

EPB3M Plastic Bearings



Product Features

- Continuous working temperature: -40°C – 80°C
- High load capacity
- Impact resistance
- Low cost
- Dry operation and maintenance free
- Good for marginal load
- Suitable for low speed operation

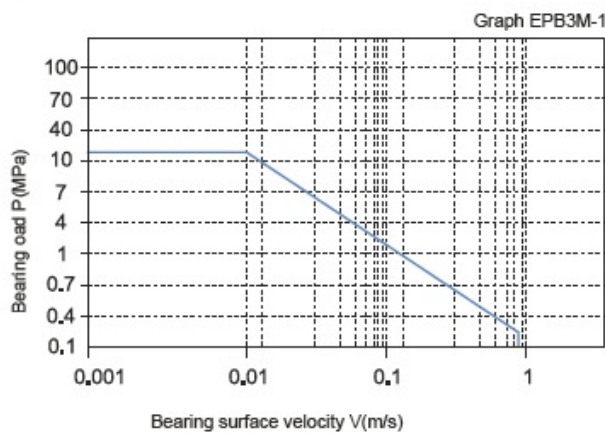
The Material Data Sheet

Common Capability	Testing Method	Unit	EPB3M
Color			Dark Grey
Density	ISO 1183	g/cm ³	1.15
Dynamic friction /steel(dry)			0.09 - 0.30
Max. PV (dry)		N/mm ² x m/s	0.2
Max. rotating velocity		m/s	0.8
Max. oscillating velocity		m/s	0.6
Max. linear velocity		m/s	2.5
Tensile strength	ISO 527	MPa	110
Compressive strength (Axial)		MPa	50
E-Modul	ISO 527	MPa	2'500
Max. static pressure of the surface, 20°C		MPa	20
Rockwell hardness	ISO 2039-2	HRR	107
Continuous work temperature		°C	-100 – +80
Short-time work temperature		°C	-100 – +170
Thermal conductivity	ASTME1461	W/m*k	0.25
Linear coef. of thermal expansion	ASTMD696	10 ⁻⁵ x K ⁻¹	10
Maisture absorpton RH50 / 23°C	ASTMD570	%	1.4
Max. water absorption, 23°C		%	7.6
Flammability	UL94		HB
Volume resistivity	IEC60093	Ωcm	>10 ¹²
Surface resistivity	IEC60093	Ω	>10 ¹¹

PV Value of Bearings

The max PV value of the EPB3M 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 EPB3M-1).

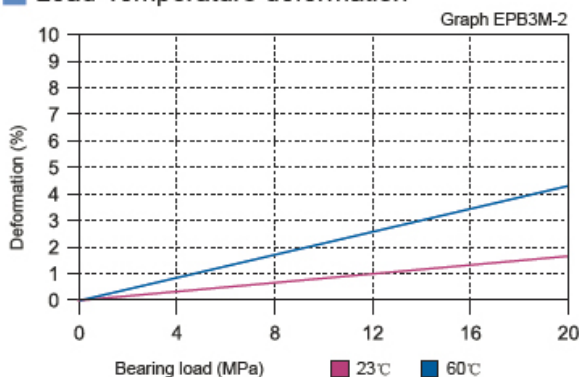
■ Permissible PV value



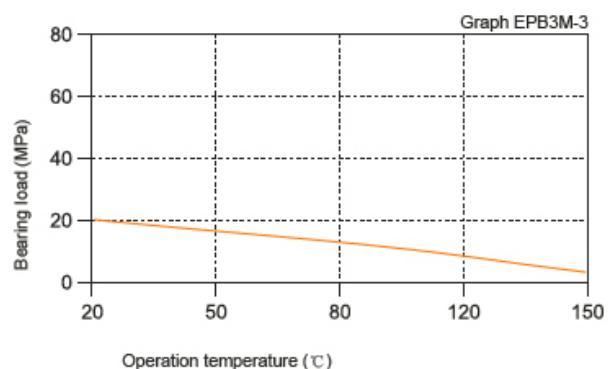
The Relation of Load, Speed and Temperature

EPB3M allows the Max static load of 20 MPa. The max compressive deformation rate under the max load is listed in Graph EPB3M-2. The actual load capacity of bearing is slightly less than 20 MPa. The bearing load is variable against the speed and temperature. Fast speed (Vmax: 0.8 m/s) results into higher temperature (Tmax: 80°C) which decreases the load capacity of the bearing. Please refer to the Graph EPB3M-3 for such variation

