

EPB18 Plastic Bearings



Product Features

A self-lubricating material with low water absorption. Good wear resistance will be maintained when used with soft shaft and hard shaft combined.

- Continuous working temperature: -50°C – +110°C
- Maintenance-free dry operation
- High load requirement
- Suitable for working in humid environment

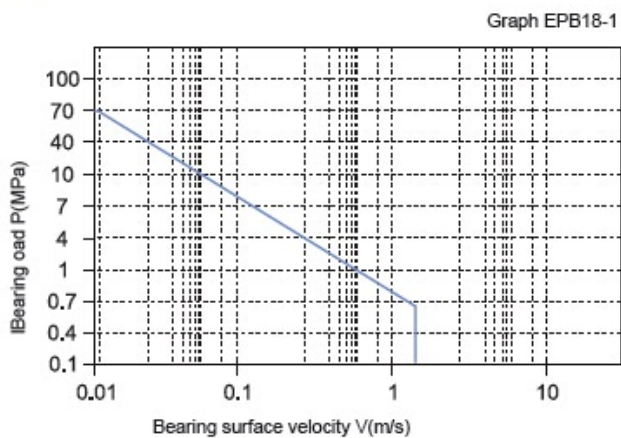
The Material Data Sheet

Common Capability	Testing Method	Unit	EPB18
Color			Yellow
Density	ISO 1183	g/cm ³	1.45
Dynamic friction /steel (dry)			0.05 - 0.18
Max. PV value		N/mm ² x m/s	0.8
Max. rotating velocity		m/s	1.2
Max. oscillating velocity		m/s	0.8
Max. linear velocity		m/s	3.0
Tensile strength	ISO 527	MPa	90
Compressive strength (Axial)		MPa	70
E-Modul	ISO 527	MPa	2'700
Max. static pressure of the surface, 20°C		MPa	70
Shore hardness	ISO 868	D	75
Continuous work temperature		°C	-50 – +110
Short-time work temperature		°C	-50 – +170
Thermal conductivity	ISO22007	W/m*k	0.3
Linear coef. of thermal expansion	ISO11359	10 ⁻⁵ x K ⁻¹	8
Maisture absorption RH50 / 23°C	ISO62	%	0.2
Max. water absorption, 23°C	ISO62	%	0.5
Flammability	UL94		HB
Volume resistivity	IEC60093	Ωcm	>10 ¹⁵
Surface resistivity	IEC60093	Ω	>10 ¹⁵

PV Value of Bearings

The max PV value of the EPB18 series bearing is 0.8 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 EPB18-1).

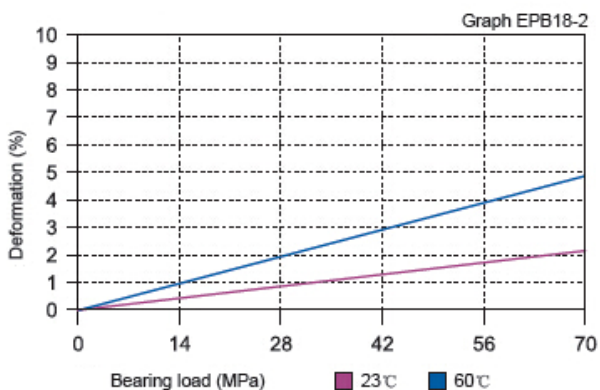
■ Permissible PV value



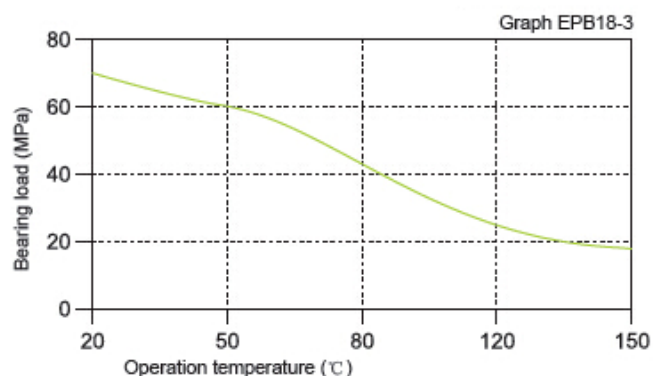
The Relation of Load, Speed and Temperature

EPB18 allows the max static load of 70 MPa. 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 70 MPa. The bearing load is variable against the speed and temperature. Fast speed (Vmax: 1,20 m/s) results into higher temperature (Tmax: 110 °C) which decreases the load capacity of the bearing. Please refer to the Graph EPB18-3 for such variation.

