iglidur® specialists | Advantages



Low water absorption iglidur® P ► From page 149



pivoting motions iglidur® P210 ► From page 157

High wear resistance in



Versatile iglidur® K

► From page 165



Low-cost material for high quantities iglidur® GLW ► From page 173

General purpose

The iglidur® materials are summarised in this group, which virtually have a universal use under normal conditions (temperature, media, etc.).

The iglidur® GLW and iglidur® J4 are specially for low-cost solutions in large series.

iglidur® P and iglidur® K have a similar potential as iglidur® G paired with significantly reduced moisture absorption, which is advantageous for use in wet environments.

- Lubrication and maintenance free
- Low weight
- Good price / performance ratio
- Predictable service life



Online product finder ▶ www.igus.eu/iglidur-finder



max. +170°C min. -40°C



4 materials Ø 3-95 mm





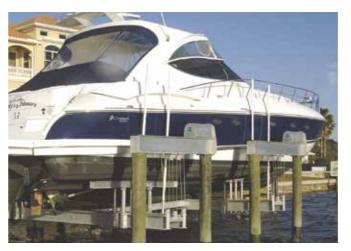


Available from stock

Detailed information about delivery time online.

iglidur® specialists | Application examples

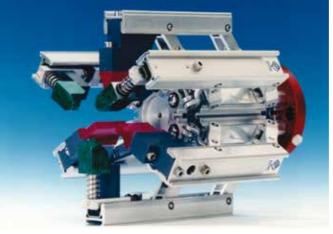
General purpose



iglidur® plastic bearings forms a practical and low priced alternative to bronze, metallic, rolled and injection-molded plain bearings.



An external load system for helicopters required a low weight, high reliability with simultaneous weather resistance and freedom from maintenance.



Thanks to the excellent mechanical and gliding properties of the bearings, the maintenance-free and lubrication free mechanical hand can be moved with the human hand.



The lubrication free igus® bearings are used, among other things, to eliminate a product contaminated by oil or fat.



The special feature here is the economical plastic bearings, which serve as rear axle bearing in the housing and allows the sensors to last considerably longer.



Thanks to the noise-dampening properties of the polymer bearings, they contribute to a significant noise reduction.

iglidur® specialists | Selection | Main properties

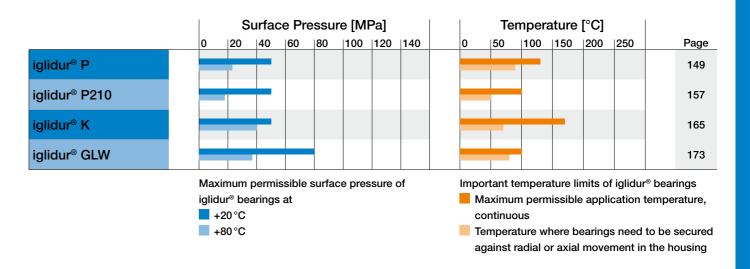
General purpose

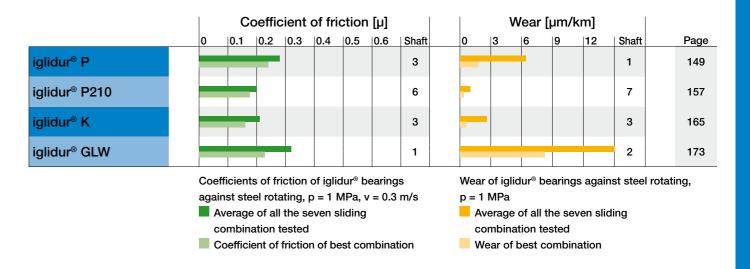
	Standard catalogue range	Bar stock	speedigus® material	Long life in dry operation	For high loads	Dirt resistant	Low coefficient of friction	Chemical resistant
iglidur® P	•		•	•		•		
iglidur® P210	•	•		•		•		
iglidur® K	•			•			•	
iglidur® GLW						•		

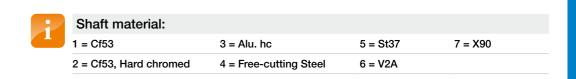
	Low water absorption	For under water use	Edge pressure	►///▼ Vibrations dampening	Food suitable	•	Temperatures up to +150°C	Economic
iglidur® P	•					•		•
iglidur® P210	•		•			•		
iglidur® K	•					•	•	•
iglidur® GLW						•		

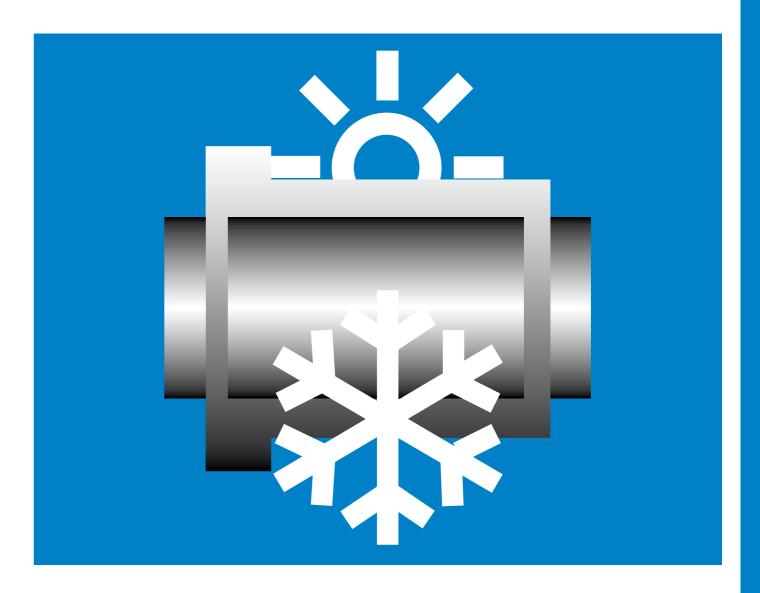
iglidur® specialists | Selection | Main properties

General purpose





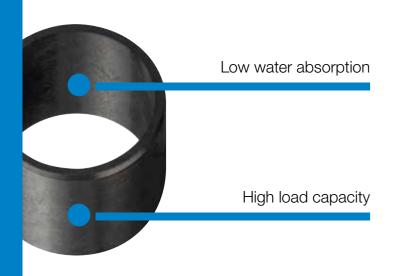




Low water absorption – iglidur® P

- Low water absorption
- Low wear rates
- High load capacity
- Low-cost
- Lubrication and maintenance free
- Standard range from stock

148



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?

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



Economic

Low wear rates

When not to use it?

