

snapmaker

PLA-CF User Guide



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Snapmaker PLA-CF is a printing filament compatible with the full range of Snapmaker 3D printers and most mainstream FDM (Fused Deposition Modeling) 3D printers on the market. This guide covers the filament's technical specifications, usage procedure, storage instructions, common issues and troubleshooting, and safety precautions.

1 Product Overview

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 $\pm$ 0.03 mm
Net Filament Weight	1 kg
Length	313 m
Spool Material	Cardboard Spool
Spool Size	Diameter: 200 mm; Height: 66 mm

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

Physical Properties

Subjects	Testing Methods	Data
Density	ISO 1183, GB/T 1033	1.29 g/cm ³ 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/m ² (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

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.

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.

3 Usage Procedure



This section demonstrates the usage procedure using the Snapmaker U1 model.



To avoid the prickly feel and skin irritation caused by carbon fibers, always wear protective gloves when handling the filament.

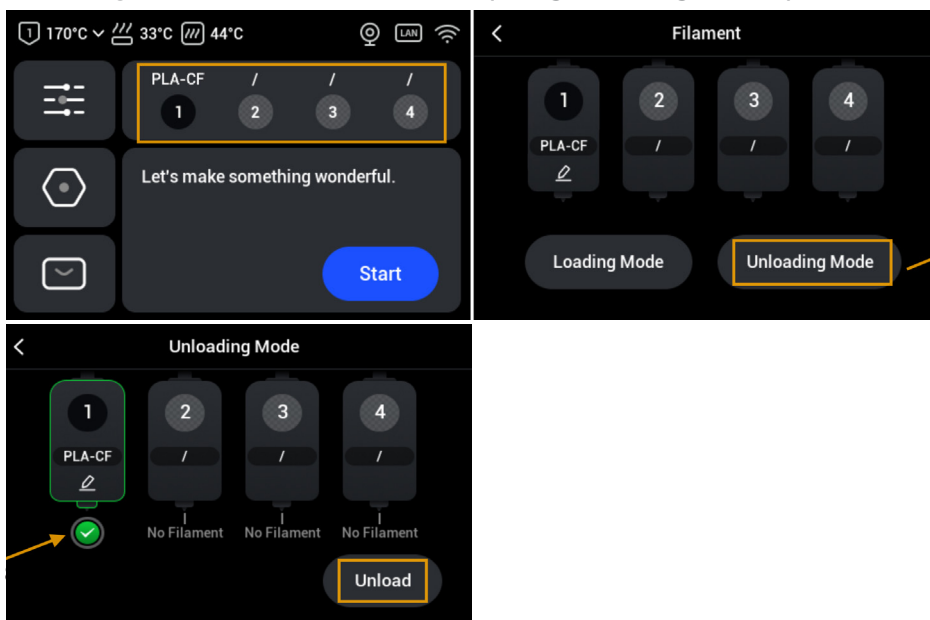
Hot End Replacement and Configuration

The carbon fibers in PLA-CF are abrasive. Click the links below for instructions on replacing your current hot ends with hardened steel hot ends (sold separately) to minimize nozzle wear.

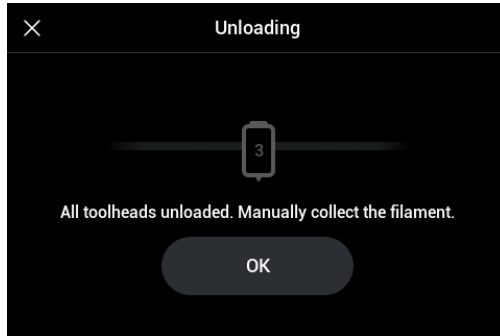
1. Check [U1 hot end replacement guide](#), to replace your current hot ends with hardened steel hot ends.
2. Check [U1 hot end replacement and configuration](#), for settings after replacement.

