闪铸科技
FLASHFORGE

Chanel letter 3D printer 广告字3D打印机

| SZ21-CN/EN-A01 | Flashforge AD1 |

用户使用说明书
USER GUIDE

Note: Please read this User Guide carefully before operating the product.Please keep this Guide properly for future reference.
注意：使用本产品时，请您先仔细阅读本产品使用说明书，再正确操作。请妥善保管本手册，以便日后查阅。

中文P55

This guide is only applicable to FLASHFORGE AD1 Series 3D printer
本手册仅适用于闪铸科技 AD1 系列3D打印机

Content | 目录

Foreword

Note: **Each 3D printer has passed the printing test before leaving the factory. It is normal if there is residual material in the extruder or slight scratch on the printing platform and does not affect the use.**

Dear Flashforge User,

Thank you for choosing and using the products of Flashforge Technology. Thank you for your support and help to Flashforge Technology.

The products of Flashforge Technology have excellent quality and performance. For your convenience, please read this Guide carefully before use and follow the instructions strictly. The Flashforge team is always ready to provide you with the perfect service. In case of any problems during the use, please contact us by phone or email listed in this Guide.

In order to better experience our products, you can also get operation knowledge of the equipment from the following ways:

· **Flashforge Chinese official website:**
Flashforge official website: www.sz3dp.com
You can visit the official website of Flashforge to find information on software and hardware, contact, equipment operation and maintenance.

Safety Instructions

Please read the following safety prompts carefully

Safety of Work Environment

◆ Please ensure that the work table of the printer is clean and tidy.
◆ Please keep the printer away from flammable gases, liquids and dust. (The high temperature generated by the operation of the equipment may react with dust, liquid or flammable gases in the air to cause a fire)
◆ Children and untrained personnel should not operate the equipment alone.

Safety of Electric Operation

◆ Be sure to ground the equipment; do not modify the plug. (Ungrounded/not properly grounded /modified plug will increase leakage risk inevitably)
◆ Do not expose the equipment to moisture or hot weather. (Damp environment increases the risk of leakage/exposure will accelerate the aging of plastic parts)
◆ Do not abuse the power cord; be sure to use the power cord provided by Flashforge Technology.
◆ Never use the equipment during thunderstorms.
◆ If the equipment won't be used for a long time, turn off the power and unplug the power cord.
◆ Be sure to turn off the power before disassembling the extruder or other parts.

Safety of Personal Operation

◆ Do not touch the extruder or platform while the equipment is running in order to avoid high temperature burns or mechanical collisions
◆ Do not touch the heating part when printing is complete in order to avoid high temperature burns.
◆ When operating, do not wear objects that are easily caught in the equipment, such as scarves, masks, gloves and jewelry.
◆ Do not operate the equipment after drinking or taking medicine.

Equipment Operation Tips

- Do not left the running equipment unattended for a long time.
- Do not modify the equipment.
- Operate the equipment in a ventilated environment.
- Do not use this equipment for illegal activities.
- Do not use this equipment to make food storage products.
- Do not use this equipment to make electrical products.
- Do not put the printing model into your mouth.
- Do not use brute force to remove the printing model.
- Do not connect the equipment with a network cable longer than 3m.
  If the equipment is not in use, please remove the supplies in the extruder.
  If the equipment is not used for a long time, use a dust cloth to cover it.
  When the adhesion of the blue textured paper becomes weaker on the shell, replace the paper.

Requirements for Equipment Operating Environment

- Temperature: 15-30℃
- Relative humidity: 20% -70%

Equipment Maintenance

- Abnormal noise may occur if the equipment is used for a long time. Please apply lubricant on the rails and the screw regularly. It is recommended to apply once every two weeks.

Equipment Placement Requirements

- The equipment needs to be placed in a dry, ventilated environment. The left and rear sides must have a space at least 20cm, the front side must have a space at least 35cm, and the right side must have a space at least 40cm.

Requirements for Equipment Compatible Supplies

- When operating the equipment, only use supplies supplied or specified by Flashforge. Third-party supplies may cause extruder blockage and damage.

Supplies Storage Requirements

- Do not unpack the supplies unless needed. Keep the storage environment dry and free of dust after unpacking.

Legally Prohibited Items

- Do not copy or print any items that are prohibited from being copied by law.
- Copy copyrighted works. Some copyrighted works can be partially copied for "fair use". Multiple copies will be considered as improper. A work of art is equivalent to
- copyrighted work.
  The above list is for reference only and does not include all content. We are not responsible for its completeness and accuracy. If you have questions about the legality of copying or printing certain items, please consult your legal counsel.

Legal Statement

- The user is not authorized to make any changes to this Guide.
- Flashforge Technology is not responsible for any safety incidents caused by the customer disassembling or modifying the equipment without permission. Without the permission of Flashforge Technology, it is prohibited to modify or translate this Guide.
- This Guide is copyrighted and Flashforge Technology reserves the right of final interpretation.

1 Equipment Introduction

Overview

3D printing technology is the technology that transforms 3D models into physical objects. The most common 3D printing technology is called FFF (Fused Filament Fabrication), which is also the application technology of AD1 Ad words printer. Its working mode is to melt the filament-shaped supplies by high temperature, cool down and solidify the supplies, and stack them layer by layer to form 3D articles.

Printing Steps

3D printing has three steps, which are acquiring model, processing model, and printing model. Select a text or pattern file of the design software, import to the FlashAD software, slice the file and send it to the printer via USB flash drive or Wi-Fi, and then start printing. Flashforge AD1 is 3D printing equipment for making luminous character shell and it can effectively improve the production efficiency of luminous characters and reduce the labor. FlashAD software is used on Flashforge advertising machine. It has three functions, i.e. generating 3D models, exporting contour lines and generating slice files, and is used to produce Ad words.

PLA supplies (for indoor use) and advertising supplies (for outdoor use) required for the production of the luminous character shells are provided.

Steps for the production of Ad words:

1. Generate a 3D model;
2. Export the contour line;
3. Generate a slice file of the 3D model and print the model;
4. Cut the acrylic sheet according to the contour line;
5. Assemble the model and acrylic sheet.

You can use the design software such as CorelDRAW to design the font or pattern and save the font or pattern file in cdr format. The AD1 advertising machine supports stl, cdr and nc formats. More formats will be supported after subsequent software and firmware upgrades.

CDR Software design > **FlashAD Software switch** > **AD1 Equipment printing**

1.1 Equipment Introduction

1.1.1 Equipment View

Filament spool

Fliament hole

Spool holder

Mounting bracket

Y-axis linkage

Y-axis guide

X-axis guide

Z-axis sensor

Teflon tube connector

Heat sinks

Cooling fan

Heating block

Nozzle

Z-axis motor

Filament detection sensor

Mounting hole

Decorating part

Filament feeding motor

X-axis motor
X-axis sensor

Drag chain

Y-axis sensor

Power switch

Ethernet port
Touch screen

Printing platform

Extruder cover

Support bracket

0.5m

0.5m

The distance of device placement spacing at least 0.5 m.

Printing platform	The part used to build a solid model.
Platform sticker	The Flashforge print sticker can be attached to the printing platform to better attach the printing model to the platform. When the platform sticker starts to affect the printing effect, please replace it in time, i.e. the attached textured paper.
Printing volume	The printing volume refers to the length *width* height of the build model. The maximum printing volume of AD1 Ad word 3D printer is 600*600*70mm. You can't directly build models that exceed this parameter.
Leveling nut	The 8 leveling nuts under the platform bracket are used to adjust the spacing between the printing platform and the nozzle.
Extruder	Feeding the filament heated and then extruded from the nozzle.
Nozzle	The lowermost brass-colored metal structure constituting the extruder; the supplies heated by the extruder are extruded here.
Cooling fan	The cooling fan is used to reduce the temperature of the extruder and accelerate the solidification of the supplies.
Filament hole	The hole for the supplies to enter the extruder; located at the top of the extruder.
Mounting bracket	The device for placing supplies; located on the back of the printer.
Filament guide tube	The supplies are fed into the white Teflon tubefrom the filament box.
Nozzle cleaner	Used to clear the residual supplies in the nozzle.

1.1.3 Equipment Parameters

Function/Specification	Parameters	Function/Specification	Parameters
Printer type	FDM	Printing accuracy	±0.5mm or 0.2%
Language	Chinese, English, Japanese	Layer thickness	0.1~0.4mm
Molding size	600*600*70mm		
Rated voltage	AD1-220V AD1-110V	Compatible format	Gfz, Stl, Nc, Cdr
Power	AD1-220V-1500W AD1-110V-1000W	Operating temperature	15~30℃
Printing speed	≤150mm/s	Slicing software	FlashAD
Idle speed	≤200mm/s	Display size	4.5 inches
Extruder temperature	≤260℃	Printing platform	Aluminum plate/glass plate (Flashforge does not provide glass plate.)
Build plate temperature	≤100℃, by 4 areas		
Filament	Advertising supplies; Advertising PLA supplies;	Leveling mode	Manual adjustment, 8 points
Machine size	1070*975*485mm	Resume print	Yes
Packing size	1170*1140*610mm		
Net weight	50.2kg	USB flash drive	Yes
Gross weight	76kg		
Extruder structure	Dual feeding, single nozzle	Filament detection function	Yes
Nozzle diameter	0.6mm	Ethernet	Yes
Filament diameter	1.75mm	Cloud platform	Yes

Power cable
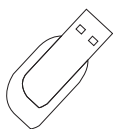
USB flash drive
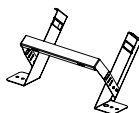
Mounting bracket
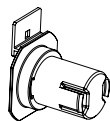
Spool holder *2

Tube connector
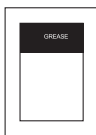
Grease*3

After-sales Service Card

Quick Start Guide

Stamping wrench*3
8mm/13mm

Allen wrench*3
1.2mm/2.5mm/5mm

Screw driver
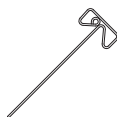
Nozzle cleaner
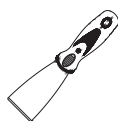
Scraper
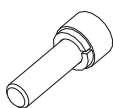
M3 hexagon socket
screw and washer*4
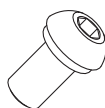
M8 hexagon
screw*4
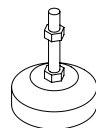
Support bracket*4
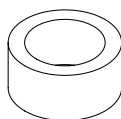
Textured paper
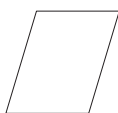
Leveling paper
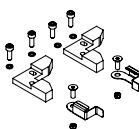
Mounting glass kit
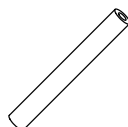
PTFE tube*4
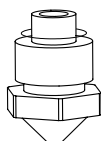
Nozzle

1.Mounting support

1.Lift the equipment to the shelf or table before installation; reserve a corner before installing the support.
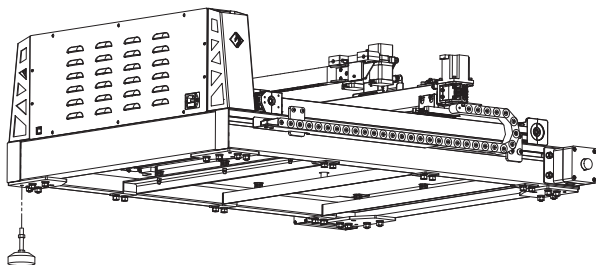
2.Rotate the support clockwise to the bottom. Install the 4 supports in sequence.
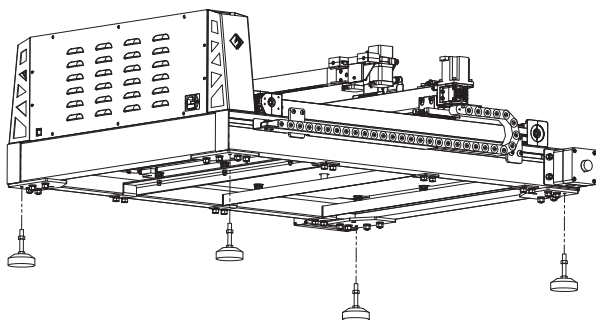
3.Shake the equipment by hand to check whether it shakes, and adjust the height of the supports to make the 3D printer stand smoothly.

2.Install the mounting bracket
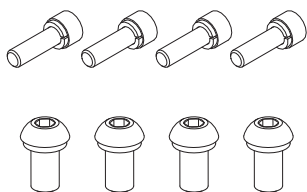
1.Remove the four M3 screws and the spring washers; remove the four M8 flat-head screws and the spring washers; remove the parts of the tray bracket and install the left and right sheet metal brackets onto the equipment.
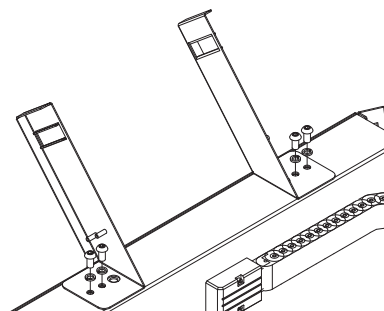
2.Use an Allen key to attach the left and right sheet metal brackets to the equipment with four M8 screws.
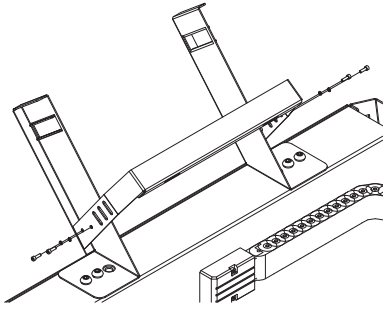
3.Use an Allen key to secure the U-shaped sheet metal bracket to the left and right brackets with 4 M3 screws.
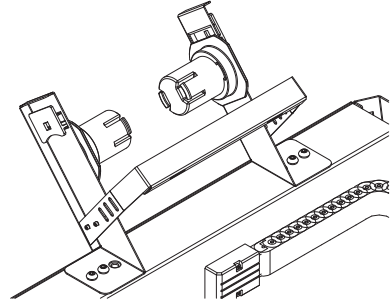
4.Place the two black tray shafts on the left and right sheet metal brackets.
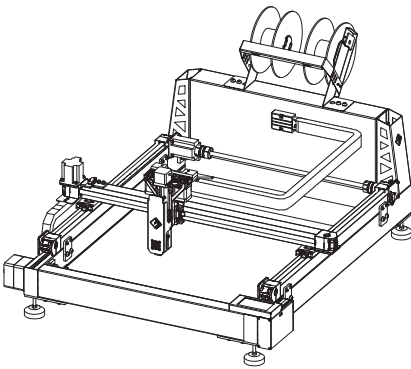
5.The tray rack and the bracket after assembly are shown in the figure.
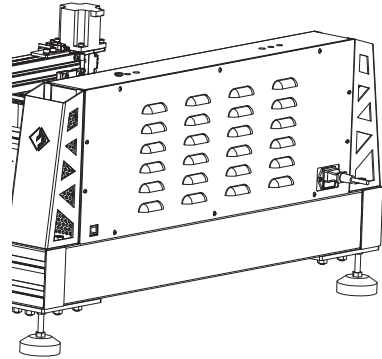
6.Connect the 3D printer to the 220V power through the power cord.
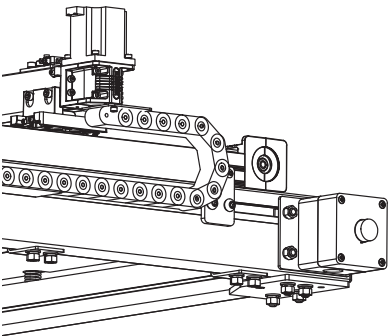
7.Press the switch button to start the equipment.

