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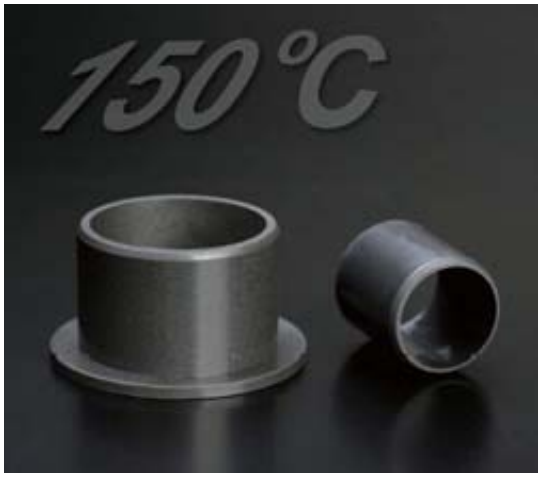
EPB19 Plastic Bearings



Product Features

Wear resistance material for temperature up to 150°C. The Features of the material is kept stable either at high or low temperature.

- Continuous working temperature: -40°C – +150°C
- Applicable for oscillating under high load
- Maintenance-free dry operation
- High pressure resistance

The Material Data Sheet

Common Capability	Testing Method	Unit	EPB19
Color			Dark Grey
Density	ISO 1183	g/cm³	1.32
Dynamic friction /steel (dry)			0.05 - 0.20
Max. PV value		N/mm² x m/s	0.7
Max. rotating speed value		m/s	1.2
Max. oscillating speed value		m/s	0.8
Max. linear speed value		m/s	4.0
Tensile strength	ISO 527	MPa	100
Compressive strength (Axial)		MPa	60
E-Modul	ISO 527	MPa	3'500
Max. static pressure of the surface, 20°C		MPa	60
Shore hardness	ISO 868	D	77
Continuous work temperature		°C	-40 – +150
Short-time work temperature		°C	-40 – +200
Thermal conductivity	ISO22007	W/m*k	0.25
Linear coef. ofthermal expansion	ISO11359	10^{-5} x K^{-1}	5
Maisture absorption RH50 / 23°C	ISO62	%	1.3
Max. water absorption, equilibrium 23°C	ISO62	%	2.5
Flammability	UL94		HB
Volume resistivity	IEC60093	Ωcm	$>10^{15}$
Surface resistivity	IEC60093	Ω	$>10^{12}$

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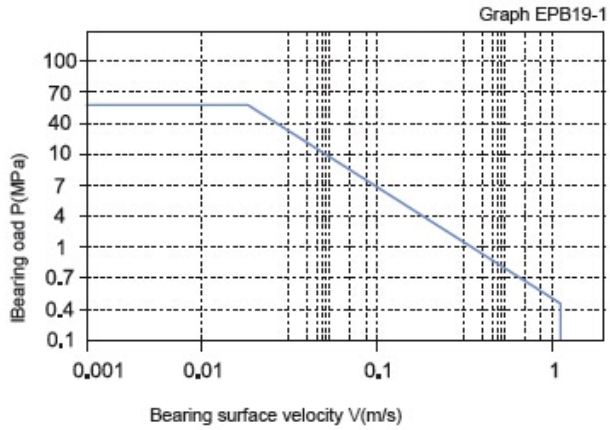
PV Value of Bearings

The max PV value of the EPB19 series bearing is 0.7 N/mm² x 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 EPB19-1).

