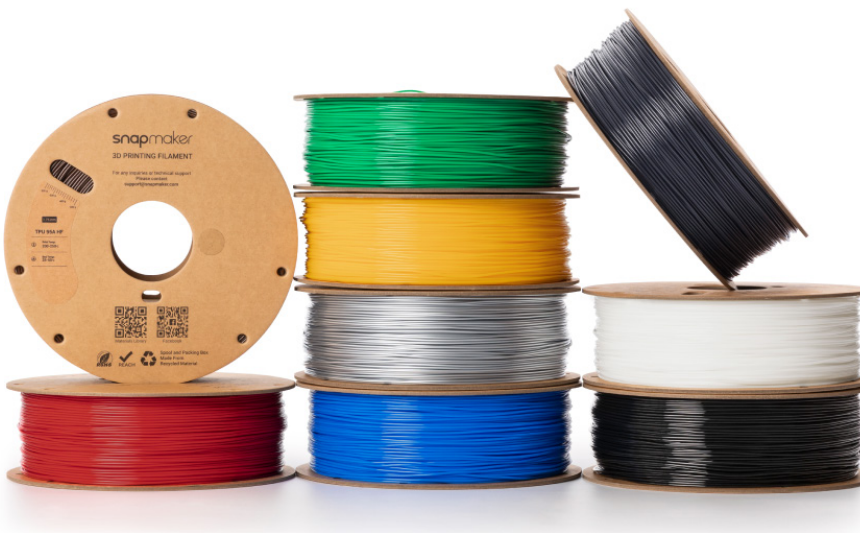
snapmaker

TPU 95A HF User Guide

Snapmaker TPU 95A HF is a printing filament compatible with 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

Snapmaker TPU 95A HF is a flexible 3D printing filament that combines high flexibility with high-speed printing performance. It supports significant bending and twisting, remaining wear-resistant and durable even under frequent dynamic deformation. It is well-suited for applications such as phone cases, protective parts, and various flexible creative accessories. Compared to conventional TPU 95A, its upgraded formulation enables faster printing speeds, greatly improving creative efficiency. Its excellent flexibility and cushioning performance make it an ideal choice for anti-slip pads, sealing gaskets, and protective components.



2 Specifications

Subjects	Data
Diameter	1.75 ± 0.03 mm
Net Filament Weight	1 kg
Length	346 m/kg
Spool Material	Cardboard Spool
Spool Size	Diameter: 200 mm; Height: 66 mm

Recommended Printing Settings

Subjects	Data
Drying Settings Before Printing	70°C , 6 h
Printing and Storage Humidity	< 20% RH (Sealed, with Desiccant)
Nozzle Size	0.4/0.6/0.8 mm
Nozzle Temperature	200–250°C
Bed Type	Smooth PEI Plate / Textured PEI Plate
Bed Surface Preparation	Glue Stick / Liquid Glue
Bed Temperature	25–50°C
Cooling Fan	ON
Printing Speed	50–110 mm/s
Retraction Length	1–2 mm
Retraction Speed	30 mm/s

Physical Properties

Subjects	Testing Methods	Data
Density	ISO 1183	1.216 g/cm³ at 23°C
Melt Index	210°C , 2.16 kg	28.5 g/10 min
Melting Temperature	DSC, 10 °C/min	177.29°C
Glass Transition Temperature	DSC, 10 °C/min	-18.56°C
Decomposition Temperature	TGA, 20 °C/min	315.11°C
Crystallization Temperature	DSC, 10 °C/min	90.52°C
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	N/A
Saturated Water Absorption Rate	25°C, 55% RH	0.69%

Mechanical Properties

Subjects	Testing Methods	Data
Shore Hardness	ISO 7619-1, GB/T 531.1	95A
Young's Modulus (X-Y)	ISO 527, GB/T 1040	N/A
Young's Modulus (Z)	ISO 527, GB/T 1040	N/A
Tensile Strength (X-Y)	ISO 527, GB/T 1040	N/A
Tensile Strength (Z)	ISO 527, GB/T 1040	18.64 ± 0.64 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	N/A
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	459.25 ± 18.09%
Bending Modulus (X-Y)	ISO 178, GB/T 9341	64.19 ± 3.17 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	N/A
Bending Strength (X-Y)	ISO 178, GB/T 9341	3.20 ± 0.07 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	N/A
Impact Strength (X-Y)	ISO 179, GB/T 1043	N/A
Impact Strength (Z)	ISO 179, GB/T 1043	N/A

