


3D printing with tribo-filaments

50 times more abrasion-resistant than standard materials for maximum service life
Components made of igus® tribo-filament are up to 50 times more wear-resistant than standard materials for 3D printing and therefore have an extremely long service life. Due to their excellent tribological properties, they are suited for 3D printing of replacement and wear-resistant parts for e.g. plain bearings, drive nuts, gears and other wear-resistant parts.
The igus® tribo-filaments can be processed on 3D printers that are based on the fused-deposition-modelling method (FDM/FFF) and that allow the nozzle temperature to be set as required.

 **Find and order the appropriate tribo-filament online**
▶ www.igus.eu/tribofilament



"How do I assess myself and my 3D printer?"

Ambient temperature of application	Beginner "Nothing can go wrong"	Advanced "Everything is usually ok"	Expert "I know what I am doing"
-30°C to +65°C	iglidur® I150	iglidur® I150 iglidur® I180	iglidur® I180 / iglidur® J260 iglidur® I170
-40°C to +80°C	iglidur® I180	iglidur® I180	iglidur® I180 / iglidur® J260 iglidur® I170
-30°C to +100°C			iglidur® J260 iglidur® C210
-100°C to +120°C			iglidur® J260
-100°C to +180°C			iglidur® A350 / iglidur® J350 iglidur® RW370 ¹⁷²⁾

¹⁷²⁾ -50°C to +170°C for iglidur® RW370



Material:
iglidur® I150

Wear-resistant parts printed the easy way

- High abrasion resistance at low speeds
- Good mechanical properties
- The easiest to process tribo-filament (even without a heated print bed)
- Food-compatible according to EU10/2011 regulation
- Nozzle temperature: +240°C up to +250°C

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Material:
iglidur® J260

Extremely long service life and excellent coefficient of friction

- Outstanding abrasion resistance of tribo-filaments
- Application temperature from -100°C to +120°C
- High-quality processing
- Nozzle temperature: +260°C up to +270°C

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Material:
iglidur® I170

Longer service life

- Improved abrasion resistance
- High-quality processing
- Nozzle temperature: +240°C up to +260°C

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Material:
iglidur® RW370

Ideal for rail technology

- Flame-retardant and high strength
- Application temperature from -50°C to +170°C
- High temperature printer necessary
- Nozzle temperature: +350°C up to +360°C

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Material:
iglidur® I180

Best combination of ability to be processed and service life

- Abrasion-resistant
- Good mechanical properties
- Nozzle temperature: +250°C up to +260°C
- Also in black (iglidur® I180-BL)

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Material:
iglidur® J350

For high temperature applications

- Excellent coefficient of friction against steel
- Application temperature from -100°C to +180°C
- High temperature necessary of at least +160°C installation space temperature
- Nozzle temperature: +360°C up to +370°C

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Material:
iglidur® C210

Resistant to chemicals and highly abrasion-resistant during printing

- High chemical resistance
- Abrasion-resistant
- High-quality processing
- Nozzle temperature: +260°C up to +270°C

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Material:
iglidur® A350

For the food industry

- Compliant with Regulation (EU) No. 10/2011 and FDA guidelines
- Application temperature from -100°C to +180°C
- High temperature printer necessary
- Nozzle temperature: +360°C up to +370°C

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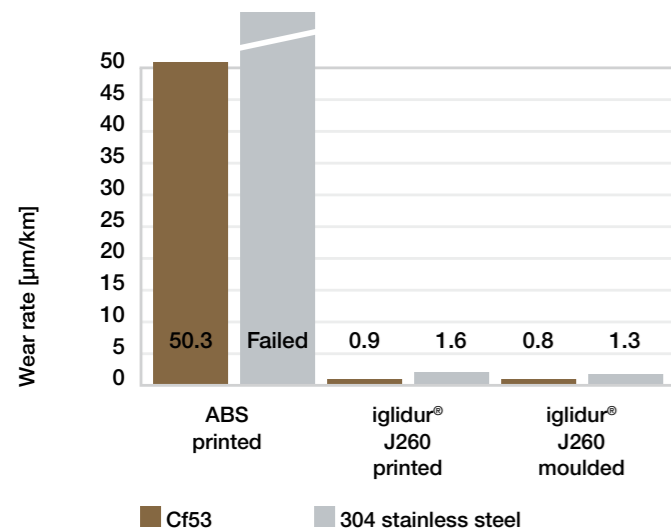


