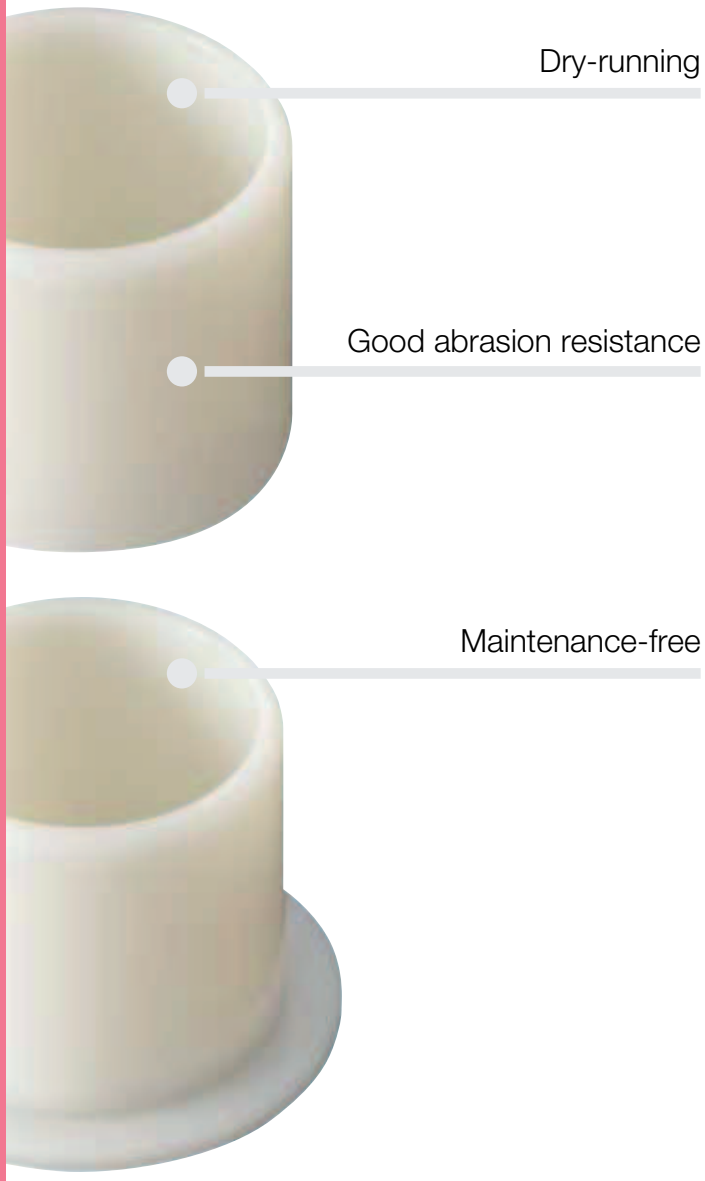
iglidur® C

Free from PTFE and silicone. In iglidur® C, the use of Teflon and silicone as lubricants is deliberately avoided. However the bearings display excellent wear resistance at low loads.



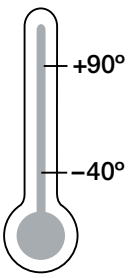
When to use it?

- When PTFE and silicone are not allowed in your application
- For applications with low speed
- If you need dirt-resistant bearings
- If you need maintenance-free, self-lubricating bearings

When not to use it?

- When highest wear resistance is required
  ▶ **iglidur® W300, page 131**
- When low coefficients of friction are required
  ▶ **iglidur® J, page 89**
  ▶ **iglidur® L250, page 239**
- If a cost-effective option is requested
  ▶ **iglidur® M250, page 107**
- When low moisture absorption is required
  ▶ **iglidur® R, page 249**