Other Physical and Chemical Properties

Subjects	Data
Odor	Odorless
Composition	Thermoplastic Polyurethane
Skin Hazards	Non-Hazardous
Chemical Stability	Stable under normal storage and handling conditions
Solubility	Insoluble in Water
Resistance to Acid	Non-Resistant
Resistance to Alkali	Non-Resistant
Resistance to Organic Solvent	Not resistant to some organic solvents
Resistance to Oil and Grease	Fair
Flammability	Flammable
Combustion Products	Water, Carbon Oxides, Nitrogen Oxides
Odor of Combustion Products	Pungent Odor

Specimen Printing Conditions

Subjects	Data
Nozzle Temperature	240°C
Bed Temperature	35°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.

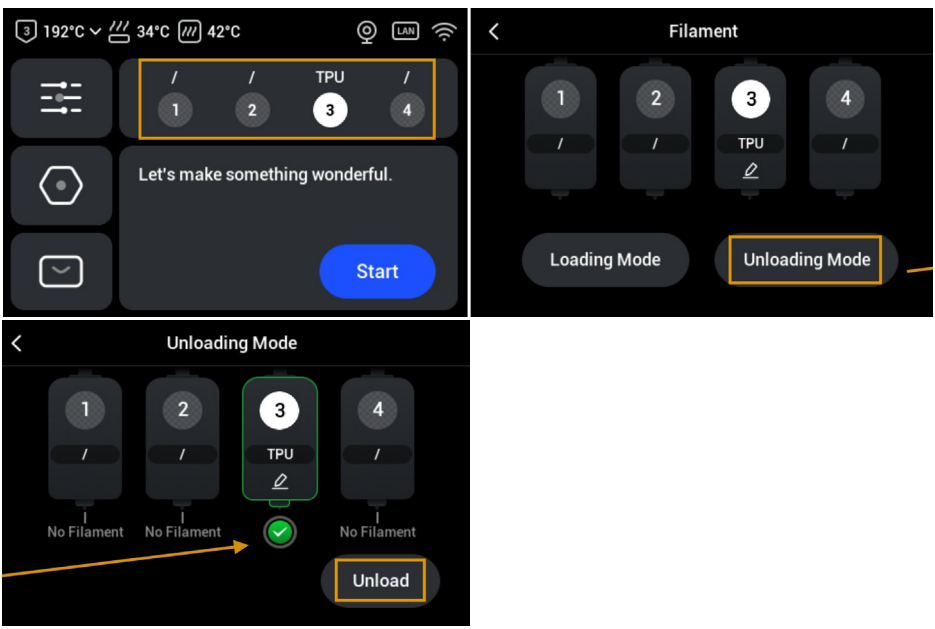
3 Usage Procedure

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

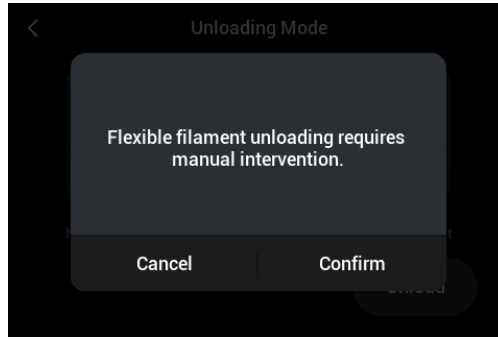
To minimize the risk of print failure, it is recommended to review the more detailed operating instructions below before proceeding.

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. A prompt will appear. Tap **Confirm**.

