Extremely wear-resistant

Strong performer on most shafts, very low coefficient of friction

iglidur® E

When to use it?

- For high speeds
- When highest wear resistance at low to medium pressures is required
- Low wear against different shafts
- When a low coefficient of friction in dry operation is requested
- For vibration dampening
- When good chemical resistance is required
- For best performance with soft shaft materials
- Low moisture absorption

When not to use it?

- When high pressures occur
  iglidur® G, iglidur® W300
- When temperatures higher than +120 °C occur
  iglidur® G, iglidur® Z
- When a cost-effective plain bearing for occasional movements is necessary
  iglidur® G

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Ø
6.0 - 20.0mm

Also available as:

Bar stock, round bar
Page 743

Bar stock, plate
Page 773

tribo-tape liner
Page 781

Guide rings
Page 641

Two hole flange bearings
Page 667

Moulded special parts
Page 696

igubal® spherical balls
Page 848

Extremely wear-resistant

Strong performer on most shafts, very low coefficient of friction

iglidur® E is especially characterised by its long service life in combination with hard-anodised aluminium shafts. Especially in linear and pivoting movement, iglidur® E offers particularly good wear-resistant properties.

- Low coefficient of friction
- Wear-resistant material for continuous operation
- Vibration-dampening

Typical application areas

- Textile industry
- Packaging industry
- Printing industry
- Vending machinery

Descriptive technical specifications		
Wear resistance at +23°C	–	+
Wear resistance at +90°C	–	+
Wear resistance at +150°C	–	+
Slide property	–	+
Wear resistance under water	–	+
Media resistance	–	+
Resistant to edge pressures	–	+
Resistant to shock and impact loads	–	+
Dirt resistance	–	+

Online product finder
www.igus.sk/iglidur-finder

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

General properties			Testing method
Density	g/cm³	1.50	
Colour		beige	
Max. moisture absorption at +23°C/50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	1.7	
Coefficient of friction, dynamic, against steel	µ	0.08-0.23	
pv value, max. (dry)	MPa · m/s	0.25	
Mechanical properties			
Flexural modulus	MPa	2,975	DIN 53457
Flexural strength at +20°C	MPa	79	DIN 53452
Compressive strength	MPa	n.s.	
Max. permissible surface pressure (+20°C)	MPa	37	
Shore D hardness		78	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+90	
Max. application temperature short-term	°C	+120	
Min. application temperature	°C	up to -50	
Thermal conductivity	W/m · K	0.25	ASTM C 177
Coefficient of thermal expansion (at +23°C)	$K^{-1} \cdot 10^{-5}$	10	DIN 53752
Electrical properties			
Specific transitional resistance	Ωcm	n.s.	
Surface resistance	Ω	$> 10^{12}$	DIN 53482

-50°C up to +90°C

37MPa

HB

RoHS-II

ISO 3547-1

Table 01: Material properties

One main advantage of iglidur® E plain bearings is the combination of a low coefficient of friction in dry operation and the low stick-slip tendency.

Moisture absorption

The moisture absorption of iglidur® E plain bearings in ambient conditions is approximately 0.2% weight. The saturation limit submerged in water is 1.7% 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® E bearings.

Radiation resistance

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

Resistance to weathering

iglidur® E plain bearings are resistant to weathering. The material properties are slightly affected. Discolouration occurs.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® E plain bearings decreases Diagram 02 shows this inverse relationship. With the long-term permitted application temperature of +90°C, the permitted surface pressure still amounts to 20MPa. The maximum recommended surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

With a maximum recommended surface pressure of 37MPa, iglidur® E plain bearings are not suitable for extreme loads. Diagram 03 shows the elastic deformation of iglidur® E at radial loads.

Surface pressure, page 45

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Permissible surface speeds

The low coefficient of friction and no stick-slip tendency of iglidur® E plain bearings are particularly important at very low speeds. However, iglidur® E can also be used for high speeds of over 1m/s. In both cases the static friction is very low and stick slip does not occur. 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 48

Temperature

iglidur® E plain bearings can be used between -50°C and +90°C; the short-term maximum permissible temperature is +120°C. Wear increases significantly at temperatures above +80°C. For temperatures over +60°C an additional securing is required.

Application temperatures, page 53
Additional securing, page 53

Friction and wear

Similar to wear resistance, the coefficient of friction μ also changes with the surface speed and load (diagrams 04 and 05).

Coefficient of friction and surfaces, page 51
Wear resistance, page 54

Shaft materials

The friction and wear are also dependent, to a large degree, on the mating partner. With increasing shaft surface finish, the coefficient of friction also increases. For iglidur® E a ground surface with an average surface finish Ra = 0.1-0.3μm is recommended. Diagram 06 and 07 display a summary of the results of tests with different shaft materials executed with plain bearings made of iglidur® E. When compared to most other iglidur® materials, iglidur® E plain bearings have very low wear results at low loads compared with all shaft materials tested. Also, for increasing loads up to 5 MPa, the wear resistance of iglidur® E plain bearings is excellent. If the shaft material you plan on using is not shown in these test results, please contact us.

Shaft materials, page 56

Installation tolerances

iglidur® E 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, 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).

Testing methods, page 61

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

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

Table 02: Chemical resistance

Chemical table, page 1170

		Rotating	Oscillating	linear
Long-term	**m/s**	1.0	0.7	2.0
Short-term	**m/s**	1.5	1.1	4.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction μ	0.08-0.23	0.09	0.04	0.04

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

	Housing		Plain bearings		Shaft	
Ø d1 [mm]	H7 [mm]		E10 [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

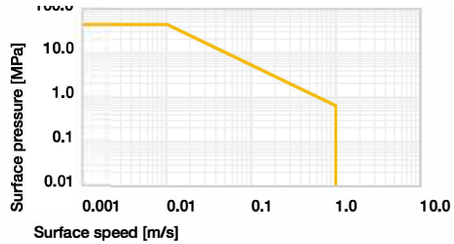

Diagram 01: Permissible pv values for iglidur® E plain bearing with a wall thickness of 1mm dry operation against a steel shaft at +20°C, mounted in a steel housing.

