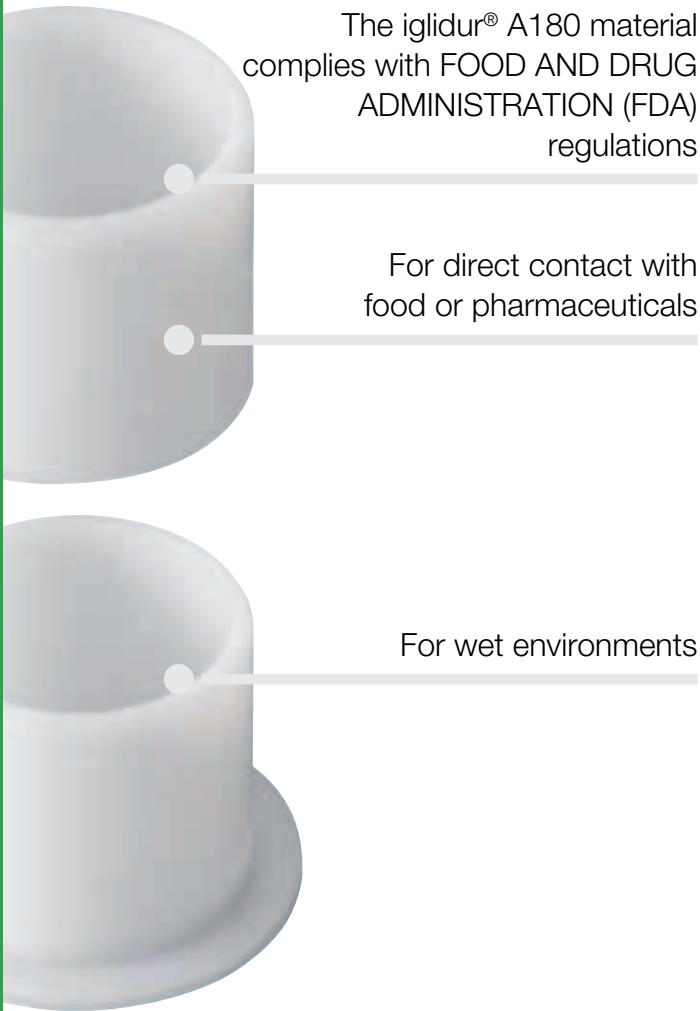


iglidur® A180

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?

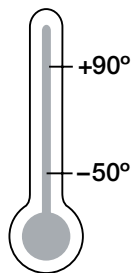
- If the bearings have direct contact with food
- If FDA-compliance is required
- If quiet operation is important
- If low water absorption is needed



