

iglidur® A180 – FDA-general purpose waterproof material



Standard range from stock

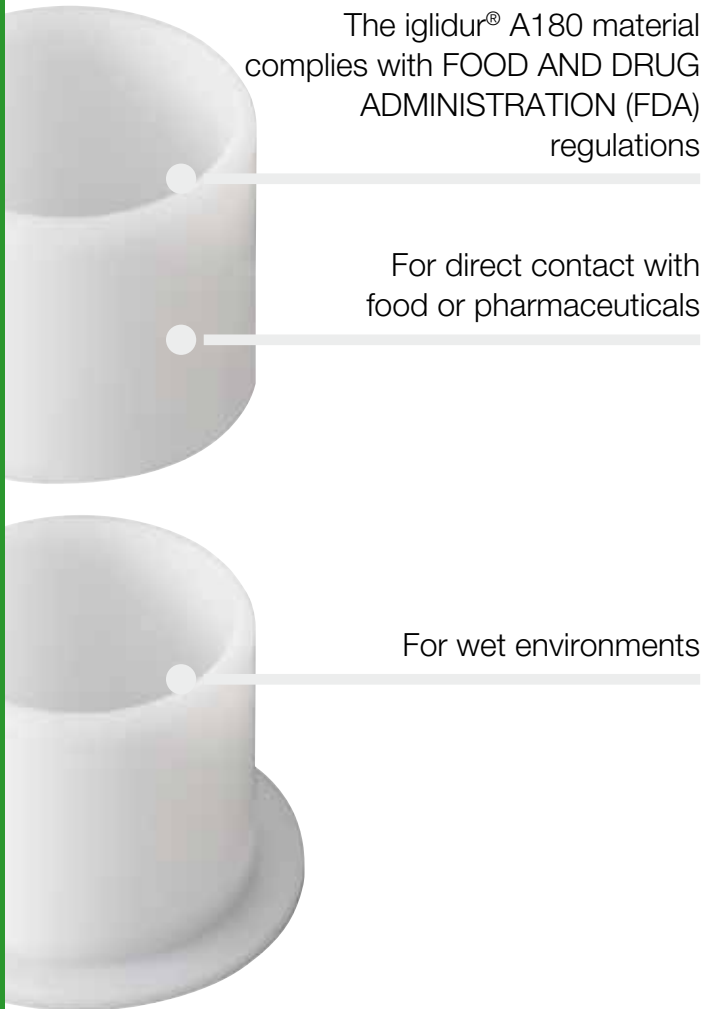
The iglidur® A180 material complies with FOOD AND DRUG ADMINISTRATION (FDA) regulations

For direct contact with food or pharmaceuticals

For wet environments

iglidur® A180

FDA-general purpose waterproof material. FDA compliant material for applications with low to medium loads in immediate environs of (or contact with) food or drugs, as well as humidity.



When to use it?

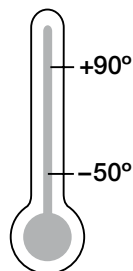
- If the bearings have direct contact with food
- If FDA-compliance is required
- If quiet operation is important
- If low water absorption is needed



When not to use?

- When the maximum abrasion resistance is necessary
 - ▶ **iglidur® J, page 89**
- When temperatures are continuously higher than +80 °C
 - ▶ **iglidur® A290, page 417**
 - ▶ **iglidur® A500, page 407**
- When a cost-effective universal bearing is required
 - ▶ **iglidur® G, page 61**
 - ▶ **iglidur® P, page 185**

Temperature



Product Range

2 types
Ø 6–30 mm
more dimensions
on request

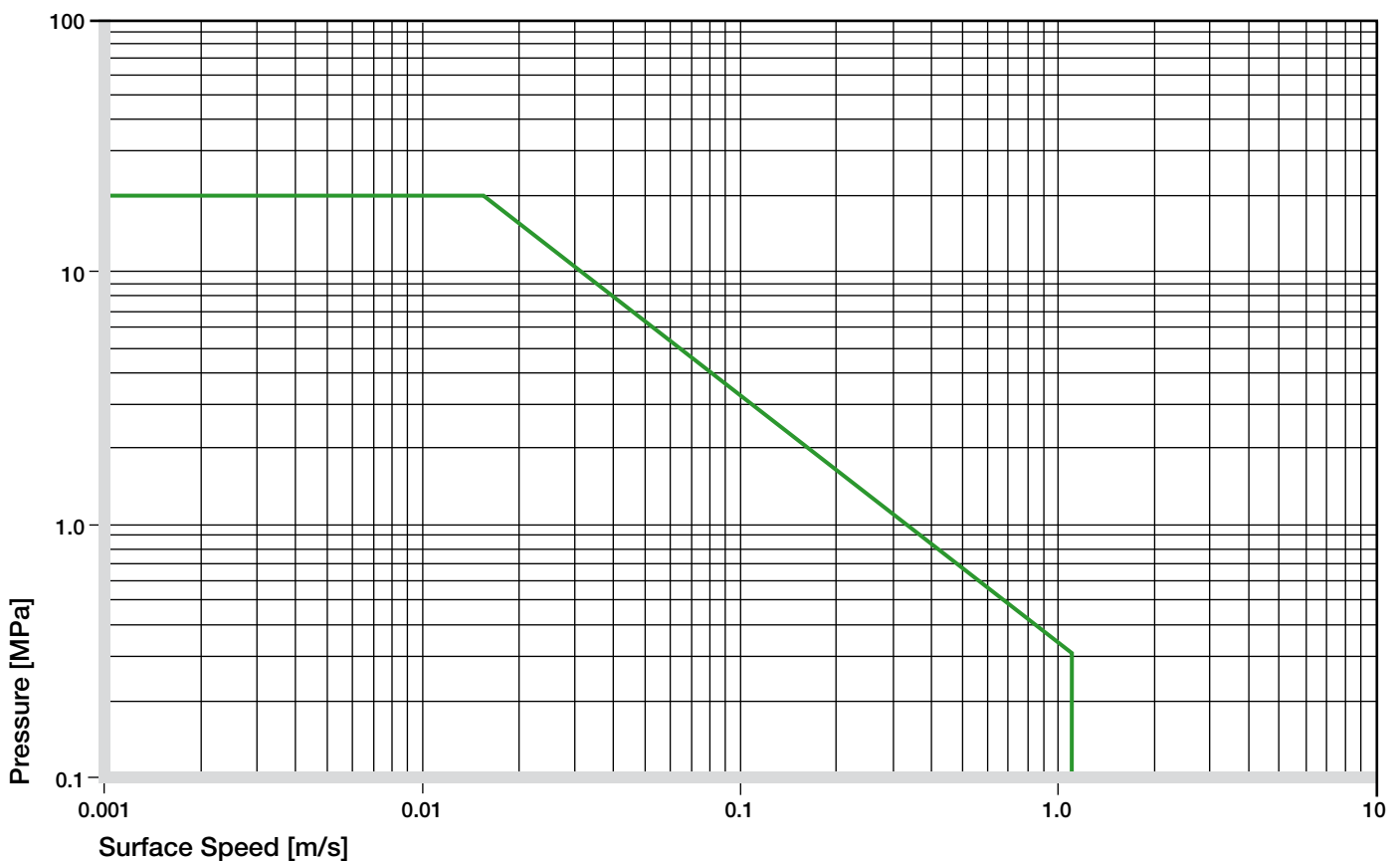


products of iglidur® A180 comply with the requirements of the FDA for repeated contact with food



Material data			
General properties	Unit	iglidur® A180	Testing Method
Density	g/cm ³	1.46	
Colour		white	
Max. moisture absorption at +23°C/50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	1.3	
Coefficient of sliding friction, dynamic against steel	μ	0.05–0.23	
pv value, max. (dry)	MPa · m/s	0.31	
Mechanical properties			
Modulus of elasticity	MPa	2,300	DIN 53457
Tensile strength at +20°C	MPa	88	DIN 53452
Compressive strength	MPa	78	
Max. recommended surface pressure (+20°C)	MPa	28	
Shore D hardness		76	DIN 53505
Physical and thermal properties			
Max. long term application temperature	°C	+90	
Max. short term application temperature	°C	+110	
Min. application temperature	°C	-50	
Thermal conductivity	W/m · K	0.25	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K ⁻¹ · 10 ⁻⁵	11	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 ¹²	DIN IEC 93
Surface resistance	Ω	> 10 ¹¹	DIN 53482

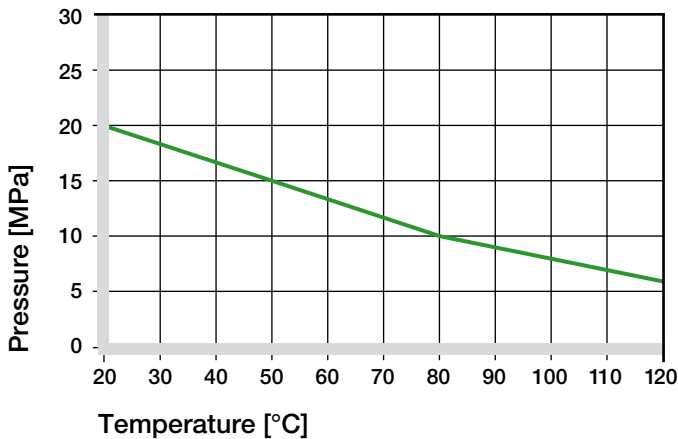
Table 01: Material Data



Graph 01: Permissible pv values for iglidur® A180 with a wall thickness of 1 mm dry running against a steel shaft at +20°C, mounted in a steel housing

Mechanical Properties

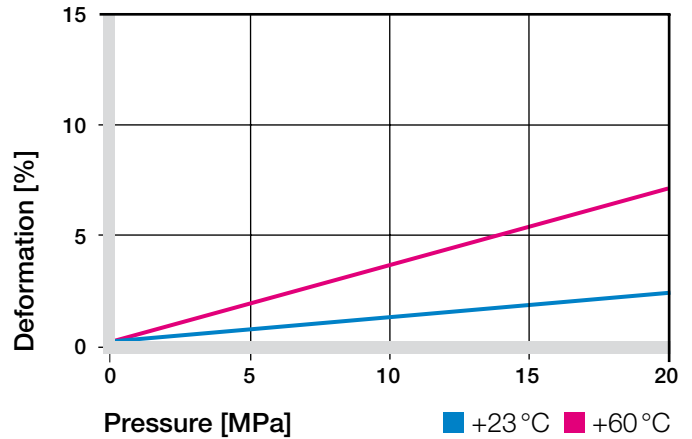
The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. With increasing temperatures, the compressive strength of iglidur® A180 plain bearings decreases. The Graph 02 shows this inverse relationship. However, at the longterm maximum temperature of +90 °C the permissible surface pressure is almost 6 MPa.



