

SOLAR TRACKER BEARINGS TECHNOLOGY

太阳能跟踪支架轴承技术



2024



...高性能聚合物技术 为客户创造价值

...High-performance Polymer Technologies Creating Value For Customers

- 成立于1995年，总注册资本2.23亿人民币；
- 年营业额超过10亿元人民币，超1000名员工；
- 拥有5个生产基地，总占地超200000m²；
- 国家级高新技术企业，超120项专利；
- IATF16949:2016、ISO9001:2015、ISO14001:2015、ISO45001:2018认证。
- CSB was established in 1995 and its legal registered capital is 223 million RMB.
- Annual turnover more than 1 Billion RMB, more than 1000 employees.
- CSB has 5 production bases with a total area of 200000m².
- China National Hi-Tech Enterprise, more than 120 patents.
- IATF16949: 2016、ISO9001: 2015、ISO14001: 2015 and ISO45001: 2018 certifications.

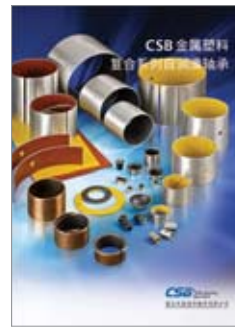
RoHS指令限制的十种有害物质 EC Directive 2011/65/EU (the RoHS Directive)

汞Hg、六价铬Cr⁶⁺、铅Pb、镉Cd、多溴联苯醚PBDE、多溴联苯PBB、邻苯二甲酸二正丁酯DBP、邻苯二甲酸正丁基苄酯BBP、邻苯二甲酸(2-己基)己酯DEHP、六溴环十二烷HBCDD。

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



"CSB", "CSB-EPB", "CSB-LIN", "CSB-BAL", "TEFPLAS", "TEXPLAS", "DURARUB", "DURAFILM", "DURAPLAS", "DURAMOV", "FLEXMOV", "DURACABLE", "DURACHAIN", "TRIBOPAD" and "TRIBOTAPE" are legally protected trademarks in China. 中国保护商标。



Polymer-tech Solutions™

聚合物技术 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°C、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°C, FDA food safety grade.



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°C、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°C.



CSB-LIN® 直线导轨丝杆 Guide Rails and Lead Screws

自润滑免维护直线驱动系统，直线滑动部件及丝杆螺母均采用高耐磨EPB13材料制成，实现长期干摩擦，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.



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.



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

连续长纤维复合材料、干摩擦性能更优越、极高的承载能力、最高静载荷240MPa，特别适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.



DURAPLAS® 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.



DURAMOV® 塑料电缆拖链 Plastic Cable Carriers

采用高强度耐磨工程塑料制成，可实现多种运动方式与行程，模块化设计易于组装和维护，适用于各类环境下低噪音长寿命运行。

The cable carriers are made of high strength and anti-wear plastics, The cable carriers are used in a variety of motion modes and strokes, modular design is easy to assemble and maintain, and it is suitable for low noise long life in various environments.



FLEXMOV® 柔性电缆 Flexible Cables

FLEXMOV® 高柔性电缆包含控制电缆、数据电缆、伺服电缆、动力电缆、总线电缆、机器人电缆等；多种护套材料如PVC、PUR和TPE可满足室内或室外等极端环境无故障运行。

FLEXMOV® flexible cables include control cables, data cables, servo cables, motor cables, bus cables, robot cables, etc.; Various jacket materials such as PVC, PUR and TPE are available to meet trouble-free operation in extreme environments such as indoors or outdoors.

<https://www.csb-ep.com>

Products
Plastic Plain Bearings

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电话: 0573 84186133/84185527
Tel: 0086 573 84187009

Solar Tracking Bracket Bearings

太阳能跟踪支架轴承



QBF1单法兰光伏支架轴承 PV Support bracket bearings

单法兰设计塑料轴承；户外耐紫外线老化；耐高低温湿热老化；低摩擦，耐磨损；自润滑、免维护；高强度、易安装

Single flange design plastic bearings; UV resistance; High and low temperature, damp-heat aging; Low friction; wear resistance; Self lubricating, maintenance-free; High strength, easy installation

P5



QBF2双法兰光伏支架轴承 PV Support bracket bearings

双法兰设计塑料轴承；户外耐紫外线老化；耐高低温湿热老化；低摩擦，耐磨损；自润滑、免维护；高强度、易安装

Double flange design plastic bearings; UV resistance; High and low temperature, damp-heat aging; Low friction, wear resistance; Self lubricating, maintenance-free; High strength, easy installation

P6



GSQB光伏跟踪支架关节轴承 PV Support bracket bearings

一体式设计塑料关节轴承座；户外耐紫外线老化；耐高低温湿热老化；低摩擦，耐磨损；适用于平地或斜坡支架；自润滑、免维护；高强度、易安装

Integrated design plastic spherical bearings; UV resistance; High and low temperature, damp-heat aging; Low friction, wear resistance; Suitable for flat or slope brackets; Self lubricating, maintenance-free; High strength, easy installation