3D print filament impresses during tests with injection moulding quality

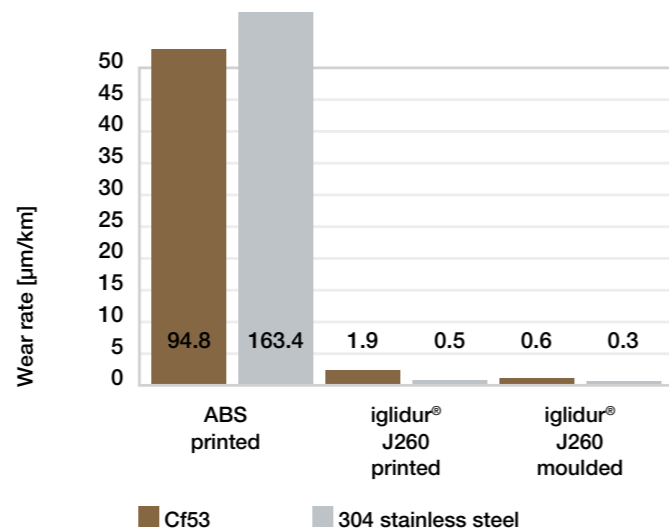
Our iglidur® J260 tribo-filament is more wear-resistant than standard 3D printing materials. A series of igus® tests show: 3D printed plain bearings made from the filament iglidur® J260 are equally as wear-resistant as our injection-moulded parts from the same material. The tests have also proven that iglidur® 3D print filaments and SLS materials have a considerably lower coefficient of friction and are up to 50 times more abrasion-resistant than conventional 3D printing materials.

This makes iglidur® tribo-filaments and SLS materials the only 3D printing materials to also offer impressive performance in moving applications. You can therefore directly install printed parts such as plain bearings, drive nuts or worm gears and use them as wear-resistant parts – from the prototype phase to series production.

- Outstanding abrasion resistance of tribo-filaments
- Application temperature from -100°C to +120°C
- High-quality processing
- Available as filament, bar stock or injection-moulded part – **from prototype to series production**



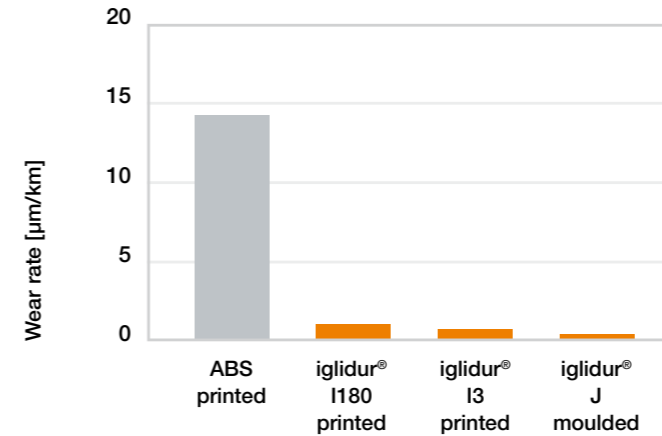
Rotating wear: p = 1MPa; v = 0.3m/s



Linear wear: p = 1MPa; v = 0.3m/s; l = 5mm

Wear-resistant parts made of iglidur® tribo-filament with the 3D printing method or parts made of iglidur® I3 with the SLS method are much more wear-resistant than standard 3D printing materials.

