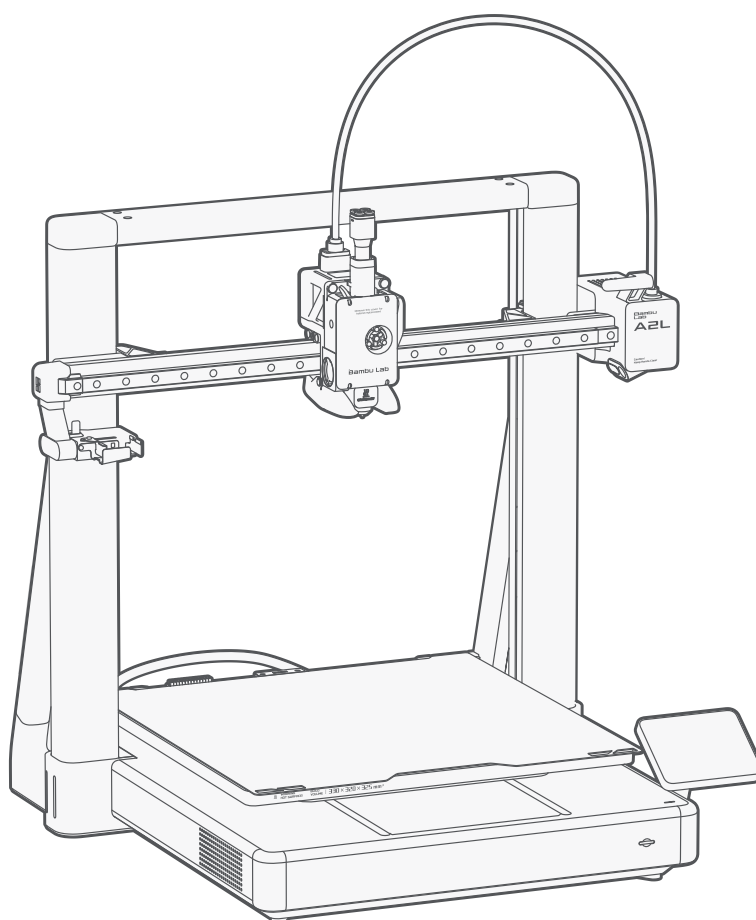


Bambu Lab A2L

3D Printing User Manual

Version 1.0 2026.08



Copyright Notice

This manual and its contents are intended solely to guide users in operating and using this product. The intellectual property rights belong to Shenzhen Bambu Lab Technology Co., Ltd. (hereinafter "Bambu Lab"). Without written permission from Bambu Lab, no part of this manual may be copied, distributed, modified, or provided to third parties in any form.

Manual Scope

This manual mainly introduces the A2L 3D printer. Some accessories or features mentioned in certain chapters are optional or upgrades and may not be included in your product package. Please refer to your specific model and configuration when studying the content and operating the printer.

Images shown in this manual are for reference only. The actual display and features may vary depending on the software or firmware version.

Version and Updates

After a firmware update, the printer touchscreen will display information about new features. You can click the link below or visit Bambu Lab Wiki and navigate to **A Series > A2L > Printer Features > A2L Firmware Release History** for details. If anything in this manual conflicts with the firmware release notes, the release notes take precedence.

wiki.bambulab.com/A2L/manual/A2L-firmware-release-history

This manual applies to firmware version: 01.01.00.00

Thank you for choosing the Bambu Lab A2L 3D Printer!

This manual provides essential information for using the 3D printing functions, including device setup, operation, and routine maintenance. To ensure safe, correct, and efficient use, read this manual carefully and make sure you understand it before use.

How to Use This Manual

- 👉 Use the table of contents and in-document links for quick navigation.
- 🔍 Use the digital PDF to search for keywords and find information quickly.
- 📖 Visit Bambu Lab Wiki (wiki.bambulab.com) and search for keywords within the chapter for more detailed steps and videos.

Quick Start

1. Read the [Read Before Use](#).
2. Start your [first print](#).
3. [Access 3D Model Resources](#).
4. [Adjust Slicing Parameters](#).
5. Review [Print Quality Issues and Solutions](#) and [Printer Issues and Solutions](#).

Additional Resources

- Unboxing and installation: See the unboxing guide (wiki.bambulab.com/general/unboxing-guide) for printer unboxing and installation instructions.
- Customized Courses: Visit Bambu Lab Academy (bambulab.com/support/academy) for structured courses on the printer and software.

Feedback

If you have any questions or suggestions about this user manual, use the following link or scan the QR code to send feedback.



bambulab.com/support/documentation/feedback

Symbol Guide

NOTE

Supplementary explanations for the main content.

TIPS

Suggestions to optimize operations, improve efficiency, or enhance convenience, helping you use the printer more effectively.

CAUTION

Operations that may affect print quality or printer performance. Proceed carefully to avoid potential issues.

DANGER

Potential hazards. Ignoring this may cause equipment damage or personal injury. Always follow the related instructions.

Technical Support

If you encounter issues during use, check this manual first. You can also visit Bambu Lab Wiki and search for troubleshooting steps, or use Bambu AI (support.bambulab.com) for maintenance tips, diagnostics, and solutions.

If your issue is not addressed or the troubleshooting steps do not resolve it, submit a service ticket or contact online technical support via the Service & Support website (bambulab.com/support) to get professional assistance.

Read Before Use

To ensure safe operation and optimal performance of this printer, carefully review the following precautions before use.

Basic Safety and Electrical Requirements

- Verify that the printer's operating voltage matches the specified requirements to avoid damage or safety hazards. Check the label next to the power socket for specific voltage requirements.
- The printer operates at high temperatures and speeds. Do not allow children or unauthorized personnel to operate the printer to prevent burns, pinching, or other accidents.
- The heatbed moves back and forth during operation. Ensure sufficient space in front of and behind the device to avoid affecting the printer's normal operation.
- Do not place hands or other body parts within the heatbed's motion range during printer operation, to prevent collision or burns.

Operation and Maintenance Recommendations

- To ensure proper functioning of the printer's internal precision mechanisms, regular maintenance is recommended. For detailed maintenance frequency and methods, see [Regular Care and Maintenance](#).
- For the best printing results, we recommend using Bambu Lab filaments. These filaments have undergone rigorous compatibility, safety, and stability testing based on the product's characteristics.
- Unless otherwise specified, always unplug the power cord before performing any procedure, maintenance, or modification to prevent electric shock or equipment damage.
- Unless otherwise specified, allow the printer to fully cool down before any operation, maintenance, or modification.

Safety Instructions for AMS lite

This printer can be used with AMS lite. Observe the following precautions before use.

- To prevent the filament from getting stuck, do not use flexible filaments such as TPU with a hardness level of 95A or lower, or damp PVA and BVOH, in the AMS lite.
- To prevent wear of the filament load path, do not use PLA Glow or third-party fiber-reinforced filaments such as CF or GF with the AMS lite.
- Avoid excessive bending or overly long PTFE tubes, as this can lead to filament loading issues.
- The AMS lite supports spools with a width of 40–68 mm and an inner diameter of 53–58 mm.

Safety Instructions for AMS 2 Pro

- To prevent filament feeding jams, do not load flexible materials such as TPU with a hardness of 95A or lower, or damp PVA and BVOH into the AMS 2 Pro.
- To use the drying function of the AMS 2 Pro, power it separately using the official Bambu Lab power adapter.

- During filament drying, the AMS 2 Pro expels moisture through external air circulation. Ensure the air intake and air vent are not blocked by other objects for the best drying performance.
- The AMS 2 Pro supports filament spool widths from 50 mm to 68 mm and diameters from 197 mm to 202 mm. Plastic spools are recommended.

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Chapter 1 Introduction

1.1 Product Introduction

The A2L is a smart 3D printer based on Fused Deposition Modeling (FDM) technology. It offers a build volume of 330×320×325 mm, meeting the needs for large models, and features comprehensive upgrades in core hardware and algorithms:

- **Upgraded Extrusion System:** Equipped with a PMSM closed-loop servo extruder, it ensures more stable power output during high-speed printing and supports active monitoring for extrusion anomalies.
- **Adaptive Vibration Compensation:** It features a multi-point calibration adaptive algorithm for the first time, significantly suppressing ripple marks on large volume and tall models during printing.
- **Physical Resonance Suppression:** The printer body's frame has two built-in granular dampers to physically absorb frame resonance and further optimize surface quality.
- **More Reliable Clumping Detection:** A new clumping detection switch is added. Dedicated hardware detects clumping through physical contact, making it more stable and reliable.
- **Multi-Dimensional Creation Expansion:** New modular mounting points are added, supporting the installation of a cutting and drawing module for 2D creative work.

When used with the Automatic Material System (AMS), it further enhances printing intelligence and ease of use:

- **AMS lite:** An open automatic material system, it supports RFID filament identification and automatic multi-color/multi-material changing.
- **AMS / AMS 2 Pro / AMS HT:** Enclosed automatic material systems, they support RFID filament identification and automatic multi-color/multi-material changing; AMS 2 Pro and AMS HT additionally support intelligent drying.

The A2L can connect up to **4 AMS units + 1 AMS lite unit** simultaneously, enabling up to **19-color** printing. AMS lite can be used in combination with AMS / AMS 2 Pro / AMS HT. For details, see [Connecting Multiple AMS Units](#).

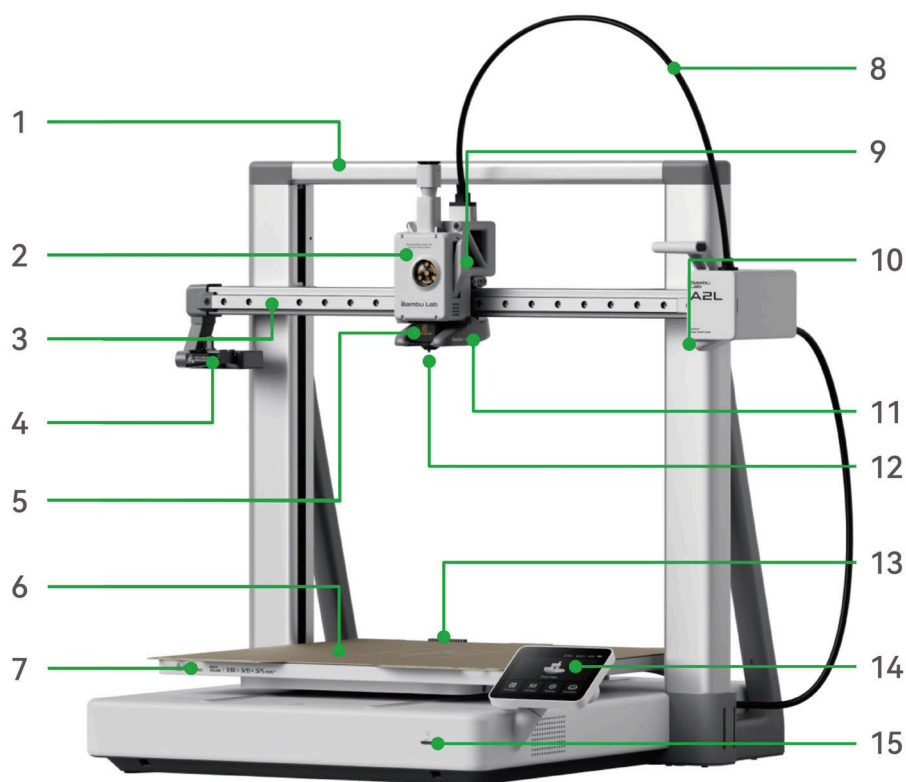
NOTE

Unless otherwise specified, AMS refers to models such as AMS, AMS 2 Pro, and AMS HT; AMS lite will be explicitly mentioned when it needs to be distinguished separately.

1.2 Printer Component Introduction

This section introduces the main components of the A2L printer, including the overall external appearance of the printer, the composition of the toolhead, and the printer screen.

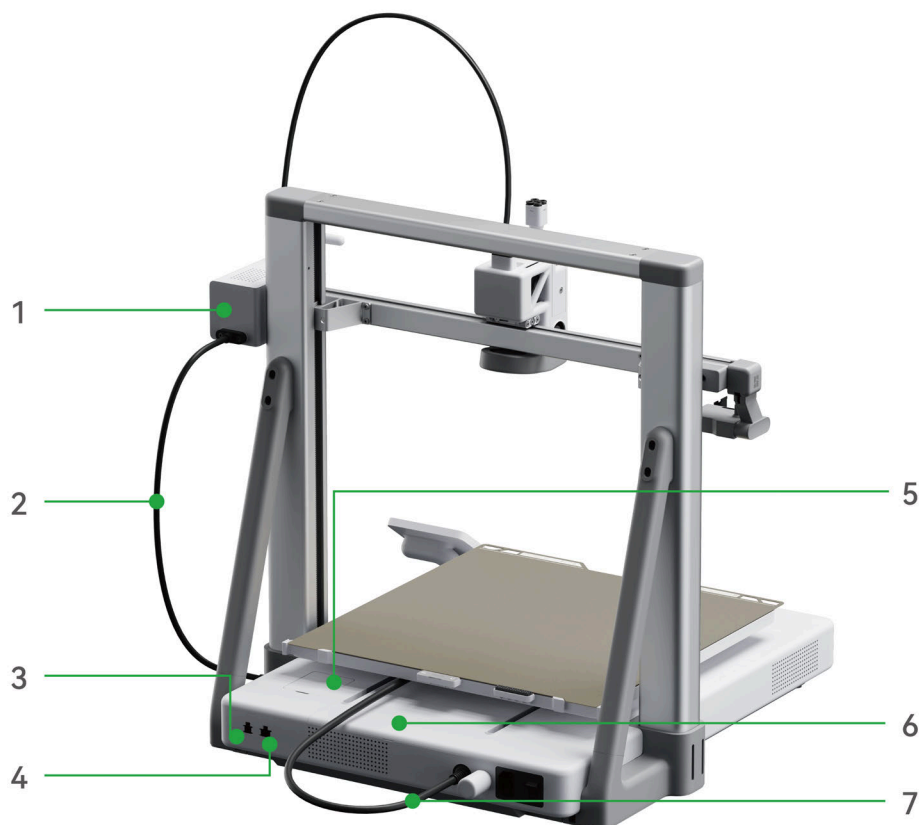
1.2.1 Printer



1. **Gantry:** Supports the toolhead and heatbed, providing a stable structural framework for printing.
2. **Toolhead:** This assembly contains multiple components, such as the extruder, hotend, and toolhead mainboard.
3. **X-Axis assembly:** Uses linear rails to ensure smooth and precise motion of the toolhead on the horizontal plane.
4. **Purge wiper:** Clears filament waste generated during various printing stages (e.g., filament changes, pauses).
5. **Hotend silicone sock:** Withstands high temperatures up to 300°C, providing thermal insulation for the hotend and preventing filament adhesion.
6. **Build plate:** Installed on the heatbed, serving as the direct support surface for model printing.
7. **Heatbed:** Heats the build plate to enhance first layer adhesion, preventing model warping or detachment.
8. **Bambu USB-C cable:** Used for data communication between the toolhead and the mainboard.
9. **Filament cutter lever:** Assists in holding the filament cutter and pushing it to cut the filament.
10. **Camera:** Provides remote live monitoring and timelapse functions for the printing process.
11. **Part cooling fan:** Rapidly cools newly extruded filament, ensuring printed layers solidify quickly and maintain their shape.
12. **Hotend:** Features an integrated design, heats quickly, and is easy to replace and maintain.
13. **Nozzle wiper:** Used to clean waste extruded from the nozzle before printing.

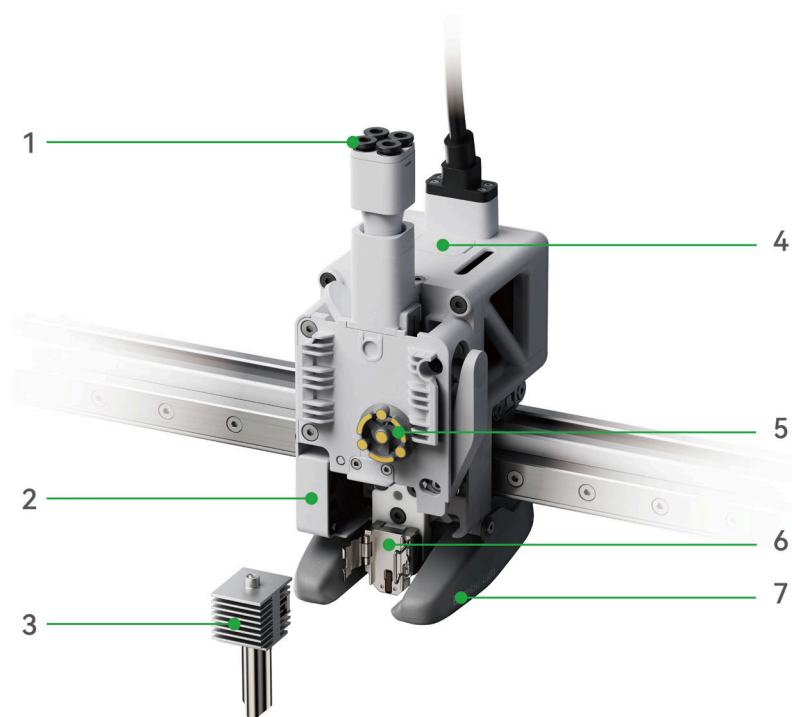
14. **Screen:** 3.5-inch touchscreen that displays printing parameters and controls the printer.

15. **MicroSD card:** Used to store files such as print files, cache files, and print process videos.



1. **X-Axis motor cover:** Located at one end of the X-axis, it houses and protects the X-axis motor and related connecting components.
2. **Integrated cable:** The main cable that connects the printer base to the gantry/toolhead components, responsible for transmitting power and control signals.
3. **4-pin port:** The port for connecting AMS lite to the printer, responsible for communication and power supply between AMS lite and the printer.
4. **6-pin port:** The port for connecting AMS devices (AMS, AMS 2 Pro, AMS HT) to the printer, responsible for communication and power supply between the devices.
5. **Z-Axis motor cover:** A protective cover installed on the outer side of the Z-axis motor, used to shield and protect the Z-axis motor and its cable interface.
6. **Y-Axis top cover:** A protective cover over the top of the Y-axis assembly, preventing dust and debris from entering.
7. **Heatbed cable:** The cable connecting the heatbed to the printer's main control/power supply system, used to power the heatbed and transmit relevant control signals.

1.2.2 Toolhead



1. **Toolhead filament inlet:** Located on top of the toolhead, it guides filament into the toolhead and feeds it into the extruder.
2. **Hotend cooling fan:** Cools the hotend heat sink to reduce heat transfer to adjacent components like the extruder. The hotend cooling fan is a high-speed rotating component. Do not touch it during operation.
3. **Hotend:** Heats and melts the filament, allowing it to extrude from the nozzle. It features a quick-locking clip structure for fast installation and removal.
4. **Expansion interface:** Connects to expansion accessories, such as the cutting module, to extend functionality.
5. **Rotary wheel:** Shows the rotation status of the extruder gear. After removing the rotary wheel, you can install the cutting module.
6. **Hotend heating assembly:** Heats the hotend to the required printing temperature, allowing the filament to fully melt and extrude from the nozzle.
7. **Part cooling fan:** Quickly cools the extruded filament, ensuring printed layers solidify rapidly and maintain their shape.

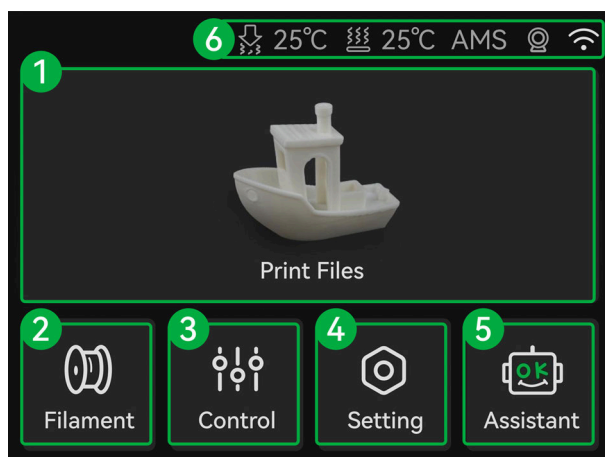
NOTE

- The A2L comes standard with a 0.4 mm stainless steel nozzle. It supports **quick-release hotends from all Bambu Lab series models**.
- The A2L can also be equipped with a cutting module for flat cutting and drawing. This module is not included with the printer and must be purchased separately.

1.2.3 Printer Screen

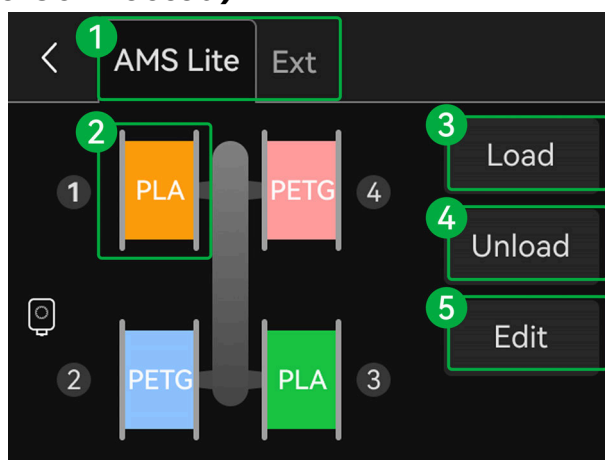
The main menu bar is on the left side of the printer touchscreen. Tap the icons to jump to the , , , , or  pages to configure and operate the printer. See [Printer Screen Control](#) for detailed feature descriptions and operation instructions.

Homepage



1. **Print Files:** Select model files from the MicroSD card, including built-in models and saved historical print models.
2. **Filament:** Go to the filament page to view and manage currently connected filament.
3. **Control:** Go to the control page to perform printer operations.
4. **Settings:** Go to the settings page to configure printer functions and system settings.
5. **Assistant:** Go to the message page to view printer operating status and maintenance reminders.
6. **Status Bar:** Displays information such as nozzle temperature, heatbed temperature, camera status, and network status.

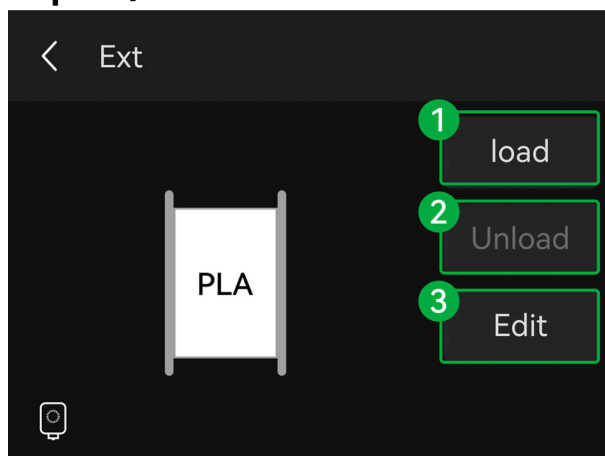
Filament Page (AMS lite Connected)



1. Switch between AMS, AMS lite, or external spool.
2. Displays filament color and type. Tap the icon to load, unload, and edit filament.
3. After selecting the corresponding spool, tap **Load** to feed the filament into the extruder until it extrudes steadily from the nozzle.

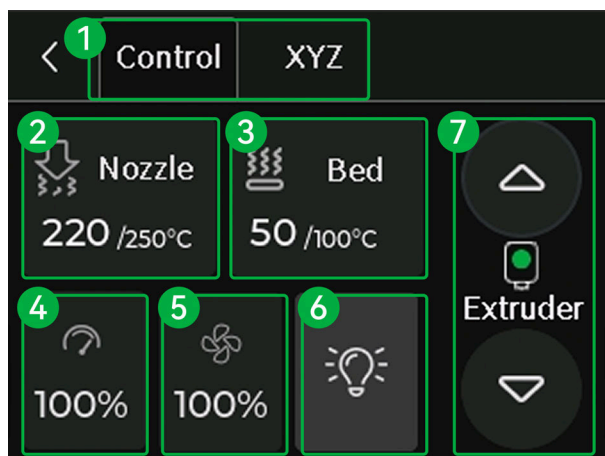
4. After selecting the corresponding spool, tap **Unload** to retract the filament from the extruder.
5. After selecting the corresponding spool, tap **Edit** to set filament properties such as manufacturer, type, color, and dynamic pressure control.

Filament Page (External Spool)



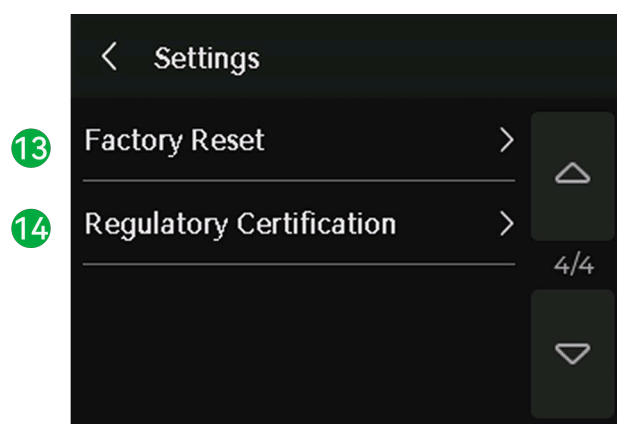
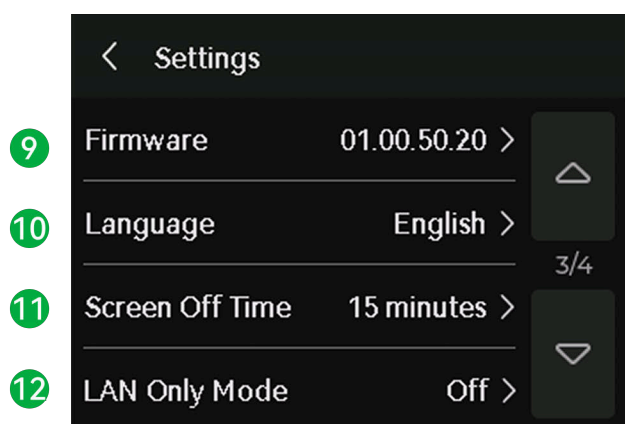
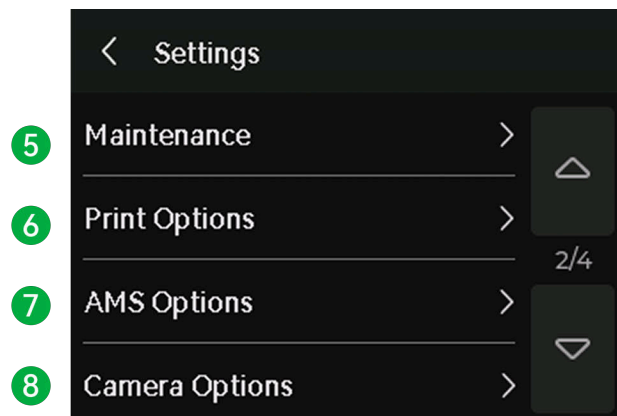
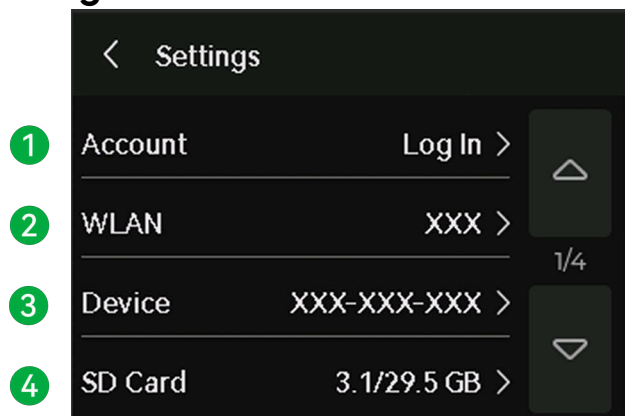
1. After selecting the corresponding spool, tap **Load** to feed the filament into the extruder until it extrudes steadily from the nozzle.
2. After selecting the corresponding spool, tap **Unload** to retract the filament from the extruder.
3. After selecting the corresponding spool, tap **Edit** to set filament properties such as manufacturer, type, color, and dynamic pressure control.

Control Page



1. Switch control view. Tap XYZ to enter the operation interface for controlling toolhead and heatbed motion.
2. Set nozzle temperature.
3. Set heatbed temperature.
4. Set print speed modes (Ludicrous, Sport, Standard, Silent).
5. Set part cooling fan speed.
6. Control LED light.
7. Manually extrude or retract filament.

Settings

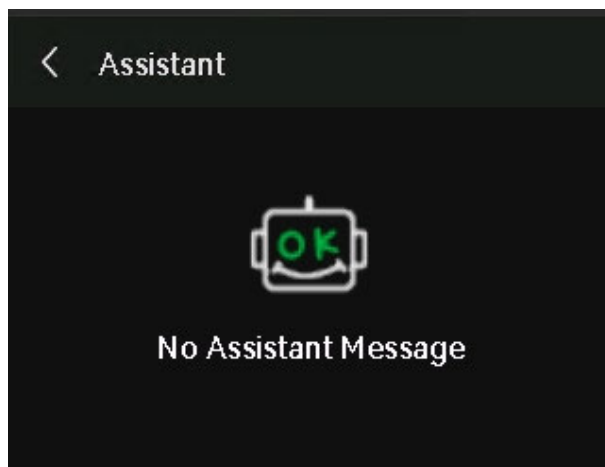


1. Log in and view account.
2. Set up the printer network, view IP and MAC addresses.
3. View printer model, camera status, device usage time, terms of use, privacy policy, printer and AMS serial numbers, and enable the experience improvement program.
4. View total and remaining capacity of the printer's SD card. To eject the SD card, tap **Eject SD Card** on this page, then manually remove it.
5. Perform printer calibration, nozzle settings and cold pull cleaning, maintenance mode switching, and first layer quality calibration.
6. Enable or disable functions such as beeping, tangled filament detection, step loss auto-recovery, clumping detection, build plate position detection, air print detection, and heatbed insulation.
7. Set filament information reading, auto refill, and AMS reordering to improve the convenience of filament identification, refill switching, and multi-AMS management.
8. Enable print process video recording and timelapse gradient mode.
9. View the current device version, release notes for this version, and offline updates.
10. Select the display language for the printer screen.
11. Select the auto-sleep duration for the printer screen.
12. Used to enable local network access mode. Once enabled, the printer can only be connected and controlled within the local network and cannot be accessed remotely via the internet.

13. Restore the printer to factory settings. Once reset, settings cannot be recovered.

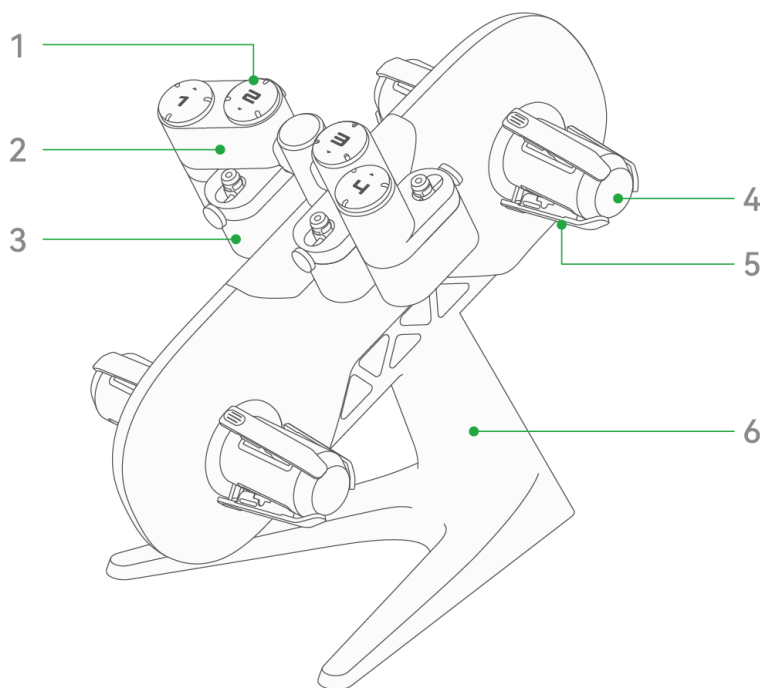
14. View the electronic label page for machine certification information.

Assistant



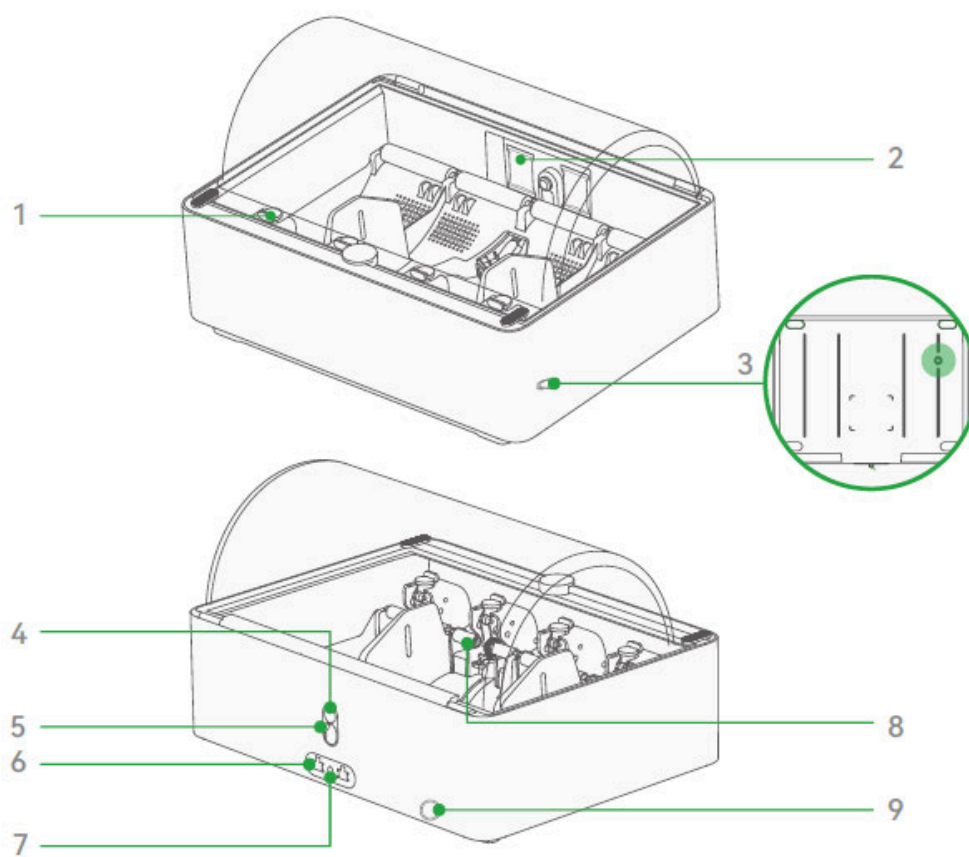
When the printer malfunctions or requires maintenance, the assistant page displays relevant prompts and provides troubleshooting suggestions. See [HMS Messages](#).

1.3 AMS lite Component Introduction



1. **Loading/Unloading Top Cover:** The numbered top cover of the AMS lite loading/unloading assembly.
2. **Loading/Unloading Assembly:** Feeds or pulls filament from the toolhead.
3. **Inlet Assembly:** Automatically pulls filament when inserted.
4. **Spool Shaft:** A support component with 3 fixed claws that work together to rotate the spool, ensuring smooth filament delivery.
5. **Spool Shaft Claws:** Spool fixing components assembled on the rotating shaft.
6. **Base Bracket:** A structural component that supports the AMS lite body.

1.4 AMS 2 Pro Component Introduction

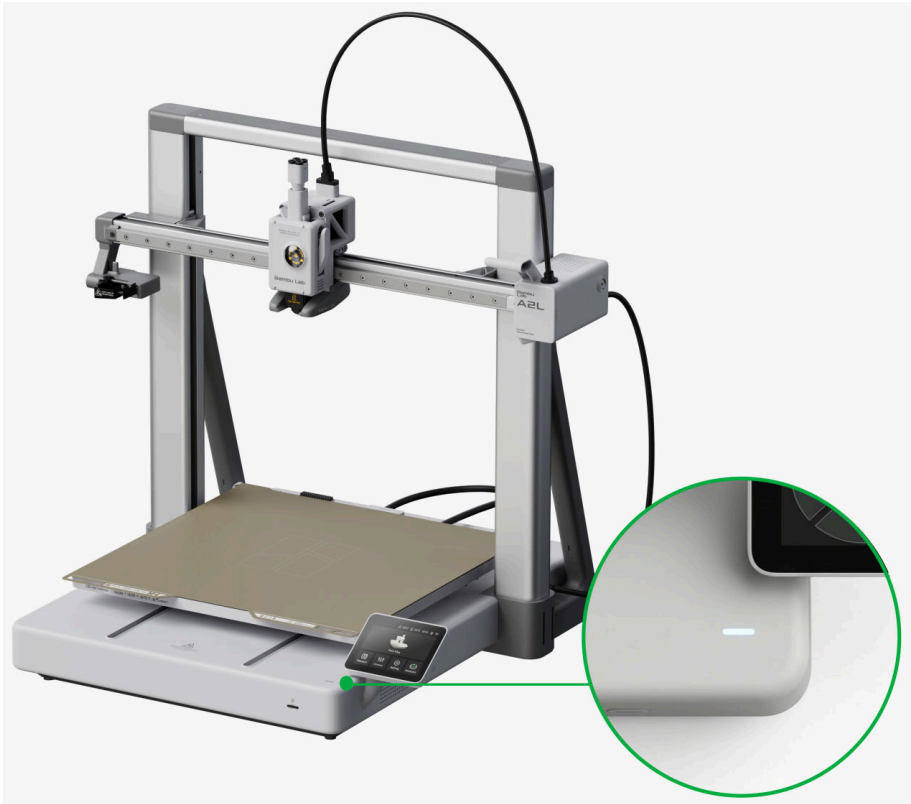


1. **Filament inlet:** Insert the filament end into this inlet, and the system will automatically detect and start loading the filament.
2. **Desiccant:** Keeps the internal AMS chamber dry.
3. **Air intake:** Introduces external dry air.
4. **PTFE tube release button:** Press this button to release and remove the PTFE tube.
5. **Filament outlet:** Connects the AMS to the printer's filament inlet.
6. **Bambu Bus port 6-pin:** Used to connect the AMS to the printer or other AMS units with a 6-pin cable.
7. **Power connector:** Plug the power adapter into this port to supply power for the drying function.
8. **Active support shaft:** Actively supports and drives the rotation of the filament spool.
9. **Air vent:** Expels moisture inside the AMS.

1.5 Printer and AMS Status

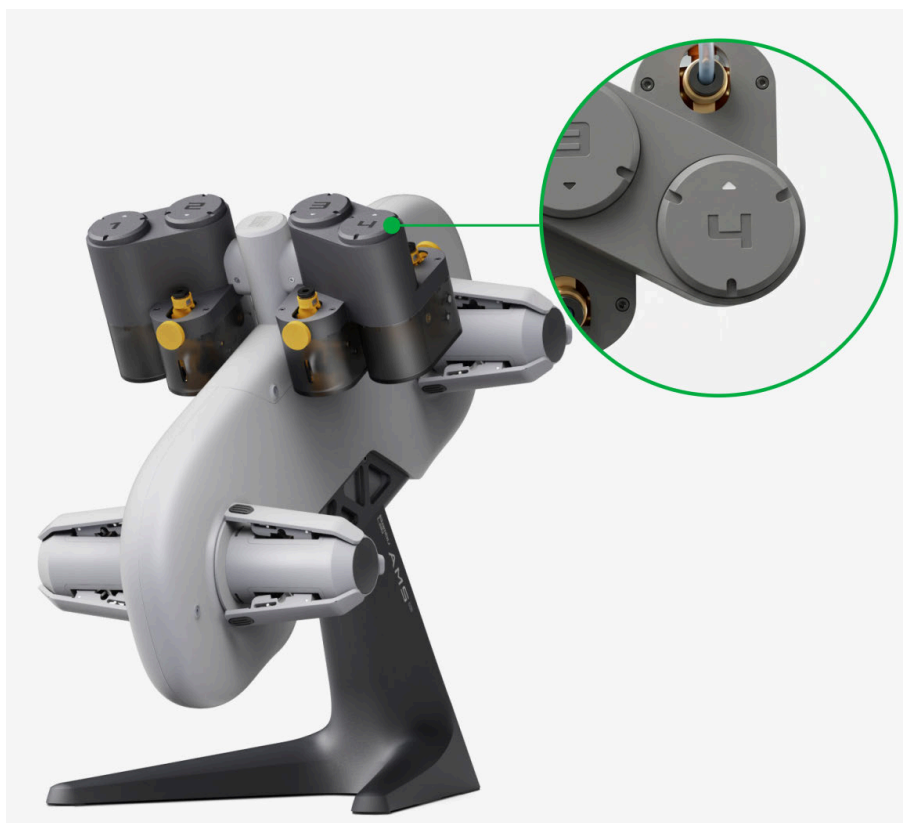
The printer and AMS provide real-time status feedback through indicator lights. The printer's screen and HMS messages in Bambu Handy and Bambu Studio offer detailed fault and maintenance information.

1.5.1 Printer Status Indicator



Indicator Status	Meaning
Flashing white light	New AI assistant messages are available, possibly indicating an issue
Solid white light	System operating normally
White light off	Printer is not powered on

1.5.2 AMS lite Status Indicator



Normal Status Blink Patterns	Meaning
Four slots with white lights flashing in sequence	All four slots are empty of filament
Solid white light stays on	The slot has filament inserted and is idle
White light breathing	The slot has filament inserted and is performing loading or reading operations
Light off (Filament inserted)	If filament is inserted in any slot, it is normal for the LED lights of other empty slots to remain off
Error Status Blinking Patterns	Meaning
Four slots flashing red	The printer cannot detect AMS lite due to a communication error
Red light double flash	Failed to load or unload filament
Red light breathing	No filament is detected by the loader after printing starts; operation resumes normally once filament is inserted
Light off (No filament inserted)	When all four slots are empty, if the LED light of a specific slot never lights up, it indicates a possible power supply anomaly with the loading/unloading component

1.5.3 AMS 2 Pro Status Indicator



The AMS indicator shows the current operating status: white light indicates normal operation, while red light indicates an error or fault.

Normal Status Blink Patterns	Meaning
Four slots with white lights flashing in sequence	AMS is initializing after power-on, and the white light turns solid when initialization is completed
Four slots breathing white	Normal drying status
Four slots with solid white lights	Indicates that all four slots have filament inserted after initialization completes; only slots with filament light up when waking up
Solid white light stays on	This slot is performing preloading, reading, or printing operations (including load and unload)
White light off	Case 1: No feeding, reading, or printing within 15 minutes after the screen turns off Case 2: 10 seconds after preloading or reading is finished Case 3: No operation within 20 minutes after initialization

Error Status Blinking Patterns	Meaning
Four slots flashing red - double flash	The printer cannot detect AMS due to a communication error
Red light breathing	No filament is detected by the filament inlet after printing starts; operation resumes normally once the filament is inserted
Red light solid	Filament may be broken inside the AMS internal hub

Error Status Blinking Patterns Meaning

Red light single flash	Generally indicates load failure. Please check whether the filament inlet is functioning properly
Red light double flash	Failed to load or unload filament
Four slots breathing red	Case 1: Abnormality occurred during drying process Case 2: When idle, the drying module NTC is disconnected, or abnormal air duct temperature is detected; check all connections are secure

1.5.4 HMS Messages

HMS (Health Management System) is the built-in fault diagnosis and status monitoring system for Bambu Lab printers and AMS (Automatic Material System).

