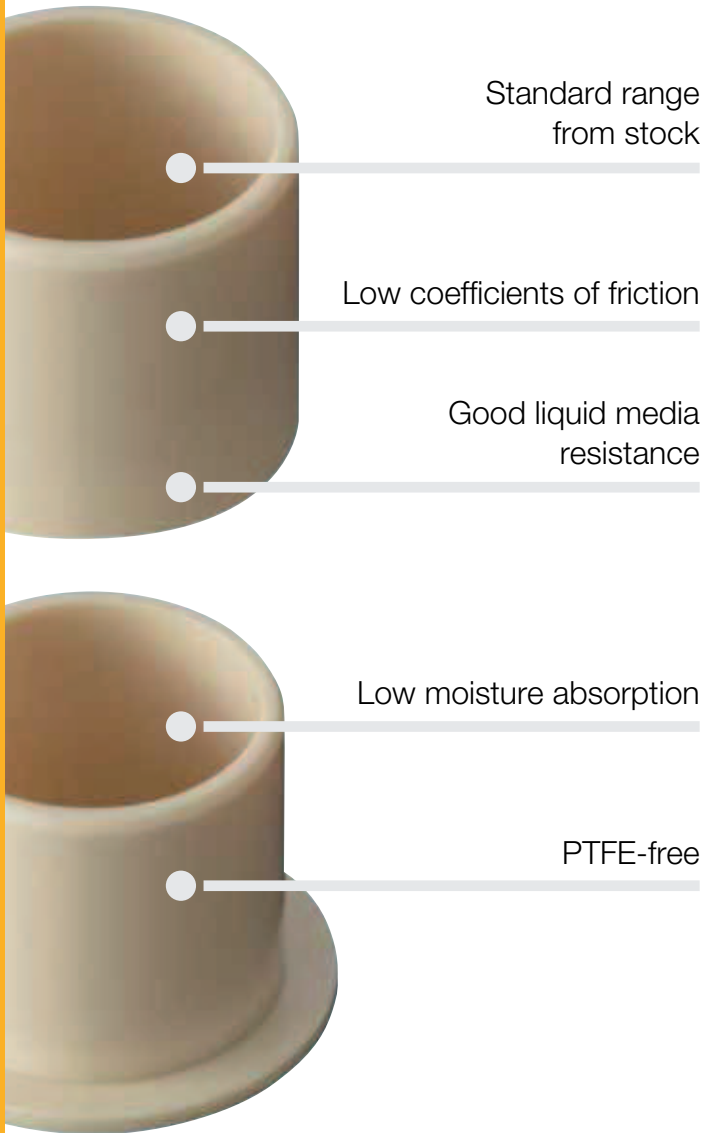


**Runs up to three times longer than iglidur® J.** iglidur® J3 is the new material with improved wear resistance at low to medium loads and high speed. The lifetime is up to three times longer than iglidur® J – the previous iglidur® champion.



#### When to use it?

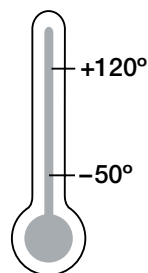
- If wear resistance (rotating or oscillating) of iglidur® J should be optimized
- If a really low coefficient of friction in dry run is necessary
- If high wear resistance at low temperatures is required
- If low moisture absorption is requested
- If good liquid media resistance is required



#### When not to use it?

- If you need a wear-resistant bearing for linear motion
  - ▶ **iglidur® J, page 89**
- If permanent temperatures exceed +90 °C
  - ▶ **iglidur® J260, page 209**
- If radial surface pressure is higher than 35 MPa
  - ▶ **iglidur® W300, page 131**

