iglidur® P

low water absorption

Standard range from stock ▶ **from page 179**

New in this catalog!

iglidur® P210

flexible, wear resistant & more

Standard range from stock ▶ **from page 191**

iglidur® K

versatile

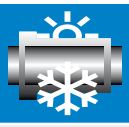
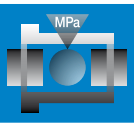
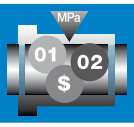
Standard range from stock ▶ **from page 199**

iglidur® GLW

low-cost material for high quantities

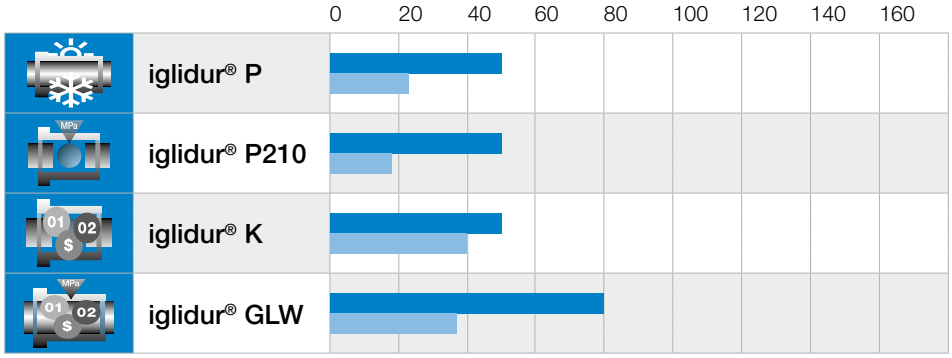
On request ▶ **from page 209**

iglidur® Specialists | Selection According to Main Criteria

iglidur® Specialists – General Purpose				
	iglidur® P	iglidur® P210	iglidur® K	iglidur® GLW
Long life dry running	●	●	●	
For high loads				●
For high temperatures				
Low friction/high speed			●	
Dirt resistant	●	●		●
Chemicals resistant				
Low water absorption	●	●	●	
Food-suitable				
Vibration-dampening				
Egde pressure		●		
For under water use				
Cost-effective	●	●	●	●
from page	179	191	199	209

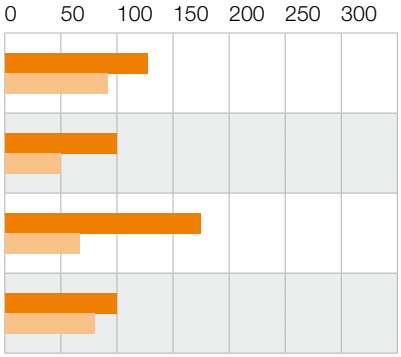
iglidur® Specialists | Selection According to Main Criteria

Load [MPa]



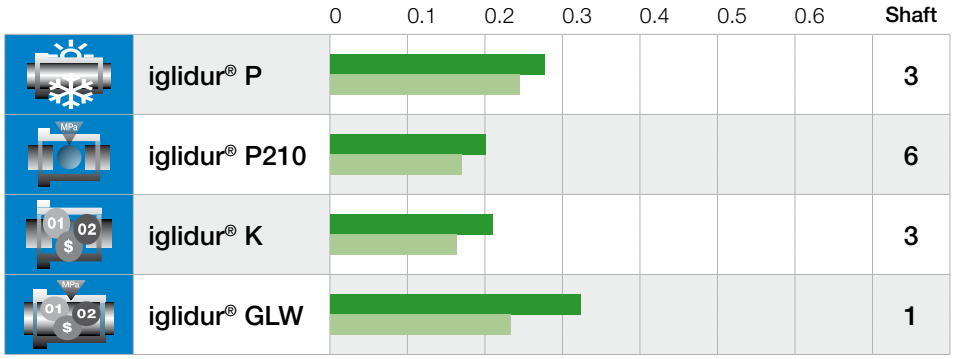
Maximum permissible radial load of iglidur® bearings at
- +20 °C
- +80 °C

Temperature [°C]



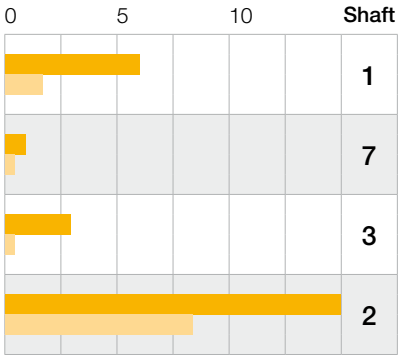
Important temperature limits of iglidur® bearings
- Maximum permissible application temperature, continuous
- Temperature where bearings need to be secured against radial or axial movement in the housing

Coefficient of Friction [µ]



Coefficients of friction of iglidur® bearings sliding against steel, p = 1 MPa, v = 0.3 m/s
- Average coefficient of all the seven sliding combinations tested
- Coefficient of friction of best combination

Wear [µm/km]



Wear of iglidur® bearings sliding against steel, p = 1 MPa
- Average wear of all the seven sliding combinations tested
- Wear of best combination

Shaft material:

1 = Cf53
2 = hard chromed
3 = Aluminum, hc
4 = Automatic screw steel
5 = HR carbon steel
6 = 304 SS
7 = High grade steel

iglidur® Specialists | Material Properties Table

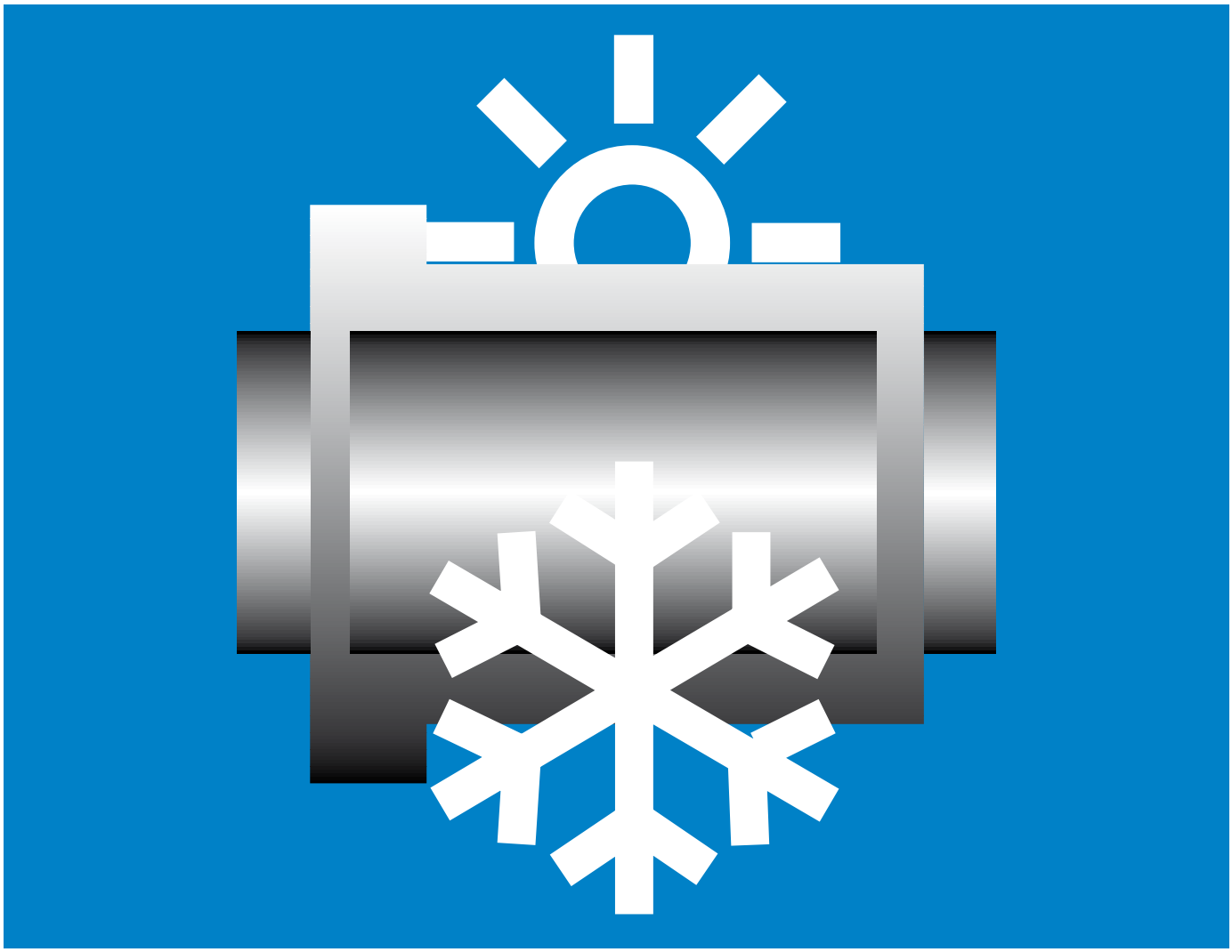
Material properties table

General properties	Unit	iglidur® P	iglidur® P210	iglidur® K	iglidur® GLW
Density	g/cm³	1.58	1.40	1.52	1.36
Colour		black	yellow	yellow beige	black
Max. moisture absorption at +23 °C/50 % r.h.	% weight	0.2	0.3	0.1	1.3
Max. water absorption	% weight	0.4	0.5	0.6	5.5
Coefficient of sliding friction. dynamic against steel	µ	0.06–0.21	0.07–0.19	0.06–0.21	0.1–0.24
pv value. max. (dry)	MPa · m/s	0.39	0.4	0.30	0.3
Mechanical properties					
Modulus of elasticity	MPa	5,300	2,500	3,500	7,700
Tensile strength at +20 °C	MPa	120	70	80	235
Compressive strength	MPa	66	50	60	74
Max. recommended surface pressure (+20 °C)	MPa	50	50	50	80
Shore D hardness		75	75	72	78
Physical and thermal properties					
Max. long term application temperature	°C	+130	+100	+170	+100
Max. short term application temperature	°C	+200	+160	+240	+160
Min. application temperature	°C	–40	–40	–40	–40
Thermal conductivity	W/m · K	0.25	0.25	0.25	0.24
Coefficient of thermal expansion (at +23 °C)	$K^{-1} \cdot 10^{-5}$	4	8	3	17
Electrical properties					
Specific volume resistance	Ωcm	$> 10^{13}$	$> 10^{12}$	$> 10^{12}$	$> 10^{11}$
Surface resistance	Ω	$> 10^{12}$	$> 10^{11}$	$> 10^{12}$	$> 10^{11}$

Material resistance (at +20 °C)

Chemical resistance	iglidur® P	iglidur® P210	iglidur® K	iglidur® GLW
Alcohol	+	+	+ to 0	+ to 0
Hydrocarbons	–	–	+	+
Greases, oils without additives	+	+	+	+
Fuels	+	+	+	+
Diluted acids	0	0	0 to –	0 to –
Strong acids	–	–	–	–
Diluted alkalines	–	–	+	+
Strong alkalines	–	–	0	0
Radiation resistance [Gy] to	$5 \cdot 10^2$	$3 \cdot 10^2$	$5 \cdot 10^2$	$3 \cdot 10^2$

+ resistant 0 conditionally resistant – not resistant

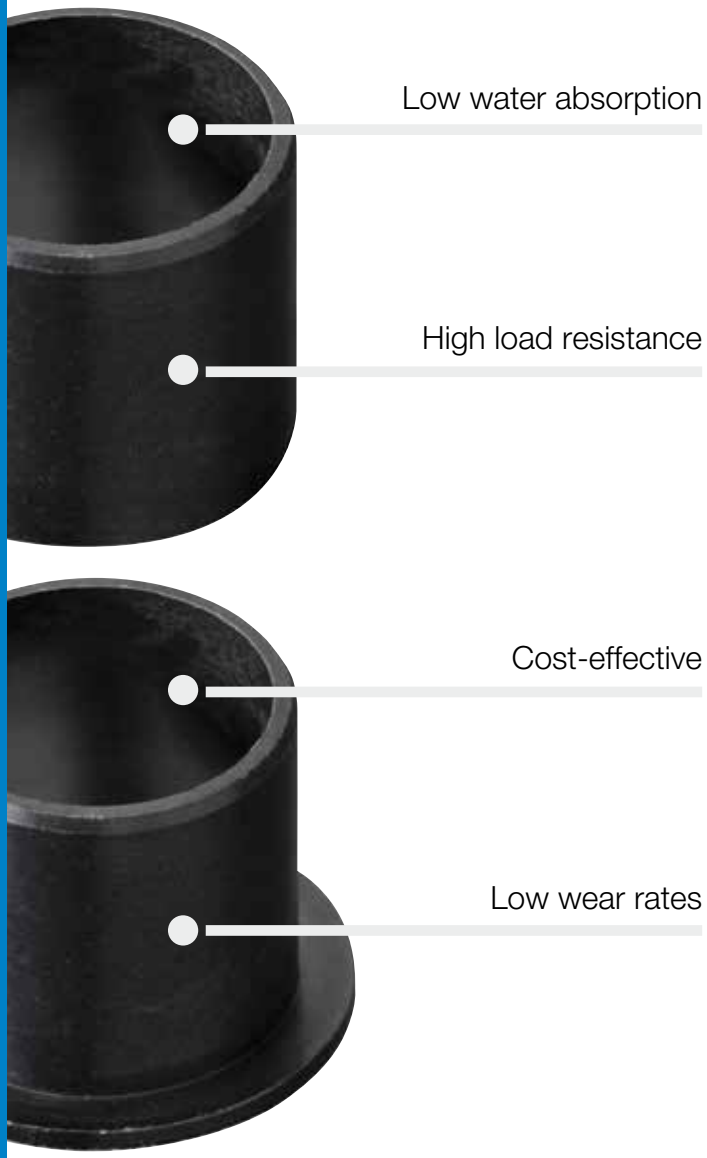


Low water absorption – iglidur® P

- Standard range from stock
- Low water absorption
- Low wear rates
- High load capacity
- Maintenance-free
- Cost-effective

iglidur® P

Low water absorption. Due to thermal stability and low water absorption, the iglidur® P bearings are among the most dimensionnally stable allround bearings under varying environmental conditions. iglidur® P bearings are recommended for oscillating and rotating movements at average loads.



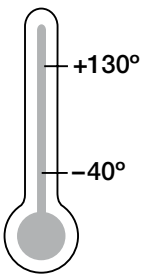
When to use it?

- When very low water absorption is needed
- When a cost-effective bearing for high pressure loads is required
- When high precision in high humidity and moderately high temperatures are needed

When not to use it?

- When the maximum application temperature is above +120 °C
  ▶ iglidur® K, page 199
- When mechanical reaming of the wall surface is necessary
  ▶ iglidur® M250, page 111
- When the highest wear resistance is needed
  ▶ iglidur® W300, page 135

Temperature



Product range

2 types
Ø 3–95 mm
more dimensions
on request

iglidur® P | Application Examples

Typical sectors of industry and application areas

● Solar technology ● Sports and leisure
● Machine Building ● Doors and gates
● Railway industry etc.

