snapmaker | **PLA-CF**

Technical Data Sheet

www.snapmaker.com

1 Filament Introduction

Snapmaker PLA-CF features high stiffness, low warping, and a matte finish. Reinforced with chopped carbon fibers, it retains standard PLA's ease of printing while delivering enhanced stiffness, making it ideal for precision-fit parts, jigs, fixtures, and load-bearing brackets. Additionally, carbon fibers help reduce shrinkage and warping, improving dimensional accuracy for more reliable large-format printing. The printed part delivers a refined, professional look reminiscent of industrial-grade components.

2 Specifications

Subjects	Data
Diameter	1.75 mm ± 0.03 mm
Net Filament Weight	1 kg
Length	313 m
Spool Material	Cardboard Spool
Spool Size	Diameter: 200 mm; Height: 66 mm

3 Recommended Printing Settings

Subjects	Data
Drying Settings Before Printing	55°C, 6 h
Printing and Storage Humidity	< 20% RH (Sealed, with Desiccant)
Nozzle Size	0.4 / 0.6 / 0.8 mm (Hardened Steel Hot Ends)
Nozzle Temperature	200–250°C
Bed Type	Smooth PEI Plate / Textured PEI Plate
Bed Surface Preparation	Glue
Bed Temperature	35–70°C
Cooling Fan	ON
Printing Speed	50–200 mm/s
Retraction Length	1–1.5 mm

(continued)

Subjects	Data
Retraction Speed	20–30 mm/s
Chamber Temperature	25–45°C
Max Overhang Angle	60°
Max Bridging Length	~ 30 mm
Support Material	PVA

Printing Tips

1. Drying & Storage

- **Pre-Drying:** PLA-CF filament has low moisture sensitivity and generally does not require drying. However, pre-drying is recommended for optimal print results. The recommended setting is 55°C for 6 hours.
- **Storage:** When not in use, we recommend keeping the filament away from direct sunlight in a sealed container with desiccant.

2. Printing

- **Use Manual Loading:** PLA-CF is an abrasive filament that may accelerate wear on the printer's automatic filament feeder. To protect the feeder and extend its service life, **do not use the automatic feeding function. Always load and unload the filament manually**. (*Note: Since the RFID readers are located near the spool holders on both sides of the printer, RFID detection is unavailable during manual filament loading unless the spool is placed on a holder.*)
- **Use Hardened Steel Hot Ends:** The carbon fibers in PLA-CF are abrasive. Replace the U1's standard stainless steel hot ends with hardened steel ones (sold separately) to minimize nozzle wear.

- **Hot End Size:** Do not use hot ends smaller than 0.4 mm, as they may cause clogging.
- **Recommended Print Settings:** Set the maximum volumetric speed to 15 mm^3/s and keep the cooling fan at maximum speed for optimal print quality. These settings are built into Snapmaker Orca and will be applied automatically when you select this filament while using the U1.
- **Improving Layer Adhesion:** If layer adhesion is insufficient, reduce the cooling fan speed or increase the printing temperature as needed.
- **Carbon Fiber Debris Precautions:** Carbon fibers may give the filament and printed parts a slightly prickly feel. Direct contact with rough or damaged surfaces and cross-sections during cutting or sanding may cause skin irritation. Do not rub or touch rough edges or fractured surfaces with bare hands. Always wear protective gloves when loading or unloading the filament and during post-processing.

4 Properties

Physical Properties

Subjects	Testing Methods	Data
Density	ISO 1183, GB/T 1033	1.29 g/cm³ at 23°C
Melt Index	210°C, 2.16 kg	9.2 g/10 min
Melting Temperature	DSC, 10°C/min	162°C
Glass Transition Temperature	DSC, 10°C/min	62°C
Decomposition Temperature	TGA, 20°C/min	N/A
Crystallization Temperature	DSC, 10°C/min	N/A
Vicat Softening Temperature	ISO 306, GB/T 1633	64°C
Heat Deflection Temperature	ISO 75, 1.8 MPa	50°C
Heat Deflection Temperature	ISO 75, 0.45 MPa	54°C
Saturated Water Absorption Rate	23°C, 70% RH	0.38%

Mechanical Properties

Subjects	Testing Methods	Data
Young's Modulus (X-Y)	ISO 527, GB/T 1040	3280.7 ± 79.6 MPa
Young's Modulus (Z)	ISO 527, GB/T 1040	2213.1 ± 42.9 MPa
Tensile Strength (X-Y)	ISO 527, GB/T 1040	31.2 ± 0.7 MPa
Tensile Strength (Z)	ISO 527, GB/T 1040	15.1 ± 0.7 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	13.2 ± 1.7%
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	0.9 ± 0.1%
Bending Modulus (X-Y)	ISO 178, GB/T 9341	3380.5 ± 52.1 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	N/A
Bending Strength (X-Y)	ISO 178, GB/T 9341	51.7 ± 0.6 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	N/A
Impact Strength (X-Y)	ISO 179, GB/T 1043	5.5 ± 0.2 kJ/m² (Notched)
Impact Strength (Z)	ISO 179, GB/T 1043	N/A

