





**iglidur<sup>®</sup> plain bearing materials  
for high load applications**

## Applications with high loads

The iglidur® plain bearings for high loads combine high wear resistance and the ability to withstand high (static) loads, impacts and edge loads.

Within these properties they all have their own special strengths. High load means radial surface pressure starting from 30 MPa up to more than 100 MPa (100 MPa means 1,000 kg on a bearing of 10 x 10 mm).

- Lubrication and maintenance-free
- Lightweight
- Good price / performance ratio
- Predictable service life



### Available from stock

Detailed information about delivery time online.



### Block pricing online

No minimum order value. From batch size 1



### Ø 4–120 mm

More dimensions on request



### Imperial dimensions available

► From page 1337



### Online product finder

► [www.igus.eu/iglidur-finder](http://www.igus.eu/iglidur-finder)

Temperature [°C] <sup>123)</sup>	Surface pressure [MPa] <sup>124)</sup>	Coefficient of friction [μ] <sup>125)</sup>	Wear [μm/km] <sup>125)</sup>	Price index
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### iglidur® Q2 – The durable heavy-duty bearing

Combined wear resistance and compressive strength at high loads

► Page 401

	120			
130		0.17	1.50	



### iglidur® Q – The peak of stability

Long service life at medium to high loads

► Page 409

	100			
135		0.19	1.90	



### New iglidur® Q290 – Heavy-duty on soft shafts

For moderate to high loads, especially on soft shafts

► Page 417

140	55	0.12	0.48	



### iglidur® TX1 – The high load bearing up to 200 MPa static and 140 MPa dynamic

For slow oscillating applications under extreme loads

► Page 423


<sup>123)</sup> Max. long-term application temperature; <sup>124)</sup> Max. permissible surface pressure at +20 °C;

<sup>125)</sup> Best combination for p = 1 MPa, v = 0.3 m/s, rotating

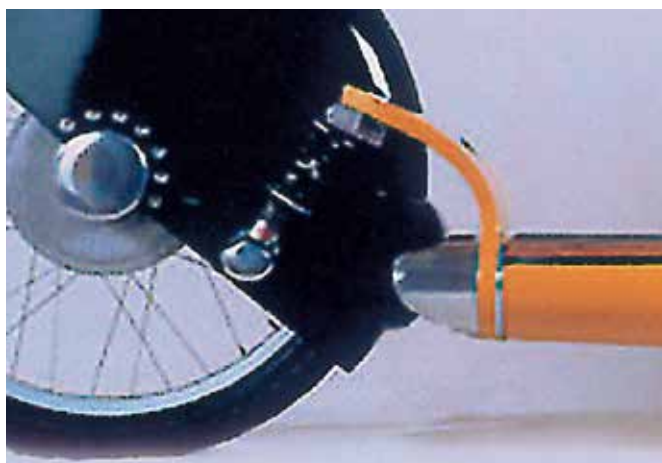
# iglidur® plain bearings | Application examples



Dust and humidity mean a high degree of wear in the contact zone of the swivelling wheels of this planting machine. iglidur® Z thrust washers resolve the problems.



The conventional roller ball bearings were replaced by iglidur® plain bearings. The plastic bearings are corrosion and dirt resistant.



iglidur® Q bearings cope with high loads just as well with various pivoting angles and are ideally suitable for the application in the "Zoob" electric scooter.



Rugged heavy-duty polymer plain bearings are used in the pendular trapezoidal axles that are produced in series. The lubrication-free machine components have been proving their worth for many years.



iglidur® plain bearings were used for mounting the wheels and the join arm of the wheel set, unlike metal bearings, they are resistant to dirt and humidity.



The spades are pushed slowly into the soil. The polymer plain bearings are able to deal with dirt, moisture, etc.





## The durable heavy-duty bearing – iglidur<sup>®</sup> Q2

Wear resistant and dimensionally stable  
at high loads

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Good price/performance ratio

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Lubrication and maintenance-free

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Standard range from stock

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Lubrication and  
maintenance-free

Wear resistant and  
dimensionally stable  
at high loads

Good cost/  
performance ratio

Shock resistant

Where previous iglidur® bearing solutions within the scope of extreme loads and strong impact forces, the iglidur® Q2 starts. Made for heavy-duty pivoting applications under extreme conditions.



### When to use it?

- When high dynamic loads occur
- When impacts, shocks and contamination occur in addition to high loads
- For highly load pivoting motions



### When not to use it?

- When only static loads occur
  - ▶ iglidur® X, page 237
  - ▶ iglidur® H2, page 315
- When high pv values occur in conjunction with high speeds
  - ▶ iglidur® Z, page 247
- When you need a low-cost all-round bearing
  - ▶ iglidur® G, page 79
- When soft shafts are in use
  - ▶ iglidur® W300, page 153

### Typical application areas

- Agricultural machines
- Utility and construction vehicles
- Machine building



#### Available from stock

Detailed information about delivery time online.



#### Block pricing online

No minimum order value. From batch size 1



max. +130 °C

min. -40 °C



Ø 4–120 mm

More dimensions on request



#### Imperial dimensions available

▶ From page 1337



#### Online product finder

▶ [www.igus.eu/iglidur-finder](http://www.igus.eu/iglidur-finder)

## Material properties table

General properties	Unit	iglidur® Q2	Testing method
Density	g/cm <sup>3</sup>	1.46	
Colour		beige-brown	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	1.1	DIN 53495
Max. water absorption	% weight	4.6	
Coefficient of sliding friction, dynamic against steel	μ	0.22–0.42	
pv value, max. (dry)	MPa · m/s	0.7	
Mechanical properties			
Flexural modulus	MPa	8,370	DIN 53457
Flexural strength at +20 °C	MPa	240	DIN 53452
Compressive strength	MPa	130	
Max. permissible surface pressure (+20 °C)	MPa	120	
Shore-D hardness		80	DIN 53505
Physical and thermal properties			
Max. long-term application temperature	°C	+130	
Max. short-term application temperature	°C	+200	
Min. application temperature	°C	-40	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	K <sup>-1</sup> · 10 <sup>-5</sup>	8	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 <sup>13</sup>	DIN IEC 93
Surface resistance	Ω	> 10 <sup>11</sup>	DIN 53482

Table 01: Material properties table

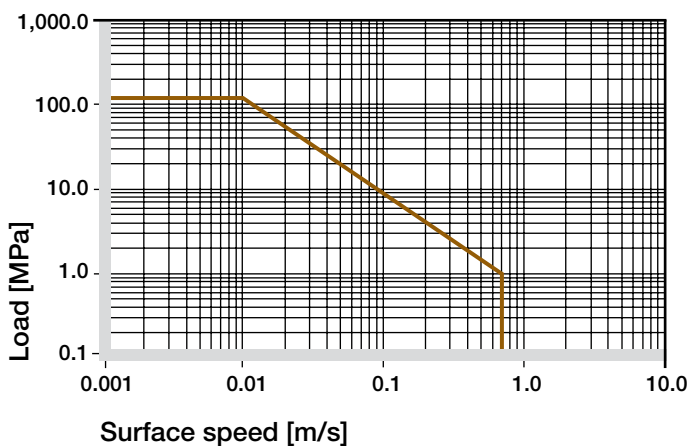


Diagram 01: Permissible pv values for iglidur® Q2 bearings with a wall thickness of 1 mm dry running against a steel shaft, at +20 °C, mounted in a steel housing

### Moisture absorption

The moisture absorption of iglidur® Q2 bearings amounts to about 1.1 % weight in standard climatic conditions. The saturation limit in water is 4.6 % weight. This must be taken into account for these types of applications.

► Diagram, [www.igus.eu/q2-moisture](http://www.igus.eu/q2-moisture)

### 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® Q2 are resistant to radiation up to an intensity of applications  $3 \cdot 10^2$  Gy.

### UV resistance

iglidur® Q2 are permanently resistant to UV radiation.

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

+ resistant 0 conditionally resistant - not resistant

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

Table 02: Chemical resistance

► Chemical table, page 1424



iglidur® Q2 plain bearings represent high load capacities and good abrasion resistance at high loads. The price-performance ratio is outstanding. Solid lubricants reduce the coefficient of friction and improve the resistance to wear, which was markedly improved as compared to other iglidur® plain bearings, especially for highly loaded pivot applications.

## Mechanical properties

With increasing temperatures, the compressive strength of iglidur® Q2 plain bearings decreases. The diagram 02 shows this inverse relationship. With the long-term permitted application temperature of +130 °C, the permitted surface pressure still amounts to 20 MPa. The permissible maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

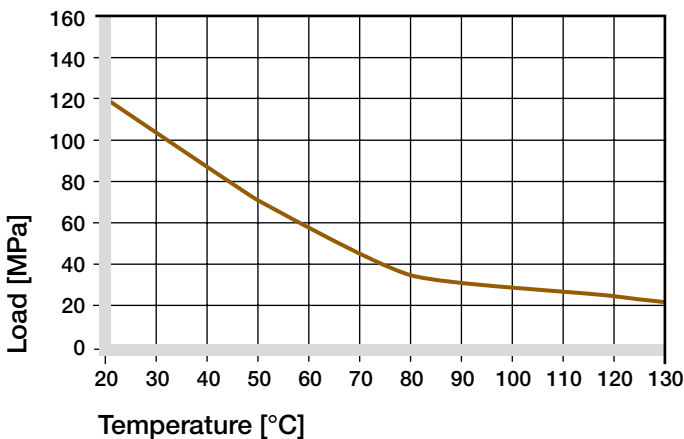


Diagram 02: Permissible maximum surface pressure as a function of temperature (120 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® Q2 at radial loads.

► Surface pressure, page 41

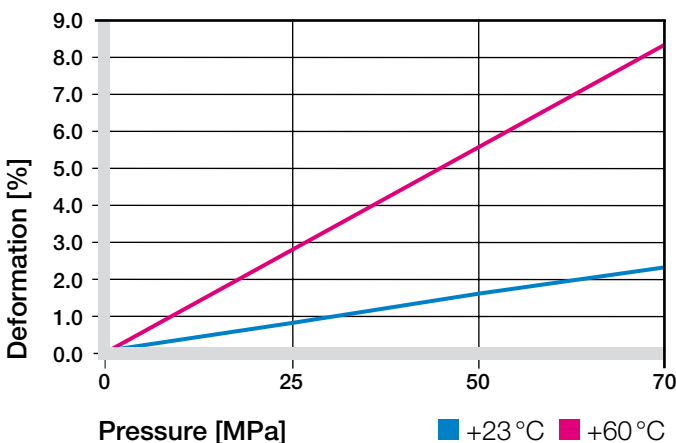


Diagram 03: Deformation under pressure and temperature

## Permissible surface speeds

The typical applications for iglidur® Q2 plain bearings are highly loaded pivoting motions at comparatively low speeds. However, relatively high speeds are still attainable. The speeds shown in table 03 are threshold values for minimal bearing loads. As loads increase, the permissible speed is reduced with higher loads due to the limitations of the pv value.

