

The chemical and temperature specialist Up to 150MPa



When to use it?

- For pressure loads up to 150MPa
- For linear movements with stainless steel at high temperatures
- Universal chemical resistance

iglidur® X

- For temperature resistance from -100°C to +250°C (short-term up to +315°C)
- For very low moisture absorption
- For high wear resistance over the entire temperature range



When not to use?

- For very low wear at high loads
- iglidur® Q, iglidur® Z
- When a cost-effective plain bearing for underwater use is required iglidur[®] H, iglidur[®] H370
- For edge loads
 iglidur® Z

-100°C up to +250°C

150MPa

Bearing technology | Plain bearing | iglidur® X

iglidur® X is defined by its combination of very high temperature resistance with high compressive strength,





Also available



Bar stock round bar Page 678



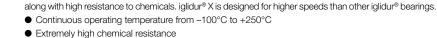


Bar stock,

plate Page 683









tribo-tape liner

Page 691



High wear resistance Typical application areas

Up to 150MPa

High compressive strength

Very low moisture absorption



Woodworking

Plastic processing industry

Aerospace engineering

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

High media resistance

Resistant to dirt

Wear resistance under water

Resistant to edge pressures Suitable for shock and impact loads

Cleanroom



Piston rings Page 584



Two hole flange bearings Page 603



special parts Page 624



spherical balls





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

Technical data

g/cm³ % weight	1.44 black	
% weight	black	
% weight		
	0.1	DIN 53495
% weight	0.5	
μ	0.09 - 0.27	
MPa · m/s	1.32	
MPa	8,100	DIN 53457
MPa	170	DIN 53452
MPa	100	
MPa	150	
	85	DIN 53505
°C	+250	
°C	+315	
°C	-100	
W/m⋅K	0.60	ASTM C 177
K⁻¹ · 10⁻⁵	5	DIN 53752
Ωcm	< 105	DIN IEC 93
Ω	< 103	DIN 53482
	% weight µ MPa·m/s MPa MPa MPa MPa MPa MPa MPa C C C C W/m·K K-1·10-5	% weight μ 0.5 μ 0.09 – 0.27 MPa·m/s 1.32 MPa 8,100 MPa 170 MPa 150 85 °C +250 °C +315 °C -100 W/m·K 0.60 K-1·10-5 5 Ωcm < 105

⁹ The good conductivity of this material can favour the generation of corrosion on the metallic contact components.

Table 01: Material properties

iglidur® X has an excellent combination of high temperature resistance, high compressive strength, and excellent resistance to chemicals. The aspect of temperature resistance and pressure susceptibility is also reflected in the pv graph.

Moisture absorption

The moisture absorption of iglidur® X plain bearings is very low. It is approximately 0.1% weight under standard climatic conditions. The maximum moisture absorption is 0.5% weight.

Vacuum

In vacuum, any present moisture is released as vapour. The use in vacuum is generally possible.

Radiation resistance

Plain bearings made from iglidur® X are resistant up to a radiation intensity of 1 · 105Gy.

Resistance to weathering

iglidur® X plain bearings are continuously resistant to weathering. The material properties are only slightly affected. Possible discolorations are only superficial.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® X 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® X at radial loads.

Surface pressure, page 41





Bearing technology | Plain bearing | iglidur® X

Permissible surface speeds

iglidur[®] X is designed for higher speeds than other iglidur[®] bearings. This is enabled by its high temperature resistance and excellent thermal conductivity. This is also made clear by the max. pv value of 1.32MPa. However, in this case, only the smallest radial loads may act on the bearings. At the given speeds, friction can cause a temperature increase to maximum permissible levels.

Surface speed, page 44

Temperature

In the case of a permissible long-term application temperature of +250°C, iglidur® X will even withstand +315°C for short periods. As in the case of all thermoplastics, the compression strength of iglidur® X decreases when temperatures rise. For temperatures over +135°C an additional securing is required. At temperatures over +170°C the axial security of the bearing in the housing needs to be tested. Please contact us if you have questions on bearing use.

Application temperatures, page 49 Additional securing, page 49

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 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® X a ground surface with an average surface finish $Ra = 0.6 - 0.8 \mu m$ is recommended. Diagrams 06 and 07 show the test results of iglidur® X plain bearings running against various shaft materials. If the shaft material you plan on using is not shown in these test results, please contact us.

