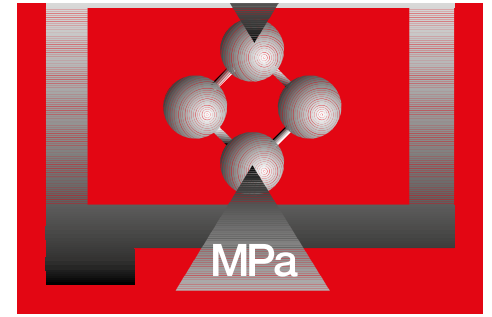




The chemical and temperature specialist

Up to 150MPa

igidur® X



When to use it?

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

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

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Ø
2.0-120.0mm



Also available
as:



Bar stock,
round bar
Page 773



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 847

The chemical and temperature specialist Up to 150MPa

igidur® X is defined by its combination of very high temperature resistance with high compressive strength, along with high resistance to chemicals. iglidur® X is designed for higher speeds than other iglidur® bearings.

- Continuous operating temperature from -100°C to +250°C
- Extremely high chemical resistance
- High compressive strength
- Low moisture absorption
- High wear resistance

Typical application areas

- Beverage industry
- Woodworking
- Plastic processing industry
- Aerospace engineering
- Cleanroom

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/igidur-finder

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

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General properties

Density	g/cm³	1.44	
Colour		black	
Max. moisture absorption at +23°C/50% r.h.	% weight	0.1	DIN 53495
Max. moisture absorption	% weight	0.5	
Coefficient of friction, dynamic, against steel	μ	0.09-0.27	
pv value, max. (dry)	MPa · m/s	1.32	

Mechanical properties

Flexural modulus	MPa	8,100	DIN 53457
Flexural strength at +20°C	MPa	170	DIN 53452
Compressive strength	MPa	100	
Max. permissible surface pressure (+20°C)	MPa	150	
Shore D hardness		85	DIN 53505

Physical and thermal properties

Max. application temperature long-term	°C	+250	
Max. application temperature short-term	°C	+315	
Min. application temperature	°C	-100	
Thermal conductivity	W/m · K	0.60	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K⁻¹ · 10⁻⁵	5	DIN 53752

Electrical properties^{*)}

Specific transitional resistance	Ωcm	< 10⁵	DIN IEC 93
Surface resistance	Ω	< 10³	DIN 53482

^{*)} The good conductivity of this material can favour the generation of corrosion on the metallic contact components.

Table 01: Material properties

igidur® 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 · 10⁵ Gy.

Resistance to weathering

igidur® X plain bearings are continuously resistant to weathering. The material properties are only slightly affected. Possible discolourations 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 45



-100°C up to
+250°C



150MPa



V-0



ISO 35471



ISO 35471



ISO 35471



ISO 35471

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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 48

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 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. 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 $R_a = 0.6-0.8\mu\text{m}$ 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® X. 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® 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 61

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

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

Table 02: Chemical resistance

Chemical table, page 1170

		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 ($R_a = 1\mu\text{m}$, 50HRC)

	Housing	Plain bearings	Shaft
$\varnothing d1$ [mm]	H7 [mm]	F10 [mm]	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	-0.036 +0.176	-0.087 +0.000
> 120-180	+0.000 +0.040	+0.043 +0.203	+0.000 +0.100

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

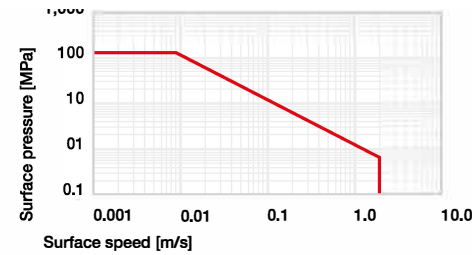


Diagram 01: Permissible pv values for iglidur® X plain bearing with a wall thickness of 1 mm dry operation against a steel shaft at +20°C, mounted in a steel housing

