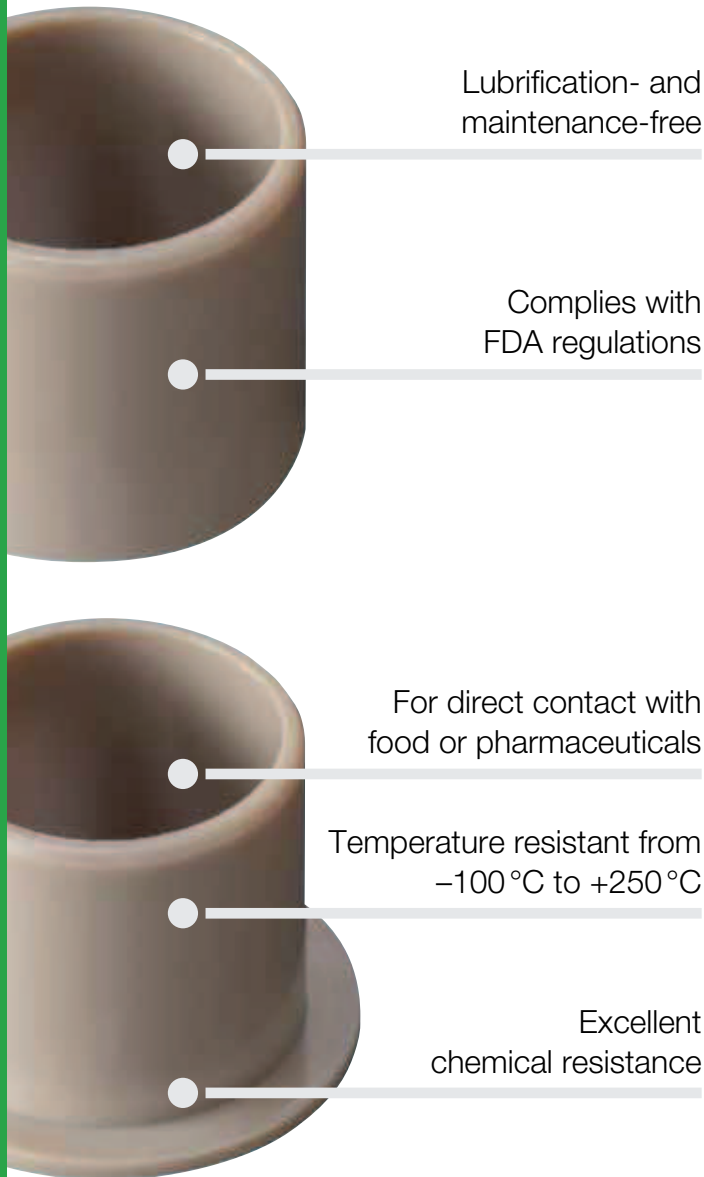


iglidur® A500

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?

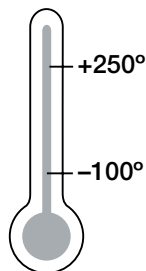
- When FDA compliance is required
- When a high chemical resistance is required
- Good abrasion resistance
- Temperature resistant from -100 °C to +250 °C