1.4 Equipment Settings

After the equipment is installed, you need to perform a series of settings before printing.

1.4.1 Extruder calibration

Before the calibration, it is necessary to confirm whether the motion state of the equipment is normal.
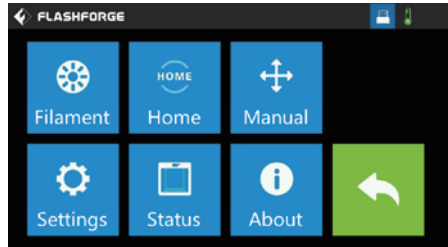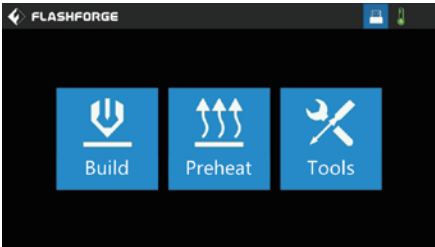
1. Click Tools - Home. At this moment, you can check whether the basic status of the equipment is normal. The equipment will automatically run to the home position.
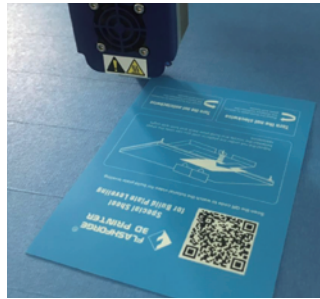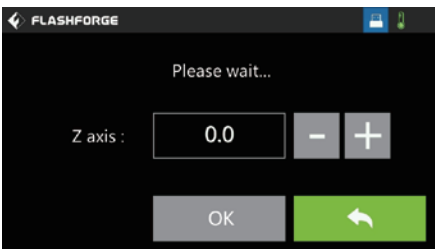

2.Click Tools - Settings - Extruder Calibration. When the extruder drops to the platform, insert the leveling paper between the nozzle and the platform. Click the plus and minus signs on the screen to calibrate the distance between the nozzle and the platform. Click the plus sign to raise the extruder, and click the minus sign to lower the extruder. The nozzle and the platform are in the proper position if the movement of the leveling paper is frictional. Click the OK button.
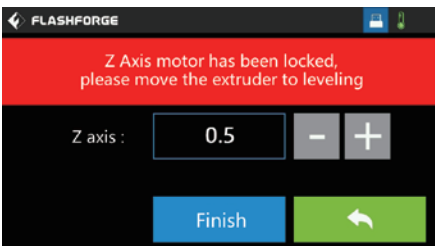

3.After clicking the OK button, the display will show that the Z-axis motor is locked. Do not click the Finish button at this moment. Once this state occurs, level the platform with the leveling tool. (For details, see the leveling operation video)
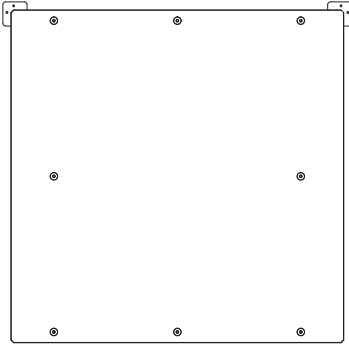
4.The platform has 8 leveling points in total. Manually slide the extruder to the positions of 8 points as shown in the figure (except for the middle position, which is the leveling reference point). Insert the leveling paper at each point in turn, and use the stamping wrench at the bottom nut to adjust the height of the platform to make the nozzle just in contact with the platform.
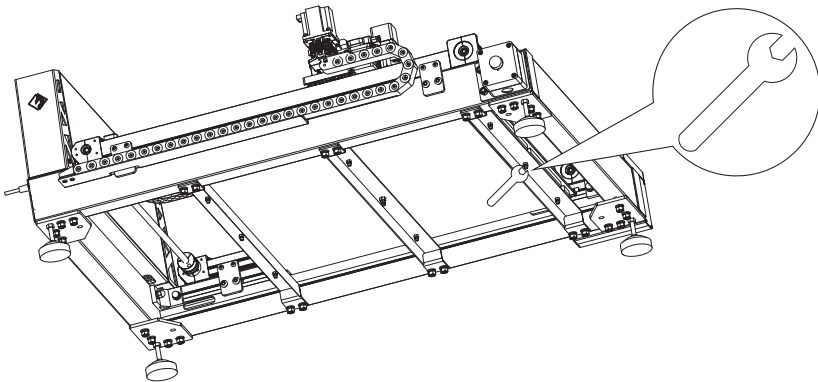

5.Take out the triangle stamping wrench from the accessory and insert it into the bottom leveling point.
Turn the stamping wrench clockwise to lower the platform and increase the clearance.
Turn the stamping wrench counterclockwise to raise the platform and decrease the clearance.
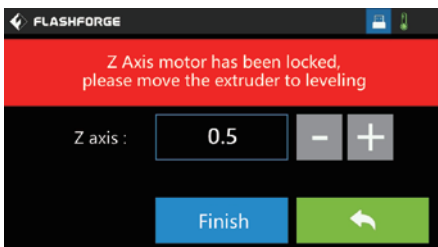
6.When the leveling is complete, click the Finish button on the screen. The extruder will rise.(For details, see the leveling operation video)
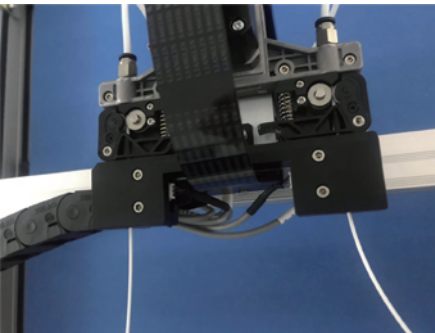
Load the filament into the spool holder on the left and right side respectively, pass the filament holes through the left and right filament detecting switches respectively, and then thread into the filament feeding motor until the filament reaches the nozzle.
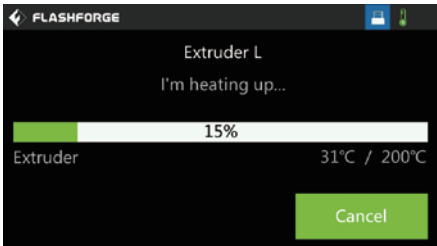
⚠ **Note: Be sure to put the left and right filament into the nozzle, or else there is a risk of blocking or abnormal extrusion.**
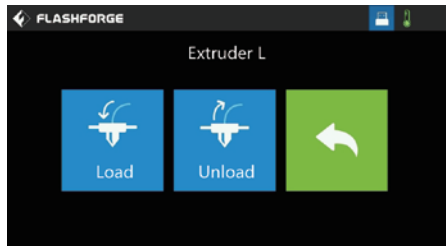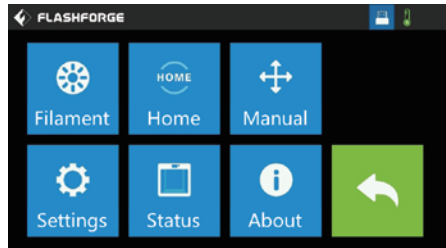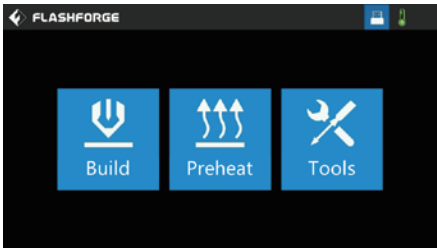
1.Click on the screen - Tools - Extruder L or Extruder R - Load.

2.After clicking, the extruder will heat up. Do not touch the lower part of the nozzle in order to avoid burns.

The left filament and the right filament need to be fed separately, and the extrusion length of left and right extruder is about 100 mm.

⚠️ **Note: When you need to print one color only, also feed the filament in the nozzle. You can set to print only one kind of supplies in the software.**
If there is a vacancy in the left and right nozzle, it may cause nozzle blockage or printing defect.
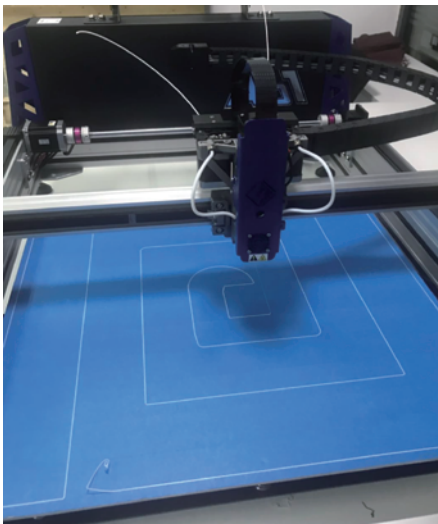
Method for verifying extruder calibration and platform flatness:
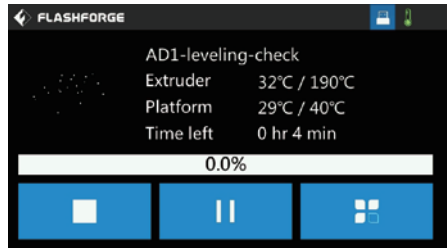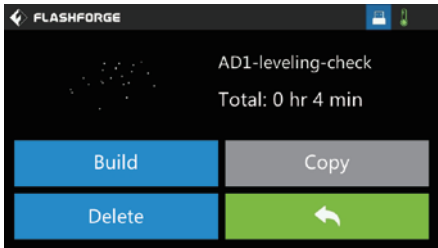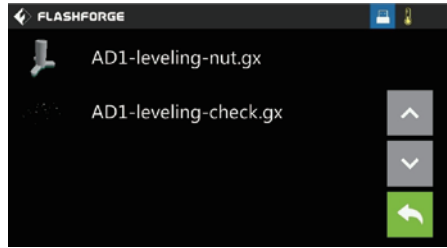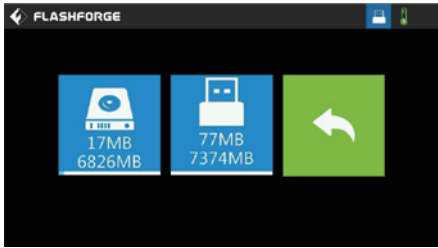
1.Click Print - Select File AD1- leaving-check.gx file.
(This step is only for inspection and not required)

2.The equipment starts to print the pattern. If the pattern adheres to the platform and isn't loose or uplifted, the platform flatness is good.

⭐ **Special Note:**

1. Since glass plate is easy to break and Flashforge does not sell glass plate, you can purchase 620*620*5mm glass for printing in local market. When making super word, some users may need glass curing. Flashforge recommends 5mm non-tempered glass;
2.Be sure to calibrate the extruder before installing the glass plate to prevent the nozzle from bumping against the glass.

Calibration method:

According to the glass thickness H, set the Z-axis coordinate to H+1MM; for example, the glass is 5mm thick, set the Z-axis coordinate value to 6mm.
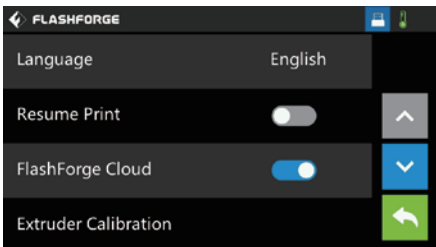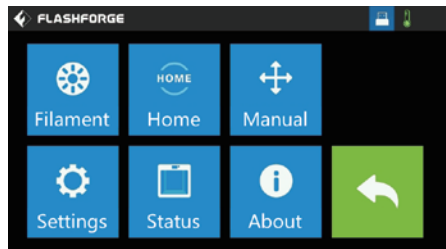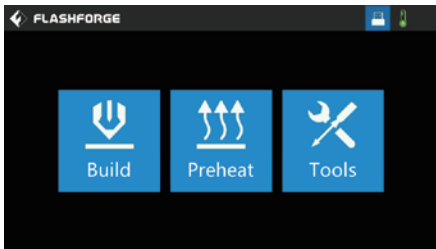
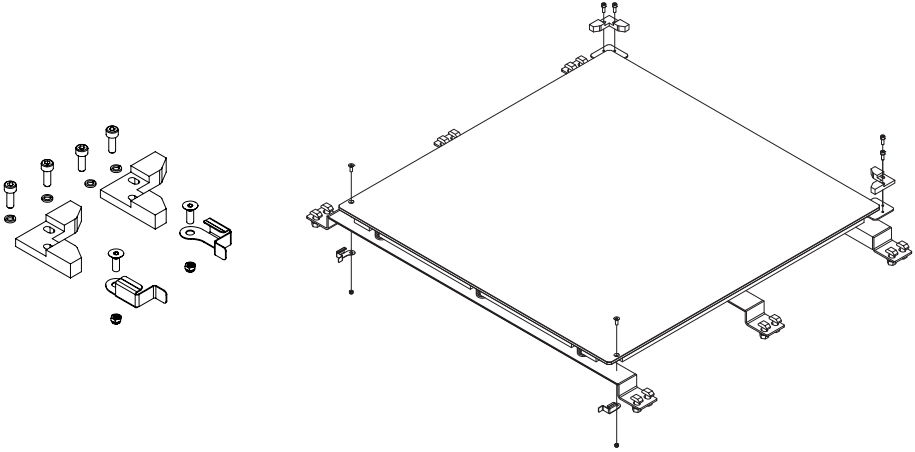1.Click Tools - Settings - extruder Calibration
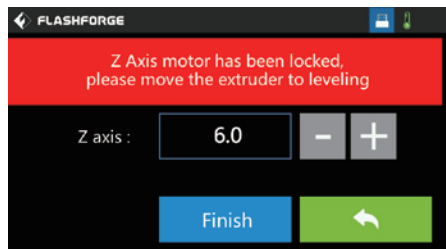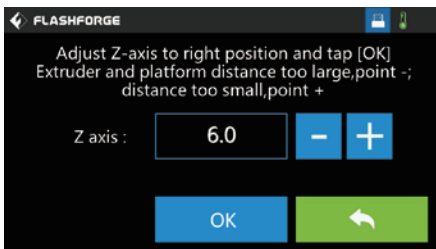
2.When the Z-axis value is set to 6, click "OK" and the Z-axis motor is locked. No other operations are required. Click Finish directly.

**The glass installation method is as shown below:**

Take out the options for glass mounting. If the textured paper on the platform aluminum plate is damaged before installation, please remove it.

1. Remove the textured paper from the edge of the original aluminum plate, pass the M4 countersunk screw through the aluminum plate and lock the metal clip under the aluminum plate with M4 lock nut.
2. Fix the right angle fixing block to the base block behind the aluminum plate with the M4 cylindrical head screw.
3. Place the glass plate over the aluminum plate and hold it with a metal clip.
4. After the glass plate installation is completed, perform a normal alignment of the platform surface and the nozzle. It can be printed normally after calibration.
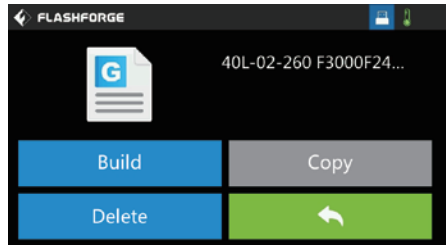
1.5 Equipment Interface

1.5.1 Printing
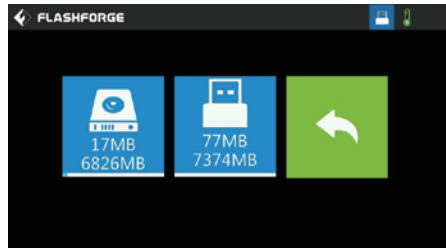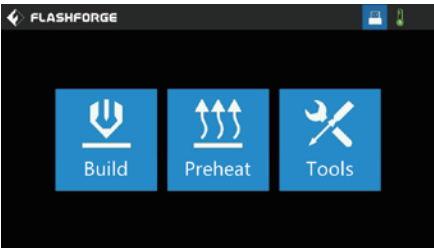
Click the Print button and choose the path to read the print file:
1. Read from the printer's memory card;
2. Read the print file from the external USB flash drive;
3. Back: Return to the previous interface.

