

**Runs up to three times longer than
iglidur® J – iglidur® J3**



Standard range from stock

Lubrication- and maintenance-free

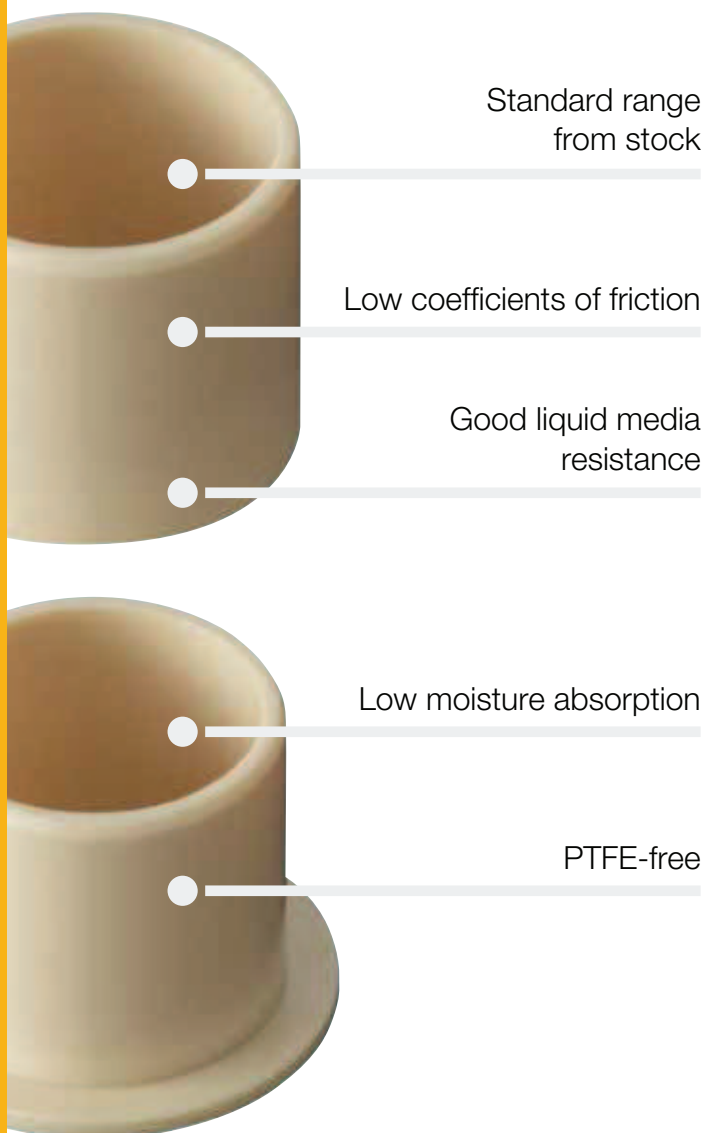
Low coefficients of friction

Good liquid media resistance

Low moisture absorption

PTFE-free

Runs up to three times longer than iglidur® J. iglidur® J3 is the new material with improved wear resistance at low to medium loads and high speed. The lifetime is up to three times longer than iglidur® J – the previous iglidur® champion.



When to use it?

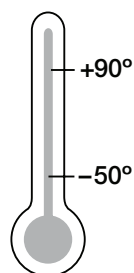
- If wear resistance (rotating or oscillating) of iglidur® J should be optimized
- If a really low coefficient of friction in dry run is necessary
- If high wear resistance at low temperatures is required
- If low moisture absorption is requested
- If good liquid media resistance is required



When not to use it?

- If you need a wear-resistant bearing for linear motion
▶ iglidur® J, page 109
- If permanent temperatures exceed +90 °C
▶ iglidur® J260, page 237
- If radial surface pressure is higher than 35 MPa
▶ iglidur® W300, page 151

