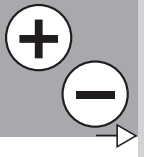


iglidur® R

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iglidur® R – Low Friction, Low Cost



- Low wear rate
- Low friction when running dry
- Very cost-effective

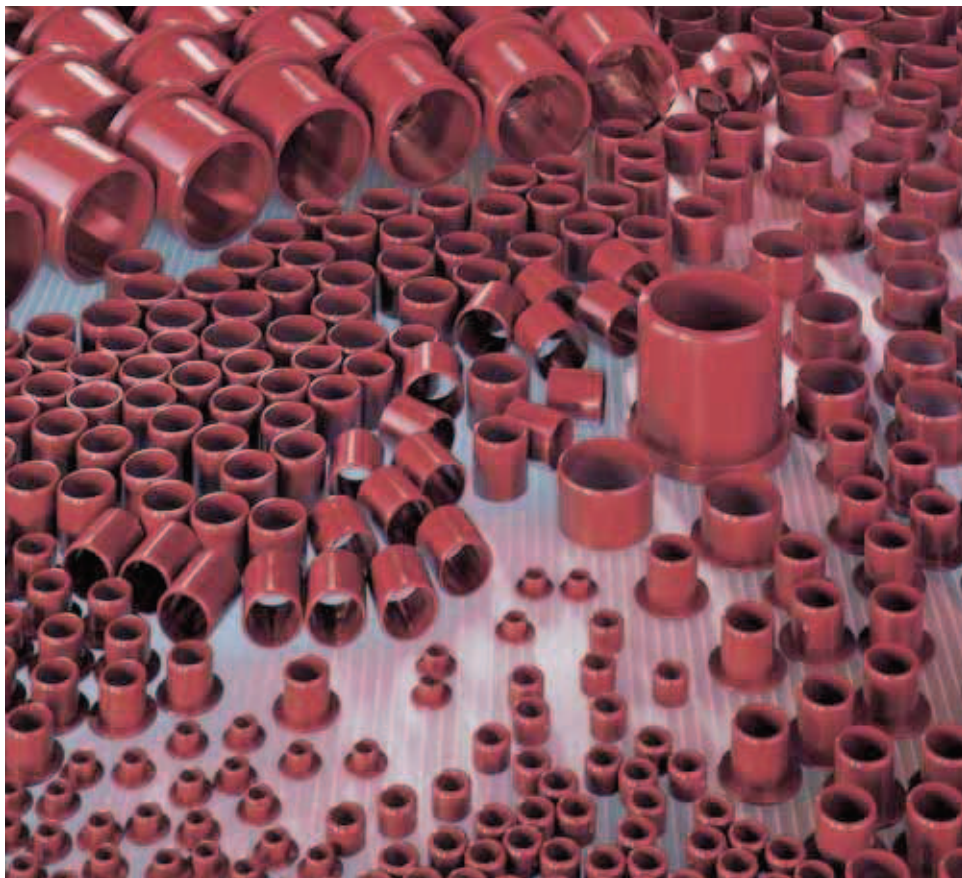


iglidur® R | Low Friction, Low Cost

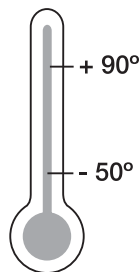
In the development of iglidur® R as a bearing material, high performance and a very low price were the top requirements. In particular, low coefficients of friction were needed at high speeds in the dry run.

iglidur® R

2 styles
Ø 6–20 mm



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igus® GmbH
51147 Cologne

Price index



Low Friction, Low Cost



When to use iglidur® R plain bearings:

- If high wear resistance at low load is required
- If you are looking for a very cost-effective bearing
- If low friction at dry operation is needed
- If edge loads occur
- If you are looking for low water absorption
- If PTFE and silicone are prohibited in the application

When not to use iglidur® R plain bearings:

