

The heavy-duty bearing – iglidur® TX1

- Up to 200 MPa static and 140 MPa dynamic
- Wear-resistant and dimensionally stable
- Good media resistance
- Lubrication and maintenance free
- Standard range from stock



Lubrication and maintenance free

Up to 200 MPa static and 140 MPa dynamic

Wear-resistant and dimensionally stable

Good media resistance

Outstanding rigidity and durability especially under high radial loads during pivoting operations characterise the bearings in the new iglidur® TX1 series. Thanks to the closed-loop wound structure, excellent dimensional stability is even achieved in cases of major jolts and impacts.



When to use it?

- When permanently high static loads occur
- For highly load pivoting motions
- When not only high loads but also high temperatures and media resistance are required



When not to use it?

- When loads of far less than 100 MPa occur
 - ▶ iglidur® G, page 83
 - ▶ iglidur® Q2, page 409
 - ▶ iglidur® Q, page 401
- For rotational movements during continuous operation
 - ▶ iglidur® W300, page 121
 - ▶ iglidur® Z, page 263
 - ▶ iglidur® G, page 83
- For high-temperature applications with average load levels
 - ▶ iglidur® X, page 133
 - ▶ iglidur® J350, page 199
 - ▶ iglidur® H, page 283



Available from stock

Detailed information about delivery time online.



max. +120 °C
min. -60 °C



Block pricing online

No minimum order value. From batch size 1



Ø 20–80 mm
more dimensions on request



Typical application areas

- Agricultural machines
- Construction machinery and commercial vehicles
- Heavy equipments, etc.

Material properties table

General properties	Unit	iglidur® TX1	Testing method
Density	g/cm³	2.1	
Colour		grey-green	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	0.2	DIN 53495
Max. water absorption	% weight	0.5	
Coefficient of sliding friction, dynamic against steel	μ	0.09–0.37	
pv value, max. (dry)	MPa · m/s	0.89	
Mechanical properties			
Modulus of elasticity	MPa	12,000	DIN 53457
Tensile strength at +20 °C	MPa	55	DIN 53452
Compressive strength	MPa	220	
Max. recommended surface pressure (+20 °C)	MPa	200	
Shore-D hardness		94	DIN 53505
Physical and thermal properties			
Max. long term application temperature	°C	+120	
Max. short term application temperature	°C	+170	
Min. application temperature	°C	-60	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	K ⁻¹ · 10 ⁻⁶	3	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 1 × 10 ¹¹	DIN IEC 93
Surface resistance	Ω	> 1 × 10 ¹³	DIN 53482

Table 01: Material properties table

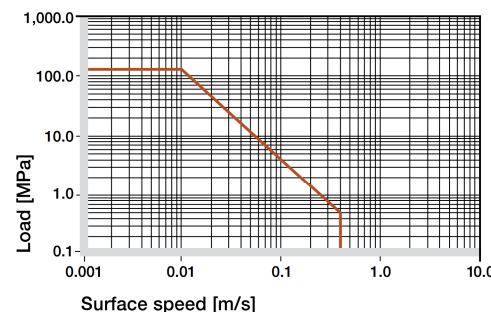


Diagram 01: Permissible pv values for iglidur® TX1 bearings with a wall thickness of 1 mm dry running against a steel shaft, at +20 °C, mounted in a steel housing

Moisture absorption

Under normal climatic conditions, the moisture absorption of iglidur® TX1 plain bearings is 0.2%. The saturation limit in water is 0.5%.

Vacuum

In a vacuum, any moisture content will outgas. Applications under vacuum conditions are possible to a limited extent.

Radiation resistance

Plain bearings made from iglidur® TX1 are resistant to radiation up to an intensity of applications 2 · 10² Gy.

UV resistance

iglidur® TX1 plain bearings are permanently resistant to UV radiation.

