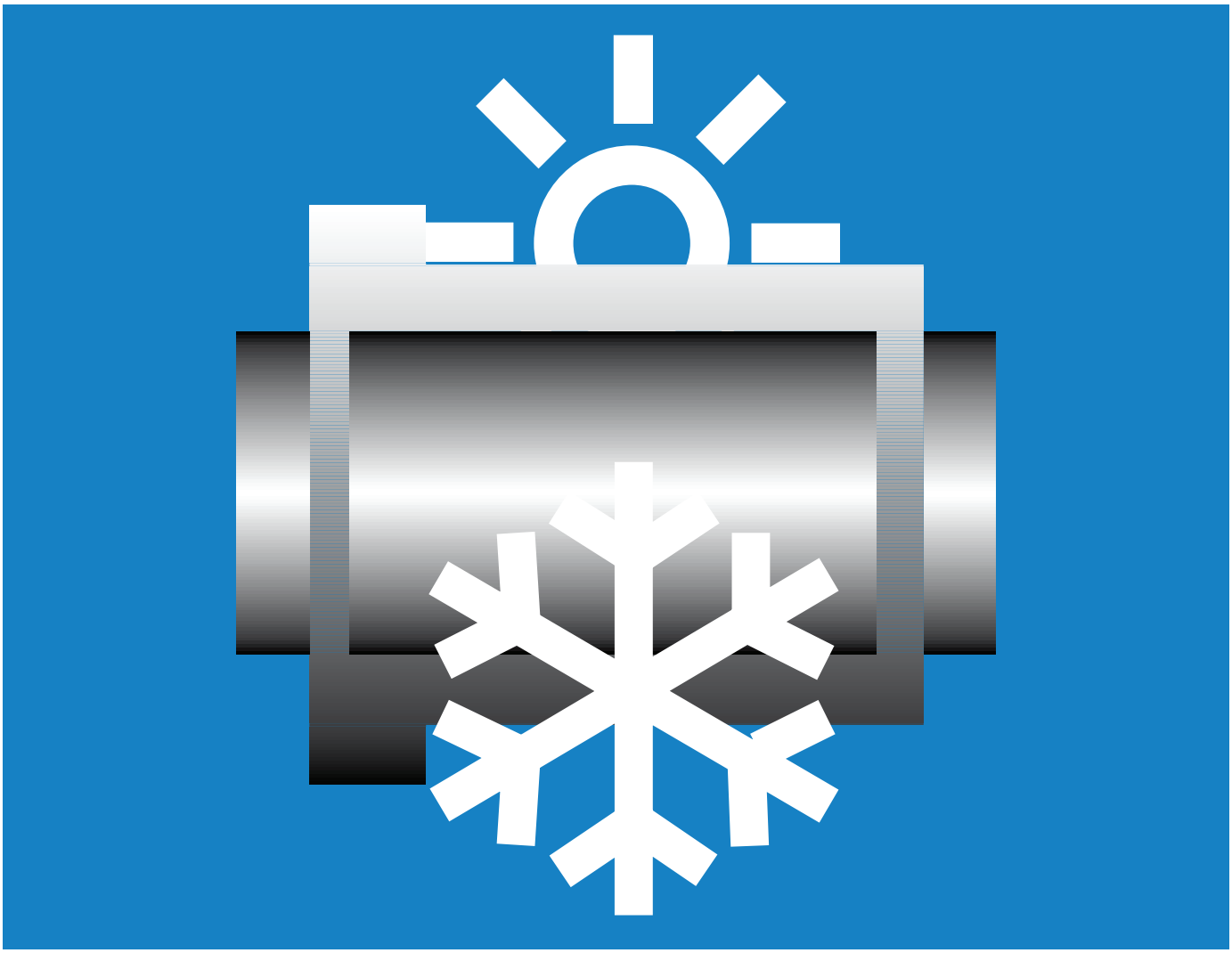