Filament Unloading

1. On the touchscreen main interface, navigate to the Filament page. Tap **Unloading Mode**. Select all toolheads requiring unloading, then tap **Unload**.



2. The printer will extract the selected toolhead and automatically heat the nozzle.
3. Once all unloading is complete, tap **OK**.



4. Rotate the spool to retract the filament from the tube until it is fully withdrawn.
5. Thread the end of the filament through the two locking holes on the spool to prevent loosening or tangling.



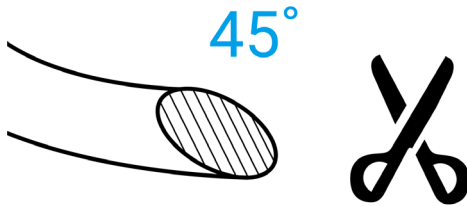
6. Remove the spool from the spool holder.
7. Repeat the steps above until all intended filaments have been successfully retrieved.

Filament 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.

1. Trim the end of the filament to an approximately 45° angle using diagonal pliers.



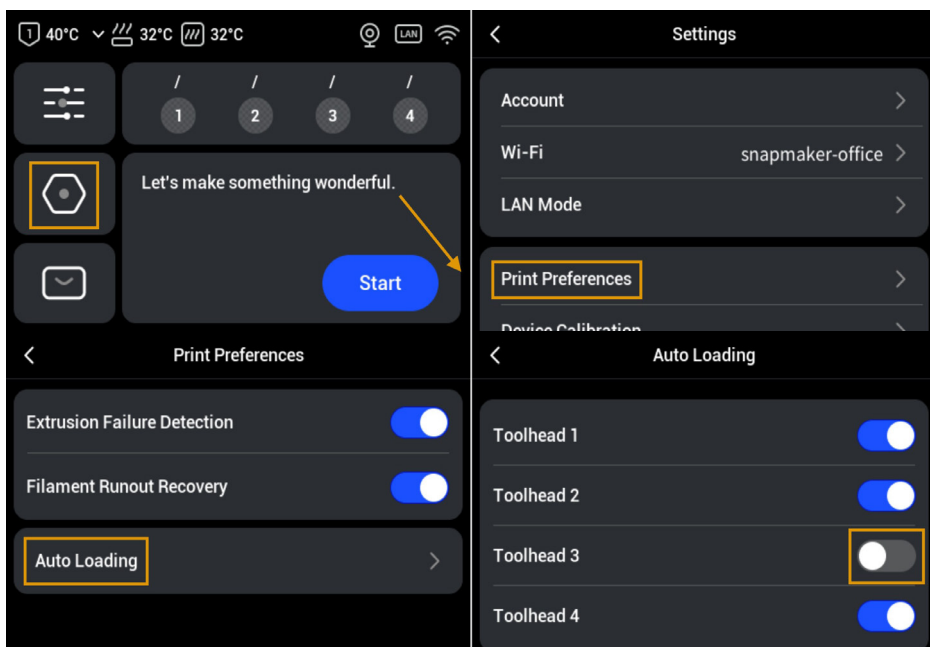
This reduces feeding resistance and improves loading reliability.

2. Mount the filament spool on the spool holder. Make sure the filament can be pulled tangentially from the bottom of the spool.

