snapmaker

PETG-CF User Guide

Snapmaker PETG-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 procedures, storage guidelines, common issues and solutions, and safety precautions.

1 Product Overview

PETG-CF is reinforced with carbon fiber to enhance the stiffness and strength of printed parts, making it suitable for load-bearing components and engineering fixtures. Its heat deflection temperature of 72.3°C helps resist deformation in elevated-temperature environments and supports outdoor applications. The carbon fiber texture also reduces the visibility of layer lines for a refined surface finish. Combining the low-warping properties of PETG with carbon fiber reinforcement, the formulation helps reduce shrinkage and edge lifting for reliable large-format printing.

2 Specifications

Subjects	Data
Diameter	1.75 ± 0.03 mm
Net Filament Weight	1 kg
Length	325 m/kg
Spool Material	Cardboard Spool
Spool Size	Diameter: 200 mm; Height: 66 mm

Recommended Printing Settings

Subjects	Data
Drying Settings Before Printing	65°C , 8 h
Printing and Storage Humidity	< 20% RH (Sealed, with Desiccant)
Nozzle Size	0.4 / 0.6 / 0.8 mm
Nozzle Temperature	240–270°C
Bed Type	Textured PEI Plate, Smooth PEI Plate
Bed Surface Preparation	Glue
Bed Temperature	60–85°C
Cooling Fan	OFF
Printing Speed	< 200 mm/s
Retraction Length	1–1.5 mm
Retraction Speed	20-30mm/s
Chamber Temperature	25–50°C
Max Overhang Angle	~ 70 °
Max Bridging Length	~ 30 mm
Support Material	N/A

Physical Properties

Subjects	Testing Methods	Data
Density	ISO 1183	1.28 g/cm³ at 23°C
Melt Index	230°C , 2.16 kg	5-12 g/10min
Melting Temperature	DSC, 10 °C/min	N/A
Glass Transition Temperature	DSC, 10 °C/min	76.6°C
Decomposition Temperature	TGA, 20 °C/min	N/A
Crystallization Temperature	DSC, 10 °C/min	N/A
Vicar Softening Temperature	ISO 306, GB/T 1633	N/A
Heat Deflection Temperature	ISO 75, 1.8 MPa	N/A
Heat Deflection Temperature	ISO 75, 0.45 MPa	72.3°C
Saturated Water Absorption Rate	23°C, 70% RH	N/A

Mechanical Properties

Subjects	Testing Methods	Data
Young's Modulus (X-Y)	ISO 527, GB/T 1040	3005.18 ± 44.20 MPa
Young's Modulus (Z)	ISO 527, GB/T 1040	2205.16 ± 26.08 MPa
Tensile Strength (X-Y)	ISO 527, GB/T 1040	57.20 ± 0.48 MPa
Tensile Strength (Z)	ISO 527, GB/T 1040	35.37 ± 0.70 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	6.90 ± 1.53%
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	2.50 ± 0.15%
Bending Modulus (X-Y)	ISO 178, GB/T 9341	3184.10 ± 49.85 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	2324.59 ± 43.58 MPa
Bending Strength (X-Y)	ISO 178, GB/T 9341	91.72 ± 0.81 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	64.77 ± 1.30 MPa
Impact Strength (X-Y)	ISO 179, GB/T 1043	30.91 ± 2.12 kJ/m²
Impact Strength (Z)	ISO 179, GB/T 1043	8.71 ± 1.51 kJ/m²

Other Physical and Chemical Properties

Subjects	Data
Odor	Odorless
Composition	Thermoplastic Polyester
Skin Hazards	Non-Hazardous
Chemical Stability	Stable under normal storage and handling conditions
Solubility	Insoluble in Water
Resistance to Acid	N/A
Resistance to Alkali	N/A
Resistance to Organic Solvent	N/A
Resistance to Oil and Grease	Good
Flammability	Flammable
Combustion Products	Water, Carbon Oxides
Odor of Combustion Products	Pungent Odor

Specimen Printing Conditions

Subjects	Data
Nozzle Temperature	260°C
Bed Temperature	70°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.

