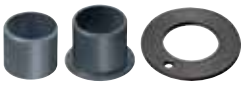
iglidur® G | **The All-Round Performer**

iglidur® G bearings cover an extremely wide range of differing requirements – they are truly "all round". Typical applications cover medium to high loads, medium sliding speeds and medium temperatures.

3 styles
> 650 dimensions
Ø 1–150 mm



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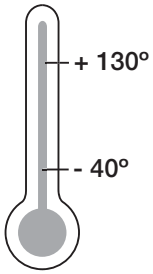


igus® UK Ltd

Price index

The All-Round Performer

When to use iglidur® G plain bearings:

- When you need an economical all-round performance bearing
- For above average loads
- For low to average running speeds
- When the bearing needs to run on different shaft materials
- For oscillating and rotational movements
- Multi-purpose use
- Maintenance-free
- Cost-effective
- Dirt resistant
- Vibration dampening

When not to use iglidur® G plain bearings:

- When mechanical reaming of the wall surface is necessary
  ▶ iglidur® M250 (chapter 4)
- When the highest wear resistance is necessary
  ▶ iglidur® W300 (chapter 5)
- If temperatures are constantly greater than 130°C
  ▶ iglidur® H (chapter 12), X (chapter 6)
- For underwater use
  ▶ iglidur® H (chapter 12), H370 (chapter 15)

Picture 2.1: Reliable under high load, wear resistant during rotations in constant use

