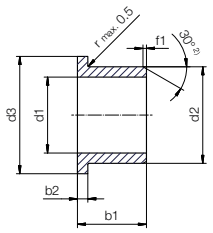
Bearing technology | Plain bearing | iglidur® A500

Flange bearing (form F)



[2] Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

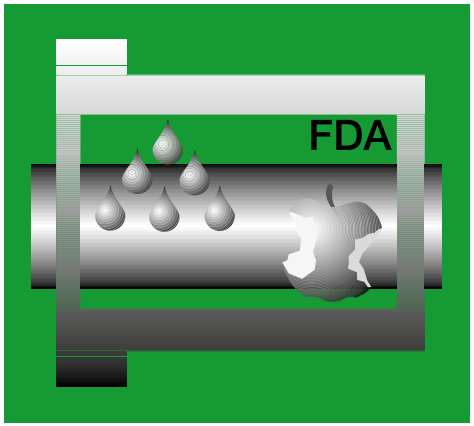
d1 [mm]	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f1 [mm]	0.3	0.5	0.8	1.2

Dimensions according to ISO 3547-1 and special dimensions

Order example: A500FM-0405-04 – no minimum order quantity.
A500 iglidur® material F Flange bearing M Metric 04 Inner Ø d1 05 Outer Ø d2 04 Total length b1

d1 [mm]	d1 Tolerance[3]	d2 [mm]	d3 d13[3] [mm]	b1 h13 [mm]	b2 h13 [mm]	Part No.
4.0	+0.010 +0.058	5.5	9.5	4.0	2.00	A500FM-0405-04
4.0		8.0	12.0	6.0	2.00	A500FM-0408-06
6.0		8.0	12.0	4.0	1.00	A500FM-0608-04
6.0		8.0	12.0	6.0	1.00	A500FM-0608-06
6.0		8.0	12.0	8.0	1.00	A500FM-0608-08
8.0	+0.013 +0.071	10.0	15.0	5.5	1.00	A500FM-0810-05
8.0		10.0	15.0	7.5	1.00	A500FM-0810-07
8.0		10.0	15.0	9.5	1.00	A500FM-0810-09
8.0		10.0	15.0	10.0	1.00	A500FM-0810-10
10.0		12.0	18.0	7.0	1.00	A500FM-1012-07
10.0		12.0	18.0	9.0	1.00	A500FM-1012-09
10.0		12.0	18.0	12.0	1.00	A500FM-1012-12
10.0		12.0	18.0	15.0	1.00	A500FM-1012-15
10.0		12.0	18.0	17.0	1.00	A500FM-1012-17
12.0	+0.016 +0.086	14.0	20.0	7.0	1.00	A500FM-1214-07
12.0		14.0	20.0	9.0	1.00	A500FM-1214-09
12.0		14.0	20.0	12.0	1.00	A500FM-1214-12
12.0		14.0	20.0	13.0	1.00	A500FM-1214-13
12.0		14.0	20.0	15.0	1.00	A500FM-1214-15
12.0		14.0	20.0	17.0	1.00	A500FM-1214-17
14.0		16.0	22.0	12.0	1.00	A500FM-1416-12
14.0		16.0	22.0	17.0	1.00	A500FM-1416-17
15.0		17.0	23.0	9.0	1.00	A500FM-1517-09
15.0		17.0	23.0	12.0	1.00	A500FM-1517-12
15.0		17.0	23.0	17.0	1.00	A500FM-1517-17
16.0	+0.016 +0.086	18.0	24.0	12.0	1.00	A500FM-1618-12
16.0		18.0	24.0	17.0	1.00	A500FM-1618-17
18.0		20.0	26.0	12.0	1.00	A500FM-1820-12
18.0		20.0	26.0	17.0	1.00	A500FM-1820-17
18.0		20.0	26.0	22.0	1.00	A500FM-1820-22
20.0	+0.020 +0.104	23.0	30.0	11.5	1.50	A500FM-2023-11
20.0		23.0	30.0	16.5	1.50	A500FM-2023-16
20.0		23.0	30.0	21.5	1.50	A500FM-2023-21
25.0		28.0	35.0	11.5	1.50	A500FM-2528-11
25.0		28.0	35.0	16.5	1.50	A500FM-2528-16
25.0		28.0	35.0	21.5	1.50	A500FM-2528-21
30.0		34.0	42.0	16.0	2.00	A500FM-3034-16
30.0		34.0	42.0	26.0	2.00	A500FM-3034-26
30.0		34.0	42.0	40.0	2.00	A500FM-3034-40
35.0	+0.025 +0.125	39.0	47.0	16.0	2.00	A500FM-3539-16
35.0		39.0	47.0	26.0	2.00	A500FM-3539-26
35.0		39.0	47.0	40.0	2.00	A500FM-3539-40
40.0		44.0	52.0	30.0	2.00	A500FM-4044-30
40.0		44.0	52.0	40.0	2.00	A500FM-4044-40
45.0		50.0	58.0	50.0	2.00	A500FM-4550-50

