

EPB15 Plastic Bearings



Product Features

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°C – 100°C
- Maintenance-free dry operation
- Low water absorption and friction
- Small wear off amount against various shaft materials

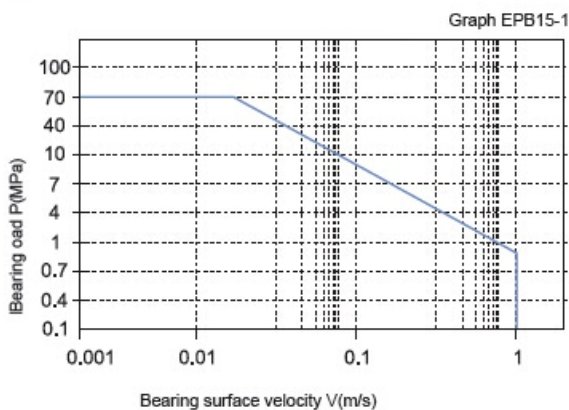
The Material Data Sheet

Common Capability	Testing Method	Unit	EPB15
Color			Yellow
Density	ISO 1183	g/cm ³	1.35
Dynamic friction /steel (dry)			0.05 - 0.15
Max. PV (dry)		N/mm ² x m/s	0.9
Max. rotating velocity		m/s	1.5
Max. oscillating velocity		m/s	1.1
Max. linear velocity		m/s	8
Tensile strength	ISO 527	MPa	130
Compressive strength (Axial)		MPa	70
E-Modul	ISO 527	MPa	4'000
Max. static pressure of the surface, 20°C		MPa	70
Shore hardness	ISO 868	D	77
Continuous work temperature		°C	-40 – +100
Short-time work temperature		°C	-40 – +180
Thermal conductivity	ASTME1461	W/m*k	0.25
Linear coef. of thermal expansion	ASTMD696	10 ⁻⁵ x K ⁻¹	7
Maisture absorption RH50 / 23°C	ASTMD570	%	1.3
Max. water absorption, 23°C		%	0.5
Flammability	UL94		HB
Volume resistivity	IEC60093	Ωcm	>10 ¹⁵
Surface resistivity	IEC60093	Ω	>10 ¹²

PV Value of Bearings

The max PV value of the EPB15 series bearing is 0.9 N/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).

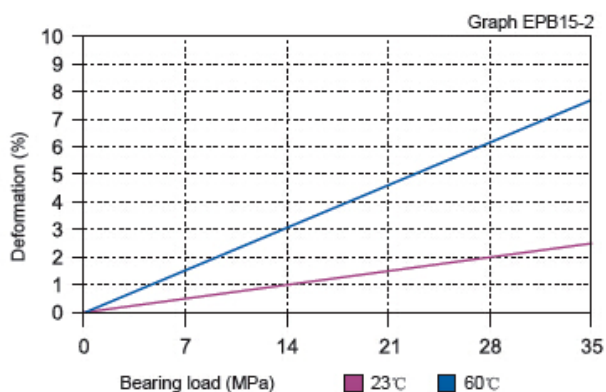
■ Permissible PV value



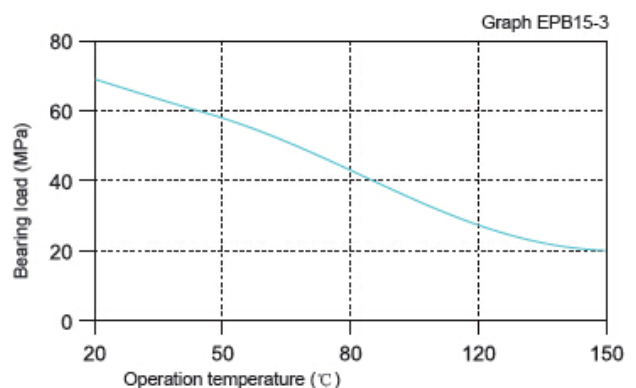
The Relation of Load, Speed and Temperature

EPB15 allows the Max static load of 70 MPa. 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 70 MPa. The bearing load is variable against the speed and temperature. Fast speed (Vmax: 1.5 m/s) results into higher temperature (Tmax: 100°C) which decreases the load capacity of the bearing. Please refer to the Graph EPB15-3 for such variation.

■ Load-Temperature deformation



■ Load-Temperature diagrams



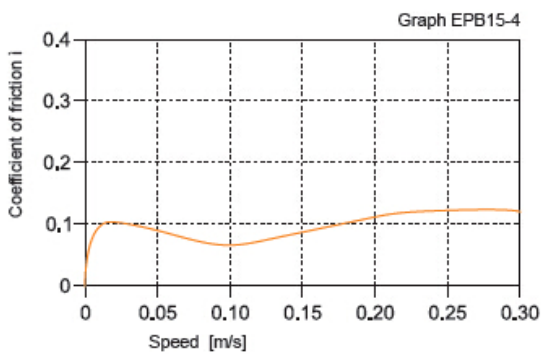
The Relation of Friction Factor, Wearing and shaft material

