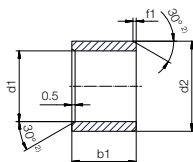


Bearing technology | Plain bearing | iglidur® Q290

Sleeve bearing (form S)



²⁾ Thickness < 0.6mm: Chamfer = 20°

i Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to d1

d1 [mm]	Ø 12–30	Ø > 30
f1 [mm]	0.8	1.2



Order example: **Q290SM-2023-20** – no minimum order quantity.

Q290 iglidur® material **S** Sleeve bearing **M** Metric **20** Inner Ø d1 **23** Outer Ø d2 **20** Total length b1

d1 [mm]	d1 Tolerance ³⁾	d2 [mm]	b1 h13 [mm]	Part No.
20.0		23.0	20.0	Q290SM-2023-20
25.0	+0.040 +0.124	28.0	30.0	Q290SM-2528-30
30.0		34.0	30.0	Q290SM-3034-30
30.0		34.0	40.0	Q290SM-3034-40
35.0	+0.050 +0.150	39.0	30.0	Q290SM-3539-30
35.0		39.0	40.0	Q290SM-3539-40
35.0		39.0	50.0	Q290SM-3539-50
40.0		44.0	40.0	Q290SM-4044-40
50.0		55.0	50.0	Q290SM-5055-50
60.0		65.0	60.0	Q290SM-6065-60
65.0	+0.060 +0.180	70.0	60.0	Q290SM-6570-60
70.0		75.0	60.0	Q290SM-7075-60
80.0		85.0	100.0	Q290SM-8085-100

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



Available from stock

Detailed information about delivery time online.

www.igus.eu/24



Online ordering

Including delivery times, prices, online tools

www.igus.eu/Q290



Ordering note

Our prices are scaled according to order quantities, current prices can be found online.

Discount scaling

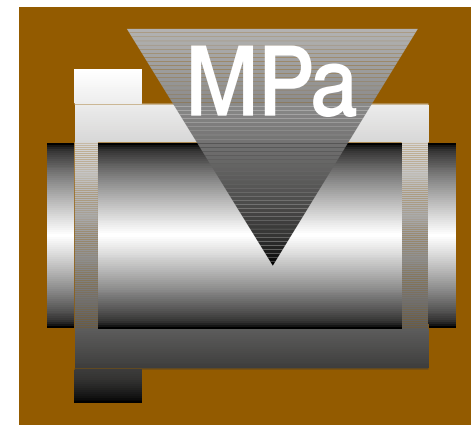
1 – 9	50 – 99	500 – 999
10 – 24	100 – 199	1,000 – 2,499
25 – 49	200 – 499	2,500 – 4,999

No minimum order value.

No low-quantity surcharges.

Free shipping within Germany for orders above €150.

472 3D CAD, finder and service life calculation ... www.igus.eu/Q290



The heavy-duty bearing for up to 200MPa static and 140MPa dynamic

For pivoting applications under extreme loads

iglidur® TX1



When to use it?

- When very high permanent static loads occur
- For highly loaded pivoting movements
- When not only high loads but also high temperatures and media resistance are required



When not to use?

- When loads of far less than 100MPa occur
iglidur® G, iglidur® Q2, iglidur® Q
- For rotational movements during continuous operation
iglidur® W300, iglidur® Z, iglidur® G
- For high-temperature applications with average load levels
iglidur® X, iglidur® J350, iglidur® H

Bearing technology | Plain bearing | iglidur® TX1



Ø
20.0 –
80.0mm



Also available
as:



Bar stock,
round bar
Page 657

The heavy-duty bearing for up to 200MPa static and 140MPa dynamic For pivoting applications under extreme loads

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

- Suitable for static loads up to 200MPa
- Wear-resistant
- High media resistance
- Lubrication-free
- Suitable for dynamic loads up to 140MPa
- Maintenance-free
- High rigidity

Typical application areas

- Agricultural engineering
- Utility and construction vehicles
- Heavy equipments