#### Temperature

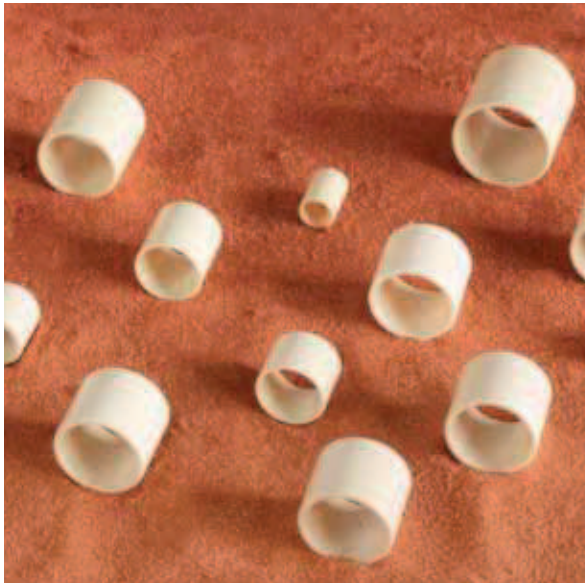


#### Product range

2 types  
Ø 3–40 mm  
more dimensions  
on request



# iglidur® J3 | Application Examples



## Typical sectors of industry and application areas

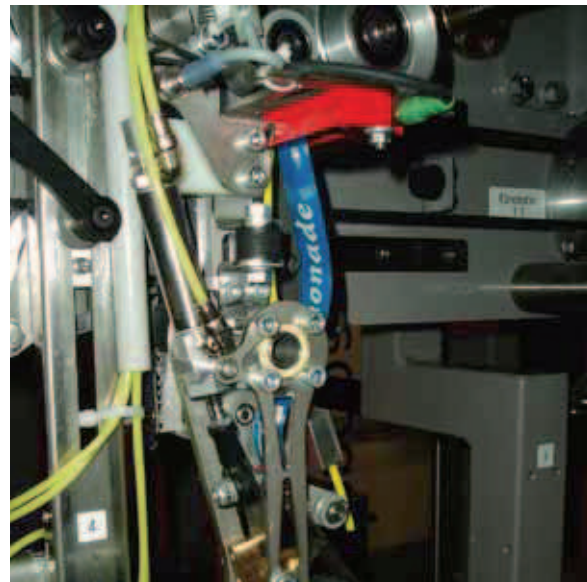
- Automation ● Printing industry
- Beverage technology ● Glass industry
- Aerospace engineering etc.

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

► [www.igus.eu/eu/iglidur-applications](http://www.igus.eu/eu/iglidur-applications)



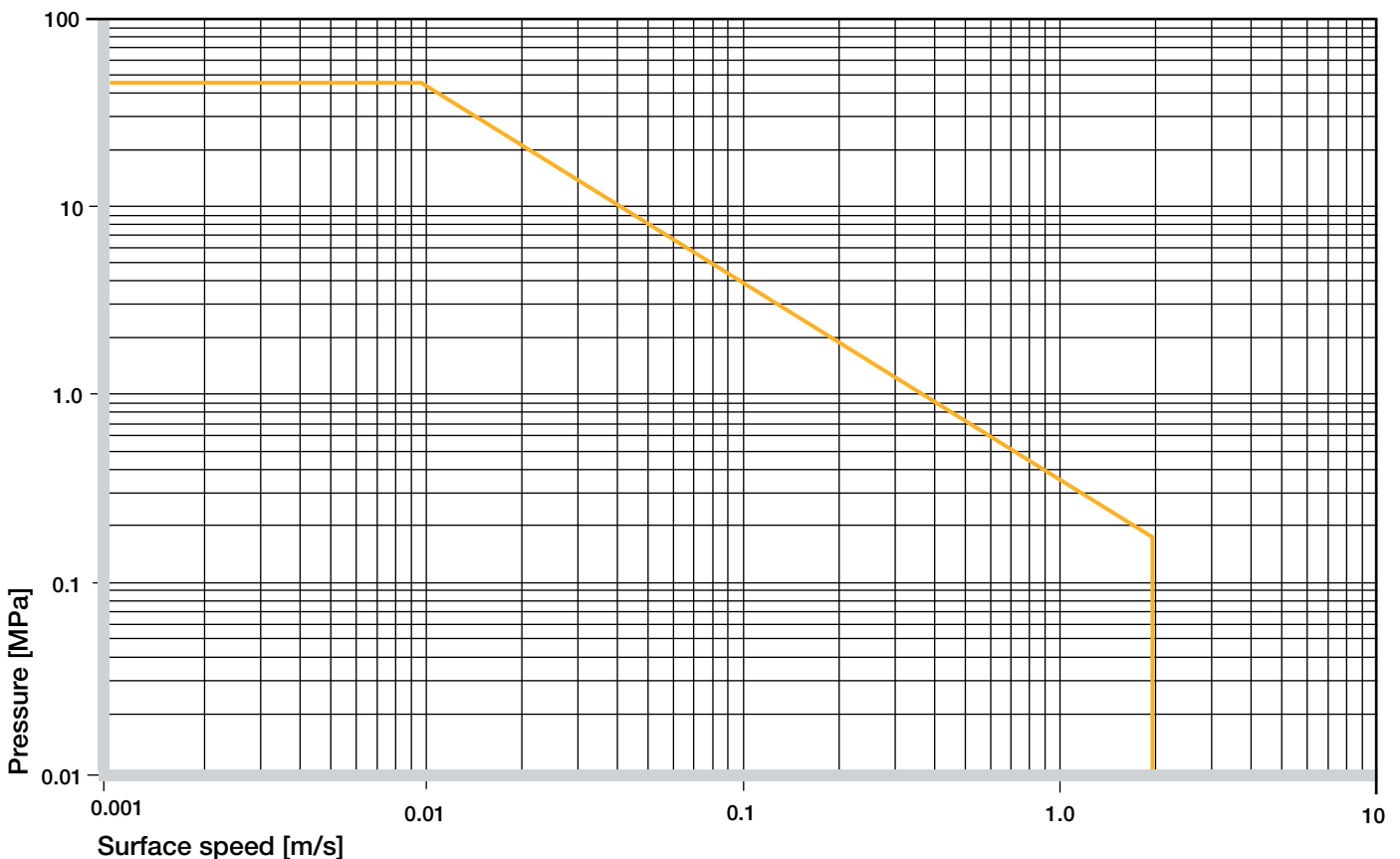
► [www.igus.eu/flap-bearings](http://www.igus.eu/flap-bearings)