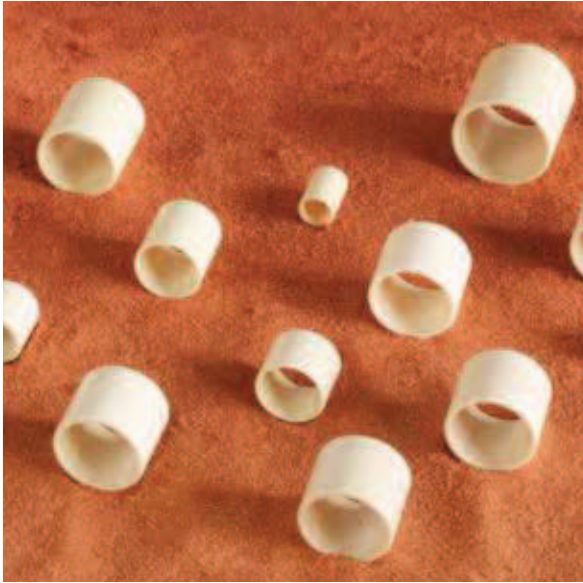
Temperature



Product range

2 types
Ø 2–40 mm
more dimensions
on request

iglidur® J3 | Application Examples



Typical sectors of industry and application areas

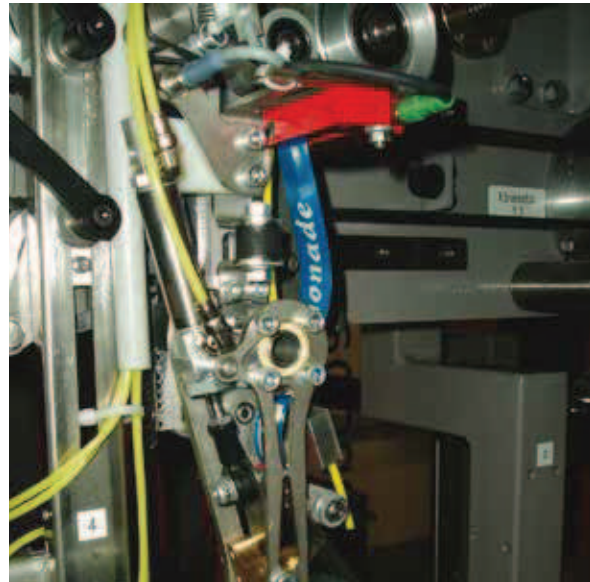
- Automation ● Printing industry
- Beverage technology ● Glass industry
- Aerospace engineering etc.

Improve technology and reduce costs –
310 exciting examples for iglidur® plain bearings online

► www.igus.eu/iglidur-applications



► www.igus.eu/flap-bearings



► www.igus.eu/carrier-handle

Material properties table

General properties	Unit	iglidur® J3	Testing method
Density	g/cm ³	1.42	
Colour		yellow	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	0.3	DIN 53495
Max. water absorption	% weight	1.3	
Coefficient of sliding friction, dynamic against steel	μ	0.06–0.20	
pv value, max. (dry)	MPa · m/s	0.5	
Mechanical properties			
Modulus of elasticity	MPa	2,700	DIN 53457
Tensile strength at +20 °C	MPa	70	DIN 53452
Compressive strength	MPa	60	
Max. recommended surface pressure (+20 °C)	MPa	45	
Shore D hardness		73	DIN 53505
Physical and thermal properties			
Max. long term application temperature	°C	+90	
Max. short term application temperature	°C	+120	
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	13	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 ¹²	DIN IEC 93
Surface resistance	Ω	> 10 ¹²	DIN 53482