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

Bearings made of iglidur® A180 are suitable for application in direct contact with foodstuffs. Hence they are the ideal solution for bearing positions on machines for the food and packaging industries, the medical equipment manufacturing, for small equipment for households, etc. The iglidur® A180 distinguishes itself also in wet cleaning or where process-dependent contact with wet media is the business of the day by its extremely low humidity absorption. Graph 03 shows the elastic deformation of iglidur® A180 during radial loading. At the recommended maximum surface pressure of 20 MPa the deformation is less than 2.5%. Plastic deformation is minimal up to this radial load. However, it is also a result of the service time.

► Surface Pressure, [page 43](#)



Graph 03: Deformation under pressure and temperature

Permissible Surface Speeds

iglidur® A180 is developed for low surface speeds. Maximum speeds up to 0.8 m/s (rotating) and 3.5 m/s (linear) respectively are permitted for continuous application in dry operation.

These given values (table 02) indicate the limits at which an increase up to the continuous permissible temperature occurs. In practice these limit values are not always reached due to interactions.

► Surface Speed, [page 45](#)

► pv value and lubrication, [page 45](#)

m/s	Rotating	Oscillating	Linear
Continuous	0.8	0.6	3.5
Short term	1.2	1	5

Table 02: Maximum running speed

Temperatures

The short-term permitted maximum temperature is +110 °C. With increasing temperatures, the compressive strength of iglidur® A180 bearings decreases. Graph 02 clarifies this connection. The temperatures prevailing in the bearing system also have an influence on the bearing wear.

► Application Temperatures, [page 46](#)

iglidur® A180	Application Temperature
Minimum	-50 °C
Max. long term	+90 °C
Max. short term	+110 °C
Add. securing is required from	+60 °C

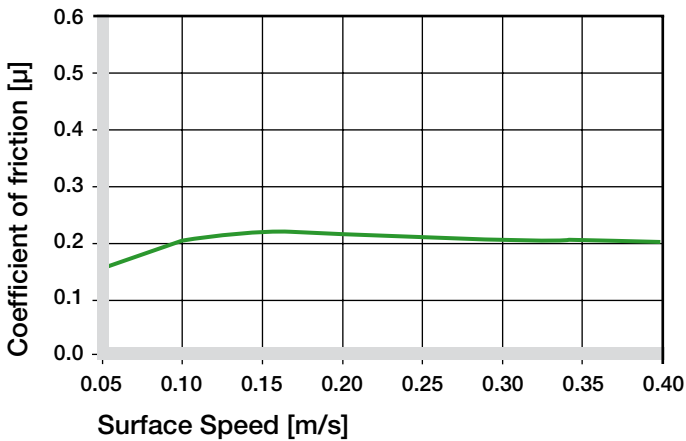
Table 03: Temperature limits

iglidur® A180 | Technical Data

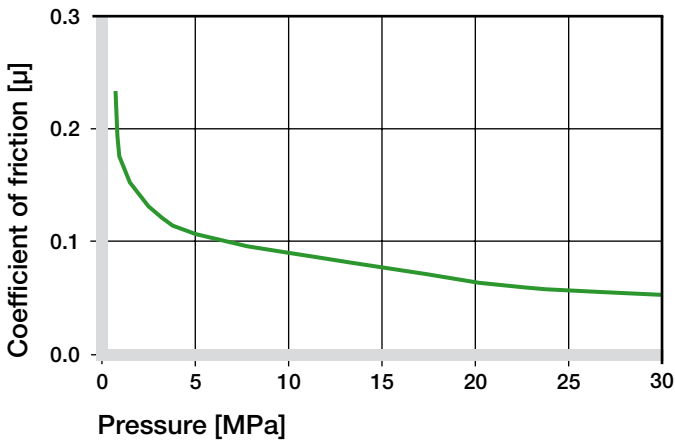
Friction and Wear

Coefficient of friction and wear resistance alter with the application parameters. In the iglidur® A180 bearings, the alteration of the friction coefficient μ dependent on surface speed and the shaft's surface finish is only negligently pronounced. With increasing load, the coefficient of friction however sinks markedly. The coefficient of friction perceptibly reduces straightaway in the load range up to 5 MPa.

- ▶ Coefficients of Friction and Surfaces, **page 48**
- ▶ Wear Resistance, **page 49**



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



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

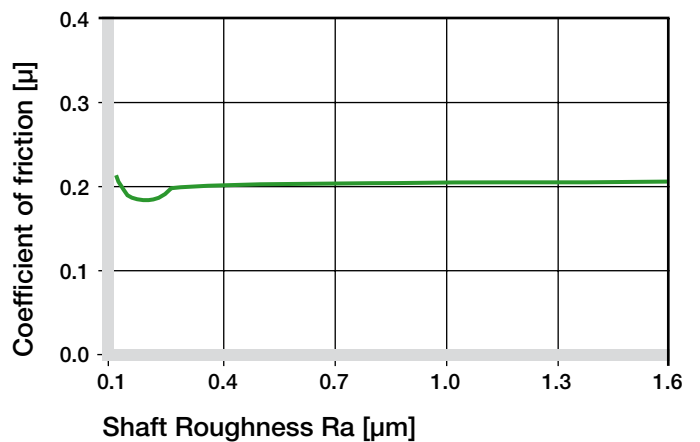
Shaft Materials

Graphs 06 to 09 show the test results of iglidur® A180 bearings running against various shaft materials.

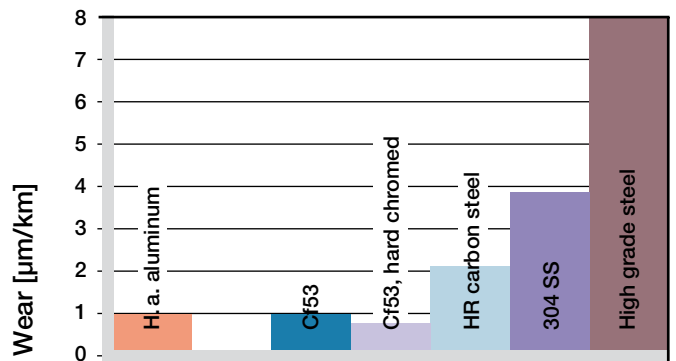
The combination “iglidur® A180/hard-anodized aluminum” clearly stands out. It attains good to excellent wear rates also with other shafts.

With Cf53 shafts, the higher wear in pivoting applications is exemplary compared to rotating applications. Graph 08 clearly shows, in the example of the V2A shafts, the direct increase in wear with rising load with “soft” shafts. The increase is hardly noticeable with hard shafts.

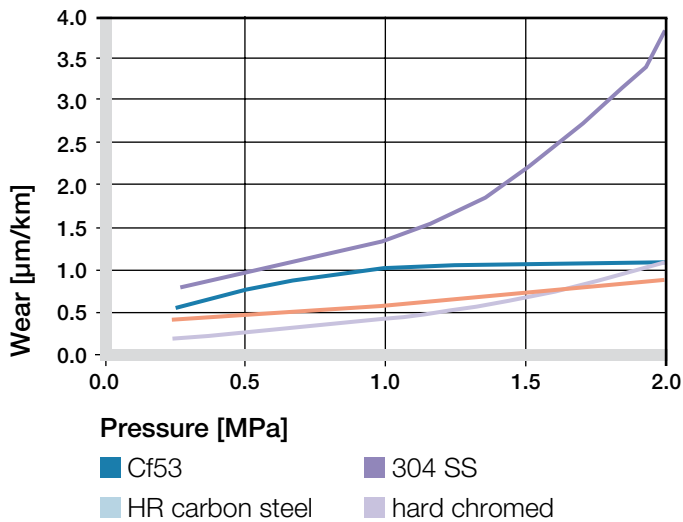
- ▶ Shaft Materials, **page 51**



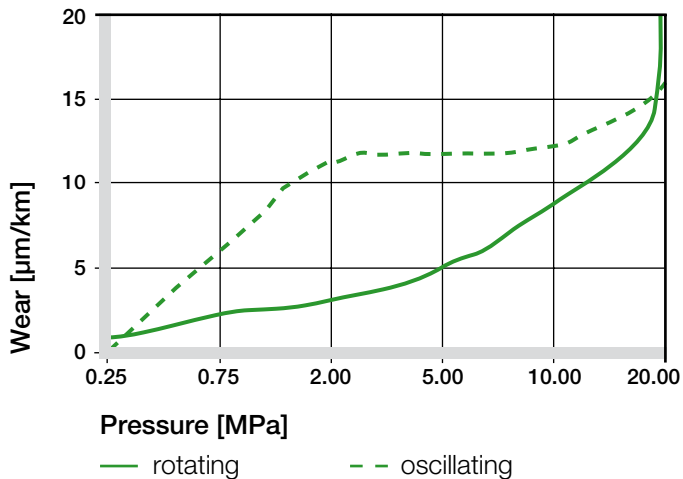
Graph 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)



Graph 07: Wear, rotating with different shaft materials, pressure $p = 2$ MPa, $v = 0.3$ m/s



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



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

iglidur® A180	Dry	Greases	Oil	Water
C.o.f. μ	0.05–0.23	0.09	0.04	0.04

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

Additional Properties

Chemical Resistance

iglidur® A180 bearings can be used under various environmental conditions and in contact with numerous chemicals. Table 05 gives an overview of the chemical resistance of iglidur® A180 bearings at room temperature.

► Chemical Table, page 974

Medium	Resistance
Alcohol	+
Hydrocarbons	+
Greases, oils without additives	+
Fuels	+
Diluted acids	0 to –
Strong acids	–
Diluted alkalines	+
Strong alkalines	+ to 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® A180 are resistant to radiation up to an intensity of $3 \cdot 10^2$ Gy. Higher radiation levels attack the material and can cause the loss of essential mechanical properties.

