snapmaker

PLA Rainbow Filament

User Guide



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Snapmaker PLA Rainbow 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 Rainbow Filament transitions smoothly through shades of cyan, purple, pink, yellow, green, and more in a single spool, with a soft matte finish that gives prints a refined look. One full rainbow color cycle uses approximately 200 g of filament. Depending on filament usage, model geometry, and print settings, prints may show a partial gradient or the full rainbow. As the starting color, filament usage, and infill density shape the final gradient, even the same model can feature different color patterns, giving each print its own unique character.



2 Specifications

Subjects	Data
Diameter	1.75 ± 0.03 mm
Net Filament Weight	1kg
Length	337 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	0.2, 0.4, 0.6, 0.8 mm
Nozzle Temperature	190–240°C
Bed Type	Textured PEI Plate, Smooth PEI Plate, Graphic Effect Steel Plate
Bed Surface Preparation	Glue
Bed Temperature	25–70°C
Cooling Fan	100%
Printing Speed	< 300 mm/s
Retraction Length	0.4–0.8 mm
Retraction Speed	20–30 mm/s
Chamber Temperature	25–45°C
Max Overhang Angle	60°
Max Bridging Length	≤ 30 mm
Support Material	Support for PLA

Physical Properties

Subjects	Testing Methods	Data
Density	ISO 1183, GB/T 1033	1.31 g/cm³ at 23°C
Melt Index	210°C, 2.16 kg	14–20 g/10 min
Melting Temperature	DSC, 10°C/min	162.6°C
Glass Transition Temperature	DSC, 10°C/min	60.6°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	62.7°C
Heat Deflection Temperature	ISO 75, 1.8 MPa	52°C
Heat Deflection Temperature	ISO 75, 0.45 MPa	57.8°C
Saturated Water Absorption Rate	23°C, 70% RH	0.36%

Mechanical Properties

Subjects	Testing Methods	Data
Young's Modulus (X-Y)	ISO 527, GB/T 1040	1997±64 MPa
Young's Modulus (Z)	ISO 527, GB/T 1040	1615±54 MPa
Tensile Strength (X-Y)	ISO 527, GB/T 1040	23.2±0.5 MPa
Tensile Strength (Z)	ISO 527, GB/T 1040	12.2±0.7 MPa
Breaking Elongation Rate (X-Y)	ISO 527, GB/T 1040	27.8±2.4%
Breaking Elongation Rate (Z)	ISO 527, GB/T 1040	0.9±0.1%
Bending Modulus (X-Y)	ISO 178, GB/T 9341	2209±75 MPa
Bending Modulus (Z)	ISO 178, GB/T 9341	N/A

(Continued)

Bending Strength (X-Y)	ISO 178, GB/T 9341	40.4±1.1 MPa
Bending Strength (Z)	ISO 178, GB/T 9341	N/A
Impact Strength (X-Y)	ISO 179, GB/T 1043	6.7±0.5kJ/m²
Impact Strength (Z)	ISO 179, GB/T 1043	N/A

Other Physical and Chemical Properties

Subjects	Data
Odor	Odorless
Composition	Polylactic Acid
Skin Hazards	Non-Hazardous
Chemical Stability	Stable under normal conditions
Solubility	Insoluble in Water
Resistance to Acid	Resistant to Weak Acid
Resistance to Alkali	Non-Resistant
Resistance to Organic Solvent	Non-Resistant
Resistance to Oil and Grease	Fair
Flammability	Flammable
Combustion Products	Water, Carbon Oxides
Odor of Combustion Products	Odorless

Specimen Printing Conditions

Subjects	Data
Nozzle Temperature	230°C
Bed Temperature	55°C
Printing Speed	50 mm/s
Infill Density	100%

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

Disclaimer

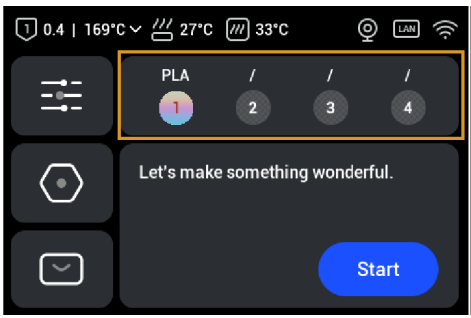
The performance and printing parameters of the aforementioned filaments are obtained by Snapmaker through testing filament samples with sample 3D printers. All data provided is for reference and comparison purposes only, and does not constitute design specifications or any warranty of quality. Actual 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.

