

For extreme rotational speeds Temperature-resistant and media-resistant **igidur® L500**



When to use it?

- For rotating applications at high speed
- When the highest service life is required
- For high pv values with low loads
- At continuous operating temperatures up to +250°C (short-term up to max. +350°C)



When not to use?

- When a universal plain bearing for high temperatures is required
igidur® X
- When medium to high pressures occur
igidur® G, iglidur® Q
- For oscillating applications
igidur® W300, iglidur® J350

Bearing technology | Plain bearing | iglidur® L500



Ø
3.0 – 10.0mm



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

For extreme rotational speeds Temperature-resistant and media-resistant

Specially developed for fast continuous operation under low loads, iglidur® L500, inter alia, is intended for fan and electric motor applications.

- Temperature-resistant up to +250°C
- For rotational movements with surface speeds up to 5m/s
- Very wear-resistant
- Low moisture absorption
- Low thermal expansion
- Lubrication-free
- Maintenance-free

Typical application areas

- Cooling fans
- Electric motors
- Fans, etc.

Descriptive technical specifications

Wear resistance at +23°C	-	<div style="width: 80%; background-color: #FFD700;"></div>	+
Wear resistance at +90°C	-	<div style="width: 70%; background-color: #FFD700;"></div>	+
Wear resistance at +150°C	-	<div style="width: 60%; background-color: #FFD700;"></div>	+
Low coefficient of friction	-	<div style="width: 90%; background-color: #FFD700;"></div>	+
Low moisture absorption	-	<div style="width: 95%; background-color: #FFD700;"></div>	+
Wear resistance under water	-	<div style="width: 85%; background-color: #FFD700;"></div>	+
High media resistance	-	<div style="width: 90%; background-color: #FFD700;"></div>	+
Resistant to edge pressures	-	<div style="width: 75%; background-color: #FFD700;"></div>	+
Suitable for shock and impact loads	-	<div style="width: 80%; background-color: #FFD700;"></div>	+
Resistant to dirt	-	<div style="width: 85%; background-color: #FFD700;"></div>	+

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

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

Technical data

General properties		Testing method	
Density	g/cm ³	1.53	
Colour		black	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.1	DIN 53495
Max. moisture absorption	% weight	0.3	
Coefficient of friction, dynamic, against steel	μ	0.08 – 0.15	
pv value, max. (dry)	MPa · m/s	4.00	
Mechanical properties			
Flexural modulus	MPa	12,015	DIN 53457
Flexural strength at +20°C	MPa	201	DIN 53452
Compressive strength	MPa	70	
Max. recommended surface pressure (+20°C)	MPa	70	
Shore D hardness		81	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+250	
Max. application temperature short-term	°C	+315	
Min. application temperature	°C	-100	
Thermal conductivity	W/m · K	0.45	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K ⁻¹ · 10 ⁻⁵	6	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	> 10 ¹⁰	DIN IEC 93
Surface resistance	Ω	> 10 ¹²	DIN 53482

Table 01: Material properties

iglidur® L500 is a plain bearing material for high speeds and fast sliding movements with low loads. Due to the low thermal expansion and low moisture absorption, bearings can be manufactured with minimal potential to expand. Applications which feature these advantages are fans, small motors, fast-running sensors or the magnet technology.

Moisture absorption

The very low moisture absorption of 0.1% weight in standard climatic conditions and 0.3% weight at maximum water absorption also enables continuous operation in high humidity or in liquid media.

Vacuum

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

Radiation resistance

Plain bearings made from iglidur® L500 are resistant up to a radiation intensity of 3 · 10²Gy. Higher radiation weakens the material and may result in a significant decrease in mechanical properties.

Resistance to weathering

iglidur® L500 plain bearings are continuously resistant to weathering. The material properties are only slightly affected. Possible discolorations are only superficial.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® L500 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® L500 at radial loads. At the maximum recommended surface pressure of 70MPa at room temperature the deformation is less than 2.5%. A plastic deformation can be negligible up to this value. It is however also dependent on the duty cycle of the load.