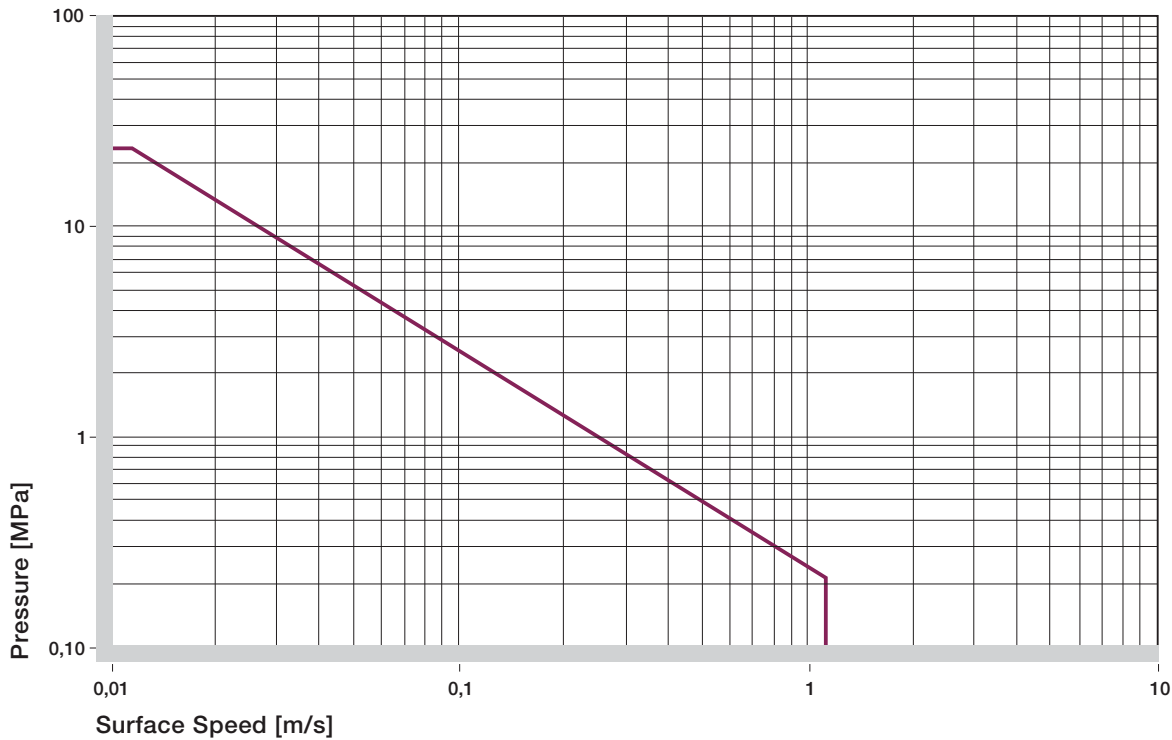
- If high pressure occurs
▶ iglidur® G (chapter 2)
- If permanent temperatures exceed 90°C
▶ iglidur® G (chapter 2),
 iglidur® P (chapter 17)
- If best wear resistance is required
▶ iglidur® J (chapter 3)

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E-mail info@igus.de

Material Table

General Properties	Unit	iglidur® R	Testing Method
Density	[g/cm ³]	1,39	
Colour		Dark Red	
Max. moisture absorption at 23°C / 50% r.F.	% weight	0,20	DIN 53495
Max. moisture absorption	% weight	1,10	
Coefficient of sliding friction, dynamic against steel μ		0,09 - 0,25	
$p \times v$ value, max. (dry)	MPa x m/s	0,27	
Mechanical Properties			
Modulus of elasticity	MPa	1.950	DIN 53457
Tensile strength 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. short term application temperature	°C	90	
Max. application temperature	°C	110	
Min. application temperature	°C	-50	
Thermal conductivity	W/m x K	0,25	ASTM C 177
Coefficient of thermal expansion (at 23°C)	K ⁻¹ x 10 ⁻⁵	11	DIN 53753
Electrical Properties			
Specific volume resistance	Ω cm	> 10 ¹²	DIN IEC 93
Surface resistance	Ω	> 10 ¹²	DIN 53482

Table 19.1: Material Data



Graph 19.1: Permissible $p \times v$ value for iglidur® R running dry against a steel shaft, at 20°C