- When the maximum application temperature is above +120°C
- ▶ iglidur® K, page 165
- When mechanical reaming of the wall surface is necessary
- ▶ iglidur® M250, page 111
- When highest wear resistance is required
- ▶ iglidur® W300, page 121



Available from stock

Detailed information about delivery time online.



max. +130 °C min. -40°C



Block pricing online

No minimum order value. From batch size 1



Ø 3-95 mm

more dimensions on request





Typical application areas

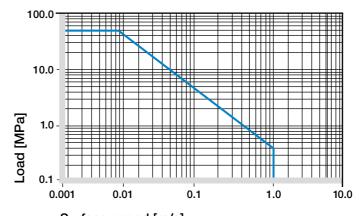
- Solar technology Sports and leisure Machine Building Doors and gates
- Railway industry etc.

iglidur® P | Technical data

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 · 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



Surface speed [m/s]

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

Moisture absorption

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

► Diagram, www.igus.eu/p-moisture

The existent humidity of iglidur® P bearings degasses in the vacuum. Use in vacuum can be limited.

Radiation resistance

Plain bearings made from iglidur® P have limited use under radioactive radiation. They are resistant to radiation up to an intensity of 5 · 10² Gy.

UV resistance

iglidur® P bearings have a good resistance to UV radiation.

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 02: Chemical resistance

With the iglidur® P plain bearing, the user has a costeffective, maintenance-free plain bearing. Compared to iglidur® G, plain bearings made from iglidur® P are suitable for use with 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. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

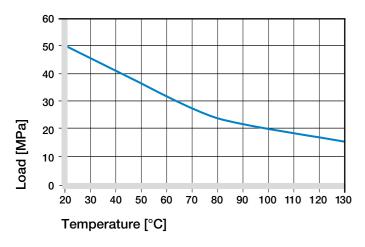


Diagram 02: Recommended maximum surface pressure of as a function of temperature (50 MPa at +20 °C)

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

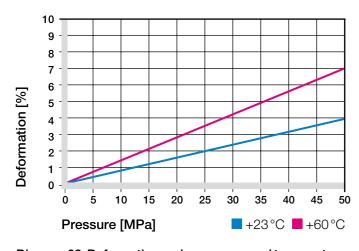


Diagram 03: Deformation under pressure and temperature

Permissible surface speeds

Plain bearings made from iglidur® P are maintenance free plain bearings, which were developed for low to average surface speeds. The maximum values given in table 03 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
Constant	1	0.7	3
Short term	2	1.4	4

Table 03: Maximum surface speeds

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 application temperature has a direct impact on bearing wear, an increase in temperature results in an increase in wear. The wear rises with increasing temperatures. At temperatures over +90°C an additional securing is required.

- Application temperatures, page 66
- Additional securing, page 67

Friction and wear

Just as the wear resistance, the coefficient of friction changes greatly with increasing load (diagrams 04 and 05). 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

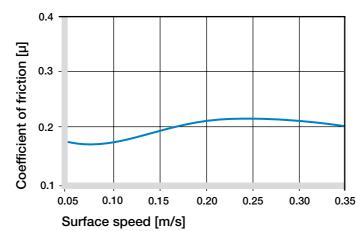


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75 MPa

0.25 互 0.20 friction 0.15 ₽ 0.10 10 15 20 25 30 35 Load [MPa]

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

Shaft materials

Diagram 06 shows results of testing different shaft materials with plain bearings made from 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

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)

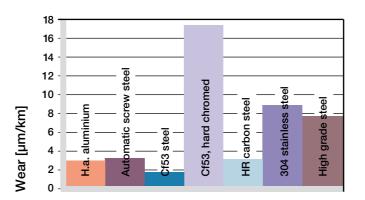


Diagram 06: Wear, rotating with different shaft materials, p = 1 MPa, v = 0.3 m/s

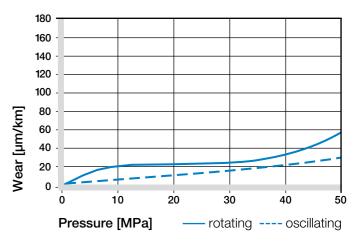


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

Installation tolerances

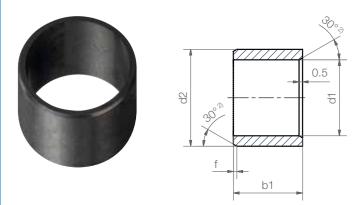
iglidur® P plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, the inner diameter automatically adjusts to the E10 tolerances. For 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 05: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

iglidur® P | Product range Sleeve bearing (Form S)



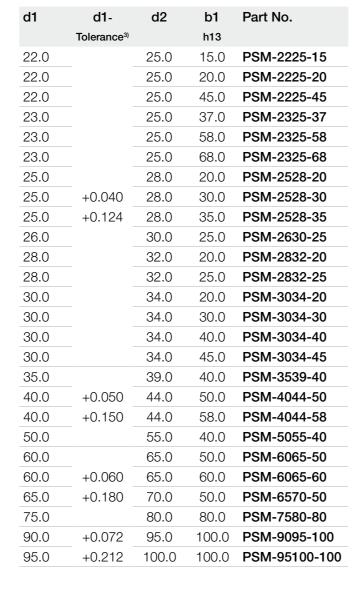
²⁾ thickness < 1 mm, chamfer = 20°

Chamfer in relation to the d1

Ø 1–6 Ø 6–12 | Ø 12–30 d1 [mm]: $\emptyset > 30$ f [mm]: 0.3 0.5 8.0

Dimensions [mm]

d1	d1- Tolerance ³⁾	d2	b1 h13	Part No.
3.0	+0.014 +0.054	4.5	3.0	PSM-0304-03
4.0	+0.020	5.5	4.0	PSM-0405-04
5.0	+0.020 - +0.068 -	7.0	5.0	PSM-0507-05
6.0	+0.000	8.0	6.0	PSM-0608-06
8.0		10.0	8.0	PSM-0810-08
8.0	+0.025	10.0	11.5	PSM-0810-11
8.0	+0.083	10.0	12.0	PSM-0810-12
10.0		12.0	10.0	PSM-1012-10
12.0		14.0	15.0	PSM-1214-15
12.0		14.0	25.0	PSM-1214-25
15.0		17.0	15.0	PSM-1517-15
15.0	. 0 000	17.0	25.0	PSM-1517-25
16.0	- +0.032 -	18.0	20.0	PSM-1618-20
16.0	- +0.102 -	18.0	42.0	PSM-1618-42
18.0		20.0	15.0	PSM-1820-15
18.0		20.0	20.0	PSM-1820-20
18.0		20.0	33.0	PSM-1820-33
20.0		22.0	22.0	PSM-2022-22
20.0		22.0	30.0	PSM-2022-30
20.0		22.0	48.0	PSM-2022-48
20.0	.0.040	22.0	51.0	PSM-2022-51
20.0		23.0	15.0	PSM-2023-15
20.0	+0.124	23.0	25.0	PSM-2023-25
20.0		23.0	30.0	PSM-2023-30
22.0		24.0	42.0	PSM-2224-42
22.0		24.0	45.0	PSM-2224-45



