

## More universal

### The advanced development of iglidur® G

# iglidur® G1



#### When to use it?

- When a universal all-round bearing is required
- When low moisture absorption is fundamental
- For low to medium speeds
- For pivoting and rotational movements



#### When not to use?

- When high shock, impact and edge loads occur
- iglidur® G*
- When lowest wear is required
- iglidur® W300*
- When the ultimate media resistance is required
- iglidur® X*
- For underwater applications
- iglidur® H370*

# Bearing technology | Plain bearings | iglidur® G1



Ø 4.0 – 50.0mm



Also available as:



Bar stock, round bar: Page 629



Bar stock, plate: Page 651



Tribo-tape liner: Page 657



Piston rings: Page 659



Two hole flange bearing: Page 581



Moulded spherical balls: Page 602



iglobal® spherical balls: Page 783

## More universal: The advanced development of iglidur® G

The most successful plastic bearing in the world - iglidur® G - improved all round: iglidur® G1, the new standard.

- Double service life at high loads
- Up to 4 times less wear at low loads
- Continuous operating temperatures up to +180°C
- Press-fit up to +120°C (iglidur® G: up to +80°C)
- Moisture absorption reduced by 50%

### Typical application areas

- Mechanical engineering
- Automation
- Sports and leisure
- Automotive industry
- Mechatronics

### 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	-	+	+

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>	1.58	
Colour		grey	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	1.7	
Coefficient of friction, dynamic, against steel			
pv value, max. (dry)	MPa · m/s	0.10 – 0.29	
<b>Mechanical properties</b>			
Flexural modulus	MPa	11,486	DIN 53457
Flexural strength at +20°C	MPa	178	DIN 53452
Compressive strength	MPa	115	
Max. recommended surface pressure (+20°C)	MPa	91	
Shore D hardness		81	DIN 53505
<b>Physical and thermal properties</b>			
Max. application temperature long-term	°C	+180	
Max. application temperature short-term	°C	+220	
Min. application temperature	°C	-40	
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>	3.7	DIN 53752
<b>Electrical properties</b>			
Specific contact resistance	Ωcm	> 10 <sup>6</sup>	DIN IEC 93
Surface resistance	Ω	> 10 <sup>6</sup>	DIN 53482

Table 01: Material properties table

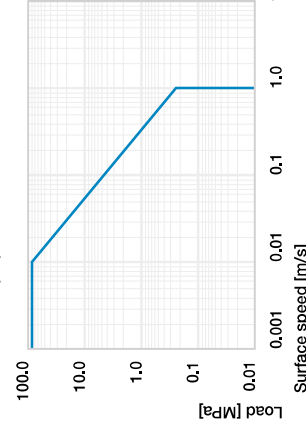


Diagram 01: Permissible pv values for iglidur® G1 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

### Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® G1 plain bearings is approximately 0.2% weight. The saturation limit in water is 1.7% weight. This must be taken into account for these types of applications.

### Vacuum

In vacuum, any present moisture is released as vapour. Use in vacuum is only possible with dehumidified iglidur® G1 bearings.

### Radiation resistance

# Bearing technology | Plain bearings | iglidur® G1

The requirement profile is demanding: comprehensive advanced development of the successful all-round classic iglidur® G. This has been achieved especially in terms of moisture absorption, thermal properties and consistently improved wear resistance. Only with shock, impact and edge loads, the robustness of iglidur® G could not quite be achieved.

## Mechanical properties

With increasing temperatures, the compressive strength of iglidur® G1 plain bearings decreases. Diagram 02 shows this inverse relationship. However, at the long-term maximum temperature of +180°C the permissible surface pressure is around 40MPa. The maximum recommended surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

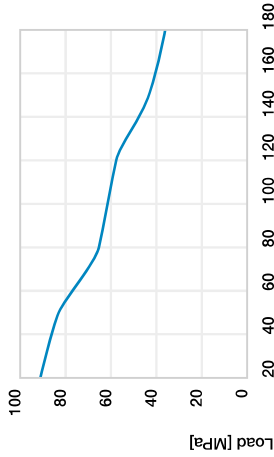


Diagram 02: Maximum recommended surface pressure as a function of temperature (91MPa at +20°C)

Diagram 03 shows the elastic deformation of iglidur® G1 at radial loads. The plastic deformation is minimal up to a pressure of approximately 100MPa. However, it is also dependent on the service time.