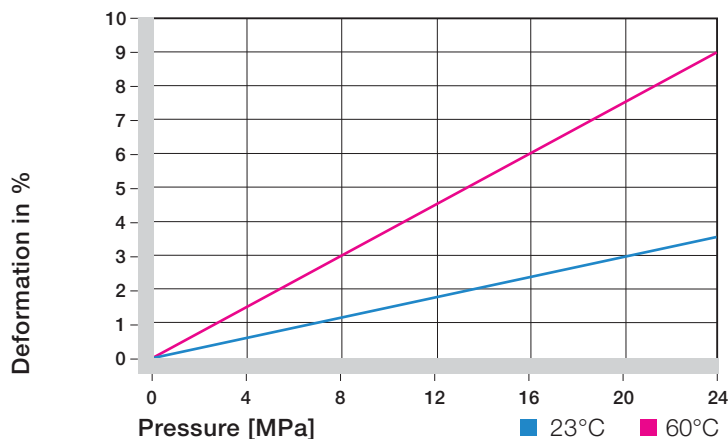


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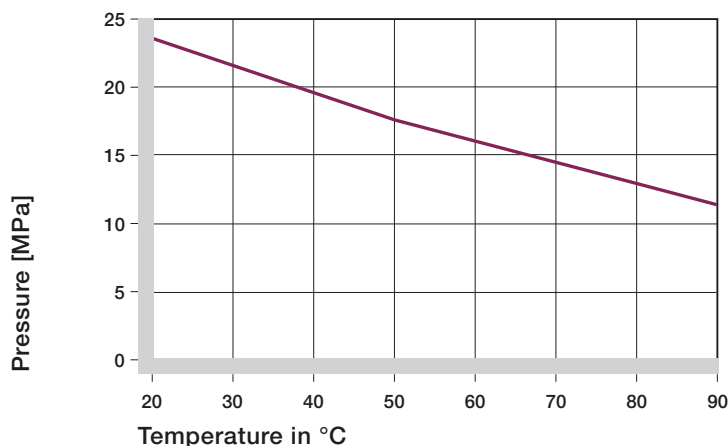
Graph 19.2: Deformation under pressure and temperature

m/s	Rotating	Oscillating	Linear
Continuous	0,8	0,6	3,5
Short term	1,2	1	5

Table 19.2: Maximum surface speeds

iglidur® R	Application Temperature
Minimum	-50 °C
Max. long term	+90 °C
Max. short term	+110 °C

Table 19.3: Temperature limits for iglidur® R



Graph 19.3: Recommended maximum surface pressure of iglidur® R as a function of temperature

During the development process of iglidur® R as a bearing material, high performance and a very low price were the top requirements. In particular, low coefficients of friction were needed at high speeds in the dry run. Plain bearings made of iglidur® R are supported by a combination of solid lubricants. This PTFE and silicone free material achieves excellent low friction values when running dry, and operates with virtually no stick slip.

Compressive Strength

iglidur® R plain bearings in the first place were developed for low to average radial loads. Graph 19.2 shows the elastic deformation of iglidur® R for radial loads. At the maximum permissible load of 23 MPa, the deformation is approximately 3%. Plastic deformation is not detectable up to this value. However, it is also dependent on the service time.

Graph 19.2

► Compressive Strength, page 1.18

Permissible Surface Speeds

iglidur® R plain bearings are used at high surface speeds. For linear movements, short-term speeds up to 10 m/s are permissible. Please note that the maximum values can only be achieved at the lowest pressure loads. These values show the speed at which friction causes a temperature increase to the maximum permitted.

Surface Speed, page 1.20

► p x v value, page 1.22

Temperatures

The maximum permissible short term temperature is 110°C, and the long term application temperature is 90°C. With increasing temperatures, the load rating of iglidur® R plain bearings decreases. Graph 19.3 shows this relationship. The ambient temperatures prevalent in the bearing system also have an effect on the bearing wear. With increasing temperatures, the wear increases.

