

EPB11 Plastic Bearings



Product Features

Wear resistance material with low friction factor without PTFE and Silicon. It conforms 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°C. If the working temperature is higher than 50°C, additional locating ring is necessary.

- Continuous working temperature: -40°C – 70°C
- Very common; suitable for most of low load
- Low operation speed low noise

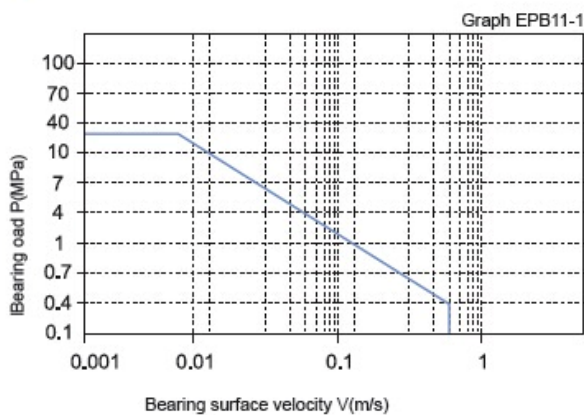
The Material Data Sheet

Common Capability	Testing Method	Unit	EPB11
Color			White
Density	ISO 1183	g/cm ³	1.05
Dynamic friction /steel (dry)			0.05 - 0.15
Max. PV (dry)		N/mm ² x m/s	0.2
Max. rotating velocity		m/s	0.5
Max. oscillating velocity		m/s	0.4
Max. linear velocity		m/s	1.0
Tensile strength	ISO 527	MPa	45
Compressive strength (Axial)		MPa	35
E-Modul	ISO 527	MPa	1000
Max. static pressure of the surface, 20°C		MPa	30
Shore hardness	ISO 868	D	70
Continuous work temperature		°C	-40 – +70
Short-time work temperature		°C	-40 – +100
Thermal conductivity	ASTME1461	W/m*k	0.3
Linear coef. of thermal expansion	ASTMD696	10 ⁻⁵ x K ⁻¹	12
Maisture absorption RH50 / 23°C	ASTMD570	%	<0.1
Max. water absorption, 23°C		%	<0.1
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 EPB11 series bearing is 0.2 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 EPB11-1).

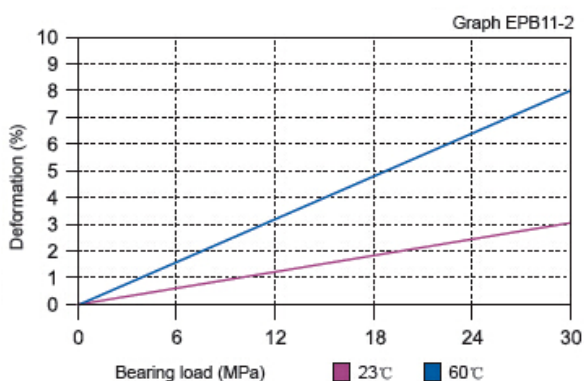
■ Permissible PV value



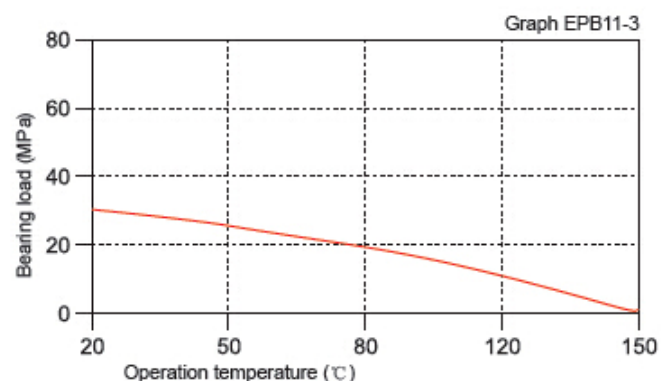
The Relation of Load, Speed and Temperature

EPB11 allows the max static load of 30 MPa. 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 30 MPa. The bearing load is variable against the speed and temperature. Fast speed (Vmax: 0.5 m/s) results into higher temperature (Tmax: 70°C) which decreases the load capacity of the bearing. Please refer to the Graph EPB11-3 for such variation.