► Surface speed, page 44

m/s	Rotating	Oscillating	Linear
Continuous	1	0.7	4
Short-term	2	1.4	5

Table 03: Maximum surface speeds

## Temperatures

iglidur® Q2 is a very temperature resistant material. The long-term upper temperature limit of +130 °C permits the broad use in applications typical for the agricultural, utility vehicle or construction equipment sectors. However, the pressure resistance of iglidur® Q2 plain bearings declines as temperatures increase. At temperatures over +70 °C an additional securing is required. 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

iglidur® Q2 has a low coefficient of friction. Please note that a sliding surface with a rough surface finish will increase the friction. The highest coefficients of friction occur at Ra = 1 µm. We recommend shaft surface finishes (Ra) of 0.1 to a maximum of 0.4 µm. Furthermore, the coefficient of friction of iglidur® Q2 plain bearings largely depends on the speed and load. The coefficient of friction also quickly increases as speeds increase. However, as the load is reduced, the coefficient of friction initially drops significantly, then moderately.

► Coefficients of friction and surfaces, page 47

► Wear resistance, page 50

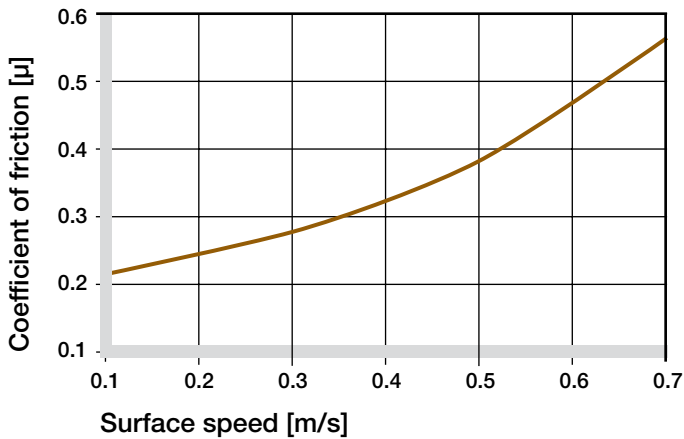


Diagram 04: Coefficient of friction as a function of the surface speed,  $p = 0.75 \text{ MPa}$

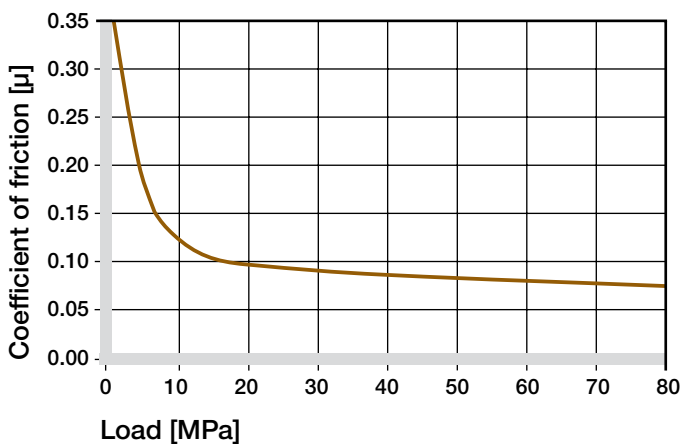


Diagram 05: Coefficient of friction as a function of the pressure,  $v = 0.01 \text{ m/s}$

### Shaft materials

Generally speaking, we recommend the use of hardened shafts for highly loaded applications. Furthermore, even at low to medium loads, iglidur® Q2 will give increased service life with "hard" shafts as compared to "soft" shafts. But for low load applications, the results are outstanding with free cutting steel as well. For high loads, the wear in pivoting applications is much lower than for rotations. If the shaft material you plan on using is not shown in these test results, please contact us.

### ► Shaft materials, page 52

iglidur® Q2	Dry	Grease	Oil	Water
C.o.f. $\mu$	0.22–0.42	0.09	0.04	0.04

Table 04: Coefficient of friction against steel ( $R_a = 1 \text{ }\mu\text{m}$ , 50 HRC)

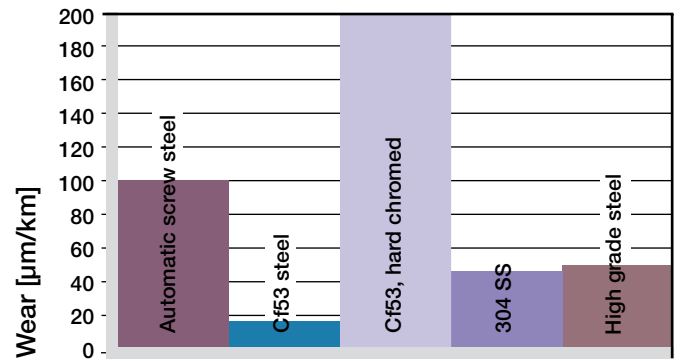


Diagram 06: Wear, pivoting with different shaft materials, pressure  $p = 45 \text{ MPa}$ ,  $v = 0.01 \text{ m/s}$

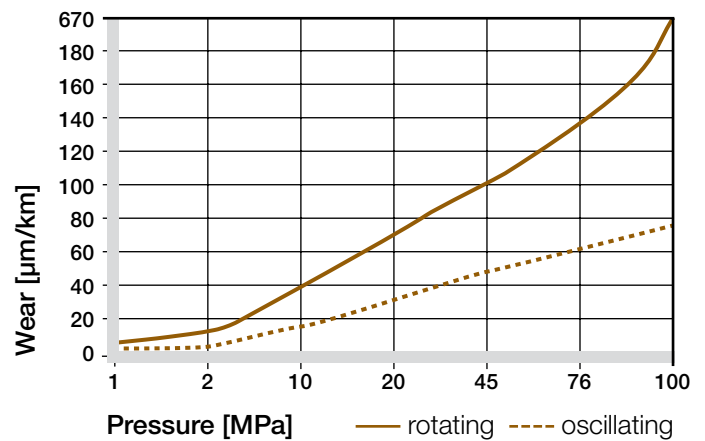


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

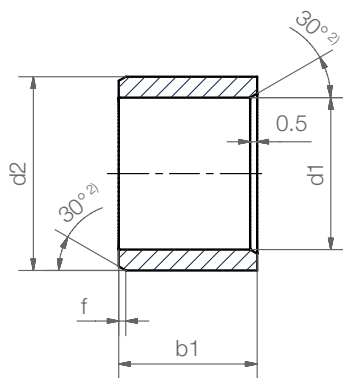
### Installation tolerances

iglidur® Q2 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 E10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

### ► Testing methods, page 57

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® Q2 E10 [mm]	Housing H7 [mm]
up to 3	0–0.025	+0.014 +0.054	0 +0.010
> 3 to 6	0–0.030	+0.020 +0.068	0 +0.012
> 6 to 10	0–0.036	+0.025 +0.083	0 +0.015
> 10 to 18	0–0.043	+0.032 +0.102	0 +0.018
> 18 to 30	0–0.052	+0.040 +0.124	0 +0.021
> 30 to 50	0–0.062	+0.050 +0.150	0 +0.025
> 50 to 80	0–0.074	+0.060 +0.180	0 +0.030
> 80 to 120	0–0.087	+0.072 +0.212	0 +0.035
>120 to 180	0–0.100	+0.085 +0.245	0 +0.040

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



<sup>2)</sup> Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

d1 [mm]:	Ø 1-6	Ø 6-12	Ø 12-30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

### Dimensions [mm]

d1	d1-Tolerance <sup>3)</sup>	d2	b1 h13	Part No.
4.0		5.5	4.0	Q2SM-0405-04
4.0		5.5	6.0	Q2SM-0405-06
5.0		7.0	5.0	Q2SM-0507-05
5.0	+0.020 +0.068	7.0	10.0	Q2SM-0507-10
6.0		8.0	6.0	Q2SM-0608-06
6.0		8.0	8.0	Q2SM-0608-08
6.0		8.0	10.0	Q2SM-0608-10
8.0		10.0	8.0	Q2SM-0810-08
8.0		10.0	10.0	Q2SM-0810-10
8.0		10.0	12.0	Q2SM-0810-12
10.0		12.0	8.0	Q2SM-1012-08
10.0	+0.025 +0.083	12.0	10.0	Q2SM-1012-10
10.0		12.0	12.0	Q2SM-1012-12
10.0		12.0	15.0	Q2SM-1012-15
10.0		12.0	20.0	Q2SM-1012-20
12.0		14.0	10.0	Q2SM-1214-10
12.0		14.0	12.0	Q2SM-1214-12
12.0		14.0	15.0	Q2SM-1214-15
12.0		14.0	20.0	Q2SM-1214-20
13.0		15.0	10.0	Q2SM-1315-10
13.0		15.0	20.0	Q2SM-1315-20
14.0	+0.032 +0.102	16.0	15.0	Q2SM-1416-15
14.0		16.0	20.0	Q2SM-1416-20
14.0		16.0	25.0	Q2SM-1416-25
15.0		17.0	15.0	Q2SM-1517-15
15.0		17.0	20.0	Q2SM-1517-20
15.0		17.0	25.0	Q2SM-1517-25
16.0		18.0	15.0	Q2SM-1618-15

<sup>3)</sup> After press-fit. Testing methods ► Page 57



### Order key

Type

Dimensions [mm]

Q2 S M-04 05-04

iglidur® material	Form S	Metric	Inner-Ø d1	Outer-Ø d2	Length b1
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Dimensions according to ISO 3547-1 and special dimensions



Imperial dimensions available

► From page 1363

d1	d1-Tolerance <sup>3)</sup>	d2	b1 h13	Part No.
16.0		18.0	20.0	Q2SM-1618-20
16.0		18.0	25.0	Q2SM-1618-25
18.0	+0.032 +0.102	20.0	15.0	Q2SM-1820-15
18.0		20.0	20.0	Q2SM-1820-20
18.0		20.0	25.0	Q2SM-1820-25
20.0		23.0	10.0	Q2SM-2023-10
20.0		23.0	15.0	Q2SM-2023-15
20.0		23.0	20.0	Q2SM-2023-20
20.0		23.0	25.0	Q2SM-2023-25
20.0		23.0	30.0	Q2SM-2023-30
22.0		25.0	15.0	Q2SM-2225-15
22.0		25.0	20.0	Q2SM-2225-20
22.0		25.0	25.0	Q2SM-2225-25
22.0		25.0	30.0	Q2SM-2225-30
24.0		27.0	15.0	Q2SM-2427-15
24.0		27.0	20.0	Q2SM-2427-20
24.0	+0.040 +0.124	27.0	25.0	Q2SM-2427-25
24.0		27.0	30.0	Q2SM-2427-30
25.0		28.0	15.0	Q2SM-2528-15
25.0		28.0	20.0	Q2SM-2528-20
25.0		28.0	25.0	Q2SM-2528-25
25.0		28.0	30.0	Q2SM-2528-30
28.0		32.0	30.0	Q2SM-2832-30
30.0		34.0	20.0	Q2SM-3034-20
30.0		34.0	25.0	Q2SM-3034-25
30.0		34.0	30.0	Q2SM-3034-30

