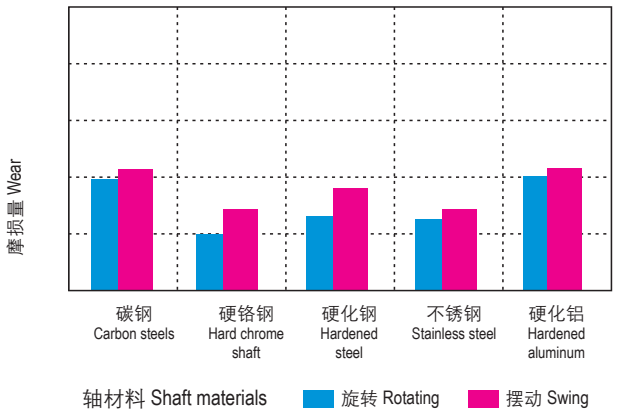
CSB-EPB17A塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB17A 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

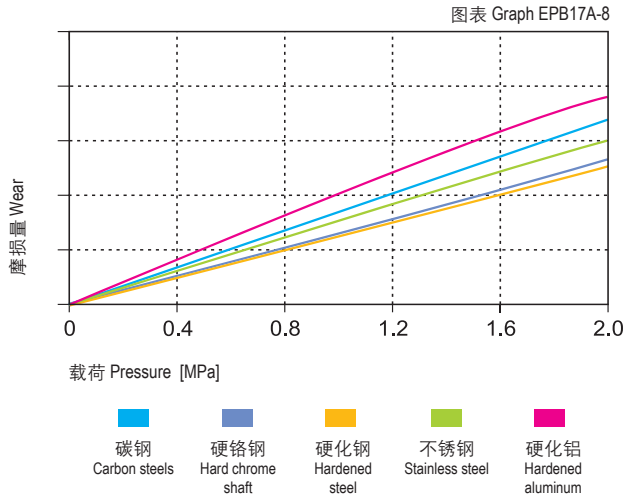
图表 Graph EPB17A-7



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 EPB17A-8



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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings　EPB18

◉ 标准产品规格表 Standard specifications: P136

产品特性 Product Features

- 低吸水率下的自润滑材料。在软轴和硬轴配合下耐磨性能同样出色
- 连续使用温度：-50℃/+110℃
- 适合干运行、免维护
- 适合高载荷运动
- 适合在潮湿环境中运行

- A self-lubricating material with low water absorbtion. Good wear resistance will be maintained when used with soft shaft and hard shaft combined
- Continuous working temperature: -50℃/+110℃
- Maintenance-free dry operation
- High load requirement
- Suitable for working in humid environment

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB18
密度 Density	ISO1183	g/cm^3	1.45
颜色 Color			黄色 Yellow
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.18
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	1.2
最大摇摆速度值 Max. oscillating velocity		m/s	0.8
最大直线速度值 Max. linear velocity		m/s	3.0
抗拉强度 Tensile strength	ISO527	MPa	90
抗压强度 (轴向) Compressive strength (Axial)		MPa	70
弹性模量 E-module	ISO527	MPa	2700
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	50
邵氏硬度 Shore hardness	ISO 868	D	75
连续工作温度 Continuous work temperature		℃	-50/110
短时运行温度 Short-time work temperature		℃	-50/170
导热性 Thermal conductivity	ASTME1461	W / m × k	0.3
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	8
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2
最大吸水率23℃ Max. water absorption, 23℃		%	0.5
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{15}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{15}$

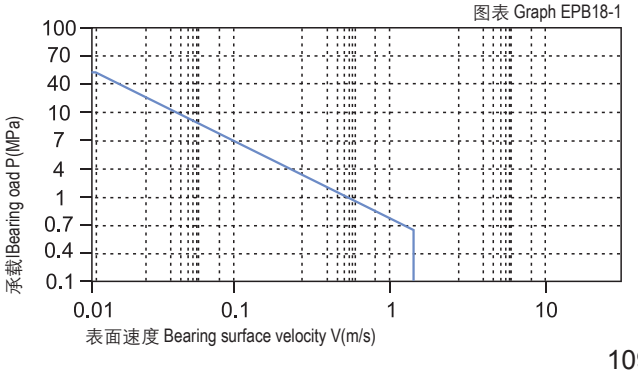
轴承PV值 PV Value

CSB-EPB18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EPB18-1。

The max PV value of the CSB-EPB18 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 EPB18-1).

■ PV图表 Permissible PV value for CSB-EPB18

图表 Graph EPB18-1



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

CSB-EPB18塑料轴承可承受最大静载荷为50Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB18-2，轴承实际工作载荷略小于50Mpa，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: 110℃) 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EPB18-3。

CSB-EPB18 allows the Max static load of 50Mpa, The max compressive deformation rate under the max load is listed in Graph EPB18-2, The actual load capacity of bearing is slightly less than 50Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.20m/s) results into higher temperature (Tmax: 110℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB18-3 for such variation.

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

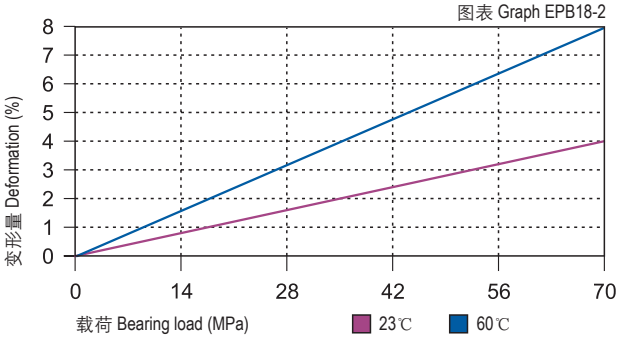
摩擦系数 Friction Factor

图EPB18-4表明CSB-EPB18轴承和大多数滑动轴承一样在载荷保持不变的情况下摩擦系数会随着旋转速度的增加略有升高；图EPB18-5表明CSB-EPB18轴承摩擦系数在速度保持不变的情况下随着载荷的增加而逐步降低；图EPB18-6表明CSB-EPB18轴承最适合的轴表面粗糙度为Ra0.2 ~ 0.6um，轴过于光滑或者过于粗糙都会导致摩擦系数升高。

Graph EPB18-4 shows that as the same as most of the slide bearing materials, the friction factor of CSB-EPB18 is increasing along with the rotation speed under a certain loading while as shown in figure EPB18-5, it is decreased along with the increasing of loading when the operation speed is stable. From figure EPB18-6, it is found that the most suitable shaft roughness is Ra0.2 to Ra0.6. Smoother shaft or rougher shaft may result into friction factor increasing.

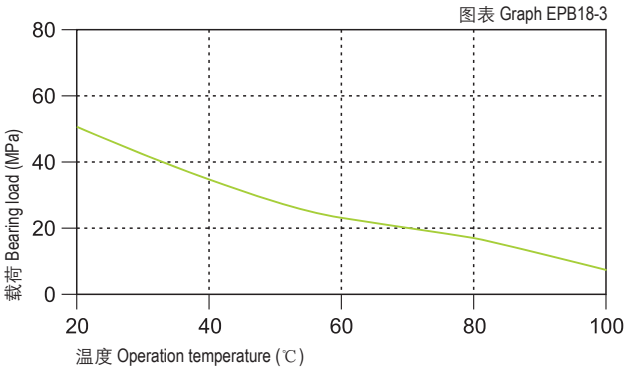
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB18-2



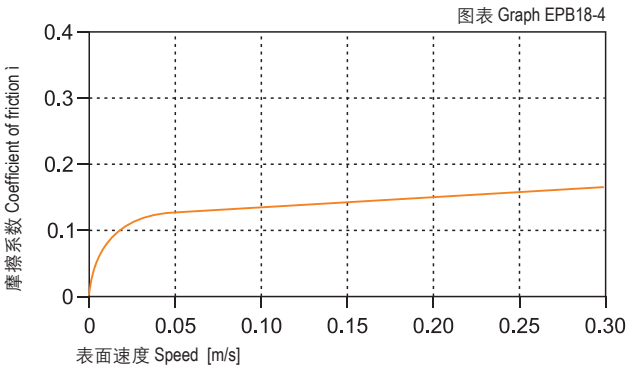
■ 载荷-温度图表 Load-Temperature diagrams

图表 Graph EPB18-3



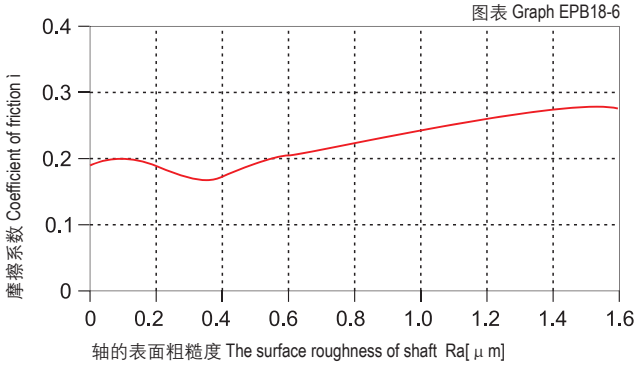
■ 摩擦系数与速度变化关系图表 P=2MPa
Coefficient of friction & the speed of bearing, p = 2 MPa

图表 Graph EPB18-4



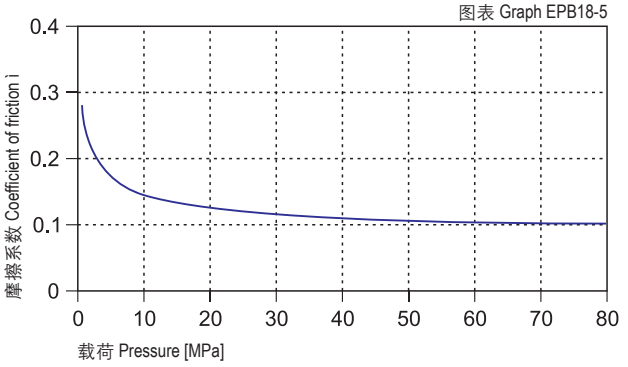
■ 摩擦系数与轴表面粗糙度关系图表
Coefficient of friction & the surface roughness of shaft

图表 Graph EPB18-6



■ 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 EPB18-5



CSB-EPB18	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05-0.18	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图EPB18-7都表明CSB-EPB18轴承的磨损受轴材料影响比较大，硬化钢轴和硬铬钢轴比较适合此轴承。图EPB18-8表明CSB-EPB18在旋转和摆动运动时选择硬铬钢轴和硬化钢轴比较适合。

Graph EPB18-7 shows the wearing is considerably affected by the shaft materials. Heat-treated steel shaft and carbon steel shaft is good for this bearing material. Graph EPB18-8 tells that CSB-EPB18 is suitable for hardened chrome steel and hardened steel shaft in rotation operation or oscillation operation.

化学抗性 Chemical Resistance

CSB-EPB18塑料轴承能抵抗部分弱酸以及各类润滑油的腐蚀。

CSB-EPB18 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-EPB18塑料轴承的吸水率为0.2%，浸泡水中最大平衡吸水率为0.5%；由于此吸水率的特性，此轴承可以应用于一般潮湿环境。

The water absorb rate of CSB-EPB18 is 0.2% under the atmospheric pressure while it is 0.5% 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-EPB18长久暴露在紫外线下颜色会发生褪变。材料性能会有所下降。

Disintegration could be possible for the material CSB-EPB18 after long period of exposing under the UV ray and therefore the performance of the material will be reduced.

安装公差 Installation Tolerances

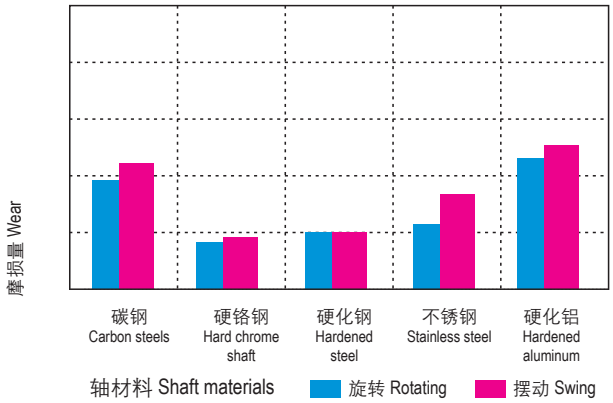
CSB-EPB18塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB18 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

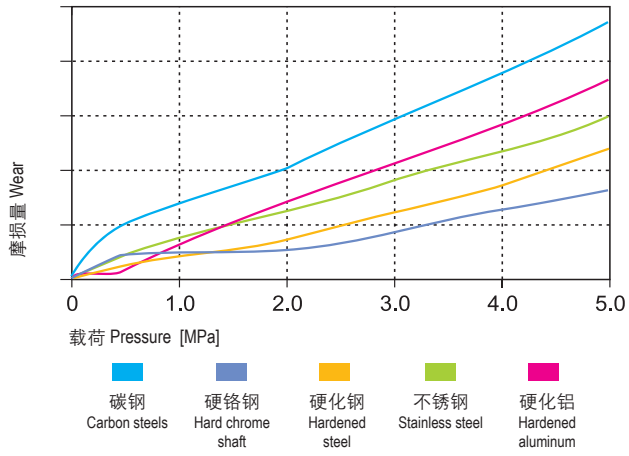
图表 Graph EPB18-7



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

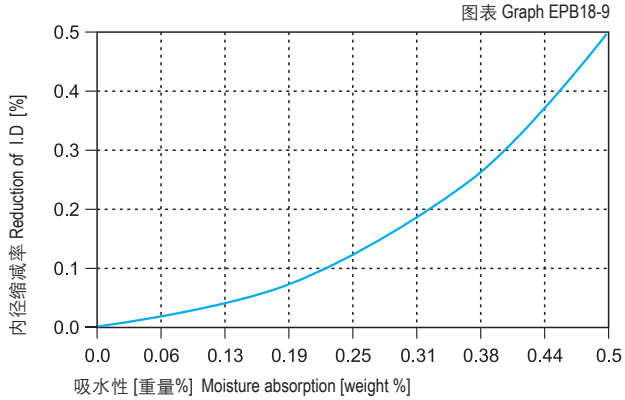
图表 Graph EPB18-8



吸水性的影响

Effect of moisture absorption on EPB18 bearings

图表 Graph EPB18-9



标准产品规格表 Standard specifications: P136

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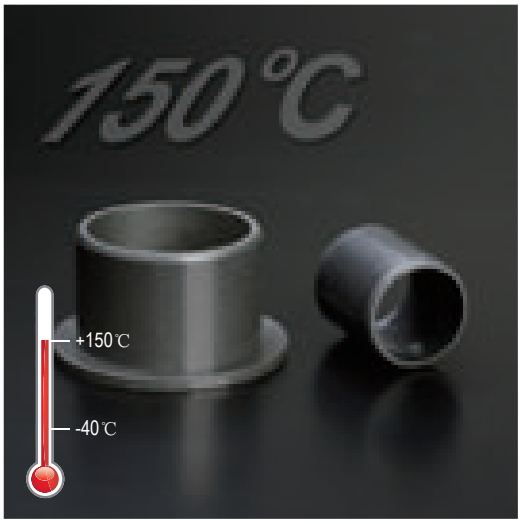
CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB19



◉ 标准产品规格表 Standard specifications: P150

产品特性 Product Features

- 高温150度下的耐磨材料。高低温下保持一致的自润滑材料
- 连续使用温度：-40℃/+150℃
- 适合高载下的摆动
- 适合干运行、免维护
- 较高的抗压强度

- Wear resistance material for temperature up to 150 ℃. The Features of the material is kept stable either at high or low temperature
- Continuous working temperature: -40℃/+150℃
- Applicable for oscillating under high load
- Maintenance-free dry operation
- High pressure resistance

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB19
密度 Density	ISO1183	g/cm^3	1.32
颜色 Color			深灰Dark Grey
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.20
最大P.V值 Max. PV (dry)		N/mm^2 × m/s	0.7
最大旋转速度值 Max. roatating velocity		m/s	1.2
最大摇摆速度值 Max. oscillating velocity		m/s	0.8
最大直线速度值 Max. linear velocity		m/s	4.0
抗拉强度 Tensile strength	ISO527	MPa	100
抗压强度 (轴向) Compressive strength (Axial)		MPa	60
弹性模量 E-module	ISO527	MPa	3500
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	60
邵氏硬度 Shore hardness	ISO 868	D	77
连续工作温度 Continuous work temperature		℃	-40/150
短时运行温度 Short-time work temperature		℃	-40/200
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} × 10^{-5}	5
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	1.3
最大吸水率23℃ Max. water absorption, 23℃		%	2.5
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	>10^{15}
面电阻率 Surface resistivity	IEC60093	Ω	>10^{12}

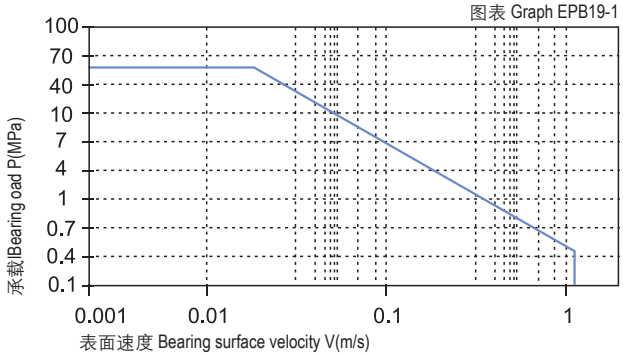
轴承PV值 PV Value

CSB-EPB19塑料轴承最大运行PV值为0.7N/mm^2 × m/s；由此决定轴承所承受的载荷与速度成反比，详细查阅EPB19-1。

The max PV value of the CSB-EPB19 plastic bearings is 0.7N/mm^2 × 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 EPB19-1).

■ PV图表 Permissible PV value for CSB-EPB19

图表 Graph EPB19-1



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

CSB-EPB19塑料轴承可承受最大静载荷为70Mpa，在此载荷下轴承的最大压缩变形量参考EPB19-2，轴承实际工作载荷略小于70Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax: 1.5m/s) 会导致摩擦温度上升，而温度上升 (Tmax: 150℃) 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EPB19-3。

CSB-EPB19 allows the Max static load of 70Mpa, The max compressive deformation rate under the max load is listed in Graph EPB19-2, The actual load capacity of bearing is slightly less than 70Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.5m/s) results into higher temperature (Tmax: 150℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB19-3 for such variation.

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

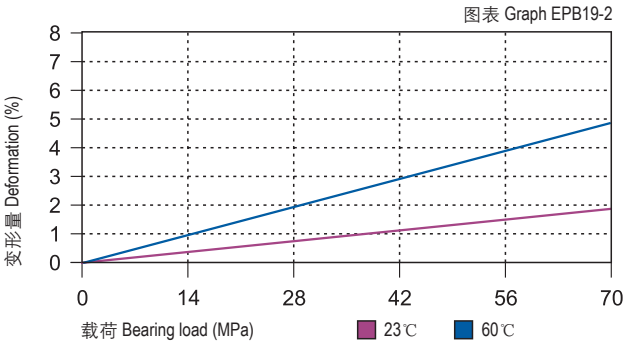
摩擦系数 Friction Factor

图表EPB19-4表明CSB-EPB19轴承的摩擦系数随着运动速度的变化影响较小，而图表EPB19-5表明CSB-EPB19轴承的摩擦系数随着载荷的增加明显减小，在载荷超过20Mpa是逐渐趋于平稳；图表EPB19-6表明CSB-EPB19轴承的摩擦系数受轴粗糙度的影响也相对比较小；虽然如此，我们还是建议轴的表面不能太光滑，也不能过于出差，推荐使用轴的粗糙度为Ra0.3 ~ 0.6um;

Graph EPB19-4 shows that the friction factor of CSB-EPB19 is not sensitive to the operation speed. Graph EPB19-5 tells that the friction factor of CSB-EPB19 is decreased along with the loading increasing and will be relatively stable when the loading reaches 20 Mpa upwards. Graph EPB19-6 shows that the friction factor of CSB-EPB19 is not sensitive to the shaft surface roughness. Therefore, it is recommended a proper shaft surface roughness in the range of Ra0.3~0.6.

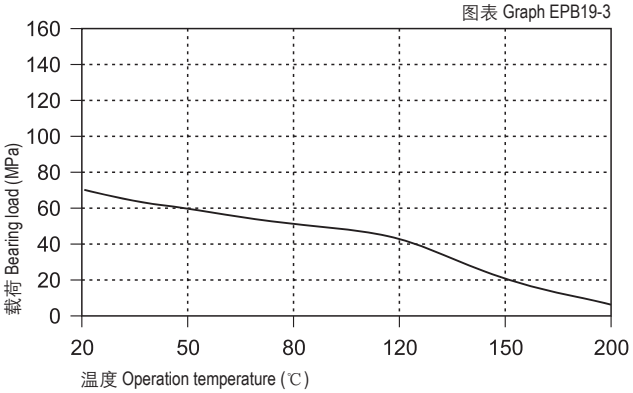
载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB19-2



载荷-温度图表 Load-Temperature diagrams

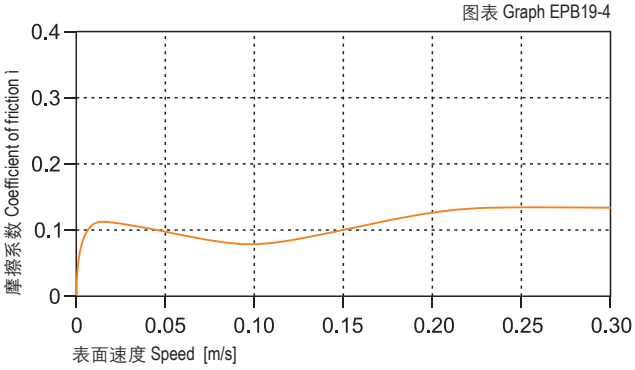
图表 Graph EPB19-3



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

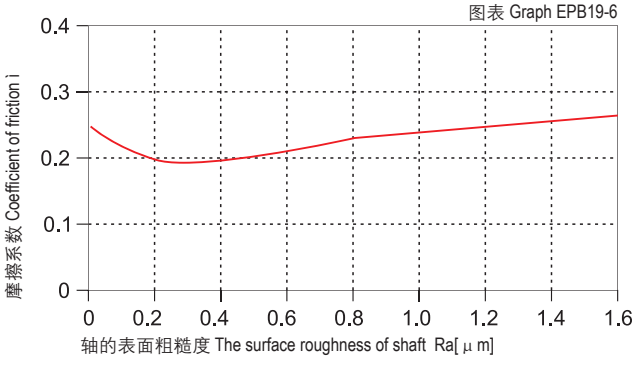
图表 Graph EPB19-4



摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

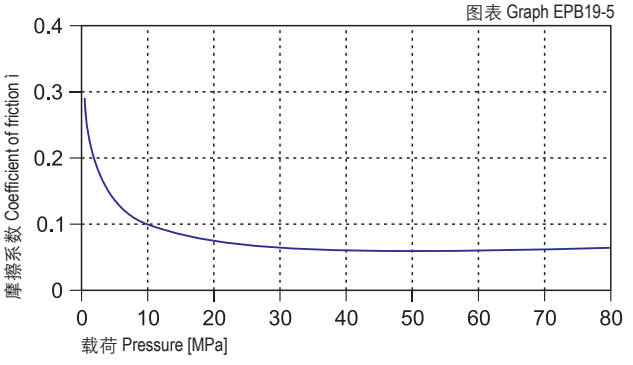
图表 Graph EPB19-6



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 EPB19-5



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CSB-EPB19	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB19-7表明CSB-EPB19轴承在2Mpa下做旋转运动时，磨损随着轴材料的变化较大；通过实验表明CSB-EPB19轴承在做旋转运动时比较适合用于硬轴，高速钢轴和硬铬轴上用于CSB-EPB19能获得良好的运行效果。图表EPB19-8表明硬铬轴更适合用于高载荷下的CSB-EPB19轴承，随着载荷的不断增加，轴承的磨损速率却变化较小。

Graph EPB19-7 shows CSB-EPB19 friction factor is variable against different shaft materials in rotation operation under loading of 2Mpa. Testing indicates that hardened shaft is best for rotation operation of CSB-EPB19. The operation condition is better when CSB-EPB19 is used against hardened steel shafts, high speed steel shaft and hardened chrome steel shaft under rotation operation. Graph EPB19-8x describes that hardened chrome steel is better for this material under high loading operation where as long as the increasing of the loading, the wearing of the bearing is relatively stable.

化学抗性 Chemical Resistance

CSB-EPB19塑料轴承能抵抗弱碱、弱酸以及各类润滑油的腐蚀。

CSB-EPB19 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-EPB19塑料轴承的吸水率为1.3%，浸泡水中最大平衡吸水率为2.5%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB19 is 1.3% under the atmospheric pressure while it is 2.5% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB19长久暴露在紫外线下颜色会发生褪变。材料性能基本都不会发生改变。

The color of CSB-EPB19 could be dimmed when it is exposed into the UV ray. The material performance stays stable.