Table 01: Material properties table

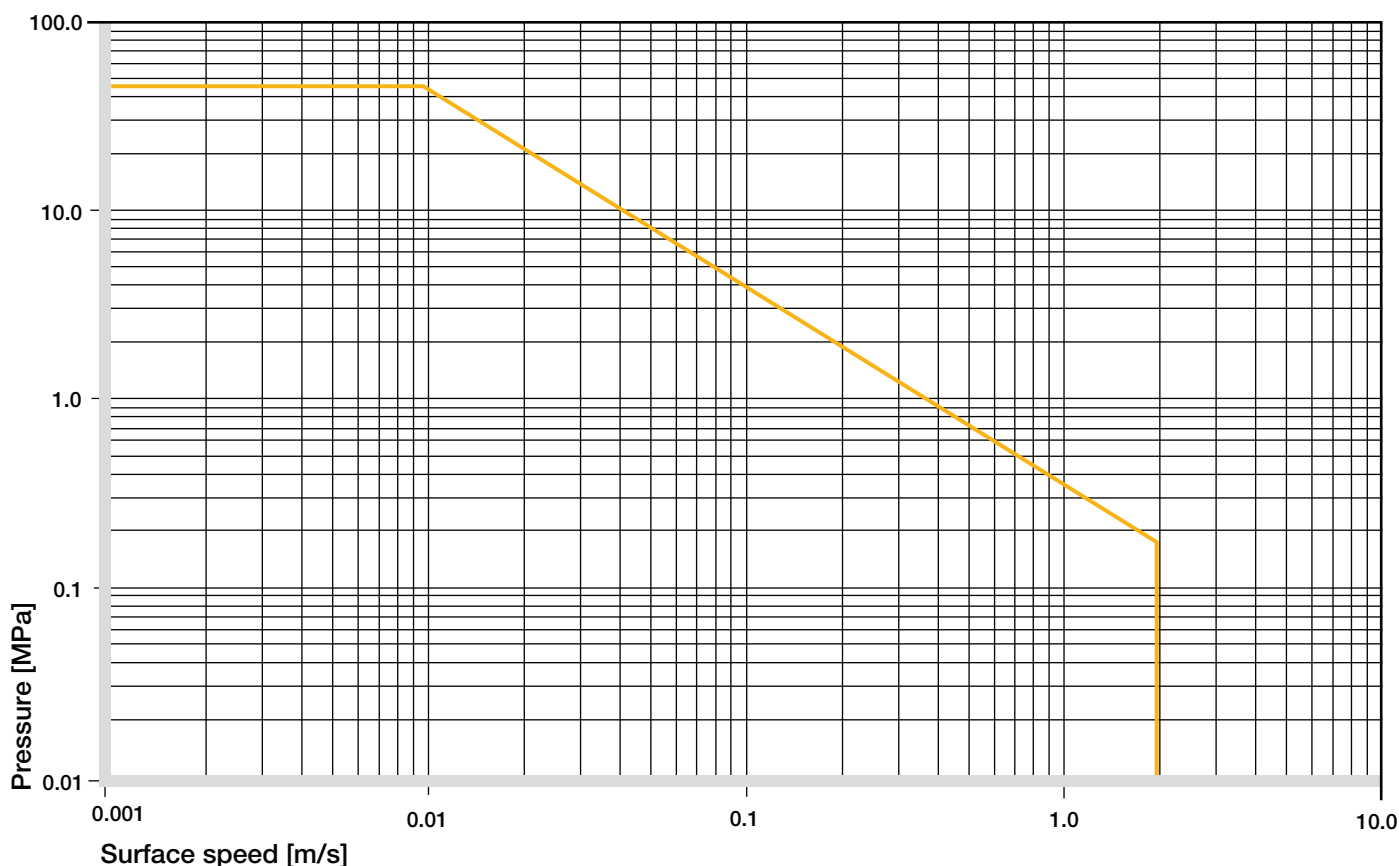


Diagram 01: Permissible pv values for iglidur® J3 with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

With respect to its general mechanical and thermal specifications, iglidur® J3 is directly comparable to our classic, iglidur® J.

Mechanical Properties

With increasing temperatures, the compressive strength of iglidur® J3 plain bearings decreases. The Diagram 02 shows this inverse relationship. However, at the longterm maximum temperature of +90°C the permissible surface pressure is almost 30 MPa. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

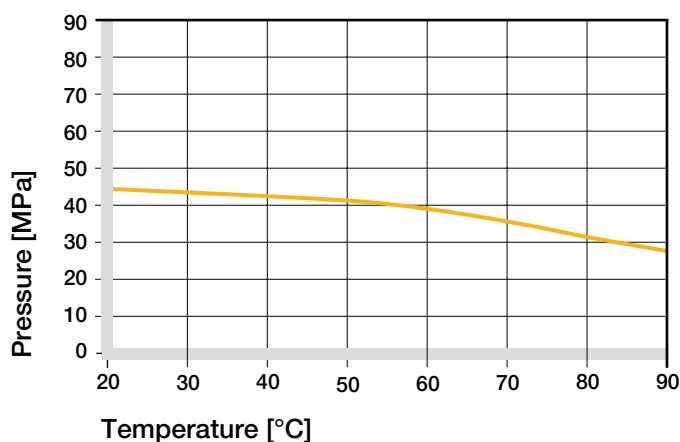


Diagram 02: Recommended maximum surface pressure as a function of temperature (45 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® J3 at radial loads. At the maximum recommended surface pressure of 45 MPa at room temperature, the deformation is less than 6%. A possible deformation could be, among others, dependent on the duty cycle of the load.

