



## "Food" bearing with high media resistance up to +90 °C – iglidur® A160

Compliant with EC directive 10/2011 EC

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FDA-compliant

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High media resistance

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Cost-effective

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Lubrication and maintenance-free

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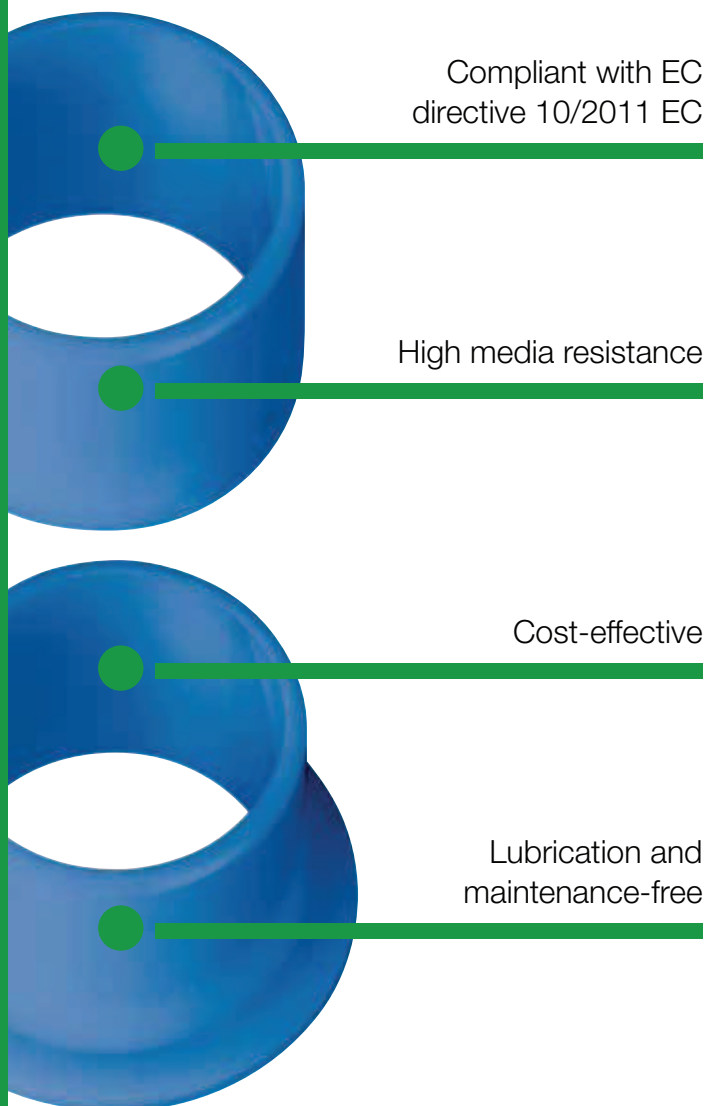
Standard range from stock

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# iglidur® A160 | "Food" bearing with high media resistance up to +90 °C

FDA- and EC 10/2011 compliant



iglidur® A160 offers maximum media resistance in the medium temperature range and is therefore a true low-cost iglidur®. The profile of properties is completed by the suitability for applications in the food industry.



## When to use it?

- When a bearing with maximum media resistance is required at normal temperatures
- When a very cost-effective bearing with high media resistance is required
- When a material compliant with the 10/2011 EC is required



## When not to use it?

- When a universal material for the food industry is required
  - ▶ iglidur® A180, page 349
  - ▶ iglidur® A181, page 325
- When a very media resistant bearing is required for applications at more than +90 °C
  - ▶ iglidur® A500, page 341
  - ▶ iglidur® X, page 237
- When a low-cost material with high wear resistance is required for dry running
  - ▶ iglidur® R, page 213

## Typical application areas

- Food industry
- Beverage technology
- Medical technology



### Available from stock

Detailed information about delivery time online.



### Block pricing online

No minimum order value. From batch size 1



max. +90 °C  
min. -50 °C



Ø 6–20 mm

More dimensions on request



### Online product finder

▶ [www.igus.eu/iglidur-finder](http://www.igus.eu/iglidur-finder)



iglidur® A160 material complies with EC Directive 10/2011 EC and also with FDA (Food and Drug Administration) specifications for repeated contact with food.

