

Specialist for linear movement

Low wear with low coefficient of friction

iglidur® J200



When to use it?

- For applications with hard-anodised shafts
- When lowest coefficient of friction is required
- When long service life at low loads is required



When not to use?

- For steel shafts
iglidur® J, iglidur® W300
- When continuous operating temperatures are higher than +90°C
iglidur® V400
- When a cost-effective universal plain bearing is required
iglidur® G, iglidur® P

Bearing technology | Plain bearing | iglidur® J200



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Also available as:



Bar stock, round bar
Page 677

Specialist for linear movement Low wear with low coefficient of friction

The specialist for low coefficient of friction and minimal wear with hard-anodised aluminium shafts.

- Recommended for hard-anodised aluminium shafts
- Low coefficient of friction
- High wear resistance
- For low and medium loads
- Lubrication-free
- Maintenance-free



Bar stock, plate
Page 683

Typical application areas

- Automation
- Linear technology
- Actuator



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

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

Technical data

General properties		Testing method	
Density	g/cm ³	1.72	
Colour		matt grey	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	0.7	
Coefficient of friction, dynamic, against steel	μ	0.11 – 0.17	
pv value, max. (dry)	MPa · m/s	0.30	
Mechanical properties			
Flexural modulus	MPa	2,800	DIN 53457
Flexural strength at +20°C	MPa	58	DIN 53452
Compressive strength	MPa	43	
Max. recommended surface pressure (+20°C)	MPa	23	
Shore D hardness		70	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+90	
Max. application temperature short-term	°C	+120	
Min. application temperature	°C	-50	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K ⁻¹ · 10 ⁻⁵	8	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	> 10 ⁸	DIN IEC 93
Surface resistance	Ω	> 10 ⁸	DIN 53482

Table 01: Material properties

iglidur® J200 is the result of the development of extremely low friction plain bearing materials. When using plain bearings in linear motion, friction can be critical. Many materials can give low coefficient of friction under high loads, but iglidur® J200 can give excellent friction values even at low loads.

Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® J200 plain bearings is approximately 0.2% weight. The saturation limit in water is 0.7% weight. These values are so low that a moisture expansion need to be considered only in extreme cases.

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® J200 are resistant up to a radiation intensity of 3 · 10²Gy.

Resistance to weathering

iglidur® J200 plain bearings are resistant to weathering. The material properties are slightly affected. Discoloration occurs.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® J200 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.

At the maximum permissible load of 23MPa, the deformation is approximately 3.5% (diagram 03). A plastic deformation can be negligible up to this value. However, it is also dependent on the service time.

Surface pressure, page 41



-50°C up to +90°C



23MPa



Permissible surface speeds

iglidur® J200 attains high surface speeds due to its excellent coefficient of friction. Continuous rotation speeds of 1.0m/s are possible. The permitted speeds are clearly higher yet in linear movements or in short-term operation. Speeds of over 15.0m/s have been successfully tested in linear applications.

Surface speed, page 44

Temperature

The maximum permissible temperature of +120°C should not be exceeded. Therefore the ambient temperature generated by friction has to be added. From +60°C onward, the bearing should be mechanically retained, so as to avoid the bearing moving out of the hole. The wear resistance also decreases exponentially from +70°C upwards.

Application temperatures, page 49

Additional securing, page 49

Friction and wear

Among all the iglidur® materials, iglidur® J200 exhibits the lowest coefficient of friction. The average coefficient of friction of all measurements, even with different shaft materials, is 0.11µ. The use of hard-anodised aluminium as a shaft material is also of importance. The comparison with the rest of the iglidur® materials shows that iglidur® J200 plain bearings are suitable for rather low loads. The influence of surface speed and load on the coefficient of friction is small. The change of the coefficient of friction at high loads is in the normal range (diagrams 04 and 05). Surface finishes (Ra) of the shaft between 0.2 – 0.4µm are ideal. The influence of the shaft material on the wear resistance is significant. Even at low loads, we recommend to have a closer look into the wear database.

