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IHR SPEZIALIST FÜR GLEITLAGER

EPB Plastic Bearings

Product Features

The most common plastic bearing material. It is suitable for the applications with working temperature not higher than 80°C. It is the preferable material with good wear resistance and economic efficient for a new designation.

- Continuous working temperature: -40°C – +80°C
- Very common; suitable for most of average & low load
- Maintenance-free dry operation
- Light wear against different shaft materials
- Low friction

The Material Data Sheet

Common Capability	Testing Method	Unit	EPB
Color			Dark Grey
Density	ISO 1183	g/cm³	1.46
Dynamic friction /steel (dry)			0.05 - 0.15
Max. PV (dry)		N/mm² x m/s	0.4
Max. rotating velocity		m/s	1.0
Max. oscillating velocity		m/s	0.7
Max. linear velocity		m/s	3.0
Tensile strength	ISO 527	MPa	80
Compressive strength (Axial)		MPa	65
E-Modul	ISO 527	MPa	2'300
Max. static pressure of the surface, 20°C		MPa	35
Rockwell hardness	ISO 2039-2	HRR	108
Continuous work temperature		°C	-40 – +80
Short-time work temperature		°C	-40 – +120
Thermal conductivity	ASTME1461	W/m*k	0.2
Linear coef. ofthermal expansion	ASTMD696	10^{-5} x K^{-1}	10
Maisture absorption RH50 / 23°C	ASTMD570	%	0.2
Max. water absorption, 23"C		%	1.2
Flammability	UL94		HB
Volume resistivity	IEC60093	Ωcm	$>10^{12}$
Surface resistivity	IEC60093	Ω	$>10^{15}$

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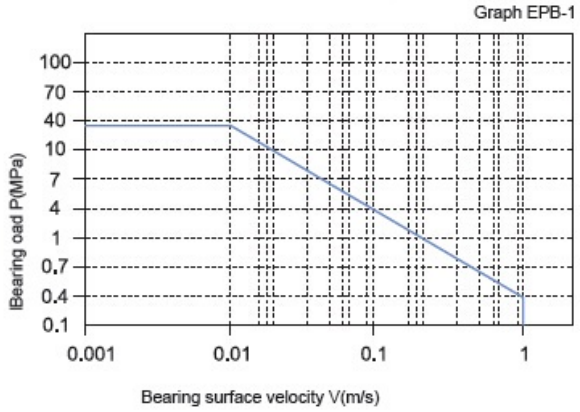
PV Value of Bearings

The max PV value of the EPB series bearing is 0.4 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 EPB-1).

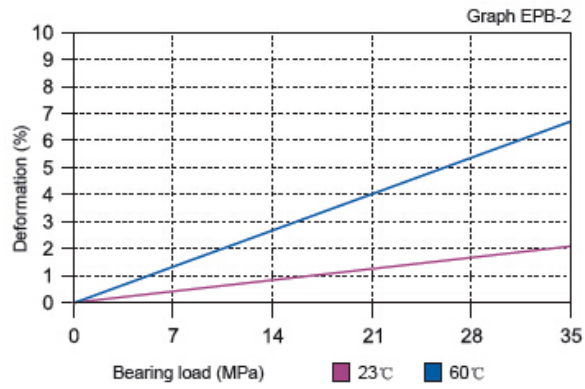
Permissible PV



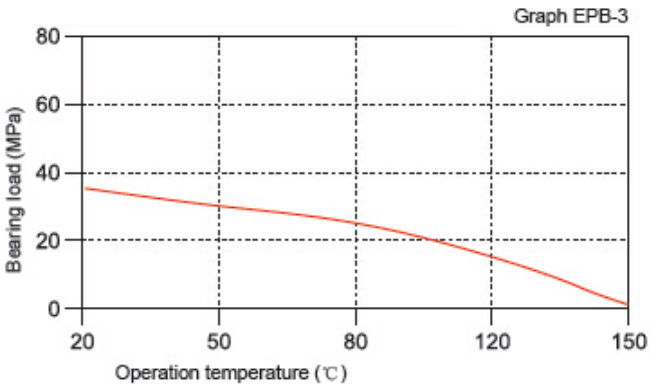
The Relation of Load, Speed and Temperature

EPB allows the Max static load of 35 MPa, 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 35 MPa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0 m/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.