► Surface Pressure, page 63

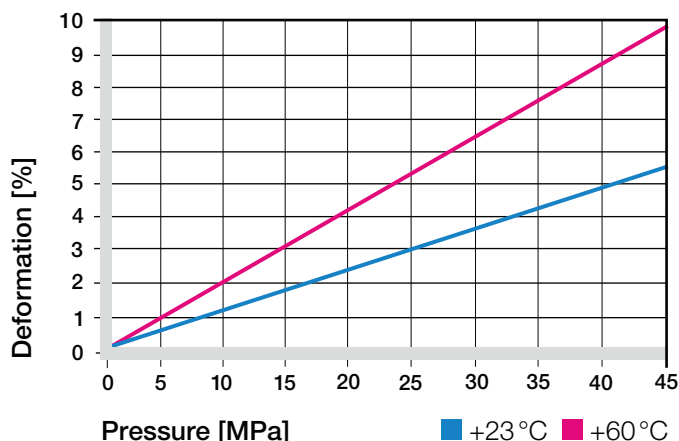


Diagram 03: Deformation under pressure and temperature

Permissible Surface Speeds

iglidur® J3 has been developed for medium to high surface speeds. The maximum values shown in table 02 can only be achieved at low pressures. At the given speeds, friction can cause a temperature increase to maximum permissible levels. In practice, though, this temperature level is rarely reached, due to varying application conditions.

► Surface Speed, page 65

m/s	Rotating	Oscillating	Linear
Continuous	1.5	1.1	8
Short term	3	2.1	10

Table 02: Maximum running speed

Temperatures

iglidur® J3 plain bearings can be used at temperatures from –50 °C up to +90 °C. The short term maximum temperature is +120 °C. The temperature in an application also has an effect on the bearing wear. With increasing temperatures, the wear increases and this effect is significant when temperatures rise over +90 °C.

► Application Temperatures, page 66

iglidur® J3	Application temperature
Minimum	–50 °C
Max. long term	+90 °C
Max. short term	+120 °C
Add. securing is required from	+60 °C

Table 03: Temperature limits

Friction and Wear

Similar to wear resistance, the coefficient of friction μ also changes with the load. The coefficient of friction decreases with increasing loads, as it shows a clear minimum at surface speeds up to 0.15 m/s (s. Diagram. 04 and 05).

► Coefficients of Friction and Surfaces, **page 68**

► Wear Resistance, **page 69**

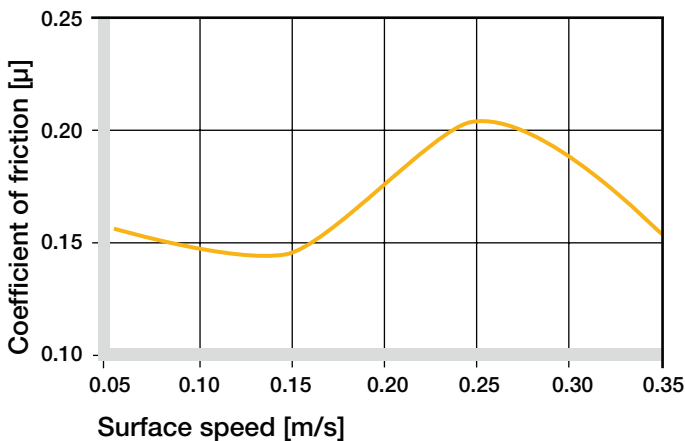


Diagram 04: Coefficient of friction as a function of the running speed, $p = 0.75 \text{ MPa}$

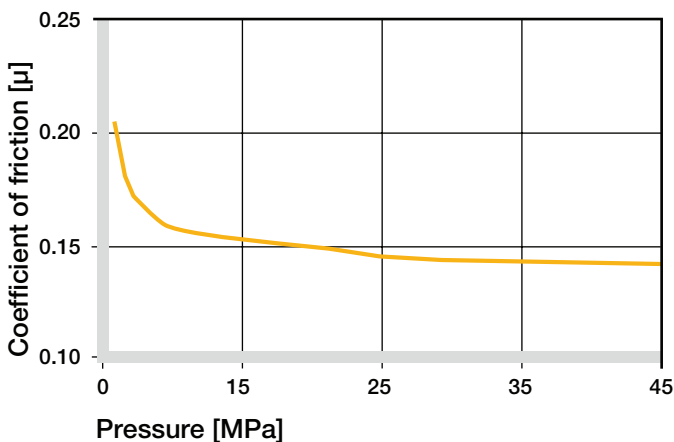


Diagram 05: Coefficient of friction as a function of the pressure, $v = 0.01 \text{ m/s}$