## Sleeve bearing (Form S)

### Dimensions [mm]

d1	d1-Tolerance <sup>3)</sup>	d2	b1 h13	Part No.
30.0	+0.040 +0.124	34.0	40.0	<b>Q2SM-3034-40</b>
30.0		35.0	40.0	<b>Q2SM-3035-40</b>
32.0	+0.050 +0.150	36.0	20.0	<b>Q2SM-3236-20</b>
32.0		36.0	30.0	<b>Q2SM-3236-30</b>
32.0		36.0	40.0	<b>Q2SM-3236-40</b>
32.0		40.0	40.0	<b>Q2SM-3240-40</b>
35.0		39.0	20.0	<b>Q2SM-3539-20</b>
35.0		39.0	30.0	<b>Q2SM-3539-30</b>
35.0	+0.050 +0.150	39.0	40.0	<b>Q2SM-3539-40</b>
35.0		39.0	50.0	<b>Q2SM-3539-50</b>
40.0		44.0	20.0	<b>Q2SM-4044-20</b>
40.0		44.0	30.0	<b>Q2SM-4044-30</b>
40.0		44.0	40.0	<b>Q2SM-4044-40</b>
40.0		44.0	50.0	<b>Q2SM-4044-50</b>

d1	d1-Tolerance <sup>3)</sup>	d2	b1 h13	Part No.
45.0		50.0	20.0	<b>Q2SM-4550-20</b>
45.0		50.0	30.0	<b>Q2SM-4550-30</b>
45.0		50.0	40.0	<b>Q2SM-4550-40</b>
45.0	+0.050 +0.150	50.0	50.0	<b>Q2SM-4550-50</b>
50.0		55.0	20.0	<b>Q2SM-5055-20</b>
50.0		55.0	30.0	<b>Q2SM-5055-30</b>
50.0		55.0	40.0	<b>Q2SM-5055-40</b>
50.0	+0.060 +0.180	55.0	50.0	<b>Q2SM-5055-50</b>
50.0		55.0	60.0	<b>Q2SM-5055-60</b>
60.0		65.0	60.0	<b>Q2SM-6065-60</b>
65.0		70.0	60.0	<b>Q2SM-6570-60</b>
70.0		75.0	60.0	<b>Q2SM-7075-60</b>
75.0		80.0	40.0	<b>Q2SM-7580-40</b>

<sup>3)</sup> After press-fit. Testing methods ► Page 57



#### Couldn't find your size?

Do you need another length, other dimensions or tolerances? You need a particular design or alternative for your application? Please call us. iglus® listens to your needs and provides you a solution very quickly.

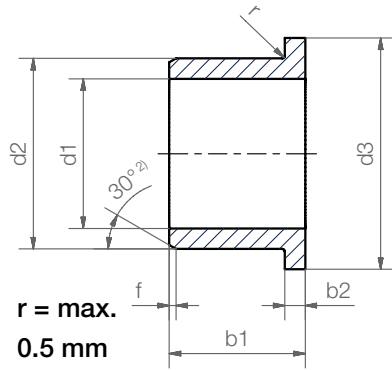


#### Even more dimensions from stock

More than 300 dimensions are now available. Search online for your required bearing.

► [www.igus.eu/iglidur-specialbearings](http://www.igus.eu/iglidur-specialbearings)

## Flange bearing (Form F)



<sup>2)</sup> Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

d1 [mm]:	Ø 1-6	Ø 6-12	Ø 12-30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

## Dimensions [mm]

d1	d1- Tolerance <sup>3)</sup>	d2	d3 d13	b1 h13	b2 -0.14	Part No.
5.0		7.0	11.0	5.0	1.0	Q2FM-0507-05
6.0	+0.020	8.0	12.0	4.0	1.0	Q2FM-0608-04
6.0	+0.068	8.0	12.0	6.0	1.0	Q2FM-0608-06
6.0		8.0	12.0	8.0	1.0	Q2FM-0608-08
8.0		10.0	15.0	3.0	1.0	Q2FM-0810-03
8.0		10.0	15.0	5.5	1.0	Q2FM-0810-05
8.0		10.0	15.0	7.5	1.0	Q2FM-0810-07
8.0		10.0	15.0	9.5	1.0	Q2FM-0810-09
8.0	+0.025	10.0	15.0	10.0	1.0	Q2FM-0810-10
10.0	+0.083	12.0	18.0	7.0	1.0	Q2FM-1012-07
10.0		12.0	18.0	9.0	1.0	Q2FM-1012-09
10.0		12.0	18.0	10.0	1.0	Q2FM-1012-10
10.0		12.0	18.0	12.0	1.0	Q2FM-1012-12
10.0		12.0	18.0	17.0	1.0	Q2FM-1012-17
12.0		14.0	20.0	7.0	1.0	Q2FM-1214-07
12.0		14.0	20.0	9.0	1.0	Q2FM-1214-09
12.0		14.0	20.0	12.0	1.0	Q2FM-1214-12
12.0		14.0	20.0	17.0	1.0	Q2FM-1214-17
14.0		16.0	22.0	5.0	1.0	Q2FM-1416-05
14.0	+0.032	16.0	22.0	12.0	1.0	Q2FM-1416-12
14.0	+0.102	16.0	22.0	17.0	1.0	Q2FM-1416-17
15.0		17.0	23.0	9.0	1.0	Q2FM-1517-09
15.0		17.0	23.0	12.0	1.0	Q2FM-1517-12
15.0		17.0	23.0	17.0	1.0	Q2FM-1517-17
16.0		18.0	24.0	12.0	1.0	Q2FM-1618-12
16.0		18.0	24.0	17.0	1.0	Q2FM-1618-17
18.0		20.0	26.0	12.0	1.0	Q2FM-1820-12

<sup>3)</sup> After press-fit. Testing methods ► Page 57



## Order key

Type      Dimensions [mm]

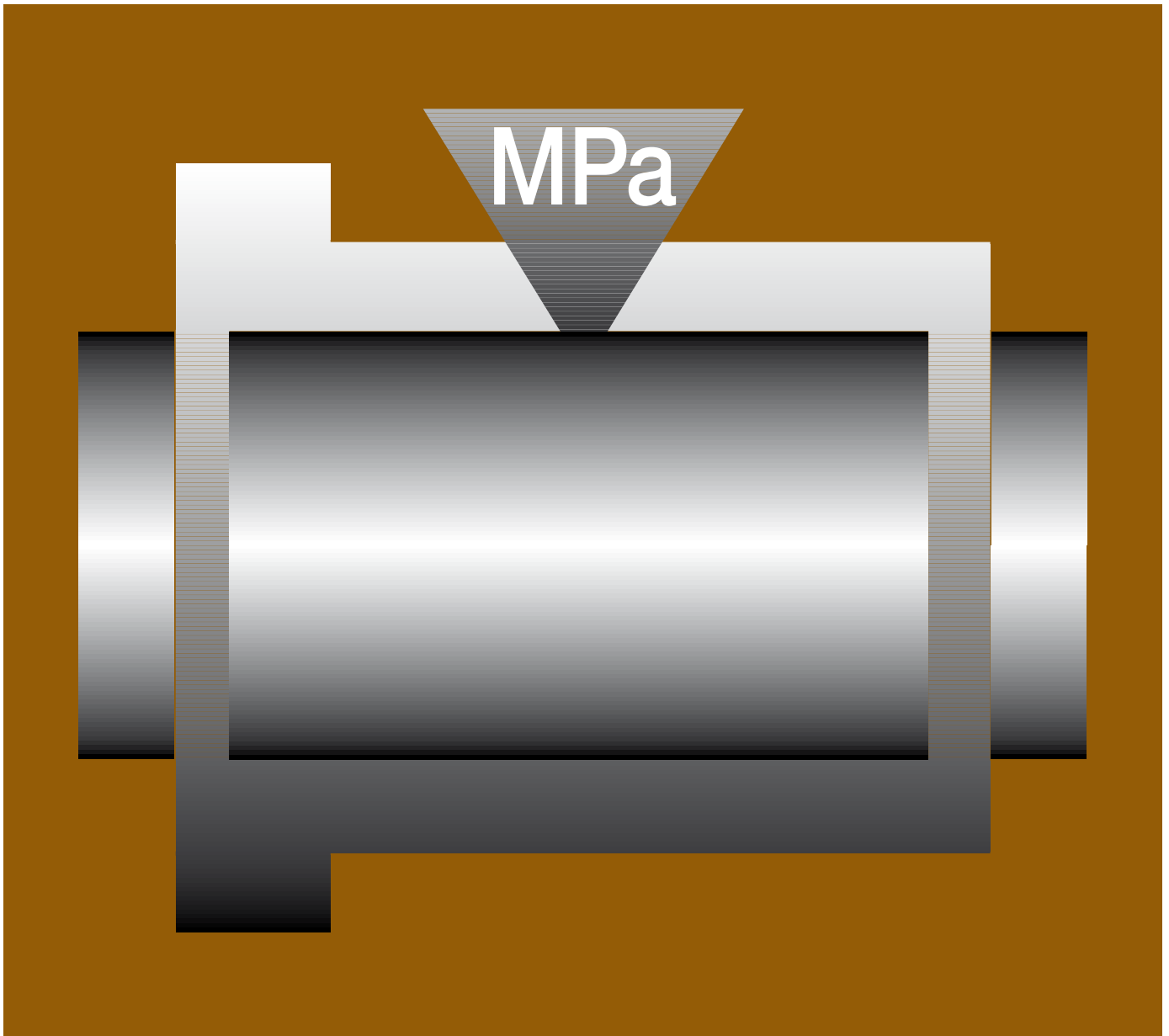
Q2 F M-06 08-04

iglidur® material	Form F	Metric	Inner-Ø d1	Outer-Ø d2	Length b1
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Dimensions according to ISO 3547-1 and special dimensions