- ☑ Graph 19.3
- ▶ Application Temperatures, page 1.23

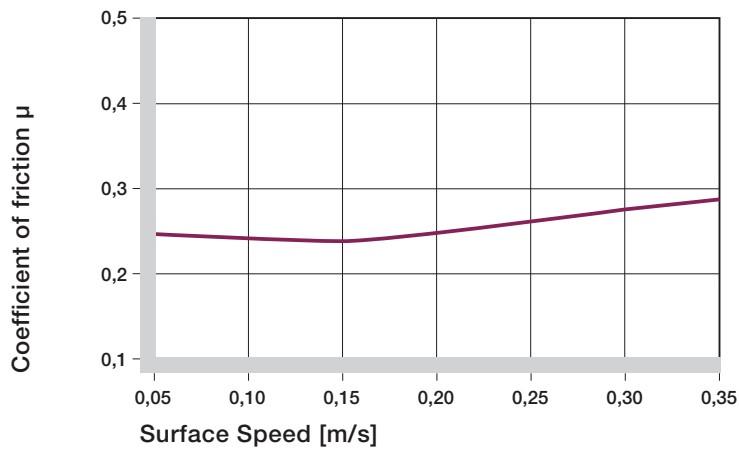
Friction and Wear

In the same way as the wear resistance, the coefficient of friction decreases with increasing load. In contrast, higher speeds have little effect on the coefficient of friction of iglidur® R plain bearings. iglidur® R is especially suitable for applications in which high $p \times v$ values are predominantly caused by the high speed, and not so much by the surface pressure. The coefficient of friction of iglidur® R plain bearings depends greatly on the shaft roughness. In the Ra range between 0.4 and 0.6 μm , the coefficient of friction reaches its optimum value. For values above and below this range, the friction of the bearing system increases quickly. Other shaft materials can be used without a large loss of tribological performance. Even with non-metallic shafts, good results were obtained in tests. Ceramic and plastic shafts can also be used.

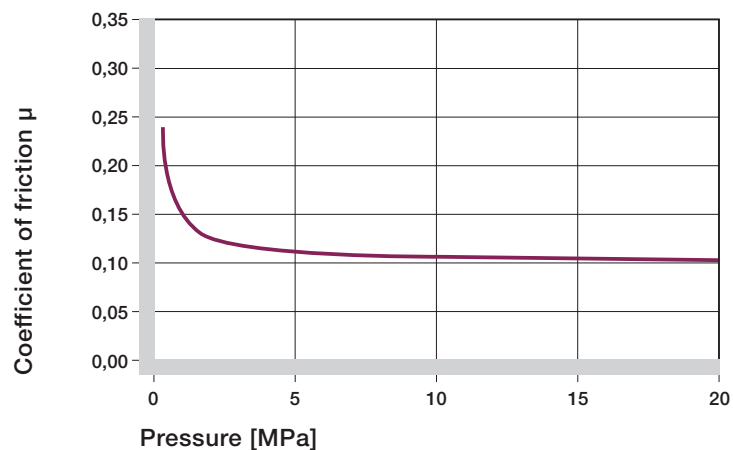
- ☑ Graphs 19.4 to 19.6
- ▶ Coefficients of Friction and Surfaces, page 1.25
- ▶ Wear Resistance, page 1.26

iglidur® R	Dry	Grease	Oil	Water
C.o.f. [μ]	0,09–0,25	0,09	0,04	0,04

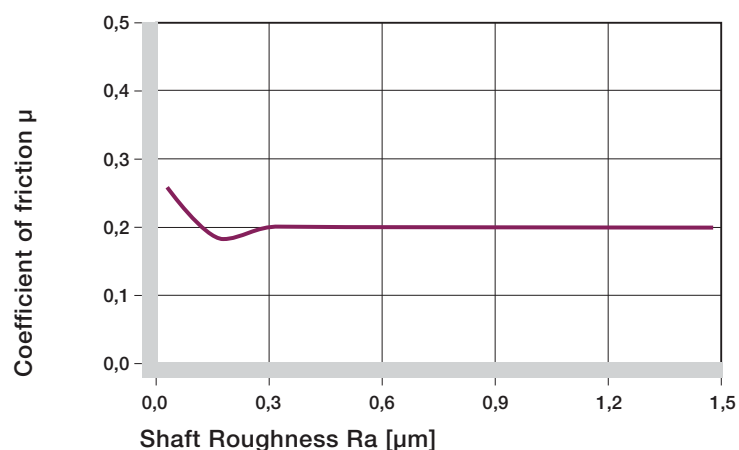
Table 19.4: Coefficients of friction for iglidur® R against steel ($R_a = 1 \mu\text{m}$, 50 HRC)