P7



光热定日镜跟踪支架轴承 Heliostat support bracket bearings

适用于定日镜主副轴及推杆安装轴承；最高动载荷140MPa；自润滑、免维护；低摩擦，耐磨损；可承受偏心边界载荷；可提供直筒轴承与止推垫片

Suitable for the shaft of heliostat and push rod installation; Max. dynamic load 140MPa; Self-lubricating, maintenance-free; Low friction, wear resistance; Boundary load is available; Available plain bearings and thrust washers

P10



光热聚光镜跟踪支架轴承 Concentrator support bracket bearings

长纤维与高强度树脂制成；最高动载荷140MPa；自润滑、免维护；低摩擦，耐磨损；适用于聚光镜跟踪支架

Made of long fiber and high-strength resin; Max. dynamic load 140MPa; Self-lubricating, maintenance-free; Low friction, wear resistance; Suitable for consecration mirror tracking bracket

P12



光伏跟踪支架方管堵塞端盖 PV Support bracket plugs

带预紧设计塑料端盖；户外耐紫外线老化；耐高低温湿热老化；高强度、易安装

Plastic end caps with pre-load tip design; UV resistance; High and low temperature, damp-heat aging; High strength, easy installation

P13

轴承材料技术数据表 Bearing material technical data table

材料性能 Material properties	标准 Standard	单位 Unit	MN527
抗拉模量 Tensile modulus	ISO527	MPa	2700
抗拉强度 Tensile strength	ISO527	MPa	63
弯曲模量 Flexural modulus	ISO178	MPa	2500
弯曲强度 Flexural strength	ISO178	MPa	85
简支梁冲击强度(有缺口) Charpy notched impact strength	ISO 179	kJ/m2	7
邵氏硬度 Shore hardness	ISO868	D	77
最大静载荷 Max. static load	ITS027	MPa	30
连续工作温度 Long-time application temperature	ITS029	°C	-40/+80
热变形温度 Heat deflection temperature(1.8MPa)	ISO72-2/A	°C	95
导热性 Thermal conductivity	ISO22007	W/m/k	0.2
线性热膨胀系数 Coefficient of thermal expansion	ISO11359	K-1*10-5	12
RH50/23°C吸湿性 Moisture absorption RH50/ 23°C	ISO62	%	0.3
最大吸水率Max. water absorption, equilibrium, 23°C	ISO62	%	1.2
燃烧性能 Flammability	UL94	Class	HB
体电阻率 Volume resistance	IEC60093	Ω*cm	>10 ¹²
面电阻率 Surface resistance	IEC60093	Ω	>10 ¹³

基座材料技术数据表 Housing material technical data sheet

材料性能 Material properties	标准 Standard	单位 Unit	M163
机械性能 Mechanical Properties			
拉伸模量 Tensile modulus[dam,1mm/min]	ISO527	MPa	11000
抗拉强度 Tensile strength[dam,50mm/min]	ISO527	MPa	175
弯曲模量 Flexural modulus[dam,2mm/min]	ISO178	MPa	9800
弯曲强度 Flexural strength[dam,2mm/min]	ISO178	MPa	250
简支梁无缺口冲击强度 Charpy unnotched impact strength	ISO179/1eU	kJ/m2	80
简支梁缺口冲击强度 Charpy notched impact strength	ISO179/1eU	kJ/m2	15
邵氏硬度 Shore hardness	ISO868	D	78
物理和热性能 Physical and Thermal Properties			
热变形温度 Heat deflection temperature[0.45MPa]	ISO75	°C	215
维卡软化温度 VICAT softening temperature[50°C/h-50N]	ISO306	°C	210
阻燃性能 Flammability	UL94	Class	HB
导电性能 Electrical Properties			
体电阻率 Volume resistance	IEC60093	Ω*cm	1013
面电阻率 Surface resistance	IEC60093	Ω	1012

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

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

■ 抗老化测试 UV stability test

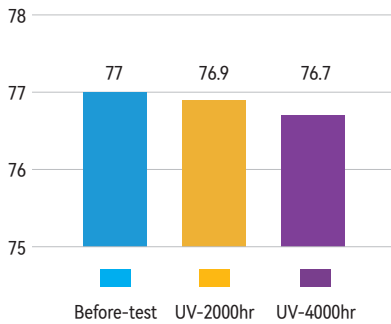
暴露周期 UV exposure periods	灯型 UV lamp	辐照度 Exposure conditions	黑标温度 Black-standard temperature	相对湿度% Relative humidity
8h -干燥 Dry		340nm	50°C±3°C	不控制 Not control
0.25h -喷淋 Spray	1A UVA-340	0.76W.m-2.n.m-1	不控制 Not control	不控制 Not control
3.75h -凝露 Condensation		关闭光源 Turn off UV lamp	50°C±3°C	不控制 Not control

