

High elasticity – iglidur® B

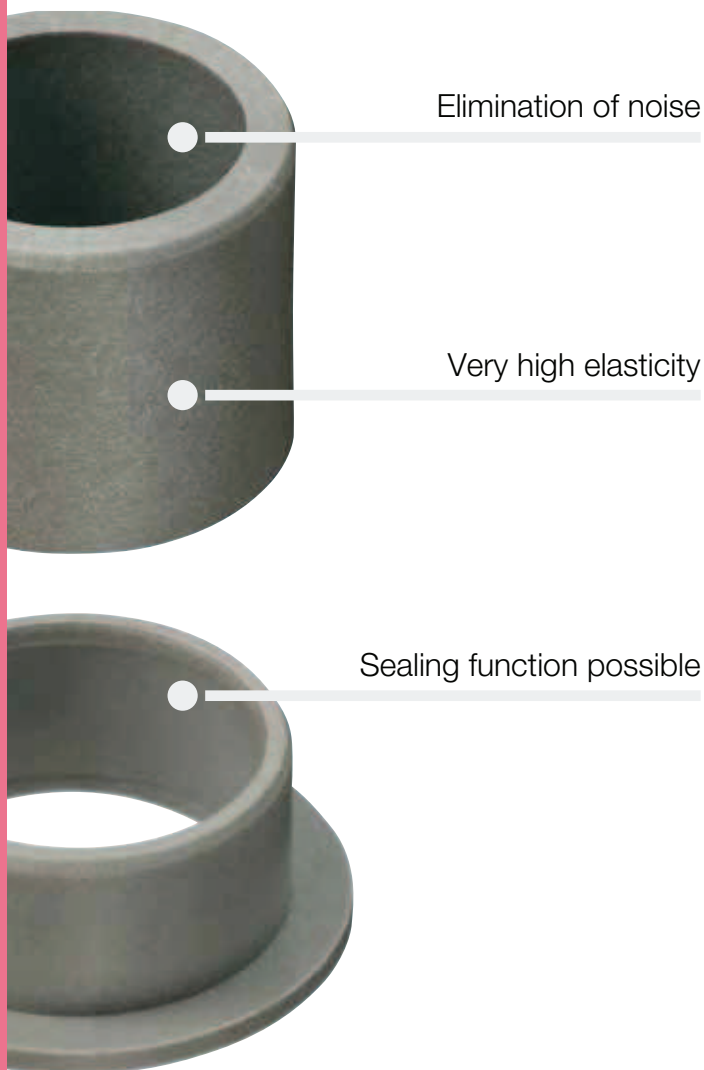


Elimination of noise

Very high elasticity

Sealing function possible

High elasticity. Vibration dampening is the predominant feature of the iglidur® B material which is also well-suited for edge loads at low pressure.



When to use it?

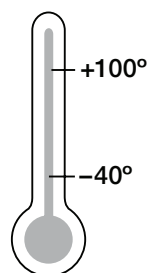
- When maximum vibration dampening is required
- When sealing function has to be integrated
- When high edge loads occur



When not to use it?

- In applications with high atmospheric humidity
▶ iglidur® J, page 109
- When a cost-effective universal bearing is required
▶ iglidur® R, page 277
- When the highest wear resistance is required
▶ iglidur® J, page 109

Temperature



Product range

on request

Material properties table

General properties	Unit	iglidur® B	Testing method
Density	g/cm ³	1.15	
Colour		grey	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	1.0	DIN 53495
Max. water absorption	% weight	6.3	
Coefficient of sliding friction, dynamic against steel	μ	0.18–0.28	
pv value, max. (dry)	MPa · m/s	0.15	
Mechanical properties			
Modulus of elasticity	MPa	1,800	DIN 53457
Tensile strength at +20 °C	MPa	55	DIN 53452
Compressive strength	MPa	20	
Max. recommended surface pressure (+20 °C)	MPa	40	
Shore D hardness		69	DIN 53505
Physical and thermal properties			
Max. long term application temperature	°C	+100	
Max. short term application temperature	°C	+130	
Max. short term ambient temperature ¹⁾	°C	+150	
Min. application temperature	°C	–40	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	K ⁻¹ · 10 ⁻⁵	12	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 ¹⁰	DIN IEC 93
Surface resistance	Ω	> 10 ⁹	DIN 53482