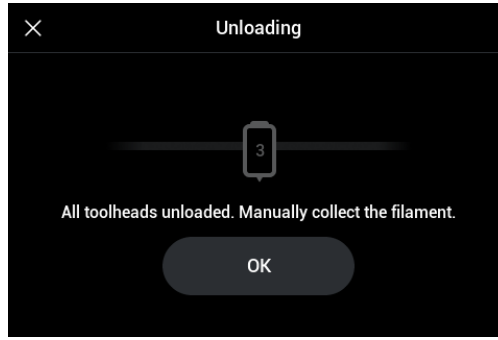


3. The printer will extract the selected toolhead and automatically heat the nozzle.

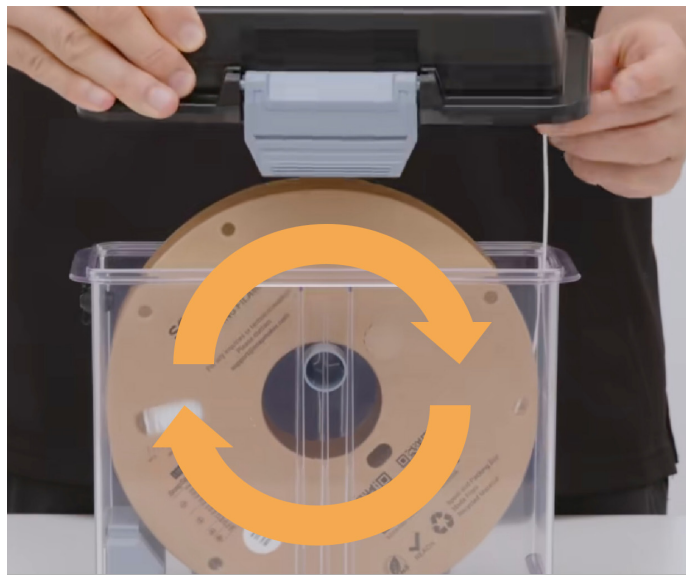
4. Once the nozzle reaches the target temperature, a dynamic guide will pop up on the screen. Tap **Next**, then manually pull the filament outward to assist with unloading.

The on-screen guidance on the touchscreen is for illustrative purposes only. The TPU 95A HF filament cannot be used with the automatic filament feeder. Please pull the filament out directly from the guide tube.

5. Once all unloading is complete, tap **OK**.



6. Rotate the spool to retract the filament from the tube until it is fully withdrawn.



7. Thread the end of the filament through the two locking holes on the spool to prevent loosening or tangling.

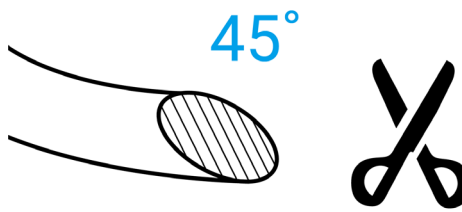
8. Keep the filament away from direct sunlight in a sealed container with desiccant.

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

Filament Loading

For rigid filament or flexible filament rated 95A or above, the default Automatic Loading mode is recommended. For flexible filament rated below 95A, please follow the instructions for Manual Loading.