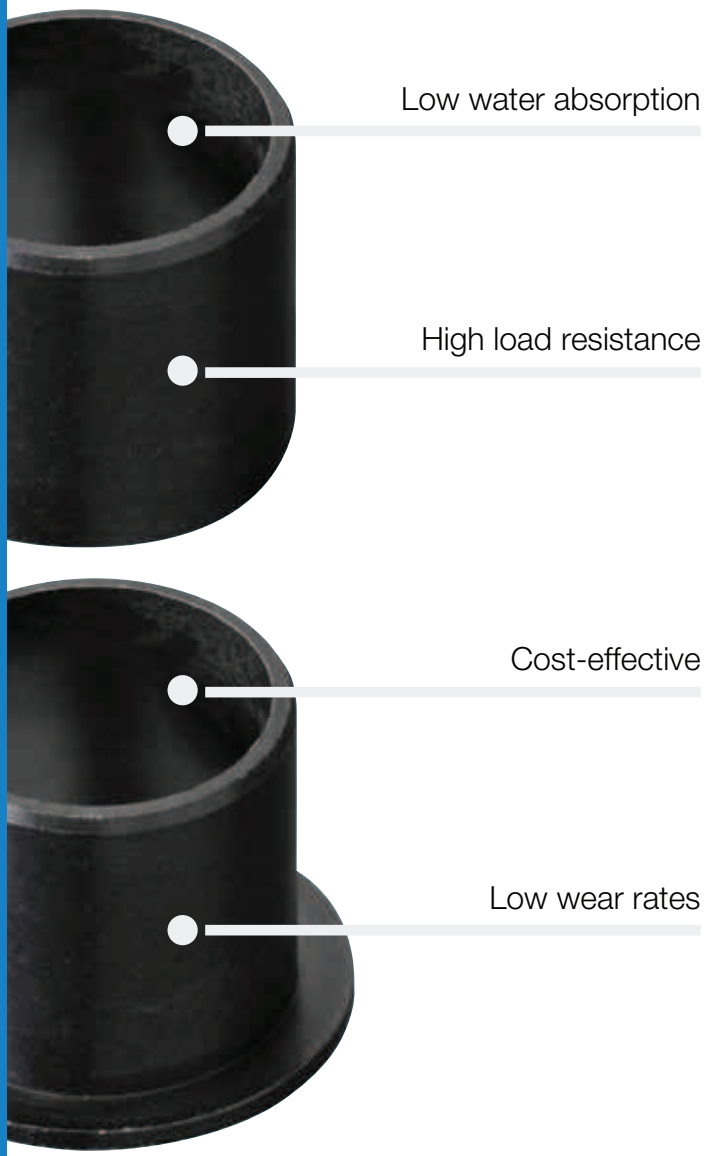