安装公差 Installation Tolerances

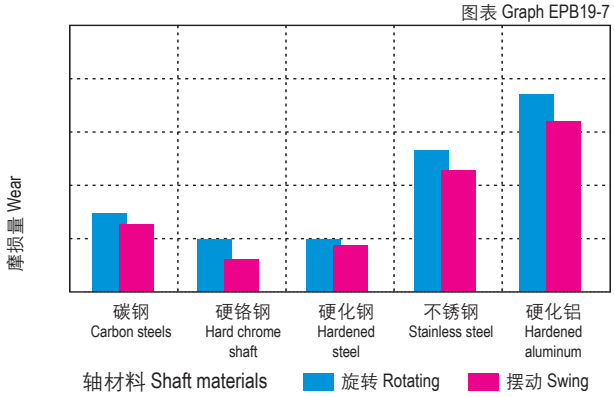
CSB-EPB19塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB19 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

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

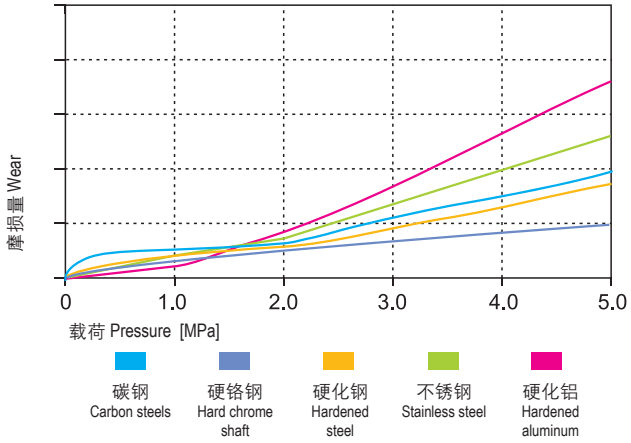
图表 Graph EPB19-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

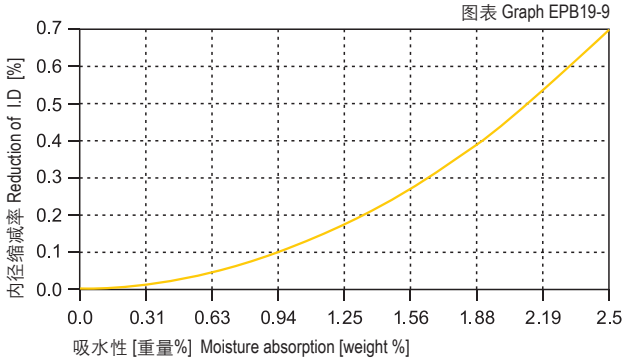
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB19-8



吸水性的影响 Effect of moisture absorption on EPB19 bearings

图表 Graph EPB19-9



直径 Di. [mm]	CSB-EPB19 E10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>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

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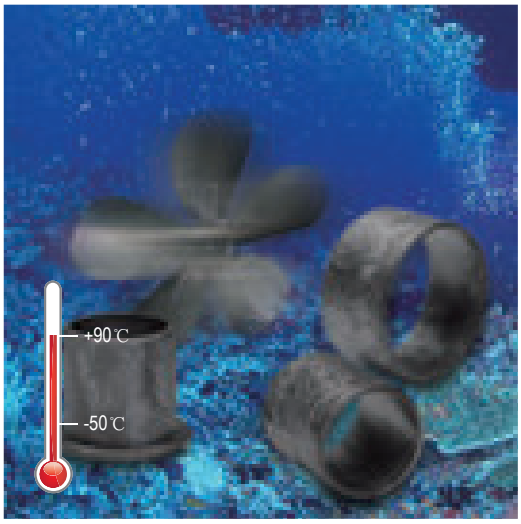
CSB-EPB™

工程塑料轴承 Plastic Plain Bearings　EPB20



◉ 标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 用于水下的自润滑材料。适合在水中做低载荷下的快速旋转运动
- 连续使用温度：-50℃/+90℃
- 适用于中低载荷
- 适用于水下
- 高速场合应用

- A self-lubricating material for applications in water. It is suitable for high speed motion under low load
- Continuous working temperature: -50℃/+90℃
- Suitable for medium load operation
- For underwater operation
- For high speed movement

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB20
密度 Density	ISO1183	g/cm^3	1.52
颜色 Color			黑色Black
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.15-0.35
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.15
最大旋转速度值 Max. roatating velocity		m/s	0.5
最大摇摆速度值 Max. oscillating velocity		m/s	0.4
最大直线速度值 Max. linear velocity		m/s	2
抗拉强度 Tensile strength	ISO527	MPa	90
抗压强度 (轴向) Compressive strength (Axial)		MPa	70
弹性模量 E-module	ISO527	MPa	9500
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	40
邵氏硬度 Shore hardness	ISO 868	D	78
连续工作温度 Continuous work temperature		℃	-50/90
短时运行温度 Short-time work temperature		℃	-50/110
导热性 Thermal conductivity	ASTME1461	W / m × k	0.6
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	6
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2
最大吸水率23℃ Max. water absorption, 23℃		%	0.8
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^5$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^5$

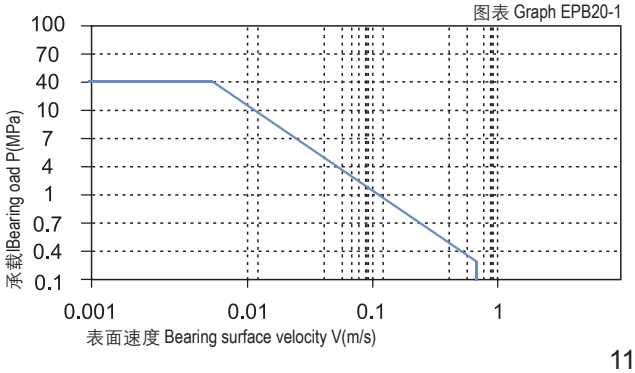
轴承PV值 PV Value

CSB-EPB20塑料轴承最大运行PV值为0.15N/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EPB20-1。

The max PV value of the CSB-EPB20 plastic bearings is 0.15N/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 EPB20-1).

■ PV图表 Permissible PV value for CSB-EPB20

图表 Graph EPB20-1



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

CSB-EPB20塑料轴承可承受最大静载荷为40Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB20-2，轴承实际工作载荷略小于40Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：0.5m/s) 会导致摩擦温度上升，而温度上升 (Tmax: 90℃) 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EPB20-3。

CSB-EPB20 allows the Max static load of 40Mpa, The max compressive deformation rate under the max load is listed in Graph EPB20-2, The actual load capacity of bearing is slightly less than 40Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.5m/s) results into higher temperature (Tmax: 90℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB20-3 for such variation.

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

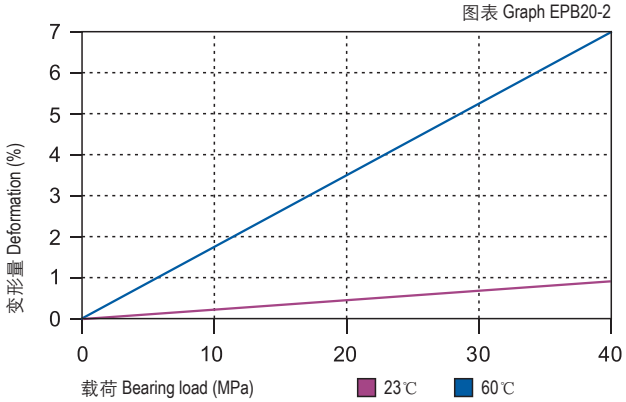
摩擦系数 Friction Factor

与其它塑料轴承基本一样，图EPB20-4表明CSB-EPB20轴承在载荷保持不变的情况下摩擦系数随着运行速度的增加而升高；图EPB20-5表明CSB-EPB20轴承在保持速度不变时摩擦系数随着载荷的增加而逐步减低。根据图EPB20-6表明CSB-EPB20轴承的摩擦系数会随着轴表面粗糙度的变化而不同，我们推荐使用轴粗糙度为Ra0.3 ~ 0.6um;

Similar with most of the plastic bearings, the friction factor of CSB-EPB20 is increased along with the operation speed when the loading is stable (see Graph EPB20-4) and is decreased along with the loading increasing when the operation speed is stable (see Graph EPB20-5). From Graph EPB20-6, it shows the friction factor of CSB-EPB20 is variable against different shaft surface roughness. The recommended shaft surface roughness is Ra0.3~0.6.

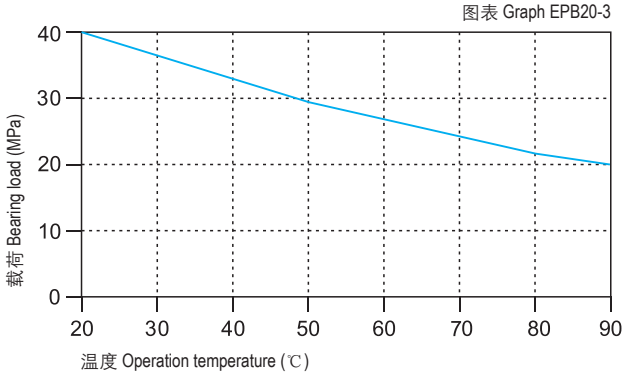
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB20-2



■ 载荷-温度图表 Load-Temperature diagrams

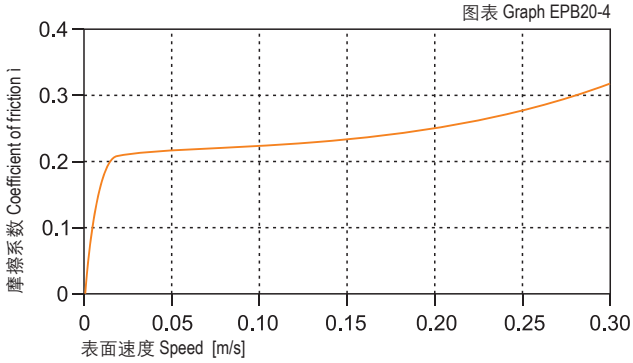
图表 Graph EPB20-3



■ 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

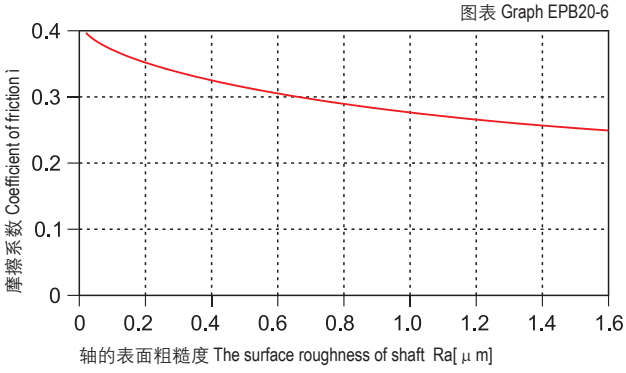
图表 Graph EPB20-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

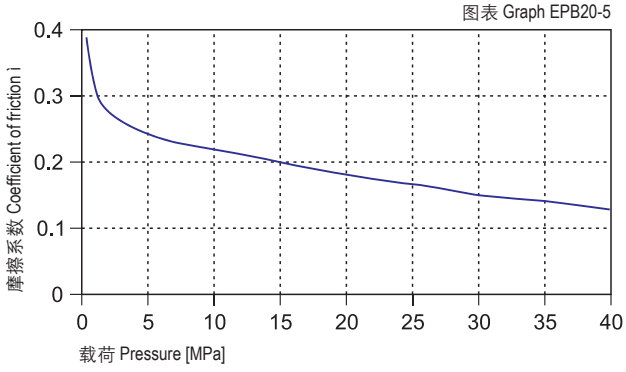
图表 Graph EPB20-6



■ 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 EPB20-5



CSB-EPB2	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.07~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图EPB20-7表明低载时硬化钢轴与硬铬钢轴比较适合用于CSB-EPB20轴承。CSB-EPB20在用于摆动运动时磨损值明显要优越于用于旋转运动。

Graph EPB20-7 shows that CSB-EPB20 is rather suitable for hardened steel shaft and hardened chrome steel shaft under lower loading andGraph EPB20-7 shows that CSB-EPB20 wearing feature is better for oscillation operation than of rotation operation.

化学抗性 Chemical Resistance

CSB-EPB20塑料轴承能抵抗部分弱酸以及各类润滑油的腐蚀。

CSB-EPB20 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-EPB20塑料轴承的吸水率为0.2%，浸泡水中最大平衡吸水率为0.4%；由于此吸水率的特性，此轴承可以应用于一般潮湿环境。

The water absorb rate of CSB-EPB20 is 0.2% under the atmospheric pressure while it is 0.4% 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-EPB20长久暴露在紫外线下颜色会发生褪变。材料性能会有所下降。

Disintegration could be possible for the material CSB-EPB20 after long period of exposing under the UV ray and therefore the performance of the material will be reduced.

安装公差 Installation Tolerances

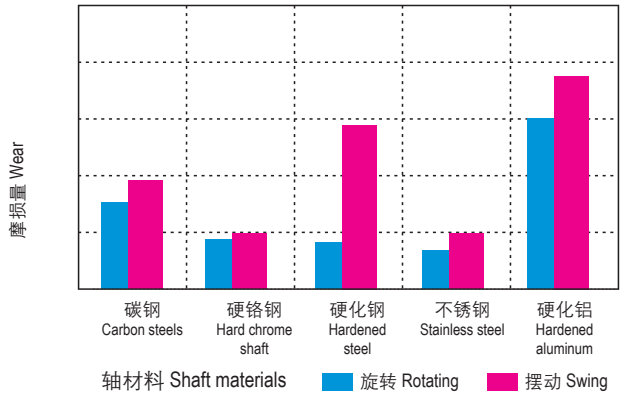
CSB-EPB20塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB20 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

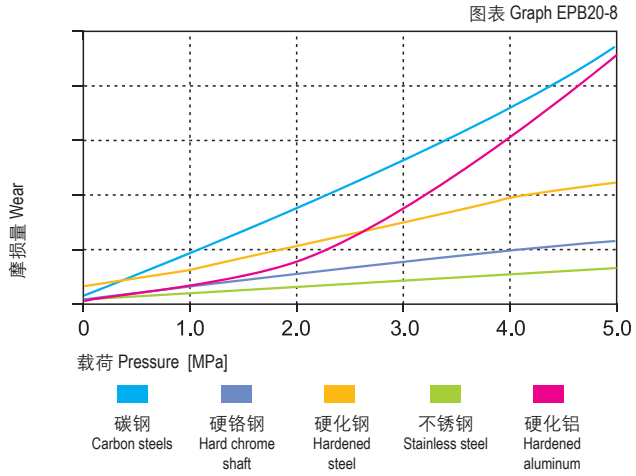
图表 Graph EPB20-7



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

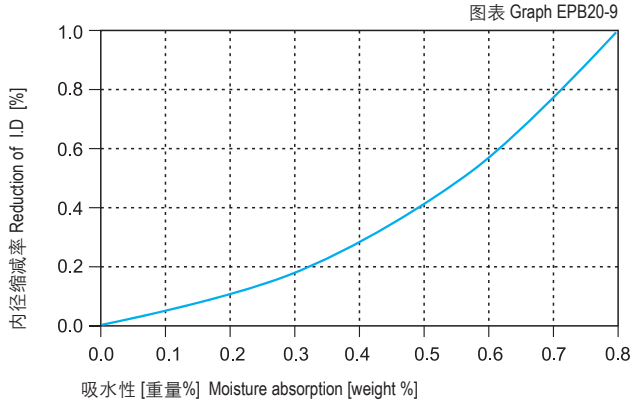
图表 Graph EPB20-8



吸水性的影响

Effect of moisture absorption on EPB20 bearings

图表 Graph EPB20-9



标准产品规格表 Standard specifications: P140

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB21

标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 高温下的低摩擦系数和耐磨性同样出色材料。抗化学腐蚀优良。被用于高温、高化学抗性要求下耐磨轴承的首选材料
- 连续使用温度：-40℃/+200℃
- 非常低的摩擦系数
- 适合干运行、免维护
- 高温和良好的化学抗性
- 适合潮湿环境中使用
- Low friction and good wear resistance for high temperature applications. The excellent chemical resistance of the material ensures athe applications for high temperature and high chemical erosion applications
- Continuous working temperature: -40℃/+200℃
- Very low coefficient of friction
- Maintenance-free dry operation
- High temperature and good chemical resistance
- Suitable for humid environment

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB21
密度 Density	ISO1183	g/cm^3	1.53
颜色 Color			浅黄色Buff
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.05-0.20
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.8
最大旋转速度值 Max. roatating velocity		m/s	2
最大摇摆速度值 Max. oscillating velocity		m/s	1
最大直线速度值 Max. linear velocity		m/s	5
抗拉强度 Tensile strength	ISO527	MPa	55
抗压强度 (轴向) Compressive strength (Axial)		MPa	78
弹性模量 E-module	ISO527	MPa	2800
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	80
邵氏硬度 Shore hardness	ISO 868	D	77
连续工作温度 Continuous work temperature		℃	-40/200
短时运行温度 Short-time work temperature		℃	-40/240
导热性 Thermal conductivity	ASTME1461	W / m × k	0.5
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	5
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.1
最大吸水率23℃ Max. water absorption, 23℃		%	0.3
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{12}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{11}$

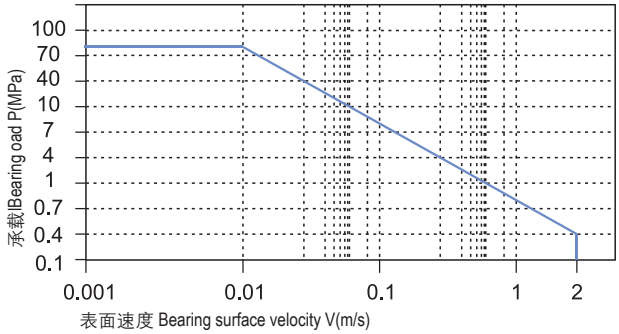
轴承PV值 PV Value

CSB-EPB21塑料轴承最大运行PV值0.8N/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EPB21-1。

The max PV value of the CSB-EPB21 plastic bearings is 0.8N/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 EPB21-1).

PV图表 Permissible PV value for CSB-EPB21

图表 Graph EPB21-1



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

CSB-EPB21塑料轴承可承受最大静载荷为80Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB21-2，轴承实际工作载荷略小于80Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：2.0m/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EPB21-3。

CSB-EPB21 allows the Max static load of 80Mpa, The max compressive deformation rate under the max load is listed in Graph EPB21-2, The actual load capacity of bearing is slightly less than 80Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 2.0m/s) results into higher temperature (Tmax: 200℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB21-3 for such variation.

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

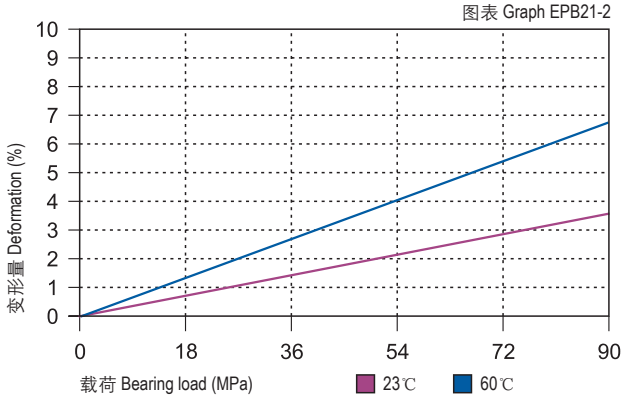
摩擦系数 Friction Factor

图表EPB21-4表明CSB-EPB21轴承在载荷保持不变时旋转下的摩擦系数会随着速度的增加而略有减低；图表EPB21-5表明CSB-EPB21轴承在速度保持不变时旋转下的摩擦系数会随着载荷的增加而逐步降低，特别是在载荷小于30Mpa的情况下。图表EPB21-6表明CSB-EPB21轴承的对磨轴粗糙度在Ra0.3 ~ 0.4um时摩擦系数几乎没有变化，但当轴表面粗糙度大于Ra0.4时摩擦系数会快速上升；我们推荐使用轴的粗糙度为Ra0.3 ~ 0.4um。

Friction factor will be slightly decreased along with the speed increasing under certain loading of the rotation operation (see Graph EPB21-4) and it will be slightly decreased along with the loading increasing under certain speed of the rotation operation especially when the loading is less than 30Mpa. Graph EPB21-5 tells that the friction of the CSB-EPB21 is not changed at all when the shaft roughness is between Ra0.3 to Ra0.4 and will be considerably increased when the shaft roughness is over Ra0.4. So the recommended shaft roughness is Ra0.3-Ra0.4.

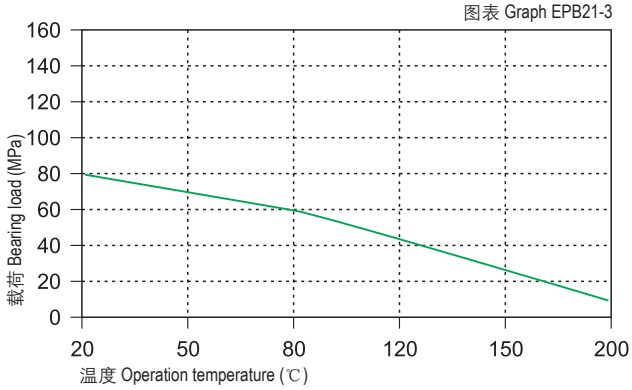
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB21-2



■ 载荷-温度图表 Load-Temperature diagrams

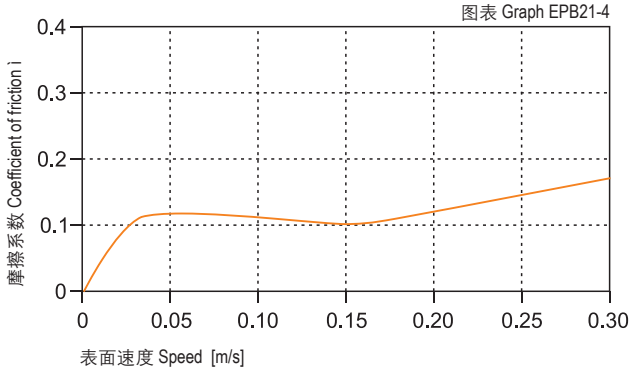
图表 Graph EPB21-3



■ 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

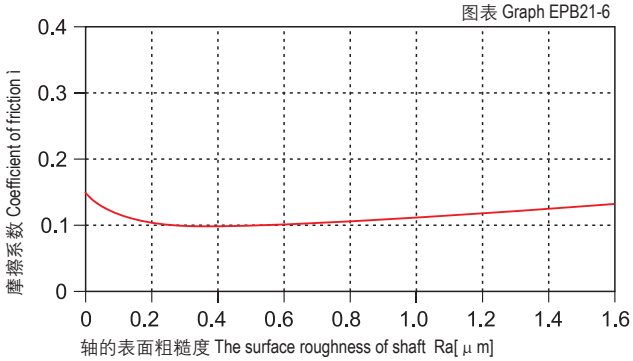
图表 Graph EPB21-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

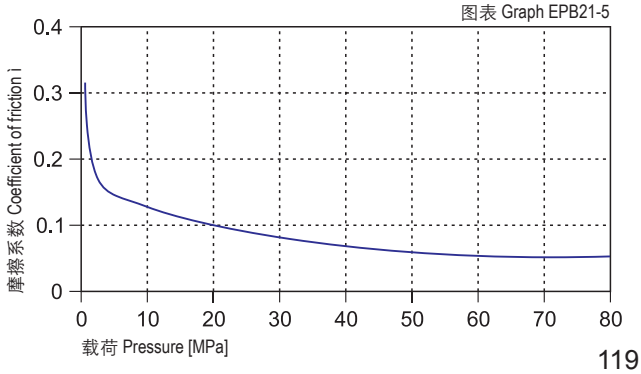
图表 Graph EPB21-6



■ 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 EPB21-5



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CSB-EPB21	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.07~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB21-7表明CSB-EPB21轴承在低载荷旋转运动时适合大都数轴材料，而在高载旋转下硬化钢轴表现尤为特出（见图表EPB21-7）；图表EPB21-8显示CSB-EPB21轴承在采用不锈钢轴摆动运动下较为合适，而在旋转运动中碳钢轴和硬化钢轴效果比较好。

Graph EPB21-7 shows that CSB-EPB21 is suitable for most of the shaft materials under low loading rotation operation and it is good for hardened carbon steel shaft under high loading rotation operation (see Graph EPB21-7). From Graph EPB21-8, we can also read that CSB-EPB21 is suitable for stainless steel shaft under oscillation operation and good for hot rolled carbon steel and hardened carbon steel shaft under rotation operation.

化学抗性 Chemical Resistance

CSB-EPB21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-EPB21 is fairly good against most of Acid and Alkalis.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB21塑料轴承的吸水率极低0.1%，浸泡水中最大平衡吸水率为0.3%；因此材料不会吸水而发生性能和尺寸变化，适合用于潮湿环境甚至水下。

The water absorb rate of CSB-EPB21 is 0.1% under the atmospheric pressure while it is 0.3% when the material is immerged into water. The material performance and dimensions of the material is stabilized for the applications under humid environment.

抗UV性能 UV Resistance

CSB-EPB21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-EPB21 after long period of exposing under the UV ray and therefore the compressive strength will be reduced.