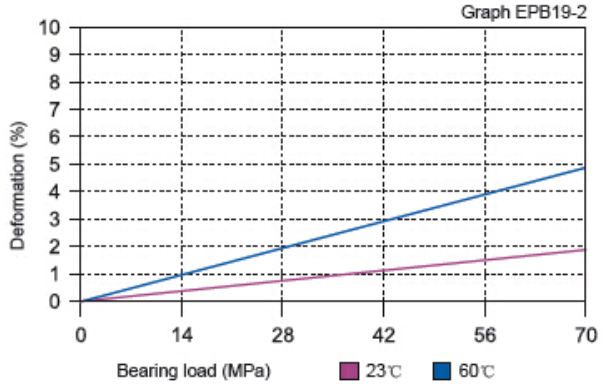
Permissible PV value



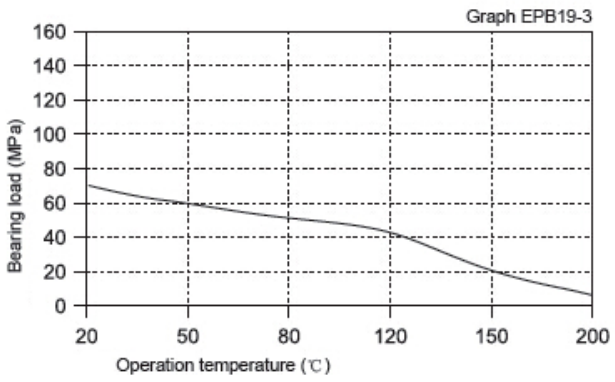
The Relation of Load, Speed and Temperature

EPB19 allows the max static load of 70 MPa. The max compressive deformation rate under the max load is listed in Graph EPB19-2. The actual load capacity of bearing is slightly less than 70 MPa. The bearing load is variable against the speed and temperature. Fast speed (Vmax: 1.5 m/s) results into higher temperature (Tmax: 150 °C) which decreases the load capacity of the bearing. Please refer to the Graph EPB19-3 for such variation.

Load-Temperature deformation



Load-Temperature diagrams



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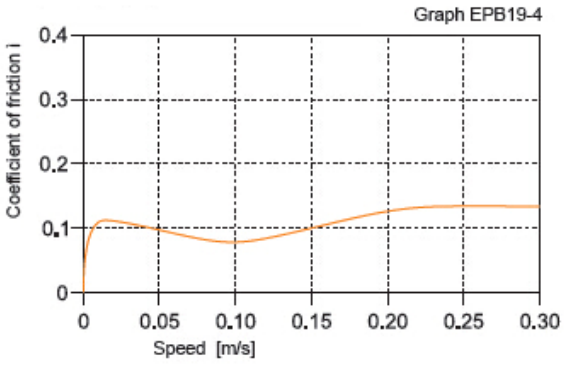
The Friction Factor, Wearing and shaft material

Friction Factor

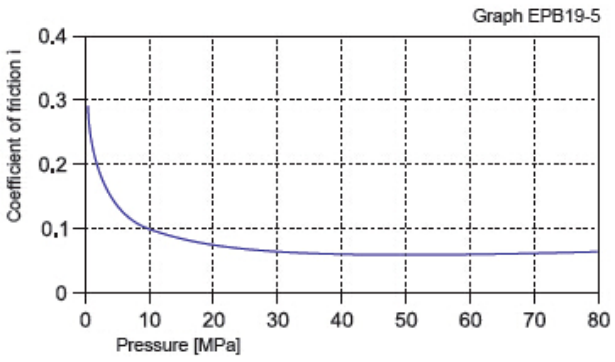
Graph EPB19-4 shows that the friction factor of EPB19 is not sensitive to the operation speed. Graph EPB19-5 tells that the friction factor of EPB19 is decreased along with the loading increasing and will be relatively stable when the loading reaches 20 MPa upwards. Graph EPB19-6 shows that the friction factor of EPB19 is not sensitive to the shaft surface roughness. Therefore, it is recommended a proper shaft surface roughness in the range of Ra 0.3 – 0.6.