Improve technology and reduce costs – 310 exciting examples for iglidur® plain bearings online

▶ www.igus.co.uk/iglidur-applications

▶ www.igus.co.uk/boat-cranes

▶ www.igus.co.uk/helicopter-loadsystem

▶ www.igus.co.uk/road-sweeper

Material properties table			
General properties	**Unit**	**iglidur® P**	**Testing method**
Density	**g/cm³**	1.58	
Colour		black	
Max. moisture absorption at +23 °C/50 % r.h.	**% weight**	0.2	DIN 53495
Max. water absorption	**% weight**	0.4	
Coefficient of sliding friction, dynamic against steel	**µ**	0.06–0.21	
pv value, max. (dry)	**MPa · m/s**	0.39	
Mechanical properties			
Modulus of elasticity	**MPa**	5,300	DIN 53457
Tensile strength at +20 °C	**MPa**	120	DIN 53452
Compressive strength	**MPa**	66	
Max. recommended surface pressure (+20 °C)	**MPa**	50	
Shore D hardness		75	DIN 53505
Physical and thermal properties			
Max. long term application temperature	**°C**	+130	
Max. short term application temperature	**°C**	+200	
Min. application temperature	**°C**	–40	
Thermal conductivity	**W/m · K**	0.25	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	**$K^{-1} \cdot 10^{-5}$**	4	DIN 53752
Electrical properties			
Specific volume resistance	**Ωcm**	$> 10^{13}$	DIN IEC 93
Surface resistance	**Ω**	$> 10^{12}$	DIN 53482

Table 01: Material properties table

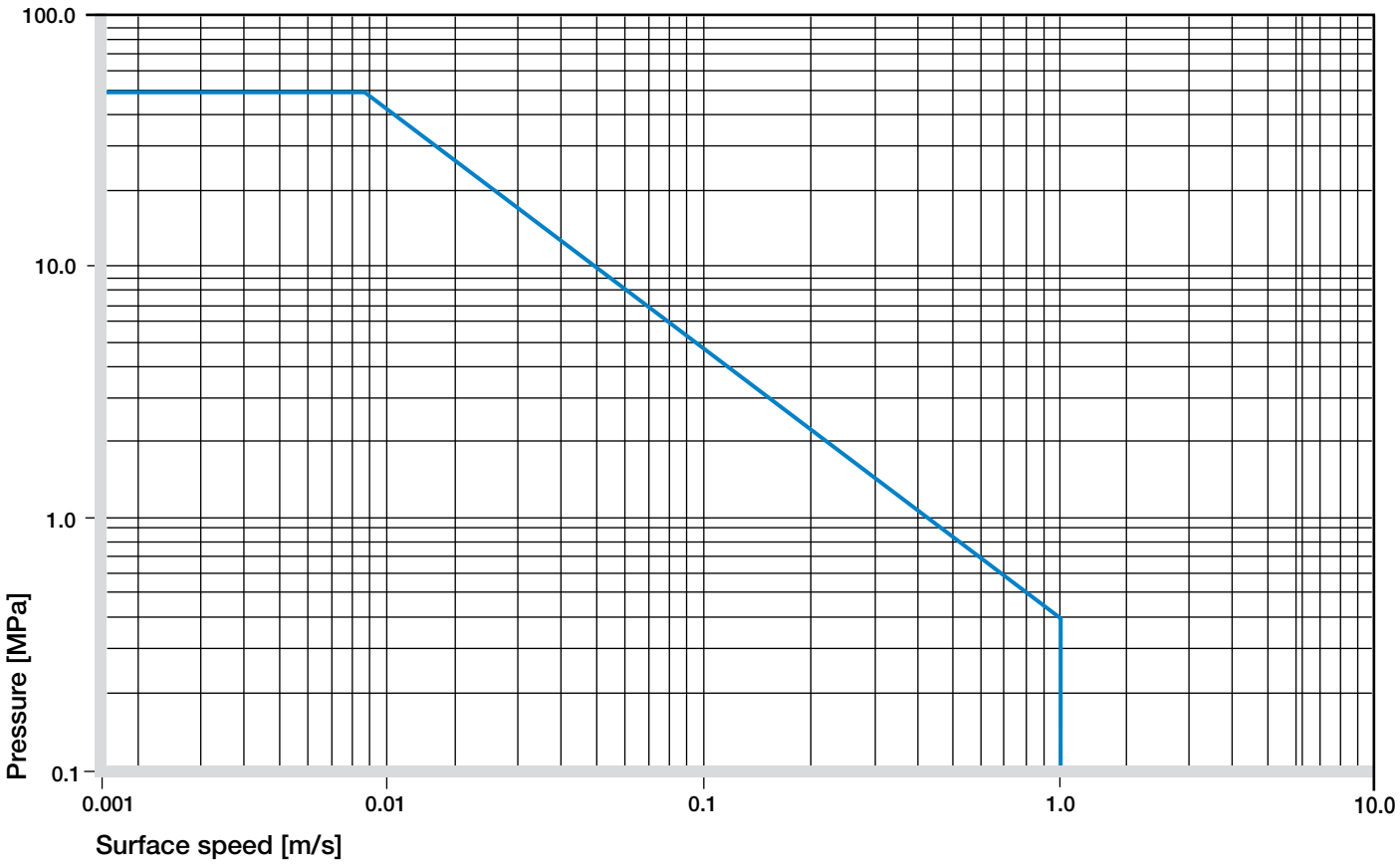


Diagram 01: Permissible pv values for iglidur® P with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

With the iglidur® P plain bearing, the user has a cost-effective, maintenance-free plain bearing. Compared to iglidur® G, plain bearings made of iglidur® P are better suited for rotating movements and average loads.

Mechanical Properties

With increasing temperatures, the compressive strength of iglidur® P plain bearings decreases. The Diagram 02 shows this inverse relationship. However, at the longterm maximum temperature of +130 °C the permissible surface pressure is almost 15 MPa. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

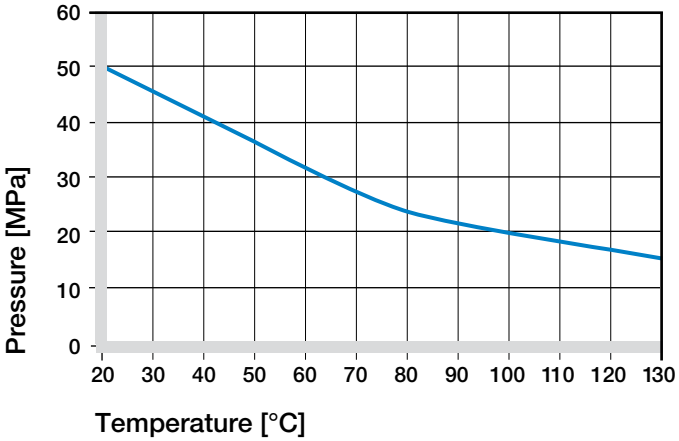


Diagram 02: Recommended maximum surface pressure as a function of temperature (50 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® P as a function of radial pressure. At the recommended maximum surface pressure of 50 MPa the deformation is less than 4 %.

▶ Surface Pressure, **page 47**

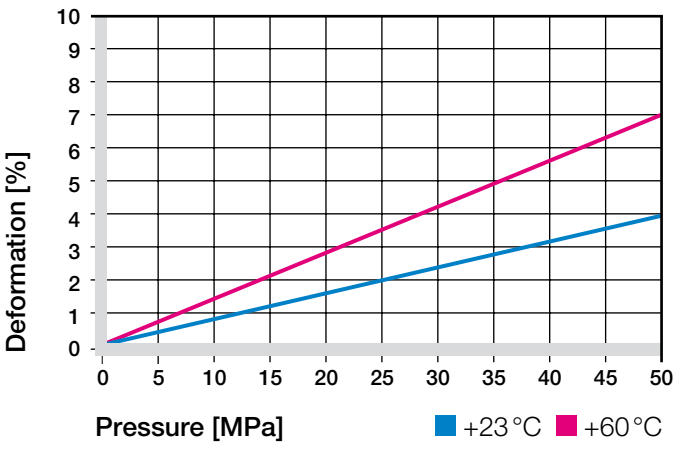


Diagram 03: Deformation under pressure and temperature

Permissible Surface Speeds

Plain bearings made of iglidur® P are maintenance-free plain bearings, which were developed for low to average surface speeds. The maximum values given in table 02 can only be achieved at a very low surface pressure. The maximum speed given is the speed at which an increase up to the continuous use temperature occurs due to friction.

▶ Surface Speed, **page 49**

m/s	Rotating	Oscillating	Linear
Continuous	1	0.7	3
Short term	2	1.4	4

Table 02: Maximum running speed

Temperatures

Even at its highest long term application temperature of +130 °C, iglidur® P does not quite reach the values of iglidur® G. The ambient temperatures in the bearing system also have an effect on the bearing wear. With increasing temperatures, the wear increases.

▶ Application Temperatures, **page 50**

iglidur® P	Application temperature
Minimum	–40 °C
Max. long term	+130 °C
Max. short term	+200 °C
Add. securing is required from	+90 °C

Table 03: Temperature limits

Friction and Wear

Just as the wear resistance, the coefficient of friction changes greatly with increasing load. With regard to iglidur® P, the coefficient of friction increases slightly when the speed increases (Diagram 04). Diagram 05 shows how the coefficient of friction drops when the load increases. Starting at approximately 6 MPa, the coefficient of friction is already below 0.1.

iglidur® P plain bearings obtain a minimum coefficient of friction on shafts with a roughness Ra from 0.1 to 0.2 µm. Both smoother and rougher shaft surface finish cause the friction to clearly increase.

▶ Coefficients of Friction and Surfaces, **page 52**
▶ Wear Resistance, **page 53**

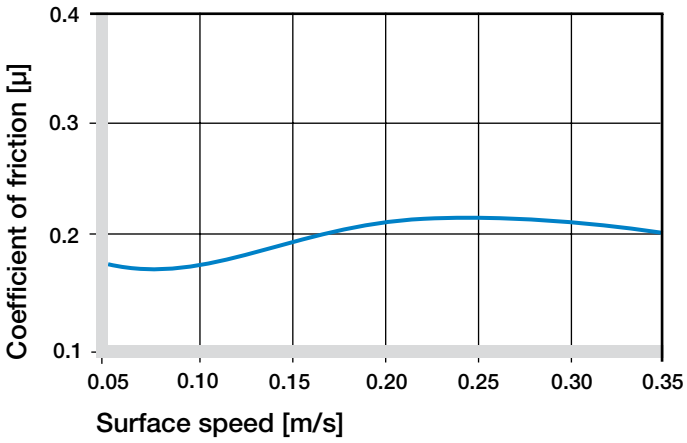


Diagram 04: Coefficient of friction as a function of the running speed, p = 0.75 MPa

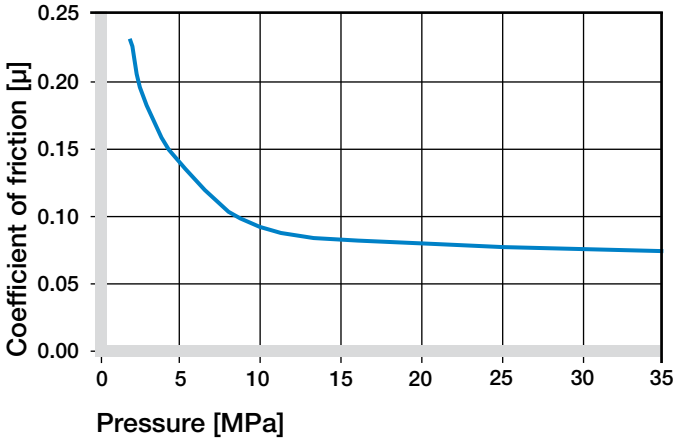


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

Shaft Materials

Diagrams 06 to 10 show results of testing different shaft materials with plain bearings made of iglidur® P.

For rotating movements, the wear of iglidur® P with Cold Rolled Steel and HR Carbon Steel shafts is very low. On the other hand, the bearings on 304 Stainless Steel shafts as well as hard-chromed shafts result in higher wear than other shaft materials even in the low load range. For example at a load of 2 MPa, Cold Rolled Steel is six times better than 304 Stainless Steel. For oscillating movements, however, is the „soft“ shaft St37 significantly less favorable than the hardened shaft versions or the V2A shafts.

▶ Shaft Materials, **page 55**

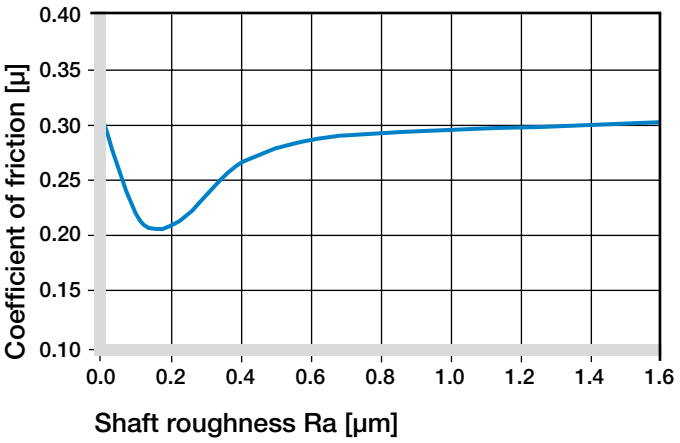


Diagram 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

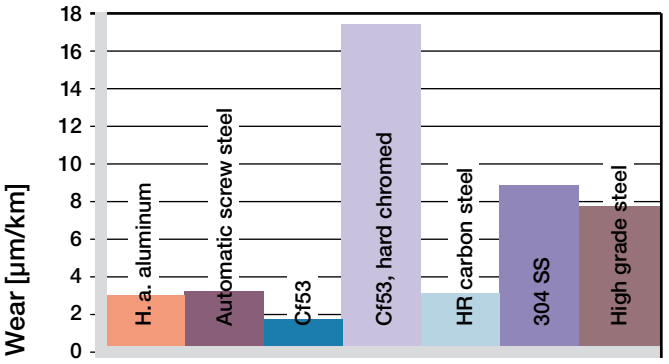


Diagram 07: Wear, rotating with different shaft materials, pressure p = 1 MPa, v = 0.3 m/s