## Material properties table

General properties	Unit	iglidur® A160	Testing method
Density	g/cm <sup>3</sup>	1.00	
Colour		blue	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	0.1	DIN 53495
Max. water absorption	% weight	0.1	
Coefficient of sliding friction, dynamic against steel	μ	0.09–0.19	
pv value, max. (dry)	MPa · m/s	0.25	
Mechanical properties			
Flexural modulus	MPa	1,151	DIN 53457
Flexural strength at +20 °C	MPa	19	DIN 53452
Compressive strength	MPa	37	
Max. permissible surface pressure (+20 °C)	MPa	15	
Shore-D hardness		60	DIN 53505
Physical and thermal properties			
Max. long-term application temperature	°C	+90	
Max. short-term application temperature	°C	+100	
Min. application temperature	°C	-50	
Thermal conductivity	W/m · K	0.30	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	K <sup>-1</sup> · 10 <sup>-5</sup>	11	DIN 53752
Electrical properties			
Specific volume resistance	Ωcm	> 10 <sup>12</sup>	DIN IEC 93
Surface resistance	Ω	> 10 <sup>12</sup>	DIN 53482

Table 01: Material properties table

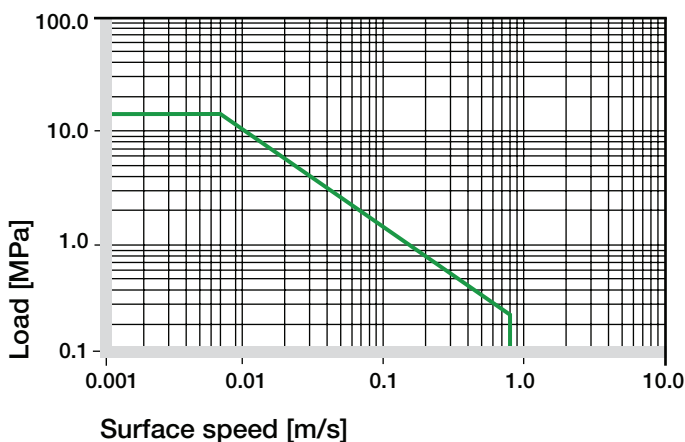


Diagram 01: Permissible pv values for iglidur® A160 bearings with a wall thickness of 1 mm dry running against a steel shaft, at +20 °C, mounted in a steel housing

### Moisture absorption

The humidity absorption of iglidur® A160 bearings amounts to about 0.1 % weight in standard climatic conditions. The saturation limit submerged in water is also approximately 0.1 % weight.

► Diagram, [www.igus.eu/a160-moisture](http://www.igus.eu/a160-moisture)

### Vacuum

When used in a vacuum, the iglidur® A160 plain bearings release moisture as a vapour. Use in a vacuum environment is only possible with dehumidified bearings.

### Radiation resistance

Plain bearings made from iglidur® A160 are resistant to radiation up to an intensity of  $1 \cdot 10^5$  Gy.

### UV resistance

iglidur® A160 plain bearings are partially resistant to UV radiation.

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

+ resistant 0 conditionally resistant – not resistant  
All data given at room temperature [+20 °C]

Table 02: Chemical resistance

► Chemical table, page 1424

iglidur® A160 plain bearings are characterised by extreme media resistance at a low-cost. Tribologically optimised, the material can be used in up to +90 °C and also possesses conformities demanded in the food processing sector. The profile of properties is completed by the "optical detectability", i.e. the blue colour, often required in the industry.

## Mechanical properties

With increasing temperatures, the compressive strength of iglidur® A160 plain bearings decreases. The permissible maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