[3] After press-fit. *Testing methods, page 57*



The all-rounder for food
FDA-compliant
iglidur® A180

When to use it?
- When the bearings have direct contact with food
- When FDA compliance is required
- When a low noise level is required
- When low moisture absorption is fundamental

When not to use?
- When the maximum wear resistance is necessary
  iglidur® J
- When continuous operating temperatures are higher than +80°C
  iglidur® A350, iglidur® A500
- When a cost-effective universal plain bearing is required
  iglidur® G, iglidur® P

Bearing technology | Plain bearing | iglidur® A180

Ø
6.0 – 30.0mm

Also available as:

Bar stock, round bar
Page 682

Bar stock, plate
Page 685

tribo-tape liner
Page 691

Piston rings
Page 581

Two hole flange bearings
Page 603

Moulded special parts
Page 624

igubal® spherical balls
Page 841

The all-rounder for food
FDA-compliant

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

- FDA-compliant
- Compliant with Regulation (EU) No. 10/2011
- High media resistance
- Suitable for wet environments
- High wear resistance
- Lubrication-free
- Maintenance-free

Typical application areas

- Food industry
- Beverage technology
- Medical technology

Descriptive technical specifications		
Wear resistance at +23°C	–	+
Wear resistance at +90°C	–	+
Wear resistance at +150°C	–	+
Low coefficient of friction	–	+
Low moisture absorption	–	+
Wear resistance under water	–	+
High media resistance	–	+
Resistant to edge pressures	–	+
Suitable for shock and impact loads	–	+
Resistant to dirt	–	+

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

Online service life calculation
www.igus.eu/iglidur-expert

iglidur® A180
+90°C
28MPa

Technical data

General properties			Testing method
Density	g/cm³	1.46	
Colour		white	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	1.3	
Coefficient of friction, dynamic, against steel	µ	0.05 – 0.23	
pv value, max. (dry)	MPa · m/s	0.31	
Mechanical properties			
Flexural modulus	MPa	2,300	DIN 53457
Flexural 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. application temperature long-term	°C	+90	
Max. application temperature short-term	°C	+110	
Min. application temperature	°C	–50	
Thermal conductivity	W/m · K	0.25	ASTM C 177
Coefficient of thermal expansion (at +23°C)	$K^{-1} \cdot 10^{-5}$	11	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	$> 10^{12}$	DIN IEC 93
Surface resistance	Ω	$> 10^{11}$	DIN 53482

Table 01: Material properties

–50°C up to +90°C

28MPa

HB

FOOD

RoHS-II

ISO 3547-1

Plain bearings made from iglidur® A180 are suitable for application in direct contact with food. Hence they are the ideal solution for bearing locations 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.

Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® A180 plain bearings is approximately 0.2% weight. The saturation limit in water is 1.3% weight. This must be taken into account for these types of applications.

Vacuum

In vacuum, any present moisture is released as vapour. Use in vacuum is only possible with dehumidified iglidur® A180 bearings.

Radiation resistance

Plain bearings made from iglidur® A180 are resistant up to a radiation intensity of $3 \cdot 10^2$Gy.

Resistance to weathering

iglidur® A180 plain bearings are not resistant to weathering. The material properties are significantly affected Severe discoloration occurs. Applications with this material under weathering conditions are not recommended.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® A180 plain bearings decreases. Diagram 02 shows this inverse relationship. The maximum recommended surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.
Diagram 03 shows the elastic deformation of iglidur® A180 at radial loads. At the maximum recommended surface pressure of 28MPa the deformation is less than 2.5%. A plastic deformation can be negligible up to this value. However, it is also dependent on the service time.
Surface pressure, page 41

Bearing technology | Plain bearing | iglidur® A180

Permissible surface speeds

iglidur® A180 was developed for low surface speeds. The given values in table 03 indicate the limits at which an increase up to the continuous permissible temperature occurs. This increase is a result of friction. In practice, though, this level is rarely reached due to varying application conditions.

Surface speed, page 44

Temperature

The iglidur® A180 plain bearings can be used in short-term temperatures up to +110°C. With increasing temperatures, the compressive strength of iglidur® A180 plain bearings decreases. Diagram 02 shows this inverse relationship. The temperatures prevailing in the bearing system also have an influence on the wear. For temperatures over +60°C an additional securing is required.

