



ESD-compatible all-rounder: Electrically conductive **igidur® F2**



When to use it?

- When the bearing should be electrically discharging
- When a universal plain bearing is required



When not to use?

- When a universal plain bearing without electrostatic discharge capacity is required
igidur® G, iglidur® P
- For underwater use
igidur® H370
- When the highest wear resistance is required
igidur® J, iglidur® W300

Bearing technology | Plain bearing | iglidur® F2



Ø
5.0 – 20.0mm



Also available as:



Bar stock, round bar
Page 684



Bar stock, plate
Page 683



tribo-tape liner
Page 691



Piston rings
Page 581



Two hole flange bearings
Page 603



Moulded special parts
Page 624



igubal® spherical balls
Page 841

ESD-compatible all-rounder: Electrically conductive

iglidur® F2 helps to prevent the build-up of electrostatic charges. Good resistance to media and temperature, suitable even in wet conditions due to low moisture absorption and good universal coefficient of wear pave the way for a wide range of applications.

- Used to prevent electro-static charges
- Suitable for wet environments
- Lubrication-free
- Maintenance-free

Typical application areas

- Mechanical engineering
- Jig construction
- Industrial handling

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

Online service life calculation
www.igus.eu/iglidur-expert

Technical data

General properties		Testing method	
Density	g/cm ³	1.52	
Colour		black	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	0.4	
Coefficient of friction, dynamic, against steel	μ	0.16 – 0.22	
pv value, max. (dry)	MPa · m/s	0.31	
Mechanical properties			
Flexural modulus	MPa	7,418	DIN 53457
Flexural strength at +20°C	MPa	93	DIN 53452
Compressive strength	MPa	61	
Max. recommended surface pressure (+20°C)	MPa	47	
Shore D hardness		72	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+120	
Max. application temperature short-term	°C	+165	
Min. application temperature	°C	-40	
Thermal conductivity	W/m · K	0.61	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K ⁻¹ · 10 ⁻⁵	5	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	< 10 ⁹	DIN IEC 93
Surface resistance	Ω	< 10 ⁹	DIN 53482

Table 01: Material properties

The prevention of electrostatic charge is an important requirement in many application areas. At the same time other technical application parameters such as wear resistance, media and temperature resistance, suitability in a wet environment etc. cannot be neglected. iglidur® F2 with its wide range of properties constitutes another universal bearing for numerous "ESD-suitable" applications.

Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® F2 plain bearings is approximately 0.2% weight. The saturation limit in water is 0.4% weight.

Vacuum

In vacuum, any present moisture is released as vapour. Use in vacuum is only possible with dehumidified iglidur® F2 bearings.

Radiation resistance

Plain bearings made from iglidur® F2 are resistant up to a radiation intensity of $3 \cdot 10^2$ Gy.

Resistance to weathering

iglidur® F2 plain bearings are resistant to weathering. The material properties are slightly affected. Discoloration occurs.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® F2 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® F2 at radial loads. A plastic deformation can be negligible up to this value. However, it is also dependent on the service time.

Surface pressure, page 41



-40°C up to +120°C



47MPa



Permissible surface speeds

The maximum permitted surface speeds are based on the operation period and the type of motion. A plain bearing is the most stressed in long-term rotating motions. Here the maximum speed for the iglidur® F2 plain bearing is 0.8m/s. In practice, though, this level is rarely reached due to varying application conditions.

Surface speed, page 44

Temperature

The ambient temperatures strongly influence the properties of plain bearings. With increasing temperatures, the compressive strength of iglidur® F2 plain bearings decreases. Diagram 02 shows this inverse relationship. For temperatures over +70°C an additional securing is required.

Application temperatures, page 49

Additional securing, page 49

Friction and wear

Coefficient of friction and wear resistance are dependent on the application parameters (diagrams 04 and 05).

Coefficient of friction and surfaces, page 47

Wear resistance, page 50

Shaft materials

Diagram 06 shows the test results of iglidur® F2 plain bearings running against various shaft materials. In the lower region of the load, free cutting steel and hard-anodised aluminium shafts, as well as HR carbon steel and hard-chromed steel shafts prove to be the most favourable in rotating applications with iglidur® F2 plain bearings with respect to wear. Diagram 07 shows significantly less wear in rotation compared to pivoting movements over the entire load range.

Shaft materials, page 52

Installation tolerances

iglidur® F2 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.

Testing methods, page 57

Chemicals	Resistance
Alcohols	+
Diluted acids	0
Diluted alkalines	-
Fuels	+
Greases, oils without additives	+
Hydrocarbons	-
Strong acids	-
Strong alkalines	-

All information given at room temperature [+20°C]

Table 02: Chemical resistance

Chemical table, page 1636

	Rotating	Oscillating	linear
long-term	m/s 0.8	0.7	3.0
short-term	m/s 1.4	1.1	5.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction μ	0.16 – 0.22	0.01	0.05	0.03

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

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

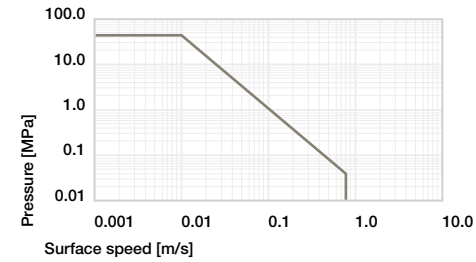


Diagram 01: Permissible pv values for iglidur® F2 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