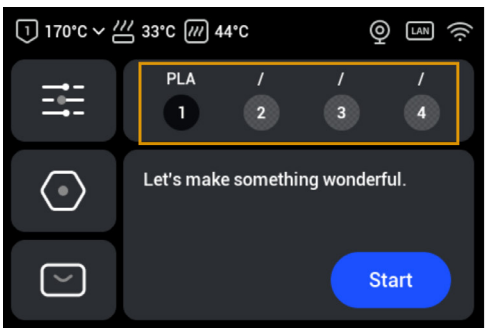
3 Usage Procedure

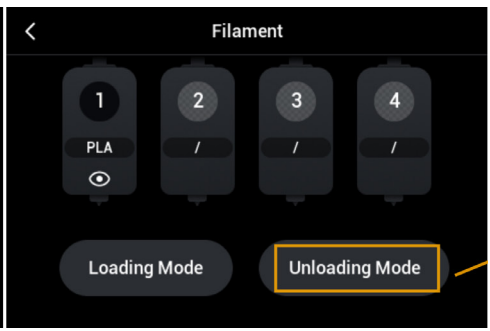
This section demonstrates the usage procedure using the Snapmaker U1 model.

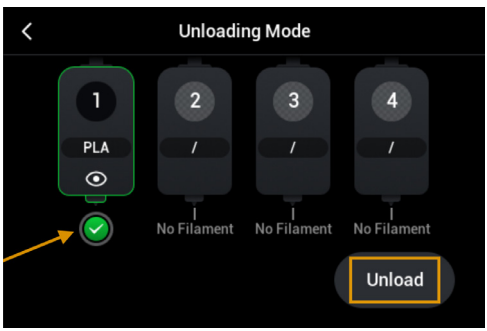
Since PETG and PLA are both rigid filaments, the procedure in this section is demonstrated using PLA as an example.

Filament Unloading

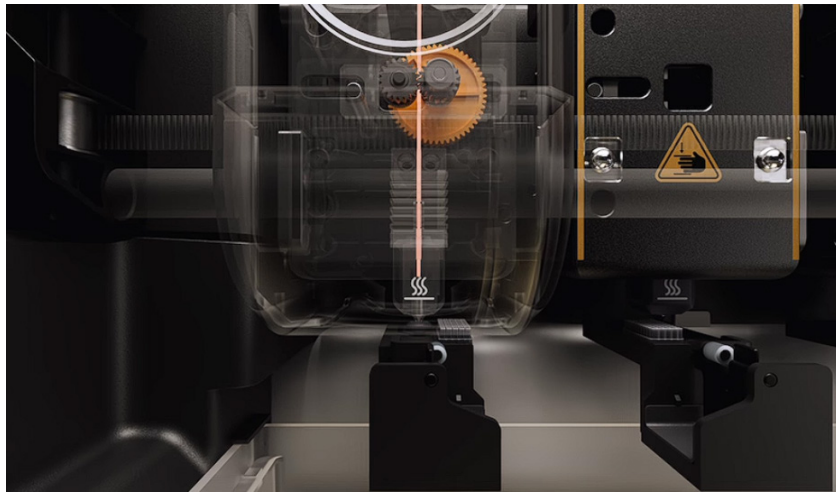
1. On the touchscreen main interface, navigate to the Filament page. Tap **Unloading Mode**. Select all toolheads requiring unloading, then tap **Unload**.