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

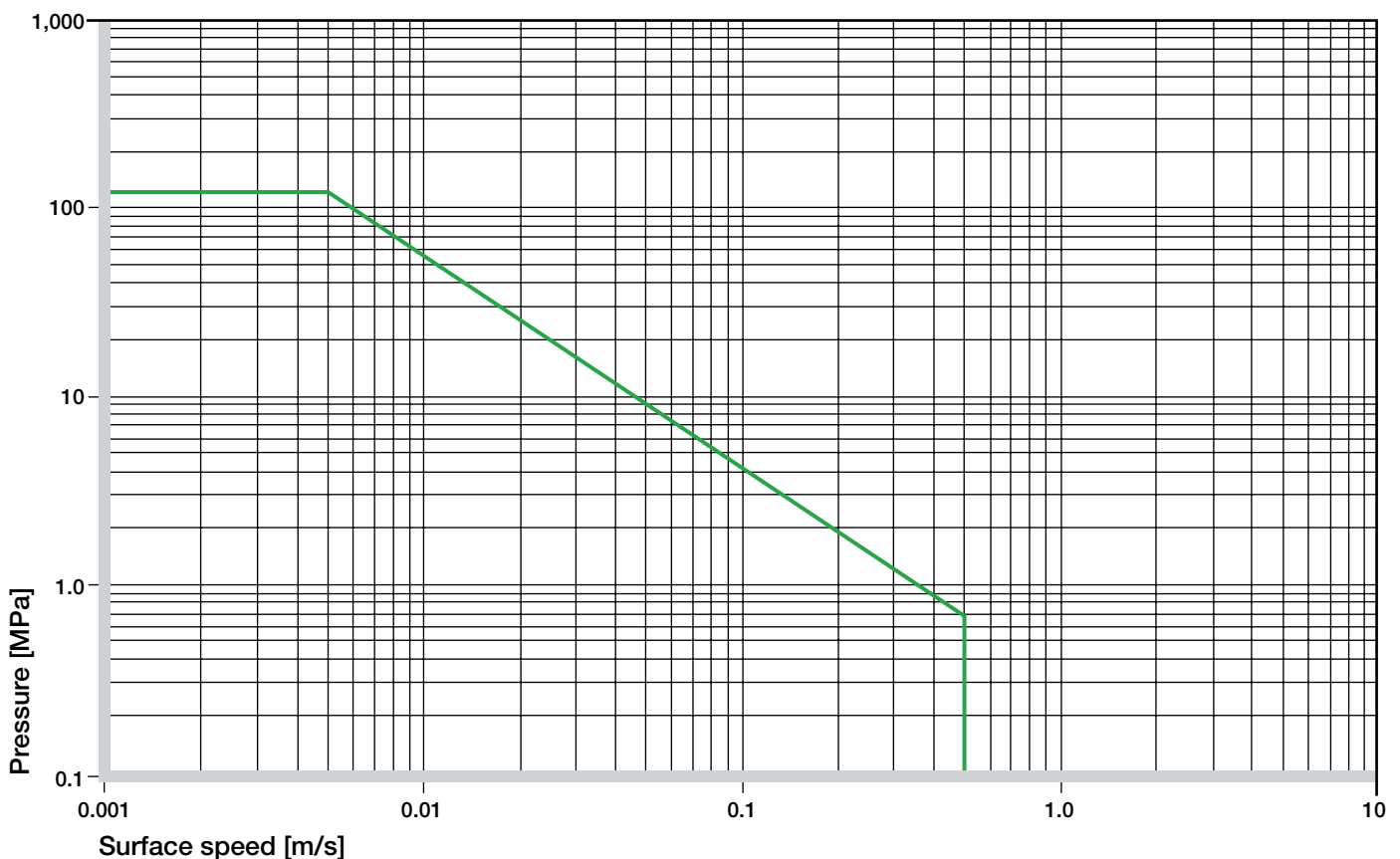


The material iglidur® A500 complies with the requirements of the FDA for repeated contact with food.