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

+ resistant 0 conditionally resistant - not resistant

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

Table 02: Chemical resistance

▶ Chemical table, page 1226

iglidur® TX1 bearings represent excellent load bearing capacity under high radial loads coupled with good abrasion resistance. The special design not only ensures excellent dimensional stability thanks to the long-fibre winding but also allows lubrication and maintenance-free operation thanks to solid lubricants. High dirt and media resistance round off the list of properties.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® TX1 plain bearings decreases. Diagram 02 clarifies this relationship. At the short-term permitted application temperature of +170°C, the permitted surface pressure is still 100 MPa. The recommended maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

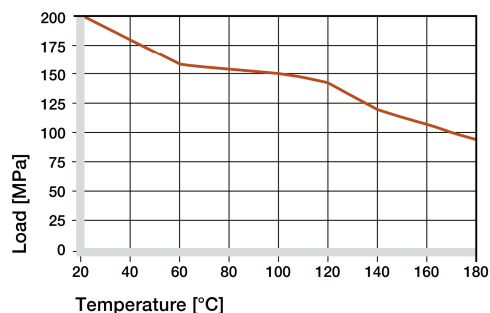


Diagram 02: Recommended maximum surface pressure of as a function of temperature (200 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® TX1 at radial load.

► Surface pressure, page 63

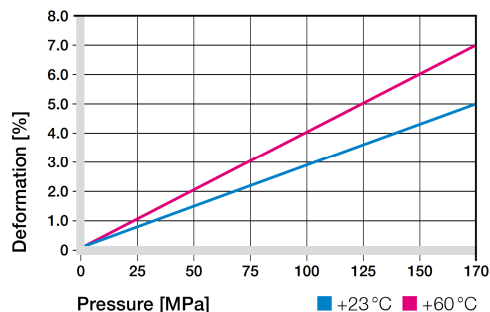


Diagram 03: Deformation under pressure and temperature

Permissible surface speeds

The typical applications for iglidur® TX1 plain bearings are high load pivoting motions at comparatively low speeds. However relatively high speeds are still attainable.

The speeds shown in table 03 are threshold values for low bearing loads. They do not provide any indication of the wear resistance under these parameters.

► Surface speed, page 65

m/s	Rotating	Oscillating	Linear
Continuous	0.4	0.2	1.0
Short Term	0.9	0.5	2.0

Table 03: Maximum surface speeds

Temperatures

iglidur® TX1 is a very temperature resistant material. The long-term upper temperature limit of +120°C permits the broad use in applications typical for the agricultural, utility vehicle or construction equipment sectors. The press-in and press-out forces of iglidur® TX1 bearings are extremely high over the entire temperature range. As a result, additional axial securing is generally unnecessary. Although the levels still remain very high, a certain decline can, however, be observed at temperatures above +100°C. In some cases, axial securing is therefore recommended from this temperature. When considering temperatures, the additional frictional heat in the bearing system must be taken into account.

► Application temperatures, page 66

► Additional securing, page 67

Friction and wear

Please note that a sliding surface with a rough surface finish will increase the friction. Shafts that are too smooth also increase the coefficient of friction of the bearing. We recommend shaft surface finishes (Ra) of 0.4 to a maximum of 0.7 µm. Furthermore, the coefficient of friction of iglidur® TX1 plain bearings largely depends on the speed and load. As the speed increases, the coefficient of friction will quickly increase as well. With increasing load, the coefficient of friction however sinks continuously.

► Coefficients of friction and surfaces, page 68

► Wear resistance, page 69

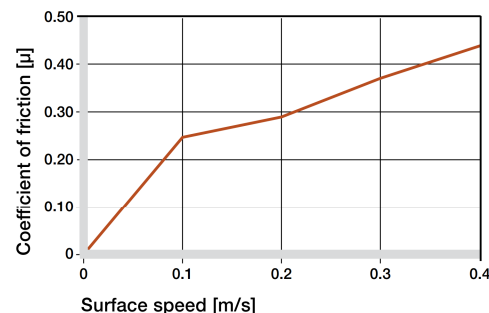


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1 MPa

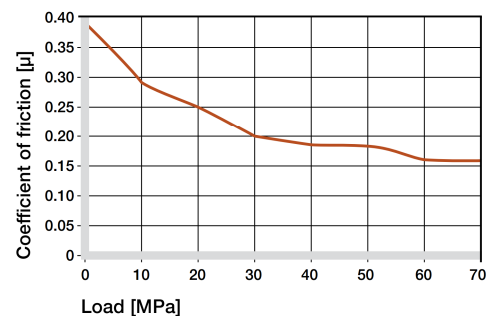


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

Shaft materials

In high load applications, we generally recommend the use of hardened shafts. This particularly applies when using iglidur® TX1. However, acceptable wear rates are also achieved on soft shafts with heavy-duty pivoting of less than 100 MPa. The comparison of the wear rate during rotation and pivoting shown in Figure 07 highlights that the strength of iglidur® TX1 lies in heavy-duty pivoting.