安装公差 Installation Tolerances

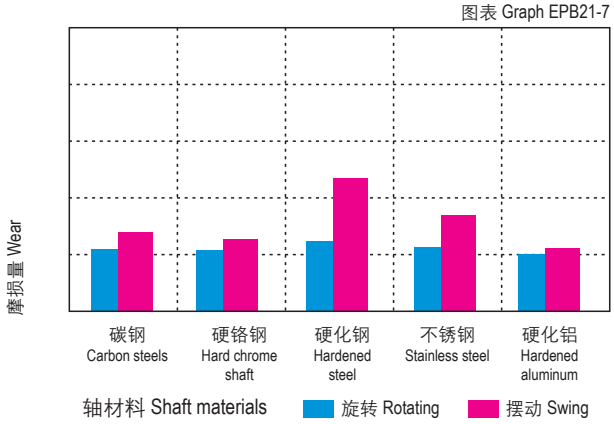
CSB-EPB21塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB21 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

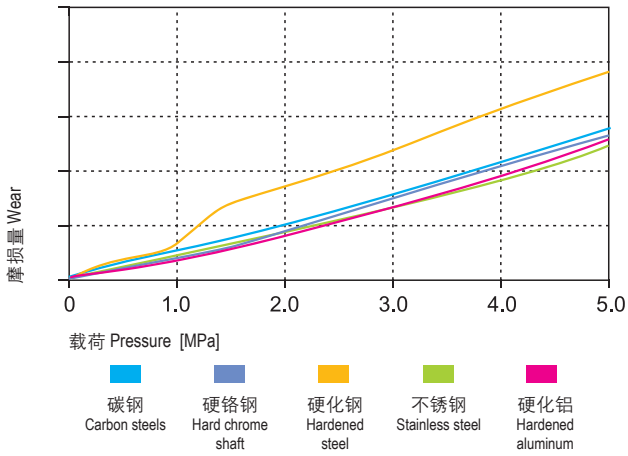
图表 Graph EPB21-7



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

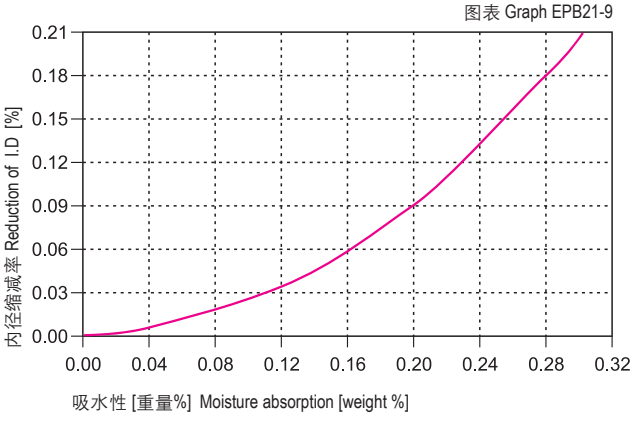
图表 Graph EPB21-8



吸水性的影响

Effect of moisture absorption on EPB21 bearings

图表 Graph EPB21-9



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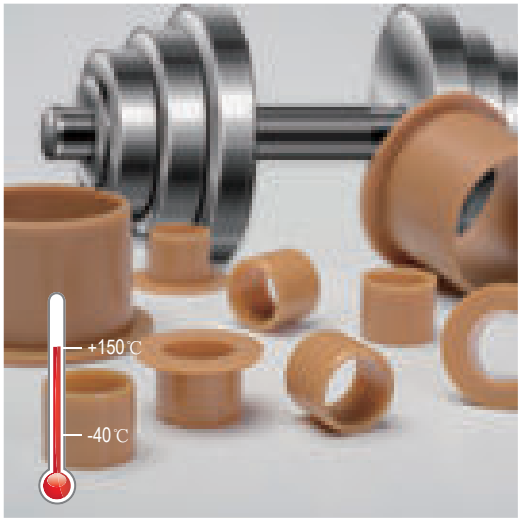


◉ 标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 极高载荷下耐磨性较好的材料。适用于其它CSB塑料轴承在极高载荷下摆动运动无法满足的场合
- 连续使用温度: -40℃/+150℃
- 承受较高载荷
- 适合用于摆动场合
- 抗污垢能力强
- Good wear resistance under extremely high load condition. It is suitable for the applications that the other CSB plastic bearing materials are not working properly with the extremely high load and oscillation motion conditions
- Continuous working temperature: -40℃/+150℃
- Suitable for high load operation
- Good for oscillating operation
- Comtainment prevention ability

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB22
密度 Density	ISO1183	g/cm^3	1.46
颜色 Color			深黄色Dark Yellow
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.15-0.35
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.7
最大旋转速度值 Max. roatating velocity		m/s	1
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	4
抗拉强度 Tensile strength	ISO527	MPa	240
抗压强度 (轴向) Compressive strength (Axial)		MPa	130
弹性模量 E-module	ISO527	MPa	9000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	120
邵氏硬度 Shore hardness	ISO 868	D	80
连续工作温度 Continuous work temperature		℃	-40/150
短时运行温度 Short-time work temperature		℃	-40/220
导热性 Thermal conductivity	ASTME1461	W / m × k	0.24
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	8
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	1.1
最大吸水率23℃ Max. water absorption, 23℃		%	4.6
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{13}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{11}$

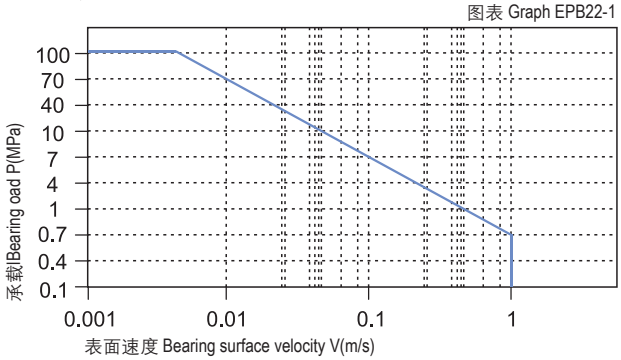
轴承PV值 PV Value

CSB-EPB22塑料轴承最大运行PV值为0.7N/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EPB22-1。

The max PV value of the CSB-EPB12 plastic bearings is 0.7N/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 EPB12-1).

■ PV图表 Permissible PV value for CSB-EPB22

图表 Graph EPB22-1



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

CSB-EPB22塑料轴承可承受最大静载荷为120Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB22-2，轴承实际工作载荷略小于120Mpa，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：150℃) 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EPB22-3。

CSB-EPB22 allows the Max static load of 120Mpa, The max compressive deformation rate under the max load is listed in Graph EPB22-2, The actual load capacity of bearing is slightly less than 120Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 150℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB22-3 for such variation.

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

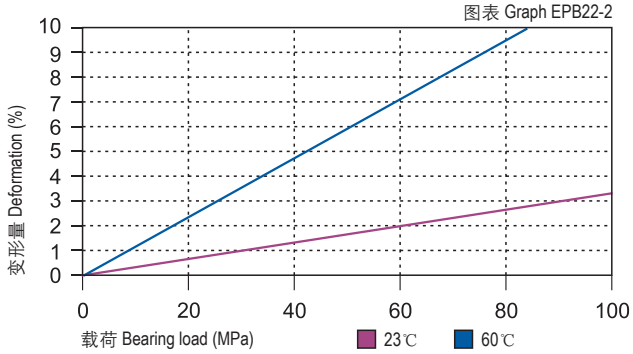
摩擦系数 Friction Factor

图表EPB22-4表明CSB-EPB22轴承的摩擦系数在载荷保持不变的情况下受速度变化影响比较小；同样在图表EPB22-5表明CSB-EPB22轴承在速度保持不变的情况下受载荷变化的影响相对也比较小；此轴承为所有滑动轴承中摩擦系数不受运行速度以及载荷影响较大的典型轴承。根据图表EPB22-6显示CSB-EPB22轴承的摩擦系数在超过Ra0.4后轴表面粗糙度几乎对轴承的摩擦系数没有任何影响，我们推荐使用轴表面粗糙度为Ra0.1 ~ 0.4um。

Graph EPB22-4 shows that the friction factor of CSB-EPB22 is not considerably affected by the operation speed when the loading is stable. At the meantime, Graph EPB22-5 shows that the friction factor of CSB-EPB22 is not considerably affected by the loading when the operation speed is stable. This bearing is the only typical material whose friction factor is not sensitive to the operation speed and loading. Graph EPB22-6 tells that the fiction factor of CSB-EPB22 will not be affected by the shaft roughness when the shaft roughness is better than Ra0.4. The recommended Shaft roughness is Ra0.1~0.4.

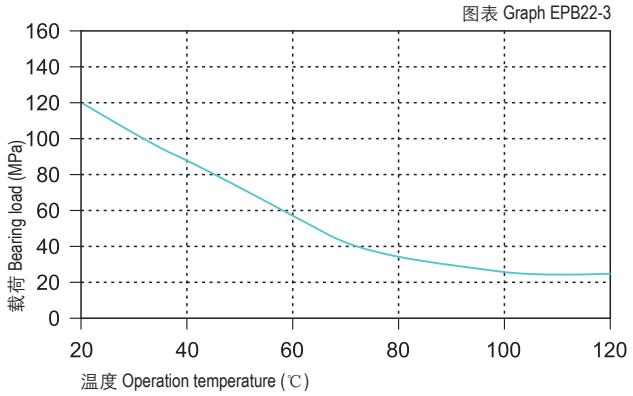
载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB22-2



载荷-温度图表 Load-Temperature diagrams

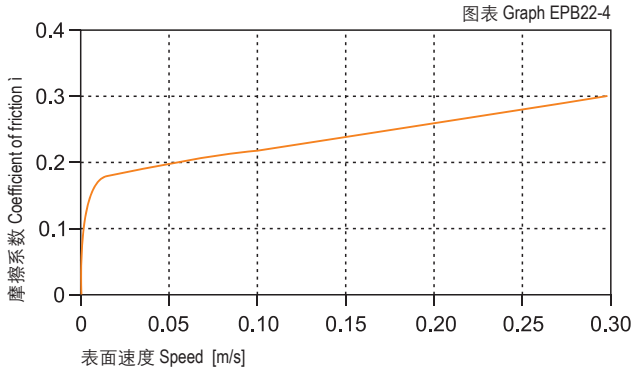
图表 Graph EPB22-3



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

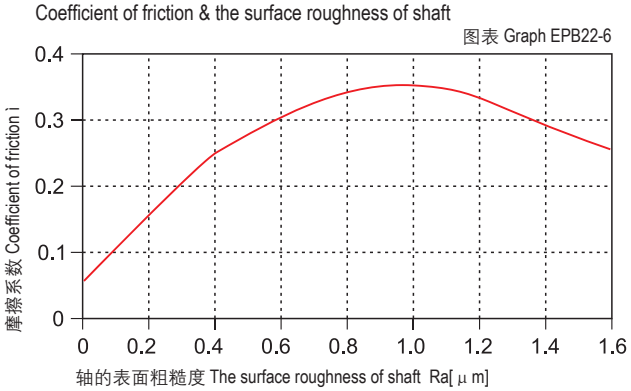
图表 Graph EPB22-4



摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

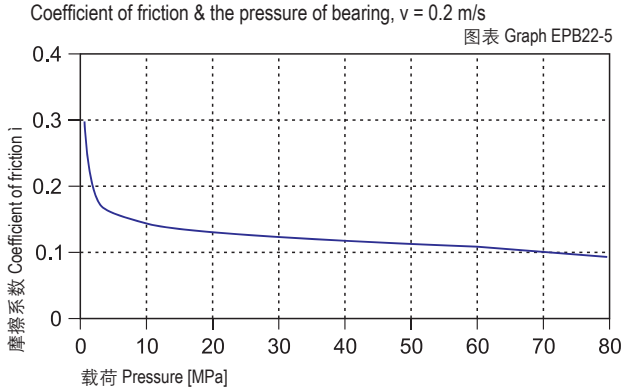
图表 Graph EPB22-6



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 EPB22-5



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CSB-EPB22	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB22-7与图表EPB22-8表明CSB-EPB16轴承比较适合采用硬铬钢轴或硬化钢轴；图表EPB22-7表明CSB-EPB22轴承在做摆动运动下的磨损性能要优越于在旋转运动下的磨损性能。图表EPB22-8表明CSB-EPB22在摆动运动时选择硬铬钢轴和硬化钢轴比较适合，在旋转运动中也是选择硬铬钢轴和硬化钢轴比较理想。

Graph EPB22-7 and Graph EPB22-8 tells that CSB-EPB16 is suitable for both hard chrome steel shaft and hardened steel shaft. Graph EPB22-8 shows that the wearing feature of CSB-EPB16 is better in oscillation operation than in rotation operation. Hardened chrome steel shaft and hardened steel shaft is the better choice under oscillation operation and hardened steel shaft and hardened chrome steel shaft is the better choice under rotation operation.

化学抗性 Chemical Resistance

CSB-EPB22塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。

CSB-EPB22 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-EPB22塑料轴承的吸水率为1.1%，浸泡水中最大平衡吸水率为4.6%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB22 is 1.1% under the atmospheric pressure while it is 4.6% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB22长久暴露在紫外线下长久后材料可能会变脆，不能承受冲击力。

CSB-EPB22 can become brittle and lost its impact resistance when it is exposed into UV ray for a certain period of time.

安装公差 Installation Tolerances

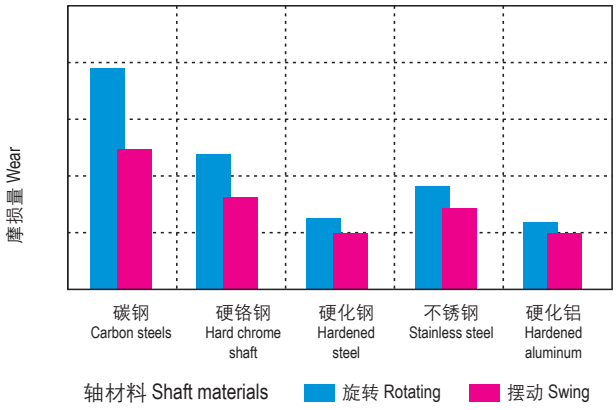
CSB-EPB22塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB22 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

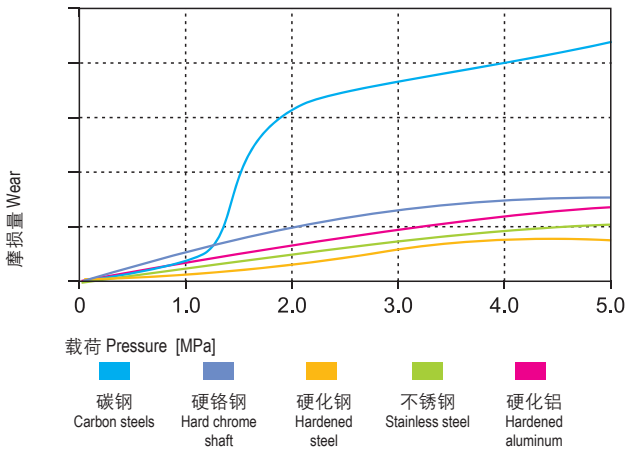
图表 Graph EPB22-7



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

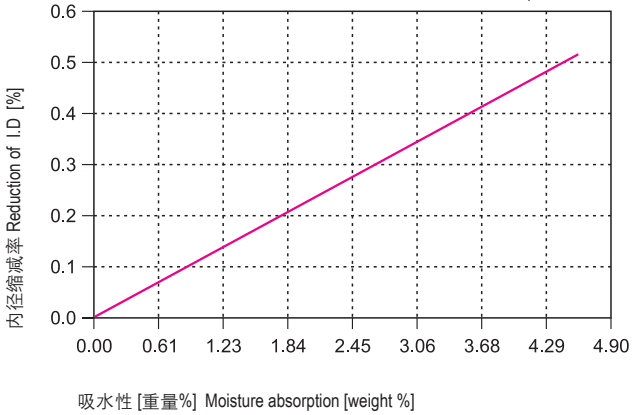
图表 Graph EPB22-8



吸水性的影响

Effect of moisture absorption on EPB22 bearings

图表 Graph EPB22-9



标准产品规格表 Standard specifications: P140

CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB23

标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 符合FDA标准的高温耐磨材料。因用于食品机械或与食品接触的场合。可在180度下保持良好的耐磨性能
- 连续使用温度：-100℃/+180℃
- 高载荷下耐磨
- 高温下食品行业应用
- 符合FDA标准

- High temperature and wear resistance material comforms to FDA regulation. It is suitable for the food machinery where the food is directly contacted with the material under the high temperature of 180℃
- Continuous working temperature: -100℃/+180℃
- Good wear resistance under high load
- For food industry under high temperature
- No special requirement on the surface roughness
- FDA standard

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB23
密度 Density	ISO1183	g/cm^3	1.42
颜色 Color			蓝色Blue
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.10-0.20
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
最大摇摆速度值 Max. oscillating velocity		m/s	0.8
最大直线速度值 Max. linear velocity		m/s	2.5
抗拉强度 Tensile strength	ISO527	MPa	110
抗压强度 (轴向) Compressive strength (Axial)		MPa	78
弹性模量 E-module	ISO527	MPa	2000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	60
邵氏硬度 Shore hardness	ISO 868	D	76
连续工作温度 Continuous work temperature		℃	-100/180
短时运行温度 Short-time work temperature		℃	-100/210
导热性 Thermal conductivity	ASTME1461	$W/m \times k$	0.24
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	8
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.6
最大吸水率23℃ Max. water absorption, 23℃		%	1.9
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{11}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{11}$

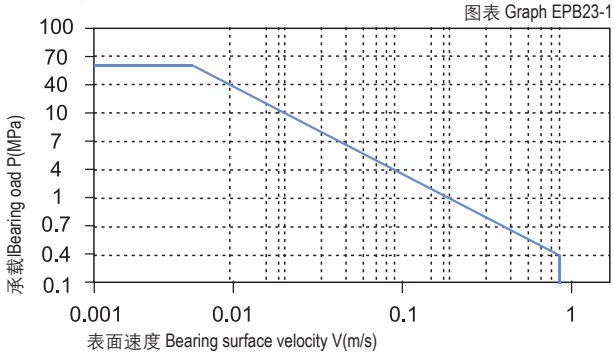
轴承PV值 PV Value

CSB-EPB23塑料轴承最大运行PV值为$0.4N/mm^2 \times m/s$；由此决定轴承所承受的载荷与速度成反比，详细查阅图表EPB23-1。

The max PV value of the CSB-EPB23 plastic bearings is $0.4N/mm^2 \times m/s$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph EPB23-1).

PV图表 Permissible PV value for CSB-EPB23

图表 Graph EPB23-1



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

CSB-EPB23塑料轴承可承受最大静载荷为60Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB23-2，轴承实际工作载荷略小于60Mpa，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: 180℃) 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EPB23-3。

CSB-EPB23 allows the Max static load of 60Mpa, The max compressive deformation rate under the max load is listed in Graph EPB23-2, The actual load capacity of bearing is slightly less than 60Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 180℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB23-3 for such variation.

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

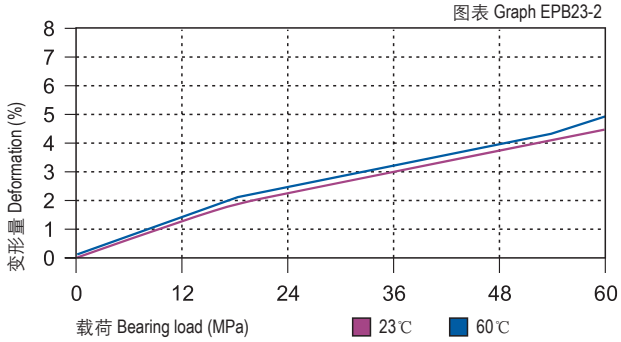
摩擦系数 Friction Factor

图表EPB23-4表明CSB-EPB23轴承的摩擦系数随着运动速度的变化影响较小，而图表EPB23-5表明CSB-EPB23轴承的摩擦系数随着载荷的增加明显减小，在载荷超过20Mpa是逐渐趋于平稳；图表EPB23-6表明CSB-EPB23轴承的摩擦系数受轴粗糙度的影响也相对比较小；虽然如此，我们还是建议轴的表面不能太光滑，也不能过于出差，推荐使用轴的粗糙度为Ra0.6 ~ 0.9um;

CSB-EPB23 Bearing Friction factor is not so sensitive to the operation speed (see Graph EPB23-4). The friction factor is considerably decreased along with the loading increasing and it will be turned to be stable when the loading reaches 20Mpa. Graph EPB23-5 shows the friction factor of the bearing is also not sensitive to the shaft roughness but we still recommend that the roughness of the shaft should be neither too smooth nor too rough. It is recommended to keep the roughness of the shaft to be within the range of Ra0.6 to Ra0.9.

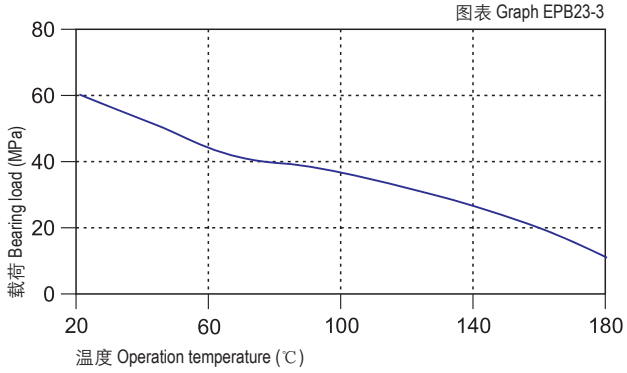
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB23-2



■ 载荷-温度图表 Load-Temperature diagrams

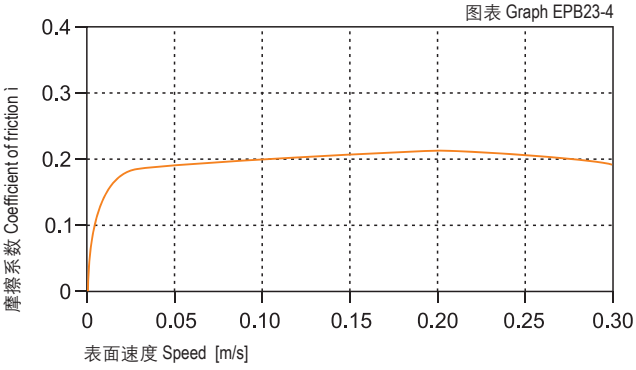
图表 Graph EPB23-3



■ 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

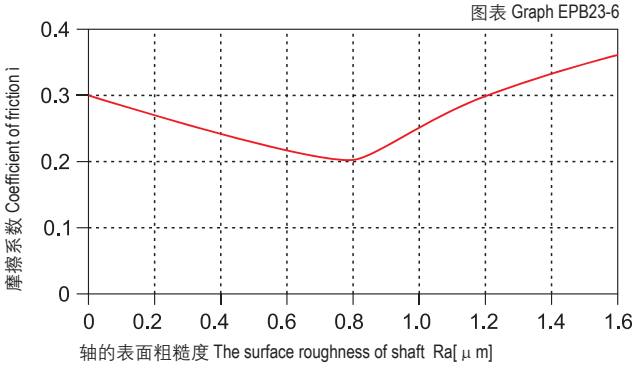
图表 Graph EPB23-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

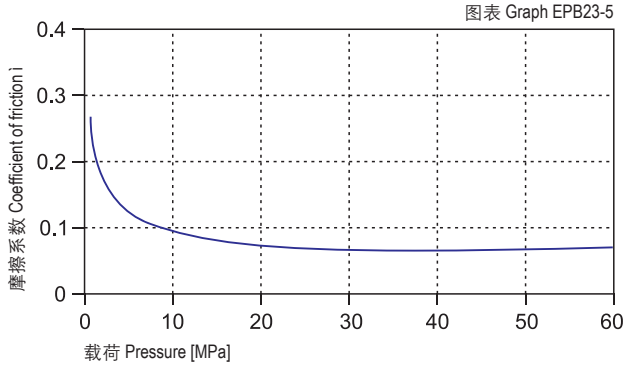
图表 Graph EPB23-6



■ 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 EPB23-5



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CSB-EPB23	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.09~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB23-7表明CSB-EPB23轴承在2Mpa下做旋转运动时，磨损随着轴材料的变化较大；通过实验表明CSB-EPB23轴承在做旋转运动时比较适合用于硬铬轴，不锈钢轴和硬铬轴上用于CSB-EPB23能获得良好的运行效果。图表EPB23-8表明硬铬轴更适合用于高载荷下的CSB-EPB23轴承，随着载荷的不断增加，轴承的磨损速率却变化较小，图表EPB23-8表明CSB-EPB23轴承在不同载荷下的差异。

Graph EPB23-7 shows that the CSB-EPB23 material is not sensitive with different materials under the rotating operation. It is suitable for hard shaft and high speed steel shaft as well as hard chrome steel shaft. Graph EPB23-8 shows that the hard chrome steel shaft is most suitable for using CSB-EPB23 bearing because the wearing speed is not sensitive when the loading is increased. From the Graph EPB23-8, it shows that CSB-EP23 features different performance.

化学抗性 Chemical Resistance

CSB-EPB23塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。

CSB-EPB23 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-EPB23塑料轴承的吸水率为0.6%，浸泡水中最大平衡吸水率为1.9%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB23 is 0.6% under the atmospheric pressure while it is 1.9% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB23长久暴露在紫外线下颜色会发生褪变。材料性能基本都不会发生改变。

The color of CSB-EPB23 could be dimmed when it is exposed into the UV ray. The material performance stays stable.

