GGT Gleit-Technik AG
Postfach 164
Meierskappelstrasse 3
CH–6403 Küssnacht am Rigi

Tel. +41 41 854 15 30
Fax +41 41 854 15 32
E-Mail info@gleitlager.ch
Web www.gleitlager.ch

gleit-technik ag
IHR SPEZIALIST FÜR GLEITLAGER

EPB2 Plastic Bearings

Product Features

The solution of middle to low load application and economic effective requirement. It is also one of the low water absorbing materials.

- Continuous working temperature: -50℃ – +100℃
- Suitable for medium load operation
- Maintenance-free dry operation
- For wet conditions
- Low cost material for high quantities

The Material Data Sheet

Common Capability	Testing Method	Unit	EPB2
Color			Olive
Density	ISO 1183	g/cm³	1.29
Dynamic friction /steel (dry)			0.07 - 0.20
Max. PV (dry)		N/mm² x m/s	0.5
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	70
E-Modul	ISO 527	MPa	2’400
Max. static pressure of the surface, 20°C		MPa	60
Rockwell hardness	ISO 2039-2	HRR	111
Continuous work temperature		℃	-50 – +100
Short-time work temperature		℃	-50 – +150
Thermal conductivity	ASTME1461	W/m*k	0.25
Linear coef. ofthermal expansion	ASTMD696	10^{-5} x K^{-1}	10
Maisture absorption RH50 / 23℃	ASTMD570	%	0.2
Max. water absorption, 23"C		%	0.4
Flammability	UL94		HB
Volume resistivity	IEC60093	Ωcm	$>10^{14}$
Surface resistivity	IEC60093	Ω	$>10^{15}$

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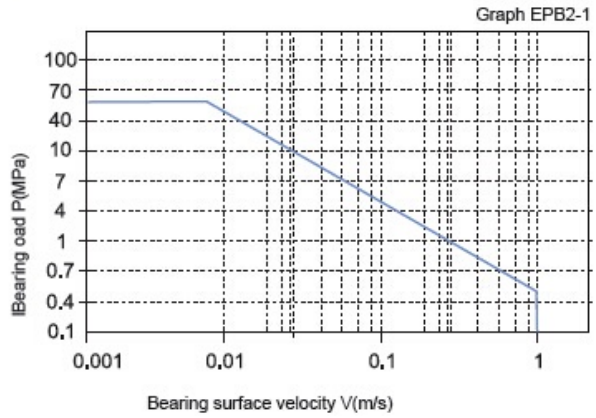
PV Value of Bearings

The max PV value of the EPB2 series bearing is 0.5 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 EPB2-1).

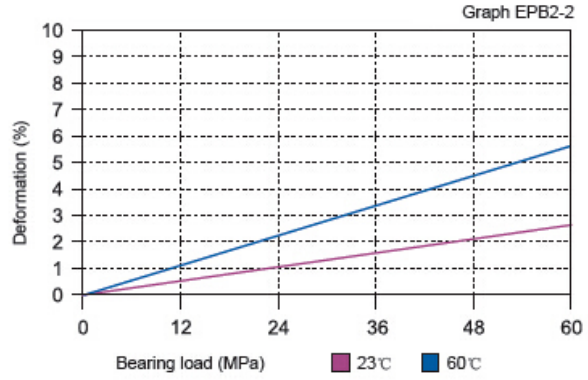
Permissible PV



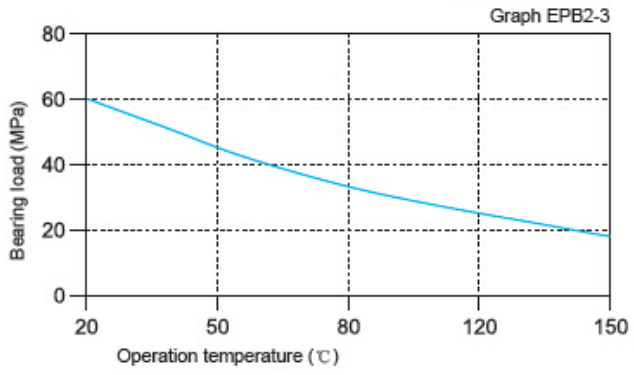
The Relation of Load, Speed and Temperature

EPB2 allows the Max static load of 60 MPa. The max compressive deformation rate under the max load is listed in Graph EPB2-2. The actual load capacity of bearing is slightly less than 60 MPa. The bearing load is variable against the speed and temperature. Fast speed (Vmax: 1.0 m/s) results into higher temperature (Tmax: 100℃) which decreases the load capacity of the bearing. Please refer to the Graph EPB2-3 for such variation.

