

## TECHNICAL DATA SHEET

### FILAFLEX 82A

#### Description

Filaflex 82A TPU is the industry's benchmark for flexible 3D printing. With 650% elongation and Shore 82A hardness, this premium TPU delivers outstanding elasticity and precision, returning to its original shape without deformation. Ideal for direct-drive printers, it ensures excellent bed adhesion without a heated bed or adhesives. Odorless, skin-safe, and resistant to fuels and solvents — the perfect blend of performance, reliability, and flexibility.

#### Key Features

- **Optimal Flexibility:** 82A Shore hardness with 650% elongation capacity
- **Superior Recovery:** Returns to original shape after stretching
- **Easy Printing:** Excellent bed adhesion without additives
- **Material Safety:** Non-toxic and skin-safe formulation
- **Chemical Resistance:** Resistant to solvents and fuels

#### Professional Applications

- **Medical & Orthopedic:** Custom insoles and prosthetic components
- **Surgical Training:** Anatomical models for operation simulation
- **Industrial Components:** Buffers, gaskets, tires, and grippers
- **Fashion & Accessories:** Textile printing, bags, and wearable items
- **Footwear Production:** Soles, custom shoes, and sandals

#### Certifications - ISO 10993 Tested & Regulatory Compliance

- [ISO 10993-5: 2009 - In Vitro Cytotoxicity Test with Filaflex](#)

- [ISO 10993-23: 2021 - Acute Skin Irritation Test with Filaflex](#)

- [ISO 10993-10: 2013 - Skin Sensitization Test with Filaflex](#)

- [Food & Skin Contact Regulatory Statement – EU 10/2011 & FDA 21 CFR 177.2600](#)



#### Resources

- [Complete Guide: How to Print with Filaflex Flexible Filament](#)

- [Troubleshooting Guide: Common Issues with Flexible Filaments](#)

- [Research and Innovation with Filaflex](#)

- [Filaflex](#)

- [Print Settings](#)

<b>Physical Property</b>	<b>Value</b>	<b>Unit</b>	<b>Test method according to</b>
Material density	1120	kg/m <sup>3</sup>	ISO 1183
Melt flow rate (230 °C / 2.16 kg)	—	g/10 min	ISO 1133

<b>Mechanical Property</b>	<b>Value</b>	<b>Unit</b>	<b>Test method according to</b>
Hardness (Shore A, 3 s)	85	—	ISO 7619-1
Tensile modulus	22	MPa	ISO 527
Tensile strength	45	MPa	DIN 53504-S2
Elongation at break	650	%	DIN 53504-S2
Stress at 20% elongation	2.5	MPa	DIN 53504-S2
Stress at 100% elongation	6	MPa	DIN 53504-S2
Stress at 300% elongation	10	MPa	DIN 53504-S2
Tear strength	70	N/mm	ISO 34-1
Abrasion resistance	25	mm <sup>3</sup>	ISO 4649
Compression set (23 °C / 72 h)	25	%	ISO 815
Compression set (70 °C / 24 h)	45	%	ISO 815
Tensile strength after storage in water (80 °C, 42 d)	32	MPa	DIN 53504-S2
Elongation at break after storage in water (80 °C, 42 d)	600	%	DIN 53504-S2
Notched impact strength (Charpy, +23 °C)	NB	kJ/m <sup>2</sup>	ISO 179
Notched impact strength (Charpy, -20 °C)	—	kJ/m <sup>2</sup>	ISO 179
Notched impact strength (Charpy, -30 °C)	NB	kJ/m <sup>2</sup>	ISO 179
Tensile notched impact strength, +23 °C	580	kJ/m <sup>2</sup>	ISO 8256/1

<b>Thermal Property</b>	<b>Value</b>	<b>Unit</b>	<b>Test method according to</b>
Glass transition temperature (10 °C/min)	-42	°C	ISO 11357-1/-2
VST Vicat softening temperature (Method A, 10 N, 120 °C/h)	113	°C	ISO 306

<b>Conductive Property</b>	<b>Value</b>	<b>Unit</b>	<b>Test method according to</b>
Volume resistivity	1E+10	Ω·m	IEC 62631-3-1