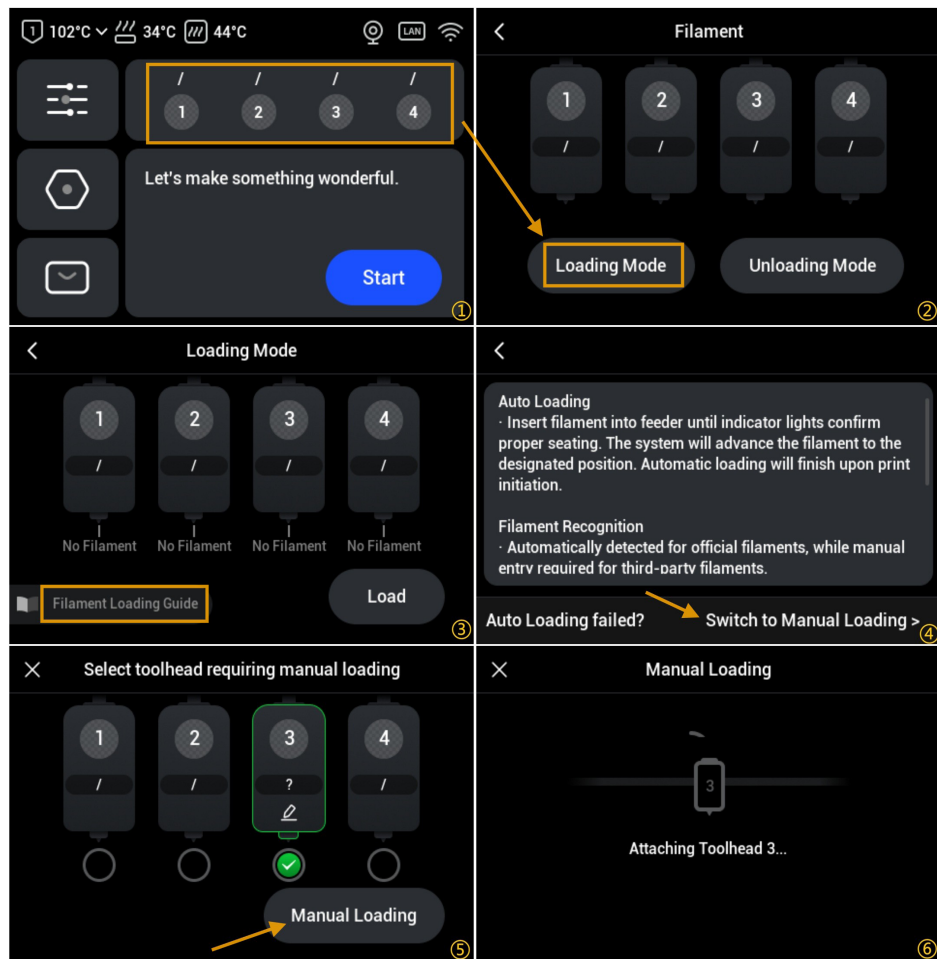
3. Press the round clamp at the end of the corresponding feeder. Unplug the tube connected to the target toolhead.



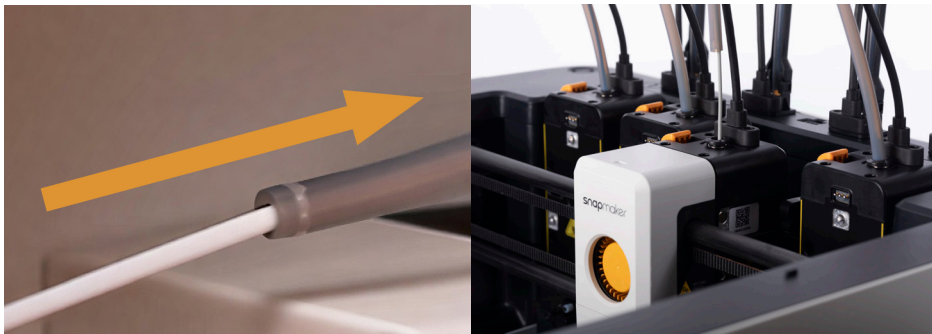
4. Before manual loading, Auto Loading mode should be disabled. On the touchscreen main interface, navigate to Settings > Print Preferences > Auto Loading, and disable Auto Loading for the corresponding toolhead.



