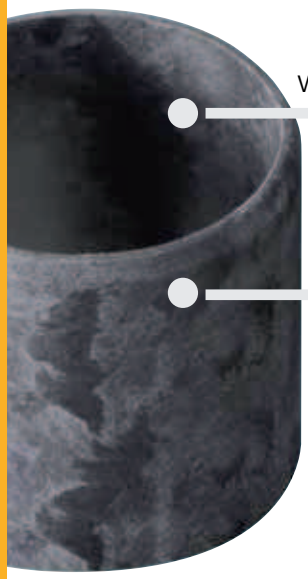
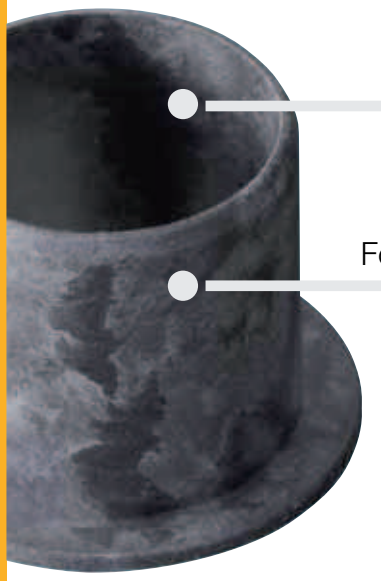
iglidur® J200

Suitable for anodized aluminum shafts. The specialist for low friction-values and minimal wear with hard anodized aluminum shaft.



Very long service life with hard anodized aluminum

Low coefficients of friction



Low wear

For low to medium loads

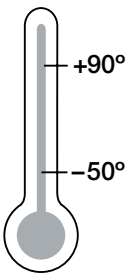
When to use it?

- For applications with anodized aluminum shafts
- When lowest coefficients of friction are required
- If long service life with low wear is required

When not to use it?

- For steel shafts
  - ▶ **iglidur® J, page 89**
  - ▶ **iglidur® W300, page 131**
- When temperatures are continuously higher than +80 °C
  - ▶ **iglidur® V400, page 279**
- When a cost-effective universal bearing is required
  - ▶ **iglidur® G, page 61**
  - ▶ **iglidur® P, page 185**

