



iglidur® A500 – Food Applications



The iglidur® A500 material complies with FOOD AND DRUG ADMINISTRATION regulations

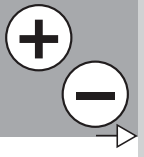
Good wear resistance

Temperature resistant from -100°C to +250°C

Excellent chemical resistance

iglidur® A500

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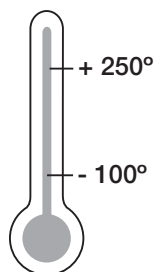
Polymer bearings made from iglidur® A500 can be exposed to extremely high temperatures and consist of materials suitable for direct contact with food (FDA-conformity). They have an exceptional resistance to chemicals and are therefore appropriate for medical equipment.

iglidur® A500

2 styles
> 10 dimensions
Ø 4–50 mm



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igus® GmbH
51147 Cologne

Price index



Very Appetising



When to use iglidur® A500 plain bearings:

- Suitable for direct contact with food
- The iglidur® A500 material complies with FOOD AND DRUG ADMINISTRATION regulations
- Good abrasion resistance
- Temperature resistant from -100°C to +250°C
- Excellent chemical resistance

When not to use iglidur® A500 plain bearings:

- When the highest wear resistance is required
 - ▶ iglidur® X (chapter 6), iglidur® Z (chapter 22)
- If no resistance to temperature or chemicals is required
 - ▶ iglidur® A180 (chapter 7), iglidur® A200 (chapter 8)
- When a cost-effective universal bearing is required
 - ▶ iglidur® G (chapter 2), iglidur® P (chapter 17)



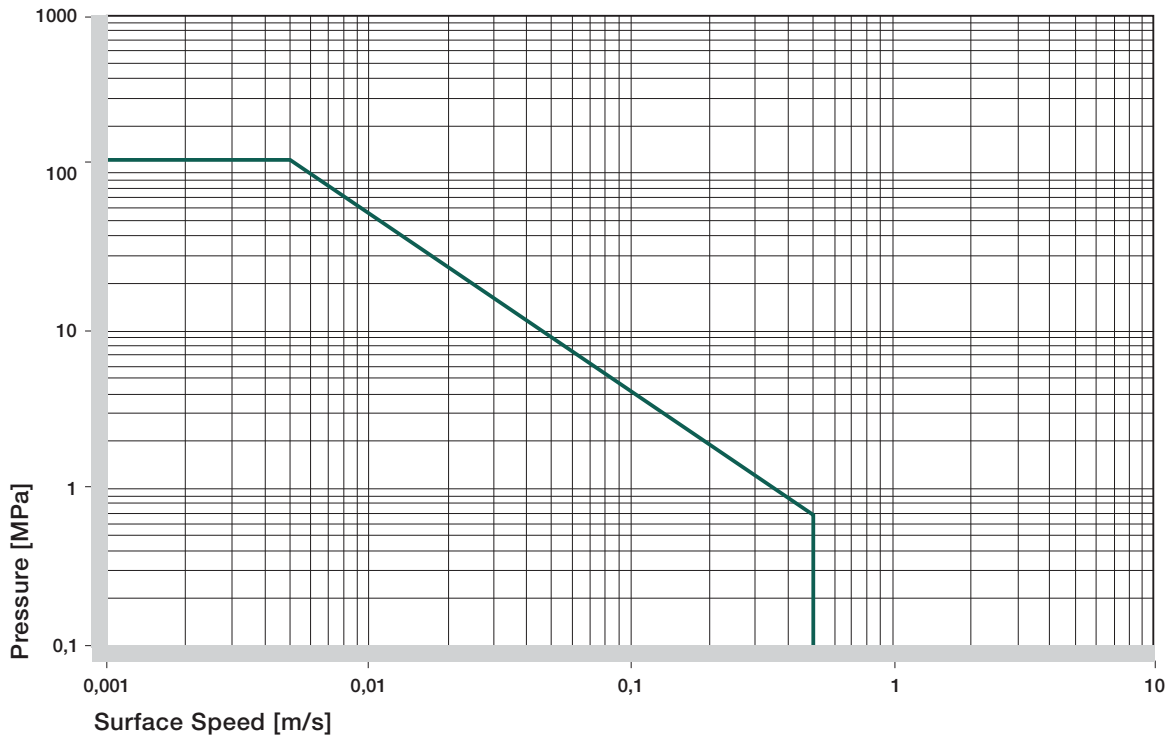
The material iglidur® A500 complies with the requirements of the FDA for repeated contact with food.