Load-Temperature deformation



Load-Temperature diagrams



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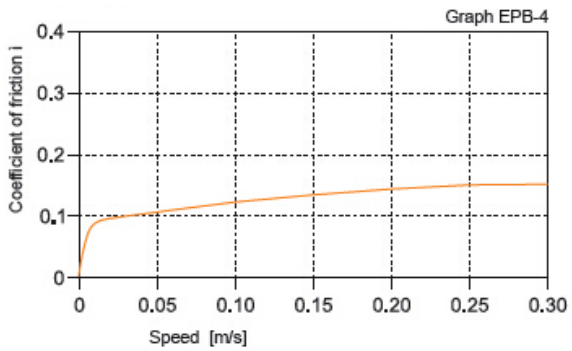
The Relation of Friction Factor, Wearing and shaft material

Friction Factor

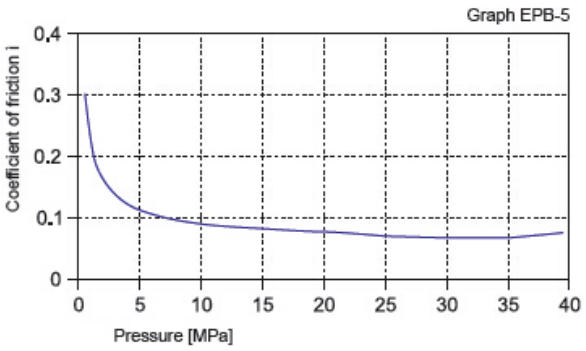
EPB friction factor is not sensitive to the operation speed and bearing loading (see Graph EPB-4 and Graph EPB-5). The above features are the most common considerations for the bearing material selection. The friction of EPB could be maintained at a relatively lower level so that the good wearing features 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 Ra 0.3 - 0.5.

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

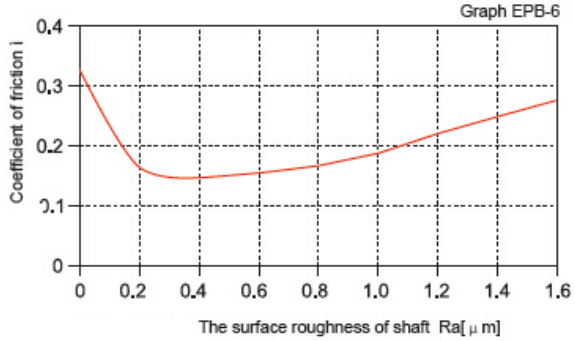
Coefficient of friction & the speed of bearing, p = 2 MPa



Coefficient of friction & the pressure of bearing, v = 0.2 m/s



Coefficient of friction & the surface roughness of shaft



Wearing and shaft material

The shaft material is an important media for the bearing wearing but EPB is suitable for almost all kinds of shaft materials. Graph EPB-7 and Graph EPB-8 show that the wearing feature of EPB is excellent when the shaft material are hardened chrome steel or hardened steel or hardened Aluminium.

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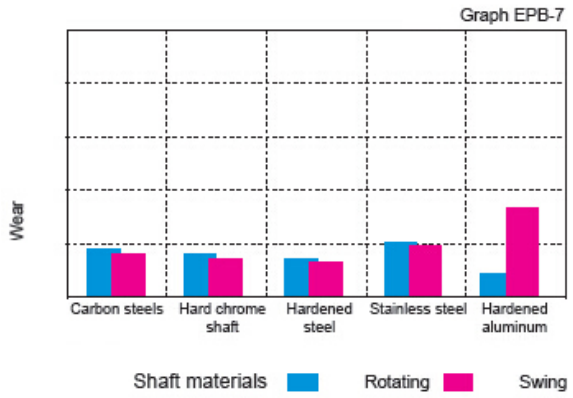
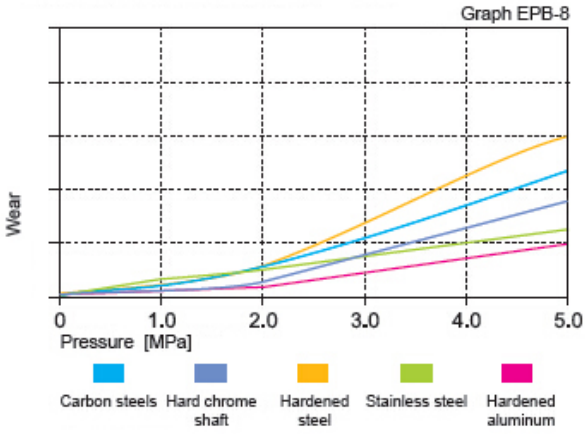
The bearing wear under rotating with different shaft materials, p = 2 MPa, v = 0.2 m/s



The bearing wear & pressure under rotating with different shaft materials, v = 0.2 m/s



Chemical Resistance

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

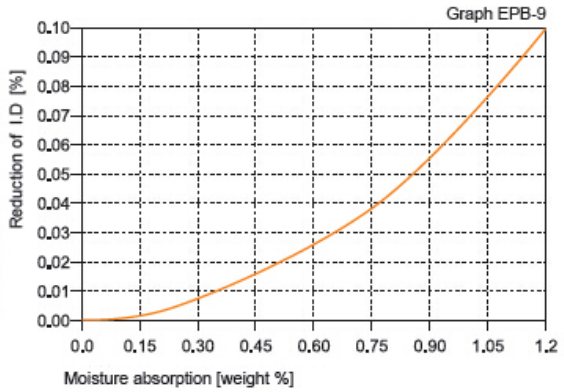
UV Resistance

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

Water Absorbability

The water absorb rate of 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.

Effect of moisture absorption on EPB 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.