When a device experiences hardware failure, print failure, or needs maintenance, HMS will provide on-screen or app notifications and offer recommended solutions.

If an HMS message appears, use any of the following methods to locate and fix the fault:

- Scan the QR code with your phone to directly access the diagnostic and troubleshooting page.
- Visit Bambu Lab Wiki and search the HMS code on the HMS Homepage to view detailed causes and troubleshooting steps for the fault.

When an HMS message appears, a notification icon  will appear at the bottom right of the homepage, and on the left side menu bar . Click any icon to enter the message page and view detailed information.

Chapter 2 First Print

2.1 Preparation Before Printing

2.1.1 Printer Placement

This is an open-structure, large-format I3-style printer. During printing, the heatbed moves frequently, and high-speed printing may cause the device and its placement surface to shake. For optimal print quality and safety, place the printer on a flat, stable surface that resists shaking, or directly on a flat floor.

If you place the printer on a table, shelf, or similar location, ensure the structure is sturdy and does not visibly shake when pushed. Do not place the printer on an unstable, slippery, or insufficiently supported surface. This prevents the device from shifting during operation or causing the device and surrounding items to fall.

CAUTION

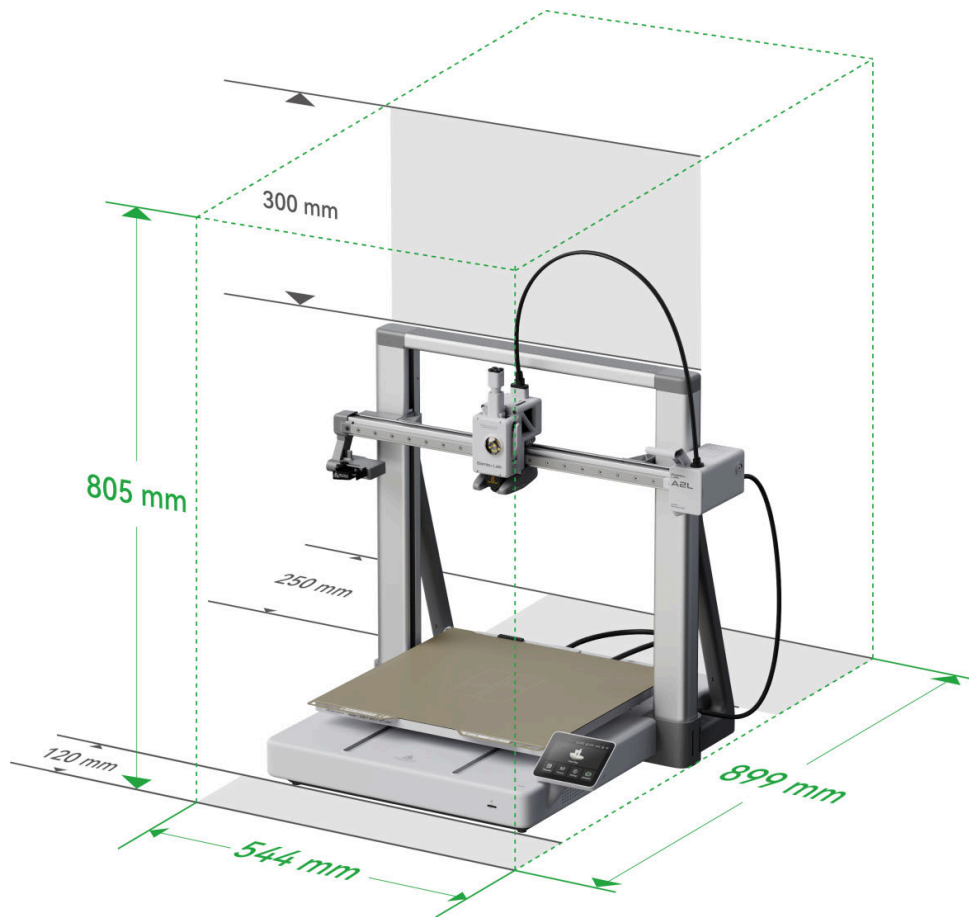
- If you need to place the printer on a table or shelf, replace the 2 foam footpads on the front of the base with the silicone footpads provided in the accessory box. This increases friction and improves stability during operation.
- Calibrate the printer only after its final placement is determined. Moving the device after calibration may cause measurement inaccuracies and affect the quality of your first print.

The light gray area indicates the clearance required for the heatbed, heatbed cable, and toolhead cable during printer operation. When placing the printer, ensure you reserve the following space:

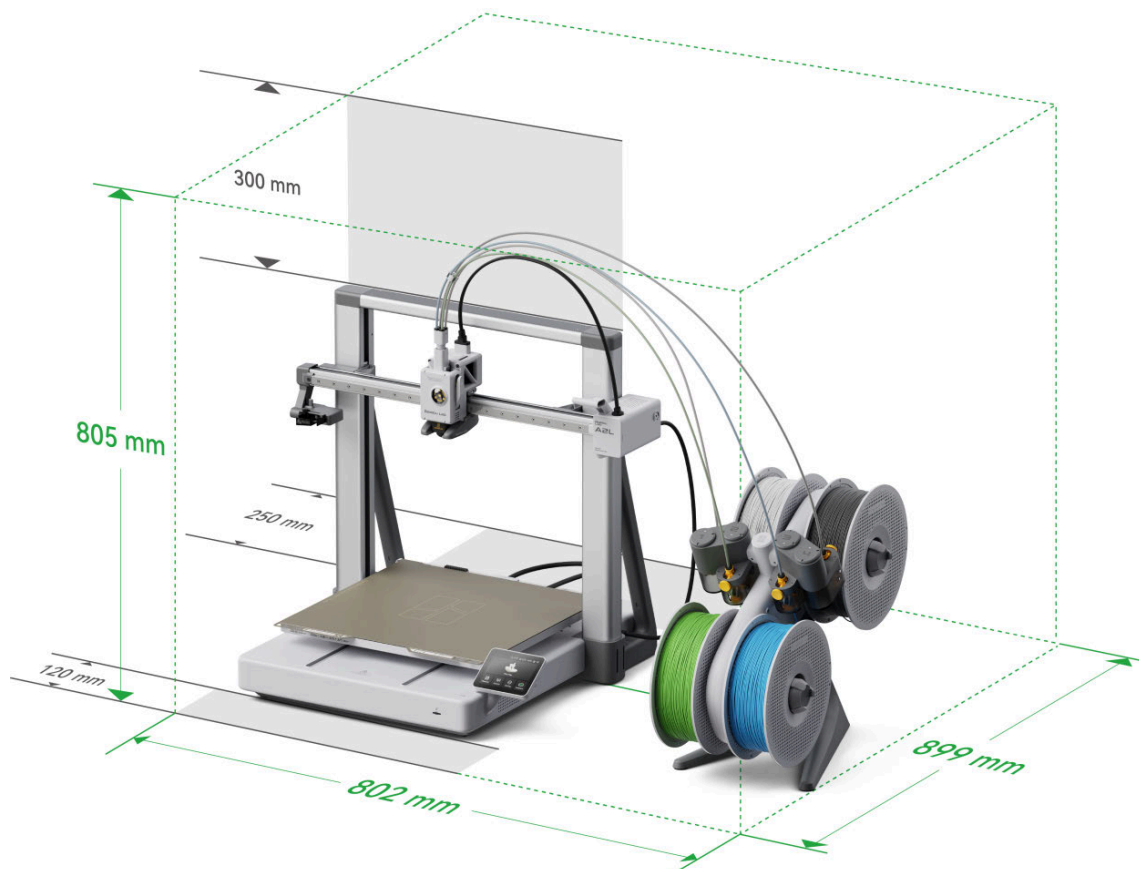
- At least 120 mm in front of the printer
- At least 250 mm behind the printer
- At least 300 mm above the printer

Depending on the usage scenario, the recommended overall placement space is as follows:

- When using only an external spool holder: at least 544 × 899 × 805 mm
- When using AMS lite and placing it on the right side of the printer: at least 802 × 899 × 805 mm



Single Printer Placement Space Dimensions



Printer Set Placement Space Dimensions

2.1.2 Initial Installation

Please follow the steps below to complete the initial installation of the printer:

Step 1. Remove Packaging Materials

Follow the "Quick Start Guide" to remove the outer box, foam, moisture-proof bag, and internal fasteners, ensuring that there is no packaging material left on or inside the printer.

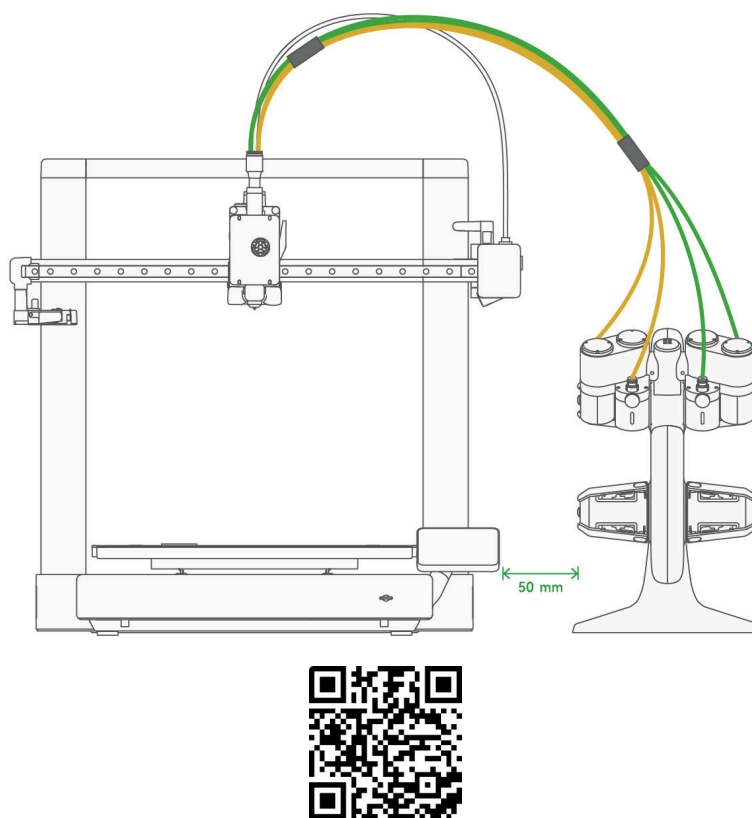
Step 2. Inspect the Printer Components

Confirm that all included accessories are present (accessory box, power cord, quick start guide, spool holder, PTFE tubes, etc.).

Step 3. Assemble the Printer

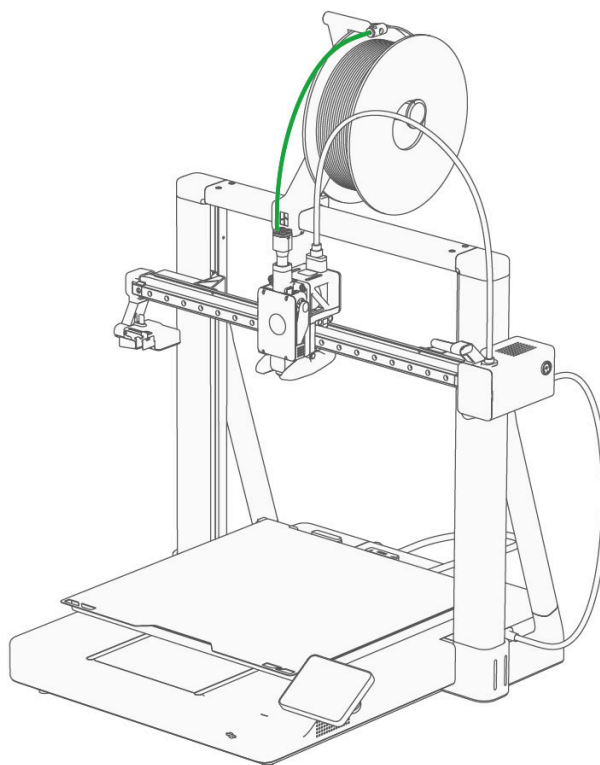
Install the printer correctly according to your purchased version and the actual loading method:

- If using AMS lite, scan the QR code below or click the link to watch the installation video and jump to the relevant sections as needed.



<https://wiki.bambulab.com/a2l/manual/unboxing-a2l-combo>

- If using the external spool holder, scan the QR code below or click the link to watch the installation video and jump to the relevant sections as needed.



<https://wiki.bambulab.com/a2l/manual/unboxing-a2l>

⚠ CAUTION

When installing the printer, do not touch the build plate surface with your hands. Hand grease and sweat can contaminate the surface, affecting print adhesion and degrading print quality. If you accidentally touch the build plate, clean it with hot water and detergent to ensure optimal adhesion.

Step 4. Check Power-On Status

- Ensure the power cord is properly connected.
- Confirm the **power switch** on the back of the printer is turned on and the indicator light is lit.
- The screen should light up normally and display the initial setup interface.

2.1.3 Initial Calibration

On first startup, the printer will automatically enter the initialization process. Follow the on-screen instructions to complete the steps:

Step 1. Language, Region, and Network Settings

Select the appropriate language and time zone, then choose an available Wi-Fi network, with the option to skip network selection if it is not required.

Step 2. Account Login

Open Bambu Handy and scan the QR code displayed on the screen to bind the printer (see [Install Bambu Handy](#)). You can skip this step if it is not required.

Step 3. Automatic Calibration

The printer will automatically perform a series of checks and calibrations, including motor noise cancellation, vibration compensation, and auto bed leveling.

Step 4. Calibration Completed

The screen displays “Calibration completed”, and you can start your first print.

2.2 Load Filament

2.2.1 Load Filament with AMS lite

Step 1. Push the spool into the AMS lite's spool spindle until it clicks into place.

Step 2. Press the release button and insert the end of the filament into the filament inlet.

Step 3. Once the device detects filament insertion, the AMS lite automatically feeds the filament, pulling it into the PTFE tube.

Step 4. The filament page on the printer's touchscreen will automatically display the recognized filament. After you initiate a print job, the AMS lite will automatically feeds the printer.



2.2.2 Load Filament with External Spool

Step 1. Confirm the filament type and color for subsequent settings. Then, place the spool on the spool holder according to the filament's winding direction.

Step 2. On the printer screen, tap **Filament** > **External Spool** > **Edit**. Select the filament type and color, then tap **Confirm** to set the filament information.

Step 3. Insert the filament end into the PTFE tube. Push the filament into the toolhead until it can no longer go forward. A small green light will appear at the toolhead on the printer screen, indicating that filament entry has been detected.

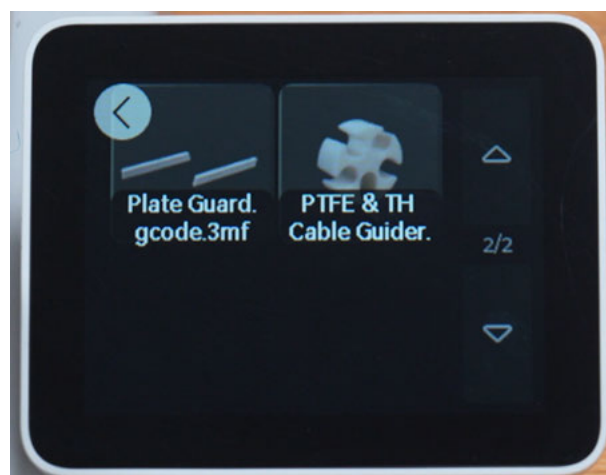
- Step 4. On the screen, tap **Load**. Wait for the nozzle to heat up. Manually push the filament again to keep it inside the extruder. Then, follow the on-screen instructions to complete the process.



2.3 Start Printing from Screen

2.3.1 Built-in Models

The printer includes several built-in accessory models and test models. Accessory models enhance equipment safety and optimize daily operation. Test models check print quality and verify printer performance.



Accessory Models

- **Heatbed Protective Frame:** Install this frame in front of the heatbed. It indicates the heatbed's motion range and provides protection when you observe or operate the printer closely, reducing the risk of collision. This model occupies more space. Print and use either this frame or the build plate protective cover, based on your needs.

- **Build Plate Protective Cover:** Install this cover on the protruding front edge of the build plate. It provides protection when you observe the heatbed or operate the printer closely, reducing the risk of being poked or bumped by the build plate's edge. This model occupies less space. Print and use either this cover or the heatbed protective frame.
- **Cable Organizer:** This organizer guides and secures the PTFE tube and toolhead cables, reducing cable movement or interference. It improves machine stability and neatness. Use it for scenarios such as connecting AMS lite or AMS 2 Pro.
- **Scraper:** Use the scraper to remove models from the build plate or material from the build plate.

Test Models

- **Panda:** Test multi-color printing effects. Use it to check switching between different filaments, color boundaries, alignment accuracy, and the overall print quality of multi-color models.
- **3D Benchy:** This classic model tests comprehensive printer performance. Use it to check print quality, dimensional accuracy, speed performance, and common printing issues.

2.3.2 Operating Steps

The printer includes built-in model files that allow you to initiate your first print job directly from the printer screen.

Step 1. On the printer screen, tap **Print Files** and select the model you want to print.

Step 2. Adjust options as needed, select the corresponding type of filament, and tap **Print**.

TIPS

Built-in printer models are sliced files, and their filament types cannot be modified. If the filament, nozzle, or other settings do not match your actual setup, initiate a print from Bambu Handy or Bambu Studio. See [Initiate a Print from Bambu Handy](#) or [Initiate a Print from Bambu Studio](#).

TIPS

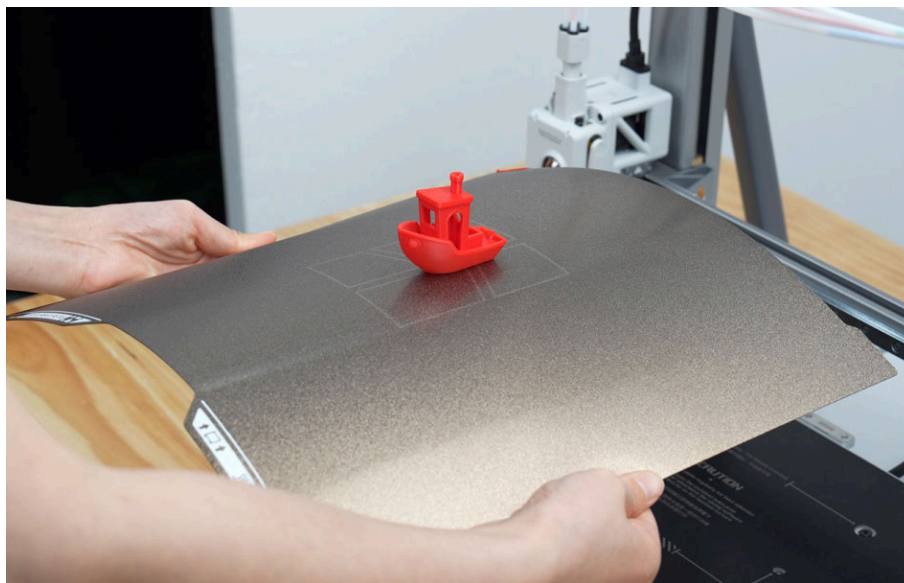
For details on compatible accessory models and their usage, visit the Bambu Lab Wiki (wiki.bambulab.com/home) and search for "A2L Accessory Models Introduction".

2.4 Remove the Model

Step 1. After printing finishes, wait until the heatbed and model have cooled down to room temperature. Then, gently remove the model from the build plate to prevent deformation or damage to the model or build plate.

Step 2. If the model is difficult to remove, gently bend the build plate or use a scraper to help detach the model.

- Step 3. Remove the prime tower (if present), carefully clean off the prime line with a scraper, then place the build plate back into the printer to start the next print.
- Step 4. Place back the build plate and make sure it aligns with the heatbed's stoppers.



⚠ CAUTION

Do not touch the build plate surface with your hands to prevent oils and sweat from your hands from contaminating the surface, which can affect print adhesion and reduce print quality. If you accidentally touch it, clean the build plate with hot water and dish soap to ensure optimal adhesion.

2.5 Unload Filament

2.5.1 Unload Filament from AMS lite

After the print job completes, the filament will automatically retract into the PTFE tube.

If the print job is canceled or interrupted, follow these steps:

- Step 1. On the screen homepage, tap the .
- Step 2. Select **AMS > Filament Spool > Unload**.

2.5.2 Unload Filament from External Spool

External spools do not support automatic unloading. You must unload filament manually.

Follow these steps:

- Step 1. Tap  > **External Spool > Unload** on the screen.
- Step 2. Follow the instructions to pull back the filament after it exits the toolhead and rotate the spool at the same time.
- Step 3. If you do not pull out the filament in time, select **Retry** on the screen and pull it out again.

2.6 Waste Disposal

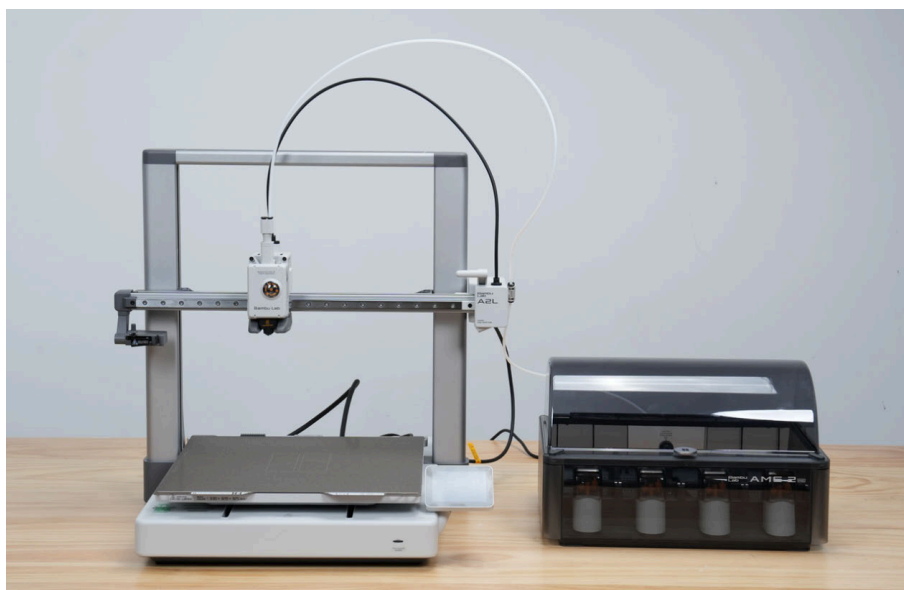
Waste refers to the excess filament extruded to clear residual filament inside the nozzle at the beginning or during multi-color, multi-material printing, to ensure print quality. This waste is expelled by the purge wiper. To ensure proper waste collection and disposal, follow these recommendations:

- Use a container to catch the waste generated by purging. A larger container will hold more waste, reducing cleaning frequency.
- Before printing, inspect the purge wiper for any residual waste.
- Regularly clean the waste collection container to prevent waste buildup from obstructing normal discharge.
- During multi-color printing, the printer frequently changes filaments; the longer the print job, the more waste is generated. Empty the container periodically during printing.
- Avoid placing or installing items near the purge wiper that could obstruct waste discharge, to prevent waste buildup or print failures.
- Dispose of waste in accordance with the regulations of your country or region.

2.7 Connecting a Single AMS/AMS 2 Pro/AMS HT

This printer can be connected directly to a single AMS, AMS 2 Pro, or AMS HT after installing the PTFE tube coupler. The connection method is described below using AMS 2 Pro as an example; AMS and AMS HT can be connected in the same way.

To connect multiple AMS units, please see [Multiple AMS Connection Guide](#).



Required Accessories

- One AMS unit (AMS, AMS 2 Pro, or AMS HT).
- One Bambu Bus Cable 6-pin for connecting the printer and AMS. Do not use the AMS first-generation cable with AMS 2 Pro or AMS HT.

- One PTFE tube for connecting the toolhead filament inlet and the PTFE tube coupler, with a recommended length of approximately 760 mm.
- One PTFE tube for connecting the PTFE tube coupler and the AMS filament outlet, with a recommended length of approximately 550 mm.
- One PTFE tube coupler (in the accessory box).

***i* TIPS**

The single PTFE tube included with the printer is 975 mm long. Shorten it before using it to connect the toolhead filament inlet and the PTFE tube coupler.

***i* TIPS**

The PTFE tube included in the AMS 2 Pro package is 550 mm long and can be directly used to connect the PTFE tube coupler and the AMS filament outlet.

***!* CAUTION**

When connecting, you must use the PTFE tube coupler. The PTFE tube coupler fixes and optimizes the tube path and, with appropriate lengths of PTFE tube, regulates filament feeding tension to prevent excessive bending or pulling of the tubes, thus improving feeding smoothness and printing stability.

Operating Steps

- Step 1. Align the PTFE tube coupler with the mounting hole next to the X-axis motor box, then insert it.

***!* CAUTION**

When installing, confirm the orientation of the PTFE tube coupler. The PTFE tube coupler has three protrusions in total; besides the two on the sides, the other protrusion should be located at the bottom.



- Step 2. Insert a PTFE tube into the AMS 2 Pro filament outlet, and connect the other end to the bottom of the PTFE tube coupler.



Step 3. Take another PTFE tube and connect it between the top of the PTFE tube coupler and any filament inlet on the toolhead.



Step 4. Connect the AMS 2 Pro and the printer with 6-pin cable.



Chapter 3 Access 3D Model Resources

3.1 MakerWorld Model Community

MakerWorld (makerworld.com) is Bambu Lab's official 3D model-sharing platform, featuring a large collection of models uploaded by talented creators across a wide range of categories, from artistic designs to practical tools. Whether you are an artist seeking inspiration or an engineer solving real-world problems, you can find models that meet your needs here. It is also a place to exchange experiences, share ideas, and learn from one another.

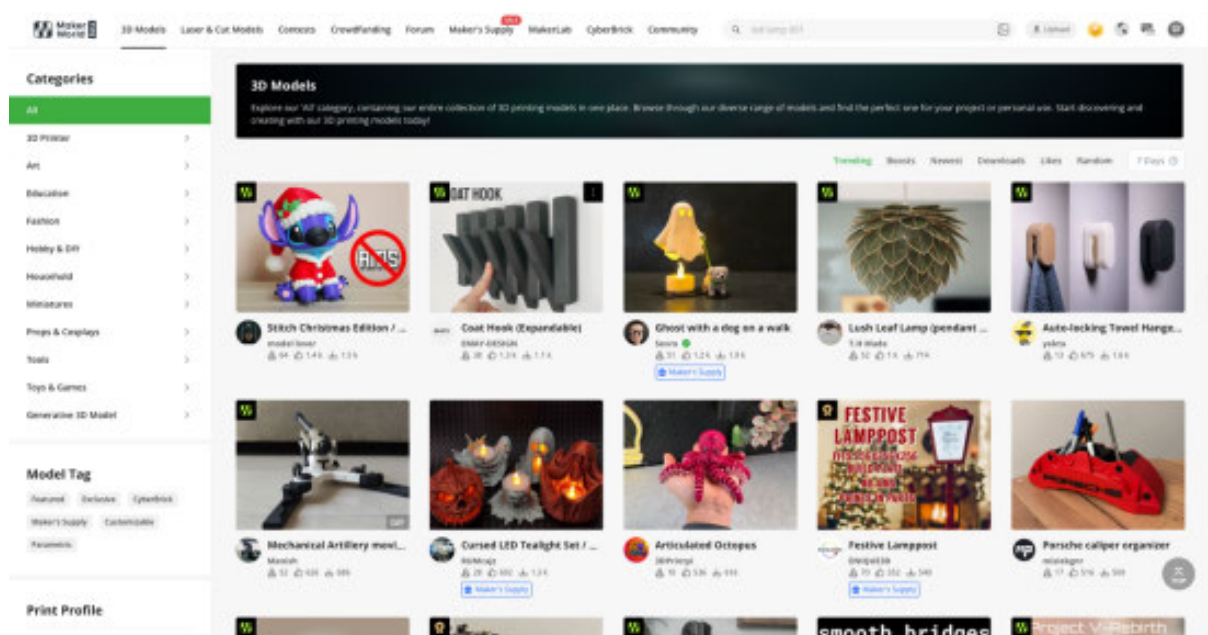
Through MakerWorld, you can:

- Browse curated models and popular community recommendations.
- Download model files in STL, CAD, or 3MF formats.
- Send models directly to Bambu Studio for slicing and printing.
- Upload and share your creative designs, and engage with the community.

MakerWorld is available on the web and directly integrated into Bambu Handy and Bambu Studio for seamless model browsing and printing.

NOTE

- 3MF files: Contain all print parameters and color information, enabling you to start printing directly in Bambu Studio.
- STL and CAD files: Contain only the model's geometry and do not include print settings or color information, so parameters must be adjusted in the slicer or printer software.



3.2 MakerLab Creative Tools

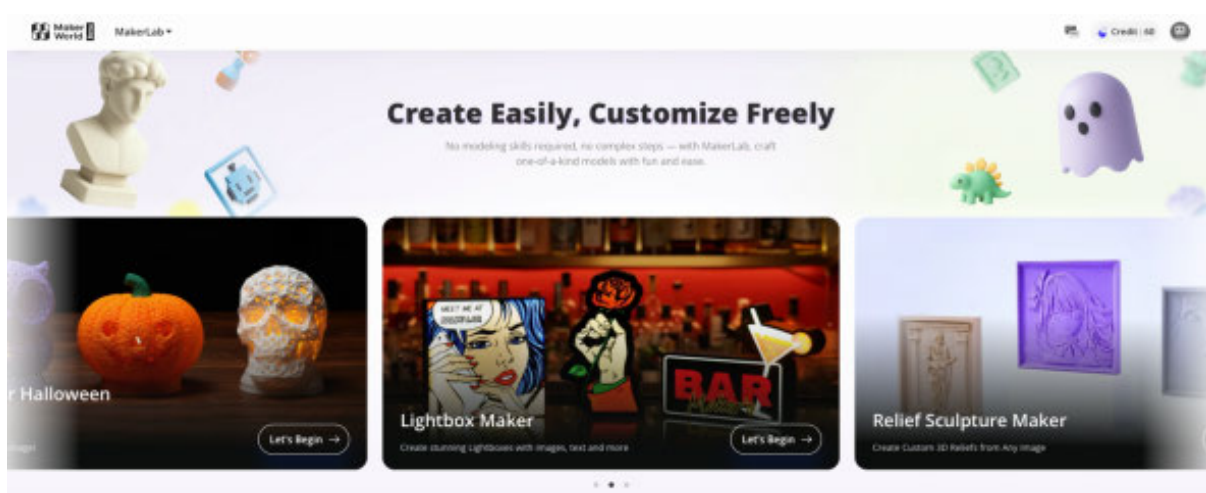
MakerLab offers a range of online creative tools to help turn your ideas into printable models. No modeling experience is needed to quickly create personalized printable models.

Creative tools include generators for lightboxes, flexi toys, relief sculptures, and vases, as well as AI-powered and parametric modeling tools, all accessible via the web.

MakerLab is also integrated into both Bambu Studio and Bambu Handy, enabling seamless model generation and printing.

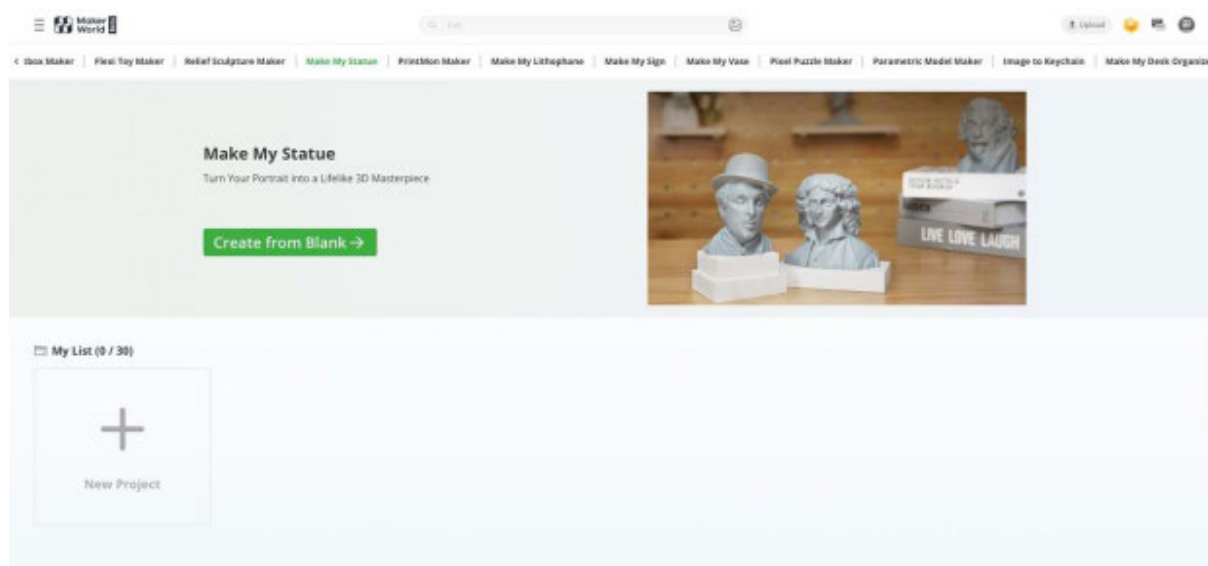
NOTE

Bambu Handy supports only some of the tools. For full feature access, use a desktop browser or Bambu Studio.

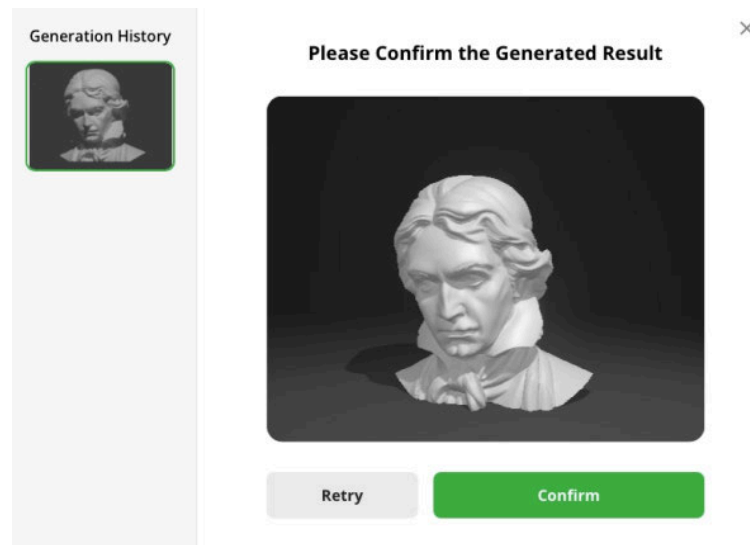


Each creative tool includes detailed instructions; follow them to complete your project. The following uses the statue generator as an example to show the workflow on the web:

Step 1. On the MakerWorld homepage top bar, click **MakerLab** > **Make My Statue** > **New Project**.



- Step 2. Upload an image as prompted, click **Confirm**, and wait for the model to be generated.
- Step 3. If satisfied with the generated model, click **Confirm** to download it. If not, click **Retry** to generate again.



- Step 4. Open Bambu Studio, click **File > Import**, and select the model file. After importing, you can proceed to slicing and start printing.

Chapter 4 Start a Print from Multiple Devices

4.1 Start a Print from Mobile Device (Bambu Handy)

Bambu Handy is an all-in-one mobile app designed for Bambu Lab 3D printers. It lets you search for and print models with one tap, remotely monitor and manage print jobs, quickly reuse past projects, and adjust settings during printing.

NOTE

The interface is continuously updated to improve the user experience. Please refer to the actual interface.

4.1.1 Install Bambu Handy

TIPS

Before installing Bambu Handy, please ensure the following:

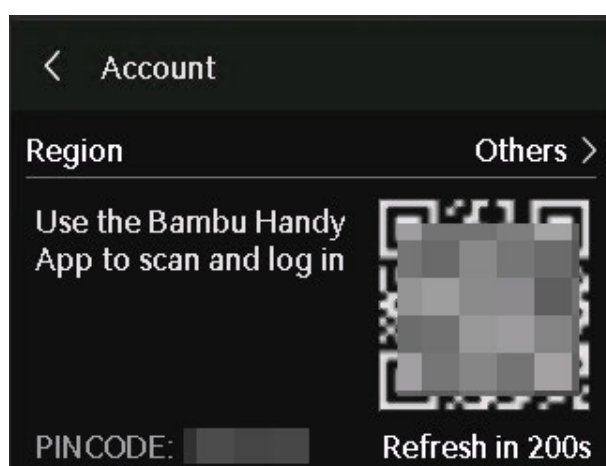
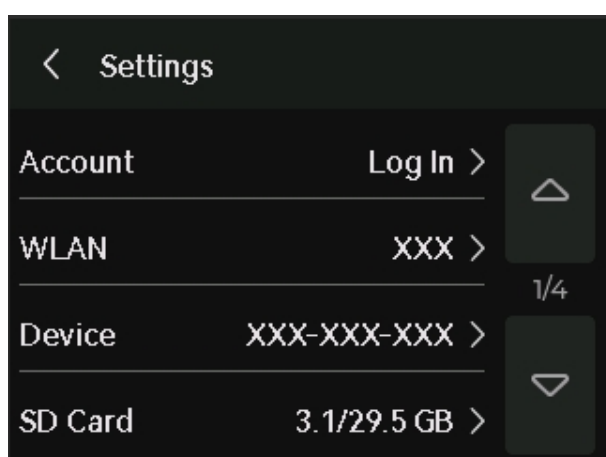
- The printer and your phone are connected to the same network (for initial binding).
- The selected region for the printer matches the region of the Bambu Handy app version.

- Step 1. Visit bambulab.com/download or search for Bambu Handy in your mobile app store to download and install the app.
- Step 2. Open Bambu Handy, read and agree to the privacy policy and user agreement, then enter the homepage.
- Step 3. On the **Me** page in Bambu Handy, tap **Sign In / Sign Up**, enter your phone number (or email address) and verification code to complete registration.

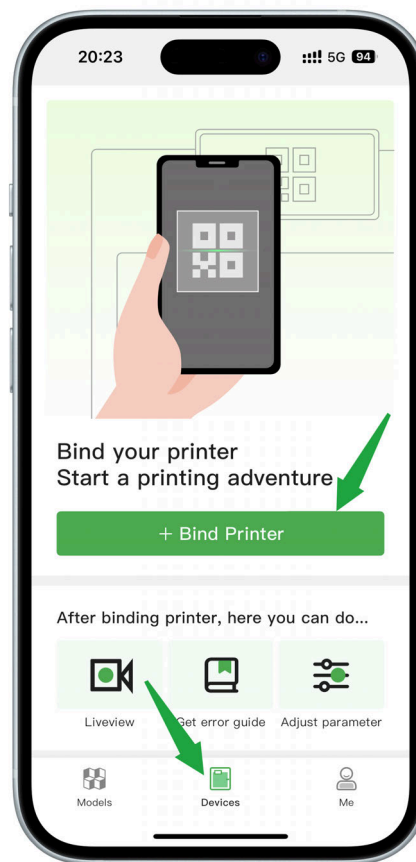
NOTE

The registration method (phone number or email address) varies according to local laws and regulations. Please follow the actual display.

- Step 4. On the printer screen, tap  > **Account**, and a QR code will appear on the screen.



Step 5. On the Bambu Handy **Devices** page, tap **+ Bind Printer**, then scan the QR code displayed on the printer screen.



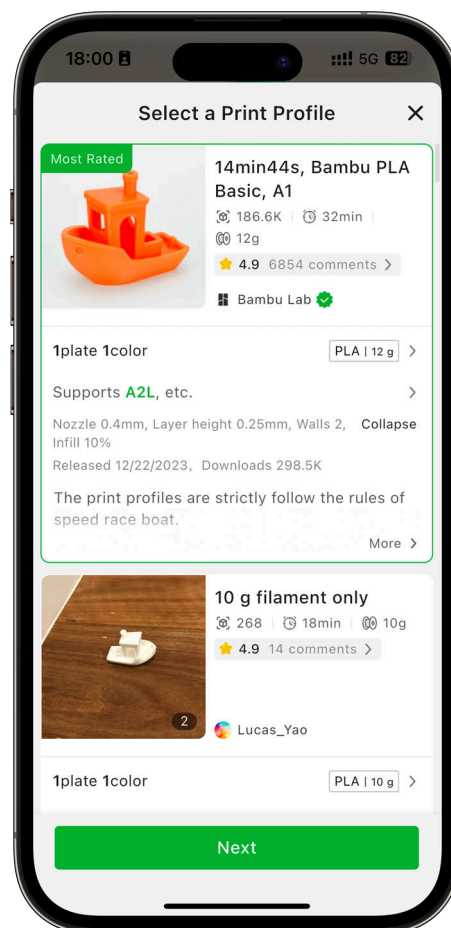
Step 6. Review and accept the terms and conditions and privacy policy, then tap **Confirm** to bind.

Step 7. Name the printer, then tap **Confirm** to complete the binding.

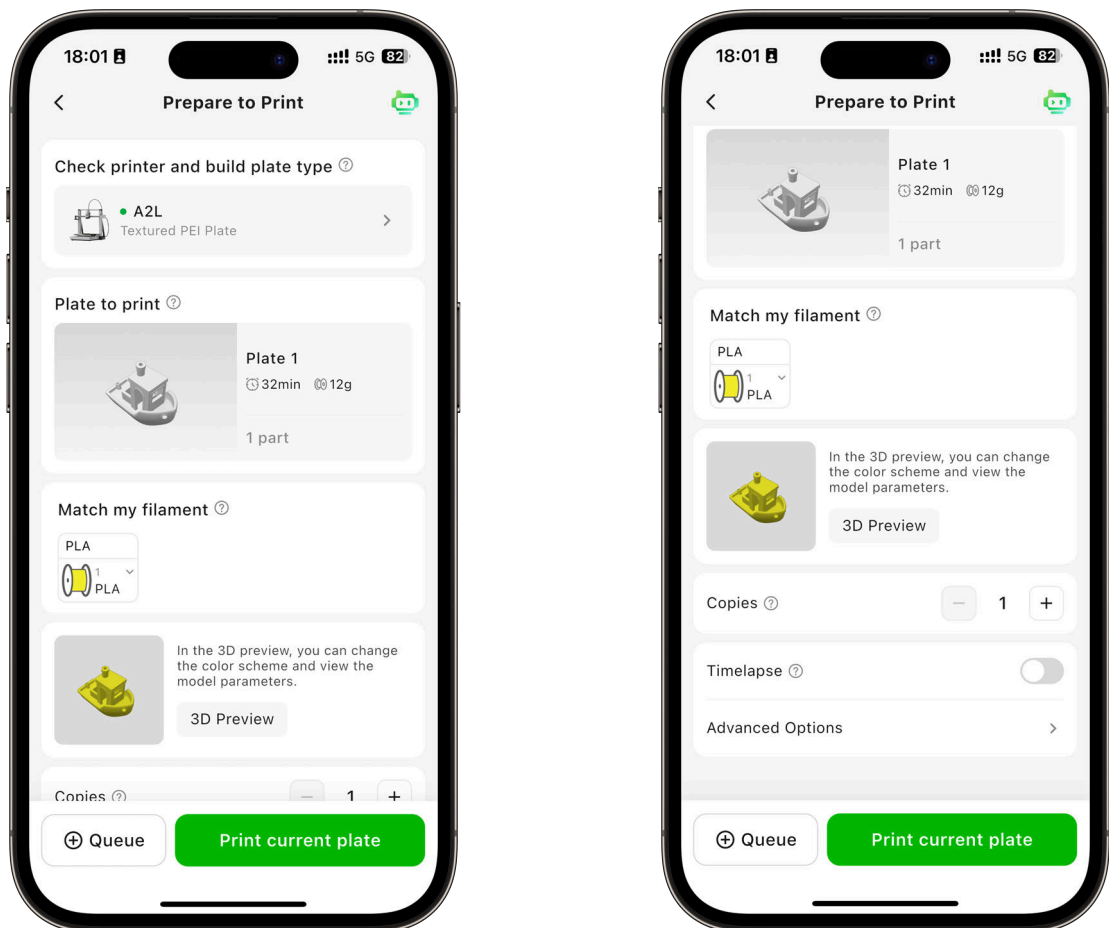
4.1.2 Start Printing in Bambu Handy

Step 1. On the **Models** page, select the model to print and tap **Prepare to Print**.