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

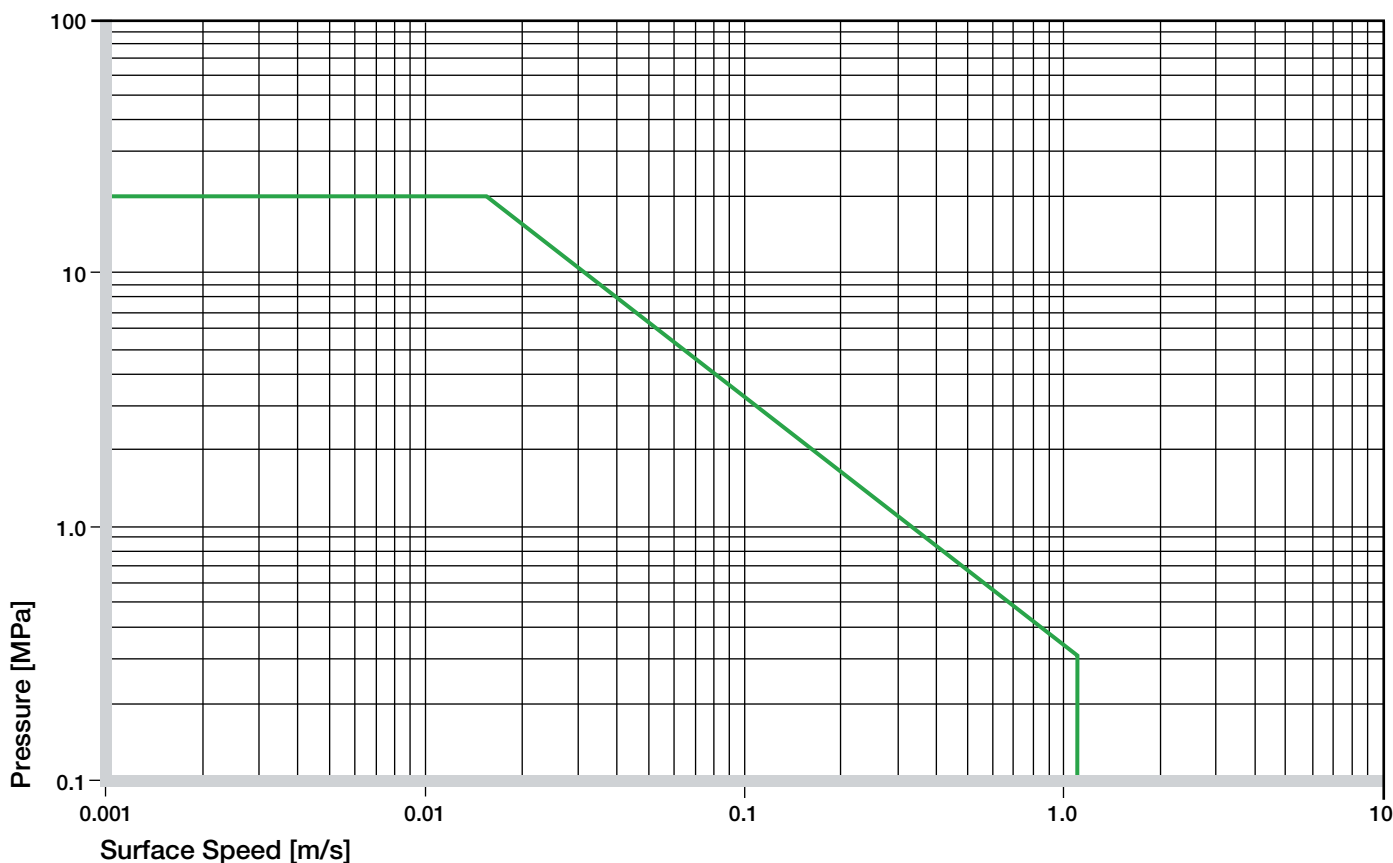


products of iglidur® A180 comply with the requirements of the FDA for repeated contact with food



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

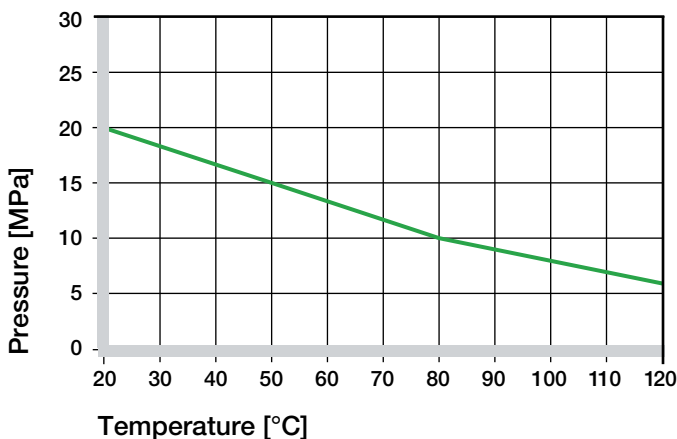
Table 01: Material Data



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

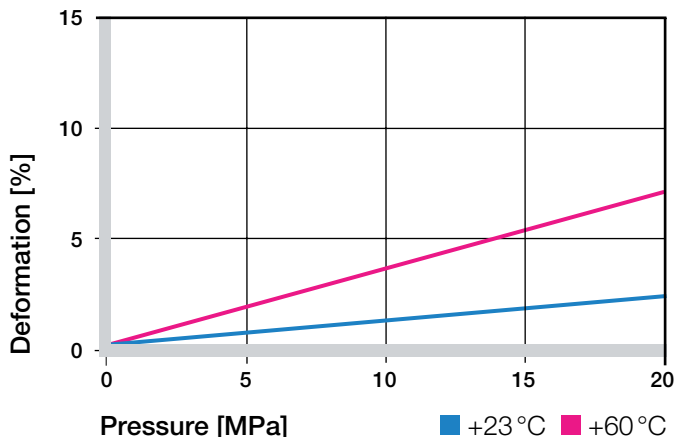
The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. With increasing temperatures, the compressive strength of iglidur® A180 plain bearings decreases. The Graph 02 shows this inverse relationship. However, 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