Load-Temperature deformation



Load-Temperature diagrams



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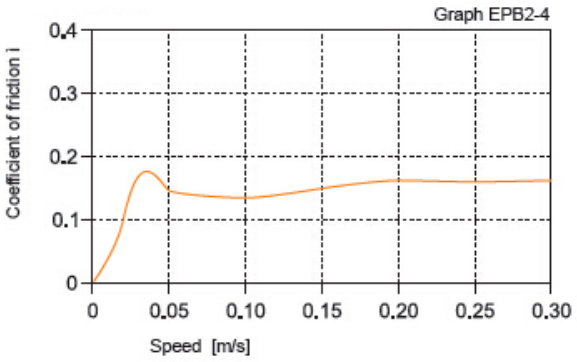
The Relation of Friction Factor, Wearing and shaft material

Friction Factor

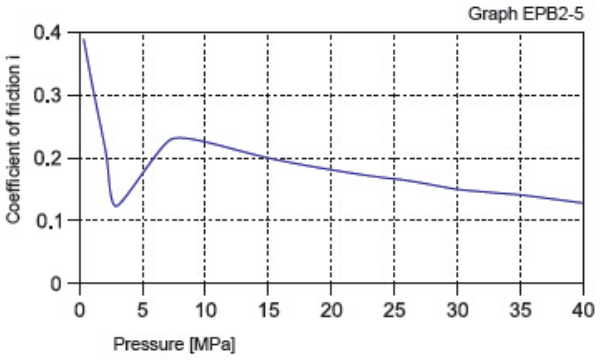
Similar with most of the plastic bearings, the friction factor of EPB2 is increased along with the operation speed when the loading is stable (see Graph EPB2-4) and is decreased along with the loading increasing when the operation speed is stable (see Graph EPB2-5). From Graph EPB2-6, it shows the friction factor of EPB2 is variable against different shaft surface roughness. The recommended shaft surface roughness is Ra 0.3 - 0.6.

EPB2	Dry	Grease	Oil	Water
Friction coef. μ	0.07 - 0.20	0.09	0.04	0.04

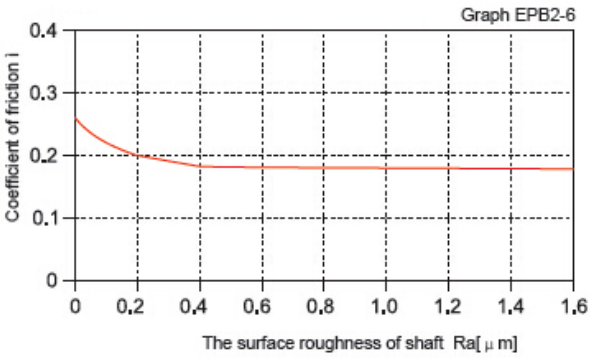
Coefficient of friction & the speed of bearing, p = 2 MPa



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



Coefficient of friction & the surface roughness of shaft



Wearing and shaft material

Graph EPB2-7 shows that EPB2 is rather suitable for hardened steel shaft and hardened chrome steel shaft under lower loading and Graph EPB2-7 shows that EPB2 wearing feature is better for oscillation operation than of rotation operation.

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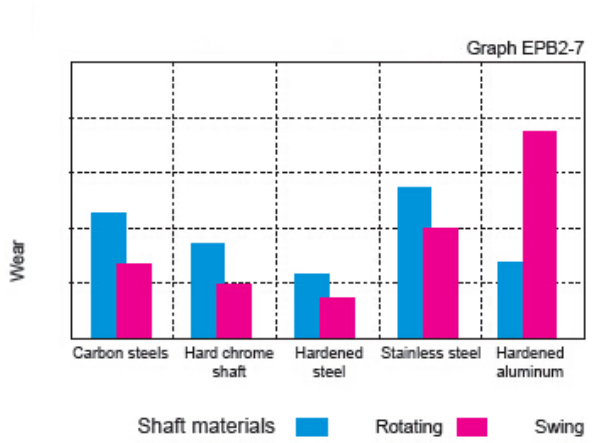
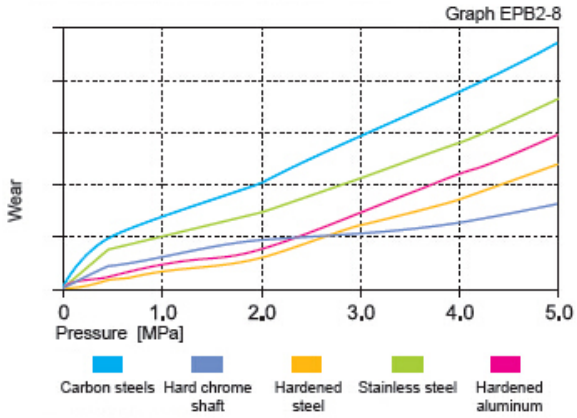
The bearing wear under rotating with different shaft materials, p = 2 MPa, v = 0.2 m/s



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



Chemical Resistance

EPB2 is good at chemical resistance against weak acidic medium and various kinds of lubricants.

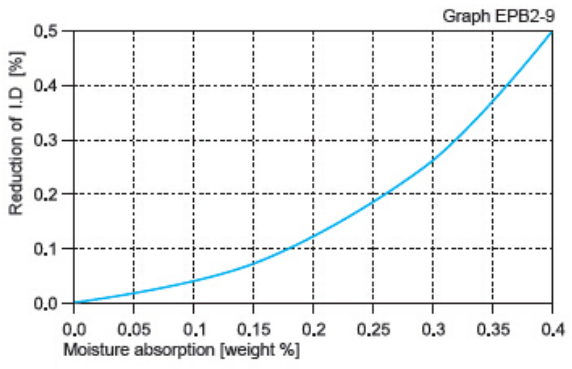
UV Resistance

Disintegration could be possible for the material EPB2 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 EPB2 is 0.2% under the atmospheric pressure while it is 0.4% 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 EPB2 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.