¹⁾ Without additional load; no sliding movement; relaxation possible

Table 01: Material properties table

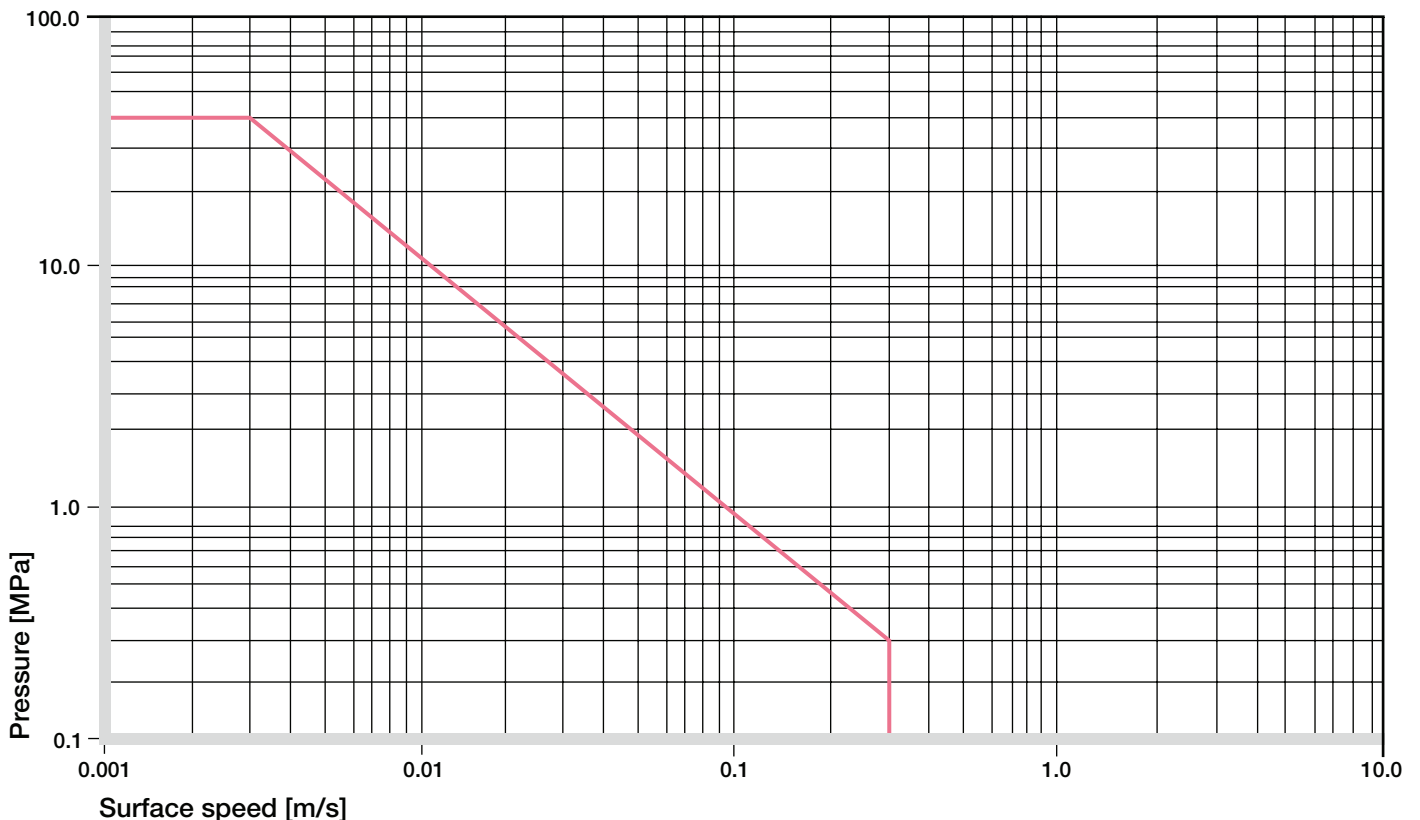


Diagram 01: Permissible pv values for iglidur® B with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

The compressive strength of the iglidur® B bearings is on the one hand low, but on the other, is an important property of the bearing. They are mainly used where vibration dampening and acoustic separation are required.

