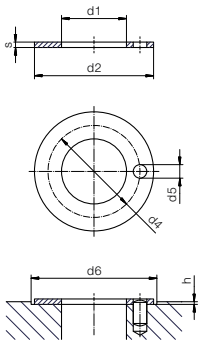
Bearing technology | Plain bearing | iglidur® Q

Thrust washer (form T)



Dimensions according to ISO 3547-1 and special dimensions

Order example: QTM-2842-015 – no minimum order quantity.
Q iglidur® material **T** Thrust washer **M** Metric **28** Inner Ø d1 **42** Outer Ø d2 **015** Thickness s

d1	d2	d4	d5	h	d6	s	Part No.
+0.25	–0.25	–0.12 +0.12	+0.375 +0.125	+0.2/–0.2	+0.12	–0.05	
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
28	42	35	4	1	42	1.5	**QTM-2842-015**
32	54	[4]	4	1	54	1.5	**QTM-3254-015**

[4] Design without fixing hole

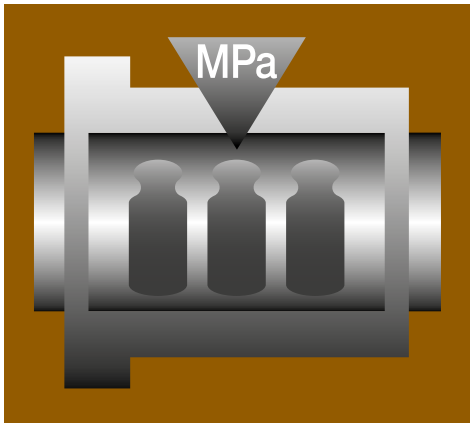
Available from stock
Detailed information about delivery time online.
www.igus.eu/24

Online ordering
Including delivery times, prices, online tools
www.igus.eu/Q

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.



Heavy-duty on soft shafts

For medium to high loads, especially on soft shafts

iglidur® Q290

When to use it?
- When a long-lasting plain bearing is required for tough operating conditions (agricultural equipment, construction machinery, etc.) with medium to high dynamic loads on "soft" shafts

When not to use?
- When permanent static loads higher than 55MPa occur
  iglidur® G, iglidur® Q, iglidur® Q2
- When an very wear-resistant plain bearing is required on "soft" shafts for minor loads
  iglidur® J, iglidur® J3
- When continuous operating temperatures are higher than +140°C
  iglidur® J350, iglidur® Z

Bearing technology | Plain bearing | iglidur® Q290

Ø
20.0 –
80.0mm

Also available as:

Bar stock, round bar
Page 657

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

Heavy-duty on soft shafts

For medium to high loads, especially on soft shafts

iglidur® Q290 shows outstanding service life in tough pivoting applications, as they are frequently found in agricultural machinery, especially on "soft" coated shafts (e.g. galvanised). The wear on the shafts is minimal.

- Recommended for soft shafts
- Suitable for high edge pressures
- Temperature-resistant up to +140°C
- Good price-performance ratio
- Lubrication-free
- Maintenance-free

Typical application areas

- Agricultural engineering
- Utility and construction vehicles

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

iglidur® Q290
+140°C
55MPa

Technical data

General properties			Testing method
Density	g/cm³	1.27	
Colour		black	
Max. moisture absorption at +23°C and 50% r.h.	% weight	3	DIN 53495
Max. moisture absorption	% weight	9.3	
Coefficient of 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. recommended surface pressure (+20°C)	MPa	55	
Shore D hardness		80	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+140	
Max. application temperature short-term	°C	+180	
Min. application temperature	°C	–40	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23°C)	$K^{-1} \cdot 10^{-5}$	7	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	$> 10^{12}$	DIN IEC 93
Surface resistance	Ω	$> 10^{12}$	DIN 53482

Table 01: Material properties

–40°C up to +140°C

55MPa

HB

RoHS-II

ISO 3547-1

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

Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® Q290 plain bearings is 3% weight. The saturation limit in water is 9.3% 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® Q290 are resistant up to a radiation intensity of $3 \cdot 10^2$Gy.

Resistance to weathering

iglidur® Q290 plain bearings are not resistant to weathering. The material properties are significantly affected Severe discoloration occurs. Applications with this material under weathering conditions are not recommended.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® Q290 plain bearings decreases. Diagram 02 shows this inverse relationship. At the short-term permitted application temperature of +180°C, the permitted surface pressure is still 10MPa. 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® Q290 at radial loads. These high elastic deformation values, even for loads of more than 50MPa, contribute significantly to the long service life under tough environmental conditions such as edge loads, collisions and impacts.

Surface pressure, page 41

Bearing technology | Plain bearing | iglidur® Q290

Permissible surface speeds

Typical applications for iglidur® Q290 plain bearings include medium 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

Temperature

The long-term upper temperature limit of +140°C permits the broad use in applications typical for the agricultural, utility vehicle or construction equipment sectors. For temperatures over +80°C an additional securing is required.

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.