► Shaft materials, page 71

iglidur® TX1	Dry	Greases	Oil	Water
C. o. f. µ	0.09–0.37	0.09	0.04	0.04

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

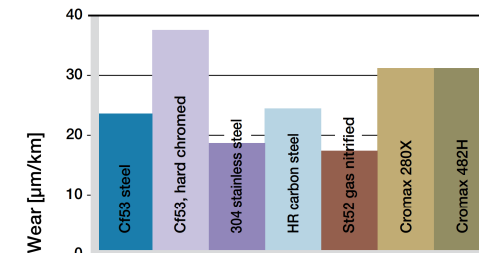


Diagram 06: Wear, rotating with different shaft materials, p = 76 MPa, v = 0.01 m/s

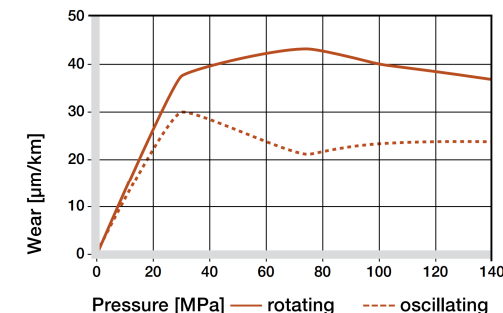


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

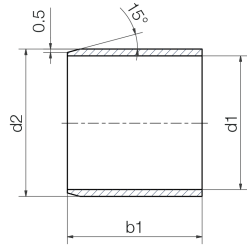
Installation tolerances

iglidur® TX1 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit 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 tolerances as stated.

► Testing methods, page 75

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® TX1 [mm]	Housing H7 [mm]
> 20 to 40	0–0.052	+0.020 +0.150	0 +0.021
> 40 to 70	0–0.062	+0.025 +0.175	0 +0.025
> 70 to 80	0–0.074	+0.050 +0.200	0 +0.030

Table 05: Important tolerances for plain bearings according to ISO 3547-1 after pressfit without possible expansion of the housing bore



Order key

Type	Dimensions
TX1 S M-2025-20	
iglidur® material	
Form S	
Metric	
Inner-Ø d1 [mm]	
Outer-Ø d2 [mm]	
Length b1 [mm]	

Dimensions [mm]

d1	d1-Tolerance ³⁸⁾	d2	b1 ±0.25	Part No.
20.0	+0.020 +0.150	25.0	20.0	TX1SM-2025-20
20.0	+0.020 +0.150	25.0	30.0	TX1SM-2025-30
20.0	+0.020 +0.150	25.0	40.0	TX1SM-2025-40
20.0	+0.020 +0.150	30.0	30.0	TX1SM-2030-30
25.0	+0.020 +0.150	30.0	20.0	TX1SM-2530-20
25.0	+0.020 +0.150	30.0	30.0	TX1SM-2530-30
25.0	+0.020 +0.150	30.0	40.0	TX1SM-2530-40
30.0	+0.020 +0.150	35.0	30.0	TX1SM-3035-30
30.0	+0.020 +0.150	35.0	40.0	TX1SM-3035-40
30.0	+0.020 +0.150	40.0	40.0	TX1SM-3040-40
40.0	+0.020 +0.150	45.0	40.0	TX1SM-4045-40
40.0	+0.025 +0.175	50.0	50.0	TX1SM-4050-50
50.0	+0.025 +0.175	55.0	50.0	TX1SM-5055-50
50.0	+0.025 +0.175	60.0	60.0	TX1SM-5060-60
60.0	+0.025 +0.175	65.0	60.0	TX1SM-6065-60
60.0	+0.025 +0.175	70.0	80.0	TX1SM-6070-80
70.0	+0.025 +0.175	75.0	60.0	TX1SM-7075-60
70.0	+0.050 +0.200	80.0	100.0	TX1SM-7080-100
80.0	+0.050 +0.200	85.0	100.0	TX1SM-8085-100
80.0	+0.050 +0.200	90.0	100.0	TX1SM-8090-100

³⁸⁾ after pressfit of the bearing in a housing with nominal dimension