Temperature



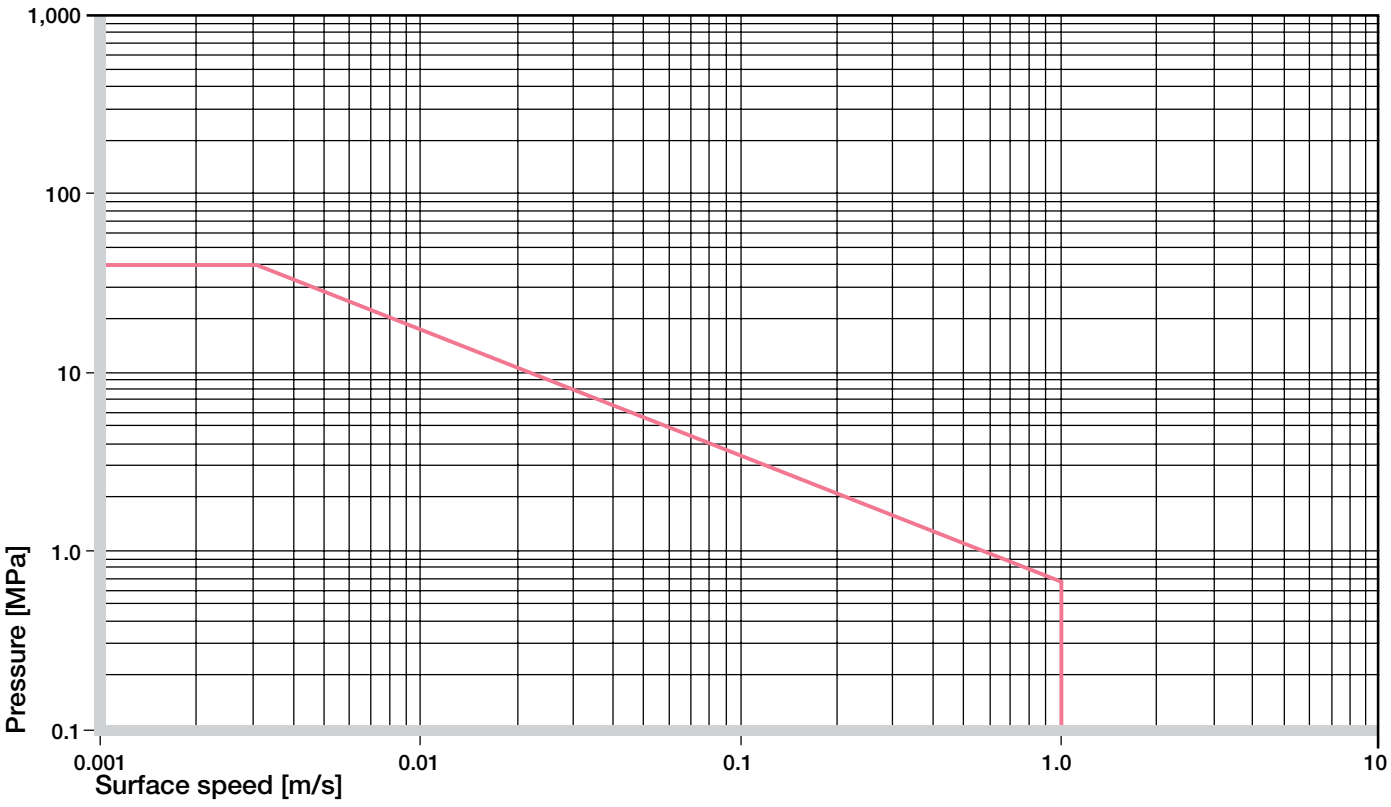
Product range

on request

Material data			
General properties	**Unit**	**iglidur® C**	**Testing method**
Density	**g/cm³**	1.1	
Colour		off white	
Max. moisture absorption at +23 °C/50 % r.h.	**% weight**	1.0	DIN 53495
Max. moisture absorption	**% weight**	6.9	
Coefficient of sliding friction, dynamic against steel	**µ**	0.17–0.25	
pv value, max. (dry)	**MPa · m/s**	0.10	
Mechanical properties			
Modulus of elasticity	**MPa**	1,900	DIN 53457
Tensile strength at +20 °C	**MPa**	60	DIN 53452
Compressive strength	**MPa**	30	
Max. recommended surface pressure (+20 °C)	**MPa**	40	
Shore D hardness		72	DIN 53505
Physical and thermal properties			
Max. long term application temperature	**°C**	+90	
Max. short term application temperature	**°C**	+130	
Maximum 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)	**$K^{-1} \cdot 10^{-5}$**	15	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