Temperature



Product range

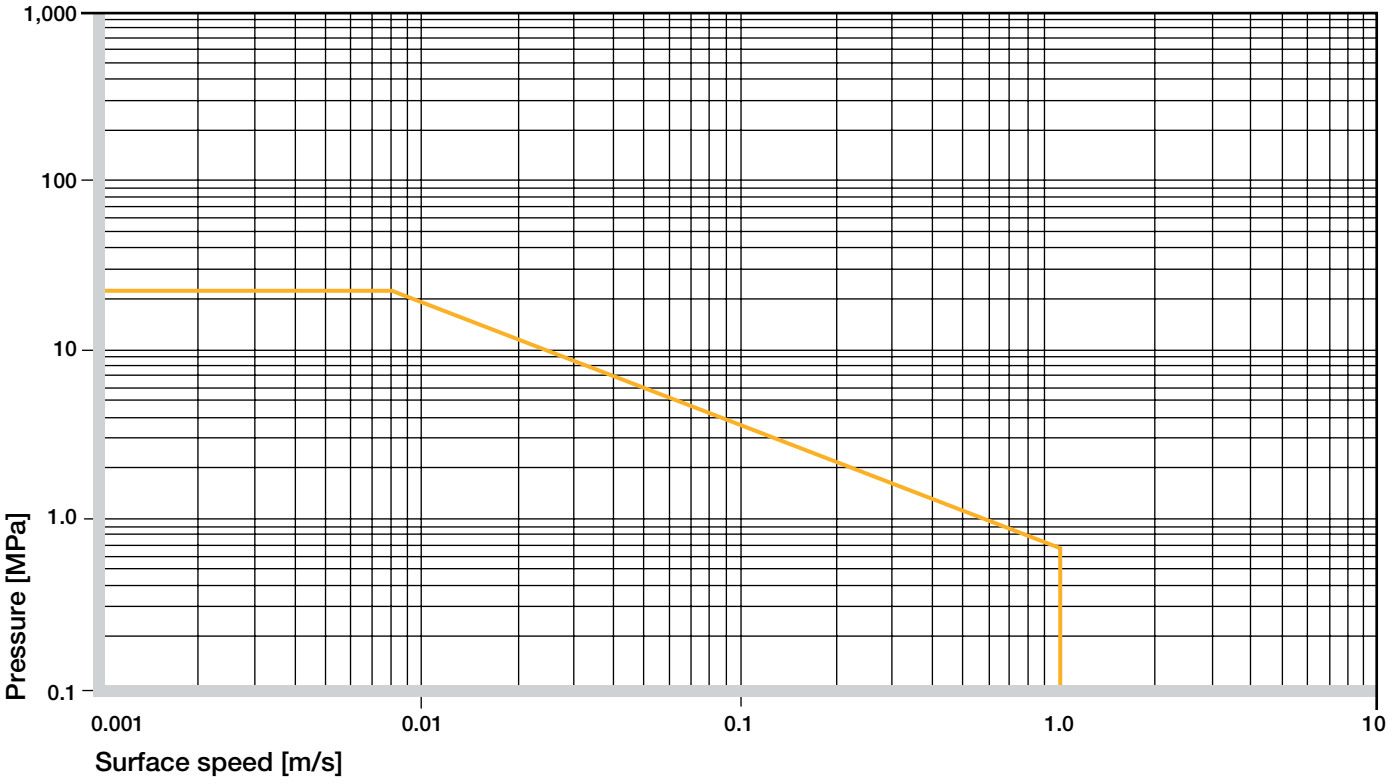
on request

iglidur® J200 | Technical Data

Material data			
General properties	**Unit**	**iglidur® J200**	**Testing method**
Density	**g/cm³**	1.72	
Colour		dark grey	
Max. moisture absorption at +23 °C/50 % r.h.	**% weight**	0.2	DIN 53495
Max. moisture absorption	**% weight**	0.7	
Coefficient of sliding friction, dynamic against steel	**µ**	0.11–0.17	
pv value, max. (dry)	**MPa · m/s**	0.30	
Mechanical properties			
Modulus of elasticity	**MPa**	2,800	DIN 53457
Tensile strength at +20 °C	**MPa**	58	DIN 53452
Compressive strength	**MPa**	43	
Max. recommended surface pressure (+20 °C)	**MPa**	23	
Shore D hardness		70	DIN 53505
Physical and thermal properties			
Max. long term application temperature	**°C**	+90	
Max. short term application temperature	**°C**	+120	
Maximum ambient temperature, short term	**°C**	+140	
Min. application temperature	**°C**	–50	
Thermal conductivity	**W/m · K**	0.24	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	**$K^{-1} \cdot 10^{-5}$**	8	DIN 53752
Electrical properties			
Specific volume resistance	**Ωcm**	$> 10^8$	DIN IEC 93
Surface resistance	**Ω**	$> 10^8$	DIN 53482

[1] Without additional load; no sliding movement; relaxation possible

Table 01: Material data

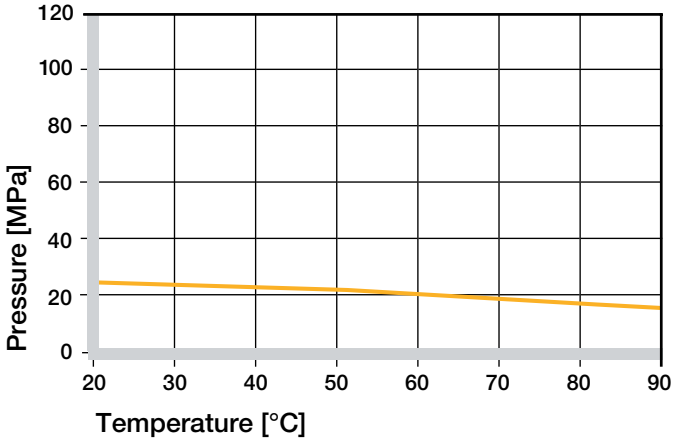


Graph 01: Permissible pv values for iglidur® J200 with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

iglidur® J200 | Technical Data

Mechanical Properties

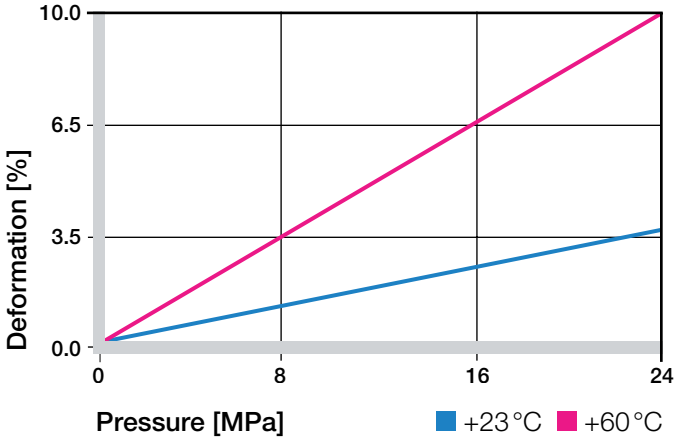
The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. With increasing temperatures, the compressive strength of iglidur® J200 plain bearings decreases. The Graph 02 shows this inverse relationship. However, at the longterm maximum temperature of +90° C the permissible surface pressure is almost 15 MPa.