Application temperatures, page 49
Additional securing, page 49

Friction and wear

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

Coefficient of friction and surfaces, page 47
Wear resistance, page 50

Shaft materials

Diagram 06 shows the test results of iglidur® A180 plain bearings running against various shaft materials. The combination "iglidur® A180/hard-anodised aluminium" 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 (diagram 07).

Shaft materials, page 52

Installation tolerances

iglidur® A180 plain bearings are standard bearings for shafts with h tolerance (recommended minimum h9). The bearings are designed for press-fit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the E10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

Testing methods, page 57

Chemicals	Resistance
Alcohols	+
Diluted acids	0 up to –
Diluted alkalines	+
Fuels	+
Greases, oils without additives	+
Hydrocarbons	+
Strong acids	–
Strong alkalines	+ up to 0

All information given at room temperature [+20°C]

Table 02: Chemical resistance

Chemical table, page 1636

		Rotating	Oscillating	linear
long-term	m/s	0.8	0.6	3.5
short-term	m/s	1.2	1.0	5.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction μ	0.05 – 0.23	0.09	0.04	0.04

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

	Housing		Plain bearing		Shaft	
Ø d1 [mm]	H7 [mm]		E10 [mm]		h9 [mm]	
0 – 3	+0.000	+0.010	+0.014	+0.054	–0.025	+0.000
> 3 – 6	+0.000	+0.012	+0.020	+0.068	–0.030	+0.000
> 6 – 10	+0.000	+0.015	+0.025	+0.083	–0.036	+0.000
> 10 – 18	+0.000	+0.018	+0.032	+0.102	–0.043	+0.000
> 18 – 30	+0.000	+0.021	+0.040	+0.124	–0.052	+0.000
> 30 – 50	+0.000	+0.025	+0.050	+0.150	–0.062	+0.000
> 50 – 80	+0.000	+0.030	+0.060	+0.180	–0.074	+0.000
> 80 – 120	+0.000	+0.035	+0.072	+0.212	–0.087	+0.000
> 120 – 180	+0.000	+0.040	+0.085	+0.245	–0.100	+0.000

Table 05: Important tolerances for plain bearings according to ISO 3547-1 after press-fit

Technical data

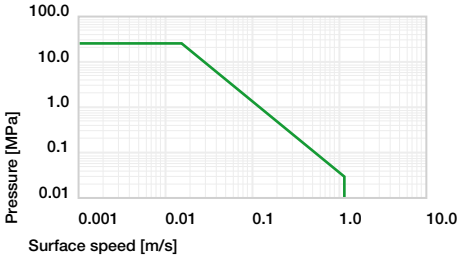


Diagram 01: Permissible pv values for iglidur® A180 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

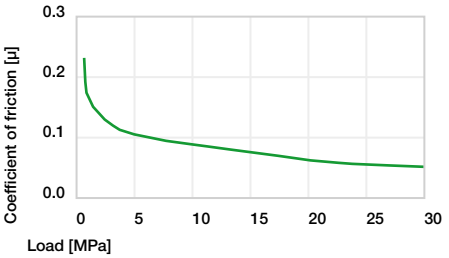


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

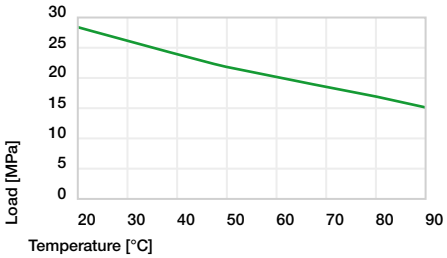


Diagram 02: Maximum recommended surface pressure as a function of temperature (28MPa at +20°C)