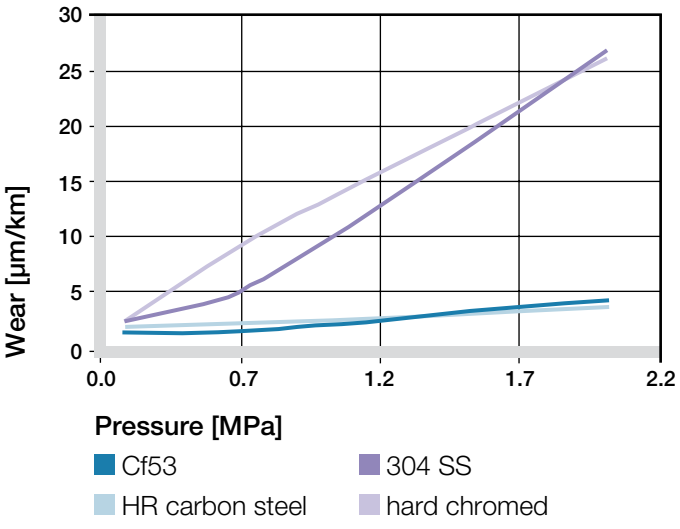


Diagram 08: Wear with different shaft materials in rotational operation, as a function of the pressure

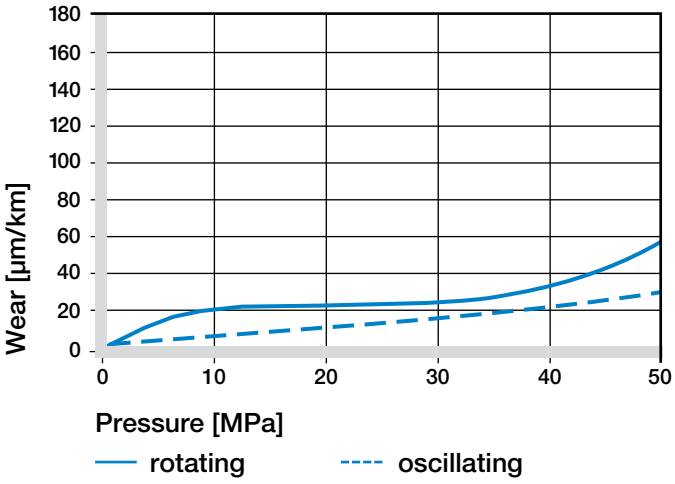


Diagram 09: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

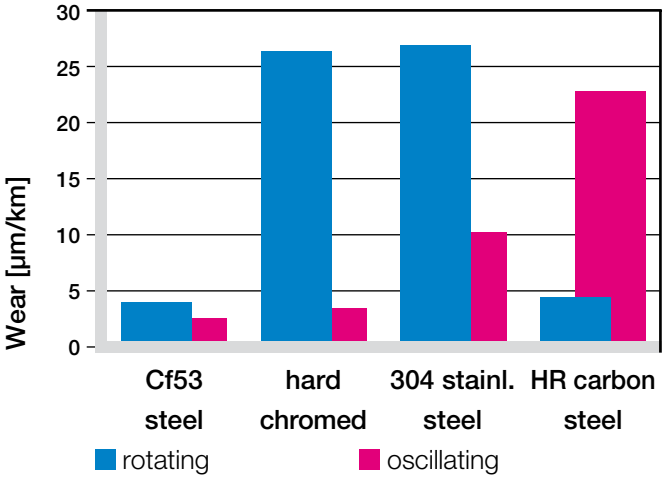


Diagram 10: Wear for rotating and oscillating applications with different shaft materials, p = 2 MPa

iglidur® P	Dry	Greases	Oil	Water
C. o. f. µ	0.06–0.21	0.09	0.04	0.04

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

Additional Properties

Chemical Resistance

iglidur® P plain bearings have a good resistance to chemicals. They are resistant to most lubricants.
iglidur® P is not attacked by most weak organic and inorganic acids.

▶ Chemical Table, **page 1118**

Medium	Resistance
Alcohol	+
Hydrocarbons	–
Greases, oils without additives	+
Fuels	+
Diluted acids	0
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 made of iglidur® P have limited use under radioactive radiation. They are resistant to radiation up to an intensity of $5 \cdot 10^2$ Gy.

UV Resistance

iglidur® P plain bearings are partially UV resistant.

Vacuum

In a vacuum environment, existing moisture in iglidur® P plain bearings is released as a vapour. Use in vacuum can be limited.

Electrical Properties

iglidur® P plain bearings are electrically insulating.

Volume resistance	$> 10^{13}$ Ωcm
Surface resistance	$> 10^{12}$ Ω

Moisture Absorption

The moisture absorption of iglidur® P plain bearings is approximately 0.2 % in standard atmosphere. The saturation limit in water is 0.4 %. This low moisture absorption is well below the values of iglidur® G.

Maximum moisture absorption	
At +23 °C/50 % r.h.	0.2 % weight
Max. water absorption	0.4 % weight

Table 06: Moisture absorption

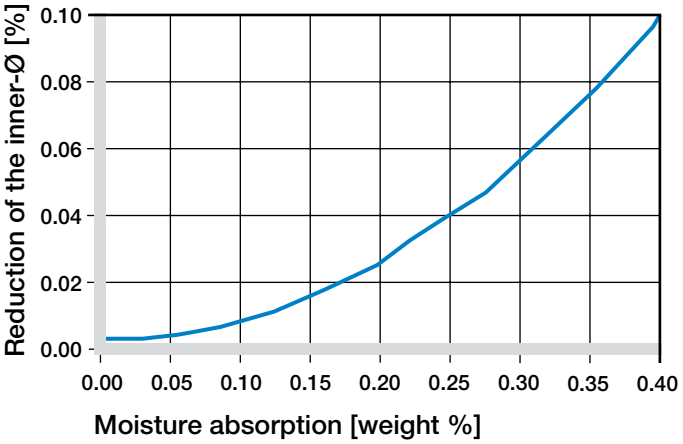


Diagram 11: Effect of moisture absorption on plain bearings

Installation Tolerances

iglidur® P 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 E10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

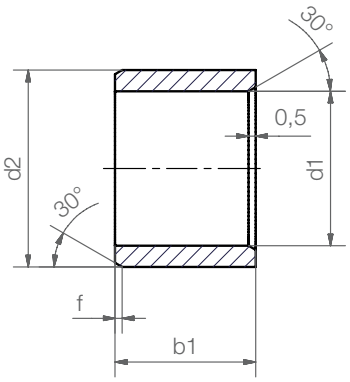
▶ Testing Methods, **page 59**

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® P 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

iglidur® P | Product Range

Sleeve bearing



Order key

PSM-0304-03

- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form S)
- Material iglidur® P

Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to the d1

d1 [mm]:	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

Dimensions [mm]

Part number	d1	d1-Tolerance*	d2	b1 h13
PSM-0304-03	3.0	+0.014 +0.054	4.5	3.0
PSM-0405-04	4.0	+0.020 +0.068	5.5	4.0
PSM-0507-05	5.0	+0.020 +0.068	7.0	5.0
PSM-0608-06	6.0	+0.020 +0.068	8.0	6.0
PSM-0810-08	8.0	+0.025 +0.083	10.0	8.0
PSM-0810-11	8.0	+0.025 +0.083	10.0	11.5
PSM-0810-12	8.0	+0.025 +0.083	10.0	12.0
PSM-1012-10	10.0	+0.025 +0.083	12.0	10.0
PSM-1214-15	12.0	+0.032 +0.102	14.0	15.0
PSM-1214-25	12.0	+0.032 +0.102	14.0	25.0
PSM-1517-15	15.0	+0.032 +0.102	17.0	15.0
PSM-1618-20	16.0	+0.032 +0.102	18.0	20.0
PSM-1618-42	16.0	+0.032 +0.102	18.0	42.0
PSM-1820-15	18.0	+0.032 +0.102	20.0	15.0
PSM-1820-20	18.0	+0.032 +0.102	20.0	20.0
PSM-1820-33	18.0	+0.032 +0.102	20.0	33.0
PSM-2022-22	20.0	+0.040 +0.124	22.0	22.0
PSM-2022-30	20.0	+0.040 +0.124	22.0	30.0
PSM-2022-51	20.0	+0.040 +0.124	22.0	51.0
PSM-2023-15	20.0	+0.040 +0.124	23.0	15.0
PSM-2023-25	20.0	+0.040 +0.124	23.0	25.0
PSM-2023-30	20.0	+0.040 +0.124	23.0	30.0
PSM-2224-45	22.0	+0.040 +0.124	24.0	45.0
PSM-2225-15	22.0	+0.040 +0.124	25.0	15.0
PSM-2225-20	22.0	+0.040 +0.124	25.0	20.0
PSM-2225-45	22.0	+0.040 +0.124	25.0	45.0
PSM-2325-37	23.0	+0.040 +0.124	25.0	37.0
PSM-2325-58	23.0	+0.040 +0.124	25.0	58.0
PSM-2325-68	23.0	+0.040 +0.124	25.0	68.0
PSM-2528-20	25.0	+0.040 +0.124	28.0	20.0
PSM-2528-30	25.0	+0.040 +0.124	28.0	30.0
PSM-2528-35	25.0	+0.040 +0.124	28.0	35.0
PSM-2630-25	26.0	+0.040 +0.124	30.0	25.0
PSM-2832-20	28.0	+0.040 +0.124	32.0	20.0
PSM-2832-25	28.0	+0.040 +0.124	32.0	25.0
PSM-3034-20	30.0	+0.040 +0.124	34.0	20.0
PSM-3034-30	30.0	+0.040 +0.124	34.0	30.0
PSM-3034-40	30.0	+0.040 +0.124	34.0	40.0
PSM-3034-45	30.0	+0.040 +0.124	34.0	45.0
PSM-3539-40	35.0	+0.050 +0.150	39.0	40.0
PSM-4044-50	40.0	+0.050 +0.150	44.0	50.0
PSM-4044-58	40.0	+0.050 +0.150	44.0	58.0
PSM-5055-40	50.0	+0.050 +0.150	55.0	40.0
PSM-6065-50	60.0	+0.060 +0.180	65.0	50.0
PSM-6065-60	60.0	+0.060 +0.180	65.0	60.0
PSM-6570-50	65.0	+0.060 +0.180	70.0	50.0
PSM-7580-80	75.0	+0.060 +0.180	80.0	80.0
PSM-9095-100	90.0	+0.072 +0.212	95.0	100.0
PSM-95100-100	95.0	+0.072 +0.212	100.0	100.0

* after pressfit. Testing methods ▶ page 59

delivery time **from stock**

prices **price list online**
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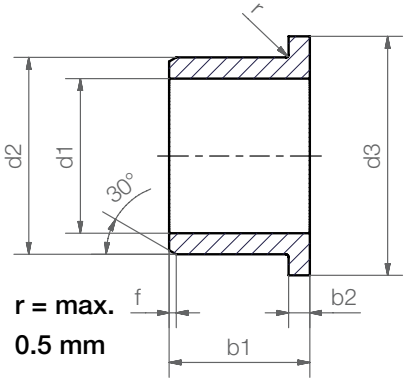
iglidur® P | Product Range

Flange bearing



r = max. 0.5 mm

Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to the d1

d1 [mm]:	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

Order key

PFM-0405-04

- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form F)
- Material iglidur® P

Dimensions [mm]

Part number	d1	d1-Tolerance*	d2	d3	b1	b2
				d13	h13	–0.14
PFM-0405-04	4.0	+0.020 +0.068	5.5	9.5	4.0	0.75
PFM-0507-05	5.0	+0.020 +0.068	7.0	11.0	5.0	1.0
PFM-0608-04	6.0	+0.020 +0.068	8.0	12.0	4.0	1.0
PFM-0608-06	6.0	+0.020 +0.068	8.0	12.0	6.0	1.0
PFM-0810-075	8.0	+0.025 +0.083	10.0	15.0	7.5	1.0
PFM-0810-10	8.0	+0.025 +0.083	10.0	15.0	10.0	1.0
PFM-0810-15	8.0	+0.025 +0.083	10.0	15.0	15.0	1.0
PFM-081012-10	8.0	+0.025 +0.083	10.0	12.0	10.0	1.0
PFM-1012-10	10.0	+0.025 +0.083	12.0	18.0	10.0	1.0
PFM-1012-17	10.0	+0.025 +0.083	12.0	18.0	17.0	1.0
PFM-1214-09	12.0	+0.032 +0.102	14.0	20.0	9.0	1.0
PFM-1214-10	12.0	+0.032 +0.102	14.0	20.0	10.0	1.0
PFM-1214-15	12.0	+0.032 +0.102	14.0	20.0	15.0	1.0
PFM-121418-08	12.0	+0.032 +0.102	14.0	18.0	8.0	1.0
PFM-121420-10	12.0	+0.032 +0.102	14.0	20.0	10.0	1.0
PFM-1416-04	14.0	+0.032 +0.102	16.0	22.0	4.0	1.0
PFM-1416-08	14.0	+0.032 +0.102	16.0	22.0	8.0	1.0
PFM-1416-12	14.0	+0.032 +0.102	16.0	22.0	12.0	1.0
PFM-141624-25	14.0	+0.032 +0.102	16.0	24.0	25.0	1.0
PFM-1420-10	14.0	+0.050 +0.160	20.0	25.0	10.0	3.0
PFM-1517-22	15.0	+0.032 +0.102	17.0	23.0	22.0	1.0
PFM-151824-32	15.0	+0.032 +0.102	18.0	24.0	32.0	1.5
PFM-1618-12	16.0	+0.032 +0.102	18.0	24.0	12.0	1.0
PFM-1618-17	16.0	+0.032 +0.102	18.0	24.0	17.0	1.0
PFM-161824-40	16.0	+0.032 +0.102	18.0	24.0	40.0	1.0

* after pressfit. Testing methods ▶ page 59

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Flange bearing

Dimensions [mm]

Part number	d1	d1-Tolerance*	d2	d3	b1	b2
				d13	h13	–0.14
PFM-1719-25	17.0	+0.032 +0.102	19.0	25.0	25.0	1.0
PFM-1820-17	18.0	+0.032 +0.102	20.0	26.0	17.0	1.0
PFM-202328-15	20.0	+0.040 +0.124	23.0	28.0	15.0	1.5
PFM-2023-16	20.0	+0.040 +0.124	23.0	30.0	16.5	1.5
PFM-2023-30	20.0	+0.040 +0.124	23.0	30.0	30.0	1.5
PFM-2427-22	24.0	+0.040 +0.124	27.0	32.0	22.0	1.5
PFM-2528-11	25.0	+0.040 +0.124	28.0	35.0	11.5	1.5
PFM-2528-21	25.0	+0.040 +0.124	28.0	35.0	21.5	1.5
PFM-3034-16	30.0	+0.040 +0.124	34.0	42.0	16.0	2.0
PFM-3034-30	30.0	+0.040 +0.124	34.0	42.0	30.0	2.0
PFM-3034-37	30.0	+0.040 +0.124	34.0	42.0	37.0	2.0
PFM-3539-26	35.0	+0.050 +0.150	39.0	47.0	26.0	2.0
PFM-4044-30	40.0	+0.050 +0.150	44.0	52.0	30.0	2.0
PFM-4044-40	40.0	+0.050 +0.150	44.0	52.0	40.0	2.0
PFM-5055-50	50.0	+0.050 +0.150	55.0	63.0	50.0	2.0
PFM-6065-40	60.0	+0.060 +0.180	65.0	73.0	40.0	2.0
PFM-6065-50	60.0	+0.060 +0.180	65.0	73.0	50.0	2.0
PFM-7075-50	70.0	+0.060 +0.180	75.0	83.0	50.0	2.0
PFM-8085-100	80.0	+0.060 +0.180	85.0	93.0	100.0	2.5

*** after pressfit. Testing methods ▶ page 59**

Don't find your size?