安装公差 Installation Tolerances

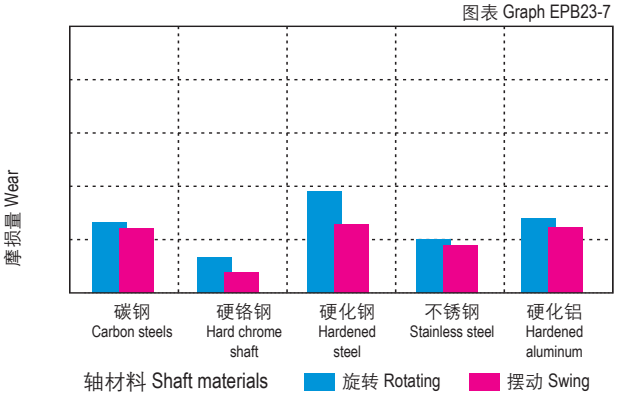
CSB-EPB23塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB23 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

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

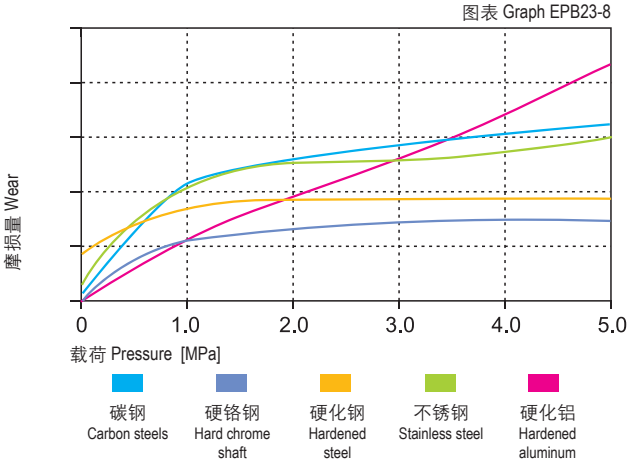
图表 Graph EPB23-7



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

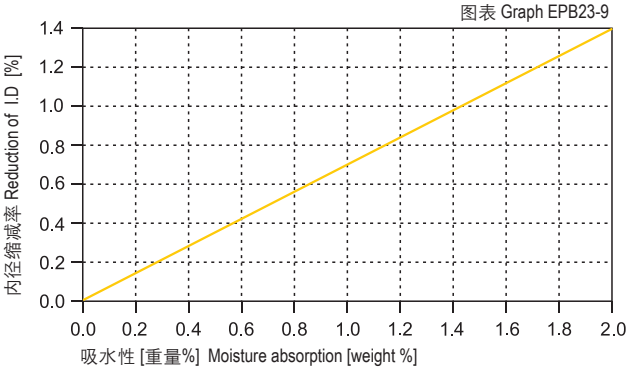
图表 Graph EPB23-8



吸水性的影响

Effect of moisture absorption on EPB23 bearings

图表 Graph EPB23-9



直径 Di. [mm]	CSB-EPB23 E10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>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

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CSB-EPB™

工程塑料轴承 Plastic Plain Bearings

EPB24

◉ 标准产品规格表 Standard specifications: P147

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℃/+200℃
- 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℃/+200℃
- High temperature and lower cost
- High wear resistance under fuel oil
- Good chemical resistance
- Suitable for humid environment

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB24
密度 Density	ISO1183	g/cm^3	1.79
颜色 Color			棕色Brown
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.08-0.25
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.7
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	1.0
抗拉强度 Tensile strength	ISO527	MPa	210
抗压强度 (轴向) Compressive strength (Axial)		MPa	110
弹性模量 E-module	ISO527	MPa	10000
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	110
邵氏硬度 Shore hardness	ISO 868	D	80
连续工作温度 Continuous work temperature		℃	-40/200
短时运行温度 Short-time work temperature		℃	-40/240
导热性 Thermal conductivity	ASTME1461	$W/m \times k$	0.24
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	5
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.1
最大吸水率23℃ Max. water absorption, 23℃		%	0.2
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{13}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{12}$

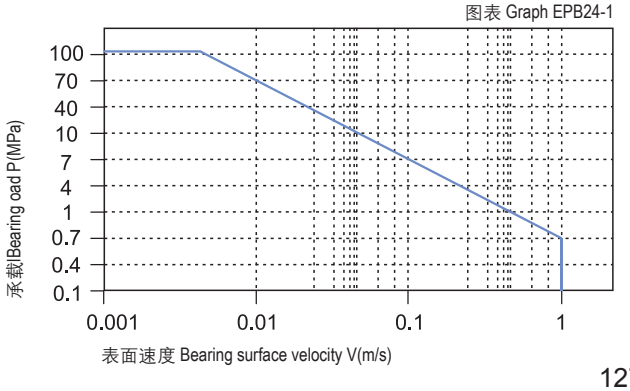
轴承PV值 PV Value

CSB-EPB24塑料轴承最大运行PV值0.70N/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EPB24-1。

The max PV value of the CSB-EPB24 plastic bearings is 0.70N/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 EPB24-1).

■ PV图表 Permissible PV value for CSB-EPB24

图表 Graph EPB24-1



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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65Mpa，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65Mpa，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 65Mpa, 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 65Mpa, 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

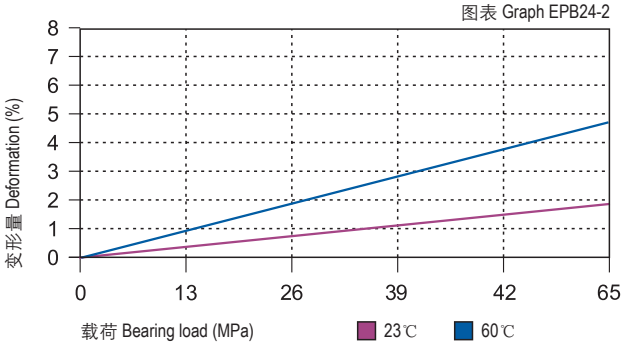
摩擦系数 Friction Factor

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 ~ 0.6um。

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.

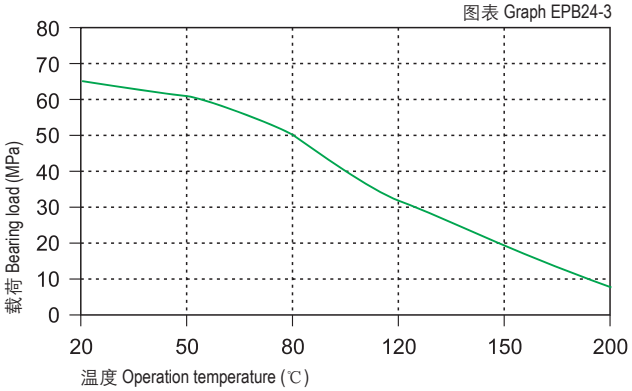
载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB24-2



载荷-温度图表 Load-Temperature diagrams

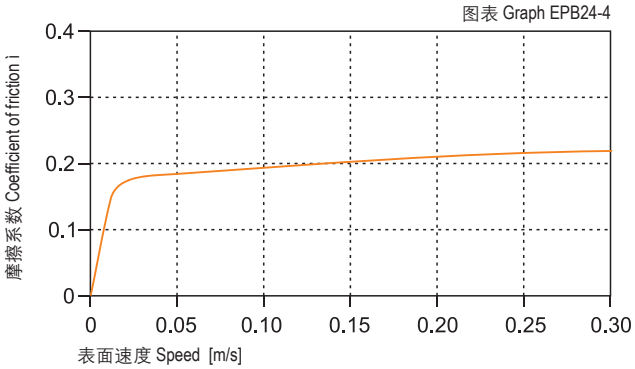
图表 Graph EPB24-3



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

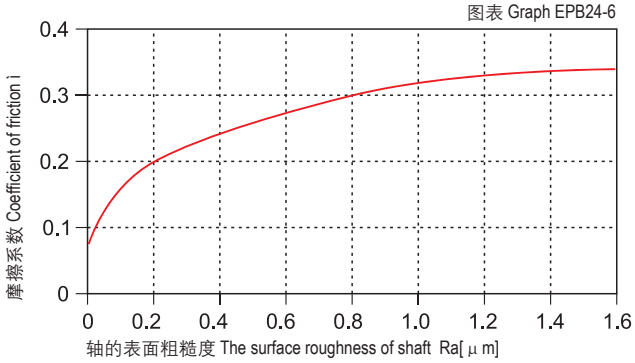
图表 Graph EPB24-4



摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

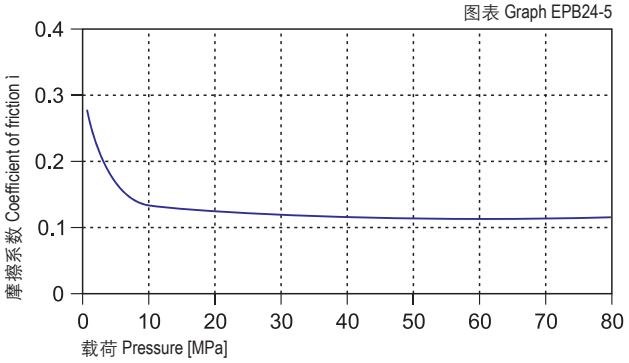
图表 Graph EPB24-6



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 EPB24-5



CSB-EPB24	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.10~0.30	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轴承同时适合用于硬质轴或软轴，在硬化钢轴和硬质阳极氧化轴上运行同样出色；但是硬铬钢轴不适合用于CSB-EPB24轴承。图表EPB24-8表明CSB-EPB24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 hardened shaft but the hardened chrome steel shaft is not good for CSB-EPB24 bearings. Graph EPB24-8 shows that 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 Absorbability

在标准大气压中，CSB-EPB24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，适合用于潮湿环境甚至水下。

The water absorb rate of CSB-EPB24 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-EPB24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

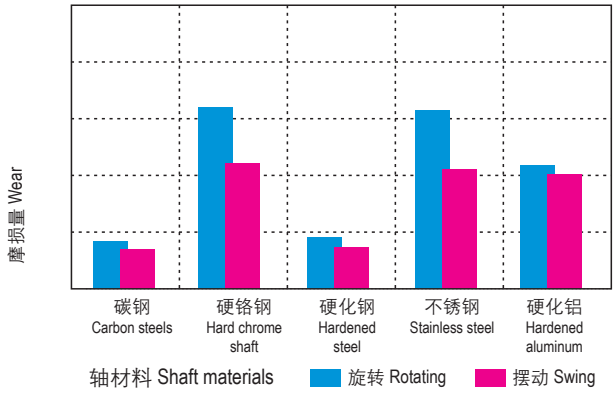
CSB-EPB24塑料轴承压装后公差 Tolerances after pressfit

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=2MPa, v=0.2m/s

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

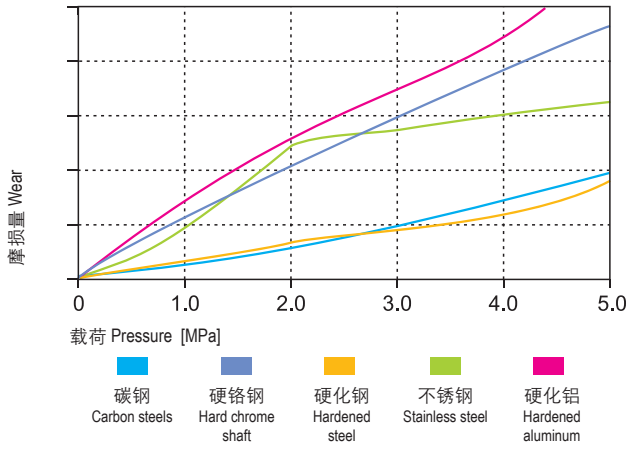
图表 Graph EPB24-7



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

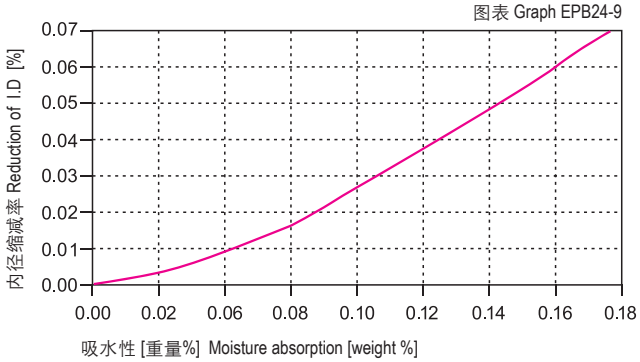
图表 Graph EPB24-8



吸水性的影响

Effect of moisture absorption on EPB24 bearings

图表 Graph EPB24-9



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

标准产品规格表 Standard specifications: P147

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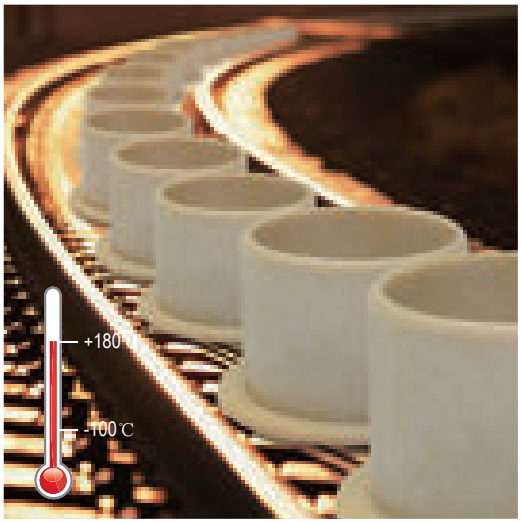
CSB-EPB™

工程塑料轴承 Plastic Plain Bearings EPB25



◉ 标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 高温180度下高耐磨材料。在旋转运动中耐磨性更为出色。对轴材料硬度要求较低
- 连续使用温度：-100℃/+180℃
- 适合干运行、免维护
- 应用于中高载荷
- 较低的摩擦系数

- Good wear resistance material under high temperature of 180℃. Better wear resistance for the rotation application and it has no critical requirement about the shaft hardness
- Continuous working temperature: -100℃/+180℃
- Maintenance-free dry operation
- Suitable in high load
- Lower 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-EPB25
密度 Density	ISO1183	g/cm^3	1.44
颜色 Color			黄色Yellow
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.08-0.20
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.45
最大旋转速度值 Max. roatating velocity		m/s	1.3
最大摇摆速度值 Max. oscillating velocity		m/s	1.0
最大直线速度值 Max. linear velocity		m/s	4.0
抗拉强度 Tensile strength	ISO527	MPa	55
抗压强度 (轴向) Compressive strength (Axial)		MPa	60
弹性模量 E-module	ISO527	MPa	2200
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	60
邵氏硬度 Shore hardness	ISO 868	D	80
连续工作温度 Continuous work temperature		℃	-100/180
短时运行温度 Short-time work temperature		℃	-100/210
导热性 Thermal conductivity	ASTME1461	W / m × k	0.24
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	7
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.3
最大吸水率23℃ Max. water absorption, 23℃		%	1.6
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{13}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{10}$

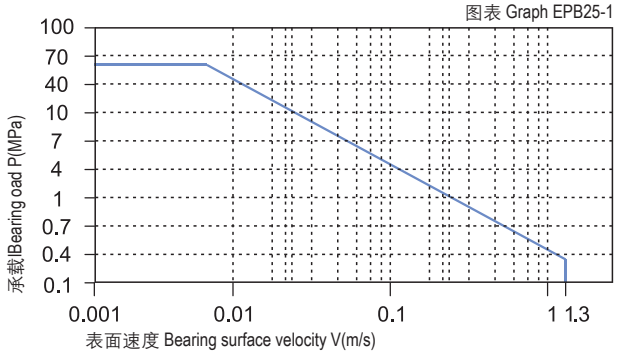
轴承PV值 PV Value

CSB-EPB25塑料轴承最大运行PV值为0.45N/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EPB25-1。

The max PV value of the CSB-EPB25 plastic bearings is 0.45N/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 EPB25-1).

■ PV图表 Permissible PV value for CSB-EPB25

图表 Graph EPB25-1



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

CSB-EPB25塑料轴承可承受最大静载荷为60Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB25-2，轴承实际工作载荷略小于60Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：1.3m/s) 会导致摩擦温度上升，而温度上升 (Tmax：180℃) 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EPB25-3。

CSB-EPB25 allows the Max static load of 60Mpa, The max compressive deformation rate under the max load is listed in Graph EPB25-2, The actual load capacity of bearing is slightly less than 60Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.3m/s) results into higher temperature (Tmax: 180℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB25-3 for such variation.

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

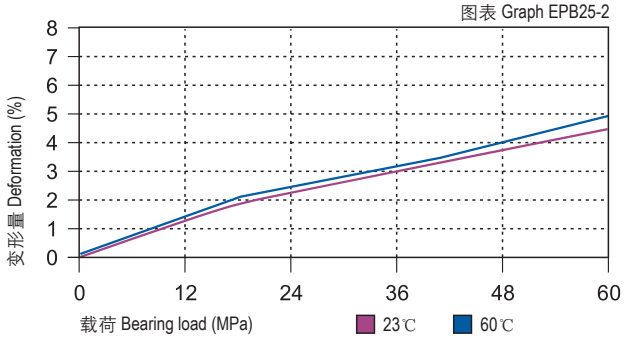
摩擦系数 Friction Factor

图表EPB25-4表明CSB-EPB25轴承的摩擦系数随着运动速度的变化影响较小，而图表EPB25-5表明CSB-EPB25轴承的摩擦系数随着载荷的增加明显减小，在载荷超过20Mpa是逐渐趋于平稳；图表EPB25-6表明CSB-EPB25轴承的摩擦系数受轴粗糙度的影响也相对比较小；虽然如此，我们还是建议轴的表面不能太光滑，也不能过于出差，推荐使用轴的粗糙度为Ra0.7 ~ 0.9um;

Graph EPB25-4 shows that the friction factor of CSB-EPB25 is not sensitive to the operation speed and Graph EPB25-5 shows that the friction factor of CSB-EPB25 is decreased along with the loading increasing and become stable when the loading is over 20Mpa. Graph EPB25-6 tells that the friction factor of CSB-EPB25 is also not sensitive to the shaft roughness but we still recommend the shaft roughness to be Ra0.7~0.9.

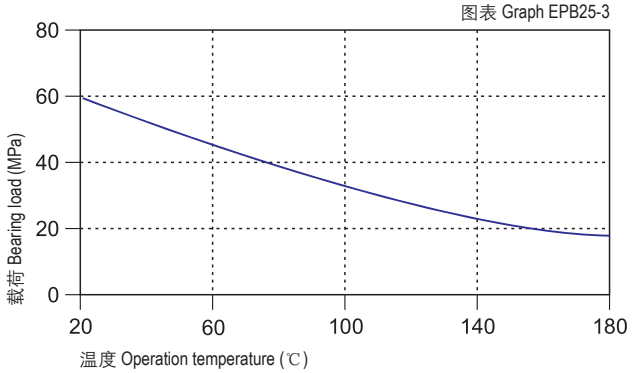
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB25-2



■ 载荷-温度图表 Load-Temperature diagrams

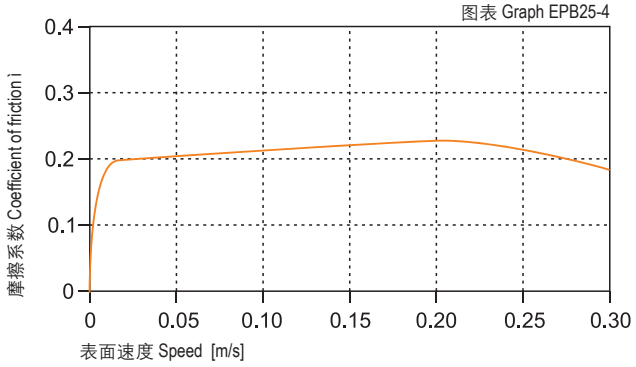
图表 Graph EPB25-3



■ 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

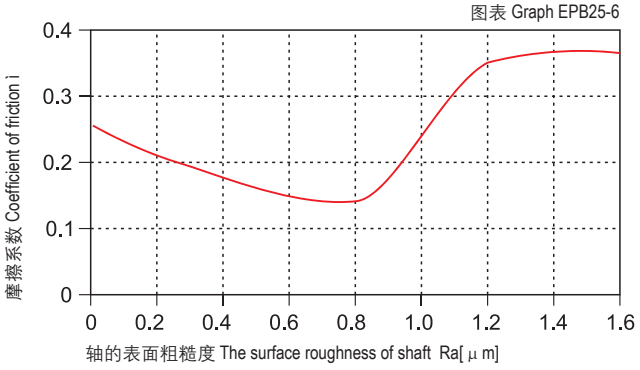
图表 Graph EPB25-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

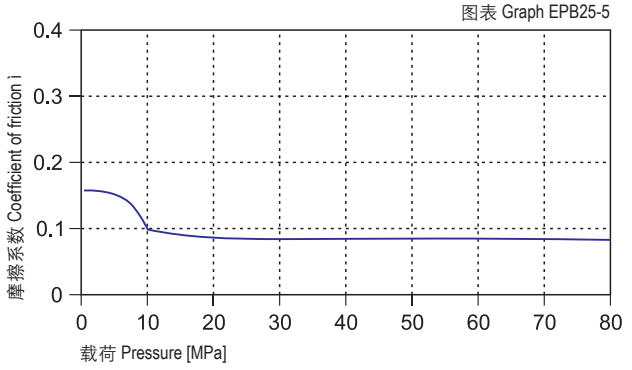
图表 Graph EPB25-6



■ 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 EPB25-5



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CSB-EPB25	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

图表EPB25-7表明CSB-EPB25轴承在2Mpa下做旋转运动时，磨损随着轴材料的变化较大；通过实验表明CSB-EPB25轴承在做旋转运动时比较适合用于硬轴，高速钢轴和硬铬轴上用于CSB-EPB25能获得良好的运行效果。图表EPB25-8表明硬铬轴更适合用于高载荷下的CSB-EPB25轴承，随着载荷的不断增加，轴承的磨损速率却变化较小。

Graph EPB25-7 shows that the wearing of CSB-EPB25 is sensitive to different materials under rotation operation with the loading of 2Mpa. It is suitable for hardened shaft, high speed steel shaft and hardened chrome steel shaft in the rotation operation. Hardened chrome steel shaft is the best choice for CSB-EPB25(Graph EPB25-8). The wearing will be decreased as long as the loading increasing.

化学抗性 Chemical Resistance

CSB-EPB25塑料轴承能抵抗弱碱以及各类润滑油的腐蚀。
CSB-EPB25 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-EPB25塑料轴承的吸水率为0.3%，浸泡水中最大平衡吸水率为1.6%；由于此吸水率的特性，我们必须考虑此轴承的应用环境。

The water absorb rate of CSB-EPB25 is 0.3% under the atmospheric pressure while it is 1.6% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

抗UV性能 UV Resistance

CSB-EPB25长久暴露在紫外线下颜色基本不会改变。材料性能基本都不会发生改变。

CSB-EPB25 can maintain its color unchanged when it is exposed into the UV ray. The material performance stays stable.

安装公差 Installation Tolerances

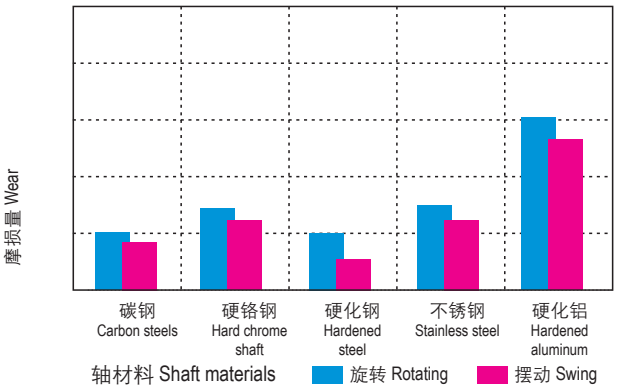
CSB-EPB25塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB25 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

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

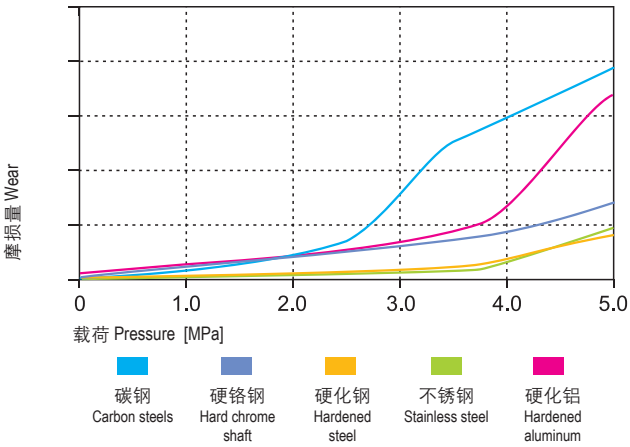
图表 Graph EPB25-7



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

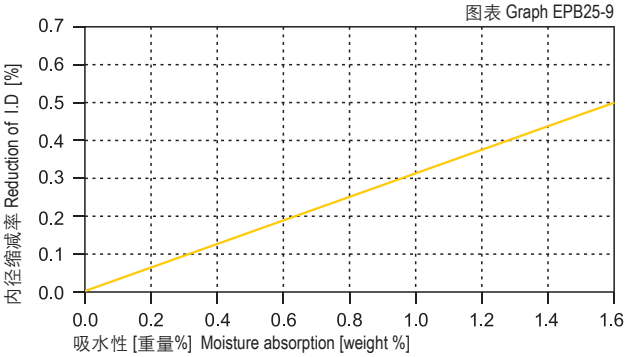
图表 Graph EPB25-8



吸水性的影响

Effect of moisture absorption on EPB25 bearings

图表 Graph EPB25-9



直径 Di. [mm]	CSB-EPB25 E10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
>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

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◉ 标准产品规格表 Standard specifications: P140

产品特性 Product Features

- 适用于软轴
- 耐磨性高
- 最高使用温度+200℃
- 高化学抗性
- 高弹性

- For soft shafts
- Excellent wear resistance
- Operation temperatures up to +200 ℃
- Good resistance to chemicals
- High elasticity

技术数据表 Technical data tabel

材料性能 Material Properties	试验方法 Testing Method	单位 Unit	CSB-EPB26
密度 Density	ISO1183	g/cm^3	1.51
颜色 Color			米色 Beige
对钢的动摩擦系数 Dynamic friction /steel(dry)			0.15-0.20
最大P.V值 Max. PV (dry)		$N/mm^2 \times m/s$	0.5
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	1.0
抗拉强度 Tensile strength	ISO527	MPa	47
抗压强度 (轴向) Compressive strength (Axial)		MPa	105
弹性模量 E-module	ISO527	MPa	4500
允许最大表面静压力(20℃)Max. static pressure of the surface, 20℃		MPa	45
邵氏硬度 Shore hardness	ISO 868	D	74
连续工作温度 Continuous work temperature		℃	-50/200
短时运行温度 Short-time work temperature		℃	-50/250
导热性 Thermal conductivity	ASTME1461	W / m × k	0.24
线性热膨胀系数 Linear coef. of thermal expansion	ASTMD696	$K^{-1} \times 10^{-5}$	3
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	＜0.1
最大吸水率23℃ Max. water absorption, 23℃		%	0.2
燃烧性能 Flammability	UL94		V0
体电阻率 Volume resistivity	IEC60093	Ω cm	$>10^{12}$
面电阻率 Surface resistivity	IEC60093	Ω	$>10^{12}$

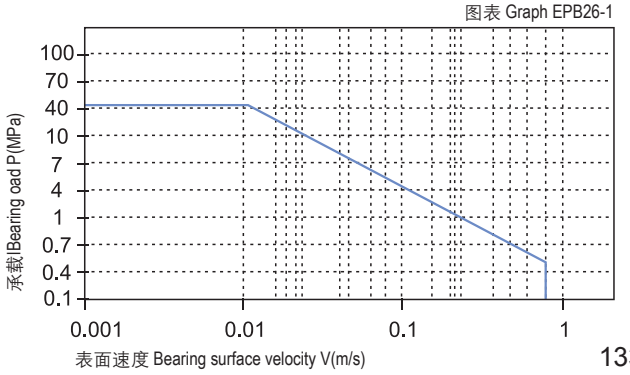
轴承PV值 PV Value

CSB-EPB26塑料轴承最大运行PV值0.5N/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EPB26-1。

The max PV value of the CSB-EPB26 plastic bearings is 0.5N/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 EPB26-1).