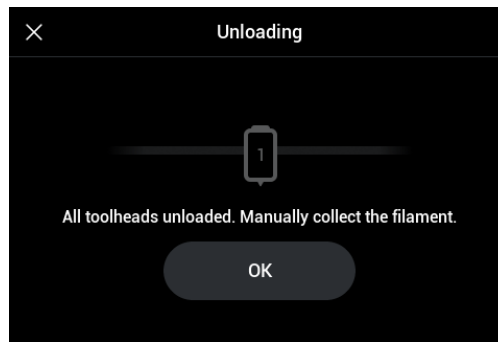




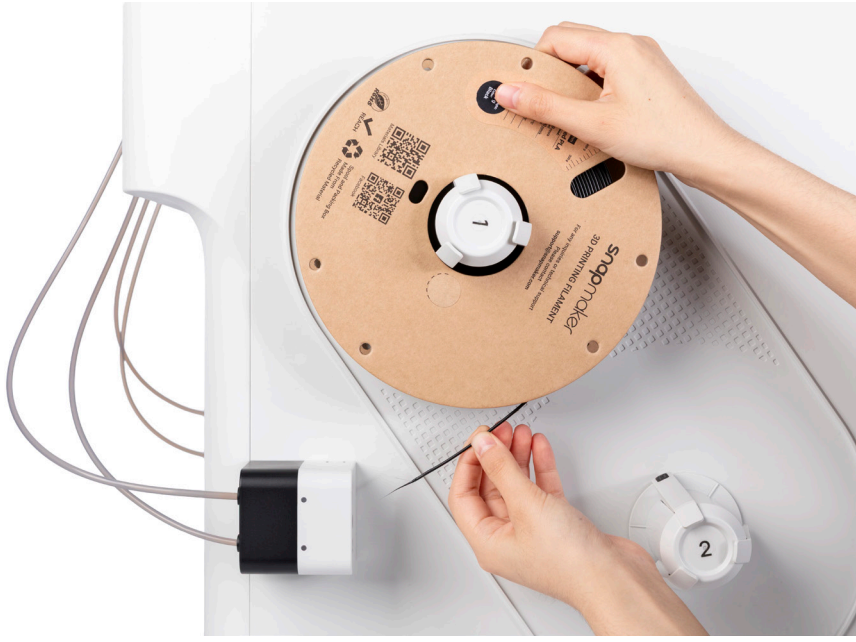
2. The printer will extract the selected toolhead and automatically heat the nozzle. Once the nozzle reaches the target temperature, the extrusion gears will retract the filament upwards, completing the unloading process.



3. The printer will sequentially unload the filament from the other selected toolheads. 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.

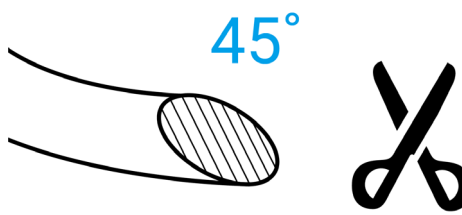
6. Remove the spool from the spool holder.

7. Repeat the steps above until all intended filaments have been successfully retrieved.

Filament Loading

PETG-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.

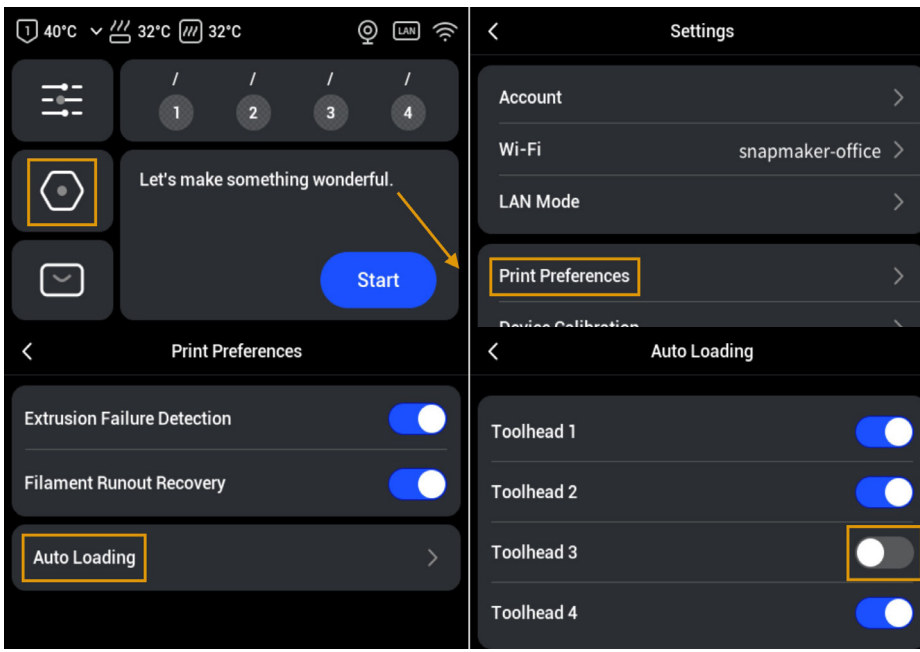


This reduces feeding resistance and improves loading reliability.