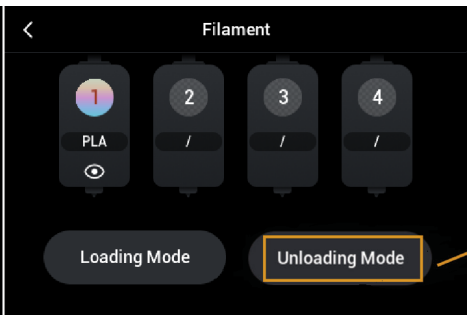
3 Usage Procedure

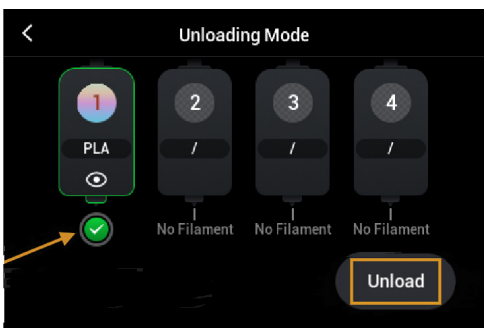
This section demonstrates the usage procedure using the Snapmaker U1 model.

Filament Unloading

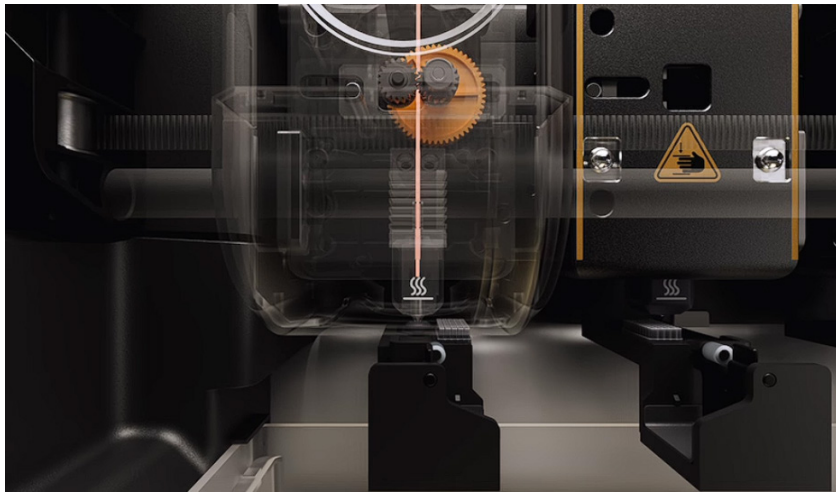
1. On the touchscreen main interface, navigate to the Filament page. Tap **Unloading Mode**. Select all toolheads requiring unloading, then tap **Unload**.



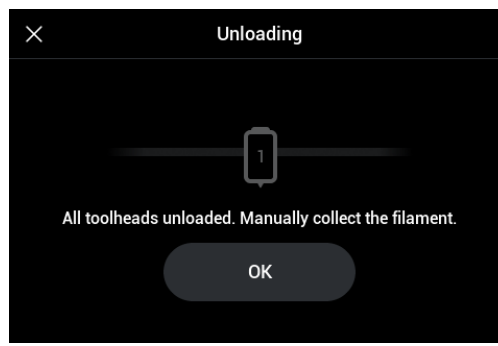




2. The printer will extract the selected toolhead and automatically heat the nozzle. Once the nozzle reaches the target temperature, the extrusion gears will retract the filament upwards, completing the unloading process.



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. If an automatic filament feeder is used, the corresponding white indicator light on the feeder will turn off once the filament has been completely retracted.



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.

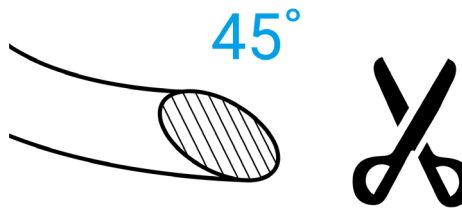


7. Repeat the steps above until all intended filaments have been successfully retrieved.

Automatic Loading

1. Trim the end of the filament at an approximately 45° angle with diagonal cutters.

This reduces feeding resistance, thus enhancing the success rate.