## Surface pressure, page 41

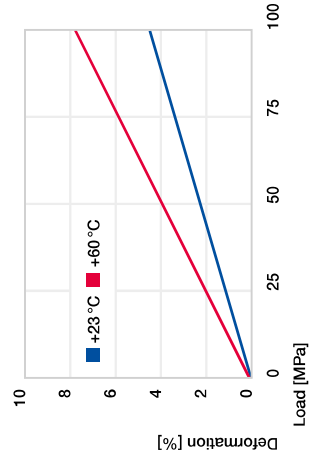


Diagram 03: Deformation under pressure and temperature

## Permissible surface speeds

iglidur® G1 has been developed for low to medium 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

	rotating	oscillating	linear
long-term	m/s 1.3	1.0	5.0
short-term	m/s 2.5	1.8	6.0

Table 03: Maximum surface speeds

## Temperature

The ambient temperatures strongly influence the properties of plain bearings. 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 +120°C. For temperatures over 120°C an additional securing of the bearings in the housing is required.

## Application temperatures, page 49 Additional securing, page 49

## Friction and wear

The coefficient of friction  $\mu$  of a plain bearing among other factors is influenced by the surface speed and the load (diagrams 04 and 05).

## Coefficient of friction and surfaces, page 47 Wear resistance, page 50

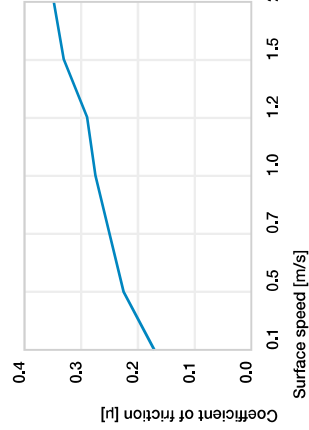


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1MPa

# Technical data

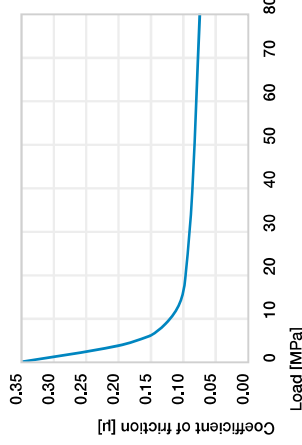


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

## 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® G1 a ground surface with an average surface finish Ra = 0.8μm is recommended. Diagram 06 shows results of testing different shaft materials with plain bearings made from iglidur® G1. It can be observed that iglidur® G1 achieves good to very good wear results with all shaft materials. The results for stainless steel types are most likely slightly lower. Diagram 07 compares the wear in rotating and pivoting applications. As with many of the iglidur® materials, wear rate is better in pivoting applications.

## Shaft materials, page 52

Dry	Greases	Oil	Water
0.10	0.29	0.09	0.04

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

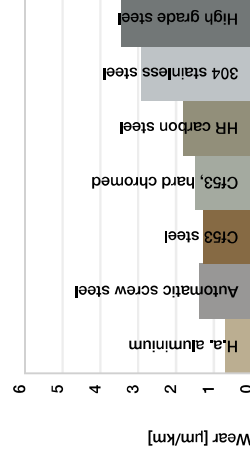


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

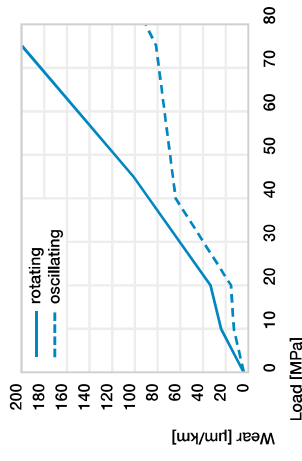


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load

## Installation tolerances

iglidur® G1 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 F10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

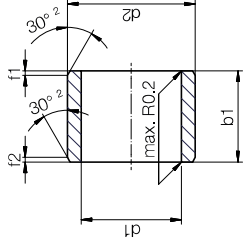
## Testing methods, page 57

Ø d1 [mm]	Housing H7 [mm]	Plain bearing F10 [mm]	Shaft h9 [mm]
0-3	+0.000 +0.010	+0.006 +0.046	-0.025 +0.000
> 3-6	+0.000 +0.012	+0.010 +0.058	-0.030 +0.000
> 6-10	+0.000 +0.015	+0.013 +0.071	-0.036 +0.000
> 10-18	+0.000 +0.018	+0.016 +0.086	-0.043 +0.000
> 18-30	+0.000 +0.021	+0.020 +0.104	-0.052 +0.000
> 30-50	+0.000 +0.025	+0.025 +0.125	-0.062 +0.000
> 50-80	+0.000 +0.030	+0.030 +0.150	-0.074 +0.000
> 80-120	+0.000 +0.035	+0.035 +0.176	-0.087 +0.000
> 120-180	+0.000 +0.040	+0.043 +0.203	-0.090 +0.100