Select the print file in the file list:
1. **Print:** Start printing;
2. **Copy:** Copy the files from the USB flash drive to the printer's local memory card (this function is not available when the local memory card is selected);
3. **Delete:** Delete this print file;
4. **Back:** Return to the previous interface.
5. **Green files in the list:** The files have been opened.
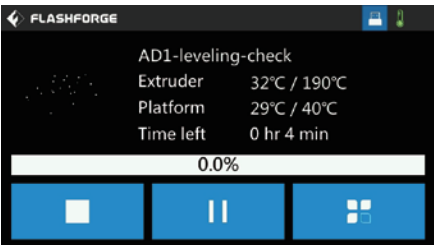
Cancel: Cancel this print task;
Pause/Start: Pause/start printing;
Tools: Real-time query or change during printing: bottom plate temperature, print time, Z-axis coordinate, filament usage, print speed, filament change settings.
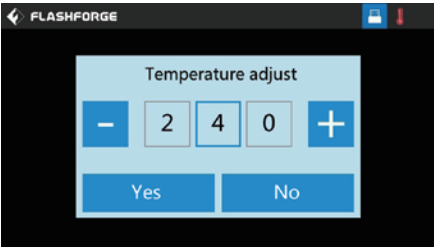
Temperature adjust: When the nozzle temperature in the page is underlined, click to change the nozzle temperature.
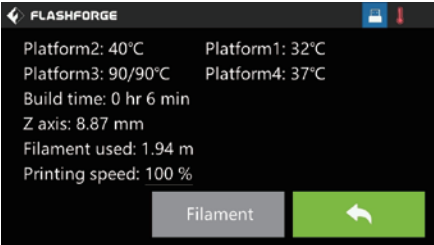
Printing speed: Can be modified during printing;
Filament: Click the Filament button when you need to change the filament in the process of printing (this function is available when printing pauses);
**Back:** Cancel the tool command and return to the print interface.
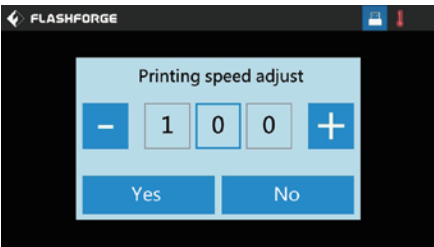
Printing speed adjust:
After starting to print, click the print speed value to modify the single digit, tens digit and hundreds digit of the print speed value respectively, click Yes to save the setting; click No to cancel the setting.
The quality of the shell is closely related to the print speed. The shell needs time to cool down. If the speed is too fast and the cooling is insufficient, the shell model will collapse and affect the quality.
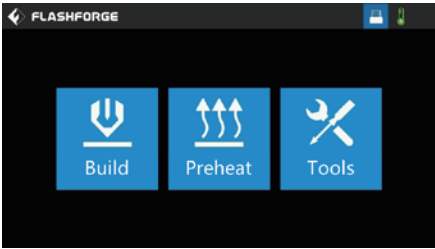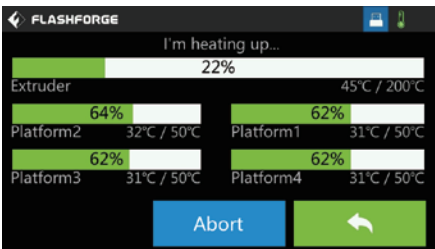
Click the Preheat icon to enter the heating interface:

1. **On/Off:** Turn on/off the heating function for extruder or platform;
2. **Temperature value:** Click this icon to set the temperature;
3. **Start:** Click the Start icon and the extruder starts to heating up;
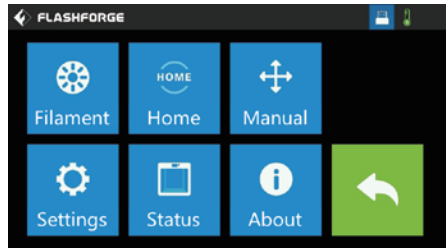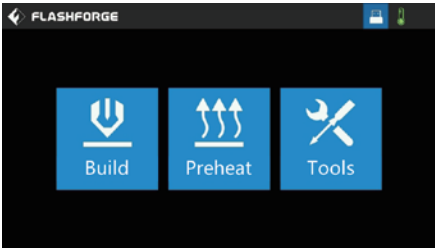4. **Back:** Return to the previous interface.
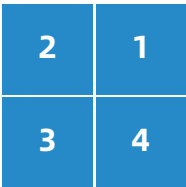
There are four heating zones of buildplate,corresponding devices of bottom plate 1, 2, 3, 4 are shown below (the screen is close to the bottom plate 4) . Default print zone is No.1


Heating interface:

1. **Actual temperature/target temperature value;**
2. **Abort:** Suspend warm-up;
3. **Back:** Return to the previous interface.

Click the Tools icon to enter the Tools interface:

1. **Filament:** Filament load or unload;
2. **Home:** Return the printer X/Y/Z axis to the mechanical home;
3. **Manual:** Manually adjust the position of the X/Y/Z axis;
4. **Settings:** Make related function settings for the printer;
5. **Status:** View the real-time status of the printer;
6. **About:** View the version information of the printer;
7. **Back:** Return to the previous interface.
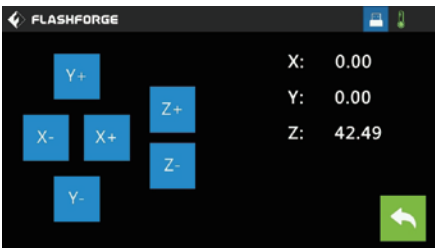
Click the manual adjustment icon to enter the manual adjustment mode:

1. **Y+:** The extruder moves in the positive direction of the Y axis, that is, backward;
2. **Y-:** The extruder moves in the negative direction of the Y axis, that is, forward;
3. **X-:** The extruder moves in the positive direction of the X axis, that is, to the left;
4. **X+:** The extruder moves to the negative direction of the X axis, that is, to the right;
5. **Z+:** The platform moves up;
6. **Z-:** The platform moves down;
7. **Back:** Return to the previous interface.
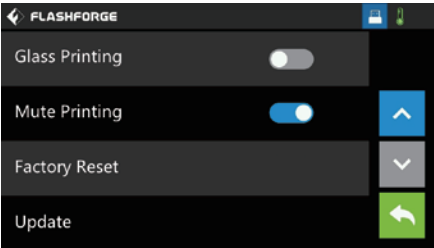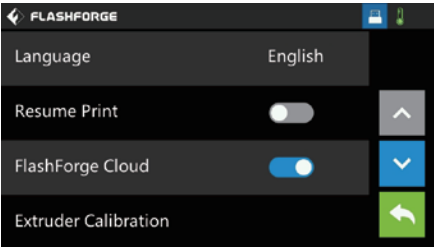
Click the Settings icon to enter the settings interface:

1. **Language:** set the printer display language;

2. **Resume Print:** Set whether to continue unfinished file when the printer is lose the power, it will recovery print when the power back, the default option is ON;;

3. **Flashforge Cloud:** Turn off/on the Flashforge Cloud printing function;

4. **Extruder calibration:** Calibrate the initial distance between the extruder and the platform;

5. **Heat Preservation:** The platform is still in heat preservation after printing, user can set the time to continue heating.;

6. **Z Offset:** Extended function of extruder calibration. After leveling, if the extruder is slightly higher or lower than the platform when printing the shell, please use this function to fine-tune the gap between the extruder and the platform by inputting the value directly. It is not recommended to adjust if you are unfamiliar with the equipment.

7. **Startup Sound:** Turn on/off the boot sound;

8. **Filament Check:** Turn on/off the Filament Check function;
When this function is turned on, if no filament is detected or the filament is used up, printing will pause automatically.

9. **Glass Printing:** After turning on the Glass Printing mode, the platform is no longer heated by areas. The four areas are heated at the same time to prevent the glass from being broken due to uneven heating;

10. **Mute Printing:** Turn on/off the Mute Printing function;

11. **Factory Reset:** Restore the factory settings;

12. **Update:** Upgrade to the latest firmware. If the equipment is connected to a wired network, you can click to upgrade online.
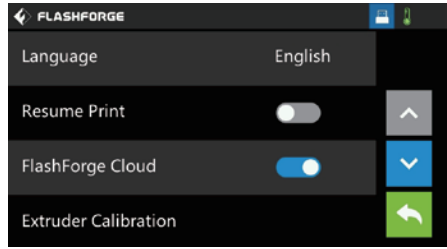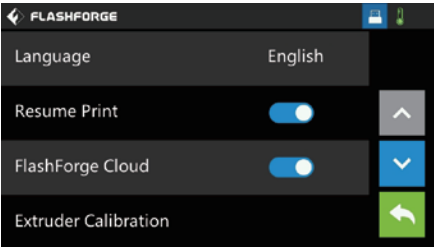
Turn on [Resume Print]

At this moment, the uninterrupted printing function is turned on. If the printer is turned off before the printing completes, the printer continues to print the unfinished model when the printer is turned on again.

Turn off [Resume Print]

At this moment, the uninterrupted printing function is turned off. If the printer is turned off before the printing completes, the printer will not continue to print the unfinished model when the printer is turned on again.
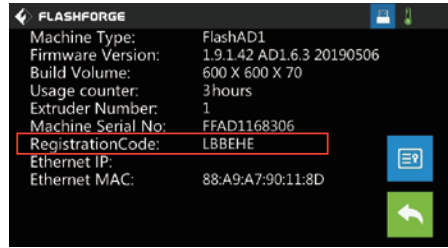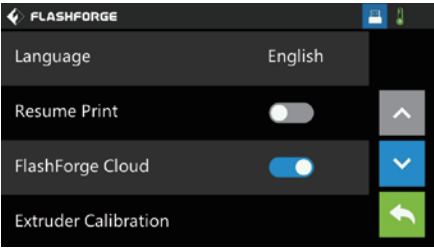
Flashforge Cloud connection

1. Turn on/off [Flashforge Cloud]

2. Find the registration code of the machine on the [Settings]-[About] page.

3. Open the Flashforge Cloud (cloud.sz3dp.com), click [Add Printer], enter the printer registration code in the pop-up window, and associate the equipment with the cloud platform. For details on how to connect the Flashforge Cloud, see the next chapter about printing.
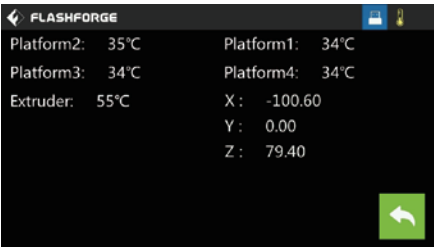
Status

Click the Status button to view the temperature of current nozzle and the current coordinate value of the nozzle.
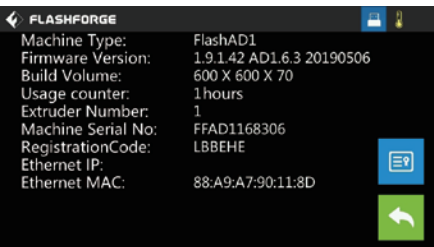
About

Display the basic information of the equipment. The details of the information are subject to the actual display.

You can view the firmware version; the print size; the cumulative print duration.

Ethernet IP address: When connecting to the Internet cable, the Ethernet IP address and Ethernet MAC address will be displayed here.

Note: When applying for after-sales service, please present the serial number in [About] to the after-sales engineer.

⚠️   **Note: The firmware is updated regularly, and the interfaces may differ.**

2 Printing

2.1 Printing Software

FlashAD software is used on Flashforge AD1 machine. It has three functions, i.e. generating 3D models, exporting contour lines and generating slice files, and is used to produce Ad words.

Steps for the production of Ad words:

1. Generate a 3D model;
2. Export the contour line;
3. Generate a slice file of the 3D model and print the model;
4. Cut the acrylic sheet according to the contour line;
5. Assemble the model and acrylic sheet.

When printing with the AD1 light-emitting shell 3D printer, it is necessary to use the luminous character slice software to produce the character shell file, and convert the character shell or graphic design file into a file identifiable by the 3D printer.

2.1.1 Obtaining Software

To get the software:

Copy the FlashAD software from the provided **USB flash drive** or download the latest version of the software from **www.sz3dp.com**.

Open the FlashAD software, click the Login button in the upper right corner, click to register a cloud account, and redirect to the cloud platform page to register, or directly log in to https://cloud.sz3dp.com to register a Flashforge cloud account.
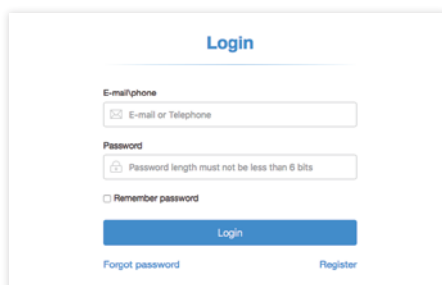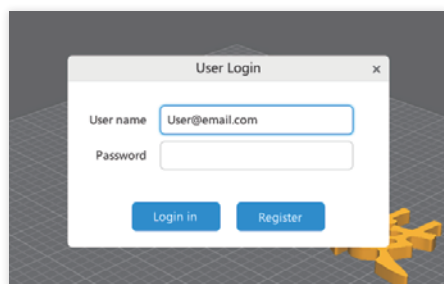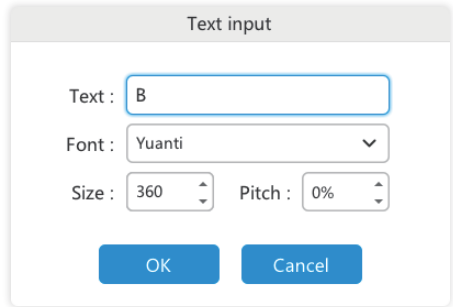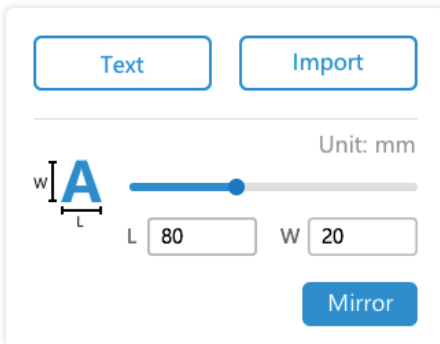
2.2 Obtaining the Shell File

FlashAD can directly generate text and the software has text input function; after clicking, input the desired text in the dialog box and select the desired font.