► [www.igus.eu/carrier-handle](http://www.igus.eu/carrier-handle)

Material data			
General properties	Unit	iglidur® J3	Testing method
Density	g/cm <sup>3</sup>	1.42	
Colour		yellow	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	0.3	DIN 53495
Max. moisture 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 <sup>-1</sup> · 10 <sup>-5</sup>	13	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 <sup>12</sup>	DIN IEC 93
Surface resistance	Ω	> 10 <sup>12</sup>	DIN 53482

Table 01: Material data

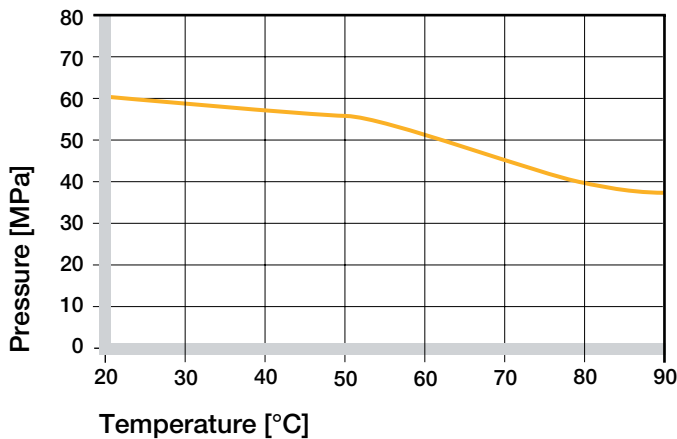


Graph 01: Permissible pv values for iglidur® J3 with a wall thickness of 1 mm dry running against a steel shaft at +20 °C, mounted in a steel housing

# iglidur® J3 | Technical Data

## Mechanical Properties

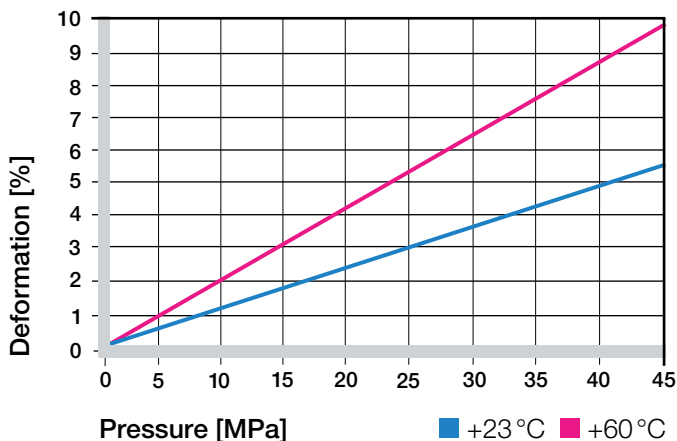
The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. With increasing temperatures, the compressive strength of iglidur® J3 plain bearings decreases. The Graph 02 shows this inverse relationship. However, at the longterm maximum temperature of +90 °C the permissible surface pressure is almost 25 MPa.