Shaft Materials

The friction and wear are also dependent, to a large degree, on the shaft material. Shafts that are too smooth, increase both the coefficient of friction and the wear of the bearing. For iglidur® J3 a ground surface with an average roughness $R_a = 0.1\text{--}0.3 \text{ μm}$ is recommended. (s. Diagram 06). Diagrams 07 to 09 shows results of testing different shaft materials with plain bearings made of iglidur® J3. In Diagram 07 it shows that iglidur® J3 can be combined with various shaft materials. At low pressures, hard anodized aluminum shafts, X90 stainless steel and Cf53 steel shafts proved to be the best. But even in combination with other shaft materials, except for free cutting steel, iglidur® J3 bearings achieve excellent wear values. Diagram 08 shows that the difference between shaft materials increase with increasing loads. Hard chromed or 304 SS-shafts are best at pressures from 2 MPa in rotation movement. Diagram 09 shows rotating and oscillating tests in comparison. With higher load, the wear increases more for rotating than for oscillating movements.

► Shaft Materials, **page 71**

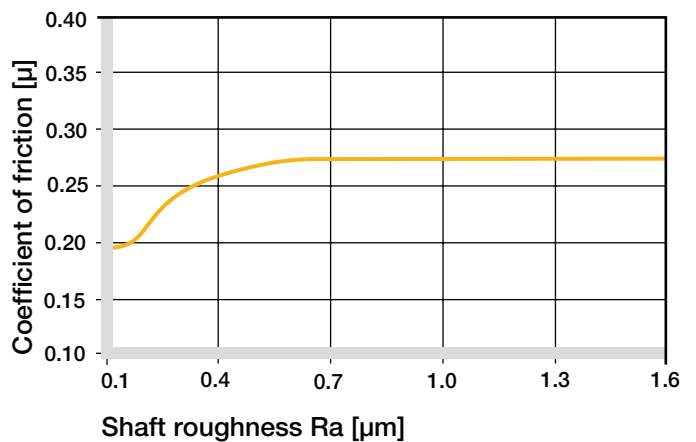


Diagram 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

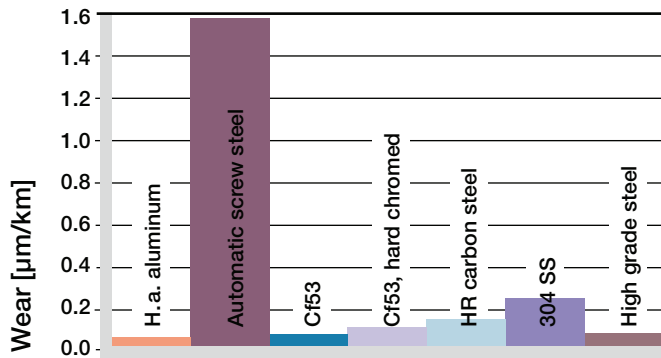


Diagram 07: Wear, rotating with different shaft materials, pressure $p = 1$ MPa, $v = 0.3$ m/s

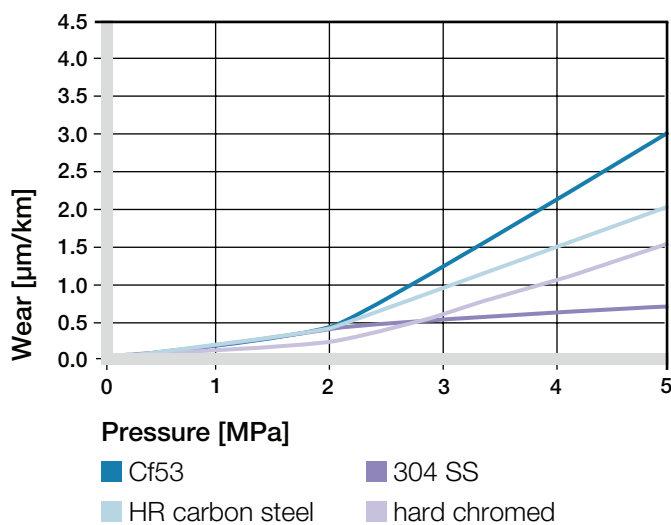


Diagram 08: Wear with different shaft materials in rotational operation, as a function of the pressure