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

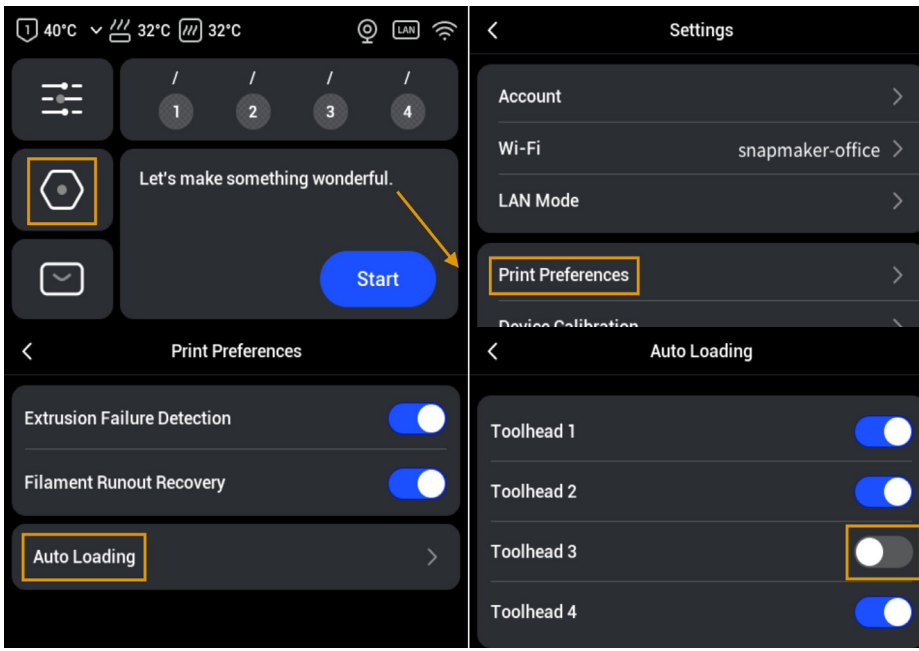


This reduces feeding resistance and improves loading reliability.

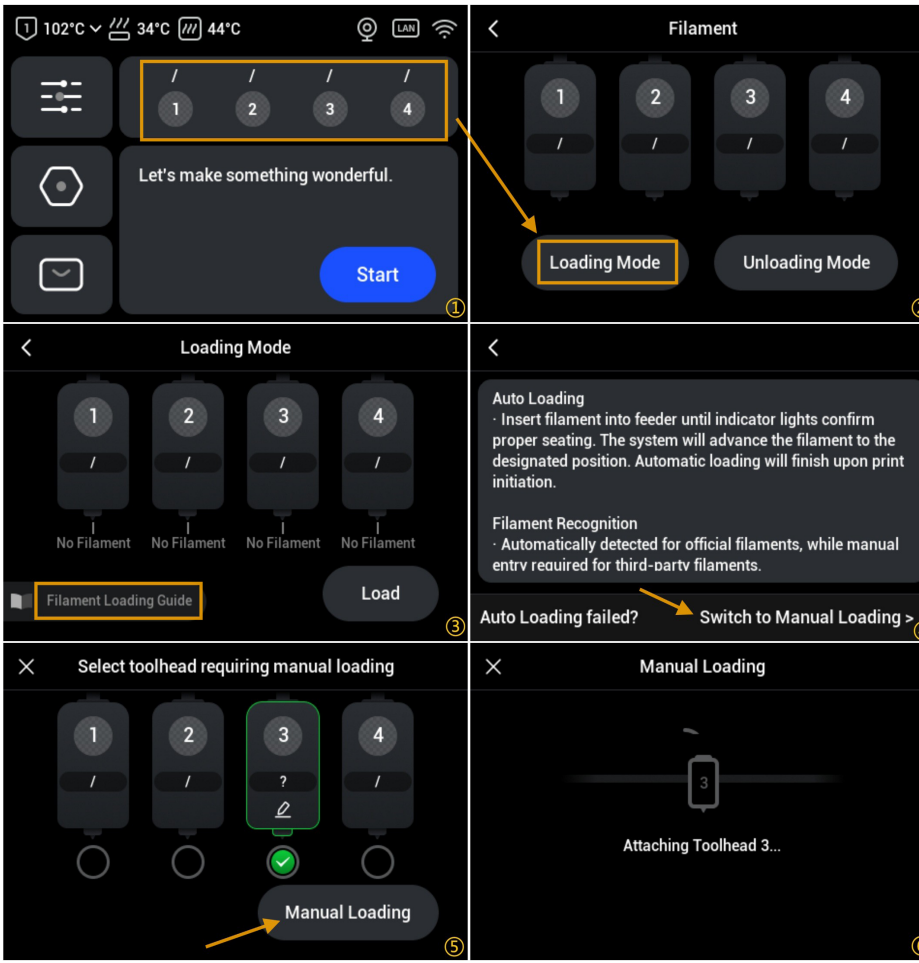
2. Mount the filament spool on the spool holder. Make sure the filament can be pulled tangentially from the bottom of the spool.

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.