测试标准 Test method: ISO 4892-3-2016

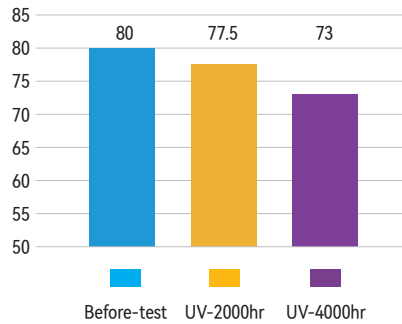
总辐照量 Total exposure: 45Kw.h

辐照时间 Exposure time: 4000h

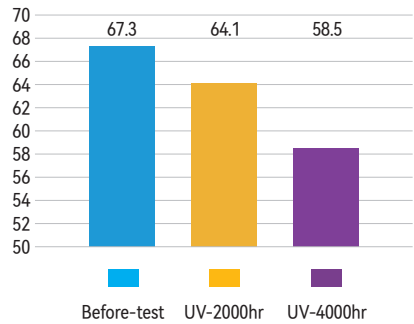
■ 邵氏硬度Shore harness [D]



■ 弯曲强度Flexural strength [MPa]



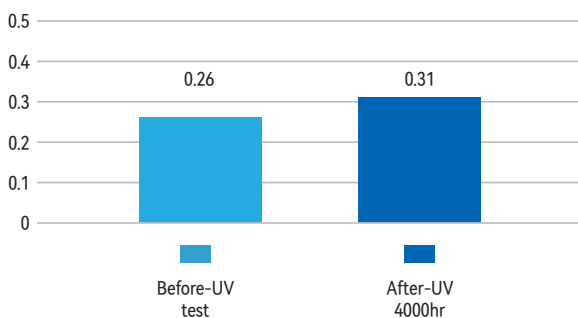
■ 抗拉强度Tensile strength [MPa]



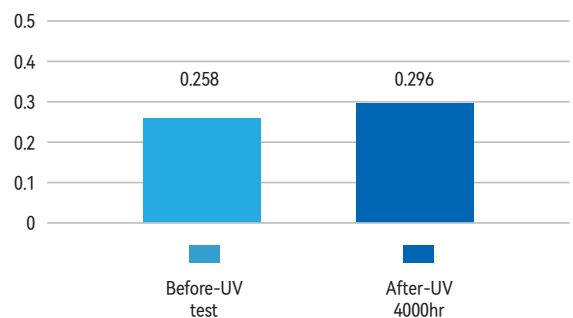
■ MN527耐磨寿命测试 Anti-wear ability test

测试条件 Test conditions	
测试环境Environment:	室温Room temp. 23°C
对偶件Shaft:	钢轴表面热镀锌Steel with hot-dip galvanized surface
等效动载荷Equivalent dynamic load:	10Kn [22.6% 有效接触面积载荷Effective contact area=3.1MPa]
摆动角度Swing angle:	±45°
摆动频率Swing frequency:	10 cycles/min
总循环数Total cycles:	13688 [参照25年循环数9125x安全系数1.5 25-year cycles 9125 x safety factor 1.5]

■ 摩擦系数Friction coefficient



■ 最终磨损Final wear [mm]



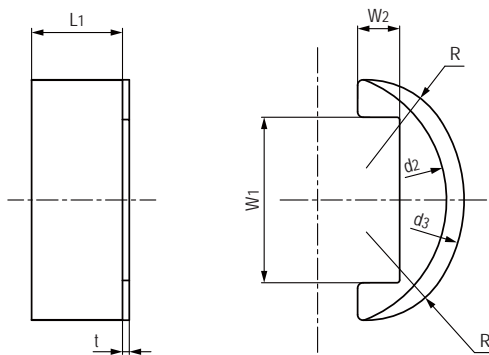
QBF1单法兰光伏支架轴承 PV Support bracket bearings



产品特性 Product features

- 单法兰设计塑料轴承
 - 户外耐紫外线老化
 - 耐高低温湿热老化
 - 低摩擦，耐磨损
 - 自润滑、免维护
 - 高强度、易安装
- Single flange design plastic bearings
 - UV resistance
 - High and low temperature, damp-heat aging
 - Low friction, wear resistance
 - Self lubricating, maintenance-free
 - High strength, easy installation

标准规格 Standard specifications



产品编码 Part No.:

QBF1-090157-090

长度 Length
 外径 Outer diameter
 内宽 Inner width

产品编码 Part No.	W1 [mm]	d2 [mm]	d3 [mm]	L1 [mm]	t [mm]	W2 [mm]	R [mm]
QBF1-090157-090	91	157	174	90	6	24	/
QBF1-140210-065	142	210	234	67	5	36	65
QBF1-150226-065	151	226	250	65	5	55	90

