

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 resistance to chemicals
- 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 bearings | iglidur® X



Also available as:
Ø 2.0 – 120.0 mm



Bar stock, round bar: Page 642



Bar stock, plate: Page 651



Tribo-tape liner: Page 657



Piston rings: Page 662



Two hole flange bearing: Page 583



Modified special parts: Page 602



Spherical balls: Page 789



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

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	-	+	+
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	1.44	
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			
pv value, max. (dry)	MPa · m/s	1.32	150MPa
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 ⁻⁶	5	DIN 53752
Electrical properties^{*)}			
Specific contact resistance	Ωcm	< 10 ⁵	DIN IEC 93
Surface resistance	Ω	< 10 ⁵	DIN 53482

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

Table 01: Material properties table

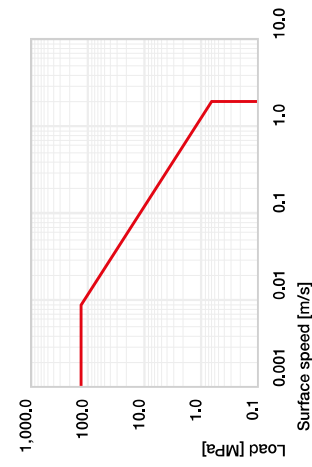


Diagram 01: Permissible pv values for iglidur® X plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

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.

UV resistance

The excellent material properties of iglidur® X do not change under UV radiation and other weathering effects.

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

+ resistant 0 conditionally resistant - not resistant
All information given at room temperature [+20°C]

Table 02: Chemical resistance

Chemical table, page 1542

Bearing technology | Plain bearings | iglidur® X

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.

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.

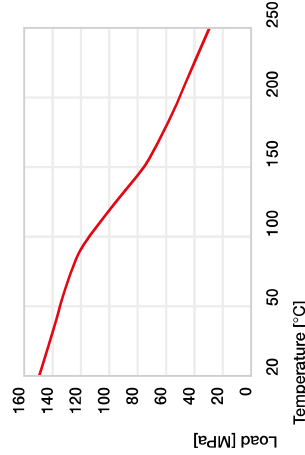


Diagram 02: Maximum recommended surface pressure as a function of temperature (150MPa at +20°C)

Diagram 03 shows the elastic deformation of iglidur® X at radial loads.

Surface pressure, page 41

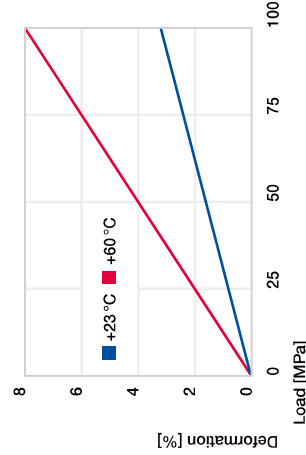


Diagram 03: Deformation under pressure and temperature

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

	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

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

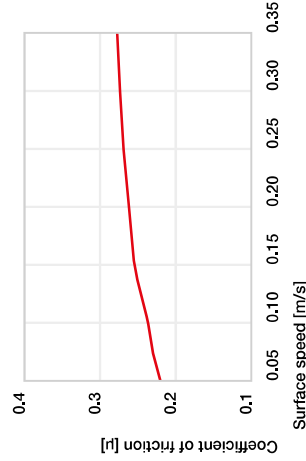


Diagram 04: Coefficient of friction as a function of the surface speed, v = 0.01 m/s

Technical data

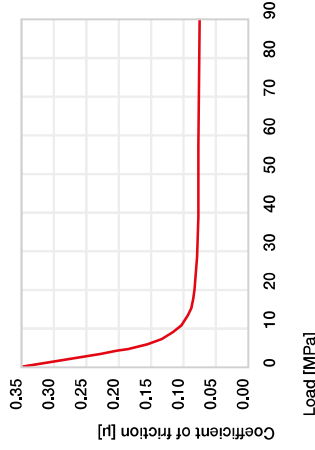


Diagram 05: Coefficient of friction as a function of the load

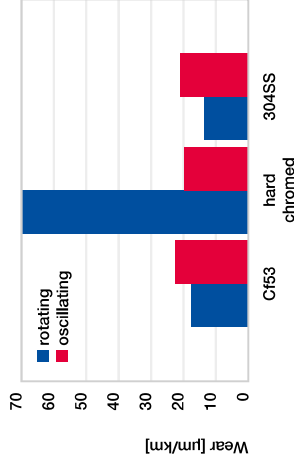


Diagram 07: Wear for rotating and oscillating applications with different shaft materials, p = 2MPa

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 μm 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

	Dry	Greases	Oil	Water
Coeff. of friction [μ]	0.09 – 0.27	0.09	0.04	0.04

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



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

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).