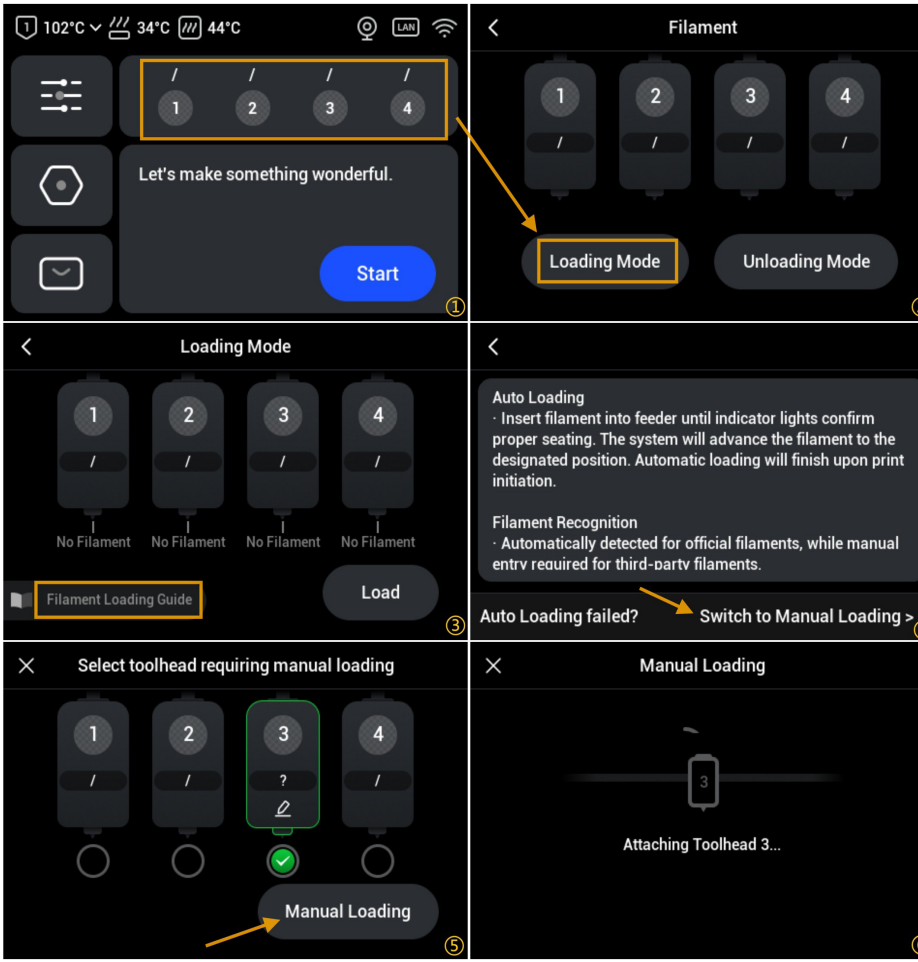
2. Mount the filament spool on the spool holder. Make sure the filament can be pulled tangentially from the bottom of the spool.

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

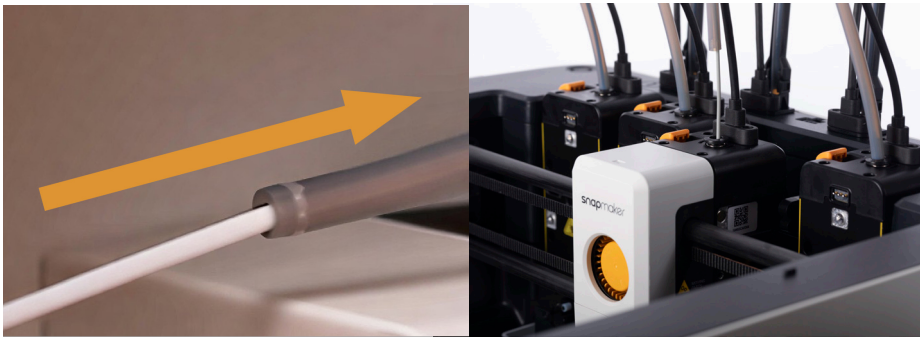
4. Before manual loading, Auto Loading mode should be disabled. On the touchscreen main interface, navigate to Settings > Print Preferences > Auto Loading, and disable Auto Loading for the corresponding toolhead.



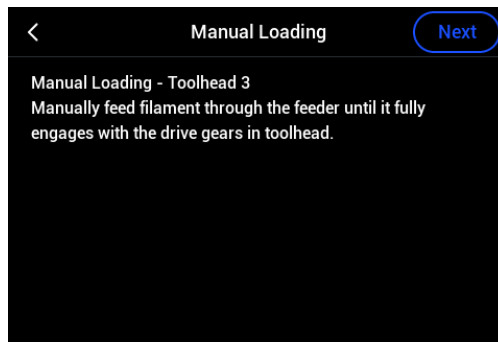
5. Return to the main interface and navigate to the Filament page. Tap Loading Mode > Filament Loading Guide > Switch to Manual Loading. Select the target toolhead and tap **Manual Loading**. The printer will extract the selected toolhead.