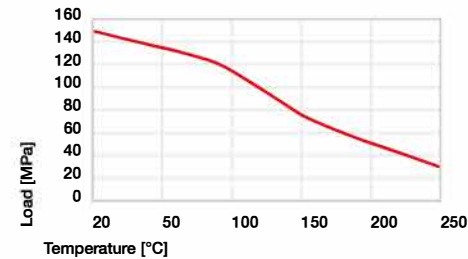


Diagram 02: Maximum recommended surface pressure as a function of temperature (150MPa at +20°C)

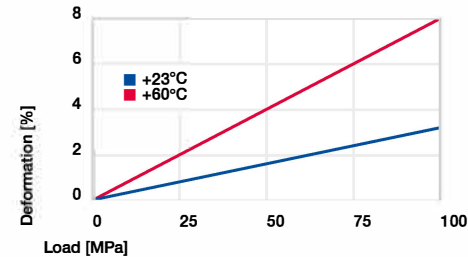


Diagram 03: Deformation under pressure and temperature

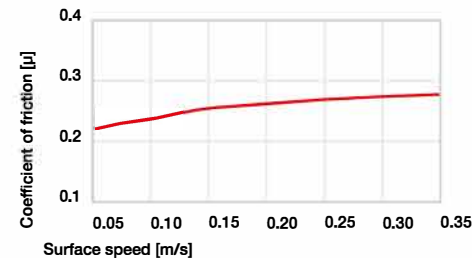


Diagram 04: Coefficient of friction as a function of the surface speed, $v = 0.01\text{m/s}$

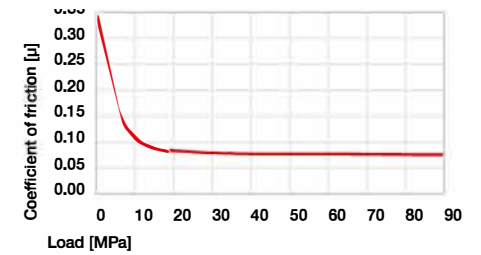


Diagram 05: Coefficient of friction as a function of the pressure, $v = 0.01\text{m/s}$

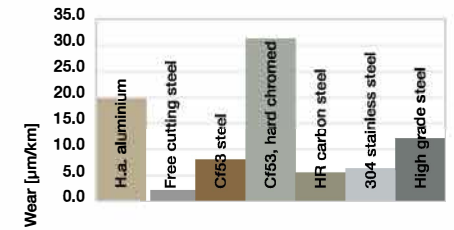


Diagram 06: Wear, rotating with different shaft materials, pressure, $p = 1\text{MPa}$, $v = 0.3\text{m/s}$

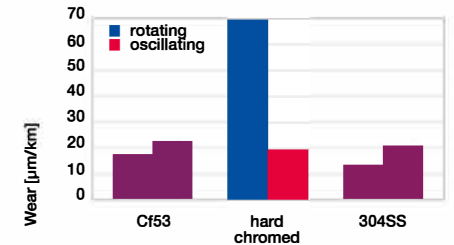
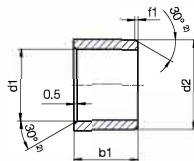


Diagram 07: Wear for rotating and oscillating applications with different shaft materials, $p = 2\text{MPa}$



³⁾ 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: **XSM-0203-03** – no minimum order quantity.

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

d1	d1	d2	b1	Part No.
[mm]	Tolerance ³⁾	[mm]	h13 [mm]	
2.0		3.5	3.0	XSM-0203-03
3.0	+0.006	4.5	3.0	XSM-0304-03
3.0	+0.046	4.5	6.0	XSM-0304-06
4.0		5.5	4.0	XSM-0405-04
4.0		5.5	6.0	XSM-0405-06
4.0		5.5	9.0	XSM-0405-09
4.0		5.5	10.0	XSM-0405-10
5.0		7.0	3.5	XSM-0507-035
5.0	+0.010	7.0	5.0	XSM-0507-05
5.0	+0.058	7.0	8.0	XSM-0507-08
5.0		7.0	10.0	XSM-0507-10
6.0		8.0	6.0	XSM-0608-06
6.0		8.0	8.0	XSM-0608-08
6.0		8.0	10.0	XSM-0608-10
6.0		8.0	13.8	XSM-0608-13
7.0		9.0	10.0	XSM-0709-10
7.0		9.0	12.0	XSM-0709-12
8.0		10.0	6.0	XSM-0810-06
8.0		10.0	8.0	XSM-0810-08
8.0		10.0	10.0	XSM-0810-10
8.0		10.0	12.0	XSM-0810-12
8.0	+0.013	10.0	15.0	XSM-0810-15
10.0	+0.071	12.0	3.5	XSM-1012-035
10.0		12.0	6.0	XSM-1012-06
10.0		12.0	8.0	XSM-1012-08
10.0		12.0	10.0	XSM-1012-10
10.0		12.0	12.0	XSM-1012-12
10.0		12.0	15.0	XSM-1012-15
10.0		12.0	20.0	XSM-1012-20