Low water absorption – iglidur® P

- 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 dimensionally stable allround bearings under varying environmental conditions. iglidur® P bearings are recommended for oscillating and rotating movements at average loads.



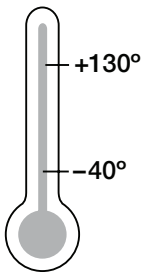
When to use it?

- 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 215
- When mechanical reaming of the wall surface is necessary
  ▶ iglidur® M250, page 127
- When the highest wear resistance is needed
  ▶ iglidur® W300, page 151

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.eu/iglidur-applications

▶ www.igus.eu/boat-cranes

▶ www.igus.eu/helicopter-loadsystem

▶ www.igus.eu/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

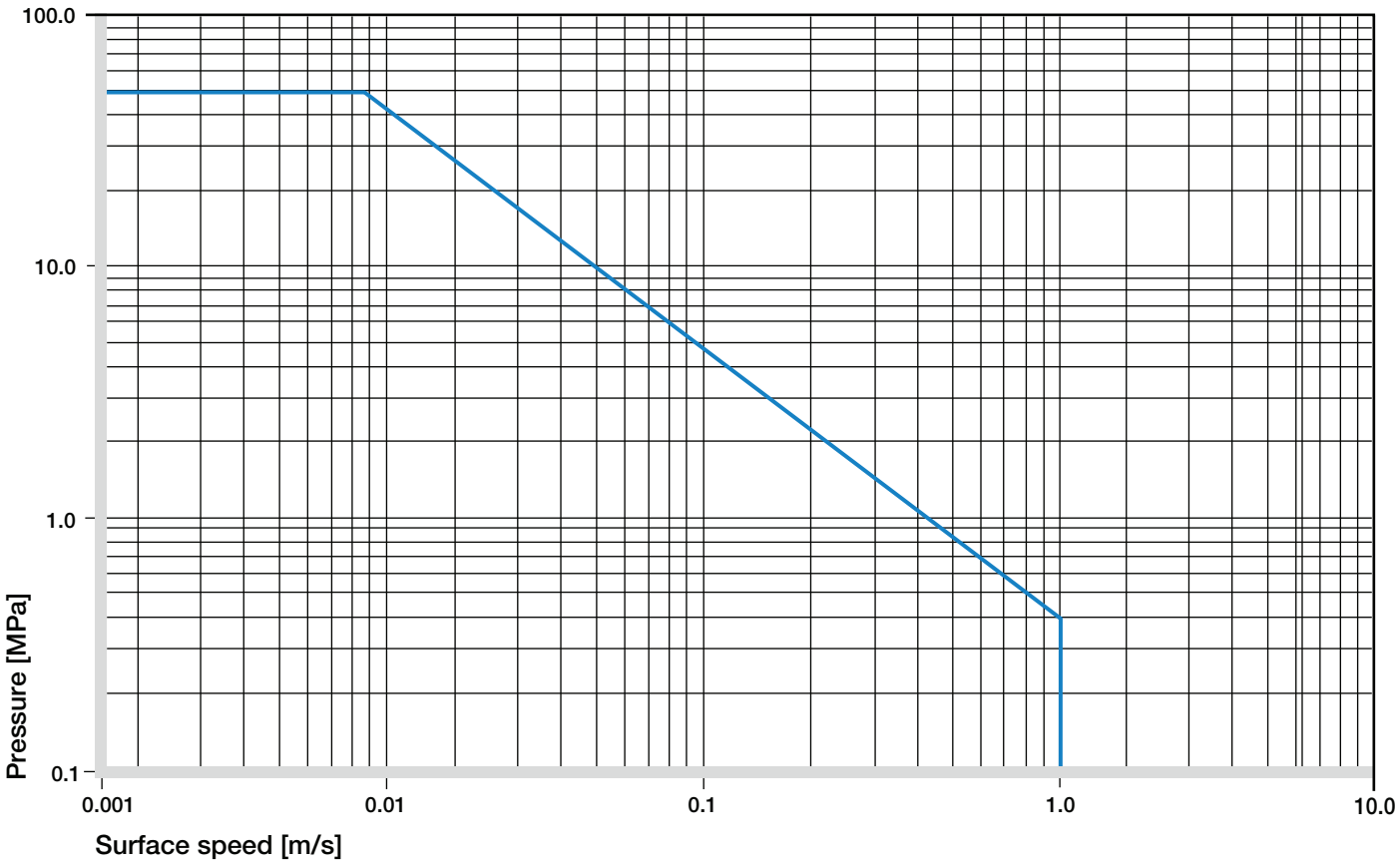


Diagram 01: Permissible pv values for iglidur® P with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

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.

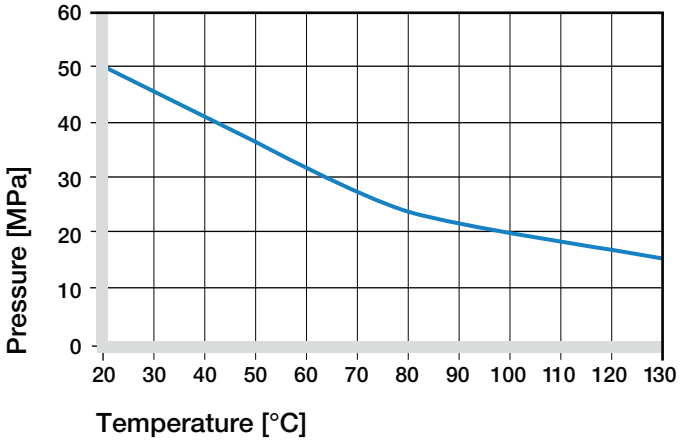


Diagram 02: Recommended maximum surface pressure as a function of temperature (50 MPa at +20 °C)