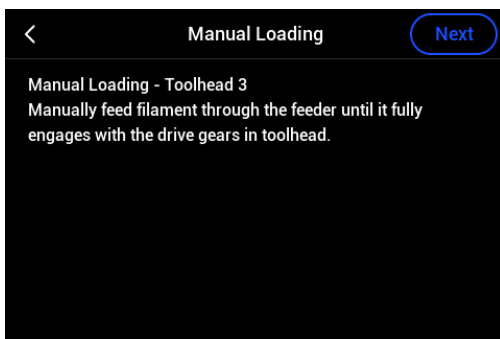
5. Return to the main interface and navigate to the Filament page. Tap Loading Mode > Filament Loading Guide > Switch to Manual Loading. Select the target toolhead and tap **Manual Loading**. The printer will extract the selected toolhead.



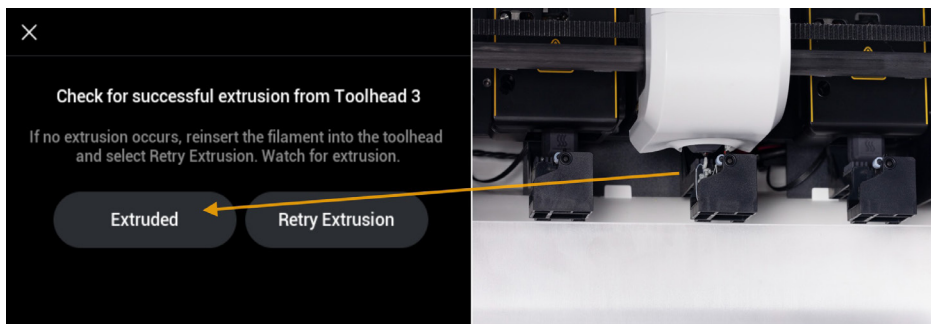
6. Follow the on-screen instructions to manually feed the filament through the tube into the toolhead. It is recommended to unplug the tube from the top of the toolhead, expose part of the filament, and push it downward manually to ensure proper contact with the extrusion gears.



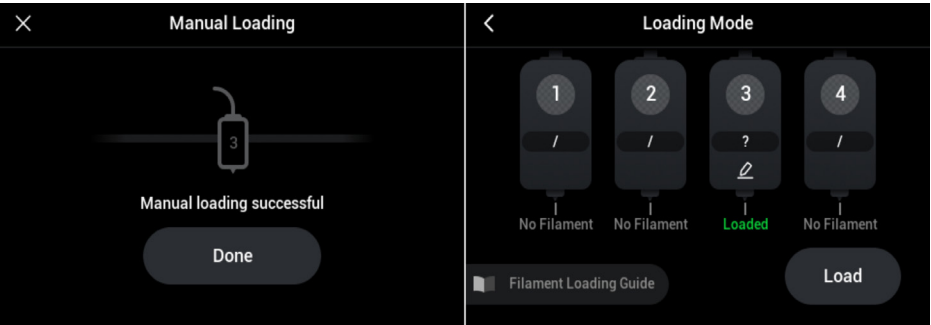
7. Tap **Next**. The printer will heat the nozzle to the target temperature and automatically extrude filament.



8. If the filament is successfully extruded, tap **Extruded > Done**. If not, re-insert the filament into the toolhead, tap **Retry Extrusion**, and keep monitoring the extrusion.



9. After the nozzle is automatically cleaned, tap **Done**.



The filament status is now updated to Loaded.

