The biopolymer
Based on renewable resources
iglidur® N54

When to use it?

- For applications with infrequent movement at low to medium loads
- At static loads
- When the environmental impact of a product needs to be optimised

When not to use?

- When a universal standard plain bearing is required
  iglidur® G
- When dealing with high motion frequencies and continuous operation
  iglidur® J
- When dealing with high temperatures
  iglidur® J350

Bearing technology | Plain bearing | iglidur® N54

Ø
6.0 – 20.0mm

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

The biopolymer
Based on renewable resources

Based on 54% renewable resources, this material also meets high technical requirements.

- Based on renewable resources
- Universal installation
- Lubrication-free
- Maintenance-free

Typical application areas

- Consumer products
- General mechanical engineering
- Furniture industry
- Industrial design

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® N54
+80°C
36MPa

Technical data

General properties			Testing method
Density	g/cm³	1.13	
Colour		green	
Max. moisture absorption at +23°C and 50% r.h.	% weight	1.6	DIN 53495
Max. moisture absorption	% weight	3.6	
Coefficient of friction, dynamic, against steel	µ	0.15 – 0.23	
pv value, max. (dry)	MPa · m/s	0.50	
Mechanical properties			
Flexural modulus	MPa	1,800	DIN 53457
Flexural strength at +20°C	MPa	70	DIN 53452
Compressive strength	MPa	30	
Max. recommended surface pressure (+20°C)	MPa	36	
Shore D hardness		74	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+80	
Max. application temperature short-term	°C	+120	
Min. application temperature	°C	–40	
Thermal conductivity	W/m · K	0.24	ASTM C 177
Coefficient of thermal expansion (at +23°C)	$K^{-1} \cdot 10^{-5}$	9	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	$> 10^{13}$	DIN IEC 93
Surface resistance	Ω	$> 10^{11}$	DIN 53482

Table 01: Material properties

–40°C up to +80°C

36MPa

HB

RoHS-II

ISO 3547-1

iglidur® N54 is the first iglidur® material based largely on biopolymers. In addition to the proven lubrication-free properties of all iglidur® materials, this is one further contribution to positive environmental stewardship. The low coefficient of friction in conjunction with long service life ensure that this material has a permanent place in the iglidur® product range.

Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® N54 plain bearings is below 1.6% weight. The saturation limit in water is 3.6% 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® N54 have limited use under radioactive radiation. They are resistant to radiation up to an intensity of $1 \cdot 10^4$Gy.

Resistance to weathering

iglidur® N54 plain bearings are resistant to weathering. The material properties are slightly affected. Discoloration occurs.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® N54 plain bearings decreases. Diagram 02 shows this inverse relationship. However, at the long-term maximum temperature of +80°C the permissible surface pressure is around 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® N54 at radial loads.
Surface pressure, page 41

Bearing technology | Plain bearing | iglidur® N54

Permissible surface speeds

Although the typical applications of iglidur® N54 plain bearings are generally in the area of intermittent operation, the maximum attainable speeds can be quite high, depending on the type of motion. The speeds stated in table 03 are limit values for the lowest bearing loads. With higher loads, the permitted speed drops with the extent of the load due to the limitations by the pv value.

Surface speed, page 44

Temperature

The short-term permissible temperature limit is +120°C, which allows the use of iglidur® N54 plain bearings in all applications involving elevated ambient temperatures. With increasing temperatures, the compressive strength of iglidur® N54 plain bearings decreases. When considering temperatures, the additional frictional heat in the bearing system must be taken into account. For temperatures over +60°C an additional securing is required.

Application temperatures, page 49
Additional securing, page 49

Friction and wear

iglidur® N54 has a low coefficient of friction. Please note that a sliding surface with a rough surface finish will increase the friction. Surface finishes (Ra) of the shaft between 0.1 – 0.4µm are ideal. The coefficient of friction of iglidur® N54 plain bearings is only marginally dependent on the surface speed. The influence of the load is greater; an increase in load lowers the coefficient of friction to as low as 0.8.

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

Shaft materials

It is important to select a suitable shaft material. As a rule, iglidur® N54 is suitable for use with hard or soft shafts, but "hard" shaft surfaces tend to give better service life. Starting at loads of 1MPa, wear increases measurably and continuously. If the shaft material you plan on using is not shown in these test results, please contact us.

Shaft materials, page 52

Installation tolerances

iglidur® N54 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	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	1.5	1.1	2.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction µ	0.15 – 0.23	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® N54
+80°C
36MPa

Technical data

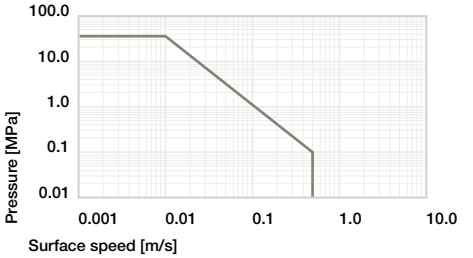


Diagram 01: Permissible pv values for iglidur® N54 plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