Bar stock,
plate
Page 683



tribo-tape liner
Page 691



Piston rings
Page 581



Two hole
flange
bearings
Page 603



Moulded
special parts
Page 624



igubal®
spherical balls
Page 841

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

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

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Technical data

General properties		Testing method	
Density	g/cm ³	2.10	
Colour		grey-green	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	0.5	
Coefficient of friction, dynamic, against steel	μ	0.09 – 0.37	
pv value, max. (dry)	MPa · m/s	0.89	
Mechanical properties			
Flexural modulus	MPa	12,000	DIN 53457
Flexural 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. application temperature long-term	°C	+120	
Max. application temperature short-term	°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 ⁻⁵	3	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	> 1 x 10 ¹¹	DIN IEC 93
Surface resistance	Ω	> 1 x 10 ¹³	DIN 53482

Table 01: Material properties

iglidur® TX1 plain bearings represent excellent load bearing capacity under high radial loads coupled with good abrasion resistance. The special design not only ensures excellent dimensional stability due 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.

Moisture absorption

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

Vacuum

In vacuum, any present moisture is released as vapour. The use in vacuum is only possible to a limited extent.

Radiation resistance

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

Resistance to weathering

iglidur® TX1 plain bearings have not yet been tested for their resistance to weathering. Please consult igus® if you're planning to use them outdoors.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® TX1 plain bearings decreases. Diagram 02 shows this inverse relationship. At the short-term permitted application temperature of +170°C, the permitted surface pressure is still 100MPa. 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® TX1 at radial loads.

Surface pressure, page 41



-60°C up to
+120°C



200MPa



Lubrication-free made easy ... from stock ... no minimum order quantity 475

Permissible surface speeds

Typical applications for iglidur® TX1 plain bearings are pivoting movements under high loads 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 44

Temperature

iglidur® TX1 is a very temperature-stable 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 plain bearings are very high over the entire temperature range. As a result, additional axial securing is usually not necessary. Although these forces remain very high, a certain decrease can be observed at temperatures above +100°C and, in some cases axial securing is therefore recommended above this temperature. When considering temperatures, the additional frictional heat in the bearing system must be taken into account.

Application temperatures, page 49

Additional securing, page 49

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. Surface finishes (Ra) of the shaft between 0.4 – 0.7µm are ideal. Furthermore, the coefficient of friction of iglidur® TX1 plain bearings largely depends on the speed and load. As the surface speed increases, the coefficient of friction will quickly increase as well. With increasing load, the coefficient of friction however decreases continuously.

Coefficient of friction and surfaces, page 47

Wear resistance, page 50

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 100MPa. The comparison of the wear rate during rotation and pivoting shown in Diagram 07 highlights that the strength of iglidur® TX1 lies in heavy-duty pivoting.

Shaft materials, page 52

Installation tolerances

iglidur® TX1 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 tolerances as stated.

Testing methods, page 57

Chemicals	Resistance
Alcohols	0
Diluted acids	+
Diluted alkalines	+
Fuels	+
Greases, oils without additives	+
Hydrocarbons	+
Strong acids	-
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 0.4	0.2	1.0
short-term	m/s 0.9	0.5	2.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction μ	0.09 – 0.37	0.09	0.04	0.04

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

Ø d1 [mm]	Housing		Plain bearing		Shaft	
	H7 [mm]		[mm]		h9 [mm]	
20 – 40	+0.000	+0.021	+0.020	+0.150	-0.052	+0.000
> 40 – 70	+0.000	+0.025	+0.025	+0.175	-0.062	+0.000
> 70 – 80	+0.000	+0.030	+0.050	+0.200	-0.074	+0.000

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

Technical data

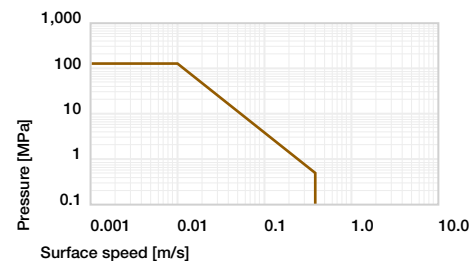


Diagram 01: Permissible pv values for iglidur® TX1 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

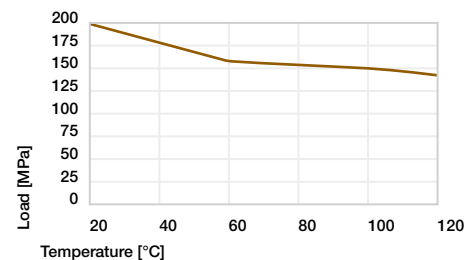


Diagram 02: Maximum recommended surface pressure of as a function of temperature (200MPa at +20°C)