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

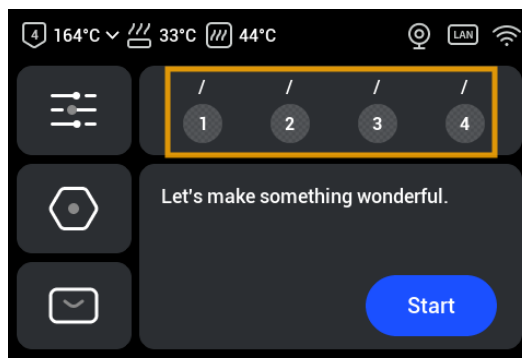


3. Insert the filament into the feeder until the white indicator light turns on.

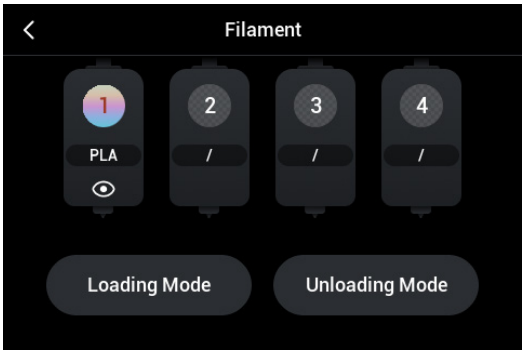


If the feeder's white light is blinking, feeding is still in progress.
If the white light remains steady, pre-loading is complete.

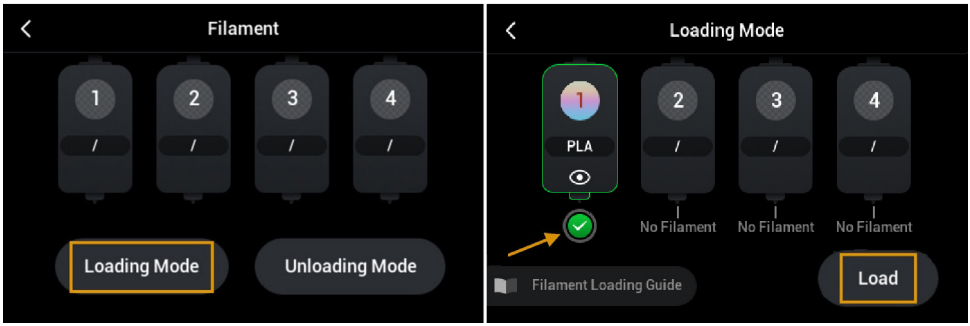
4. On the touchscreen main interface, navigate to the Filament page to edit filament information.



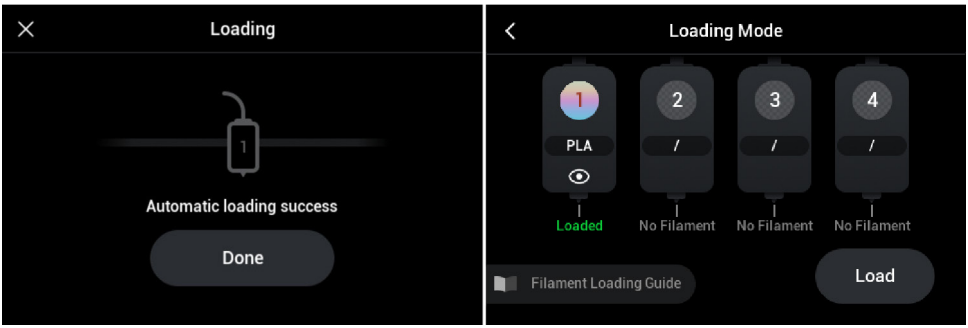
Using RFID-equipped Snapmaker official filament, the device will automatically recognize the filament information; no manual editing is needed.



5. On the Filament page, tap **Loading Mode**, select the corresponding filament, tap **Load**.



6. The printer will automatically perform the following steps: extract the toolhead, feed filament into the nozzle, heat the nozzle, extrude filament, and cleanse old material from the toolhead. Upon completion, tap **Done** on the screen.



The filament status is now updated to **Loaded**.

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:** The 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, store the filament in a dry place away from direct sunlight to maintain consistent print quality.

2. Printing

- **Adjusting the Color Gradient:** A full rainbow color cycle uses approximately 200 g of filament. The range of colors and gradient effect in your print depend on how much filament is used. You can change how colors are distributed across your model by choosing a different starting color or adjusting the infill density.

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 ≤ 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. 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.	1. Increase bed temperature. 2. Clean bed with ethyl alcohol; apply dedicated bed adhesive if needed. 3. Maintain stable ambient temperature, avoid drafts.
Filament tangle/feeding jam	1. Spool deformed. 2. Spool placed at an incorrect angle. 3. Filament kinked or damaged.	1. Manually adjust the deformed area of the spool to restore its original state. 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.

7 Additional Notes

1. This document is the user guide for Snapmaker PLA Rainbow 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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