Dimensions according to ISO 3547-1

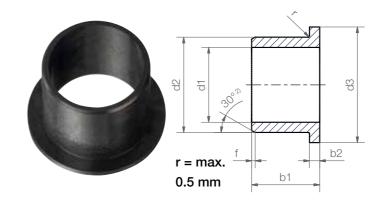
and special dimensions

Order key

S M-0304-03

iglidur® P | Product range

Flange bearing (Form F)



²⁾ thickness < 1 mm, chamfer = 20°

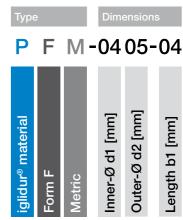
Chamfer in relation to the d1

Ø 1-6 Ø 6–12 | Ø 12–30 | d1 [mm]: $\emptyset > 30$ f [mm]: 0.3 0.5

Dimensions [mm]

d1	d1-	d2	d3	b1	b2	Part No.
	Tolerance ³⁾		d13	h13		
4.0		5.5	9.5	4.0	0.75	PFM-0405-04
5.0	+0.020	6.0	10.0	3.0	0.5	PFM-0506-03
5.0	+0.020	7.0	11.0	5.0	1.0	PFM-0507-05
6.0	+0.000	8.0	12.0	4.0	1.0	PFM-0608-04
6.0		8.0	12.0	6.0	1.0	PFM-0608-06
7.0		9.0	15.0	4.0	1.0	PFM-0709-04
8.0		10.0	15.0	7.5	1.0	PFM-0810-075
8.0	+0.025	10.0	15.0	10.0	1.0	PFM-0810-10
8.0	+0.023	10.0	15.0	15.0	1.0	PFM-0810-15
8.0	+0.003	10.0	12.0	10.0	1.0	PFM-081012-10
10.0		12.0	18.0	10.0	1.0	PFM-1012-10
10.0		12.0	18.0	17.0	1.0	PFM-1012-17
12.0		14.0	20.0	9.0	1.0	PFM-1214-09
12.0		14.0	20.0	10.0	1.0	PFM-1214-10
12.0		14.0	20.0	15.0	1.0	PFM-1214-15
12.0	+0.032	14.0	18.0	8.0	1.0	PFM-121418-08
12.0		14.0	20.0	10.0	1.0	PFM-121420-10
14.0	+0.102	16.0	22.0	4.0	1.0	PFM-1416-04
14.0		16.0	22.0	8.0	1.0	PFM-1416-08
14.0		16.0	22.0	12.0	1.0	PFM-1416-12
14.0		16.0	24.0	25.0	1.0	PFM-141624-25
14.0	+0.050 +0.160	20.0	25.0	10.0	3.0	PFM-1420-10
15.0	+0.032 +0.102	17.0	23.0	22.0	1.0	PFM-1517-22





Dimensions according to ISO 3547-1 and special dimensions

d1	d1- Tolerance ³⁾	d2	d3 d13	b1 h13	b2	Part No.
15.0		18.0	24.0	32.0	1.5	PFM-151824-32
16.0		18.0	24.0	12.0	1.0	PFM-1618-12
16.0	+0.032	18.0	24.0	17.0	1.0	PFM-1618-17
16.0	+0.102	18.0	24.0	40.0	1.0	PFM-161824-40
17.0		19.0	25.0	25.0	1.0	PFM-1719-25
18.0		20.0	26.0	17.0	1.0	PFM-1820-17
20.0		23.0	28.0	15.0	1.5	PFM-202328-15
20.0		23.0	30.0	16.5	1.5	PFM-2023-16
20.0		23.0	30.0	30.0	1.5	PFM-2023-30
24.0	+0.040	27.0	32.0	22.0	1.5	PFM-2427-22
25.0	+0.124	28.0	35.0	11.5	1.5	PFM-2528-11
25.0	+0.124	28.0	35.0	21.5	1.5	PFM-2528-21
30.0		34.0	42.0	16.0	2.0	PFM-3034-16
30.0		34.0	42.0	30.0	2.0	PFM-3034-30
30.0		34.0	42.0	37.0	2.0	PFM-3034-37
35.0		39.0	47.0	26.0	2.0	PFM-3539-26
40.0	+0.050	44.0	52.0	30.0	2.0	PFM-4044-30
40.0	+0.150	44.0	52.0	40.0	2.0	PFM-4044-40
50.0		55.0	63.0	50.0	2.0	PFM-5055-50
0.0		65.0	73.0	40.0	2.0	PFM-6065-40
60.0	+0.060	65.0	73.0	50.0	2.0	PFM-6065-50
70.0	+0.180	75.0	83.0	50.0	2.0	PFM-7075-50
30.0		85.0	93.0	100.0	2.5	PFM-8085-100