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

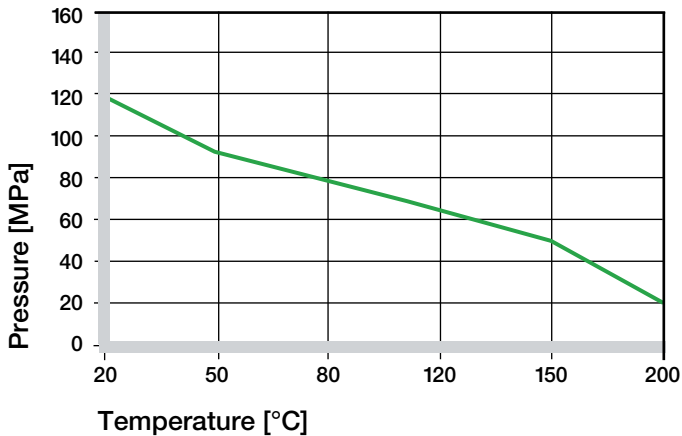
Table 01: Material data



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

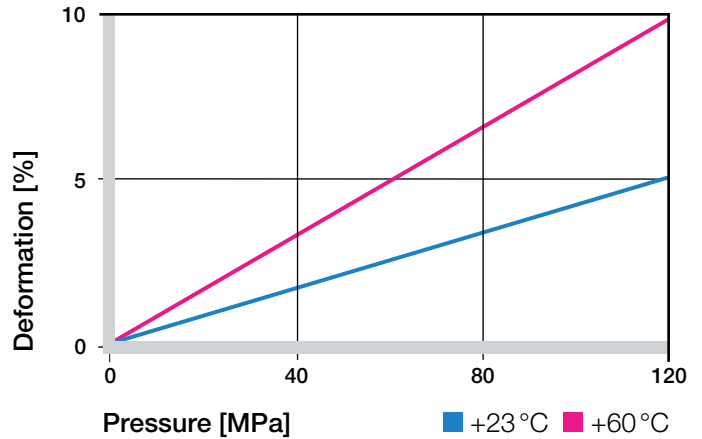
The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. With increasing temperatures, the compressive strength of iglidur® A500 plain bearings decreases. The Graph 02 shows this inverse relationship. However, 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