Lifetime calculation, CAD files and much more support ▶ www.igus.co.uk/en/g

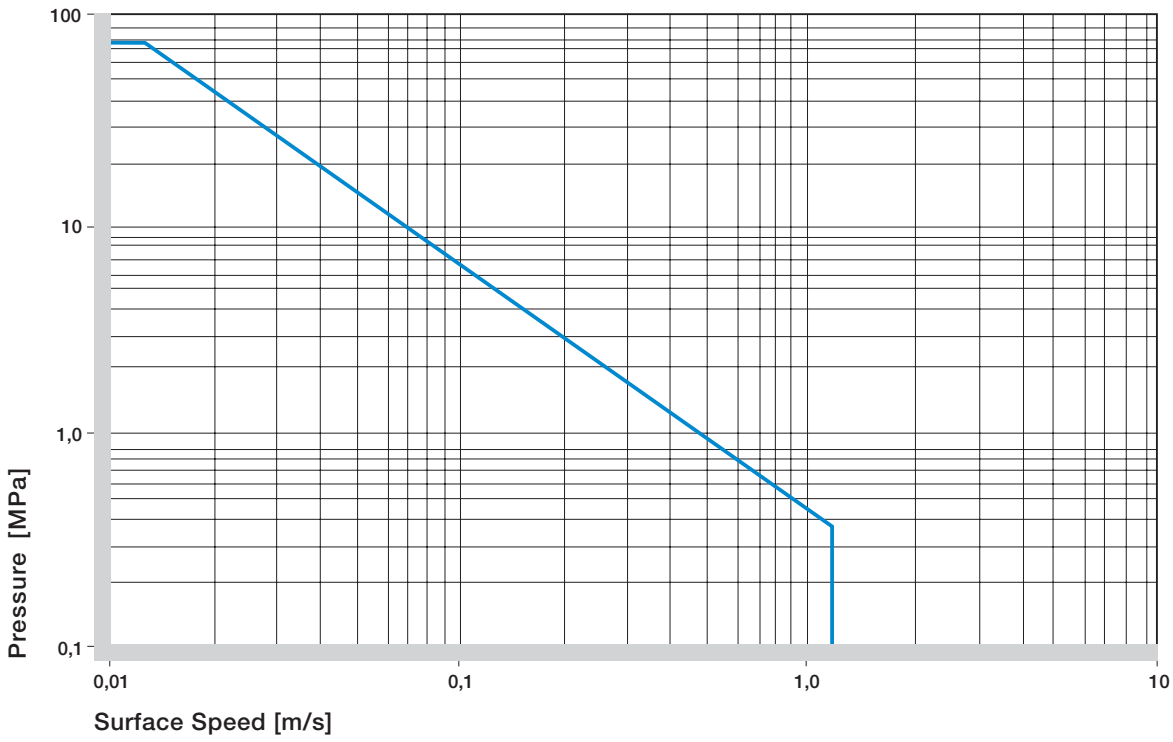
Material Table

General Properties	Unit	iglidur® G	Testing Method
Density	g/cm³	1,46	
Colour		Dark grey	
Max. moisture absorption at 23°C / 50% r.F.	% weight	0,7	DIN 53495
Max. moisture absorption	% weight	4,0	
Coefficient of sliding friction, dynamic against steel	µ	0,08 - 0,15	
p x v value, max. (dry)	MPa x m/s	0,42	
Mechanical Properties			
Modulus of elasticity	MPa	7.800	DIN 53457
Tensile strength at 20°C	MPa	210	DIN 53452
Compressive strength	MPa	78	
Max. recommended surface pressure (20°C)	MPa	80	
Shore D hardness		81	DIN 53505
Physical and Thermal Properties			
Max. long term application temperature	°C	130	
Max. short term application temperature	°C	220	
Min. application temperature	°C	-40	
Thermal conductivity	W/m x K	0,24	ASTM C 177
Coefficient of thermal expansion (at 23°C)	$K^{-1} \times 10^{-5}$	9	DIN 53752
Electrical Properties			
Specific volume resistance	Ωcm	$> 10^{13}$	DIN IEC 93
Surface resistance	Ω	$> 10^{11}$	DIN 53482

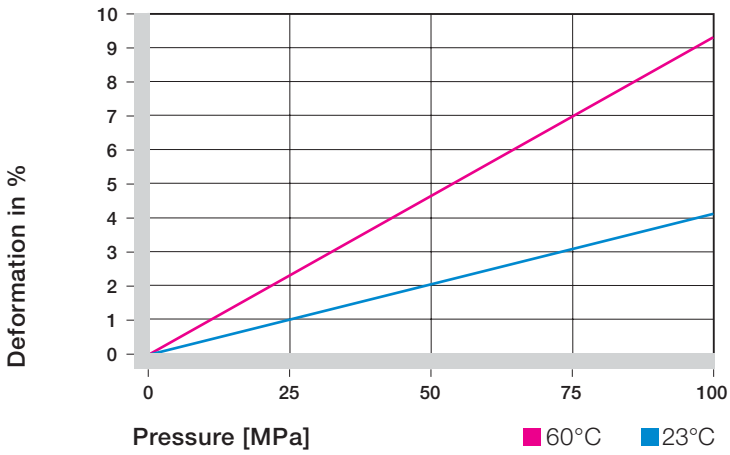
Table 2.1: Material Data

Picture 2.2: tested at a load of 18,000 N for 10,000 cycles, resulted in no measurable wear

Picture 2.3: The pneumatic rotational drive unit in steam lines at steam temperatures up to 135°C



Graph 2.1: Permissible p x v values for iglidur® G running dry against a steel shaft, at 20°C



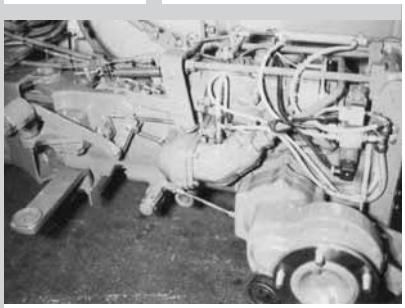
Graph 2.2: Deformation under pressure and temperature

Surface Pressure

Picture 2.2 shows the elastic deformation of iglidur® G during radial loading. At the recommended maximum surface pressure of 80 MPa the deformation is less than 5%. The plastic deformation is minimal up to a pressure of approximately 100 MPa. However, it is also dependant on the cycle time.