UV Resistance

iglidur® A180 bearings are resistant to UV radiation, but the tribological properties deteriorate with continuous exposure.

Vacuum

When used in a vacuum environment, the iglidur® A180 plain bearings release moisture as a vapour. Therefore, only dehumidified bearings are suitable in a vacuum environment.

Electrical Properties

iglidur® A180 plain bearings are electrically insulating.

Volume resistance	$> 10^{12} \Omega\text{cm}$
Surface resistance	$> 10^{11} \Omega$

iglidur® A180 | Technical Data

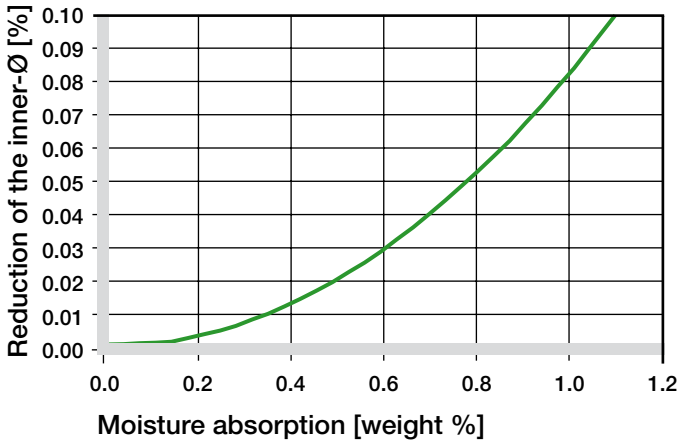
Moisture Absorption

The moisture absorption of iglidur® A180 plain bearings is approximately 0.2 % in standard atmosphere. The saturation limit submerged in water is 5 %. This must be taken into account for these types of applications.

Maximum moisture absorption

At +23 °C/50 % r.h.	0.2 % weight
Max. moisture absorption	1.3 % weight

Table 06: Moisture absorption



Graph 10: Effect of moisture absorption on plain bearings

Installation Tolerances

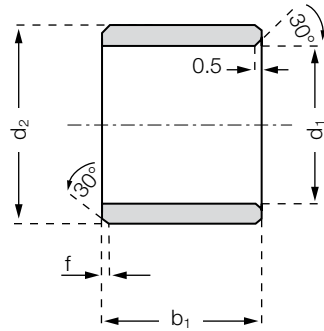
iglidur® A180 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, the inner diameter adjusts to meet the specified tolerances.

► Testing Methods, page 55

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® A180 E10 [mm]	Housing H7 [mm]
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

Table 07: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

Sleeve bearing



Order key

A180SM-0608-10



- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form S)
- Material iglidur® A180

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
A180SM-0608-10	6	+0.020 +0.068	8	10
A180SM-0810-10	8	+0.025 +0.083	10	10
A180SM-1012-10	10	+0.025 +0.083	12	10
A180SM-1214-15	12	+0.032 +0.102	14	15
A180SM-1618-15	16	+0.032 +0.102	18	15
A180SM-2023-20	20	+0.040 +0.124	23	20
A180SM-2528-30	25	+0.040 +0.124	28	30
A180SM-3034-20	30	+0.040 +0.124	34	20

* after pressfit. Testing methods ► page 55



delivery available
time from stock



prices price list online
www.igus.co.uk/en/a180



Order Part Number
example A180SM-0608-10



iglidur® A200 – FDA-compliant and vibration-dampening, absorbs moisture



Standard range from stock

iglidur® A200 material complies with Food and Drug Administration (FDA) regulations

For direct contact with food or pharmaceuticals

For low speeds

iglidur® A200

FDA-compliant and vibration-dampening, absorbs moisture. FDA compliant material for applications with low to medium loads in immediate environs of (or contact) with food or drugs.



iglidur® A200 material complies with FOOD AND DRUG ADMINISTRATION (FDA) regulations

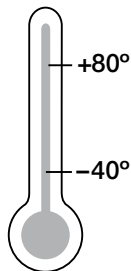


For direct contact with food or pharmaceuticals



For low speeds

Temperature



When to use it?

- Suitable for direct contact with food
- When quiet operation is important
- When dirt needs to become embedded
- If FDA compliance is necessary



When not to use it?

- When the maximum abrasion resistance is necessary
 - ▶ **iglidur® W300, page 131**
- When temperatures are continuously higher than +80 °C
 - ▶ **iglidur® A290, page 417**
 - ▶ **iglidur® A500, page 407**
- When a cost-effective universal bearing is required
 - ▶ **iglidur® G, page 61**
- For operations in wet environments
 - ▶ **iglidur® A180, page 371**

Product range

3 types
Ø 1–32 mm
more dimensions
on request

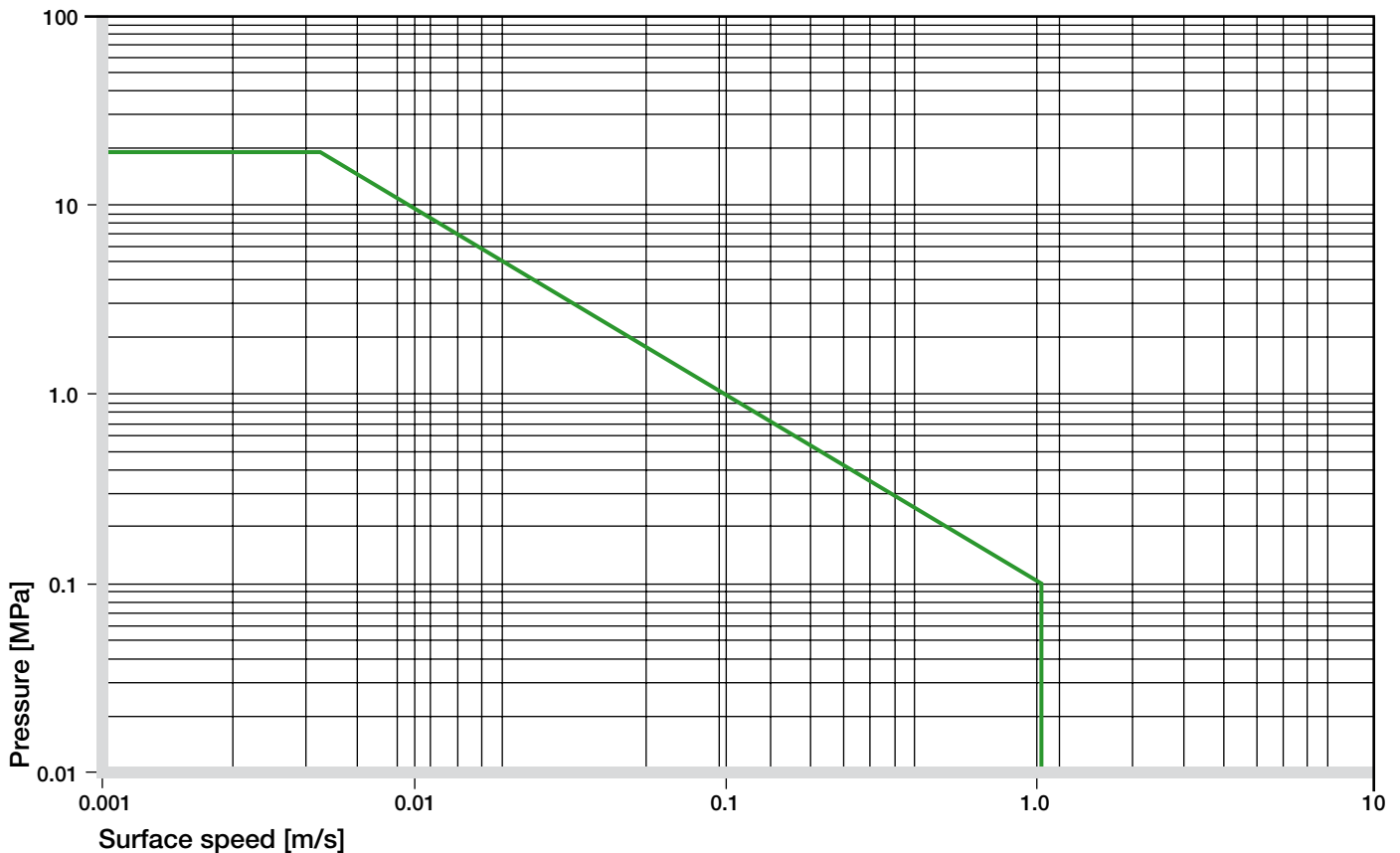


Products of iglidur® A200 comply with the requirements of the FDA for repeated contact with food



Material data			
General properties	Unit	iglidur® A200	Testing method
Density	g/cm ³	1.14	
Colour		white	
Max. moisture absorption at +23°C/50% r.h.	% weight	1.5	DIN 53495
Max. moisture absorption	% weight	7.6	
Coefficient of sliding friction, dynamic against steel	μ	0.10–0.40	
pv value, max. (dry)	MPa · m/s	0.09	
Mechanical properties			
Modulus of elasticity	MPa	2,500	DIN 53457
Tensile strength at +20°C	MPa	116	DIN 53452
Compressive strength	MPa	54	
Max. recommended surface pressure (+20°C)	MPa	18	
Shore D hardness		81	DIN 53505
Physical and thermal properties			
Max. long term application temperature	°C	+80	
Max. short term application temperature	°C	+170	
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	10	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 ¹³	DIN IEC 93
Surface resistance	Ω	> 10 ¹²	DIN 53482

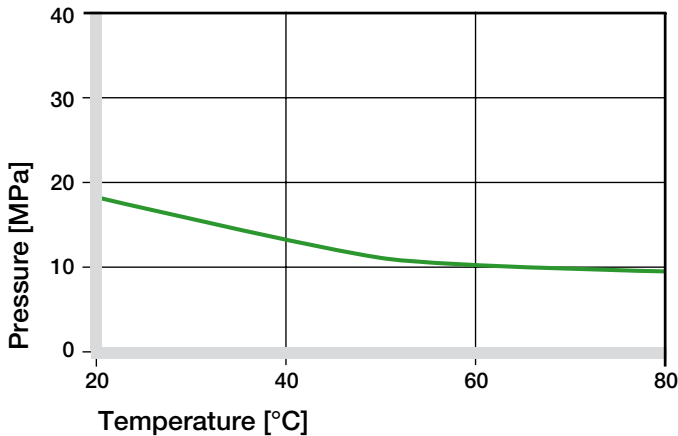
Table 01: Material data



Graph 01: Permissible pv values for iglidur® A200 with a wall thickness of 1 mm dry running against a steel shaft at +20°C, mounted in a steel housing

Mechanical Properties

The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. With increasing temperatures, the compressive strength of iglidur® A200 plain bearings decreases. The Graph 02 shows this inverse relationship. However, at the longterm maximum temperature of +40 °C the permissible surface pressure is almost 5 MPa.