EPB19	Dry	Grease	Oil	Water
Friction coef. μ	0.05 – 0.20	0.09	0.04	0.04

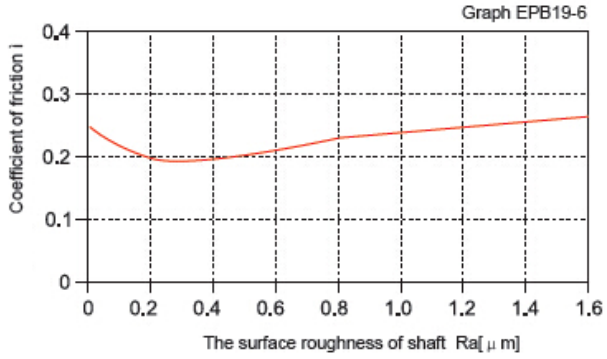
Coefficient of friction & the speed of bearing, p = 2 MPa



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 EPB19-7 shows EPB19 friction factor is variable against different shaft materials in rotation operation under loading of 2 MPa. Testing indicates that hardened shaft is best for rotation operation of EPB19. The operation condition is better when EPB19 is used against hardened steel shafts, high speed steel shaft and

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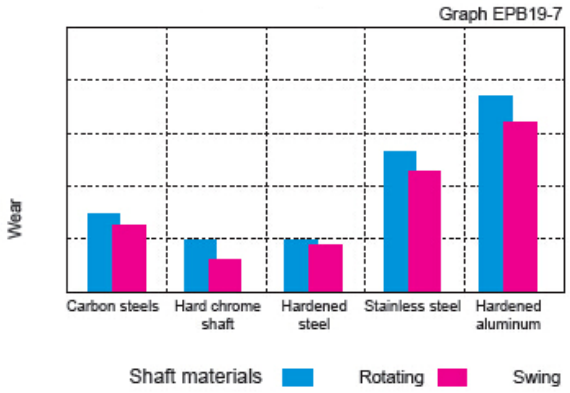
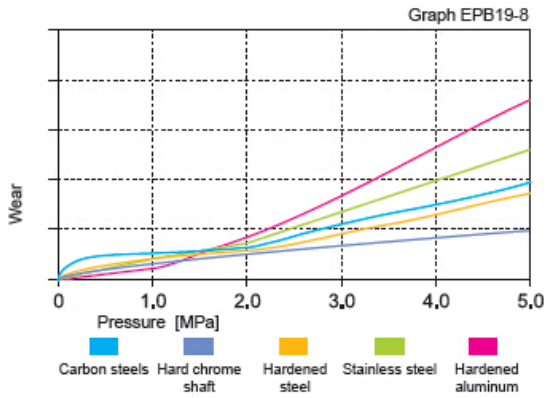
hardened chrome steel shaft under rotation operation. Graph EPB19-8 describes that hardened chrome steel is better for this material under high loading operation where as long as the increasing of the loading, the wearing of the bearing is relatively stable.

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

EPB19 is good at chemical resistance against mild base, weak acidic medium and various kinds of lubricants.

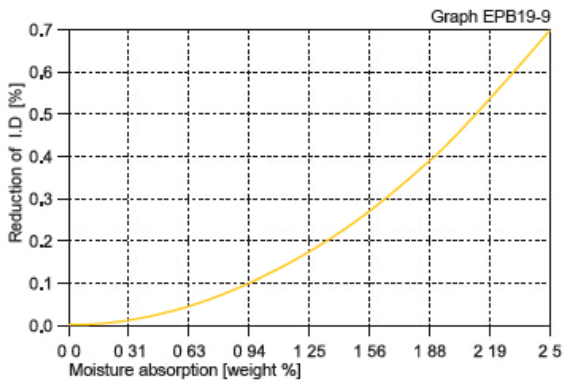
UV Resistance

The color of EPB19 could be dimmed when it is exposed into the UV ray. The material performance stays stable.

Water Absorbability

The water absorb rate of EPB19 is 1.3% under the atmospheric pressure while it is 2.5% when the material is immerged into water. The application environment has to be considered because of its water absorb properties.

Effect of moisture absorption on EPB19 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.