Coefficient of friction and surfaces, page 47

Wear resistance, page 50

Shaft materials

The shaft material has a great impact on the wear resistance. In fact, all shaft materials (smooth or hardened) are suitable for use with iglidur® J200, but the best results are achieved with hard-anodised aluminium. In particular when used in linear motion, this running surface has proven its value.

Shaft materials, page 52

Installation tolerances

iglidur® J200 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	+
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 1.0	0.7	10.0
short-term	m/s 1.5	1.1	15.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction µ	0.11 – 0.17	0.09	0.04	0.04

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

	Housing	Plain bearing	Shaft
Ø d1 [mm]	H7 [mm]	E10 [mm]	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

iglidur® J200 plain bearings are manufactured to special order.

Technical data

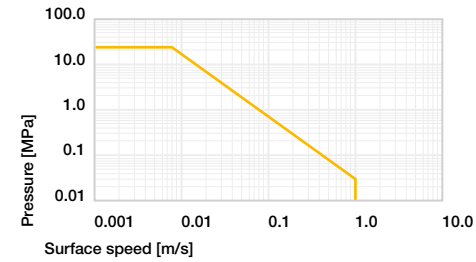


Diagram 01: Permissible pv values for iglidur® J200 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

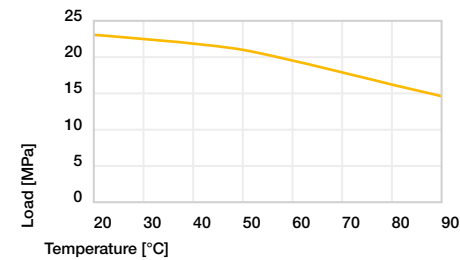


Diagram 02: Maximum recommended surface pressure as a function of temperature (23MPa at +20°C)

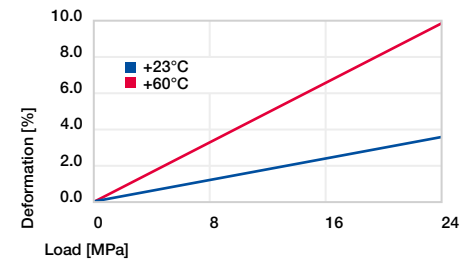


Diagram 03: Deformation under pressure and temperature

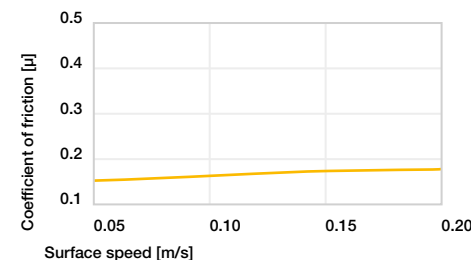


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75MPa

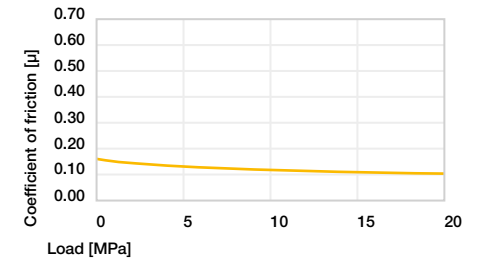


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

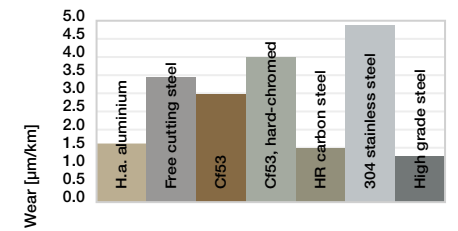


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

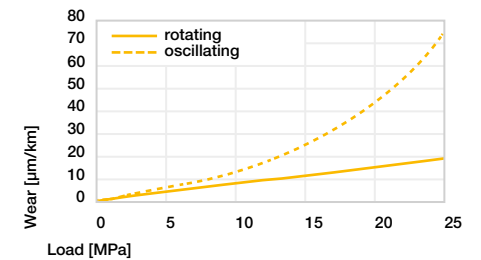


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load