Other Physical and Chemical Properties

Subjects	Data
Odor	Odorless
Composition	Polylactic Acid (PLA), chopped carbon fiber (8% by weight)
Skin Hazards	N/A
Chemical Stability	N/A
Solubility	N/A
Resistance to Acid	Weak Acids: Good / Strong Acids: Poor
Resistance to Alkali	Weak Alkalis: Fair / Strong Alkalis: Poor
Resistance to Organic Solvent	N/A
Resistance to Oil and Grease	Good
Flammability	N/A
Combustion Products	N/A
Odor of Combustion Products	N/A

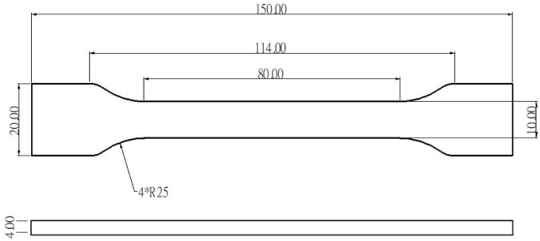
5 Specimen Test

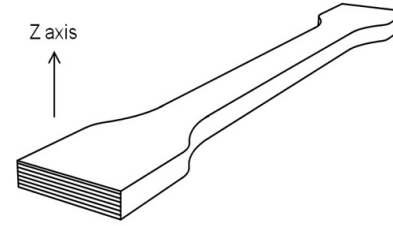
Specimen Printing Conditions

Subjects	Data
Nozzle Temperature	230°C
Bed Temperature	50°C
Printing Speed	50 mm/s
Infill Density	100%

Based on 0.4 mm nozzle. Printing conditions may vary with different nozzle diameters.

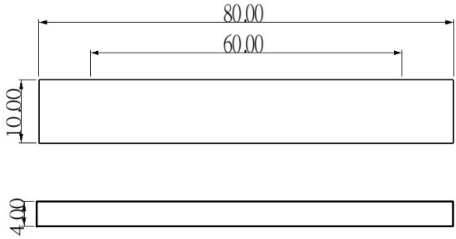
Tensile Testing Specimen

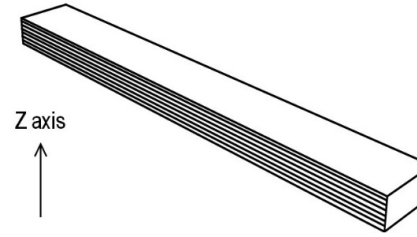




ISO 527, GB/T 1040

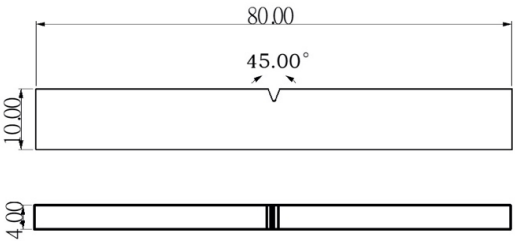
Flexural Testing Specimen

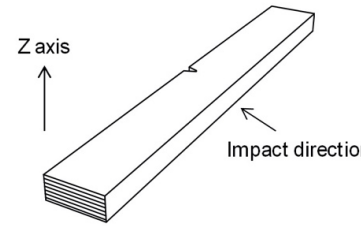




ISO 178, GB/T 9341

Impact Testing Specimen

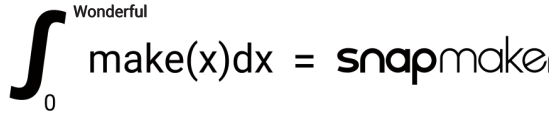




ISO 179, GB/T 1043

6 Disclaimer

The performance and printing parameters of the aforementioned filaments are obtained by Snapmaker through testing filament samples with sample 3D printers. All data provided is for reference and comparison purposes only, and does not constitute design specifications or any warranty of quality. Actual 3D printing quality and final part performance are subject to various factors including, but not limited to, printer equipment, model design, environmental conditions, and printing parameters. Users shall independently evaluate the compliance and safety of printed models and finished parts, including legal compliance, application safety, and structural reliability. Snapmaker shall not be held liable for any direct or indirect losses arising from the use of the aforementioned filaments, including equipment damage, print failure, personal injury, and property damage.



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