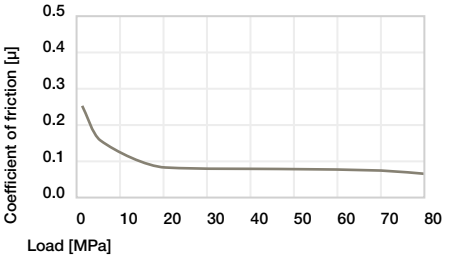


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

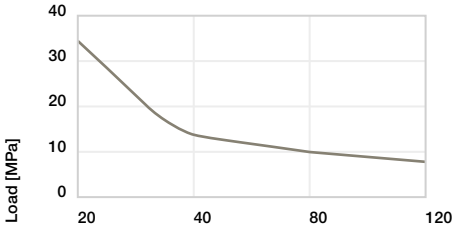


Diagram 02: Maximum recommended surface pressure as a function of temperature (36MPa at +20°C)

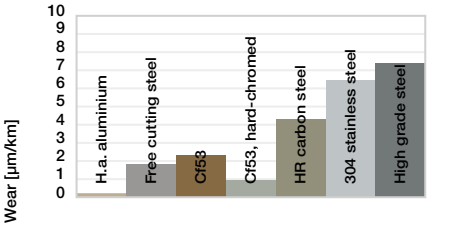


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

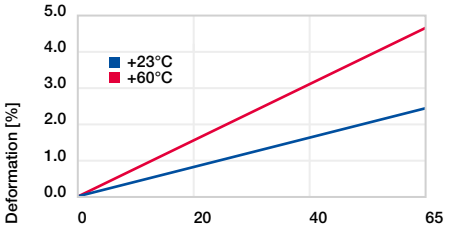


Diagram 03: Deformation under pressure and temperature

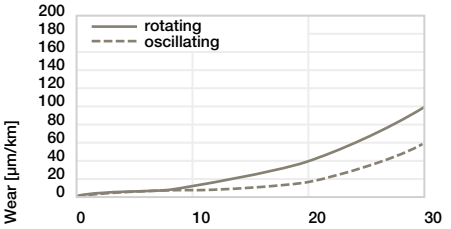


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the load

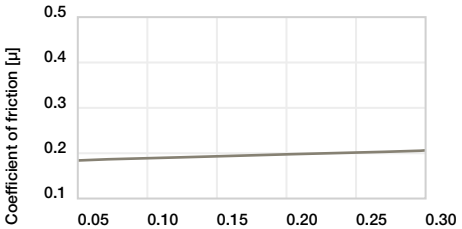
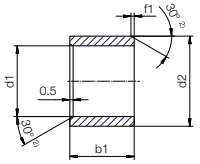


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1MPa

Bearing technology | Plain bearing | iglidur® N54

Sleeve bearing (form S)



[2] Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm]	Ø 6–12	Ø 12–30
f1 [mm]	0.5	0.8

Dimensions according to ISO 3547-1 and special dimensions

Order example: N54SM-0608-06 **– no minimum order quantity.**
N54 iglidur® material S Sleeve bearing M Metric 06 Inner Ø d1 08 Outer Ø d2 06 Total length b1

d1 [mm]	d1 Tolerance[3]	d2 [mm]	b1 h13 [mm]	Part No.
6.0	+0.020 +0.068	8.0	6.0	**N54SM-0608-06**
8.0	+0.025 +0.083	10.0	10.0	**N54SM-0810-10**
10.0		12.0	10.0	**N54SM-1012-10**
12.0	+0.032 +0.102	14.0	12.0	**N54SM-1214-12**
16.0		18.0	15.0	**N54SM-1618-15**
20.0	+0.040 +0.124	23.0	20.0	**N54SM-2023-20**

[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/N54

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.

iglidur® N54
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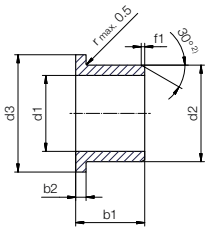
36MPa

Bearing technology | Plain bearing | iglidur® N54

Flange bearing (form F)



[2] Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm]	Ø 6–12	Ø 12–30
f1 [mm]	0.5	0.8

Dimensions according to ISO 3547-1 and special dimensions

Order example: N54FM-0608-06 **– no minimum order quantity.**
N54 iglidur® material F Flange bearing M Metric 06 Inner Ø d1 08 Outer Ø d2 06 Total length b1

d1 [mm]	d1 Tolerance[3]	d2 [mm]	d3 d13[3] [mm]	b1 h13 [mm]	b2 h13 [mm]	Part No.
6.0	+0.020 +0.068	8.0	12.0	6.0	1.00	**N54FM-0608-06**
8.0	+0.025 +0.083	10.0	15.0	10.0	1.00	**N54FM-0810-10**
10.0		12.0	18.0	10.0	1.00	**N54FM-1012-10**
12.0	+0.032 +0.102	14.0	20.0	12.0	1.00	**N54FM-1214-12**
16.0		18.0	24.0	17.0	1.00	**N54FM-1618-17**
20.0	+0.040 +0.124	23.0	30.0	21.5	1.50	**N54FM-2023-21**

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

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