Surface pressure, page 41



-100°C up to
+250°C



70MPa



V-0



RoHS



ISO
35474

Permissible surface speeds

iglidur® L500 has been developed especially for high surface speeds with low loads. Due to the high temperature resistance of iglidur® L500, the limit of the bearing has been increased significantly. In addition, the extremely low wear allows the high acceleration speeds to be reached and maintained. The maximum speeds are shown in table 03.

Surface speed, page 44

Temperature

The iglidur® L500 plain bearings can be used in short-term temperatures up to +315°C. For temperatures over +135°C an additional securing is required. Higher temperatures can also cause the plain bearing to lose its press-fit and move in the hole.

Application temperatures, page 49

Additional securing, page 49

Friction and wear

The excellent coefficient of friction level of iglidur® L500 in dry operation decreases considerably with speed. Diagram 04 shows this with respect to a steel shaft. As the load increases, the coefficient of friction decreases, especially in the range up to 20MPa (diagram 05).

Coefficient of friction and surfaces, page 47

Wear resistance, page 50

Shaft materials

Diagram 07 shows the result of a comparison test between iglidur® L500 and a sintered bearing. The wear of the sintered bearing increases exponentially above 1.5m/s, while the iglidur® L500 plain bearing retains a near constant wear rate up to and above 4m/s.

Shaft materials, page 52

Installation tolerances

iglidur® L500 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 57

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

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

Table 02: Chemical resistance

Chemical table, page 1636

	Rotating	Oscillating	linear
long-term	m/s 4.0	1.5	5.0
short-term	m/s 5.0	3.0	8.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction μ	0.08 – 0.15	0.09	0.04	0.04

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

Ø d1 [mm]	Housing		Plain bearing		Shaft	
	H7 [mm]	F10 [mm]	F10 [mm]	h9 [mm]	h9 [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

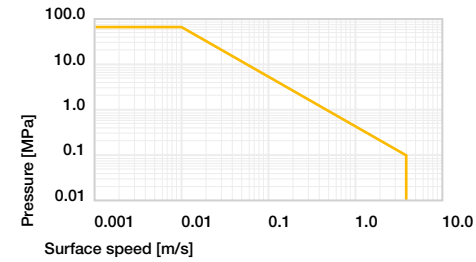


Diagram 01: Permissible pv values for iglidur® L500 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

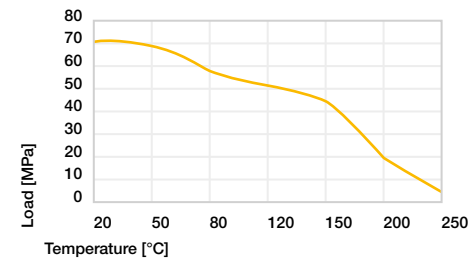


Diagram 02: Maximum recommended surface pressure as a function of temperature (70MPa at +20°C)