Shaft materials, page 52

Installation tolerances

iglidur® X 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

Chemicals	Resistance
Alcohols	+
Diluted acids	+
Diluted alkalines	+
Fuels	+
Greases, oils without additives	+
Hydrocarbons	+
Strong acids	0 up to –
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	1.5	1.1	5.0
short-term	m/s	3.5	2.5	10.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction μ	0.09 - 0.27	0.09	0.04	0.04

Table 04: Coefficient of friction against steel (Ra = 1um.

Ø d1 [mm]	Housin H7 [mn	J	bearing 0 [mm]	•	naft [mm]
0-3	+0.000 +0.	010 +0.00	6 +0.046	-0.025	+0.000
> 3 - 6	+0.000 +0.	012 +0.01	0 +0.058	-0.030	+0.000
> 6 - 10	+0.000 +0.	015 +0.01	3 +0.071	-0.036	+0.000
> 10 - 18	+0.000 +0.	018 +0.01	6 +0.086	-0.043	+0.000
> 18 – 30	+0.000 +0.	021 +0.02	0 +0.104	-0.052	+0.000
> 30 - 50	+0.000 +0.	025 +0.02	5 +0.125	-0.062	+0.000
> 50 - 80	+0.000 +0.	030 +0.03	0 +0.150	-0.074	+0.000
> 80 - 120	+0.000 +0.	035 +0.03	6 +0.176	-0.087	+0.000
> 120 - 180	+0.000 +0.	040 +0.04	3 +0.203	+0.000	+0.100

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

Technical data

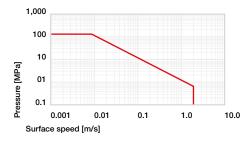


Diagram 01: Permissible pv values for iglidur® X plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

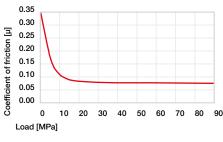


Diagram 05: Coefficient of friction as a function of the pressure, $v = 0.01 \,\text{m/s}$

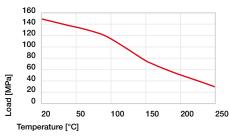


Diagram 02: Maximum recommended surface pressure as a function of temperature (150MPa at +20°C)

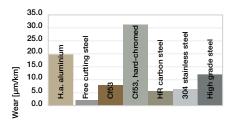


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

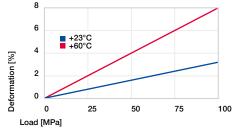


Diagram 03: Deformation under pressure and temperature

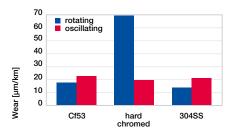


Diagram 07: Wear for rotating and oscillating applications with different shaft materials, p = 2MPa

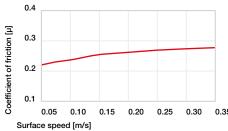


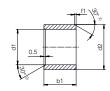
Diagram 04: Coefficient of friction as a function of the surface speed, v = 0.01m/s



Bearing technology | Plain bearing | iglidur® X

Sleeve bearing (form S)





2) Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm] Ø 1-6 Ø 6-12 | Ø 12-30 | Ø > 300.3 8.0 1.2

Dimensions according to ISO 3547-1 and special dimensions



Order example: XSM-0203-03 – no minimum order quantity.

X iglidur® material S Sleeve bearing M Metric 02 Inner Ø d1 03 Outer Ø d2 03 Total length b1