d1	d1- Tolerance <sup>3)</sup>	d2	d3 d13	b1 h13	b2 -0.14	Part No.
18.0	+0.032	20.0	26.0	17.0	1.0	Q2FM-1820-17
18.0	+0.102	20.0	26.0	22.0	1.0	Q2FM-1820-22
20.0		23.0	30.0	12.0	1.5	Q2FM-2023-12
20.0		23.0	30.0	11.5	1.5	Q2FM-2023-11
20.0		23.0	30.0	16.5	1.5	Q2FM-2023-16
20.0		23.0	30.0	21.5	1.5	Q2FM-2023-21
25.0	+0.040	28.0	35.0	11.5	1.5	Q2FM-2528-11
25.0	+0.124	28.0	35.0	16.5	1.5	Q2FM-2528-16
25.0		28.0	35.0	21.5	1.5	Q2FM-2528-21
30.0		34.0	42.0	16.0	2.0	Q2FM-3034-16
30.0		34.0	42.0	26.0	2.0	Q2FM-3034-26
30.0		34.0	42.0	37.0	2.0	Q2FM-3034-37
30.0		34.0	42.0	40.0	2.0	Q2FM-3034-40
35.0		39.0	47.0	16.0	2.0	Q2FM-3539-16
35.0		39.0	47.0	26.0	2.0	Q2FM-3539-26
35.0		39.0	47.0	40.0	2.0	Q2FM-3539-40
40.0	+0.050	44.0	52.0	3<0.0	2.0	Q2FM-4044-30
40.0	+0.150	44.0	52.0	40.0	2.0	Q2FM-4044-40
45.0		50.0	58.0	50.0	2.0	Q2FM-4550-50
50.0		55.0	63.0	10.0	2.0	Q2FM-5055-10
50.0		55.0	63.0	50.0	2.0	Q2FM-5055-50
60.0	+0.060	65.0	73.0	60.0	2.0	Q2FM-6065-60
80.0	+0.180	85.0	93.0	100.0	2.5	Q2FM-8085-100
100.0	+0.072 +0.212	105.0	125.0	90.0	2.5	Q2FM-100105125-90
120.0	+0.085 +0.245	125.0	145.0	90.0	2.5	Q2FM-120125145-90



## The peak of stability – iglidur<sup>®</sup> Q

Excellent wear resistance, especially for extreme loads

---

For extreme pv values

---

Good coefficients of friction

---

Resistant to dirt

---

Lubrication and maintenance-free

---

Standard range from stock

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Excellent wear resistance,  
especially for extreme loads

Recommended for  
extreme pv values

Good coefficients of friction

Resistant to dirt

iglidur® Q is the low priced solution for high duty cycles with extreme loads. Bearings made from this material can be used in all types of motion, but is best suited to oscillating applications.



### When to use it?

- For oscillating applications
- Excellent wear resistance, especially for extreme loads
- For extreme pv values
- If the bearing should be insensitive to dirt



### When not to use it?

- For underwater applications
  - ▶ iglidur® H370, page 291
- When temperatures are constantly greater than +135 °C
  - ▶ iglidur® H, page 299
  - ▶ iglidur® X, page 237
  - ▶ iglidur® Z, page 247
- In situations involving high edge loads or strong impact loads
  - ▶ iglidur® Q2, page 401

### Typical application areas

- Construction machinery industry
- Sheet metal industry
- Agricultural machines
- Railway technology
- Doors and gates



#### Available from stock

Detailed information about delivery time online.



#### Block pricing online

No minimum order value. From batch size 1



max. +135 °C

min. -40 °C



Ø 6–90 mm

More dimensions on request



#### Imperial dimensions available

▶ From page 1337



#### Online product finder

▶ [www.igus.eu/iglidur-finder](http://www.igus.eu/iglidur-finder)

## Material properties table

General properties	Unit	iglidur® Q	Testing method
Density	g/cm <sup>3</sup>	1.40	
Colour		black	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	0.9	DIN 53495
Max. water absorption	% weight	4.9	
Coefficient of sliding friction, dynamic against steel	μ	0.05–0.15	
pv value, max. (dry)	MPa · m/s	0.55	
Mechanical properties			
Flexural modulus	MPa	4,500	DIN 53457
Flexural strength at +20 °C	MPa	120	DIN 53452
Compressive strength	MPa	89	
Max. permissible surface pressure (+20 °C)	MPa	100	
Shore-D hardness		83	DIN 53505
Physical and thermal properties			
Max. long-term application temperature	°C	+135	
Max. short-term application temperature	°C	+155	
Min. application temperature	°C	-40	
Thermal conductivity	W/m · K	0.23	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	K <sup>-1</sup> · 10 <sup>-5</sup>	5	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 <sup>15</sup>	DIN IEC 93
Surface resistance	Ω	> 10 <sup>12</sup>	DIN 53482

Table 01: Material properties table

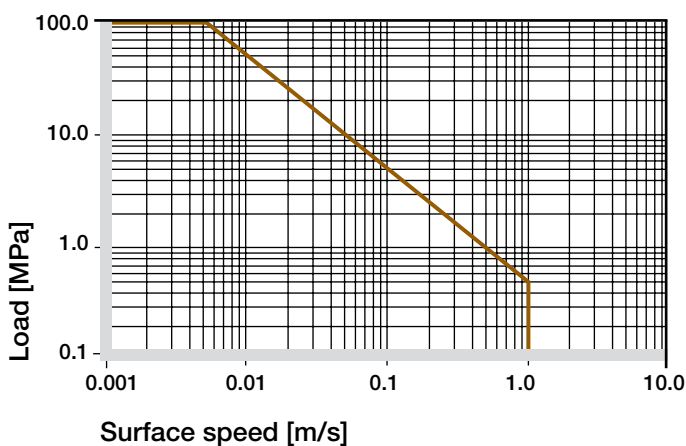


Diagram 01: Permissible pv values for iglidur® Q bearings with a wall thickness of 1 mm dry running against a steel shaft, at +20 °C, mounted in a steel housing

### Moisture absorption

The moisture absorption of iglidur® Q plain bearings is approximately 0.9 % weight in standard climatic conditions. The saturation limit in water is 4.9% weight. This must be taken into account for these types of applications.

► Diagram, [www.igus.eu/q-moisture](http://www.igus.eu/q-moisture)

### Vacuum

iglidur® Q plain bearings outgas in a vacuum. Therefore, only dehumidified bearings are suitable in vacuum.

### Radiation resistance

Plain bearings made from iglidur® D are resistant to radiation up to an intensity of  $3 \cdot 10^2$  Gy.

### UV resistance

The tribological properties of iglidur® Q plain bearings stay constant for the most part under weathering effects.

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

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

Table 02: Chemical resistance

► Chemical table, page 1424



iglidur® Q bearings were developed especially for extreme loads. Under high loads, iglidur® Q figures among the iglidur® materials that display the best wear resistance. From a radial pressure of 25 MPa, it outclasses even bearings made from the extremely abrasion resistant iglidur® W300. Specific solid lubricants, precisely integrated into the material, ensure that the maintenance-free dry operation is guaranteed under any load.

## Mechanical properties

With increasing temperatures, the compressive strength of iglidur® Q plain bearings decreases. The diagram 02 shows this inverse relationship. The permissible maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

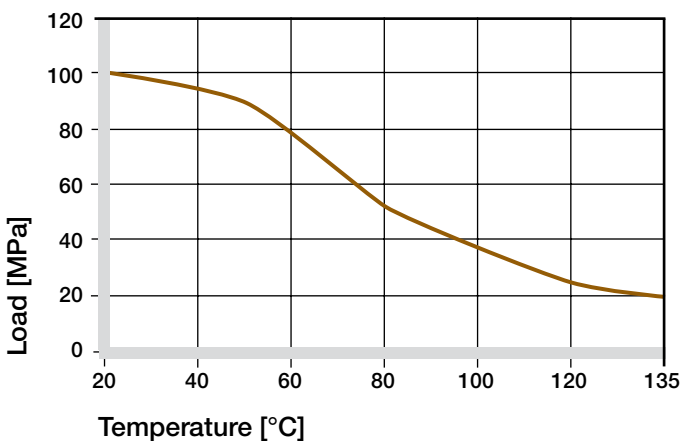


Diagram 02: Permissible maximum surface pressure as a function of temperature (100 MPa at +20 °C)

iglidur® Q is a material used when high pv values are reached with high loads. Diagram 03 shows the elastic deformation of iglidur® Q at radial loads. At the permissible maximum surface pressure of 100 MPa the deformation is less than 3%.

### ► Surface pressure, page 41

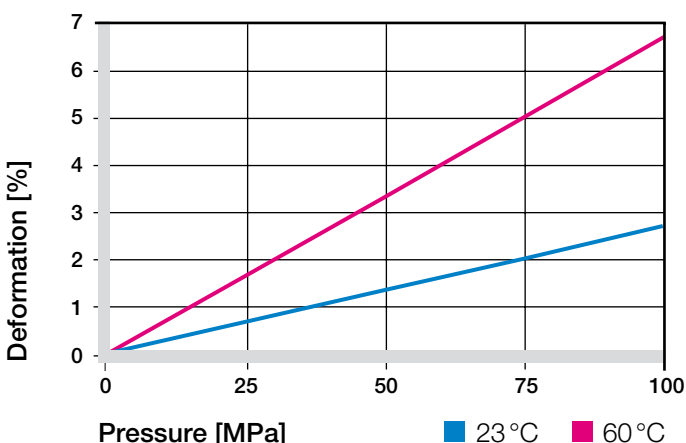


Diagram 03: Deformation under pressure and temperature

## Permissible surface speeds

Under extreme radial loads, the iglidur® Q bearings can reach the maximum pv values, which are possible in the dry operation with plain bearings. Though the iglidur® Q bearings have the greatest advantages with high loads and low speeds, high surface speeds are also attainable due to the excellent coefficients of friction. The values stated in table 03 show the speed at which the temperature rises to the maximum permitted value as a result of friction.

### ► Surface speed, page 44

m/s	Rotating	Oscillating	Linear
Continuous	1	0.7	5
Short-term	2	1.4	6

Table 03: Maximum surface speeds

## Temperatures

Plain bearings made from iglidur® Q have excellent wear resistance even at high temperatures. At temperatures over +50 °C an additional securing is required. Also, notice that the coefficient of friction increases rapidly as temperature increases from around +100 °C.

### ► Application temperatures, page 49

### ► Additional securing, page 49

## Friction and wear

Although most dry running plastic bearings feature decreasing coefficients of friction with increasing pressure, iglidur® Q goes further than most, under high pressures the material gives excellent low values (diagrams 04 and 05).