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 63**

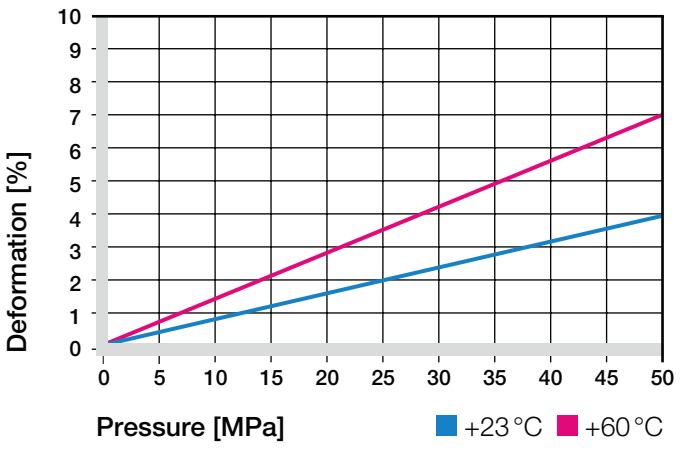


Diagram 03: Deformation under pressure and temperature

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 65**

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 66**

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 68**
▶ Wear Resistance, **page 69**

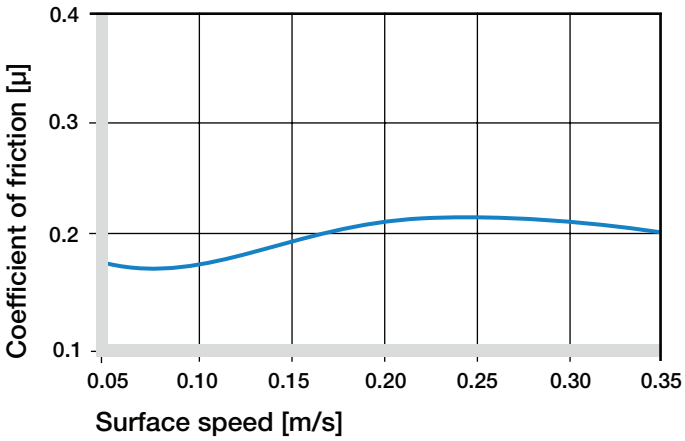


Diagram 04: Coefficient of friction as a function of the running speed, p = 0.75 MPa