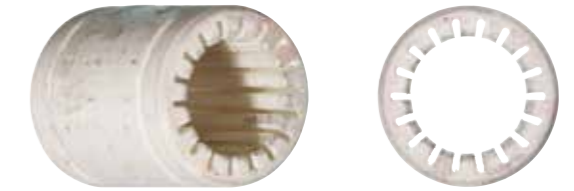
The following tests also show "printed as good as injection-moulded": the 3D-printed iglidur® plain bearings are comparable to conventionally made plain bearings with respect to wear resistance.



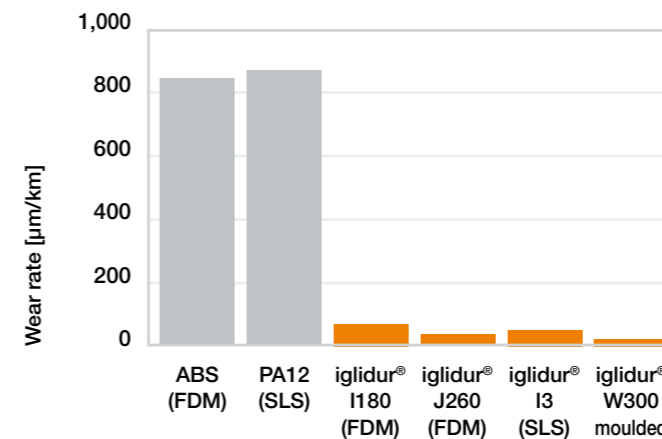
Linear wear: p = 0.11MPa; v = 0.34m/s; l = 370mm



ABS printed



iglidur® I180 printed



Wear, rotating p = 20 MPa; v = 0.01m/s, 304 stainless steel



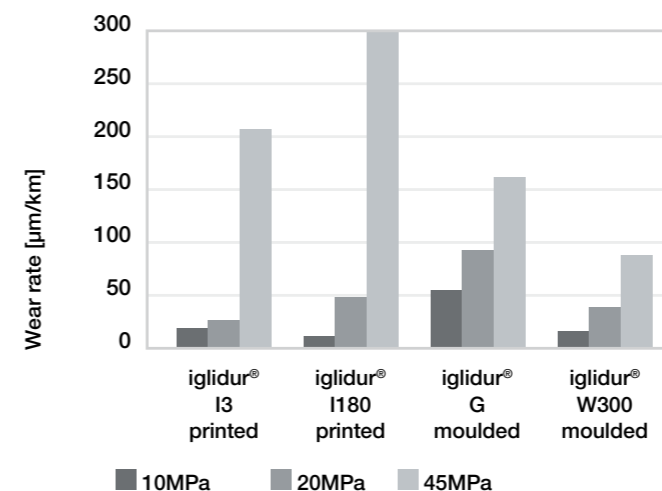
ABS

PA12



iglidur® I3

iglidur® I180



Wear, pivoting shaft: 304 stainless steel, v = 0.01m/s; β = 60°



iglidur® I3

iglidur® I180



iglidur® G

iglidur® W300



iglidur® I150



Order key

tribo-filament	Diameter	Weight
I150-PF-	0175	-0250
iglidur® material	tribo-filament	Ø [mm · 100]
		Spool weight [g]

iglidur® I150 – makes printing even easier

- High abrasion resistance at low speeds
- Good mechanical properties
- The tribo-filament that is easiest to process
- Compliant with food requirements according to (EU) No 10/2011
- Recommended printing surface: igus® adhesive film or glue-stick on glass
- Also to be processed without a heated print bed (prerequisite: igus® adhesive film ► **Page 728**)

Dimensions [mm]

Filament diameter	Outer Ø spool	Inner Ø spool	Spool width	Weight [g]	Part No.
1.75	205	55	55	250	I150-PF-0175-0250
1.75	205	55	67	750	I150-PF-0175-0750
3.00	205	55	55	250	I150-PF-0300-0250
3.00	205	55	67	750	I150-PF-0300-0750