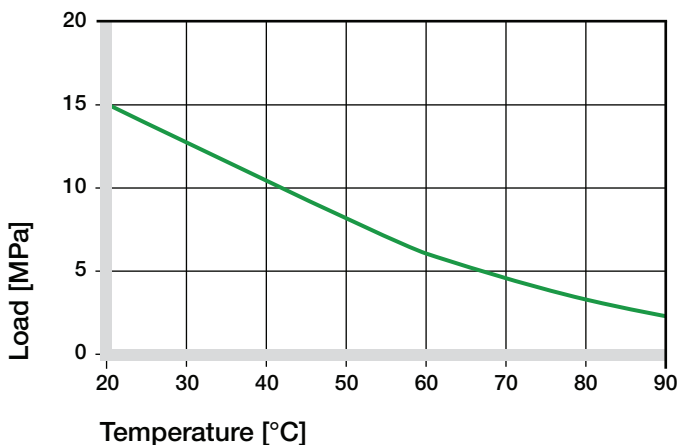


Diagram 02: Permissible maximum surface pressure as a function of temperature (15 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® A160 during radial loading. Plastic deformation is minimal up to a radial load of 15 MPa. It is nonetheless depending on the duration of the applied force.

- ▶ Surface pressure, [page 41](#)

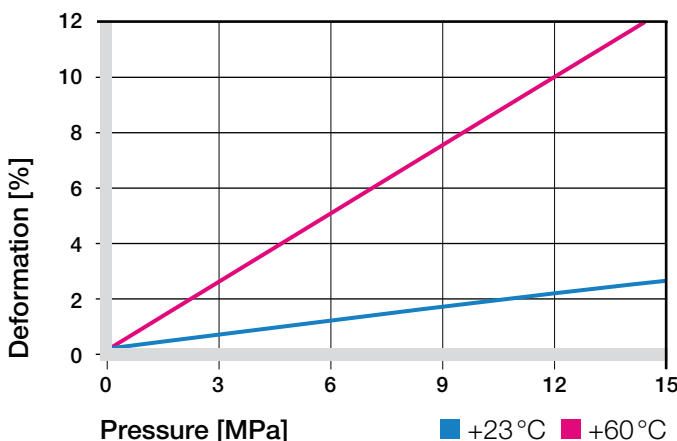


Diagram 03: Deformation under pressure and temperature

## Permissible surface speeds

iglidur® A160 was developed for low surface speeds. Maximum speeds up to 0.5 m/s (rotating) and 2.0 m/s (linear) respectively are permitted for continuous application in dry operation.

The given values in table 03 indicate the limits at which an increase up to the continuous permissible temperature occurs. This increase is a result of friction. In practice, though, this temperature level is rarely reached, due to varying application conditions.

- ▶ Surface speed, [page 44](#)
- ▶ pv value and lubrication, [page 86](#)

m/s	Rotating	Oscillating	Linear
Continuous	0.5	0.4	2
Short-term	0.7	0.6	3

Table 03: Maximum surface speeds

## Temperatures

With increasing temperatures, the compressive strength of iglidur® A160 plain bearings decreases. The diagram 02 shows this inverse relationship. The temperatures prevailing in the bearing system also have an influence on the bearing wear. At temperatures over +60 °C an additional securing is required.

- ▶ Application temperatures, [page 49](#)
- ▶ Additional securing, [page 49](#)

## Friction and wear

Coefficient of friction and wear resistance alter with the application parameters. For iglidur® A160 bearings, the alteration of the coefficient of friction  $\mu$  depends on surface speed and the shaft surface finish is only negligently pronounced. With increasing load, the coefficient of friction however sinks markedly. In the Ra range between 0.6 and 0.7  $\mu\text{m}$ , the coefficient of friction attains the optimum value.

- ▶ Coefficients of friction and surfaces, [page 47](#)
- ▶ Wear resistance, [page 50](#)