Step 2. Tap **Next** to enter the preparation page.

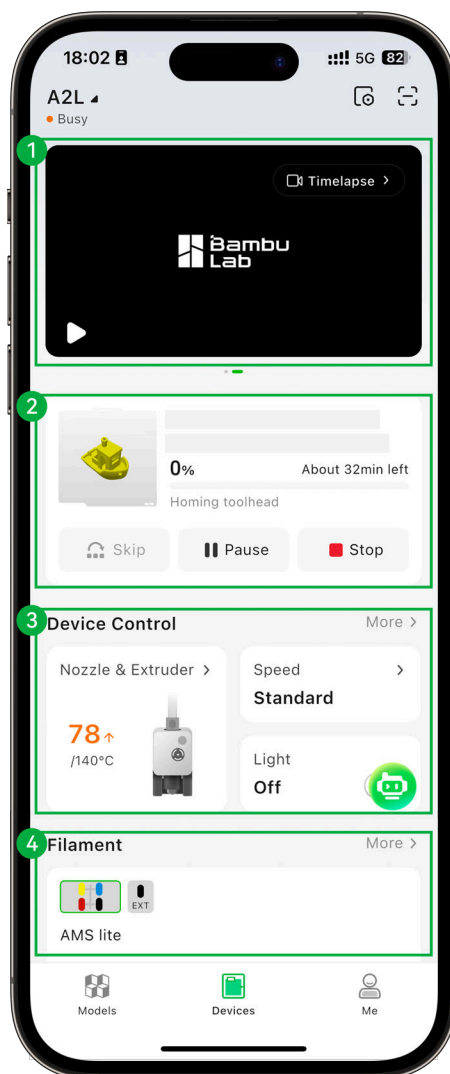


Step 3. Confirm the printer, build plate model, and filament type. Set the print quantity, and if needed, set timelapse and advanced options. Then tap **Start Print**.



Step 4. On the **Devices** page, monitor the print job or perform other operations.

4.1.3 Device Interface Overview



1. **Camera view:** Remotely view the live feed of the printer to monitor print status.
2. **Task control:** View the current print layer and estimated remaining time. Pause or stop printing as needed. When printing multiple parts, if a model experiences issues such as collapse or layer shifting, you can skip that model and continue printing the remaining models.
3. **Device control:** Adjust print speed, heatbed temperature, light, and more (see [Printer Screen Controls](#)).
4. **Filament:** View the filament connected to the printer.

4.2 Start a Print from Computer (Bambu Studio)

4.2.1 Install Bambu Studio

Bambu Studio is the official slicing software developed by Bambu Lab, featuring customized functions designed specifically for Bambu 3D printers. It offers a project-based workflow, optimized slicing algorithms, and an intuitive graphical interface to deliver a smooth printing experience. Before 3D printing, the model must be sliced, which means converting the 3D model into instruc-

tions recognizable by the printer. This is a critical step in turning your creative design into a physical printed product.

To smoothly install and run Bambu Studio, please ensure your computer meets the following requirements:

- **Operating system:** Windows 10, macOS 10.15, Ubuntu 20.02, Fedora 36 or later (any one supported).
- **Processor:** Intel® Core 2 or AMD Athlon® 64; 2 GHz or higher.
- **Memory:** Minimum 4 GB RAM; 8 GB RAM or higher recommended.
- **Storage:** At least 2 GB of available space.
- **Graphics support:** OpenGL 2.0 compatible.

Installation Steps

Step 1. Download Bambu Studio.

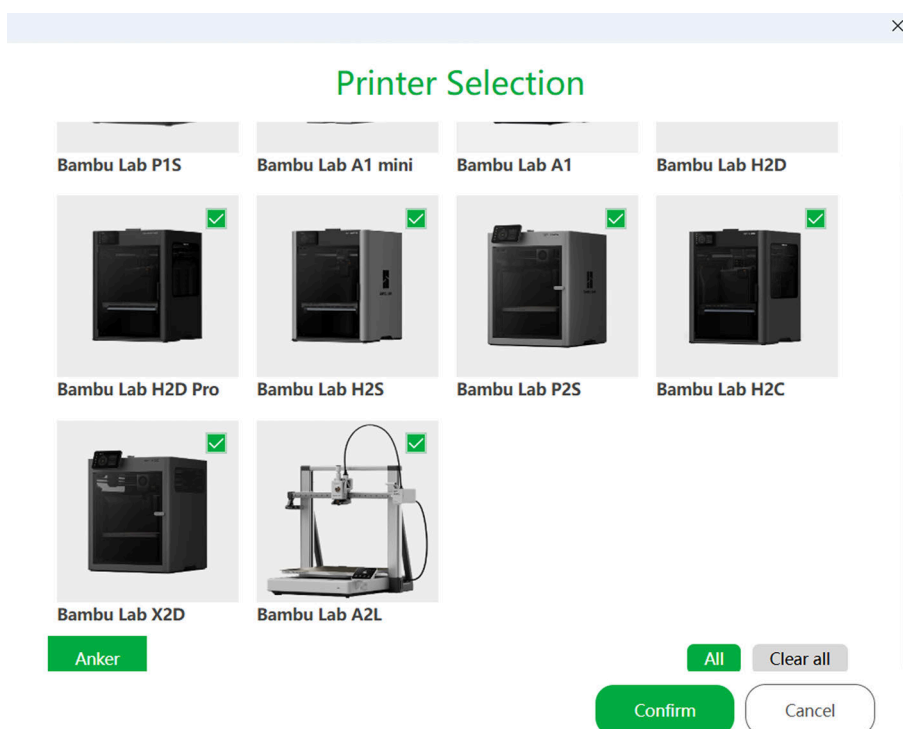
- Windows and MacOS versions: bambulab.com/download
- Linux version: github.com/bambulab/BambuStudio/releases

Step 2. Double-click the downloaded .exe file and follow the on-screen instructions to complete the installation and open the software.

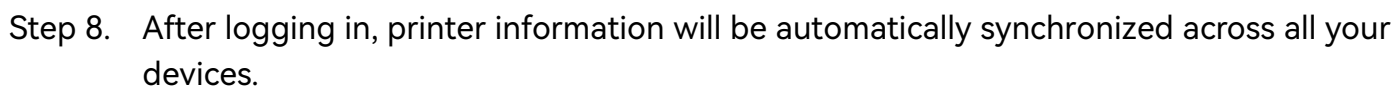
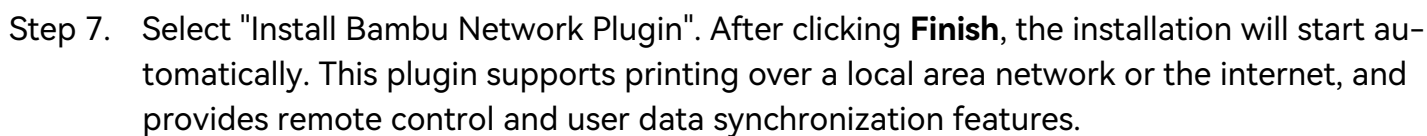
Step 3. Select your region and click **Next**.

Step 4. Read and choose whether to join the customer experience improvement program.

Step 5. Select your **printer model and nozzle size** presets, then click **Next**. The chosen presets will be used for slicing to generate optimal print paths.

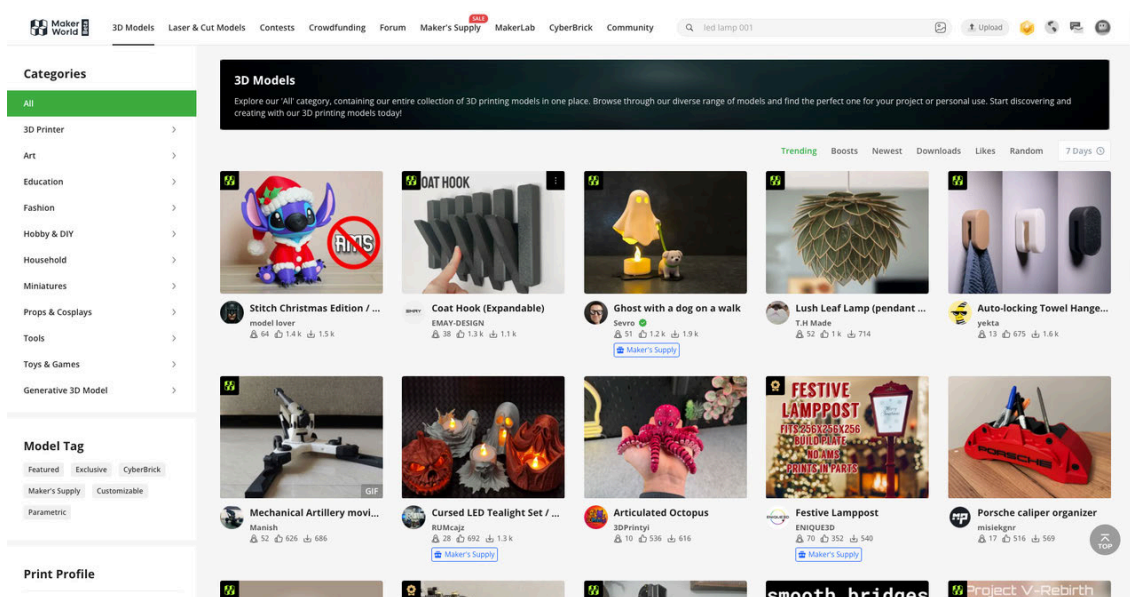


Step 6. Select filament presets, then click **Next**. Filament presets include print temperature and other parameters. Once you select a filament, all printing parameters will be applied during slicing without manual adjustments.



4.2.2 Download and Import Model

MakerWorld hosts a wide variety of high-quality models uploaded by creators, including model files and complete print profiles. The creators have predefined the print parameters, allowing you to download and send the model to the printer with one click, requiring no complex setup.



MakerWorld Models

Step 1: Select the model you want to print on the MakerWorld website or within Bambu Studio's online models, then go to the model details page.

Step 2: Choose a print profile that matches your printer model and printing needs.

Step 3: If you use MakerWorld in a browser, click **Open in Bambu Studio**. If you use Bambu Studio, click **Download and open**.

Step 4: Bambu Studio will automatically download the model and open it in the Prepare page.

Other Models

Step 1: Prepare the model file.

NOTE

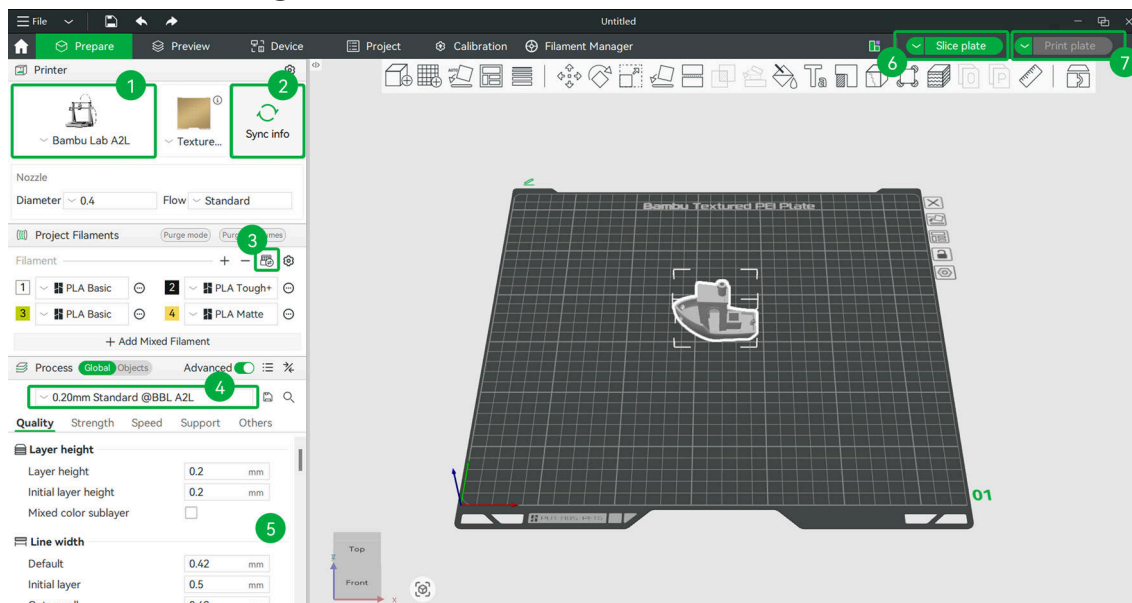
Bambu Studio supports the following file formats: .3mf, .stl, .stp, .step, .amf, and .obj.

Step 2: Import the model using your preferred method.

- Method 1: In the top left corner, select **File > Import > Import File** (3MF/STL/STEP/SVG/OBJ/AMF...).
- Method 2: In the Prepare page, click  in the top toolbar, select the model file, then click Open.
- Method 3: Drag and drop the model file directly onto the plate in the Bambu Studio Prepare page.

Step 3: After successful import, the model will automatically load onto the build plate, ready for previewing, editing, or slicing.

4.2.3 Start Printing in Bambu Studio



- Step 1. Select the correct printer model.
- Step 2. Click **Sync info** to sync nozzle and filament information.
- Step 3. In the Project Filament list, click  to sync AMS filament information.
- Step 4. Click the Process drop-down list and choose the layer height for your model. Keep in mind that a smaller layer height will increase print time. For most models printed with a 0.4 mm nozzle, a 0.2 mm layer height provides a good balance between print quality and efficiency.
- Step 5. Adjust slicing parameters as needed.

NOTE

Process presets include appropriate default parameters suitable for most print jobs. You can adjust them based on your actual needs or desired results.

- Step 6. After completing all settings, slice the model to view color schemes, filament usage, print time, and other information in the Preview page.
- Step 7. Send the print job. Confirm the filament used, then click **Send**.

4.3 Start a Print from Printer Screen

The printer's MicroSD card stores built-in model files and print history. You can directly select and quickly start printing from the screen.

- Step 1. On the printer screen, tap **Print Files** and select the model you want to print.
- Step 2. Adjust options as needed, select the corresponding type of filament, then tap **Print**.

Chapter 5 Adjust Slicing Parameters in Bambu Studio

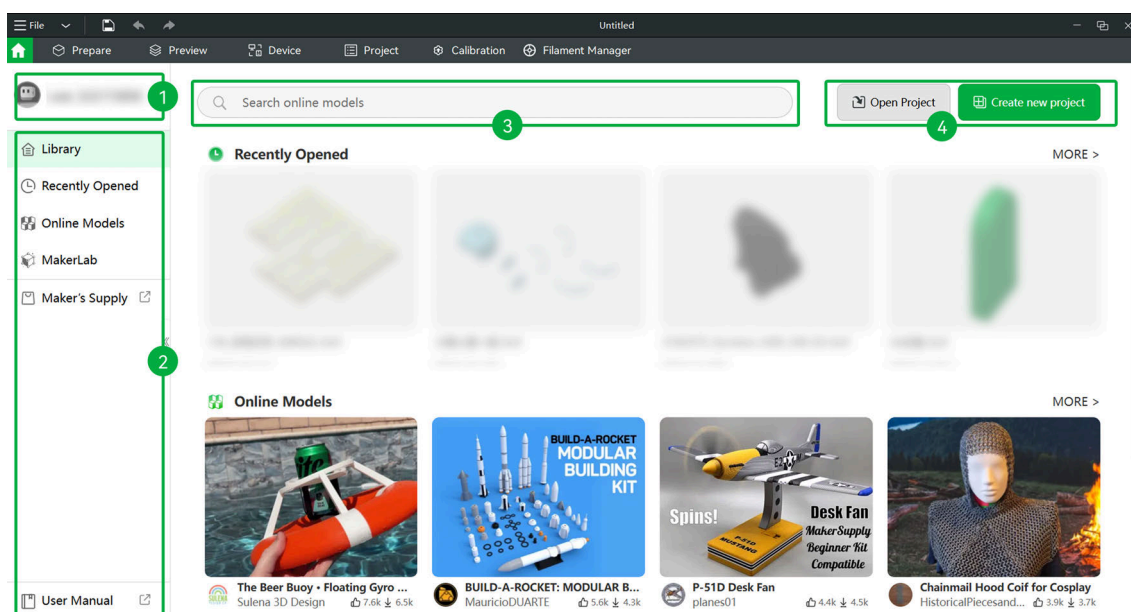
5.1 Bambu Studio Interface Overview

NOTE

- Some screenshots show other printer models for reference only and do not affect the actual workflow.
- The interface is continuously updated to improve the user experience. Please refer to the actual interface in the software.

Homepage

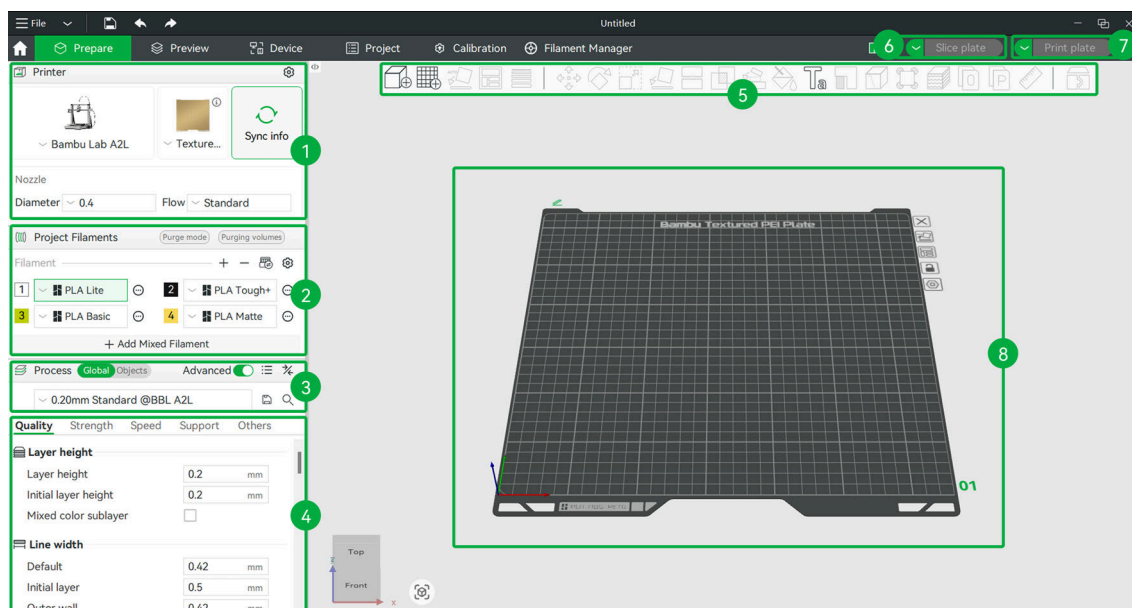
The homepage brings together model management, resource access, and learning guidance. It is the starting point when you open Bambu Studio.



1. **Account info:** View the current account or log out.
2. **Page navigation:** Quickly access recently opened files, online models on MakerWorld, Maker-Lab, Maker's Supply, print history, and tutorials.
3. **Search bar:** Enter keywords to search online models on MakerWorld.
4. **Project operations:** Open local projects or create new ones.

Prepare Page

The Prepare page is used to adjust models, select the printer and filament, set print parameters, slice models, and send print jobs.



1. **Printer settings:** After selecting a printer model, sync the build plate, hotend specifications, AMS, and filament information with one click. Bambu Studio automatically matches the slicing and print settings based on the selected configuration.
2. **Filament settings:** Displays the filament types and colors used in the current file. Click the + icon to manually add or remove filament. The system automatically loads preset parameters for the selected filament type.
3. **Process presets:** Provides preset parameter combinations for different quality levels, such as Standard and High Quality, which can be applied globally with one click.
4. **Print parameter details:** Models downloaded from MakerWorld usually include complete print parameters and require no additional setup. For special effects, you can adjust the parameters manually (see [Adjust Slicing Parameters](#)).
5. **Top toolbar:** After importing a model, select an object to edit and view it using the toolbar (see [Use the Top Toolbar](#)).
6. **Slice button:** Click to slice the current plate or all plates, and display the slicing results.
7. **Print and export:** Start printing or export files. Click to choose from the following options:
 - **Print plate:** Start printing the sliced file for the currently selected plate immediately.
 - **Print all plates:** Send sliced files for all plates to the printer and start printing the last plate immediately. After it finishes, select the next plate from **Print Files** to continue printing.
 - **Export single plate/all sliced files:** Export the sliced files to your computer, or copy the files to a MicroSD card to start offline printing from the printer screen.
 - **Send/Send all plates:** Send the sliced files to the printer's MicroSD card. You can then manually start the print job from the printer screen.

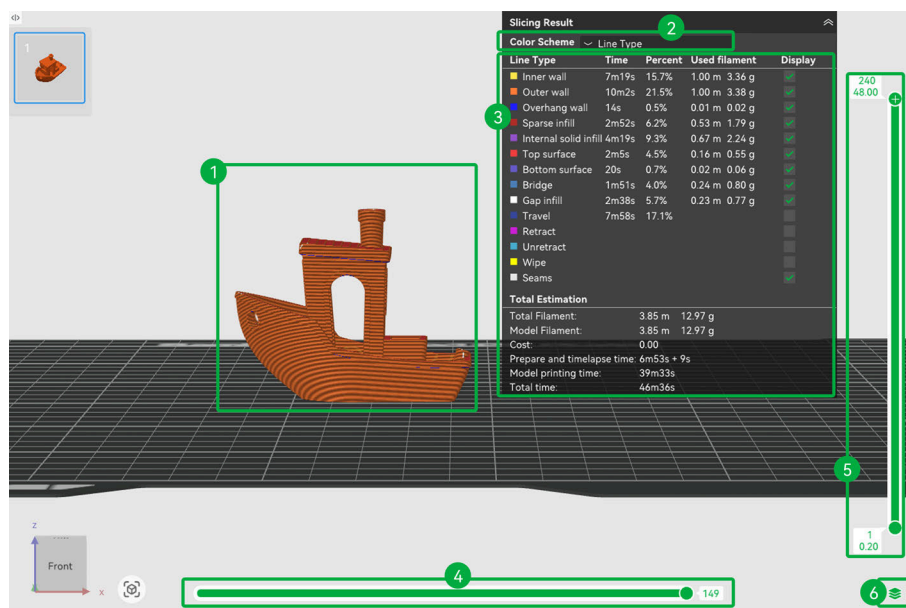
NOTE

When sending via network or starting a print job, the Bambu Network Plugin must be installed, and Bambu Studio and the printer must be on the same network.

8. **Print plate:** Place and edit models. A project can contain multiple plates.

Preview Page

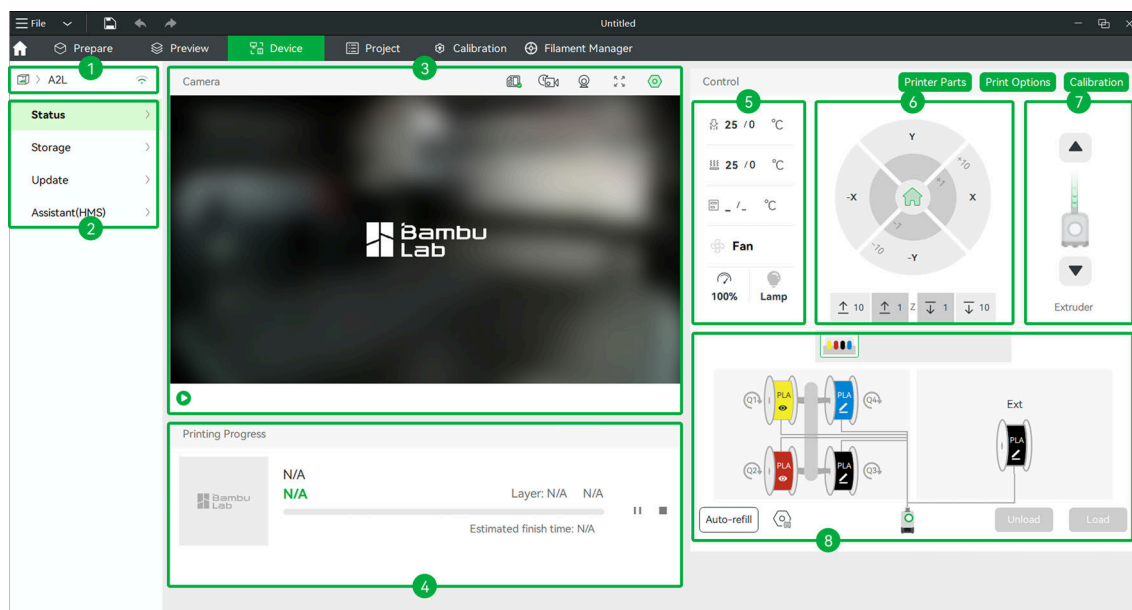
The Preview page is used to view slicing results and detailed information for each layer. You can also add custom operations to specific layers.



- Model preview:** Shows the sliced model. The model colors change automatically based on the selected color scheme. You can view the meaning of each color in the slicing result panel.
- Information categories:** Select the slicing information category to view, such as line type, filament, or print speed.
- Details:** Shows detailed information for the selected category, including what each color represents and the corresponding data.
- Single-layer path:** Drag the progress bar to view the toolhead motion path on the selected layer.
- Layer details:** View the model's layer count, layer height, and print time. Drag the layer slider to check the slicing results layer by layer. Right-click to add custom operations to a specific layer, such as custom G-code, pause, or filament change.
- Display mode:** Switch between viewing all layers and viewing a single layer.

Device Page

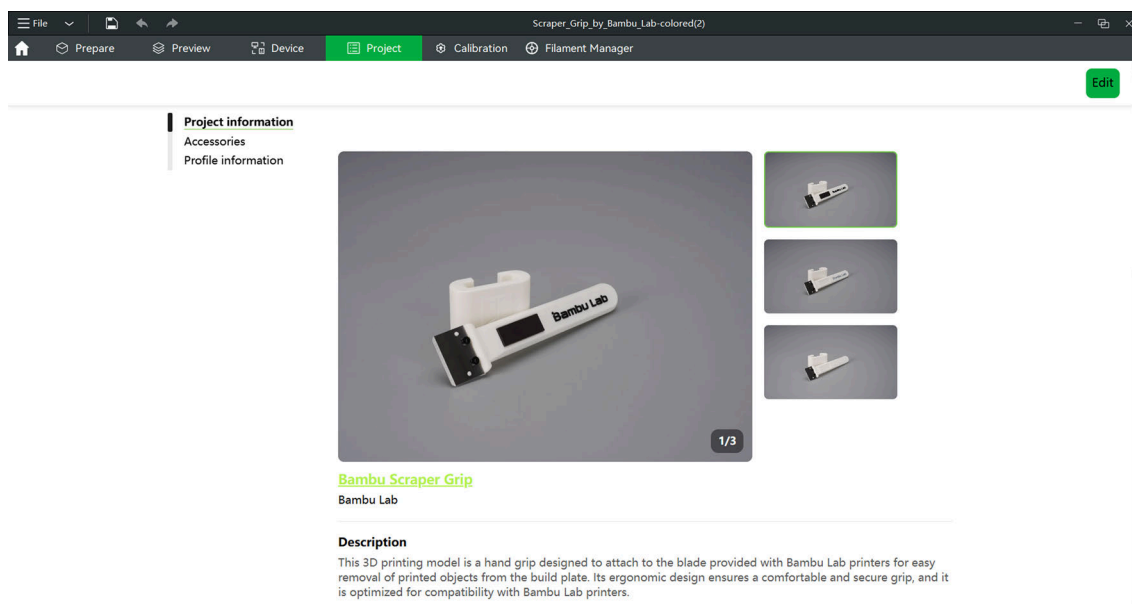
Displays the status of the connected printer and its operation options. You can also perform the same operations on the printer touchscreen (see [Common Screen Operations](#)).



1. **Device info:** Shows the currently connected printer. Tap to switch devices.
2. **Device status and management:** View printer information, including device status, storage media, firmware updates, and the Health Management System (HMS). Supports real-time monitoring, device control, MicroSD card file viewing, and firmware updates.
3. **Live video:** Play or pause the live video and manage recording and livestream status.
4. **Current print job:** Displays information about the current print job, including the job thumbnail and print progress. You can skip objects, pause, start/resume, or stop the job.
5. **Temperature control:** Set the nozzle and heatbed temperature. The number on the left is the current temperature, and the number on the right is the target temperature.
6. **Motion control:** Move the toolhead and heatbed when the printer is idle.
7. **Extruder control:** Shows the extruder Load status. A green dot indicates that the filament is loaded. Use the up and down arrows to manually extrude or retract 1 cm of filament.
8. **Filament management:** View and edit filament information, and control load, unload, and auto to refill. After connecting an AMS, you can also enable read filament on insertion, read filament on startup, remaining filament estimation, and other features.

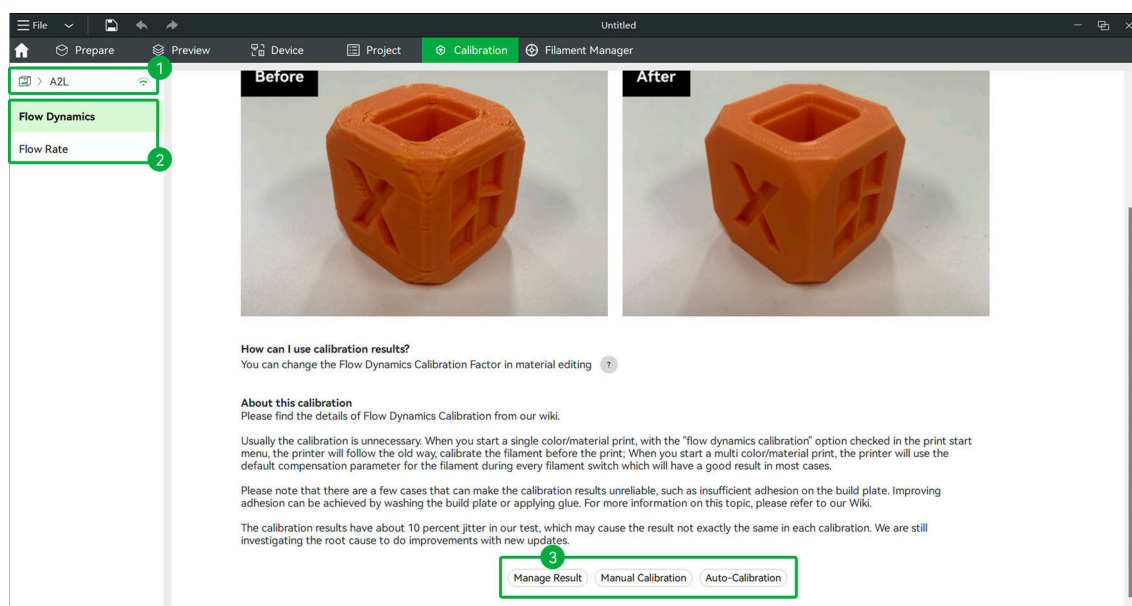
Project Page

Displays the project information contained in the current 3MF file, including model description, required accessories, and configuration file details.



Calibration Page

The Calibration page is used to adjust the printer's extrusion accuracy, ensuring accurate extrusion and stable print quality. Calibration is recommended when changing filament brands or hotends, or when obvious extrusion issues occur. For details, see [Filament Calibration](#).



1. Printer: Switch printers.
2. Calibration type: Choose **Flow Dynamics Calibration** or **Flow Rate Calibration**.
3. Calibration options: Manage calibration results and perform manual or automatic calibration.

5.2 Use the Top Toolbar

The top toolbar is located at the top of the Prepare page in Bambu Studio. It is used to import models, adjust model position and size, and perform auxiliary operations before printing.



i TIPS

The toolbar updates automatically based on the selected objects, and only available functions are enabled. Select at least one object before using a tool.

5.2.1 Position and Resize the Model

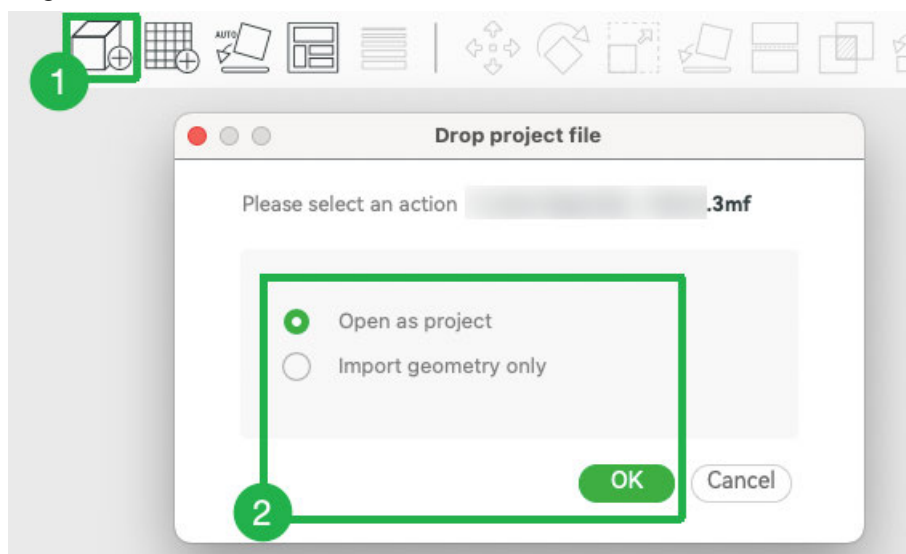
This section introduces the tools in the toolbar related to model placement and size adjustment, including Add Models, Add Plate, Auto Orient, Arrange All Objects, Move and Align, Rotate, Scale, Lay on Face, and Measure.

Add Models

Import 3D model files, such as 3MF or STL, from your computer.

Operating Steps:

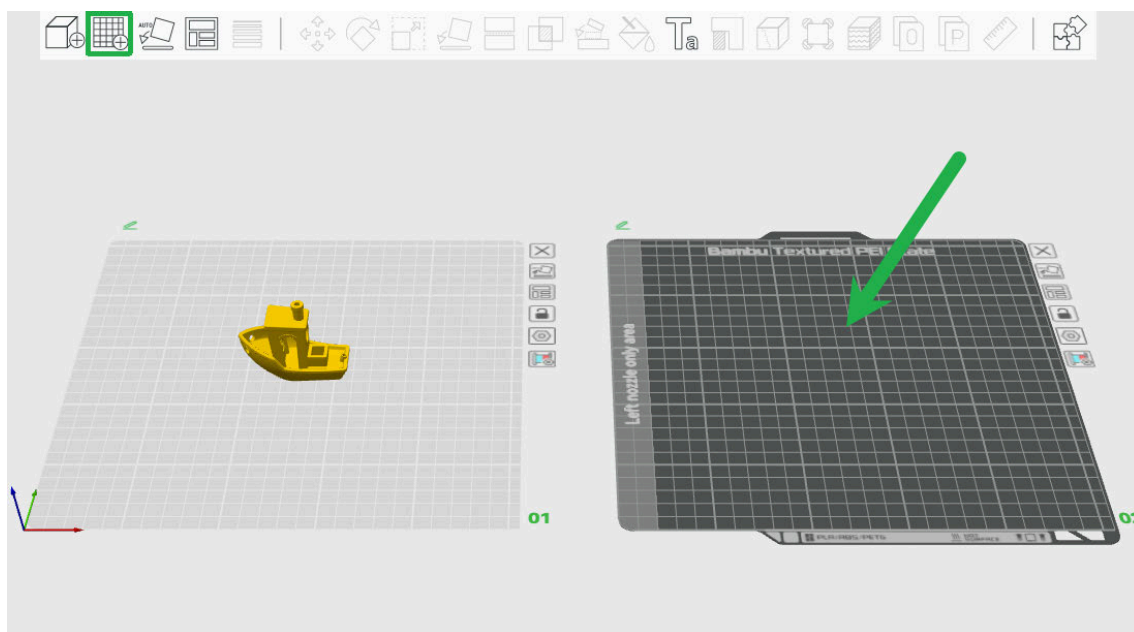
1. Click  to select local files.
2. If importing a 3MF file, select an action and click **OK**.
 - Open as project: Closes the current project and opens a new one.
 - Import geometry only: Imports only the model's geometry into the current project and ignores print settings.



Add Plate

Adds one new build plate to the current project for placing new objects. Use this when you need to prepare different models separately or use different settings for the same model.

In the top toolbar, click . The new plate appears at the end of the current project.

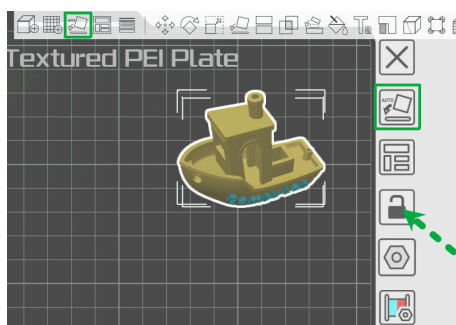


Auto Orient

Automatically adjusts the orientation of all objects in the project for optimal printing. It is recommended to use this feature when you are unsure how to orient an object.

Adjust within the following scopes:

- All objects in the project: In the top toolbar, click .
- All objects on a **single plate**: Click  on the right side of the build plate.
- All objects on selected plates: First, click  on the right side of the build plates you do not want to adjust, then click  in the top toolbar.
- Adjust an **object**: Use the **Rotation** tool to adjust manually (see [Position and Resize the Model](#) for details).



Arrange All Objects

Automatically arrange all objects in the current project to avoid overlap. After importing a model with multiple objects, use this to quickly create an initial layout.

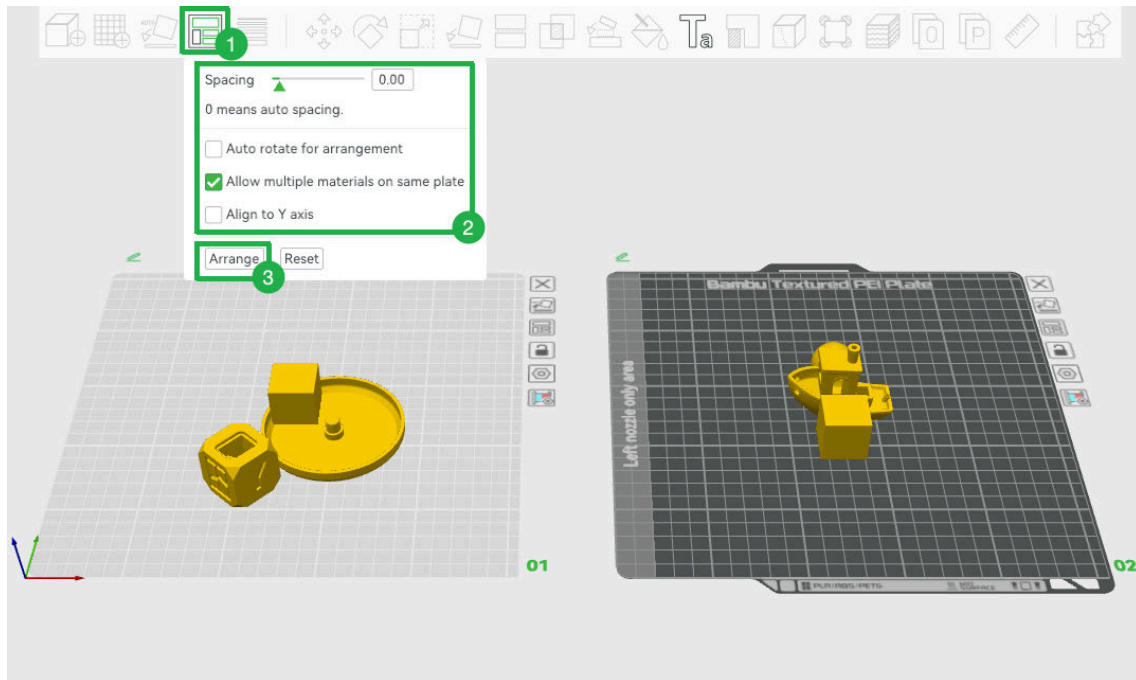
Operating Steps:

- **Arrange all objects in the project**

Step 1: Click .

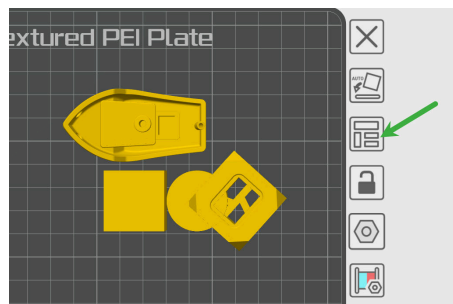
Step 2: Set placement requirements.

Step 3: Click **Arrange** (Shortcut: A).