Here is an example of generating text with software.
· Export vector design drawing in cdr format from software such as CorelDRAW, and import the file into FlashAD.
· Click the text button, enter the word "B", and customize the font and size.
(the font size is more intuitive for cdr file)

<table>
<tr><td>Text</td><td>Import</td></tr>
<tr><td colspan="2">Unit: mm</td></tr>
<tr><td>W A L</td><td>L 80 W 20</td></tr>
<tr><td></td><td>Mirror</td></tr>
</table>

Text input

Text : B
Font : Yuanti
Size : 360   Pitch : 0%

OK   Cancel

2.3.1 Typesetting

Text	Import

Unit: mm

W A L

L 80   W 20

Mirror

Top ☐ 🏳️ 🏳️
☐ 🏳️
☐ 🏳️
☐ 🏳️

Bottom ☐ 🏳️
☐ 🏳️
☐ 🏳️
☐ 🏳️

🖨️ 0.8   ⬭ 1.0   🌈
◁ 20   ⬭ 3.0
🔺 10° X 0.8 ☐ Inversion
⬡ 30° X 2

Create 3D Model

Outline
Print

W A L Display the size of the shell, and drag to change the size.

Top/Bottom: Different types of characters appear after setting.

🌈 Set the color of the shell layer. If only one color is set, the default is to print with the filament in the right tray.

🖨️ The default is 0.8mm; this parameter does not need to be set.

⬭ The thickness of the printed shell. The default is 1mm. The higher the value, the thicker the shell is.

◁ The overall height of the printed shell. The default is 20mm. The higher the value, the higher the shell is. The maximum height supported is 70mm.

⬭ It meas the epitaxial distance of top side.It meas arc word, user can set the round size, the x represents the vertical distance of bottom side(same as top side)

🔺 The tilt angle of the printed shell during straight edge print. If the font size is small, the tilt angle should be set small, or lese it will be easy to fail. X represents the the vertical distance from the bottom.

⬡ It meas arc word, user can set the round size, the x represents the vertical distance of bottom

After a series of required settings, click the Generate 3D Model button and the text will be converted from 2D to 3D.

⚠️ **Note:**

1. When Reverse and Mirror are selected at the same time, the model is inverted.
2. When the shell is set to the lower straight edge and the upper oblique bevel, click the Invert and Mirror button, and the set step will be invalid.
3. When adding the bottom width and setting inverted mirror, the bottom widened portion of the shell model will be displayed on the upper surface of the shell after printing.
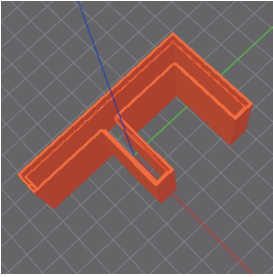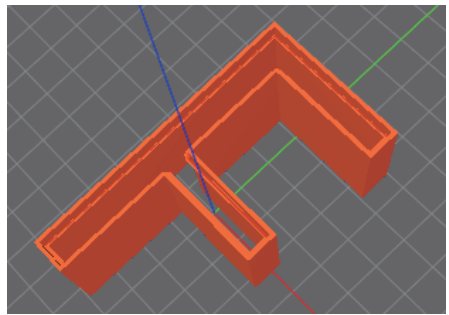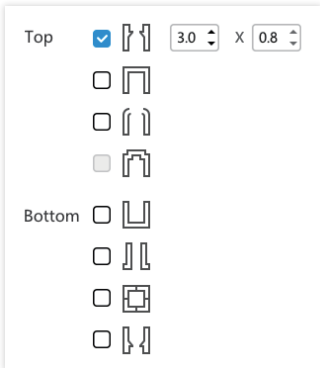
Tilt effect
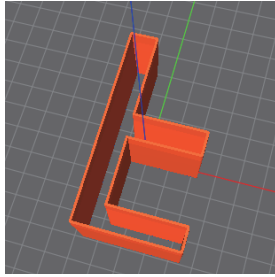
Mirror and invert effect
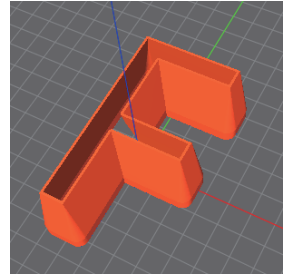
Straight edge + bevel effect after X value is set
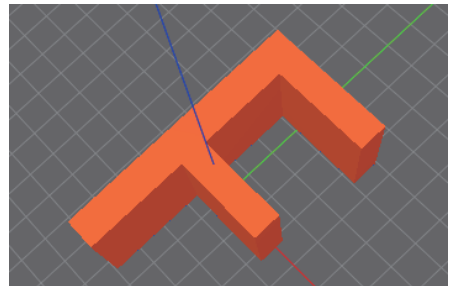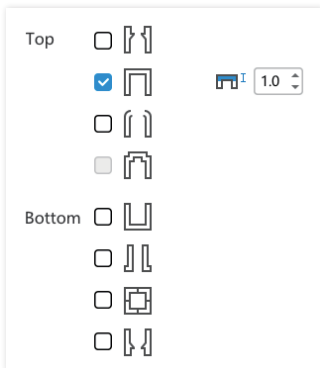
Select Step for the top surface to set the height from the step to the top surface and the width required for the step.
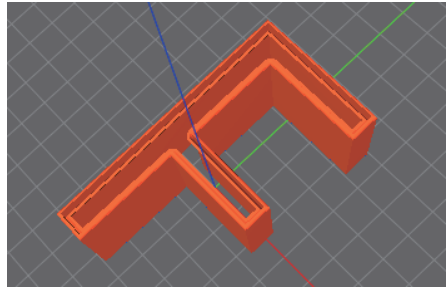

Top step effect

Select Close for the top surface, and the top of the shell will be closed.

Top closure effect

31

Select Chamfer for the top surface, and the curvature of the top surface will form a chamfer. The chamfer size is customized.

Top chamfering effect
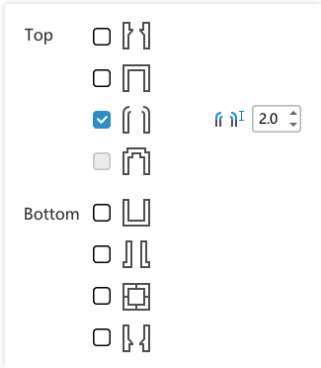
Select Close for the bottom surface, and the bottom of the shell will be closed.

Bottom closure effect
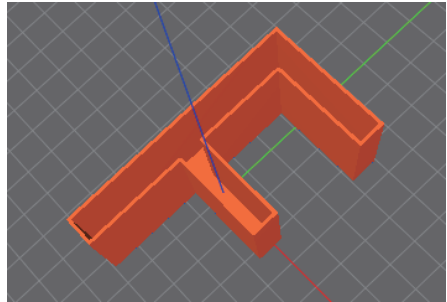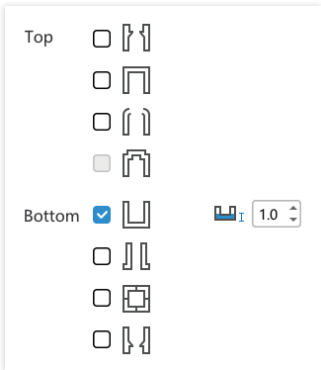
Select Widen for the bottom surface, the bottom will have an outer edge, which depends on the setting.
Recommended extension is 1mm, which will facilitate the adhesion of the shell to the platform.

Bottom widening effect
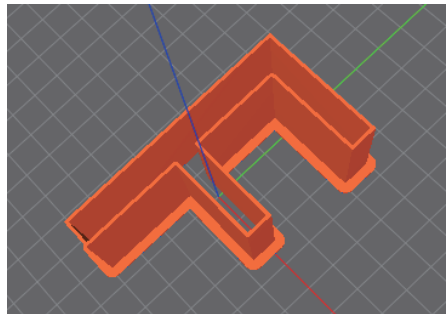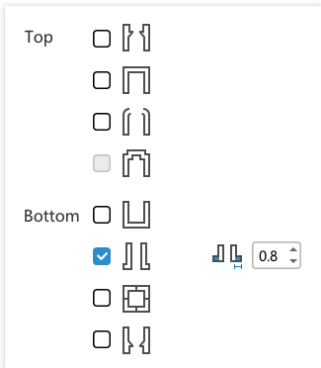
Select Bracket for the bottom surface and there will be a bracket between the shells, which is conducive to the shell adhesion.
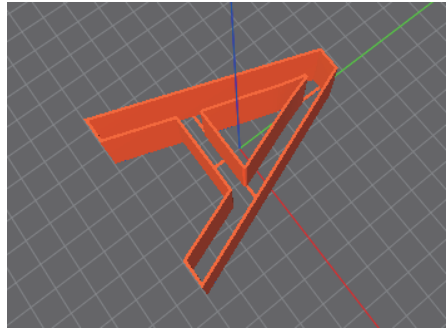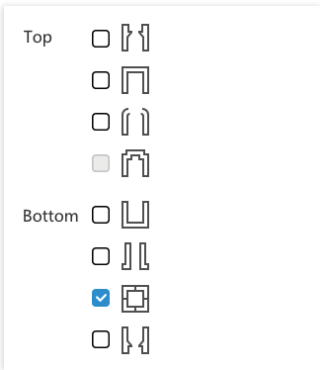
Bottom bracket effect

Select Step for the bottom surface to set the height from the step to the bottom surface and the width required for the step.

Bottom step effect

Click this button to set the color of the shell layer.
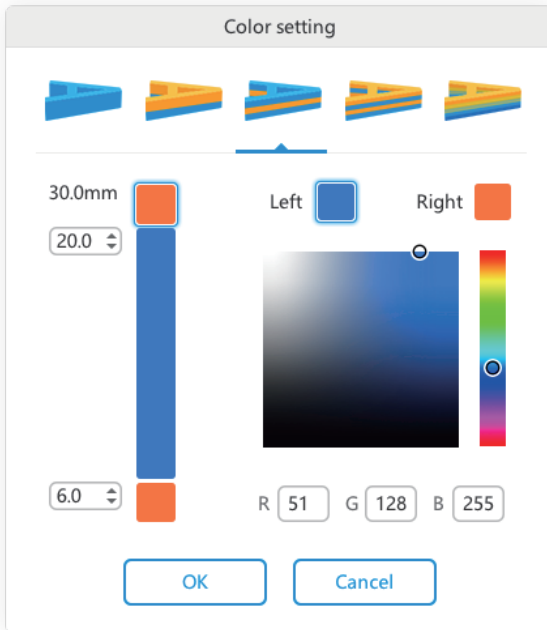
Represent:
Monochrome printing
Two-color printing
Two-color interlacing
Two-color cycle interlacing
Two-color free cycle interlacing

Take the three-layer color separation printing as an example: set the first layer to orange (indicating that the first layer is printed with the right extruder; orange here is only used to distinguish the left and right extruder, and does not necessarily represent the true color). If the total height i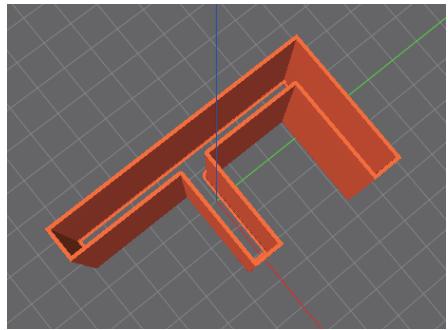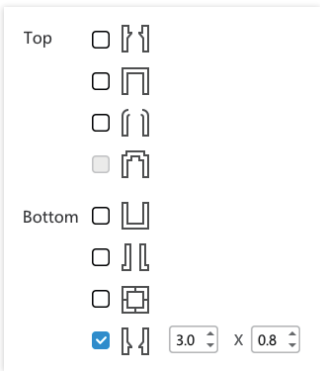s set to 30, the lower color can be set in the box. The number in the middle color box is the height of the first color separation plus the second color separation; the top color is the same as the color of the first color separation; the left and right extruder can be switched by clicking the color block.

For example: the total height of the model is 30mm, the first color separation setting is 6mm, and the second color separation setting is 20mm, indicating that the first color separation height is 6mm, the second color separation height is 14mm, and the third color separation height is 10mm;
Other layering principles are similar.
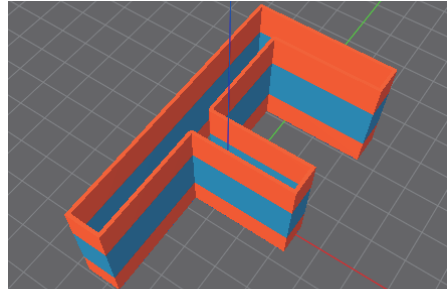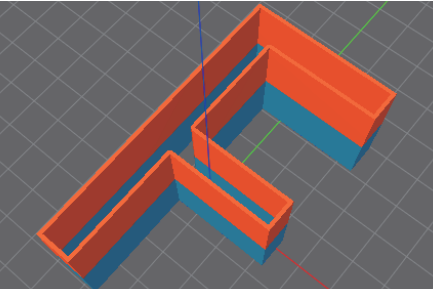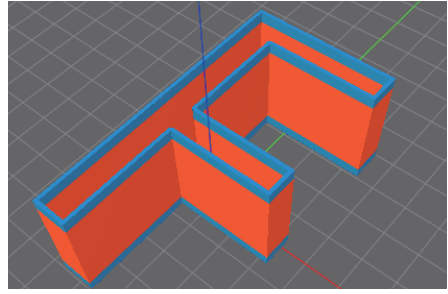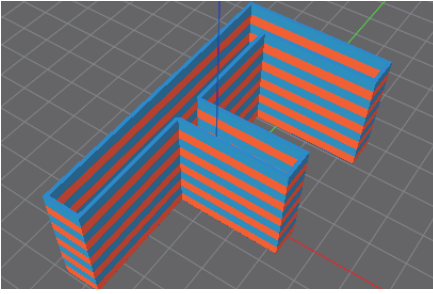
Text color layering effect

2.3.4 Moving, Rotation and Zooming Settings
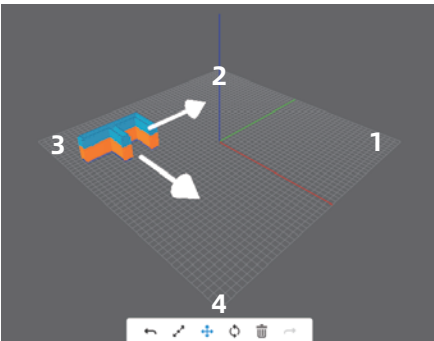
Select the Move button, an arrow appears on the word, click the arrow or drag the text directly to appropriate position. **Select the platform area, corresponding to the bottom plates 1, 2, 3 and 4. The default position is area No. 3 of the bottom plate, which saves time for platform heating when printing in single words.**
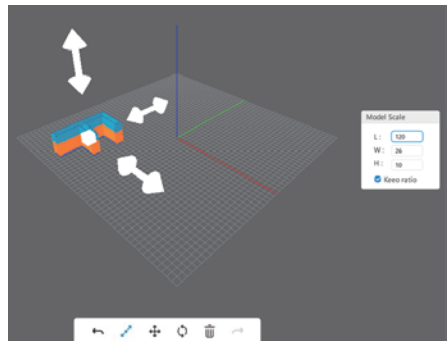
Select the Zoom button to change the font size; click the arrow to zoom by one direction and click the block to zoom as a whole.

Use FlashAD software to generate 3D text model:

Click "Outline" to pop up the "Outline" window. The 3D model is divided into four types of contour lines: top interior, top exterior, bottom interior and bottom exterior. In order to achieve different requirements, the scaling factor of the contour line can be set (value range: -5%~5%, two decimal places). Complete the settings and click "OK" to save the contour line.