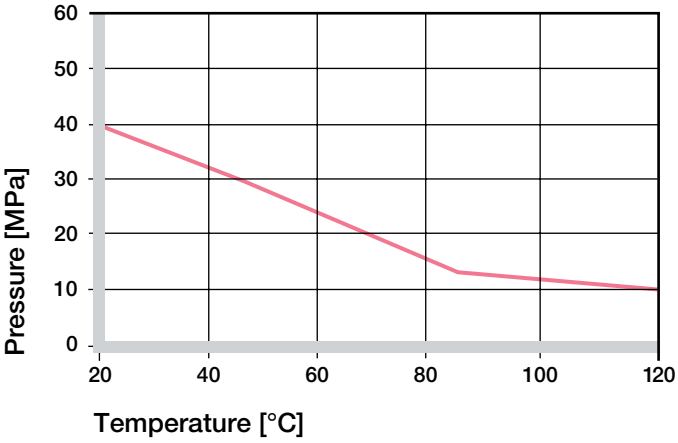
Table 01: Material data



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

Mechanical Properties

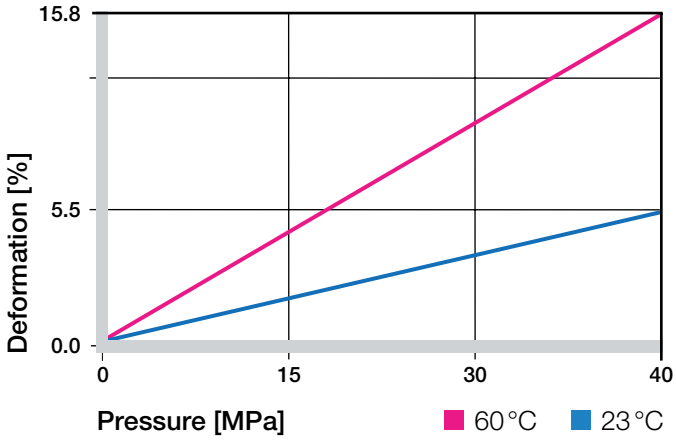
The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. With increasing temperatures, the compressive strength of iglidur® C plain bearings decreases. The Graph 02 shows this inverse relationship. However, at the longterm maximum temperature of +90 °C the permissible surface pressure is almost 10 MPa.



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

Though iglidur® C is a very soft material, it also has a maximum surface pressure limit of 40 MPa. The high elasticity makes the bearing suitable for vibrations and edge loads.

▶ Surface Pressure, **page 43**



Graph 03: Deformation under pressure and temperature

Permissible Surface Speeds

Though important solid lubricants have been deliberately avoided in the development of the iglidur® C, the bearings are very wear resistant and for this reason suitable also for continuous movements at medium surface speeds. Though speeds up to 1.5 m/s can be achieved short term, for general long term applications the speeds should be below 05 m/s.

▶ Surface Speed, **page 45**

m/s	Rotating	Oscillating	Linear
Continuous	1	0.7	2
Short term	1.5	1.1	3

Table 02: Maximum running speed

Temperatures

The short-term maximum application temperature is +170 °C. However no real loads are possible at this temperature. Therefore it would be reasonable to limit the operating temperature to about +120 °C.

Note that the bearing should be mechanically secured in the housing from temperatures of +70 °C to prevent the bearing coming out of the housing.

▶ Application Temperatures, **page 46**

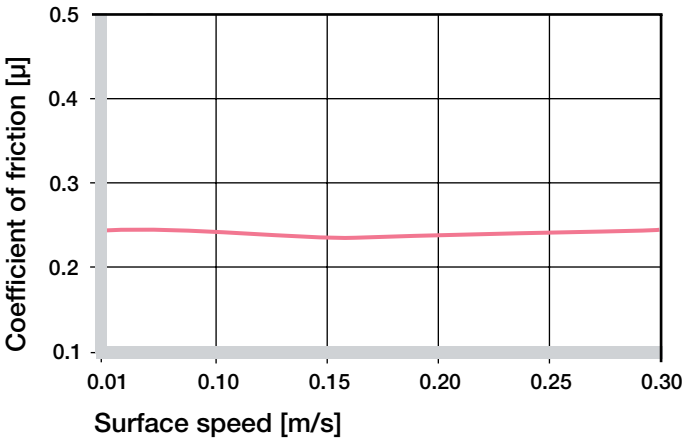
iglidur® C	Application temperature
Minimum	–40 °C
Max. long term	+90 °C
Max. short term	+130 °C
Add. securing is required from	+40 °C

