

Low-cost Abrasion-resistant igidur® R



When to use it?

- When high wear resistance at low loads is required
- When a cost-effective plain bearing is required
- When very low coefficients of friction in dry operation are required
- When high edge loads occur
- When you are looking for low water absorption
- When PTFE and silicone are not allowed in your application



When not to use?

- When high pressure occurs
igidur® G
- When continuous operating temperatures are higher than +90°C
igidur® G, iglidur® P
- When the best wear resistance is required
igidur® J

Bearing technology | Plain bearing | iglidur® R



Ø
2.0 – 35.0mm



Also available as:



Bar stock, round bar
Page 676

Low-cost Abrasion-resistant

Low-cost material with low coefficient of friction and good wear resistance at low to medium loads.

- High wear resistance
- Low coefficient of friction
- Cost-effective
- Low moisture absorption
- Lubrication-free
- Maintenance-free



Bar stock, plate
Page 683

Typical application areas

- Sports and leisure
- Model making
- Furniture industry
- Mechatronics



tribo-tape liner
Page 691



Piston rings
Page 581



Two hole flange bearings
Page 603



Moulded special parts
Page 624



igubal® spherical balls
Page 846

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	1.39	
Colour		dark red	
Max. moisture absorption at +23°C and 50% r.h.	% weight	0.2	DIN 53495
Max. moisture absorption	% weight	1.1	
Coefficient of friction, dynamic, against steel	μ	0.09 – 0.25	
pv value, max. (dry)	MPa · m/s	0.27	
Mechanical properties			
Flexural modulus	MPa	1,950	DIN 53457
Flexural strength at +20°C	MPa	70	DIN 53452
Compressive strength	MPa	68	
Max. recommended surface pressure (+20°C)	MPa	23	
Shore D hardness		77	DIN 53505
Physical and thermal properties			
Max. application temperature long-term	°C	+90	
Max. application temperature short-term	°C	+110	
Min. application temperature	°C	-50	
Thermal conductivity	W/m · K	0.25	ASTM C 177
Coefficient of thermal expansion (at +23°C)	K ⁻¹ · 10 ⁻⁵	11	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	> 10 ¹²	DIN IEC 93
Surface resistance	Ω	> 10 ¹²	DIN 53482

Table 01: Material properties

The development of the iglidur® R as a bearing material focused on high performance and very low cost. Especially in the dry operation low coefficient of friction and wear were to be achieved. Plain bearings made from iglidur® R are supported by a combination of solid lubricants. The PTFE and silicon-free material achieves extremely low coefficient of friction in dry operation and runs largely free of stick-slip effects.

Moisture absorption

Under standard climatic conditions, the moisture absorption of iglidur® R plain bearings is approximately 0.2% weight. The saturation limit in water is 1.1% weight. This must be taken into account for these types of applications.

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® R are resistant up to a radiation intensity of $3 \cdot 10^2$ Gy.

Resistance to weathering

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

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® R 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® R at radial loads. At the maximum recommended surface pressure of 23MPa the deformation is about 4% at room temperature. 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® R plain bearings are suitable for high surface speeds. Speeds of up to 5.0m/s are permitted in linear motions. The maximum values shown in table 03 can only be achieved at low pressures. The specified values show the speed at which due to friction an increase in temperature up to the long-term permitted value can occur.

Surface speed, page 44

Temperature

With increasing temperatures, the compressive strength of iglidur® R plain bearings decreases. Diagram 02 shows this inverse relationship. The temperatures prevailing in the bearing system also have an influence on the wear. For temperatures over +50°C an additional securing is required.

Application temperatures, page 49

Additional securing, page 49

Friction and wear

Similar to wear resistance, the coefficient of friction μ also changes with the surface speed and load (diagrams 04 and 05). iglidur® R is especially suitable for applications in which high pv values are induced mainly through the high surface speed rather than surface pressure. Less distinct is the dependency of the coefficient of friction of the iglidur® R plain bearings on the shaft surface.