Outline	
Outline	
Print	

Outline			
Up Outline :	☐ Inner	☑ Outer	
Down Outline :	☐ Inner	☑ Outer	
Scale Ratio :	0.5 %		
	OK	Cancel	
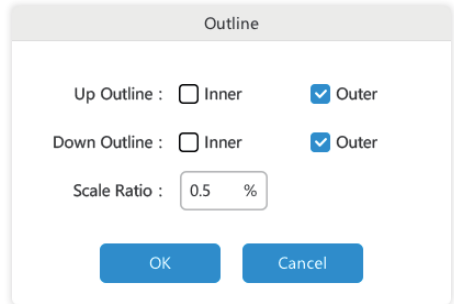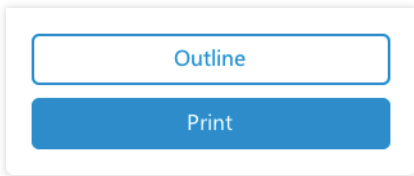
Click "Outline" : The file of the engraving panel will be exported. This file can be imported into the laser engraver to engrave the panel.

⚠️ **For the production of contour lines and acrylic sheets, the problems that may be encountered and their solutions are exemplified here.**

• When creating a model with a "step", it is recommended that the height of the step is slightly larger than the thickness of the acrylic sheet to prevent shedding.
For example, if the thickness of the acrylic sheet is 2mm, set the step to 3.0mmX1.6mm, as shown in the figure.
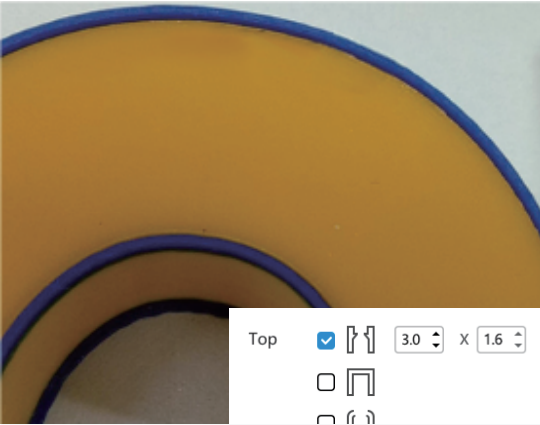
• Some characters have a small contour gap. After generating a 3D model, there may be coincidence and closure, and the exported contour lines may have crossover and interruption, as shown in the figure:
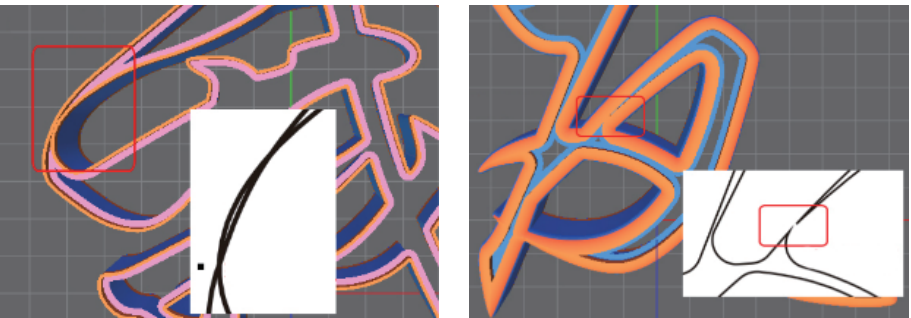
• When there is chamfering effect, the contour line outside the top surface does not exist; when the top surface is closed, the contour line of the top surface does not exist; when the bottom surface is closed, the contour line of the bottom surface does not exist.

Specific description of cutting acrylic sheet

The contour line is exported in plt format and opened or imported in the relevant software to check if it is complete and correct. Contour lines are typically imported from CorelDRAW. In addition, there are many types of cutters on the market. In order to ensure the accuracy, it is recommended to use a laser cutter to cut the contour lines. There are many types of laser cutters, and the commonly used flame cutter is introduced here.

• Since the temperature of the flame cutter is not uniform, the surface of the acrylic sheet will have a higher temperature and a higher shrinkage, and the cut surface will be inclined. In order to make the acrylic sheet easier to assemble into a 3D model, first mirror the contour line horizontally before cutting.

• When the 3D model is printed, there is a thickening of filaments at the corners. In order to increase the matching degree between the model and the contour line, the FlashAD is set to have a rounded corner of 0.8mm when the contour line is exported. If the cutter is not accurate enough, it may be considered a right angle. At this moment, the corners of the acrylic sheet can be trimmed, and the rounded corners of the contour line can be modified in the CorelDRAW according to the precision of the cutter, as shown in the figure:
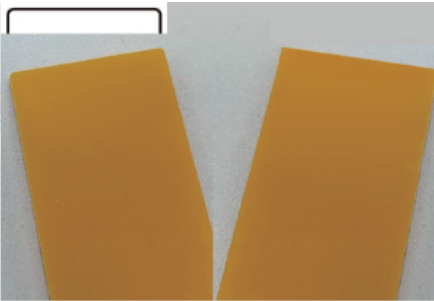
As described above, the contour lines have crossover, interruption and small gap, and disconnection occurs during cutting, which is unavoidable.

• If it is not a laser cutter, consider the compensation of the tool radius when cutting. For example, if the tool diameter is 4mm, the contour line should have 2mm radius compensation outward or inward during cutting.

Acrylic sheet assembly

When assembling, put the model in the bottom and the acrylic sheet on the top, align the edges and corners, press as a whole to avoiding falling and light transmittance, and then apply glue for reinforcement.

Instructions:
• There are different levels of filament accumulation and deformation at the corners and bends, especially for models with a large degree of curvature and a tilting effect. You need to press hard or polish the acrylic, or modify the contour line, as shown in the figure:

• As mentioned above, the model has overlap, the contour line and the acrylic sheet have interruption, and need to be assembled separately. The effect is as shown in the figure, and the interrupted part will not transmit light.

Contour line initial calibration

There are many parameters of the cutter. Different parameters and different precision will produce different errors; different supplies have different shrinkage rates, and the model will also produce errors when printing. Therefore, please calibrate the contour line before use.

Calibration method:

1. Open FlashAD, "A", font: stxingka, width: 253mm, chamfer: height 5mm, generate the model, and export the contour line of the top interior; "B", font: Yuanti, length: 212mm, step: 3.0mmX1 .6mm, tilt: 10, generate the model, and export the contour line of the top interior.

2. Print the model separately, cut the acrylic sheet along the contour line, assemble the acrylic sheet, and adjust the scaling ratio of the contour line according to the matching degree. If the acrylic sheet is too large, increase the scaling ratio, e.g. from -0.5% to -0.8%; on the contrary, reduce the scaling ratio, e.g. from -0.5% to -0.2%, until the acrylic snaps into the model and there is no falling or light transmittance.

Click Print and the page will go to the print interface.
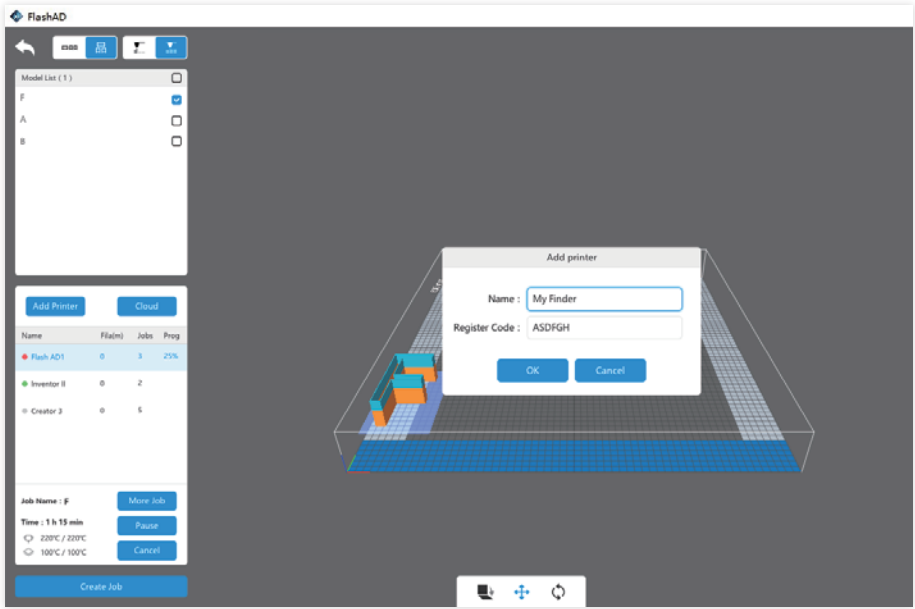
Click Add Printer to associate the equipment to FlashAD and the cloud platform. Find the registration code on the About page and enter it in the dialog box. Enter the equipment name, which can be customized. Click OK to associate the equipment. If no network cable is plugged, the equipment will display offline status. If the network cable is plugged, the equipment is online. When online, the set file can be sent directly to the printer for printing.

Model List (1)

F ☑
A ☐
B ☐

Add Printer   Cloud

Name	Fila(m)	Jobs	Prog
● Flash AD1	0	3	25%
● Inventor II	0	2	
● Creator 3	0	5	

Job Name : F   More Job

Time : 1 h 15 min   Pause

🌡 220℃ / 220℃
♢ 100℃ / 100℃   Cancel

Create Job

⭐ **Shell placement instructions:**

The shell is placed on the bottom plate 3 by default. The placement area is 3-4-1-2; you can move the shell position.

The shell is broken up and printed in one stroke. For example, the character "i" will be automatically divided into 2 shell parts. When this mode is selected, the surface of the model is smoother and has no seams, which is more beautiful. This mode is recommended for printing simple shell shape (circle shell).
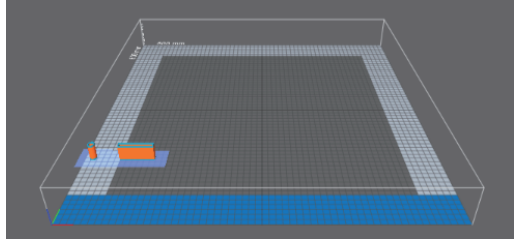
Print the word as a whole; it prints the entire shell first before printing the next. When this option is selected, a blue highlight mark will appear on the bottom surface; the printing order is character by character. This print mode allows removing and producing the printed shells first.
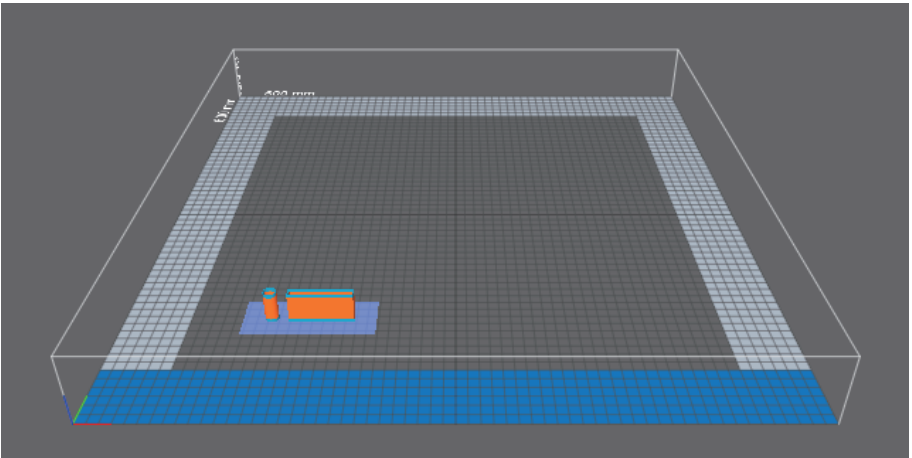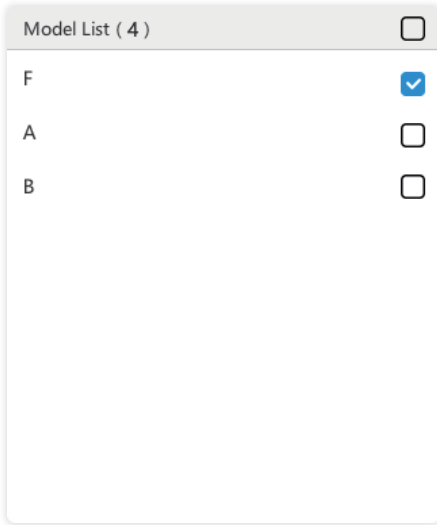
The shell is printed in one piece and won't be split into several parts. This mode has higher productivity when printing, but seams are created on the surface of the shell.
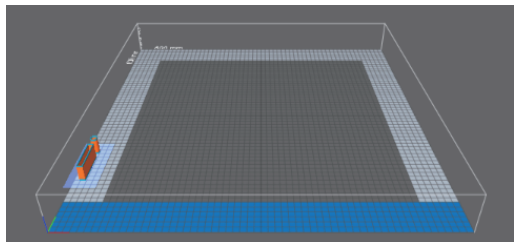
The shell will be printed in layers. It first prints the first layer of the first shell, then the first layer of the second shell, and the first layer of the third shell. The shell will be printed by layers in turn. This mode requires all the shells to be printed before the shells can be removed.

42

The model list allows printing the current shell or not; click to check or cancel; when unchecked, the model is hidden and will not be printed.

Click to generate a print task and a pop-up window will appear.

Standard print settings ▲

Advanced mode settings ▶

File Name: The file name can be changed for subsequent differentiation.

Print Quality: Select low, standard or high; the lower the quality, the faster the printing speed is; the higher the quality, the slower the printing speed is. It is recommended to select the standard mode.

Print Material: When selecting A-PETG, the default temperature of the bottom plate and the nozzle is 95°C and 230°C; when printing supplies are A-PLA, the default temperature of the bottom plate and the nozzle is 50°C and 220°C; it can also be changed according to the actual situation; for the shell settings corresponding to the parameter settings, refer to 2.3.10 Print Shell Size and the corresponding parameter setting method of the shell wall thickness.

Platform Grid: Help the bottom plate to adhere. When special pattern is needed, this option can be added, but the printing time will increase. Generally, it is not recommended. This function can also be used to connect disperse shells. When the shell is removed, it will not be separated. It can also be used to make embedding characters. The embedding will prevent the split shell from offsetting. If it is used for connection, set the density to be smaller.

Form a triangular structure; Form a hexagonal structure; Form a wave shape structure;
Density: Indicate the density of the texture.

Path Slice: The software selects path as the default slice mode to have better print quality.

V Shape Edge: When this option is selected, a V-shaped edge will be printed on the outer edge of the shell to increase the adhesion to the platform. When printing a shell larger than 200mm, it is recommended to check this setting to increase the print success rate and prevent printing failures due to the shell failing to adhere to the platform.

Advanced: Advanced mode provides more parameters for user settings.

General	Retraction	Switch Color	Other

Layer Height :	0.3	mm
Extrusion Ratio :	100	%
Print Speed :	120	mm/s
Travel Speed :	200	mm/s
Z Uplift :	0.25	mm
First Layer Extrusion :	100	%
First Layer Speed :	30	mm/s

Layer Height: You can customize the speed and layer height. The higher the layer height, the clearer the layers are and the shorter the printing time is; it is recommended to set the layer height to 0.25-0.3mm.

Extrusion Ratio: The larger the filament output, the more filaments are spit out from the nozzle, and the formed shell will become thicker; the recommended starting speed is slow;

Print Speed: It is recommended to print at a speed of 40-50mm/s; different shell settings are described on the next page.

Travel Speed: The speed at which the equipment is running when no model is being printed.

Z Uplift: The height that Z-axis lifts during idle running.

First Layer Extrusion: The increase in the filament output in the first layer facilitates the adhesion of the first layer to the platform.