Mechanical Properties

With increasing temperatures, the compressive strength of iglidur® B plain bearings decreases. The Diagram 02 shows this inverse relationship. However, at the longterm maximum temperature of +100°C the permissible surface pressure is almost 10 MPa. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

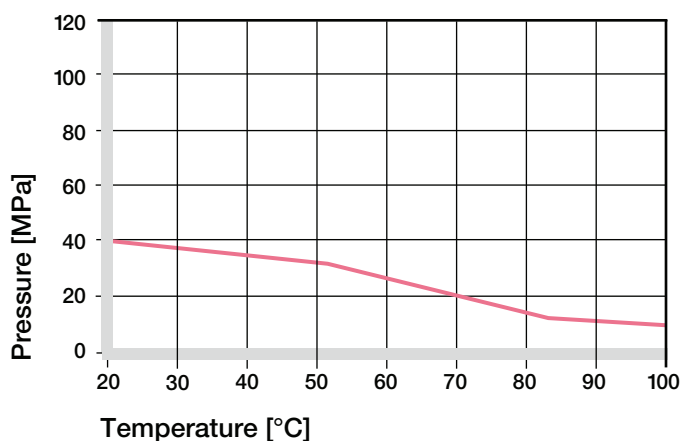


Diagram 02: Recommended maximum surface pressure as a function of temperature (40 MPa at +20 °C)

The elastic deformation at 40 MPa at room temperature is 5.3 % (Diagram 03).

► Surface Pressure, page 63

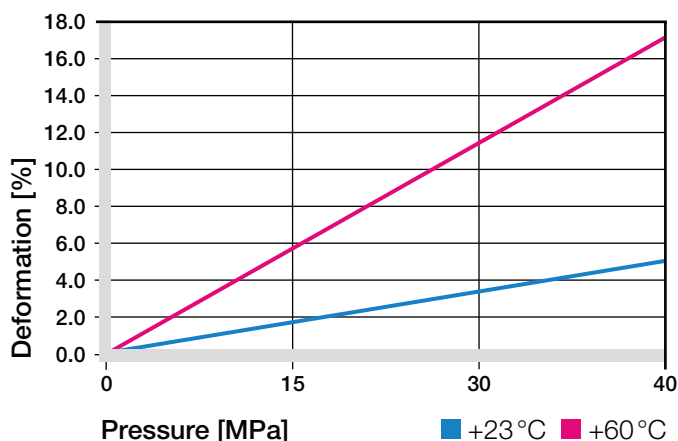


Diagram 03: Deformation under pressure and temperature

Permissible Surface Speeds

iglidur® B bearings can be continuously used up to 0.7 m/s. The frictional heat provides the speed limits. In practice, though, this temperature level is rarely reached, due to varying application conditions.

► Surface Speed, page 65

m/s	Rotating	Oscillating	Linear
Continuous	0.7	0.5	2
Short term	1	0.7	3

Table 02: Maximum running speed

Temperatures

The operating temperature of the iglidur® B bearings is limited to +100°C. From +50°C onward, the very soft bearing should be mechanically fastened, so that the danger of bushings creeping out of the bores is avoided. The wear resistance declines disproportionately from +70 °C.

► Application Temperatures, page 66

iglidur® B	Application temperature
Minimum	–40 °C
Max. long term	+100 °C
Max. short term	+130 °C
Add. securing is required from	+50 °C

Table 03: Temperature limits

Friction and Wear

The coefficients of friction increase slightly with the speed and decrease with the load. Surface finishes of the shaft between 0.4 and 0.6 Ra are ideal. The iglidur® B bearings assume a center position in wear resistance. As far as the bearing load is not too high, the attained wear values are pretty good. An increase in load results in a disproportionate increase in abrasion.

► Coefficients of Friction and Surfaces, **page 68**

► Wear Resistance, **page 69**

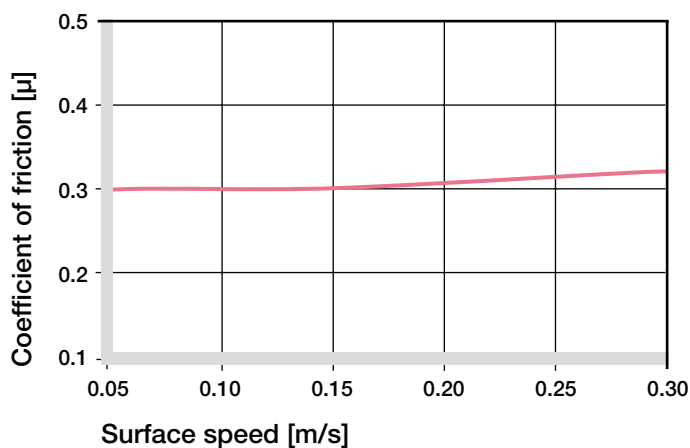


Diagram 04: Coefficient of friction as a function of the running speed, $p = 0.75 \text{ MPa}$