Solar Tracking Bracket Bearings

太阳能跟踪支架轴承

QBF2

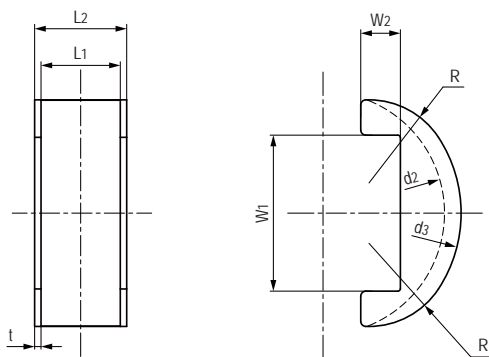
QBF2双法兰光伏支架轴承 PV Support bracket bearings



产品特性 Product features

- 双法兰设计塑料轴承
 - 户外耐紫外线老化
 - 耐高低温湿热老化
 - 低摩擦，耐磨损
 - 自润滑、免维护
 - 高强度、易安装
- Double flange design plastic bearings
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 - High strength, easy installation

标准规格 Standard specifications



产品编码 Part No.:

QBF2-120190-060

长度 Length

外径 Outer diameter

内宽 Inner width

产品编码 Part No.	W1 [mm]	d2 [mm]	d3 [mm]	L1 [mm]	t [mm]	W2 [mm]	L2 [mm]	R [mm]
QBF2-120190-060	122	190	216	62	5	31	72	65
QBF2-140210-060	142	210	234	62	5	36	72	65
QBF2-150226-060	151	226	250	60	5	55	70	90
QBF2-170255-070	171	255	275	70	5	65	80	110

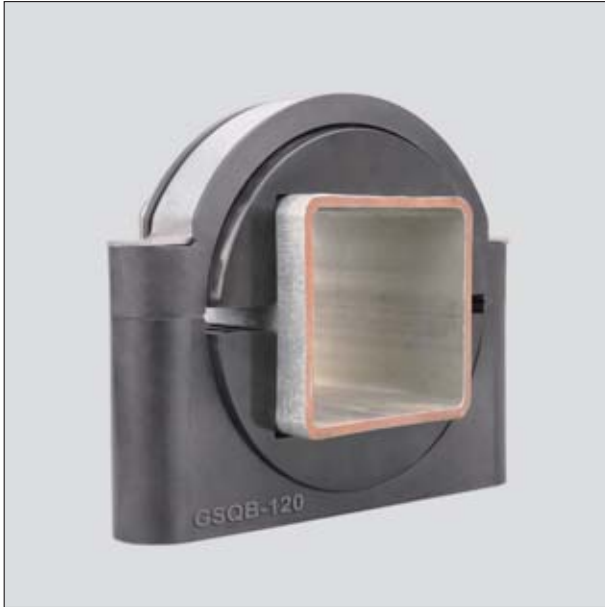
www.csb-ep.com
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Tel: 0086 573 84187009

QBF2

Plastic Plain Bearings

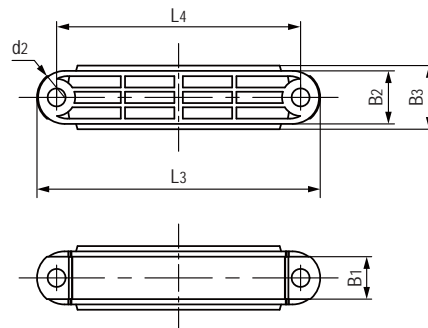
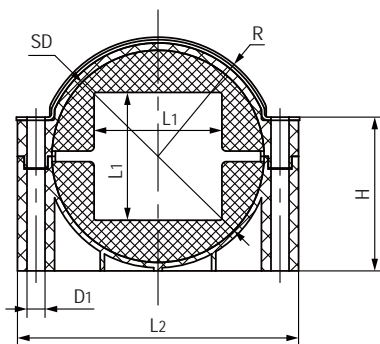
GSQB光伏跟踪支架关节轴承 PV Support bracket bearings



产品特性 Product features

- 一体式设计塑料关节轴承座
 - 户外耐紫外线老化
 - 耐高低温湿热老化
 - 低摩擦，耐磨损
 - 适用于平地或斜坡支架
 - 自润滑、免维护
 - 高强度、易安装
- Integrated design plastic spherical bearings
 - UV resistance
 - High and low temperature, damp-heat aging
 - Low friction, wear resistance
 - Suitable for flat or slope brackets
 - Self lubricating, maintenance-free
 - High strength, easy installation