First Layer Speed: It is recommended to set the print speed of the first layer to 10-20mm/s; if the first layer speed is too fast, the filament material can't adhere to the platform and cause print failure easily.

| General | Retraction | Switch color | Other |

Retraction Speed :	60	mm/s
Retraction Length :	5	mm
Compensate Speed :	255	mm/s
Compensate Length :	0.25	mm

Retraction Speed: The speed of the filament pulled back to the nozzle when the extruder is lifted; increasing the pullback speed will reduce wiredrawing.

Retraction Length: The length of the filament pulled back to the nozzle when the extruder is lifted; increasing the pullback length will reduce wiredrawing. Setting a large pullback length will result in filament shortage.

Compensate Speed : it means feeding filament speed after retraction. It should be lower than retraction speed.

Compensate Length : The compensate length is to prevent the situation that lacking of the filament on the word shell if the retraction length is too large (no need to set this item if the abnormal situation does not exist)

General	Retraction	Switch color	Other		General	Retraction	Switch color	Other

Color Change Mode :	⦿ Spin	○ Wall		Color Change Mode :	○ Spin	⦿ Wall
Speed :	60	%		Speed :	60	%
Extrusion Length :	300	mm		Extrusion Length :	300	mm
Extruder Uplift hight :	5	mm		Shift Position X :	298	mm
Extruder Shift Distance :	10	mm		Shift Position Y :	268	mm

Switch color: Select color change wall, input the coordinates, or use the default setting; when changing colors, the color change wall will be printed before printing the second color; it increases the adhesion of materials between different colors. The color change length is recommended to be greater than 300mm.

Speed (Color change deceleration): The ratio of the printing speed of the first layer to the normal printing speed when the two colors are switched. The speed reduction is beneficial to the adhesion between materials.

Extrusion Length: Before the two colors are switched, set the length of the pre-spinning. When the setting value is 0, the spinning stops when the color is changed; when the setting value is 40, the other color will first spit out 40mm of filament when the color is changed (this function prevents poor adhesion of supplies during color change and color layer cracks)

Extruder Uplift hight: the hight of the extruder remove away from model.

Extruder Shift Distance: the distance of the extruder remove away from model.

Shift Position X/ Shift Position Y: Wall position X and Y coordinate values.

	General	Retraction	Switch color	Other	

Combine Area Threshold :	160	mm²	
Start Speed :	100	%	
Start Distance :	100	mm	
Suspention Deceleration :	80	%	
XY Acc :	2000	mm/s²	
Z-axis Speed :	0.25	mm/s	
Z-axis Acc :	200	mm/s²	

Combine Area Threshold: When larger shell and smaller shell are printed at the same time, higher speed will result in insufficient cooling of the small shell and affect the shell quality. Setting this value means that when the path of the shell is less than the value, the equipment automatically reduces the print speed to ensure the print quality of the small shell.

Start Speed: In the integrated printing mode, too fast starting speed easily causes filament shortage at the starting point. Therefore, setting a slow starting speed is beneficial to ensure the quality of the shell. The value of this setting is a percentage of the normal print speed.

Start Distance: Adapt the length of start speed.

Suspension Deceleration: The speed at which the steps are printed. The slower the speed, the better the adhesion of the steps is. It is recommended to set the value to 30-50%. The suspension speed is calculated as the percentage multiplied by the printing speed. It is not recommended to exceed 30mm/s.

XY Acc: The accelerationof XY moving.

Z-axis Speed: The speed at which the Z-axis is lifted.

Z-axis Acc: The accelerationof Z moving.

It is recommended to use the default value, and you can also fine-tune the parameters as needed.

After setting, click OK to generate a slice file. If the equipment is bound and connected to the network, the file can be directly transferred to the printer. You can also save the file to a USB flash drive and print it through the USB flash drive.

Print shell size	Print speed	Print temperature (Ad PLA)
<15 cm	30-40 mm/s	210-220 ℃
15-20 cm	40-50 mm/s	215-220 ℃
20-30 cm	50-55 mm/s	215-220 ℃
30-40 cm	55-60 mm/s	220 ℃
50-60 cm	60-70 mm/s	220-225 ℃

Note: When the size of the print shell is small, it is recommended to use a lower print speed so that the shell has better cooling effect and the surface texture is smoother.

Shell wall thickness	Setting method (nozzle diameter and wall thickness)
0.6 mm	Nozzle diameter: 0.6 Wall thickness: 0.6 Extrusion ratio: 100%
0.8 mm	Nozzle diameter: 0.8 Wall thickness: 0.8 Extrusion ratio: 100%
1 mm	Nozzle diameter: 0.8 Wall thickness: 0.8 Extrusion ratio: 125%
1.2 mm	Nozzle diameter: 0.6 Wall thickness: 1.2 Extrusion ratio: 100% (the path will print two circles)
2 mm	Nozzle diameter: 0.8 Wall thickness: 2 Extrusion ratio: 125%

Remark: The wall thickness of the shell is related to the set nozzle diameter, wall thickness setting and the filament output of nozzle. The default setting is 0.8/0.8/125%; that is, a wall thickness about 1mm;
The relationship is: shell wall thickness = nozzle diameter * filament output * (set wall thickness/nozzle diameter)
If the shell wall thickness is 1, the nozzle diameter is 0.6mm and the wall thickness is 1mm, it will print two circles, so the printing time will be lengthened; when the nozzle diameter is set to 0.8, the wall thickness set to 0.8 and the filament output set to 125%, it only prints one circle.

As described above, the actual thickness is slightly different from the theoretical calculation. The following data are measured values for reference:

（1）0.6 mm：set nozzle：0.6，thickness：0.6，flow rate：100%，Wall thickness is too thin，we don't recommended，suggest set flow rate：120%, print thickness is 0.7mm

（2）0.8 mm：set nozzle：0.6，thickness：0.6，flow rate：140%

（3）1 mm：set nozzle：0.6，thickness：0.6，flow rate：160%

（4）1.2 mm：set nozzle：0.6，thickness：0.6，flow rate：200% or set nozzle：0.8，thickness：0.8，flow rate：150%

（5）1.5 mm：set nozzle：0.6，thickness：1.2，flow rate：100% (print two circles)；or set nozzle：1，thickness：1，flow rate：150% (print one circle)

（6）1.8 mm：set nozzle：0.6，thickness：1.2，flow rate：120% (print two circles)

（7）2.4 mm：set nozzle：0.8，thickness：1.6，flow rate：130% (print two circles)；or set nozzle：0.6，thickness：1.8，flow rate：120% (print three circles)

2.3.11 Slice File Transfer Settings
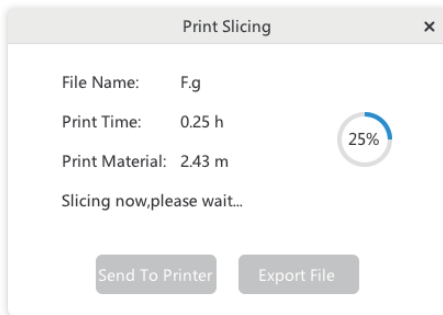
The print slice window pops up. After the slicing is completed, it can be sent to the printer and exported to the USB flash drive.
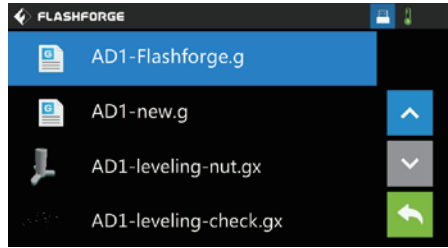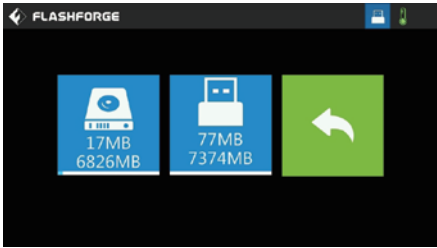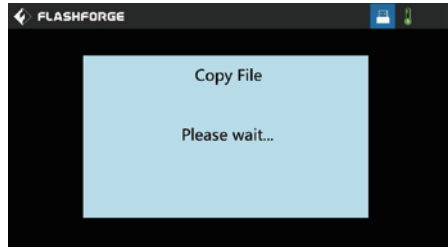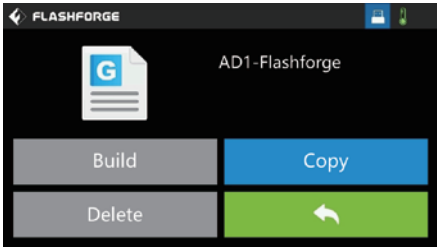
Insert the USB flash drive into the equipment, click the file in the USB flash drive, click the Copy button, copy the GFZ file into the memory, and then return to the file in the memory for printing. After copying to memory, the file suffix is .g, which can be recognized by the device and printed.

In the task interface, you can check whether the printer is busy. If it is not busy, you can send a file and print it directly. If the current printer is busy, the new file will be added to the task list. After the current shell is printed, you can continue to click print.

The interface displays the name of the task, the remaining print time, the nozzle and bottom plate temperature, and more tasks for viewing the task list.

Pause: Pause current print task
Cancel: Cancel current print task

⭐ **Special Note:**

FlashAD function is updated regularly. The equipment guide will not be updated in real time. The software update is accompanied by instructions. The latest FlashAD software can be obtained from the official website (www.sz3dp.com).

3 Maintenance and Support

3.1 Copy Log
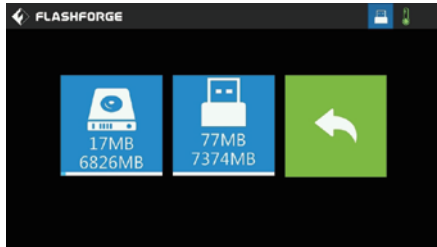
1. Insert the USB flash drive and the ⬛ icon will appear in the upper right corner of the touch screen.

2. Click the ⬛ icon 3 times consecutively, and the icon will jitter, indicating that the log has been copied to the USB flash drive; unplug the USB flash drive.

3. Insert the USB flash drive into your computer and open the USB flash drive folder to find the log file.

4. Please send the log file and equipment serial number to Flashforge Customer Service.

3.2 Maintenance and Overhaul

Problem	Cause	Corrective measures
Model can't adhere to the platform	The platform is not flat, or the extruder calibration value is deviated	Please follow the instructions to calibrate the extruder and level the platform; other simple methods: attach blue tape for compensation in position with large gap. Increasing the filament output of the first layer can increase adhesion.
Supplies can't be properly extruded	Check if the extruder is clogged	Warm up the extruder and manually push the filament to check if it can be extruded. If not, press the black tab of the air pipe connector, take out the filament guide pipe, and use the needle cleaner to get through the nozzle.
The extruder can't return to the original position	1. The limit switch line is faulty; 2. Running is obstructed	Check the status of the limit switch and whether the equipment collides with the limit switch when it is running moves. If not, check whether there is no obstacle. Confirm whether the limit switch function is disabled. If yes, please contact after-sales service.
The screen is black and there is no response	1. The power may not be powered on; 2. Screen failure	If the power supply is normal, but the screen has no response when the power is turned on, turn off the equipment power. Use a screwdriver to disassemble the screen box, carefully pull out the screen, re-plug the screen cable, and then turn on the power and check if the screen is lit. If the screen still does not light up, please contact after-sales service.
Bulging filament under the heating part of the extruder	The copper nozzle is not screwed into the position, which leads to the filament leakage	First heat and clear the residual filament and then reassemble the copper nozzle. You can contact the after-sales service to request the operation video and operate according to the video.
Noise is very high when printing	Printing speed is too fast	Reduce the printing speed or reduce the acceleration parameters.
The x/y axis can't move	The drive chip is damaged or the motor cable is damaged	Please contact the after-sales staff.

3.3 Daily Maintenance

1. When the equipment isn't used, please close the top cover and close the front door to avoid dust. If it won't be used for a long time, it is recommended to put it in the original packaging.

2. Regularly apply lubricant to the moving parts (general grease). If the equipment is used frequently, apply lubricant (grease) at least once every two weeks. If it isn't used for a long time, apply lubricant (grease) at least every 4 months.

3. At the end of each print, please clean the contour lines and other debris on the platform in time to avoid affecting the quality of the model printed next time.

4. Print stickers are consumables. When the adhesion of the printing platform sticker is reduced or damaged, please replace the printed sticker in time to avoid affecting the printing effect.

5. When the equipment is used for the first time or the printing supplies are replaced, only use official consumables of Flashforge until the extruded supplies are the same color as the loaded supplies.

6. If the equipment isn't used, pay attention to avoid dust.

3.4 Help and Support

The professional after-sales and sales team of Flashforge is always on call. We are willing to solve any problems you may have while using AD1. If you can't find a solution to your problem in this guide, you can visit our official website, or contact us by phone or QQ.

In our official website, you can find the descriptions and solutions of some common problems. You can find the operation video of the corresponding product in the video bar. Many of your problems can be resolved here: http://sz3dp.com.

You can contact after-sales team of Flashforge to solve the problems by phone and QQ every Monday to Saturday from 8:00 a.m. to 5:00 p.m. If you contact us during non-working hours, we will respond to you and resolve your problems as soon as possible during the working hours. We are sorry for any inconvenience.

Note: A small amount of impurities will remain in the nozzle when different filaments are replaced and cause nozzle clogging. It is not a quality problem and is not within the 400-hour life span. If you have this problem, please contact the after-sales service or local dealer, and complete the dredging work under the guidance of after-sales service personnel.

