

## The new endurance runner: specialist for pivoting applications and pulsating loads

Up to 10MPa, up to three times more  
wear-resistant than iglidur® J  
**igidur® J3**



### When to use it?

- When optimising wear resistance compared to iglidur® J
- When very low coefficients of friction in dry operation are required
- When high wear resistance at low loads is required
- When low moisture absorption is fundamental
- When good liquid media resistance is required



### When not to use?

- When a wear-resistant plain bearing for linear motion is required  
*igidur® J*
- When continuous operating temperatures are higher than +90°C  
*igidur® J260*
- When radial surface pressure is higher than 45MPa  
*igidur® W300*

# Bearing technology | Plain bearing | iglidur® J3



Ø  
2.0 – 50.0mm



Also available as:



Bar stock, round bar  
Page 675

**The new endurance runner: specialist for pivoting applications and pulsating loads**  
Up to 10MPa, up to three times more wear-resistant than iglidur® J



Bar stock, plate  
Page 683

iglidur® J3 is a material with improved wear resistance at low to medium loads and high speed. The service life is up to 300% longer than iglidur® J – the proven top endurance runner material.

- Low coefficient of friction
- High media resistance
- Low moisture absorption
- PTFE-free
- Lubrication-free
- Maintenance-free



tribo-tape liner  
Page 691

### Typical application areas

- Automation
- Printing industry
- Beverage industry
- Glass industry
- Aerospace engineering



Piston rings  
Page 584

### 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	-		+



Two hole flange bearings  
Page 603



Moulded special parts  
Page 624



igubal® spherical balls  
Page 841

**Online product finder**  
[www.igus.eu/iglidur-finder](http://www.igus.eu/iglidur-finder)

**Online service life calculation**  
[www.igus.eu/iglidur-expert](http://www.igus.eu/iglidur-expert)



# Technical data

General properties		Testing method	
Density	g/cm <sup>3</sup>	1.42	
Colour		yellow	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.3	DIN 53495
Max. moisture absorption	% weight	1.3	
Coefficient of friction, dynamic, against steel	μ	0.06 – 0.20	
pv value, max. (dry)	MPa · m/s	0.50	
Mechanical properties			
Flexural modulus	MPa	2,700	DIN 53457
Flexural 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. application temperature long-term	°C	+90	
Max. application temperature short-term	°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 contact resistance	Ωcm	> 10 <sup>12</sup>	DIN IEC 93
Surface resistance	Ω	> 10 <sup>12</sup>	DIN 53482

Table 01: Material properties

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

### Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® J3 plain bearings is approximately 0.3% weight. The saturation limit in water is 1.3% weight. These values are so low that a moisture expansion need to be considered only in extreme cases.

### Vacuum

In vacuum, any present moisture is released as vapour. Use in vacuum is only possible with dehumidified iglidur® J3 bearings.

### Radiation resistance

Resistant to radiation up to an intensity of 1 · 10<sup>4</sup>Gy.

### Resistance to weathering

iglidur® J3 plain bearings are resistant to weathering. The material properties are slightly affected. Discoloration occurs.

### Mechanical properties

With increasing temperatures, the compressive strength of iglidur® J3 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® J3 at radial loads. At the maximum recommended surface pressure of 45MPa at room temperature the deformation is less than 6%. A possible deformation could be, among others, dependant on the duty cycle of the load.

**Surface pressure, page 41**



-50°C up to +90°C



45MPa



## Permissible surface speeds

iglidur® J3 is also suitable for medium to high surface speeds. The maximum values shown in table 03 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 level is rarely reached due to varying application conditions.

**Surface speed, page 44**

## Temperature

The temperatures prevailing in the bearing system also have an influence on the wear. With increasing temperatures, the wear increases and this effect is significant when temperatures rise over +90°C. 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  $\mu$  also changes with the surface speed and load (diagrams 04 and 05).