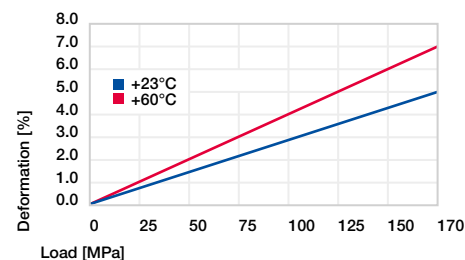


Diagram 03: Deformation under pressure and temperature

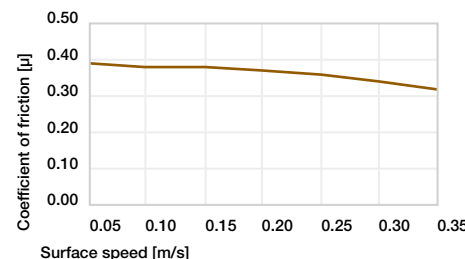


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1MPa

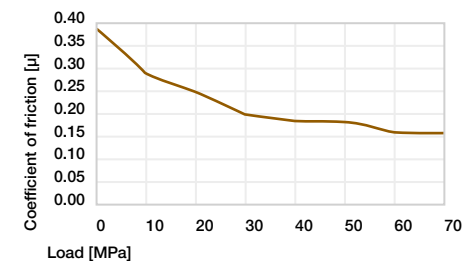


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

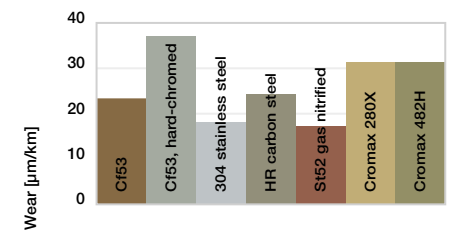


Diagram 06: Wear, rotating with different shaft materials, p = 76MPa, v = 0.01m/s

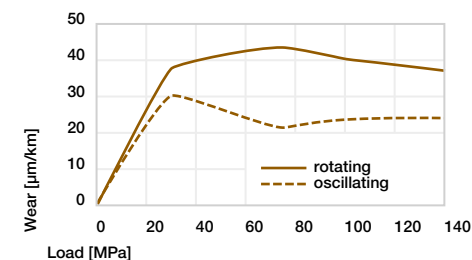
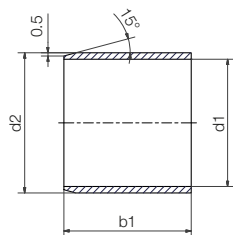


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load

Bearing technology | Plain bearing | iglidur® TX1

Sleeve bearing (form S)



Order example: **TX1SM-2025-20** – no minimum order quantity.

TX1 iglidur® material **S** Sleeve bearing **M** Metric **20** Inner Ø d1 **25** Outer Ø d2 **20** Total length b1

d1 [mm]	d1 Tolerance ³⁸⁾	d2 [mm]	b1 h13 [mm]	Part No.	
20.0	+0.020 +0.150	25.0	20.0	TX1SM-2025-20	
20.0		25.0	30.0	TX1SM-2025-30	
20.0		25.0	40.0	TX1SM-2025-40	
20.0		30.0	30.0	TX1SM-2030-30	
25.0		30.0	20.0	TX1SM-2530-20	
25.0		30.0	30.0	TX1SM-2530-30	
25.0		30.0	40.0	TX1SM-2530-40	
30.0		+0.025 +0.175	35.0	30.0	TX1SM-3035-30
30.0			35.0	40.0	TX1SM-3035-40
30.0			40.0	40.0	TX1SM-3040-40
40.0	45.0		40.0	TX1SM-4045-40	
40.0	50.0		50.0	TX1SM-4050-50	
50.0	55.0		50.0	TX1SM-5055-50	
50.0	60.0		60.0	TX1SM-5060-60	
60.0	65.0		60.0	TX1SM-6065-60	
60.0	70.0		80.0	TX1SM-6070-80	
70.0	75.0		60.0	TX1SM-7075-60	
70.0	+0.050 +0.200	80.0	100.0	TX1SM-7080-100	
80.0		85.0	100.0	TX1SM-8085-100	
80.0		90.0	100.0	TX1SM-8090-100	

³⁸⁾ After press-fit of the bearing in a housing with nominal dimension