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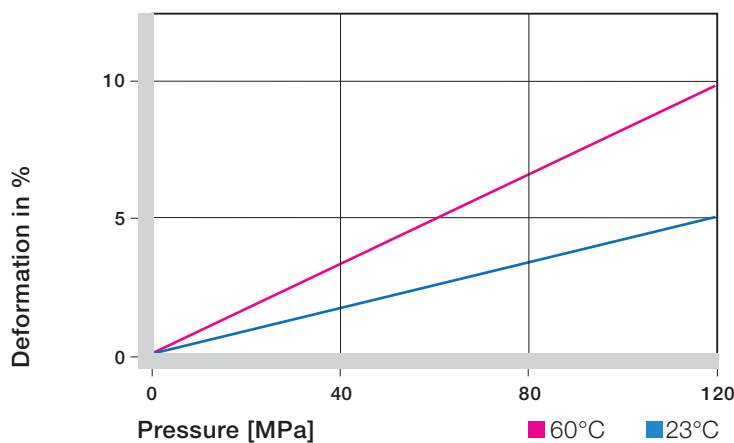
Material Table

General properties	Unit	iglidur® A500	Testing method
Density	g/cm ³	1,28	
Colour		Brown	
max. moisture absorption at 23 °C/50% r.F.	% weight	0,3	DIN 53495
max. water absorption	% weight	0,5	
Coefficient of sliding friction, dynamic against steel μ		0,26 - 0,41	
p x v value, max. (dry)	MPa x 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 x K	0,24	ASTM C 177
Coefficient of thermal expansion (at 23°C)	K ⁻¹ x 10 ⁻⁵	9	DIN 53752
Electrical properties			
Specific volume resistance	Ω cm	> 10 ¹⁴	DIN IEC 93
Surface resistance	Ω	> 10 ¹³	DIN 53482

Table 10.1: Material Data



Graph 10.1: Permissible p x v values for iglidur® A500 with a wall thickness of 1 mm running dry against a steel shaft at 20°C, mounted in a steel housing



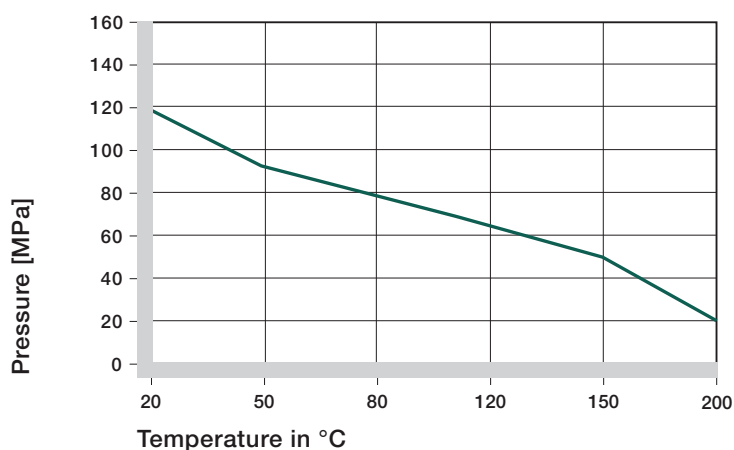
Graph 10.2: Deformation under pressure and temperature

m/s	Rotating	Oscillating	Linear
Continuous	0,6	0,4	1
Short term	1	0,7	2

Table 10.2: Maximum surface speeds

iglidur® A500	Application Temperatures
Minimum	-100 °C
Max. long term	+250 °C
Max. short term	+300 °C