- **Arrange all objects on the current plate**

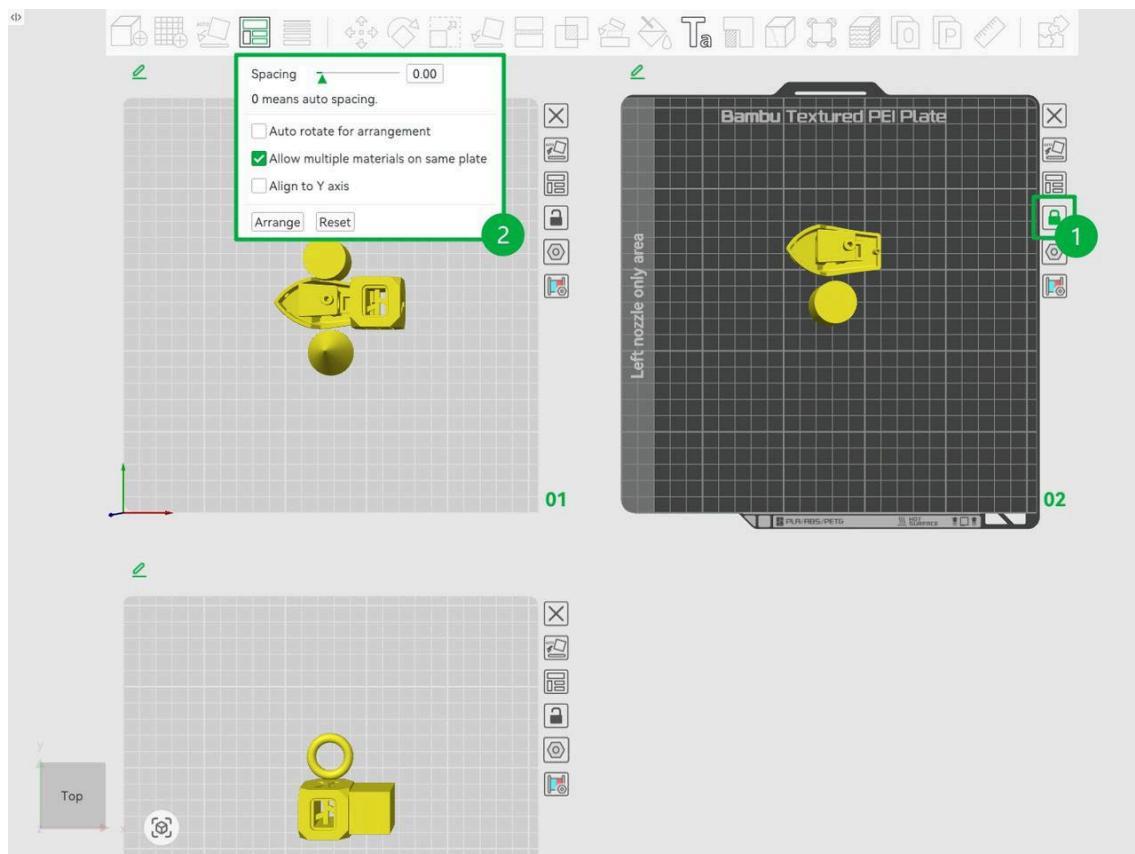
On the right side of the build plate, click  (Shortcut: Shift + A).



- **Arrange all objects on selected plates**

Step 1: Click  on the right side of the build plates you do not want to arrange.

Step 2: Click  in the top toolbar. Set placement requirements, then click **Arrange**.



Move and Align

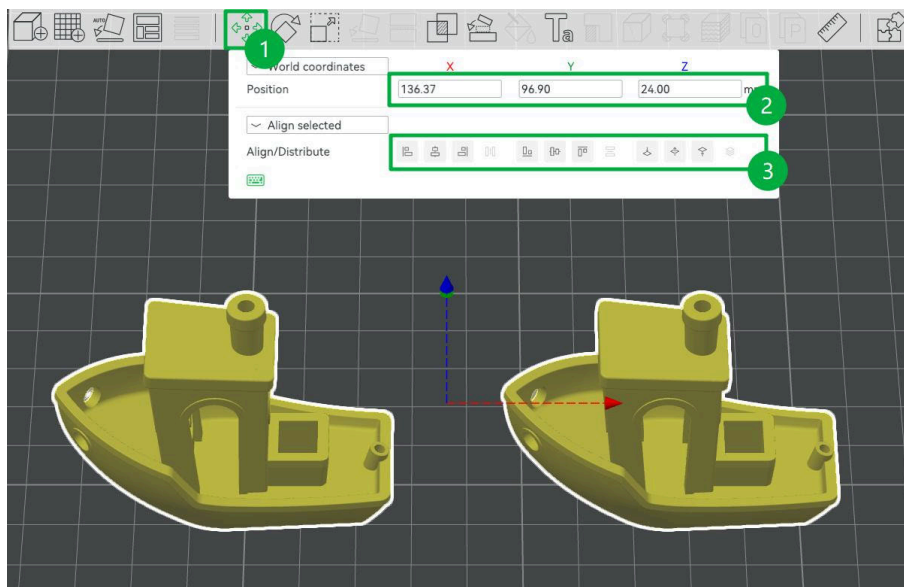
After selecting an object or part, you can drag it directly with the left mouse button or use the Move tool to view and precisely set its position coordinates. You can also select multiple objects to align them as needed, or align multiple parts within a single object.

Operating Steps:

Step 1: Click .

Step 2: Enter values in the coordinate box to precisely set the position.

Step 3: Align the selected objects or parts.



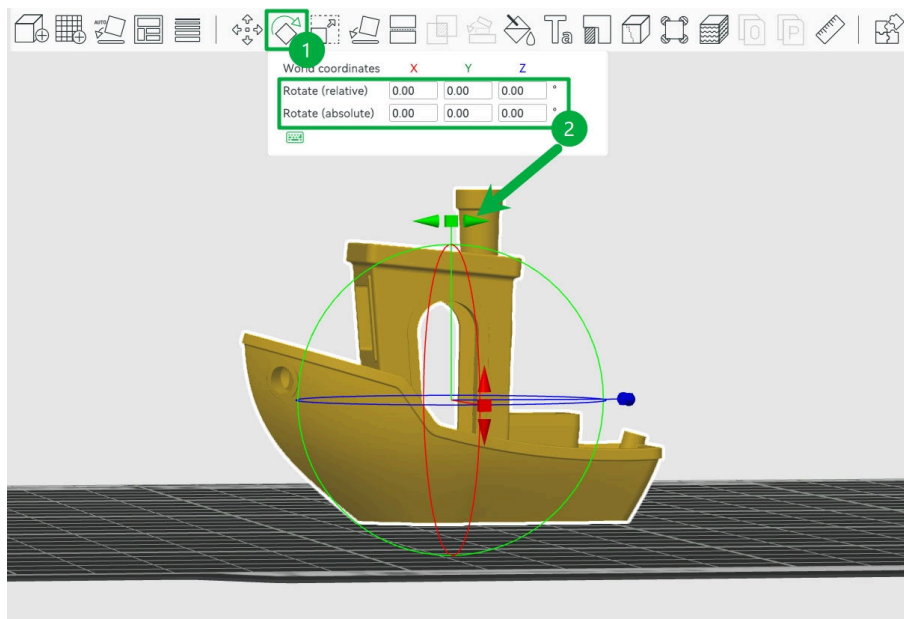
Rotation

Manually adjust the object's print orientation.

Operating Steps:

Step 1: Click  to open the adjustment interface.

Step 2: Drag the endpoints of the **X / Y / Z** axis to rotate, or enter the rotation angle directly.



Scale

Adjust the overall or local size of an object.

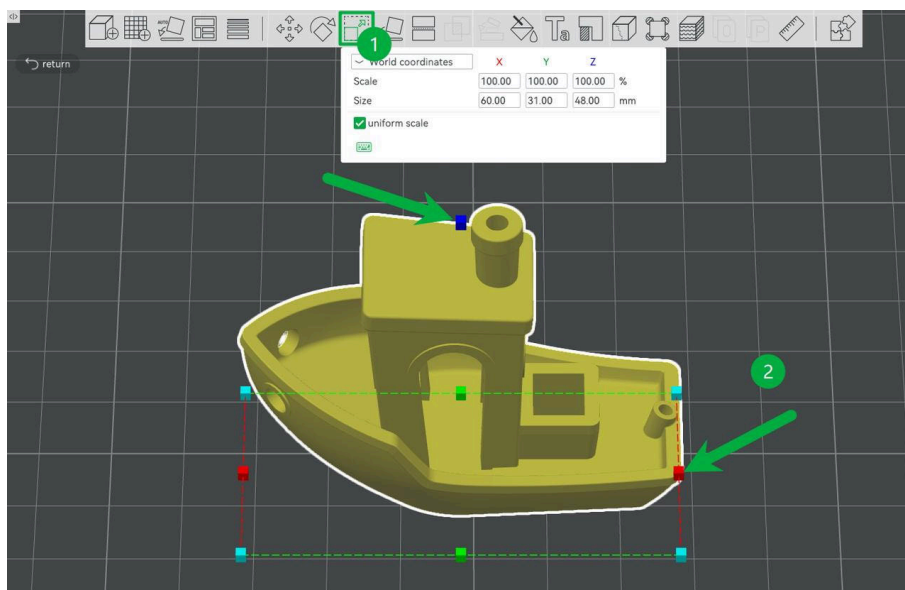
Operating Steps:

Step 1: Click  to open the adjustment interface.

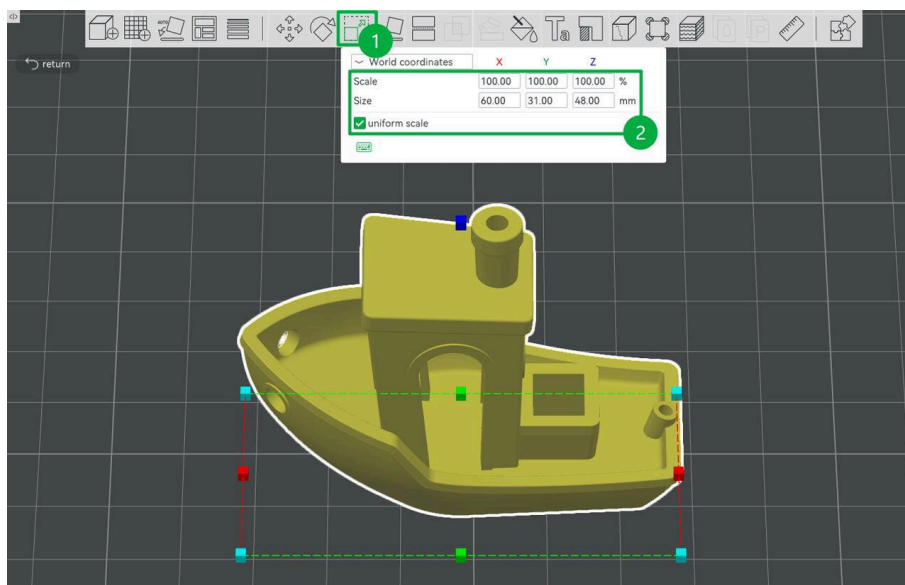
Step 2: Choose one method to adjust the size:

- Method 1: Drag the model handles.
 - Drag the four bottom corner handles to scale proportionally.

- Drag the other handles to stretch in a single direction.
- Method 2: Enter dimensions or a scale ratio.
 - Select **Uniform Scale**: Changing any one value will proportionally adjust the others.
 - Clear it to adjust the **X / Y / Z** dimensions independently.



Method 1



Method 2

Lay on Face

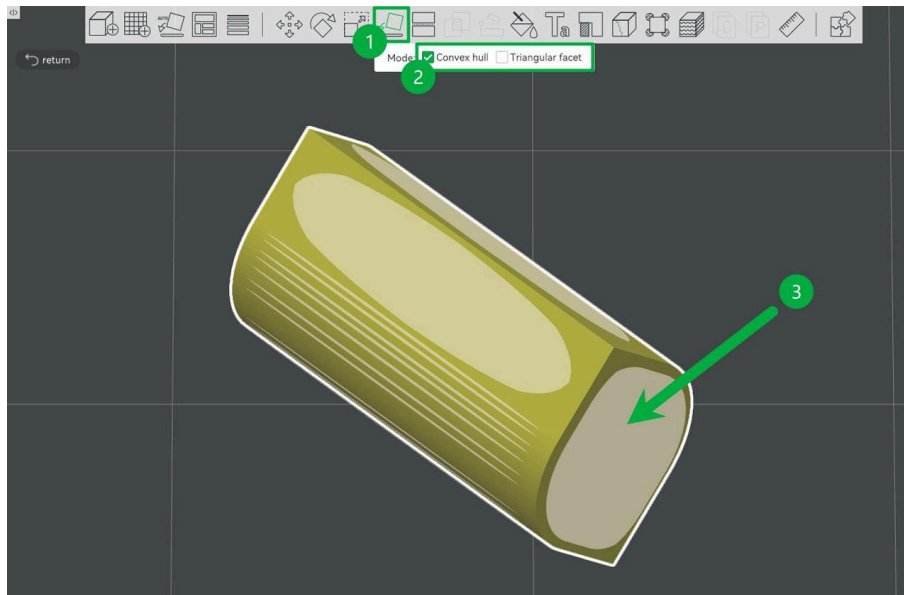
Manually set a selected face of the model as the print base. This feature is useful when Auto Orient does not give the desired result or when a specific face needs to be placed on the build plate.

Operating Steps:

Step 1: Click  to open the adjustment interface.

Step 2: Choose a display mode: **Convex hull** or **Triangular facet**.

Step 3: Click the face on the object that you want to use as the bottom face.



Measure

Measure the distance and angle between different points on the same object, or between multiple objects. This is often used to confirm that model dimensions meet expectations before printing.

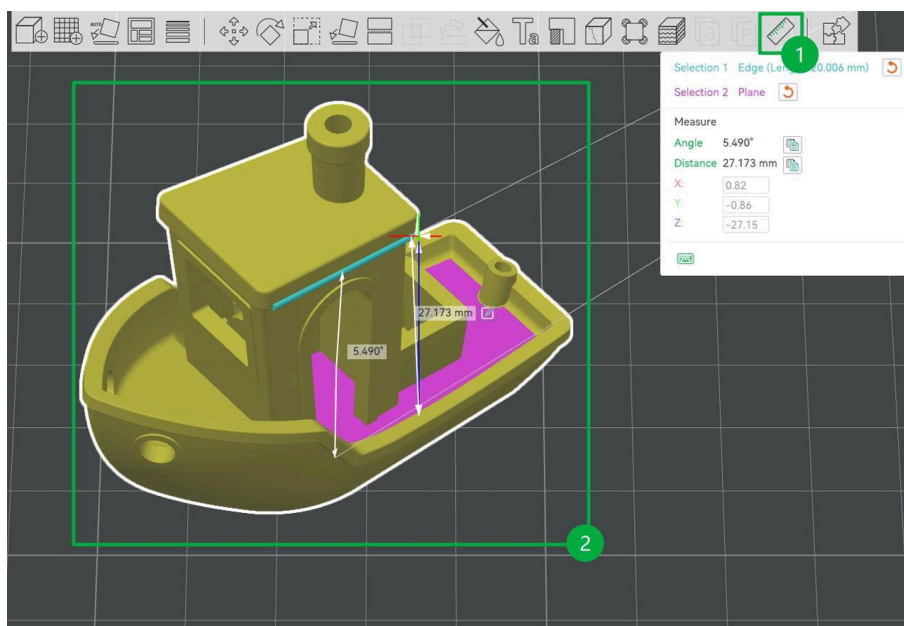
Operating Steps:

Step 1: Click  to open the adjustment interface.

Step 2: Select the two measurement ends (such as line segments or faces) in sequence to view the results.

TIPS

To measure the distance and angle between multiple objects, first select the objects, then click .



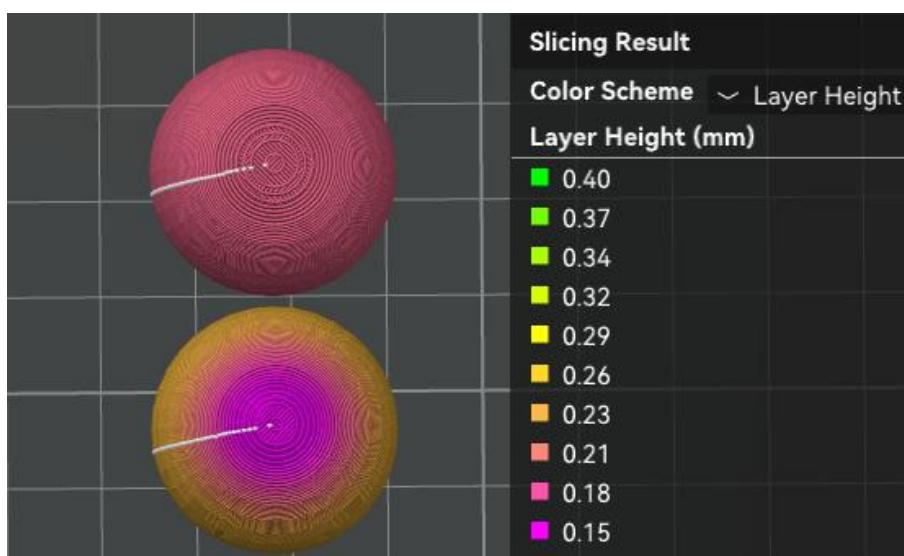
5.2.2 Control Print Quality and Local Features

The local control tools in the toolbar are used to adjust layer height, color, text, support, seam, brim, and surface textures for the entire model or specific areas, balancing print quality and appearance.

Variable Layer Height

For models with spherical or sloped top surfaces, this feature automatically adjusts the layer height in different height ranges to make the top surface smoother and reduce visible stepping.

It is suitable for models with higher appearance requirements.



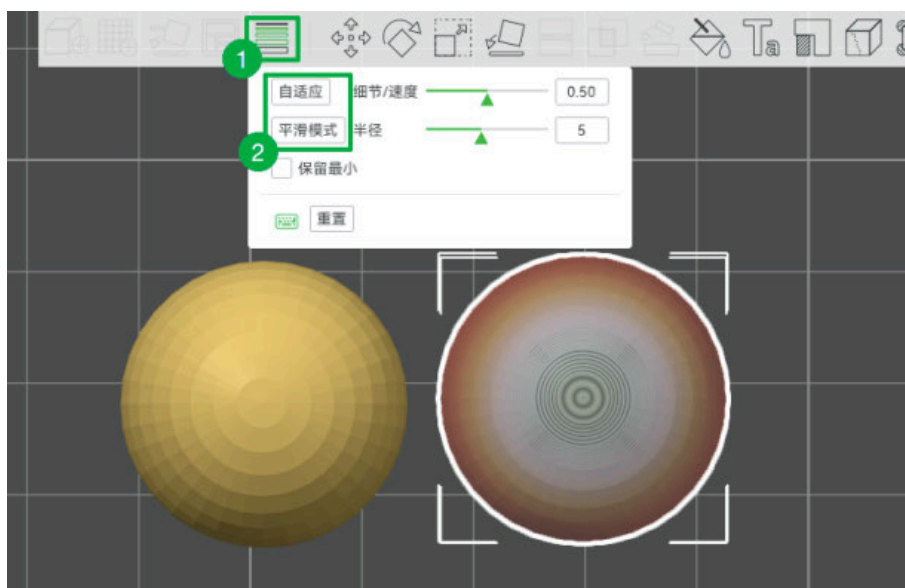
Operating Steps:

Step 1: Click  to open the adjustment interface.

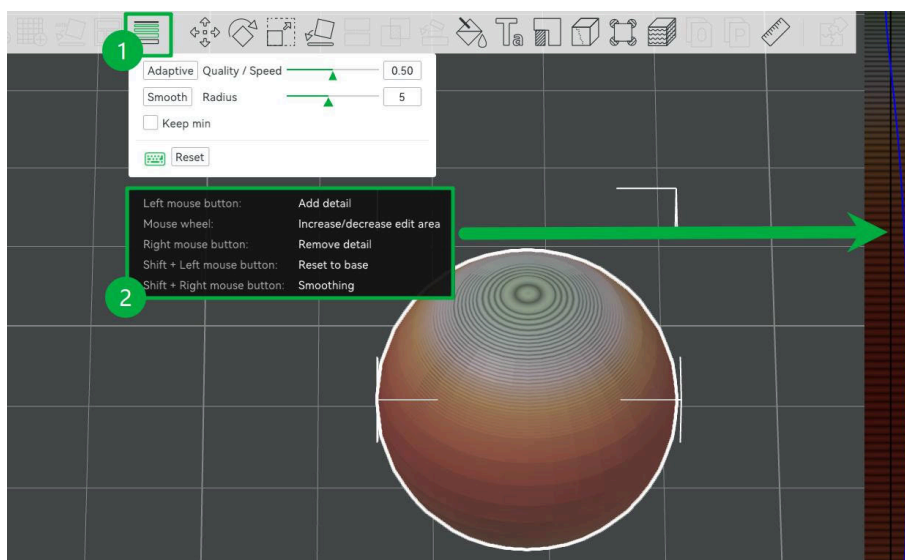
Step 2: Adjust layer height.

- Method 1: Click **Adaptive**, then click **Smooth Mode** several times.

- Method 2: Follow the key instructions to adjust the layer height bar on the right and precisely control the layer height at specific positions.



Method 1



Method 2

Color Painting

Assign filament colors to the whole object or a specific area, suitable for multi-color printing.

Operating Steps:

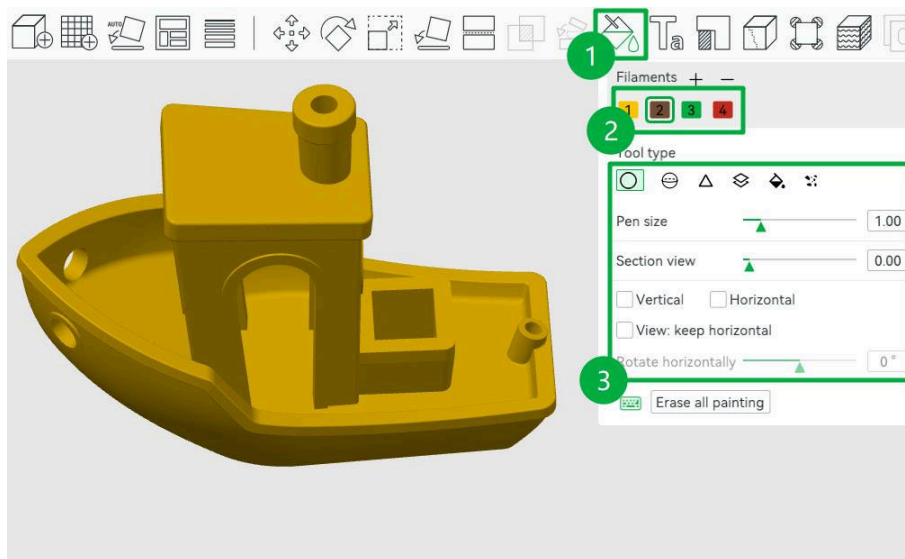
Step 1: Click  to enter the color painting interface.

Step 2: Select a color.

Step 3: Select a color painting tool, then adjust the pen size or section view:

- Circle: Apply curved color painting to surfaces.
- Sphere: Apply color painting to all faces within the spherical area (including hidden faces).

- **Triangle:** Apply color painting to the triangular face under the cursor; drag to continuously apply color painting.
- **Height range:** Apply color painting to all faces within the specified height range.
- **Fill:** Spread color painting from the selected face to connected areas. When **Edge detection** is enabled, you can set a smart fill angle, and color painting will automatically stop at corners sharper than that angle.
- **Gap fill:** Automatically detect small gaps and fill them with adjacent colors.



Text Shape

Add 3D text to the model surface (supports flat and curved surfaces). Use it for labels, numbers, or descriptive text.

Operating Steps:

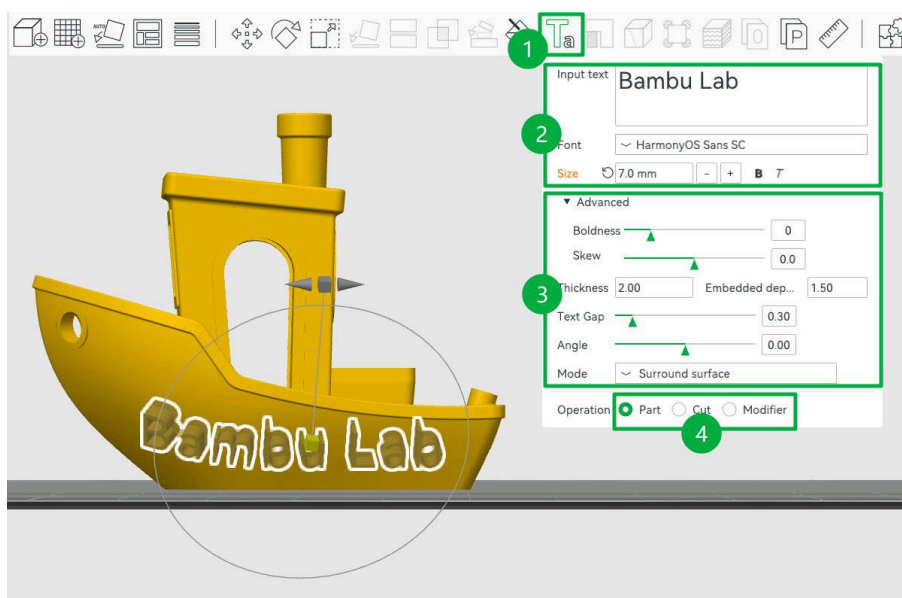
Step 1: Click  to enter the editing interface.

Step 2: Enter text and set the font and size.

Step 3: Adjust the text position.

Step 4: Select the generation type:

- **Part:** Creates an independent solid part, which is sliced as a regular model.
- **Cut:** Applies a Boolean subtraction to the model to create an engraved effect.
- **Modifier:** Does not change the geometry. It only modifies print settings (e.g., color) for the area overlapping the model. This can be used to create 2D text patterns flush with the model surface.



Supports Painting

Manually add or block support structures in specific areas by painting on the model.

Operating Steps:

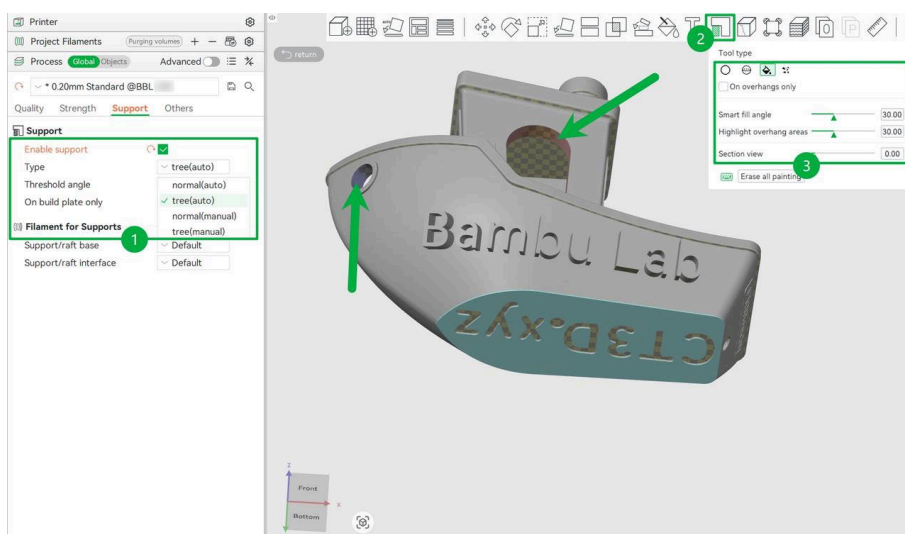
Step 1: In the Support settings under Process, select **Enable support** and choose a support type.

- Auto: The system generates supports automatically. You can slice the model and check the result before deciding whether manual adjustments are needed.
- Manual: Supports are generated only in painted areas.

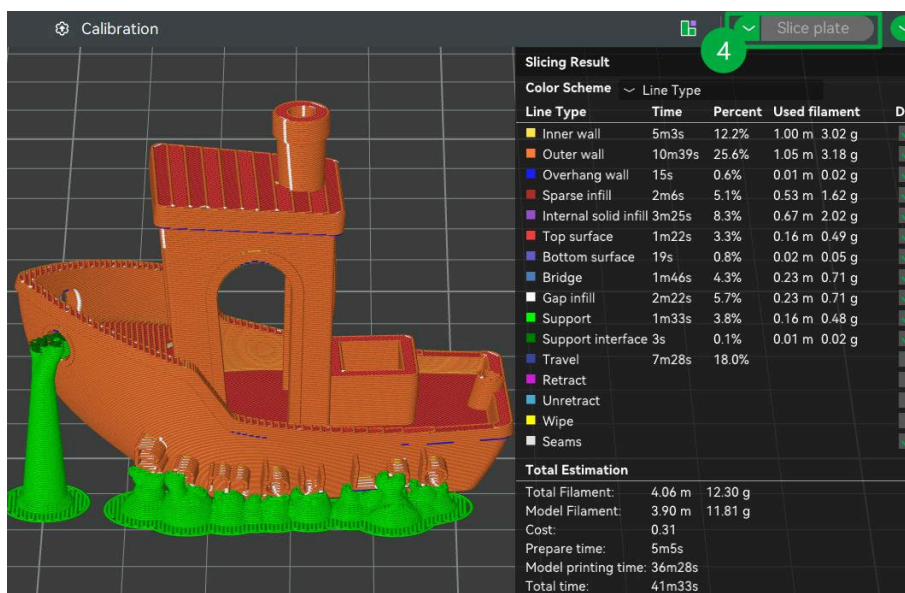
Step 2: Click  to enter the support painting interface.

Step 3: Select a painting tool and paint on the model:

- Left-click: Add supports (The area is shown in blue).
- Right-click: Block supports (The area is shown in red).



Step 4: Click **Slice Plate** to check the results.



Seam Painting

When the automatically generated seam affects appearance, you can manually specify the seam location.

Operating Steps:

Step 1: Set the seam position in the quality settings of the Process panel.

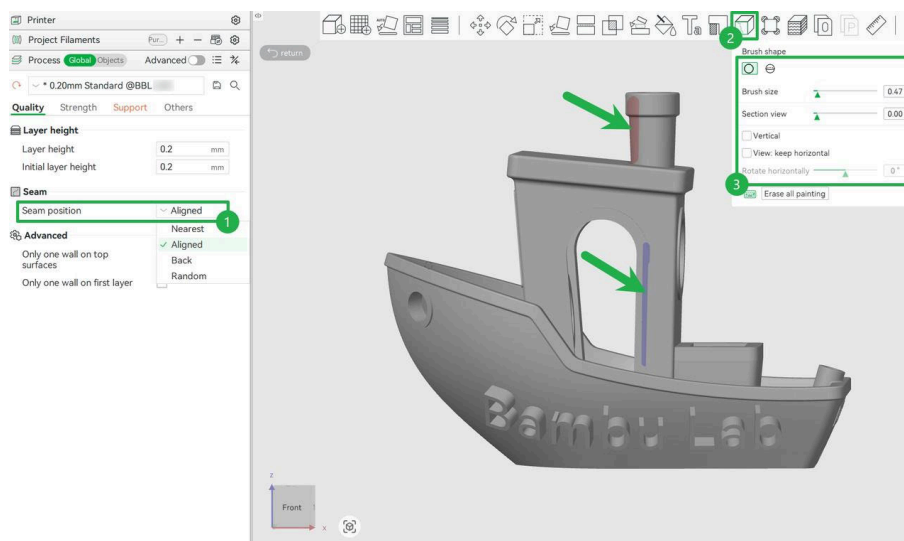
TIPS

Click **Slice Plate** to enter the Preview page and check the seam result.

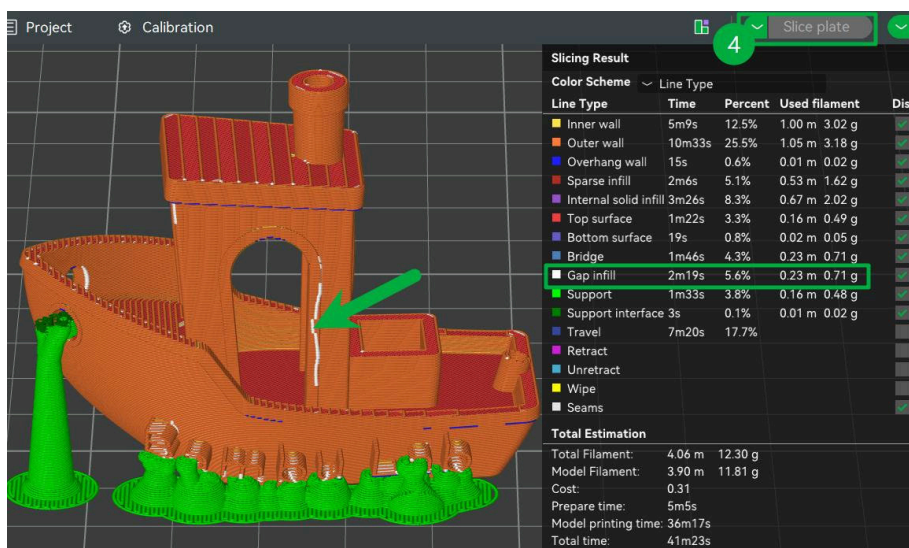
Step 2: Click  to enter the seam painting interface.

Step 3: Select a painting tool and paint on the model:

- Left-click: Set the Z seam (the area is shown in blue).
- Right-click: Block the Z seam (the area is shown in red).



Step 4: Click **Slice Plate** to check the seam result.



Brim Ears

Generate a brim around sharp corners and other areas to improve adhesion and reduce warping without making removal more difficult. Suitable when you need localized adhesion enhancement without a full brim around the model.

Operating Steps:

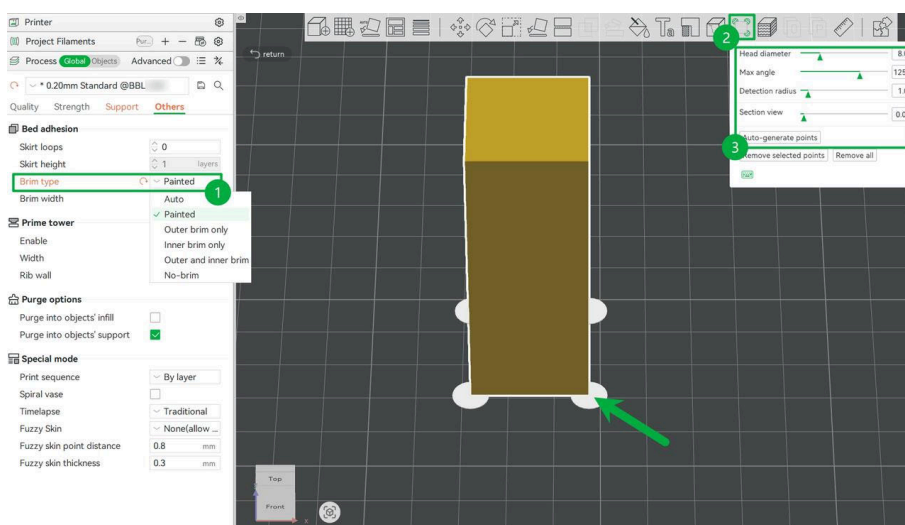
Step 1: In the Others section of the Process panel, set **Brim Type** to **Painted**.

NOTE

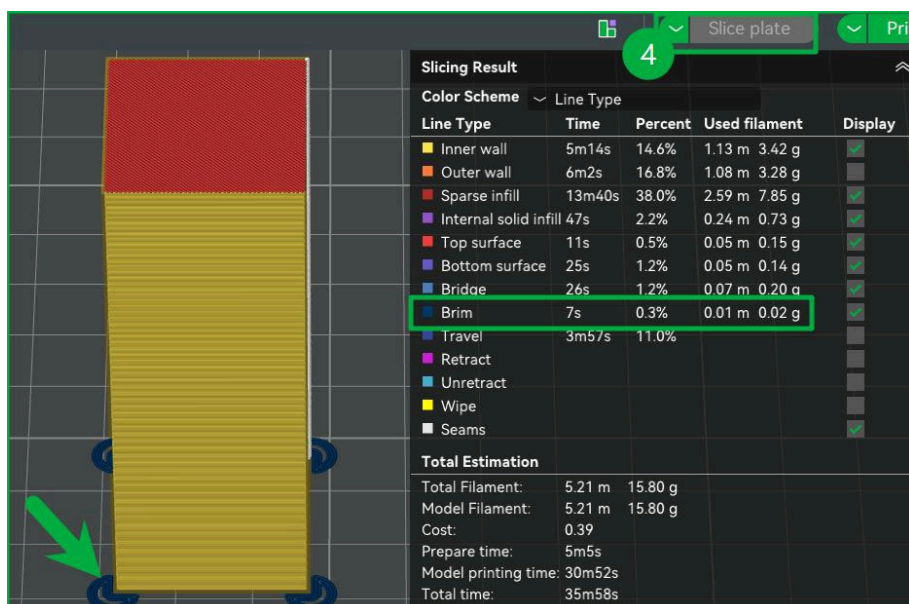
The brim ear does not work unless the brim type is set to **Painted**.

Step 2: Click  to enter the brim ears painting interface.

Step 3: Select **Auto-generate points** or manually adjust brim parameters, then left-click to draw at the desired positions.



Step 4: Click Slice Plate and check the result.



Fuzzy Skin Painting

Create a rough texture similar to animal fur in a specified area by painting. This effect is used for special appearances.

Operating Steps:

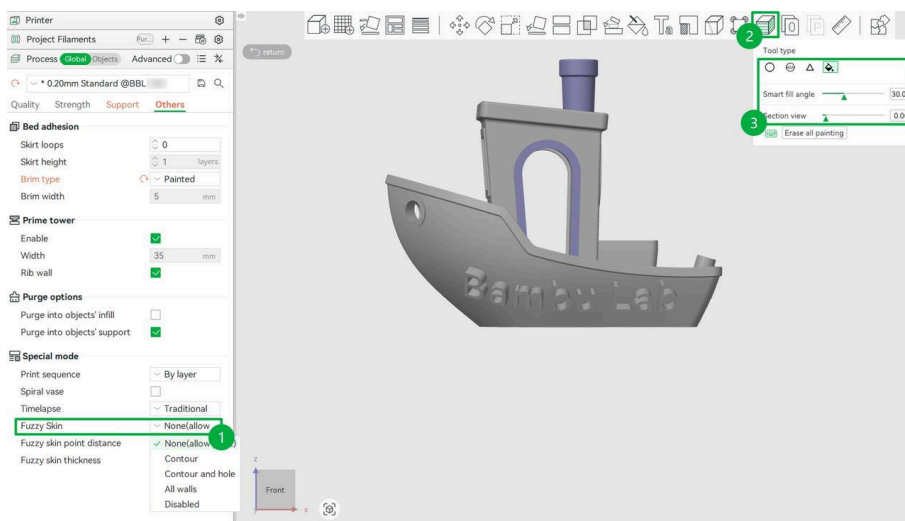
Step 1: In the Others section of the Process panel, set **Fuzzy Skin** to **None (allow paint)**.

TIPS

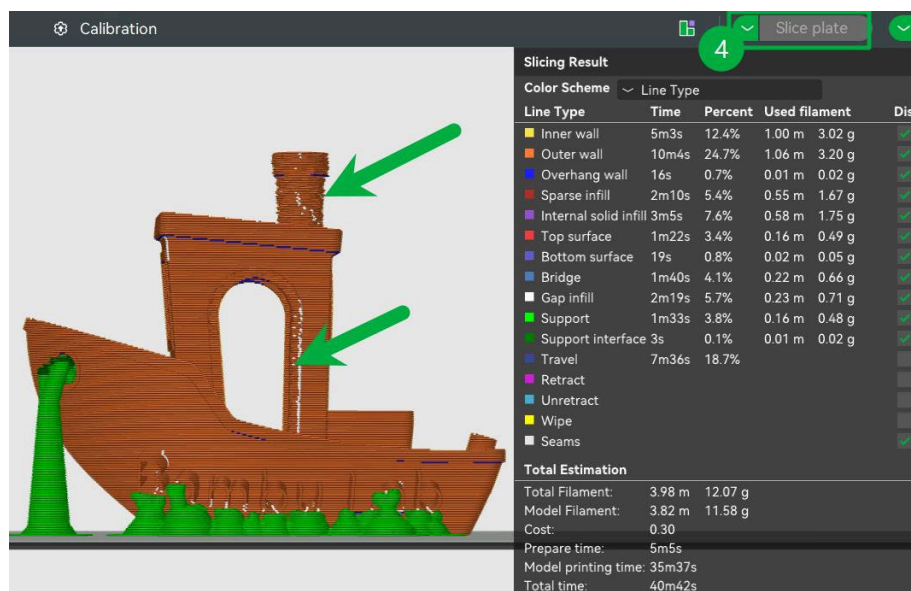
If set to other modes, the painting results will be overridden.

Step 2: Click  to enter the fuzzy skin painting interface.

Step 3: Select the painting tool and left-click where you want to paint.



Step 4: Click **Slice Plate** to check the results.

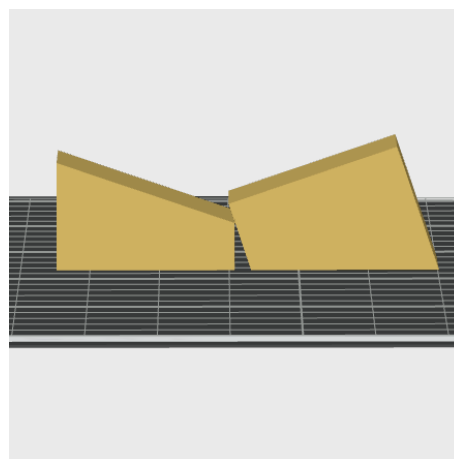
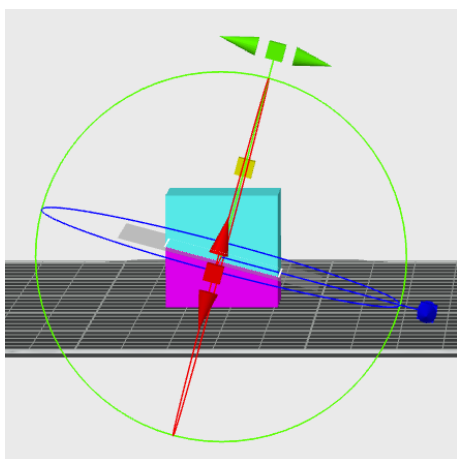


5.2.3 Adjust Model Structure

Cut

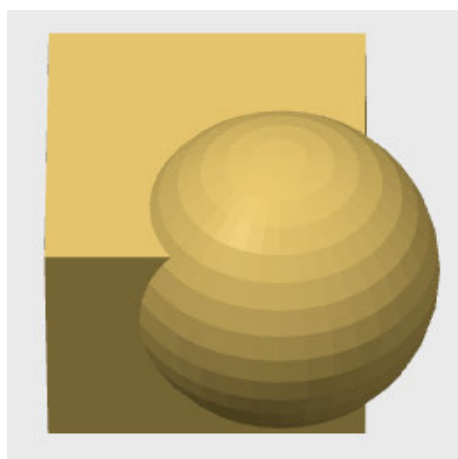
Click  to define a custom cutting plane and cut the model. Common uses include:

- Split an oversized model into parts for printing and assembly;
- Create a flat bottom surface for printing;
- Print only part of the model.

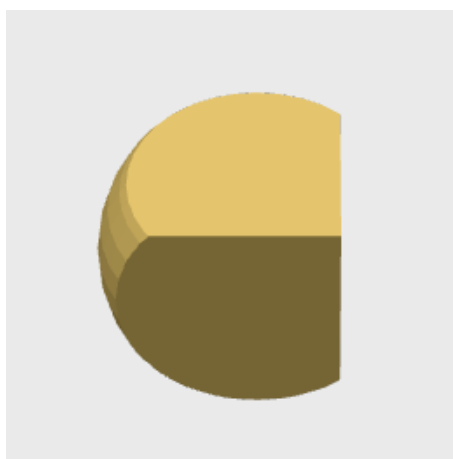


Mesh Boolean

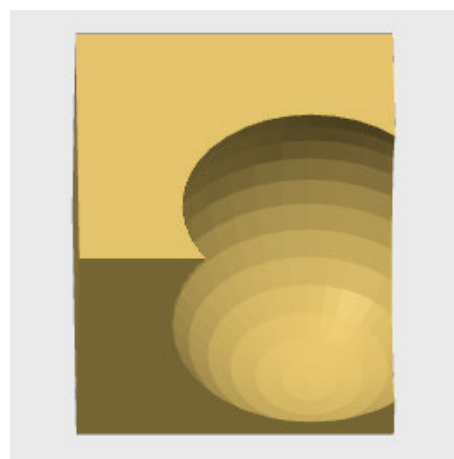
Click  to perform Union, Subtraction, or Intersection operations on multiple objects and generate a new model.