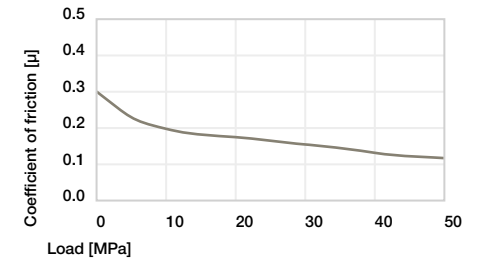


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

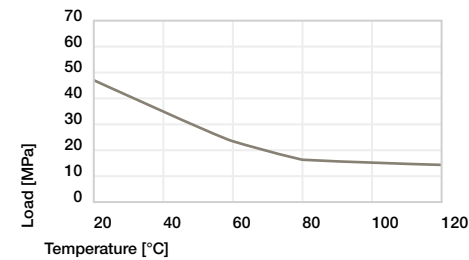


Diagram 02: Maximum recommended surface pressure as a function of temperature (47MPa at +20°C)

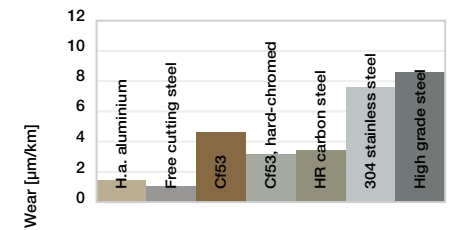


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

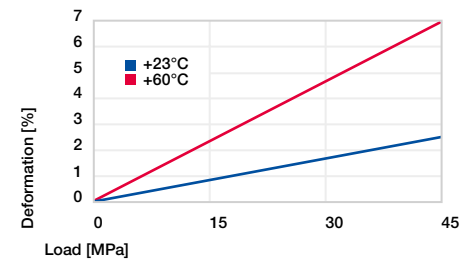


Diagram 03: Deformation under pressure and temperature

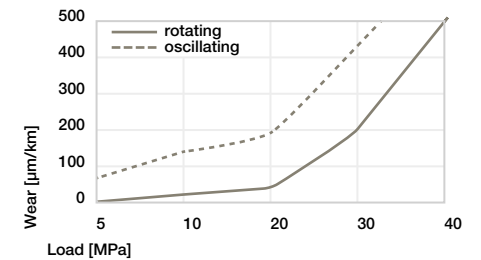


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load

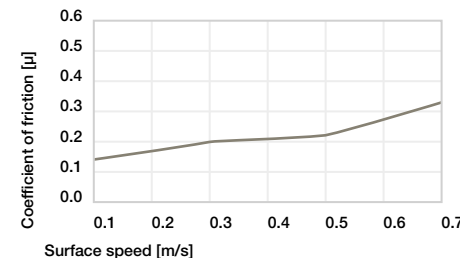
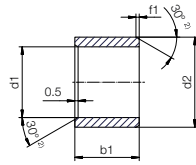


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1MPa

Bearing technology | Plain bearing | iglidur® F2

Sleeve bearing (form S)



²⁾ Thickness < 0.6mm: Chamfer = 20°

i Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to d1

d1 [mm]	Ø 1-6	Ø 6-12	Ø 12-30
f1 [mm]	0.3	0.5	0.8



Order example: F2SM-0507-10 – no minimum order quantity.

F2 iglidur® material S Sleeve bearing M Metric 05 Inner Ø d1 07 Outer Ø d2 10 Total length b1

d1	d1	d2	b1	Part No.
[mm]	Tolerance ³⁾	[mm]	h13 [mm]	
5.0	+0.020 +0.068	7.0	10.0	F2SM-0507-10
6.0		8.0	6.0	F2SM-0608-06
7.0		9.0	10.0	F2SM-0709-10
8.0	+0.025 +0.083	10.0	10.0	F2SM-0810-10
10.0		12.0	10.0	F2SM-1012-10
10.0		12.0	15.0	F2SM-1012-15
12.0	+0.032 +0.102	14.0	12.0	F2SM-1214-12
16.0		18.0	15.0	F2SM-1618-15
20.0		23.0	20.0	F2SM-2023-20

³⁾ After press-fit. *Testing methods, page 57*



Available from stock

Detailed information about delivery time online.

www.igus.eu/24



Online ordering

Including delivery times, prices, online tools

www.igus.eu/F2



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

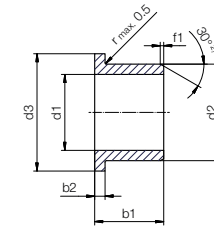
No minimum order value.

No low-quantity surcharges.

Free shipping within Germany for orders above €150.

Bearing technology | Plain bearing | iglidur® F2

Flange bearing (form F)



²⁾ Thickness < 0.6mm: Chamfer = 20°

i Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to d1

d1 [mm]	Ø 1-6	Ø 6-12	Ø 12-30
f1 [mm]	0.3	0.5	0.8



Order example: F2FM-0608-06 – no minimum order quantity.

F2 iglidur® material F Flange bearing M Metric 06 Inner Ø d1 08 Outer Ø d2 06 Total length b1

d1	d1	d2	d3	b1	b2	Part No.
[mm]	Tolerance ³⁾	[mm]	d13 ³⁾ [mm]	h13 [mm]	h13 [mm]	
6.0	+0.020 +0.068	8.0	12.0	6.0	1.00	F2FM-0608-06
8.0		10.0	15.0	10.0	1.00	F2FM-0810-10
10.0	+0.025 +0.083	12.0	18.0	10.0	1.00	F2FM-1012-10
12.0		14.0	20.0	12.0	1.00	F2FM-1214-12
16.0	+0.032 +0.102	18.0	24.0	17.0	1.00	F2FM-1618-17
20.0		23.0	30.0	21.5	1.50	F2FM-2023-21

³⁾ After press-fit. *Testing methods, page 57*



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