Table 10.3: Temperature limits for iglidur® A500



Graph 10.3: Recommended maximum surface pressure of iglidur® A500 as a function of temperature

Plain bearings of iglidur® A500 can be used at very high temperatures and are suitable for applications involving direct contact with foodstuffs (FDA compliant). They feature excellent chemical resistance, and are therefore qualified for the most challenging applications found in food industry machinery.

Surface Pressure

Although iglidur® A500 is a very flexible material, it at the same time features an excellent compressive strength, even at high temperatures. Graph 10.3 shows the recommended maximum surface pressure of the bearings against temperature. This combination of high strength and high flexibility gives real benefits in applications involving vibration and edge loadings.

Due to the fact that the wear rate of the plain bearings rapidly increases from pressures of 10 to 20 MPa, we recommend to thoroughly check applications above these values.

☑ Graphs 10.2 and 10.3

▶ Surface Pressure, page 1.18

Permissible Surface Speeds

Due to its high temperature resistance, iglidur® A500 also allows for high surface speeds. However, the coefficient of friction continues to increase with these high speeds, resulting in a greater heating of the bearings. Test results show that iglidur® A500 plain bearings are more resistant to wear in oscillating movements; the permissible $p \times v$ values are also higher in oscillating operation.

▶ Surface Speed, page 1.20

▶ $p \times v$ value, page 1.22

Temperatures

The short term permissible highest application temperature is 300°C. The compressive strength of iglidur® A500 plain bearings decreases with increasing temperatures. Graph 10.3 illustrates this relationship.

The ambient temperatures occurring in the bearing system also have an impact on the wear of the bearing.

iglidur® A500	Dry	Grease	Oil	Water
C.o.f. [μ]	0,26–0,41	0,09	0,04	0,04

Table 10.4: Coefficients of friction for iglidur® A500 against steel (Ra = 1 μm , 50 HRC)

☑ Graph 10.3

▶ Application Temperatures, page 1.23

Friction and Wear

The coefficient of friction depends on the load acting on the bearing. The coefficient of friction μ at first highly decreases with increasing load. The most favourable coefficient of friction is attained from approx. 10 MPa.

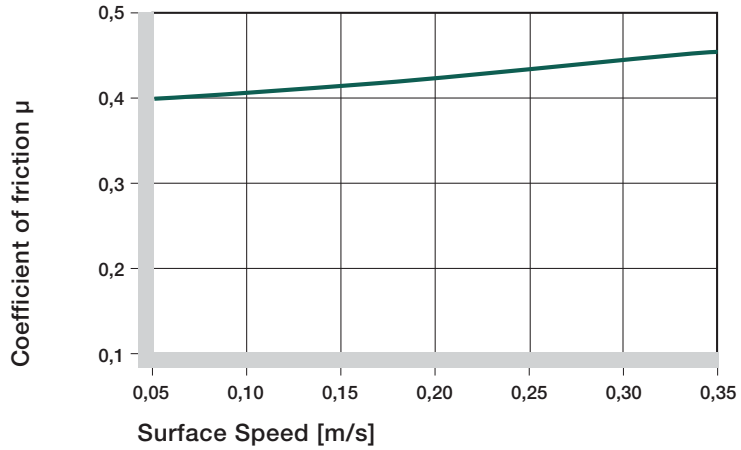
However, friction and wear also to a large extent depend on the running surface.

Therefore, shafts that are too smooth not only increase the coefficient of friction, but can also increase the wear of the bearings. Ground surfaces with an average medium roughness of Ra = 0.4 to 0.9 μm are the most suitable.