After-sales service hotline: 400-886-6023
After-sales e-mail: flashforge@flashforge.zohodesk.com / support@flashforge.zohodesk.com
Company Address: No. 518, Xianyuan Road, Wucheng District, Jinhua, Zhejiang Province

* When contacting the after-sales service, please provide the serial number of the machine, that is, the barcode of the equipment and the firmware version number, so that the service personnel can check the problem*
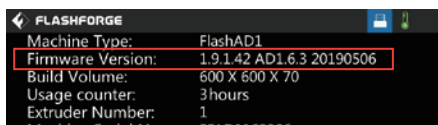
注： 每台3D打印机在出厂前都经过打印测试，若设备喷头内存在耗材残留或打印平台有轻微划
痕，都属正常现象，不影响使用。

尊敬的闪铸用户，

感谢您选择、使用闪铸科技的产品。感谢您对闪铸科技的大力支持和帮助。

闪铸科技的产品质量优质、性能上佳。为了您使用方便，请您在使用之前仔细阅读本说明书，
并严格按照说明书的指示进行操作。整个闪铸科技团队时刻准备为您提供最优质的服务。在使用过
程中无论遇到什么问题，请按照说明书结尾所提供的电话、邮箱与我们进行联系。

为了您能够更好地体验我们的产品，您还可以从以下途径获取设备的操作知识：

· 闪铸中文官网：

闪铸的官方网址：www.sz3dp.com
您可以登陆闪铸官网寻找相关软硬件、联系方式、设备操作、设备保养等信息。

安全说明

请确保认真阅读以下安全提示

工作环境安全

◆ 请保证打印机的工作台面干净整洁。

◆ 请保证打印机工作时远离可燃性气体、液体及灰尘。（设备运行产生的高温有可能会与空气中的粉尘、液体、可燃性气体反应引发火灾）

◆ 儿童及未经培训的人员请勿单独操作设备。

用电操作安全

◆ 请务必将设备接地；切勿改装设备的插头。（未接地/未正确接地/改装插头必然会增加漏电风险）

◆ 请勿将设备暴露在潮湿或烈日的环境中。（潮湿的环境会增加漏电的风险/暴晒会加速塑件老化）

◆ 请勿滥用电源线，务必使用闪铸科技提供的电源线。

◆ 切勿在雷雨天气使用设备。

◆ 如长时间不使用设备，请关闭设备并拔下电源线插头。

◆ 拆装喷头等部件时请勿带电操作，请务必关机操作。

个人操作安全

◆ 在设备运行时，请勿触碰喷头、平台等位置。以免高温烫伤或机械碰撞

◆ 在打印刚完成时，请勿触碰喷头。避免高温烫伤

◆ 在操作设备时，请勿穿戴围巾、口罩、手套、珠宝装饰等容易卷入设备的物件。

◆ 请勿在饮酒、服药之后操作设备。

设备使用提示

◆ 切勿长时间离开正在运行的设备。

◆ 请勿自行对该设备进行任何改装。

◆ 请在通风的环境下操作设备。

◆ 请勿利用该设备进行违法犯罪的活动。

◆ 请勿利用该设备制作食物储存类产品。

◆ 请勿利用该设备制作电器类产品。

◆ 请勿将打印模型放入口腔。

◆ 请勿用蛮力卸下打印模型。

◆ 请勿使用长度大于3米的网线连接本设备。

设备若不使用请退出喷头中的耗材。

设备若长期不使用请使用防尘布遮盖。

当蓝色美纹纸对字壳的粘附性变弱时，请更换蓝色美纹纸。

设备运行环境要求

◆ 温度：室温15-30℃为宜

◆ 湿度：20%-70%为宜。

设备维护

◆ 长时间使用设备可能出现异响，请定期在导轨处以及丝杆处涂抹润滑油，建议是两周一次。

设备放置要求

◆ 设备需要放置于干燥通风的环境中。设备左侧和后侧必须要留至少20cm的距离，前侧必须要留至少35cm的距离，右侧必须要留至少40cm的距离。

设备兼容耗材要求

◆ 在使用该设备时，请使用闪铸提供或指定的耗材。第三方耗材可能容易造成喷头堵塞及喷头损坏。

耗材储存要求

◆ 除非需要使用耗材，否则请勿轻易将耗材拆封。拆封后请保持储存环境干燥，无尘。

法律禁止项目

◆ 请勿复制或打印法律禁止复制的任何项目。

◆ 复制受版权保护的作品。一些受版权保护的作品可以被部分复制以进行"合理使用"。多份复制将被视为不正当使用。艺术作品等同于受版权保护的作品。

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法律申明

◆ 用户无权对此使用手册进行任何修改。

◆ 客户若自行拆装或改造设备造成任何安全事故，闪铸科技概不负责。未经闪铸科技允许，任何人不得对该手册进行修改或翻译。本手册受版权保护，闪铸科技对本手册保留最终解释权。

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第一章 设备介绍

总体概述

3D打印机技术即将三维模型转化成实物的技术。最常见的3D打印技术被称为FFF(Fused Filament Fabrication)，即熔丝制造技术，AD1广告字打印机的应用技术即FFF。其工作方式是通过高温融化丝状耗材，耗材降温后固化，通过耗材逐层叠加形成立体物品。

打印步骤

3D打印包括三个步骤，即获取模型、处理模型及打印模型。使用设计软件文字或图案的文件，导入FlashAD文件处理软件，文件切片处理后将文件通过U盘或无线传输发送至打印机，开始打印。

闪铸AD1是用于制作发光字字壳的3D打印设备，有效提升发光字制作效率，减少人工。

闪铸FlashAD软件是运用在闪铸广告机上的一款软件，具有生成3D模型、导出轮廓线、生成切片文件三大功能，用于广告字的制作。

配套发光字字壳制作所需的PLA耗材（建议室内使用）以及广告专用耗材（可室外使用）。

广告字的制作步骤：

1、生成3D模型；

2、导出轮廓线；

3、生成3D模型的切片文件、打印模型；

4、按照轮廓线切割亚克力板；

5、模型和亚克力板的装配。

用户可通过CorelDRAW等设计软件，将字体或图案设计完成，保存导出cdr格式的字体或图案文件，当前FlashAD广告机专用软件导入格式支持stl、cdr、nc三种格式。后续若软固件升级，可支持更多格式。

CDR 软件设计	>	FlashAD 软件切换	>	AD1 设备打印

1.1 设备介绍

1.1.1 设备视图

料盘

料盘轴

过丝孔

料盘架

Y轴联动装置

Y轴导轨

X轴导轨

Z轴传感器

气管接头

喷头散热块

喷头风扇

喷头加热块

铜喷嘴

联轴器

料盘架安装孔

Z轴电机

装饰件

丝料检测开关

X轴电机

进丝电机

X轴传感器

拖链

Y轴传感器

电源开关

以太网口

触控屏

打印平台

喷头罩

脚架

0.5m

0.5m
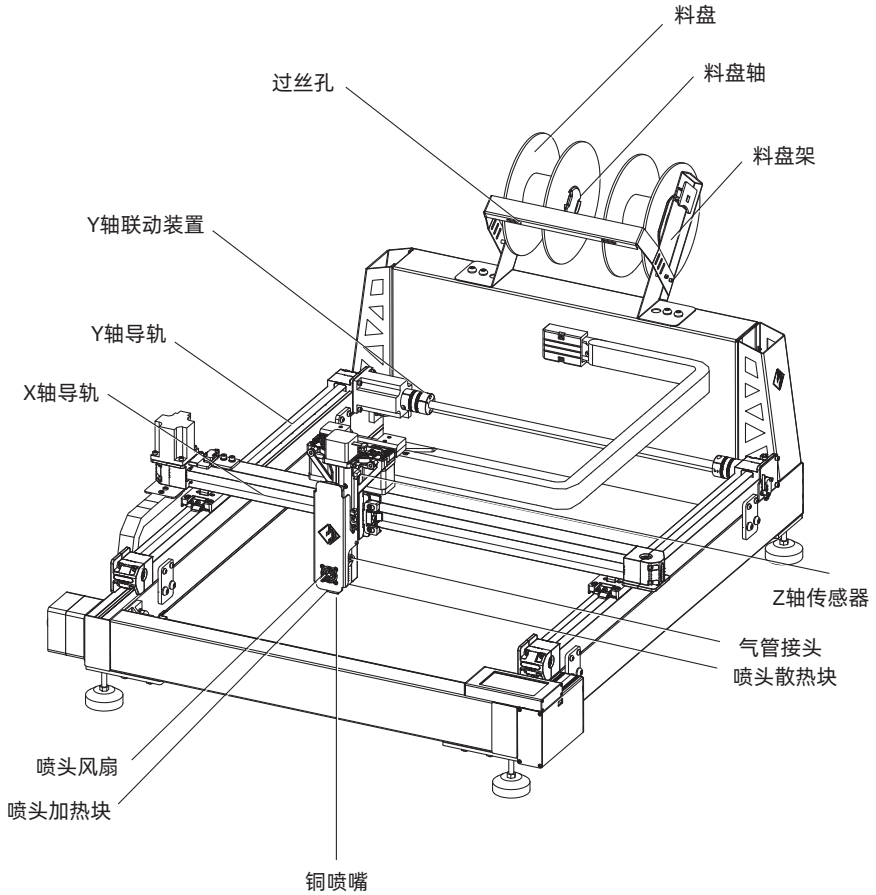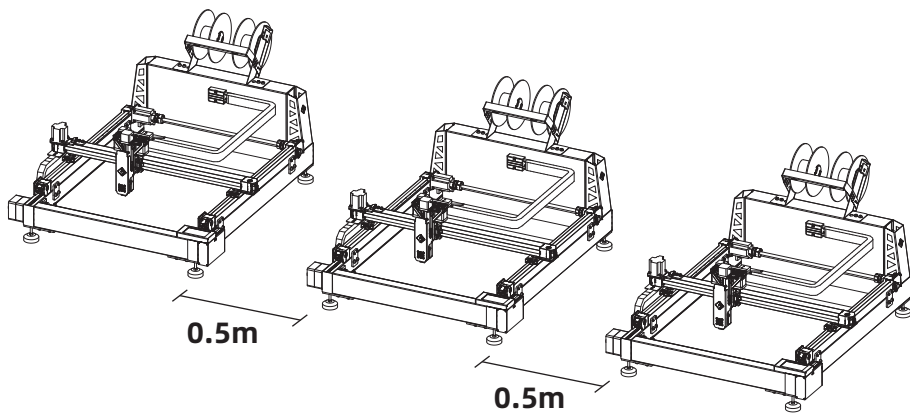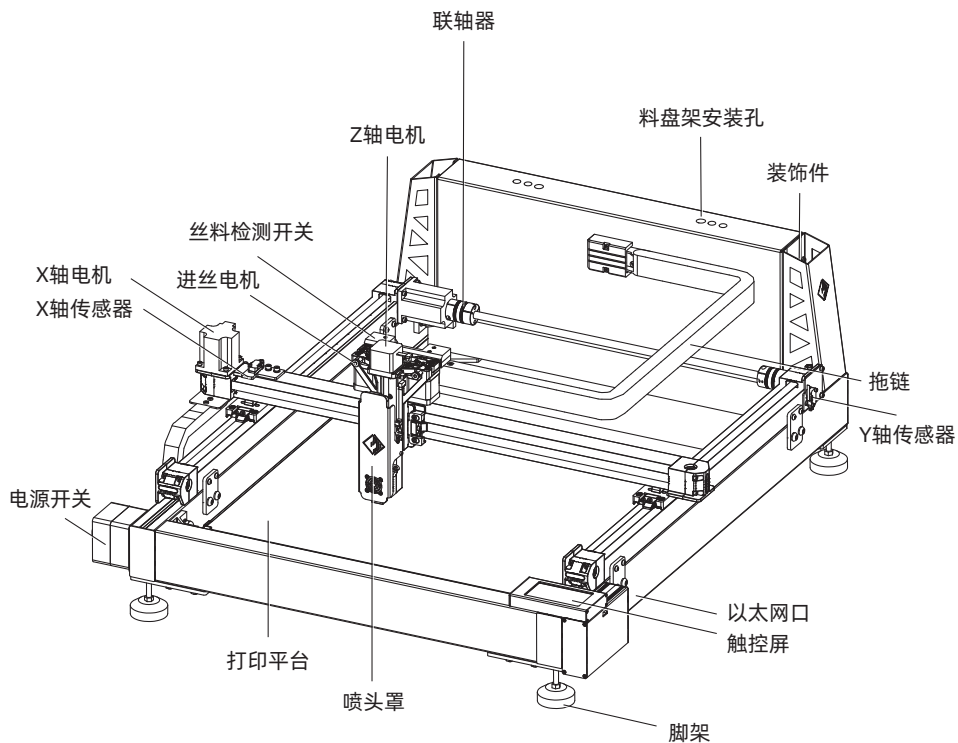
设备摆放间距至少0.5米。

打印平台	用于构建实体模型的部分。
平台贴纸	闪铸打印贴纸能够粘贴在打印平台上，目的是能够让打印模型更好地粘贴在打印平台上。当平台贴纸开始影响打印效果的时候，请及时更换。即附赠的美纹纸。
打印体积	打印体积是指构建模型的长*宽*高。AD1 广告字3D打印机最大打印体积为600*600*70mm。用户不能直接构建超过该参数的模型。
调平螺母	平台支架下的8颗调平螺母用于调节打印平台和喷嘴的间距。
喷头	将耗材从进丝孔导入、加热，再从喷嘴挤出。
喷嘴	构成喷头的最下部的黄铜色金属结构，经过喷头加热的耗材从该处挤出。
喷头风扇	喷头风扇用于降低喷头运作时的温度及加速耗材的凝固。
进丝孔	耗材进入喷头的入口，位于喷头顶部。
料盘架	放置耗材的装置，位于打印机背部。
导丝管	将耗材从丝盘盒引入喷头的白色塑料细管。
通针	用于疏通喷头，清理喷头中残余的耗材。

功能/规格	参数	功能/规格	参数
打印机类型	堆积成型 Deposition Modeling	喷头结构	双进丝，单喷嘴。
		喷嘴孔径	0.6mm
语言	中文，English，日本語	丝料直径	1.75mm
成型尺寸	600*600*70mm	打印精度	±0.5mm或0.2%
额定电压	AD1-220V AD1-110V		
		层厚	0.1~0.4mm
功率	AD1-220V-1500W AD1-110V-1000W	支持文件格式	Gfz，Stl，Nc，Cdr
		使用温度	15~30℃
打印速度	最高150mm/s	切片软件	FlashAD
空走速度	最高200mm/s	显示屏尺寸	4.5英寸
喷头温度	最高260℃	打印平台	铝板/玻璃板 （自行采购组装，非配套）
底板加热	最高100℃， 分4块区域加热		
		调平方式	手动调节，8点
支持耗材类型	广告专用耗材； 广告PLA耗材；	断电续打	支持
		U盘支持	支持U盘打印
机器尺寸	1070*975*485mm	丝料检测功能	支持
包装尺寸	1170*1140*610mm	以太网接口	支持
净重	50.2kg	云平台支持	支持
毛重	76kg		
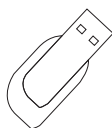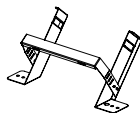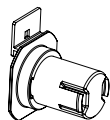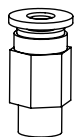
电源线	U盘	料盘架	料盘轴*2
气管接头	润滑脂*3	售后服务卡	快速启动指南
开口扳手*3 8mm/13mm	内六角扳手*3 1.2mm/2.5mm/5mm	一字螺丝刀	通针
铲刀	M3内六角 螺丝与垫片*4	M8内六角 平圆头螺丝*4	支脚*4
美纹纸	调平纸	安装玻璃配件包	PTFE管 *4
喷嘴			
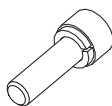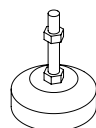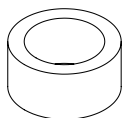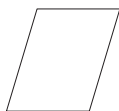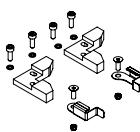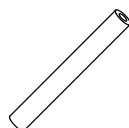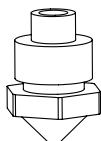
1.安装支脚

1.安装前先将设备抬至货架或桌子上；安装支脚前需先预留一个角落，以便安装。
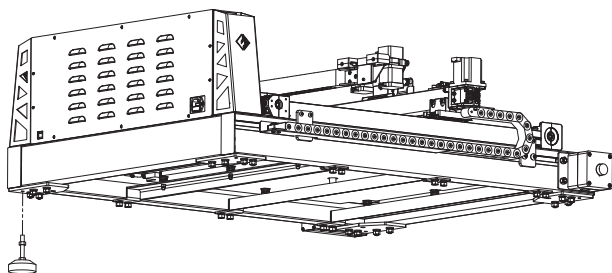
2.按顺时针旋转直接将支脚旋至底。依次安装上4个支脚。
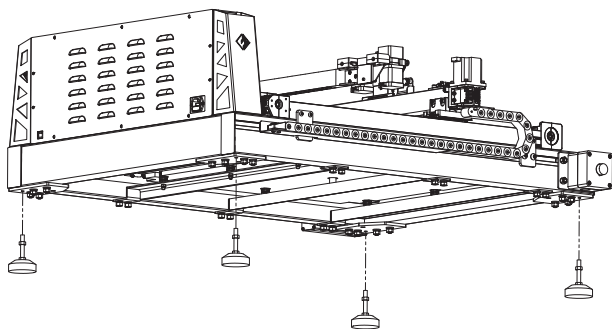
3.用手晃动设备不会摇晃，调整支脚高度，使3D打印机放置平稳。