Graph 19.4: Coefficients of friction of iglidur® R as a function of the running speed; $p = 0.75 \text{ MPa}$



Graph 19.5: Coefficients of friction of iglidur® R as a function of the pressure, $v = 0.01 \text{ m/s}$

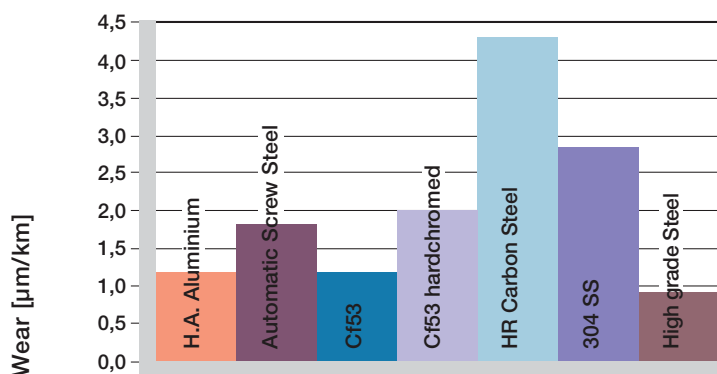


Graph 19.6: Coefficients of friction of iglidur® R as a function of the shaft surface (Cf53 hardened and ground steel)

iglidur® R

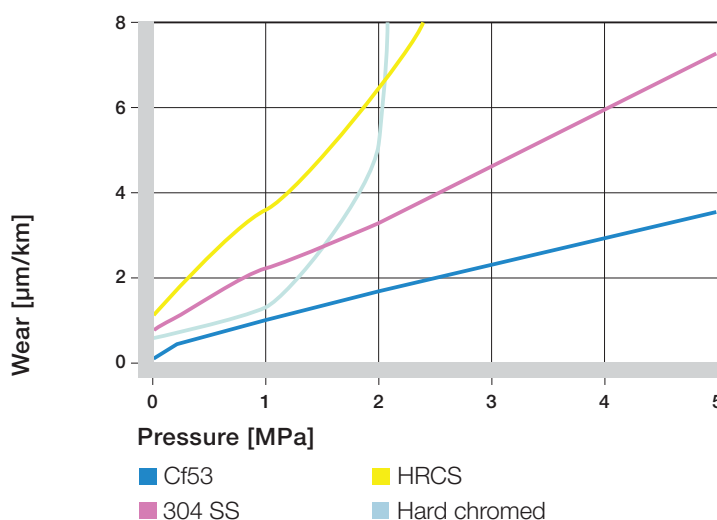
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Navigation icons: Home, Search, Information, and a unit selector showing 'mm'.

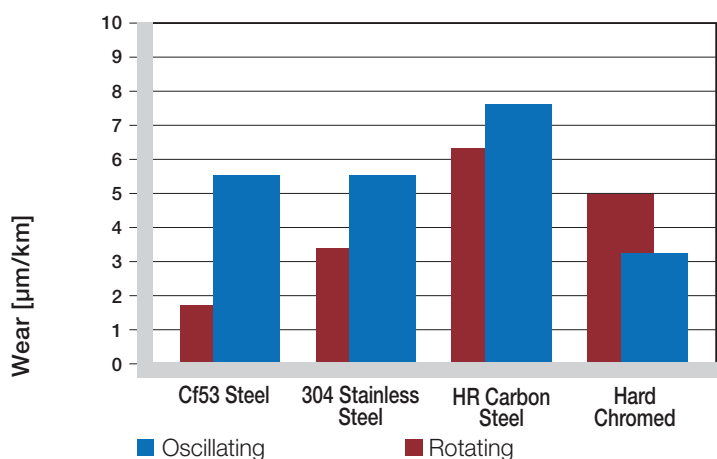


Shaft Materials

Graph 19.7: Wear of iglidur® R, rotating application with different shaft materials, $p = 0.75 \text{ MPa}$, $v = 0.5 \text{ m/s}$