Table 05: Important tolerances for plain bearings according to ISO 3547-1 after press-fit

# Bearing technology | Plain bearings | iglidur® G1

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
f [mm]	0.3	0.5	0.8	1.2

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

**i** Order example: **G1SM-0405-04** - no minimum order quantity.

**G1** iglidur® material **S** Sleeve bearing **M** Metric **Ø4** Inner Ø d1 **Ø5** Outer Ø d2 **Ø4** Total length b1

# Product range

d1 [mm]	Tolerance <sup>3)</sup>	d2 [mm]	b1 h13 [mm]	Part No.
30.0	+0,040	34.0	25.0	G1SM-3034-25
30.0		34.0	30.0	G1SM-3034-30
30.0	+0,124	34.0	40.0	G1SM-3034-40
32.0		36.0	20.0	G1SM-3236-20
32.0		36.0	30.0	G1SM-3236-30
32.0		36.0	40.0	G1SM-3236-40
35.0	+0,050	39.0	20.0	G1SM-3539-20
35.0		39.0	30.0	G1SM-3539-30
35.0	+0,150	39.0	40.0	G1SM-3539-40
35.0		39.0	50.0	G1SM-3539-50
40.0		44.0	20.0	G1SM-4044-20
40.0		44.0	30.0	G1SM-4044-30

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

d1 [mm]	Tolerance <sup>3)</sup>	d2 [mm]	b1 h13 [mm]	Part No.
40.0		44.0	40.0	G1SM-4044-40
40.0		44.0	50.0	G1SM-4044-50
45.0		50.0	20.0	G1SM-4550-20
45.0		50.0	30.0	G1SM-4550-30
45.0	+0,050	50.0	40.0	G1SM-4550-40
45.0	+0,150	50.0	50.0	G1SM-4550-50
50.0		55.0	20.0	G1SM-5055-20
50.0		55.0	30.0	G1SM-5055-30
50.0		55.0	40.0	G1SM-5055-40
50.0		55.0	50.0	G1SM-5055-50
50.0		55.0	60.0	G1SM-5055-60

d1 [mm]	Tolerance <sup>3)</sup>	d2 [mm]	b1 h13 [mm]	Part No.
4.0	+0,020	5.5	4.0	G1SM-0405-04
4.0	+0,068	5.5	6.0	G1SM-0405-06
5.0		7.0	5.0	G1SM-0507-05
5.0	+0,010	7.0	10.0	G1SM-0507-10
6.0	+0,040	8.0	6.0	G1SM-0608-06
6.0		8.0	8.0	G1SM-0608-08
6.0		8.0	10.0	G1SM-0608-10
8.0		10.0	8.0	G1SM-0810-08
8.0		10.0	10.0	G1SM-0810-10
8.0		10.0	12.0	G1SM-0810-12
10.0	+0,025	12.0	8.0	G1SM-1012-08
10.0	+0,083	12.0	10.0	G1SM-1012-10
10.0		12.0	12.0	G1SM-1012-12
10.0		12.0	15.0	G1SM-1012-15
10.0		12.0	20.0	G1SM-1012-20
12.0		14.0	10.0	G1SM-1214-10
12.0		14.0	12.0	G1SM-1214-12
12.0		14.0	15.0	G1SM-1214-15
12.0		14.0	20.0	G1SM-1214-20
13.0		15.0	10.0	G1SM-1315-10
13.0	+0,032	15.0	20.0	G1SM-1315-20
14.0	+0,102	16.0	15.0	G1SM-1416-15
14.0		16.0	20.0	G1SM-1416-20
14.0		16.0	25.0	G1SM-1416-25
14.0		16.0	30.0	G1SM-1416-30
15.0		17.0	15.0	G1SM-1517-15
15.0		17.0	20.0	G1SM-1517-20
15.0		17.0	25.0	G1SM-1517-25
16.0		18.0	15.0	G1SM-1618-15
16.0		18.0	20.0	G1SM-1618-20
16.0	+0,032	18.0	25.0	G1SM-1618-25
18.0	+0,102	20.0	15.0	G1SM-1820-15
18.0		20.0	20.0	G1SM-1820-20
18.0		20.0	25.0	G1SM-1820-25
20.0		23.0	10.0	G1SM-2023-10
20.0		23.0	15.0	G1SM-2023-15
20.0		23.0	20.0	G1SM-2023-20
20.0		23.0	25.0	G1SM-2023-25
20.0		23.0	30.0	G1SM-2023-30
22.0		25.0	15.0	G1SM-2225-15
22.0		25.0	20.0	G1SM-2225-20
22.0		25.0	25.0	G1SM-2225-25
22.0		25.0	30.0	G1SM-2225-30
24.0	+0,040	27.0	15.0	G1SM-2427-15
24.0	+0,124	27.0	20.0	G1SM-2427-20
24.0		27.0	25.0	G1SM-2427-25
24.0		27.0	30.0	G1SM-2427-30
25.0		28.0	15.0	G1SM-2528-15
25.0		28.0	20.0	G1SM-2528-20
25.0		28.0	25.0	G1SM-2528-25
25.0		28.0	30.0	G1SM-2528-30
28.0		32.0	20.0	G1SM-2832-20
28.0		32.0	25.0	G1SM-2832-25
28.0		32.0	30.0	G1SM-2832-30
30.0		34.0	20.0	G1SM-3034-20