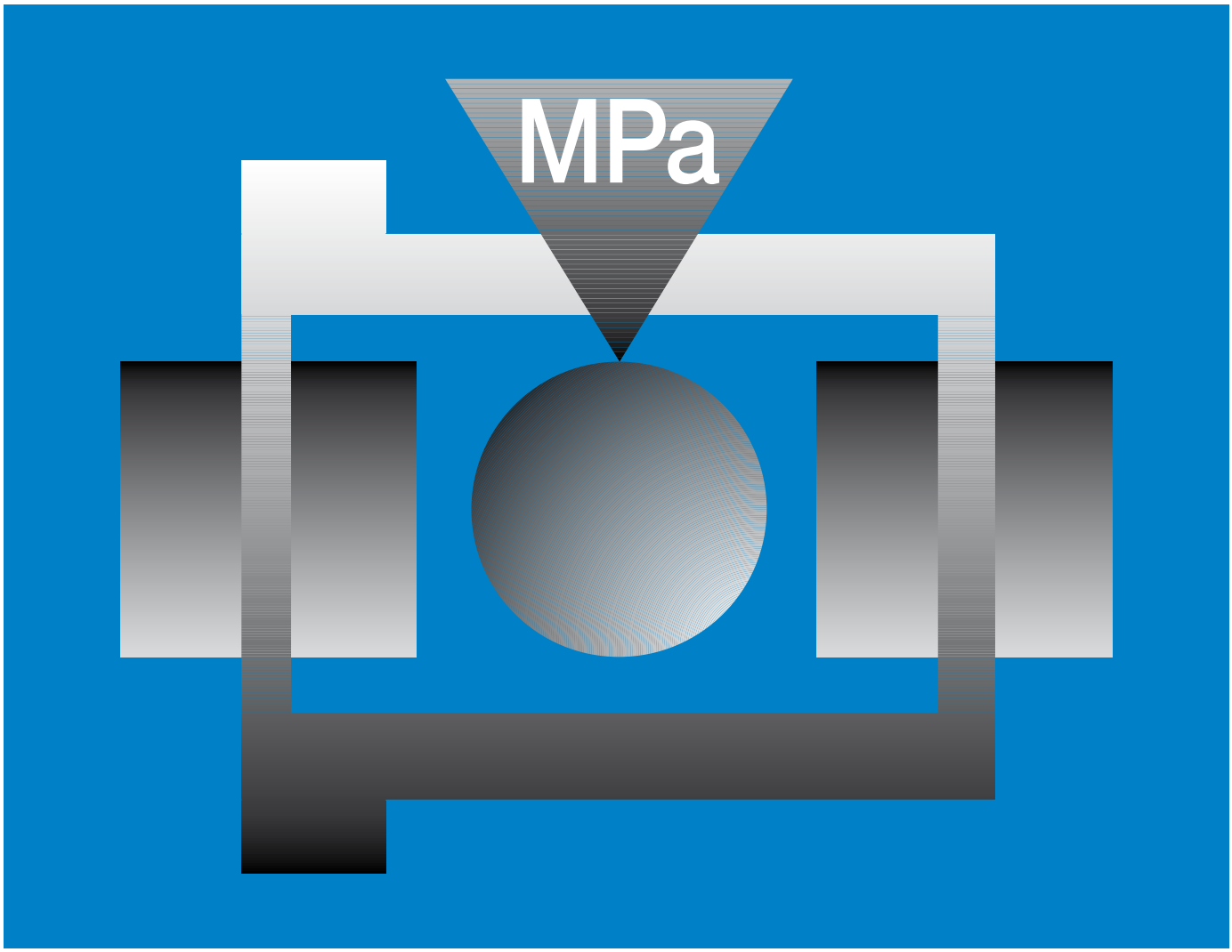
Do you need another length, other dimensions or tolerances? You need a particular design or alternative for your application? Please call us. igus® listens to your needs and provides you a solution in a very short time.

Even more dimensions from stock

More than 300 dimensions are now available. Search online for your required bearing.

▶ www.igus.co.uk/iglidur-specialbearings

My Sketches



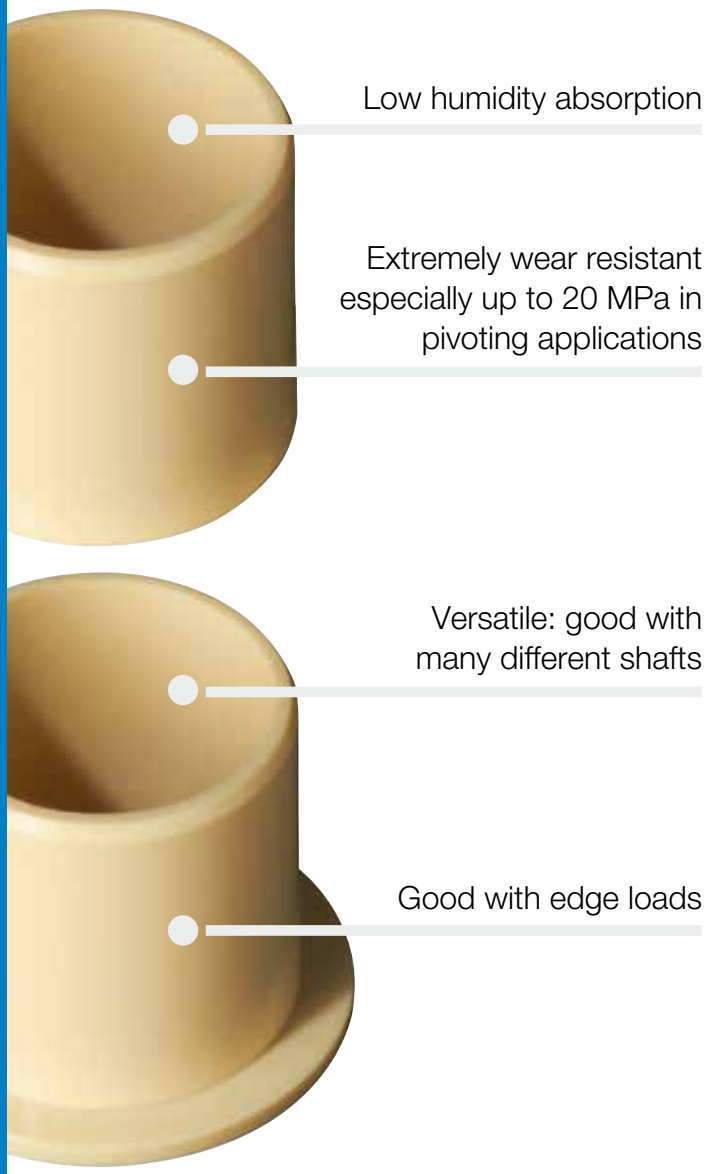
Flexible, wear resistant & more – iglidur® P210

- Standard range from stock
- Low humidity absorption
- Extremely wear resistant especially up to 20 MPa in pivoting applications
- Versatile: good with many different shafts
- Good with edge loads

New in this catalog!

iglidur® P210

Flexible, wear resistant & more. This versatile material has already proven its worth in many customer-specific solutions and as a bar stock material. Clip-on or pretensioned design as well as vehicle interior applications are possible. Now available in a standard size range.



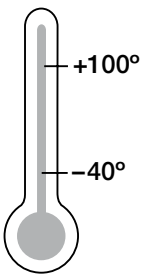
When to use it?

- When you need a universal bearing for use in a moist environment
- When you need a wear-resistant bearing for pivoting applications at medium loads
- When edge loads and shocks occur
- When the surface pressure of iglidur® J is insufficient

When not to use it?

- When you need a universal bearing with the largest possible range of dimensions
  ▶ iglidur® G, page 65
- When you need a bearing for highly loaded pivoting applications
  ▶ iglidur® Q, page 485
  ▶ iglidur® Q2, page 499
- When temperatures in excess of +100 °C occur
  ▶ iglidur® V400, page 301
  ▶ iglidur® J350, page 241

Temperature



Product range

2 types
Ø 6–20 mm
more dimensions
on request

Material properties table			
General properties	**Unit**	**iglidur® P210**	**Testing method**
Density	**g/cm³**	1.40	
Colour		yellow	
Max. moisture absorption at +23 °C/50 % r.h.	**% weight**	0.3	DIN 53495
Max. water absorption	**% weight**	0.5	
Coefficient of sliding friction, dynamic against steel	**µ**	0.07–0.19	
pv value, max. (dry)	**MPa · m/s**	0.4	
Mechanical properties			
Modulus of elasticity	**MPa**	2,500	DIN 53457
Tensile strength at +20 °C	**MPa**	70	DIN 53452
Compressive strength	**MPa**	50	
Max. recommended surface pressure (+20 °C)	**MPa**	50	
Shore D hardness		75	DIN 53505
Physical and thermal properties			
Max. long term application temperature	**°C**	+100	
Max. short term application temperature	**°C**	+160	
Min. application temperature	**°C**	–40	
Thermal conductivity	**W/m · K**	0.25	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	**$K^{-1} \cdot 10^{-5}$**	8	DIN 53752
Electrical properties			
Specific volume resistance	**Ωcm**	$> 10^{12}$	DIN IEC 93
Surface resistance	**Ω**	$> 10^{11}$	DIN 53482

Table 01: Material properties table

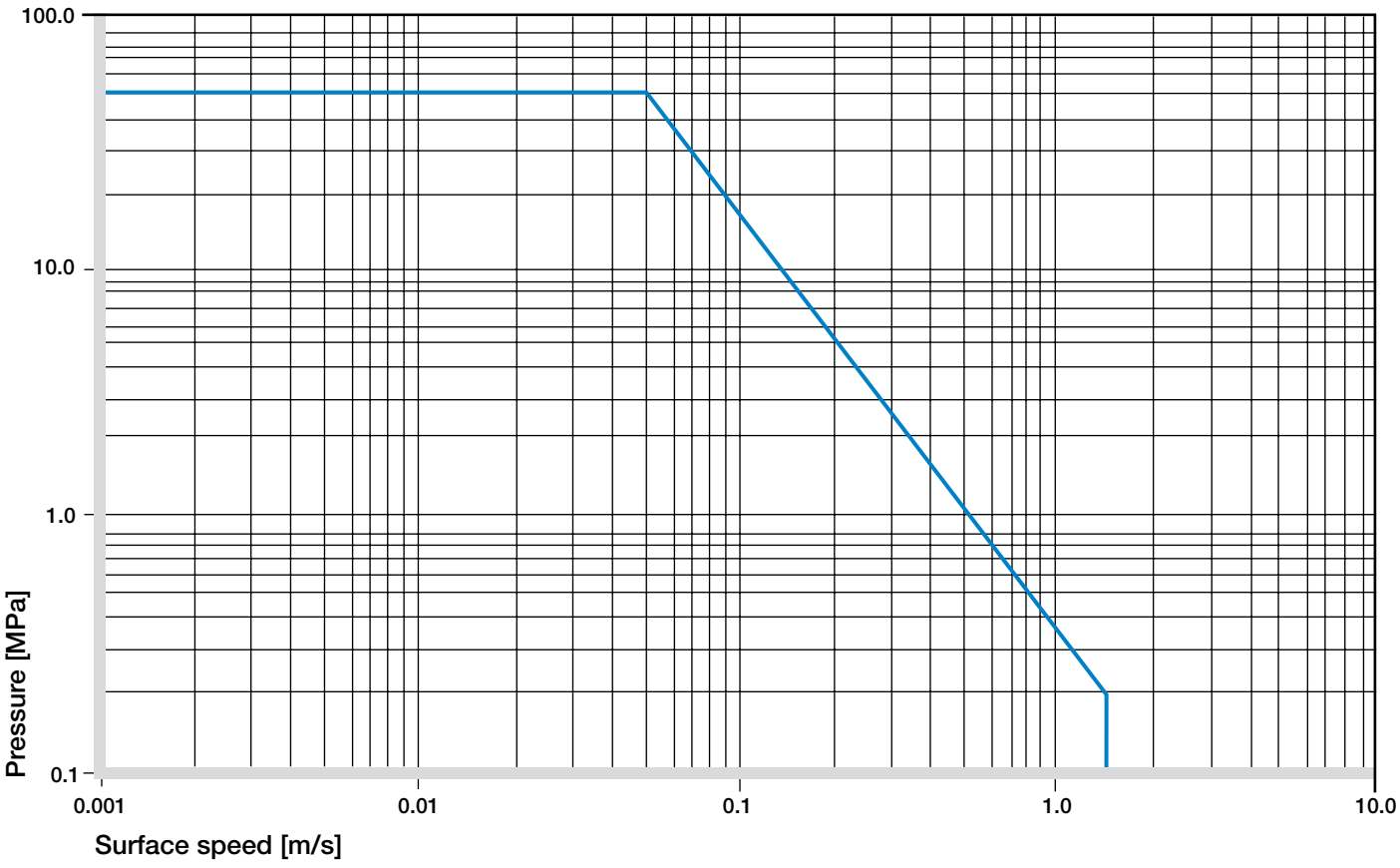


Diagram 01: Permissible pv values for iglidur® P210 with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

iglidur® P210 | Technical Data

iglidur® P210 plain bearings provide the user with versatile all-round bearings, which have proven to have above average service life, primarily in pivoting applications at medium loads of up to 20 MPa.

Mechanical Properties

With increasing temperatures, the compressive strength of iglidur® P210 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.

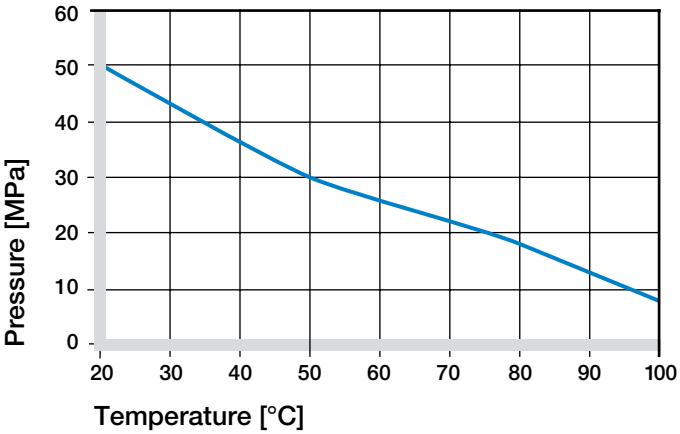


Diagram 02: Recommended maximum surface pressure as a function of temperature (50 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® P210 as a function of radial pressure. At the recommended maximum surface pressure of 50 MPa the deformation at room temperature is less than 3 %.

