

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 $+250^{\circ}\text{C}$ (short-term up to $+315^{\circ}\text{C}$)
- 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
igidur® Q, iglidur® Z
- When a cost-effective plain bearing for underwater use is required
igidur® H, iglidur® H370
- For edge loads
igidur® Z

Bearing technology | Plain bearing | iglidur® X



Ø
2.0 –
120.0mm



Also available
as:



Bar stock,
round bar
Page 678

The chemical and temperature specialist Up to 150MPa

iglidur® 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
- Very low moisture absorption
- High wear resistance



Bar stock,
plate
Page 683

Typical application areas

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



tribo-tape liner
Page 691



Piston rings
Page 584

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	-	■	■	■	■	■	■	■	■	+



Two hole
flange
bearings
Page 603



Moulded
special parts
Page 624



igubal®
spherical balls
Page 847

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

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

280 3D CAD, finder and service life calculation ... www.igus.eu/X



Technical data

General properties		Testing method	
Density	g/cm ³	1.44	
Colour		black	
Max. moisture absorption at +23°C and 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. recommended 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 ⁹⁾			
Specific contact resistance	Ωcm	< 10 ⁵	DIN IEC 93
Surface resistance	Ω	< 10 ⁹	DIN 53482

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 · 10⁶Gy.

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



-100°C up to
+250°C



150MPa



V-0



ISO 3547



RoHS



ISO 3547



ISO 3547

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 $R_a = 0.6 - 0.8\mu\text{m}$ 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 ($R_a = 1\mu\text{m}$, 50HRC)

Ø d1 [mm]	Housing		Plain bearing		Shaft	
	H7 [mm]	F10 [mm]	F10 [mm]	h9 [mm]	h9 [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

Technical data

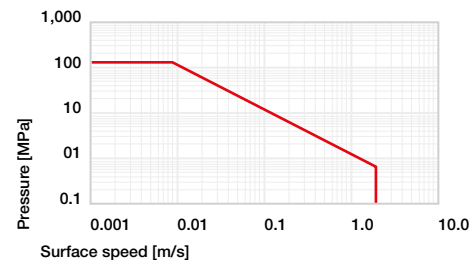


Diagram 01: Permissible pv values for iglidur® X plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

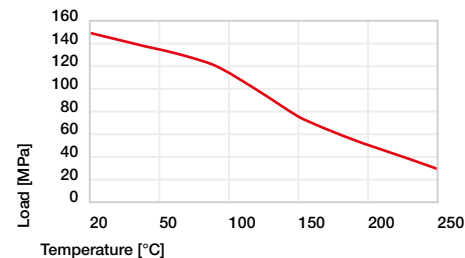


Diagram 02: Maximum recommended surface pressure as a function of temperature (150MPa at +20°C)

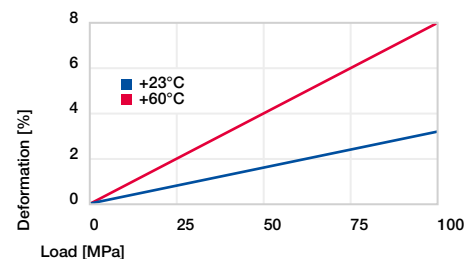


Diagram 03: Deformation under pressure and temperature

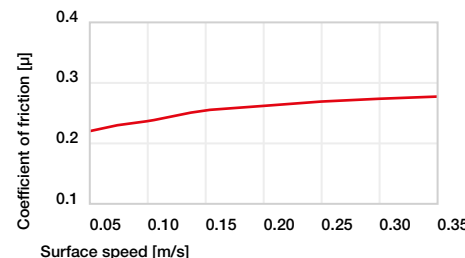


Diagram 04: Coefficient of friction as a function of the surface speed, $v = 0.01\text{m/s}$

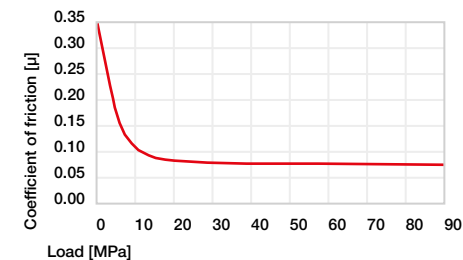


Diagram 05: Coefficient of friction as a function of the pressure, $v = 0.01\text{m/s}$