Graph 19.8: Wear of iglidur® R with different shaft materials in rotating applications



Graph 19.9: Wear with different shaft materials, oscillating and rotating applications, $p = 2 \text{ MPa}$

Shaft Materials

Graphs 19.7 to 19.9 show results of testing different shaft materials with plain bearings made of iglidur® R.

In the low load range, the hard chromed shaft is the most suitable shaft material for iglidur® R plain bearings. At loads greater than 2 MPa, shafts made of Cf53 hardened and ground steel and 304 Stainless Steel increase wear resistance.

For oscillating operation, the CF53 hardened and ground steel shafts and the 304 Stainless Steel shafts can be used in the low load range. If the shaft material you plan to use is not contained in the test results presented here, please contact us.

- Graphs 19.7 to 19.9
- Shaft Materials, page 1.28

Installation Tolerances

iglidur® R plain bearings are meant to be oversized before being pressfit. The bearings are designed for pressfit into a housing with a H7 tolerance. After being assembled into a nominal size housing, the inner diameter is adjusted to meet our specified tolerances. Please adhere to the catalogue specifications for housing bore and recommended shaft sizes. This will help to ensure optimal performance of iglidur® R plain bearings.

- Testing Methods, page 1.35

Chemical Resistance

iglidur® R plain bearings are resistant to very weak acids, diluted alkaline, fuels and all types of lubricants.

The moisture absorption of iglidur® R plain bearings is approximately 0.2% in standard atmosphere. The saturation limit in water is 1%. This low moisture absorption allows for design in wet environments.

- Graph 19.10
- Chemical Table, page 70.10

Radiation Resistance

Plain bearings made from iglidur® R are resistant to radiation up to an intensity of 3×10^2 Gy.

UV Resistance

iglidur® R plain bearings are resistant to UV radiation, but the tribological properties are reduced by permanent exposure.

Vacuum

In a vacuum environment, iglidur® R plain bearings release gases. It is only possible to use iglidur® R in a vacuum to a limited extent.

Electrical Properties

iglidur® R plain bearings are electrically insulating.

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® R E10 [mm]
up to 3	0–0,025	+0,014 +0,054
> 3 to 6	0–0,030	+0,020 +0,068
> 6 to 10	0–0,036	+0,025 +0,083
> 10 to 18	0–0,043	+0,032 +0,102
> 18 to 30	0–0,052	+0,040 +0,124
> 30 to 50	0–0,062	+0,050 +0,150

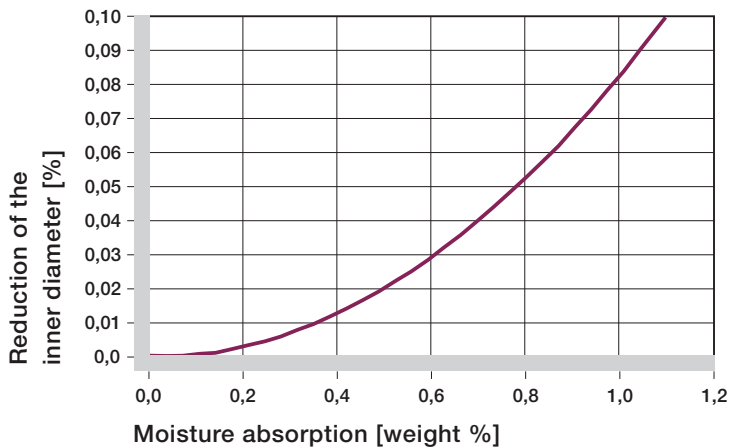
Table 19.5: Essential tolerances for iglidur® R plain bearings according to ISO 3547-1 after pressfit