**Graph 02: Recommended maximum surface pressure as a function of temperature (40 MPa at +20 °C)**

Graph 03 shows the elastic deformation of iglidur® J3 during radial loading. At the recommended maximum surface pressure of 40 MPa the deformation is less than 3%. The plastic deformation is minimal up to a pressure of approximately 100 MPa. The possible plastic deformation depends on the applied pressure, as well as other external factors.

### ► Surface Pressure, page 43



**Graph 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 45

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 46

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

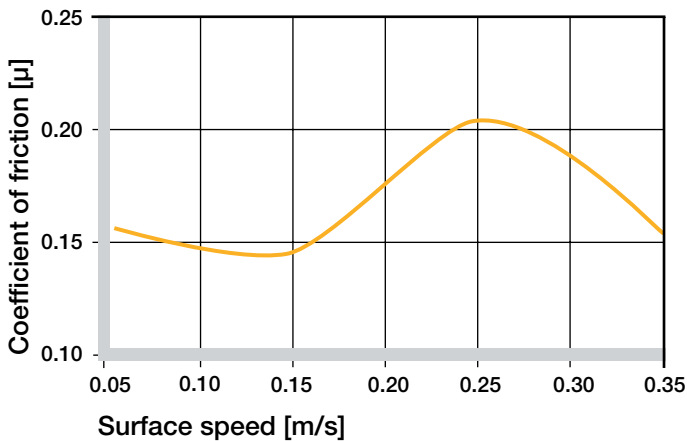
**Table 03: Temperature limits**

## Friction and Wear

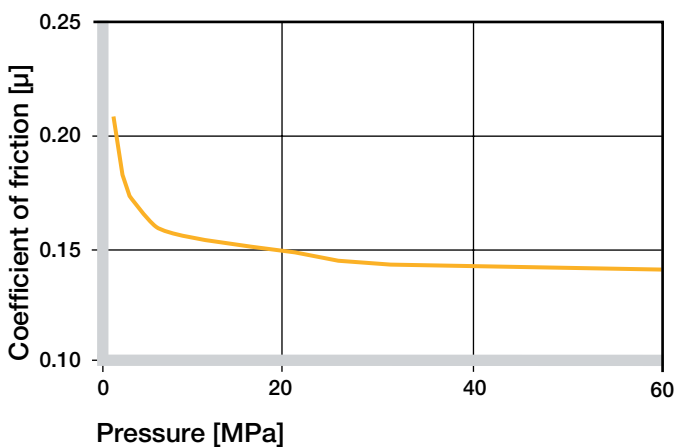
Similar to wear resistance, the coefficient of friction  $\mu$  also changes with the load. The coefficient of friction decreases with increasing loads, as it shows a clear minimum at surface speeds up to 0.15 m/s (s. Graph. 04 and 05).

► Coefficients of Friction and Surfaces, **page 48**

► Wear Resistance, **page 49**



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

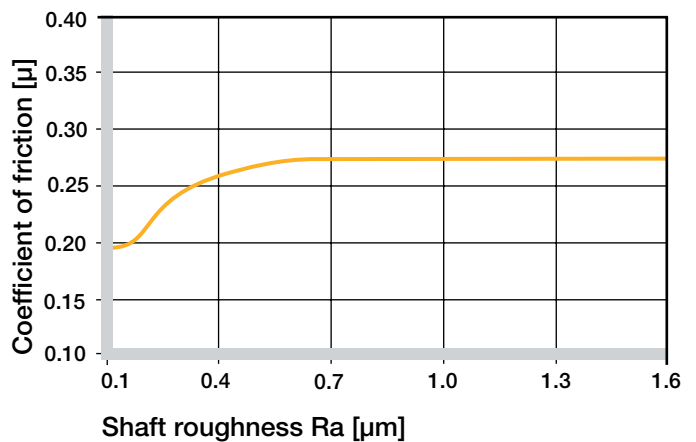


Graph 05: Coefficient of friction as a function of the pressure,  $v = 0,01 \text{ m/s}$