标准规格 Standard specifications



产品编码 Part No.:
GSQB-100

内宽 Inner width

产品编码 Part No.	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	d1 [mm]	d2 [mm]	H [mm]	SD [mm]	R [mm]	B1 [mm]	B2 [mm]	B3 [mm]
GSQB-100	101	265	267	230	17	26	145	200	112.4	40	50	60
GSQB-110	111	265	267	230	17	26	145	200	112.4	40	50	60
GSQB-120	121	265	267	230	17	26	145	200	112.4	40	50	60
GSQB-140	141	312	312	273	17	26	179	245	134.9	40	50	60
GSQB-150	151	312	312	273	17	26	179	245	134.9	40	50	60

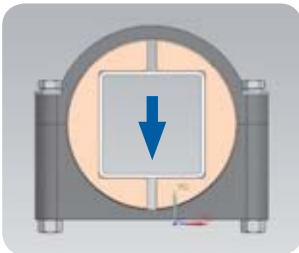
Solar Tracking Bracket Bearings

太阳能跟踪支架轴承

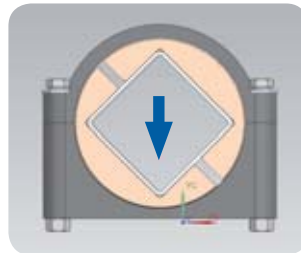
GSQB-120轴承承载性能试验 Bearing load capacity test

测试项目与方向 Test items and directions		测试数据 Test data
GSQB-120 抗压试验 Compression test	测试方向Test direction A+	130 kN
	测试方向Test direction B+	60 kN
	测试方向Test direction C+	120 kN
GSQB-120 抗拉试验 Tensile test	测试方向Test direction A-	40 kN
	测试方向Test direction B-	50 kN
	测试方向Test direction C-	50 kN

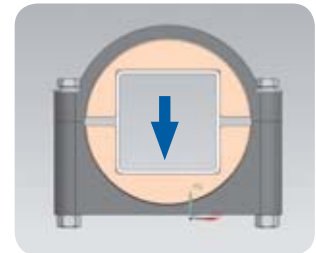
抗压试验-加载角度为9度 Compression test with an angle of 9 degree



测试方向Test Direction
A+

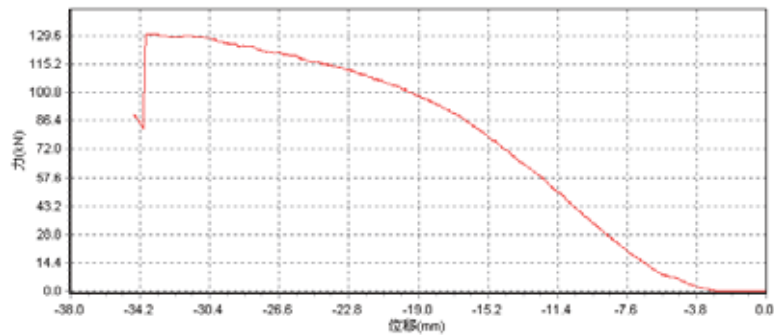


测试方向Test Direction
B+

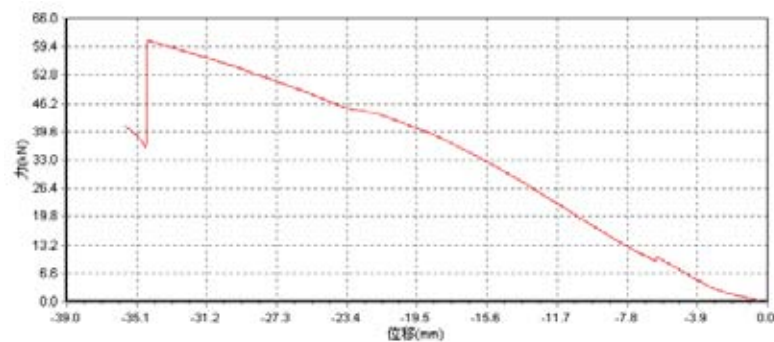


测试方向Test Direction
C+

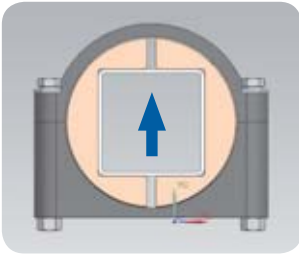
测试方向Test Direction A+ / C+



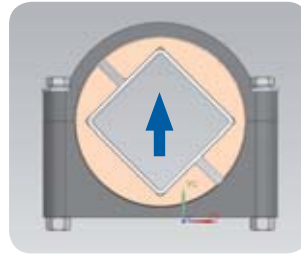
测试方向Test Direction B+



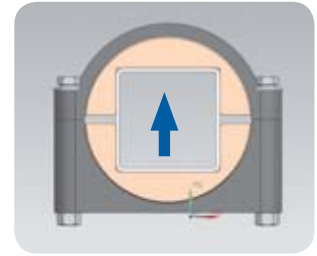
■ 抗拉试验-加载角度为9度 Tensile test with an angle of 9 degree