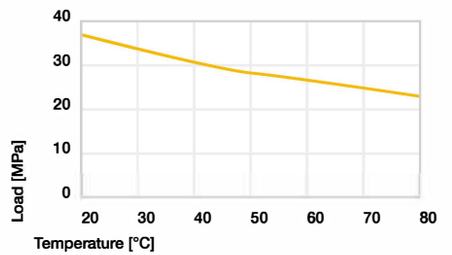

Diagram 02: Maximum recommended surface pressure as a function of temperature (35MPa at +20°C)

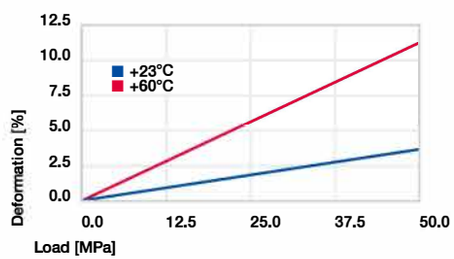

Diagram 03: Deformation under pressure and temperature

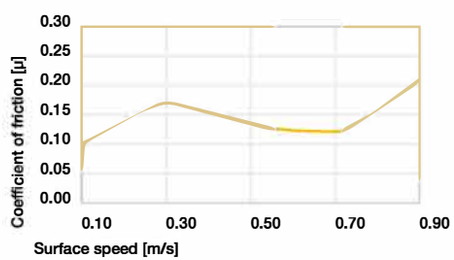

Diagram 04: Coefficient of friction as a function of the surface speed, p = 1MPa

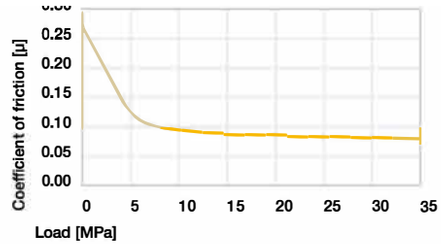

Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01m/s

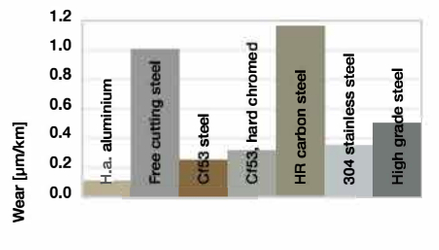

Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

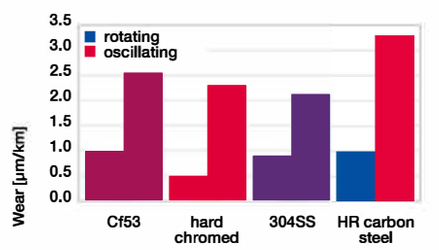

Diagram 07: Wear for rotating and oscillating applications with different shaft materials, p = 2MPa

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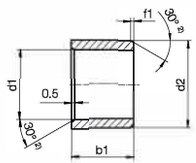

[2] Thickness < 0.6mm: chamfer = 20°

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

Dimensions according to ISO 3547-1 and special dimensions

Order example: ESM-0608-06 **- no minimum order quantity.**
E iglidur® material S Cylindrical M Metric 06 Inner Ø d1 08 Outer Ø d2 06 Total length b1

d1 [mm]	d1 Tolerance[3]	d2 [mm]	b1 h13 [mm]	Part No.
6.0	+0.020 +0.068	8.0	6.0	**ESM-0608-06**
8.0	+0.025 +0.083	10.0	10.0	**ESM-0810-10**
10.0	+0.025 +0.083	12.0	10.0	**ESM-1012-10**
12.0	+0.032 +0.102	14.0	12.0	**ESM-1214-12**
16.0	+0.032 +0.102	18.0	15.0	**ESM-1618-15**
16.0	+0.032 +0.102	18.0	17.0	**ESM-1618-17**
20.0	+0.040 +0.124	23.0	20.0	**ESM-2023-20**
20.0	+0.040 +0.124	23.0	21.0	**ESM-2023-21**

[3] After press-fit. *Testing methods, page 61*

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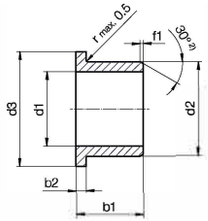
Ordering note
Our prices are scaled according to order quantities, current prices can be found online.

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.



[2] 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

Dimensions according to ISO 3547-1 and special dimensions

Order example: EFM-0608-06 **- no minimum order quantity.**
E iglidur® material F With Flange M Metric 06 Inner Ø d1 08 Outer Ø d2 06 Total length b1

d1 [mm]	d1 Tolerance[3]	d2 [mm]	d3 d13[3] [mm]	b1 h13 [mm]	b2 h13 [mm]	Part No.
6.0	+0.020 +0.068	8.0	12.0	6.0	1.00	**EFM-0608-06**
8.0	+0.025 +0.083	10.0	15.0	9.5	1.00	**EFM-0810-10**
10.0	+0.025 +0.083	12.0	18.0	9.0	1.00	**EFM-1012-10**
12.0	+0.032 +0.102	14.0	20.0	12.0	1.00	**EFM-1214-12**
16.0	+0.032 +0.102	18.0	24.0	17.0	1.00	**EFM-1618-17**
20.0	+0.040 +0.124	23.0	30.0	21.5	1.50	**EFM-2023-21**

[3] After press-fit. *Testing methods, page 61*

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