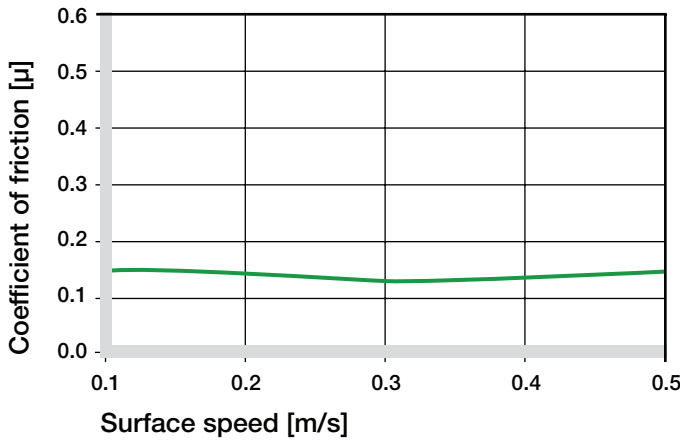


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1 MPa

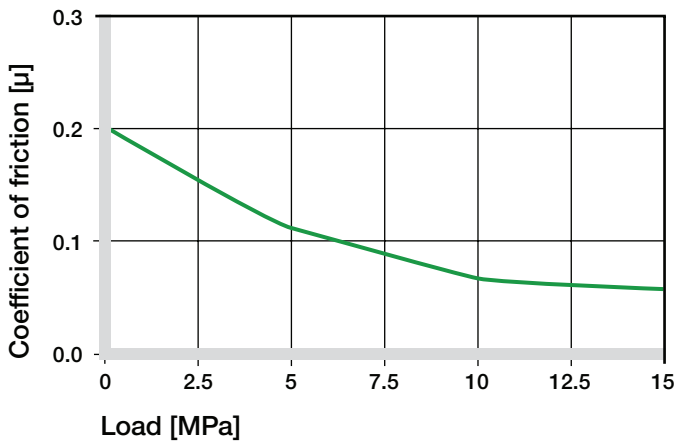


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

### Shaft materials

Diagram 06 shows results of testing different shaft materials with plain bearings made from iglidur® A160 running dry. For rotational applications with low loads, the most interesting, media- and corrosion-resistant shaft materials 304 stainless steel, high grade steel and hard chrome-plated steel reveal themselves as particularly good counter partners. On high grade steel shafts, however, the wear increases the fastest with the load (diagram 06). With Cf53 shafts, the wear in pivoting applications is exemplary compared to rotating applications. In rotation the wear, as with many other iglidur® materials, is higher than when pivoting (diagram 07).

► Shaft materials, page 52

iglidur® A160	Dry	Greases	Oil	Water
C.o.f. μ	0.09–0.19	0.08	0.03	0.04

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

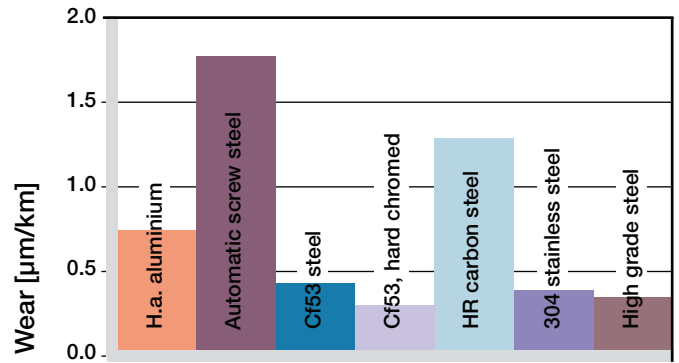


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1 MPa, v = 0.3 m/s

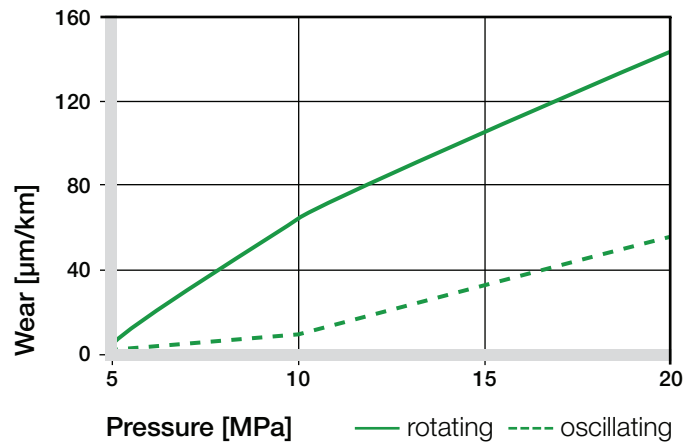


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

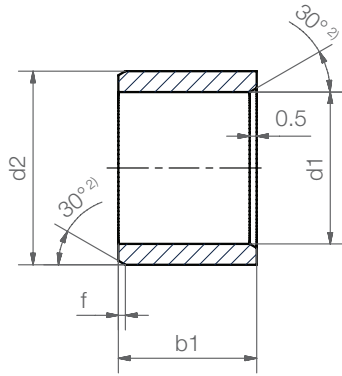
### Installation tolerances

iglidur® A160 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit 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.