d1	d1 Tolerance ³⁾	d2	b1 h13	Part No.	d1	d1 Tolerance ³⁾	d2	b1 h13	Part No.
[mm]		[mm]	[mm]		[mm]		[mm]	[mm]	
2.0	+0.006	3.5	3.0	XSM-0203-03	12.0		14.0	3.5	XSM-1214-035
3.0	+0.006	4.5	3.0	XSM-0304-03	12.0		14.0	6.0	XSM-1214-06
3.0	+0.040	4.5	6.0	XSM-0304-06	12.0		14.0	8.0	XSM-1214-08
4.0		5.5	4.0	XSM-0405-04	12.0		14.0	10.0	XSM-1214-10
4.0		5.5	6.0	XSM-0405-06	12.0		14.0	12.0	XSM-1214-12
4.0		5.5	9.0	XSM-0405-09	12.0		14.0	15.0	XSM-1214-15
4.0		5.5	10.0	XSM-0405-10	12.0		14.0	20.0	XSM-1214-20
5.0		7.0	3.5	XSM-0507-035	12.0		14.0	25.0	XSM-1214-25
5.0	+0.010	7.0	5.0	XSM-0507-05	13.0		15.0	10.0	XSM-1315-10
5.0	+0.058	7.0	8.0	XSM-0507-08	13.0		15.0	20.0	XSM-1315-20
5.0		7.0	10.0	XSM-0507-10	14.0		16.0	12.0	XSM-1416-12
6.0		8.0	6.0	XSM-0608-06	14.0		16.0	15.0	XSM-1416-15
6.0		8.0	8.0	XSM-0608-08	14.0		16.0	20.0	XSM-1416-20
6.0		8.0	10.0	XSM-0608-10	14.0	+0.016	16.0	25.0	XSM-1416-25
6.0		8.0	13.8	XSM-0608-13	15.0	+0.016	17.0	7.0	XSM-1517-07
7.0		9.0	10.0	XSM-0709-10	15.0	+0.000	17.0	10.0	XSM-1517-10
7.0		9.0	12.0	XSM-0709-12	15.0		17.0	15.0	XSM-1517-15
8.0		10.0	6.0	XSM-0810-06	15.0		17.0	20.0	XSM-1517-20
8.0		10.0	8.0	XSM-0810-08	15.0		17.0	25.0	XSM-1517-25
8.0		10.0	10.0	XSM-0810-10	16.0		18.0	10.0	XSM-1618-10
8.0		10.0	12.0	XSM-0810-12	16.0		18.0	12.0	XSM-1618-12
8.0	+0.013	10.0	15.0	XSM-0810-15	16.0		18.0	15.0	XSM-1618-15
10.0	+0.071	12.0	3.5	XSM-1012-035	16.0		18.0	20.0	XSM-1618-20
10.0		12.0	6.0	XSM-1012-06	16.0		18.0	25.0	XSM-1618-25
10.0		12.0	8.0	XSM-1012-08	16.0		18.0	35.0	XSM-1618-35
10.0		12.0	10.0	XSM-1012-10	17.0		19.0	20.0	XSM-1719-20
10.0		12.0	12.0	XSM-1012-12	18.0		20.0	15.0	XSM-1820-15
10.0		12.0	15.0	XSM-1012-15	18.0		20.0	20.0	XSM-1820-20
10.0		12.0	20.0	XSM-1012-20	18.0		20.0	25.0	XSM-1820-25

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



Product range

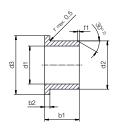
		-							
d1	d1	d2	b1	Part No.	d1	d1	d2	b1	Part No.
F3	Tolerance ³⁾	f1	h13		f1	Tolerance ³⁾	f1	h13	
[mm]	. 0.010	[mm]	[mm]		[mm]		[mm]	[mm]	VOM 0004 00
20.0	+0.016	22.0	14.0	XSM-2022-140	30.0	. 0. 000	34.0	20.0	XSM-3034-20
20.0	+0.086	20.0	115	VCM 0000 145	30.0	+0.020	34.0	25.0	XSM-3034-25