Coefficient of friction and surfaces, page 47
Wear resistance, page 50

Shaft materials

Generally, the use of hardened shafts is recommended for higher loads starting at approximately 10MPa. 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

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 particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

Testing methods, page 57

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

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

Table 02: Chemical resistance

Chemical table, page 1636

		Rotating	Oscillating	linear
long-term	m/s	0.8	0.6	1.0
short-term	m/s	2.0	1.4	2.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction μ	0.14 – 0.26	0.09	0.04	0.04

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

Ø d1 [mm]	Housing H7 [mm]		Plain bearing E10 [mm]		Shaft h9 [mm]	
0 – 3	+0.000	+0.010	+0.014	+0.054	–0.025	+0.000
> 3 – 6	+0.000	+0.012	+0.020	+0.068	–0.030	+0.000
> 6 – 10	+0.000	+0.015	+0.025	+0.083	–0.036	+0.000
> 10 – 18	+0.000	+0.018	+0.032	+0.102	–0.043	+0.000
> 18 – 30	+0.000	+0.021	+0.040	+0.124	–0.052	+0.000
> 30 – 50	+0.000	+0.025	+0.050	+0.150	–0.062	+0.000
> 50 – 80	+0.000	+0.030	+0.060	+0.180	–0.074	+0.000
> 80 – 120	+0.000	+0.035	+0.072	+0.212	–0.087	+0.000
> 120 – 180	+0.000	+0.040	+0.085	+0.245	–0.100	+0.000

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

Technical data

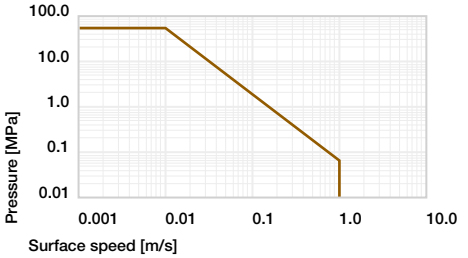


Diagram 01: Permissible pv values for iglidur® Q290 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

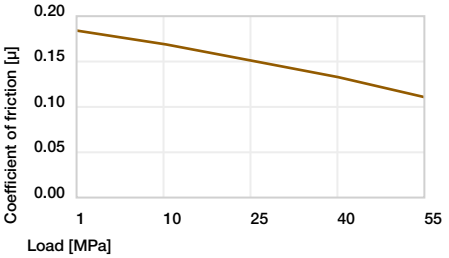


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s against Cf53

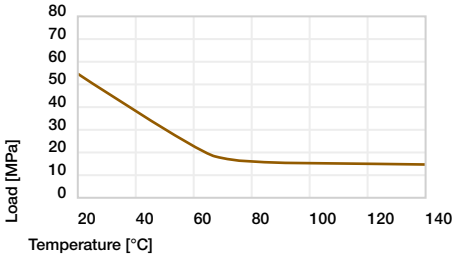


Diagram 02: Maximum recommended surface pressure of as a function of temperature (55MPa at +20°C)

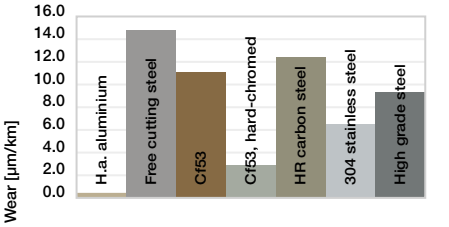


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

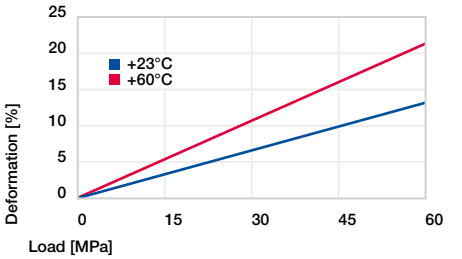


Diagram 03: Deformation under pressure and temperature

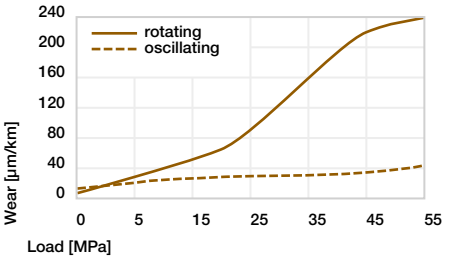


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load

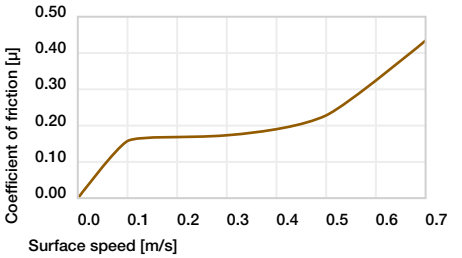


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1MPa

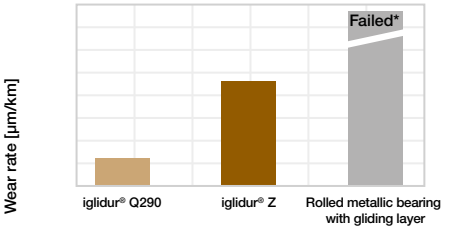
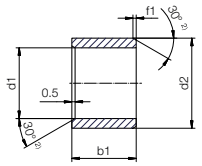


Diagram 08: Wear, pivoting applications on galvanised shafts, p >50MPa, v = 0.01m/s

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

Bearing technology | Plain bearing | iglidur® Q290

Sleeve bearing (form S)



[2] Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

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

Dimensions according to ISO 3547-1 and special dimensions

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	+0.040 +0.124	23.0	20.0	Q290SM-2023-20
25.0		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	+0.060 +0.180	65.0	60.0	Q290SM-6065-60
65.0		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
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Discount scaling		
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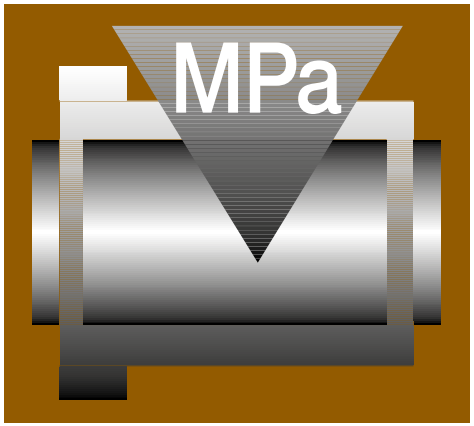

The heavy-duty bearing for up to 200MPa static and 140MPa dynamic

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