Graph 2.2

▶ Surface Pressure, page 1.18



Picture 2.4: Vibrations, dirt, and temperatures up to 130°C occur in the area surrounding the engine

m/s	Rotating	Oscillating	Linear
Continuous	1	0,7	4
Short term	2	1,4	5

Table 2.2: Maximum running speed

Permissible Surface Speeds

iglidur® G has been developed for low to medium surface speeds. The maximum values shown in table 2.2 can only be achieved at low pressures. At the given speeds, friction can cause a temperature increase to maximum permissible levels. In practice, though, this temperature level is rarely reached, due to varying application conditions.

▶ Surface Speed, page 1.20
▶ p x v value, page 1.22

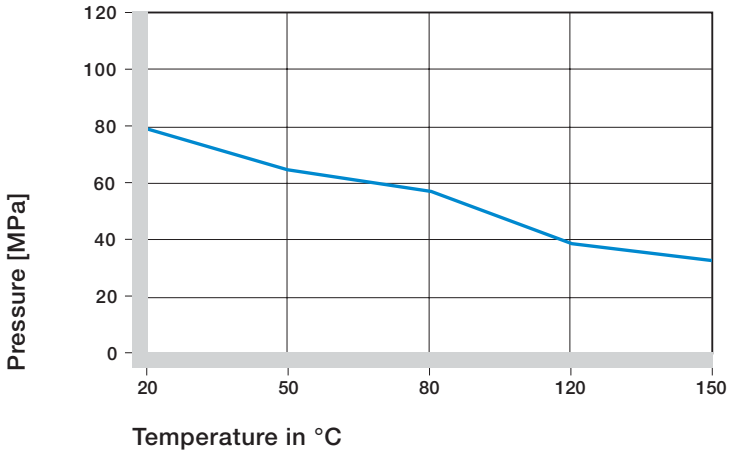
Picture 2.5: Conveyor chains: Through edge loading, short term surface pressures of over 50 MPa can occur

iglidur® G	Application Temperature
Minimum	- 40 °C
Max. long term	+ 130 °C
Max. short term	+ 220 °C

Table 2.3: Temperature limits for iglidur® G

Temperatures

Application temperatures greatly affect the properties of plain bearings.
The short term maximum temperature is 220°C, this allows the use of iglidur® G plain bearings in heat treating applications in which the bearings are not subjected to additional loading.
With increasing temperatures, the compressive strength of iglidur® G plain bearings decreases. The Graph 2.3 shows this inverse relationship. However, at the long-term maximum temperature of 130°C the permissible surface pressure is still above 35 MPa.
The ambient temperatures that are prevalent in applications also have an effect on the bearing wear. With increasing temperatures, the wear increases and this effect is significant when temperatures rise over 120°C.



Graph 2.3: Recommended maximum surface pressure of iglidur® G as a function of temperature

Graph 2.3

▶ Application Temperatures, page 1.23

Friction and Wear

Similar to wear resistance, the coefficient of friction μ also changes with the load. The coefficient of friction decreases with increasing loads, whereas an increase in surface speed causes an increase of the coefficient of friction. This relationship explains the excellent results of iglidur® G plain bearings for high loads and low speeds (see Graphs 2.4 and 2.5).
The friction and wear are also dependent, to a large degree, on the shaft material. Shafts that are too smooth, increase both the coefficient of friction and the wear of the bearing. For iglidur® G a ground surface with an average roughness Ra = 0.8 μm is recommended (see Graph 2.6).

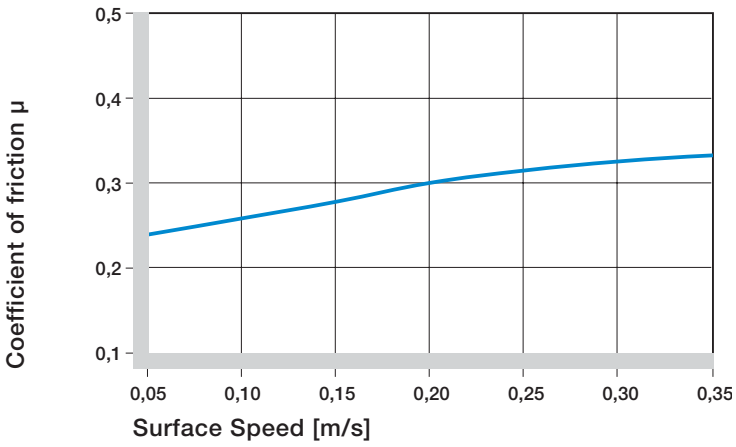
Graphs 2.4 to 2.6
▶ Coefficients of Friction and Surfaces, page 1.25
▶ Wear Resistance, page 1.26