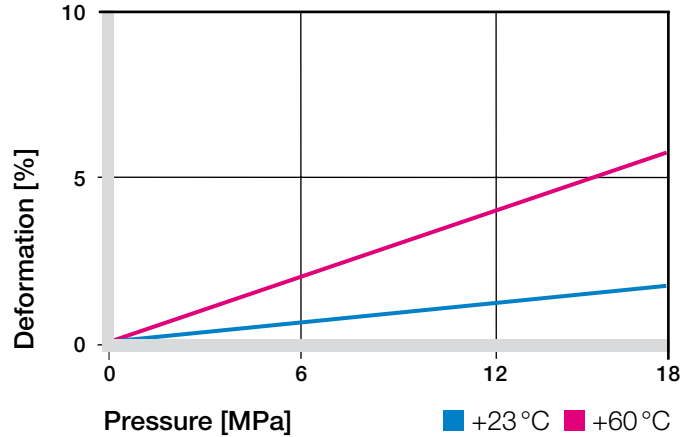
Graph 02: Recommended maximum surface pressure as a function of temperature (18 MPa at +20 °C)

Bearings made of iglidur® A200 are suitable for application in direct contact with foodstuffs. Hence they are the ideal solution for bearing positions in machines for the food industry, medical equipment manufacturing, for small equipment for households, etc. As the admixture of lubricants should be foregone in favor of food compatibility, the thermoplastic composition of iglidur® A200 is particularly adjusted for abrasion resistance. In addition the iglidur® A200 is characterized by its capacity to embed dirt and by its quiet operating behavior.

The good wear properties, dirt resistance and the possibility for dry operation allow to replace elaborately sealed, lubricated bearings for little costs.

Graph 03 shows the elastic deformation of iglidur® A200 during radial loading. At the recommended maximum surface pressure of 18 MPa the deformation is less than 2%. A plastic deformation can be neglected up to this value. It is nonetheless depending on the duration of the applied force.

► Surface Pressure, page 43



Graph 03: Deformation under pressure and temperature

Permissible Surface Speeds

iglidur® A200 was developed for low surface speeds. With regard to running dry in continuous use, a maximum of 0.8 m/s (rotating) or 2 m/s (linear) is possible.

These given values indicate the limits at which an increase up to the continuous permissible temperature occurs. This increase is a result of friction. In practice, these limit values are not often reached, due to varying application conditions.

► Surface Speed, page 45

► pv value, page 45

m/s	Rotating	Oscillating	Linear
Continuous	0.8	0.6	2
Short term	1.5	1.1	3

Table 02: Maximum running speed

Temperatures

The maximum permissible short term temperature +170 °C. With increasing temperatures, the compressive strength of iglidur® A200 plain bearings decreases. Graph 02 shows this relationship. The ambient temperatures prevalent in the bearing system also have an effect on the bearing wear.

► Application Temperatures, page 46

iglidur® A200	Application temperature
Minimum	-40 °C
Max. long term	+80 °C
Max. short term	+170 °C
Add. securing is required from	+50 °C

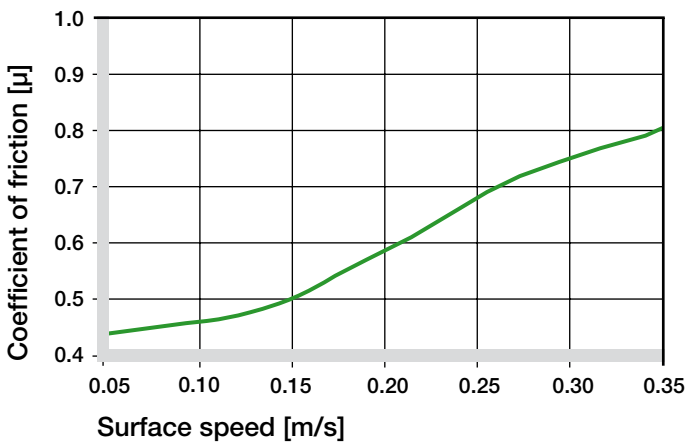
Table 03: Temperature limits

iglidur® A200 | Technical Data

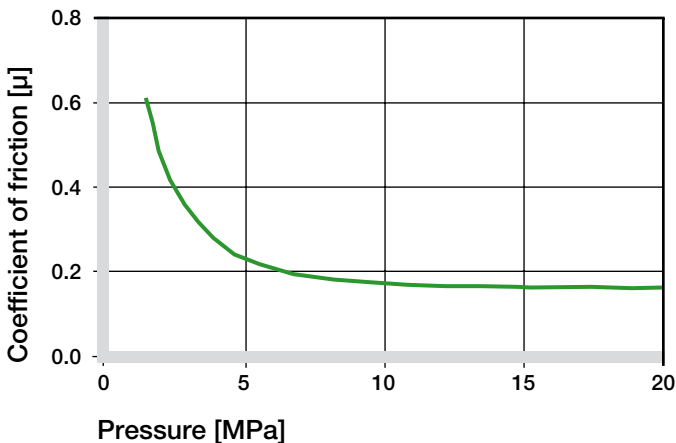
Friction and Wear

Just as the wear resistance, the coefficient of friction also changes with the load. For iglidur® A200 plain bearings, the coefficient of friction μ decreases slightly with increasing load. Friction and wear also depend to a high degree on the reverse partner. The shaft can be a decisive factor for an ideal pairing of the bearing system. Thus extremely smooth shafts enhance not only the coefficient of friction, but also the bearing wear. The most suited are smoothed surfaces with an average surface finish of $R_a = 0.4$ to $0.6 \mu\text{m}$.

- ▶ Coefficients of Friction and Surfaces, **page 48**
- ▶ Wear Resistance, **page 49**



Graph 04: Coefficient of friction as a function of the running speed, $p = 0.75 \text{ MPa}$

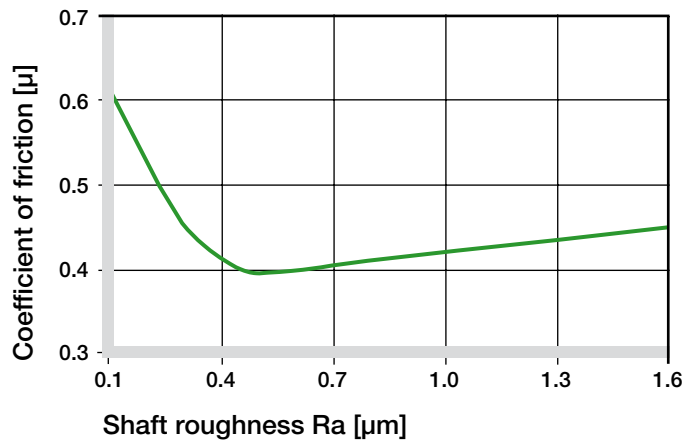


Graph 05: Coefficient of friction as a function of the pressure, $v = 0.01 \text{ m/s}$

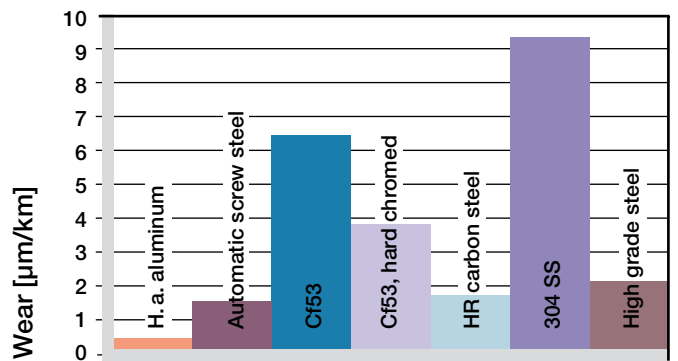
Shaft Materials

Graphs 06 to 09 show the test results of iglidur® A200 bearings running against various shaft materials. The combination “iglidur® A200/hard-chromed shaft” clearly stands out. Up to a range of about 2.5 MPa , the wear of this combination remains largely independent of load. In pivoting applications below a load $p = 2 \text{ MPa}$, the wear of iglidur® A200 bearings is higher than in rotating applications with equal load. Here the St37 shaft is a positive exception with its much less coefficient of wear.