■ Load-Temperature deformation



■ Load-Temperature diagrams



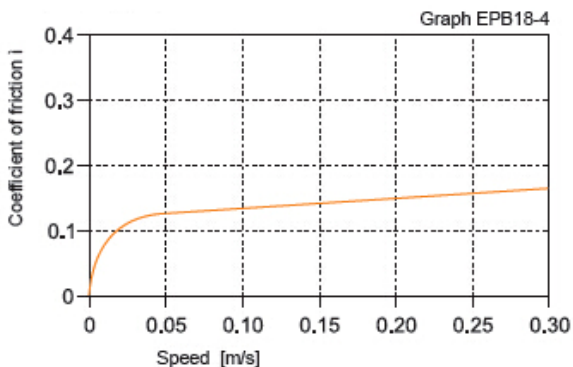
The Friction Factor, Wearing and shaft material

Friction Factor

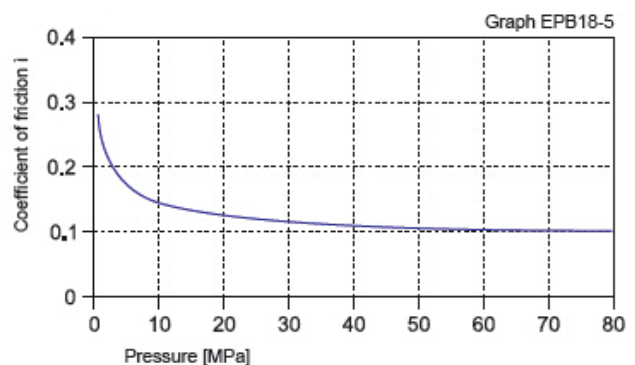
Graph EPB18-4 shows that as the same as most of the slide bearing materials, the friction factor of EPB18 is increasing along with the rotation speed under a certain loading while as shown in figure EPB18-5, it is decreased along with the increasing of loading when the operation speed is stable. From figure EPB18-6, it is found that the most suitable shaft roughness is Ra 0.2 to Ra 0.6. Smoother shaft or rougher shaft may result into friction factor increasing.

EPB18	Dry	Grease	Oil	Water
Friction coef. μ	0.05 – 0.25	0.09	0.04	0.04

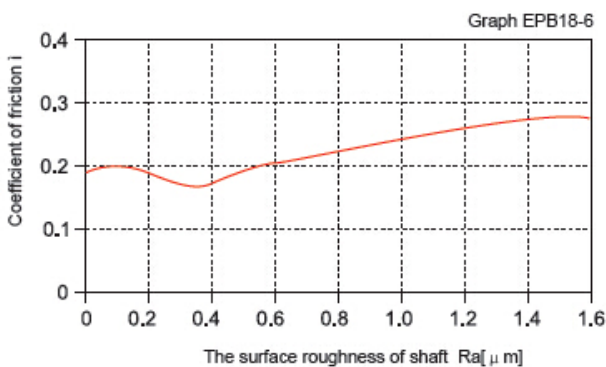
■ Coefficient of friction & the speed of bearing,
 $p = 2 \text{ MPa}$



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



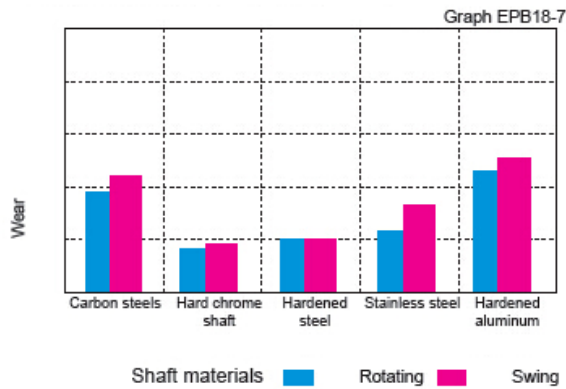
■ Coefficient of friction & the surface roughness of shaft



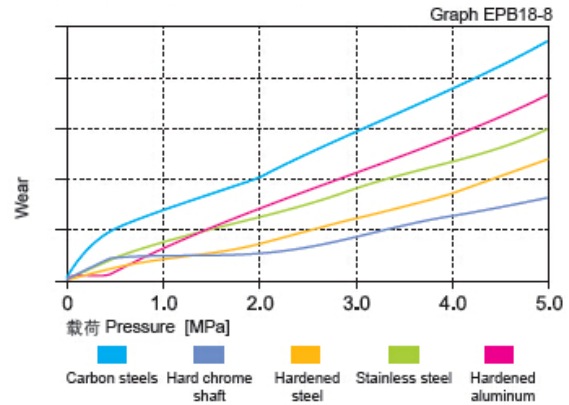
Wearing and shaft material

Graph 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 EPB18 is suitable for hardened chrome steel and hardened steel shaft in rotation operation or oscillation operation.

■ 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

EPB18 is good at chemical resistance against weak acidic medium and various kinds of lubricants.

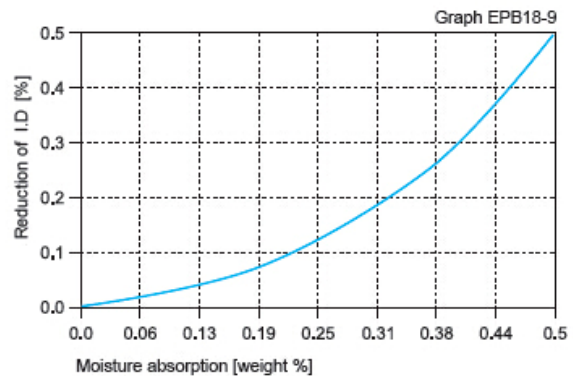
UV Resistance

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

Water Absorbability

The water absorb rate of EPB18 is 0.2% under the atmospheric pressure while it is 0.5% when the material is immersed into water. With its low water absorbability, the material is suitable for humid environment applications.

■ Effect of moisture absorption on EPB18 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.