▶ Surface Pressure, **page 47**

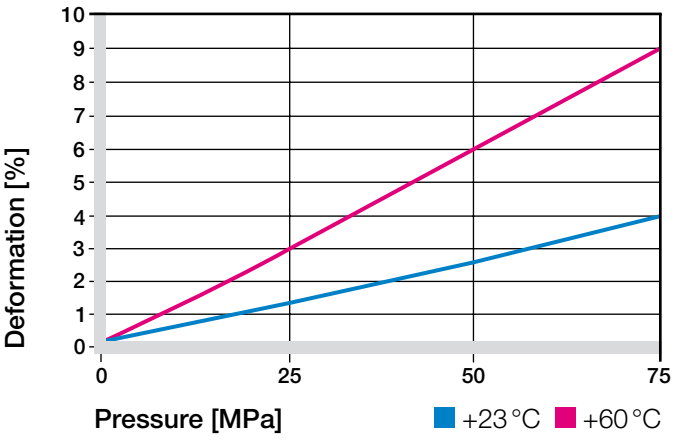


Diagram 03: Deformation under pressure and temperature

Permissible Surface Speeds

Plain bearings made of iglidur® P210 are maintenance-free plain bearings, which were developed for low to average surface speeds. The maximum values given in table 02 can only be achieved at a very low surface pressure. The maximum speed given is the speed at which an increase up to the continuous use temperature occurs due to friction.

▶ Surface Speed, **page 49**

m/s	Rotating	Oscillating	Linear
Continuous	1	0.7	3
Short term	2	1.4	4

Table 02: Maximum running speed

Temperatures

With its highest long term application temperature of +100 °C, iglidur® P210 is suitable for a large application spectrum. If higher temperatures are required, the best seller iglidur® G with a maximum long-term temperature of +130 °C can be used. The ambient temperatures in the bearing system also have an effect on the bearing wear. With increasing temperatures, the wear increases.

▶ Application Temperatures, **page 50**

iglidur® P210	Application temperature
Minimum	–40 °C
Max. long term	+100 °C
Max. short term	+160 °C
Add. securing is required from	+50 °C

Table 03: Temperature limits

Friction and Wear

With regard to iglidur® P210, the coefficient of friction increases continuously with the speed. Just as the wear resistance, the coefficient of friction changes greatly with increasing load. Diagram 05 shows how the coefficient of friction drops when the load increases. Starting at approximately 10 MPa, the coefficient of friction is already below 0.1.
iglidur® P210 plain bearings obtain a minimum coefficient of friction on shafts with a roughness Ra from 0.5 to 0.6 µm. Both smoother and rougher shaft surface finish cause the friction to increase significantly.

▶ Coefficients of Friction and Surfaces, **page 52**
▶ Wear Resistance, **page 53**

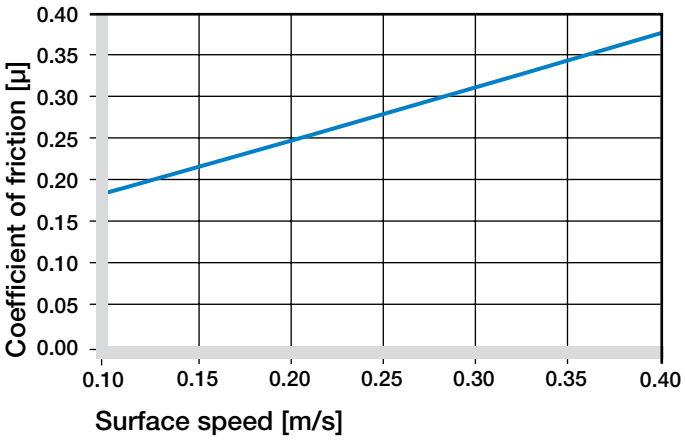


Diagram 04: Coefficient of friction as a function of the running speed, p = 1 MPa

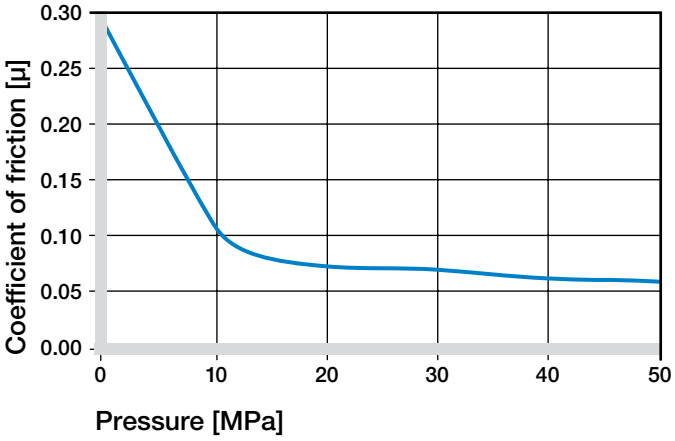


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

Shaft Materials

Diagrams 06 to 08 show results of testing different shaft materials with plain bearings made of iglidur® P210.
For rotating motions at radial loads below 1 MPa, iglidur® P210 has generally very low wear. Wear is only significantly higher in combination with St37 shafts. Generally, rotational wear will be higher than for a pivoting application of equal load. This is only reversed at loads above 25 MPa (Diagram 08).

▶ Shaft Materials, **page 55**

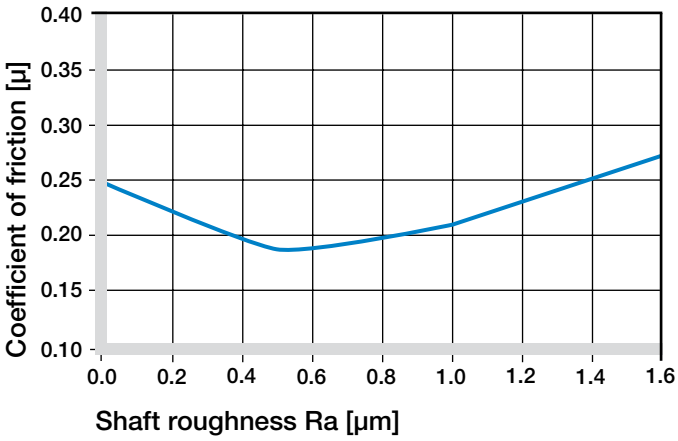


Diagram 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

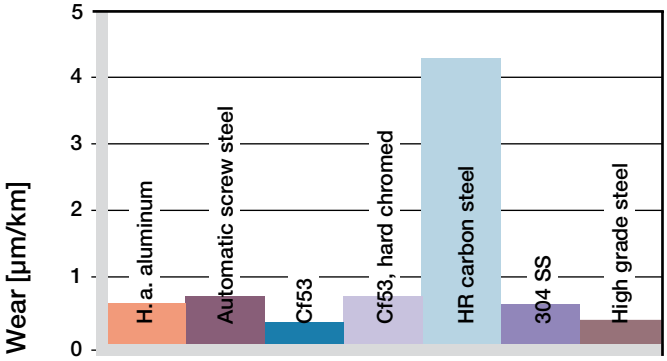


Diagram 07: Wear, rotating with different shaft materials, pressure p = 1 MPa, v = 0.3 m/s

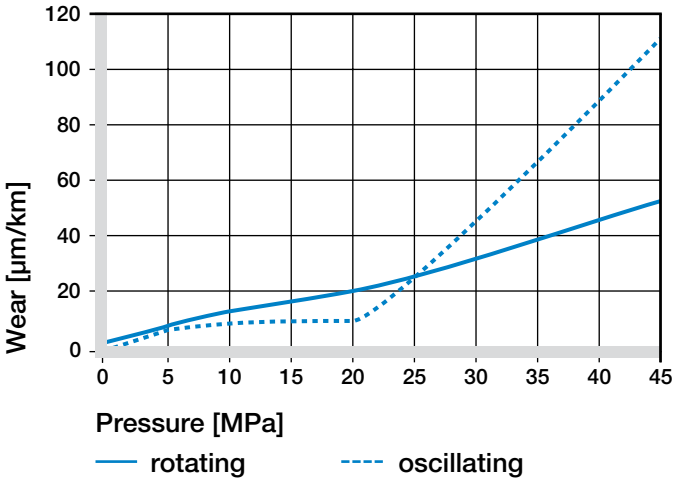


Diagram 08: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

iglidur® P210	Dry	Greases	Oil	Water
C. o. f. µ	0.07–0.19	0.09	0.04	0.04

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

Additional Properties

Chemical Resistance

iglidur® P210 plain bearings have a good resistance to chemicals. They are resistant to most lubricants.
iglidur® P210 is not attacked by most weak organic and inorganic acids.

▶ Chemical Table, **page 1118**

Medium	Resistance
Alcohol	+
Hydrocarbons	–
Greases, oils without additives	+
Fuels	+
Diluted acids	0
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 made of iglidur® P210 have limited use under radioactive radiation. They are resistant to radiation up to an intensity of $3 \cdot 10^2$ Gy.

UV Resistance

iglidur® P210 plain bearings are partially UV resistant.

Vacuum

In a vacuum environment, any existing moisture in iglidur® P210 plain bearings is released as a vapour. Use in vacuum is limited.

Electrical Properties

iglidur® P210 plain bearings are electrically insulating.

Volume resistance	$> 10^{12}$ Ωcm
Surface resistance	$> 10^{11}$ Ω

Moisture Absorption

The moisture absorption of iglidur® P210 plain bearings is approximately 0.3 % in standard atmosphere. The saturation limit in water is 0.5 %. This low moisture absorption is well below the values of iglidur® G.

Maximum moisture absorption	
At +23 °C/50 % r.h.	0.3 % weight
Max. water absorption	0.5 % weight

Table 06: Moisture absorption

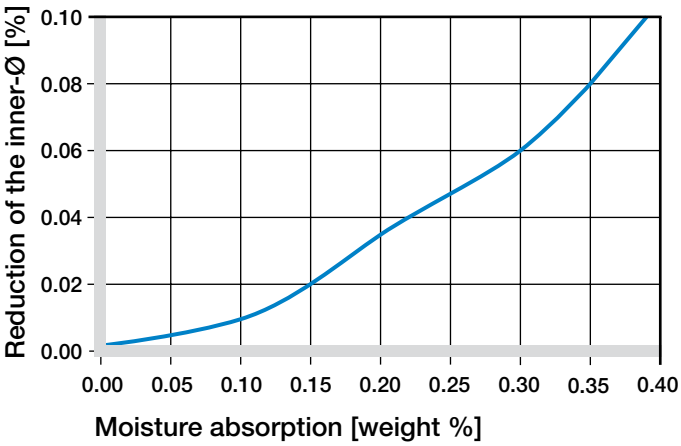


Diagram 09: Effect of moisture absorption on plain bearings

Installation Tolerances

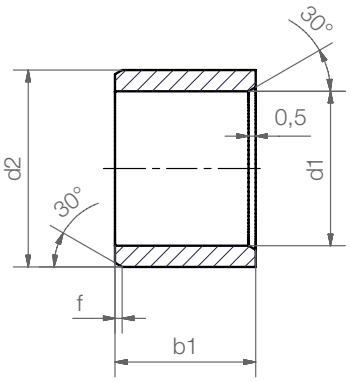
iglidur® P210 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the E10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

▶ Testing Methods, **page 59**

Diameter d1 [mm]			Shaft h9 [mm]	iglidur® P210 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

Sleeve bearing



Order key

P210SM-0608-06

- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form S)
- Material iglidur® P210

Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to the d1

d1 [mm]:	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

Dimensions [mm]

Part number		d1	d1-Tolerance*	d2	b1 h13
P210SM-0608-06	New!	6.0	+0.020 +0.068	8.0	6.0
P210SM-0810-10	New!	8.0	+0.025 +0.083	10.0	10.0
P210SM-1012-10	New!	10.0	+0.025 +0.083	12.0	10.0
P210SM-1214-12	New!	12.0	+0.032 +0.102	14.0	12.0
P210SM-1618-15	New!	16.0	+0.032 +0.102	18.0	15.0
P210SM-2023-20	New!	20.0	+0.040 +0.124	23.0	20.0

* after pressfit. Testing methods ▶ page 59

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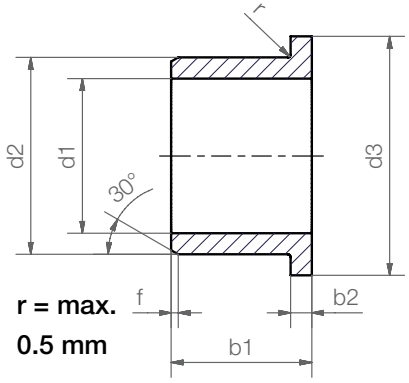
New in this catalog!

iglidur® P210 | Product Range

Flange bearing



r = max. 0.5 mm

Order key

P210FM-0608-06

- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form F)
- Material iglidur® P210

Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to the d1

d1 [mm]:	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

Dimensions [mm]

Part number		d1	d1-Tolerance*	d2	d3 d13	b1 h13	b2 –0.14
P210FM-0608-06	New!	6.0	+0.020 +0.068	8.0	12.0	6.0	1.0
P210FM-0810-10	New!	8.0	+0.025 +0.083	10.0	15.0	10.0	1.0
P210FM-1012-10	New!	10.0	+0.025 +0.083	12.0	18.0	10.0	1.0
P210FM-1214-12	New!	12.0	+0.032 +0.102	14.0	20.0	12.0	1.0
P210FM-1618-17	New!	16.0	+0.032 +0.102	18.0	24.0	17.0	1.0
P210FM-2023-21	New!	20.0	+0.040 +0.124	23.0	30.0	21.5	1.5

* after pressfit. Testing methods ▶ page 59

Don't find your size?

Do you need another length, other dimensions or tolerances? You need a particular design or alternative for your application? Please call us. igus® listens to your needs and provides you a solution in a very short time.

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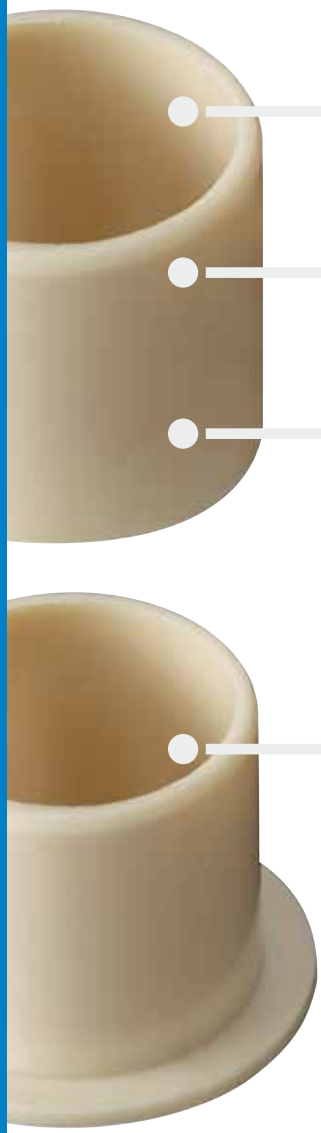
prices price list online
www.igus.co.uk/en/p210

Versatile – iglidur® K

- Standard range from stock
- Lubrication- and maintenance-free
- Low moisture absorption
- Wear-resistant
- Cost-effective

iglidur® K

Versatile. iglidur® K is the new general purpose bearing for medium temperatures, low moisture absorption and good environmental resistance.