■ PV图表 Permissible PV value for CSB-EPB26

图表 Graph EPB26-1



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

CSB-EPB26塑料轴承可承受最大静载荷为45Mpa，在此载荷下轴承的最大压缩变形量参考图表EPB26-2，轴承实际工作载荷略小于45Mpa，载荷还受到运行速度以及温度的影响，速度越快 (Vmax：0.9m/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EPB26-3。

CSB-EPB26 allows the Max static load of 45Mpa, The max compressive deformation rate under the max load is listed in Graph EPB26-1, The actual load capacity of bearing is slightly less than 45Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 0.9m/s) results into higher temperature (Tmax: 200℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB26-3 for such variation.

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

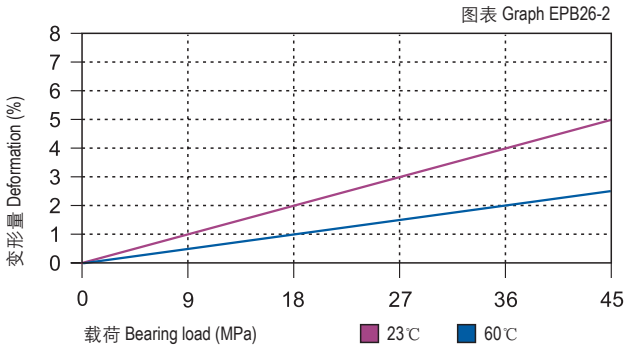
摩擦系数 Friction Factor

图表EPB26-4表明CSB-EPB26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EPB26-5表明CSB-EPB26轴承在保持速度不变的情况下，载荷从0增加到45Mpa过程中摩擦系数会逐步降低。图表EPB26-6表明CSB-EPB26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 ~ 0.6um。

Graph EPB26-4 shows the friction factor of CSB-EPB26 is not obviously effected by the operation speed when the loading is stable and Graph EPB26-5 shows it will be decreasing along with the loading is increased from 0 to 45 Mpa when the operation speed is unchanged. The friction factor of CSB-EPB26 is increased along with the increasing of the shaft roughness. The recommended shaft roughness is Ra0.1 to Ra0.6.

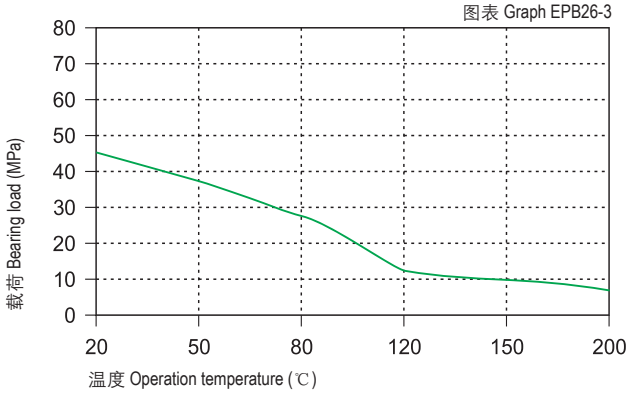
■ 载荷-温度-变形量图表 Load-Temperature deformation

图表 Graph EPB26-2



■ 载荷-温度图表 Load-Temperature diagrams

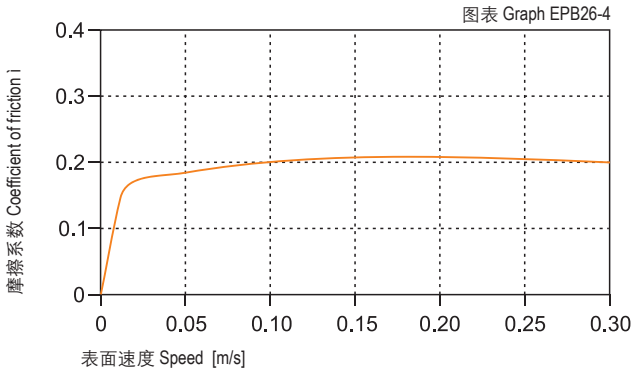
图表 Graph EPB26-3



■ 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

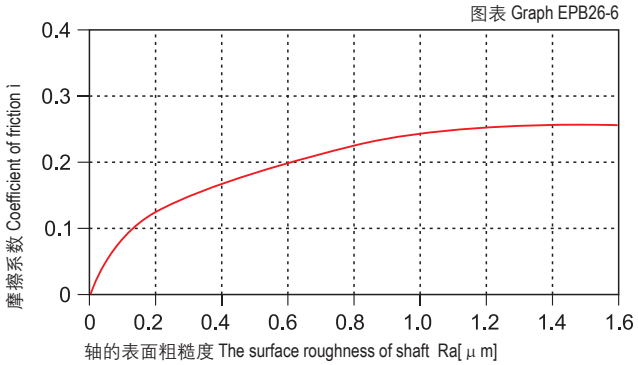
图表 Graph EPB26-4



■ 摩擦系数与轴表面粗糙度关系图表

Coefficient of friction & the surface roughness of shaft

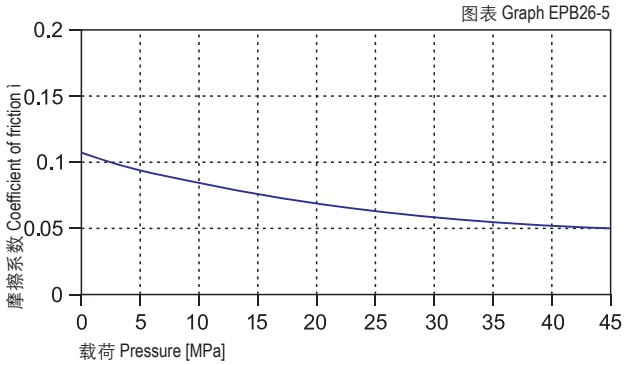
图表 Graph EPB26-6



■ 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 EPB26-5



CSB-EPB26	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.15~0.20	0.09	0.04	0.04

磨损与轴材料 Wearing and shaft material

图表EPB26-7与图表EPB26-8表明CSB-EPB26轴承同时适合用于硬质轴或软轴，在硬化钢轴和硬质阳极氧化轴上运行同样出色；但是硬化铝轴不适合用于CSB-EPB26轴承。图表EPB26-8表明CSB-EPB26轴承在做旋转运动下的磨损要略好于摆动运动下的磨损。

Graph EPB26-7 and Graph EPB26-8 tells that the CSB-EPB26 is very good for Hardened shaft and soft shaft and it features excellent both on hardened steel shaft and hardened shaft but the hardened aluminum shaft is not good for CSB-EPB26 bearings. Graph EPB26-8 shows that the wearing of CSB-EPB26 is better on rotation operation than on oscillation operation.

化学抗性 Chemical Resistance

CSB-EPB26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-EPB26 is fairly good against most of Acid and Alkalis.

吸水性 Water Absorbability

在标准大气压中，CSB-EPB26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，适合用于潮湿环境甚至水下。

The water absorb rate of CSB-EPB26 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-EPB26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-EPB26 after long period of exposing under the UV ray and therefore the compressive strength will be reduced.

安装公差 Installation Tolerances

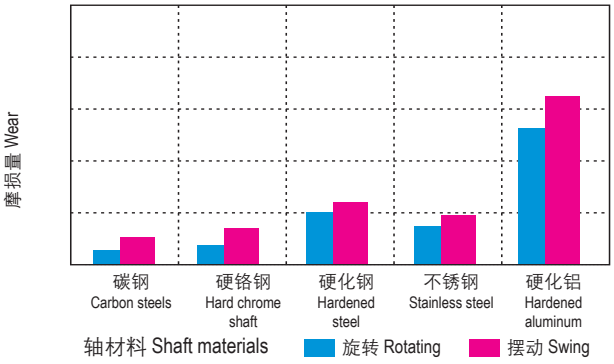
CSB-EPB26塑料轴承压装后公差 Tolerances after pressfit

直径 Di. [mm]	CSB-EPB26 E10 [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

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

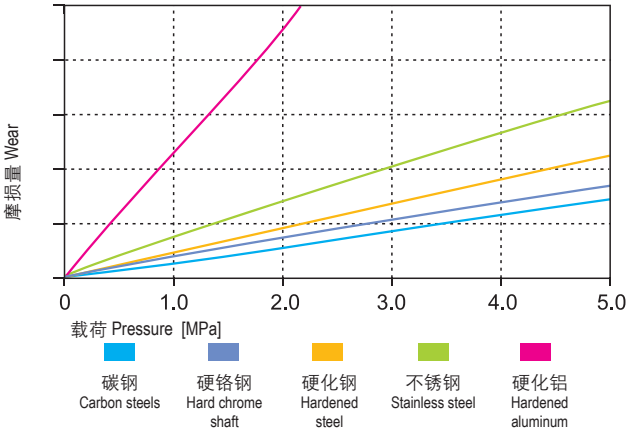
图表 Graph EPB26-7



旋转磨损随轴材料与压力变化关系 v=0.2m/s

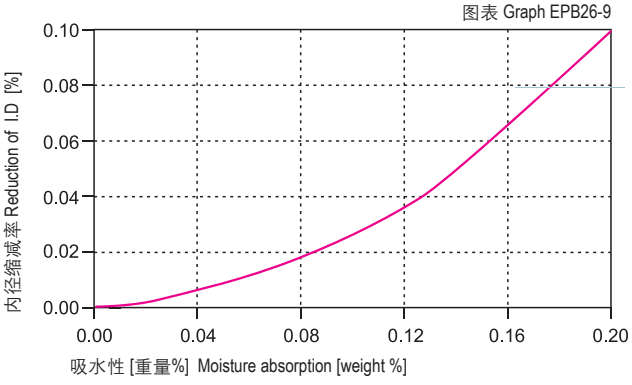
Wear & pressure under rotating with different shaft materials, v = 0.2 m/s

图表 Graph EPB26-8



吸水性的影响 Effect of moisture absorption on EPB26 bearings

图表 Graph EPB26-9



标准产品规格表 Standard specifications: P140

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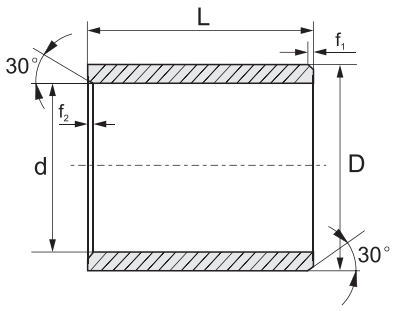
CSB-EPB™ Standard Specifications

EPB\EPBH\EPB1\EPB2\EPB2D\EPB6\EPB13\EPB18 标准规格

直套 Metric Cylindrical Bushings



推荐安装公差 Recommend fitting tolerance:
座孔 Housing: H7
轴 Shaft: h9
订购编码 Order PN:

EPB -0608-06
d D L
材料 Material

d	f_1	f_2
1-6	0.3	0.5
6-12	0.5	
12-30	0.8	
>30	1.2	

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB-0304-03	3	+0.014/+0.054	4.5	3
EPB-0304-05	3	+0.014/+0.054	4.5	5
EPB-0304-06	3	+0.014/+0.054	4.5	6
EPB-0305-05	3	+0.014/+0.054	5	5
EPB-0405-04	4	+0.02/+0.068	5.5	4
EPB-0405-06	4	+0.02/+0.068	5.5	6
EPB-0405-08	4	+0.02/+0.068	5.5	8
EPB-0406-06	4	+0.02/+0.068	6	6
EPB-0507-05	5	+0.02/+0.068	7	5
EPB-0507-08	5	+0.02/+0.068	7	8
EPB-0507-10	5	+0.02/+0.068	7	10
EPB-0507-12	5	+0.02/+0.068	7	12
EPB-0507-18	5	+0.02/+0.068	7	18
EPB-0608-04	6	+0.02/+0.068	8	4
EPB-0608-05	6	+0.02/+0.068	8	5
EPB-0608-06	6	+0.02/+0.068	8	6
EPB-0608-08	6	+0.02/+0.068	8	8
EPB-0608-10	6	+0.02/+0.068	8	10
EPB-0608-11	6	+0.02/+0.068	8	11
EPB-0810-05	8	+0.025/+0.083	10	5
EPB-0810-06	8	+0.025/+0.083	10	6
EPB-0810-08	8	+0.025/+0.083	10	8
EPB-0810-10	8	+0.025/+0.083	10	10
EPB-0810-11	8	+0.025/+0.083	10	11
EPB-0810-12	8	+0.025/+0.083	10	12
EPB-0810-15	8	+0.025/+0.083	10	15
EPB-0811-10	8	+0.025/+0.083	11	10
EPB-0812-10	8	+0.025/+0.083	12	10
EPB-0911-06	9	+0.025/+0.083	11	6
EPB-1012-04	10	+0.025/+0.083	12	4
EPB-1012-05	10	+0.025/+0.083	12	5
EPB-1012-06	10	+0.025/+0.083	12	6
EPB-1012-08	10	+0.025/+0.083	12	8
EPB-1012-10	10	+0.025/+0.083	12	10
EPB-1012-12	10	+0.025/+0.083	12	12

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB-1012-15	10	+0.025/+0.083	12	15
EPB-1014-10	10	+0.025/+0.083	14	10
EPB-1014-16	10	+0.025/+0.083	14	16
EPB-1012-18	10	+0.025/+0.083	12	18
EPB-1012-20	10	+0.025/+0.083	12	20
EPB-1214-06	12	+0.032/+0.102	14	6
EPB-1214-08	12	+0.032/+0.102	14	8
EPB-1214-10	12	+0.032/+0.102	14	10
EPB-1214-12	12	+0.032/+0.102	14	12
EPB-1214-15	12	+0.032/+0.102	14	15
EPB-1214-20	12	+0.032/+0.102	14	20
EPB-1214-25	12	+0.032/+0.102	14	25
EPB-1214-30	12	+0.032/+0.102	14	30
EPB-1215-20	12	+0.032/+0.102	15	20
EPB-1216-12	12	+0.032/+0.102	16	12
EPB-1315-07	13	+0.032/+0.102	15	7
EPB-1315-10	13	+0.032/+0.102	15	10
EPB-1416-08	14	+0.032/+0.102	16	8
EPB-1416-10	14	+0.032/+0.102	16	10
EPB-1416-12	14	+0.032/+0.102	16	12
EPB-1416-15	14	+0.032/+0.102	16	15
EPB-1416-20	14	+0.032/+0.102	16	20
EPB-1416-25	14	+0.032/+0.102	16	25
EPB-1517-10	15	+0.032/+0.102	17	10
EPB-1517-12	15	+0.032/+0.102	17	12
EPB-1517-15	15	+0.032/+0.102	17	15
EPB-1517-17	15	+0.032/+0.102	17	17
EPB-1517-20	15	+0.032/+0.102	17	20
EPB-1517-25	15	+0.032/+0.102	17	25
EPB-1618-10	16	+0.032/+0.102	18	10
EPB-1618-12	16	+0.032/+0.102	18	12
EPB-1618-15	16	+0.032/+0.102	18	15
EPB-1618-20	16	+0.032/+0.102	18	20
EPB-1618-25	16	+0.032/+0.102	18	25
EPB-1619-5.5S	16	+0.015/+0.055	19	5.5

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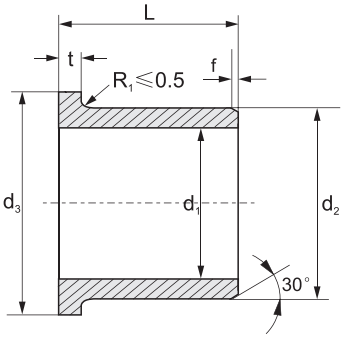
订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB-1620-16	16	+0.032/+0.102	20	16
EPB-1820-15	18	+0.032/+0.102	20	15
EPB-1820-20	18	+0.032/+0.102	20	20
EPB-1820-25	18	+0.032/+0.102	20	25
EPB-2022-12	20	+0.04/+0.124	22	12
EPB-2022-15	20	+0.04/+0.124	22	15
EPB-2022-28	20	+0.04/+0.124	22	28
EPB-2023-10	20	+0.04/+0.124	23	10
EPB-2023-15	20	+0.04/+0.124	23	15
EPB-2023-20	20	+0.04/+0.124	23	20
EPB-2023-23	20	+0.04/+0.124	23	23
EPB-2023-25	20	+0.04/+0.124	23	25
EPB-2023-30	20	+0.04/+0.124	23	30
EPB-2025-15	20	+0.04/+0.124	25	15
EPB-2225-15	22	+0.04/+0.124	25	15
EPB-2225-20	22	+0.04/+0.124	25	20
EPB-2225-25	22	+0.04/+0.124	25	25
EPB-2225-30	22	+0.04/+0.124	25	30
EPB-2528-10	25	+0.04/+0.124	28	10
EPB-2528-12	25	+0.04/+0.124	28	12
EPB-2528-15	25	+0.04/+0.124	28	15
EPB-2528-20	25	+0.04/+0.124	28	20
EPB-2528-25	25	+0.04/+0.124	28	25
EPB-2528-30	25	+0.04/+0.124	28	30
EPB-2529-25	25	+0.04/+0.124	29	25
EPB-2530-25	25	+0.02/+0.104	30	25
EPB-2832-20	28	+0.04/+0.124	32	20
EPB-2832-25	28	+0.04/+0.124	32	25
EPB-2832-30	28	+0.04/+0.124	32	30
EPB-3034-20	30	+0.04/+0.124	34	20
EPB-3034-25	30	+0.04/+0.124	34	25
EPB-3034-30	30	+0.04/+0.124	34	30
EPB-3034-40	30	+0.04/+0.124	34	40

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB-3236-20	32	+0.05/+0.15	36	20
EPB-3236-23	32	+0.05/+0.15	36	23
EPB-3236-25	32	+0.05/+0.15	36	25
EPB-3236-30	32	+0.05/+0.15	36	30
EPB-3236-40	32	+0.05/+0.15	36	40
EPB-3539-15	35	+0.05/+0.15	39	15
EPB-3539-20	35	+0.05/+0.15	39	20
EPB-3539-25	35	+0.05/+0.15	39	25
EPB-3539-30	35	+0.05/+0.15	39	30
EPB-3539-40	35	+0.05/+0.15	39	40
EPB-3539-50	35	+0.05/+0.15	39	50
EPB-4044-20	40	+0.05/+0.15	44	20
EPB-4044-30	40	+0.05/+0.15	44	30
EPB-4044-40	40	+0.05/+0.15	44	40
EPB-4044-50	40	+0.05/+0.15	44	50
EPB-4550-30	45	+0.05/+0.15	50	30
EPB-4550-40	45	+0.05/+0.15	50	40
EPB-4550-50	45	+0.05/+0.15	50	50
EPB-5055-10	50	+0.05/+0.15	55	10
EPB-5055-20	50	+0.05/+0.15	55	20
EPB-5055-30	50	+0.05/+0.15	55	30
EPB-5055-40	50	+0.05/+0.15	55	40
EPB-5055-50	50	+0.05/+0.15	55	50
EPB-5456-30	54	+0.060/+0.180	56	30
EPB-6065-50	60	+0.060/+0.180	65	50
EPB-7075-50	70	+0.060/+0.180	75	50
EPB-8085-40	80	+0.060/+0.180	85	40
EPB-8590-40	85	+0.072/+0.212	90	40
EPB-125130-60S	125	+0.043/+0.143	130	60
EPB-150155-60S	150	+0.043/+0.143	155	60

*d公差为压入标准H7座孔（符合ISO3547-1）后公差
*Tolerance d: after being pressed into housing H7 (ISO3547-1)

翻边轴套 Metric Flange Bushings



推荐安装公差 Recommend fitting tolerance:
座孔 Housing: H7
轴 Shaft: h9
订购编码 Order PN:

EPB F-0608-06
d1 d2 L
翻边轴套 Flange bushes
材料 Material

d	f
1-6	0.3
6-12	0.5
12-30	0.8
>30	1.2

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CSB-EPB™ Standard Specifications

EPB\EPBH\EPB1\EPB2\EPB2D\EPB6\EPB13\EPB18 标准规格

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{-0.14}$ [mm]
EPBF-0304-03	3	+0.014/+0.054	4.5	7.5	3	0.75
EPBF-0304-05	3	+0.014/+0.054	4.5	7.5	5	0.75
EPBF-0405-03	4	+0.02/+0.068	5.5	9.5	3	0.75
EPBF-0405-06	4	+0.02/+0.068	5.5	9.5	6	0.75
EPBF-0507-03	5	+0.02/+0.068	7	11	3	1
EPBF-0507-04	5	+0.02/+0.068	7	11	4	1
EPBF-0507-05	5	+0.02/+0.068	7	11	5	1
EPBF-0608-04	6	+0.02/+0.068	8	12	4	1
EPBF-0608-05	6	+0.02/+0.068	8	12	5	1
EPBF-0608-06	6	+0.02/+0.068	8	12	6	1
EPBF-0608-08	6	+0.02/+0.068	8	12	8	1
EPBF-0608-10	6	+0.02/+0.068	8	12	10	1
EPBF-0810-05	8	+0.025/+0.083	10	15	5	1
EPBF-0810-06	8	+0.025/+0.083	10	15	6	1
EPBF-0810-07	8	+0.025/+0.083	10	15	7	1
EPBF-0810-09	8	+0.025/+0.083	10	15	9	1
EPBF-0810-10	8	+0.025/+0.083	10	15	10	1
EPBF-081014-12	8	+0.025/+0.083	10	14	12	1
EPBF-081014-12F2	8	+0.025/+0.083	10	14	12	2
EPBF-0810-12	8	+0.025/+0.083	10	15	12	1
EPBF-081018-13	8	+0.025/+0.083	10	18	13	1
EPBF-081017-15	8	+0.025/+0.083	10	17	15	1
EPBF-081216-10	8	+0.013/+0.071	12	16	10	2
EPBF-0912-10	9	+0.025/+0.083	12	18	10	2
EPBF-1012-05	10	+0.025/+0.083	12	18	5	1
EPBF-1012-06	10	+0.025/+0.083	12	18	6	1
EPBF-1012-07	10	+0.025/+0.083	12	18	7	1
EPBF-1012-08	10	+0.025/+0.083	12	18	8	1
EPBF-1012-09	10	+0.025/+0.083	12	18	9	1
EPBF-1012-10	10	+0.025/+0.083	12	18	10	1
EPBF-1012-12	10	+0.025/+0.083	12	18	12	1
EPBF-1012-15	10	+0.025/+0.083	12	18	15	1
EPBF-1012-17	10	+0.025/+0.083	12	18	17	1
EPBF-101216-12	10	+0.013/+0.071	12	16	12	2
EPBF-101418-10	10	+0.013/+0.071	14	18	10	2
EPBF-1214-04	12	+0.032/+0.102	14	20	4	1
EPBF-1214-05	12	+0.032/+0.102	14	20	5	1
EPBF-1214-06	12	+0.032/+0.102	14	20	6	1
EPBF-1214-07	12	+0.032/+0.102	14	20	7	1
EPBF-1214-09	12	+0.032/+0.102	14	20	9	1
EPBF-1214-10	12	+0.032/+0.102	14	20	10	1
EPBF-1214-12	12	+0.032/+0.102	14	20	12	1
EPBF-1214-13	12	+0.032/+0.102	14	20	13	1
EPBF-1214-15	12	+0.032/+0.102	14	20	15	1
EPBF-1214-17	12	+0.032/+0.102	14	20	17	1
EPBF-1214-18	12	+0.032/+0.102	14	20	18	1
EPBF-1214-20	12	+0.032/+0.102	14	20	20	1
EPBF-121417-04	12	+0.032/+0.102	14	17	4	1
EPBF-121417-05	12	+0.032/+0.102	14	17	5	1
EPBF-121418-12F2	12	+0.016/+0.086	14	18	12	2
EPBF-121418-25	12	+0.032/+0.102	14	18	25	1
EPBF-121418-40F2	12	+0.016/+0.086	14	18	40	2
EPBF-121620-10	12	+0.016/+0.086	16	20	10	2
EPBF-121620-12	12	+0.016/+0.086	16	20	12	2