Coefficient of friction and surfaces, page 47

Wear resistance, page 50

Shaft materials

Diagrams 06 and 07 show the test results of iglidur® R plain bearings running against various shaft materials. At 0.3m/s and 1MPa, the high grade steel and Cf53 shafts are the best materials. With increasing loads the iglidur® R bearings feature the best wear behaviour with Cf53 and 304 stainless steel shafts. In pivoting applications, the hard-chromed shaft proves to be the ideal mating surface. 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® R 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	0.8	0.6	3.5
short-term m/s	1.2	1.0	5.0

Table 03: Maximum surface speeds

	Dry	Greases	Oil	Water
Coefficient of friction μ	0.09 - 0.25	0.09	0.04	0.04

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

\emptyset d1 [mm]	Housing		Plain bearing		Shaft	
	H7 [mm]	E10 [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

Technical data

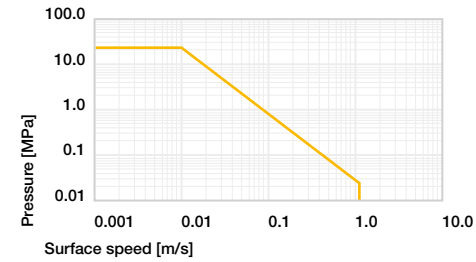


Diagram 01: Permissible pv values for iglidur® R plain bearings with a wall thickness of 1mm, dry operation against a steel shaft, at +20°C, mounted in a steel housing

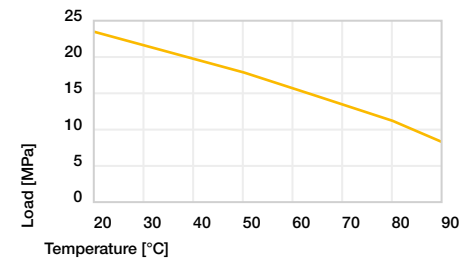


Diagram 02: Maximum recommended surface pressure as a function of temperature (23MPa at +20°C)

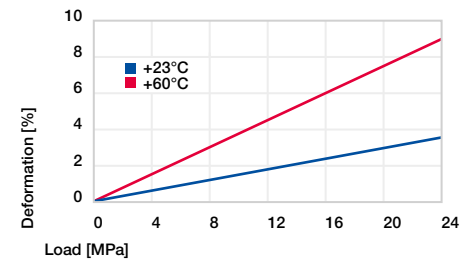


Diagram 03: Deformation under pressure and temperature

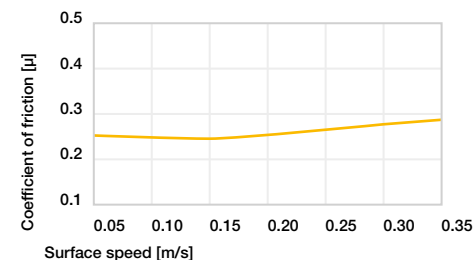


Diagram 04: Coefficient of friction as a function of the surface speed, p = 0.75MPa

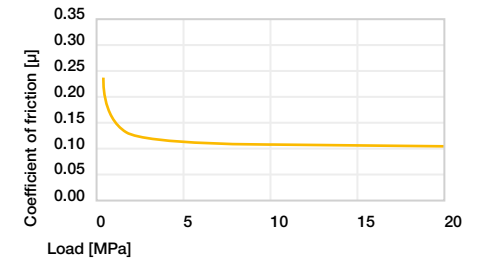


Diagram 05: Coefficient of friction as a function of the load, v = 0.01m/s

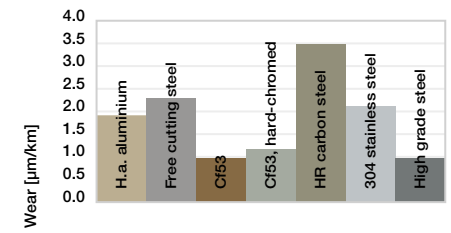


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1MPa, v = 0.3m/s

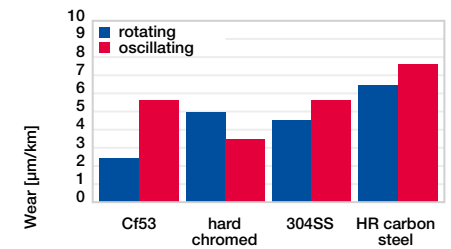
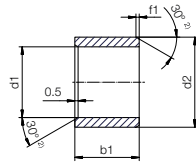


Diagram 07: Wear for rotating and oscillating applications with different shaft materials, p = 2MPa

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Sleeve bearing (form S)



²⁾ Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm]	Ø 1-6	Ø 6-12	Ø 12-30	Ø > 30
f1 [mm]	0.3	0.5	0.8	1.2

i Dimensions according to ISO 3547-1 and special dimensions



Order example: **RSM-0203-07** – no minimum order quantity.