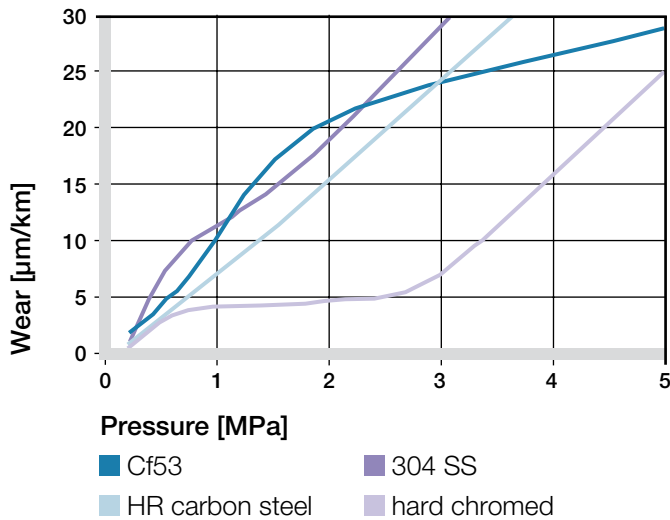
- ▶ Shaft Materials, **page 51**



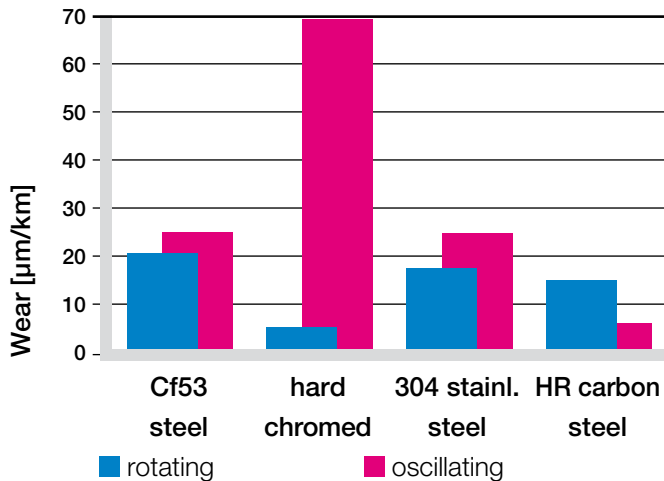
Graph 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)



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



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



Graph 09: Wear for rotating and oscillating applications with different shaft materials, p = 2 MPa

iglidur® A200	Dry	Greases	Oil	Water
C. o. f. μ	0.1–0.4	0.09	0.04	0.04

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

Additional Properties

Chemical Resistance

iglidur® A200 plain bearings have strong resistance to chemicals. They are also resistant to most lubricants.

► Chemical Table, page 974

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

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

Table 05: Chemical resistance

Radiation Resistance

Plain bearings made of iglidur® A200 are resistant to radiation up to an intensity of $1 \cdot 10^4$ Gy. Higher radiation levels attack the material and can cause the loss of essential mechanical properties.

UV Resistance

iglidur® A200 plain bearings are resistant to UV radiation.

Vacuum

In a vacuum environment, iglidur® A200 plain bearings have restricted use.

Electrical Properties

iglidur® A200 plain bearings are electrically insulating.

Volume resistance	$> 10^{13} \Omega\text{cm}$
Surface resistance	$> 10^{11} \Omega$

iglidur® A200 | Technical Data

Moisture Absorption

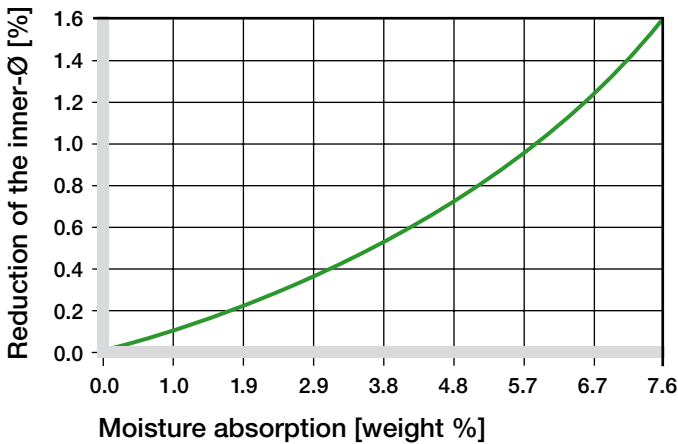
The moisture absorption of iglidur® A200 plain bearings is approximately 1.5 % in standard atmosphere. The saturation limit submerged in water is 7.6 %. This must be taken into account for these types of applications.

Maximum moisture absorption

At +23 °C/50 % r.h. 1.5 % weight

Max. moisture absorption 7.6 % weight

Table 06: Moisture absorption



Graph 10: Effect of moisture absorption on plain bearings

Installation Tolerances

iglidur® A200 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9).

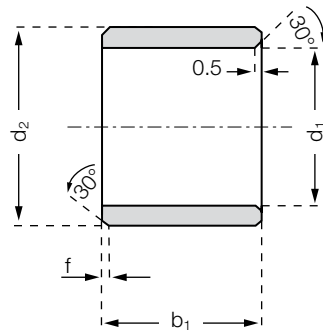
The bearings are designed for pressfit into a housing machined to a H7 tolerance. After the installation in a housing bore with the tolerance H7, the inner diameter of the bearing automatically adjusts to the D11 tolerance.

► Testing Methods, page 55

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® A200 D11 [mm]	Housing H7 [mm]
up to 3	0-0.025	+0.020 +0.080	0 +0.010
> 3 to 6	0-0.030	+0.030 +0.105	0 +0.012
> 6 to 10	0-0.036	+0.040 +0.130	0 +0.015
> 10 to 18	0-0.043	+0.050 +0.160	0 +0.018
> 18 to 30	0-0.052	+0.065 +0.195	0 +0.021
> 30 to 50	0-0.062	+0.080 +0.240	0 +0.025

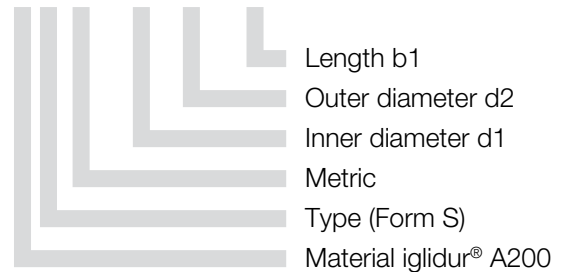
Table 07: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

Sleeve bearing



Order key

ASM-0103-02



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
ASM-0103-02	1.0	+0.020 +0.080	3.0	2.0
ASM-0104-02	1.5	+0.020 +0.080	4.0	2.0
ASM-0205-02	2.0	+0.020 +0.080	5.0	2.0
ASM-0205-03	2.0	+0.020 +0.080	5.0	3.0
ASM-0206-03	2.5	+0.020 +0.080	6.0	3.0
ASM-0305-03	3.0	+0.020 +0.080	5.0	3.0
ASM-0305-04	3.0	+0.020 +0.080	5.0	4.0
ASM-0306-03	3.0	+0.020 +0.080	6.0	3.0
ASM-0306-04	3.0	+0.020 +0.080	6.0	4.0
ASM-0407-03	4.0	+0.030 +0.105	7.0	3.0
ASM-0407-04	4.0	+0.030 +0.105	7.0	4.0
ASM-0407-06	4.0	+0.030 +0.105	7.0	6.0
ASM-0408-06	4.0	+0.030 +0.105	8.0	6.0
ASM-0508-04	5.0	+0.030 +0.105	8.0	4.0
ASM-0508-05	5.0	+0.030 +0.105	8.0	5.0
ASM-0508-08	5.0	+0.030 +0.105	8.0	8.0
ASM-0509-05	5.0	+0.030 +0.105	9.0	5.0
ASM-0509-08	5.0	+0.030 +0.105	9.0	8.0
ASM-0608-10	6.0	+0.030 +0.105	8.0	10.0
ASM-0609-06	6.0	+0.030 +0.105	9.0	6.0
ASM-0610-04	6.0	+0.030 +0.105	10.0	4.0
ASM-0610-06	6.0	+0.030 +0.105	10.0	6.0
ASM-0610-10	6.0	+0.030 +0.105	10.0	10.0
ASM-0612-06	6.0	+0.030 +0.105	12.0	6.0
ASM-0612-10	6.0	+0.030 +0.105	12.0	10.0

Part number	d1	d1-Tolerance*	d2	b1 h13
ASM-0710-05	7.0	+0.040 +0.130	10.0	5.0
ASM-0710-08	7.0	+0.040 +0.130	10.0	8.0
ASM-0810-06	8.0	+0.040 +0.130	10.0	6.0
ASM-0810-08	8.0	+0.040 +0.130	10.0	8.0
ASM-0810-10	8.0	+0.040 +0.130	10.0	10.0
ASM-0811-08	8.0	+0.040 +0.130	11.0	8.0
ASM-0811-12	8.0	+0.040 +0.130	11.0	12.0
ASM-0812-06	8.0	+0.040 +0.130	12.0	6.0
ASM-0812-08	8.0	+0.040 +0.130	12.0	8.0
ASM-0812-10	8.0	+0.040 +0.130	12.0	10.0
ASM-0812-12	8.0	+0.040 +0.130	12.0	12.0
ASM-0814-06	8.0	+0.040 +0.130	14.0	6.0
ASM-0814-10	8.0	+0.040 +0.130	14.0	10.0
ASM-0912-14	9.0	+0.040 +0.130	12.0	14.0
ASM-1012-10	10.0	+0.040 +0.130	12.0	10.0
ASM-1014-06	10.0	+0.040 +0.130	14.0	6.0
ASM-1014-08	10.0	+0.040 +0.130	14.0	8.0
ASM-1014-10	10.0	+0.040 +0.130	14.0	10.0
ASM-1014-16	10.0	+0.040 +0.130	14.0	16.0
ASM-1016-06	10.0	+0.040 +0.130	16.0	6.0
ASM-1016-10	10.0	+0.040 +0.130	16.0	10.0
ASM-1016-16	10.0	+0.040 +0.130	16.0	16.0
ASM-1214-20	12.0	+0.050 +0.160	14.0	20.0
ASM-1216-15	12.0	+0.050 +0.160	16.0	15.0
ASM-1216-20	12.0	+0.050 +0.160	16.0	20.0

* after pressfit. Testing methods ► page 55



delivery available
time from stock



prices price list online
www.igus.co.uk/en/a200



order part number
example ASM-0103-02



Sleeve bearing

Dimensions [mm]