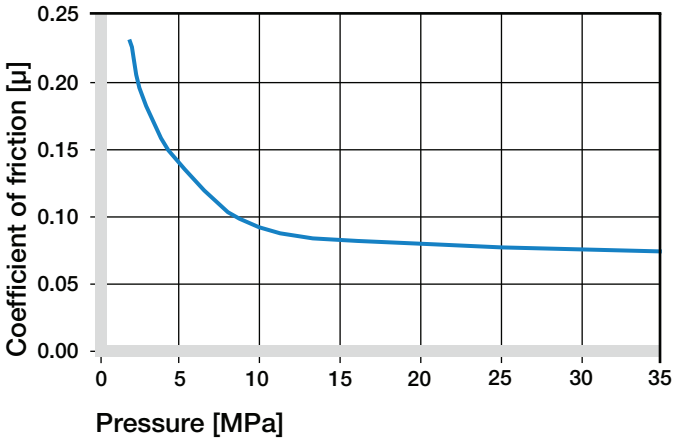


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

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 71**

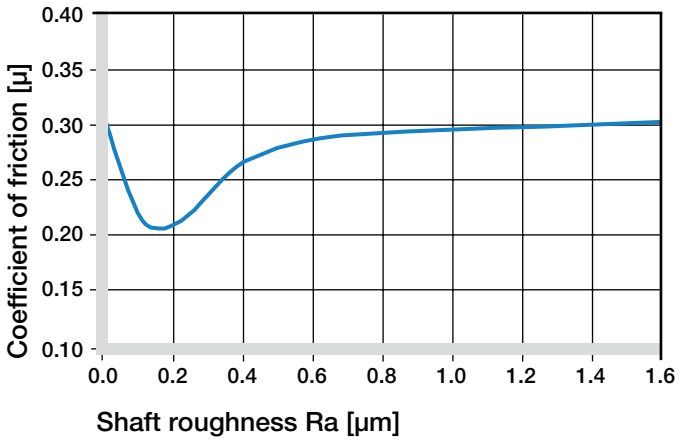


Diagram 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

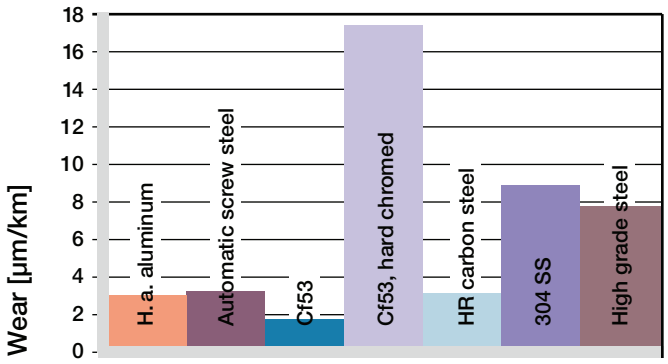


Diagram 07: Wear, rotating with different shaft materials, pressure p = 1 MPa, v = 0.3 m/s

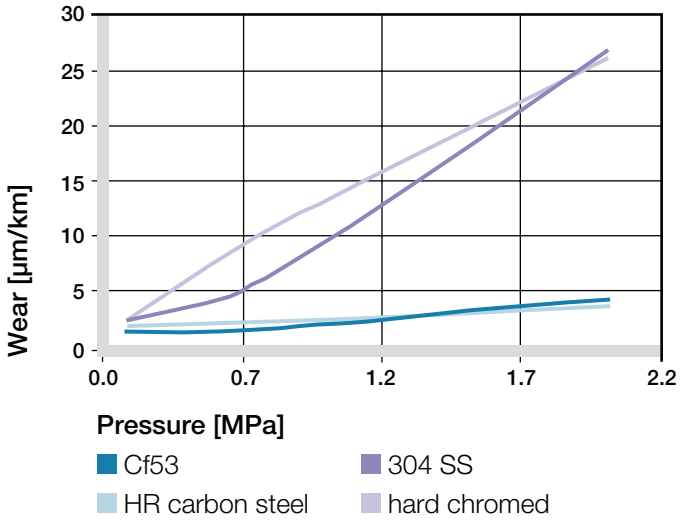


Diagram 08: Wear with different shaft materials in rotational operation, as a function of the pressure