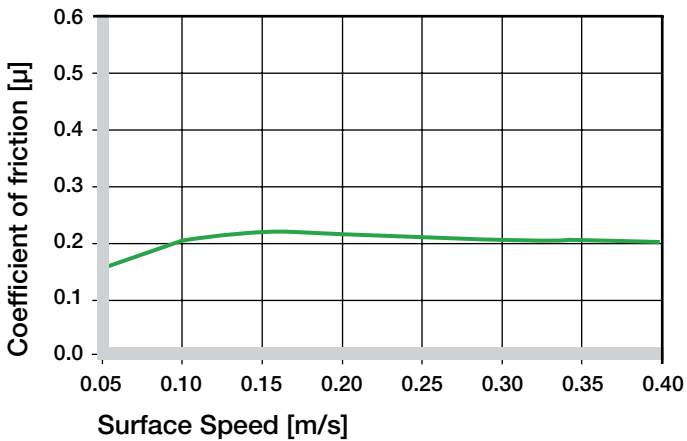
Table 03: Temperature limits

iglidur® A180 | Technical Data

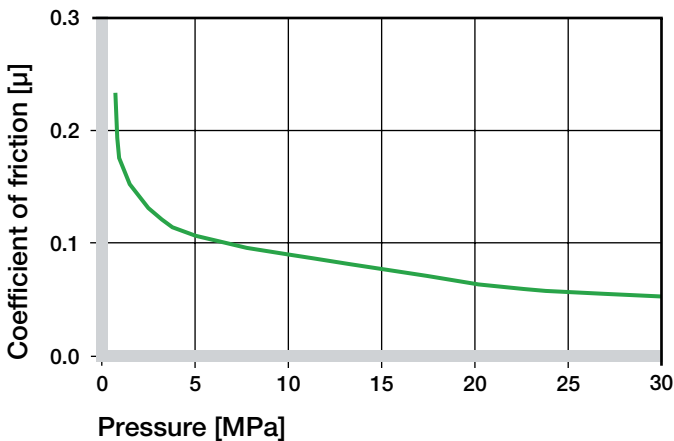
Friction and Wear

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

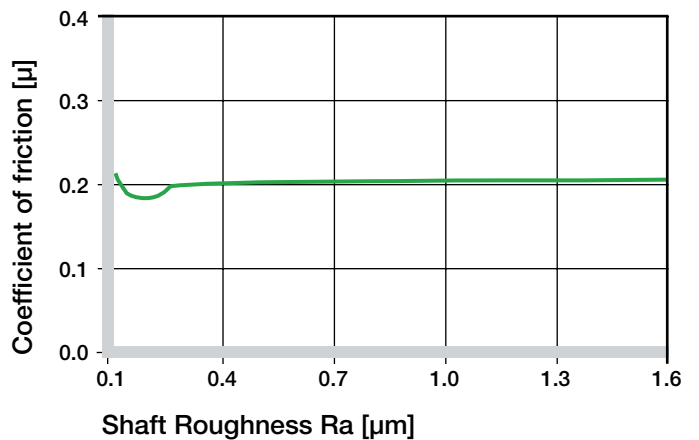
Shaft Materials

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

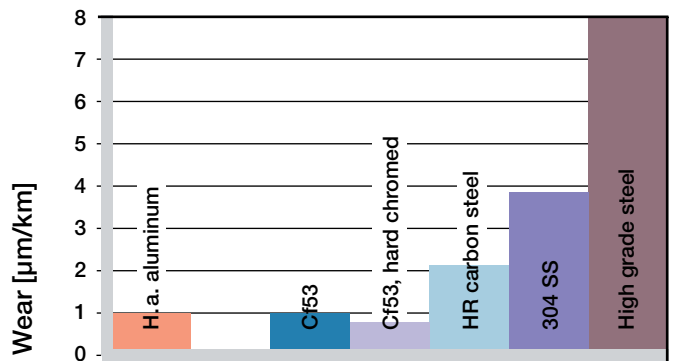
The combination “iglidur® A180/hard-anodized aluminum” clearly stands out. It attains good to excellent wear rates also with other shafts.

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.