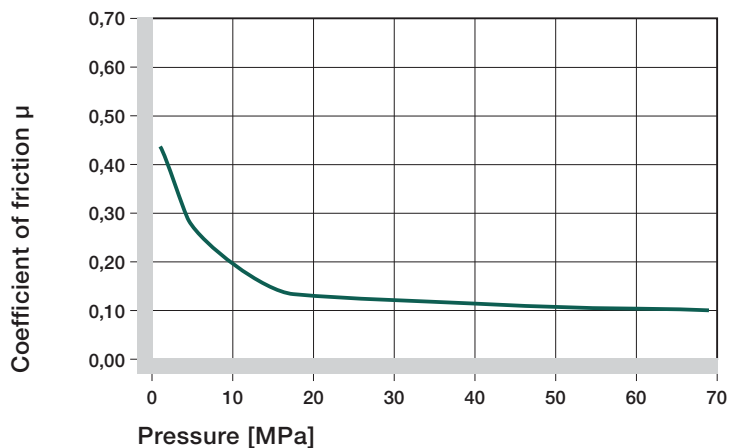
☑ Graphs 10.4 to 10.6

▶ Coefficients of Friction and Surfaces, page 1.25

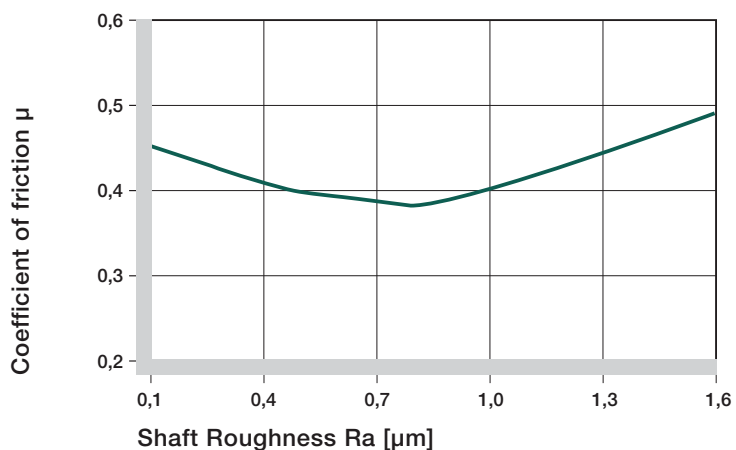
▶ Wear Resistance, page 1.26



Graph 10.4: Coefficients of friction of iglidur® A500 as a function of the surface speed, p = 0.75 MPa



Graph 10.5: Coefficients of friction of iglidur® A500 as a function of the pressure, v = 0.01 m/s



Graph 10.6: Coefficients of friction of iglidur® A500 as a function of the shaft surface (Cf53 hardened and ground steel)

iglidur® A500

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Navigation icons: +, |, i, mm