**Coefficient of friction and surfaces, page 47**

**Wear resistance, page 50**

## 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 surface finish  $R_a = 0.1 - 0.3\mu\text{m}$  is recommended. The diagram 06 shows that iglidur® J3 can be combined with various shaft materials. Diagram 07 shows rotating and pivoting applications in comparison. With higher load, the wear increases more for rotating than for pivoting movements.

**Shaft materials, page 52**

## Installation tolerances

iglidur® J3 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). In relation to the installation tolerance, the inner diameter changes with the absorption of humidity.

**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	1.5	1.1	8.0
short-term m/s	3.0	2.1	10.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction $\mu$	0.06 - 0.20	0.09	0.04	0.04

Table 04: Coefficient of friction against steel ( $R_a = 1\mu\text{m}$ , 50HRC)

$\varnothing d1$ [mm]	Housing		Plain bearing		Shaft	
	H7 [mm]	E10 [mm]	H7 [mm]	E10 [mm]	h9 [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

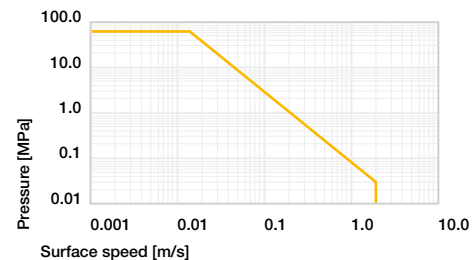


Diagram 01: Permissible pv values for iglidur® J3 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

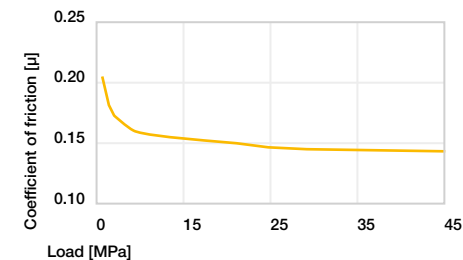


Diagram 05: Coefficient of friction as a function of the load,  $v = 0.01\text{m/s}$

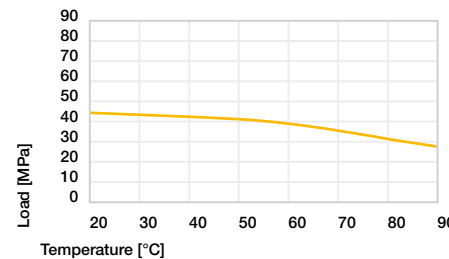


Diagram 02: Maximum recommended surface pressure as a function of temperature (45MPa at +20°C)

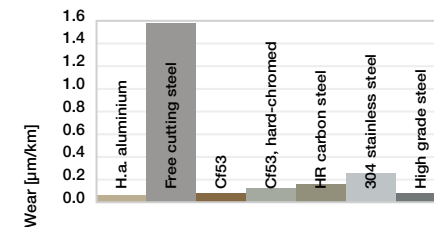


Diagram 06: Wear, rotating with different shaft materials, pressure,  $p = 1\text{MPa}$ ,  $v = 0.3\text{m/s}$

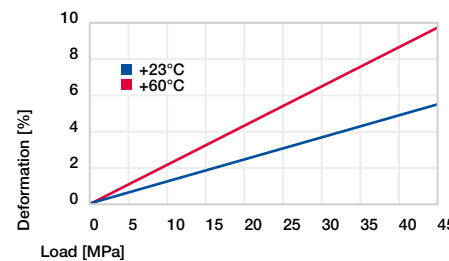


Diagram 03: Deformation under pressure and temperature

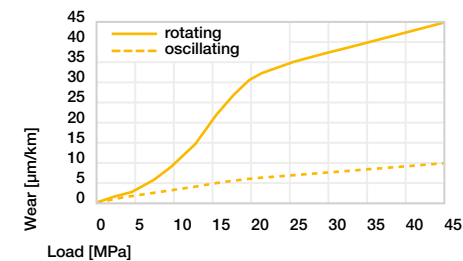


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load

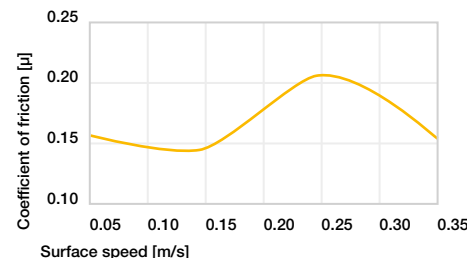
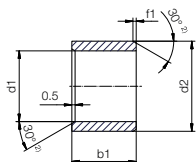