20.0		22.0	14.5	XSM-2022-145	30.0	+0.104	34.0	30.0	XSM-3034-30
20.0		22.0	17.0	XSM-2022-17	30.0		34.0	40.0	XSM-3034-40
20.0		22.0	18.0	XSM-2022-18	32.0		36.0	20.0	XSM-3236-20
20.0		22.0	20.0	XSM-2022-20	32.0		36.0	25.0	XSM-3236-25
20.0		23.0	7.0	XSM-2023-07	32.0		36.0	30.0	XSM-3236-30
20.0		23.0	10.0	XSM-2023-10	32.0		36.0	35.0	XSM-3236-35
20.0		23.0	15.0	XSM-2023-15	32.0		36.0	40.0	XSM-3236-40
20.0		23.0	20.0	XSM-2023-20	32.0		36.0	54.0	XSM-3236-54
20.0		23.0	25.0	XSM-2023-25	35.0		39.0	20.0	XSM-3539-20
20.0		23.0	30.0	XSM-2023-30	35.0		39.0	30.0	XSM-3539-30
22.0		25.0	15.0	XSM-2225-15	35.0		39.0	40.0	XSM-3539-40
22.0		25.0	20.0	XSM-2225-20	35.0		39.0	50.0	XSM-3539-50
22.0		25.0	25.0	XSM-2225-25	40.0	+0.025	44.0	20.0	XSM-4044-20
22.0		25.0	30.0	XSM-2225-30	40.0	+0.125	44.0	30.0	XSM-4044-30
24.0		26.0	20.0	XSM-2426-20	40.0	10.120	44.0	40.0	XSM-4044-40
24.0		27.0	6.0	XSM-2427-06	40.0		44.0	50.0	XSM-4044-50
24.0		27.0	15.0	XSM-2427-15	45.0		50.0	20.0	XSM-4550-20
24.0	+0.020	27.0	20.0	XSM-2427-20	45.0		50.0	30.0	XSM-4550-30
24.0	+0.020	27.0	25.0	XSM-2427-25	45.0		50.0	40.0	XSM-4550-40
24.0	+0.104	27.0	30.0	XSM-2427-30	45.0		50.0	50.0	XSM-4550-50
25.0		28.0	7.7	XSM-2528-077	50.0		55.0	20.0	XSM-5055-20
25.0		28.0	9.0	XSM-2528-09	50.0		55.0	30.0	XSM-5055-30
25.0		28.0	12.0	XSM-2528-12	50.0		55.0	40.0	XSM-5055-40
25.0		28.0	13.0	XSM-2528-13	50.0		55.0	50.0	XSM-5055-50
25.0		28.0	15.0	XSM-2528-15	50.0		55.0	60.0	XSM-5055-60
25.0		28.0	20.0	XSM-2528-20	55.0		60.0	50.0	XSM-5560-50
25.0		28.0	25.0	XSM-2528-25	60.0		65.0	45.0	XSM-6065-45
25.0		28.0	30.0	XSM-2528-30	60.0		65.0	60.0	XSM-6065-60
25.0		28.0	35.0	XSM-2528-35	65.0	+0.030	70.0	50.0	XSM-6570-50
26.0		28.0	10.0	XSM-2628-10	70.0	+0.150	75.0	70.0	XSM-7075-70
27.0		30.0	5.7	XSM-2730-05	75.0		80.0	60.0	XSM-7580-60
28.0		32.0	20.0	XSM-2832-20	80.0		85.0	100.0	
28.0		32.0	25.0	XSM-2832-25	90.0		95.0	100.0	
28.0		32.0	30.0	XSM-2832-30	100.0	+0.036	105.0	100.0	XSM-100105-100
28.0		32.0	69.0	XSM-2832-69	110.0	+0.176	115.0	100.0	XSM-110115-100
30.0		34.0	10.0	XSM-3034-10	120.0	10.170	125.0	100.0	XSM-120125-100
30.0		34.0	15.0	XSM-3034-15	120.0		120.0	.00.0	7.0 120120 100
50.0		57.0	10.0	7.5.11 000 - 10					