Graph 02: Recommended maximum surface pressure of a function of temperature (23 MPa at +20 °C)

Graph 03 shows the deformation of the material at room temperature to the recommended maximum limit. At the recommended maximum surface pressure of 23 MPa the deformation is less than 3,5 %. A plastic deformation can be neglected up to this value. It is nonetheless depending on the duration of the applied force.

▶ Surface Pressure, **page 43**



Graph 03: Deformation under pressure and temperature

Permissible Surface Speeds

iglidur® J200 attains high surface speeds through its excellent coefficients of friction. Continuous rotary speeds of 1 m/s are possible. The permitted speeds are clearly higher yet in linear movements or in short-term operation. Speeds of over 15 m/s were successfully tested in linear movements.

▶ Surface Speed, **page 45**

m/s	Rotating	Oscillating	Linear
Continuous	1	0.7	10
Short term	1.5	1.1	15

Table 02: Maximum running speed

Temperatures

The bearings made of iglidur® J200 were not developed for high temperatures. The maximum permitted temperature of +120 °C should not be exceeded. Thereby the ambient temperature generated by friction has to be added. From +60 °C onward, the bearing should be mechanically fastened, so that the danger of bushings creeping out of the bores is avoided. The wear resistance too declines disproportionately from +70 °C.

▶ Application Temperatures, **page 46**

iglidur® J200	Application temperature
Minimum	–50 °C
Max. long term	+90 °C
Max. short term	+120 °C
Add. securing is required from	+60 °C

Table 03: Temperature limits

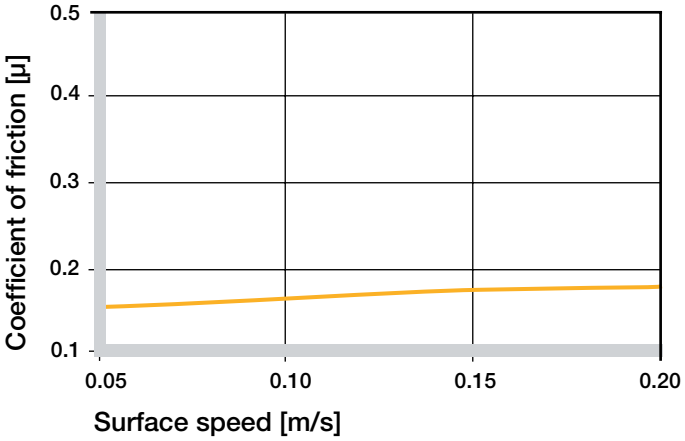
Friction and Wear

iglidur® J200 is the result of the development of extremely low friction plain bearing materials. When using plain bearings in linear motion, friction can be critical. Many materials can give low coefficients of friction under high loads, but iglidur® J200 can give excellent friction values even at low loads. iglidur® J200 presents the lowest coefficients of friction of all iglidur® materials. The average coefficient of friction of all measurements, even with different shaft materials, is 0.11. The use of hard anodized aluminum as a shaft material is also of importance.

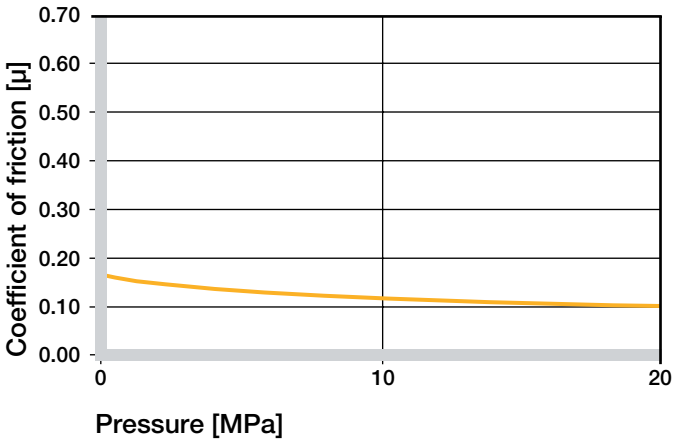
iglidur® J200 | Technical Data

The comparison to the other iglidur® materials reveals that iglidur® J200 plain bearings are more suitable for lower loads. The influence of sliding speed and load on the wear is small. The chenge of the coefficient of friction at high loads is in the normal range (graph. 04 and 05). The optimum shaft roughness is between 0.2 and 0.4 µm Ra. The influence of the shaft material on the wear performanvce on the other hand is significant. Even at low loads, we recommend to have a closer look into the wear database.