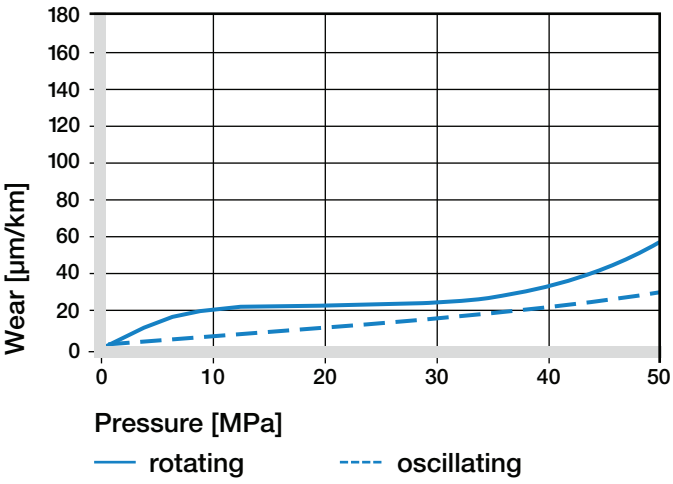


Diagram 09: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

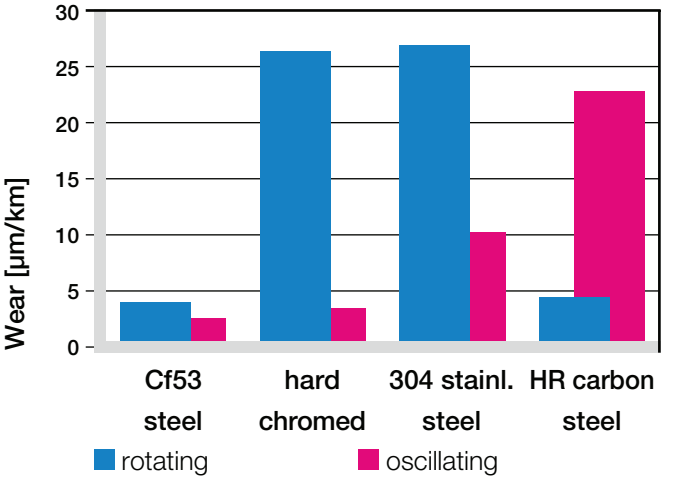


Diagram 10: Wear for rotating and oscillating applications with different shaft materials, p = 2 MPa

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 1258**

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

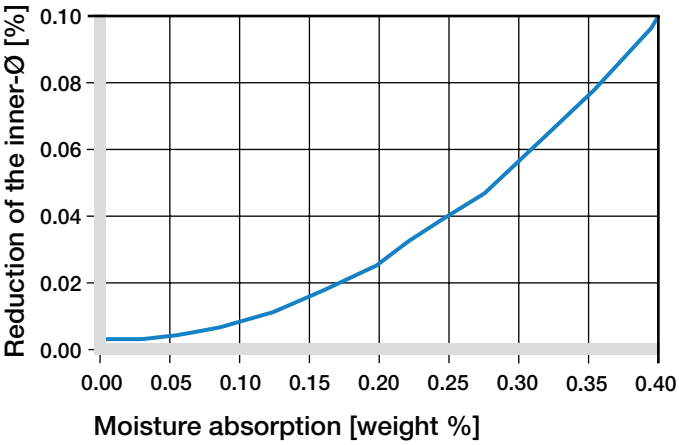


Diagram 11: Effect of moisture absorption on plain bearings

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).

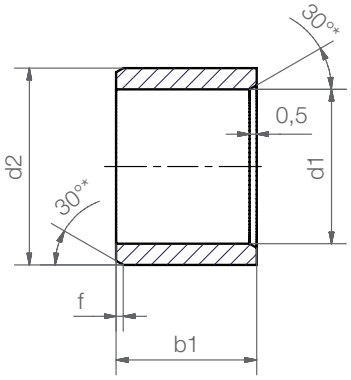
▶ Testing Methods, **page 75**

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

*** thickness < 1 mm, chamfer = 20°**

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

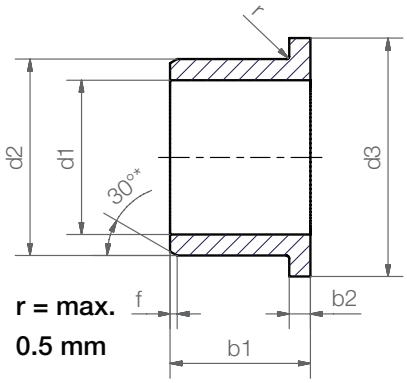
* after pressfit. Testing methods ▶ page 75

delivery time from stock

prices price list online www.igus.eu/eu/p

iglidur® P | Product Range

Flange bearing



r = max. 0.5 mm

Dimensions according to ISO 3547-1 and special dimensions

* thickness < 1 mm, chamfer = 20°

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 d13	b1 h13	b2 –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 75

delivery time from stock

prices price list online www.igus.eu/eu/p

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 75**

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