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

Bearing technology | Plain bearing | iglidur® X

Flange bearing (form F)





2) Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm] Ø 1-6 Ø 6-12 | Ø 12-30 | $\emptyset > 30$ f1 [mm] 0.3 8.0 1.2

Dimensions according to ISO 3547-1 and special dimensions



Order example: XFM-0304-05 - no minimum order quantity.

X iglidur® material F Flange bearing M Metric 03 Inner Ø d1 04 Outer Ø d2 05 Total length b1

d1	d1	d2	d3	b1	h2	Part No.	d1	d1	d2	d3	b1	h2	Part No.
u.	Tolerance ³⁾	uz	d13 ³⁾	h13	h13	raitivo.	۵.	Tolerance ³⁾	uz	d13 ³⁾	h13	h13	Tarrivo.
[mm]		[mm]	[mm]	[mm]	[mm]		[mm]		[mm]	[mm]	[mm]	[mm]	
2.0	+0.006	4.0	6.0	3.0	1.00	XFM-020406-03	12.0		14.0	18.0	3.9	1.00	XFM-121418-039
3.0	+0.046	4.5	7.5	5.0	0.75	XFM-0304-05	12.0		14.0	20.0	5.5	1.00	XFM-1214-055
4.0		5.5	9.5	4.0	0.75	XFM-0405-04	12.0	_	14.0	18.0	5.9	1.00	XFM-121418-059
4.0		5.5	9.5	6.0	0.75	XFM-0405-06	12.0		14.0	20.0	9.0	1.00	XFM-1214-09
4.0	- - +0.010 -	5.5	8.0	6.0	0.75	XFM-040508-06	12.0		14.0	20.0	12.0	1.00	XFM-1214-12
5.0	- +0.010 ·	7.0	11.0	5.0	1.00	XFM-0507-05	12.0		14.0	20.0	15.0	1.00	XFM-1214-15
6.0	+0.006	8.0	12.0	4.0	1.00	XFM-0608-04	12.0		14.0	20.0	17.0	1.00	XFM-1214-17
6.0		8.0	12.0	8.0	1.00	XFM-0608-08	14.0		16.0	22.0	10.0	1.00	XFM-1416-10
6.0		8.0	12.0	10.0	1.00	XFM-0608-10	14.0	+0.016	16.0	22.0	12.0	1.00	XFM-1416-12
8.0		10.0	12.0	4.0	1.00	XFM-081012-04	14.0	+0.016	16.0	22.0	17.0	1.00	XFM-1416-17
8.0		10.0	15.0	5.5	1.00	XFM-0810-05	15.0	- 10.000	17.0	23.0	6.0	1.00	XFM-1517-06
8.0		10.0	15.0	7.5	1.00	XFM-0810-07	15.0		17.0	23.0	9.0	1.00	XFM-1517-09
8.0		10.0	15.0	8.0	1.00	XFM-0810-08	15.0	_	17.0	23.0	12.0	1.00	XFM-1517-12
8.0		10.0	15.0	9.5	1.00	XFM-0810-09	15.0		17.0	23.0	17.0	1.00	XFM-1517-17
8.0		10.0	14.0	31.5	1.00	XFM-081014-31	16.0		18.0	24.0	12.0	1.00	XFM-1618-12
9.0		11.0	15.0	18.0	0.50	XFM-0911-18	16.0	_	18.0	24.0	17.0	1.00	XFM-1618-17
10.0		12.0	18.0	5.0	1.00	XFM-1012-05	18.0	_	20.0	26.0	12.0		XFM-1820-12
10.0	+0.013	12.0	18.0	6.0	1.00	XFM-1012-06	18.0		20.0	26.0	17.0	1.00	XFM-1820-17
10.0	+0.071	12.0	18.0	7.0	1.00	XFM-1012-07	18.0		20.0	26.0	22.0	1.00	XFM-1820-22
10.0		12.0	15.0	8.0	1.00	XFM-1012-08	20.0		23.0	30.0	6.5		XFM-2023-065
10.0		12.0	18.0	9.0	1.00	XFM-1012-09	20.0		23.0	30.0	7.5	1.50	XFM-2023-075
10.0		12.0	18.0	12.0	1.00	XFM-1012-12	20.0	_	23.0	30.0	11.5	1.50	XFM-2023-11
10.0		12.0	18.0	15.0	1.00	XFM-1012-15	20.0	+0.020	23.0	30.0	16.5	1.50	XFM-2023-16
10.0		12.0	18.0	17.0	1.00	XFM-1012-17	20.0	+0.104	23.0	30.0	21.0	1.50	XFM-2023-21
10.0	_	12.0	18.0	18.0		XFM-1012-18	25.0		28.0	33.0	8.0		XFM-252833-08
10.0		12.0	15.0	22.0	1.00	XFM-1012-22	25.0		28.0	35.0	11.5	1.50	XFM-2528-11
10.0		12.0	18.0	25.0	1.00	XFM-1012-25	25.0	_	28.0	35.0	13.5		XFM-2528-13
							25.0		28.0	35.0	16.5	1.50	XFM-2528-16

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



Product range

d1	d1 Tolerance ³⁾	d2	d3 d13 ³⁾	b1 h13	b2 h13	Part No.
[mm]		[mm]	[mm]	[mm]	[mm]	
25.0		28.0	35.0	21.0	1.50	XFM-2528-21
27.0	+0.020	30.0	38.0	20.0	1.50	XFM-2730-20
30.0	+0.020	34.0	42.0	16.0	2.00	XFM-3034-16
30.0	+0.104	34.0	42.0	26.0	2.00	XFM-3034-26
30.0		34.0	42.0	40.0	2.00	XFM-3034-40
32.0		36.0	45.0	15.0	2.00	XFM-3236-15
32.0	+0.025	36.0	45.0	26.0	2.00	XFM-3236-26
35.0	+0.125	39.0	47.0	16.0	2.00	XFM-3539-16
35.0		39.0	47.0	26.0	2.00	XFM-3539-26

3) After press-fit.	Testing methods,	, page 57
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d1	d1 Tolerance ³	d2	d3 d13 ³⁾	b1 h13	b2 h13	Part No.
[mm]	Tolerance	[mm]	[mm]	[mm]		
40.0		44.0	52.0	22.0	2.00	XFM-4044-22
40.0	+0.025	44.0	52.0	30.0	2.00	XFM-4044-30
40.0	+0.025	44.0	52.0	40.0	2.00	XFM-4044-40
45.0	+0.125	50.0	58.0	50.0	2.00	XFM-4550-50
50.0		55.0	63.0	40.0	2.00	XFM-5055-40
60.0	+0.030	65.0	73.0	40.0	2.00	XFM-6065-40
70.0	+0.030 ·	75.0	83.0	40.0	2.00	XFM-7075-40
75.0	+0.150	80.0	88.0	50.0	2.00	XFM-7580-50

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