Diagram 04: Coefficient of friction as a function of the surface speed,  $p = 0.75\text{MPa}$

## Sleeve bearing (form S)



<sup>2)</sup> 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

**i** Dimensions according to ISO 3547-1 and special dimensions

**i** Order example: **J3SM-0304-05** – no minimum order quantity.

**J3** iglidur® material **S** Sleeve bearing **M** Metric **03** Inner Ø d1 **04** Outer Ø d2 **05** Total length b1

d1 [mm]	d1 Tolerance <sup>3)</sup>	d2 [mm]	b1 [mm]	Part No.
3.0	+0.014 +0.054	4.5	5.0	J3SM-0304-05
4.0		5.5	4.0	J3SM-0405-04
4.0		5.5	6.0	J3SM-0405-06
5.0	+0.020	7.0	5.0	J3SM-0507-05
5.0	+0.068	7.0	10.0	J3SM-0507-10
6.0		8.0	6.0	J3SM-0608-06
6.0		8.0	8.0	J3SM-0608-08
6.0		8.0	10.0	J3SM-0608-10
8.0		10.0	8.0	J3SM-0810-08
8.0		10.0	10.0	J3SM-0810-10
8.0		10.0	12.0	J3SM-0810-12
10.0	+0.025	12.0	8.0	J3SM-1012-08
10.0	+0.083	12.0	10.0	J3SM-1012-10
10.0		12.0	12.0	J3SM-1012-12
10.0		12.0	15.0	J3SM-1012-15
10.0		12.0	20.0	J3SM-1012-20
12.0		14.0	10.0	J3SM-1214-10
12.0		14.0	12.0	J3SM-1214-12
12.0		14.0	15.0	J3SM-1214-15
12.0		14.0	20.0	J3SM-1214-20
13.0		15.0	10.0	J3SM-1315-10
13.0	+0.032	15.0	20.0	J3SM-1315-20
14.0	+0.102	16.0	15.0	J3SM-1416-15
14.0		16.0	20.0	J3SM-1416-20
14.0		16.0	25.0	J3SM-1416-25
15.0		17.0	15.0	J3SM-1517-15
15.0		17.0	20.0	J3SM-1517-20
15.0		17.0	25.0	J3SM-1517-25

d1 [mm]	d1 Tolerance <sup>3)</sup>	d2 [mm]	b1 [mm]	Part No.
15.0		17.0	30.0	J3SM-1517-30
16.0		18.0	15.0	J3SM-1618-15
16.0		18.0	20.0	J3SM-1618-20
16.0	+0.032	18.0	25.0	J3SM-1618-25
18.0	+0.102	20.0	15.0	J3SM-1820-15
18.0		20.0	20.0	J3SM-1820-20
18.0		20.0	25.0	J3SM-1820-25
18.0		21.0	25.0	J3SM-1821-25
20.0		23.0	10.0	J3SM-2023-10
20.0		23.0	15.0	J3SM-2023-15
20.0		23.0	20.0	J3SM-2023-20
20.0		23.0	25.0	J3SM-2023-25
20.0		23.0	30.0	J3SM-2023-30
22.0		25.0	15.0	J3SM-2225-15
22.0		25.0	20.0	J3SM-2225-20
22.0		25.0	25.0	J3SM-2225-25
22.0		25.0	30.0	J3SM-2225-30
24.0	+0.040	27.0	15.0	J3SM-2427-15
24.0	+0.124	27.0	20.0	J3SM-2427-20
24.0		27.0	25.0	J3SM-2427-25
24.0		27.0	30.0	J3SM-2427-30
25.0		28.0	15.0	J3SM-2528-15
25.0		28.0	20.0	J3SM-2528-20
25.0		28.0	25.0	J3SM-2528-25
25.0		28.0	30.0	J3SM-2528-30
28.0		32.0	20.0	J3SM-2832-20
28.0		32.0	25.0	J3SM-2832-25
28.0		32.0	30.0	J3SM-2832-30
30.0		34.0	20.0	J3SM-3034-20