Table 03: Temperature limits

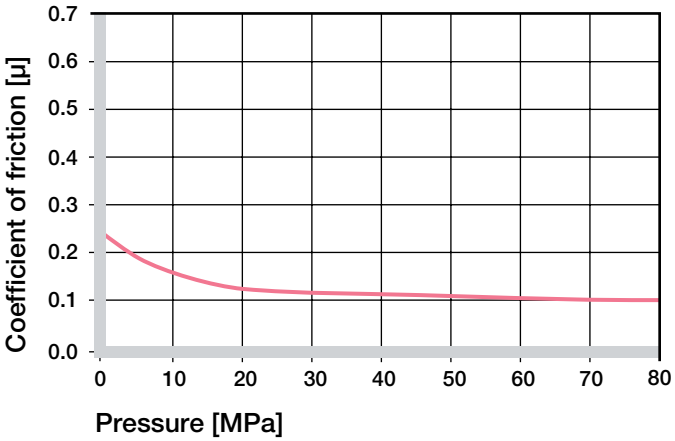
Friction and Wear

The coefficient of friction of the iglidur® C bearing is dependent to a large degree on the shaft surface finish. Even though PTFE and silicone have been designed out of this material, iglidur® C still gives very low coefficients of friction. Similarly the wear of the bearing is very good in applications with rotating or pivoting motions with low loads.

▶ 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

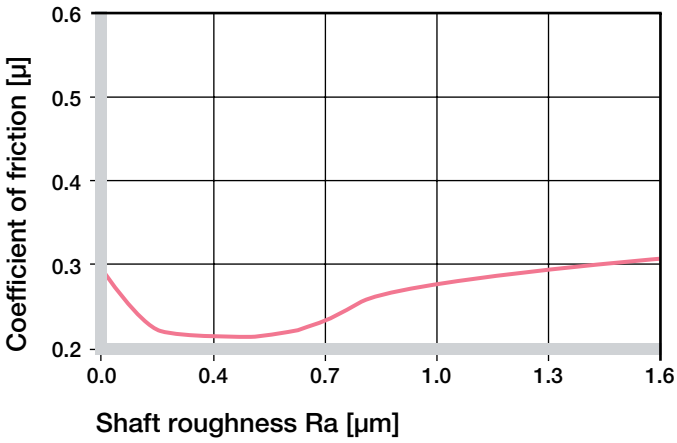


Graph 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

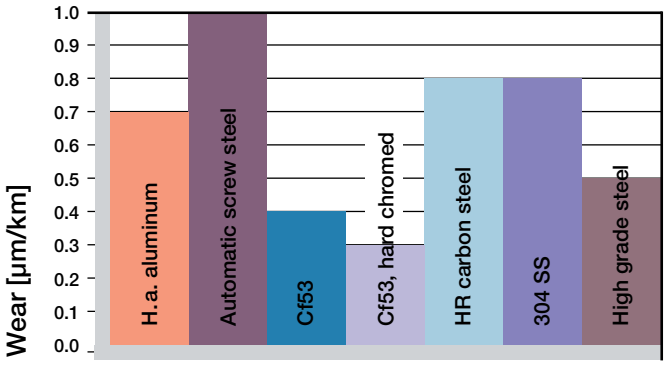
Shaft Materials

Graph 07 clearly shows how critical the choice of shaft material is. Though all results of this rotation test under the load of 0.75 MPa can be read as excellent, the difference is significant.
Graph 08 shows eventually that this difference rises still further with increasing loads.