³⁾ after pressfit. Testing methods ▶ Page 75

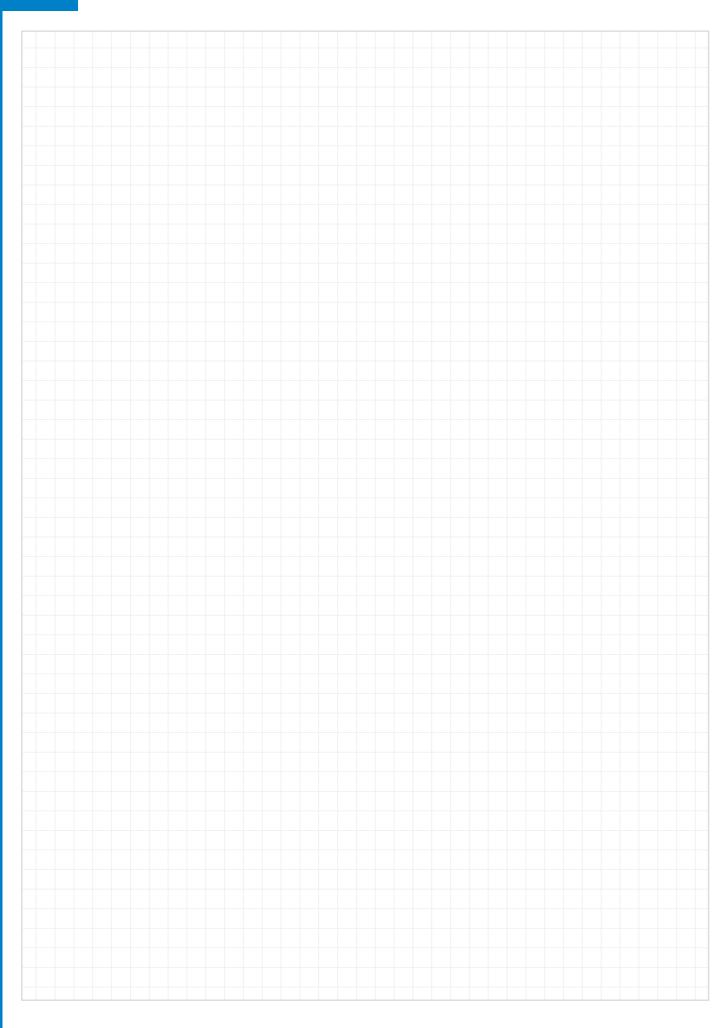


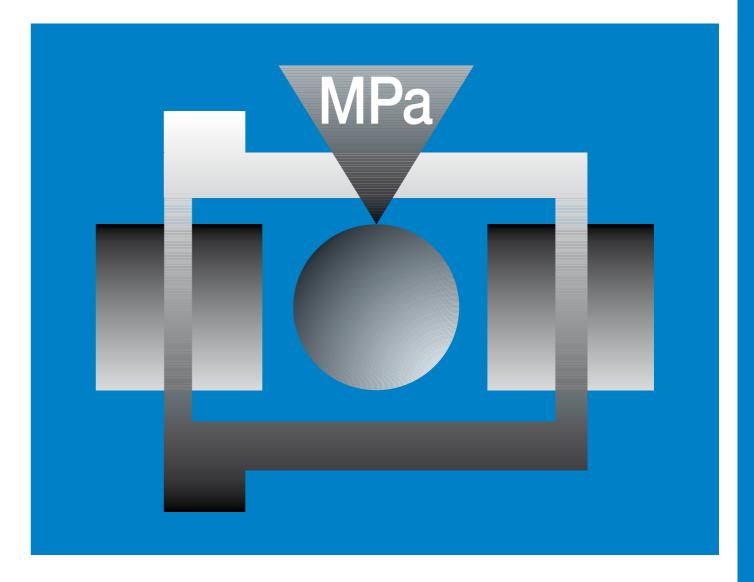
Even more dimensions from stock

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

▶ www.igus.eu/iglidur-specialbearings

³⁾ after pressfit. Testing methods ▶ Page 75



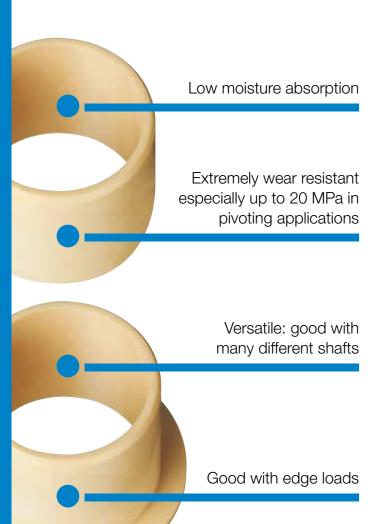


Flexible, wear resistant & more iglidur® P210

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

iglidur® P210 | Extremely wear-resistant in pivoting motions

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 83
- ➤ When you need a bearing for highly loaded pivoting applications
- ► iglidur® Q, page 401
- ► iglidur® Q2, page 409
- When temperatures in excess of +100°C occur
- ► iglidur® G, page 83
- ► iglidur® J350, page 199



Available from stock

Detailed information about delivery time online.



max. +100 °C min. -40 °C



Block pricing online

No minimum order value. From batch size 1



Ø 6–25 mm

more dimensions on request





Typical application areas

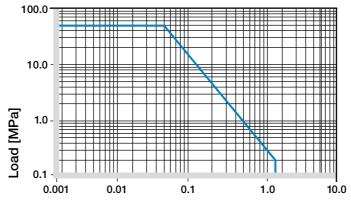
● Automotive interior area, hinges ● Sports and leisure ● Bicycles etc.

iglidur® P210 | Technical data

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 · 10⁻⁵	8	DIN 53752
Electrical properties			
Specific volume resistance	Ω cm	> 10 ¹²	DIN IEC 93
Surface resistance	Ω	> 1011	DIN 53482

Table 01: Material properties table



Surface speed [m/s]

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

Moisture absorption

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

► Diagram, www.igus.eu/p210-moisture

Vacuum

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

Radiation resistance

Plain bearings made from 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 bearings have a good resistance to UV radiation.

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 02: Chemical resistance

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. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

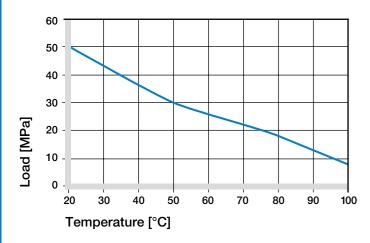


Diagram 02: Recommended maximum surface pressure of as a function of temperature (50 MPa at +20 °C)

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 63

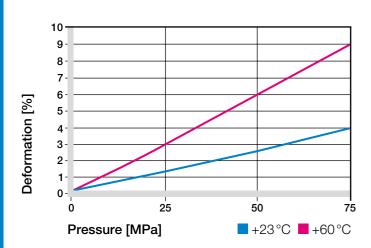


Diagram 03: Deformation under pressure and temperature

Permissible surface speeds

Plain bearings made from iglidur® P210 are maintenancefree plain bearings, which were developed for low to average surface speeds. The maximum values given in table 03 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
Constant	1	0.7	3
Short term	2	1.4	4

Table 03: Maximum surface speeds

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, iglidur® G with a max. long-term temperature of +130 °C can be used. The ambient application temperature has a direct impact on bearing wear, an increase in temperature results in an increase in wear. The wear rises with increasing temperatures. At temperatures over +50 °C an additional securing is required.

- ► Application temperatures, page 66
- ► Additional securing, page 67

Friction and wear

Similar to wear resistance, the coefficient of friction also changes with the load (diagrams 04 and 05).