Union



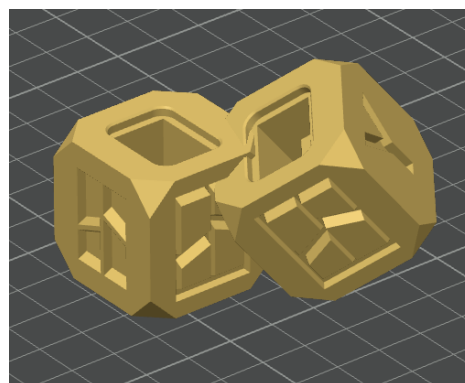
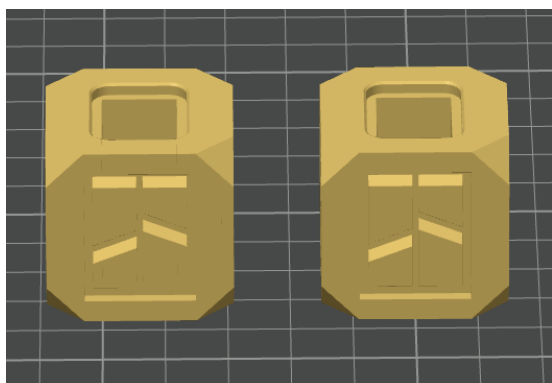
Intersection



Subtraction

Assemble

Click  to select 2 points or 2 faces to quickly align and assemble objects, without needing to input exact coordinates.



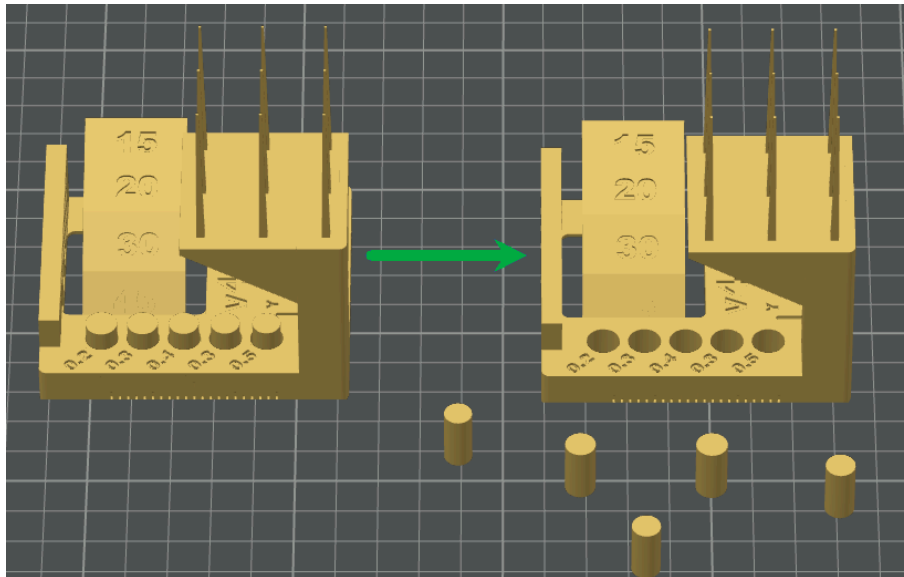
TIPS

When multiple objects are selected, assembly is supported only along the **X** and **Y** axes.

To assemble along the **Z** axis, first select multiple objects, right-click and choose **Merge**, then perform **Assemble**.

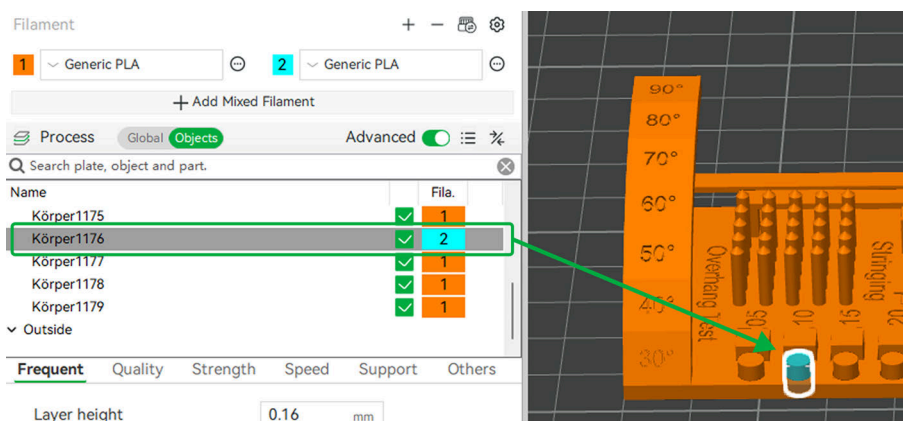
Split to Objects

Click  to split 1 object into multiple independent objects. Use this when the model is too large to print or when you need to set different parameters for different parts.



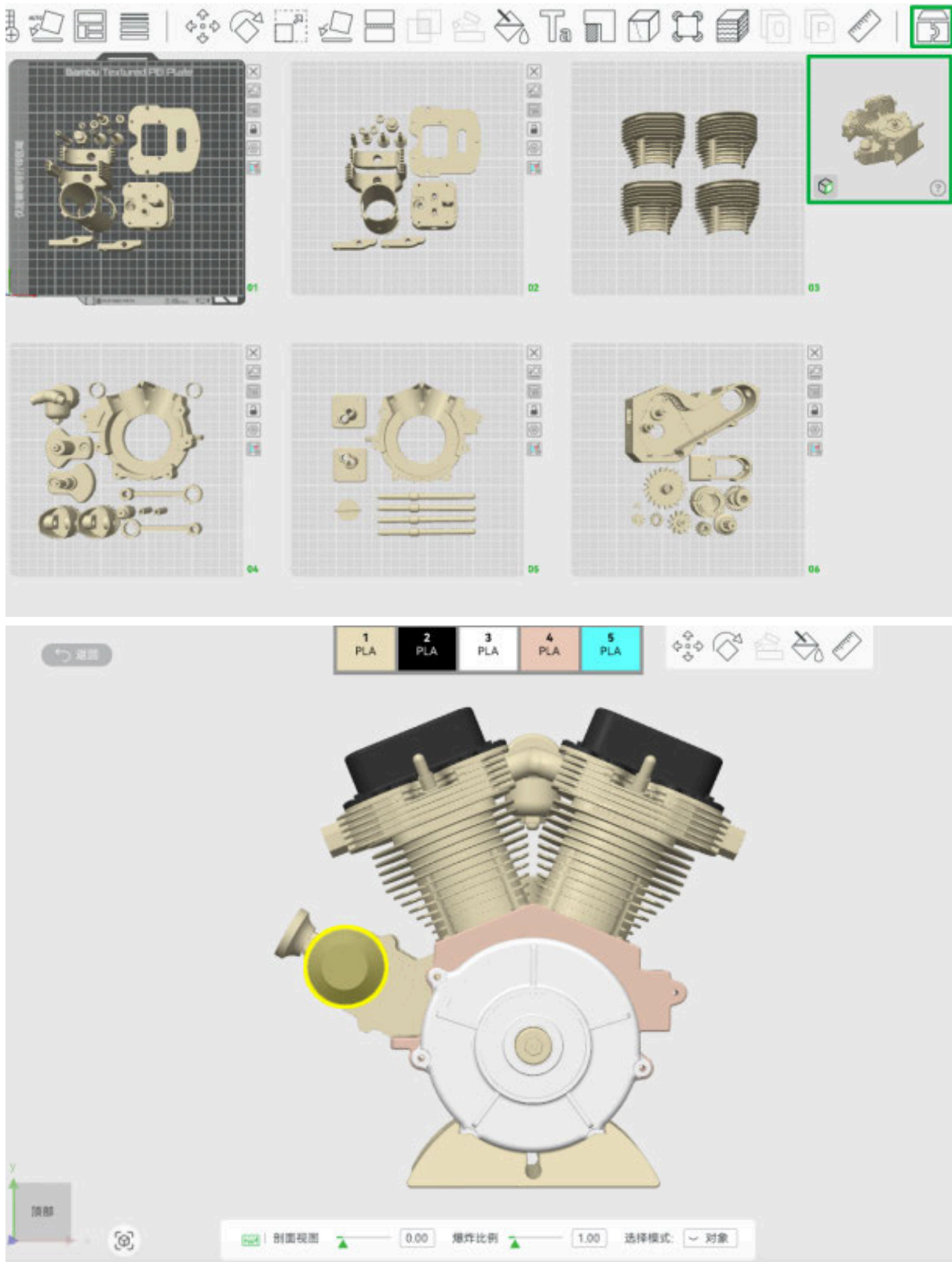
Split to Parts

Click  to keep the object intact while converting its sections into separate parts, allowing separate filament color settings for each part.



Overview

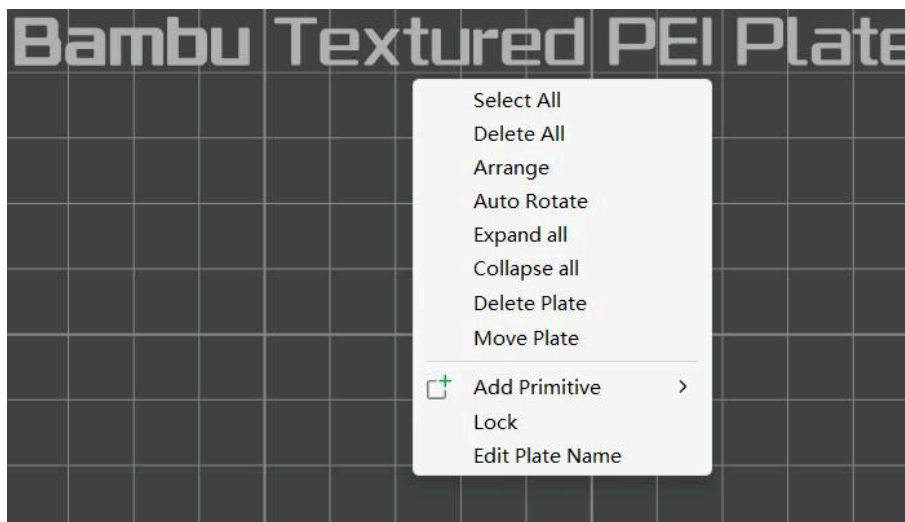
Click  or the thumbnail to visually check how the model is merged and color model parts using a section view or exploded view. This view only provides an assembly preview and does not modify the model structure.



5.3 Use the Right-Click Menu

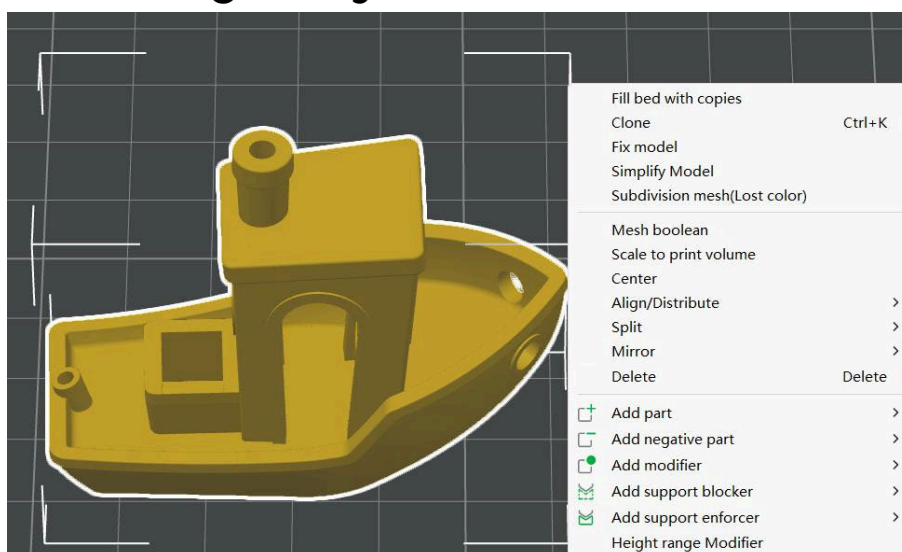
On the Prepare page, right-click in the object list or workspace to open a shortcut menu for the current selection.

5.3.1 Right-Click Plate



- **Select All:** Select all objects on the current plate.
- **Delete All:** Delete all objects on the current plate.
- **Arrange / Auto Rotate:** Automatically adjust the position and orientation of all objects on the current plate.
- **Expand/Collapse All:** Expand/collapse the object list hierarchy in the Process bar.
- **Delete Plate:** Delete the current plate. Objects on the plate will move to the off-plate area.
- **Move Plate:** Changes the number of the current plate, and its position will be updated accordingly.
- **Add Primitive:** Add a built-in standard model or import an SVG file.
- **Lock:** Locks the plate. When locked, the Arrange and Auto Orient tools are unavailable.
- **Edit Plate Name:** Change the name of the current plate.

5.3.2 Right-Click Single Object



Copy and Simplify

- **Fill build plate with copies:** Automatically clone the selected object to fill the current build plate.

- **Clone:** Select the number of copies and automatically arrange them on the current build plate.
- **Simplify Model:** Adjust the number of triangles in the model to reduce slicing time (this may not shorten print time).

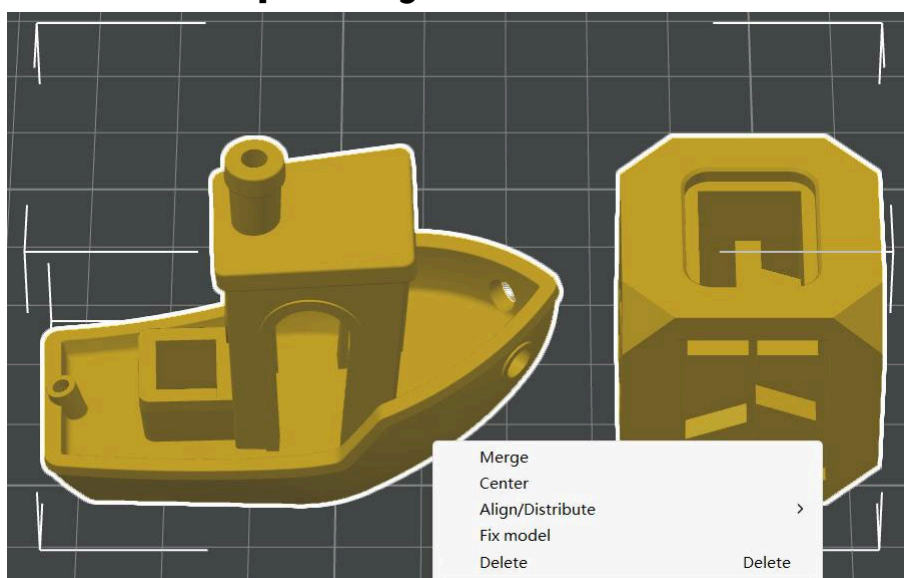
Placement and Transformation

- **Center:** Move the selected object to the center of the current build plate.
- **Align/Distribute:** Adjust the alignment and distribution of parts within the selected object.
- **Split:** Split the selected object into multiple objects or parts.
- **Mirror:** Mirror the object along the **X / Y / Z** axis.

Local Features

- **Add part:** Add parts to the selected object.
- **Add negative part:** Subtract a specified shape from the selected object to create a hollow. Supports cubes, cylinders, spheres, cones, or custom shapes.
- **Add modifier:** Change print settings in the area where the selected object overlaps with the modifier (such as color, speed, or strength). Supports cubes, cylinders, spheres, cones, or custom shapes.
- **Add support blocker:** Prevent supports from being generated in the area where the selected object overlaps with the support blocker. Supports cubes, cylinders, spheres, cones, or custom shapes.
- **Add support enforcer:** Force supports to be generated in the area where the selected object overlaps with the support enforcer. Supports cubes, cylinders, spheres, cones, or custom shapes.
- **Height range modifier:** Change print settings for a specified height range of the object (such as color, speed, or strength).

5.3.3 Right-Click Multiple Objects



- **Merge:** Combine multiple objects into 1 object. The original objects remain as parts within the new object.
- **Center:** Move all selected objects to the center of the current plate.

- **Align/Distribute:** Adjust the alignment and distribution among the selected objects.

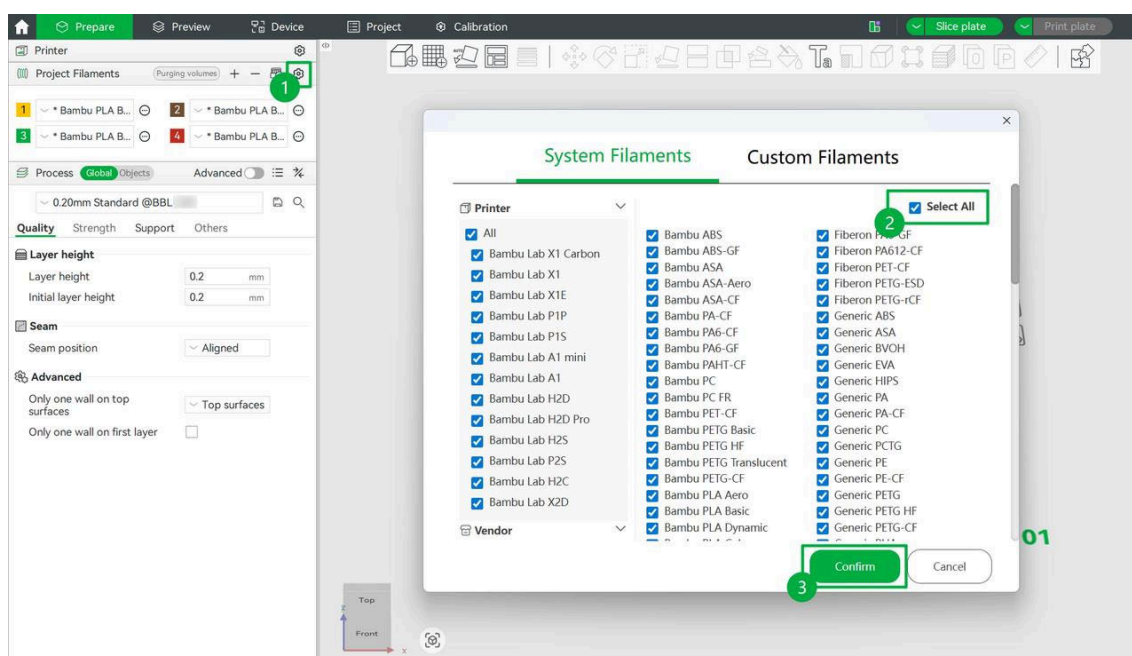
5.4 Adjust Slicing Parameters

5.4.1 Filament Presets

Filament presets include all parameters related to the filament itself during printing, such as temperature, flow rate, and cooling settings.

Use Default Filament Presets

Bambu Studio features built-in official system presets, covering all official filaments and some third-party filaments. You can select all filaments with one click and use the default settings immediately.

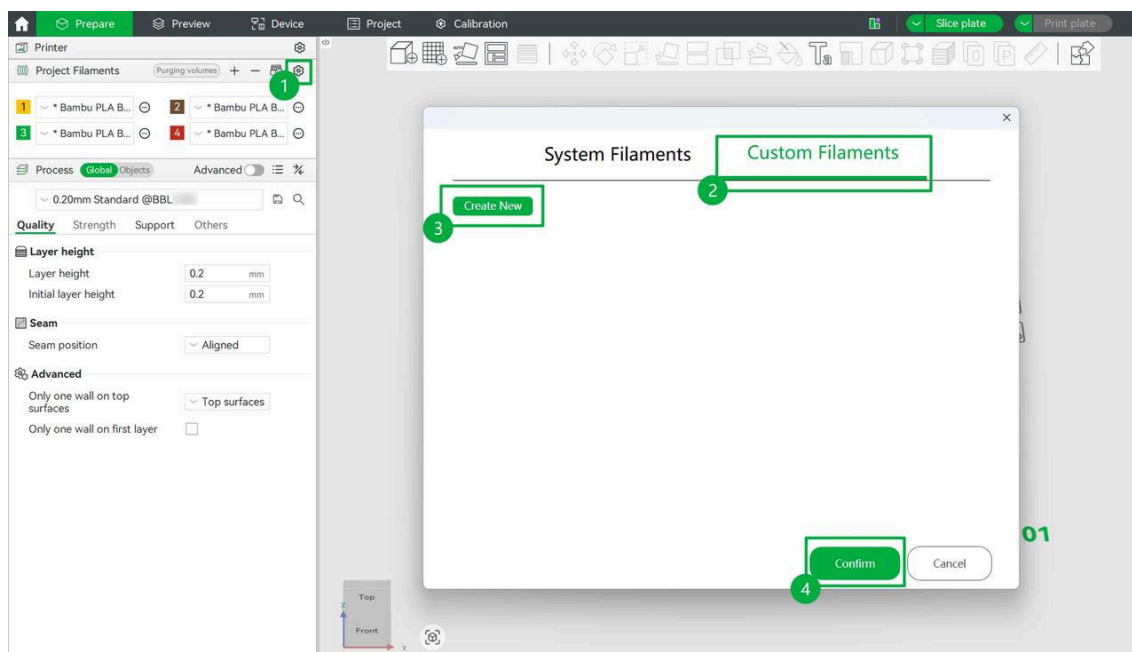


TIPS

System filament presets are pre-optimized for the printer and are recommended for new users.

Custom Filament Presets

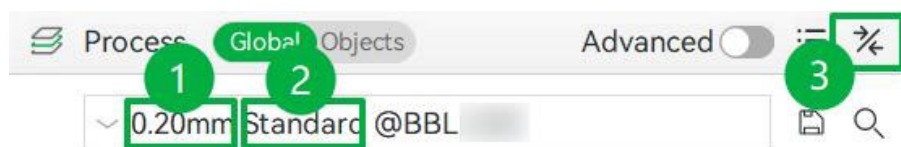
If your filament is not included in the system presets, select the corresponding Generic preset first, then fine-tune it based on the manufacturer's recommended settings and save it as a custom filament for future use.



5.4.2 Process Presets

Use Default Preset

Process presets include the main settings required for a print job, such as quality, strength, print speed, and supports. You can select a system preset from the drop-down menu in the Process panel.



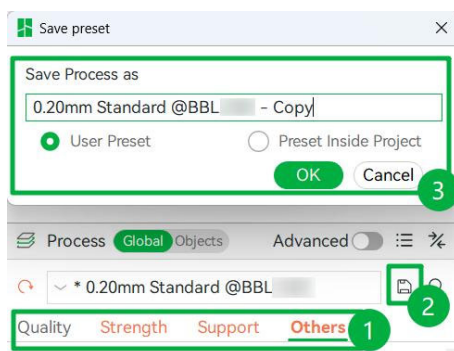
1. **Layer Height:** A smaller layer height produces finer detail, but usually increases print time. The default value is **0.2 mm**.
2. **Quality Level:** Presets are optimized with different priorities. Common types include:
 - **Standard:** Balances print quality, strength, and print time. Suitable for most models and everyday printing.
 - **High Quality:** Lowers print speed and acceleration to improve surface quality and detail.
 - **Strength:** Increases Wall loops and infill density to improve structural strength.
3. **Compare Presets:** Select any two to view their settings and see the differences.

TIPS

- Beginners are advised to keep the default preset settings and avoid changing them unless necessary.
- Available presets may vary depending on the list shown in the software.

Create Custom Preset

Bambu Studio supports custom presets. For special needs, adjust parameters and save as a new **process preset** for future use.



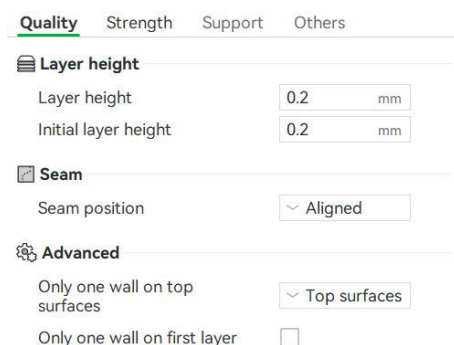
5.4.3 Quality Settings

Quality settings affect the model's **detail, surface smoothness, and overall appearance**. The system process presets are optimized for most scenarios to provide a good balance between print quality and print time.

For models with higher appearance requirements, such as curved, sloped, or display models, adjust the relevant settings to improve surface finish. If print speed matters more, reduce the level of detail accordingly.

TIPS

Quality settings are interrelated, and changing one setting in isolation may affect the overall result. Use the default settings unless you have specific requirements.



5.4.4 Strength Settings

Print strength determines a model's **sturdiness, durability, and load-bearing capacity**. It is mainly affected by shell thickness and internal structure (such as infill).

The system process presets provide balanced strength settings for common use cases, helping ensure reliable model structure while maintaining print efficiency.

For functional or load-bearing parts, you can increase strength-related settings as needed. For display-only models, no extra reinforcement is required.

TIPS

Increasing model strength usually uses more filament and extends print time. Adjust the settings based on the intended use.

Quality **Strength** Support Others

Walls

Wall loops

Embedding the wall into the infill ☐

Top/bottom shells

Top surface pattern

Top shell layers

Top shell thickness mm

Top paint penetration layers

Bottom surface pattern

Bottom shell layers

Bottom shell thickness mm

Bottom paint penetration layers

Internal solid infill pattern

Sparse infill

Sparse infill density %

Fill multiline

Sparse infill pattern

5.4.5 Supports

Models with overhangs, bridges, or complex structures usually require supports to ensure print stability and prevent collapse during printing. Bambu Studio can automatically generate multiple support types. The default settings work well for most models and balance stability with ease of post-processing.

For models with high surface quality requirements or complex structures, you can adjust the support settings as needed to make supports easier to remove and reduce surface marks.

i TIPS

More support is not always better. Too much support increases post-processing work, so automatic support is recommended first.

Quality Strength **Support** Others

Support

Enable support ☒

Type

Threshold angle °

On build plate only ☐

Filament for Supports

Support/raft base

Support/raft interface

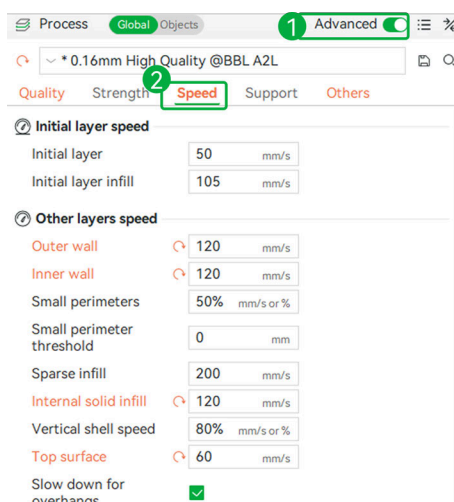
5.4.6 Print Speed

Print speed parameters affect the model's **formation stability, surface quality, and print efficiency**. Speeds that are too fast may lead to detail loss or rough surfaces, while speeds that are too slow significantly extend print time.

The system process presets configure appropriate default speed parameters for different print jobs, suitable for most situations.

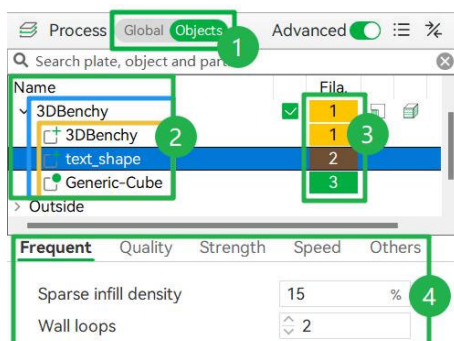
i TIPS

If you are unfamiliar with the parameters, keep the default speed. To adjust, enable **Advanced Mode** in **Process** before modifying.



5.4.7 Adjust Local Parameters

Besides modifying global parameters, you can set parameters and assign filament for specific objects or local areas, such as parts, negative parts, or modifiers.



Operating Steps:

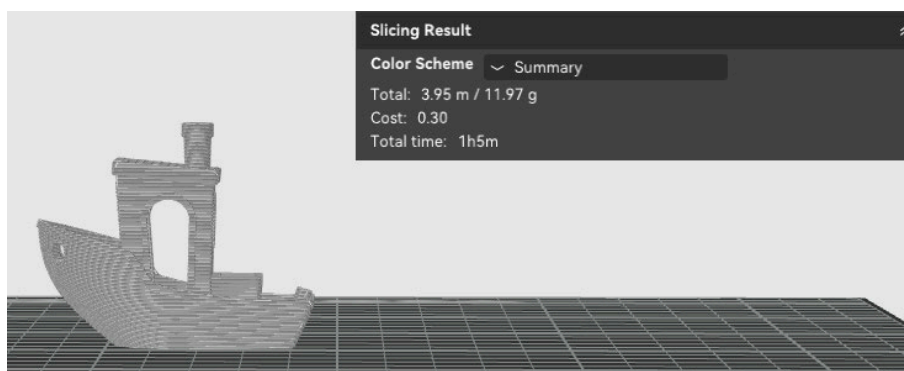
1. At the top of the process panel on the left, switch to **Objects** to access the object list.
2. Expand the list hierarchy (**Plate > Objects > Parts / Negative parts / Modifiers**), and select the target section to adjust.
3. Select dedicated filaments for the target section.
4. Modify its printing parameters separately in the list below.

5.5 Check Slicing Result

After slicing, the system automatically switches to the preview page. To ensure successful printing and avoid waste, review the following before starting the print job.

5.5.1 Print Summary

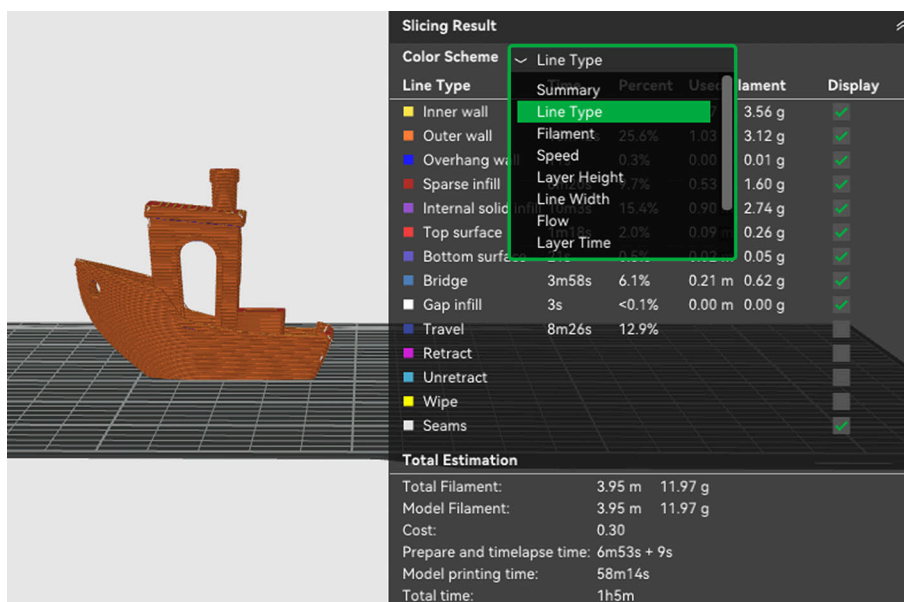
View a summary of the current print job in the slicing results panel.



- **Filament Usage:** The estimated filament length and weight required to print the model.
- **Cost Estimate:** The estimated print cost, calculated automatically based on the **Price** in the filament settings.
- **Print Time:** The estimated total time required to complete the print.

5.5.2 Color Preview

Use the dropdown menu to check slicing information by different dimensions.

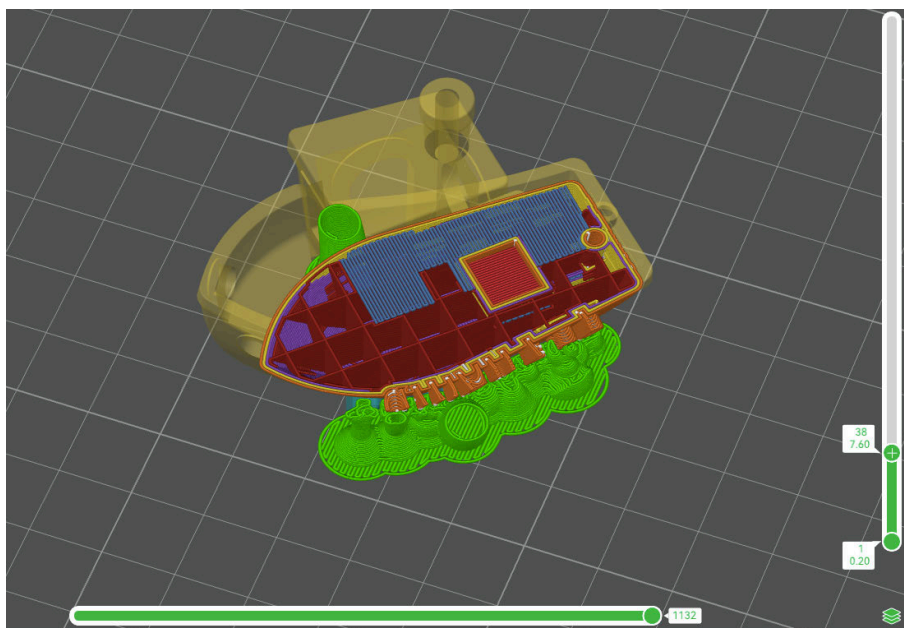


We recommend checking the following information:

- **Line Type:** Check the distribution of supports, outer walls, and infill (with particular attention to where supports are generated).
- **Speed:** Observe the toolhead speed at different locations to identify abrupt speed changes.
- **Layer Height:** Check the effect of variable layer height settings and observe whether the transitions are smooth.
- **Flow:** Observe whether the filament extrusion volume is evenly distributed.
- **Layer Time:** Identify areas with short cooling times (such as tips) to prevent overheating and deformation.

5.5.3 Print Path

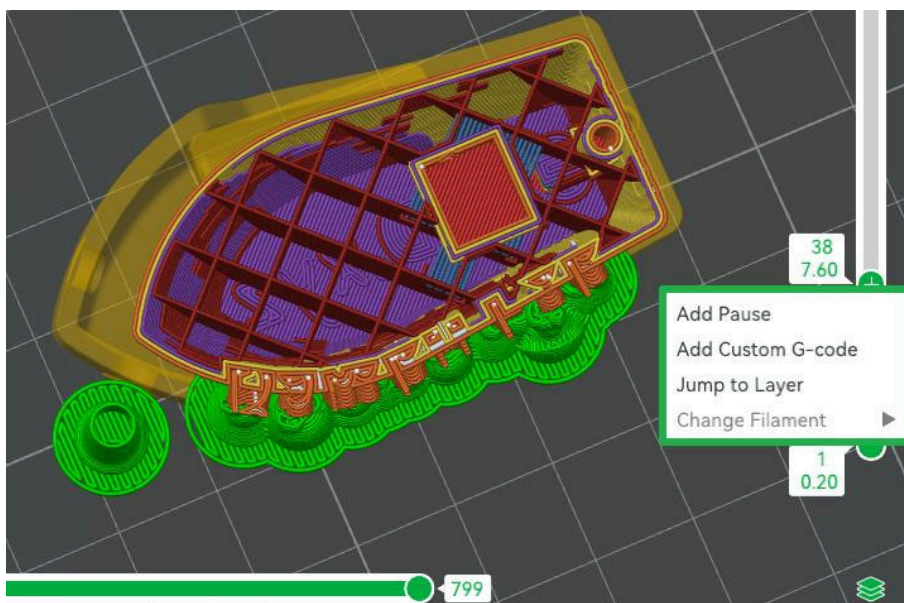
Use the sliders on the right and bottom of the preview page for detailed inspection:



- **Vertical Slider:** Drag vertically to view the stack of each layer and check internal fill structure or overhangs.
- **Horizontal Slider:** Simulate the exact toolhead motion on the current layer and verify the start and end points.

5.5.4 Layer Settings

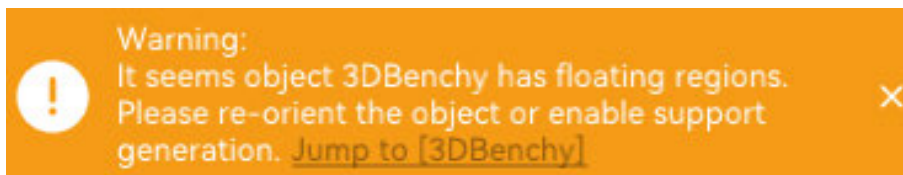
Right-click the + button on the vertical slider to customize the current layer:



- **Add Pause:** Pause printing before the selected layer and requires manual resumption. This can be used to embed materials such as magnets into the model.
- **Add Custom G-code:** Add custom G-code at the selected layer to activate various personalized functions.
- **Jump to Layer:** Enter a specific layer number to jump precisely to that layer.
- **Change Filament:** Change the filament at the selected layer. This feature requires using AMS.

5.5.5 Warnings and Tips

If the software detects potential risks (such as the model not touching the heatbed, an excessive overhang angle, or missing supports), a yellow warning icon will appear next to the Slice button.



CAUTION

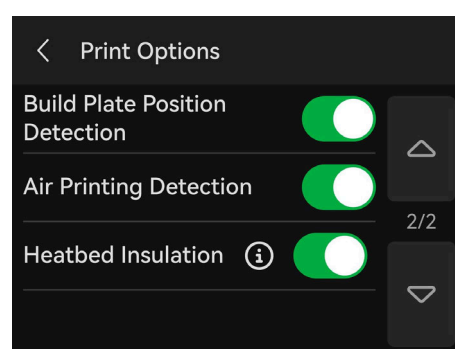
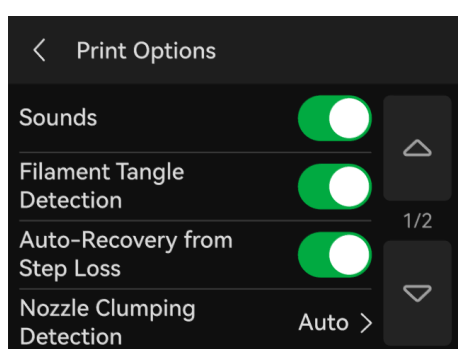
Before printing, always expand the warning details to check whether you need to reposition the model or enable supports.

Chapter 6 Key Features

6.1 Intelligent Detection

The printer supports various Intelligent Detection functions. These functions identify abnormal situations during printing. They pause the print and prompt the user to address the issue when necessary. This reduces the risk of print failure, filament waste, or equipment damage.

Intelligent Detection functions include Clumping detection, air print detection, filament tangle detection, and build plate position detection. On the printer screen, go to  > **Print Options** to enable or disable these functions as needed.



6.1.1 Nozzle Clumping Detection

Clumping refers to melted filament wrapping around the nozzle during printing due to poor model adhesion or abnormal material pile-up. If printing continues, it may cause print failure or damage to the toolhead.

After enabling clumping detection, the printer checks for abnormal material pile-up around the nozzle during printing. If potential Clumping is detected, the printer pauses the print and displays a prompt, allowing you to clean the nozzle and model promptly to prevent the issue from escalating.

On the printer touchscreen, tap  > **Print Options** > **Clumping Detection** to select one of the following modes:

- **Auto:** The printer automatically determines whether to enable detection based on the current filament type. Recommended.
- **On:** Nozzle Clumping Detection is enabled for all filament types.
- **Off:** Nozzle Clumping Detection is disabled for all filament types.

CAUTION

Nozzle Clumping Detection only assists in identifying anomalies and is not a complete substitute for manual observation. We recommend cleaning the build plate before printing and monitoring the print status via Bambu Handy or Bambu Studio.

6.1.2 Air Printing Detection

Air print refers to a condition during printing where the toolhead moves as expected, but the nozzle fails to extrude filament. This leads to material shortages, layer gaps, or print failure in the model.

After enabling Air Printing Detection, the printer monitors filament extrusion during printing. If potential air print is detected, the printer pauses and displays a prompt. This helps you promptly check the filament, extruder, or hotend.

CAUTION

When Air Printing Detection is triggered, some material shortage may already be present on the model surface. Before resuming the print, inspect the model's quality and then decide whether to continue printing.

6.1.3 Filament Tangle Detection

Filament tangling refers to situations where the filament knots, jams, or bends excessively in the spool, AMS, or filament path, causing abnormally increased feeding resistance.

When filament tangle detection is enabled, the printer monitors the feeding status during printing. If a potential tangle or jam is detected, the printer pauses printing or attempts to load the filament again, and prompts you to check the filament path.

When printing with an external spool or AMS lite, you can tap  > **Print Options** > **Filament Tangle Detection** on the printer's screen to enable or disable this feature. When printing with AMS, AMS 2 Pro, or AMS HT, the relevant detection function is usually enabled by default with the automatic feeding function.

CAUTION

When printing TPU, TPE, or damp flexible/water-soluble filaments, filament tangle detection may not accurately identify abnormalities. Before printing, confirm that the spool is placed correctly, the filament tube is securely connected, and the path is smooth, avoiding excessively long or severely bent tubes.

6.1.4 Build Plate Position Detection

Build Plate Position Detection checks if the build plate is correctly placed on the heatbed before a print. This feature helps prevent printing directly on the heatbed if the build plate is forgotten, reducing the risk of print failures, heatbed damage, or excessive nozzle wear.

When enabled, the printer automatically performs a check before a print job starts. If the build plate is not correctly placed, the printer will pause the job and display a prompt. Follow the on-screen prompts to place or reinstall the build plate before continuing.

On the printer screen, tap  > **Print Options** > **Build Plate Position Detection** to enable or disable this feature.

CAUTION

Before starting a print, ensure the build plate is correctly attached to the heatbed and aligned with the heatbed's limit position.

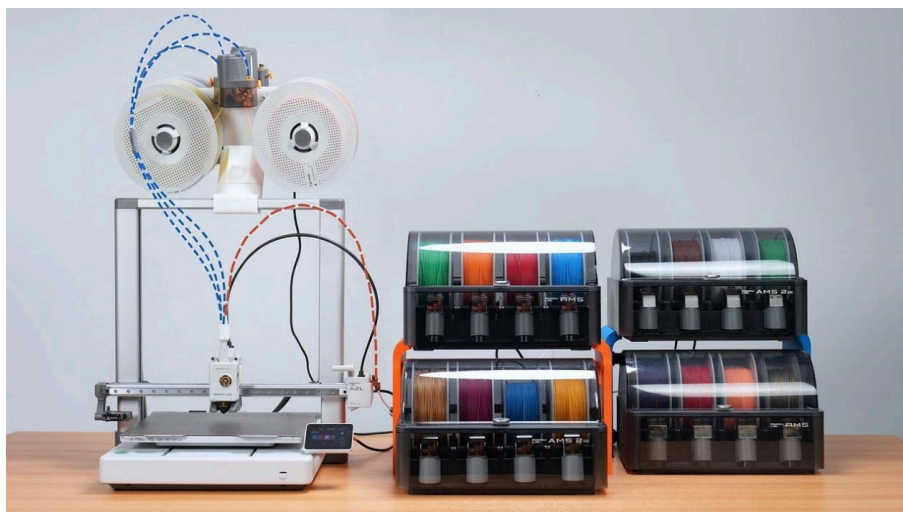
If changing or repositioning the build plate, ensure the build plate surface is flat and free of foreign objects.