Part number	d1	d1-Tolerance*		d2	b1 h13
ASM-1218-08	12.0	+0.050	+0.160	18.0	8.0
ASM-1218-10	12.0	+0.050	+0.160	18.0	10.0
ASM-1218-15	12.0	+0.050	+0.160	18.0	15.0
ASM-1218-20	12.0	+0.050	+0.160	18.0	20.0
ASM-1416-10	14.0	+0.050	+0.160	16.0	10.0
ASM-1416-15	14.0	+0.050	+0.160	16.0	15.0
ASM-1416-20	14.0	+0.050	+0.160	16.0	20.0
ASM-1420-10	14.0	+0.050	+0.160	20.0	10.0
ASM-1420-15	14.0	+0.050	+0.160	20.0	15.0
ASM-1420-20	14.0	+0.050	+0.160	20.0	20.0
ASM-1517-10	15.0	+0.050	+0.160	17.0	10.0
ASM-1517-15	15.0	+0.050	+0.160	17.0	15.0
ASM-1521-10	15.0	+0.050	+0.160	21.0	10.0
ASM-1521-15	15.0	+0.050	+0.160	21.0	15.0
ASM-1521-20	15.0	+0.050	+0.160	21.0	20.0
ASM-1618-12	16.0	+0.050	+0.160	18.0	12.0
ASM-1618-20	16.0	+0.050	+0.160	18.0	20.0
ASM-1620-20	16.0	+0.050	+0.160	20.0	20.0
ASM-1620-25	16.0	+0.050	+0.160	20.0	25.0
ASM-1622-12	16.0	+0.050	+0.160	22.0	12.0
ASM-1622-15	16.0	+0.050	+0.160	22.0	15.0
ASM-1622-16	16.0	+0.050	+0.160	22.0	16.0
ASM-1622-20	16.0	+0.050	+0.160	22.0	20.0
ASM-1622-25	16.0	+0.050	+0.160	22.0	25.0
ASM-1824-12	18.0	+0.050	+0.160	24.0	12.0
ASM-1824-20	18.0	+0.050	+0.160	24.0	20.0
ASM-1824-30	18.0	+0.050	+0.160	24.0	30.0
ASM-2023-15	20.0	+0.065	+0.195	23.0	15.0
ASM-2023-20	20.0	+0.065	+0.195	23.0	20.0
ASM-2025-20	20.0	+0.065	+0.195	25.0	20.0
ASM-2025-15	20.0	+0.065	+0.195	25.0	15.0
ASM-2025-30	20.0	+0.065	+0.195	25.0	30.0
ASM-2026-15	20.0	+0.065	+0.195	26.0	15.0

Part number	d1	d1-Tolerance*		d2	b1 h13
ASM-2026-20	20.0	+0.065	+0.195	26.0	20.0
ASM-2026-30	20.0	+0.065	+0.195	26.0	30.0
ASM-2226-15	22.0	+0.065	+0.195	26.0	15.0
ASM-2228-10	22.0	+0.065	+0.195	28.0	10.0
ASM-2228-15	22.0	+0.065	+0.195	28.0	15.0
ASM-2228-20	22.0	+0.065	+0.195	28.0	20.0
ASM-2228-30	22.0	+0.065	+0.195	28.0	30.0
ASM-2430-15	24.0	+0.065	+0.195	30.0	15.0
ASM-2430-20	24.0	+0.065	+0.195	30.0	20.0
ASM-2430-30	24.0	+0.065	+0.195	30.0	30.0
ASM-2528-12	25.0	+0.065	+0.195	28.0	12.0
ASM-2528-20	25.0	+0.065	+0.195	28.0	20.0
ASM-2530-20	25.0	+0.065	+0.195	30.0	20.0
ASM-2530-30	25.0	+0.065	+0.195	30.0	30.0
ASM-2530-40	25.0	+0.065	+0.195	30.0	40.0
ASM-2532-20	25.0	+0.065	+0.195	32.0	20.0
ASM-2532-30	25.0	+0.065	+0.195	32.0	30.0
ASM-2532-40	25.0	+0.065	+0.195	32.0	40.0
ASM-2630-20	26.0	+0.065	+0.195	30.0	20.0
ASM-2632-30	26.0	+0.065	+0.195	32.0	30.0
ASM-2734-20	27.0	+0.065	+0.195	34.0	20.0
ASM-2734-30	27.0	+0.065	+0.195	34.0	30.0
ASM-2734-40	27.0	+0.065	+0.195	34.0	40.0
ASM-2833-20	28.0	+0.065	+0.195	33.0	20.0
ASM-2836-20	28.0	+0.065	+0.195	36.0	20.0
ASM-2836-30	28.0	+0.065	+0.195	36.0	30.0
ASM-2836-40	28.0	+0.065	+0.195	36.0	40.0
ASM-3038-20	30.0	+0.065	+0.195	38.0	20.0
ASM-3038-30	30.0	+0.065	+0.195	38.0	30.0
ASM-3038-40	30.0	+0.065	+0.195	38.0	40.0
ASM-3240-20	32.0	+0.080	+0.240	40.0	20.0
ASM-3240-30	32.0	+0.080	+0.240	40.0	30.0
ASM-3240-40	32.0	+0.080	+0.240	40.0	40.0

* after pressfit. Testing methods ► page 55



iglidur® A500 – FDA-material for high temperatures and high load



Standard range from stock

Lubrication- and maintenance-free

Complies with FDA regulations

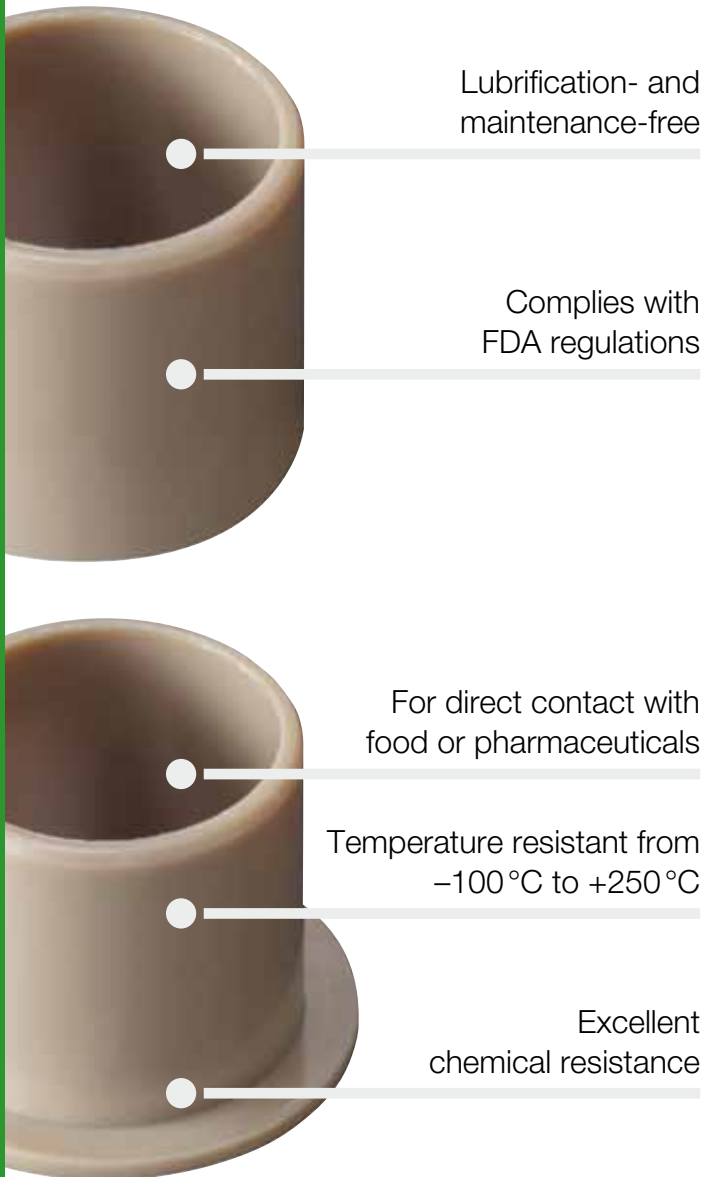
For direct contact with food or pharmaceuticals

Temperature resistant from -100°C to $+250^{\circ}\text{C}$

High chemical-resistance

iglidur® A500

FDA-material for high temperatures and high load. Polymer bearings made from iglidur® A500 can be exposed to extremely high temperatures and consist of materials suitable for direct contact with food (FDA-conformity).



When to use it?

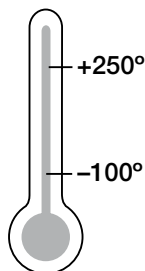
- When FDA compliance is required
- When a high chemical resistance is required
- Good abrasion resistance
- Temperature resistant from -100 °C to +250 °C



When not to use it?

- When the highest wear resistance is required
 - ▶ iglidur® X, page 153
 - ▶ iglidur® Z, page 299
- If no resistance to temperature or chemicals is required
 - ▶ iglidur® A180, page 371
 - ▶ iglidur® A200, page 381
- When a cost-effective universal bearing is required
 - ▶ iglidur® G, page 61
 - ▶ iglidur® P, page 185