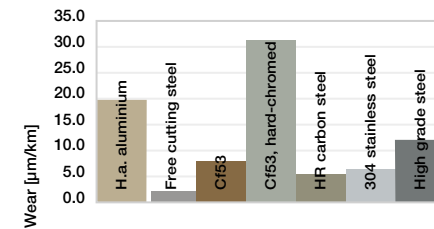


Diagram 06: Wear, rotating with different shaft materials, pressure, $p = 1\text{MPa}$, $v = 0.3\text{m/s}$

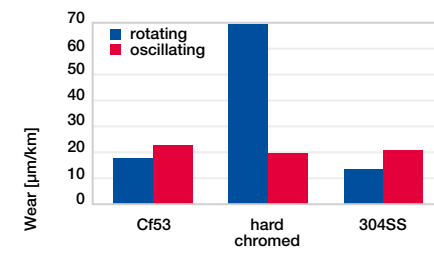
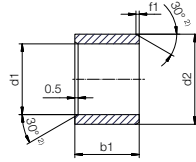


Diagram 07: Wear for rotating and oscillating applications with different shaft materials, $p = 2\text{MPa}$

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 > 30
f1 [mm]	0.3	0.5	0.8	1.2

i Dimensions according to ISO 3547-1 and special dimensions

i 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	Part No.
[mm]		[mm]	[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 Tolerance ³⁾	d2	b1	Part No.
[mm]		[mm]	[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 57

Product range

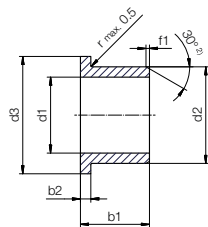
d1	d1 Tolerance ³⁾	d2	b1	Part No.
[mm]		[mm]	[mm]	
20.0	+0.016	22.0	14.0	XSM-2022-140
20.0	+0.086	22.0	14.0	XSM-2022-140
20.0		22.0	14.5	XSM-2022-145
20.0		22.0	17.0	XSM-2022-17
20.0		22.0	18.0	XSM-2022-18
20.0		22.0	20.0	XSM-2022-20
20.0		23.0	7.0	XSM-2023-07
20.0		23.0	10.0	XSM-2023-10
20.0		23.0	15.0	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 57

d1	d1 Tolerance ³⁾	d2	b1	Part No.
[mm]		[mm]	[mm]	
30.0		34.0	20.0	XSM-3034-20
30.0	+0.020	34.0	25.0	XSM-3034-25
30.0	+0.104	34.0	30.0	XSM-3034-30
30.0		34.0	40.0	XSM-3034-40
32.0		36.0	20.0	XSM-3236-20
32.0		36.0	25.0	XSM-3236-25
32.0		36.0	30.0	XSM-3236-30
32.0		36.0	35.0	XSM-3236-35
32.0		36.0	40.0	XSM-3236-40
32.0		36.0	54.0	XSM-3236-54
35.0		39.0	20.0	XSM-3539-20
35.0		39.0	30.0	XSM-3539-30
35.0		39.0	40.0	XSM-3539-40
35.0		39.0	50.0	XSM-3539-50
40.0		44.0	20.0	XSM-4044-20
40.0	+0.025	44.0	30.0	XSM-4044-30
40.0	+0.125	44.0	40.0	XSM-4044-40
40.0		44.0	50.0	XSM-4044-50
45.0		50.0	20.0	XSM-4550-20
45.0		50.0	30.0	XSM-4550-30
45.0		50.0	40.0	XSM-4550-40
45.0		50.0	50.0	XSM-4550-50
50.0		55.0	20.0	XSM-5055-20
50.0		55.0	30.0	XSM-5055-30
50.0		55.0	40.0	XSM-5055-40
50.0		55.0	50.0	XSM-5055-50
50.0		55.0	60.0	XSM-5055-60
55.0		60.0	50.0	XSM-5560-50
60.0		65.0	45.0	XSM-6065-45
60.0		65.0	60.0	XSM-6065-60
65.0	+0.030	70.0	50.0	XSM-6570-50
70.0	+0.150	75.0	70.0	XSM-7075-70
75.0		80.0	60.0	XSM-7580-60
80.0		85.0	100.0	XSM-8085-100
90.0		95.0	100.0	XSM-9095-100
100.0	+0.036	105.0	100.0	XSM-100105-100
110.0	+0.176	115.0	100.0	XSM-110115-100
120.0		125.0	100.0	XSM-120125-100

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	Ø > 30
f1 [mm]	0.3	0.5	0.8	1.2

i Dimensions according to ISO 3547-1 and special dimensions

i 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	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	0.50	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
14.0	+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 57

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Product range

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		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

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		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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