■ Load-Temperature deformation



■ Load-Temperature diagrams

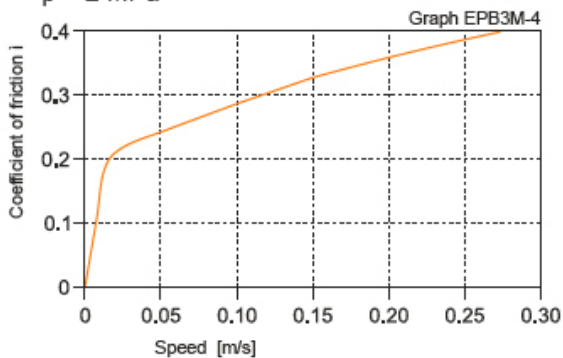


The Friction Factor, Wearing and shaft material

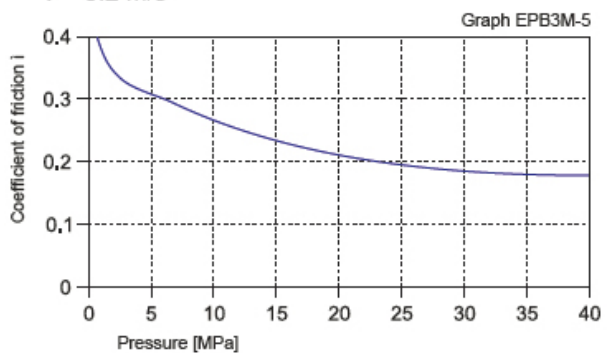
EPB3M Bearing Friction factor is increased along with the increasing of the operation speed (See Graph EPB3M-4) therefore it is suitable for the application under low speed operation. The friction factor of EP3M is decreased along with the loading increasing (see Graph EPB3M-5). The friction factor and wearing of the bearing is considerably affected by the counter shaft roughness. The Graph EPB3M-6 shows that the bearing could achieve its best performance when the counter shaft surface roughness is around Ra 0.6.

EPB3M	Dry	Grease	Oil	Water
Friction coef. μ	0.10 ~ 0.30	0.09	0.04	0.04

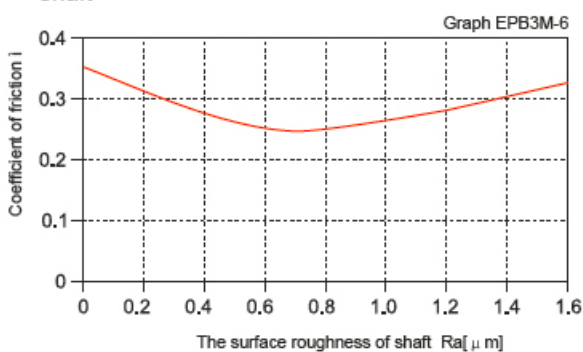
■ Coefficient of friction & the speed of bearing, $p = 2 \text{ MPa}$



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



■ Coefficient of friction & the surface roughness of shaft

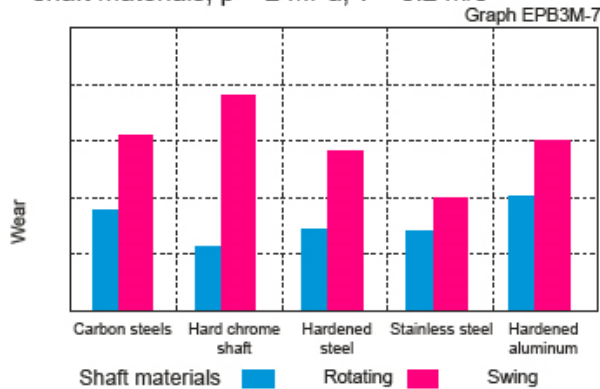


Wearing and shaft material

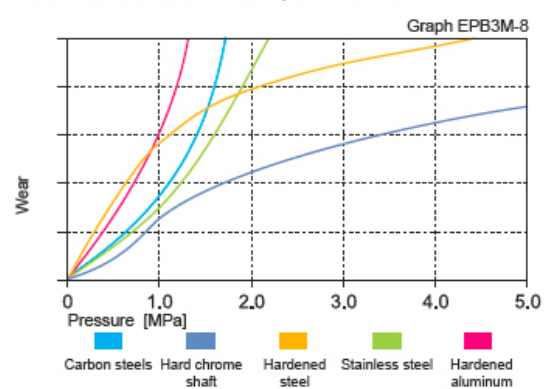
Test of the bearing against various shaft materials shows that the material EPB3M features the wearing performance of the material is not sensitive with different materials where the loading is over 2 MPa (See Graph EPB3M-7). The bearing performance remains the best when the loading is in the lower range. When the loading is increased, the wearing will be sharply increased. From the Graph EPB3M-8, the EPB3M

material is better for the application with the counter shaft material of hard chrome steel. Graph EPB3M-8 shows that the material is better for rotation operation than 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

EPB3M is good at chemical resistance against weak acidic medium and various kinds of lubricants.

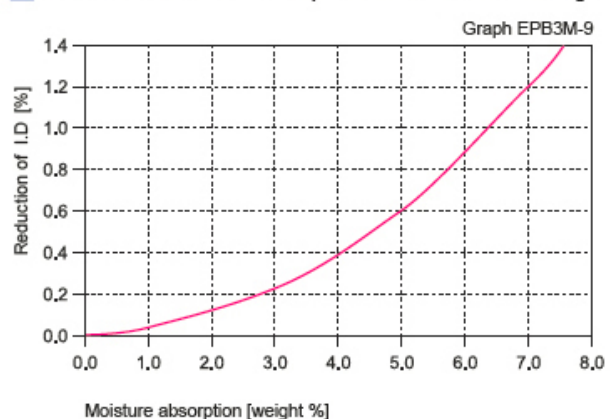
UV Resistance

EPB3M can maintain its color unchanged when it is exposed into the UV ray. The material performance stays stable.

Water Absorbability

The water absorb rate of EPB3M is 1.4% under the atmospheric pressure while it is 7.6% when the material is immersed into water. The application environment has to be considered because of its water absorb properties.

■ Effect of moisture absorption on EPB3M 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.