<sup>3)</sup> After press-fit. *Testing methods, page 57*

## Product range

d1 [mm]	d1 Tolerance <sup>3)</sup>	d2 [mm]	b1 [mm]	Part No.
30.0	+0.040	34.0	25.0	J3SM-3034-25
30.0	+0.124	34.0	30.0	J3SM-3034-30
30.0		34.0	40.0	J3SM-3034-40
32.0		36.0	20.0	J3SM-3236-20
32.0		36.0	30.0	J3SM-3236-30
32.0		36.0	40.0	J3SM-3236-40
35.0	+0.050	39.0	20.0	J3SM-3539-20
35.0	+0.150	39.0	30.0	J3SM-3539-30
35.0		39.0	40.0	J3SM-3539-40
35.0		39.0	50.0	J3SM-3539-50
40.0		44.0	20.0	J3SM-4044-20
40.0		44.0	30.0	J3SM-4044-30

<sup>3)</sup> After press-fit. *Testing methods, page 57*

d1 [mm]	d1 Tolerance <sup>3)</sup>	d2 [mm]	b1 [mm]	Part No.
40.0		44.0	40.0	J3SM-4044-40
40.0		44.0	50.0	J3SM-4044-50
45.0		50.0	20.0	J3SM-4550-20
45.0		50.0	30.0	J3SM-4550-30
45.0	+0.050	50.0	40.0	J3SM-4550-40
45.0	+0.150	50.0	50.0	J3SM-4550-50
50.0		55.0	20.0	J3SM-5055-20
50.0		55.0	30.0	J3SM-5055-30
50.0		55.0	40.0	J3SM-5055-40
50.0		55.0	50.0	J3SM-5055-50
50.0		55.0	60.0	J3SM-5055-60

**Available from stock**  
Detailed information about delivery time online.  
[www.igus.eu/24](http://www.igus.eu/24)

**Online ordering**  
Including delivery times, prices, online tools  
[www.igus.eu/J3](http://www.igus.eu/J3)

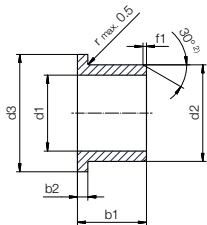
**Ordering note**  
Our prices are scaled according to order quantities, current prices can be found online.

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.**

# Bearing technology | Plain bearing | iglidur® J3

## Flange bearing (form F)



<sup>2)</sup> 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

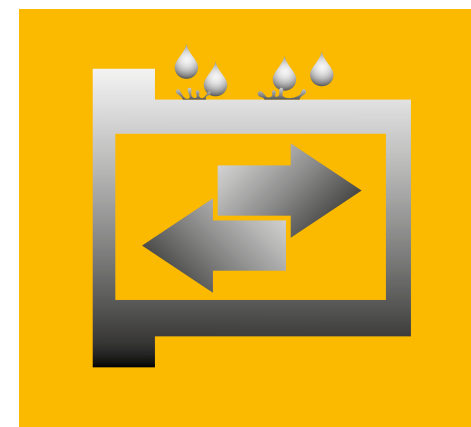
**i** Dimensions according to ISO 3547-1 and special dimensions

**i** Order example: **J3FM-0304-05** – no minimum order quantity.  
**J3** iglidur® material **F** Flange bearing **M** Metric **03** Inner Ø d1 **04** Outer Ø d2 **05** Total length b1