6.2 Connect Multiple AMS Units

An A2L can connect up to 4 AMS units and 1 AMS lite simultaneously, supporting up to 19-color printing. Specifically, 4 AMS units provide 16 filament feed paths, and 1 AMS lite provides 3 filament feed paths. This section briefly introduces the connection method. For detailed steps, visit the Bambu Lab Wiki and search for 'A2L AMS Connection Guide'.

NOTE

- In this section, AMS refers to AMS, AMS 2 Pro, and AMS HT.
- AMS lite can be mixed with AMS units, but only one filament source can feed material at a time during printing.
- The actual number of usable colors is affected by factors such as filament inlet usage, device connection method, and model filament settings.



NOTE

The 3 blue tubes connect to AMS lite, and the 1 orange tube connects to AMS.

6.2.1 Required Devices and Accessories

This section illustrates the required devices, accessories, and setup steps for a maximum connection configuration. Prepare the following items before connecting.

Devices and Connection Accessories

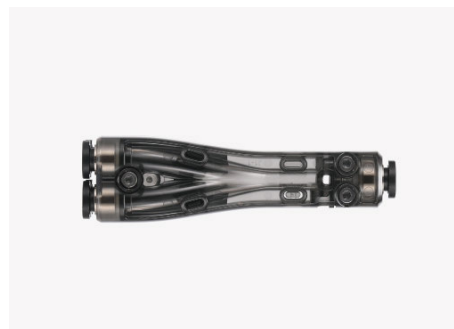
- **AMS:** 4 units. You can use AMS, AMS 2 Pro, or AMS HT.
- **AMS lite:** 1 unit. Connect to the printer using its included 4-pin connection cable.
- **Bambu Bus Cable 6-pin:** 4 cables, for connecting the printer and AMS, and daisy-chaining multiple AMS units.
- **4-in-1 PTFE adapter:** 1 unit, must be purchased separately.
- **PTFE Tube Coupler:** 1 unit, included in the accessory box.
- **PTFE Tube:** Quantity as needed. Trim to the appropriate length based on the actual placement of the AMS.
- **H2.0 allen key:** 1 unit, for installing relevant accessories.

⚠ CAUTION

- Do not use AMS Gen1 cables to connect AMS 2 Pro or AMS HT; otherwise, it may cause communication issues.
- When connecting multiple AMS units to an A2L printer, use the 4-in-1 PTFE adapter Gen1. The 4-in-1 PTFE adapter II is not currently supported.



4-in-1 PTFE adapter Gen1



4-in-1 PTFE adapter II

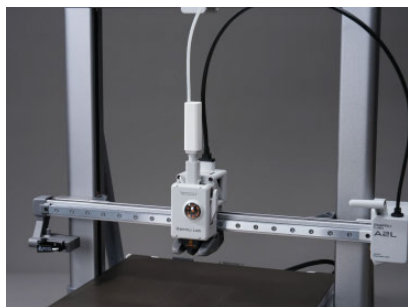
Recommended Printable Accessory Models

To optimize filament tube and cable routing, we recommend printing and installing the following accessory models before connecting:

- **Filament Tube Positioning Guide:** Reduces excessive bending of the filament tube at the tool-head inlet.
- **AMS lite Top-Mount Solution:** Allows you to place the AMS lite on top of the printer to save space.
- **AMS lite Top-Mount 4-pin Connection Cable Organizer:** Secures the AMS lite's 4-pin connection cable.
- **AMS Double-Layer Bracket:** Optimizes placement space for multiple AMS units.

i TIPS

Go to MakerWorld and search for the corresponding model name. Select the appropriate model to download and print. Prioritize official models; if none are available, refer to highly-rated or well-documented community models, and follow the instructions on the model page for printing and installation.



Filament Tube Positioning Guide



AMS lite Top-Mount Solution



AMS lite Top-Mount 4-pin Cable Organizer

6.2.2 Operating Steps

Step 1. Preparation

Before connecting, turn off the printer power and position the AMS and AMS lite appropriately based on available space. If you have prepared accessory models, complete the initial installation according to the model page or official tutorial first.

Step 2. Connecting the AMS lite

When connecting multiple AMS units, the AMS lite must free up 1 toolhead filament inlet for AMS use; therefore, the AMS lite only connects to 3 filament tubes.

Follow these steps in order:

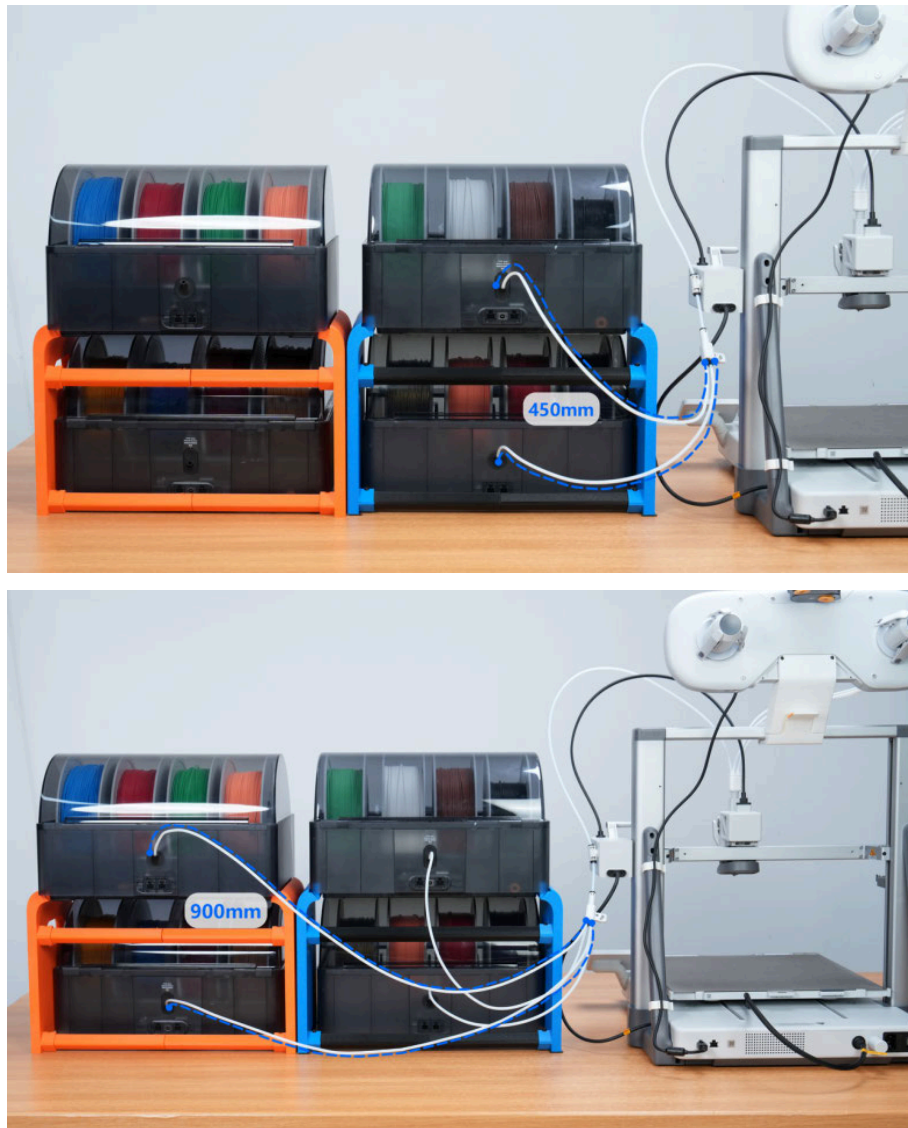
1. Remove 1 filament tube from the AMS lite and connect the remaining 3 filament tubes to the toolhead filament inlet.
2. To top-mount the AMS lite, first install the AMS lite top mount bracket, then secure the AMS lite to the printer's gantry.
3. Plug the AMS lite 4-pin connector into the 4-pin port on the back of the printer.
4. Organize the filament tubes and cables, ensuring they are free from significant bends, tension, or hanging obstructions.

Step 3. Connecting 4 AMS Units

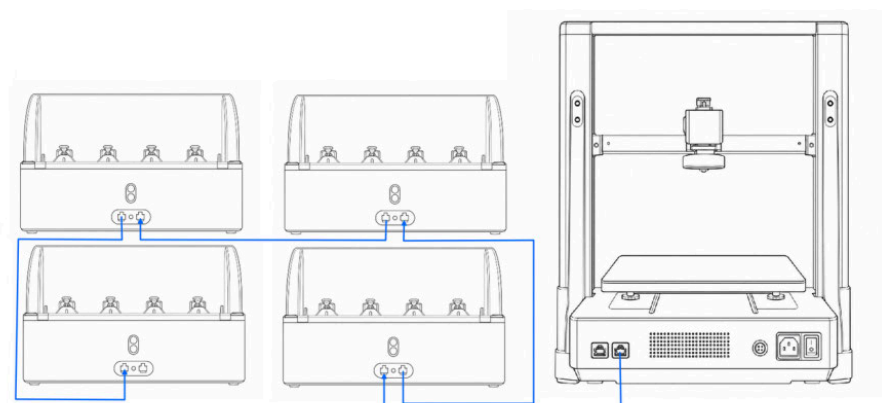
1. Install the PTFE tube coupler next to the X-axis motor housing and ensure the connector is oriented correctly.
2. Use a filament tube approximately 760 mm long to connect the toolhead filament inlet and the PTFE tube coupler.
3. Use a short filament tube to connect the PTFE tube coupler and the 4-in-1 PTFE adapter.



4. Connect the 4 AMS units to the 4-in-1 PTFE adapter using filament tubes. Select appropriate filament tube lengths based on the actual placement of each AMS to avoid excessively long or bent tubes. For example, in the illustrated layout below, use two 450 mm filament tubes for closer AMS units and two 900 mm filament tubes for further AMS units.



5. Use a Bambu Bus Cable 6-pin to connect the printer and the AMS, and daisy-chain multiple AMS units in sequence.



6. After completing the connection, turn on the printer power.

 CAUTION

- When connecting AMS, use the PTFE tube coupler to properly route the filament tubes. Do not directly connect the AMS filament tubes to the toolhead filament inlet to prevent the tubes from hanging on the gantry or bending excessively, which could increase feeding resistance.
- Ensure smooth filament tube routing, avoiding hanging, excessive bending, or snagging by other components.
- If you need to use the drying function of AMS 2 Pro or AMS HT, connect the corresponding external power supply.

Step 4. Check Connection Status

After completing the connection, on the printer screen, tap  to check if all connected AMS and AMS lite units are displayed.

If the screen does not display an AMS unit, check the following:

- Whether the Bambu Bus Cable 6-pin or 4-pin connector is securely plugged in.
- Whether the AMS is properly powered on.
- Whether multiple AMS units are daisy-chained in sequence.
- Whether the filament tubes are connected to the correct positions.

Step 5. View AMS Display Order

After connecting multiple AMS units, the printer automatically assigns AMS IDs based on the cable connection order. The AMS directly connected to the printer is usually displayed as AMS-A, and subsequent daisy-chained AMS units are displayed as AMS-B, AMS-C, and AMS-D, respectively.

The AMS lite does not participate in AMS ID sorting and is displayed separately.

To reorder AMS units, on the printer screen, tap  > **AMS Options** > **Reorder AMS**, then reconnect the AMS units according to the on-screen prompts.

6.3 Multicolor Printing

The A2L supports automatic filament changes using AMS and manual filament changes using an external spool. It also supports combining AMS and external spools within the same task. During multi-color or multi-material printing, the printer purges to reduce the impact of residual filament in the nozzle on print quality. The following sections introduce various multi-color printing methods and purge mode settings.

6.3.1 Multicolor Printing with AMS

The automatic material system (AMS) automatically changes materials during printing based on the sliced file. This makes it suitable for printing multi-color models, multi-material models, or models that use specialized support materials.

When performing multicolor printing with AMS, the printer automatically unloads, cuts, and loads filament according to the model's color settings. You do not need to manually change filament at color change points, which simplifies complex multicolor print jobs.

6.3.2 Multicolor Printing with External Spool

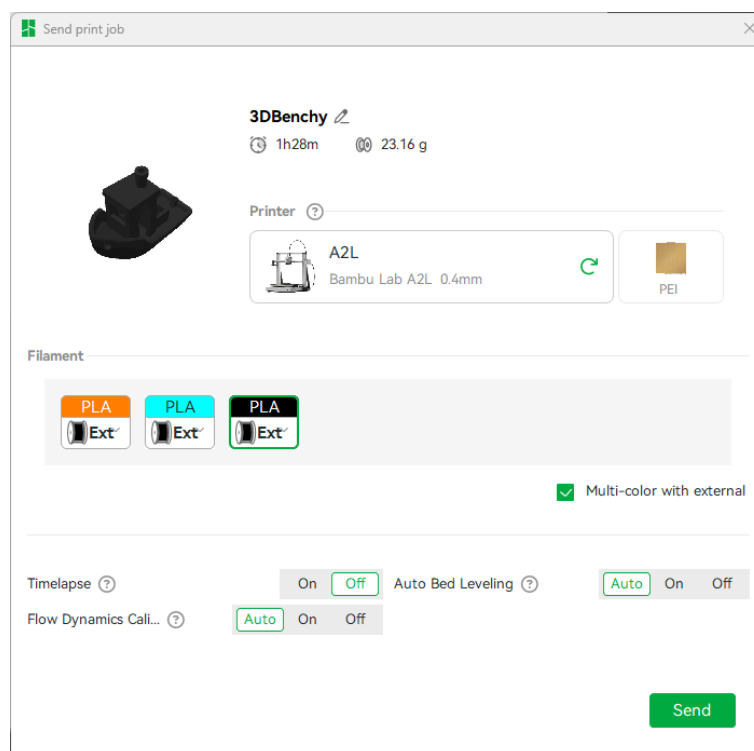
If an AMS is not connected, you can manually change filament using an external spool for multi-color printing. During printing, the printer will automatically pause at color change points and prompt you on the screen to change the filament.

Printing Requirements

- A2L firmware version must be 01.01.00.00 or higher.
- Bambu Studio version must be 2.5.2.65 or higher.

Operating Steps

- Step 1. In Bambu Studio, import your multi-color model and complete slicing settings.
- Step 2. On the preparation page before starting the print, select the option for multi-color printing using an external spool.
- Step 3. After printing starts, the printer will automatically pause when a color change is needed.
- Step 4. Following the screen prompts, unload the current filament and load the new color filament from the external spool.
- Step 5. After confirming the new filament has extruded properly, click **Continue** to resume printing.



TIPS

Manual multi-color printing requires timely action from the user during color changes. It is recommended to confirm that all required filament colors are prepared before printing and arranged in printing order for easy replacement.

6.3.3 Combining AMS and External Spool for Multicolor Printing

The A2L supports simultaneous connection of an AMS and an external spool, allowing mixed use of different Load sources in a print job. This method is suitable for incorporating special filaments that are unsupported or not recommended for AMS into multicolor printing, such as certain TPU or carbon fiber enhanced filaments.

Operating Steps

- Step 1. On the printer screen, tap  > **External Spool** > **Edit** to set the filament type and color for the external spool.
- Step 2. Open Bambu Studio. On the Device page, click **Sync** to synchronize the AMS and external spool filament information from the printer to the software.
- Step 3. In Bambu Studio, use the color painting tool to assign colors and filaments to your model.
- Step 4. After confirming the model colors and filament assignments are correct, slice the model and start printing. Bambu Studio will calculate the purge volume based on the color and material settings to reduce the impact of old color residue on the print quality after a filament change.

⚠ CAUTION

- When switching between AMS and the external spool, follow the on-screen prompts to complete the Unload and Load operations.
- For flexible filaments like TPU, use the external spool for printing. Do not place them in the AMS lite or AMS.

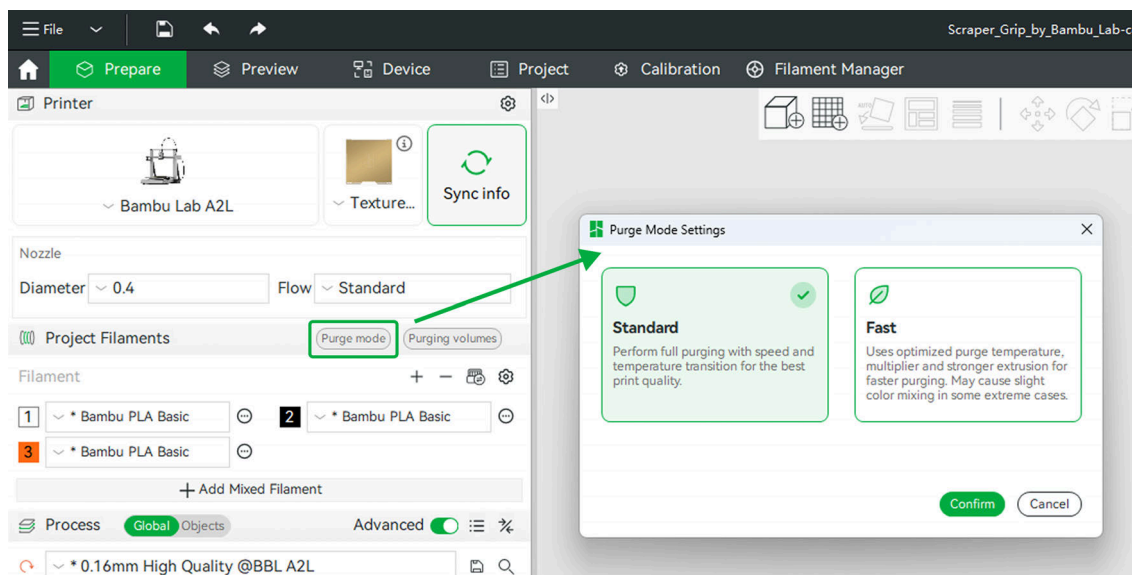
6.3.4 Fast Purge Mode

For multi-color or multi-material printing, the printer purges after filament changes. This cleans old filament residue from the nozzle, reducing color mixing or material residue affecting print quality.

This printer supports two purge modes in Bambu Studio: Standard mode and Quick mode. Choose between saving filament and reducing print time based on your printing needs.

- **Standard Mode:** Purges according to the filament prime volume set in slicing. This mode uses relatively less filament. It is suitable for print jobs where filament saving is a priority or where high demands are placed on color transition and print quality.
- **Fast Mode:** Reduces waiting time during material change purges, thereby shortening the total print time for multi-color prints. Compared to Standard mode, Quick mode typically saves about 15% of print time, but purge filament consumption will increase.

Operating Steps



- Step 1. Open the multi-color model in Bambu Studio.
- Step 2. Go to the Prepare page and find the purge mode on the right side of the project filament list.
- Step 3. Select Standard mode or Fast mode as needed.
- Step 4. After completing other print settings, perform slicing and start the print.

 NOTE

If you manually adjust the purge coefficient, the system will use the manually set purge ratio. For more information, search for “A2L Purge Mode Introduction” in the Bambu Lab Wiki.

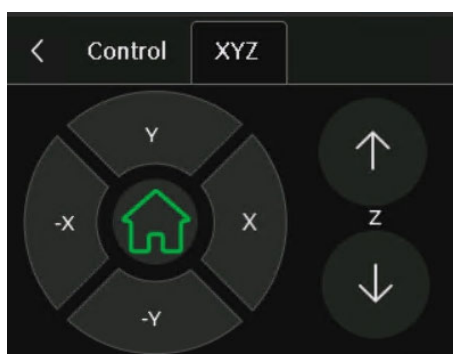
Chapter 7 Basic Controls and Functions

7.1 Printer Screen Control

7.1.1 XYZ Axes Motion

Control the motion of the toolhead and heatbed when the printer is idle. For example, when you need to clean or maintain the printer, you can use the touchscreen to move the toolhead and heatbed for more space.

On the touchscreen, select  > **XYZ** to move the toolhead and heatbed.



- X/-X: Tap the button to move the toolhead left/right along the X-axis.
- Y/-Y: Tap the button to move the heatbed front/back along the Y-axis.
-  Homing: Homes all axes.
- Tap Up/Down: Moves the X-axis gantry up/down along the Z-axis.

7.1.2 Print Speed

You can change the print speed in real-time during printing, which affects print time and model surface quality. Generally, increasing the print speed shortens print time but may result in poorer surface quality. Reducing the print speed can improve surface quality but extends print time.

On the printer screen, select  > **Speed** to adjust the print speed. There are four modes:



- Ludicrous: 166% of normal print speed and acceleration.
- Sport: 124% of normal print speed and acceleration.
- Standard: normal print speed and acceleration.

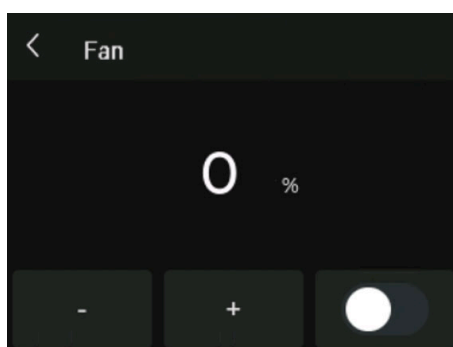
- **Silent:** 50% of normal print speed and acceleration.

You can flexibly adjust the print speed based on actual needs during printing. For example, when encountering intricate details or overhanging structures, lowering the speed improves surface quality and printing success rate.

7.1.3 Part Cooling Fan

A part cooling fan cools the filament extruded by the nozzle, helping models set quickly. Adjusting the fan speed appropriately can improve **print quality**.

On the printer screen, select  > **Fan** to turn the part cooling fan on or off and adjust its speed.

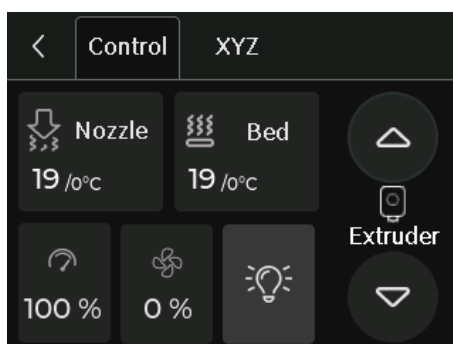


1. **Increasing Fan Speed:** Helps improve overhangs, bridging, and detail, and reduces stringing and overheated edges.
2. **Decreasing Fan Speed:** Helps mitigate warping, cracking, and poor layer adhesion.
3. Turn the fan on or off.

7.1.4 Extruder

Control extruder loading and unloading for routine maintenance, filament replacement, nozzle cleaning, and print preparation.

On the printer screen, select the  > **up/down buttons** to manually extrude or retract 1 cm of filament. A green light indicates that filament has entered the extruder.



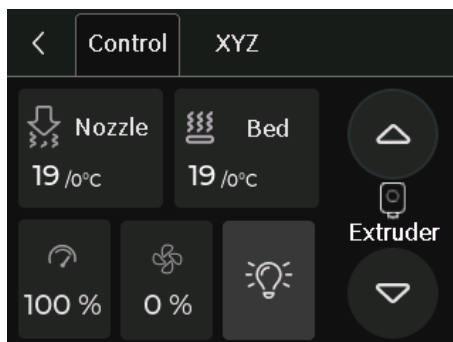
7.1.5 Heatbed Temperature

On the printer screen, select  > **Bed**, enter a value to set the bed temperature.

7.1.6 Nozzle Temperature

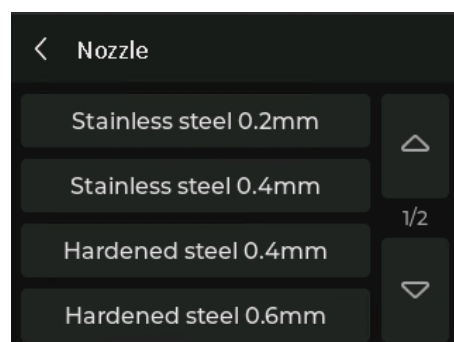
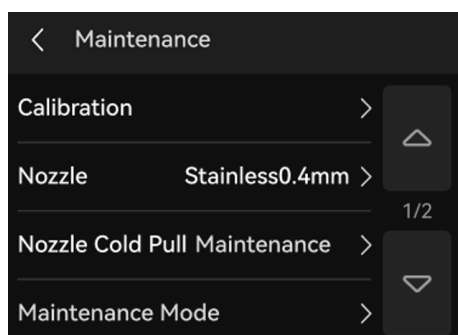
Set the nozzle temperature to facilitate routine maintenance, filament replacement, nozzle cleaning, and print preparation.

On the printer screen, select  > **Nozzle**, enter the desired value to set the nozzle temperature.



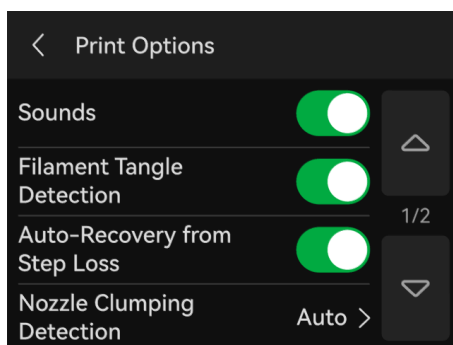
7.1.7 Nozzle Info

The printer comes standard with a 0.4 mm stainless steel nozzle. If you replace it with a nozzle of a different diameter or material, on the printer screen, go to **Maintenance** >  > **Nozzle**, and update the nozzle information to the current specifications and material to ensure correct slicing parameters.



7.1.8 Sound

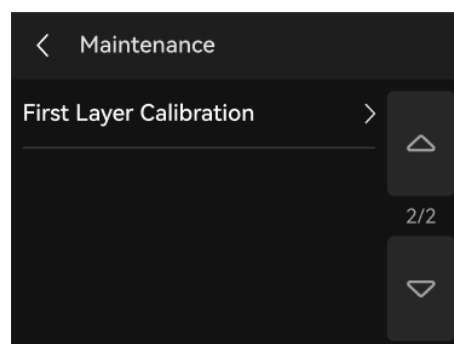
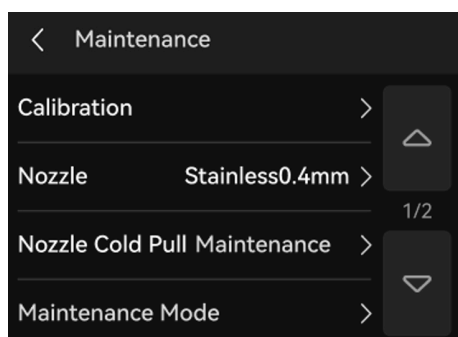
When the sound option is enabled, the printer will emit tones upon power-on, at the start of printing, and at the end of printing. On the printer screen, navigate to  > **Print Options** > **Sound** to enable or disable the sound.



7.1.9 Light

On the printer's touchscreen, select > to turn the light on or off.

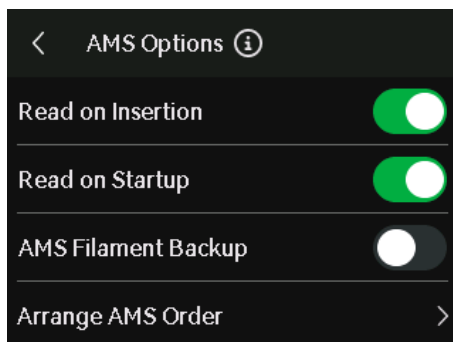
7.1.10 Maintenance



On the printer screen, select > **Maintenance** to perform calibration, nozzle settings, and related maintenance operations.

- **Calibration:** Perform printer calibrations such as Motor Noise Cancellation, Vibration Compensation, and Auto Bed Leveling.
- **Nozzle:** After replacing the hotend with a different diameter or material, update the nozzle information here.
- **Nozzle Cold Pull Maintenance:** Used to clear internal residue or blockages from the nozzle.
- **Maintenance Mode:** Used for partial cleaning, disassembly, or maintenance scenarios.
- **First Layer Quality Calibration:** Used to fine-tune the first layer height, improving issues where the first layer is too high or too low.

7.1.11 AMS Options



After connecting the AMS, you can configure relevant features in **AMS Options**.

- Read on Insertion: Read RFID information after inserting the filament.
- Read on Power-on: Automatically read filament information from the AMS after powering on.
- AMS filament backup: When filament in the current slot runs out, automatically switch to compatible backup filament.
- Reorder AMS: Reorder the display sequence of multiple AMS units.

7.2 Photo and Video

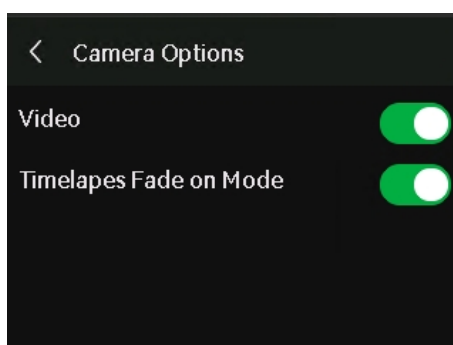
The printer's built-in live view camera, located in the X-axis motor box, is primarily used for real-time monitoring, timelapse photography, and photo and video recording. This section details the printer's photo and video recording functions.

7.2.1 Video Recording

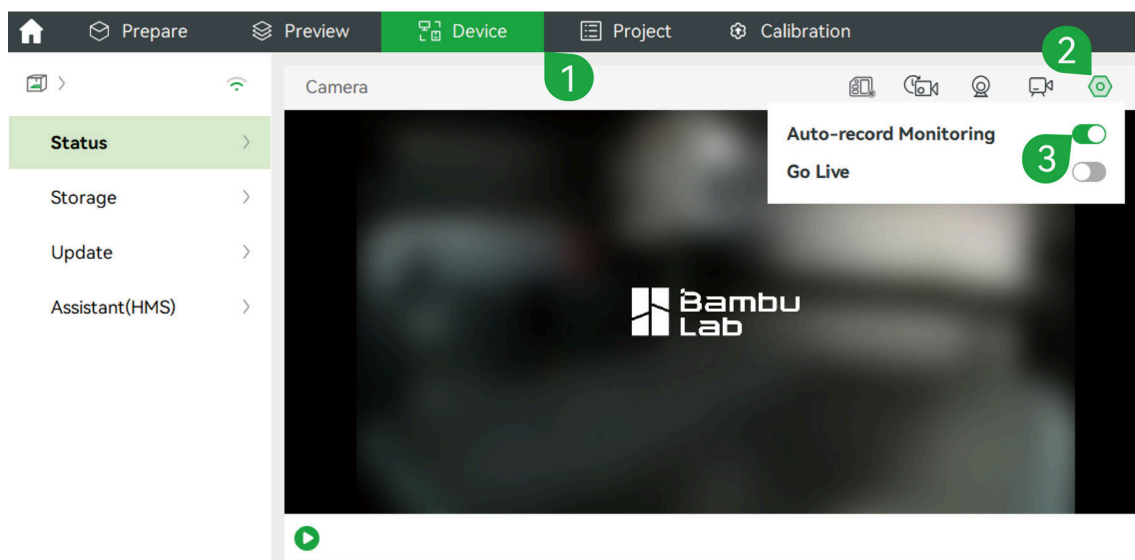
The printer is able to record the print process. This makes it easy to check the overall print status and serves as a valuable reference for troubleshooting and after-sales support.

Before enabling this feature, ensure a MicroSD card is inserted. You can enable or disable video recording using the following two methods:

- On the printer screen, select **Camera options > Video** to turn the recording feature on or off;

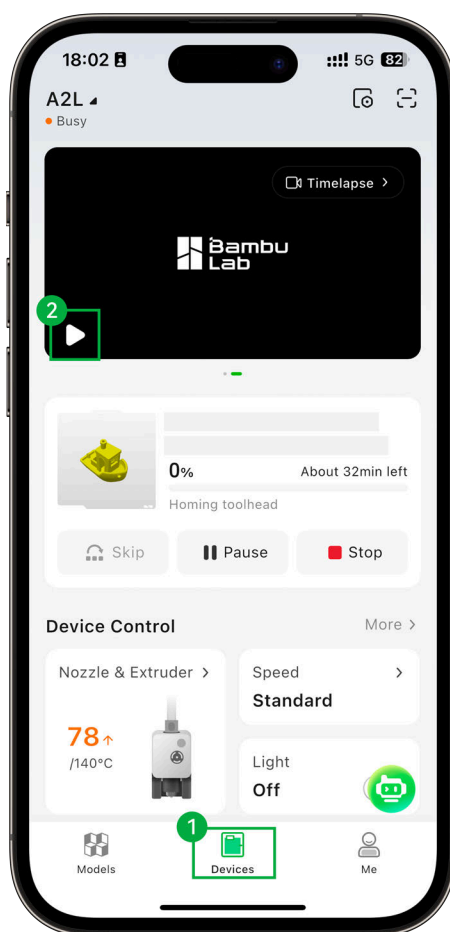


- In Bambu Studio, click **Device > Camera > Auto-record Monitoring** to enable the video recording function.



7.2.2 Photo Capture

You can capture photos to record the model printing process. Using the printer's live view camera, you can remotely monitor printer operations and easily capture photos of the printing area to document the printing progress.



Step 1. Open the **Devices** page in Bambu Handy.

Step 2. Tap  to view the camera preview.

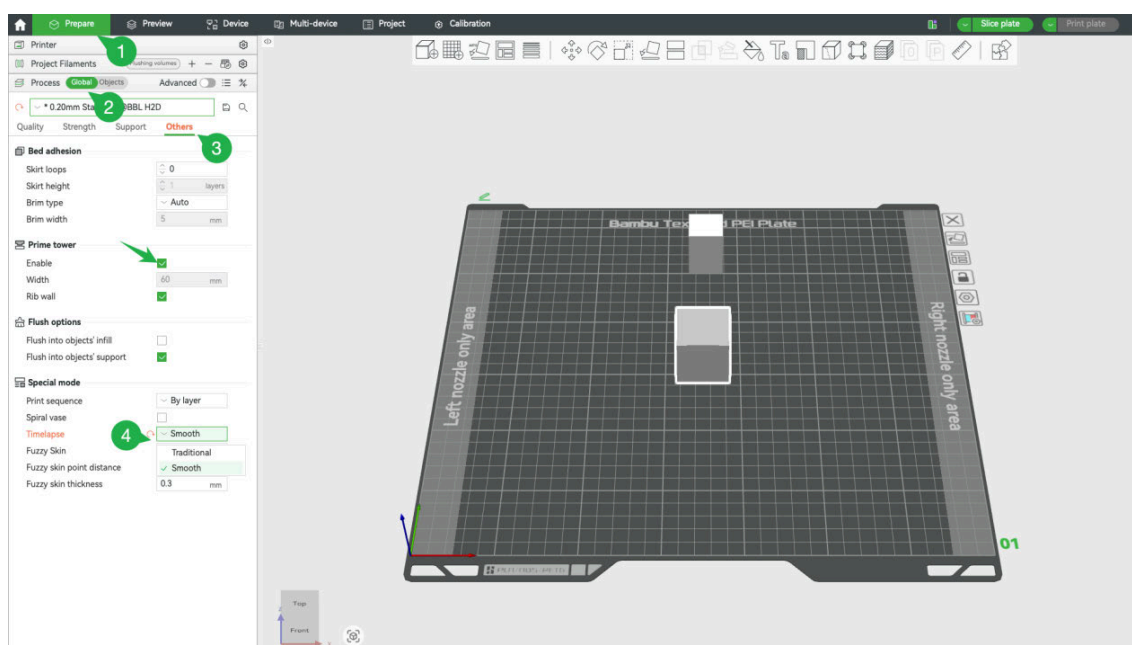
Step 3. Tap  to capture a photo.

7.2.3 Timelapse

The timelapse function automatically takes a photo after each layer is printed and combines all photos into an accelerated video. There are two timelapse modes:

- **Traditional mode (default):** After each layer is printed, the printer takes a photo at the current position, and the toolhead stays at the end of the layer. As a result, you can see the toolhead moving in the video.
- **Smooth mode:** After each layer is printed, the toolhead moves to the prime tower or a safe position before taking a photo so the toolhead remains stationary in the video. This mode automatically generates a prime tower.

You can switch the timelapse photography mode on the **Prepare** page in Bambu Studio by navigating to **Process > Global > Others > Special mode > Timelapse**.



TIPS

If you select the smooth mode, please ensure prime tower is enabled (enabled by default).

Activation Methods

Before starting a print job, you can manually select whether to enable the timelapse feature.

- **Printer Screen:** On the print initiation interface, find **Timelapse**, and tap to enable it.
- **Bambu Studio:** After slicing, click **Print plate/Print all plates** in the upper-right corner. In the **send print job** pop-up window, find **Timelapse** and turn it **On**.
- **Bambu Handy:** On the **Prepare** page, go to **Options, Timelapse**, and tap to enable Timelapse.

7.3 Network Connection

This printer supports Wi-Fi and LAN Only mode for network connection. When LAN Only mode is enabled, you can further configure Developer Mode.

7.3.1 LAN Only Mode

When enabled, the printer can only be accessed and controlled within the local area network. It cannot be accessed remotely via the internet, nor can it use cloud features such as Bambu Handy and print history. This mode is suitable for users or enterprise environments with higher data security and privacy requirements.

On the touchscreen, you can select  > **LAN Only mode** and enable LAN-only mode.



7.3.2 Developer Mode

When enabled, the printer allows third-party software or devices to directly control and manage print tasks and process data. This offers greater flexibility for advanced use but may involve security risks.

After enabling LAN Only mode, you can enable Developer Mode in  > **LAN Only mode** > **Developer Mode**.

7.4 Update and Restore

7.4.1 Update Firmware

The printer firmware will be continuously updated for new features. When a new firmware version is available, you can update it using the following methods:

Online Update

When the printer is connected via Wi-Fi, it will check for new firmware updates. You can update the firmware online through the printer screen.

Method 1: When new firmware is available, a prompt will appear on the printer screen asking if you want to update. Tap **Yes** and follow the instructions to complete the update.

Method 2: You can also select  > **Firmware** > **Update** on the screen to manually update.

Offline Update

If the printer is offline or cannot access Bambu Lab cloud services, you can update the firmware using a MicroSD card and an offline update package.

- Step 1: Download the corresponding offline update package from the Bambu Lab firmware download webpage <https://bambulab.com/support/firmware-download/a2l>.
- Step 2: On the screen, select  > **SD Card** > **Eject** to safely eject the MicroSD card.

 CAUTION

Hot-swapping cards is not supported on this machine. Therefore, always safely eject the MicroSD card from the printer's screen before removing it.

- Step 3: Copy the offline update package to the root directory of the MicroSD card.
- Step 4: Reinsert the MicroSD card. On the printer screen, select  > **Firmware** > **Offline Update**. Then, select the firmware version to update to, and tap **Update**. The printer will automatically restart after the update is complete.

7.4.2 Initialization

Reset the printer to its factory default state. All custom settings and user data will be erased. This action is irreversible, so make sure no important data remains before proceeding.

On the screen, select  > **Restore to Factory Settings** to complete initialization.

Chapter 8 Filament Introduction and Usage

8.1 Select the Appropriate Filament

The A2L is an open-frame model, with a maximum heatbed temperature of 80°C and a maximum nozzle temperature of 300°C. To ensure print quality and stability, we recommend using low-temperature filaments such as PLA, PETG, and TPU, along with their support materials. High-temperature filaments such as ABS, ASA, PC, PA, and PET are not supported.

Below is a brief introduction to the characteristics and applications of several recommended filaments. For detailed features and parameters, please see the Bambu Filament Guide: <https://bambulab.com/filament/guide>.

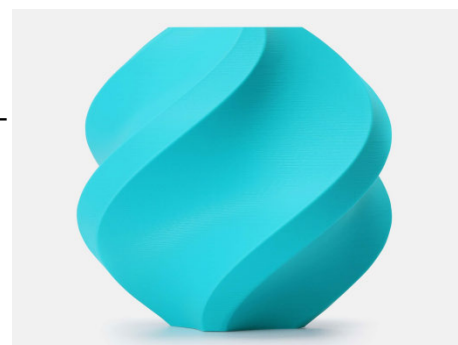
NOTE

This printer comes with a default 0.4 mm stainless steel nozzle, which supports PLA, PETG, TPU, and PVA filaments. If you need to print carbon fiber reinforced filaments like PLA-CF and PETG-CF, please replace it with a hardened steel nozzle.

Basic Filaments

PLA

- The most common entry-level 3D printing filament. It is eco-friendly, non-toxic, biodegradable, and easy to print, but has limited mechanical performance.
- Suitable for everyday prototyping, home printing, and low-load applications.



PETG

- Offers good mechanical performance, with water, heat, and chemical resistance. However, it must be kept dry, and its smooth surface can show scratches easily.
- Suitable for containers, durable parts, and functional parts.



Aesthetic Filaments

PLA Silk/Silk+

- Has a silky texture and high gloss. However, it must be kept dry, as moisture can easily cause stringing.
- Suitable for models that require a silky texture or metallic sheen.



PLA Wood

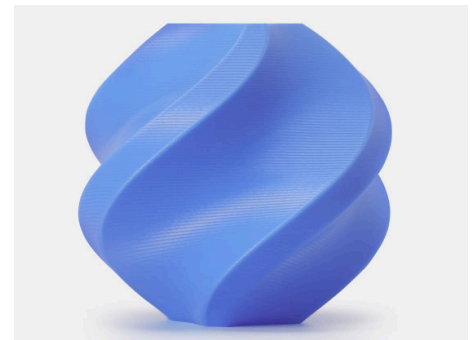
- Contains natural wood particle additives for a matte, solid-wood-like texture. However, it must be kept dry, as moisture can easily cause discoloration.
- Suitable for natural or forest-style models. The matte texture also helps hide layer lines.



Flexible Filaments

TPU

- Highly elastic and wear-resistant, but relatively slow to print.
- Suitable for flexible models, such as shoe sole prototypes, seals, and cushioning pads.



NOTE

The hardness of TPU filament is measured by the Shore A hardness. A lower value means the filament is softer, while a higher value means it is harder. Common hardness levels include 75A, 80A, 83A, 85A, 90A, and 95A.

It is recommended to print with TPU of 85A hardness and above. Higher hardness improves printing stability and reduces the risk of print failure.

Fiber-Reinforced Filaments

Carbon Fiber Reinforced (-CF)

- Carbon fiber is added to filaments such as PLA or PETG to significantly improve rigidity and strength while keeping the material lightweight.
- Suitable for load-bearing structural parts and lightweight structural designs.



Support Filaments

PVA (Water-soluble)

- A flexible, biodegradable polymer with strong moisture absorption. It absorbs water from the air and dissolves in water. Commonly used as a water-soluble support filament in 3D printing.
- Use PVA as support filament for complex models or models where supports are difficult to remove manually.



PLA/PETG Support Filament

- A support filament with good print compatibility, easy removal, and smooth contact surfaces.
- Support filament designed specifically for use with PLA and PETG printing.



NOTE

Support filaments are specially optimized for good stability. They should only be used for printing support structures. Using them for the model body may reduce model strength and surface quality.