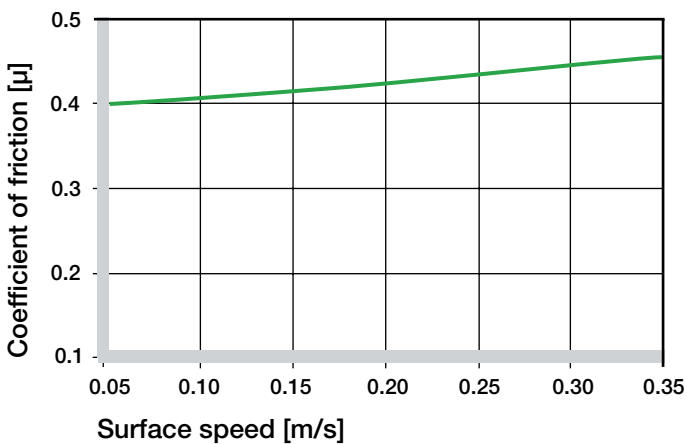
Table 03: Temperature limits

iglidur® A500 | Technical Data

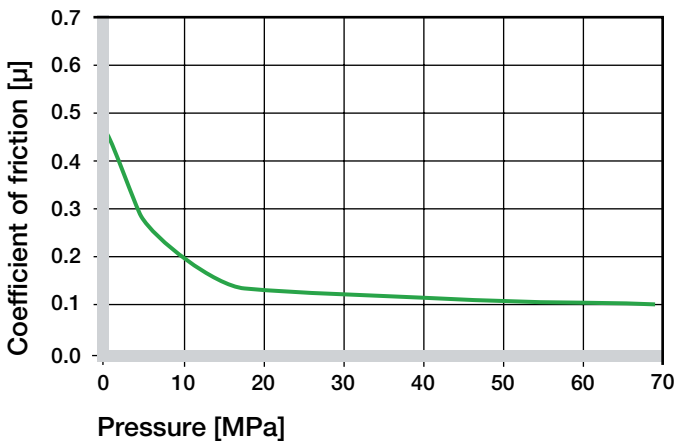
Friction and Wear

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, $p = 0.75 \text{ MPa}$



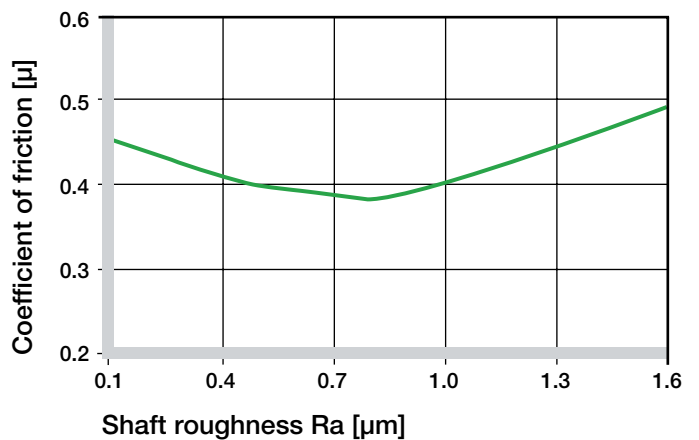
Graph 05: Coefficient of friction as a function of the pressure, $v = 0.01 \text{ m/s}$

Shaft Materials

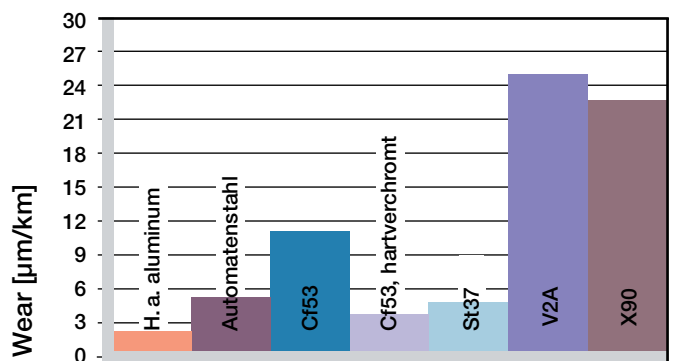
The graphs 06 to 09 display a summary of the results of tests with different shaft materials conducted with bearings made of iglidur® A500. The combination “iglidur® A500/hard-chromed shaft” clearly stands out in rotating application. Up to about 2.0 MPa , the wear of this combination remains largely 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.

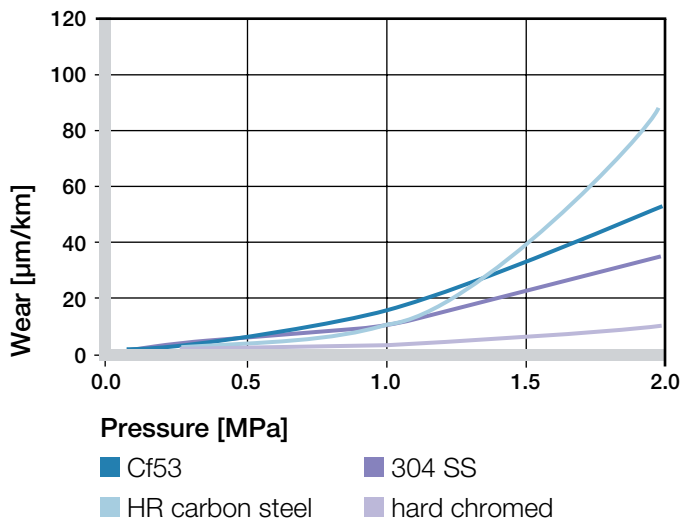
- ▶ Shaft Materials, **page 51**



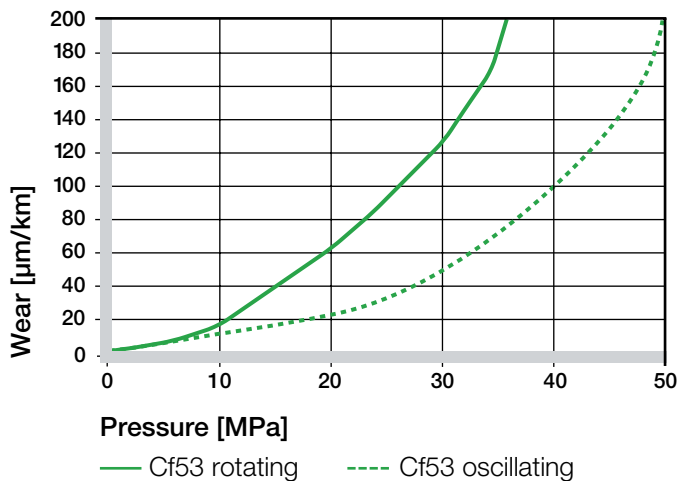
Graph 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)