- Coefficients of friction and surfaces, page 68
- ► Wear resistance, page 69

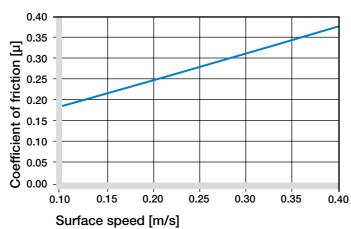


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1 MPa

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

Shaft materials

Diagram 06 shows results of testing different shaft materials with plain bearings made from 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 07).

➤ Shaft materials, page 71

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 μ m, 50 HRC)

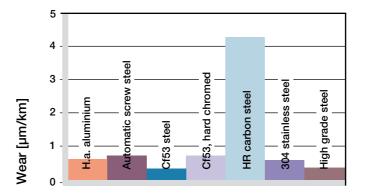


Diagram 06: Wear, rotating with different shaft materials, p = 1 MPa, v = 0.3 m/s

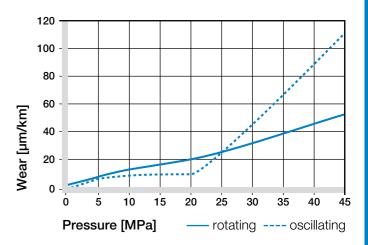


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

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, 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

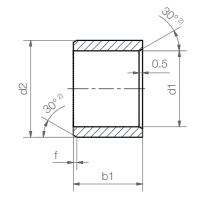
Diameter	r	Shaft	iglidur® P210	Housing
d1 [mm]		h9 [mm]	E10 [mm]	H7 [mm]
up to	3	0-0.025	+0.014 +0.054	0 +0.010
> 3 to	6	0-0.030	+0.020 +0.068	0 +0.012
> 6 to	10	0-0.036	+0.025 +0.083	0 +0.015
> 10 to	18	0-0.043	+0.032 +0.102	0 +0.018
> 18 to	30	0-0.052	+0.040 +0.124	0 +0.021
> 30 to	50	0-0.062	+0.050 +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 05: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

iglidur® P210 | Product range

Sleeve bearing (Form S)



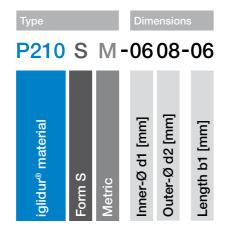




Chamfer in relation to the d1

d1 [mm]: Ø 1–6 Ø 6–12 | Ø 12–30 $\emptyset > 30$ f [mm]:

Order key



Dimensions according to ISO 3547-1 and special dimensions

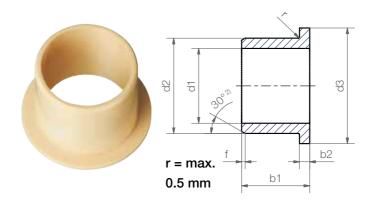
Dimensions [mm]

d1	d1-Tolerance3)	d2	b1	Part No.
			h13	
6.0	+0.020 +0.068	8.0	6.0	P210SM-0608-06
8.0	+0.025 +0.083	10.0	10.0	P210SM-0810-10
10.0	+0.025 +0.083	12.0	10.0	P210SM-1012-10
12.0	+0.032 +0.102	14.0	12.0	P210SM-1214-12
16.0	+0.032 +0.102	18.0	15.0	P210SM-1618-15
20.0	+0.040 +0.124	23.0	20.0	P210SM-2023-20

³⁾ after pressfit. Testing methods ▶ Page 75

iglidur® P210 | Product range

Flange bearing (Form F)

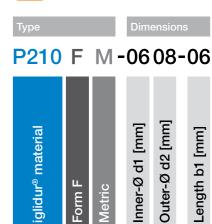


²⁾ thickness < 1 mm, chamfer = 20°

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 according to ISO 3547-1 and special dimensions

Dimensions [mm]

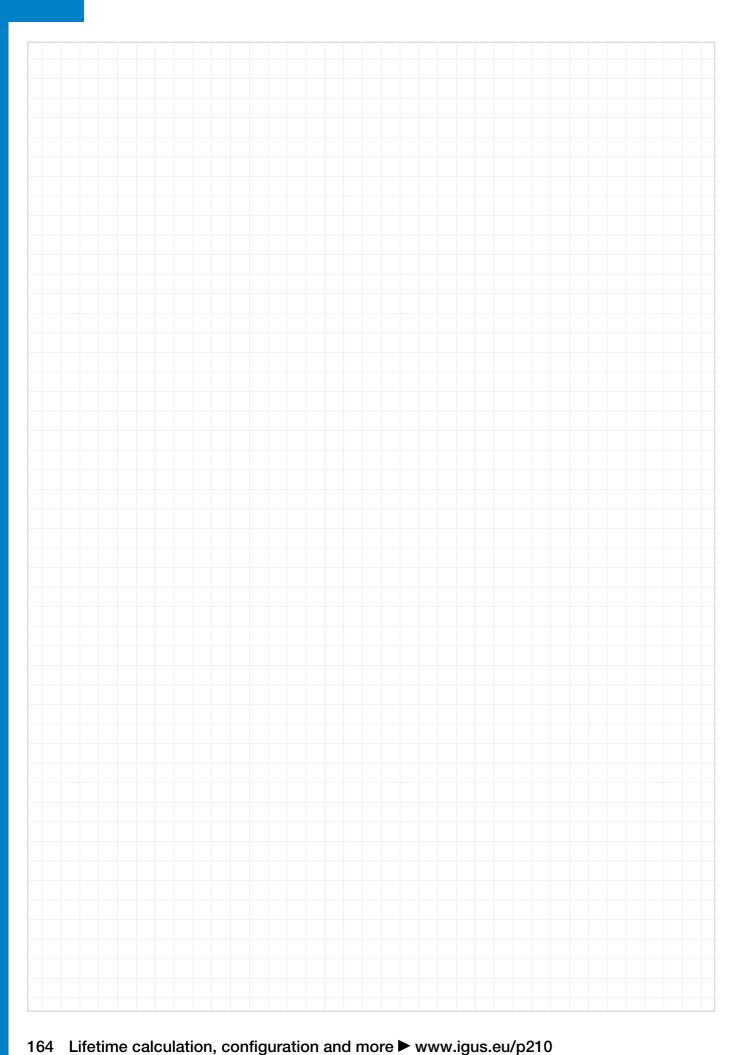
d1	d1-Tolerance ³⁾	d2	d3 d13	b1 h13	b2 -0.14	Part No.
6.0	+0.020 +0.068	8.0	12.0	6.0	1.0	P210FM-0608-06
8.0	+0.025 +0.083	10.0	15.0	10.0	1.0	P210FM-0810-10
8.0	+0.025 +0.083	10.0	16.0	15.0	1.0	P210FM-081016-15
10.0	+0.025 +0.083	12.0	18.0	10.0	1.0	P210FM-1012-10
12.0	+0.032 +0.102	14.0	20.0	12.0	1.0	P210FM-1214-12
16.0	+0.032 +0.102	18.0	24.0	17.0	1.0	P210FM-1618-17
20.0	+0.040 +0.124	23.0	30.0	21.5	1.5	P210FM-2023-21
25.0	+0.040 +0.124	28.0	35.0	21.0	1.5	P210FM-2528-21