Lubrication- and maintenance-free

Low moisture absorption

Wear-resistant

Cost-effective

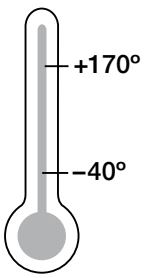
When to use it?

- When you need a cost-effective general purpose bearing
- For use in wet environments
- When good wear resistance is required at medium loads

When not to use it?

- When highest wear resistance is necessary
  ▶ iglidur® W300, page 135
- If high media-resistance is required
  ▶ iglidur® X6, page 291
- When a high-temperature bearing is needed
  ▶ iglidur® H370, page 359

Temperature



Product range

2 types
Ø 6–20 mm
more dimensions
on request

iglidur® K | Application Examples

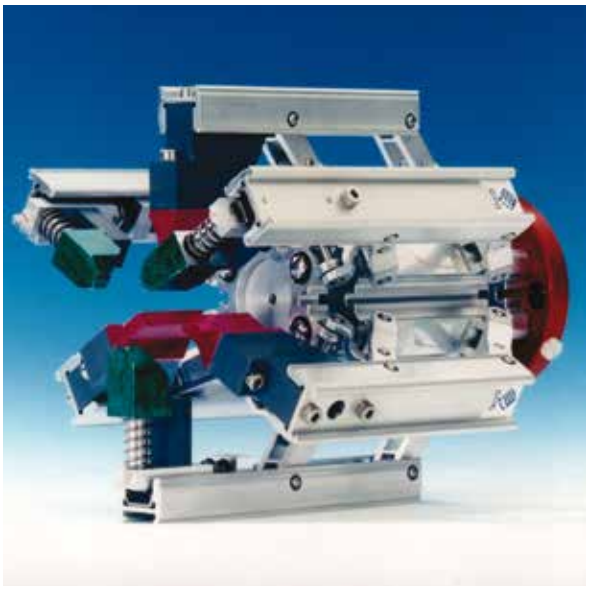
Typical sectors of industry and application areas

- Printing industry
- Electronics industry
- Packaging
- Medical
- Polymer processing machines etc.

Improve technology and reduce costs – 310 exciting examples for iglidur® plain bearings online

▶ www.igus.co.uk/iglidur-applications

▶ www.igus.co.uk/satellite-receiver



▶ www.igus.co.uk/mechanical-hand

iglidur® K | Technical Data

Material properties table

General properties	Unit	iglidur® K	Testing method
Density	g/cm³	1.52	
Colour		yellow beige	
Max. moisture absorption at +23 °C/50 % r. h.	% weight	0.1	DIN 53495
Max. water absorption	% weight	0.6	
Coefficient of sliding friction, dynamic against steel	µ	0.06–0.21	
pv value, max. (dry)	MPa · m/s	0.30	
Mechanical properties			
Modulus of elasticity	MPa	3,500	DIN 53457
Tensile strength at +20 °C	MPa	80	DIN 53452
Compressive strength	MPa	60	
Max. recommended surface pressure (+20 °C)	MPa	50	
Shore D hardness		72	DIN 53505
Physical and thermal properties			
Max. long term application temperature	°C	+170	
Max. short term application temperature	°C	+240	
Min. application temperature	°C	–40	
Thermal conductivity	W/m · K	0.25	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	$K^{-1} \cdot 10^{-5}$	3	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10^{12}	DIN IEC 93
Surface resistance	Ω	> 10^{12}	DIN 53482

Table 01: Material properties table

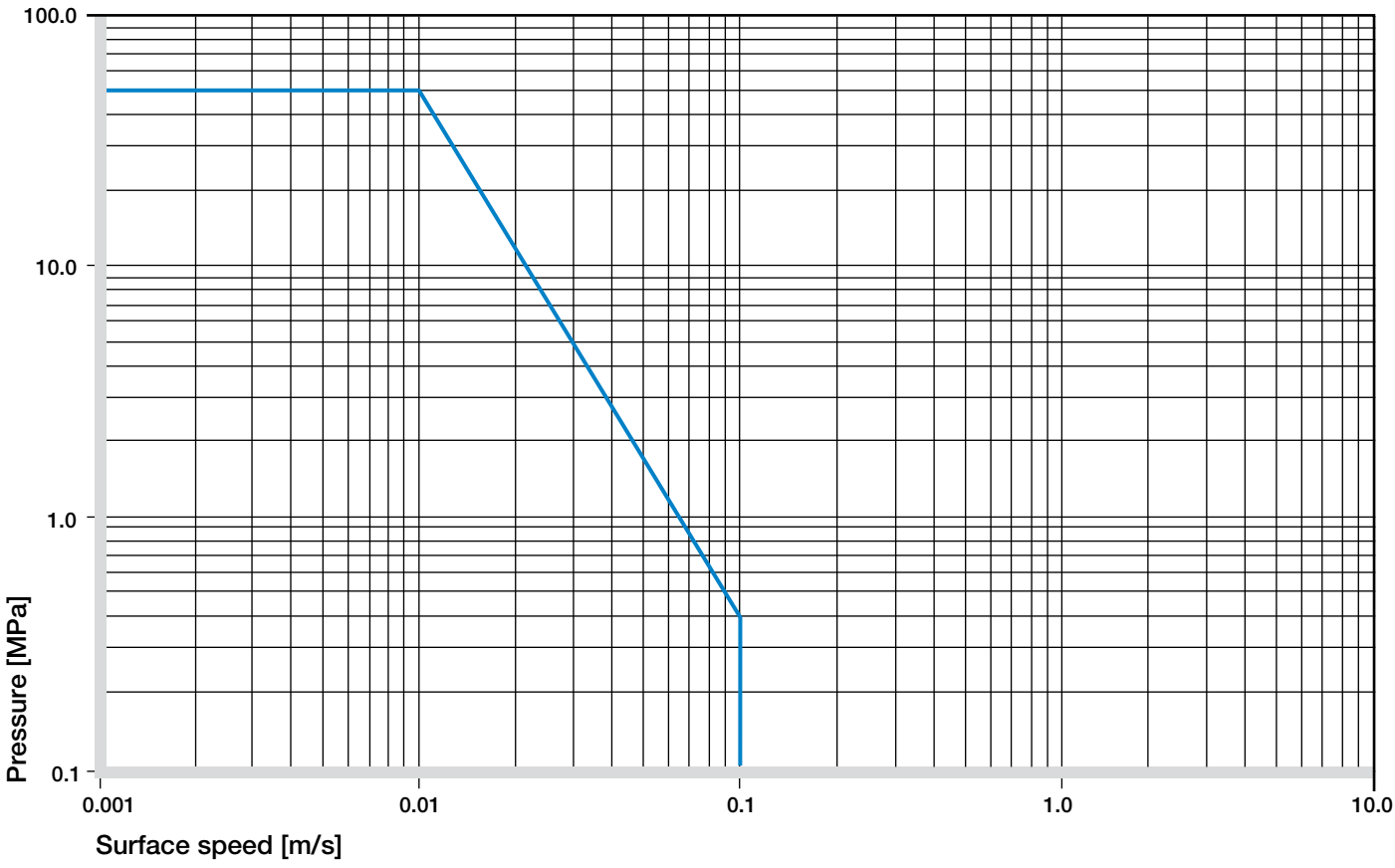


Diagram 01: Permissible pv values for iglidur® K with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

iglidur® K is characterized by its good wear characteristics at low moisture absorption and good thermal and mechanical specifications. This supports a very universal application spectrum.

Mechanical Properties

With increasing temperatures, the compressive strength of iglidur® K plain bearings decreases. Diagram 02 shows this inverse relationship. However, at the longterm maximum temperature of +170° C the permissible surface pressure is almost 20 MPa. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

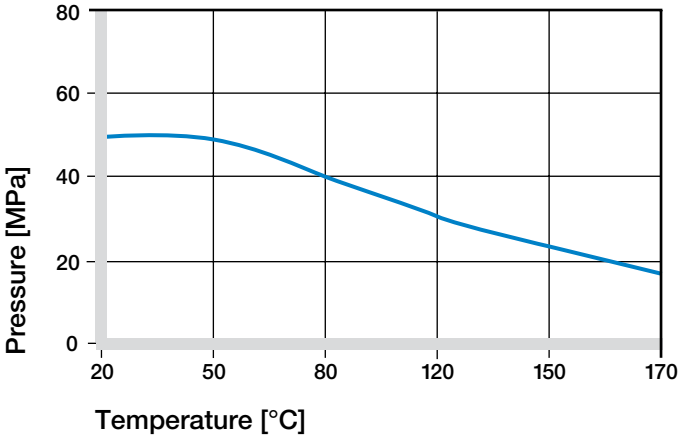


Diagram 02: Recommended maximum surface pressure as a function of temperature (50 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® K at radial loads. At the recommended maximum surface pressure of 50 MPa the deformation is less than 3 %. Plastic deformation can occur, this depends on the applied pressure.

▶ Surface Pressure, **page 47**

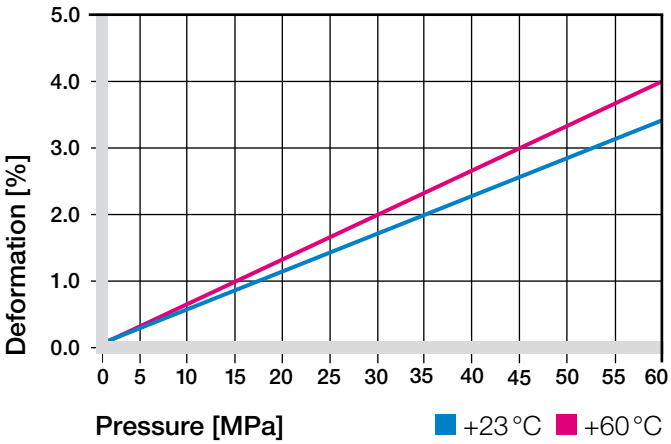


Diagram 03: Deformation under pressure and temperature

Permissible Surface Speeds

iglidur® K has been developed for low to medium surface speeds. The maximum values shown in table 02 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 49**

m/s	Rotating	Oscillating	Linear
Continuous	1	0.7	3
Short term	2	1.4	4

Table 02: Maximum running speed

Temperatures

iglidur® K plain bearings can be used at temperatures from –40 °C up to +170 °C. The short term maximum temperature is +240 °C, The ambient temperatures of the application also have an effect on the bearing wear. With increasing temperatures, the wear increases and this effect is significant when temperatures rise over +100 °C.

▶ Application Temperatures, **page 50**

iglidur® K	Application temperature
Minimum	–40 °C
Max. long term	+170 °C
Max. short term	+240 °C
Add. securing is required from	+70 °C

Table 03: Temperature limits

Friction and Wear

Similar to wear resistance, the coefficient of friction μ also changes with the load. The coefficient of friction decreases with increasing pressure (Diagram 05), whereas an increase in surface speed causes an increase of the coefficient of friction (Diagram 04). A noticeable increase is found over 0.15 m/s.

▶ Coefficients of Friction and Surfaces, **page 52**
▶ Wear Resistance, **page 53**

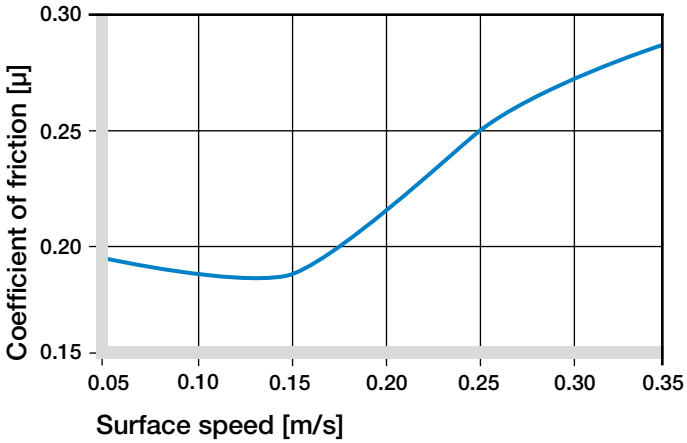


Diagram 04: Coefficient of friction as a function of the running speed, p = 0.75 MPa

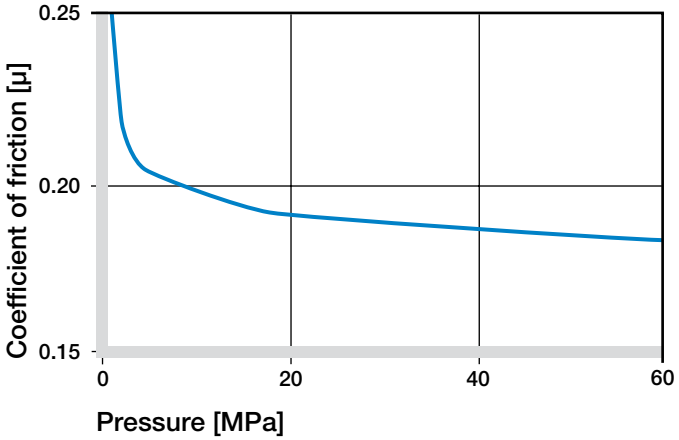


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

Shaft Materials

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® K a ground surface with an average roughness Ra = 0.15–0.20 µm is recommended.

Diagrams 06 and 07 show results of testing different shaft materials with plain bearings made of iglidur® K. It can be seen from Diagram 07 that iglidur® K can be combined with a large number of different shaft materials. Only hard-chromed shafts are unsuitable. 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.

The comparison of rotational movements to oscillating movements shows that the wear is almost identical at a pressure up to 5 MPa. The higher the loads, the greater the difference.