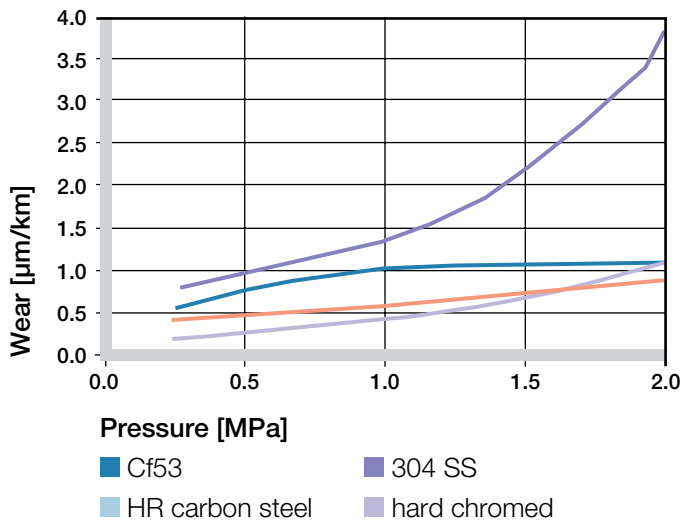
- ▶ Shaft Materials, **page 51**



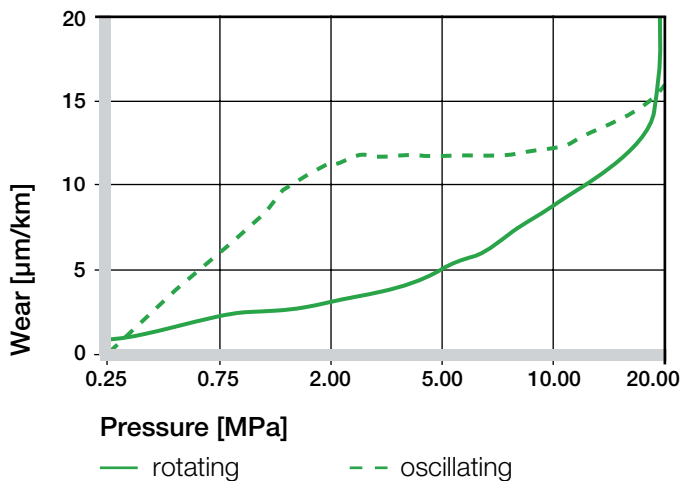
Graph 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)



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

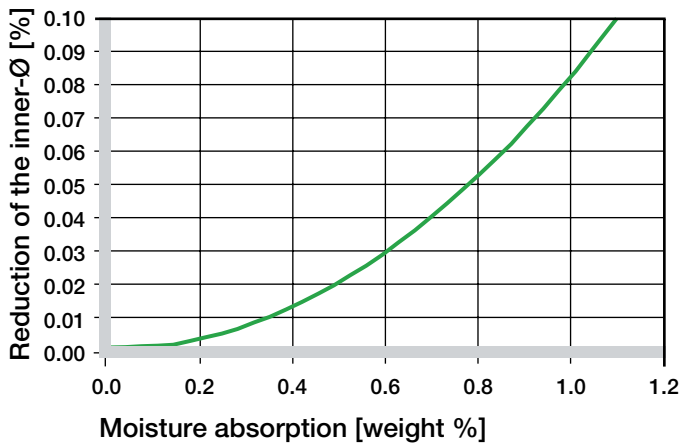
The moisture absorption of iglidur® A180 plain bearings is approximately 0.2 % in standard atmosphere. The saturation limit submerged in water is 5 %. This must be taken into account for these types of applications.

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

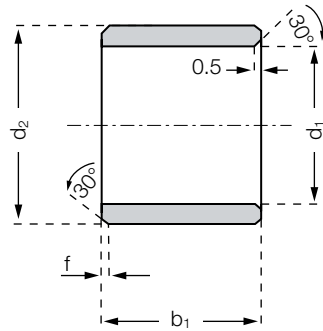
iglidur® A180 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, the inner diameter adjusts to meet the specified tolerances.

► 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

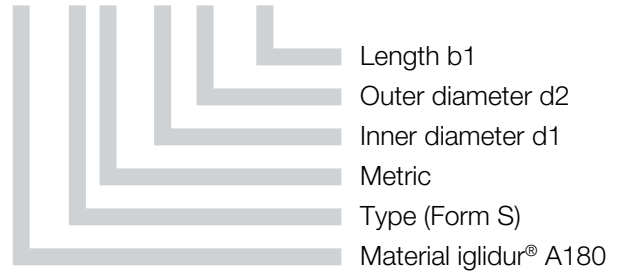
Table 07: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

Sleeve bearing



Order key

A180SM-0608-10



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



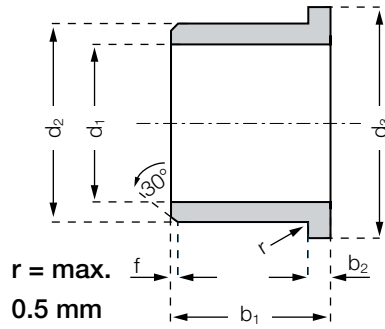
prices price list online
www.igus.eu/eu/a180



Order Part Number
example A180SM-0608-10

iglidur® A180 | Product Range

Flange bearing



Order key

A180FM-0608-06



Length b1
Outer diameter d2
Inner diameter d1
Metric
Type (Form F)
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	d3	b1 h13	b2
A180FM-0608-06	6	+0.020 +0.068	8	12	6	1
A180FM-0810-10	8	+0.025 +0.083	10	15	10	1
A180FM-1012-10	10	+0.025 +0.083	12	18	10	1
A180FM-1214-15	12	+0.032 +0.102	14	20	15	1
A180FM-1618-17	16	+0.032 +0.102	18	24	17	1
A180FM-2023-21	20	+0.040 +0.124	23	30	21.5	1.5
A180FM-2528-21	25	+0.040 +0.124	28	35	21.5	1.5
A180FM-3034-26	30	+0.040 +0.124	34	42	26	2

* after pressfit. Testing methods ► page 55



delivery available
time from stock



prices price list online
www.igus.eu/eu/a180



Order Part Number
example A180FM-0608-06

My Sketches