### ► Coefficients of friction and surfaces, page 47

### ► Wear resistance, page 50

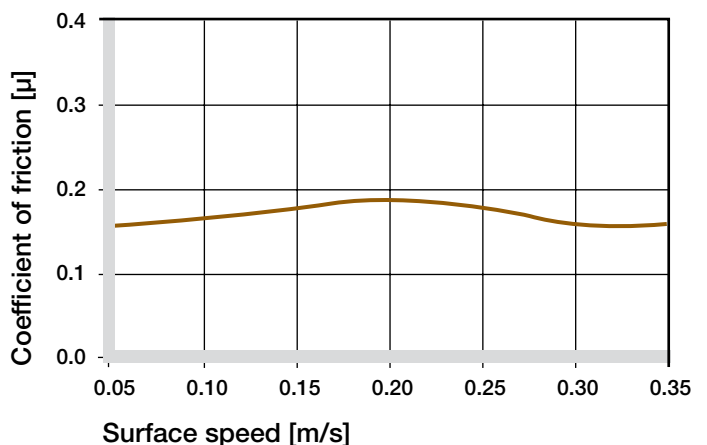


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75 MPa

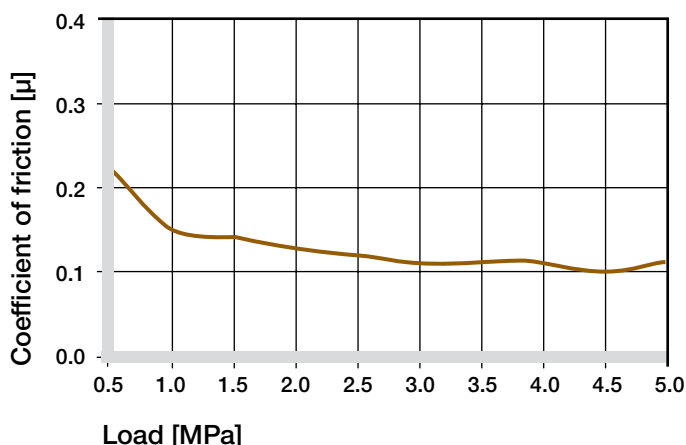


Diagram 05: Coefficient of friction as a function of the pressure,  $v = 0.01$  m/s

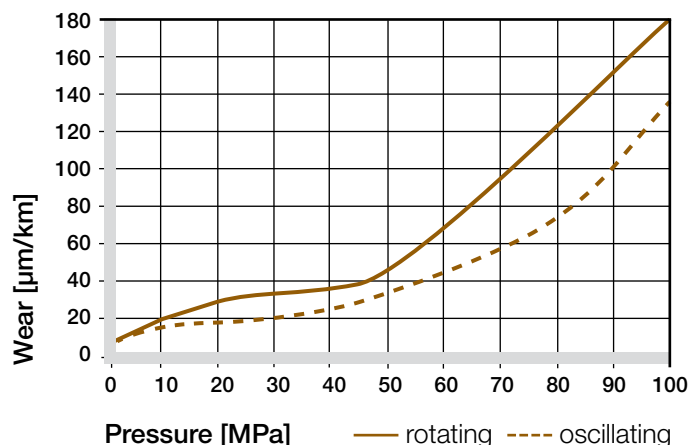


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

### Shaft materials

Diagram 06 displays a summary of the results of tests with different shaft materials conducted with bearings made from iglidur® Q.

The strengths offered by iglidur® heavy-duty materials become clear from 30 MPa. iglidur® Q stands out in particular. Other heavy-duty materials such as iglidur® Q2 and TX1 only offer the best performances in terms of wear when subjected to even higher loads. iglidur® Q offers strikingly good wear properties on many different shaft materials.

### ► Shaft materials, page 52

iglidur® Q	Dry	Grease	Oil	Water
C.o.f. μ	0.05–0.15	0.09	0.04	0.04

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

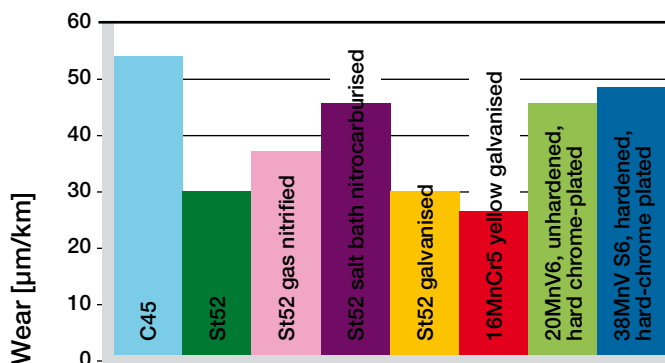


Diagram 06: Wear, pivoting with different shaft materials, pressure  $p = 30$  MPa,  $v = 0.01$  m/s

### Installation tolerances

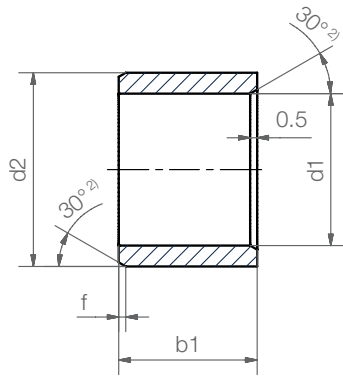
iglidur® Q plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9).

After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the E10 tolerances. For specific dimensions the tolerance differs depending on the wall thickness (please see the product range table).

### ► Testing methods, page 57

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® Q E10 [mm]	Housing H7 [mm]
up to 3	0–0.025	+0.014 +0.054	0 +0.010
> 3 to 6	0–0.030	+0.020 +0.068	0 +0.012
> 6 to 10	0–0.036	+0.025 +0.083	0 +0.015
> 10 to 18	0–0.043	+0.032 +0.102	0 +0.018
> 18 to 30	0–0.052	+0.040 +0.124	0 +0.021
> 30 to 50	0–0.062	+0.050 +0.150	0 +0.025
> 50 to 80	0–0.074	+0.060 +0.180	0 +0.030
> 80 to 120	0–0.087	+0.072 +0.212	0 +0.035
>120 to 180	0–0.100	+0.085 +0.245	0 +0.040

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



<sup>2)</sup> Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

d1 [mm]:	Ø 1-6	Ø 6-12	Ø 12-30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

### Dimensions [mm]

d1	d1-Tolerance <sup>3)</sup>	d2	b1 h13	Part No.
6.0	+0.020 +0.068	8.0	10.0	<b>QSM-0608-10</b>
8.0	+0.025	10.0	8.0	<b>QSM-0810-08</b>
10.0	+0.083	12.0	10.0	<b>QSM-1012-10</b>
12.0		14.0	10.0	<b>QSM-1214-10</b>
12.0		14.0	20.0	<b>QSM-1214-20</b>
16.0	+0.032	18.0	8.0	<b>QSM-1618-08</b>
16.0	+0.102	18.0	12.5	<b>QSM-1618-12</b>
16.0		18.0	20.0	<b>QSM-1618-20</b>
18.0		20.0	20.0	<b>QSM-1820-20</b>
20.0		22.0	15.0	<b>QSM-2022-15</b>
20.0		23.0	15.0	<b>QSM-2023-15</b>
20.0		23.0	20.0	<b>QSM-2023-20</b>
20.0		23.0	25.0	<b>QSM-2023-25</b>
20.0	+0.040	23.0	30.0	<b>QSM-2023-30</b>
25.0	+0.124	28.0	25.0	<b>QSM-2528-25</b>
25.0		28.0	48.0	<b>QSM-2528-48</b>
30.0		34.0	20.0	<b>QSM-3034-20</b>
30.0		34.0	35.0	<b>QSM-3034-35</b>
30.0		34.0	40.0	<b>QSM-3034-40</b>
35.0	+0.050 +0.150	39.0	15.0	<b>QSM-3539-15</b>

<sup>3)</sup> After press-fit. Testing methods ► Page 57



### Order key

Type Dimensions [mm]

**Q S M -06 08 -10**

iglidur® material	Form S	Metric	Inner-Ø d1	Outer-Ø d2	Length b1
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Dimensions according to ISO 3547-1 and special dimensions

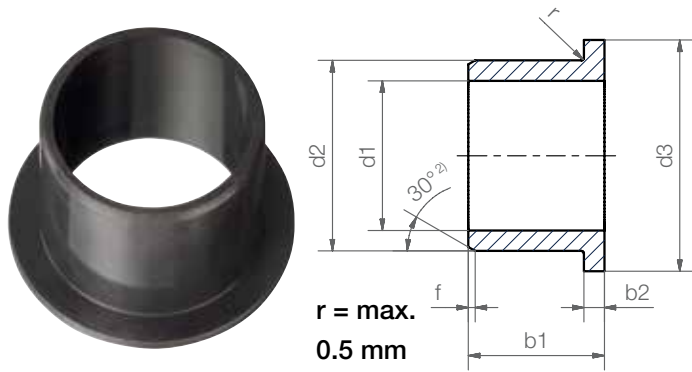


Imperial dimensions available

► From page 1363

d1	d1-Tolerance <sup>3)</sup>	d2	b1 h13	Part No.
35.0		39.0	30.0	<b>QSM-3539-30</b>
35.0		39.0	35.0	<b>QSM-3539-35</b>
35.0		39.0	50.0	<b>QSM-3539-50</b>
40.0		44.0	30.0	<b>QSM-4044-30</b>
40.0		44.0	40.0	<b>QSM-4044-40</b>
40.0	+0.050	44.0	47.0	<b>QSM-4044-47</b>
45.0	+0.150	50.0	25.2	<b>QSM-4550-252</b>
45.0		50.0	50.0	<b>QSM-4550-50</b>
50.0		55.0	50.0	<b>QSM-5055-50</b>
50.0		55.0	60.0	<b>QSM-5055-60</b>
50.0		55.0	80.0	<b>QSM-5055-80</b>
55.0		60.0	50.0	<b>QSM-5560-50</b>
60.0		65.0	50.0	<b>QSM-6065-50</b>
65.0	+0.060	70.0	34.0	<b>QSM-6570-34</b>
70.0	+0.180	75.0	50.0	<b>QSM-7075-50</b>
75.0		80.0	40.0	<b>QSM-7580-40</b>
80.0		85.0	60.0	<b>QSM-8085-60</b>
90.0	+0.072 +0.212	95.0	50.0	<b>QSM-9095-50</b>

## Flange bearing (Form F)



<sup>2)</sup> Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

d1 [mm]:	Ø 1-6	Ø 6-12	Ø 12-30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