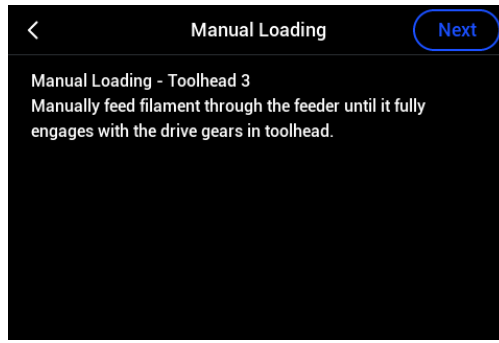


5. Return to the main interface and navigate to the Filament page. Tap Loading Mode > Filament Loading Guide > Switch to Manual Loading. Select the target toolhead and tap **Manual Loading**. The printer will extract the selected toolhead.

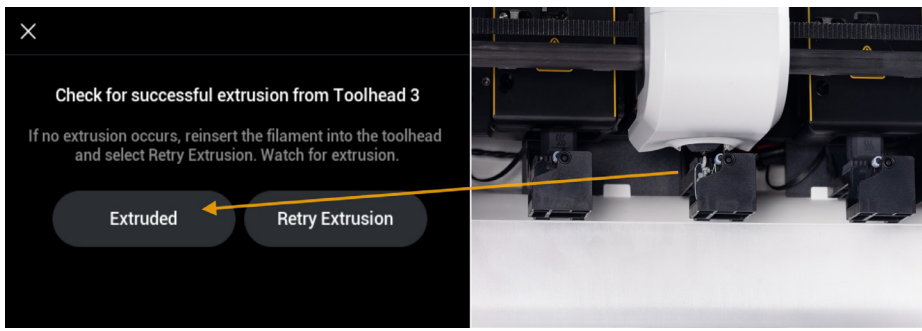


6. Follow the on-screen instructions to manually feed the filament through the tube into the toolhead. It is recommended to unplug the tube from the top of the toolhead, expose part of the filament, and push it downward manually to ensure proper contact with the extrusion gears.

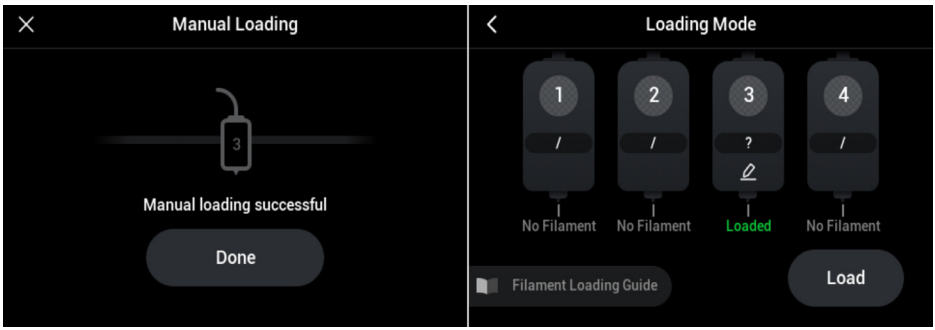
7. Tap **Next**. The printer will heat the nozzle to the target temperature and automatically extrude filament.



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.