► Testing methods, page 57

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® A160 E10 [mm]	Housing H7 [mm]
up to 3	0–0.025	+0.014 +0.054	0 +0.010
> 3 to 6	0–0.030	+0.020 +0.068	0 +0.012
> 6 to 10	0–0.036	+0.025 +0.083	0 +0.015
> 10 to 18	0–0.043	+0.032 +0.102	0 +0.018
> 18 to 30	0–0.052	+0.040 +0.124	0 +0.021
> 30 to 50	0–0.062	+0.050 +0.150	0 +0.025

Table 05: Important tolerances for plain bearings according to ISO 3547-1 after pressfit



## Order key

Type

Dimensions [mm]

A160 S M-0608-06

iglidur® material	Form S	Metric	Inner-Ø d1	Outer-Ø d2	Length b1
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Dimensions according to ISO 3547-1  
and special dimensions

<sup>2)</sup> Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

d1 [mm]:    Ø 1-6    |    Ø 6-12    |    Ø 12-30    |    Ø > 30

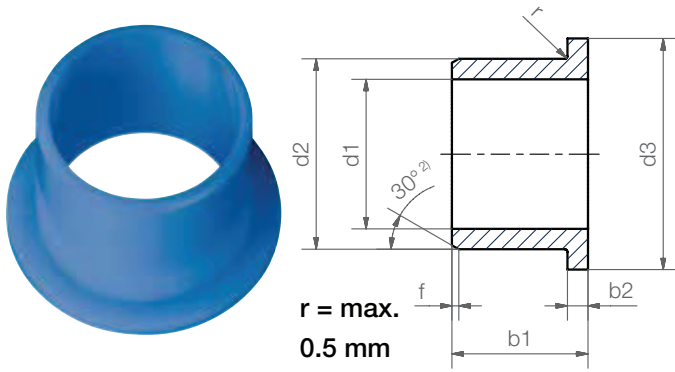
f [mm]:        0.3        |        0.5        |        0.8        |        1.2

## Dimensions [mm]

d1	d1-Tolerance <sup>3)</sup>	d2	b1 h13	Part No.
6.0	+0.020 +0.068	8.0	6.0	A160SM-0608-06
8.0	+0.025 +0.083	10.0	10.0	A160SM-0810-10
10.0	+0.025 +0.083	12.0	10.0	A160SM-1012-10
12.0	+0.032 +0.102	14.0	12.0	A160SM-1214-12
16.0	+0.032 +0.102	18.0	15.0	A160SM-1618-15
20.0	+0.040 +0.124	23.0	20.0	A160SM-2023-20

<sup>3)</sup> After press-fit. Testing methods ► Page 57

## Flange bearing (Form F)



### Order key

Type

Dimensions [mm]

**A160 F M-06 08-06**

iglidur® material	Form F	Metric	Inner-Ø d1	Outer-Ø d2	Length b1
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<sup>2)</sup> Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

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



Dimensions according to ISO 3547-1 and special dimensions

### Dimensions [mm]

d1	d1-Tolerance <sup>3)</sup>	d2	d3 d13	b1 h13	b2 -0.14	Part No.
6.0	+0.020 +0.068	8.0	12.0	6.0	1.0	<b>A160FM-0608-06</b>
8.0	+0.025 +0.083	10.0	15.0	10.0	1.0	<b>A160FM-0810-10</b>
10.0	+0.025 +0.083	12.0	18.0	10.0	1.0	<b>A160FM-1012-10</b>
12.0	+0.032 +0.102	14.0	20.0	12.0	1.0	<b>A160FM-1214-12</b>
16.0	+0.032 +0.102	18.0	24.0	17.0	1.0	<b>A160FM-1618-17</b>
20.0	+0.040 +0.124	23.0	30.0	21.5	1.5	<b>A160FM-2023-21</b>

<sup>3)</sup> After press-fit. Testing methods ► Page 57



### Couldn't find your size?

Do you need another length, other dimensions or tolerances? You need a particular design or alternative for your application? Please call us. igus® listens to your needs and provides you a solution very quickly.