### Dimensions [mm]

d1	d1- Tolerance <sup>3)</sup>	d2	d3	b1	b2	Part No.
6.0	+0.020	8.0	12.0	3.0	1.0	<b>QFM-0608-03</b>
6.0	+0.068	8.0	12.0	4.0	1.0	<b>QFM-0608-04</b>
8.0		10.0	15.0	5.5	1.0	<b>QFM-0810-05</b>
8.0		10.0	15.0	6.0	1.0	<b>QFM-0810-06</b>
10.0	+0.025	12.0	18.0	6.0	1.0	<b>QFM-1012-06</b>
10.0	+0.083	12.0	18.0	10.0	1.0	<b>QFM-1012-10</b>
10.0		12.0	15.0	3.5	1.0	<b>QFM-101215-035</b>
10.0		12.0	15.0	8.0	1.0	<b>QFM-101215-08</b>
12.0		14.0	20.0	8.0	1.0	<b>QFM-1214-08</b>
12.0		14.0	20.0	12.0	1.0	<b>QFM-1214-12</b>
12.0		14.0	20.0	20.0	1.0	<b>QFM-1214-20</b>
14.0	+0.032	16.0	22.0	12.0	1.0	<b>QFM-1416-12</b>
16.0	+0.102	18.0	24.0	17.0	1.0	<b>QFM-1618-17</b>
18.0		20.0	26.0	12.0	1.0	<b>QFM-1820-12</b>
18.0		20.0	26.0	5.0	1.0	<b>QFM-182026-051</b>

<sup>3)</sup> After press-fit. Testing methods ► Page 57



### Order key

Type      Dimensions [mm]

**Q F M -06 08-03**

iglidur® material	Form F	Metric	Inner-Ø d1	Outer-Ø d2	Length b1
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Dimensions according to ISO 3547-1 and special dimensions



Imperial dimensions available

► From page 1385

d1	d1- Tolerance <sup>3)</sup>	d2	d3	b1	b2	Part No.
20.0		23.0	30.0	21.5	1.5	<b>QFM-2023-21</b>
25.0	+0.040	28.0	35.0	21.5	1.5	<b>QFM-2528-21</b>
26.0	+0.124	29.0	35.0	5.0	1.5	<b>QFM-2629-05</b>
27.0		30.0	38.0	20.0	1.5	<b>QFM-2730-20</b>
30.0		34.0	42.0	37.0	2.0	<b>QFM-3034-37</b>
35.0		39.0	47.0	26.0	2.0	<b>QFM-3539-26</b>
35.0		39.0	50.0	35.0	2.0	<b>QFM-353950-35</b>
40.0	+0.050	44.0	52.0	14.0	2.0	<b>QFM-4044-14</b>
40.0	+0.150	44.0	52.0	40.0	2.0	<b>QFM-4044-40</b>
50.0		55.0	63.0	10.0	2.0	<b>QFM-5055-10</b>
50.0		55.0	63.0	50.0	2.0	<b>QFM-5055-50</b>
60.0	+0.060	65.0	78.0	50.0	2.0	<b>QFM-6065-50</b>
70.0	+0.180	75.0	83.0	50.0	2.0	<b>QFM-7075-50</b>



### Couldn't find your size?

Do you need another length, other dimensions or tolerances? You need a particular design or alternative for your application? Please call us. igus® listens to your needs and provides you a solution very quickly.

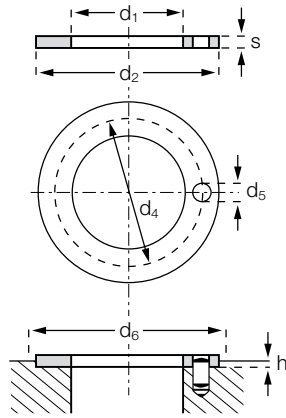


### Even more dimensions from stock

More than 300 dimensions are now available. Search online for your required bearing.

► [www.igus.eu/iglidur-specialbearings](http://www.igus.eu/iglidur-specialbearings)

## Thrust Washer (Form T)



## Order key

Type

Dimensions [mm]

Q T M-28 42-015

iglidur® material

Form T

Metric

Inner-Ø d1 [mm]

Outer-Ø d2 [mm]

Thickness s [mm]



Dimensions according to ISO 3547-1  
and special dimensions



Imperial dimensions available  
► From page 1363

## Dimensions [mm]

d1	d2	s	d4	d5	h	d6	Part No.
+0.3	-0.3	-0.06	-0.12/+0.12	-0.375/+0.125	+0.2/-0.2	+0.12	
28.0	42.0	1.5	35.0	4.0	1.0	42.0	QTM-2842-015
32.0	54.0	1.5	43.0	4.0	1.0	54.0	QTM-3254-015



## Heavy-duty on soft shafts – iglidur<sup>®</sup> Q290

Long life especially on soft shafts

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Resistant to edge loads

---

Continuous use up to +140°C

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Good price/performance ratio

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Lubrication and maintenance-free

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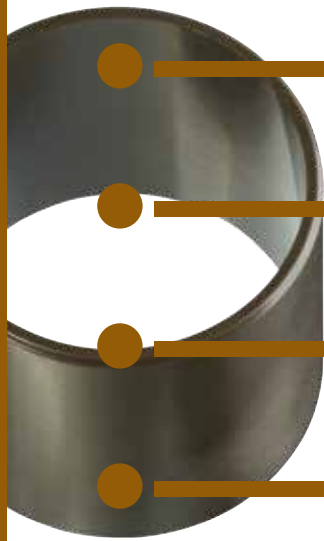
Standard range from stock

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# iglidur® Q290 | Heavy-duty on soft shafts

For moderate to high loads, especially on soft shafts



Long life especially on soft shafts

Continuous use up to +140 °C

Resistant to edge loads

Lubrication and maintenance-free

iglidur® Q 290 shows outstanding service life in robust pivoting applications, as they are frequently found in some agricultural machinery, especially on "soft" coated shafts (e.g. galvanised). The wear on the shafts is minimal.



## When to use it?

- If a long-lasting bearing is needed for rugged operating conditions (agricultural equipment, construction machinery, etc.) with moderate to high dynamic loads on "soft" shafts



## When not to use it?

- If permanent static loads of more than 55 MPa occur
  - ▶ iglidur® G, page 79
  - ▶ iglidur® Q, page 409
  - ▶ iglidur® Q2, page 401
- If an extremely wear-resistant bearing is needed on "soft" shafts for minor loads
  - ▶ iglidur® J, page 141
  - ▶ iglidur® J3, page 165
- If constant temperatures of greater than +140 °C occur
  - ▶ iglidur® J350, page 173
  - ▶ iglidur® Z, page 247

## Typical application areas

- Agricultural machines
- Utility and construction vehicles



### Available from stock

Detailed information about delivery time online.



### Block pricing online

No minimum order value. From batch size 1



max. +140 °C  
min. -40 °C



Ø 20–80 mm

More dimensions on request



### Online product finder

▶ [www.igus.eu/iglidur-finder](http://www.igus.eu/iglidur-finder)

## Material properties table

General properties	Unit	iglidur® Q290	Testing method
Density	g/cm <sup>3</sup>	1.27	
Colour		black	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	3.0	DIN 53495
Max. water absorption	% weight	9.3	
Coefficient of sliding friction, dynamic against steel	μ	0.14–0.26	
pv value, max. (dry)	MPa · m/s	0.70	
Mechanical properties			
Flexural modulus	MPa	3,074	DIN 53457
Flexural strength at +20 °C	MPa	97	DIN 53452
Compressive strength	MPa	68	
Max. permissible surface pressure (+20 °C)	MPa	55	
Shore-D hardness		80	DIN 53505
Physical and thermal properties			
Max. long-term application temperature	°C	+140	
Max. short-term application temperature	°C	+180	
Min. application temperature	°C	-40	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	K <sup>-1</sup> · 10 <sup>-5</sup>	7	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	>10 <sup>12</sup>	DIN IEC 93
Surface resistance	Ω	>10 <sup>12</sup>	DIN 53482

Table 01: Material properties table

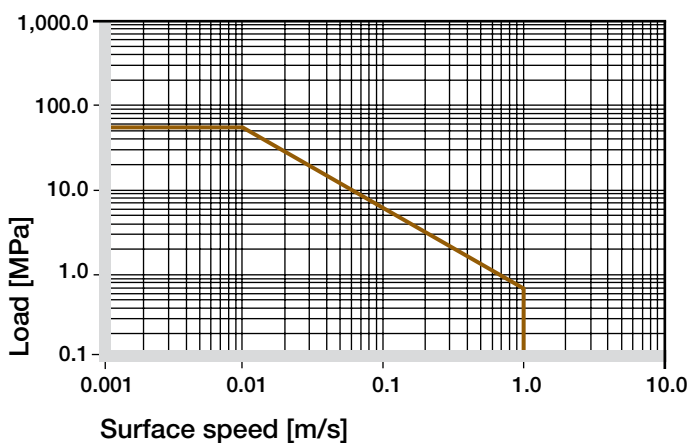


Diagram 01: Permissible pv values for iglidur® Q290 bearings running against a steel shaft, at +20 °C, mounted in a steel housing

### Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® Q290 plain bearings is 3.0 % weight. The saturation limit in water is 9.3 % weight.

### Vacuum

In a vacuum, any moisture content will outgas. Use in vacuum is only possible to a limited extent.

### Radiation resistance

Plain bearings made from iglidur® Q290 are resistant to radiation up to an intensity of applications  $3 \cdot 10^2$  Gy.

### UV resistance

iglidur® Q290 bearings have good resistance to UV rays and other weathering effects.

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

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

Table 02: Chemical resistance

► Chemical table, page 1424



iglidur® Q290 bearings do not have the highest static load capacity within the iglidur® product range, instead the material shows its strengths at moderate to high dynamic loads: outstanding service life is achieved for rugged pivoting applications, e.g. in agricultural or construction machinery, and especially on "soft" shafts, for both the shafts and bearings!

## Mechanical properties

With increasing temperatures, the compressive strength of iglidur® Q290 plain bearings decreases. The diagram 02 shows this inverse relationship. With the short-term permitted application temperature of +180 °C, the permitted surface pressure is still more than 10 MPa. The permissible maximum surface pressure is a mechanical material requirement. No conclusions regarding the tribological properties can be drawn from this.

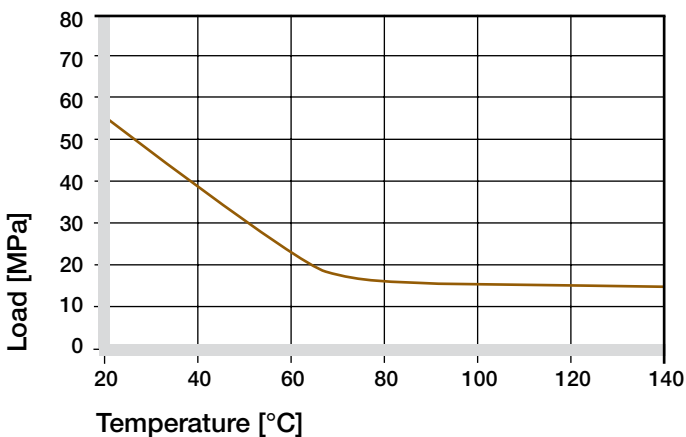


Diagram 02: Permissible maximum surface pressure as a function of temperature (55 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® Q290 at radial loads. These high elastic deformation values, even for loads of more than 50 MPa, contribute significantly to the long service life under rugged environmental conditions such as edge loads, collisions and impacts.