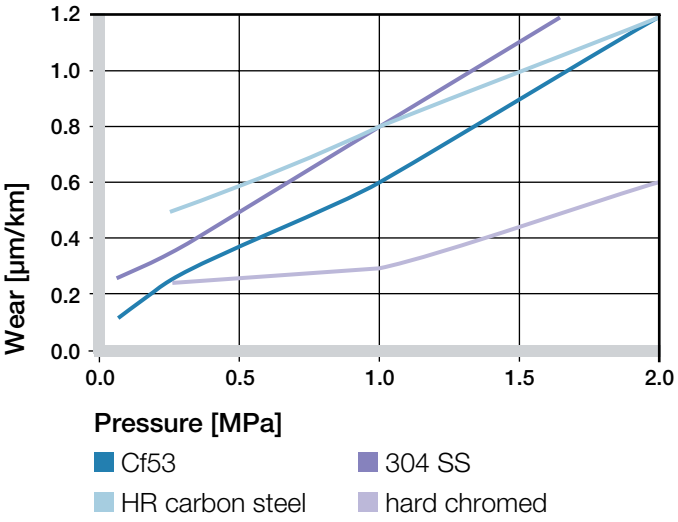
▶ Shaft Materials, **page 51**



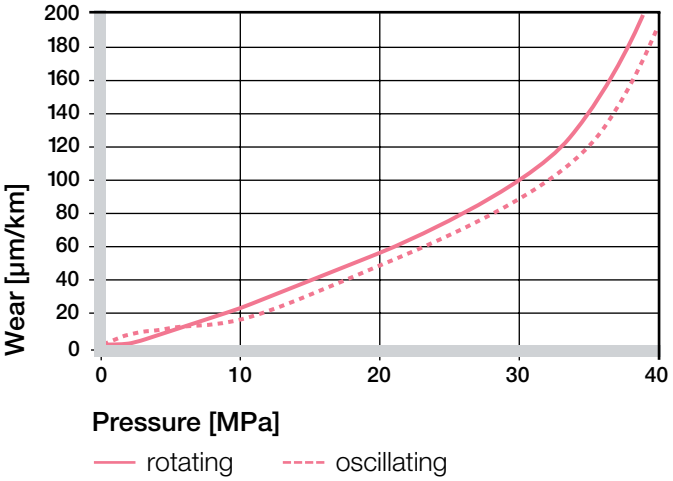
Graph 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)



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



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



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

iglidur® C	Dry	Greases	Oil	Water
C. o. f. µ	0.17–0,25	0.09	0.04	0.04

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

Additional Properties

Chemical Resistance

iglidur® C plain bearings are resistant to detergents, greases, oils, diluted alkalines and weak acids.

▶ Chemical Table, **page 974**

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

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

Radiation Resistance

Plain bearings of iglidur® C are radiation resistant up to a radiation intensity of $2 \cdot 10^4$ Gy. Higher radiation affects the material and can result in a loss of important mechanical characteristics.

UV Resistance

iglidur® C plain bearings are not resistant to UV radiation. For applications in outdoor areas, or in cases of other intensive radiation, adequate protection against direct radiation must be provided.

Vacuum

When used in a vacuum environment, the iglidur® C plain bearings release moisture as a vapour. Therefore, only dehumidified bearings are suitable in a vacuum environment.

Electrical Properties

iglidur® C plain bearings are electrically insulating.

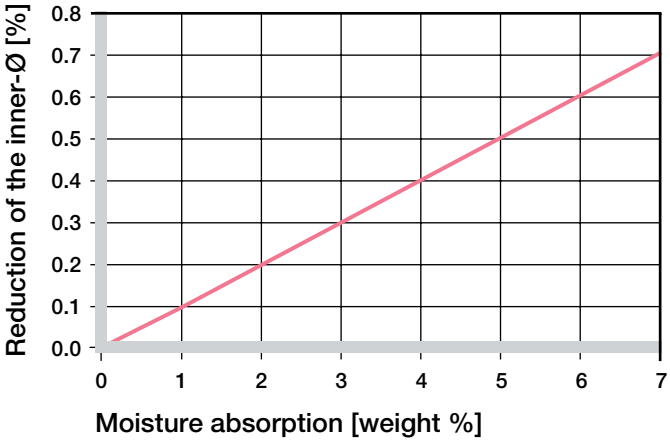
Volume resistance	$> 10^{10}$ Ωcm
Surface resistance	$> 10^{9}$ Ω 10

Moisture Absorption

The moisture absorption of iglidur® C plain bearings is approx. 7 % when saturated in water, and this needs to be taken into account if this material is to be used in wet enviroments.

Maximum moisture absorption	
At +23 °C/50 % r.h.	1.0 % weight
Max. moisture absorption	6.9 % weight

Table 06: Moisture absorption



Graph 10: Effect of moisture absorption on plain bearings

Installation Tolerances

iglidur® C plain bearings are meant to be oversized before being pressfit. 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 is adjusted to meet our specified tolerances.

▶ Testing Methods, **page 55**

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® C 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® C plain bearings are produced to special order.