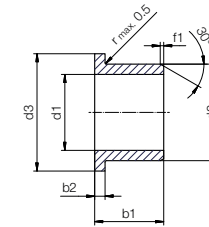
R iglidur® material S Sleeve bearing M Metric 02 Inner Ø d1 03 Outer Ø d2 07 Total length b1

d1 [mm]	d1 Tolerance ³⁾	d2 [mm]	b1 h13 [mm]	Part No.
2.0	+0.014 +0.054	3.6	7.0	RSM-0203-07
4.0		5.5	4.0	RSM-0405-04
5.0	+0.020 +0.068	7.0	5.0	RSM-0507-05
6.0		8.0	6.0	RSM-0608-06
8.0		10.0	10.0	RSM-0810-10
10.0	+0.025 +0.083	12.0	5.0	RSM-1012-05
10.0		12.0	10.0	RSM-1012-10
10.0		12.0	15.0	RSM-1012-15
12.0		14.0	12.0	RSM-1214-12
14.0		16.0	15.0	RSM-1416-15
15.0	+0.032 +0.102	17.0	15.0	RSM-1517-15
16.0		18.0	15.0	RSM-1618-15
18.0		20.0	25.0	RSM-1820-25
20.0		23.0	15.0	RSM-2023-15
20.0		23.0	20.0	RSM-2023-20
25.0		28.0	25.0	RSM-2528-25
28.0	+0.040 +0.124	32.0	12.0	RSM-2832-12
30.0		34.0	25.0	RSM-3034-25
30.0		34.0	30.0	RSM-3034-30
35.0	+0.050 +0.150	39.0	30.0	RSM-3539-30

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

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Flange bearing (form F)



²⁾ Thickness < 0.6mm: Chamfer = 20°

Chamfer in relation to d1

d1 [mm]	Ø 1-6	Ø 6-12	Ø 12-30
f1 [mm]	0.3	0.5	0.8

i Dimensions according to ISO 3547-1 and special dimensions



Order example: **RFM-0405-03** – no minimum order quantity.

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

d1 [mm]	d1 Tolerance ³⁾	d2 [mm]	d3 d13 ³⁾ [mm]	b1 h13 [mm]	b2 h13 [mm]	Part No.
4.0		5.5	9.0	3.0	0.75	RFM-0405-03
4.0	+0.020 +0.068	5.5	9.5	4.0	0.75	RFM-0405-04
5.0		7.0	11.0	5.0	1.00	RFM-0507-05
6.0		8.0	12.0	6.0	1.00	RFM-0608-06
8.0		10.0	15.0	5.0	1.00	RFM-0810-05
8.0	+0.025 +0.083	10.0	15.0	10.0	1.00	RFM-0810-10
10.0		12.0	18.0	10.0	1.00	RFM-1012-10
10.0		12.0	18.0	18.0	1.00	RFM-1012-18
12.0		14.0	20.0	10.0	1.00	RFM-1214-10
12.0		14.0	20.0	12.0	1.00	RFM-1214-12
14.0	+0.032 +0.102	16.0	22.0	17.0	1.00	RFM-1416-17
15.0		17.0	23.0	17.0	1.00	RFM-1517-17
16.0		18.0	24.0	17.0	1.00	RFM-1618-17
18.0		20.0	26.0	17.0	1.00	RFM-1820-17
20.0		23.0	30.0	21.5	1.50	RFM-2023-21
22.0	+0.040 +0.124	25.0	29.0	4.5	1.50	RFM-222529-045
25.0		28.0	35.0	21.5	1.50	RFM-2528-21

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/R



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.