Shaft Materials

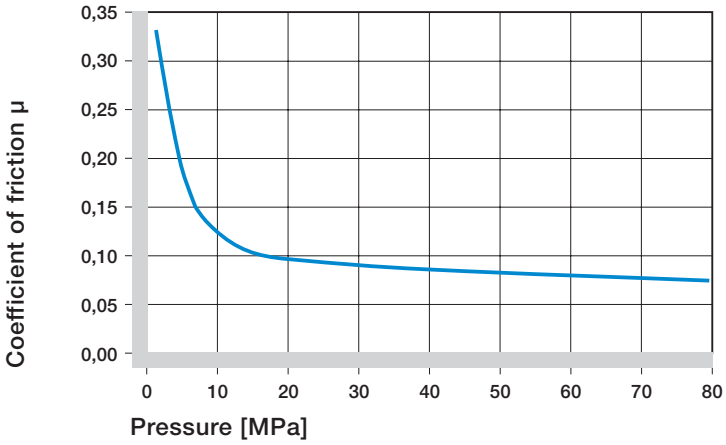
Graphs 2.7 and 2.8 show results of testing different shaft materials with plain bearings made of iglidur® G.
In Graph 2.7 it shows that iglidur® G can be combined with various shaft materials. The simple shaft materials of free-cutting steel and HR carbon steel have proven best at low loads. This helps to design cost-effective systems, since both iglidur® G and the shaft are economically priced.
It is important to notice that with increasing loads, the recommended hardness of the shaft increases. The “soft” shafts tend to wear more easily and thus increase the wear of the overall system. If the loads exceed 2 MPa it is important to recognize that the wear rate (the gradient of the curves) clearly decreases with the hard shaft materials.
The comparison of rotational movements to oscillating movements shows that iglidur® G provides advantages in oscillating movements. The wear of the bearing is smaller for equivalent conditions. The higher the load, the greater the difference. This means that iglidur® G can be used for oscillating movements that are well above the given maximum load of 80 MPa.

iglidur® G	Dry	Grease	Oil	Water
C.o.f. [μ]	0,08 - 0,15	0,09	0,04	0,04

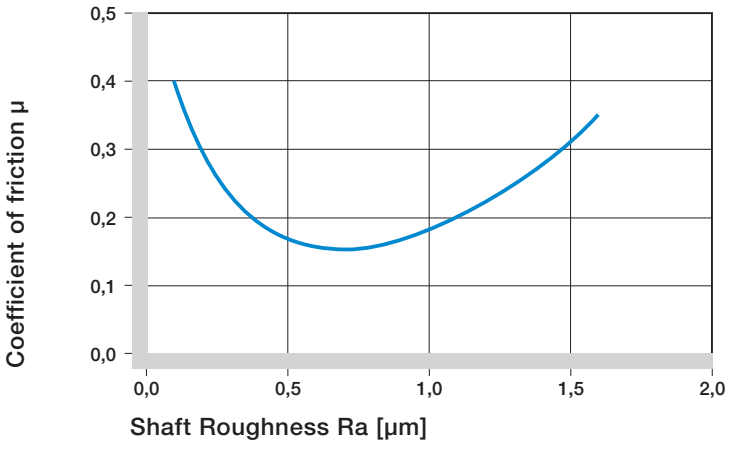
Table 2.4: Coefficient of friction for iglidur® G against steel (Ra = 1 μm, 50 HRC)