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{-0.14}$ [mm]
EPBF-131519-12	13	+0.032/+0.102	15	19	12	1
EPBF-1416-052	14	+0.032/+0.102	16	22	5.2	1
EPBF-1416-08	14	+0.032/+0.102	16	22	8	1
EPBF-1416-10	14	+0.032/+0.102	16	22	10	1
EPBF-1416-12	14	+0.032/+0.102	16	22	12	1
EPBF-1416-17	14	+0.032/+0.102	16	22	17	1
EPBF-141620-06	14	+0.016/+0.086	16	20	6	2
EPBF-141620-15	14	+0.016/+0.086	16	20	15	2
EPBF-141822-20	14	+0.032/+0.102	18	22	20	2
EPBF-151720-05	15	+0.032/+0.102	17	20	5	1
EPBF-1517-09	15	+0.032/+0.102	17	23	9	1
EPBF-1517-12	15	+0.032/+0.102	17	23	12	1
EPBF-151720-12	15	+0.032/+0.102	17	20	12	1
EPBF-1517-15	15	+0.032/+0.102	17	23	15	1
EPBF-1517-17	15	+0.032/+0.102	17	23	17	1
EPBF-1517-20	15	+0.032/+0.102	17	23	20	1
EPBF-1518-12	15	+0.032/+0.102	18	23	12	1
EPBF-1517-25	15	+0.032/+0.102	17	23	25	1
EPBF-1618-12	16	+0.032/+0.102	18	24	12	1
EPBF-1618-17	16	+0.032/+0.102	18	24	17	1
EPBF-161822-22	16	+0.016/+0.086	18	22	22	2
EPBF-162024-16	16	+0.016/+0.086	20	24	16	2
EPBF-162024-22	16	+0.016/+0.086	20	24	22	2
EPBF-1820-12	18	+0.032/+0.102	20	26	12	1
EPBF-1820-17	18	+0.032/+0.102	20	26	17	1
EPBF-1820-20	18	+0.032/+0.102	20	26	20	1
EPBF-182024-22	18	+0.016/+0.086	20	24	22	2
EPBF-2022-15	20	+0.04/+0.124	22	25	15	1.5
EPBF-2023-11.5	20	+0.04/+0.124	23	30	11.5	1.5
EPBF-2023-16.5	20	+0.04/+0.124	23	30	16.5	1.5
EPBF-2023-21.5	20	+0.04/+0.124	23	30	21.5	1.5
EPBF-2023-25	20	+0.04/+0.124	23	30	25	1.5
EPBF-202330-15	20	+0.02/+0.104	23	30	15	2
EPBF-202330-22	20	+0.02/+0.104	23	30	22	2
EPBF-202430-20	20	+0.02/+0.104	24	30	20	2
EPBF-202530-15	20	+0.02/+0.104	25	30	15	2
EPBF-202732-20	20	+0.02/+0.104	27	32	20	2
EPBF-2225-11.5	22	+0.04/+0.124	25	33	11.5	1.5
EPBF-2528-11.5	25	+0.04/+0.124	28	35	11.5	1.5
EPBF-2528-16.5	25	+0.04/+0.124	28	35	16.5	1.5
EPBF-2528-21.5	25	+0.04/+0.124	28	35	21.5	1.5
EPBF-252835-22	25	+0.02/+0.104	28	35	22	2
EPBF-252835-32	25	+0.02/+0.104	28	35	32	2
EPBF-253035-20	25	+0.02/+0.104	30	35	20	2.5
EPBF-253035-25	25	+0.02/+0.104	30	35	25	2.5
EPBF-303335-04	30	+0.02/+0.104	33	35	4	1
EPBF-3034-09	30	+0.04/+0.124	34	42	9	2
EPBF-3034-16	30	+0.04/+0.124	34	42	16	2
EPBF-3034-26	30	+0.04/+0.124	34	42	26	2
EPBF-3034-32	30	+0.04/+0.124	34	42	32	2
EPBF-3034-37	30	+0.04/+0.124	34	42	37	2
EPBF-303445-18	30	+0.02/+0.104	34	45	18	2
EPBF-303445-22	30	+0.02/+0.104	34	45	22	2
EPBF-303445-32	30	+0.04/+0.124	34	45	32	2

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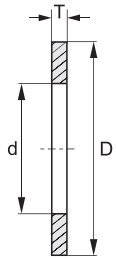
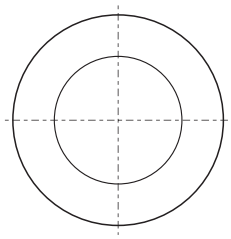
订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{-0.14}$ [mm]
EPBF-3236-16	32	+0.05/+0.15	36	40	16	2
EPBF-3236-26	32	+0.05/+0.15	36	40	26	2
EPBF-3539-16	35	+0.05/+0.15	39	47	16	2
EPBF-3539-26	35	+0.05/+0.15	39	47	26	2
EPBF-353950-22	35	+0.025/+0.125	39	50	22	2
EPBF-4044-30	40	+0.05/+0.15	44	52	30	2
EPBF-4044-40	40	+0.05/+0.15	44	52	40	2
EPBF-404455-17	40	+0.025/+0.125	44	55	17	2
EPBF-4550-25	45	+0.05/+0.15	50	58	25	2
EPBF-4550-45	45	+0.05/+0.15	50	58	45	2
EPBF-4550-50	45	+0.05/+0.15	50	58	50	2
EPBF-455060-45	45	+0.025/+0.125	50	60	45	2.5
EPBF-5055-20	50	+0.05/+0.15	55	63	20	2
EPBF-5055-30	50	+0.05/+0.15	55	63	30	2

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{-0.14}$ [mm]
EPBF-5055-40	50	+0.05/+0.15	55	63	40	2
EPBF-5055-50	50	+0.05/+0.15	55	63	50	2
EPBF-505563-50	50	+0.025/+0.125	55	63	50	2
EPBF-505565-20.5	50	+0.025/+0.125	55	65	20.5	2.5
EPBF-6065-60	60	+0.06/+0.18	65	73	60	2
EPBF-657080-60	65	+0.03/+0.15	70	80	60	2.5
EPBF-7075-50	70	+0.060/+0.180	75	83	50	2
EPBF-758090-25	75	+0.030/+0.150	80	90	25	2.5
EPBF-758090-40	75	+0.030/+0.150	80	90	40	2.5
EPBF-9095110-50	90	+0.036/+0.176	95	110	50	2.5
EPBF-120125140-50	120	+0.072/+0.212	125	140	50	2.5

*d_1公差为压入标准H7座孔（ISO3547-1）后公差
*Tolerance d_1: after being pressed into housing H7(ISO3547-1)

垫片 Metric Thrust Washers





订购编码 Order PN:

EPBW-0818-015

d D T

垫片 Washer

材料Material

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPBW-0509-006	5	9	0.6
EPBW-0615-015	6	15	1.5
EPBW-0620-015	6	20	1.5
EPBW-0815-005	8	15	0.5
EPBW-0815-015	8	15	1.5
EPBW-0818-010	8	18	1.0
EPBW-0818-015	8	18	1.5
EPBW-1018-010	10	18	1.0
EPBW-1018-015	10	18	1.5
EPBW-1018-020	10	18	2.0
EPBW-1024-015	10	24	1.5
EPBW-1224-015	12	24	1.5
EPBW-1226-015	12	26	1.5
EPBW-1426-015	14	26	1.5
EPBW-1430-015	14	30	1.5
EPBW-1524-015	15	24	1.5
EPBW-1630-015	16	30	1.5
EPBW-1632-015	16	32	1.5
EPBW-1832-015	18	32	1.5
EPBW-1836-015	18	36	1.5

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPBW-2030-015	20	30	1.5
EPBW-2036-015	20	36	1.5
EPBW-2038-015	20	38	1.5
EPBW-2238-015	22	38	1.5
EPBW-2242-015	22	42	1.5
EPBW-2442-015	24	42	1.5
EPBW-2444-015	24	44	1.5
EPBW-2548-015	25	48	1.5
EPBW-2644-015	26	44	1.5
EPBW-2848-015	28	48	1.5
EPBW-3054-015	30	54	1.5
EPBW-3254-015	32	54	1.5
EPBW-3662-015	36	62	1.5
EPBW-3862-015	38	62	1.5
EPBW-4266-015	42	66	1.5
EPBW-4674-020	46	74	2.0
EPBW-4874-020	48	74	2.0
EPBW-5178-020	51	78	2.0
EPBW-5278-020	52	78	2.0
EPBW-6290-020	62	90	2.0

*根据要求提供定位孔设计 The fixing bore design upon request.

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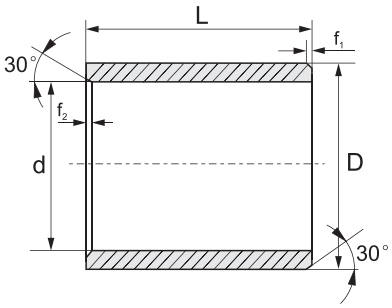
CSB-EPB™ Standard Specifications

EPB3\EPB3G\EPB5A\EPB9\EPB12\EPB16\EPB20\EPB21\EPB22\EPB23\EPB25\EPB26 标准规格

直套 Metric Cylindrical Bushings



推荐安装公差 Recommend fitting tolerance:

座孔 Housing: H7

轴 Shaft: h9

订购编码 Order PN:

EPB3 -0608-06

d D L

材料 Material

d	f_1	f_2
1-6	0.3	0.5
6-12	0.5	
12-30	0.8	
>30	1.2	

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB3-0203-03	2	+0.014/+0.054	3.5	3
EPB3-0304-03	3	+0.014/+0.054	4.5	3
EPB3-0304-05	3	+0.014/+0.054	4.5	5
EPB3-0304-06	3	+0.014/+0.054	4.5	6
EPB3-0405-04	4	+0.02/+0.068	5.5	4
EPB3-0405-06	4	+0.02/+0.068	5.5	6
EPB3-0506-05S	5	+0.01/+0.04	6	5
EPB3-0507-05	5	+0.02/+0.068	7	5
EPB3-0507-08	5	+0.02/+0.068	7	8
EPB3-0507-10	5	+0.02/+0.068	7	10
EPB3-0608-04	6	+0.02/+0.068	8	4
EPB3-0608-05	6	+0.02/+0.068	8	5
EPB3-0608-06	6	+0.02/+0.068	8	6
EPB3-0608-08	6	+0.02/+0.068	8	8
EPB3-0608-09	6	+0.02/+0.068	8	9
EPB3-0608-10	6	+0.02/+0.068	8	10
EPB3-0608-11	6	+0.02/+0.068	8	11
EPB3-0810-05	8	+0.025/+0.083	10	5
EPB3-0810-06	8	+0.025/+0.083	10	6
EPB3-0810-07	8	+0.025/+0.083	10	7
EPB3-0810-08	8	+0.025/+0.083	10	8
EPB3-0810-10	8	+0.025/+0.083	10	10
EPB3-0810-12	8	+0.025/+0.083	10	12
EPB3-0810-13	8	+0.025/+0.083	10	13
EPB3-0810-15	8	+0.025/+0.083	10	15
EPB3-0810-21	8	+0.025/+0.083	10	21
EPB3-1011-06	10	+0.025/+0.083	11	6
EPB3-1012-04	10	+0.025/+0.083	12	4
EPB3-1012-05	10	+0.025/+0.083	12	5
EPB3-1012-06	10	+0.025/+0.083	12	6
EPB3-1012-07	10	+0.025/+0.083	12	7
EPB3-1012-08	10	+0.025/+0.083	12	8
EPB3-1012-09	10	+0.025/+0.083	12	9
EPB3-1012-10	10	+0.025/+0.083	12	10
EPB3-1012-12	10	+0.025/+0.083	12	12
EPB3-1012-14	10	+0.025/+0.083	12	14

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB3-1012-15	10	+0.025/+0.083	12	15
EPB3-1012-17	10	+0.025/+0.083	12	17
EPB3-1012-20	10	+0.025/+0.083	12	20
EPB3-1213-12S	12	+0.016/+0.059	13	12
EPB3-1214-04	12	+0.032/+0.102	14	4
EPB3-1214-06	12	+0.032/+0.102	14	6
EPB3-1214-08	12	+0.032/+0.102	14	8
EPB3-1214-10	12	+0.032/+0.102	14	10
EPB3-1214-12	12	+0.032/+0.102	14	12
EPB3-1214-14	12	+0.032/+0.102	14	14
EPB3-1214-15	12	+0.032/+0.102	14	15
EPB3-1214-20	12	+0.032/+0.102	14	20
EPB3-1214-25	12	+0.032/+0.102	14	25
EPB3-1315-15	13	+0.032/+0.102	15	15
EPB3-1315-25	13	+0.032/+0.102	15	25
EPB3-1416-03	14	+0.032/+0.102	16	3
EPB3-1416-08	14	+0.032/+0.102	16	8
EPB3-1416-10	14	+0.032/+0.102	16	10
EPB3-1416-15	14	+0.032/+0.102	16	15
EPB3-1416-20	14	+0.032/+0.102	16	20
EPB3-1416-25	14	+0.032/+0.102	16	25
EPB3-1517-10	15	+0.032/+0.102	17	10
EPB3-1517-12	15	+0.032/+0.102	17	12
EPB3-1517-15	15	+0.032/+0.102	17	15
EPB3-1517-20	15	+0.032/+0.102	17	20
EPB3-1517-25	15	+0.032/+0.102	17	25
EPB3-1618-10	16	+0.032/+0.102	18	10
EPB3-1618-12	16	+0.032/+0.102	18	12
EPB3-1618-15	16	+0.032/+0.102	18	15
EPB3-1618-20	16	+0.032/+0.102	18	20
EPB3-1618-25	16	+0.032/+0.102	18	25
EPB3-1618-30	16	+0.032/+0.102	18	30
EPB3-1820-10	18	+0.032/+0.102	20	10
EPB3-1820-12	18	+0.032/+0.102	20	12
EPB3-1820-15	18	+0.032/+0.102	20	15
EPB3-1820-20	18	+0.032/+0.102	20	20

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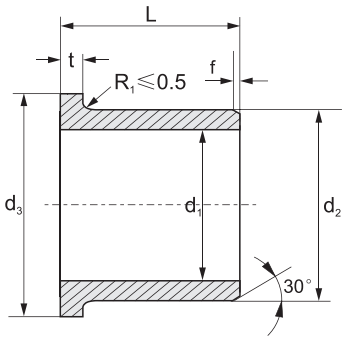
订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB3-1820-25	18	+0.032/+0.102	20	25
EPB3-2022-20	20	+0.04/+0.124	22	20
EPB3-2022-30	20	+0.04/+0.124	22	30
EPB3-2023-10	20	+0.04/+0.124	23	10
EPB3-2023-15	20	+0.04/+0.124	23	15
EPB3-2023-20	20	+0.04/+0.124	23	20
EPB3-2023-25	20	+0.04/+0.124	23	25
EPB3-2023-30	20	+0.04/+0.124	23	30
EPB3-2225-15	22	+0.04/+0.124	25	15
EPB3-2225-20	22	+0.04/+0.124	25	20
EPB3-2225-25	22	+0.04/+0.124	25	25
EPB3-2225-30	22	+0.04/+0.124	25	30
EPB3-2528-12	25	+0.04/+0.124	28	12
EPB3-2528-15	25	+0.04/+0.124	28	15
EPB3-2528-20	25	+0.04/+0.124	28	20
EPB3-2528-24	25	+0.04/+0.124	28	24
EPB3-2528-25	25	+0.04/+0.124	28	25
EPB3-2528-30	25	+0.04/+0.124	28	30
EPB3-2528-35	25	+0.04/+0.124	28	35
EPB3-2832-30	28	+0.04/+0.124	32	30
EPB3-3034-15	30	+0.04/+0.124	34	15
EPB3-3034-20	30	+0.04/+0.124	34	20
EPB3-3034-24	30	+0.04/+0.124	34	24
EPB3-3034-25	30	+0.04/+0.124	34	25
EPB3-3034-30	30	+0.04/+0.124	34	30
EPB3-3034-35	30	+0.04/+0.124	34	35
EPB3-3034-40	30	+0.04/+0.124	34	40
EPB3-3236-30	32	+0.05/+0.15	36	30
EPB3-3236-40	32	+0.05/+0.15	36	40
EPB3-3539-14	35	+0.05/+0.15	39	14
EPB3-3539-20	35	+0.05/+0.15	39	20
EPB3-3539-25	35	+0.05/+0.15	39	25
EPB3-3539-30	35	+0.05/+0.15	39	30

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB3-3539-40	35	+0.05/+0.15	39	40
EPB3-3539-50	35	+0.05/+0.15	39	50
EPB3-3640-20	36	+0.05/+0.15	40	20
EPB3-4044-10	40	+0.05/+0.15	44	10
EPB3-4044-16	40	+0.05/+0.15	44	16
EPB3-4044-20	40	+0.05/+0.15	44	20
EPB3-4044-30	40	+0.05/+0.15	44	30
EPB3-4044-40	40	+0.05/+0.15	44	40
EPB3-4044-50	40	+0.05/+0.15	44	50
EPB3-4246-40	42	+0.05/+0.15	46	40
EPB3-4246-50	42	+0.05/+0.15	46	50
EPB3-4550-40	45	+0.05/+0.15	50	40
EPB3-4550-50	45	+0.05/+0.15	50	50
EPB3-5055-20	50	+0.05/+0.15	55	20
EPB3-5055-30	50	+0.05/+0.15	55	30
EPB3-5055-40	50	+0.05/+0.15	55	40
EPB3-5055-50	50	+0.05/+0.15	55	50
EPB3-5560-20	55	+0.06/+0.18	60	20
EPB3-5560-26	55	+0.06/+0.18	60	26
EPB3-5560-40	55	+0.06/+0.18	60	40
EPB3-5560-50	55	+0.06/+0.18	60	50
EPB3-5560-60	55	+0.06/+0.18	60	60
EPB3-6065-30	60	+0.06/+0.18	65	30
EPB3-6065-40	60	+0.06/+0.18	65	40
EPB3-6065-50	60	+0.06/+0.18	65	50
EPB3-6065-60	60	+0.06/+0.18	65	60
EPB3-6570-50	65	+0.06/+0.18	70	50
EPB3-7075-60	70	+0.06/+0.18	75	60
EPB3-7580-40	75	+0.06/+0.18	80	40
EPB3-115121-90	115	+0.072/+0.212	121	90
EPB3-120125-100	120	+0.072/+0.212	125	100

*d公差为压入标准H7座孔（ISO3547-1）后公差
*Tolerance d: after being pressed into housing H7(ISO3547-1)

翻边轴套 Metric Flange Bushings



推荐安装公差 Recommend fitting tolerance:
座孔 Housing: H7
轴 Shaft: h9
订购编码 Order PN:

EPB3F-0608-06
d1 d2 L
翻边轴套 Flange bushes
材料 Material

d	f
1-6	0.3
6-12	0.5
12-30	0.8
>30	1.2

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CSB-EPB™ Standard Specifications

EPB3\EPB3G\EPB5A\EPB9\EPB12\EPB16\EPB20\EPB21\EPB22\EPB23\EPB25\EPB26 标准规格

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{0.14}$ [mm]
EPB3F-0304-03	3	+0.014/+0.054	4.5	7.5	3	0.75
EPB3F-0304-05	3	+0.014/+0.054	4.5	7.5	5	0.75
EPB3F-0405-03	4	+0.02/+0.068	5.5	9.5	3	0.75
EPB3F-0405-04	4	+0.02/+0.068	5.5	9.5	4	0.75
EPB3F-0405-06	4	+0.02/+0.068	5.5	9.5	6	0.75
EPB3F-0506-3.5S	5	+0.01/+0.04	6	10	3.5	0.5
EPB3F-0506-05S	5	+0.01/+0.04	6	10	5	0.5
EPB3F-050614-06S	5	+0.01/+0.04	6	14	6	0.5
EPB3F-0507-03	5	+0.02/+0.068	7	11	3	1
EPB3F-0507-04	5	+0.02/+0.068	7	11	4	1
EPB3F-0507-05	5	+0.02/+0.068	7	11	5	1
EPB3F-0507-07	5	+0.02/+0.068	7	11	7	1
EPB3F-0607-10	6	+0.01/+0.04	7	11	10	0.5
EPB3F-0608-04	6	+0.02/+0.068	8	12	4	1
EPB3F-0608-05	6	+0.02/+0.068	8	12	5	1
EPB3F-0608-06	6	+0.02/+0.068	8	12	6	1
EPB3F-0608-07	6	+0.02/+0.068	8	12	7	1
EPB3F-0608-08	6	+0.02/+0.068	8	12	8	1
EPB3F-0608-10	6	+0.02/+0.068	8	12	10	1
EPB3F-0708-08S	7	+0.013/+0.049	8	12	8	0.5
EPB3F-0809-12	8	+0.013/+0.049	9	13	12	0.5
EPB3F-0810-04	8	+0.025/+0.083	10	15	4	1
EPB3F-0810-05	8	+0.025/+0.083	10	15	5	1
EPB3F-0810-07	8	+0.025/+0.083	10	15	7	1
EPB3F-0810-09	8	+0.025/+0.083	10	15	9	1
EPB3F-0810-10	8	+0.025/+0.083	10	15	10	1
EPB3F-0810-15	8	+0.025/+0.083	10	15	15	1
EPB3F-0810-30	8	+0.025/+0.083	10	15	30	1
EPB3F-1012-04	10	+0.025/+0.083	12	18	4	1
EPB3F-1012-05	10	+0.025/+0.083	12	18	5	1
EPB3F-1012-06	10	+0.025/+0.083	12	18	6	1
EPB3F-1012-07	10	+0.025/+0.083	12	18	7	1
EPB3F-1012-09	10	+0.025/+0.083	12	18	9	1
EPB3F-1012-10	10	+0.025/+0.083	12	18	10	1
EPB3F-1012-12	10	+0.025/+0.083	12	18	12	1
EPB3F-1012-15	10	+0.025/+0.083	12	18	15	1
EPB3F-1012-17	10	+0.025/+0.083	12	18	17	1
EPB3F-101216-06	10	+0.025/+0.083	12	16	6	1
EPB3F-101216-09	10	+0.025/+0.083	12	16	9	1
EPB3F-1213-12S	12	+0.016/+0.059	13	17	12	0.5
EPB3F-1214-06	12	+0.032/+0.102	14	20	6	1
EPB3F-1214-07	12	+0.032/+0.102	14	20	7	1
EPB3F-1214-09	12	+0.032/+0.102	14	20	9	1
EPB3F-1214-10	12	+0.032/+0.102	14	20	10	1
EPB3F-1214-11	12	+0.032/+0.102	14	20	11	1
EPB3F-1214-12	12	+0.032/+0.102	14	20	12	1
EPB3F-1214-15	12	+0.032/+0.102	14	20	15	1

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{0.14}$ [mm]
EPB3F-1214-17	12	+0.032/+0.102	14	20	17	1
EPB3F-1214-20	12	+0.032/+0.102	14	20	20	1
EPB3F-1214-24	12	+0.032/+0.102	14	20	24	1
EPB3F-1416-03	14	+0.032/+0.102	16	22	3	1
EPB3F-1416-04	14	+0.032/+0.102	16	22	4	1
EPB3F-1416-06	14	+0.032/+0.102	16	22	6	1
EPB3F-1416-08	14	+0.032/+0.102	16	22	8	1
EPB3F-1416-12	14	+0.032/+0.102	16	22	12	1
EPB3F-1416-17	14	+0.032/+0.102	16	22	17	1
EPB3F-1416-21	14	+0.032/+0.102	16	22	21	1
EPB3F-1517-05	15	+0.032/+0.102	17	23	5	1
EPB3F-1517-09	15	+0.032/+0.102	17	23	9	1
EPB3F-1517-12	15	+0.032/+0.102	17	23	12	1
EPB3F-1517-17	15	+0.032/+0.102	17	23	17	1
EPB3F-1517-20	15	+0.032/+0.102	17	23	20	1
EPB3F-1618-09	16	+0.032/+0.102	18	24	9	1
EPB3F-1618-12	16	+0.032/+0.102	18	24	12	1
EPB3F-1618-17	16	+0.032/+0.102	18	24	17	1
EPB3F-1618-21	16	+0.032/+0.102	18	24	21	1
EPB3F-1719-09	17	+0.032/+0.102	19	25	9	1
EPB3F-1719-25	17	+0.032/+0.102	19	25	25	1
EPB3F-1820-04	18	+0.032/+0.102	20	26	4	1
EPB3F-1820-06	18	+0.032/+0.102	20	26	6	1
EPB3F-1820-11	18	+0.032/+0.102	20	26	11	1
EPB3F-1820-12	18	+0.032/+0.102	20	26	12	1
EPB3F-1820-17	18	+0.032/+0.102	20	26	17	1
EPB3F-1820-22	18	+0.032/+0.102	20	26	22	1
EPB3F-1820-30	18	+0.032/+0.102	20	26	30	1
EPB3F-2023-3.2	20	+0.04/+0.124	23	30	3.2	1.5
EPB3F-2023-07	20	+0.04/+0.124	23	30	7	1.5
EPB3F-2023-11.5	20	+0.04/+0.124	23	30	11.5	1.5
EPB3F-2023-16.5	20	+0.04/+0.124	23	30	16.5	1.5
EPB3F-2023-21.5	20	+0.04/+0.124	23	30	21.5	1.5
EPB3F-222535-09	22	+0.04/+0.124	25	35	9	1.5
EPB3F-2427-10	24	+0.04/+0.124	27	32	10	1.5
EPB3F-2528-11.5	25	+0.04/+0.124	28	35	11.5	1.5
EPB3F-2528-16.5	25	+0.04/+0.124	28	35	16.5	1.5
EPB3F-2528-21.5	25	+0.04/+0.124	28	35	21.5	1.5
EPB3F-2528-30	25	+0.04/+0.124	28	35	30	1.5
EPB3F-2830-36	28	+0.04/+0.124	30	35	36	2
EPB3F-3032-12	30	+0.04/+0.124	32	37	12	1
EPB3F-3034-16	30	+0.04/+0.124	34	42	16	2
EPB3F-3034-20	30	+0.04/+0.124	34	42	20	2
EPB3F-3034-26	30	+0.04/+0.124	34	42	26	2
EPB3F-3034-37	30	+0.04/+0.124	34	42	37	2
EPB3F-3034-45	30	+0.04/+0.124	34	42	45	2
EPB3F-3236-16	32	+0.05/+0.15	36	40	16	2

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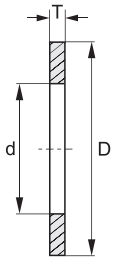
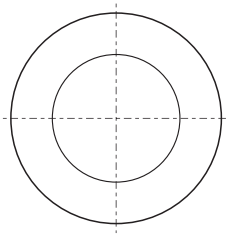
EPB3F-3236-26	32	+0.05/+0.15	36	40	26	2
EPB3F-3539-07	35	+0.05/+0.15	39	47	7	2
EPB3F-3539-12	35	+0.05/+0.15	39	47	12	2
EPB3F-3539-16	35	+0.05/+0.15	39	47	16	2
EPB3F-3539-26	35	+0.05/+0.15	39	47	26	2
EPB3F-3539-36	35	+0.05/+0.15	39	47	36	2
EPB3F-4044-14	40	+0.05/+0.15	44	52	14	2
EPB3F-4044-20	40	+0.05/+0.15	44	52	20	2
EPB3F-4044-30	40	+0.05/+0.15	44	52	30	2
EPB3F-4044-40	40	+0.05/+0.15	44	52	40	2
EPB3F-4044-50	40	+0.05/+0.15	44	52	50	2
EPB3F-4246-50	42	+0.05/+0.15	46	53	50	2
EPB3F-4550-30	45	+0.05/+0.15	50	58	30	2
EPB3F-4550-50	45	+0.05/+0.15	50	58	50	2