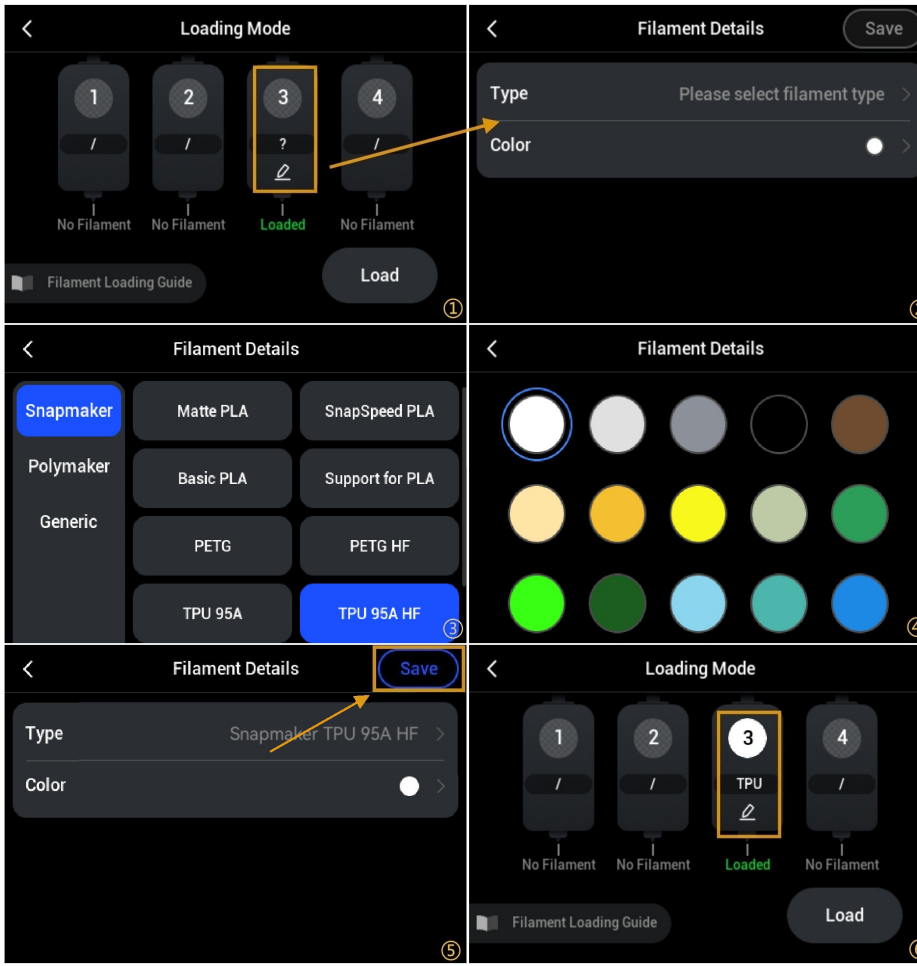
9. After the nozzle is automatically cleaned, tap **Done**.



The filament status is now updated to Loaded.

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

11. Edit the filament information.
Tap the icon below the corresponding filament, select the filament type and color, then tap **Save**.



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

Test Print and Final Print

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:** TPU is extremely hygroscopic and must be dried before use. Dry the filament at 70°C for 6 hours.
- **Storage:** When not in use, keep the filament away from direct sunlight in a sealed container with desiccant.
- **Recommended Solution**: We highly recommend using SnapDryer, which serves as an all-in-one solution to perfectly dry and store your filament. Watch our video guide to get started with SnapDryer.

2. Printing

- **Nozzle Selection:** Printing with a 0.2 mm nozzle is not recommended.
- **Loading & Unloading:** TPU is a flexible filament that demands precise control during loading and unloading. Improper handling may lead to issues such as loading problems or nozzle clogs.To minimize the risk of print failures, the filament must be loaded and unloaded manually. Do not use the automatic filament feeder. We strongly recommend watching our video guide before your first print.
- **Drying While Printing:** For optimal print quality, we recommend using SnapDryer while printing.

- **Removal**: TPU tends to over-stick to the build plate, which may damage the print during removal. We recommend spraying alcohol at the interface between the model and the bed during removal.
- **Optimizing First-Layer Adhesion:** If first-layer adhesion fails, please check the bed levelling and clean the build plate. If the issue persists, apply a glue stick or liquid glue to improve adhesion.
- **Fixing Bubbles & Stringing**: If you notice bubbles or heavy stringing, dry your filament thoroughly first. If stringing continues, try reducing the distance between models, increasing the retraction length or speed, and decreasing the travel speed.
- **Fixing Model Collapse**: If the model collapses during printing, first ensure the cooling fan speed is set to 100%. Additionally, you can rotate the model so the affected area faces the cooling fan and position it closer to the fan. This enhances localized cooling and improves print quality.