Graph 2.4: Coefficient of friction of iglidur® G as a function of the running speed, p = 0.75 MPa



Graph 2.5: Coefficient of friction of iglidur® G as a function of the pressure



Graph 2.6: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

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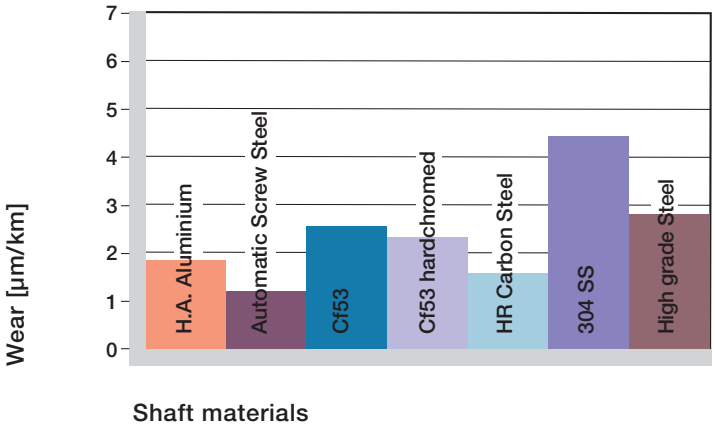
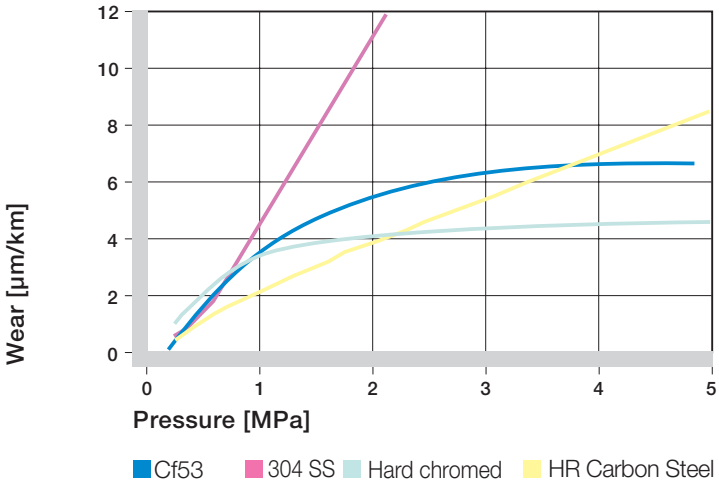
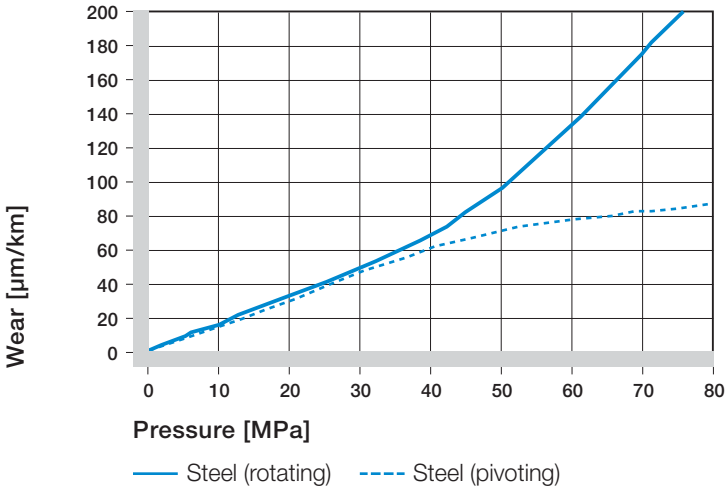


Graph 2.7: Wear of iglidur® G, rotating with different shaft materials, pressure p = 0.75 MPa, v = 0.5 m/s



Graph 2.8: Wear with different shaft materials in rotational operation, as a function of the pressure



Graph 2.9: Wear for pivoting and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

For these loads, the use of hardened shafts is recommended.
In addition to the shaft materials presented here, many others have been tested. If the shaft material you plan on using is not shown in these test results, please contact us.