▶ Coefficients of Friction and Surfaces, **page 48**
▶ Wear Resistance, **page 49**



Graph 04: Coefficient of friction as a function of the running speed, p = 0.75 MPa

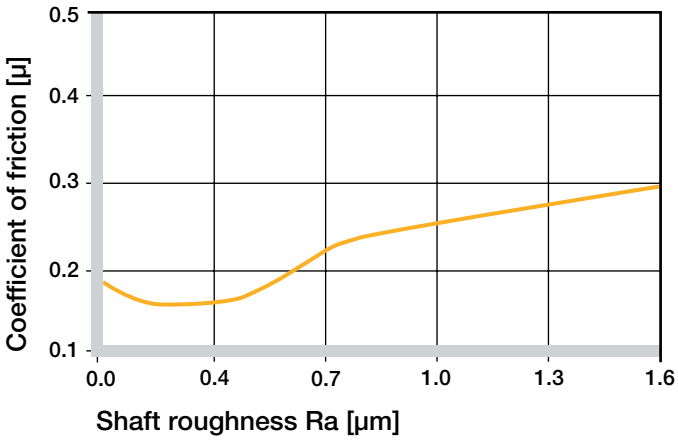


Graph 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

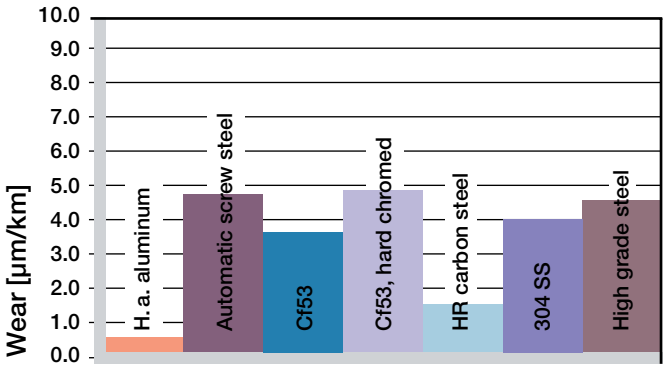
Shaft Materials

The shaft material used has a great impact on the wear resistance. In fact, all shaft materials (smooth or hardened) are suitable for use with iglidur® J200, but the best results are achieved with hard anodized aluminum. In particular when used in linear motion, this running surface has proven its value.

▶ Shaft Materials, **page 51**

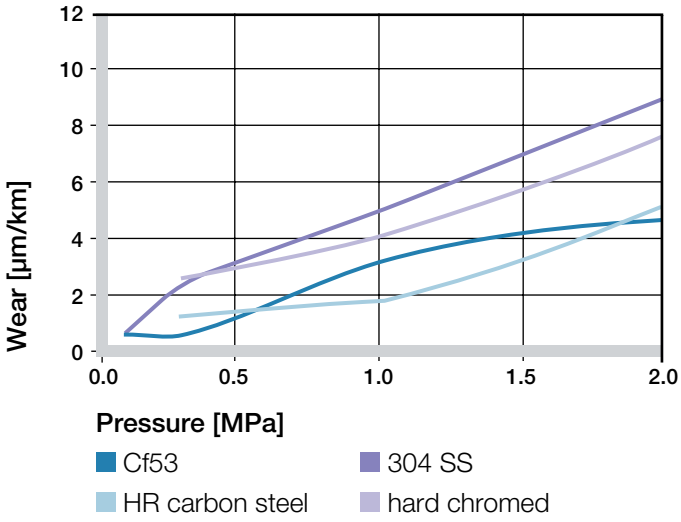


Graph 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

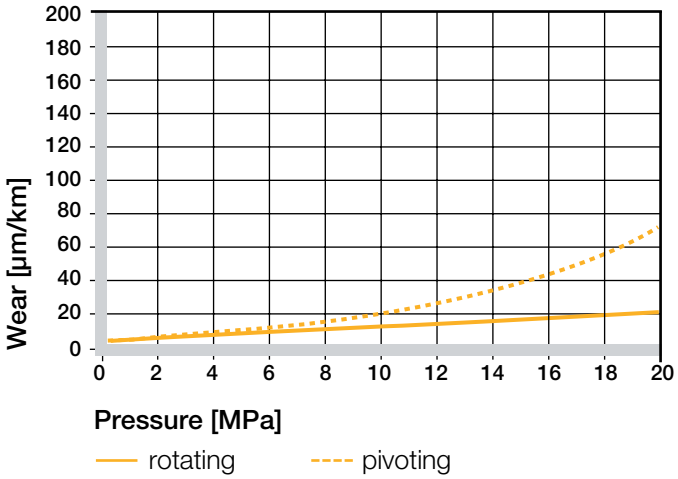


Graph 07: Wear, rotating with different shaft materials, pressure p = 0.75 MPa, v = 0.5 m/s