## Printing Properties

## Recommended

### 1. Material Preparation

Drying Temperature	55 °C
Minimum Time	1 hour
Note	Drying is crucial for optimal results

### 2. Basic Parameters, Speed Settings and Retraction Settings

#### Nozzle 0.4 mm

Layer Height	0.2 mm
Line Width	0.35 mm
Volumetric Speed (mm <sup>3</sup> /s)	3.2 mm <sup>3</sup> /s
Temperature	240 °C
External Perimeter	50% - 22.85 mm/s
Internal Perimeters	75% - 34.27 mm/s
Infill	100% - 45.7 mm/s
Top/Bottom	60% - 27.42 mm/s
First Layer	30% - 13.71 mm/s
Retraction distance	1.5–3.0 mm
Retraction speed	40 mm/s
Retraction Z-Hop	0.2 mm

#### Nozzle 0.6 mm

Layer Height	0.3 mm
Line Width	0.55 mm
Volumetric Speed (mm <sup>3</sup> /s)	7.2 mm <sup>3</sup> /s
Temperature	242 °C
External Perimeter	50% - 21.80 mm/s
Internal Perimeters	75% - 32.70 mm/s
Infill	100% - 43.60 mm/s
Top/Bottom	60% - 26.16 mm/s
First Layer	30% - 13.08 mm/s
Retraction distance	1.5–3.0 mm
Retraction speed	40 mm/s
Retraction Z-Hop	0.2 mm

#### Nozzle 0.8 mm

Layer Height	0.4 mm
Line Width	0.75 mm
Volumetric Speed (mm <sup>3</sup> /s)	12.8 mm <sup>3</sup> /s
Temperature	245 °C
External Perimeter	50% - 21.33 mm/s
Internal Perimeters	75% - 32.00 mm/s

Infill	100% - 42.67 mm/s
Top/Bottom	60% - 25.60 mm/s
First Layer	30% - 12.80 mm/s
Retraction distance	2.5–3.5 mm
Retraction speed	40 mm/s
Retraction Z-Hop	0.2 mm
<b>Nozzle 1.0 mm</b>	
Layer Height	0.5 mm
Line Width	0.95 mm
Volumetric Speed (mm <sup>3</sup> /s)	20.0 mm <sup>3</sup> /s
Temperature	248 °C
External Perimeter	50% - 21.05 mm/s
Internal Perimeters	75% - 31.58 mm/s
Infill	100% - 42.11 mm/s
Top/Bottom	60% - 25.26 mm/s
First Layer	30% - 12.63 mm/s
Retraction distance	2.5–3.5 mm
Retraction speed	40 mm/s
Retraction Z-Hop	0.2 mm

### 3. Bed Temperature

Small parts	Room temperature (no heating)
Large parts	45–50 °C

### 4. Cooling

General Fan	0% (always off)
Force fan on overhangs/bridges	OFF
Layers < 8 seconds	50%
First layer	0%

### 5. Troubleshooting

Irregular extrusion	<ol style="list-style-type: none"> <li>1. Dry the filament</li> <li>2. Check extruder</li> <li>3. Reduce printing speed</li> </ol>
Poor adhesion	<ol style="list-style-type: none"> <li>1. Dry the filament</li> <li>2. Use adhesive</li> <li>3. Adjust first layer</li> </ol>
Stringing	<ol style="list-style-type: none"> <li>1. Dry the filament</li> <li>2. Adjust retraction</li> <li>3. Increase travel speed</li> <li>4. Check temperature</li> </ol>

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## 6. Best Practices

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- Keep filament dry – store and dry before use.
  - Preferably use a direct drive extruder system.
  - Print multiple small parts simultaneously for better results.
  - Use maximum travel speed to minimize stringing.
  - These are initial recommendations. Adjust depending on your printer, environment, and part geometry.
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## Disclaimer

PLEASE NOTE: These printing parameters are initial recommendations based on our experience. They may need adjustment depending on your specific 3D printer, environmental conditions, and the geometry of the part you are printing. Use these settings as a starting point and fine-tune them according to your specific needs.

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