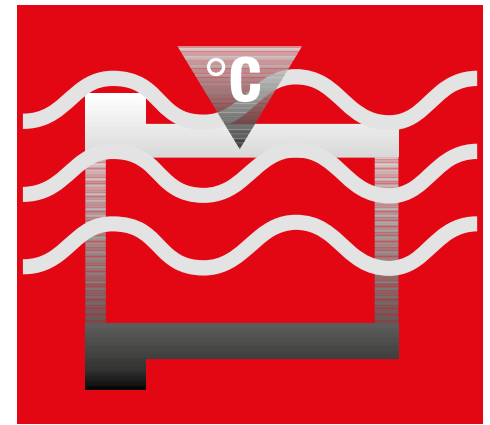




For hot liquids

Continuous wear resistance in liquids

iglidur® UW500



When to use it?

- When plain bearings need to be used in liquids
- For high speeds
- For high temperatures
- When a high chemical resistance is required



When not to use it?

- When a cost-effective underwater plain bearing for the standard temperature range is required
iglidur® UW
- When a cost-effective underwater plain bearing is required for rare operations
iglidur® H
- When a cost-effective universal plain bearing is required
iglidur® G

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Bearing technology | Plain bearings | iglidur® UW500



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Also available
as:



Bar stock,
round bar
Page 743



Bar stock,
plate
Page 773



tribo-tape liner
Page 781



Guide rings
Page 641



Two hole
flange
bearings
Page 667



Moulded
special parts
Page 696



igubal®
spherical balls
Page 993



For hot liquids Continuous wear resistance in liquids

iglidur® UW500 was developed for underwater applications at higher temperatures up to +250°C. In addition, the plain bearings will run in chemicals which would act as a lubricant.

- High temperature resistance
- Suitable for high surface speeds
- Lubrication-free
- Suitable for underwater applications
- Maintenance-free

Typical application areas

- Plant construction
- Pumps
- Chemical industry

Descriptive technical specifications

Wear resistance at +23°C	-		+
Wear resistance at +90°C	-		+
Wear resistance at +150°C	-		+
Slide property	-		+
Wear resistance under water	-		+
Media resistance	-		+
Resistant to edge pressures	-		+
Resistant to shock and impact loads	-		+
Dirt resistance	-		+

Online product finder

www.igus.sk/iglidur-finder



Online service life calculation

www.igus.sk/iglidur-expert



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Technical data

General properties		Testing method	
Density	g/cm³	1.49	
Colour		black	
Max. moisture absorption at +23°C/50% r.h.	% weight	0.1	DIN 53495
Max. moisture absorption ⁹⁾	% weight	0.5	
Coefficient of friction, dynamic, against steel	μ	0.20-0.36	
pv value, max. (dry)	MPa · m/s	0.35	
Mechanical properties			
Flexural modulus	MPa	16,000	DIN 53457
Flexural strength at +20°C	MPa	260	DIN 53452
Compressive strength	MPa	140	
Max. permissible surface pressure (+20°C)	MPa	140	
Shore D hardness		86	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+250	
Max. application temperature short-term	°C	+300	
Min. application temperature	°C	-100	
Thermal conductivity	W/m · K	0.60	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K ⁻¹ · 10 ⁻⁵	4	DIN 53752
Electrical properties ⁹⁾			
Specific transitional resistance	Ωcm	< 10 ⁹	DIN IEC 93
Surface resistance	Ω	< 10 ⁹	DIN 53482

⁹⁾ The good conductivity of this material can favour the generation of corrosion on the metallic contact components.

⁹⁾ All results were obtained under laboratory conditions with demineralised water. For application with direct water contact, we recommend tests under real application conditions.

Table 01: Material properties

The plain bearings made from iglidur® UW500 were developed for underwater applications with high temperatures. Examples for this are water pumps in automotive engineering, but also the field of medical engineering and related sectors. Unless the underwater operation is explicitly stated, the information in this chapter describes iglidur® UW500 in dry operation.

Moisture absorption

The moisture absorption of iglidur® UW500 plain bearings is below 0.1% weight in ambient conditions. The maximum moisture absorption is 0.5% weight. iglidur® UW500 plain bearings can be used for underwater applications.

Vacuum

In vacuum, any present moisture is released as vapour. The use in vacuum is generally possible.

Radiation resistance

Plain bearings made from iglidur® UW500 are resistant up to a radiation intensity of 1 · 10⁵ Gy. They resist to hard gamma radiation (1,000Mrad) and alpha or beta radiation (10,000Mrad).

Resistance to weathering

iglidur® UW500 plain bearings are continuously resistant to weathering. The material properties are only slightly affected. Possible discolourations are only superficial.

Mechanical properties

When temperatures increase, the compressive strength of iglidur® UW500 plain bearings decreases. Diagram 02 shows this inverse relationship. The maximum recommended surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this. Diagram 03 shows the elastic deformation of iglidur® UW500 under different loads.

Surface pressure, page 45



-100°C up to
+250°C



140 MPa



V-0



ISO 35471



RoHS



ISO 35471



ISO 35471



Bearing technology | Plain bearings | iglidur® UW500

Permissible surface speeds

iglidur® UW500 plain bearings can be used in applications involving dry operation as well as in liquids in a wide variety of applications. Due to hydrodynamic lubrication at high speeds, surface speeds far above 1.5m/s can be achieved.

Surface speed, page 48

Temperature

iglidur® UW500 can be used in applications where there are continuous temperatures of +150°C. If the bearings are mechanically secured, these temperatures can be even higher than +200°C. iglidur® UW500 belongs to the most temperature-resistant iglidur® materials. For temperatures over +150°C an additional securing is required.