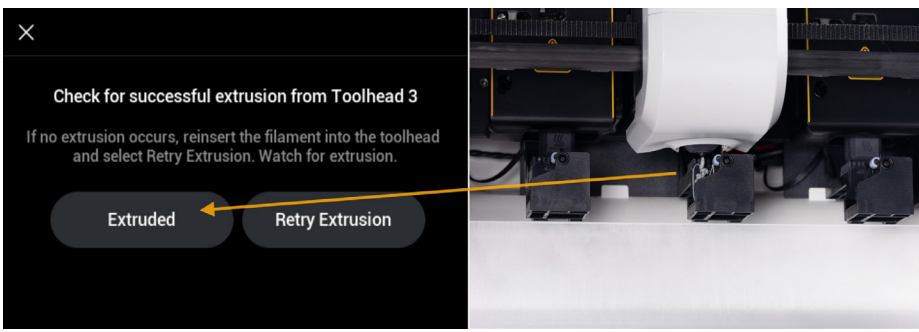
6. Follow the on-screen instructions to manually feed the filament through the tube into the toolhead. It is recommended to unplug the tube from the top of the toolhead, expose part of the filament, and push it downward manually to ensure proper contact with the extrusion gears.



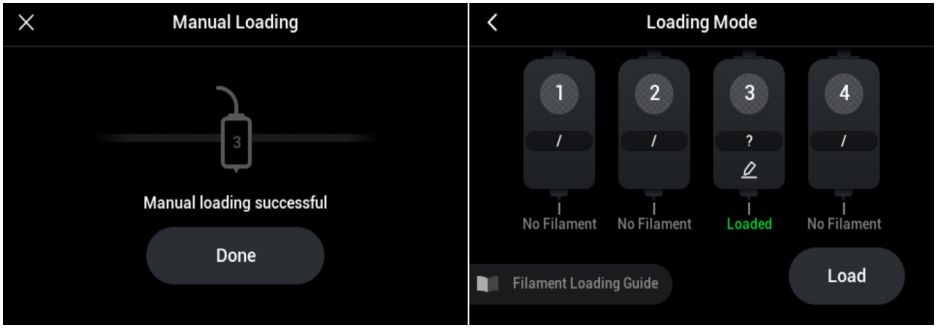
7. Tap **Next**. The printer will heat the nozzle to the target temperature and automatically extrude filament.



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**.

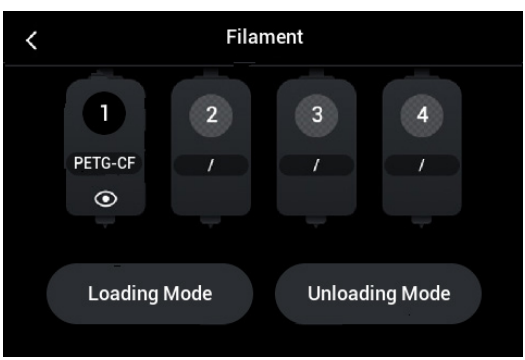


The filament status is now updated to Loaded.