▶ Shaft Materials, **page 55**

iglidur® K	Dry	Greases	Oil	Water
C. o. f. µ	0.06–0.21	0.09	0.04	0.04

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

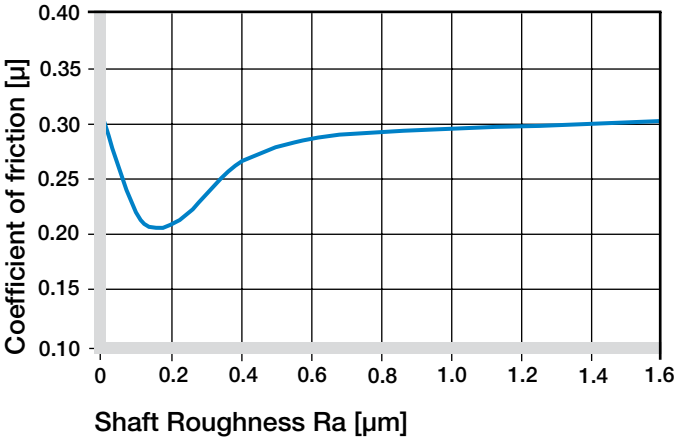


Diagram 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

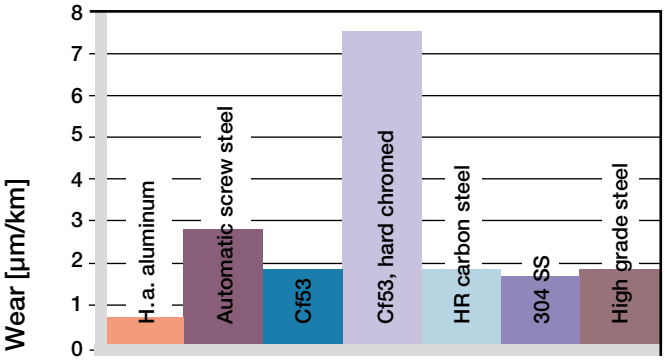


Diagram 07: Wear, rotating with different shaft materials, pressure p = 1 MPa, v = 0.3 m/s

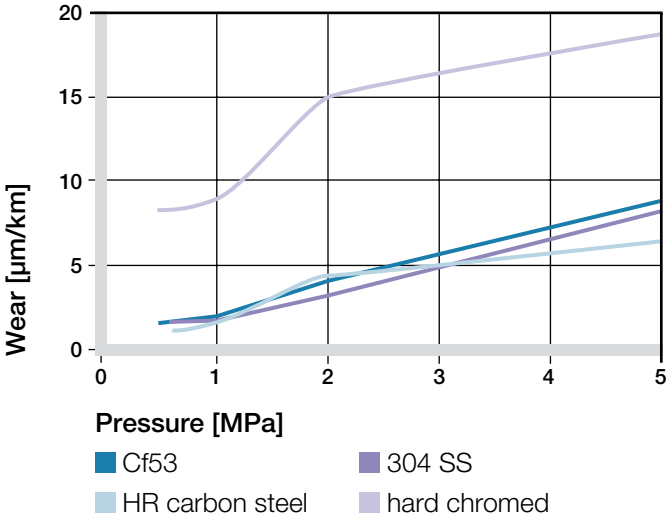


Diagram 08: Wear with different shaft materials in rotational operation, as a function of the pressure

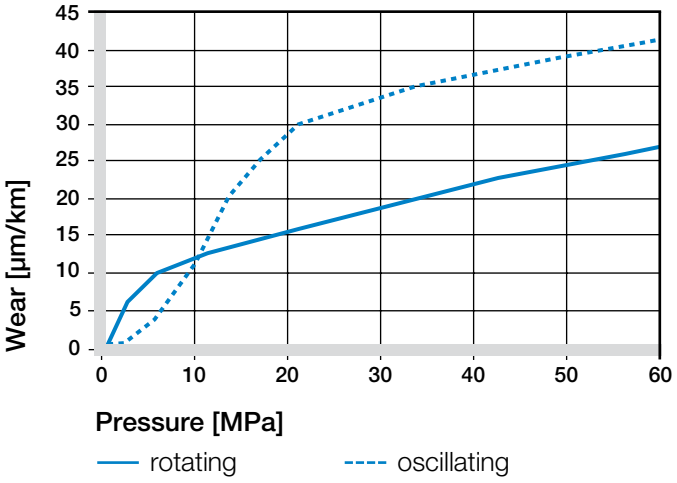


Diagram 09: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

Additional Properties

Chemical Resistance

iglidur® K plain bearings are resistant to diluted alkaline and very weak acids, as well as fuels and all types of lubricants. The low moisture absorption also permits use in wet or damp environments.

▶ Chemical Table, **page 1118**

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 made from iglidur® K are resistant to radiation up to an intensity of $5 \cdot 10^2$ Gy.

UV Resistance

iglidur® K plain bearings become discoloured under UV radiation. However, hardness,compressive strength and the wear resistance of the material do not change.

Vacuum

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

Electrical Properties

iglidur® K plain bearings are electrically insulating.

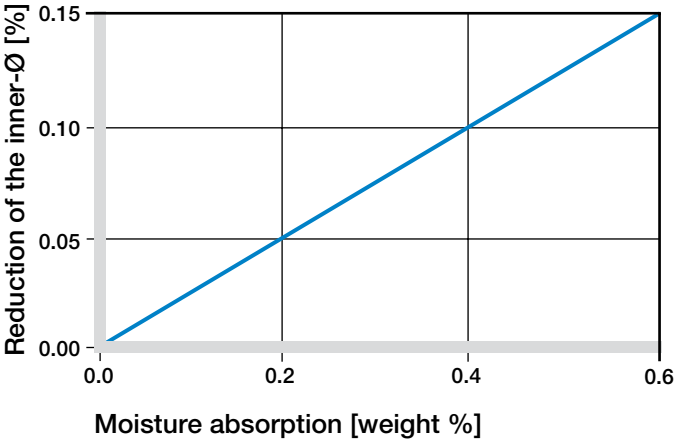
Volume resistance	$> 10^{12}$ Ωcm
Surface resistance	$> 10^{12}$ Ω

Moisture Absorption

The moisture absorption of iglidur® K plain bearings is approximately 0.1 % in the standard atmosphere. The saturation limit submerged in water is 0.6 %. These values are so low that the swelling only has to be considered in extreme cases.

Maximum moisture absorption	
At +23 °C/50 % r.h	0.1 % weight
Max. water absorption	0.6 % weight

Table 06: Moisture absorption



Installation Tolerances

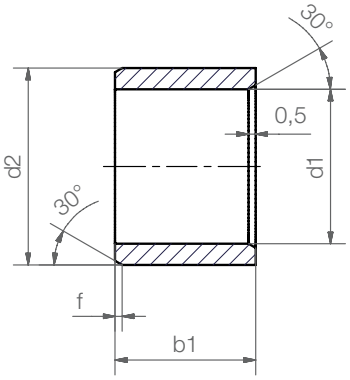
iglidur® K plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the E10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table). In relation to the installation tolerance, the inner diameter changes with the absorption of humidity.

▶ Testing Methods, **page 59**

Diameter d1 [mm]			Shaft h9 [mm]	iglidur® K 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

Sleeve bearing



Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to the d1

d1 [mm]:	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

Order key

KSM-0608-06

- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form S)
- Material iglidur® K

Dimensions [mm]

Part number	d1	d1-Tolerance*	d2	b1 h13
KSM-0608-06	6.0	+0.020 +0.068	8.0	6.0
KSM-0810-10	8.0	+0.025 +0.083	10.0	10.0
KSM-1012-10	10.0	+0.025 +0.083	12.0	10.0
KSM-1214-12	12.0	+0.032 +0.102	14.0	12.0
KSM-1618-15	16.0	+0.032 +0.102	18.0	15.0
KSM-2023-20	20.0	+0.040 +0.124	23.0	20.0

* after pressfit. Testing methods ▶ page 59

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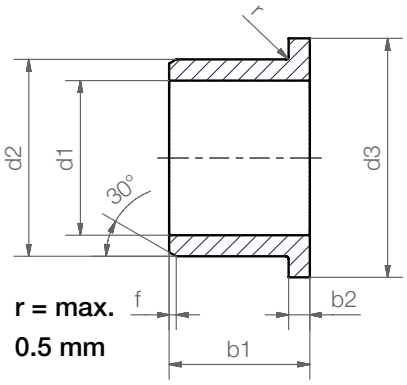
iglidur® K | Product Range

Flange bearing



r = max. 0.5 mm

Order key

KFM-0608-06

- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form F)
- Material iglidur® K

Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to the d1

d1 [mm]:	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

Dimensions [mm]

Part number	d1	d1-Tolerance*	d2	d3 d13	b1 h13	b2 –0.14
KFM-0608-06	6.0	+0.020 +0.068	8.0	12.0	6.0	1.0
KFM-0810-10	8.0	+0.025 +0.083	10.0	15.0	10.0	1.0
KFM-1012-10	10.0	+0.025 +0.083	12.0	18.0	10.0	1.0
KFM-1214-12	12.0	+0.032 +0.102	14.0	20.0	12.0	1.0
KFM-1618-17	16.0	+0.032 +0.102	18.0	24.0	17.0	1.0
KFM-2023-21	20.0	+0.040 +0.124	23.0	30.0	21.5	1.5

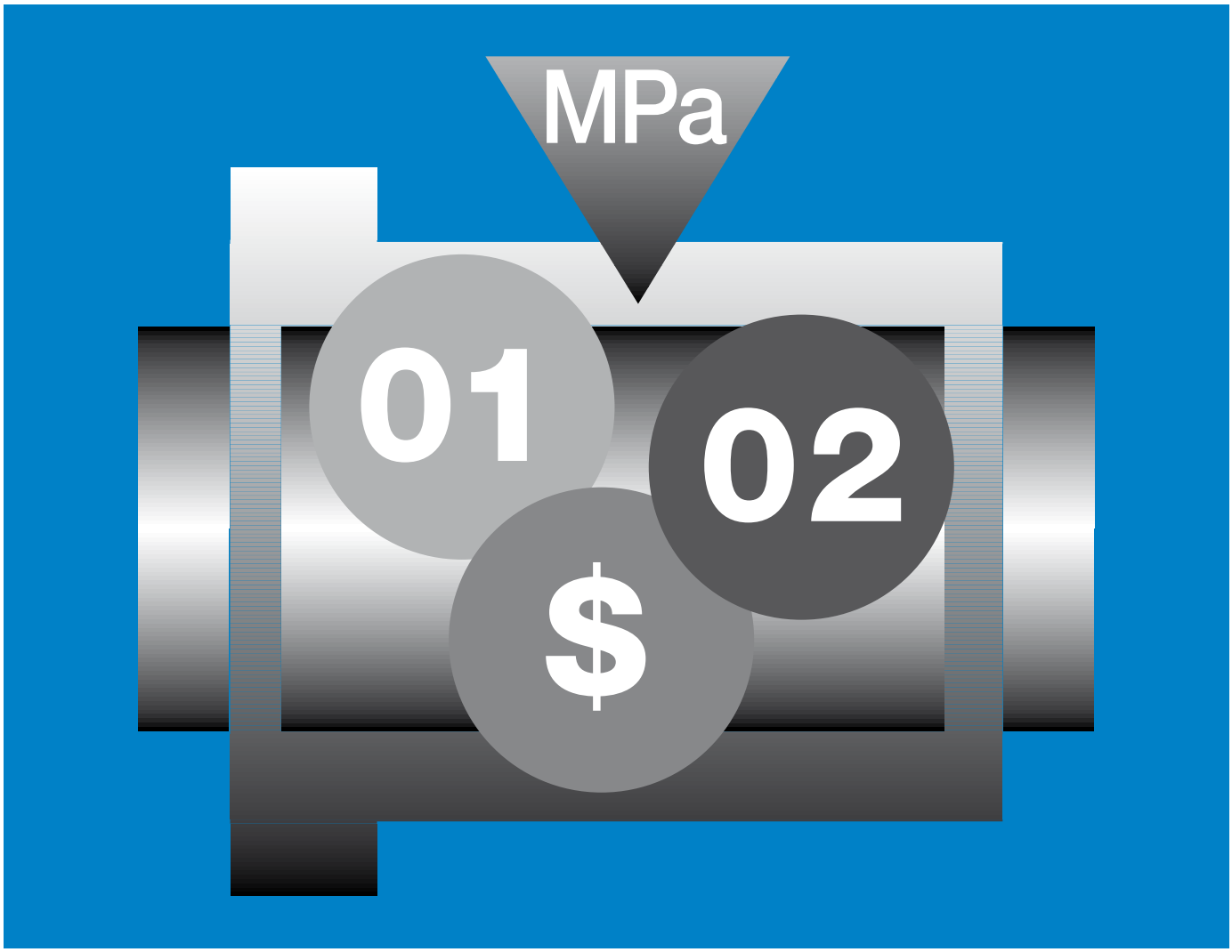
*** after pressfit. Testing methods ▶ page 59**

Don't find your size?

Do you need another length, other dimensions or tolerances? You need a particular design or alternative for your application? Please call us. igus® listens to your needs and provides you a solution in a very short time.

delivery time **from stock**

prices **price list online**
www.igus.co.uk/en/k



Low-cost material for high quantities – iglidur® GLW

- Applications with static loads
- Maintenance-free dry running
- Cost-effective
- Resistant to dirt
- Resistant to vibrations

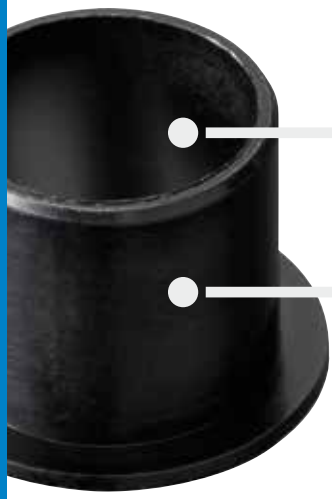
iglidur® GLW

Low-cost material for high quantities. Low cost material for medium loads. iglidur® GLW plain bearings are prefered in applications with static load, where only occasional movement takes place.

Applications with static loads

Maintenance-free dry running

Cost-effective



Resistant to dirt

Resistant to vibrations

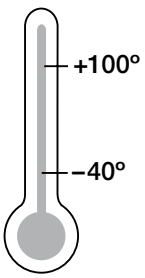
When to use it?

- When you need an economical universal bearing for mass production
- For high, primarily static loads
- For low to medium speeds

When not to use it?