d1	d1	d2	b1	Part No.
[mm]	Tolerance ³⁾	[mm]	h13 [mm]	
12.0		14.0	3.5	XSM-1214-035
12.0		14.0	6.0	XSM-1214-06
12.0		14.0	8.0	XSM-1214-08
12.0		14.0	10.0	XSM-1214-10
12.0		14.0	12.0	XSM-1214-12
12.0		14.0	15.0	XSM-1214-15
12.0		14.0	20.0	XSM-1214-20
12.0		14.0	25.0	XSM-1214-25
13.0		15.0	10.0	XSM-1315-10
13.0		15.0	20.0	XSM-1315-20
14.0		16.0	12.0	XSM-1416-12
14.0		16.0	15.0	XSM-1416-15
14.0		16.0	20.0	XSM-1416-20
14.0		16.0	25.0	XSM-1416-25
15.0	+0.016	17.0	7.0	XSM-1517-07
15.0	+0.086	17.0	10.0	XSM-1517-10
15.0		17.0	15.0	XSM-1517-15
15.0		17.0	20.0	XSM-1517-20
15.0		17.0	25.0	XSM-1517-25
16.0		18.0	10.0	XSM-1618-10
16.0		18.0	12.0	XSM-1618-12
16.0		18.0	15.0	XSM-1618-15
16.0		18.0	20.0	XSM-1618-20
16.0		18.0	25.0	XSM-1618-25
16.0		18.0	35.0	XSM-1618-35
17.0		19.0	20.0	XSM-1719-20
18.0		20.0	15.0	XSM-1820-15
18.0		20.0	20.0	XSM-1820-20
18.0		20.0	25.0	XSM-1820-25

³⁾ After press-fit. Testing methods, page 61

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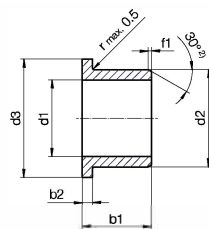
d1	d1	d2	b1	Part No.
[mm]	Tolerance ³⁾	[mm]	h13 [mm]	
20.0	+0.016 +0.086	22.0	14.0	XSM-2022-140
20.0		22.0	14.5	XSM-2022-145
20.0		22.0	17.0	XSM-2022-17
20.0		22.0	18.0	XSM-2022-18
20.0		22.0	20.0	XSM-2022-20
20.0		23.0	7.0	XSM-2023-07
20.0		23.0	10.0	XSM-2023-10
20.0		23.0	15.0	XSM-2023-15
20.0		23.0	20.0	XSM-2023-20
20.0		23.0	25.0	XSM-2023-25
20.0		23.0	30.0	XSM-2023-30
22.0		25.0	15.0	XSM-2225-15
22.0		25.0	20.0	XSM-2225-20
22.0		25.0	25.0	XSM-2225-25
22.0		25.0	30.0	XSM-2225-30
24.0		26.0	20.0	XSM-2426-20
24.0		27.0	6.0	XSM-2427-06
24.0		27.0	15.0	XSM-2427-15
24.0	+0.020	27.0	20.0	XSM-2427-20
24.0	+0.104	27.0	25.0	XSM-2427-25
24.0		27.0	30.0	XSM-2427-30
25.0		28.0	7.7	XSM-2528-077
25.0		28.0	9.0	XSM-2528-09
25.0		28.0	12.0	XSM-2528-12
25.0		28.0	13.0	XSM-2528-13
25.0		28.0	15.0	XSM-2528-15
25.0		28.0	20.0	XSM-2528-20
25.0		28.0	25.0	XSM-2528-25
25.0		28.0	30.0	XSM-2528-30
25.0		28.0	35.0	XSM-2528-35
26.0		28.0	10.0	XSM-2628-10
27.0		30.0	5.7	XSM-2730-05
28.0		32.0	20.0	XSM-2832-20
28.0		32.0	25.0	XSM-2832-25
28.0		32.0	30.0	XSM-2832-30
28.0		32.0	69.0	XSM-2832-69
30.0		34.0	10.0	XSM-3034-10
30.0		34.0	15.0	XSM-3034-15