Application temperatures, page 53

Additional securing, page 53

Friction and wear

Diagrams 04 and 05 show the coefficient of friction of iglidur® UW500 plain bearings as a function of surface speed and pressure. The friction and wear are also dependent, to a large degree, on the mating partner. Ground surfaces with an average surface finish Ra of 0.1 to 0.4µm are ideal.

Coefficient of friction and surfaces, page 51

Wear resistance, page 54

Shaft materials

Diagram 06 shows results of testing different shaft materials with plain bearings made from iglidur® UW500.

Shaft materials, page 56

Installation tolerances

iglidur® UW500 plain bearings are standard bearings for shafts with h tolerance (recommended minimum h9). The bearings are designed for press-fit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the F10 tolerances. For particular dimensions the tolerance differs depending on the wall thickness (please see product range table).

Testing methods, page 61

Product range

iglidur® UW500 plain bearings are manufactured to special order.

Chemicals	Resistance
Alcohols	+
Diluted acids	+
Diluted alkalines	+
Fuels	+
Greases, oils without additives	+
Hydrocarbons	+
Strong acids	+
Strong alkalines	+

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

Table 02: Chemical resistance

Chemical table, page 1170

		Rotating	Oscillating	linear
Long-term	m/s	0.8	0.6	2.0
Short-term	m/s	1.5	1.1	3.0

Table 03: Maximum surface speeds

		Dry	Greases	Oil	Water
Coefficient of friction μ		0.20-0.36	0.09	0.04	0.04

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

Ø d1 [mm]	Housing		Plain bearings		Shaft	
	H7 [mm]	F10 [mm]	F10 [mm]	h9 [mm]		
0-3	+0.000	+0.010	+0.006	+0.046	-0.025	+0.000
> 3-6	+0.000	+0.012	+0.010	+0.058	-0.030	+0.000
> 6-10	+0.000	+0.015	+0.013	+0.071	-0.036	+0.000
> 10-18	+0.000	+0.018	+0.016	+0.086	-0.043	+0.000
> 18-30	+0.000	+0.021	+0.020	+0.104	-0.052	+0.000
> 30-50	+0.000	+0.025	+0.025	+0.125	-0.062	+0.000
> 50-80	+0.000	+0.030	+0.030	+0.150	-0.074	+0.000
> 80-120	+0.000	+0.035	-0.036	+0.176	-0.087	+0.000
> 120-180	+0.000	+0.040	+0.043	+0.203	+0.000	+0.100

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

Technical data

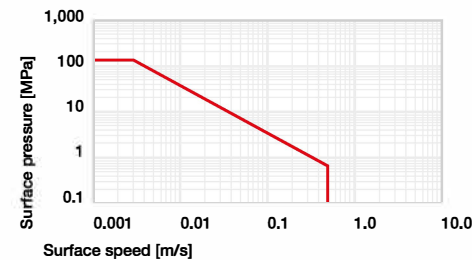


Diagram 01: Permissible pv values for iglidur® UW500 with a wall thickness of 1mm dry operation against a steel shaft at +20°C, mounted in a steel housing

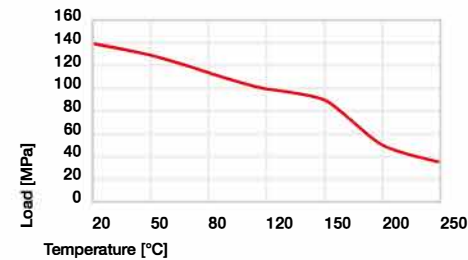


Diagram 02: Maximum recommended surface pressure as a function of temperature (140MPa at +20°C)

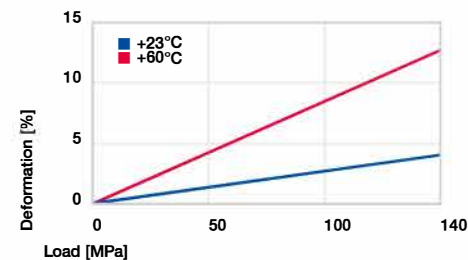


Diagram 03: Deformation under pressure and temperature

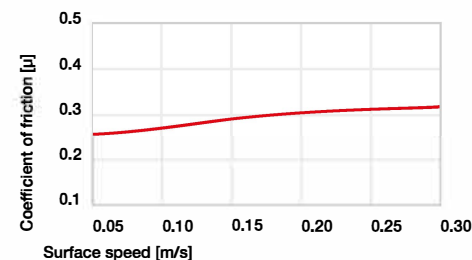


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75MPa

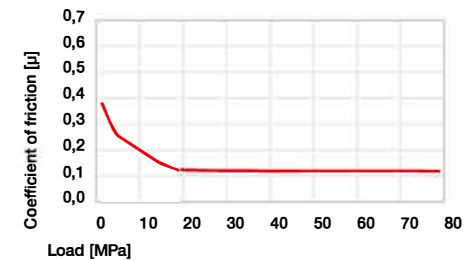


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

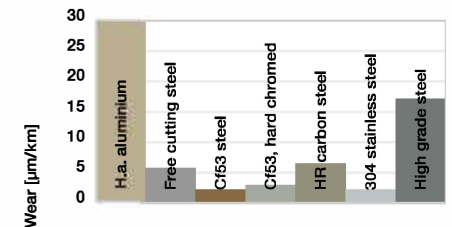


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

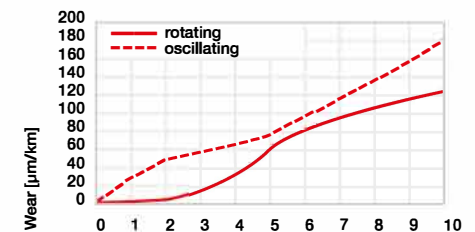


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load