10. After successful loading, re-insert the tube into the top of the toolhead.

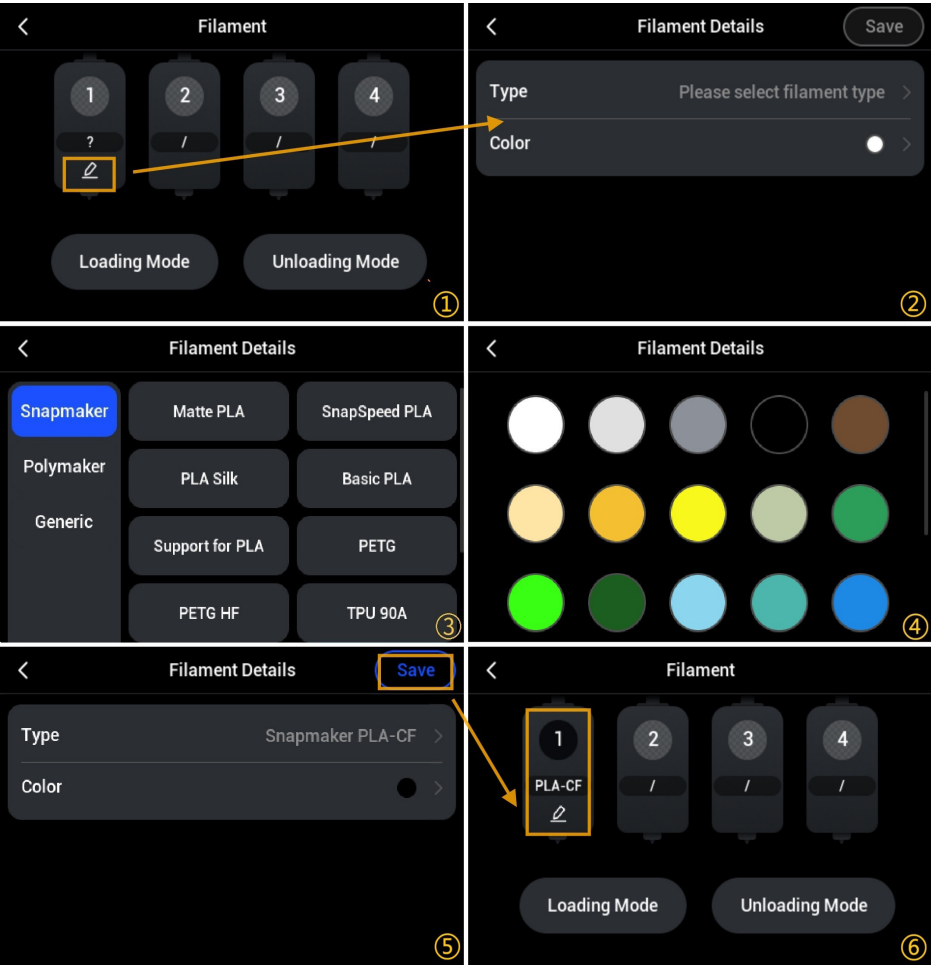


11. Edit filament information.

Using RFID-equipped Snapmaker official filament, the device will automatically recognize the filament information; no manual editing is needed.



For Snapmaker filament without RFID or when the U1's built-in spool holder is not used, manual editing is required. Tap the edit icon below the corresponding filament, select filament type and color, and tap **Save**.



12. Repeat the steps above to load filament for other toolheads.

Test Printing and Final Printing

1. Test Printing: Before printing a final part, it is recommended to print a small test model (e.g., a 20 mm × 20 mm × 20 mm calibration cube) to verify smooth extrusion, proper formation, and nozzle condition. Proceed with final printing only if no abnormalities are observed.

2. Final Printing: Upload the sliced model file to the 3D printer and start the printing process. Ensure the filament spool is securely positioned to prevent it from falling off the spool holder during printing, which could disrupt the process.

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 mm³/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 Storage Instructions

The storage environment significantly affects the performance of 3D printing filament. Follow these guidelines to extend the filament's usable life:

1. Storage Environment: PLA softens under prolonged sunlight exposure and is not resistant to water or corrosion. Store PLA filament and printed parts in a dry, cool, well-ventilated area, away from direct sunlight, high temperature, and high humidity (recommended ambient temperature: 5–30°C, humidity $\leq$ 20%). Keep away from open flames, heat sources (e.g., heaters, ovens), and corrosive substances.

2. Unopened Filament: Keep the filament sealed in its original packaging to prevent moisture absorption and contamination. Performance may degrade and printing issues may arise if stored for excessively long periods. Use the filament promptly after purchase.