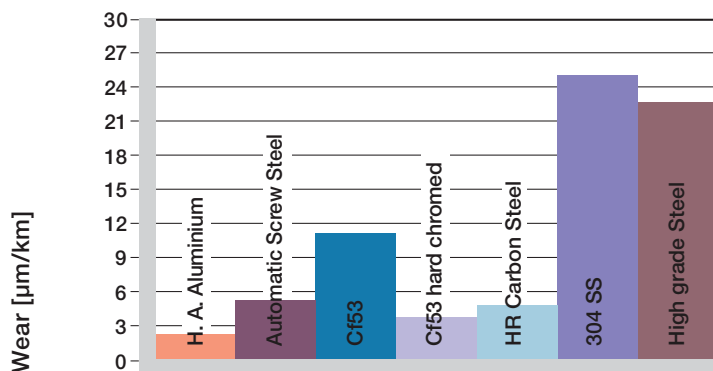
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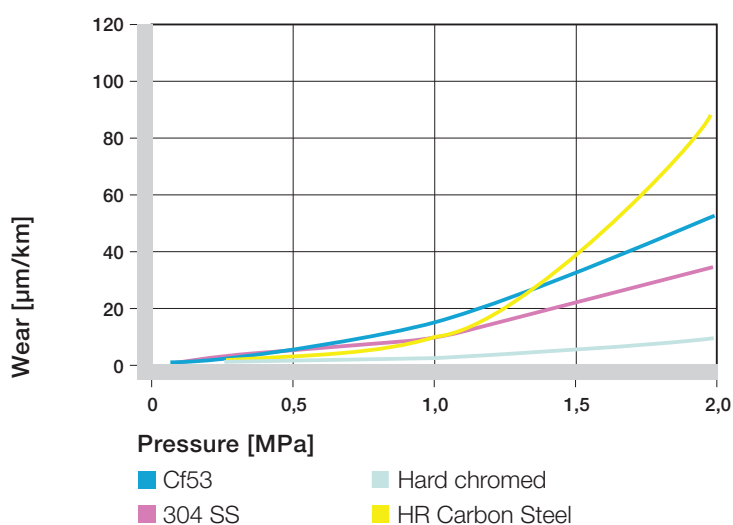
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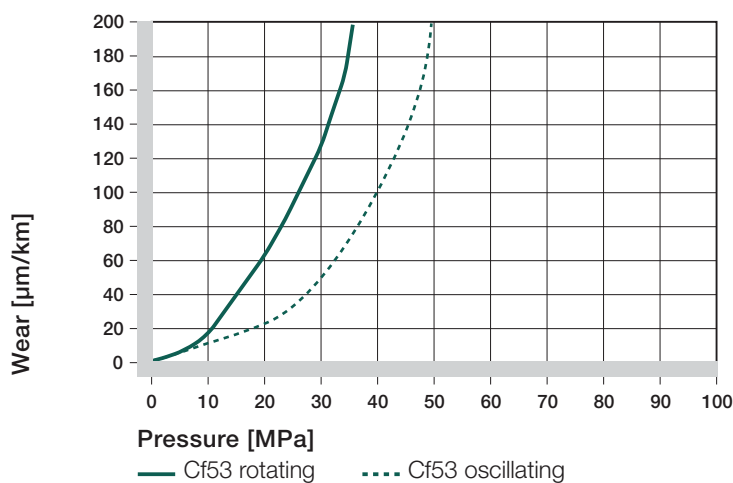
10.6



Shaft materials

 Graph 10.7: Wear of iglidur® A500, rotating application with different shaft materials, $p = 0.75$ MPa, $v = 0.5$ m/s


Graph 10.8: Wear of iglidur® A500 with different shaft materials in rotating applications



Graph 10.9: Wear for rotating and oscillating applications as a function of the pressure (Cf53 hardened and ground steel)

Shaft Materials

Graphs 10.7 to 10.9 illustrate an extract of the results of tests with different shaft materials carried out with iglidur A500 plain bearings. The combination “igidur® A500 against hard chromed shaft” is especially striking with regard to rotation. Up to approx. 2.0 MPa, the wear of this combination remains almost irrespective of load.

With regard to oscillating movements against shafts of Cf53, the wear resistance is better than that of rotation under the same pressure. If the shaft material you intend to use is not included in these graphs, please contact us.

Graphs 10.7 to 10.9

Shaft Materials, pages 1.28

Installation Tolerances

igidur® A500 plain bearings are standard bearings for shafts with h tolerance (h9 is recommended at least).

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 of the bearings is automatically adjusted to F10 tolerance.

Testing Methods, page 1.35

Chemical Resistance

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

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

Graph 10.10

Chemical Table, pages 70.1

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 2×10^5 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.