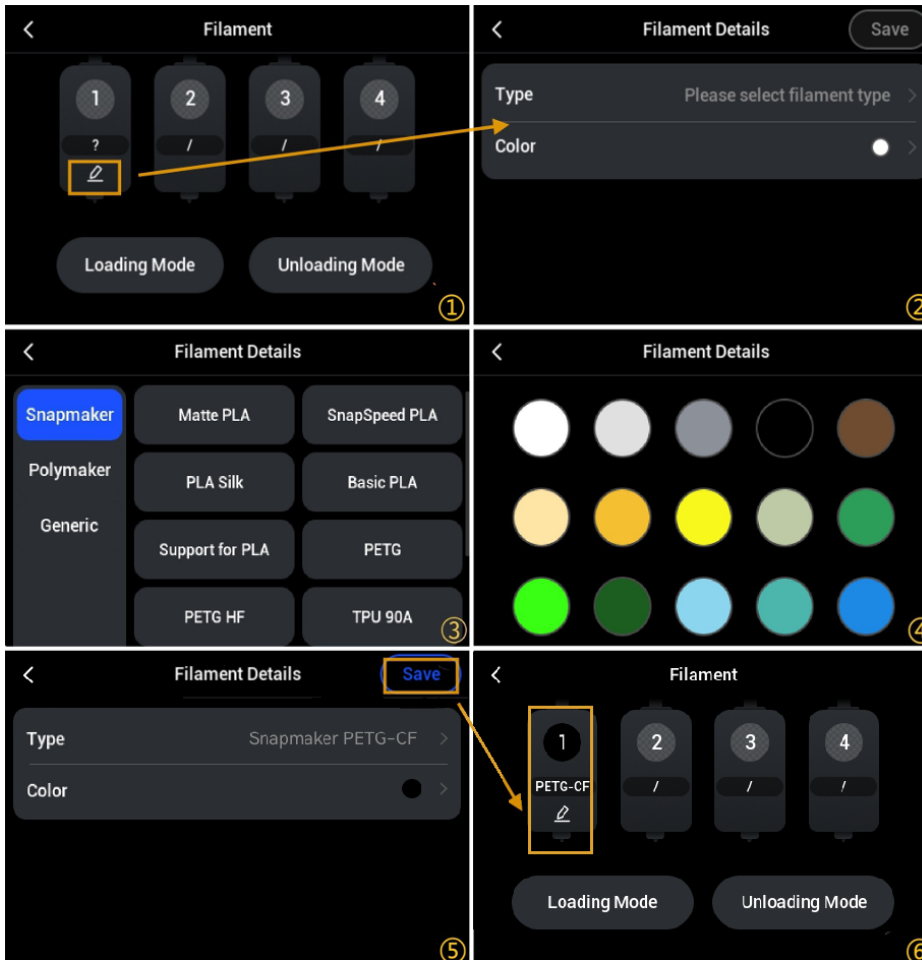
10. After successful loading, re-insert the tube into the top of the toolhead.

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 Print and Final Print

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

2. Final Print: Import the model file into 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-Dry**: PETG-CF has moderate moisture sensitivity, so drying before use is optional. However, pre-drying is recommended for optimal print results. The recommended setting is 65°C for 8 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:** PETG-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 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.
- **Improving Layer Adhesion:** If layer adhesion is insufficient, try reducing the print speed or cooling fan speed, or slightly increasing the nozzle temperature.
- **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

3D printing filament storage conditions directly affect print quality. To extend filament service life, strictly follow the guidelines below:

1. PETG-CF is hygroscopic and will absorb moisture from the air if stored for extended periods in humid environments, potentially causing issues such as stringing, bubbling, and rough surface finish during printing. Store PETG-CF filament and printed parts in a dry, cool, well-ventilated area, away from direct sunlight, high temperature, and high humidity (recommended ambient temperature: 10–30°C, humidity <20% RH). Keep away from open flames, heat sources (e.g., heaters, ovens), and corrosive substances.

2. Unopened filament: Keep sealed in its original packaging to prevent moisture absorption and contamination. Filament may degrade in performance and cause printing anomalies if stored for overly extended periods. Use promptly after purchase.

3. Opened filament: After use, promptly reseal the remaining filament in a sealed bag or a dedicated storage container, adding desiccant (e.g., silica gel). It is recommended to use opened filament within one month. If stored for an extended period, dry the filament before printing: 65°C for 8 hours. In humid regions, use the filament as soon as possible or ensure it is properly sealed.

4. Spool care: Avoid dropping, crushing, or impacting the spool to prevent deformation that may cause filament tangling. If tangling occurs, do not force the filament. Gently straighten it before use to avoid 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 clog using appropriate tools.
Bubbles or stringing on surface	1. Filament absorbed moisture. 2. Nozzle temperature too high. 3. Cooling fan off or inadequate airflow. 4. Printing speed too fast.	1. Dry the filament. 2. Decrease nozzle temperature by 5–10°C. 3. Turn on cooling fan and adjust fan speed. 4. Reduce printing speed appropriately.
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 isopropyl 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. Spool deformed. 2. Spool placed at an incorrect angle. 3. Filament kinked or damaged.	1. Replace with an undamaged spool. 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 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 must be supervised by an adult at all times.

2. Environmental Ventilation: When heated, PETG emits trace amounts of volatile organic compounds (VOCs) and ultrafine particles. Although its emission levels are significantly lower than those of ABS, prolonged printing in an enclosed space may still lead to accumulation. When printing reinforced versions such as PETG-CF, use an enclosed printer and ensure adequate ventilation.

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.

6. 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.

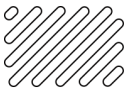
7 Additional Notes

1. This document is the user guide for Snapmaker PETG-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.



MAKE
SOMETHING
WONDERFUL

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

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