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



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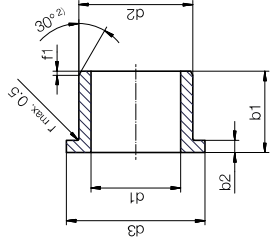
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# Bearing technology | Plain bearings | iglidur® G1

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
f [mm]	0.3	0.5	0.8	1.2

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



**Order example:** G1FM-0608-04 - no minimum order quantity.

G1 iglidur® material **F** Flange bearing **M** Metric **Ø 06** Inner **Ø d1** **08** Outer **Ø d2** **Ø d4** Total length **b1**

d1 [mm]	d1 Tolerance <sup>3)</sup>	d2 [mm]	d3 [mm]	b1 h13 [mm]	b2 [mm]	Part No.
6.0	+0.020 +0.068	8.0	12.0	4.0	1.00	G1FM-0608-04
6.0		8.0	12.0	8.0	1.00	G1FM-0608-08
8.0		10.0	15.0	5.5	1.00	G1FM-0810-05
8.0		10.0	15.0	7.5	1.00	G1FM-0810-07
8.0		10.0	15.0	9.5	1.00	G1FM-0810-09
10.0	+0.025 +0.083	12.0	18.0	7.0	1.00	G1FM-1012-07
10.0		12.0	18.0	9.0	1.00	G1FM-1012-09
10.0		12.0	18.0	12.0	1.00	G1FM-1012-12
10.0		12.0	18.0	17.0	1.00	G1FM-1012-17
12.0		14.0	20.0	7.0	1.00	G1FM-1214-07
12.0		14.0	20.0	9.0	1.00	G1FM-1214-09
12.0		14.0	20.0	12.0	1.00	G1FM-1214-12
12.0		14.0	20.0	17.0	1.00	G1FM-1214-17
14.0		16.0	22.0	12.0	1.00	G1FM-1416-12
14.0		16.0	22.0	17.0	1.00	G1FM-1416-17
15.0	+0.032 +0.102	17.0	23.0	9.0	1.00	G1FM-1517-09
15.0		17.0	23.0	12.0	1.00	G1FM-1517-12
15.0		17.0	23.0	17.0	1.00	G1FM-1517-17
16.0		18.0	24.0	12.0	1.00	G1FM-1618-12
16.0		18.0	24.0	17.0	1.00	G1FM-1618-17
18.0		20.0	26.0	12.0	1.00	G1FM-1820-12
18.0		20.0	26.0	17.0	1.00	G1FM-1820-17
18.0		20.0	26.0	22.0	1.00	G1FM-1820-22
20.0		23.0	30.0	11.5	1.50	G1FM-2023-11
20.0		23.0	30.0	16.5	1.50	G1FM-2023-16
20.0	+0.040 +0.124	23.0	30.0	21.5	1.50	G1FM-2023-21
25.0		28.0	35.0	11.5	1.50	G1FM-2528-11
25.0		28.0	35.0	16.5	1.50	G1FM-2528-16

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

# Product range

d1 [mm]	d1 Tolerance <sup>3)</sup>	d2 [mm]	d3 d13 [mm]	b1 h13 [mm]	b2 [mm]	Part No.
25.0		28.0	35.0	21.5	-0,14	
30.0	+0.040 +0.124	34.0	42.0	16.0	2.00	G1FM-2528-21
30.0		34.0	42.0	26.0	2.00	G1FM-3034-16
35.0		39.0	47.0	16.0	2.00	G1FM-3034-26
35.0		39.0	47.0	26.0	2.00	G1FM-3539-16
40.0	+0.050 +0.150	44.0	52.0	30.0	2.00	G1FM-3539-26
40.0		44.0	52.0	40.0	2.00	G1FM-4044-30
45.0		50.0	58.0	50.0	2.00	G1FM-4044-40
45.0		50.0	58.0	50.0	2.00	G1FM-4044-50

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



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