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{0.14}$ [mm]
EPB3F-5055-10	50	+0.05/+0.15	55	63	10	2
EPB3F-5055-40	50	+0.05/+0.15	55	63	40	2
EPB3F-5055-50	50	+0.05/+0.15	55	63	50	2
EPB3F-6065-07	60	+0.06/+0.18	65	73	7	2
EPB3F-6065-22	60	+0.06/+0.18	65	73	22	2
EPB3F-6065-30	60	+0.06/+0.18	65	73	30	2
EPB3F-6065-50	60	+0.06/+0.18	65	73	50	2
EPB3F-6570-50	65	+0.06/+0.18	70	78	50	2
EPB3F-7075-50	70	+0.06/+0.18	75	83	50	2
EPB3F-9095-11	90	+0.072/+0.212	95	103	11	2.5
EPB3F-100105-11.5	100	+0.072/+0.212	105	113	11.5	2.5
EPB3F-100105-100	100	+0.072/+0.212	105	113	100	2.5

*d_1公差为压入标准H7座孔（ISO3547-1）后公差
*Tolerance d_1: after being pressed into housing H7(ISO3547-1)

垫片 Metric Thrust Washers





订购编码 Order PN:

EPB3W-0818-015

d D T

垫片 Washer

材料Material

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB3W-0509-006	5	9	0.6
EPB3W-0615-015	6	15	1.5
EPB3W-0620-015	6	20	1.5
EPB3W-0815-005	8	15	0.5
EPB3W-0815-015	8	15	1.5
EPB3W-0818-010	8	18	1.0
EPB3W-0818-015	8	18	1.5
EPB3W-1018-010	10	18	1.0
EPB3W-1018-015	10	18	1.5
EPB3W-1018-020	10	18	2.0
EPB3W-1224-015	12	24	1.5
EPB3W-1426-015	14	26	1.5
EPB3W-1524-015	15	24	1.5
EPB3W-1630-015	16	30	1.5

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB3W-1832-015	18	32	1.5
EPB3W-2036-015	20	36	1.5
EPB3W-2238-015	22	38	1.5
EPB3W-2442-015	24	42	1.5
EPB3W-2640-0075	26	40	0.75
EPB3W-2644-015	26	44	1.5
EPB3W-2848-015	28	48	1.5
EPB3W-3254-015	32	54	1.5
EPB3W-3862-015	38	62	1.5
EPB3W-4266-015	42	66	1.5
EPB3W-4874-020	48	74	2.0
EPB3W-5278-020	52	78	2.0
EPB3W-6290-020	62	90	2.0

*根据要求提供定位孔设计 The fixing bore design upon request

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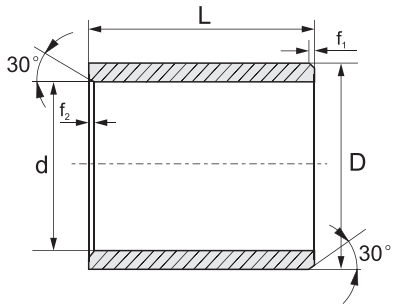
CSB-EPB™ Standard Specifications

EPB3M 标准规格

直套 Metric Cylindrical Bushings



推荐安装公差 Recommend fitting tolerance:

座孔 Housing: H7

轴 Shaft: h9

订购编码 Order PN:

EPB3M -0608-06

d D L

材料 Material

d	f_1	f_2
1-6	0.3	0.5
6-12	0.5	
12-30	0.8	
>30	1.2	

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB3M-0306-04	3	+0.020/+0.080	6	4
EPB3M-0509-05	5	+0.030/+0.105	9	5
EPB3M-0509-08	5	+0.030/+0.105	9	8
EPB3M-0610-04	6	+0.030/+0.105	10	4
EPB3M-0610-06	6	+0.030/+0.105	10	6
EPB3M-0610-08	6	+0.030/+0.105	10	8
EPB3M-0610-10	6	+0.030/+0.105	10	10
EPB3M-0612-06	6	+0.030/+0.105	12	6
EPB3M-0612-10	6	+0.030/+0.105	12	10
EPB3M-0812-04	8	+0.040/+0.130	12	4
EPB3M-0812-06	8	+0.040/+0.130	12	6
EPB3M-0812-08	8	+0.040/+0.130	12	8
EPB3M-0812-10	8	+0.040/+0.130	12	10
EPB3M-0812-12	8	+0.040/+0.130	12	12
EPB3M-0814-06	8	+0.040/+0.130	14	6
EPB3M-0814-10	8	+0.040/+0.130	14	10
EPB3M-1014-06	10	+0.040/+0.130	14	6
EPB3M-1014-08	10	+0.040/+0.130	14	8
EPB3M-1014-10	10	+0.040/+0.130	14	10
EPB3M-1014-12	10	+0.040/+0.130	14	12
EPB3M-1016-06	10	+0.040/+0.130	16	6
EPB3M-1016-08	10	+0.040/+0.130	16	8
EPB3M-1016-10	10	+0.040/+0.130	16	10
EPB3M-1216-10	12	+0.050/+0.160	16	10
EPB3M-1216-15	12	+0.050/+0.160	16	15
EPB3M-1216-20	12	+0.050/+0.160	16	20
EPB3M-1218-08	12	+0.050/+0.160	18	8
EPB3M-1218-10	12	+0.050/+0.160	18	10
EPB3M-1218-12	12	+0.050/+0.160	18	12
EPB3M-1218-15	12	+0.050/+0.160	18	15
EPB3M-1218-20	12	+0.050/+0.160	18	20

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB3M-1420-10	14	+0.050/+0.160	20	10
EPB3M-1420-15	14	+0.050/+0.160	20	15
EPB3M-1420-20	14	+0.050/+0.160	20	20
EPB3M-1521-10	15	+0.050/+0.160	21	10
EPB3M-1521-15	15	+0.050/+0.160	21	15
EPB3M-1521-20	15	+0.050/+0.160	21	20
EPB3M-1521-25	15	+0.050/+0.160	21	25
EPB3M-1620-12	16	+0.050/+0.160	20	12
EPB3M-1620-15	16	+0.050/+0.160	20	15
EPB3M-1620-20	16	+0.050/+0.160	20	20
EPB3M-1620-25	16	+0.050/+0.160	20	25
EPB3M-1622-12	16	+0.050/+0.160	22	12
EPB3M-1622-15	16	+0.050/+0.160	22	15
EPB3M-1622-20	16	+0.050/+0.160	22	20
EPB3M-1622-25	16	+0.050/+0.160	22	25
EPB3M-2025-14	20	+0.065/+0.195	25	14
EPB3M-2025-20	20	+0.065/+0.195	25	20
EPB3M-2026-15	20	+0.065/+0.195	26	15
EPB3M-2026-17	20	+0.065/+0.195	26	17
EPB3M-2026-20	20	+0.065/+0.195	26	20
EPB3M-2026-30	20	+0.065/+0.195	26	30
EPB3M-2530-20	25	+0.065/+0.195	30	20
EPB3M-2530-30	25	+0.065/+0.195	30	30
EPB3M-2532-20	25	+0.065/+0.195	32	20
EPB3M-2532-30	25	+0.065/+0.195	32	30
EPB3M-3038-20	30	+0.065/+0.195	38	20
EPB3M-3038-30	30	+0.065/+0.195	38	30
EPB3M-3038-40	30	+0.065/+0.195	38	40

*d公差为压入标准H7座孔（ISO3547-1）后公差

*Tolerance d: after being pressed into housing H7(ISO3547-1)

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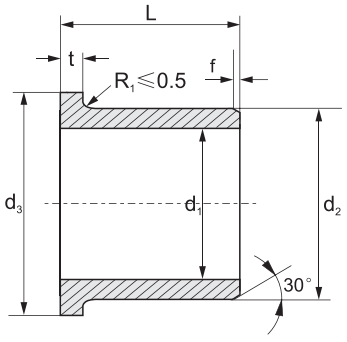
翻边轴套 Metric Flange Bushings



推荐安装公差 Recommend fitting tolerance:
座孔 Housing: H7
轴 Shaft: h9
订购编码 Order PN:

EPB3MF-0306-04
d1 d2 L
翻边轴套 Flange bushes
材料 Material

d	f
1-6	0.3
6-12	0.5
12-30	0.8
>30	1.2

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [D11] [mm]	d_2 [mm]	d_3 (d13) [mm]	L (h13) [mm]	t (h13) [mm]
EPB3MF-0306-04	3	+0.020/+0.080	6	9	4	1.5
EPB3MF-0509-05	5	+0.030/+0.105	9	13	5	2
EPB3MF-0509-06	5	+0.030/+0.105	9	13	6	2
EPB3MF-0509-08	5	+0.030/+0.105	9	13	8	2
EPB3MF-0610-04	6	+0.030/+0.105	10	14	4	2
EPB3MF-0610-06	6	+0.030/+0.105	10	14	6	2
EPB3MF-0610-08	6	+0.030/+0.105	10	14	8	2
EPB3MF-0610-10	6	+0.030/+0.105	10	14	10	2
EPB3MF-0612-06	6	+0.030/+0.105	12	14	6	3
EPB3MF-0612-10	6	+0.030/+0.105	12	14	10	3
EPB3MF-0812-06	8	+0.040/+0.130	12	16	6	2
EPB3MF-0812-08	8	+0.040/+0.130	12	16	8	2
EPB3MF-0812-10	8	+0.040/+0.130	12	16	10	2
EPB3MF-0812-12	8	+0.040/+0.130	12	16	12	2
EPB3MF-081416-06	8	+0.040/+0.130	14	16	6	3
EPB3MF-081416-10	8	+0.040/+0.130	14	16	10	3
EPB3MF-0814-06	8	+0.040/+0.130	14	18	6	3
EPB3MF-0814-10	8	+0.040/+0.130	14	18	10	3
EPB3MF-1014-06	10	+0.040/+0.130	14	19	6	2
EPB3MF-1014-08	10	+0.040/+0.130	14	19	8	2
EPB3MF-1014-10	10	+0.040/+0.130	14	19	10	2
EPB3MF-101420-12	10	+0.040/+0.130	14	20	12	2
EPB3MF-101620-06	10	+0.040/+0.130	16	20	6	3
EPB3MF-1016-08	10	+0.040/+0.130	16	22	8	3
EPB3MF-101620-10	10	+0.040/+0.130	16	20	10	3
EPB3MF-1216-10	12	+0.050/+0.160	16	22	10	2
EPB3MF-1216-20	12	+0.050/+0.160	16	22	20	2
EPB3MF-1218-08	12	+0.050/+0.160	18	24	8	3
EPB3MF-1218-10	12	+0.050/+0.160	18	22	10	3
EPB3MF-1218-12	12	+0.050/+0.160	18	24	12	3

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [D11] [mm]	d_2 [mm]	d_3 (d13) [mm]	L (h13) [mm]	t (h13) [mm]
EPB3MF-1218-15	12	+0.050/+0.160	18	22	15	3
EPB3MF-1218-20	12	+0.050/+0.160	18	22	20	3
EPB3MF-1420-10	14	+0.050/+0.160	20	25	10	3
EPB3MF-1420-15	14	+0.050/+0.160	20	25	15	3
EPB3MF-1420-20	14	+0.050/+0.160	20	25	20	3
EPB3MF-1521-10	15	+0.050/+0.160	21	27	10	3
EPB3MF-1521-15	15	+0.050/+0.160	21	27	15	3
EPB3MF-1521-20	15	+0.050/+0.160	21	27	20	3
EPB3MF-1521-25	15	+0.050/+0.160	21	27	25	3
EPB3MF-1620-12	16	+0.050/+0.160	20	27	12	3
EPB3MF-1620-15	16	+0.050/+0.160	20	27	15	3
EPB3MF-1620-20	16	+0.050/+0.160	20	27	20	3
EPB3MF-1620-25	16	+0.050/+0.160	20	27	25	3
EPB3MF-1622-12	16	+0.050/+0.160	22	28	12	3
EPB3MF-1622-15	16	+0.050/+0.160	22	28	15	3
EPB3MF-1622-20	16	+0.050/+0.160	22	28	20	3
EPB3MF-1622-25	16	+0.050/+0.160	22	28	25	3
EPB3MF-162230-15	16	+0.050/+0.160	22	30	15	2
EPB3MF-2026-15	20	+0.065/+0.195	26	32	15	3
EPB3MF-2026-20	20	+0.065/+0.195	26	32	20	3
EPB3MF-2026-30	20	+0.065/+0.195	26	32	30	3
EPB3MF-2430-30	24	+0.065/+0.195	30	36	30	3
EPB3MF-2532-20	25	+0.065/+0.195	32	38	20	4
EPB3MF-2532-30	25	+0.065/+0.195	32	38	30	4
EPB3MF-3038-20	30	+0.065/+0.195	38	44	20	4
EPB3MF-3038-30	30	+0.065/+0.195	38	44	30	4
EPB3MF-3038-40	30	+0.065/+0.195	38	44	40	4

*d_1公差为压入标准H7座孔（ISO3547-1）后公差
*Tolerance d_1: after being pressed into housing H7(ISO3547-1)

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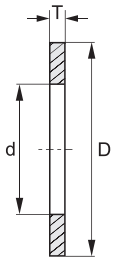
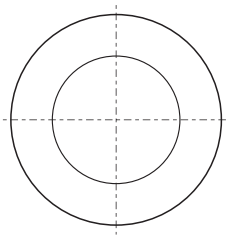
CSB-EPB™ Standard Specifications

EPB3M 标准规格

垫片 Metric Thrust Washers





订购编码 Order PN:

EPB3MW-0818-015

d D T

垫片 Washer

材料Material

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB3MW-0509-006	5	9	0.6
EPB3MW-0615-015	6	15	1.5
EPB3MW-0620-015	6	20	1.5
EPB3MW-0815-005	8	15	0.5
EPB3MW-0815-015	8	15	1.5
EPB3MW-0818-005	8	18	0.5
EPB3MW-0818-010	8	18	1.0
EPB3MW-0818-015	8	18	1.5
EPB3MW-1018-010	10	18	1.0
EPB3MW-1018-015	10	18	1.5
EPB3MW-1018-020	10	18	2.0
EPB3MW-1224-012	12	24	1.2
EPB3MW-1224-015	12	24	1.5
EPB3MW-1426-015	14	26	1.5
EPB3MW-1524-015	15	24	1.5

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB3MW-1630-015	16	30	1.5
EPB3MW-1832-015	18	32	1.5
EPB3MW-2032-010	20	32	1.0
EPB3MW-2036-015	20	36	1.5
EPB3MW-2238-015	22	38	1.5
EPB3MW-2442-015	24	42	1.5
EPB3MW-2644-015	26	44	1.5
EPB3MW-2848-015	28	48	1.5
EPB3MW-3254-015	32	54	1.5
EPB3MW-3862-015	38	62	1.5
EPB3MW-4266-015	42	66	1.5
EPB3MW-4874-020	48	74	2.0
EPB3MW-5278-020	52	78	2.0
EPB3MW-6290-020	62	90	2.0

*根据要求提供定位孔设计 The fixing bore design upon request

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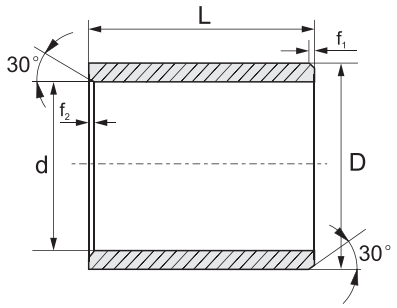
直套 Metric Cylindrical Bushings



推荐安装公差 Recommend fitting tolerance:

座孔 Housing: H7

轴 Shaft: h9

订购编码 Order PN:

EPB5 -0608-06

d D L

材料 Material

d	f_1	f_2
1-6	0.3	0.5
6-12	0.5	
12-30	0.8	
>30	1.2	

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB5-0304-03	3	+0.006/+0.046	4.5	3
EPB5-0304-06	3	+0.006/+0.046	4.5	6
EPB5-0405-04	4	+0.010/+0.058	5.5	4
EPB5-0405-06	4	+0.010/+0.058	5.5	6
EPB5-0507-05	5	+0.010/+0.058	7	5
EPB5-0507-08	5	+0.010/+0.058	7	8
EPB5-0608-06	6	+0.010/+0.058	8	6
EPB5-0608-08	6	+0.010/+0.058	8	8
EPB5-0608-10	6	+0.010/+0.058	8	10
EPB5-0810-06	8	+0.013/+0.071	10	6
EPB5-0810-08	8	+0.013/+0.071	10	8
EPB5-0810-10	8	+0.013/+0.071	10	10
EPB5-0810-12	8	+0.013/+0.071	10	12
EPB5-0810-15	8	+0.013/+0.071	10	15
EPB5-1012-06	10	+0.013/+0.071	12	6
EPB5-1012-08	10	+0.013/+0.071	12	8
EPB5-1012-10	10	+0.013/+0.071	12	10
EPB5-1012-12	10	+0.013/+0.071	12	12
EPB5-1012-15	10	+0.013/+0.071	12	15
EPB5-1012-20	10	+0.013/+0.071	12	20
EPB5-1214-06	12	+0.016/+0.086	14	6
EPB5-1214-08	12	+0.016/+0.086	14	8
EPB5-1214-10	12	+0.016/+0.086	14	10
EPB5-1214-12	12	+0.016/+0.086	14	12
EPB5-1214-15	12	+0.016/+0.086	14	15
EPB5-1214-20	12	+0.016/+0.086	14	20
EPB5-1214-25	12	+0.016/+0.086	14	25
EPB5-1416-12	14	+0.016/+0.086	16	12
EPB5-1416-15	14	+0.016/+0.086	16	15
EPB5-1416-20	14	+0.016/+0.086	16	20
EPB5-1517-07	15	+0.016/+0.086	17	7
EPB5-1517-10	15	+0.016/+0.086	17	10
EPB5-1517-15	15	+0.016/+0.086	17	15
EPB5-1517-20	15	+0.016/+0.086	17	20
EPB5-1517-25	15	+0.016/+0.086	17	25

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB5-1618-10	16	+0.016/+0.086	18	10
EPB5-1618-12	16	+0.016/+0.086	18	12
EPB5-1618-15	16	+0.016/+0.086	18	15
EPB5-1618-20	16	+0.016/+0.086	18	20
EPB5-1618-25	16	+0.016/+0.086	18	25
EPB5-1618-35	16	+0.016/+0.086	18	35
EPB5-1719-20	17	+0.016/+0.086	19	20
EPB5-1820-15	18	+0.016/+0.086	20	15
EPB5-1820-20	18	+0.016/+0.086	20	20
EPB5-1820-25	18	+0.016/+0.086	20	25
EPB5-2023-10	20	+0.020/+0.104	23	10
EPB5-2023-15	20	+0.020/+0.104	23	15
EPB5-2023-20	20	+0.020/+0.104	23	20
EPB5-2023-25	20	+0.020/+0.104	23	25
EPB5-2023-30	20	+0.020/+0.104	23	30
EPB5-2225-15	22	+0.020/+0.104	25	15
EPB5-2225-20	22	+0.020/+0.104	25	20
EPB5-2528-09	25	+0.020/+0.104	28	9
EPB5-2528-12	25	+0.020/+0.104	28	12
EPB5-2528-13	25	+0.020/+0.104	28	13
EPB5-2528-15	25	+0.020/+0.104	28	15
EPB5-2528-20	25	+0.020/+0.104	28	20
EPB5-2528-30	25	+0.020/+0.104	28	30
EPB5-2528-35	25	+0.020/+0.104	28	35
EPB5-2832-20	28	+0.020/+0.104	32	20
EPB5-2832-30	28	+0.020/+0.104	32	30
EPB5-3034-15	30	+0.020/+0.104	34	15
EPB5-3034-20	30	+0.020/+0.104	34	20
EPB5-3034-25	30	+0.020/+0.104	34	25
EPB5-3034-30	30	+0.020/+0.104	34	30
EPB5-3034-40	30	+0.020/+0.104	34	40
EPB5-3236-25	32	+0.025/+0.125	36	25
EPB5-3236-30	32	+0.025/+0.125	36	30
EPB5-3236-40	32	+0.025/+0.125	36	40
EPB5-3539-20	35	+0.025/+0.125	39	20

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CSB-EPB™ Standard Specifications

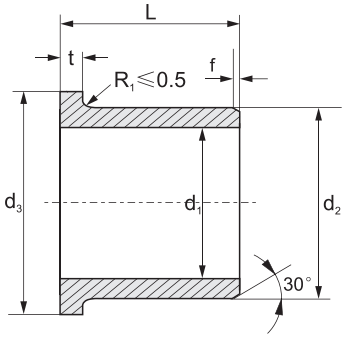
EPB4/EPB5/EPB8/EPB10/EPB24 标准规格

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB5-3539-30	35	+0.025/+0.125	39	30
EPB5-3539-40	35	+0.025/+0.125	39	40
EPB5-3539-50	35	+0.025/+0.125	39	50
EPB5-4044-20	40	+0.025/+0.125	44	20
EPB5-4044-30	40	+0.025/+0.125	44	30
EPB5-4044-40	40	+0.025/+0.125	44	40
EPB5-4044-50	40	+0.025/+0.125	44	50
EPB5-4550-30	45	+0.025/+0.125	50	30
EPB5-4550-50	45	+0.025/+0.125	50	50
EPB5-5055-30	50	+0.025/+0.125	55	30
EPB5-5055-40	50	+0.025/+0.125	55	40

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
EPB5-5055-60	50	+0.025/+0.125	55	60
EPB5-5560-26	55	+0.030/+0.150	60	26
EPB5-5560-50	55	+0.030/+0.150	60	50
EPB5-6065-45	60	+0.030/+0.150	65	45
EPB5-6065-60	60	+0.030/+0.150	65	65
EPB5-6570-50	65	+0.030/+0.150	70	50
EPB5-7075-50	70	+0.030/+0.150	75	50
EPB5-7075-70	70	+0.030/+0.150	75	70
EPB5-7580-60	75	+0.030/+0.150	80	60

*d公差为压入标准H7座孔（ISO3547-1）后公差
*Tolerance d: after being pressed into housing H7(ISO3547-1)

翻边轴套 Metric Flange Bushings



推荐安装公差 Recommend fitting tolerance:
座孔 Housing: H7
轴 Shaft: h9
订购编码 Order PN:

EPB5F-0608-06
d1 d2 L
翻边轴套 Flange bushes
材料 Material

d	f
1-6	0.3
6-12	0.5
12-30	0.8
>30	1.2

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3 (d13) [mm]	L(h13) [mm]	$t_{-0.14}$ [mm]
EPB5F-0304-05	3	+0.006/+0.046	4.5	7.5	5	0.75
EPB5F-0405-04	4	+0.010/+0.058	5.5	9.5	4	0.75
EPB5F-0405-06	4	+0.010/+0.058	5.5	9.5	6	0.75
EPB5F-0507-05	5	+0.010/+0.058	7	11	5	1
EPB5F-0507-08	5	+0.010/+0.058	7	11	8	1
EPB5F-0608-04	6	+0.010/+0.058	8	12	4	1
EPB5F-0608-06	6	+0.010/+0.058	8	12	6	1
EPB5F-0608-08	6	+0.010/+0.058	8	12	8	1
EPB5F-0608-10	6	+0.010/+0.058	8	12	10	1
EPB5F-0810-05	8	+0.013/+0.071	10	15	5.5	1
EPB5F-0810-06	8	+0.013/+0.071	10	15	6	1
EPB5F-0810-07	8	+0.013/+0.071	10	15	7	1
EPB5F-0810-08	8	+0.013/+0.071	10	15	8	1
EPB5F-0810-09	8	+0.013/+0.071	10	15	9	1
EPB5F-0810-10	8	+0.013/+0.071	10	15	10	1
EPB5F-0810-15	8	+0.013/+0.071	10	15	15	1
EPB5F-0812-06	8	+0.025/+0.083	12	16	6	2
EPB5F-1012-04	10	+0.013/+0.071	12	18	4	1
EPB5F-1012-05	10	+0.013/+0.071	12	18	5	1

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3 (d13) [mm]	L(h13) [mm]	$t_{-0.14}$ [mm]
EPB5F-1012-06	10	+0.013/+0.071	12	18	6	1
EPB5F-1012-08	10	+0.013/+0.071	12	18	8	1
EPB5F-1012-09	10	+0.013/+0.071	12	18	9	1
EPB5F-1012-10	10	+0.013/+0.071	12	18	10	1
EPB5F-1012-12	10	+0.013/+0.071	12	18	12	1
EPB5F-1012-15	10	+0.013/+0.071	12	18	15	1
EPB5F-1012-17	10	+0.013/+0.071	12	18	17	1
EPB5F-1012-20	10	+0.013/+0.071	12	18	20	1
EPB5F-1012-22	10	+0.013/+0.071	12	18	22	1
EPB5F-1012-25	10	+0.013/+0.071	12	18	25	1
EPB5F-1214-07	12	+0.016/+0.086	14	20	7	1
EPB5F-1214-09	12	+0.016/+0.086	14	20	9	1
EPB5F-1214-10	12	+0.016/+0.086	14	20	10	1
EPB5F-1214-12	12	+0.016/+0.086	14	20	12	1
EPB5F-1214-15	12	+0.016/+0.086	14	20	15	1
EPB5F-1214-20	12	+0.016/+0.086	14	20	20	1
EPB5F-1416-10	14	+0.016/+0.086	16	22	10	1
EPB5F-1416-12	14	+0.016/+0.086	16	22	12	1
EPB5F-1416-17	14	+0.016/+0.086	16	22	17	1