Temperature



Product range

2 types
 Ø 4–50 mm
 more dimensions
 on request

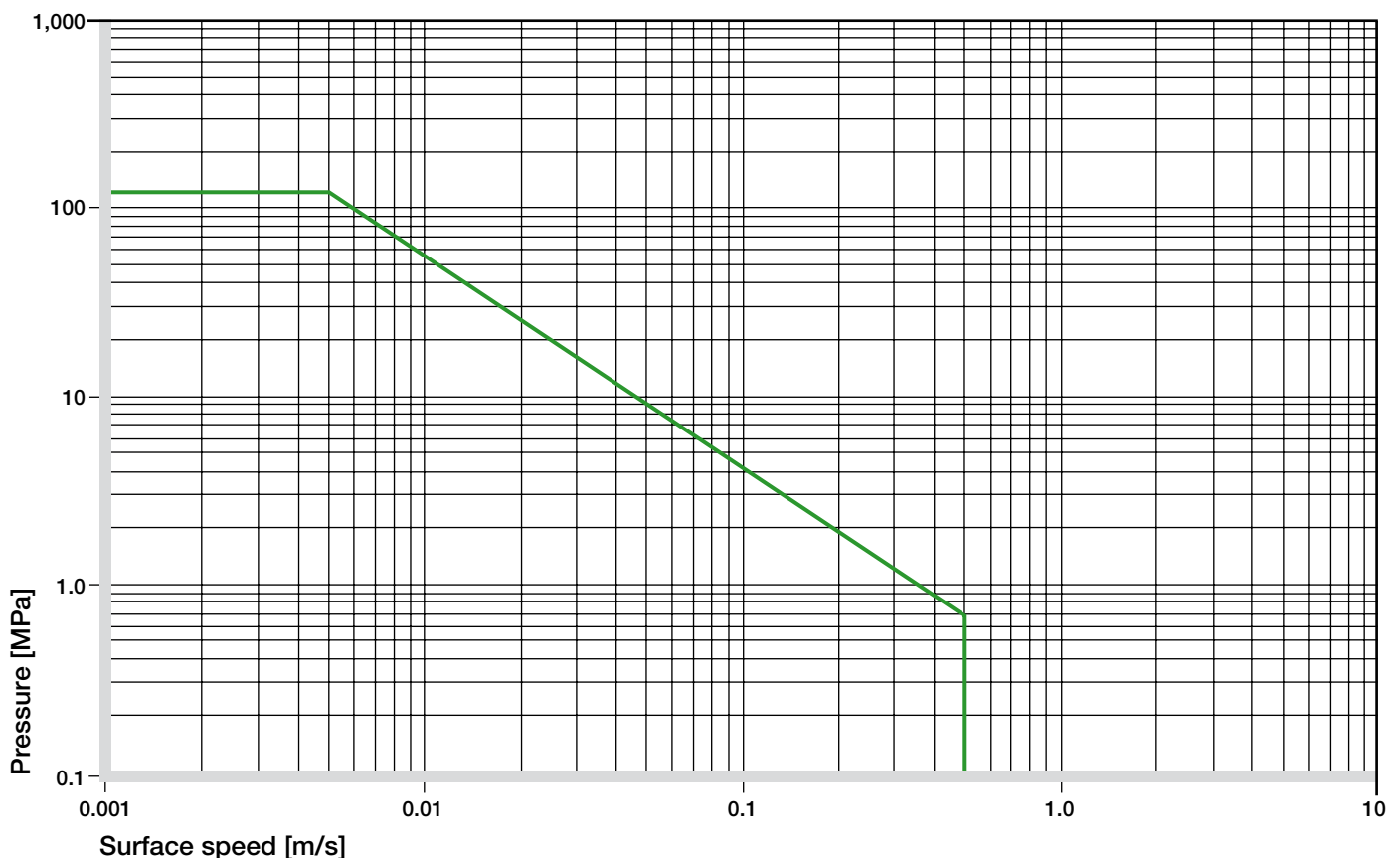


The material iglidur® A500 complies with the requirements of the FDA for repeated contact with food.



Material data			
General properties	Unit	iglidur® A500	Testing method
Density	g/cm ³	1.28	
Colour		brown	
Max. moisture absorption at +23°C/50% r.h.	% weight	0.3	DIN 53495
Max. moisture absorption	% weight	0.5	
Coefficient of sliding friction, dynamic against steel	μ	0.26–0.41	
pv value, max. (dry)	MPa · m/s	0.28	
Mechanical properties			
Modulus of elasticity	MPa	3,600	DIN 53457
Tensile strength at +20°C	MPa	140	DIN 53452
Compressive strength	MPa	118	
Max. recommended surface pressure (+20°C)	MPa	120	
Shore D hardness		83	DIN 53505
Physical and thermal properties			
Max. long term application temperature	°C	+250	
Max. short term application temperature	°C	+300	
Min. application temperature	°C	-100	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K ⁻¹ · 10 ⁻⁵	9	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 ¹⁴	DIN IEC 93
Surface resistance	Ω	> 10 ¹³	DIN 53482

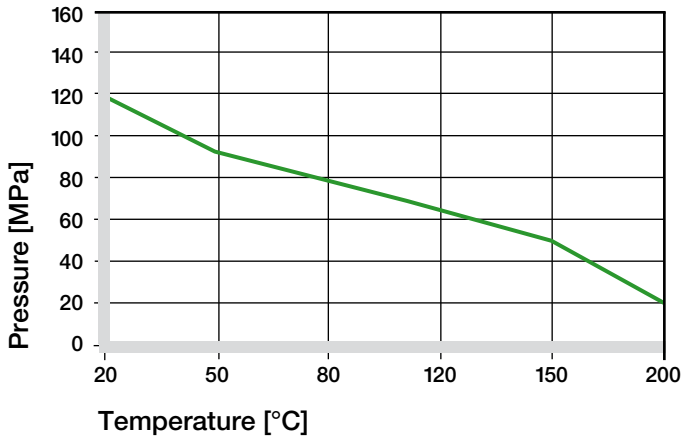
Table 01: Material data



Graph 01: Permissible pv values for iglidur® A500 with a wall thickness of 1 mm dry running against a steel shaft at +20°C, mounted in a steel housing

Mechanical Properties

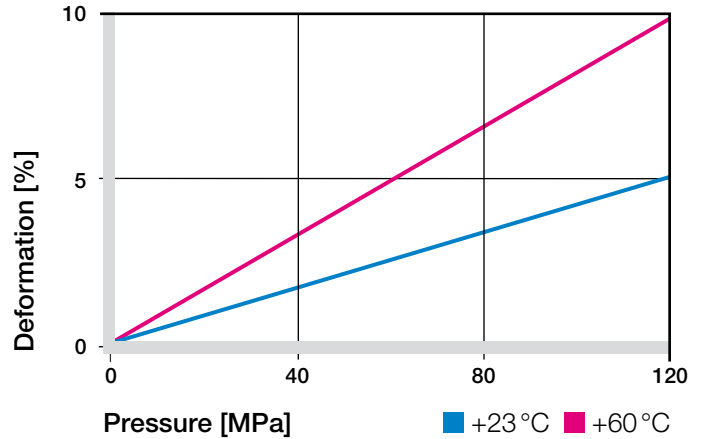
The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. With increasing temperatures, the compressive strength of iglidur® A500 plain bearings decreases. The Graph 02 shows this inverse relationship. However, at the longterm maximum temperature of +200 °C the permissible surface pressure is almost 20 MPa.



Graph 02: Recommended maximum surface pressure as a function of temperature (120 MPa at +20 °C)

Bearings made of iglidur® A500 can be used at high temperatures and are permitted for use in direct contact with foodstuffs (FDA compatible). They exhibit an exceptionally good chemical resistance and are suitable for heavy-duty use in machinery for the food industry. Though iglidur® A500 is an extremely soft material, it simultaneously possesses an excellent compressive strength even at high temperatures. Graph 03 shows the maximum recommended surface pressure of the bearing dependent on the temperature. This combination of high stability and high flexibility acts very positively during vibrations and edge loads. As the wear of the bearing rapidly escalates from pressures of 10 to 20 MPa, we recommend a particularly accurate testing of the application above these limits.

► Surface Pressure, [page 43](#)



Graph 03: Deformation under pressure and temperature

Permissible Surface Speeds

iglidur® A500 also permits high surface speeds due to the high temperature resistance. The coefficient of friction rises however by these high rotatory speeds leading to a higher heating up of the bearing. Tests show that bearings made of iglidur® A500 are more wear resistant in pivoting motions, and the permitted pv values are also higher in the pivoting application.

► Surface Speed, [page 45](#)

m/s	Rotating	Oscillating	Linear
Continuous	0.6	0.4	1
Short term	1	0.7	2

Table 02: Maximum running speed

Temperatures

The short-term permitted maximum application temperature is +300 °C. With increasing temperatures, the compressive strength of iglidur® A500 bearings decreases. Graph 02 clarifies this connection. The temperatures prevailing in the bearing system also have an influence on the bearing wear.

► Application Temperatures, [page 46](#)

iglidur® A500	Application temperature
Minimum	-100 °C
Max. long term	+250 °C
Max. short term	+300 °C
Add. securing is required from	+130 °C

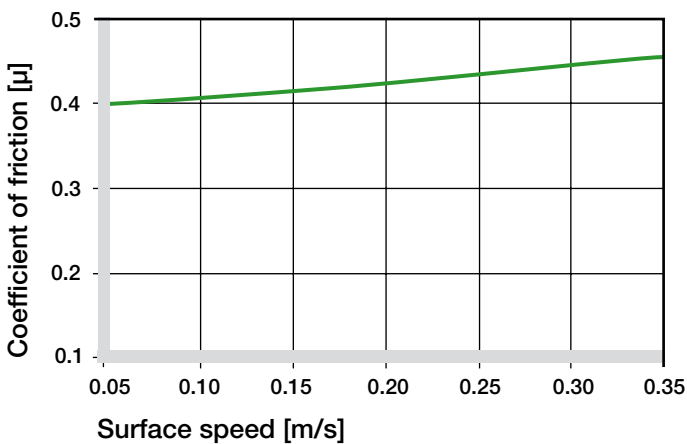
Table 03: Temperature limits

iglidur® A500 | Technical Data

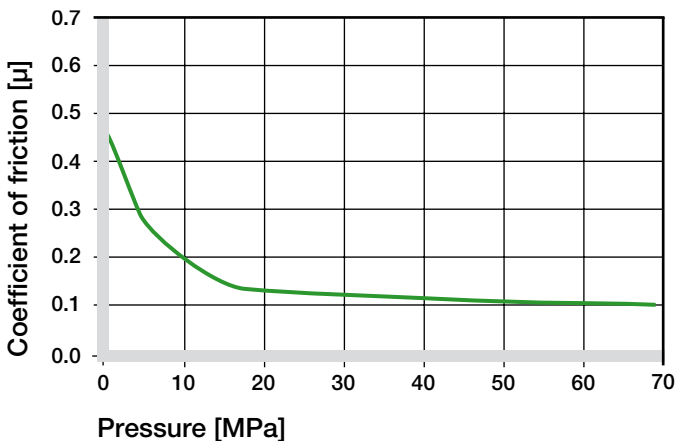
Friction and Wear

The coefficient of friction is dependent on the load that acts on the bearing. In iglidur® A500 bearings, the friction coefficient μ initially declines with increasing load. The most favorable coefficient of friction is attained from about 10 MPa. Friction and wear also depend to a high degree on the reverse partner. Thus extremely smooth shafts enhance not only the coefficient of friction, but also the bearing wear. The most suited are smoothed surfaces with an average surface finish of $R_a = 0.4$ to $0.6 \mu\text{m}$.