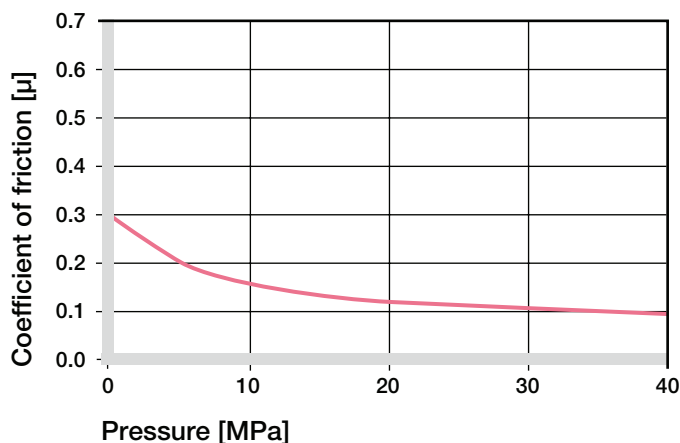


Diagram 05: Coefficient of friction as a function of the pressure, $v = 0.01 \text{ m/s}$

Shaft Materials

The influence of the shaft is not very large on the wear resistance.

Diagram 07 and 08 clarify that very similar wear data are attained with different shaft materials. If high operational performances are expected, the bearing load should not be too high.

► Shaft Materials, **page 71**

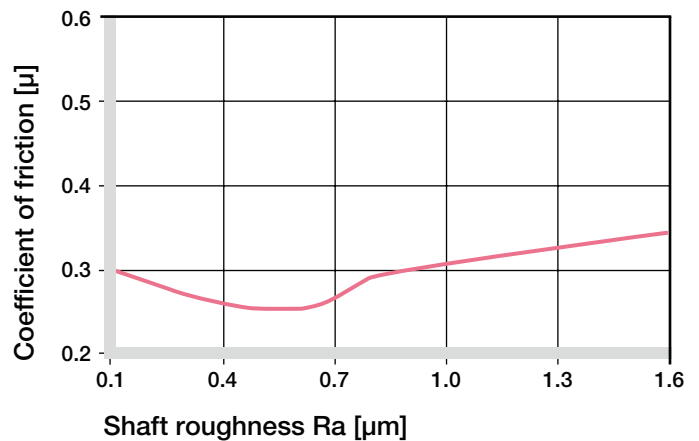


Diagram 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

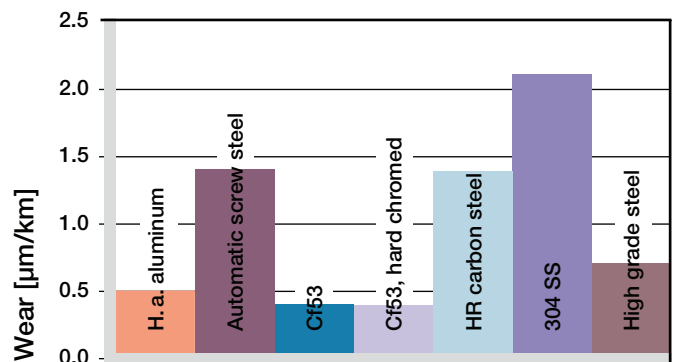


Diagram 07: Wear, rotating with different shaft materials, pressure $p = 1 \text{ MPa}$, $v = 0.3 \text{ m/s}$

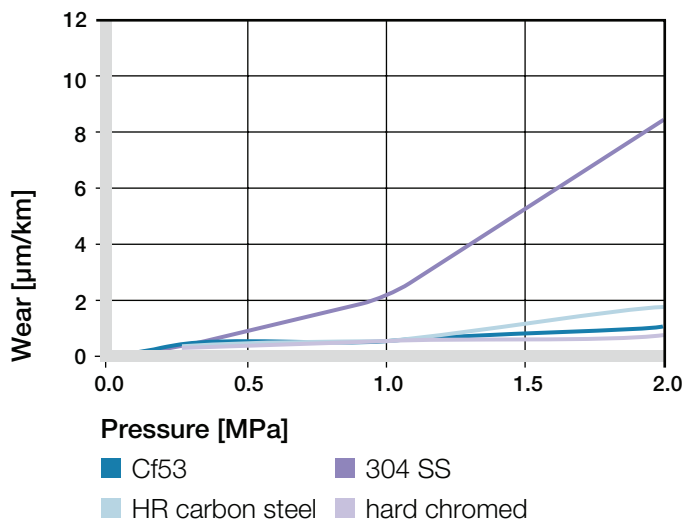


Diagram 08: Wear with different shaft materials in rotational operation, as a function of the pressure