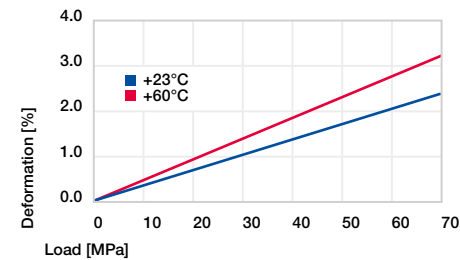


Diagram 03: Deformation under pressure and temperature

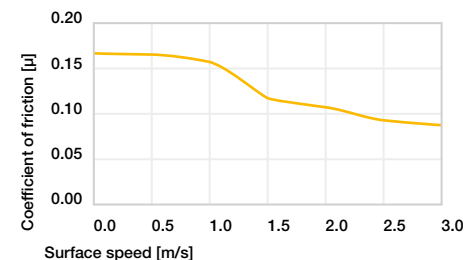


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75MPa

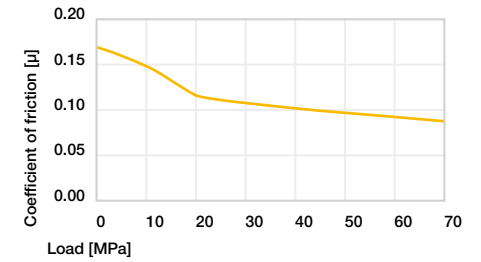


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

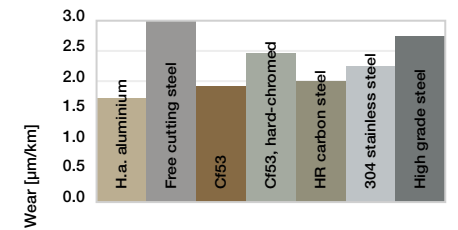


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

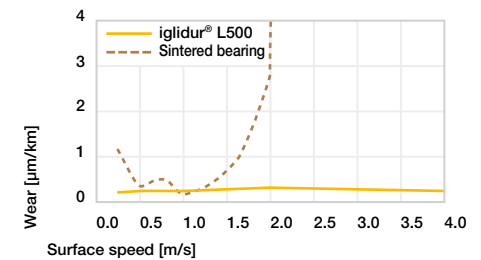
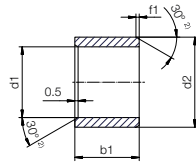


Diagram 07: Rotating wear against Cf53, p = 0.25MPa, T = +23°C

Bearing technology | Plain bearing | iglidur® L500

Sleeve bearing (form S)



²⁾ Thickness < 0.6mm: Chamfer = 20°

i Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to d1

d1 [mm]	Ø 1–6	Ø 6–12
f1 [mm]	0.3	0.5



Order example: **L500SM-0304-03** – no minimum order quantity.

L500 iglidur® material **S** Sleeve bearing **M** Metric **03** Inner Ø d1 **04** Outer Ø d2 **03** Total length b1

d1	d1 Tolerance ³⁾	d2	b1 h13	Part No.
[mm]		[mm]	[mm]	
3.0	+0.006 +0.046	4.5	3.0	L500SM-0304-03
4.0		5.5	4.0	L500SM-0405-04
5.0	+0.010 +0.058	7.0	5.0	L500SM-0507-05
6.0		8.0	6.0	L500SM-0608-06
8.0	+0.013 +0.071	10.0	10.0	L500SM-0810-10
10.0		12.0	10.0	L500SM-1012-10

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/L500



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

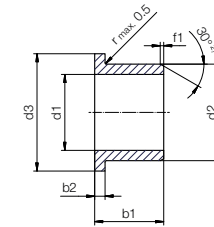
No minimum order value.

No low-quantity surcharges.

Free shipping within Germany for orders above €150.

Bearing technology | Plain bearing | iglidur® L500

Flange bearing (form F)



²⁾ Thickness < 0.6mm: Chamfer = 20°

i Dimensions according to ISO 3547-1 and special dimensions

Chamfer in relation to d1

d1 [mm]	Ø 1–6	Ø 6–12
f1 [mm]	0.3	0.5



Order example: **L500FM-0304-05** – no minimum order quantity.

L500 iglidur® material **F** Flange bearing **M** Metric **03** Inner Ø d1 **04** Outer Ø d2 **05** Total length b1

d1	d1 Tolerance ³⁾	d2	d3 d13 ³⁾	b1 h13	b2 h13	Part No.
[mm]		[mm]	[mm]	[mm]	[mm]	
3.0	+0.006 +0.046	4.5	7.5	5.0	0.75	L500FM-0304-05
4.0		5.0	9.5	4.0	0.75	L500FM-0405-04
5.0	+0.010 +0.058	7.0	11.0	7.0	1.00	L500FM-0507-07
6.0		8.0	12.0	8.0	1.00	L500FM-0608-08
8.0	+0.013 +0.071	10.0	15.0	9.5	1.00	L500FM-0810-09
10.0		12.0	18.0	9.5	1.00	L500FM-1012-09

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



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