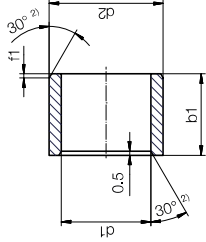
Testing methods, page 57

	Housing	Plain bearing	Shaft
Ø d1 [mm]	F10 [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

Bearing technology | Plain bearings | 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 > 30
f [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 **Ø2** Inner **Ø1** Outer **Ø3** Total length **b1**

d1	d1 Tolerance ³⁾	d2	b1	h13	Part No.
[mm]	[mm]	[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	+0.010	7.0	3.5	XSM-0507-035	
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	

³⁾ After press-fit. Testing methods page 57

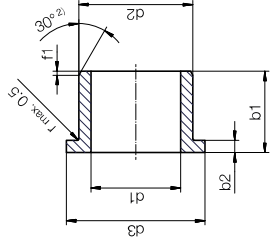
Product range

d1	d1 Tolerance ³⁾	d2	b1	h13	Part No.
[mm]	[mm]	[mm]	[mm]	[mm]	
20.0	+0.016	22.0	14.0	XSM-2022-140	
30.0	+0.086				
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	
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	15.0	XSM-3034-15	

³⁾ After press-fit. Testing methods page 57

Bearing technology | Plain bearings | 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
f [mm]	0.3	0.5	0.8	1.2

i Dimensions according to ISO 3547-1 and special dimensions

i Order example: **XFM-020406-03** - 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 Tolerance ³⁾ [mm]	d2 [mm]	d3 [mm]	b1 h13 -0,14 [mm]	b2 [mm]	Part No.
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	8,0	6,0	0,75	XFM-040508-06
4,0	+0,010	5,5	9,5	6,0	0,75	XFM-0405-06
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
12,0	+0,016	14,0	18,0	3,9	1,00	XFM-121418-039
12,0	+0,086	14,0	20,0	5,5	1,00	XFM-1214-055

³⁾ After press-fit. Testing methods page 57

Product range

d1	d1 Tolerance ³⁾ [mm]	d2 [mm]	d3 [mm]	b1 h13 -0,14 [mm]	b2 [mm]	Part No.
30,0	+0,020	34,0	42,0	26,0	2,00	XFM-3034-26
30,0	+0,104	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
40,0		44,0	52,0	22,0	2,00	XFM-4044-22

³⁾ After press-fit. Testing methods page 57

d1	d1 Tolerance ³⁾ [mm]	d2 [mm]	d3 [mm]	b1 h13 -0,14 [mm]	b2 [mm]	Part No.
40,0		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	+0,150	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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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

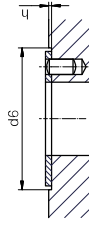
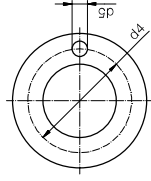
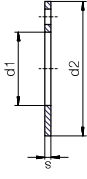
No minimum order value.

No low-quantity surcharges.

Free shipping within Germany for orders above €150.

Bearing technology | Plain bearings | iglidur® X

Thrust washer (form T)



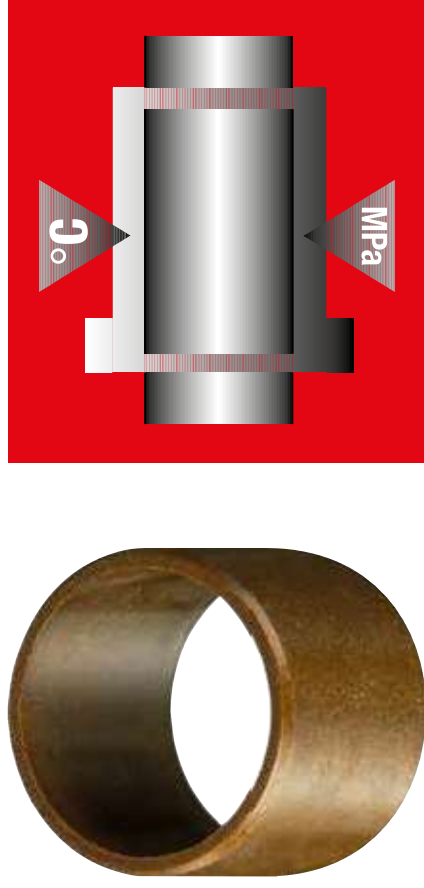
i Dimensions according to ISO 3547-1 and special dimensions

i 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** Thickness **s**

d1	d2	d4	d5	h	d6	s	Part No.
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
+0.25	-0.25	-0.12	+0.375	+0.2/-0.2	+0.12	-0.05	
		+0.12	+0.125				
		[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



Long service life under extreme conditions

Resistant to wear and impact even at high loads and temperatures

iglidur® Z



When to use it?

- For temperatures up to +250°C long-term or +310°C short-term
- When low wear is required especially under high radial loads
- For high surface speeds
- For edge pressure in connection with high surface pressures



When not to use?

- For low loads and temperatures
- **iglidur® P**
- When a cost-effective all-round plain bearing is required
- **iglidur® G**
- When electrically conductive plain bearings are required
- **iglidur® F, iglidur® H, iglidur® H370**