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

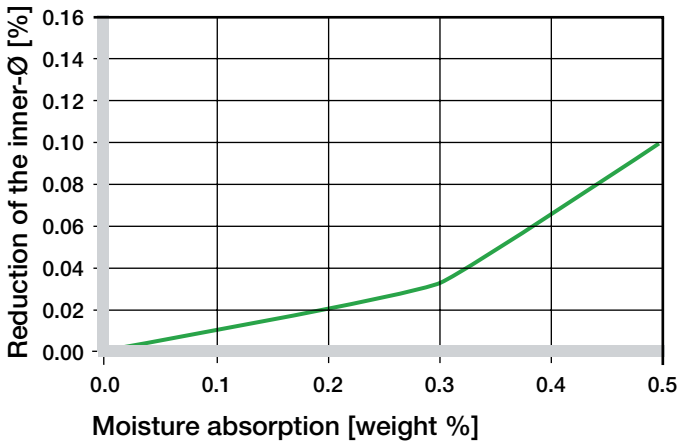
Moisture Absorption

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

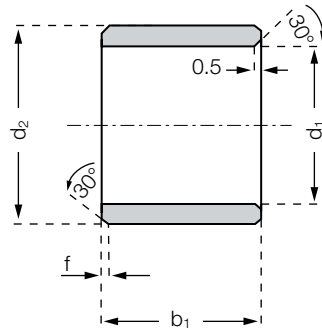
iglidur® A500 bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). After the installation in a housing bore with H7 tolerance, the inner diameter of the bearing automatically adjusts to the E10 tolerance.

► 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

Sleeve bearing



Order key

A500SM-0507-05



- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form S)
- Material iglidur® A500

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
A500SM-0507-05	5.0	+0.010 +0.058	7.0	5.0
A500SM-0810-06	8.0	+0.013 +0.071	10.0	6.0
A500SM-0810-10	8.0	+0.013 +0.071	10.0	10.0
A500SM-1012-12	10.0	+0.013 +0.071	12.0	12.0
A500SM-1416-16	14.0	+0.016 +0.086	16.0	16.0
A500SM-2023-30	20.0	+0.020 +0.104	23.0	30.0
A500SM-2225-30	22.0	+0.020 +0.104	25.0	30.0
A500SM-3236-30	32.0	+0.030 +0.150	36.0	30.0
A500SM-3539-50	35.0	+0.025 +0.125	39.0	50.0
A500SM-5055-30	50.0	+0.025 +0.125	55.0	30.0

* after pressfit. Testing methods ► page 55



delivery available
time from stock



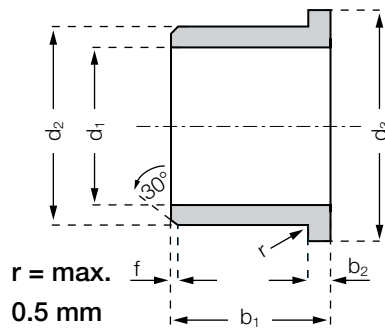
prices price list online
www.igus.eu/eu/a500



order part number
example A500SM-0507-05

iglidur® A500 | Product Range

Flange bearing



Order key

A500FM-0405-04



- Length b1
- Outer diameter d2
- Inner diameter d1
- Metric
- Type (Form F)
- Material iglidur® A500

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.eu/eu/a500



order part number
example A500FM-0405-04

My Sketches