测试方向Test Direction
A-

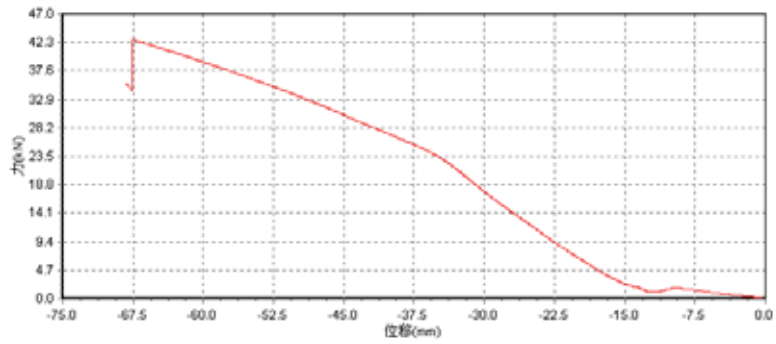


测试方向Test Direction
B-

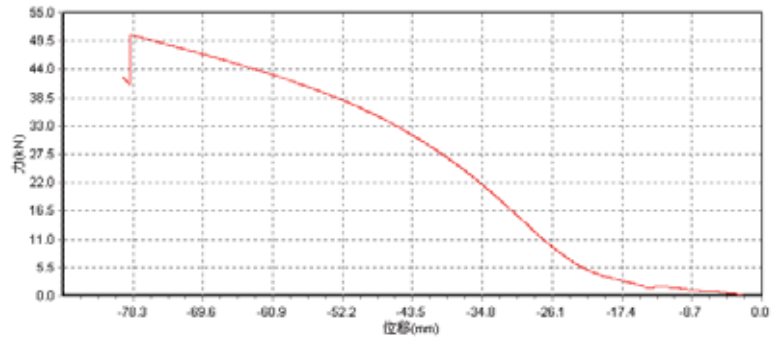


测试方向Test Direction
C-

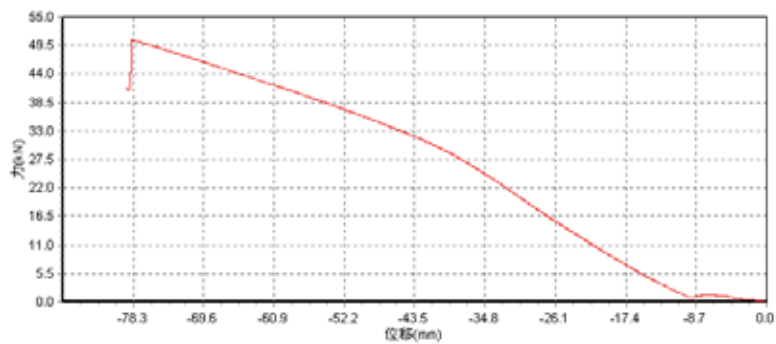
测试方向Test Direction A-



测试方向Test Direction B-



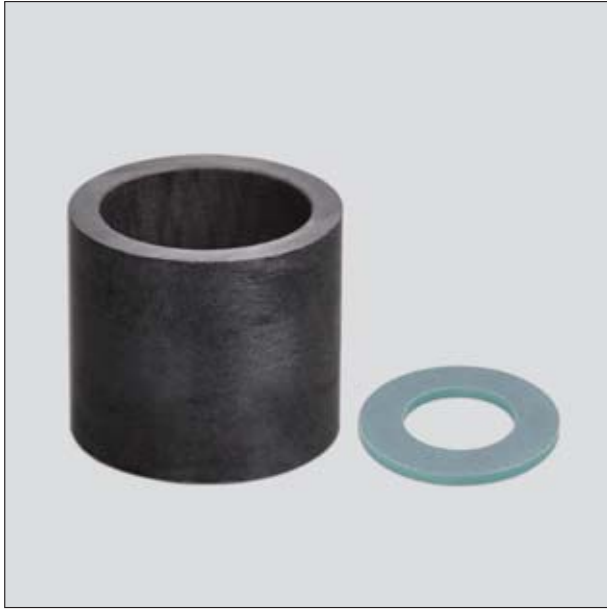
测试方向Test Direction C-



Solar Tracking Bracket Bearings

太阳能跟踪支架轴承

光热定日镜跟踪支架轴承 Heliostat support bracket bearings



产品特性 Product features

- 适用于定日镜主副轴及推杆安装轴承
 - 最高动载荷140MPa
 - 自润滑、免维护
 - 低摩擦，耐磨损
 - 可承受偏心边界载荷
 - 可提供直筒轴承与止推垫片
- Suitable for the shaft of heliostat and push rod installation
 - Max. dynamic load 140MPa
 - Self-lubricating, maintenance-free
 - Low friction, wear resistance
 - Boundary load is available
 - Available plain bearings and thrust washers