Material properties

General properties	Unit	iglidur® I150	iglidur® I180	iglidur® I180-BL
Density	g/cm³	1.30	1.21	1.21
Colour		white	white	black
Max. moisture absorption at +23°C/50% r. h.	% weight	0.3	0.3	0.3
Max. total moisture absorption	% weight	0.7	0.9	0.9
Mechanical properties				
Flexural modulus	MPa	1,700	1,700	1,700
Flexural strength at +20°C	MPa	54/37 ¹³⁰⁾	46/33 ¹³⁰⁾	46/33 ¹³⁰⁾
Shore D hardness		62	66	66
Physical and thermal properties				
Max. long-term application temperature	°C	+65	+80	+80
Max. short-term application temperature	°C	+75	+90	+90
Min. continuous application temperature	°C	-30	-40	-40
Electrical properties				
Specific contact resistance	Ωcm	> 10 ¹³	> 10 ¹²	> 10 ¹²
Surface resistance	Ω	> 10 ¹²	> 10 ¹¹	> 10 ¹¹

Table 01: Material properties table

¹³⁰⁾ Printed flat/upright



iglidur® I180



Order key

tribo-filament	Diameter	Weight
I180-PF-	0175	-0250
iglidur® material	tribo-filament	Ø [mm · 100]
		Spool weight [g]



iglidur® I180-BL

iglidur® I180 – flexible

- High degree of abrasion resistance, even in the case of dynamic applications
- Good mechanical properties
- Max. application temperature: +80°C
- Recommended printing surface: igus® adhesive film ► **Page 728**

iglidur® I180-BL – for visible parts

- In black for visible parts
- Same mechanical and tribological properties as iglidur® I180 in white

Dimensions [mm]

Filament diameter	Outer Ø spool	Inner Ø spool	Spool width	Weight [g]	Part No.
1.75	205	55	55	250	I180-PF-0175-0250
1.75	205	55	67	750	I180-PF-0175-0750
3.00	205	55	55	250	I180-PF-0300-0250
3.00	205	55	67	750	I180-PF-0300-0750
1.75	205	55	55	250	I180-BL-PF-0175-0250
1.75	205	55	67	750	I180-BL-PF-0175-0750
3.00	205	55	55	250	I180-BL-PF-0300-0250
3.00	205	55	67	750	I180-BL-PF-0300-0750

Processing and accessories
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Complete processing instructions online (in the download area of the respective material)
► www.igus.eu/tribofilament

Part No. adhesive film for print bed
PF-01-0203-0203 (203 x 203mm)
PF-01-0254-0228 (254 x 228mm)



iglidur® J260



Order key

tribo-filament	Diameter	Weight
J260-PF-	0175	-0250
iglidur® material	tribo-filament	Ø [mm · 100]
		Spool weight [g]

iglidur® J260 – extremely long service life

- Outstanding abrasion resistance of tribo-filaments
- Application temperature from -100°C to +120°C
- For experts: high-quality processing
- Recommended printing surface:
igus® adhesive film ► **Page 728**

Dimensions [mm]

Filament diameter	Outer Ø spool	Inner Ø spool	Spool width	Weight [g]	Part No.
1.75	205	55	55	250	J260-PF-0175-0250
1.75	205	55	67	750	J260-PF-0175-0750
3.00	205	55	55	250	J260-PF-0300-0250
3.00	205	55	67	750	J260-PF-0300-0750

Material properties

General properties	Unit	iglidur® J260	iglidur® J350
Density	g/cm³	1.35	1.44
Colour		Yellow	Yellow
Max. moisture absorption at +23°C/50% r. h.	% weight	0.2	0.3
Max. total moisture absorption	% weight	0.4	1.6
Mechanical properties			
Flexural modulus	MPa	1,000	1,400
Flexural strength at +20°C	MPa	41/13 ¹³⁰⁾	45/-
Shore D hardness		66	80
Physical and thermal properties			
Max. long-term application temperature	°C	+120	+180
Max. short-term application temperature	°C	+140	+220
Min. continuous application temperature	°C	-100	-100
Electrical properties			
Specific contact resistance	Ωcm	> 10 ¹²	> 10 ¹³
Surface resistance	Ω	> 10 ¹⁰	> 10 ¹⁰