## Shaft Materials

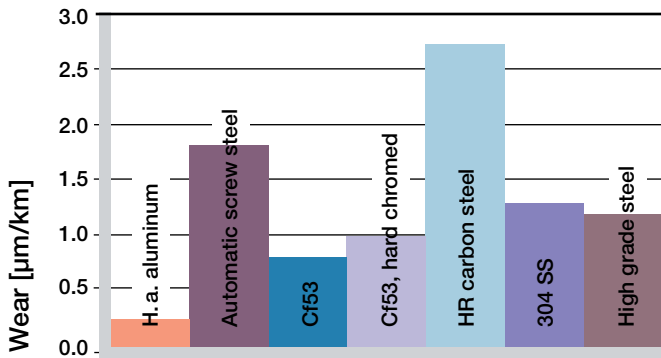
The friction and wear are also dependent, to a large degree, on the shaft material. Shafts that are too smooth, increase both the coefficient of friction and the wear of the bearing. For iglidur® J3 a ground surface with an average roughness  $R_a = 0,1-0,3 \mu\text{m}$  is recommended. (s. Graph 06). Graphs 07 to 09 shows results of testing different shaft materials with plain bearings made of iglidur® J3. In Graph 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. Graph 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. Graph 09 shows rotating and oscillating tests in comparison. With higher load, the wear increases more for rotating than for oscillating movements.

► Shaft Materials, **page 51**

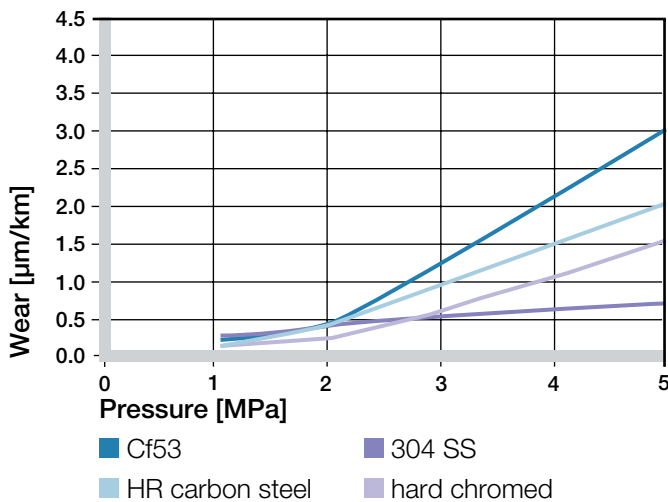


Graph 06: Coefficient of friction as function of the shaft surface (Cf53 hardened and ground steel)

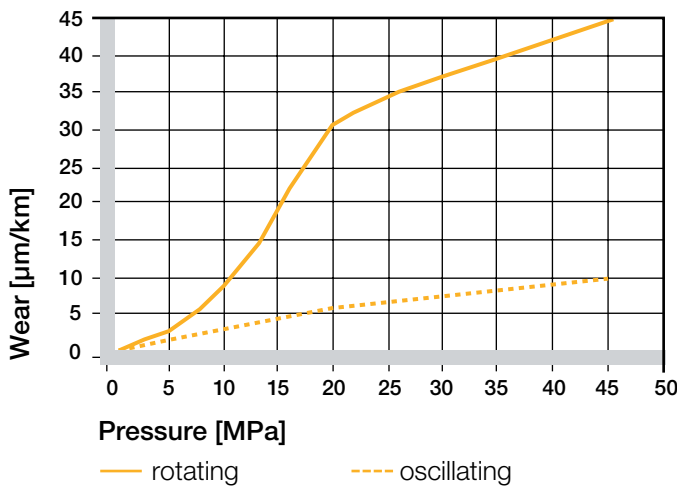
# iglidur® J3 | Technical Data



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® J3	Dry	Greases	Oil	Water
C.o.f. $\mu$	0.08–0.15	0.09	0.04	0.04

Table 04: Coefficient of friction against steel ( $R_a = 1 \text{ }\mu\text{m}$ , 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 974

Medium	Resistance
Alcohol	+
Hydrocarbons	+
Greases, oils without additives	+
Fuels	+
Diluted acids	0 to –
Strong acids	–
Diluted alkalis	+
Strong alkalis	+ 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  $1 \cdot 10^4 \text{ Gy}$ .