- ▶ Coefficients of Friction and Surfaces, **page 48**
- ▶ Wear Resistance, **page 49**



Graph 04: Coefficient of friction as a function of the running speed, $p = 0.75 \text{ MPa}$



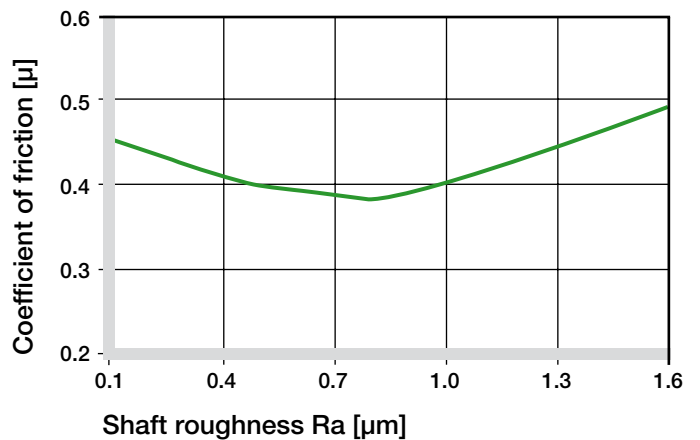
Graph 05: Coefficient of friction as a function of the pressure, $v = 0.01 \text{ m/s}$

Shaft Materials

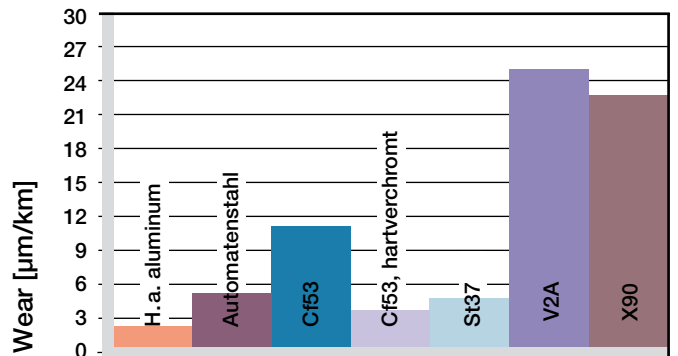
The graphs 06 to 09 display a summary of the results of tests with different shaft materials conducted with bearings made of iglidur® A500. The combination “iglidur® A500/hard-chromed shaft” clearly stands out in rotating application. Up to about 2.0 MPa, the wear of this combination remains largely independent of load. In pivoting motions with Cf53 shafts, the wear resistance is better than in rotations under equal load.

Please contact us in case the shaft material scheduled by you is not included in these figures.

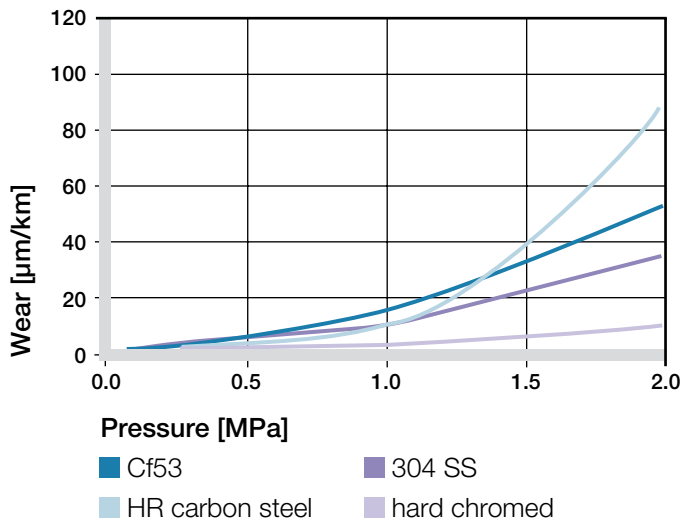
- ▶ Shaft Materials, **page 51**



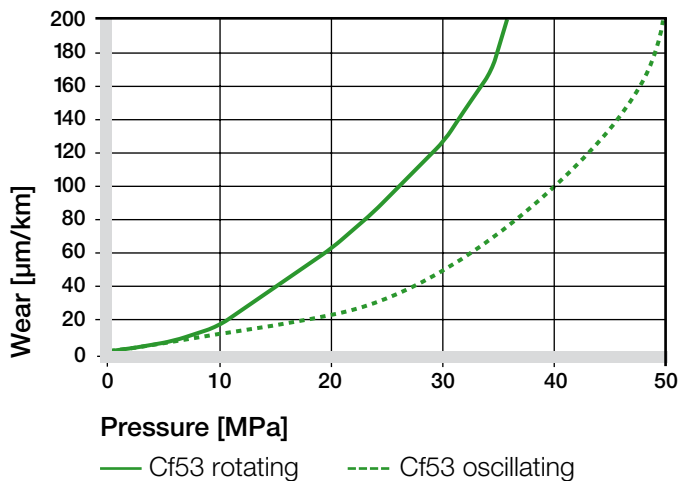
Graph 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)



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



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



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

iglidur® A500	Dry	Greases	Oil	Water
C. o. f. μ	0.26–0.41	0.09	0.04	0.04

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

Additional Properties

Chemical Resistance

iglidur® A500 plain bearings feature an excellent resistance with regard to detergents, greases, oils, bases and acids.

► Chemical Table, page 974

Medium	Resistance
Alcohol	+
Hydrocarbons	+
Greases, oils without additives	+
Fuels	+
Diluted acids	+
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 of iglidur® A500 rank among the most radiation resistant products in the iglidur® range. The bearings are resistant up to a radiation intensity of $2 \cdot 10^5$ Gy. Higher radiation affects the material and can result in the loss of basic mechanical characteristics.

UV Resistance

To a large extent, iglidur® A500 plain bearings are resistant to UV radiation.

Vacuum

In a vacuum, iglidur® A500 plain bearings can only be used to a limited degree.

Electrical Properties

iglidur® A500 plain bearings are electrically insulating.

Volume resistance	$> 10^{14} \Omega\text{cm}$
Surface resistance	$> 10^{13} \Omega$

iglidur® A500 | Technical Data

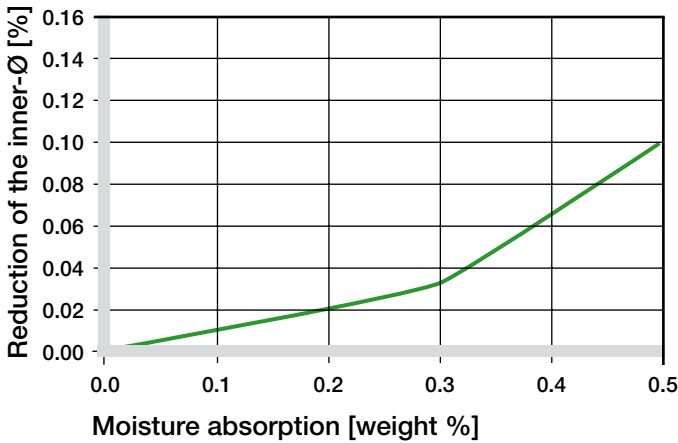
Moisture Absorption

The moisture absorption of iglidur® A500 plain bearings is only 0.5 % when saturated.

Maximum moisture absorption

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

Table 06: Moisture absorption



Graph 10: Effect of moisture absorption on plain bearings

Installation Tolerances

iglidur® A500 bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). After the installation in a housing bore with H7 tolerance, the inner diameter of the bearing automatically adjusts to the E10 tolerance.

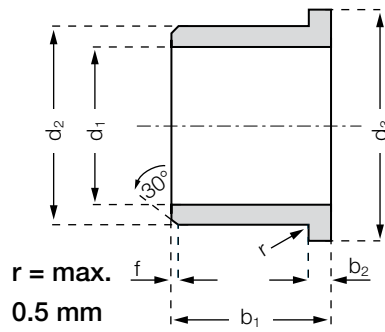
► Testing Methods, page 55

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® A500 F10 [mm]	Housing H7 [mm]
up to 3	0-0.025	+0.006 +0.046	0 +0.010
> 3 to 6	0-0.030	+0.010 +0.058	0 +0.012
> 6 to 10	0-0.036	+0.013 +0.071	0 +0.015
> 10 to 18	0-0.043	+0.016 +0.086	0 +0.018
> 18 to 30	0-0.052	+0.020 +0.104	0 +0.021
> 30 to 50	0-0.062	+0.025 +0.125	0 +0.025
> 50 to 80	0-0.074	+0.030 +0.150	0 +0.030

Table 07: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

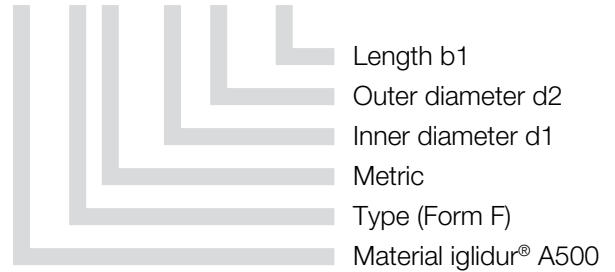
iglidur® A500 | Product Range

Flange bearing



Order key

A500FM-0405-04



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
A500FM-0405-04	4.0	+0.010 +0.058	5.5	9.5	4.0	0.75
A500FM-0608-06	6.0	+0.010 +0.058	8.0	12.0	6.0	1.0
A500FM-0810-10	8.0	+0.013 +0.071	10.0	15.0	10.0	1.0
A500FM-1012-09	10.0	+0.013 +0.071	12.0	18.0	9.0	1.0
A500FM-1012-15	10.0	+0.013 +0.071	12.0	18.0	15.0	1.0
A500FM-1214-13	12.0	+0.016 +0.086	14.0	20.0	13.0	1.0
A500FM-1214-15	12.0	+0.016 +0.086	14.0	20.0	15.0	1.0
A500FM-1517-17	15.0	+0.016 +0.086	17.0	23.0	17.0	1.0
A500FM-1618-17	16.0	+0.016 +0.086	18.0	24.0	17.0	1.0
A500FM-2023-21	20.0	+0.020 +0.104	23.0	30.0	21.0	1.5
A500FM-3034-40	30.0	+0.020 +0.104	34.0	42.0	40.0	2.0
A500FM-3539-40	35.0	+0.025 +0.125	39.0	47.0	40.0	2.0

* after pressfit. Testing methods ► page 55



delivery available
time from stock



prices price list online
www.igus.co.uk/en/a500



order part number
example A500FM-0405-04