³⁾ After press-fit. Testing methods, page 61

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³⁾ 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: **XFM-0304-05** – no minimum order quantity.

X iglidur® material **F** With flange **M** Metric **03** Inner Ø d1 **04** Outer Ø d2 **05** Total length b1

d1	d1	d2	d3	b1	b2	Part No.
[mm]	Tolerance ³⁾	[mm]	d13 ³⁾	h13	h13	
2.0	+0.006	4.0	6.0	3.0	1.00	XFM-020406-03
3.0	+0.046	4.5	7.5	5.0	0.75	XFM-0304-05
4.0		5.5	9.5	4.0	0.75	XFM-0405-04
4.0		5.5	9.5	6.0	0.75	XFM-0405-06
4.0	+0.010	5.5	8.0	6.0	0.75	XFM-040508-06
5.0	+0.058	7.0	11.0	5.0	1.00	XFM-0507-05
6.0		8.0	12.0	4.0	1.00	XFM-0608-04
6.0		8.0	12.0	8.0	1.00	XFM-0608-08
6.0		8.0	12.0	10.0	1.00	XFM-0608-10
8.0		10.0	12.0	4.0	1.00	XFM-081012-04
8.0		10.0	15.0	5.5	1.00	XFM-0810-05
8.0		10.0	15.0	7.5	1.00	XFM-0810-07
8.0		10.0	15.0	8.0	1.00	XFM-0810-08
8.0		10.0	15.0	9.5	1.00	XFM-0810-09
8.0		10.0	14.0	31.5	1.00	XFM-081014-31
9.0		11.0	15.0	18.0	1.00	XFM-0911-18
10.0		12.0	18.0	5.0	1.00	XFM-1012-05
10.0	+0.013	12.0	18.0	6.0	1.00	XFM-1012-06
10.0	+0.071	12.0	18.0	7.0	1.00	XFM-1012-07
10.0		12.0	15.0	8.0	1.00	XFM-1012-08
10.0		12.0	18.0	9.0	1.00	XFM-1012-09
10.0		12.0	18.0	12.0	1.00	XFM-1012-12
10.0		12.0	18.0	15.0	1.00	XFM-1012-15
10.0		12.0	18.0	17.0	1.00	XFM-1012-17
10.0		12.0	18.0	18.0	1.00	XFM-1012-18
10.0		12.0	15.0	22.0	1.00	XFM-1012-22
10.0		12.0	18.0	25.0	1.00	XFM-1012-25