4 Storage Instructions

The storage environment for 3D printing filament directly affects print quality. Flexible filaments are particularly sensitive to moisture. To extend the service life of the filament, strictly follow the guidelines below:

1. Storage Environment: TPU is highly hygroscopic and will absorb moisture when exposed to humid air, which may cause issues such as stringing, bubbling, and reduced layer adhesion. Store the filament in a dry, cool, and well-ventilated place, away from direct sunlight, high temperatures, and high humidity (recommended ambient temperature: 10–30°C, humidity < 20%). Keep away from fire, heat sources (e.g., radiators, ovens), and corrosive substances. A sealed storage container with desiccant is recommended.

2. Unopened Filament: Keep the filament sealed in its original packaging to prevent moisture absorption and contamination. Prolonged storage may lead to degraded performance and printing anomalies. Use the filament promptly after purchase.

3. Opened Filament: TPU absorbs moisture very easily. After use, promptly reseal the remaining filament in a sealed bag or a dedicated storage container with an adequate amount of desiccant (e.g., silica gel). It is recommended to maintain storage humidity below 20%. For best results, dried filament should be printed from a dry box; extended open-air feeding (sideload) is not recommended. It is recommended to use the filament within one month of opening. If stored for an extended period, the filament must be dried before printing: dry at 70°C for 6 hours. 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 that may cause filament tangling. If tangling occurs, do not pull forcefully. Gently straighten the filament before use to avoid breakage.

5 Common Issues and Troubleshooting

Common Issue	Potential Cause	Recommended Solution
No extrusion/ inconsistent extrusion	1. Filament has absorbed excessive moisture. 2. Nozzle temperature too low, filament not fully melted. 3. Nozzle clogged.	1. Dry the filament. 2. Increase the nozzle temperature by 5–10°C. 3. Clear the nozzle clog using appropriate tools.
Bubbles/stringing on model surface	1. Filament has absorbed excessive moisture. 2. Nozzle temperature too high. 3. Improper retraction settings. 4. Cooling fan speed too high or too low.	1. Thoroughly dry the filament before printing. 2. Decrease the nozzle temperature by 5–10°C. 3. Increase retraction distance and retraction speed. 4. Adjust the cooling fan speed to 50–70%, avoiding extremes.
Edge warping/poor first-layer adhesion	1. Improper heated bed temperature. 2. Bed surface not clean, poor adhesion. 3. First-layer printing speed too high.	1. Set the bed temperature to the recommended range. 2. Clean the bed surface with isopropyl alcohol; apply dedicated adhesive if needed. 3. Reduce first-layer printing speed.
Filament tangle/ feeding jam	1. Deformed spool or improper spool feeding angle. 2. Filament deformed or kinked due to improper storage.	1. Inspect the spool and adjust the feeding angle. 2. Cut away damaged or kinked sections and reload the filament.
Weak layer adhesion/ delamination	1. Nozzle temperature too low. 2. Printing speed too high. 3. Cooling fan speed too high. 4. Filament has absorbed excessive moisture.	1. Increase nozzle temperature. 2. Reduce printing speed appropriately. 3. Lower the cooling fan speed appropriately. 4. Thoroughly dry the filament before printing.

6 Safety Precautions

1. High-temperature protection: During printing, the nozzle and molten filament reach extremely high temperatures. Do not touch the nozzle or freshly printed hot models to avoid burns. Children must be supervised by an adult at all times. After printing, allow the nozzle and heated bed to cool completely before handling.

2. Environmental ventilation: When heated, TPU may release trace amounts of volatile organic compounds (VOCs) and ultrafine particles. Although its emission levels are lower than those of engineering plastics such as ABS, it is recommended to use the printer in a well-ventilated area or with an air purification system. Users with a history of respiratory or chronic illness are advised to wear a mask for additional protection.

3. Moisture management: TPU 95A HF is highly hygroscopic and will absorb moisture when exposed to humid air, which may lead to issues such as stringing, bubbling, and reduced layer adhesion. After opening, the filament should be promptly sealed and stored with an adequate amount of desiccant. If the filament has already absorbed moisture, be sure to dry it thoroughly before printing.

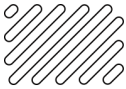
7 Additional Notes

1. This document is the user guide for Snapmaker TPU 95A HF 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

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