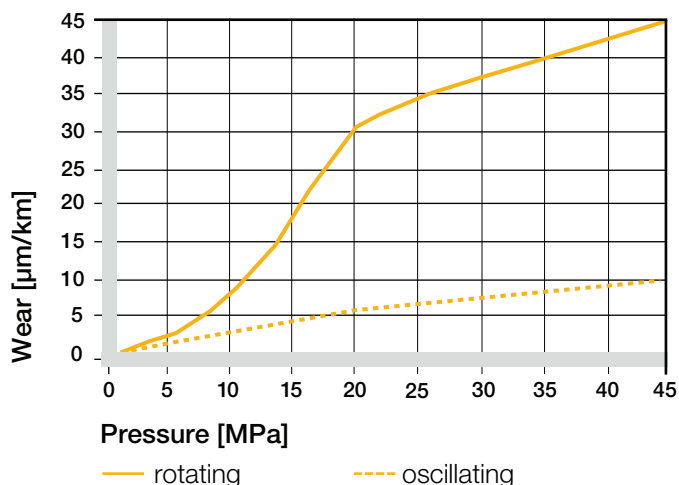


Diagram 09: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

iglidur® J3	Dry	Greases	Oil	Water
C.o.f. μ	0.06–0.20	0.09	0.04	0.04

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

Additional Properties

Chemical Resistance

iglidur® J3 bearings are resistant to diluted alkalis and very weak acids as well as to fuels and all kinds of lubricants. The low humidity absorption allows them to be used in wet or humid environments. iglidur® J3 bearings are also resistant to conventional detergents used in the food industry.

► Chemical Table, page 1258

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

Resistant to radiation up to an intensity of $1 \cdot 10^4$ Gy.

UV Resistance

iglidur® J3 plain bearings become discoloured under UV radiation. However, hardness, compressive strength and the wear resistance of the material do not change.

Vacuum

In vacuum applications, any absorbed moisture content is degassed. For this reason only dehumidified iglidur® J3 bearings are suitable for use in a vacuum.

Electrical Properties

iglidur® J3 plain bearings are electrically insulating.

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

Moisture Absorption

The moisture absorption of iglidur® J3 plain bearings is approximately 0.3 % in the standard atmosphere. The saturation limit submerged in water is 1.3 %. These values are so low that design changes due to absorption are only necessary in extreme cases.

Maximum moisture absorption

At +23 °C/50 % r.h.	0.3 % weight
Max. water absorption	1.3 % weight

Table 06: Moisture absorption

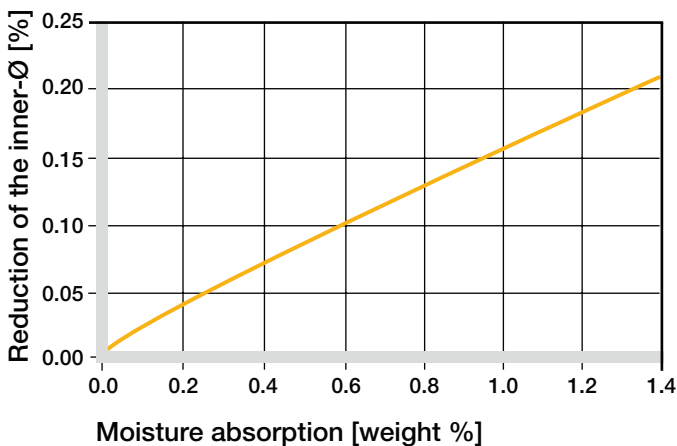


Diagram 10: Effect of moisture absorption on plain bearings

Installation Tolerances

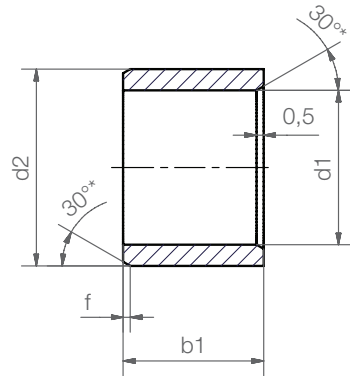
iglidur® J3 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the E10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table). In relation to the installation tolerance, the inner diameter changes with the absorption of humidity.