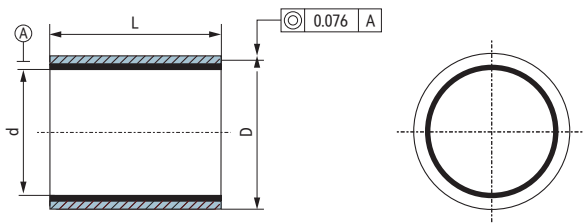
技术数据表 Technical data table

材料性能 Material properties	标准 Standard	单位 Unit	CRB
密度 Density	ISO1183	g/cm ³	1.95
最大吸水率Max. water absorption	ISO62	%	0.1
极限PV值 Max. PV (dry)	ITS026	N/mm ² ×m/s	1.8
摩擦系数 Coefficient of friction	ITS025	μ	0.03~0.12
连续运行温度 Long-term application temperature	ITS029	°C	+160
短时运行温度 Short-term application temperature	ITS029	°C	+180
最低运行温度 Lowest application temperature	ITS029	°C	-100
最高速度 Max. Speed	ITS032	m/s	0.20
抗压强度 Compressive strength	ITS033	MPa	420
最大静载荷 Max. static load	ITS027	MPa	240
最大动载荷 Max. dynamic load	ITS028	MPa	140
邵氏硬度 Shore hardness	ISO868	D	95
线性热膨胀系数(25 ~ 150°C) Linear coef. of thermal Expansion	ISO11359	10 ⁻⁶ ×K ⁻¹	13

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

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

标准规格 Standard specifications

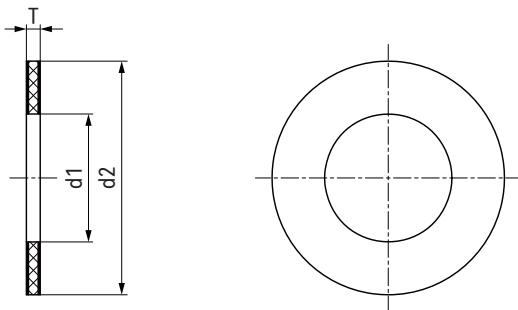


产品编码 Part No.:

CRB-20 25-30
 长度 Length
 外径 Outer diameter
 内径 Inner diameter

长度公差表 Length tolerance table		L		
		≤75 mm	> 75 to < 150 mm	≥150 mm
d	≤75 mm	-0.50 mm	-1.00 mm	-1.50 mm
	> 75 to ≤120 mm	-1.00 mm	-1.00 mm	-1.50 mm
	> 120 to ≤150 mm	-1.00 mm	-1.50 mm	-1.50 mm

产品编码 Part No.	轴承尺寸 Bearing Size		推荐尺寸 Recommend		装配间隙 Assembly Interference	标准长度 Standard Length L
	内径 d	外径 D	轴 Shaft D _s h7	孔 Housing H7 D _H		
CRB-2530-L	25 ^{+0.200} / _{+0.120}	30 ^{+0.100} / _{+0.050}	25 ⁰ / _{-0.021}	30 ^{+0.021} / ₀	0.029-0.100	15、20、25、30
CRB-2535-L	25 ^{+0.200} / _{+0.120}	35 ^{+0.100} / _{+0.050}	25 ⁰ / _{-0.021}	35 ^{+0.025} / ₀	0.025-0.100	15、20、25、30
CRB-3035-L	30 ^{+0.200} / _{+0.120}	35 ^{+0.100} / _{+0.050}	30 ⁰ / _{-0.021}	35 ^{+0.025} / ₀	0.025-0.100	15、20、25、30
CRB-3040-L	30 ^{+0.200} / _{+0.120}	40 ^{+0.100} / _{+0.050}	30 ⁰ / _{-0.021}	40 ^{+0.025} / ₀	0.025-0.100	15、20、25、30
CRB-3540-L	35 ^{+0.200} / _{+0.120}	40 ^{+0.100} / _{+0.050}	35 ⁰ / _{-0.025}	40 ^{+0.025} / ₀	0.025-0.100	15、20、25、30
CRB-3545-L	35 ^{+0.200} / _{+0.120}	45 ^{+0.100} / _{+0.050}	35 ⁰ / _{-0.025}	45 ^{+0.025} / ₀	0.025-0.100	15、20、25、30



产品编码 Part No.:

DR12W-2540-030
 厚度 Thickness
 外径 Outer diameter
 内径 Inner diameter

产品编码 Part No.	d ₁ ^{+0.5} [mm]	d _{2-0.5} [mm]	T _{±0.15} [mm]
DR12W-2540-030	25	40	3
DR12W-2545-030	25	45	3
DR12W-3050-030	30	50	3
DR12W-3055-030	30	55	3
DR12W-3560-030	35	60	3
DR12W-3565-030	35	65	3
DR12W-4060-030	40	60	3
DR12W-4065-030	40	65	3
DR12W-4565-030	45	65	3
DR12W-4570-030	45	70	3

Solar Tracking Bracket Bearings

太阳能跟踪支架轴承

CRB

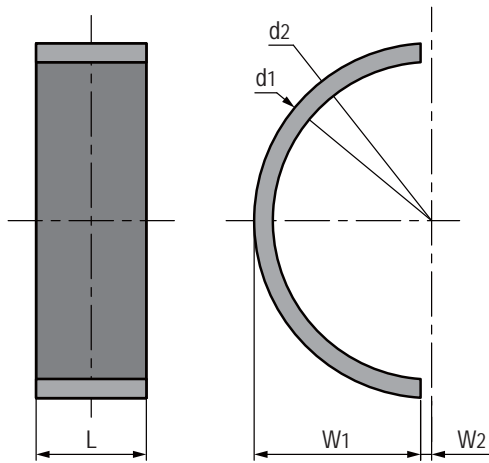
光热聚光镜跟踪支架轴承 Concentrator support bracket bearings



产品特性 Product features

- 长纤维与高强度树脂制成
 - 最高动载荷140MPa
 - 自润滑、免维护
 - 低摩擦，耐磨损
 - 适用于聚光镜跟踪支架
- Made of long fiber and high-strength resin
 - Max. dynamic load 140MPa
 - Self-lubricating, maintenance-free
 - Low friction, wear resistance
 - Suitable for consecration mirror tracking bracket

标准规格 Standard specifications



产品编码 Part No.:

CRB-170190-59-HP

长度 Length

外径 Outer diameter

内径 Inner diameter

产品编码 Part No.	d1 [mm]	d2 [mm]	W1 [mm]	W2 [mm]	L [mm]
CRB-170190-59-HP	170	190	94	1	59
CRB-202216-120-HP	202	216	107	1	120

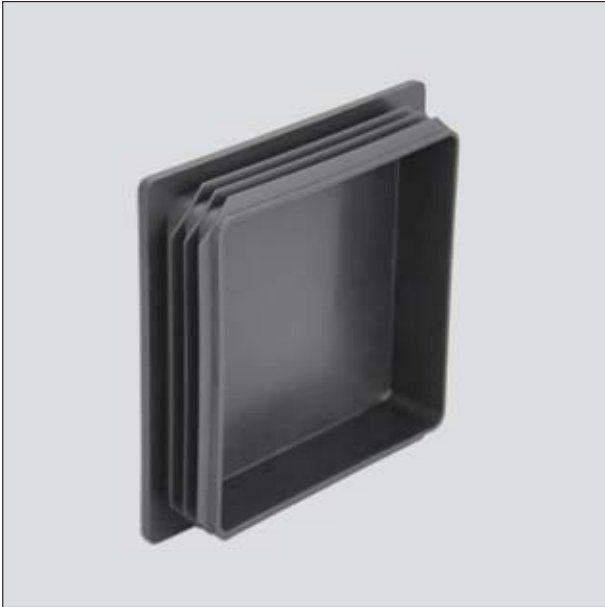
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CRB

Plastic Plain Bearings

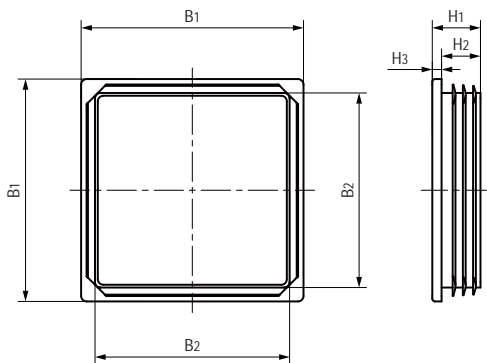
光伏跟踪支架方管堵塞端盖 PV Support bracket plugs



产品特性 Product features

- 带预紧设计塑料端盖
 - 户外耐紫外线老化
 - 耐高低温湿热老化
 - 高强度、易安装
-
- Plastic end caps with pre-load tip design
 - UV resistance
 - High and low temperature, damp-heat aging
 - High strength, easy installation

标准规格 Standard specifications



产品编码 Part No.:

PL-100

方管尺寸 Square profile dimension

产品编码 Part No.	B1 [mm]	B2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	方管型材壁厚 C-profile thickness [mm]
PL-100	100	85	23	18	5	2~5
PL-120	120	105	26	21	5	2~5
PL-150	150	138	24	20	4	2~5

[Https: //www.csb-ep.com](https://www.csb-ep.com)

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▣ CSB PLASTIC distributor



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