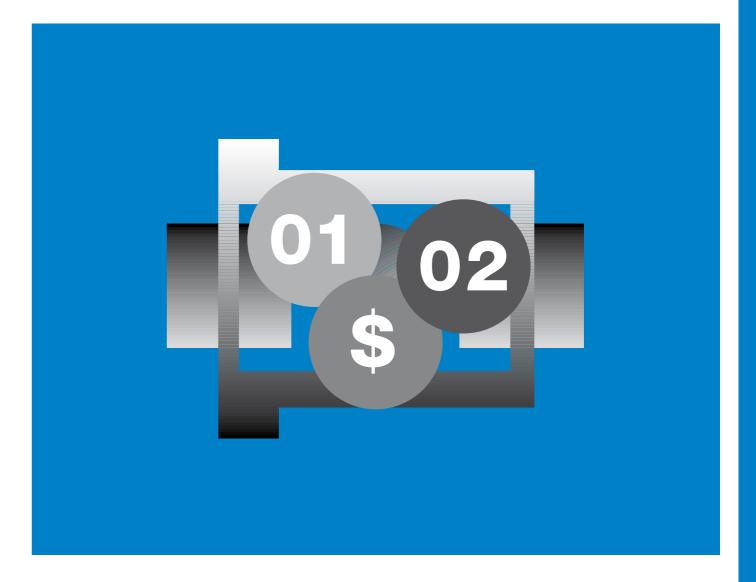
³⁾ after pressfit. Testing methods ▶ Page 75



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.



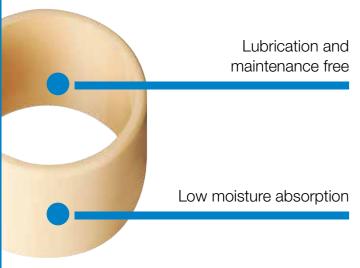


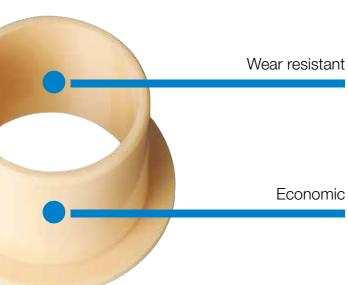
Versatile – iglidur® K

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

iglidur[®] **K** | Low-cost for medium temperatures

Versatile





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



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 121
- If high media-resistance is required
- ▶ iglidur® X6, page 247
- When a high-temperature bearing is needed
- ▶ iglidur® H, page 283





max. +170°C min. -40°C

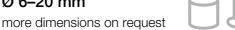


Block pricing online

No minimum order value. From batch size 1



Ø 6-20 mm





Typical application areas

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

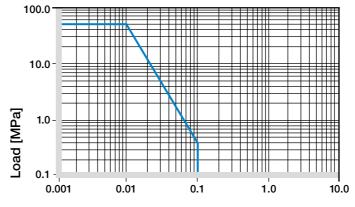
iglidur® K | Technical data

iglidur[®]

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 · 10 ⁻⁵	3	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 ¹²	DIN IEC 93
Surface resistance	Ω	> 1012	DIN 53482

Table 01: Material properties table



Surface speed [m/s]

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

Moisture absorption

The moisture absorption of iglidur® K plain bearings is approximately 0.1 % in ambient conditions. The saturation limit submerged in water is 0.6 %. These values are so low that a moisture expansion need to be considered only in extreme cases.

► Diagram, www.igus.eu/k-moisture

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

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, the material properties do not change.

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 02: Chemical resistance

iglidur® K | Technical data

iglidur® K is characterised 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 clarifies this relationship. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

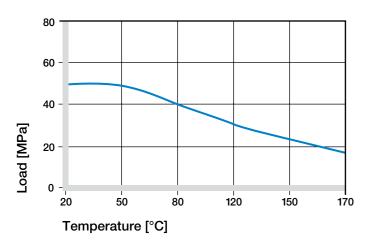


Diagram 02: Recommended maximum surface pressure of as a function of temperature (50 MPa at +20 °C)

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%. A possible deformation could be, among others, dependant on the duty cycle of the load.

➤ Surface pressure, page 63

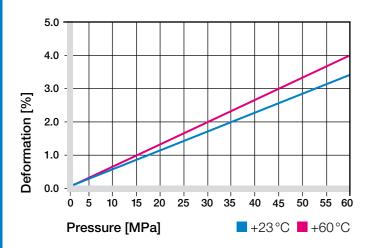


Diagram 03: Deformation under pressure and temperature

Permissible surface speeds

iglidur® K has been developed for low to medium surface speeds. The maximum values shown in table 03 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 65

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

Table 03: Maximum surface speeds

Temperatures

The ambient application temperature has a direct impact on bearing wear, an increase in temperature results in an increase in wear. With increasing temperatures, the wear increases and this effect is significant when temperatures rise over +100 °C. At temperatures over +70 °C an additional securing is required.

- ► Application temperatures, page 66
- ► Additional securing, page 67

Friction and wear

Similar to wear resistance, the coefficient of friction also changes with the load (diagrams 04 and 05).

- Coefficients of friction and surfaces, page 68
- ➤ Wear resistance, page 69

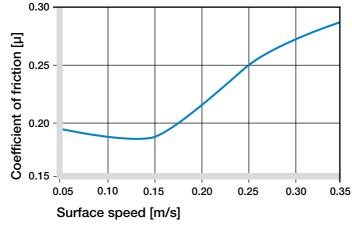


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75 MPa

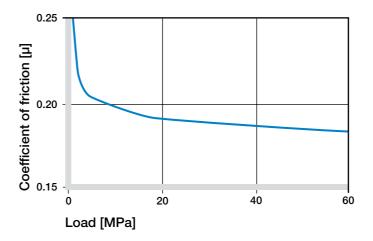


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

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– $0.20 \, \mu m$ is recommended.

Diagram 06 shows results of testing different shaft materials with plain bearings made from iglidur® K. 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 (diagram 07).