Friction Factor

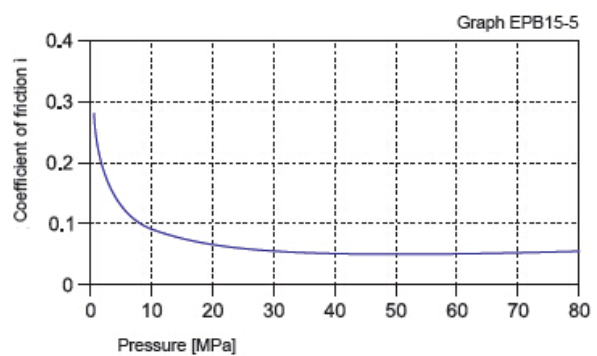
Graph EPB15-4 shows that the friction factor of EPB15 is not sensitive to the operation speed and Graph EPB15-5 shows that the friction factor of EPB15 is decreased along with the loading increasing and become stable when the loading is over 20 MPa. Graph EPB15-6 tells that the friction factor of EPB15 is also not sensitive to the shaft roughness but we still recommend the shaft roughness to be Ra 0.3 - 0.6.

EPB15	Dry	Grease	Oil	Water
Friction coef. μ	0.05 - 0.15	0.09	0.04	0.04

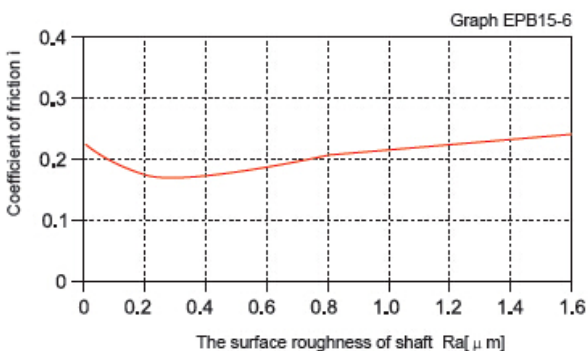
■ Coefficient of friction & the speed of bearing,
 $p = 2 \text{ MPa}$



■ Coefficient of friction & the pressure of bearing,
 $v = 0.2 \text{ m/s}$



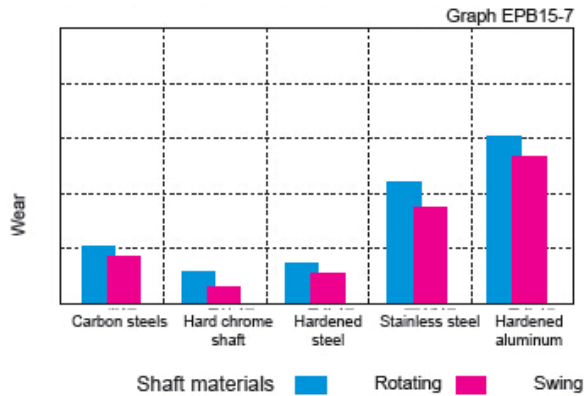
■ Coefficient of friction & the surface roughness of shaft



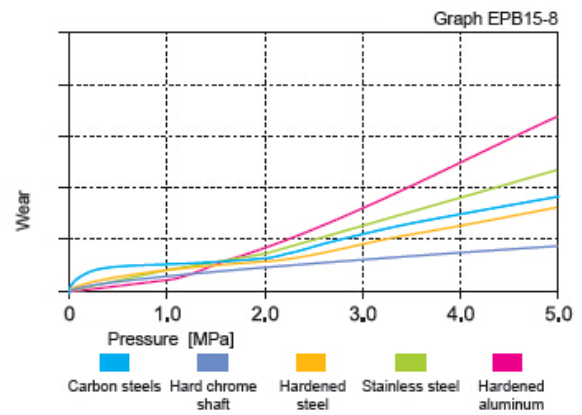
Wearing and shaft material

Graph EPB15-7 shows that the wearing of EPB15 is sensitive to different materials under rotation operation with the loading of 2 MPa. 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 EPB15 (Graph EPB15-8). The wearing will be decreased as long as the loading increasing.

■ The bearing wear under rotating with different shaft materials, $p = 2 \text{ MPa}$, $v = 0.2 \text{ m/s}$



■ The bearing wear & pressure under rotating with different shaft materials, $v = 0.2 \text{ m/s}$



Chemical Resistance

EPB15 is good at chemical resistance against weak acidic medium and various kinds of lubricants.

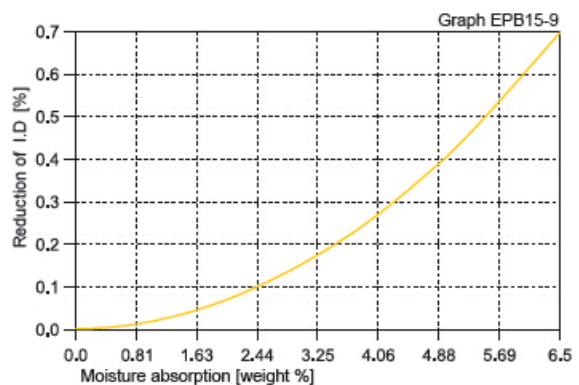
UV Resistance

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

Water Absorbability

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

■ Effect of moisture absorption on EPB15 bearings



NOTES

Data herein is typical and not the maximum values of the material specifications. Unless otherwise specified, all data listed is for all specification products. We reserve the right to change tech-Data without notice due to the improvement of material technology.