d1	d1	d2	d3	b1	b2	Part No.
[mm]	Tolerance ³⁾	[mm]	d13 ³⁾	h13	h13	
12.0		14.0	18.0	3.9	1.00	XFM-121418-039
12.0		14.0	20.0	5.5	1.00	XFM-1214-055
12.0		14.0	18.0	5.9	1.00	XFM-121418-059
12.0		14.0	20.0	9.0	1.00	XFM-1214-09
12.0		14.0	20.0	12.0	1.00	XFM-1214-12
12.0		14.0	20.0	15.0	1.00	XFM-1214-15
12.0		14.0	20.0	17.0	1.00	XFM-1214-17
14.0		16.0	22.0	10.0	1.00	XFM-1416-10
14.0		16.0	22.0	12.0	1.00	XFM-1416-12
14.0	+0.016	16.0	22.0	17.0	1.00	XFM-1416-17
15.0	+0.086	17.0	23.0	6.0	1.00	XFM-1517-06
15.0		17.0	23.0	9.0	1.00	XFM-1517-09
15.0		17.0	23.0	12.0	1.00	XFM-1517-12
15.0		17.0	23.0	17.0	1.00	XFM-1517-17
16.0		18.0	24.0	12.0	1.00	XFM-1618-12
16.0		18.0	24.0	17.0	1.00	XFM-1618-17
18.0		20.0	26.0	12.0	1.00	XFM-1820-12
18.0		20.0	26.0	17.0	1.00	XFM-1820-17
18.0		20.0	26.0	22.0	1.00	XFM-1820-22
20.0		23.0	30.0	6.5	1.50	XFM-2023-065
20.0		23.0	30.0	7.5	1.50	XFM-2023-075
20.0		23.0	30.0	11.5	1.50	XFM-2023-11
20.0		23.0	30.0	16.5	1.50	XFM-2023-16
20.0	+0.020	23.0	30.0	21.0	1.50	XFM-2023-21
25.0	+0.104	28.0	33.0	8.0	1.00	XFM-252833-08
25.0		28.0	35.0	11.5	1.50	XFM-2528-11
25.0		28.0	35.0	13.5	1.50	XFM-2528-13
25.0		28.0	35.0	16.5	1.50	XFM-2528-16

³⁾ After press-fit. Testing methods, page 61

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d1	d1	d2	d3	b1	b2	Part No.
[mm]	Tolerance ³⁾	[mm]	d13 ³⁾	h13	h13	
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	+0.104	34.0	42.0	16.0	2.00	XFM-3034-16
30.0		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 61

d1	d1	d2	d3	b1	b2	Part No.
[mm]	Tolerance ³⁾	[mm]	d13 ³⁾	h13	h13	
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	+0.125	44.0	52.0	40.0	2.00	XFM-4044-40
45.0		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	+0.150	75.0	83.0	40.0	2.00	XFM-7075-40
75.0		80.0	88.0	50.0	2.00	XFM-7580-50



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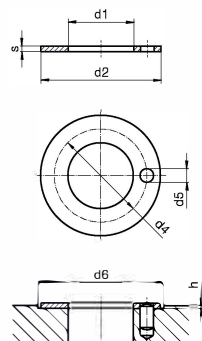
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i Dimensions according to ISO 3547-1 and special dimensions

key Order example: **XTM-0620-015** – no minimum order quantity.
X iglidur® material **T** Thrust washer **M** Metric **06** Inner Ø d1 **20** Outer Ø d2 **015** Height s

d1	d2	d4	d5	h	d6	Øs	Part No.
+0.25	-0.25	-0.12 +0.12	+0.375 +0.125	+0.2/-0.2	+0.12	-0.05	
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
6	20	13	1.5	1	20	1.5	XTM-0620-015
8	18	13	1.5	1	18	1.5	XTM-0818-015
8	29	⁴⁾	⁴⁾	1	29	1.5	XTM-0829-015
8	30	⁴⁾	⁴⁾	1	30	1.5	XTM-0830-015
10	18	⁴⁾	⁴⁾	0.7	18	1	XTM-1018-010
12	24	18	1.5	1	24	1.5	XTM-1224-015
14	26	20	2	1	26	1.5	XTM-1426-015
15	22	⁴⁾	⁴⁾	0.5	22	0.8	XTM-1522-008
15	24	19.5	1.5	1	24	1.5	XTM-1524-015
16	30	22	2	1	30	1.5	XTM-1630-015
18	32	25	2	1	32	1.5	XTM-1832-015
20	36	28	3	1	36	1.5	XTM-2036-015
22	38	30	3	1	38	1.5	XTM-2238-015
24	42	33	3	1	42	1.5	XTM-2442-015
26	44	35	3	1	44	1.5	XTM-2644-015
28	48	38	4	1	48	1.5	XTM-2848-015
32	54	43	4	1	54	1.5	XTM-3254-015
38	62	50	4	1	62	1.5	XTM-3862-015
42	66	54	4	1	66	1.5	XTM-4266-015
48	74	61	4	1.5	74	2	XTM-4874-020
52	78	65	4	1.5	78	2	XTM-5278-020
62	90	76	4	1.5	90	2	XTM-6290-020

⁴⁾ Design without fixing hole