► Shaft materials, page 71

iglidur® K	Dry	Greases	Oil	Water
C.o.f. u	0.06-0.21	0.09	0.04	0.04

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

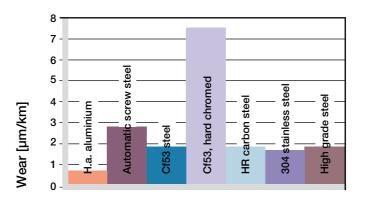


Diagram 06: Wear, rotating with different shaft materials, p = 1 MPa, v = 0.3 m/s

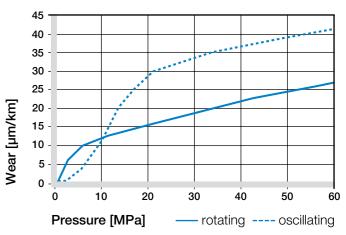


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

Installation tolerances

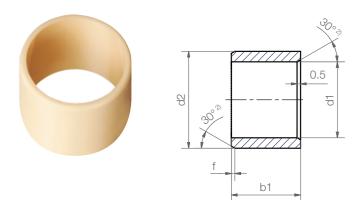
iglidur® K plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, the inner diameter automatically adjusts to the E10 tolerances. For 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 75

Diameter	Shaft	iglidur® K	Housing
d1 [mm]	h9 [mm]	E10 [mm]	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 05: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

iglidur® K | Product range Sleeve bearing (Form S)

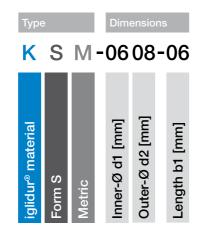


²⁾ thickness < 1 mm, chamfer = 20°

Chamfer in relation to the d1

d1 [mm]: Ø 1–6 Ø 6–12 | Ø 12–30 $\emptyset > 30$ f [mm]:

Order key



Dimensions according to ISO 3547-1 and special dimensions

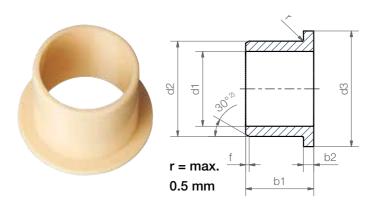
Dimensions [mm]

d1	d1-Tolerance3)	d2	b1	Part No.
			h13	
6.0	+0.020 +0.068	8.0	6.0	KSM-0608-06
8.0	+0.025 +0.083	10.0	10.0	KSM-0810-10
10.0	+0.025 +0.083	12.0	10.0	KSM-1012-10
12.0	+0.032 +0.102	14.0	12.0	KSM-1214-12
16.0	+0.032 +0.102	18.0	15.0	KSM-1618-15
20.0	+0.040 +0.124	23.0	20.0	KSM-2023-20

³⁾ after pressfit. Testing methods ▶ Page 75

iglidur® K | Product range

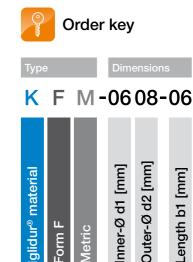
Flange bearing (Form F)



²⁾ 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 according to ISO 3547-1 and special dimensions

Dimensions [mm]

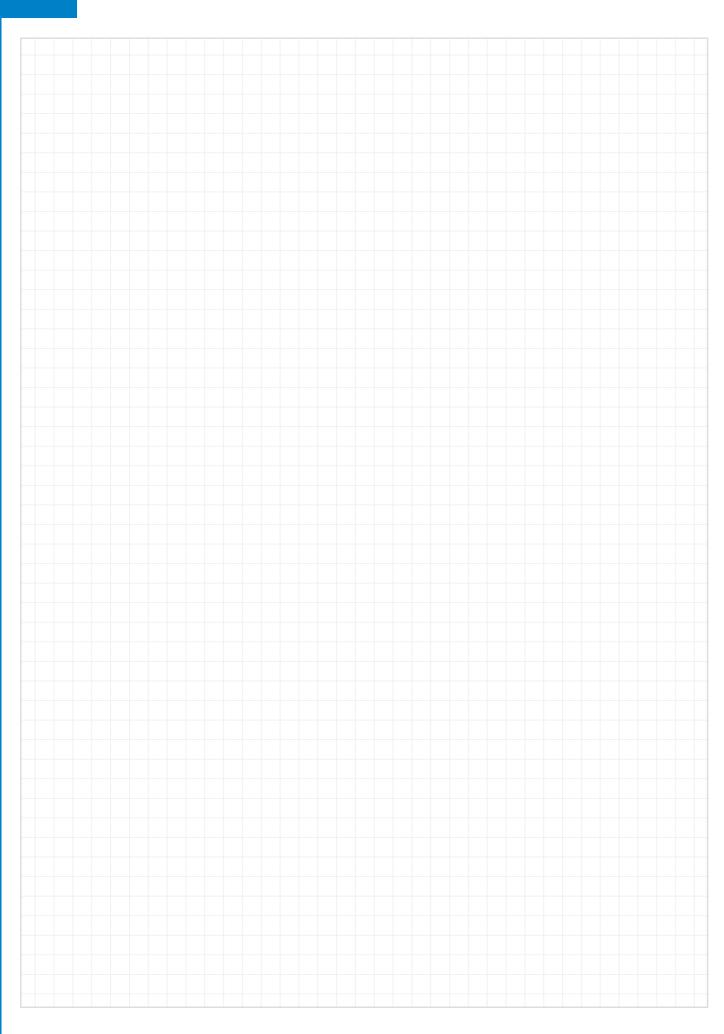
d1	d1-Tolerance ³⁾	d2	d3 d13	b1 h13	b2 -0.14	Part No.
6.0	+0.020 +0.068	8.0	12.0	6.0	1.0	KFM-0608-06
8.0	+0.025 +0.083	10.0	15.0	10.0	1.0	KFM-0810-10
10.0	+0.025 +0.083	12.0	18.0	10.0	1.0	KFM-1012-10
12.0	+0.032 +0.102	14.0	20.0	12.0	1.0	KFM-1214-12
16.0	+0.032 +0.102	18.0	24.0	17.0	1.0	KFM-1618-17
20.0	+0.040 +0.124	23.0	30.0	21.5	1.5	KFM-2023-21