### ► Surface pressure, page 41

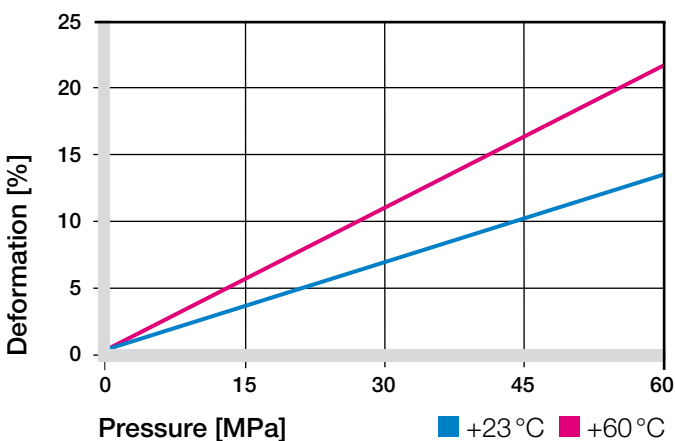


Diagram 03: Deformation under pressure and temperature

## Permissible surface speeds

Typical applications for iglidur® Q290 bearings include mid to high-load pivoting movements at comparatively slow 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

m/s	Rotating	Oscillating	Linear
Continuous	0.8	0.6	1.0
Short-term	2.0	1.4	2.0

Table 03: Maximum surface speeds

## Temperatures

The maximum long-term application temperature of +140 °C enables the use of iglidur® Q290 in, for example, typical applications in the agricultural, commercial vehicle or construction sectors. Starting at an operating temperature of +80 °C, an additional axial safeguard is necessary for the bearing, as a press fit alone is no longer sufficient.

### ► 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. The coefficient of friction of iglidur® Q290 increases as the speed increases (Diagram 04). In contrast, the coefficient of friction drops continually with the radial load, as illustrated by Diagram 05.

### ► Coefficients of friction and surfaces, page 47

### ► Wear resistance, page 50

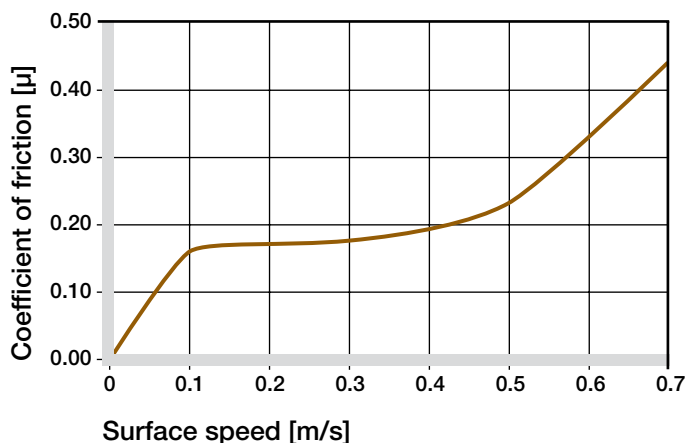


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1 MPa

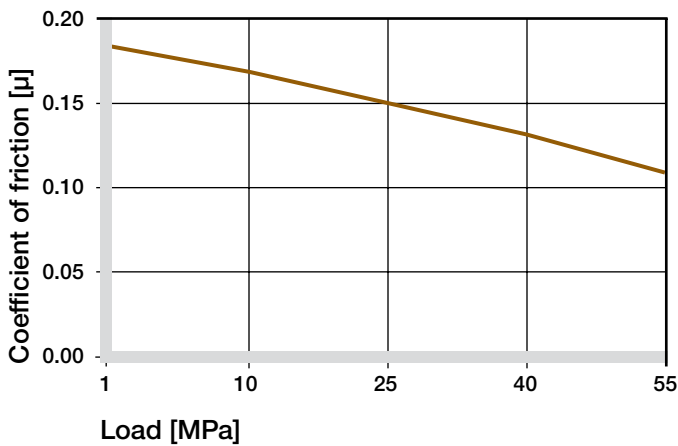


Diagram 05: Coefficient of friction as a function of the pressure,  $v = 0.01$  m/s against Cf53

### Shaft materials

Generally, the use of hardened shafts is recommended for higher loads starting at approximately 10 MPa. This is, however, often not the case in practice, especially in connection with corrosion-resistant coating methods. Thus, the iglidur® Q290 material has a lot of importance in such applications. Diagram 08 shows this very clearly in connection with galvanised shafts. The special suitability for pivoting applications is shown in diagram 07.

► Shaft materials, page 52

iglidur® Q290	Dry	Grease	Oil	Water
C.o.f. $\mu$	0.15–0.23	0.09	0.04	0.04

Table 04: Coefficient of friction against steel ( $R_a = 1 \mu\text{m}$ , 50 HRC)

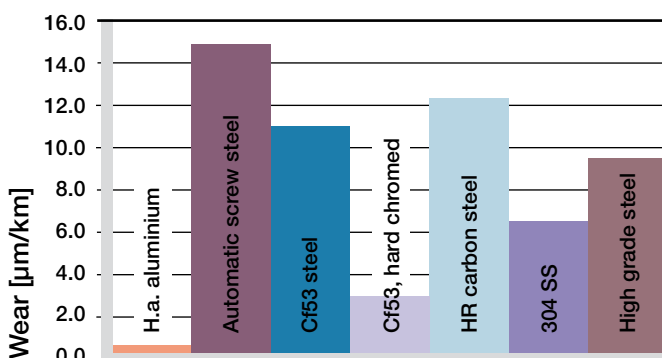


Diagram 06: Wear, rotating with different shaft materials,  $p = 1$  MPa,  $v = 0.3$  m/s

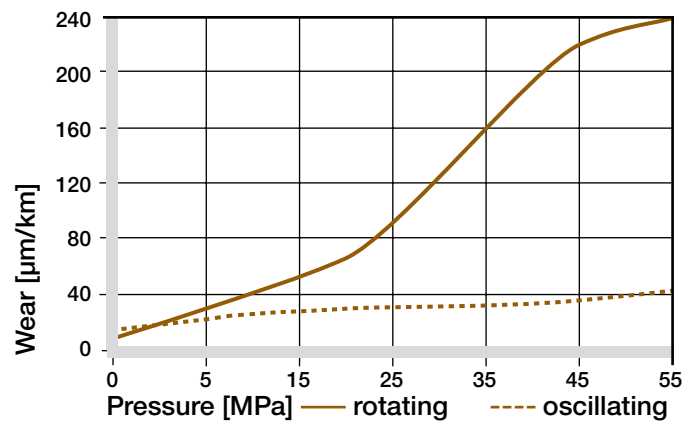


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

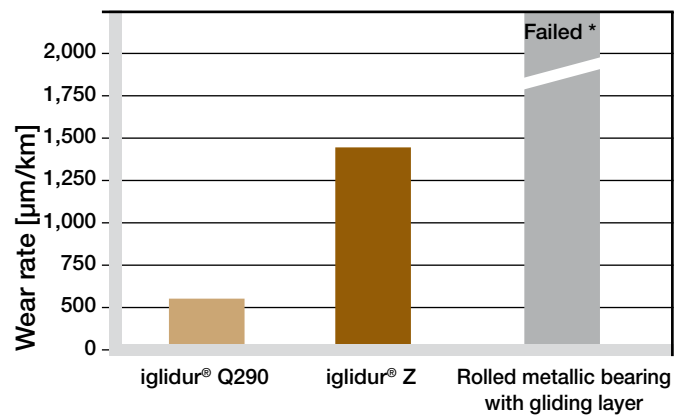


Diagram 08: Wear, pivoting applications on galvanised shafts,  $p > 50$  MPa,  $v = 0.01$  m/s

\* Shaft St52 galvanised. Cycle frequency 60,000. Tested with bearing diameter 20 mm and 20 mm length. The force in the test was 30,400 N

### Installation tolerances

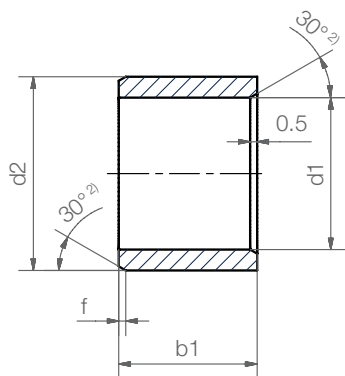
iglidur® Q290 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for press-fit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the E10 tolerances. For specific dimensions the tolerance differs depending on the wall thickness (please see the product range table).

► Testing methods, page 57

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® Q290 E10 [mm]	Housing H7 [mm]
up to 3	0–0.025	+0.014 +0.054	0 +0.010
> 3 to 6	0–0.030	+0.020 +0.068	0 +0.012
> 6 to 10	0–0.036	+0.025 +0.083	0 +0.015
> 10 to 18	0–0.043	+0.032 +0.102	0 +0.018
> 18 to 30	0–0.052	+0.040 +0.124	0 +0.021
> 30 to 50	0–0.062	+0.050 +0.150	0 +0.025

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

## Sleeve bearing (Form S)



## Order key

Type

Dimensions [mm]

Q290 S M-20 23-20

iglidur® material

Form S

Metric

Inner-Ø d1

Outer-Ø d2

Length b1

<sup>2)</sup> Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

d1 [mm]:    Ø 1-6    |    Ø 6-12    |    Ø 12-30    |    Ø > 30

f [mm]:        0.3        |        0.5        |        0.8        |        1.2

## Dimensions [mm]

d1	d1-Tolerance <sup>3)</sup>	d2	b1 ±0.25	Part No.
20.0	+0.040 +0.124	23.0	20.0	Q290SM-2023-20
25.0	+0.040 +0.124	28.0	30.0	Q290SM-2528-30
30.0	+0.040 +0.124	34.0	30.0	Q290SM-3034-30
30.0	+0.040 +0.124	34.0	40.0	Q290SM-3034-40
35.0	+0.050 +0.150	39.0	30.0	Q290SM-3539-30
35.0	+0.050 +0.150	39.0	40.0	Q290SM-3539-40
35.0	+0.050 +0.150	39.0	50.0	Q290SM-3539-50
40.0	+0.050 +0.150	44.0	40.0	Q290SM-4044-40
50.0	+0.050 +0.150	55.0	50.0	Q290SM-5055-50
60.0	+0.060 +0.180	65.0	60.0	Q290SM-6065-60
65.0	+0.060 +0.180	70.0	60.0	Q290SM-6570-60
70.0	+0.060 +0.180	75.0	60.0	Q290SM-7075-60
80.0	+0.060 +0.180	85.0	100.0	Q290SM-8085-100

<sup>3)</sup> After press-fit. Testing methods ► Page 57



**MPa**

## The high load bearing up to 200 MPa static and 140 MPa dynamic – iglidur<sup>®</sup> 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

---



# iglidur® TX1 | The high load bearing up to 200 MPa static and 140 MPa dynamic

For slow oscillating applications under extreme loads



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 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 79
  - ▶ iglidur® Q2, page 401
  - ▶ iglidur® Q, page 409
- For rotational movements during continuous operation
  - ▶ iglidur® W300, page 153
  - ▶ iglidur® Z, page 247
  - ▶ iglidur® G, page 79
- For high-temperature applications with average load levels
  - ▶ iglidur® X, page 237
  - ▶ iglidur® J350, page 173
  - ▶ iglidur® H, page 299

## Typical application areas

- Agricultural machines
- Construction machinery and commercial vehicles
- Heavy equipments



### Available from stock

Detailed information about delivery time online.