8.2 Printing Conditions

The A2L is an open-frame 3D printer that comes standard with a 0.4 mm stainless steel nozzle, with a maximum nozzle temperature of 300 °C and a maximum heatbed temperature of 80 °C. It supports non-engineering filaments with lower ambient temperature requirements, such as PLA, PETG, TPU, and PVA. After replacing with a hardened steel nozzle, it can also print carbon-fiber reinforced filaments like PLA-CF and PETG-CF.

The following lists common printing conditions for Bambu filaments on this printer. Please confirm all settings before printing to ensure stable and reliable print quality. For detailed filament parameters and printing guides, visit Bambu Lab Wiki (wiki.bambulab.com/home) and search for the filament name (such as PLA).

 NOTE

- ✓ indicates recommended, required, or mandatory actions, such as mandatory drying.
- indicates allowed or suggested actions, such as recommended drying.
- ✗ indicates prohibited or incompatible configurations, such as incompatibility with a 0.2 mm nozzle.

Filament	Hotend Compatibility		Printing Requirements		AMS*
Name	Nozzle Size*	Nozzle Material*	Print temperature (°C)	Drying	Compatibility
PLA Basic	All	All	190 - 240	○	All
PLA Wood	✗ 0.2 mm	All	190 - 240	○	Incompatible with AMS lite
PLA Silk/Silk+	All	All	190 - 240	○	All
PLA Glow	✗ 0.2 mm	Hardened steel	190 - 240	○	Incompatible with AMS lite
PETG	All	All	230 - 270	○	All
TPU for AMS (68D)	✗ 0.2 mm	High-flow not supported	200-250	✓	All
TPU 95A HF	✗ 0.2 mm	High-flow not supported	200-250	✓	Manual loading only through AMS HT's TPU filament outlet
TPU 90A	✗ 0.2 mm	High-flow not supported	200-250	✓	Manual loading only through AMS HT's TPU filament outlet
TPU 85A	✗ 0.2 mm ✗ 0.4 mm	High-flow not supported	200-250	✓	Manual loading only through AMS HT's TPU filament outlet
PVA (dried condition)	✗ 0.2 mm	All	210 - 250	✓	All
PLA/PETG Support filament	All	All	190 - 240	○	All

Filament	Hotend Compatibility		Printing Requirements		AMS*
Name	Nozzle Size*	Nozzle Material*	Print temperature (°C)	Drying	Compatibility
Carbon Fiber Reinforced PLA (PLA-CF)	× 0.2 mm	Must use hard-ened steel; High-flow not recommended	210 - 250	○	Incompatible with AMS lite
Carbon Fiber Reinforced PETG (PETG-CF)	× 0.2 mm	Must use hard-ened steel; High-flow not recommended	240 - 270	○	Incompatible with AMS lite

 NOTE

- **Nozzle Size:** Includes nozzles with diameters of 0.2 mm, 0.4 mm, 0.6 mm, and 0.8 mm.
- **Nozzle Materials:** Includes hardened steel and stainless steel, as well as their high-flow versions.
- **AMS Compatibility:** Includes AMS, AMS 2 Pro, AMS HT, and AMS lite.

8.3 Filament Preparation

Filament dryness and flow parameters often affect print quality. For example, damp Silk PLA filament is prone to producing "String" defects during printing; when using third-party filament, the preset flow parameters may not achieve optimal print results.

This section explains when drying and calibration are needed and provides step-by-step instructions. You can prepare the filament as needed.

8.3.1 Dry the Filament

When stored in a non-sealed environment, some filaments absorb moisture from the air and become damp. During printing, the internal moisture rapidly vaporizes in the hot nozzle, causing stringing, holes, and reduced structural strength in printed parts.



Filament not dried



Filament Drying

For moisture-sensitive filaments, dry the filament before printing for more stable print quality:

- PLA: PLA Wood, PLA Silk/Silk+, PLA-CF, Foaming PLA (PLA Aero).
- PETG: PETG HF, PETG Translucent, etc.
- PVA, TPU, and other supported moisture-sensitive filaments.
- All carbon fiber/glass fiber reinforced filaments (including -CF or -GF).

NOTE

Please visit MakerWorld (makerworld.com), search for “stringing”, download a suitable test model, and print it to determine whether the filament needs drying based on the print quality.

Drying Filament with AMS 2 Pro/AMS HT

AMS 2 Pro and AMS HT have built-in drying modules that heat and dry filament. During drying, the spool rotates automatically for more even results.

AMS Model	Filament Capacity	Max Temperature
AMS 2 Pro	4	65 °C
AMS HT	1	85 °C
AMS Gen1	No drying module	
AMS lite	No drying module	

When drying filament with AMS, follow the notes and steps below:

CAUTION

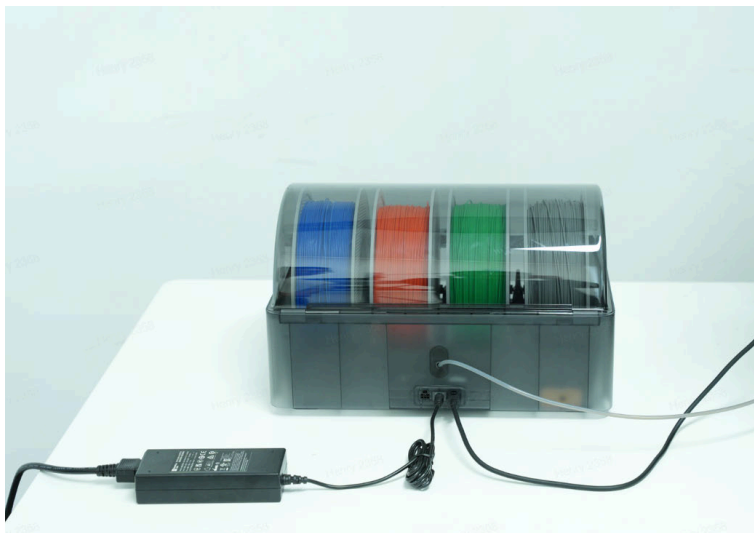
- When using the AMS drying function, connect the AMS to a power outlet using the official power adapter.
- To enable “printing while drying,” upgrade the printer and AMS 2 Pro firmware to the latest version to activate this feature.
- Before drying, pull the filament out of the AMS filament inlet and secure it to the inside of the spool with tape to prevent it from unwinding.

Step 1: Connect the AMS to the printer (see the Quick Start Guide or the [Initial Installation](#)).

Step 2: Place the filament into the AMS slot, then close the AMS cover and locking tab.

Step 3: On the printer screen, select  > .

Step 4: Select the **filament type**. The printer automatically applies the preset drying temperature and duration. Tap **Start** to begin drying.



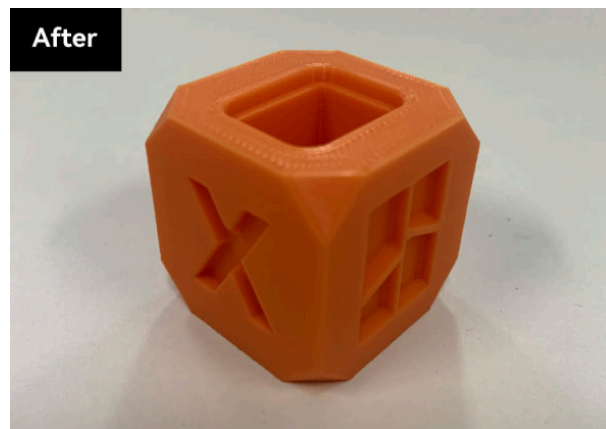
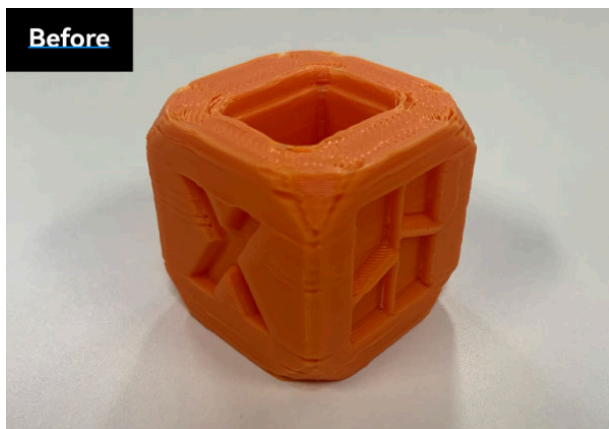
Other Drying Methods

You can use a forced-air dryer to dry filament. Please visit Bambu Lab Wiki (wiki.bambulab.com/home) and search for “filament drying guide” to find drying parameter tables for various filaments.

8.3.2 Filament Calibration

Filament calibration includes two types: flow dynamics and flow rate.

- **Flow dynamics calibration:** Compensates for extrusion pressure lag and improves extrusion stability (e.g., improving print quality around model corners).



- **Flow rate calibration** helps reduce under-extrusion and over-extrusion, improving surface smoothness, layer adhesion, and more.



When using official Bambu Lab filament, you can directly apply the official preset parameters without frequent filament calibration. When **changing filament brands** or **hotends**, or encountering **specific print quality issues**, refer to the applicable calibration scenarios and steps below.

NOTE

Visit Bambu Lab Wiki (wiki.bambulab.com/home) and search for "Flow Dynamics Calibration" and "Flow Rate Calibration" to learn about the calibration principles and detailed steps.

Flow Dynamics Calibration

The printer supports both automatic and manual calibration methods. Perform **flow dynamics calibration** when using third-party filament, replacing the hotend, or changing filament parameters (such as Max volumetric speed or print temperature in Bambu Studio).

Material Type	Stage	Platform	Method
Manual calibration	When the printer is idle	Bambu Studio only	Visually check the print quality of the test model and manually enter the corresponding coefficient
Auto-calibration	When the printer is idle or starting a print job	Printer screen, Bambu Handy, and Bambu Studio	The printer automatically performs calibration and provides the recommended result

- **Calibrate when starting a print job**

On the Send print job page, **Enable** flow dynamics calibration to automatically calibrate the filament used for printing. If you cannot find this option, expand **advanced options**.

- **Calibrate when the printer is idle**

Step 1: On the **Calibration** page in Bambu Studio, click **Flow Dynamics**, then select **Auto-Calibration** or **Manual Calibration**.

Step 2: Select the printer **preset** and wait for the printer to start calibration. Then enter the filament coefficient (K) based on the recommended automatic calibration result or your visual inspection of the printed test model.

NOTE

Visit Bambu Lab Wiki (wiki.bambulab.com/home) and search for "Flow Dynamics Calibration" to learn how to determine the coefficient for manual calibration.

Flow Rate Calibration

If the preset flow rate does not match the filament, under-extrusion or over-extrusion may occur, causing poor surface quality, weak layer bonding, and other issues. However, these print quality issues are not always caused by an incorrect flow rate. Before running flow rate calibration, first check the printer's basic calibration items and the model structure (see [Print Quality Issues and Solutions](#)).

If these issues have been ruled out and the print defect is mainly related to a specific filament, follow the notes and steps below:

Step 1: On the **Calibration** page in Bambu Studio, click **Flow Rate** and select **Manual Calibration**.

Step 2: Select the printer **preset** and **Calibration Type** (**Complete Calibration** is recommended for first-time use).

Step 3: Wait for the printer to start calibration, then enter the filament coefficient (K) based on the recommended automatic calibration result or your visual inspection of the test model.

NOTE

Visit Bambu Lab Wiki (wiki.bambulab.com/home) and search for "Flow Rate Calibration" to learn how to determine the calibration coefficient.

8.4 TPU Printing Requirements

8.4.1 Hardness Classification

TPU is a flexible filament that easily absorbs moisture. It has higher requirements for daily storage, drying, and loading method. TPU filaments with different hardness levels also vary in printer compatibility and loading method. Common TPU hardness levels and corresponding loading methods are listed below:

Hardness Level		A2L Printer	AMS	Supported Loading Method
68D (Bambu Lab AMS-dedicated TPU)	High	Compatible	All	AMS filament inlet
95A	Relatively high	Compatible	AMS HT (Manual feeding)	Toolhead filament inlet
90A	Medium	Compatible	AMS HT (Manual feeding)	Toolhead filament inlet

Hardness Level		A2L Printer	AMS	Supported Loading Method
85A	Relative-ly low	Compatible only when using a 0.6 mm or larger nozzle	AMS HT (Manual feeding)	Toolhead filament inlet
Below 85A	Low	Incompatible	Incompatible	/

⚠ CAUTION

- TPU filament (except AMS-dedicated TPU) cannot be loaded through the AMS filament inlet.
- When AMS HT is used to print TPU, it only acts as a sealed container; filament is fed out through the TPU filament outlet manually. It does not support automatic loading.

8.4.2 Print Preparation

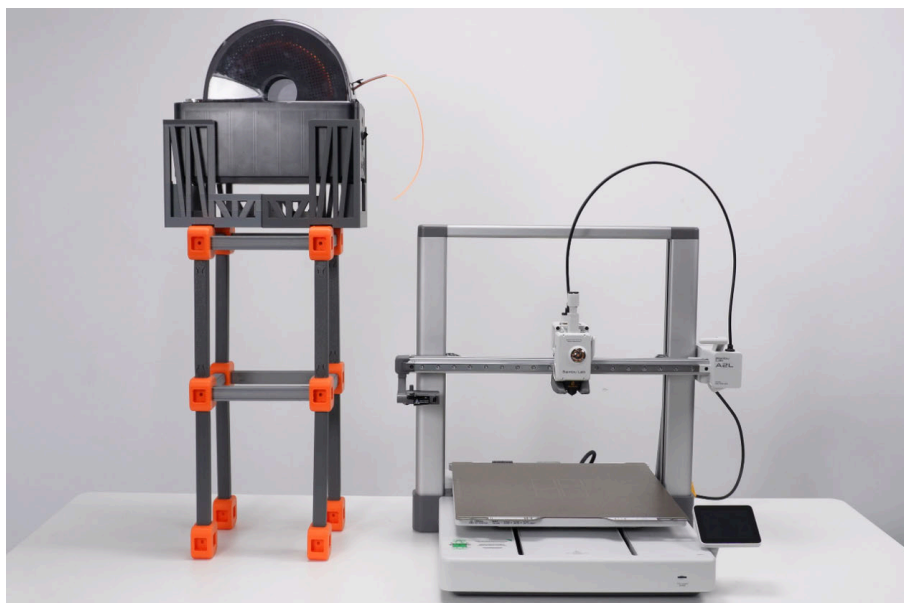
Visit the Bambu Lab Wiki (wiki.bambulab.com/home) and search for "A2L TPU 90A Printing Guide" for detailed instructions and illustrated guidance. **Before initiating a print with TPU**, refer to the general checklist below for preparation:

Stage	Preparation	Steps
Before Printing	Dry the filament	Select the drying equipment and settings based on the filament type
	Check Printer Configuration	Ensure the current AMS, build plate, and hotend support TPU filament printing
	Clean the Printer	• Clean and dry the build plate • Use a new hotend if possible, or perform cold pull maintenance (do not use fiber reinforced filament) • Check the extruder gear for debris and clean it if needed
Load Filament	Confirm the loading method	Determine the supported filament inlet based on the TPU hardness
	* Prepare a filament sealed box and spool shaft	For longer prints, place the filament in a sealed container, such as a rice storage container, and print a spool shaft holder for filament loading
	* Use the top-mounted spool holder bracket	Print a holder rack for the filament spool or sealed container, and ensure the filament outlet is higher than the toolhead
	Extrude Manually	On the printer screen, tap  at low frequency to manually extrude

Stage	Preparation	Steps
Initiate a Print	Adjust filament parameters and model position	- Set the appropriate filament print temperature and heatbed temperature, and disable the Flow Dynamics Calibration option - If the model is pre-positioned at the corner of the build plate, move the model to the center in Bambu Studio
After Printing	Unload Filament	Heat up the hotend, tap  slowly on the screen and manually pull out the filament
	Store the Filament	Store the filament in a sealed box with desiccant, keeping the ambient humidity below 20% RH.

 NOTE

When printing AMS-incompatible TPU, prepare a filament sealed box or sealed container. Visit MakerWorld (makerworld.com), search for "TPU holder," download a suitable holder model, then print and install it according to the model instructions.

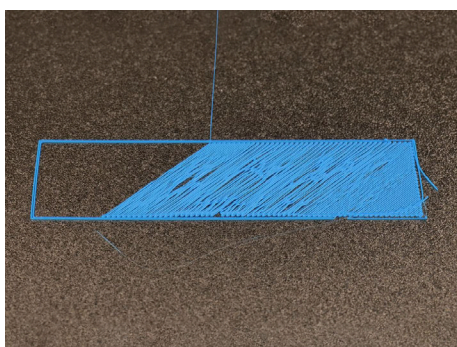


Chapter 9 Print Quality Issues and Solutions

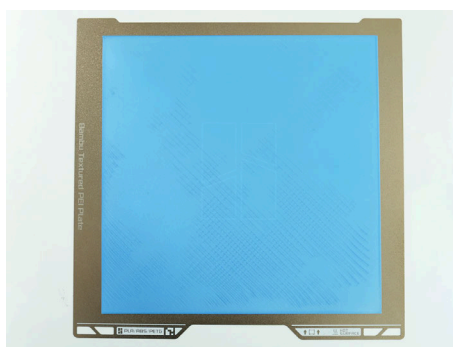
During 3D printing, print quality can be affected by various factors such as filament, environmental conditions, parameter settings, or equipment status. This section summarizes common print quality issues and provides basic troubleshooting steps and solutions to help you quickly identify and resolve problems.

If the methods in this section still do not resolve the issue, it is recommended to visit the Wiki for more detailed instructions, or contact Technical Support for assistance.

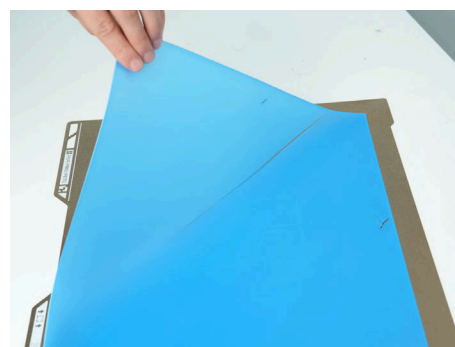
9.1 Quickly Identify Print Quality Issues



First layer not sticking



First layer too low



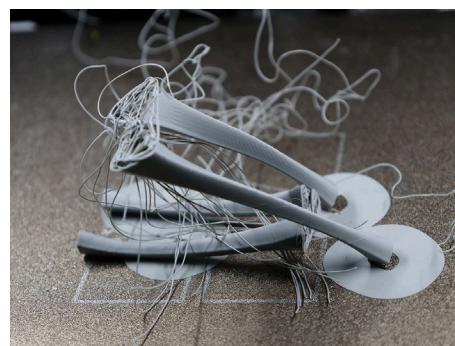
First layer too high/sparse



Air print, clogging,
and under-extrusion



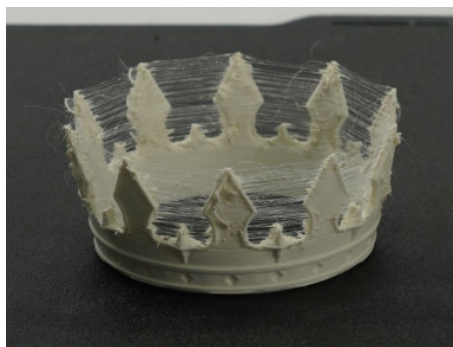
Model warping
and detachment



Model collapse and
spaghetti printing



Poor overhang quality



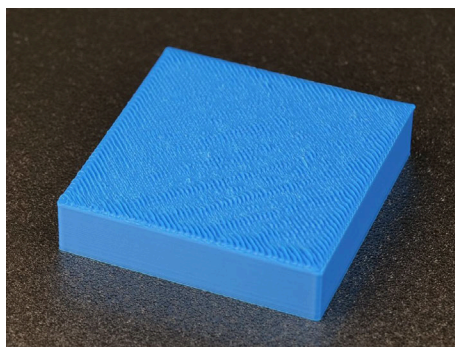
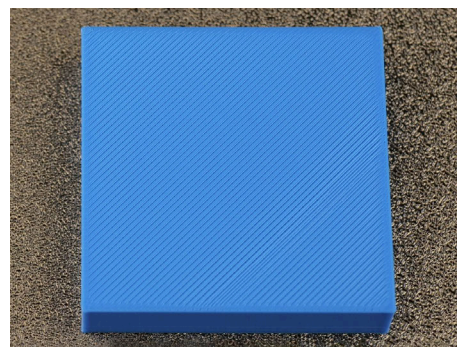
String and oozing



Gloss difference



Seam

Top layer filament overflow
(over-extrusion)Top layer gaps
(under-extrusion)

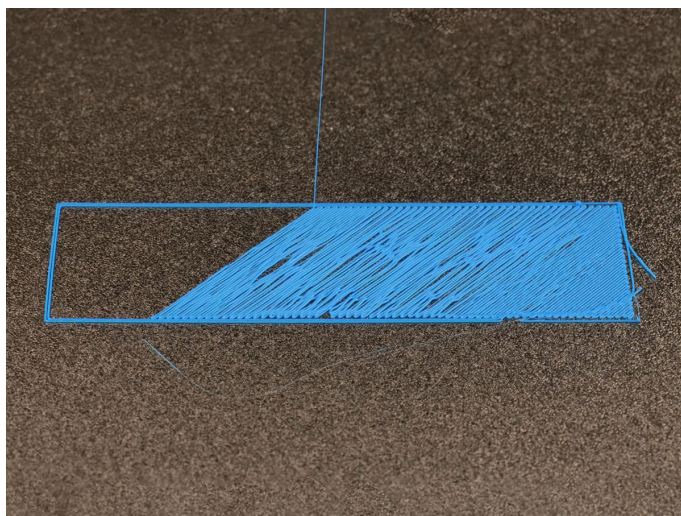
9.2 First Layer Issues

The quality of the first layer directly affects model adhesion, print stability, and the quality of subsequent layers. Poor adhesion or uneven laying of the first layer can lead to model warping, detachment, spaghetti, or clumping. The A2L is an open-frame printer, making it sensitive to changes in ambient temperature. When printing, avoid direct drafts from air conditioning or significant fluctuations in ambient temperature. This prevents instability of the heatbed and ensures optimal first layer quality. This section explains common first layer issues and their solutions, helping you quickly diagnose and optimize your first layer prints.

Search for "First Layer Test" models on **MakerWorld**. Print these test models to quickly check your first layer status and adjust settings.

9.2.1 First Layer Not Sticking

When printing the first layer, if the material does not firmly adhere to the build plate surface, the printed lines may be thin, wavy, or dragged as the nozzle moves. As printing continues, the model may shift or detach from the build plate, causing print failure.



Possible Causes and Solutions

1. Mismatched build plate

Ensure the build plate type is compatible with the filament, and select the correct build plate in the slicing software.

TIPS

Visit Bambu Lab Wiki (wiki.bambulab.com/home) and search for “build plate introduction” to see detailed information on build plate and filament compatibility.

2. **Dirty build plate surface**

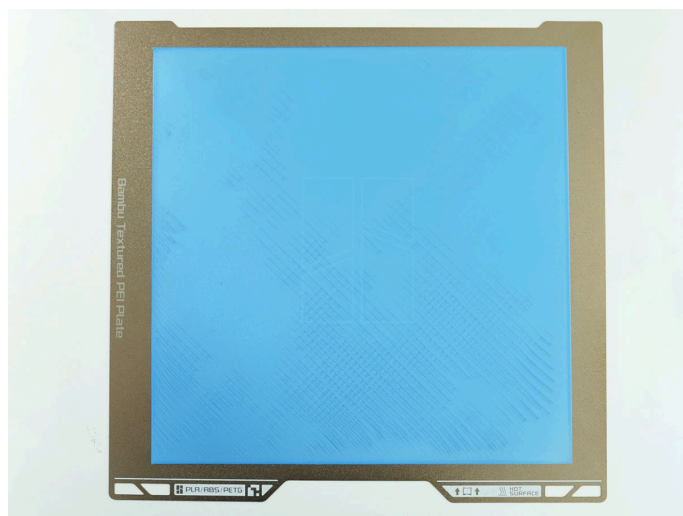
Clean the build plate surface with warm water and a neutral detergent to remove any contaminants without damaging the build plate coating.

3. **Bed leveling not performed**

On the printer screen, tap  > **Maintenance** > **Calibration**, then select Auto Bed Leveling or 80 °C Bed Leveling to perform bed leveling. Alternatively, on the Device page in Bambu Studio, select **Calibration** > **Bed Leveling** to perform bed leveling.

9.2.2 First Layer Too Low

When printing the first layer, if the nozzle is too close to the build plate, the extruded material will be over-compressed. The printed lines may appear significantly wider, with raised edges from excess extrusion. The surface may look flattened, and the nozzle might scrape the printed material as it moves.



Possible Causes and Solutions

1. **Heatbed not leveled**

On the printer screen, select  > **Maintenance** > **Calibration**. Run Auto Bed Leveling and 80°C heatbed leveling. When starting a print job, enable Auto Bed Leveling.

2. **Incorrect hotend installation**

Check if the hotend is properly installed and its lock is secured. A loose hotend may affect first layer height.

3. **First layer height needs fine-tuning**

On the printer screen, tap  > **Maintenance** > **First Layer Quality Calibration**. If the first layer is too low overall, adjust the calibration value slightly in the positive direction. Increase by 0.005 mm for testing. If peeling or material pile-up is significant, increase by 0.01 mm. After adjustment, print a first layer test model again to confirm if the first layer is normal.

4. **Loose rear screws on hotend heating assembly**

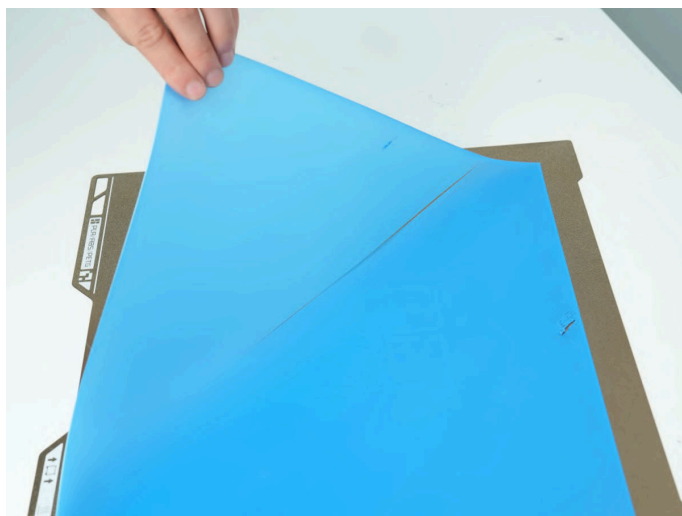
If the first layer is still significantly too low after leveling and first layer quality calibration, check if the screws on the hotend heating assembly are loose. For detailed instructions, search for 'A2L First Layer Print Quality Improvement Guide' on the Bambu Lab Wiki.

CAUTION

You cannot adjust the first layer height in real-time during a print. Complete calibration and testing before printing.

9.2.3 First Layer Too High/Sparse

If the nozzle is too far from the build plate when printing the first layer, the extruded material cannot be properly pressed down and spread out. The lines may appear thin and rounded, with noticeable gaps between them, preventing them from forming a continuous surface. Overall, the first layer may look loose or incomplete.



Possible Causes and Solutions

1. **Heatbed not leveled**

On the printer screen, select  > **Maintenance** > **Calibration**, then run Auto Bed Leveling and 80°C heatbed leveling. When starting a print job, enable Auto Bed Leveling.

2. **Nozzle wiper abnormal**

Check if the nozzle wiping plate or heatbed wiper strip is clean, and ensure the nozzle wiping plate is not bent. Insufficient nozzle wiping can affect leveling and first layer height.

3. **Residue or oozing on the nozzle**

Check the nozzle surface for residual filament or oozing. If the nozzle is not clean before leveling, it may affect height measurement, leading to a high first layer.

4. First layer height needs fine-tuning

On the printer screen, go to  > **Maintenance** > **First Layer Quality Calibration**. If the first layer is too high overall, adjust the calibration value negatively in small increments. For testing, decrease by 0.005 mm at a time; if peeling or material pile-up is significant, decrease by 0.01 mm at a time. After adjustment, reprint the first layer test model to confirm that the lines are properly adhered and compressed.

NOTE

After changing the build plate, the first layer status may change. If the first layer is noticeably too high or too low after changing the build plate, re-calibrate the first layer quality.

9.3 Print Issues During Printing

9.3.1 Air Printing, Clogging, and Under-Extrusion

During printing, if the nozzle or extrusion path becomes clogged or extrusion is unstable, filament may not be extruded consistently. This can cause missing lines, layer gaps, or areas with little or no material. In severe cases, the nozzle continues moving, but little to no filament comes out, and the print cannot continue properly.



Possible Causes

- Clogged hotend
- Clogged extruder

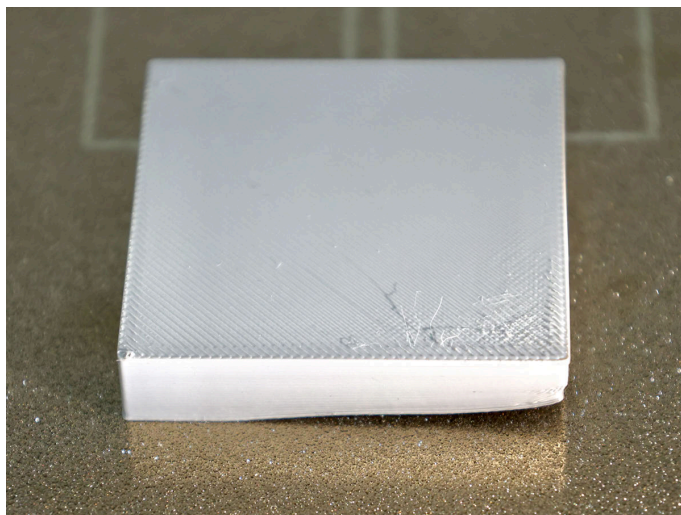
Solutions

Step 1: Troubleshoot the clogged area; see [Toolhead Clog Troubleshooting](#).

Step 2: Based on the troubleshooting results, clean the nozzle or extruder; see [Hotend Clog Cleaning](#) or [Extruder Clog Cleaning](#).

9.3.2 Model Warping and Detachment

During printing, if the model experiences localized shrinkage or does not adhere firmly to the build plate, it may lead to warping or complete detachment. Warped areas are typically accompanied by a noticeable horizontal ridge. This is because the model lifting reduces the distance to the nozzle, causing extrusion lines to flatten and overflow.



Possible Causes

Insufficient adhesion between the model and the build plate.

Solutions

1. Make sure the build plate type matches the filament used, and select the correct build plate type in your slicing software (Bambu Studio or Bambu Handy).
2. In Bambu Studio, enable brim to increase the contact area between the model's bottom surface and the build plate.
3. Perform bed leveling.
4. Clean the build plate and nozzle.
5. Apply glue to the build plate surface if necessary to enhance adhesion.
6. Increase the bed temperature appropriately.

9.3.3 Model Collapse and Spaghetti Printing

During printing, if the model does not adhere firmly to the build plate or lacks structural stability, it may shift or partially collapse. The extruded filament cannot stack along the intended path, gradually forming tangled strands or blobs that look like spaghetti.



Possible Causes and Solutions

- 1. Small contact area between the model and the build plate**
Enable Brim in Bambu Studio to increase the model's contact area with the build plate.
- 2. Part of the model is floating above the build plate in Bambu Studio**
Click  in the top toolbar of Bambu Studio to automatically use a larger flat surface as the base.
- 3. The model has tall, thin, or overhanging sections**
Add extra supports to secure these areas. You can also paint supports manually.
- 4. Tall model with unstable center of gravity**
Add supports and reduce print speed and acceleration. Lay the model flat whenever possible, or split the model before printing if needed.

9.4 Surface Quality Issues

9.4.1 Poor Overhang Quality

When printing overhangs, if the extruded material does not cool and solidify in time, it may sag because there is no support underneath. The overhang area may show drooping, uneven edges, or a rough surface, affecting both appearance and structural quality.



Possible Causes and Solutions

1. **Insufficient support**

Check the overhang angle. If the angle from vertical is greater than 45°, add support structures.

2. **Print speed too high**

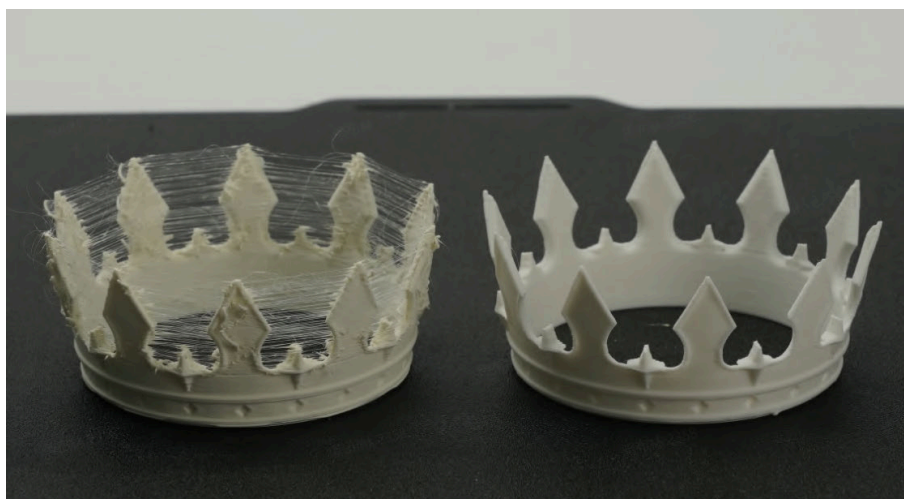
Reduce the print speed, or enable the Slow down for overhangs function.

3. **Insufficient cooling**

Lower the nozzle temperature as needed, increase the auxiliary part cooling fan and part cooling fan speeds, and open the printer front door and top glass cover to improve heat dissipation.

9.4.2 Stringing or Oozing

During printing, if molten filament continues to ooze from the nozzle during movement or travel, fine strands may appear on the model surface, or excess material may build up in some areas. This usually appears as stringing between models or across surfaces, or as small blobs of excess material.



Possible Causes and Solutions

1. **Damp filament**

Dry the filament. For detailed steps, see [Dry the Filament](#).

2. **Long travel distance and insufficient retraction length**

Increase the retraction length or speed appropriately to prevent molten filament from leaking during travel moves.

3. **Special model structure or improper plate arrangement**

Reduce the spacing between models and enable the avoid crossing walls feature in the slicing software.

4. **Worn or oversized nozzle**

Ensure the actual nozzle matches the slicing settings. Check the nozzle condition and replace it if worn.

9.4.3 Gloss Difference

At the same temperature, lower print speeds produce smoother surfaces. At the same speed, higher temperatures produce smoother surfaces. If uneven gloss appears on the model surface during printing, it is usually caused by differences in material melting or cooling rate, which affect flow and lead to changes in surface roughness. This issue is more noticeable on highly reflective materials.



Possible Causes and Solutions

1. **Significant differences in print speed across different areas of the model (such as slow down for overhangs areas)**

For large models, reduce the outer wall speed as needed. For small models, reduce the overall print speed. If necessary, disable Slow down for overhangs.

2. **High print speed when printing at a low layer height (such as 0.08 mm)**

This may cause scale-like gloss differences on the model surface. Consider increasing the layer height, lowering print speed, or raising print temperature accordingly.

9.4.4 Seam

In FDM 3D printing, the start and end points of each layer naturally form a seam. This is normal. You can use the following methods to reduce seam visibility and improve the model's appearance.



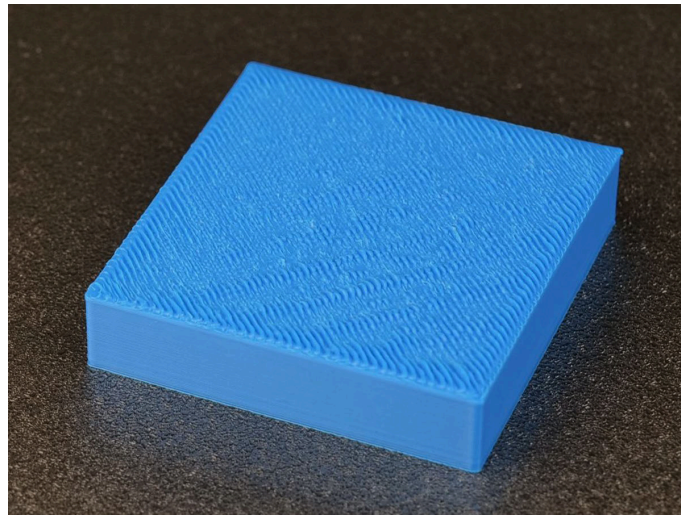
Optimization Methods

1. Set the wall loops to 3.
2. Print the model separately to avoid seam buildup caused by printing multiple models at the same time.
3. Increase the nozzle temperature appropriately and reduce the outer wall speed.
4. For ring-shaped or rotationally symmetric models, try enabling **Spiral vase** mode.

9.5 Top Layer Issues

9.5.1 Top Surface Filament Over-Extrusion

When printing the top surface of a model, if the flow rate is too high, the nozzle is abnormal, or extrusion is unstable, more filament than expected may be extruded. This can cause excess material to build up on the top layer, resulting in an uneven surface, raised lines, and squeezed extrusion paths. Visible bumps or ridges may form, affecting the model's appearance and accuracy.



Possible Causes and Solutions

1. **Flow rate too high**

Recalibrate the flow rate on the Calibration page of Bambu Studio.

2. **Incorrect nozzle size**

Verify that the nozzle diameter set in the slicing software matches the actual nozzle.

9.5.2 Top Layer Gaps (Under-Extrusion)

When printing the model's top layer, if the flow rate is too low, the nozzle is abnormal, or extrusion is unstable, the top layer material may not fill the gaps between adjacent lines. This can cause visible gaps, an uneven surface, and sometimes exposed internal structure or supports, resulting in an incomplete or sunken top surface that affects appearance and flatness.



1. **Flow rate too low**

Recalibrate the flow rate on the Calibration page of Bambu Studio.

2. **Incorrect nozzle size**

Verify that the nozzle diameter set in the slicing software matches the actual nozzle.

3. **Filament extrusion clog**

Clean and maintain the extruder, PTFE tube, and nozzle.

Chapter 10 Printer Issues and Solutions

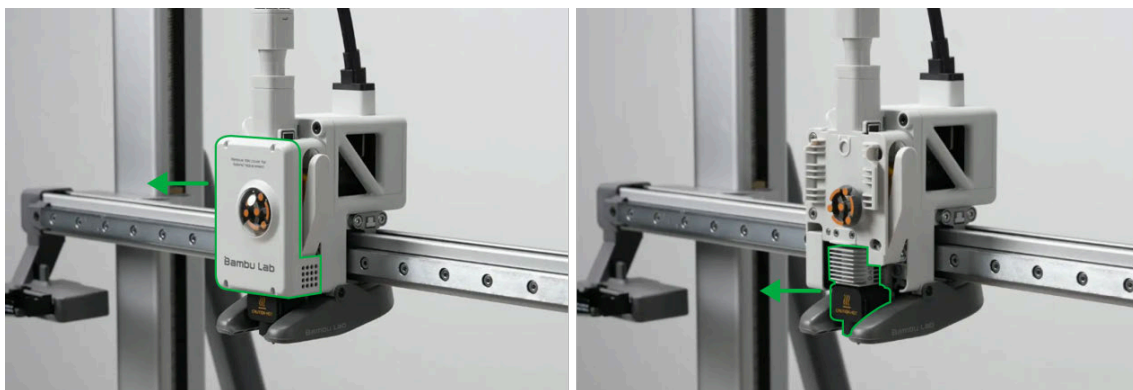
This section summarizes some common issues and basic troubleshooting methods. It does not cover all possible problems. If you cannot find your issue or a solution here, we recommend visiting the Wiki for more detailed troubleshooting instructions or contacting technical support for further assistance.

10.1 Toolhead Clog Troubleshooting

If error messages like “extruder motor overload” or “air print” appear during printing, or if the toolhead moves normally but no filament is extruded from the nozzle (or the extruded line is too thin), this indicates a clog in the extruder or hotend inside the toolhead. Follow the steps below to troubleshoot.

Step 1. Press the right filament cutter lever to cut the filament.

Step 2. Remove the toolhead front cover, hotend silicone sock, and hotend.



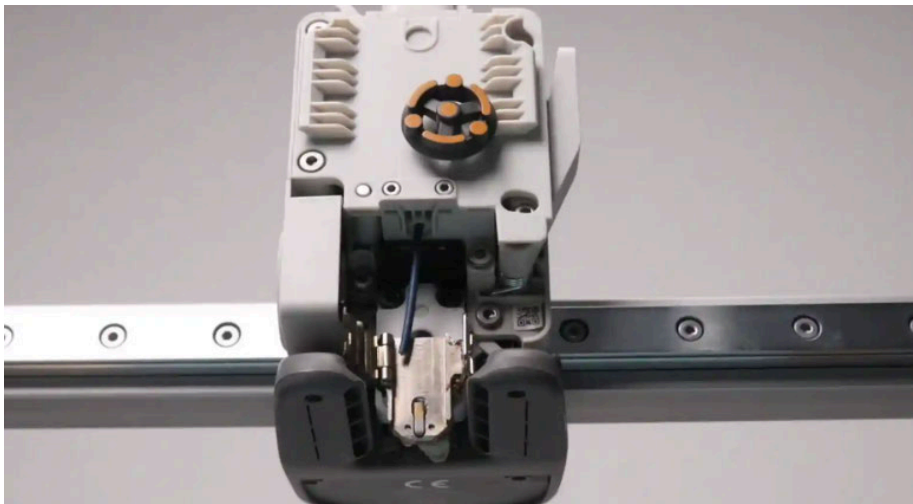
Step 3. Press the black outer ring of the toolhead filament inlet and pull out the PTFE tube.

Step 4. Insert a new filament into the toolhead filament inlet until it cannot be pushed forward.

Step 5. On the printer screen's control page, tap . If the printer prompts “Please heat the nozzle to above 170°C”, select “Continue Loading”.

Step 6. Check whether the filament is extruded from the extruder.

- If the filament extrudes successfully, this indicates a probable nozzle clog; see [Hotend Clog Cleaning](#);
- If the filament cannot be fed out of the extruder, this indicates an extruder malfunction or an internal jam; see [Extruder Clog Cleaning](#).



10.2 Hotend Clog Cleaning

10.2.1 Operation Overview

Hotend clogs typically occur in the hotend cold zone (①) and the nozzle (②). They may appear as clog error messages on the printer, or as clear under-extrusion in prints (e.g., layer separation or obvious gaps on the model surface).