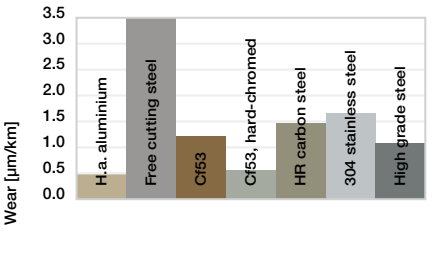


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

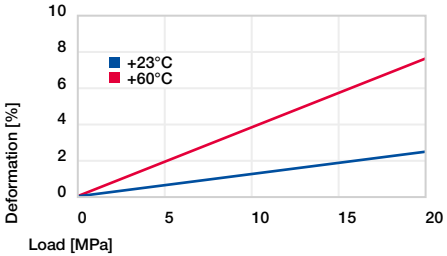


Diagram 03: Deformation under pressure and temperature

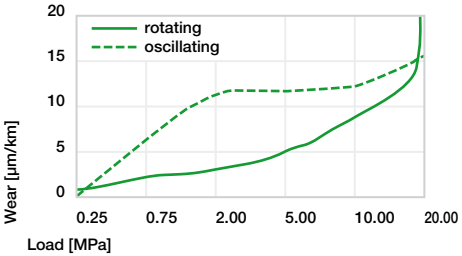


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load

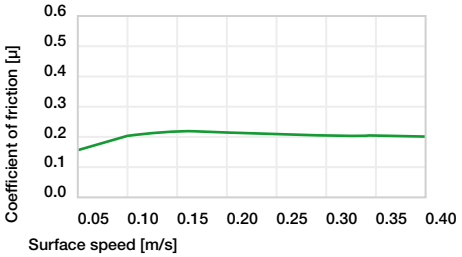
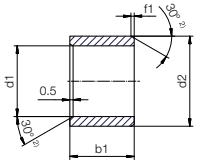


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75MPa

Bearing technology | Plain bearing | iglidur® A180

Sleeve bearing (form S)



[2] Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm]	Ø 6–12	Ø 12–30
f1 [mm]	0.5	0.8

Dimensions according to ISO 3547-1 and special dimensions

Order example: A180SM-0608-10 – no minimum order quantity.
A180 iglidur® material S Sleeve bearing M Metric 06 Inner Ø d1 08 Outer Ø d2 10 Total length b1

d1 [mm]	d1 Tolerance[3]	d2 [mm]	b1 h13 [mm]	Part No.
6.0	+0.020 +0.068	8.0	10.0	**A180SM-0608-10**
8.0	+0.025 +0.083	10.0	10.0	**A180SM-0810-10**
10.0		12.0	10.0	**A180SM-1012-10**
12.0	+0.032 +0.102	14.0	15.0	**A180SM-1214-15**
16.0		18.0	15.0	**A180SM-1618-15**
20.0	+0.040 +0.124	23.0	20.0	**A180SM-2023-20**
25.0		28.0	30.0	**A180SM-2528-30**
30.0		34.0	20.0	**A180SM-3034-20**

[3] After press-fit. *Testing methods, page 57*

Available from stock
Detailed information about delivery time online.
www.igus.eu/24

Online ordering
Including delivery times, prices, online tools
www.igus.eu/A180

Ordering note
Our prices are scaled according to order quantities, current prices can be found online.

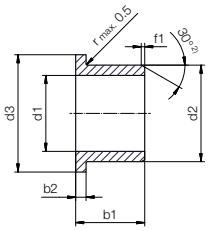
Discount scaling		
1 – 9	50 – 99	500 – 999
10 – 24	100 – 199	1,000 – 2,499
25 – 49	200 – 499	2,500 – 4,999

No minimum order value.
No low-quantity surcharges.
Free shipping within Germany for orders above €150.

iglidur® A180
+90°C
28MPa

Bearing technology | Plain bearing | iglidur® A180

Flange bearing (form F)



[2] Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm]	Ø 1–6	Ø 6–12	Ø 12–30
f1 [mm]	0.3	0.5	0.8

Dimensions according to ISO 3547-1 and special dimensions

Order example: A180FM-0608-06 – no minimum order quantity.
A180 iglidur® material F Flange bearing M Metric 06 Inner Ø d1 08 Outer Ø d2 06 Total length b1

d1 [mm]	d1 Tolerance[3]	d2 [mm]	d3 d13[3] [mm]	b1 h13 [mm]	b2 h13 [mm]	Part No.
6.0	+0.020 +0.068	8.0	12.0	6.0	1.00	**A180FM-0608-06**
8.0	+0.025 +0.083	10.0	15.0	10.0	1.00	**A180FM-0810-10**
10.0		12.0	18.0	10.0	1.00	**A180FM-1012-10**
12.0	+0.032 +0.102	14.0	20.0	15.0	1.00	**A180FM-1214-15**
16.0		18.0	24.0	17.0	1.00	**A180FM-1618-17**
20.0	+0.040 +0.124	23.0	30.0	21.5	1.50	**A180FM-2023-21**
25.0		28.0	35.0	21.5	1.50	**A180FM-2528-21**
30.0		34.0	42.0	26.0	2.00	**A180FM-3034-26**

[3] After press-fit. *Testing methods, page 57*

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www.igus.eu/24

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Including delivery times, prices, online tools
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1 – 9	50 – 99	500 – 999
10 – 24	100 – 199	1,000 – 2,499
25 – 49	200 – 499	2,500 – 4,999

No minimum order value.
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Free shipping within Germany for orders above €150.