■ Load-Temperature deformation



■ Load-Temperature diagrams



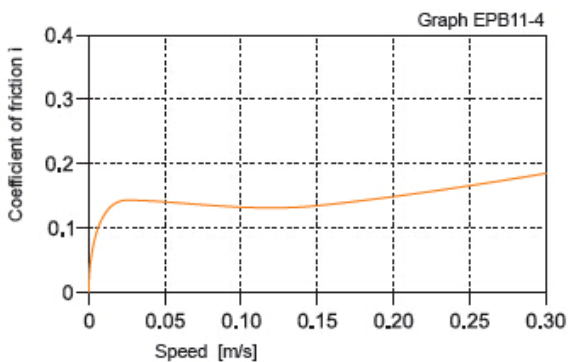
The Relation of Friction Factor, Wearing and shaft material

Friction Factor

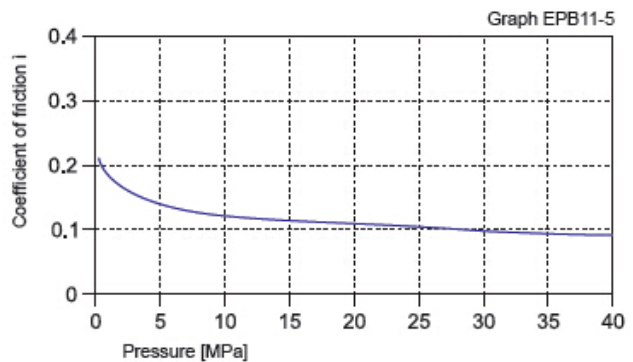
Graph EPB11-4 and Graph EPB11-5 shows that the friction factor of EPB11 is not considerably variable against the changing of the loading and operation speed because there is no Fluorine and Silicon in this material and therefore its low friction feature is completely depended on the material Features. Graph EPB11-6 shows that the friction factor of EPB11 is sensitive to the shaft roughness. The shaft roughness of Ra 0.2 – 0.6 is recommended for the best performance of EPB11 bearings.

EPB11	Dry	Grease	Oil	Water
Friction coef. μ	0.05 - 0.15	0.09	0.04	0.04

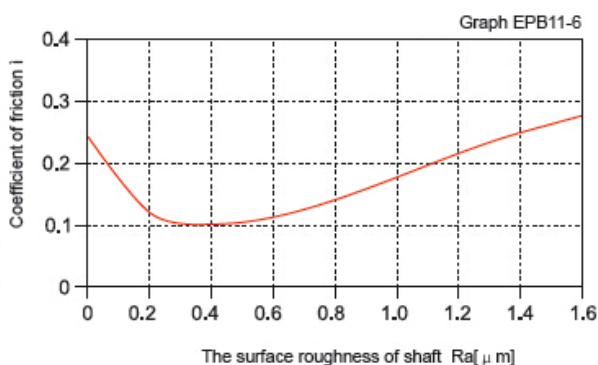
■ Coefficient of friction & the speed of bearing,
 $p = 2 \text{ MPa}$



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



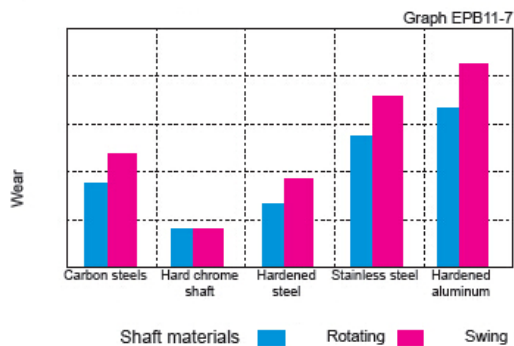
■ Coefficient of friction & the surface roughness of shaft



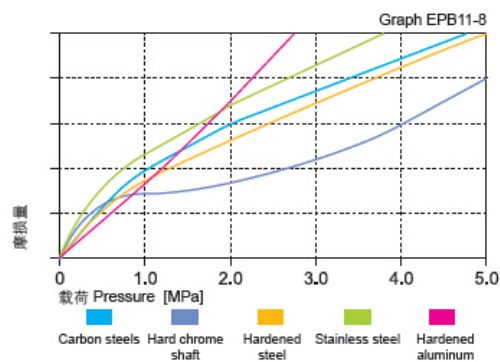
Wearing and shaft material

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

■ 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

EPB11 is good at chemical resistance against mild base, weak acidic medium and various kinds of lubricants.

UV Resistance

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

Water Absorbability

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

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.