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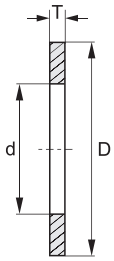
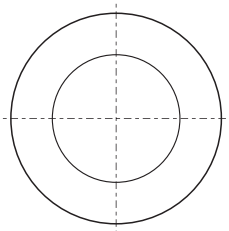
订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3 (d13) [mm]	L(h13) [mm]	$t_{-0.14}$ [mm]
EPB5F-1517-06	15	+0.016/+0.086	17	23	6	1
EPB5F-1517-12	15	+0.016/+0.086	17	23	12	1
EPB5F-1517-17	15	+0.016/+0.086	17	23	17	1
EPB5F-1618-10	16	+0.016/+0.086	18	24	10	1
EPB5F-1618-12	16	+0.016/+0.086	18	24	12	1
EPB5F-1618-13	16	+0.016/+0.086	18	24	13	1
EPB5F-1618-17	16	+0.016/+0.086	18	24	17	1
EPB5F-1618-25	16	+0.016/+0.086	18	24	25	1
EPB5F-1820-12	18	+0.016/+0.086	20	26	12	1
EPB5F-1820-17	18	+0.016/+0.086	20	26	17	1
EPB5F-2023-07	20	+0.020/+0.104	23	30	7	1.5
EPB5F-2023-11.5	20	+0.020/+0.104	23	30	11.5	1.5
EPB5F-2023-16.5	20	+0.020/+0.104	23	30	16.5	1.5
EPB5F-2023-21.5	20	+0.020/+0.104	23	30	21.5	1.5
EPB5F-2023-30	20	+0.020/+0.104	23	30	30	1.5
EPB5F-2528-13.5	25	+0.020/+0.104	28	35	13.5	1.5
EPB5F-2528-21.5	25	+0.020/+0.104	28	35	21.5	1.5
EPB5F-2528-30	25	+0.020/+0.104	28	35	30	1.5
EPB5F-3034-16	30	+0.020/+0.104	34	42	16	2

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3 (d13) [mm]	L(h13) [mm]	$t_{-0.14}$ [mm]
EPB5F-3034-26	30	+0.020/+0.104	34	42	26	2
EPB5F-3034-40	30	+0.020/+0.104	34	42	40	2
EPB5F-3236-15	32	+0.025/+0.125	36	45	15	2
EPB5F-3236-26	32	+0.025/+0.125	36	45	26	2
EPB5F-3539-26	35	+0.025/+0.125	39	47	26	2
EPB5F-4044-22	40	+0.025/+0.125	44	52	22	2
EPB5F-4044-30	40	+0.025/+0.125	44	52	30	2
EPB5F-4044-40	40	+0.025/+0.125	44	52	40	2
EPB5F-4550-50	45	+0.025/+0.125	50	58	50	2
EPB5F-5055-40	50	+0.025/+0.125	55	63	40	2
EPB5F-5055-50	50	+0.025/+0.125	55	63	50	2
EPB5F-6065-40	60	+0.030/+0.150	65	75	40	2
EPB5F-6065-50	60	+0.030/+0.150	65	75	50	2
EPB5F-7075-40	70	+0.030/+0.150	75	83	40	2
EPB5F-7075-50	70	+0.030/+0.150	75	83	50	2
EPB5F-7580-50	75	+0.030/+0.150	80	88	50	2

*d_1公差为压入标准H7座孔（ISO3547-1）后公差
*Tolerance d_1: after being pressed into housing H7(ISO3547-1)

垫片 Metric Thrust Washers





订购编码 Order PN:

EPB5W-0509-006

d D T

垫片 Washer

材料Material

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB5W-0509-006	5	9	0.6
EPB5W-0615-015	6	15	1.5
EPB5W-0620-015	6	20	1.5
EPB5W-0815-005	8	15	0.5
EPB5W-0815-015	8	15	1.5
EPB5W-0818-010	8	18	1.0
EPB5W-0818-015	8	18	1.5
EPB5W-1018-010	10	18	1.0
EPB5W-1018-015	10	18	1.5
EPB5W-1018-020	10	18	2.0
EPB5W-1224-015	12	24	1.5
EPB5W-1426-015	14	26	1.5
EPB5W-1524-015	15	24	1.5
EPB5W-1630-015	16	30	1.5

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB5W-1832-015	18	32	1.5
EPB5W-2036-015	20	36	1.5
EPB5W-2238-015	22	38	1.5
EPB5W-2442-015	24	42	1.5
EPB5W-2640-0075	26	40	0.75
EPB5W-2644-015	26	44	1.5
EPB5W-2848-015	28	48	1.5
EPB5W-3254-015	32	54	1.5
EPB5W-3862-015	38	62	1.5
EPB5W-4266-015	42	66	1.5
EPB5W-4874-020	48	74	2.0
EPB5W-5278-020	52	78	2.0
EPB5W-6290-020	62	90	2.0

*根据要求提供定位孔设计 The fixing bore design upon request

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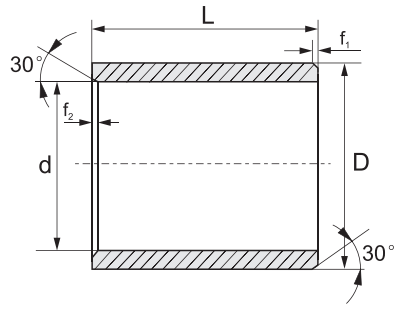
CSB-EPB™ Standard Specifications

EPB7\EPB6A\EPB5Z\EPB5A\EPB15\EPB19 标准规格

直套 Metric Cylindrical Bushings



推荐安装公差 Recommend fitting tolerance:

座孔 Housing: H7

轴 Shaft: h9

订购编码 Order PN:

EPB7-0608-06

d D L

材料 Material

d	f_1	f_2
1-6	0.3	0.5
6-12	0.5	
12-30	0.8	
>30	1.2	

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L[h13] [mm]
EPB7-0304-03	3	+0.014/+0.054	4.5	3
EPB7-0304-05	3	+0.014/+0.054	4.5	5
EPB7-0304-06	3	+0.014/+0.054	4.5	6
EPB7-0405-04	4	+0.02/+0.068	5.5	4
EPB7-0405-06	4	+0.02/+0.068	5.5	6
EPB7-0405-08	4	+0.02/+0.068	5.5	8
EPB7-0405-10	4	+0.02/+0.068	5.5	10
EPB7-0507-05	5	+0.02/+0.068	7	5
EPB7-0507-08	5	+0.02/+0.068	7	8
EPB7-0507-10	5	+0.02/+0.068	7	10
EPB7-0608-06	6	+0.02/+0.068	8	6
EPB7-0608-08	6	+0.02/+0.068	8	8
EPB7-0608-09	6	+0.02/+0.068	8	9
EPB7-0608-10	6	+0.02/+0.068	8	10
EPB7-0608-11	6	+0.02/+0.068	8	11
EPB7-0810-06	8	+0.025/+0.083	10	6
EPB7-0810-08	8	+0.025/+0.083	10	8
EPB7-0810-10	8	+0.025/+0.083	10	10
EPB7-0810-12	8	+0.025/+0.083	10	12
EPB7-0810-13	8	+0.025/+0.083	10	13
EPB7-0810-15	8	+0.025/+0.083	10	15
EPB7-0810-21	8	+0.025/+0.083	10	21
EPB7-1012-04	10	+0.025/+0.083	12	4
EPB7-1012-06	10	+0.025/+0.083	12	6
EPB7-1012-08	10	+0.025/+0.083	12	8
EPB7-1012-10	10	+0.025/+0.083	12	10
EPB7-1012-12	10	+0.025/+0.083	12	12
EPB7-1012-20	10	+0.025/+0.083	12	20
EPB7-1214-05	12	+0.032/+0.102	14	5
EPB7-1214-06	12	+0.032/+0.102	14	6
EPB7-1214-10	12	+0.032/+0.102	14	10
EPB7-1214-12	12	+0.032/+0.102	14	12
EPB7-1214-15	12	+0.032/+0.102	14	15
EPB7-1214-20	12	+0.032/+0.102	14	20
EPB7-1214-25	12	+0.032/+0.102	14	25
EPB7-1416-10	14	+0.032/+0.102	16	10
EPB7-1416-15	14	+0.032/+0.102	16	15

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L[h13] [mm]
EPB7-1416-20	14	+0.032/+0.102	16	20
EPB7-1416-25	14	+0.032/+0.102	16	25
EPB7-1517-10	15	+0.032/+0.102	17	10
EPB7-1517-20	15	+0.032/+0.102	17	20
EPB7-1517-25	15	+0.032/+0.102	17	25
EPB7-1618-08	16	+0.032/+0.102	18	8
EPB7-1618-15	16	+0.032/+0.102	18	15
EPB7-1618-20	16	+0.032/+0.102	18	20
EPB7-1618-25	16	+0.032/+0.102	18	25
EPB7-1820-20	18	+0.032/+0.102	20	20
EPB7-2022-15	20	+0.04/+0.124	22	15
EPB7-2023-10	20	+0.04/+0.124	23	10
EPB7-2023-15	20	+0.04/+0.124	23	15
EPB7-2023-20	20	+0.04/+0.124	23	20
EPB7-2023-23	20	+0.04/+0.124	23	23
EPB7-2023-30	20	+0.04/+0.124	23	30
EPB7-2225-15	22	+0.04/+0.124	25	15
EPB7-2225-20	22	+0.04/+0.124	25	20
EPB7-2225-25	22	+0.04/+0.124	25	25
EPB7-2225-30	22	+0.04/+0.124	25	30
EPB7-2528-12	25	+0.04/+0.124	28	12
EPB7-2528-20	25	+0.04/+0.124	28	20
EPB7-2528-25	25	+0.04/+0.124	28	25
EPB7-2528-30	25	+0.04/+0.124	28	30
EPB7-2832-20	28	+0.04/+0.124	32	20
EPB7-2832-25	28	+0.04/+0.124	32	25
EPB7-2832-30	28	+0.04/+0.124	32	30
EPB7-3034-20	30	+0.04/+0.124	34	20
EPB7-3034-25	30	+0.04/+0.124	34	25
EPB7-3034-30	30	+0.04/+0.124	34	30
EPB7-3034-40	30	+0.04/+0.124	34	40
EPB7-3236-20	32	+0.05/+0.15	36	20
EPB7-3236-30	32	+0.05/+0.15	36	30
EPB7-3236-40	32	+0.05/+0.15	36	40
EPB7-3539-20	35	+0.05/+0.15	39	20
EPB7-3539-30	35	+0.05/+0.15	39	30
EPB7-3539-40	35	+0.05/+0.15	39	40

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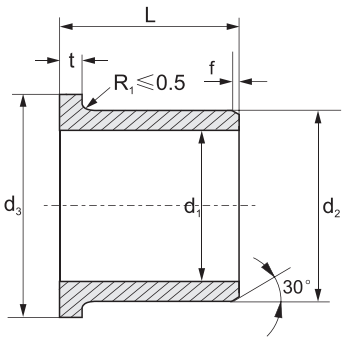
订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L[h13] [mm]
EPB7-3539-50	35	+0.05/+0.15	39	50
EPB7-4044-20	40	+0.05/+0.15	44	20
EPB7-4044-30	40	+0.05/+0.15	44	30
EPB7-4044-40	40	+0.05/+0.15	44	40
EPB7-4044-50	40	+0.05/+0.15	44	50

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L[h13] [mm]
EPB7-5055-40	50	+0.05/+0.15	55	40
EPB7-5055-50	50	+0.05/+0.15	55	50

*d公差为压入标准H7座孔（ISO3547-1）后公差
*Tolerance d: after being pressed into housing H7(ISO3547-1)

翻边轴套 Metric Flange Bushings



推荐安装公差 Recommend fitting tolerance:
座孔 Housing: H7
轴 Shaft: h9
订购编码 Order PN:

EPB7F-0608-06
d1 d2 L
翻边轴套 Flange bushes
材料 Material

d	f
1-6	0.3
6-12	0.5
12-30	0.8
>30	1.2

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{0.14}$ [mm]
EPB7F-0304-03	3	+0.014/+0.054	4.5	7.5	3	0.75
EPB7F-0304-05	3	+0.014/+0.054	4.5	7.5	5	0.75
EPB7F-0405-03	4	+0.02/+0.068	5.5	9.5	3	0.75
EPB7F-0405-04	4	+0.02/+0.068	5.5	9.5	4	0.75
EPB7F-0405-06	4	+0.02/+0.068	5.5	9.5	6	0.75
EPB7F-0506-15	5	+0.02/+0.068	6	10	15	0.5
EPB7F-0507-04	5	+0.02/+0.068	7	11	4	1
EPB7F-0507-05	5	+0.02/+0.068	7	11	5	1
EPB7F-0507-10	5	+0.02/+0.068	7	11	10	1
EPB7F-0608-04	6	+0.02/+0.068	8	12	4	1
EPB7F-0608-06	6	+0.02/+0.068	8	12	6	1
EPB7F-0608-08	6	+0.02/+0.068	8	12	8	1
EPB7F-0608-10	6	+0.02/+0.068	8	12	10	1
EPB7F-0810-04	8	+0.025/+0.083	10	15	4	1
EPB7F-0810-05	8	+0.025/+0.083	10	15	5	1
EPB7F-0810-07	8	+0.025/+0.083	10	15	7	1
EPB7F-0810-08F2.5	8	+0.025/+0.083	10	15	8	2.5
EPB7F-0810-09	8	+0.025/+0.083	10	15	9	1
EPB7F-0810-10	8	+0.025/+0.083	10	15	10	1
EPB7F-0810-30	8	+0.025/+0.083	10	15	30	1
EPB7F-1012-06	10	+0.025/+0.083	12	18	6	1
EPB7F-1012-07	10	+0.025/+0.083	12	18	7	1
EPB7F-1012-10	10	+0.025/+0.083	12	18	10	1
EPB7F-1012-12	10	+0.025/+0.083	12	18	12	1
EPB7F-1012-15	10	+0.025/+0.083	12	18	15	1
EPB7F-1012-17	10	+0.025/+0.083	12	18	17	1

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{0.14}$ [mm]
EPB7F-1214-04	12	+0.032/+0.102	14	18	4	1
EPB7F-1214-07	12	+0.032/+0.102	14	20	7	1
EPB7F-1214-09	12	+0.032/+0.102	14	20	9	1
EPB7F-1214-10	12	+0.032/+0.102	14	20	10	1
EPB7F-1214-11	12	+0.032/+0.102	14	20	11	1
EPB7F-1214-12	12	+0.033/+0.102	14	20	12	1
EPB7F-1214-15	12	+0.032/+0.102	14	20	15	1
EPB7F-1214-17	12	+0.032/+0.102	14	20	17	1
EPB7F-1214-20	12	+0.032/+0.102	14	20	20	1
EPB7F-1416-12	14	+0.032/+0.102	16	22	12	1
EPB7F-1416-17	14	+0.032/+0.102	16	22	17	1
EPB7F-1517-12	15	+0.032/+0.102	17	23	12	1
EPB7F-1517-17	15	+0.032/+0.102	17	23	17	1
EPB7F-1517-20	15	+0.032/+0.102	17	23	20	1
EPB7F-1618-09	16	+0.032/+0.102	18	24	9	1
EPB7F-1618-12	16	+0.032/+0.102	18	24	12	1
EPB7F-1618-17	16	+0.032/+0.102	18	24	17	1
EPB7F-1820-17	18	+0.032/+0.102	20	26	17	1
EPB7F-1820-22	18	+0.032/+0.102	20	26	22	1
EPB7F-2023-11.5	20	+0.04/+0.124	23	30	11.5	1.5
EPB7F-2023-16.5	20	+0.04/+0.124	23	30	16.5	1.5
EPB7F-2023-21.5	20	+0.04/+0.124	23	30	21.5	1.5
EPB7F-2528-11.5	25	+0.04/+0.124	28	35	11.5	1.5
EPB7F-2528-16.5	25	+0.04/+0.124	28	35	16.5	1.5
EPB7F-2528-21.5	25	+0.04/+0.124	28	35	21.5	1.5
EPB7F-3034-16	30	+0.04/+0.124	34	42	16	2

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CSB-EPB™ Standard Specifications

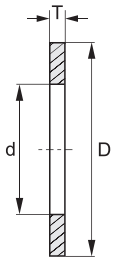
EPB7\EPB6A\EPB5Z\EPB5A\EPB15\EPB19 标准规格

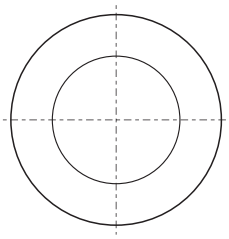
订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{-0.14}$ [mm]
EPB7F-3034-26	30	+0.04/+0.124	34	42	26	2
EPB7F-3034-37	30	+0.04/+0.124	34	42	37	2
EPB7F-3236-16	32	+0.05/+0.15	36	40	16	2
EPB7F-3236-26	32	+0.05/+0.15	36	40	26	2
EPB7F-3539-09	35	+0.05/+0.15	39	47	9	2
EPB7F-3539-16	35	+0.05/+0.15	39	47	16	2
EPB7F-3539-26	35	+0.05/+0.15	39	47	26	2

订购编码 Order PN	d_1 [mm]	d_1-公差 After fitting [mm]	d_2 [mm]	d_3[d13] [mm]	L[h13] [mm]	$t_{-0.14}$ [mm]
EPB7F-4044-30	40	+0.05/+0.15	44	52	30	2
EPB7F-4550-50	45	+0.05/+0.15	50	58	50	2
EPB7F-5055-40	50	+0.05/+0.15	55	63	40	2

*d_1公差为压入标准H7座孔（ISO3547-1）后公差
*Tolerance d_1: after being pressed into housing H7(ISO3547-1)

垫片 Metric Thrust Washers





订购编码 Order PN:

EPB7W-0818-015

d D T

垫片 Washer

材料Material

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB7W-0509-006	5	9	0.6
EPB7W-0615-015	6	15	1.5
EPB7W-0620-015	6	20	1.5
EPB7W-0815-005	8	15	0.5
EPB7W-0815-015	8	15	1.5
EPB7W-0818-005	8	18	0.5
EPB7W-0818-010	8	18	1.0
EPB7W-0818-015	8	18	1.5
EPB7W-1018-010	10	18	1.0
EPB7W-1018-015	10	18	1.5
EPB7W-1018-020	10	18	2.0
EPB7W-1224-012	12	24	1.2
EPB7W-1224-015	12	24	1.5
EPB7W-1426-015	14	26	1.5
EPB7W-1524-015	15	24	1.5

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB7W-1630-015	16	30	1.5
EPB7W-1832-015	18	32	1.5
EPB7W-2032-010	20	32	1.0
EPB7W-2036-015	20	36	1.5
EPB7W-2238-015	22	38	1.5
EPB7W-2442-015	24	42	1.5
EPB7W-2644-015	26	44	1.5
EPB7W-2848-015	28	48	1.5
EPB7W-3254-015	32	54	1.5
EPB7W-3862-015	38	62	1.5
EPB7W-4266-015	42	66	1.5
EPB7W-4874-020	48	74	2.0
EPB7W-5278-020	52	78	2.0
EPB7W-6290-020	62	90	2.0

*根据要求提供定位孔设计 The fixing bore design upon request

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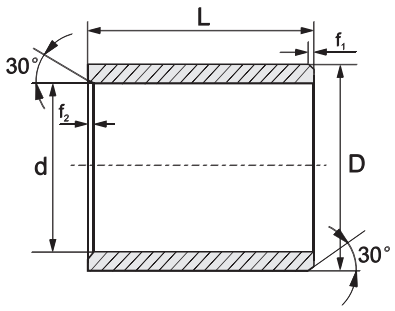
CSB-EPB™ Standard Specifications

EPB11\EPB14\EPB14A\EPB17\EPB17A 标准规格　Polymer-tech Solution™

直套 Metric Cylindrical Bushings



推荐安装公差 Recommend fitting tolerance:
座孔 Housing:　H7
轴 Shaft:　h9
订购编码 Order PN:

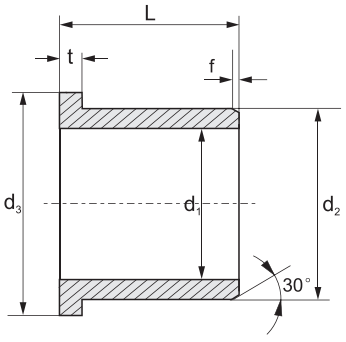
EPB14 -0609-08
d D L
材料 Material

d	f_1	f_2
1-6	0.3	0.5
6-12	0.5	
12-30	0.8	
>30	1.2	

订购编码 Order PN	d [mm]	d公差 Tolerance	D [mm]	L(h13) [mm]
EPB14-0508-06	5	+0.030/+0.105	8	6
EPB14-0609-08	6	+0.030/+0.105	9	8
EPB14-0812-08	8	+0.040/+0.130	12	8
EPB14-1014-10	10	+0.040/+0.130	14	10
EPB14-1216-10	12	+0.050/+0.160	16	10
EPB14-1521-15	15	+0.050/+0.160	21	15
EPB14-1622-15	16	+0.050/+0.160	22	15
EPB14-1824-20	18	+0.050/+0.160	24	20
EPB14-2026-20	20	+0.065/+0.195	26	20
EPB14-2228-20	22	+0.065/+0.195	28	20
EPB14-2530-25	25	+0.065/+0.195	30	25
EPB14-2532-30	25	+0.065/+0.195	32	30
EPB14-2834-30	28	+0.065/+0.195	34	30
EPB14-2836-30	28	+0.065/+0.195	36	30
EPB14-3036-30	30	+0.065/+0.195	36	30
EPB14-3038-30	30	+0.065/+0.195	38	30
EPB14-3240-30	32	+0.080/+0.240	40	30
EPB14-3543-35	35	+0.080/+0.240	43	35
EPB14-3545-40	35	+0.080/+0.240	45	40
EPB14-4048-40	40	+0.080/+0.240	48	40
EPB14-4050-40	40	+0.080/+0.240	50	40
EPB14-4553-50	45	+0.080/+0.240	53	50
EPB14-4555-40	45	+0.080/+0.240	55	40
EPB14-5060-50	50	+0.080/+0.240	60	50

*d_1公差为压入标准H7座孔（ISO3547-1）后公差　*Tolerance d_1: after being pressed into housing H7(ISO3547-1)

翻边轴套 Metric Flange Bushings



推荐安装公差 Recommend fitting tolerance:
座孔 Housing:　H7
轴 Shaft:　h9
订购编码 Order PN:

EPB14 F-0609-08
d_1 d_2 L
翻边轴套 Flange bushes
材料 Material

d	f
1-6	0.3
6-12	0.5
12-30	0.8
>30	1.2

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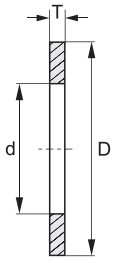
CSB-EPB™ Standard Specifications

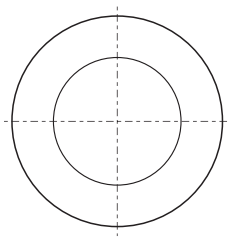
EPB11\EPB14\EPB14A\EPB17\EPB17A 标准规格

订购编码 Order PN	d_1 [mm]	d_1公差 Tolerance	d_2 [mm]	d_3(d13) Tolerance	L(h13) [mm]	t(h13) [mm]
EPB14F-0508-08	5	+0.030/+0.105	8	11	8	1.5
EPB14F-0609-08	6	+0.030/+0.105	9	12	8	2
EPB14F-0812-10	8	+0.040/+0.130	12	16	10	2
EPB14F-1014-15	10	+0.040/+0.130	14	18	15	2
EPB14F-1216-15	12	+0.050/+0.160	16	20	15	2
EPB14F-1521-20	15	+0.050/+0.160	21	27	20	3
EPB14F-1622-20	16	+0.050/+0.160	22	28	20	3
EPB14F-1824-20	18	+0.050/+0.160	24	30	20	3
EPB14F-2026-25	20	+0.065/+0.195	26	32	25	3
EPB14F-2228-25	22	+0.065/+0.195	28	34	25	3
EPB14F-2530-30	25	+0.065/+0.195	30	37	30	3
EPB14F-2532-30	25	+0.065/+0.195	32	38	30	4
EPB14F-2834-30	28	+0.065/+0.195	34	40	30	3
EPB14F-2836-30	28	+0.065/+0.195	36	42	30	4
EPB14F-3036-35	30	+0.065/+0.195	36	42	35	3
EPB14F-3038-30	30	+0.065/+0.195	38	44	30	4
EPB14F-3240-35	32	+0.080/+0.240	40	48	35	4
EPB14F-3543-40	35	+0.080/+0.240	43	51	40	4
EPB14F-3545-40	35	+0.080/+0.240	45	50	40	5
EPB14F-4048-45	40	+0.080/+0.240	48	56	45	4
EPB14F-4050-40	40	+0.080/+0.240	50	56	40	5
EPB14F-4553-50	45	+0.080/+0.240	53	61	50	4
EPB14F-4555-40	45	+0.080/+0.240	55	63	40	5
EPB14F-5060-50	50	+0.080/+0.240	60	70	50	5

*d_1公差为压入标准H7座孔（ISO3547-1）后公差 *Tolerance d_1: after being pressed into housing H7(ISO3547-1)

垫片 Metric Thrust Washers





订购编码 Order PN:

EPB14W-0613-008

d D T

垫片 Washer

材料 Material

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB14W-0613-008	6	13	0.8
EPB14W-0815-008	8	15	0.8
EPB14W-1020-008	10	20	0.8
EPB14W-1225-008	12	25	0.8
EPB14W-1530-008	15	30	0.8
EPB14W-2040-008	20	40	0.8
EPB14W-2245-008	22	45	0.8
EPB14W-2550-008	25	50	0.8

订购编码 Order PN	$d^{+0.25}$ [mm]	$D_{-0.25}$ [mm]	$T_{-0.05}$ [mm]
EPB14W-2855-008	28	55	0.8
EPB14W-3060-008	30	60	0.8
EPB14W-3260-008	32	60	0.8
EPB14W-3565-008	35	65	0.8
EPB14W-4070-008	40	70	0.8
EPB14W-4575-008	45	75	0.8
EPB14W-5080-008	50	80	0.8

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