Graphs 2.7 to 2.9
▶ Shaft Materials, pages 1.2

Installation Tolerances

iglidur® G plain bearings are meant to be oversized before 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 adjusts to meet our specified tolerances. Please adhere to the catalogue specifications for housing bore and recommended shaft sizes. This will help to ensure an optimal performance of iglidur® plain bearings. Please contact an iglidur® technical expert for more information.

▶ Testing Methods, page 1.32/1.33

Chemical Resistance

iglidur® G plain bearings have strong resistance to chemicals. They are also resistant to most lubricants.
iglidur® G plain bearings are not attacked by most weak organic or inorganic acids. The moisture absorption of iglidur® G plain bearings is approximately 1% in the standard atmosphere. The saturation limit submerged in water is 5%. This must be taken into account for these types of applications.

Graph 2.10
▶ Chemical Table, page 70.1

Radiation Resistance

Plain bearings made from iglidur® G are resistant to radiation up to an intensity of 300 Gy.

UV Resistance

iglidur® G plain bearings are permanently resistant to UV radiation.

Vacuum

iglidur® G plain bearings outgas in a vacuum. Use in a vacuum environment is only possible with dehumidified bearings.

Electrical Properties

iglidur® G plain bearings are electrically insulating.

Application Example

Picture 2.7: iglidur® G plain bearings have been proven in control levers and pedals of farm tractors and construction vehicles

Picture 2.8: A high amount of dust accumulation occurs in exhaust valves on automatic milling machines

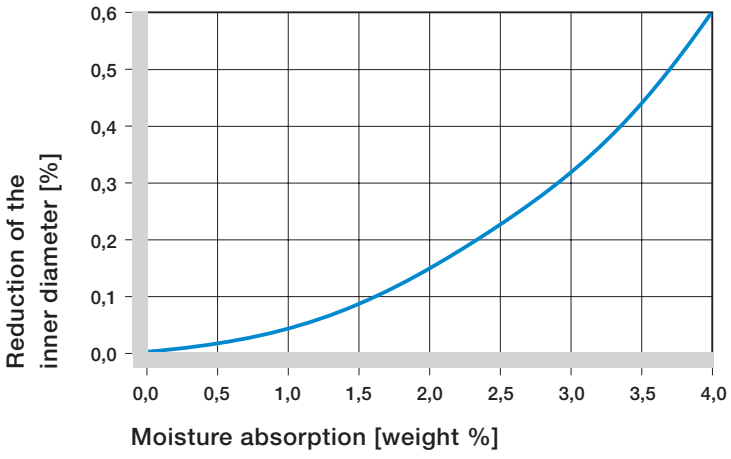
Diameter d1 [mm]	Shaft h9 [mm]	iglidur® G E10 [mm]
up to 3	0 - 0,025	+0,014 + 0,054
> 3 to 6	0 - 0,030	+0,020 + 0,068
> 6 to 10	0 - 0,036	+0,025 + 0,083
> 10 to 18	0 - 0,043	+0,032 + 0,102
> 18 to 30	0 - 0,052	+0,040 + 0,124
> 30 to 50	0 - 0,062	+0,050 + 0,150
> 50 to 80	0 - 0,074	+0,060 + 0,180
> 80 to120	0 - 0,087	+0,072 + 0,212
> 120	0 - 0,100	+0,085 + 0,245

Table 2.5: Important tolerances for iglidur® G plain bearings according to ISO 3547-1 after pressfit

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

Table 2.6: Chemical resistance of iglidur® G – detailed list, page 70.1

+ resistant 0 conditionally resistant – not resistant
All data given at room temperature [20°C]



Graph 2.10: Effect of moisture absorption on iglidur® G plain bearings

iglidur® G	
Specific volume resistance	> 10^{13} Ωcm
Surface resistance	> 10^{11} Ω

Table 2.7: Electrical properties of iglidur® G

Picture 2.6: In tests under high radial forces, distances of 3,000 km are covered with negligible wear values