► Testing Methods, page 75

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® J3 E10 [mm]	Housing H7 [mm]
up 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
> 50 to 80	0–0.074	+0.060 +0.180	0 +0.030
> 80 to 120	0–0.087	+0.072 +0.212	0 +0.035
> 120 to 180	0–0.100	+0.085 +0.245	0 +0.040

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

Sleeve bearing



Order key

J3SM-0304-05



Length b1
Outer diameter d2
Inner diameter d1
Metric
Type (Form S)
Material iglidur® J3

Dimensions according to ISO 3547-1 and special dimensions

* thickness < 1 mm, chamfer = 20°

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
J3SM-0304-05	3.0	+0.014 +0.054	4.5	5.0
J3SM-0507-05	5.0	+0.020 +0.068	7.0	5.0
J3SM-0608-06	6.0	+0.020 +0.068	8.0	6.0
J3SM-0810-10	8.0	+0.025 +0.083	10.0	10.0
J3SM-1012-10	10.0	+0.025 +0.083	12.0	10.0
J3SM-1214-15	12.0	+0.032 +0.102	14.0	15.0
J3SM-1618-15	16.0	+0.032 +0.102	18.0	15.0
J3SM-2023-20	20.0	+0.040 +0.124	23.0	20.0
J3SM-2528-30	25.0	+0.040 +0.124	28.0	30.0
J3SM-3034-30	30.0	+0.040 +0.124	34.0	30.0
J3SM-3539-40	35.0	+0.050 +0.150	39.0	40.0
J3SM-4044-40	40.0	+0.050 +0.150	44.0	40.0

* after pressfit. Testing methods ► page 75

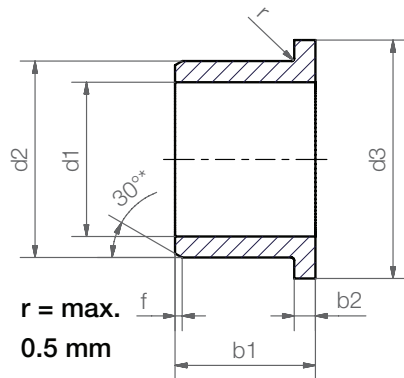


delivery from stock
time



prices price list online
www.igus.eu/eu/j3

Flange bearing



Order key

J3FM-0304-05



Length b1
Outer diameter d2
Inner diameter d1
Metric
Type (Form F)
Material iglidur® J3

Dimensions according to ISO 3547-1 and special dimensions

* thickness < 1 mm, chamfer = 20°

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
J3FM-0203505-05	2.0	+0.014 +0.054	3.5	5.0	5.0	0.75
J3FM-0304-05	3.0	+0.014 +0.054	4.5	7.5	5.0	0.75
J3FM-0507-05	5.0	+0.020 +0.068	7.0	11.0	5.0	1.0
J3FM-0608-06	6.0	+0.020 +0.068	8.0	12.0	6.0	1.0
J3FM-0810-10	8.0	+0.025 +0.083	10.0	15.0	10.0	1.0
J3FM-1012-10	10.0	+0.025 +0.083	12.0	18.0	10.0	1.0
J3FM-1214-12	12.0	+0.032 +0.102	14.0	20.0	12.0	1.0
J3FM-1618-17	16.0	+0.032 +0.102	18.0	24.0	17.0	1.0
J3FM-2023-21	20.0	+0.040 +0.124	23.0	30.0	21.5	1.5
J3FM-2528-21	25.0	+0.040 +0.124	28.0	35.0	21.5	1.5
J3FM-3034-26	30.0	+0.040 +0.124	34.0	42.0	26.0	2.0
J3FM-3539-26	35.0	+0.050 +0.150	39.0	47.0	26.0	2.0
J3FM-4044-40	40.0	+0.050 +0.150	44.0	52.0	40.0	2.0

* after pressfit. Testing methods ► page 75



Don't find your size?

Do you need another length, other dimensions or tolerances? You need a particular design or alternative for your application? Please call us. igus® listens to your needs and provides you a solution in a very short time.



Even more dimensions from stock

More than 300 dimensions are now available. Search online for your required bearing.

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time



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