### Block pricing online

No minimum order value. From batch size 1



max. +120 °C  
min. -60 °C



Ø 20–80 mm

More dimensions on request



### Online product finder

▶ [www.igus.eu/iglidur-finder](http://www.igus.eu/iglidur-finder)

## Material properties table

General properties	Unit	iglidur® TX1	Testing method
Density	g/cm <sup>3</sup>	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			
Flexural modulus	MPa	12,000	DIN 53457
Flexural strength at +20 °C	MPa	55	DIN 53452
Compressive strength	MPa	220	
Max. permissible 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	
Lower usage temperature	°C	-60	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	K <sup>-1</sup> · 10 <sup>-5</sup>	3	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 1 × 10 <sup>11</sup>	DIN IEC 93
Surface resistance	Ω	> 1 × 10 <sup>13</sup>	DIN 53482

Table 01: Material properties table

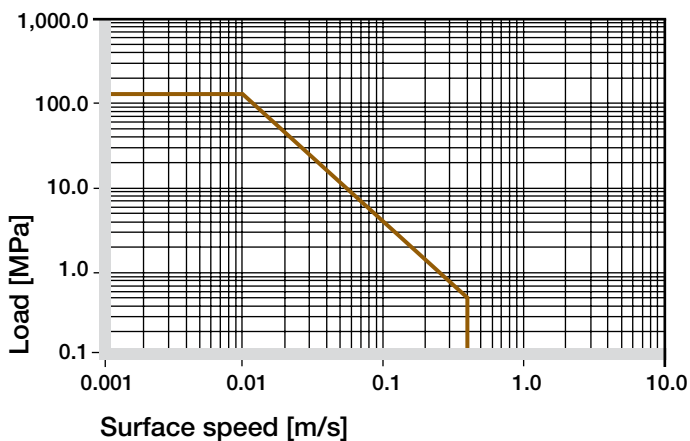


Diagram 01: Permissible pv values for iglidur® TX1 bearings with a wall thickness of 1 mm dry running against a steel shaft, at +20 °C, mounted in a steel housing

### Moisture absorption

Under 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 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  $2 \cdot 10^2$  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]

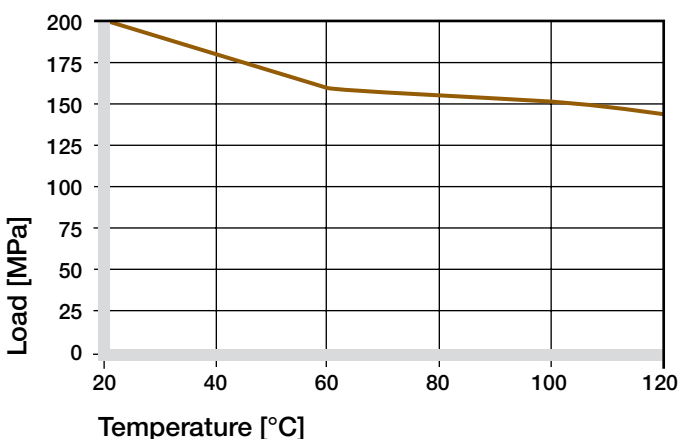
Table 02: Chemical resistance

► Chemical table, page 1424

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 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.

## Mechanical properties

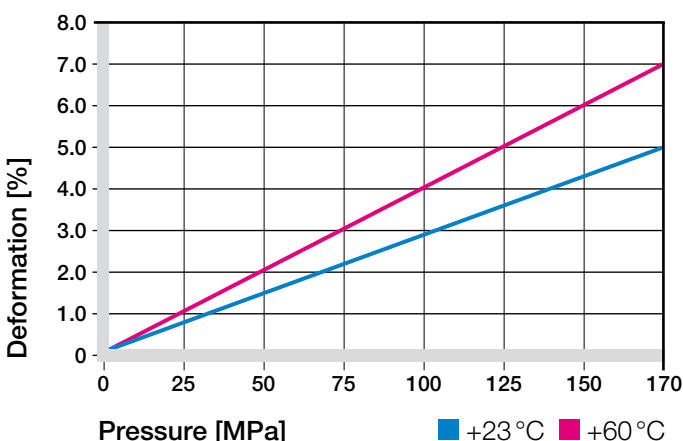
With increasing temperatures, the compressive strength of iglidur® TX1 plain bearings decreases. The diagram 02 shows this inverse relationship. At the short-term permitted application temperature of +170 °C, the permitted surface pressure is still 100 MPa. The permissible maximum surface pressure is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



**Diagram 02: Permissible maximum surface pressure 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 41



**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 44

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 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. 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 47

## ► Wear resistance, page 50

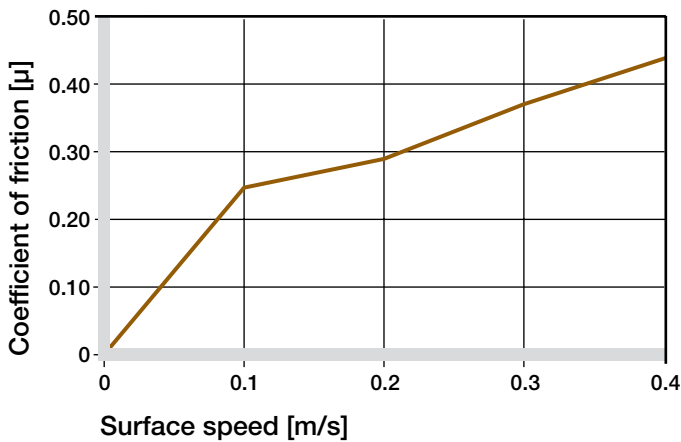


Diagram 04: Coefficient of friction as a function of the surface speed,  $p = 1 \text{ MPa}$

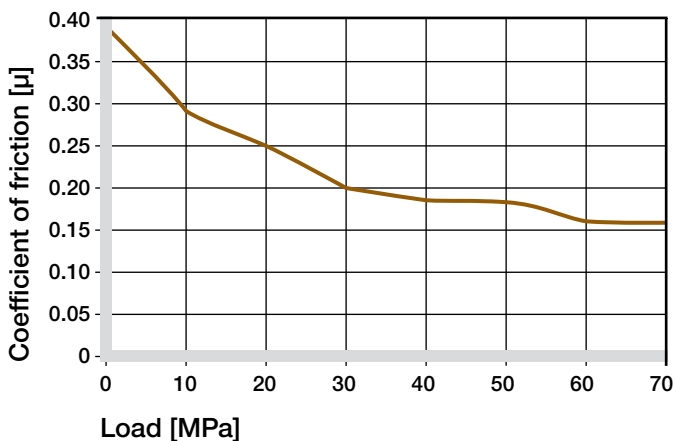


Diagram 05: Coefficient of friction as a function of the pressure,  $v = 0.01 \text{ m/s}$

### 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 52

iglidur® TX1	Dry	Grease	Oil	Water
C.o.f. $\mu$	0.09–0.37	0.09	0.04	0.04

Table 04: Coefficient of friction against steel ( $R_a = 1 \text{ }\mu\text{m}$ , 50 HRC)

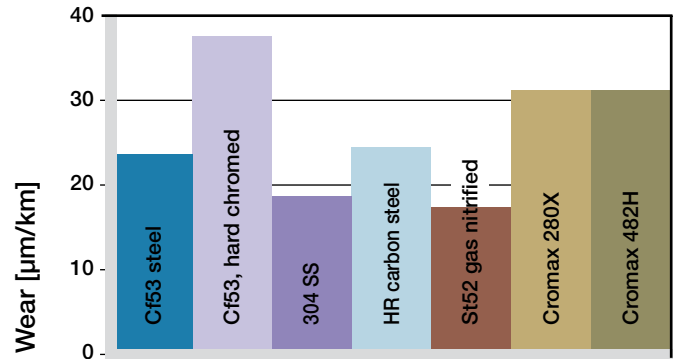


Diagram 06: Wear, rotating with different shaft materials,  $p = 76 \text{ MPa}$ ,  $v = 0.01 \text{ m/s}$

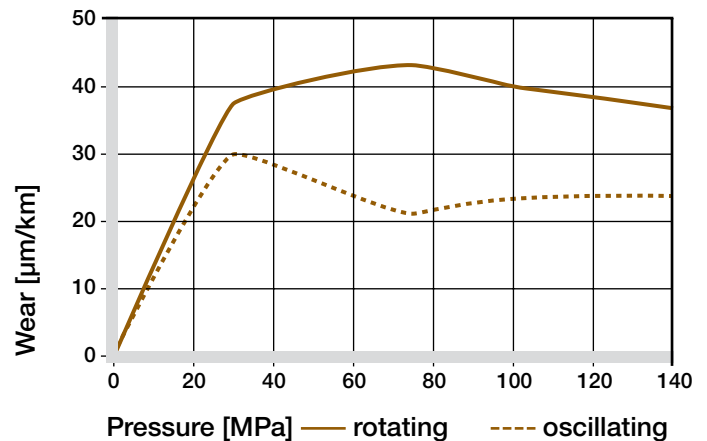


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

### 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.

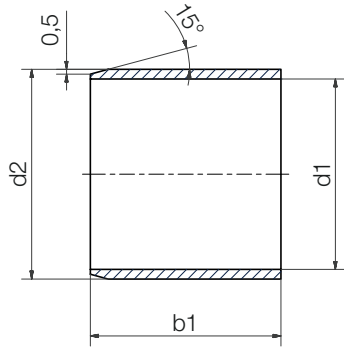
### ► Testing methods, page 57

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 press-fit without possible expansion of the housing bore



## Sleeve bearing (Form S)



## Order key

Type

Dimensions [mm]

TX1 S M-2025-20

iglidur® material

Form S

metric

Inner-Ø d1

Outer-Ø d2

Length b1

## Dimensions [mm]

d1	d1-Tolerance <sup>38)</sup>	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

<sup>38)</sup> After pressfit of the bearing in a housing with nominal dimension