### 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 <sup>12</sup> Ωcm
Surface resistance	> 10 <sup>12</sup> Ω 10

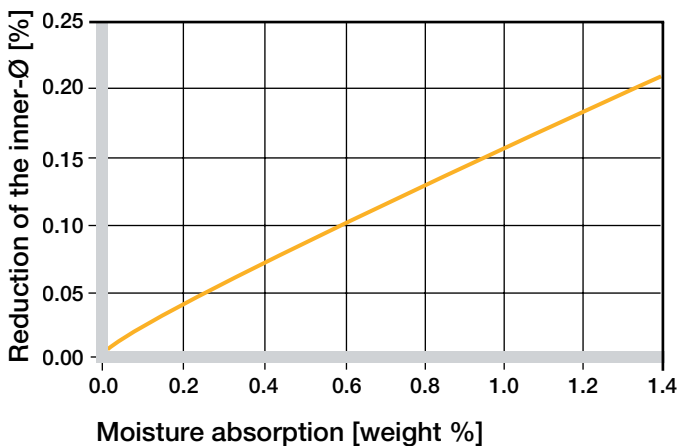
## Moisture Absorption

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. moisture absorption	1.3% weight

**Table 06: Moisture absorption**



**Graph 10: Effect of moisture absorption on plain bearings**

## Installation Tolerances

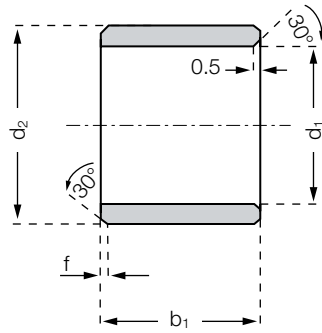
iglidur® J3 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, the inner diameter adjusts to meet the specified tolerances.

► Testing Methods, **page 55**

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

Chamfer in relation to the d1

d1 [mm]:    Ø 1–6    |    Ø 6–12    |    Ø 12–30    |    Ø &gt; 30

f [mm]:        0.3        |        0.5        |        0.8        |        1.2

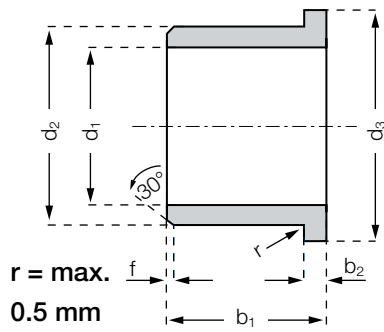
## Dimensions [mm]

Part number	d1	Tolerance pressfitted in H7	d2	b1
J3SM-0304-05	3	+0.020 +0.068	4.5	5
J3SM-0507-05	5	+0.020 +0.068	7	5
J3SM-0608-06	6	+0.020 +0.068	8	6
J3SM-0810-10	8	+0.025 +0.083	10	10
J3SM-1012-10	10	+0.025 +0.083	12	10
J3SM-1214-15	12	+0.032 +0.102	14	15
J3SM-1618-15	16	+0.032 +0.102	18	15
J3SM-2023-20	20	+0.040 +0.124	23	20
J3SM-2528-30	25	+0.040 +0.124	28	30
J3SM-3034-30	30	+0.040 +0.124	34	30
J3SM-3539-40	35	+0.050 +0.150	39	40
J3SM-4044-40	40	+0.050 +0.150	44	40

delivery available  
time from stockprices price list online  
www.igus.eu/eu/j3order part number  
example J3SM-0304-05



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

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	Tolerance pressfitted in H7	d2	d3	b1	b2
J3FM-0304-05	3	+0.020 +0.068	4.5	7.5	5	0.75
J3FM-0507-05	5	+0.020 +0.068	7	11	5	1
J3FM-0608-06	6	+0.020 +0.068	8	12	6	1
J3FM-0810-10	8	+0.025 +0.083	10	15	10	1
J3FM-1012-10	10	+0.025 +0.083	12	18	10	1
J3FM-1214-12	12	+0.032 +0.102	14	20	12	1
J3FM-1618-17	16	+0.032 +0.102	18	24	17	1
J3FM-2023-21	20	+0.040 +0.124	23	30	21.5	1.5
J3FM-2528-21	25	+0.040 +0.124	28	35	21.5	1.5
J3FM-3034-26	30	+0.040 +0.124	34	42	26	2
J3FM-3539-26	35	+0.050 +0.150	39	47	26	2
J3FM-4044-40	40	+0.050 +0.150	44	52	40	2

delivery available from stock

prices price list online [www.igus.eu/eu/j3](http://www.igus.eu/eu/j3)

order part number example J3FM-0304-05