iglidur® J200 | Technical Data



Graph 08: Wear with different shaft materials in rotational operation, as a function of the pressure



Graph 09: Wear for pivoting and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

iglidur® J200	Dry	Greases	Oil	Water
C. o. f. µ	0,11–0,17	0,09	0,04	0,04

Table 04: Coefficient of friction against steel (Ra = 1 µm, 50 HRC)

Additional Properties

Chemical Resistance

iglidur® J200 plain bearings are resistant to diluted alkalines, as well as to solvents and all types of lubricants.

▶ Chemical Table, **page 974**

Medium	Resistance
Alcohol	+
Hydrocarbons	+
Greases, oils without additives	+
Fuels	+
Diluted acids	0 to –
Strong acids	–
Diluted alkalines	+
Strong alkalines	+ to 0

+ resistant 0 conditionally resistant – not resistant
All data given at room temperature [+20 °C]
Table 05: Chemical resistance

Radiation Resistance

Plain bearings made of iglidur® J200 are radiation resistant up to a radiation intensity of $3 \cdot 10^2$ Gy.

UV Resistance

iglidur® J200 plain bearings are very resistant to the impact of UV radiation.

Vacuum

Use in a vacuum is only possible to a limited extent. Also, only dehumidified bearings made from iglidur® J200 should be tested in a vacuum.

Electrical Properties

iglidur® J200 plain bearings are electrically insulating.

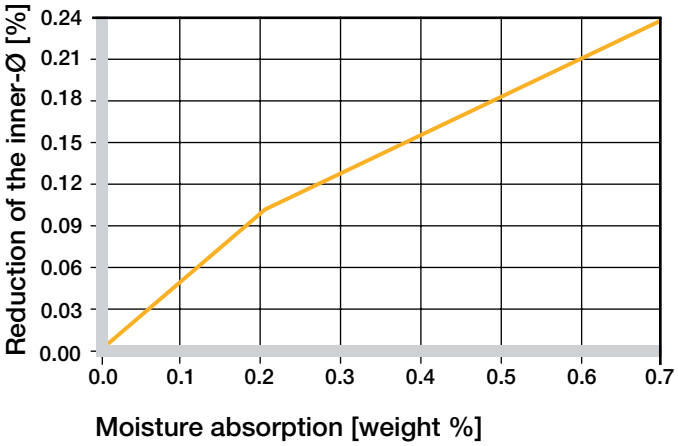
Volume resistance	$> 10^8$ Ωcm
Surface resistance	$> 10^8$ Ω

Moisture Absorption

The moisture absorption of iglidur® J200 plain bearings in standard atmosphere is approximately 0.2 %. The saturation limit in water is 0.7 %. Due to these low values considering expansion by moisture absorption is only required in extreme cases.

Maximum moisture absorption	
At +23 °C/50 % r.h.	0.2 % weight
Max. moisture absorption	0.7 % weight

Table 06: Moisture absorption



Graph 10: Effect of moisture absorption on plain bearings

Installation Tolerances

iglidur® J200 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, the inner diameter adjusts to meet the specified tolerances.

▶ Testing Methods, **page 55**

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® J200 E10 [mm]	Housing H7 [mm]
up to 3	0–0.025	+0.014 +0.054	0 +0.010
> 3 to 6	0–0.030	+0.020 +0.068	0 +0.012
> 6 to 10	0–0.036	+0.025 +0.083	0 +0.015
> 10 to 18	0–0.043	+0.032 +0.102	0 +0.018
> 18 to 30	0–0.052	+0.040 +0.124	0 +0.021
> 30 to 50	0–0.062	+0.050 +0.150	0 +0.025
> 50 to 80	0–0.074	+0.060 +0.180	0 +0.030
> 80 to 120	0–0.087	+0.072 +0.212	0 +0.035
> 120 to 180	0–0.100	+0.085 +0.245	0 +0.040

Table 07: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

Product Range

At present, iglidur® J200 plain bearings are made to special order.