d1	d1 Tolerance <sup>3)</sup>	d2	d3	b1	b2	Part No.
[mm]	[mm]	[mm]	d13 <sup>3)</sup>	h13	h13	
2.0	+0.014	3.5	5.0	5.0	0.75	J3FM-0203505-05
3.0	+0.054	4.5	7.5	5.0	0.75	J3FM-0304-05
5.0		7.0	11.0	5.0	1.00	J3FM-0507-05
6.0	+0.020	8.0	12.0	4.0	1.00	J3FM-0608-04
6.0	+0.068	8.0	12.0	6.0	1.00	J3FM-0608-06
6.0		8.0	12.0	8.0	1.00	J3FM-0608-08
8.0		10.0	15.0	5.5	1.00	J3FM-0810-05
8.0		10.0	15.0	7.5	1.00	J3FM-0810-07
8.0		10.0	15.0	9.5	1.00	J3FM-0810-09
8.0		10.0	15.0	10.0	1.00	J3FM-0810-10
10.0	+0.025	12.0	18.0	7.0	1.00	J3FM-1012-07
10.0	+0.083	12.0	18.0	9.0	1.00	J3FM-1012-09
10.0		12.0	18.0	10.0	1.00	J3FM-1012-10
10.0		12.0	18.0	12.0	1.00	J3FM-1012-12
10.0		12.0	18.0	17.0	1.00	J3FM-1012-17
12.0		14.0	20.0	7.0	1.00	J3FM-1214-07
12.0		14.0	20.0	9.0	1.00	J3FM-1214-09
12.0	+0.032	14.0	20.0	12.0	1.00	J3FM-1214-12
12.0	+0.102	14.0	20.0	17.0	1.00	J3FM-1214-17
14.0		16.0	22.0	12.0	1.00	J3FM-1416-12
14.0		16.0	22.0	17.0	1.00	J3FM-1416-17

d1	d1 Tolerance <sup>3)</sup>	d2	d3	b1	b2	Part No.
[mm]	[mm]	[mm]	d13 <sup>3)</sup>	h13	h13	
15.0		17.0	23.0	9.0	1.00	J3FM-1517-09
15.0	+0.032	17.0	23.0	12.0	1.00	J3FM-1517-12
15.0	+0.102	17.0	23.0	17.0	1.00	J3FM-1517-17
16.0		18.0	24.0	12.0	1.00	J3FM-1618-12
16.0		18.0	24.0	17.0	1.00	J3FM-1618-17
18.0		20.0	26.0	12.0	1.00	J3FM-1820-12
18.0		20.0	26.0	17.0	1.00	J3FM-1820-17
18.0		20.0	26.0	22.0	1.00	J3FM-1820-22
18.0		21.0	25.0	12.0	1.00	J3FM-1821-12
20.0		23.0	30.0	11.5	1.50	J3FM-2023-11
20.0	+0.040	23.0	30.0	16.5	1.50	J3FM-2023-16
20.0	+0.124	23.0	30.0	21.5	1.50	J3FM-2023-21
25.0		28.0	35.0	11.5	1.50	J3FM-2528-11
25.0		28.0	35.0	16.5	1.50	J3FM-2528-16
25.0		28.0	35.0	21.5	1.50	J3FM-2528-21
30.0		34.0	42.0	16.0	2.00	J3FM-3034-16
30.0		34.0	42.0	26.0	2.00	J3FM-3034-26
35.0		39.0	47.0	16.0	2.00	J3FM-3539-16
35.0		39.0	47.0	26.0	2.00	J3FM-3539-26
40.0	+0.050	44.0	52.0	30.0	2.00	J3FM-4044-30
40.0	+0.150	44.0	52.0	40.0	2.00	J3FM-4044-40
45.0		50.0	58.0	50.0	2.00	J3FM-4550-50

<sup>3)</sup> After press-fit. Testing methods, page 57



## Proven long-life material in black Wear-resistant endurance runner up to 10MPa iglidur® J3B



### When to use it?

- When optimising wear resistance compared to iglidur® J
- When low moisture absorption is fundamental
- When good liquid media resistance is required
- When high wear resistance at low loads is required
- When very low coefficients of friction in dry operation are required



### When not to use?

- When a wear-resistant plain bearing for linear motion is required  
*iglidur® J*
- When continuous operating temperatures are higher than +90°C  
*iglidur® J260*
- When radial surface pressure is higher than 45MPa  
*iglidur® W300*