3. Opened Filament: Reseal any unused filament immediately, placing it in a sealed bag or dedicated storage box. Adding desiccants (e.g., silica gel) is recommended to improve moisture protection. It is advisable to use the opened filament within 3 months to avoid moisture absorption and oxidation. In humid regions, use the filament as soon as possible or ensure it is properly sealed.

4. Spool Care: Avoid dropping, crushing, or bumping the spool to prevent deformation which could cause filament tangling. If tangles occur, do not pull aggressively. Gently untangle the filament before use to prevent breakage.

5 Common Issues and Troubleshooting

Common Issue	Potential Cause	Recommended Solution
No extrusion/filament breakage	1. Filament absorbed moisture/clumped. 2. Nozzle temperature too low, filament not fully melted. 3. Extruder gear pressure insufficient or slipping. 4. Nozzle clogged.	1. Dry the filament. 2. Increase nozzle temperature by 5–10°C. 3. Adjust extruder gear tension; clean debris from the gear. 4. Clear nozzle clogs using appropriate tools.
Bubbles or stringing on surface	1. Filament absorbed moisture. 2. Nozzle temperature too high. 3. Cooling fan off or inadequate airflow.	1. Dry the filament. 2. Decrease nozzle temperature by 5–10°C. 3. Turn on cooling fan and adjust fan speed.
Edge warping/part detaching from bed	1. Bed temperature too low. 2. Bed surface not clean, poor adhesion. 3. Large temperature fluctuations or drafts in printing environment. 4. Filament shrinkage rate too high.	1. Increase bed temperature. 2. Clean bed with ethyl alcohol; apply dedicated bed adhesive if needed. 3. Maintain stable ambient temperature, avoid drafts. 4. Adjust print parameters, reduce cooling fan speed.
Filament tangle/feeding jam	1. Knots and Tangles. 2. Spool placed at an incorrect angle. 3. Filament kinked or damaged.	1. Untangle the knots, straighten the filament end, and secure the end in the spool's locking holes. 2. Adjust spool placement angle to ensure smooth feeding. 3. Cut away damaged/kinked sections and reload filament.
Weak layer adhesion/delamination	1. Nozzle temperature too low. 2. Printing speed too high. 3. Cooling fan speed too high.	1. Increase nozzle temperature. 2. Reduce printing speed. 3. Lower cooling fan speed appropriately.

6 Safety Precautions

1. High-Temperature Protection: During printing, the nozzle and molten filament reach extremely high temperatures. Do not touch the nozzle, filament guide tube, or freshly printed hot models to prevent burns. Children should be supervised by an adult at all times.

2. Environmental Safety: Some materials may emit odors, ultrafine particles, or volatile substances when heated. It is recommended to use the device in a well-ventilated area.

3. Equipment Operation: Strictly follow the printer's operating guidelines. Do not disassemble or modify the printer arbitrarily. When installing or changing filament, ensure the printer is powered off or in standby mode to prevent accidental injury.

4. Filament Usage: Do not use damaged, deteriorated, or expired filament, as this may clog the nozzle, damage the printer, and compromise print quality. When cutting filament, use sharp cutters to ensure a clean, even cut.

5. Disposal: Discard used filament and print waste in recyclable or general waste bins according to local regulations.

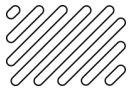
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7 Additional Notes

1. This document is the user guide for Snapmaker PLA-CF filament. For issues not covered in this guide, contact Snapmaker official customer support for professional technical assistance.
2. Regular printer maintenance (cleaning nozzle, extruder gear, and build plate) together with high-quality filament is recommended to improve printing outcomes and extend the lifespan of both the equipment and the filament.

8 After-sales Service

For questions regarding printing techniques or filament usage, please contact Snapmaker official customer support for one-on-one operational guidance.



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"The world is but a canvas to our imagination."
— Henry David Thoreau