Medium	Resistance
Alcohol	+
Hydrocarbons	+
Greases, oils	
without additives	+
Fuels	+
Diluted acids	0 to –
Strong acids	–
Diluted alkalines	+
Strong alkalines	+ to 0

Table 19.6: Chemical resistance of iglidur® R – detailed list, page 70.1

+ resistant 0 conditionally resistant – not resistant

All data given at room temperature [20°C]



Graph 19.10: Effect of moisture absorption on iglidur® R plain bearings

iglidur® R	
Specific	
volume resistance	> $10^{12} \Omega\text{cm}$
Surface resistance	> $10^{12} \Omega$

Table 19.7: Electrical Properties of iglidur® R

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iglidur® R | Sleeve Bearing | mm

R..M

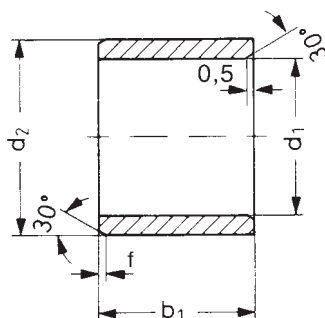
mm

iglidur® R – Type S/F

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Data in mm

Structure – part no.
R S M-0608-06



Chamfer in relation to the d1

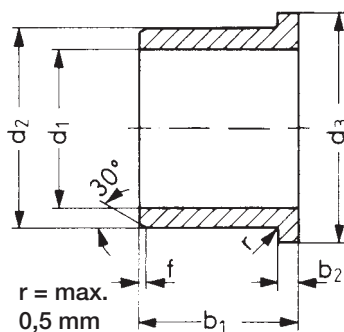
Dimensions according to ISO
3547-1 and special dimensions

d1 [mm]:	Ø 1-6	Ø 6-12	Ø 12-30	Ø > 30
f [mm]:	0,3	0,5	0,8	1,2

Part Number	d1	d1 Tolerance*	d2	b1 h13
RSM-0608-06	6	+0,020 +0,068	8	6
RSM-0810-10	8	+0,025 +0,083	10	10
RSM-1012-05	10	+0,025 +0,083	12	5
RSM-1012-10	10	+0,025 +0,083	12	10
RSM-1012-15	10	+0,025 +0,083	12	15
RSM-1214-12	12	+0,032 +0,102	14	12
RSM-1416-15	14	+0,032 +0,102	16	15
RSM-1618-15	16	+0,032 +0,102	18	15
RSM-2023-15	20	+0,040 +0,124	23	15
RSM-2023-20	20	+0,040 +0,124	23	20
RSM-3034-25	30	+0,040 +0,124	34	25
RSM-3539-30	35	+0,050 +0,150	39	30

*after pressfit. Testing methods ► page 1.35

iglidur® R | Flange Bearing | mm



Data in mm

Structure – part no.
R F M-0608-06



Chamfer in relation to the d1

Dimensions according to ISO
3547-1 and special dimensions

d1 [mm]:	Ø 1-6	Ø 6-12	Ø 12-30	Ø > 30
f [mm]:	0,3	0,5	0,8	1,2

Part Number	d1	d1 Tolerance*	d2	d3	b1 h13	b2
RFM-0608-06	6	+0,020 +0,068	8	12	6	1
RFM-0810-05	8	+0,025 +0,083	10	15	5	1
RFM-0810-10	8	+0,025 +0,083	10	15	10	1
RFM-1012-10	10	+0,025 +0,083	12	18	10	1
RFM-1012-18	10	+0,025 +0,083	12	18	18	1
RFM-1214-12	12	+0,032 +0,102	14	20	12	1
RFM-1416-17	14	+0,032 +0,102	16	22	17	1
RFM-1618-17	16	+0,032 +0,102	18	24	17	1
RFM-2023-21	20	+0,040 +0,124	23	30	21,5	1,5

*after pressfit. Testing methods ► page 1.35