

EPB5 Plastic Bearings



Product Features

- Continuous working temperature: -100°C – +250°C
- Suitable for high load operation
- High load capacity at higher temperature
- Good chemical resistance
- Low water absorption
- High pressure resistance

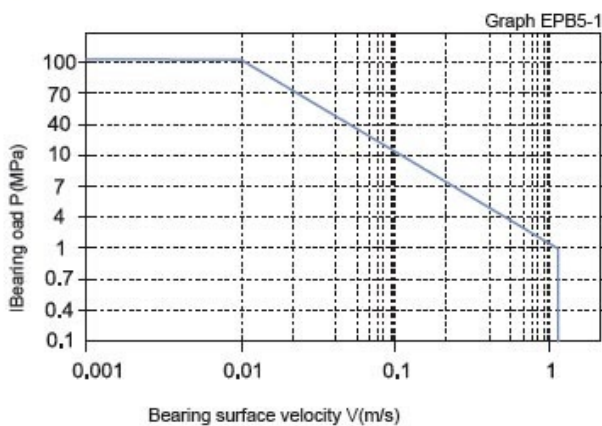
The Material Data Sheet

Common Capability	Testing Method	Unit	EPB5
Color			Black
Density	ISO 1183	g/cm ³	1.44
Dynamic friction /steel (dry)			0.09 - 0.25
Max. PV (dry)		N/mm ² x m/s	1.5
Max. rotating velocity		m/s	1.5
Max. oscillating velocity		m/s	1.1
Max. linear velocity		m/s	5.0
Tensile strength	ISO 527	MPa	170
Compressive strength (Axial)		MPa	100
E-Modul	ISO 527	MPa	7'900
Max. static pressure of the surface, 20°C		MPa	150
Rockwell hardness	ISO 2039-2	HRR	120
Continuous work temperature		°C	-100 – +250
Short-time work temperature		°C	-100 – +315
Thermal conductivity	ASTME1461	W/m*k	0.6
Linear coef. of thermal expansion	ASTMD696	10 ⁻⁵ x K ⁻¹	5
Maisture absorption RH50 / 23°C	ASTMD570	%	0.1
Max. water absorption, 23°C		%	0.5
Flammability	UL94		V0
Volume resistivity	IEC60093	Ωcm	>10 ⁸
Surface resistivity	IEC60093	Ω	>10 ⁷

PV Value of Bearings

The max PV value of the EPB5 series bearing is 1.5 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 EPB5-1).

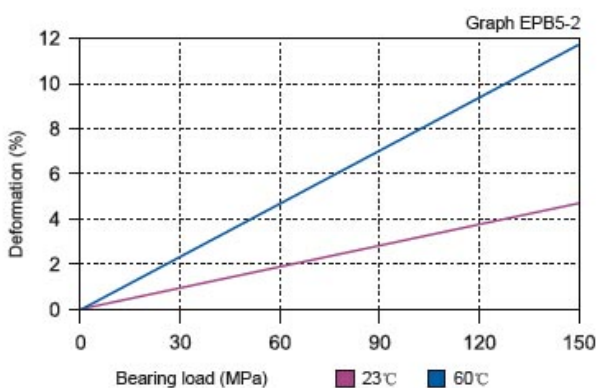
■ Permissible PV value



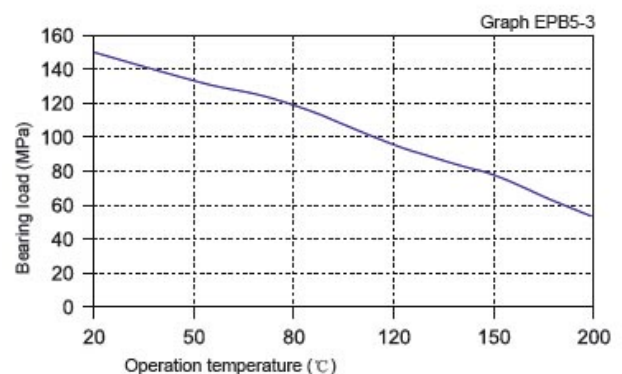
The Relation of Load, Speed and Temperature

EPB5 allows the max static load of 150 MPa. The max compressive deformation rate under the max load is listed in Graph EPB5-2. The actual load capacity of bearing is slightly less than 150 MPa. The bearing load is variable against the speed and temperature. Fast speed (Vmax: 1.5 m/s) results into higher temperature (Tmax: 250°C) which decreases the load capacity of the bearing. Please refer to the Graph EPB5-3 for such variation.