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® A500 F10 [mm]	
up to 3	0-0,025	+0,006	+0,046
> 3 to 6	0-0,030	+0,010	+0,058
> 6 to 10	0-0,036	+0,013	+0,071
> 10 to 18	0-0,043	+0,016	+0,086
> 18 to 30	0-0,050	+0,020	+0,104
> 30 to 50	0-0,062	+0,025	+0,125

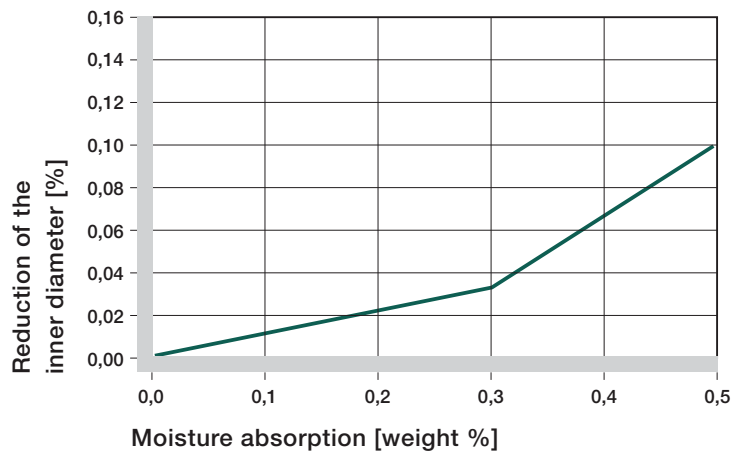
Table 10.5: Essential tolerances for iglidur® A500 plain bearings according to ISO 3547-1 after pressfit

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

Table 10.6: Chemical resistance of iglidur® A500 – detailed list, page 70.1

+ resistant 0 conditionally resistant – not resistant

All data given at room temperature [20°C]



Graph 10.10: Effect of moisture absorption on iglidur® A500 plain bearings

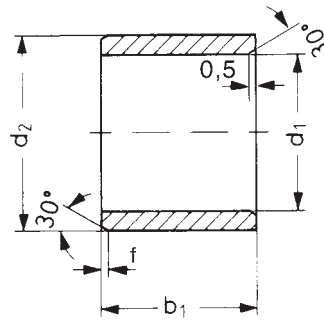
iglidur® A500	
Specific	
volume resistance	> $10^{14} \Omega\text{cm}$
Surface resistance	> $10^{13} \Omega$

Table 10.7: Electrical properties of iglidur® A500

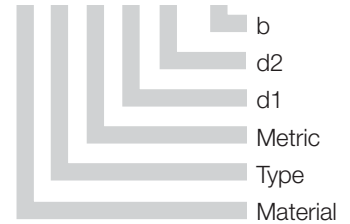
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Navigation icons: +, |, i, mm



Data in mm
Structure – part no.
A500S M-0507-05



mm

iglidur® A500 – Type S

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10.8

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

Bestellnummer	d1	d1-Toleranz*	d2	b1
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 1.35

Order example

Our price breaks are defined by the order quantity.

1- 9	25-49	100-199	500- 999	2500-4999
10-24	50-99	200-499	1000-2499	

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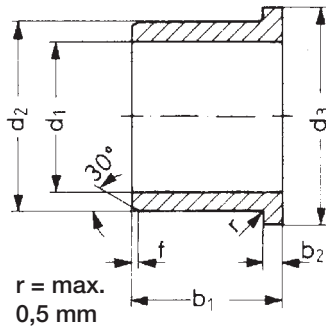


Type S

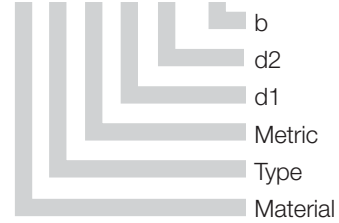


Type F

Lifetime calculation, CAD files and much more support ► www.igus.de/en/a500



Data in mm
Structure – part no.
A500 F M-0405-04



Dimensions according to ISO 3547-1 and special dimensions

d1 [mm]:	Ø 1-6	Ø 6-12	Ø 12-30	Ø > 30
f [mm]:	0,3	0,5	0,8	1,2

Part Number	d1	d1 Tolerance*	d2	d3	b1	b2
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 1.35

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mm

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