Table 01: Material properties table

¹³⁰⁾ Printed flat/upright



iglidur® J350



Order key

tribo-filament	Diameter	Weight
J350-PF-	0175	-0250
iglidur® material	tribo-filament	Ø [mm · 100]
		Spool weight [g]

iglidur® J350 – for high temperature applications

- Max application temperature: +180°C
- Can be processed with high-temperature 3D printer
- Nozzle temperature: +360°C up to +370°C

- Installation area temperature: from +160°C to +200°C
- Recommended printing surface: PET film

Dimensions [mm]

Filament diameter	Outer Ø spool	Inner Ø spool	Spool width	Weight [g]	Part No.
1.75	205	55	55	250	J350-PF-0175-0250

Processing and accessories
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Part No. adhesive film for print bed
PF-01-0203-0203 (203 x 203mm)
PF-01-0254-0228 (254 x 228mm)

Complete processing instructions online
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► www.igus.eu/tribofilament



iglidur® I170



Order key

tribo-filament	Diameter	Weight
I170-PF-	0175	-0250
iglidur® material	tribo-filament	Ø [mm · 100]
		Spool weight [g]

iglidur® I170 – optimised service life

- Improved abrasion resistance
- Application temperature: +80°C
- For experts: high-quality processing
- Recommended printing surface:
igus® adhesive film ► **Page 728**

Dimensions [mm]

Filament diameter	Outer Ø spool	Inner Ø spool	Spool width	Weight [g]	Part No.
1.75	205	55	55	250	I170-PF-0175-0250
1.75	205	55	67	750	I170-PF-0175-0750
3.00	205	55	55	250	I170-PF-0300-0250
3.00	205	55	67	750	I170-PF-0300-0750

Material properties

General properties	Unit	iglidur® I170	iglidur® C210
Density	g/cm³	1.21	1.40
Colour		Yellow	white
Max. moisture absorption at +23°C/50% r. h.	% weight	0.5	0.3
Max. total moisture absorption	% weight	1.6	0.7
Mechanical properties			
Flexural modulus	MPa	1,000	1,600
Flexural strength at +20°C	MPa	33/17 ¹³⁰⁾	38/30 ¹³⁰⁾
Shore D hardness		64	70
Physical and thermal properties			
Max. long-term application temperature	°C	+75	+100
Max. short-term application temperature	°C	+85	+180
Min. continuous application temperature	°C	-40	-30
Electrical properties			
Specific contact resistance	Ωcm	> 10 ¹²	> 10 ¹³
Surface resistance	Ω	> 10 ¹¹	> 10 ¹²

Table 01: Material properties table

¹³⁰⁾ Printed flat/upright



iglidur® C210



Order key

tribo-filament	Diameter	Weight
C210-PF-	0175	-0250
iglidur® material	tribo-filament	Ø [mm · 100]
		Spool weight [g]

iglidur® C210 – chemicals and high abrasions resistance

- Resistance to many acids, solvents and hydrogen
- Abrasion-resistant
- Max application temperature: +100°C
- For experts: high-quality processing

- Recommended printing surface:
igus® adhesive film ► **Page 728**

Dimensions [mm]

Filament diameter	Outer Ø spool	Inner Ø spool	Spool width	Weight [g]	Part No.
1.75	205	55	55	250	C210-PF-0175-0250
3.00	205	55	55	250	C210-PF-0300-0250



Processing and accessories
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Part No. adhesive film for print bed
PF-01-0203-0203 (203 x 203mm)
PF-01-0254-0228 (254 x 228mm)



Complete processing instructions online
(in the download area of the respective material)
► www.igus.eu/tribofilament



iglidur® RW370



Order key

tribo-filament	Diameter	Weight
RW370-PF-	0175	-0750
iglidur® material	tribo-filament	Ø [mm · 100]
		Spool weight [g]

iglidur® RW370 – ideal for the rail industry

- Flame-retardant, according to UL94-V0 and DIN EN 45545
- Flexural strength 91MPa
- High wear resistance
- Can be processed with high-temperature 3D printer
- Max application temperature: +170°C
- Available for 3D printing (Ø 1.75mm), as bar stock and as injection-moulding material
- Lubrication and maintenance-free
- Recommended printing surface: PET film