Before unclogging, identify where the clog is located:

Clog Location	Possible Causes	Unclogging Method
Hotend (inlet and cold zone)	Filament diameter too large (> 1.8 mm) or inconsistent	Unclog with Allen Key
	Heat creep causes filament to soften or swell	
Nozzle	Nozzle temperature is set too low, causing the filament to melt slowly and accumulate in the nozzle	Unclog by Manual Extrusion

Clog Location	Possible Causes	Unclogging Method
Nozzle	Filament contains particles (e.g., carbon fiber or glow-in-the-dark filament), or impurities are stuck inside the nozzle	Unclog with Unclogging Pin, Unclog by Cold Pull
	High-temperature and low-temperature filaments are used together or in succession, causing the residual filament to remain unmelted and unable to extrude	

- Step 1. On the  page, select the corresponding filament, then tap **Unload** (ignore any error messages).
- Step 2. **Remove the hotend.**
- Step 3. Check if the filament at the hotend inlet is swollen or jammed.
- Step 4. If the filament is stuck at the inlet, use an allen key to clear it. If the filament is not stuck, reinstall the hotend onto the toolhead, and follow the nozzle unclogging methods listed above.

10.2.2 Unclog by Manual Extrusion

Heat the nozzle to a higher temperature and extrude filament to clear the clog by increasing filament flow.

- Step 1. On the printer screen, select  > **Nozzle**, set the nozzle temperature slightly above the recommended print temperature for that filament, then tap **Confirm** to start heating.

TIPS

See **Printing Conditions** for the recommended filament print temperature range. For example, set to 250°C for PLA filament.

- Step 2. After the nozzle heats up, tap  to extrude filament and check whether molten filament comes out of the nozzle.

**⚠ CAUTION**

When using TPU filament, tap the  extrude button no more than 3 times, and avoid rapid and continuous tapping.

If the filament cannot be extruded normally from the nozzle, or if the extruded filament is too thin and brittle, see [Unclog with Unclogging Pin](#) for the next step.

10.2.3 Unclog With Unclogging Pin

Heat the nozzle to a higher temperature, then use a fine-tipped unclogging pin to clear the nozzle from bottom to top. This helps the molten filament inside the nozzle extrude smoothly.

Tools: heat-resistant gloves, unclogging pin (included in the toolbox).

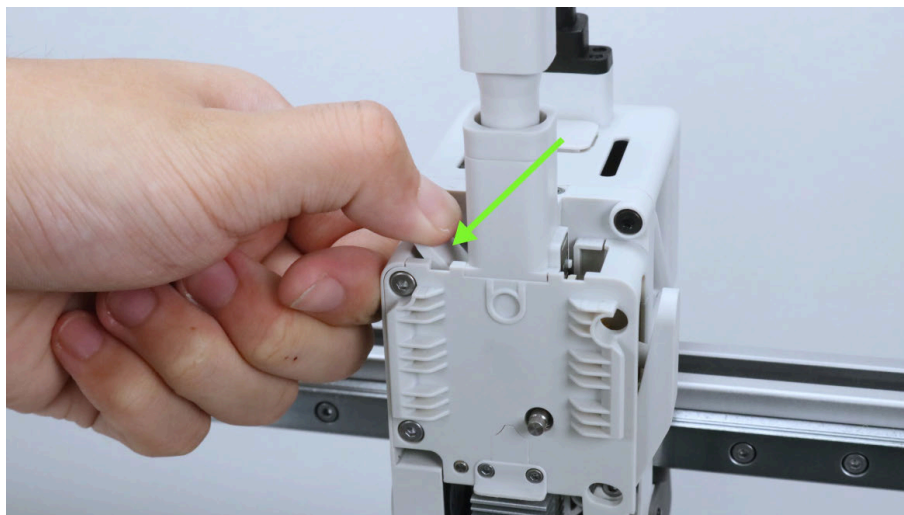
** TIPS**

This method does not apply to nozzles smaller than 0.4 mm.

** DANGER**

Wear protective gloves when using the unclogging pin. Keep your head away from the printer/nozzle area to avoid contact with molten filament that may eject from the nozzle.

Step 1. Press the extruder idler lever once to release the filament pressure inside the nozzle.



Step 2. On the printer touchscreen, tap > **Nozzle**, set the nozzle temperature slightly above the recommended print temperature for the filament, then tap **Confirm** to start heating.

i TIPS

See [Printing Conditions](#) for the recommended print temperature range for the filament. For example, set to 250 °C for PLA filament.

Step 3. After the nozzle heats up, insert the unclogging pin and move it up and down several times.



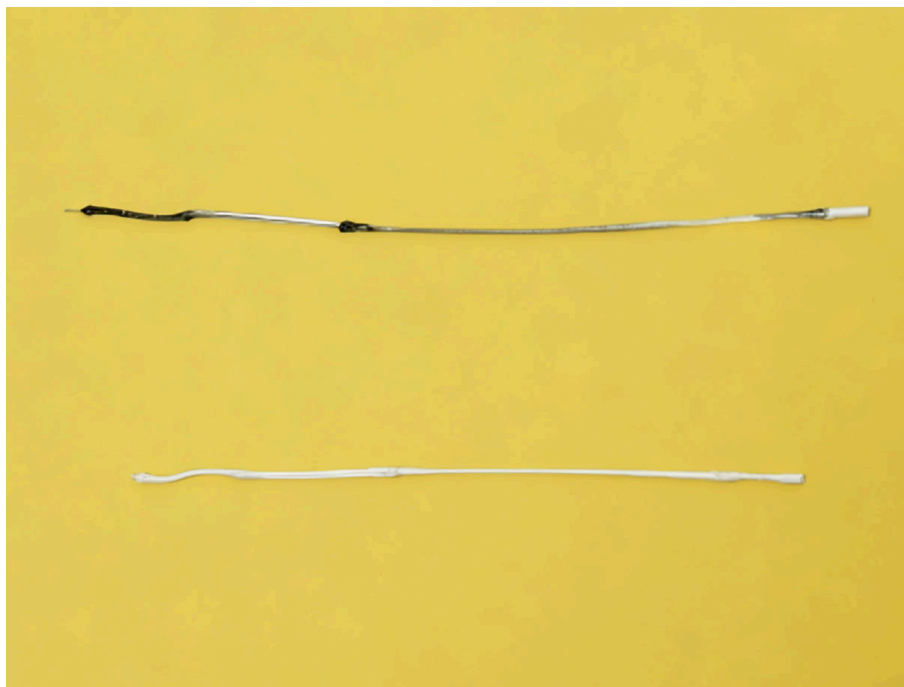
After unclogging with the Unclogging Pin, tap to extrude filament. If the filament does not extrude normally from the nozzle, or if the extruded filament is too thin or breaks easily, see [Cold Pull Unclogging](#) for the next step.

10.2.4 Unclog by Cold Pull

Cold Pull is a common nozzle maintenance method. During the process, the nozzle is heated to soften the filament, then the filament is pulled out after it cools and partially solidifies. Repeat the cold pull several times to better remove clogs and residue inside the nozzle.

On the printer touchscreen, tap  > **Maintenance** > **Nozzle Cold Pull Maintenance**, then follow the on-screen instructions to complete the process:

- Step 1. Select the nozzle and filament that need cleaning.
- Step 2. Remove the PTFE tube from the toolhead.
- Step 3. Insert the previously used filament. The printer will automatically heat the nozzle, purge residual filament, and cool it to the proper temperature.
- Step 4. Manually pull out the filament. Repeat the process based on actual needs.
- Step 5. After the cold pull is complete, reinstall the PTFE tube on the toolhead.



10.2.5 Unclog With Allen Key

Tools: heat-resistant gloves, allen key H1.5, pliers, lighter.

If a swollen filament is stuck inside the hotend and cannot be extruded or pulled out, insert a heated allen key into the filament to soften it and allow it to wrap around the key, then pull them out together.

CAUTION

This method only applies to allen key H1.5.

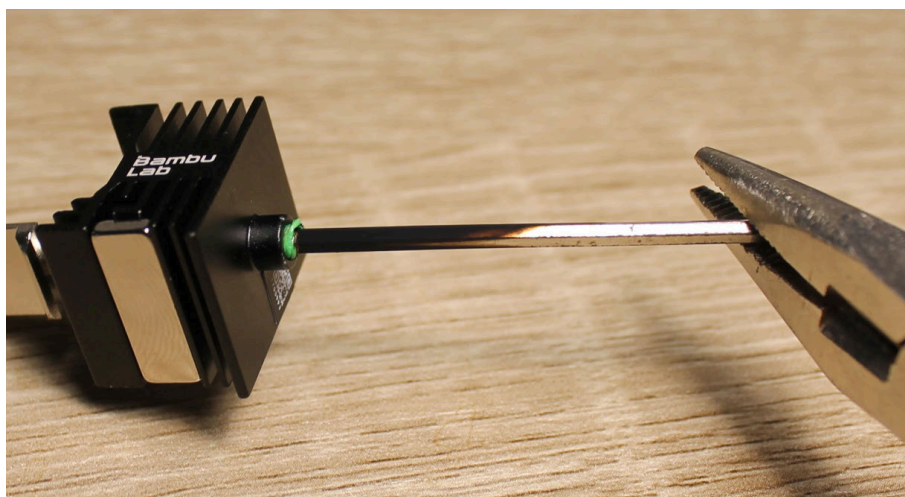
DANGER

Always wear heat-resistant gloves during operation to prevent burns from dripping molten filament.

- Step 1. Remove the hotend.
- Step 2. Hold the allen key with pliers and heat its end for about 10 seconds. Be careful to avoid burns.



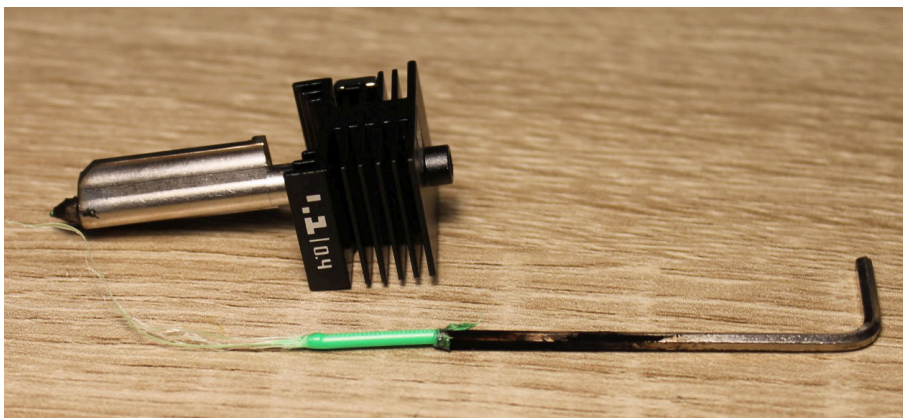
- Step 3. Quickly insert the allen key into the hotend and ensure the filament fully covers the key. Push forward until the allen key passes through the heatsink (as shown below), then wait about 30 seconds to cool.



- Step 4. Heat the nozzle tip with a lighter for about 20 seconds. Slowly pull out the allen key to remove the filament and clog from inside the hotend.

⚠ DANGER

- Do not overheat the nozzle or use high-power butane torches. A regular gas lighter is recommended.
- The nozzle only needs to be hot enough to pull out the filament and allen key. Overheating the nozzle may cause the filament to drip or burst. Always keep the nozzle tip pointed away from yourself.



Step 5. Once finished, reinstall the hotend.

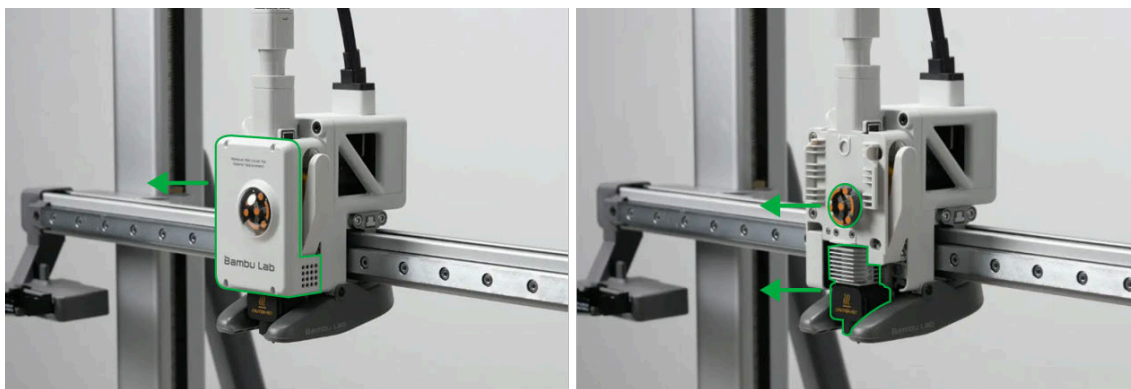
10.3 Extruder Clog Cleaning

10.3.1 Disassembly and Cleaning

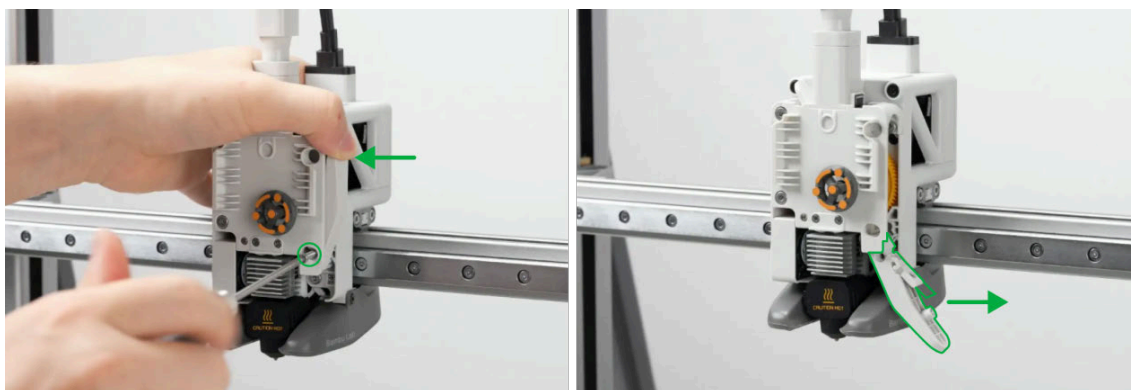
Tools: H1.5 and H2.0 allen keys, brush, cutting pliers.

Step 1. Remove the toolhead front cover.

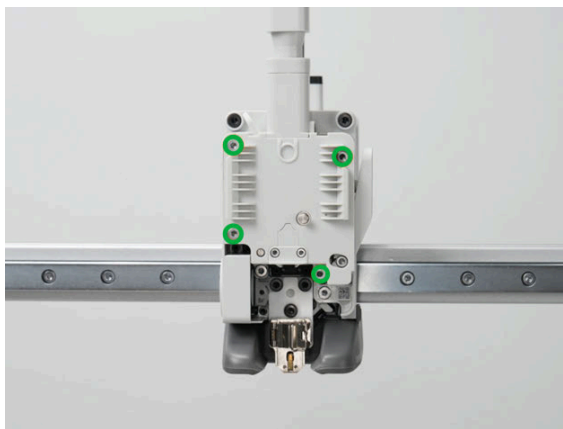
Step 2. Remove the hotend silicone sock, hotend, and rotating wheel.



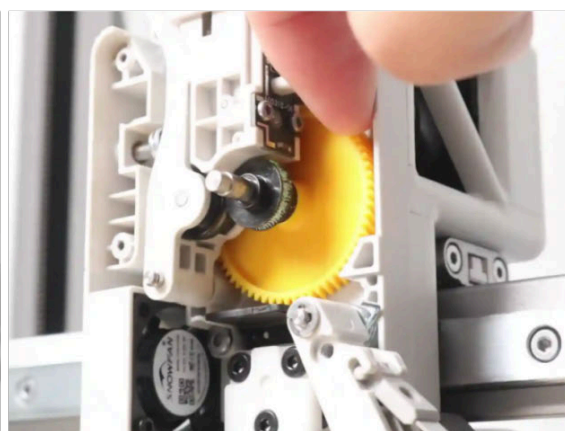
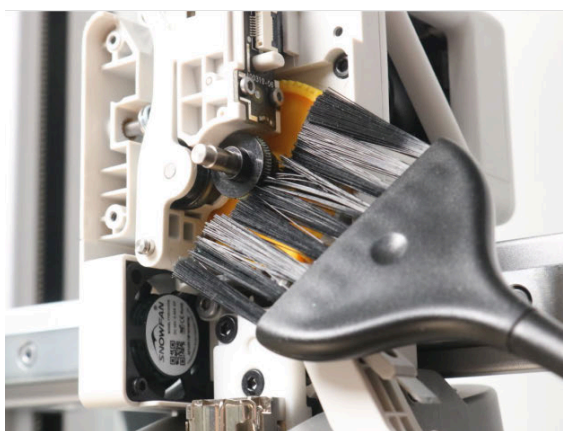
Step 3. Unscrew the filament cutter locking screw to unlock the filament cutter. During disassembly, hold the filament cutter lever to prevent the filament cutter from springing out.



Step 4. Use an H2.0 hex wrench to unscrew the 4 screws on the extruder unit front cover and remove the extruder unit front cover.



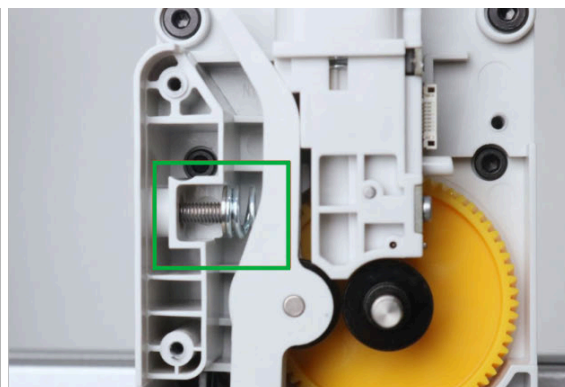
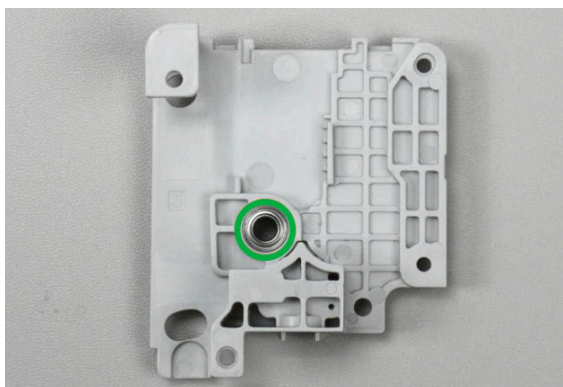
Step 5. Use a stiff brush or pointed tweezers to clean the filament debris from the extruder gear. After cleaning one side, manually rotate the gear and continue cleaning the other side.



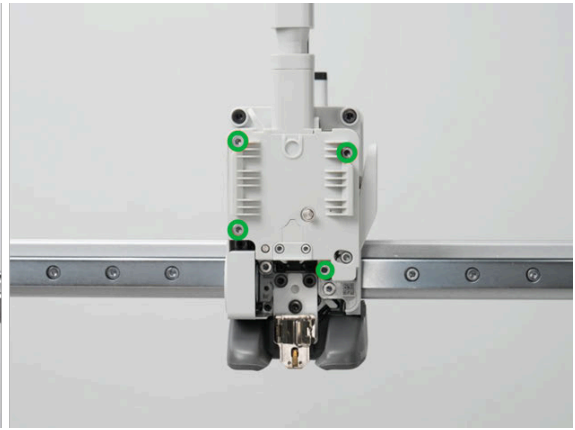
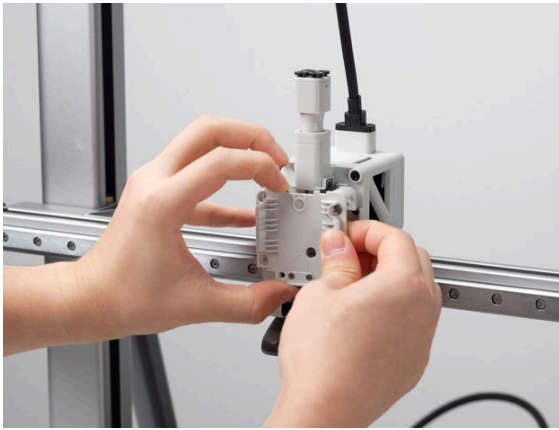
10.3.2 Reassemble Parts

Tool: allen key H2.0.

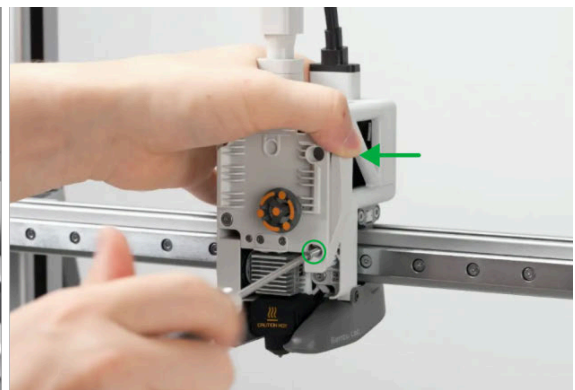
Step 1. Before reassembling the components, check if the front cover bearing is missing. Without this bearing, normal extrusion will not be possible. Also, check the screw, washer, and spring positions on the right side of the passive gear shaft.



Step 2. Reinstall the extruder unit front cover and use an H2.0 allen key to tighten the 4 screws to secure it.



Step 3. Align the filament cutter with the cutter slot inside the extruder. Hold the filament cutter lever in place and use an H2.0 allen key to tighten the filament cutter limit screw.



Step 4. Install the hotend, hotend silicone sock, and rotating wheel. Then install the toolhead front cover.



Chapter 11 Regular Care and Maintenance

11.1 Regular Maintenance

11.1.1 Maintenance Frequency

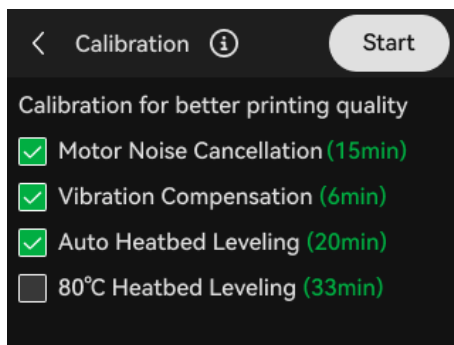
Component		Type	Frequency	Operating Steps
Printer	Printer system	Calibration	After regular maintenance	On the printer screen, select  > Maintenance > Calibration .
XYZ axes	X-axis guide rail	Clean and Lubricate with lubricant oil	1 month	Use a non-woven cloth dampened with alcohol to wipe, then apply lubricant oil to the guide rails after cleaning.
	Y-axis guide rail	Clean and Lubricate with lubricant oil	Monthly or every 200 printing hours, whichever comes first	
	Z-axis lead screw	Clean and Lubricate with lubricant grease	Every 3 months	Use a non-woven cloth dampened with alcohol to wipe, then apply Lubricant Grease to the Lead Screw after cleaning.
	XYZ axes idler pulleys	Lubricate with lubricant oil	When abnormal noises occur during motion	Apply a small amount of lubricant oil between the idler pulley and the metal shaft.
Toolhead	Toolhead filament cutter	Inspect / Replace	Inspect every 3 spools for PLA and PETG filament	Disassemble the filament feed block to check if the blade is sharp and intact. If the blade is worn, notched, or cannot cut filament smoothly, replace it with a new filament cutter.
	Extruder	Clean	When under-extrusion, filament jam, or air print occurs; every 5 spools for non-carbon fiber filament; every 2 spools for carbon fiber filament	Clean out internal debris.
	Part cooling fan	Clean	Monthly	Inspect the air duct for foreign objects or dust accumulation, then clean it.
	Hotend cooling fan	Clean	Monthly	Remove the hotend. Check the fan for foreign objects or dust accumulation, then clean it.

Component		Type	Frequency	Operating Steps
Toolhead	Hotend	Clean or Replace	When the hotend cannot extrude filament, extrusion is abnormal, or the nozzle surface is dirty	If the hotend is not clogged, refer to the Unclog by Cold Pull operating steps. If the hotend is clogged, refer to the Hotend Clog Cleaning procedure. If the clog cannot be cleared, replace the hotend. To clean filament residue on the nozzle surface, heat the nozzle to 220°C, then wipe it off. Wear heat-resistant gloves.
	Hotend silicone sock	Replace	When the silicone sock shows signs of damage or does not stay securely on the hotend	After ensuring the nozzle has cooled to room temperature, pinch the protruding parts on both sides of the silicone sock and remove it for inspection or replacement.
	Hotend heating assembly	Clean	Regularly	Enter maintenance mode, then set the nozzle temperature to 220°C. Wipe the surface of the heating assembly with a lint-free cloth (wear heat-resistant gloves).
Build plate		Clean	Clean regularly; clean when adhesion decreases or when the surface has grease or stains	Wash the surface with warm water and dish detergent, then wipe it dry.
Purge wiper		Clean or Replace	When the purge wiper movement is stuck, purging is abnormal, filament change is abnormal, or waste and debris accumulate	Use a brush and tweezers to remove excess waste. Then use an air duster or blower to clear debris, residue, and dust. If the movement structure is deformed, replace the purge wiper.
PTFE tube		Replace	When the PTFE tube shows obvious signs of Wear; Replace regularly: every 6 spools for non-carbon fiber filaments like PLA; every 2 spools for high-friction materials like carbon fiber filament or wood	Replace with a new tube.

11.1.2 Print Calibration

To ensure print accuracy and stable operation, perform a full Print Calibration after moving the printer or maintaining key components such as the XYZ axes and toolhead.

On the printer screen, tap  > **Maintenance** > **Calibration** to enter the calibration page, then select the calibration task as needed.



You can also start calibration tasks via Bambu Handy or Bambu Studio. Follow the steps below:

- Bambu Studio: Go to the **Device** page, select **Status**. Click **Calibration**, choose the calibration task as needed, then click **Start Calibration**.
- Bambu Handy: Go to the **Devices** page, select  > **Calibration**, choose the calibration task as needed, then tap Start Calibration.

NOTE

The interface is continuously updated to improve the user experience. Please refer to the actual interface.

11.1.3 XYZ Axes

CAUTION

Make sure the printer is powered off during maintenance.

Clean and Lubricate the X-Axis Guide Rail

Tools: lint-free cloth, alcohol, lubricant oil.

Step 1: Power off the printer.

Step 2: Move the toolhead to the far right. Apply a small amount of alcohol to a lint-free cloth, then wipe the X-axis 2–3 times.

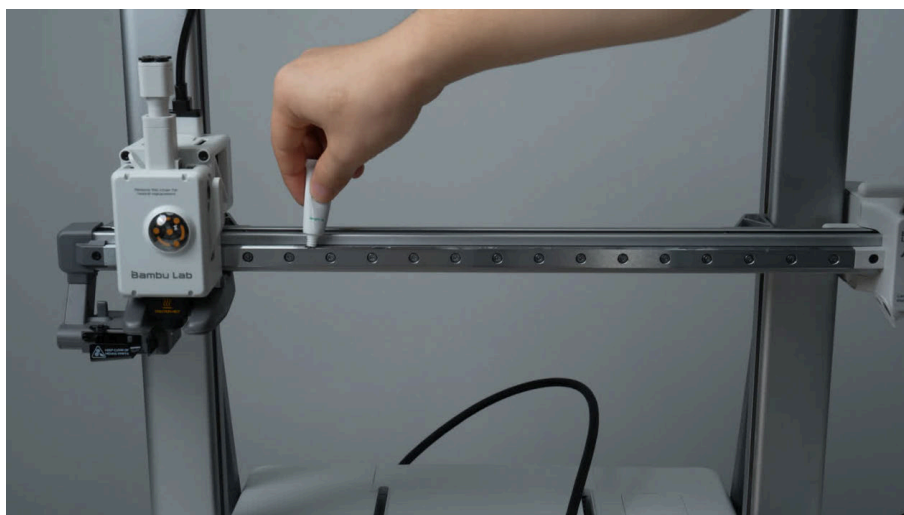
Step 3: Move the toolhead to the far left and continue wiping the remaining area.

Step 4: Apply lubricant oil to the upper and lower surfaces of the X-axis guide rail.

Step 5: Use a lint-free cloth to wipe off excess lubricant oil. Then, push and pull the toolhead back and forth to evenly distribute the lubricant oil on the X-axis guide rail.

CAUTION

Only use lubricant oil for the X-axis guide rail. Do not use lubricant grease.



Clean and Lubricate the Y-Axis Guide Rail

Tools: lint-free cloth, alcohol, lubricant oil.

Step 1: Power off the printer.

Step 2: Lift the X-axis to raise the toolhead height.

Step 3: Push the heatbed to the front (screen side) and remove the Y-axis top cover.

Step 4: Apply a small amount of alcohol to a lint-free cloth, wipe the rear Y-axis steel rod, then apply lubricant oil to the Y-axis steel rod.

Step 5: Move the heatbed to the rear, wipe the front Y-axis steel rod, then apply lubricant oil to the Y-axis steel rod.

Step 6: Move the heatbed back and forth to evenly distribute the lubricant oil.

Step 7: Clean off excess lubricant oil and reattach the Y-axis top cover.



Clean and Lubricate the Z-Axis

Tools: lint-free cloth, alcohol, lubricant grease.

⚠ CAUTION

The Z-axis lead screw uses lubricant grease. Unlike the lubricant oil used for the X/Y-axis guide rails, do not use lubricant oil for Z-axis lubrication.

Step 1: Power off the printer.

Step 2: Push the toolhead to the top. Apply a small amount of alcohol to a lint-free cloth.

Step 3: Push down the Z-axis. Use a lint-free cloth to wipe the lower half of the lead screw surface.

Step 4: Push the Z-axis up and wipe the upper half of the lead screw surface.

Step 5: Apply lubricant grease to the Z-axis lead screw.

Step 6: After powering on, tap  > **Maintenance** > **Calibration** on the screen. Select **Vibration Compensation** and start it to cause XYZ-axes motion, which helps evenly distribute the lubricant grease.



11.1.4 Build Plate

Tools: dish detergent, sponge or brush.

Wash the build plate with warm water and dish detergent. Dry it completely before attaching it to the heatbed for use.



11.2 Replace Accessories

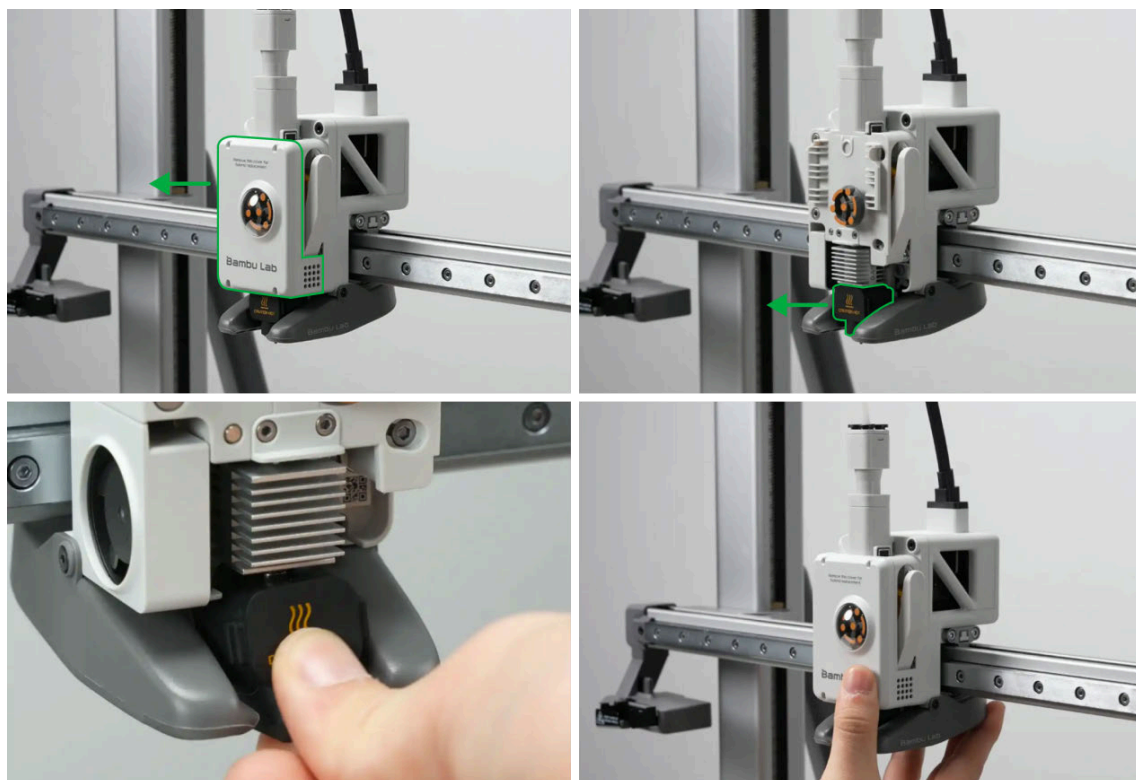
11.2.1 Hotend Silicone Sock

Tools and accessories: Replacement Silicone Sock for Hotend.

The Silicone Sock for Hotend is installed on the outside of the hotend to reduce heat loss and minimize filament adhesion to the hotend surface. Replace the silicone sock if it is loose, damaged, or significantly deformed.

DANGER

Before replacement, ensure the nozzle temperature has cooled down to room temperature to prevent burns.



- Step 1. Remove the toolhead front cover.
- Step 2. Pinch both sides of the silicone sock. Pull it diagonally downwards to remove the old silicone sock.
- Step 3. Install the replacement silicone sock onto the hotend from bottom to top. Ensure the silicone sock fits flat and snugly, does not block the nozzle tip, and does not touch surrounding plastic parts.
- Step 4. Snap the toolhead front cover back into place.

11.2.2 Hotend

Tools and accessories: a replacement hotend, heat-resistant gloves.

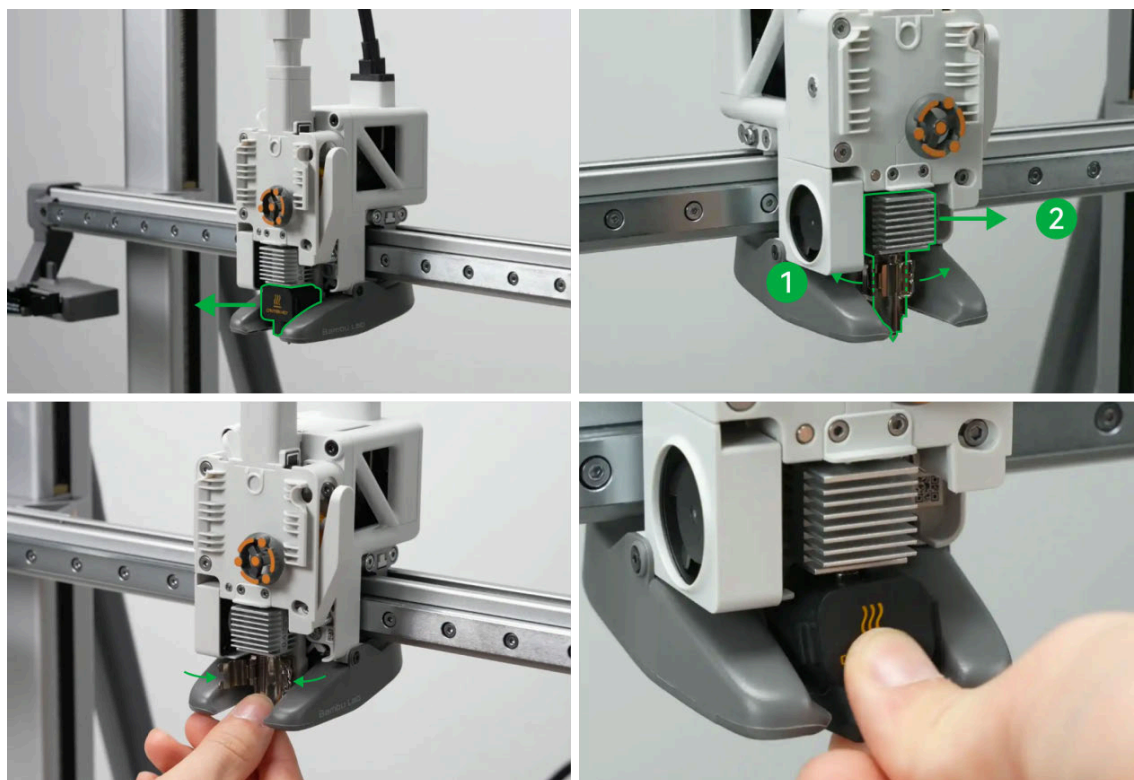
Replace the hotend when it is clogged or damaged, or when standard unclogging steps fail to restore normal extrusion.

DANGER

Before replacement, ensure the nozzle has cooled to room temperature to prevent burns. If you must work with a hot nozzle, wear heat-resistant gloves.

TIPS

Before replacement, cut the filament. If the filament has not been cut, press the filament cutter lever on the right side of the toolhead to cut it.



- Step 1. Remove the toolhead front cover and the hotend silicone sock.
- Step 2. Unlock the hotend locking tab, hold both sides of the hotend heat sink, and remove the hotend.
- Step 3. Insert the replacement hotend. Lock the left hotend latch first, then the right one, ensuring they fit snugly.
- Step 4. Reinstall the hotend silicone sock and the toolhead front cover.

NOTE

If you replaced the hotend with a different diameter or material, tap **⚙ > Maintenance > Nozzle** on the printer screen, select the correct nozzle specification and save.

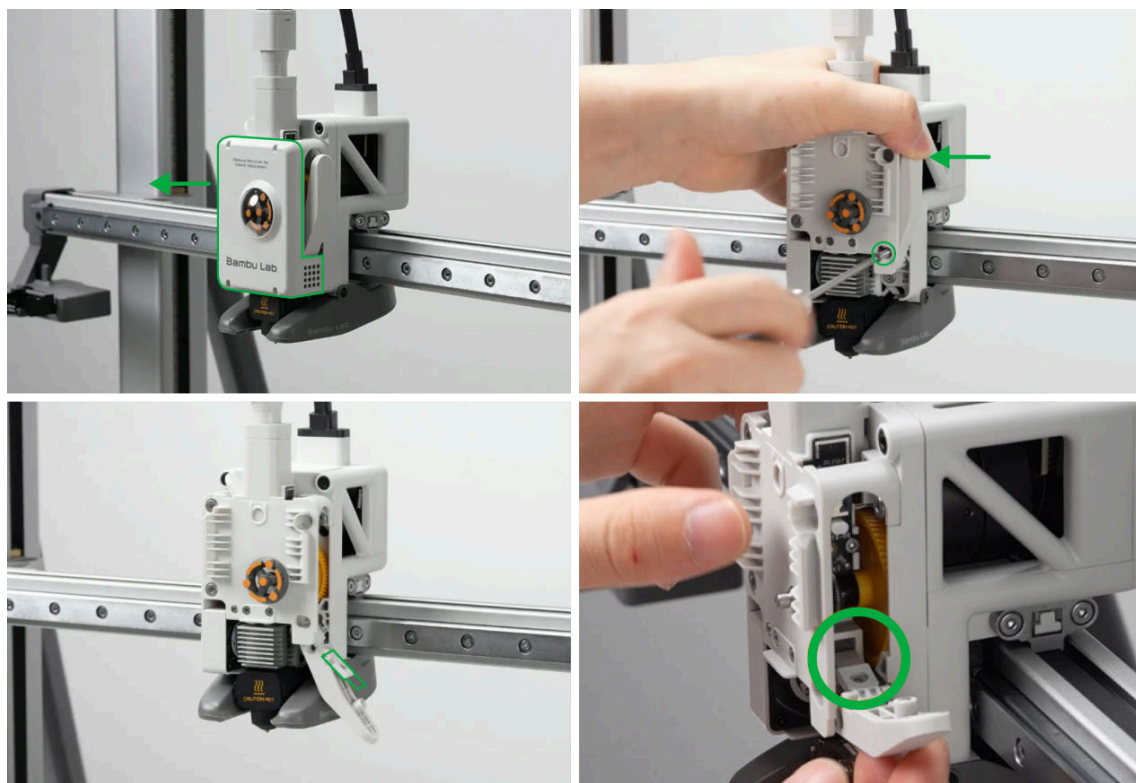
11.2.3 Toolhead Filament Cutter

Tools and accessories: Replacement toolhead filament cutter, needle-nose pliers or tweezers.

The toolhead filament cutter cuts filament during unloading and filament changes. After long-term use, the blade may become dull or experience wear, leading to incomplete filament cuts, abnormal unloading, or failed material changes. If these issues occur, replace the filament cutter.

⚠ DANGER

The blade edge is sharp, posing a risk of cuts during operation. Do not touch the blade directly; use tweezers for assistance.



- Step 1. Remove the toolhead front cover.
- Step 2. Hold the filament cutter lever and loosen the screw below to let the lever hang naturally.
- Step 3. Remove the filament cutter and insert a new one.
- Step 4. Hold the lever, insert the blade into the slot on the side of the extruder, and tighten the screw.
- Step 5. Snap the toolhead front cover back into place.

⚠ CAUTION

After installation, ensure the filament cutter is not loose and can cut normally with the lever movement.

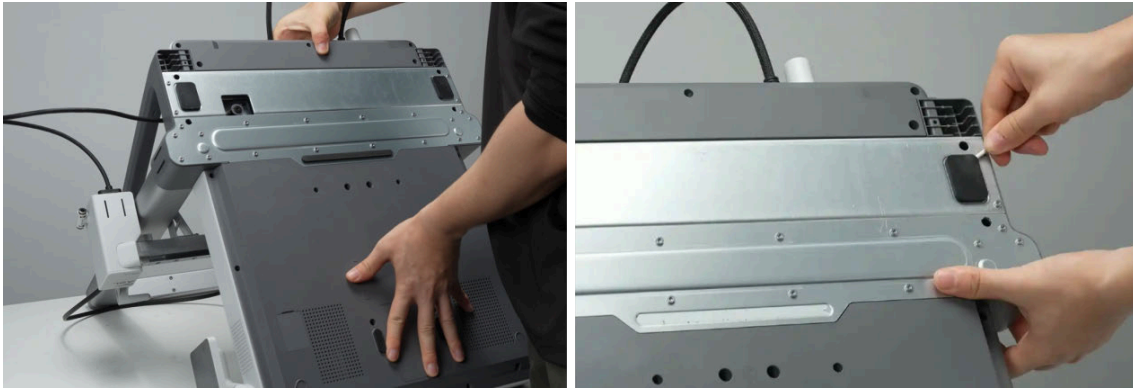
11.2.4 Supportive Footpad

Tools and accessories: Replacement supportive footpads, tweezers, alcohol, non-woven cloth or cleaning cloth.

Supportive footpads reduce printer shaking during printer operation and enhance device placement stability. Replace them when they are deformed, detached, or lost, or if you need to improve the device's anti-slip performance on a desktop.

⚠ CAUTION

Before replacing the supportive footpads, turn off the printer power and disconnect the power cable. When moving or flipping the printer, hold the body securely to prevent the device from slipping or colliding.



- Step 1. Move the printer to a flat, stable surface, lower the Z-Axis, and then flip the printer over.
- Step 2. Remove the old supportive footpads from the bottom of the printer and clean off any adhesive residue.
- Step 3. Align the replacement supportive footpads with the installation positions, attach them, and press firmly to secure them.

 NOTE

The printer's main support is provided by the hard supportive footpads. It is normal for some soft supportive footpads to be slightly suspended. As long as the main hard supportive footpads make stable contact with the surface, this generally will not affect print quality.

Enjoy!

The manual is subject to change without notice.
Visit the Bambu Lab website for a latest version.



bambulab.com/support/documentation