■ Load-Temperature deformation



■ Load-Temperature diagrams

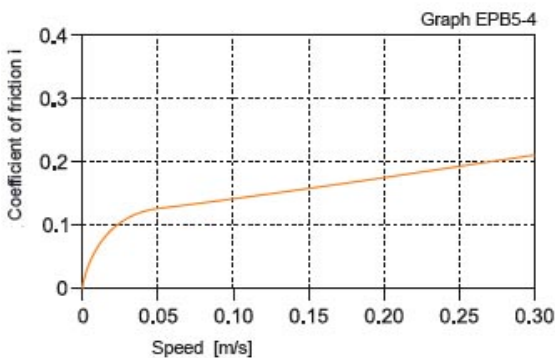


The Friction Factor, Wearing and shaft material

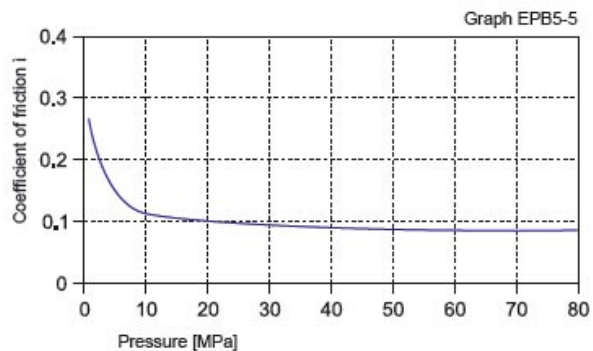
EPB5 Bearing Friction factor is increased along with the increasing of the operation speed under certain loading (see Graph EPB5-4. The friction factor of EP5 is decreased along with the loading increasing not over 20 MPa (see Graph EPB5-5). The friction factor will not change much along with the speed when the loading is over 20 MPa. The Graph EPB5-6 shows that the bearing could achieve its best performance when the counter shaft surface roughness is around Ra0.6 to Ra0.8

EPB5	Dry	Grease	Oil	Water
Friction coef. μ	0.09 ~ 0.25	0.09	0.04	0.04

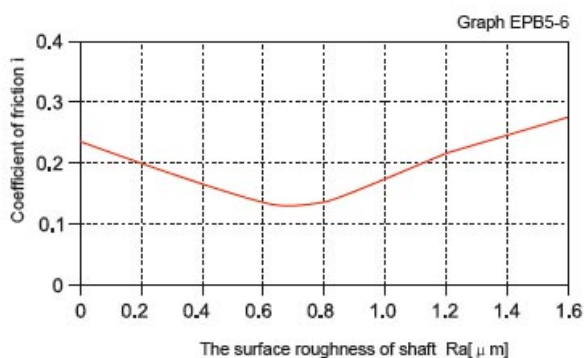
■ Coefficient of friction & the speed of bearing, $p = 2 \text{ MPa}$



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



■ Coefficient of friction & the surface roughness of shaft

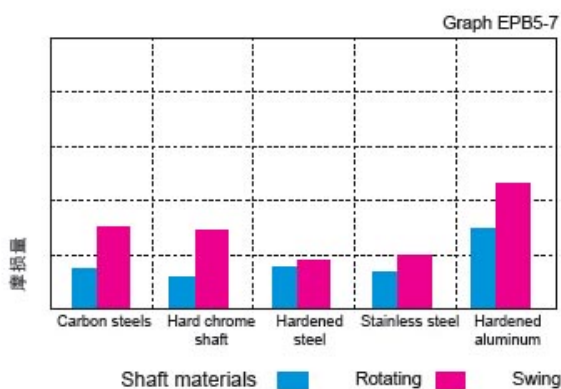


Wearing and shaft material

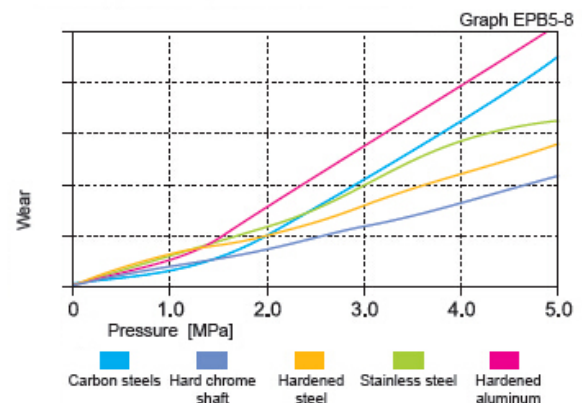
Graph EPB5-7 and Graph EPB5-8 show the test results of the material EPB5 running against different shaft materials. It is suitable for stainless steel and hot rolled carbon steel shaft when the loading is less than 2MPa and it will be more suitable for heat treated steel and carbon steel shaft when the loading is over

2MPa. Graph EPB5-7 shows EPB5 is good for rotation operation. Specially, from the Graph EPB5-9, it is read that EPB5 is with better performance under high temperature around 150°C comparing with under the ambient temperature of 23°C.

■ 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

Chemical Resistance of EPB5 is very good. It can work well in the heavy acid of 65%.

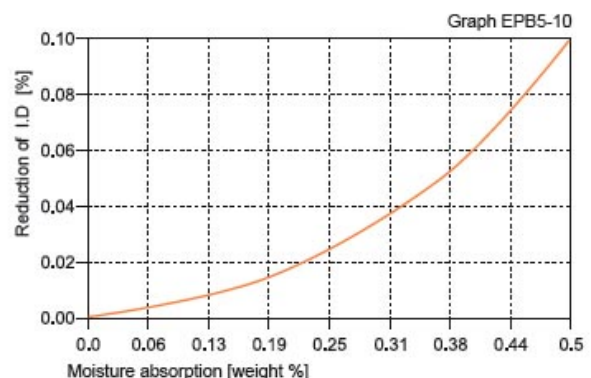
UV Resistance

EPB5 can maintain its performance to be stable even exposed in the UV ray for long period.

Water Absorbability

The water absorb rate of EPB5 is less than 0.1% under the atmospheric pressure while it is 0.5% when the material is immersed into water. The material performance and dimensions of the material is stabilized for the applications under humid environment.

■ Effect of moisture absorption on EPB5 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.