Dimensions [mm]

Filament diameter	Outer Ø spool	Inner Ø spool	Spool width	Weight [g]	Part No.
1.75	215	38	82	1,055	RW370-PF-0175-0750

Material properties

General properties	Unit	iglidur® RW370	iglidur® A350
Density	g/cm³	1.34	1.42
Colour		beige	blue
Max. moisture absorption at +23°C/50% r. h.	% weight	0.25	0.6
Max. total moisture absorption	% weight	1.2	1.9
Mechanical properties			
Flexural modulus	MPa	2,100	1.250/1.390 ¹³⁰⁾
Flexural strength at +20°C	MPa	91/30 ¹³⁰⁾	50/46 ¹³⁰⁾
Shore D hardness		80	76
Physical and thermal properties			
Max. long-term application temperature	°C	+170	+180
Max. short-term application temperature	°C	+190	+210
Min. continuous application temperature	°C	-50	-100
Electrical properties			
Specific contact resistance	Ωcm	> 10 ¹²	> 10 ¹¹
Surface resistance	Ω	> 10 ¹²	> 10 ¹¹

Table 01: Material properties table

¹³⁰⁾ Printed flat/upright



iglidur® A350



Order key

tribo-filament	Diameter	Weight
A350-PF-	0175	-0750
iglidur® material	tribo-filament	Ø [mm · 100]
		Spool weight [g]

iglidur® A350 – for the food industry

- Compliant with Regulation (EU) No. 10/2011 and FDA guidelines
- Available as 3D printing filament, bar stock and for injection moulding
- In industry standard blue
- Max. application temperature: +180°C
- Complies with the fire prevention requirements of the Federal Aviation Administration of the USA (FAA) for aircraft interiors
- Suitable for autoclave
- Recommended bonding surface: PET film

Dimensions [mm]

Filament diameter	Outer Ø spool	Inner Ø spool	Spool width	Weight [g]	Part No.
1.75	215	38	82	1,055	A350-PF-0175-0750

Processing and accessories
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Complete processing instructions online
(in the download area of the respective material)
► www.igus.eu/tribofilament

Processing instructions

iglidur® tribo-filaments can be processed on any 3D printer that is equipped with a heated print bed on which temperatures are adjustable. The igus® adhesive film allows a good adhesion between the iglidur® tribo-filament and the print bed.

- Good ventilation should be provided during processing
- When heated above +300°C, hazardous fumes are produced
- For iglidur® J350, iglidur® A350, and iglidur® RW370, a high-temperature printer is necessary

igus® print bed film for your print bed

Thanks to the film available from igus® for the print bed, there is very good adhesion between the iglidur® tribo-filament and the print bed.

- Useable up to approximately 20 times
- "Set" the degree of adhesion by means of print bed temperature
- 3D printer without heating bed? The combination of iglidur® I150 with this print bed film also makes it possible to make wear-resistant parts oneself with such 3D printers

Spool

iglidur® tribo-filaments weighing 250g or 750g are wound onto a spool. Larger dimensions available upon request.

Filament thickness

The iglidur® tribo-filaments are available with 1.75mm and 3mm thickness. The 3mm filaments can be used without problems in 3D printers that need a 2.85mm filament.



Example: Part No. tribo-filaments

I150-PF-0175-0250

for 250g spool with a diameter of 1.75mm made of the iglidur® material I150



Complete processing instructions online (in the download area of the respective material)

▶ www.igus.eu/tribofilament



Part No. adhesive film for print bed

PF-01-0203-0203 (203 x 203mm)

PF-01-0254-0228 (254 x 228mm)



Test kits

for 25g of filament, loose with 1.75mm diameter made of the iglidur® material I150