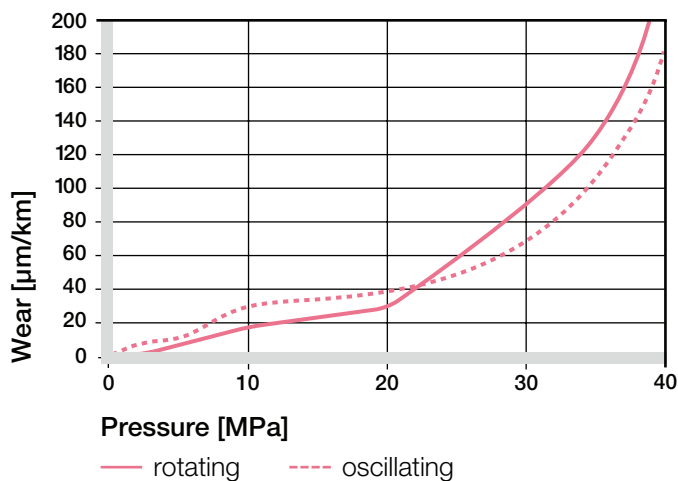


Diagram 09: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

iglidur® B	Dry	Greases	Oil	Water
C.o.f. μ	0.18–0.28	0.09	0.04	0.04

Table 04: Coefficient of friction against steel ($R_a = 1 \mu\text{m}$, 50 HRC)

Additional Properties

Chemical Resistance

iglidur® B plain bearings are not very resistant to chemicals. Where chemical resistance is required, other iglidur® materials featuring better characteristics should be used.

► Chemical Table, page 1258

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

+ resistant 0 conditionally resistant – not resistant

All data given at room temperature [+20 °C]

Table 05: Chemical resistance

Radiation Resistance

Plain bearings of iglidur® B are radiation resistant to a radiation intensity of $3 \cdot 10^2 \text{ Gy}$.

UV Resistance

iglidur® B plain bearings are not resistant to the impact of UV radiation.

Vacuum

Use of iglidur® B plain bearings is limited in vacuum. Only dehumidified bearings should be tested.

Electrical Properties

iglidur® B plain bearings are electrically insulating.

Volume resistance	$> 10^{10} \Omega\text{cm}$
Surface resistance	$> 10^9 \Omega 10$

Moisture Absorption

The moisture absorption is relatively high and must be considered in the selection and design.

Maximum moisture absorption

At +23 °C/50 % r.h. 1.0 % weight

Max. water absorption 6.3 % weight

Table 06: Moisture absorption

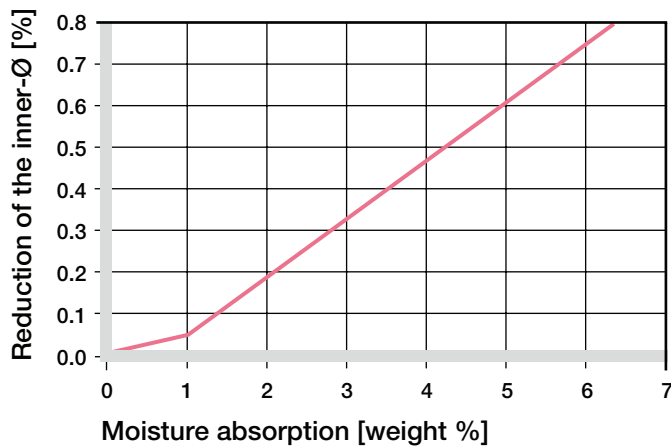


Diagram 10: Effect of moisture absorption on plain bearings

Installation Tolerances

iglidur® B 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, in standard cases the inner diameter automatically adjusts to the D11 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

► Testing Methods, page 75

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® B D11 [mm]	Housing H7 [mm]
up to 3	0–0.025	+0.020 +0.080	0 +0.010
> 3 to 6	0–0.030	+0.030 +0.105	0 +0.012
> 6 to 10	0–0.036	+0.040 +0.130	0 +0.015
> 10 to 18	0–0.043	+0.050 +0.160	0 +0.018
> 18 to 30	0–0.052	+0.065 +0.195	0 +0.021
> 30 to 50	0–0.062	+0.080 +0.240	0 +0.025
> 50 to 80	0–0.074	+0.100 +0.290	0 +0.030

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

Product Range

iglidur® B plain bearings are manufactured to special order.