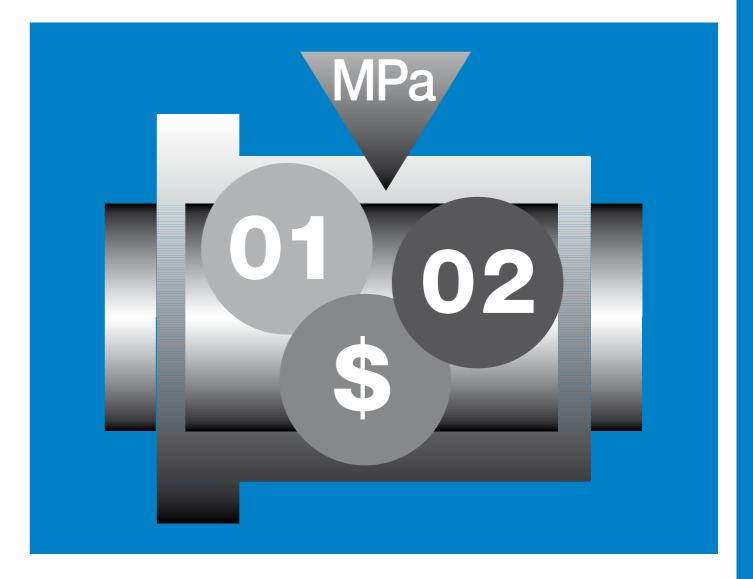
³⁾ after pressfit. Testing methods ▶ Page 75



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.



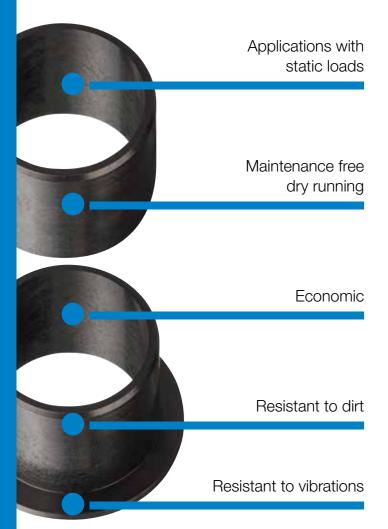


Low-cost material for high quantities – iglidur® GLW

- Applications with static loads
- Low-cost
- Dirt-resistant
- Resistant to vibrations
- Lubrication and maintenance free

iglidur® GLW | Low-cost material for high quantities

For high quantities and medium loads



iglidur® GLW plain bearings are prefered in applications with static load, where only occasional movement takes place.



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 83
- When highest wear resistance is required
- ▶ iglidur® W300, page 121
- When temperatures continuously exceed +130°C
- ▶ iglidur® K, page 165
- For underwater applications
- ▶ iglidur® H2, page 315



Available on request

Detailed information about delivery time online



max. +100 °C min. -40 °C



Order-related



Order-related





Typical application areas

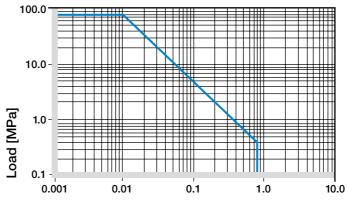
◆ Automation ◆ Automotive ◆ Industrial handling

iglidur® GLW | Technical data

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 · 10⁻⁵	17	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 1011	DIN IEC 93
Surface resistance	Ω	> 1011	DIN 53482

Table 01: Material properties table



Surface speed [m/s]

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

Moisture absorption

The moisture absorption of iglidur® GLW plain bearings is approximately 1.3% in ambient conditions. The saturation limit in water is 5.5%. This must be taken into account along with other environmental influences.

► Diagram, www.igus.eu/glw-moisture

Vacuum

When used in vacuum, the iglidur[®] GLW plain bearings release moisture as a vapour. Use in a vacuum should be tested beforehand.

Radiation resistance

Plain bearings made from 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.

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 02: Chemical resistance

With plain bearings made from 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. Diagram 02 clarifies this relationship. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this

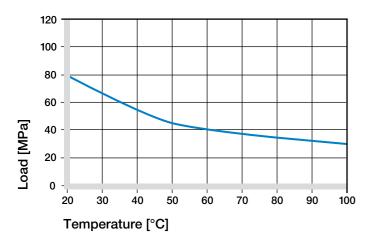


Diagram 02: Recommended maximum surface pressure of as a function of temperature (80 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® GLW at radial loads. At the maximum recommended surface pressure of 80 MPa at room temperature the deformation is less than 3%. At this load the plastic deformation is minimal. It is however also dependent on the duty cycle of the load.

➤ Surface pressure, page 63

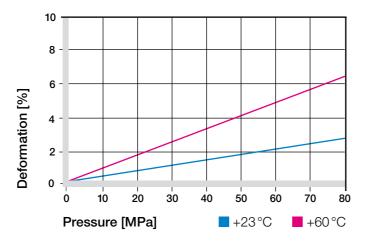


Diagram 03: Deformation under pressure and temperature

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 03 are only possible at the lowest pressures. In practice, these values are rarely reached, due to the increasing temperatures approaching or exceeding the maximum permitted value.

➤ Surface speed, page 65

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

Table 03: Maximum surface speeds

Temperatures

The ambient temperatures greatly influence the wear performance of plastic bearings. Diagram 02 clarifies this relationship. With increasing temperatures in the bearing system, the wear also increases. At temperatures over +80°C an additional securing is required.

- ► Application temperatures, page 66
- Additional securing, page 67

Friction and wear

Similar to wear resistance, the coefficient of friction µ also changes with increasing load (diagrams 04 and 05)

- Coefficients of friction and surfaces, page 68
- ➤ Wear resistance, page 69

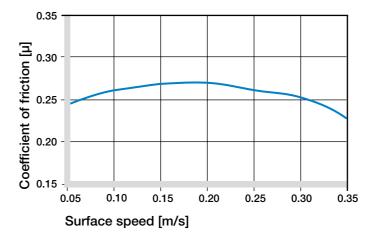


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75 MPa

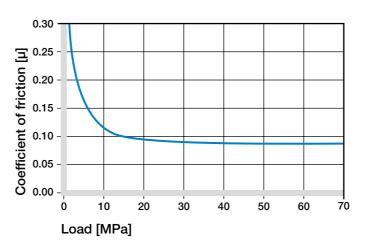


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

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. A ground surface with an average roughness Ra between 0.1 and 0.2 µm is the most suitable. The diagram 06 shows 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 71

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)

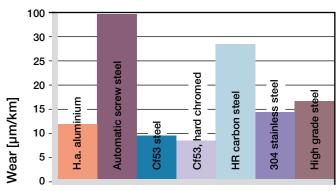


Diagram 06: Wear, rotating with different shaft materials, p = 1 MPa, v = 0.3 m/s

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, 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 [®] 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 05: 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.