- When mechanical reaming of the wall surface is necessary
  ▶ iglidur® M250, page 111
- For primarily dynamic loads
  ▶ iglidur® G, page 65
- When the highest wear resistance is necessary
  ▶ iglidur® W300, page 135
- When temperatures continuously exceed +130 °C
  ▶ iglidur K, page 199
- For underwater applications
  ▶ iglidur H370, page 359

Temperature



Product range

on request

Material properties table			
General properties	**Unit**	**iglidur® GLW**	**Testing method**
Density	**g/cm³**	1.36	
Colour		black	
Max. moisture absorption at +23 °C/50 % r.h.	**% weight**	1.3	DIN 53495
Max. water absorption	**% weight**	5.5	
Coefficient of sliding friction, dynamic against steel	**µ**	0.1–0.24	
pv value, max. (dry)	**MPa · m/s**	0.3	
Mechanical properties			
Modulus of elasticity	**MPa**	7,700	DIN 53457
Tensile strength at +20 °C	**MPa**	235	DIN 53452
Compressive strength	**MPa**	74	
Max. recommended surface pressure (+20 °C)	**MPa**	80	
Shore D hardness		78	DIN 53505
Physical and thermal properties			
Max. long term application temperature	**°C**	+100	
Max. short term application temperature	**°C**	+160	
Min. application temperature	**°C**	–40	
Thermal conductivity	**W/m · K**	0.24	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	**$K^{-1} \cdot 10^{-5}$**	17	DIN 53752
Electrical properties			
Specific volume resistance	**Ωcm**	> 10^{11}	DIN IEC 93
Surface resistance	**Ω**	> 10^{11}	DIN 53482

Table 01: Material properties table

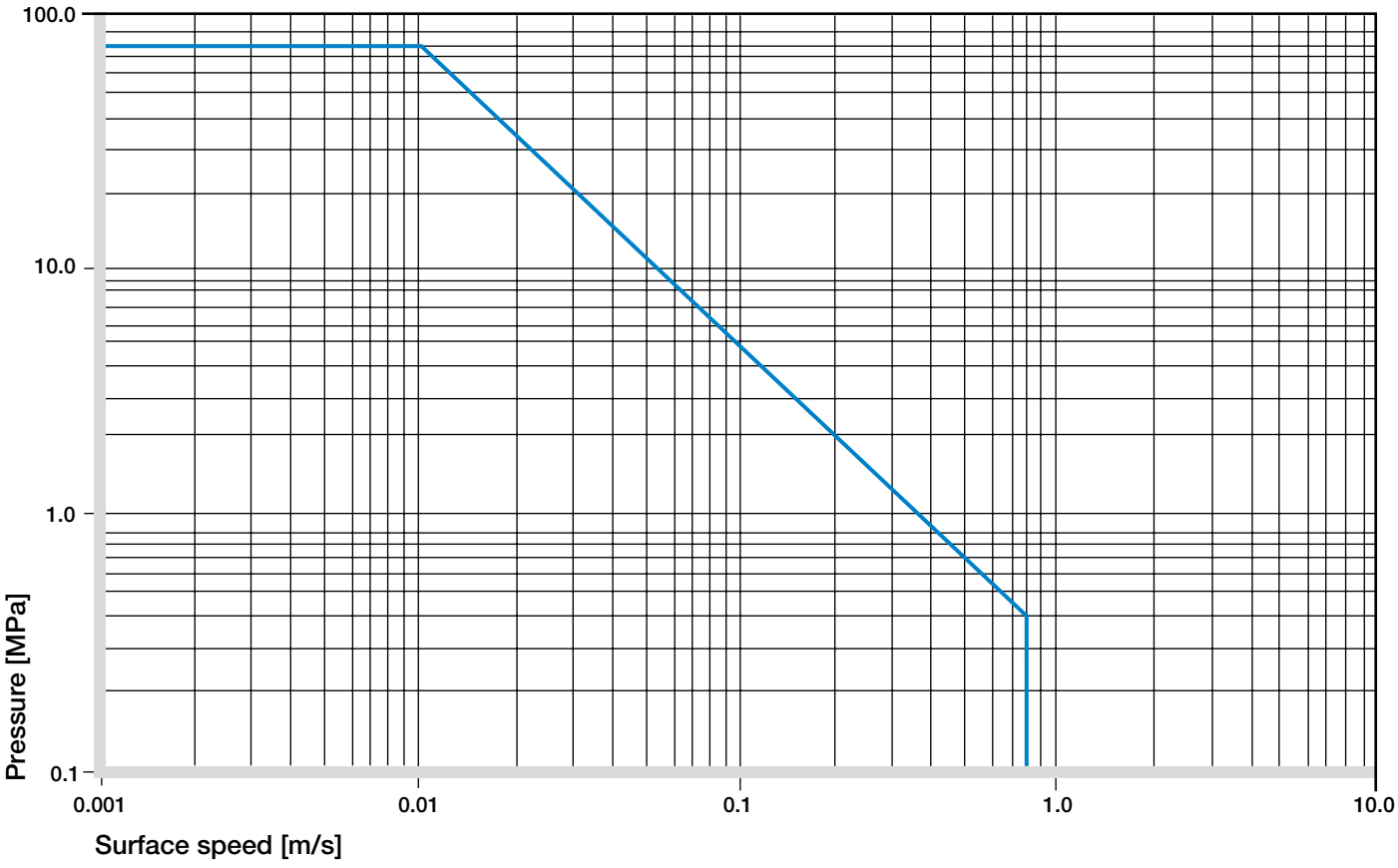


Diagram 01: Permissible pv values for iglidur® GLW with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

iglidur® GLW | Technical Data

With plain bearings made of iglidur® GLW we can offer our customers an alternative to iglidur® G for mass production applications. Featuring similar mechanical designed as iglidur® G, iglidur® GLW plain bearings are primarily recommended for static loads. With regard to these applications, in which the dynamic properties of iglidur® G to a large extent are unimportant, iglidur® GLW presents a very cost-effective alternative.

Mechanical Properties

With increasing temperatures, the compressive strength of iglidur® GLW 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 30 MPa. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

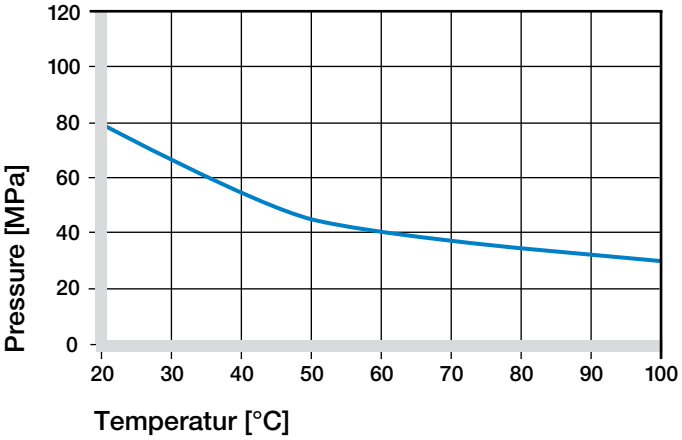


Diagram 02: Recommended maximum surface pressure as a function of temperature (80 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® GLW at radial loads. At the recommended maximum surface pressure of 70 MPa at room temperature, the deformation is less than 3 %. At this load the plastic deformation is minimal. However, it is also dependent on the duty cycle of the application.

▶ Surface Pressure, **page 47**

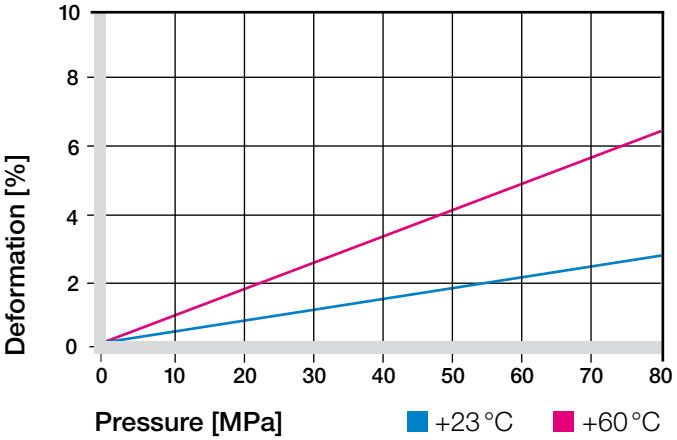


Diagram 03: Deformation under pressure and temperature

Permissible Surface Speeds

iglidur® GLW was developed for low to average surface speeds. In constant operation, a maximum speed of 0.8 m/s (rotating) or 2.5 m/s (linear) is permitted. Please note that the maximum values shown in table 02 are only possible at the lowest pressures. In practice, these values are rarely reached, due to the increasing temperatures approach ing or exceeding the maximum permitted value.

▶ Surface Speed, **page 49**

m/s	Rotating	Oscillating	Linear
Continuous	0.8	0.6	2.5
Short term	1	0.7	3

Table 02: Maximum running speed

Temperatures

To a large extent, the surrounding temperatures affect the properties of plain bearings. Diagram 02 shows the inverse relationship. With increasing temperatures in the bearing system, the wear also increases.

▶ Application Temperatures, **page 50**

iglidur® GLW	Application temperature
Minimum	–40 °C
Max. long term	+100 °C
Max. short term	+160 °C
Add. securing is required from	+80 °C

Table 03: Temperature limits

Friction and Wear

Similar to wear resistance, the coefficient of friction μ also changes with increasing load. It is striking that the coefficient of friction μ decreases with increasing pressure. This relationship explains the excellent suitability of iglidur® GLW plain bearings with regard to high loads.

▶ Coefficients of Friction and Surfaces, **page 52**
▶ Wear Resistance, **page 53**

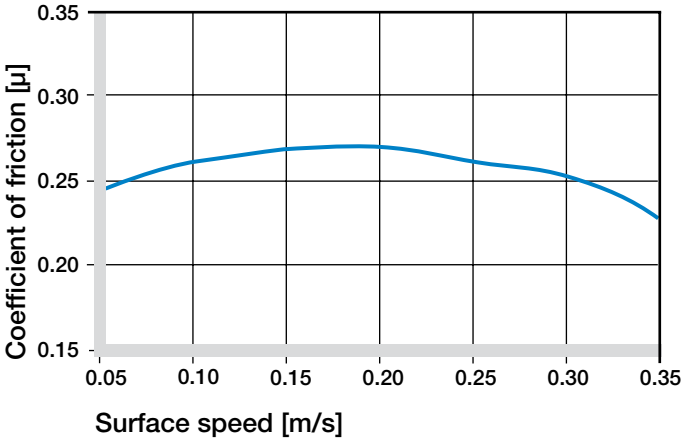


Diagram 04: Coefficient of friction as a function of the running speed, p = 0.75 MPa

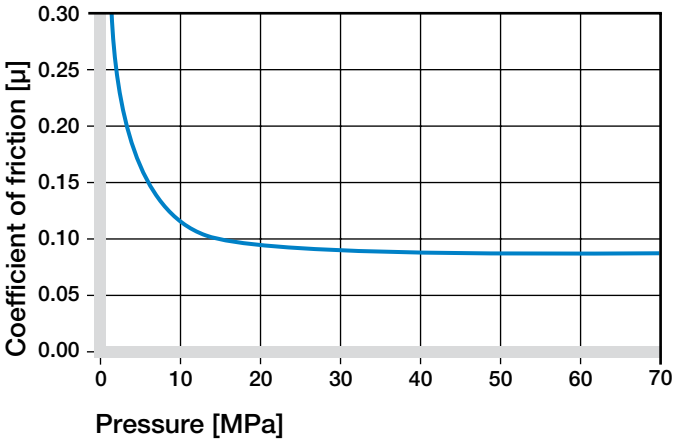


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

Shaft Materials

To a large extent, friction and wear depend on the shaft material. Shafts that are too smooth increase both the coefficient of friction and the wear of the bearing. A ground surface with an average roughness Ra between 0.1 and 0.2 μm is the most suitable (Diagram 06). The following diagrams show an extract of the results of tests with different shaft materials carried out with iglidur® GLW plain bearings. If the shaft material you plan on using is not shown in these test results, please contact us.

▶ Shaft Materials, **page 55**

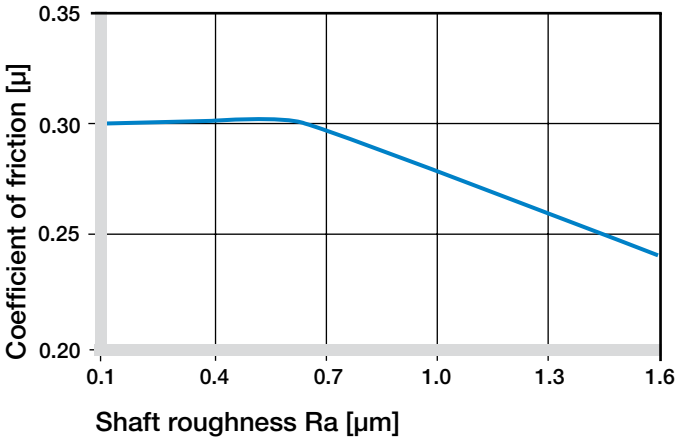


Diagram 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

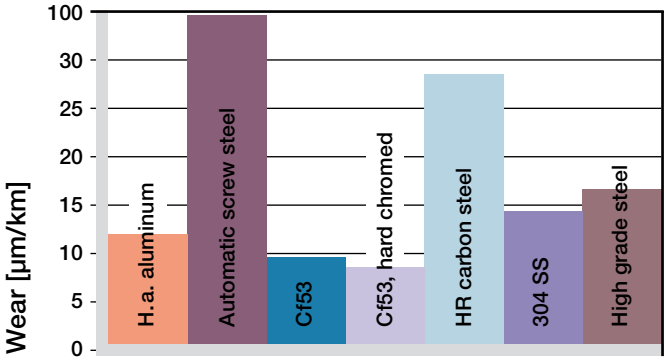


Diagram 07: Wear, rotating with different shaft materials, pressure, p = 1 MPa, v = 0.3 m/s

iglidur® GLW	Dry	Greases	Oil	Water
C.o.f. μ	0.10–0.24	0.09	0.04	0.04

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

Additional Properties

Chemical Resistance

iglidur® GLW plain bearings have a good resistance to chemicals. They are resistant to most lubricants.
iglidur® GLW is not attacked by most organic and inorganic acids.

▶ Chemical Table, **page 1118**

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 made of iglidur® GLW are resistant to radiation up to an intensity of $3 \cdot 10^2$ Gy.

UV Resistance

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

Vacuum

In a vacuum environment iglidur® GLW plain bearings release gases. Use in a vacuum should be tested beforehand.

Electrical Properties

iglidur® GLW plain bearings are electrically insulating.

Volume resistance	$> 10^{11}$ Ωcm
Surface resistance	$> 10^{11}$ Ω 10

Moisture Absorption

The moisture absorption of iglidur® GLW plain bearings is approximately 1.3 % in standard atmosphere. The saturation limit in water is 5.5 %. This must be taken into account with regard to the respective operating conditions.

Maximum moisture absorption	
At +23 °C/50 % r.h.	1.3 % weight
Max. water absorption	5.5 % weight

Table 06: Moisture absorption

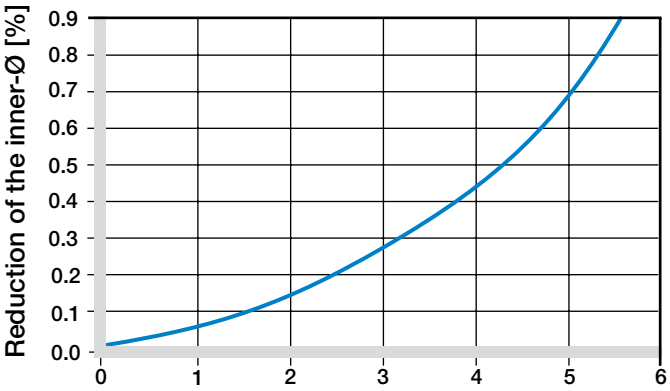


Diagram 08: Effect of moisture absorption on plain bearings

Installation Tolerances

iglidur® GLW 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 E10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

▶ Testing Methods, **page 59**

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® GLW 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

iglidur® GLW plain bearings are made to special order. For high volume applications, please request iglidur® GLW plain bearings as an alternative to iglidur® G.