2.安装料盘轴与料盘
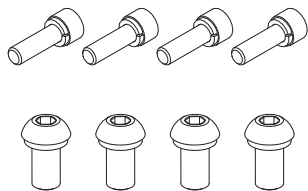
1.将4颗M3螺丝以及对应M3弹垫取出；将4颗M8平圆头的螺丝以及对应弹垫垫片取出；取出料盘支架的零件，将左右钣金支架安装到设备中。
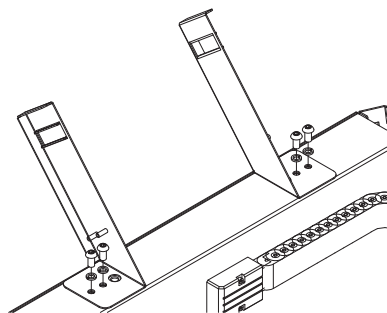
2.使用内六角扳手，将左右钣金支架通过4颗M8的螺丝其固定到设备上。
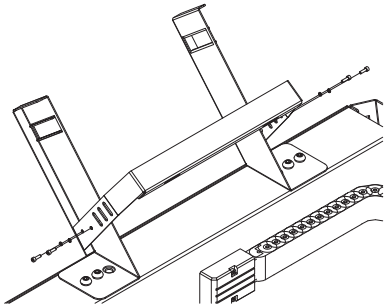
3.使用内六角扳手将U型钣金支架通过4颗M3
　螺丝固定到左右支架中。
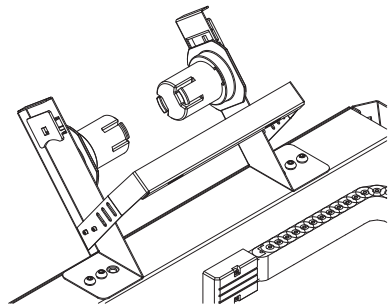
4.将两个黑色料盘轴左右钣金支架上。
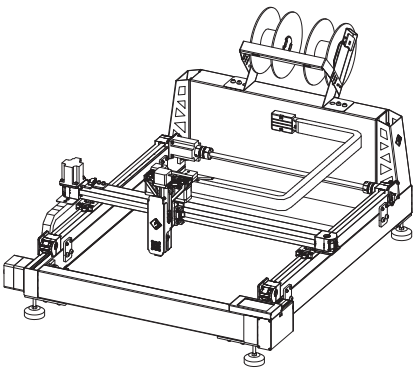
5.料盘架以及支架整机装配完成后如图所示。
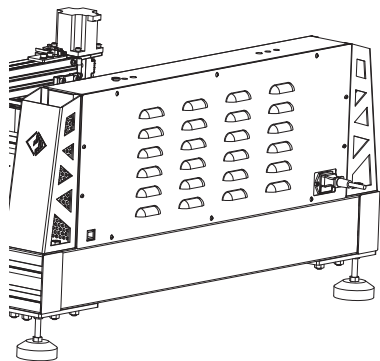
6.通过电源线将3D打印机连到220V电源上。
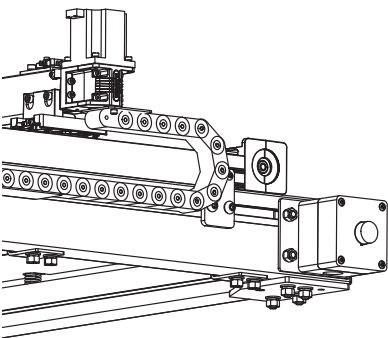
7.按下开关按钮，开机启动，此时设备安装完成。

1.4 设备设置操作

设备安装完成后，需要先将设备进行一系列的设置，方可打印

1.4.1 喷头校准

首先需要进行喷头校准设置，在喷头校准前需要先确认设备运动状态是否正常。
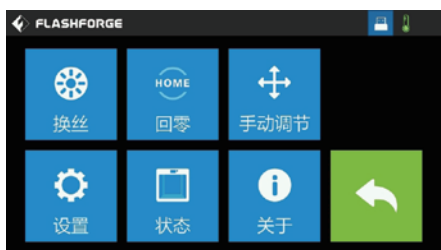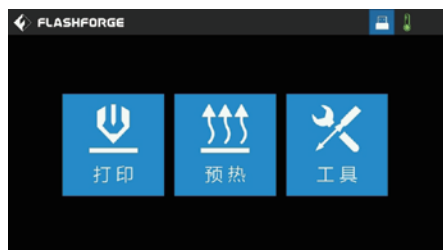
1. 点击工具-回零。此时可查看设备基础状态是否正常。设备自动会运行至零位。

2. 点击工具-设置-喷头校准。喷头会下降至平台处，使用调平纸，将纸塞入喷嘴与平台之间，点击屏幕中的加减号校准喷头与平台的距离。点击加号喷头抬升，点击减号喷头下降。调平纸移动有摩擦感受即视为喷头与平台当前处于合适位置。 点击确认按钮。

3. 点击确认按钮后，显示屏会出现Z轴电机已锁定的状态，此时不要点击完成按钮。出现此状态后，利用随箱的调平工具对平台进行调平。（具体方式也可详见调平操作视频）
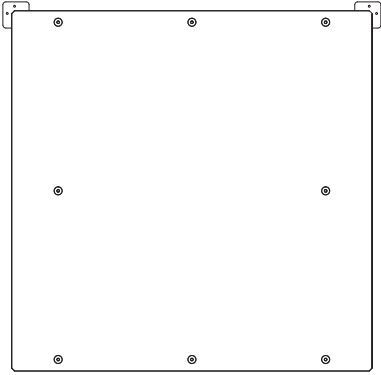
4.平台总体有8个可调平的点，依次手动滑动喷头至如图8个点位置（中间位置除外，中间点位置是作为调平基准点）。依次在各点位置处插入调平纸，在底部螺母处使用开口扳手调整平台高低，使得喷嘴与平台刚好接触。
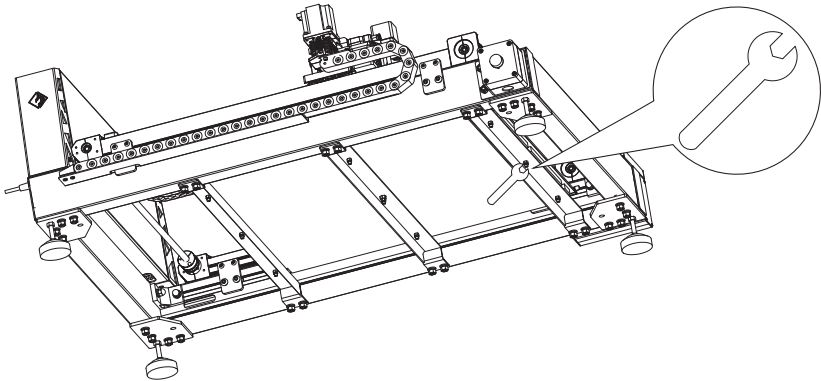
5.在配件中拿出开口扳手调节对应底部调平点。
　顺时针拧开口扳手，平台下降，间隙变大。逆时针拧开口扳手，平台上升，间隙变小。

6.调平完成后，点击屏幕的完成按钮，喷头会抬升。
　调平操作详细请查看调平视频（随设备附赠的U盘中）用于辅助参考。
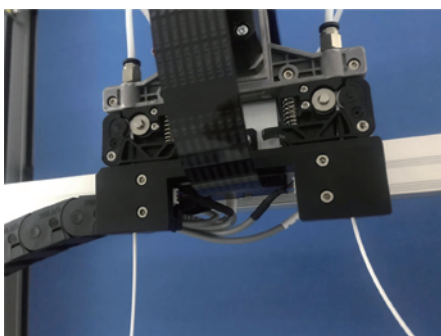
将配套的丝料装入料盘架，左右各一卷料盘，并将料盘上的丝料分别穿过左右丝料检测开关，再穿入进丝电机，直到丝料到达喷嘴。

⚠️ **注意：请务必将左右丝料都装入喷头，否则有堵丝风险或出丝异常。**
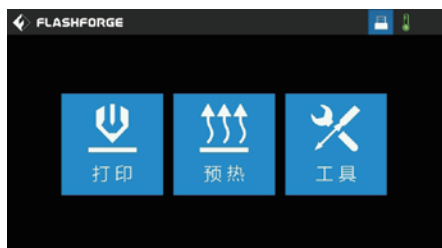
1.点击屏幕中-工具-换丝-左丝料-进丝。

2.点击进丝后，喷头会加热，此时请勿触碰喷嘴下部，以免烫伤；
  左丝料与右丝料分别都需要进行进丝，左右喷头各需要丝料挤出长度约100mm。

⚠️ **注意：当只需要打印一个颜色的丝料时，也请在左右喷头中都进丝，打印时可在软件中设置只打印一种耗材；若左右侧喷嘴腔有一处空缺可能会导致喷头堵或者打印不良。**

检验喷头校准以及平台平面度的方法：
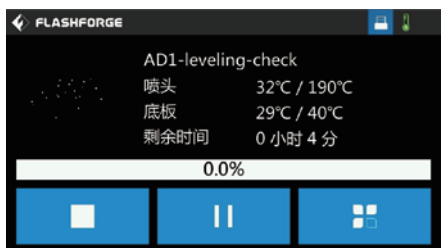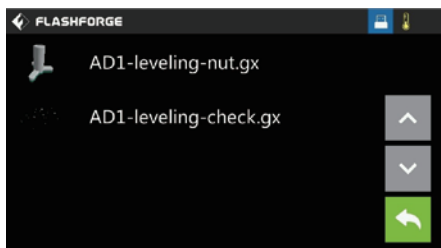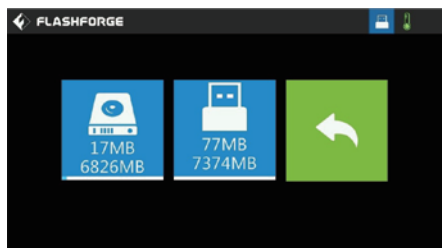
1.点击打印-选择文件 AD1- leaving-check.gx 文件。
（此步骤仅是检验作用，非必须的操作步骤）
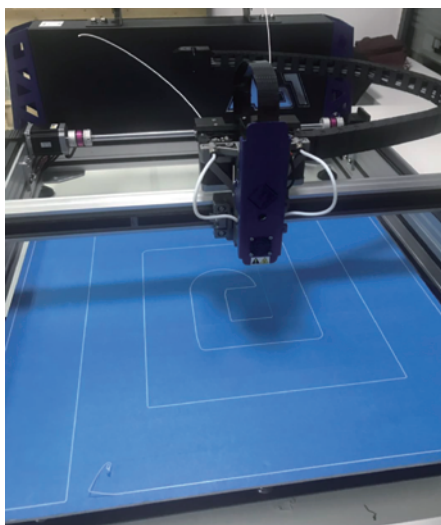
2.设备开始打印图案，若图案粘附在平台上，图案无松散起翘等现象说明平台平面度良好。

⭐ **特别说明：**

1. 由于玻璃运输容易破碎，闪铸不额外售卖玻璃，用户可自行采购620*620*5mm的玻璃用于打印，制作超级字时部分需要直接带玻璃固化的用户可选择玻璃打印。闪铸推荐使用5mm不钢化的玻璃；

2.安装玻璃前请务必先进行喷头校准，以免喷头磕到玻璃。

校准方式：

根据玻璃厚度H，将Z轴坐标设置为H+1MM，例如玻璃为5mm厚，将Z轴坐标值设置到6mm。
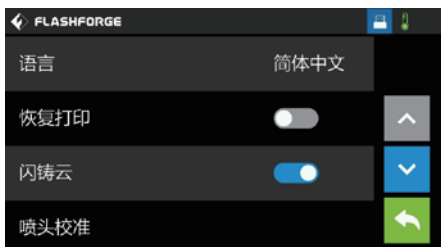
1.点击工具-设置-喷头校准

2.Z轴坐标设置到6的时候，直接点击确认， 出现Z轴电机已锁定的提示后，无需其它操作，直接点击完成。

玻璃安装方式如图所示：

拿出玻璃安装的选配件，安装玻璃前如平台铝板上的美纹纸已起翘破损，请撕除。
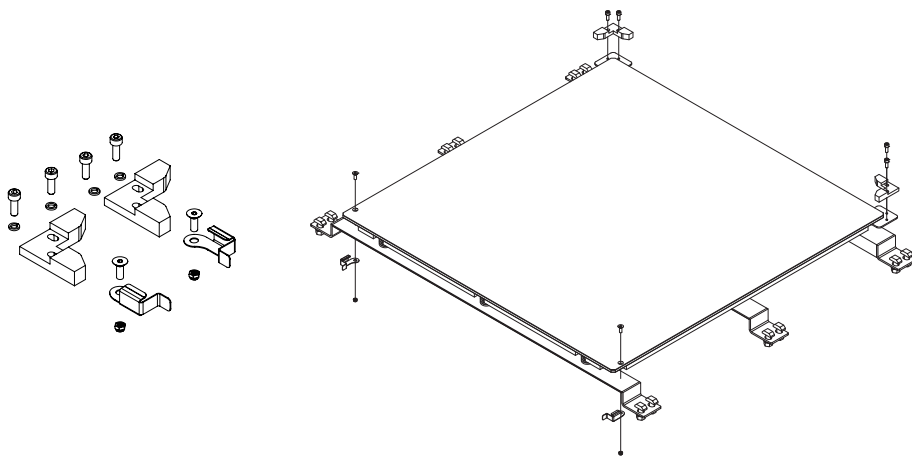
1.将原先铝板上的靠近边缘处的美纹纸撕除，用M4的沉头螺丝穿过铝板用M4锁紧螺母将 金属卡扣锁在铝板下方。

2.将直角固定块通过M4圆柱头螺丝固定在铝板后方的基块上 。

3.将玻璃放到铝板上方，用金属卡扣扣住。

4.玻璃安装完成后，再进行一次常规的平台面与喷嘴的校准操作调平。校准后即可正常打印。

1.5 设备界面
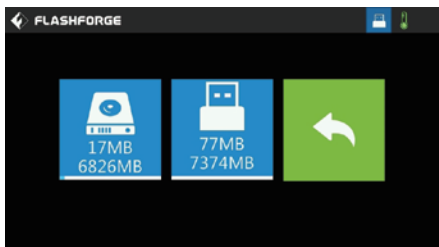
点击打印按钮，选择读取打印文件的路径：

1. 从打印机本地存储卡中读取；

2. 从外接U盘中读取打印文件；

3. 返回：返回上一界面。
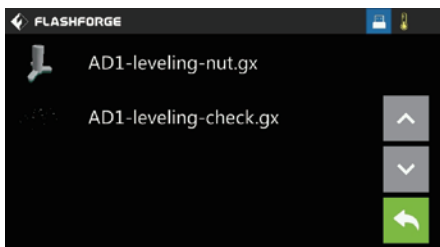
在文件列表中选择打印文件：

1. **打印：**开始打印；

2. **复制：**将U盘中的文件复制到打印机本地存储卡(选择本地存储卡打印时此功能不可用)；

3. **删除：**删除此打印文件；

4. **返回：**返回上一界面。

5. **列表中的绿色文件：**表示此文件已被打开过。
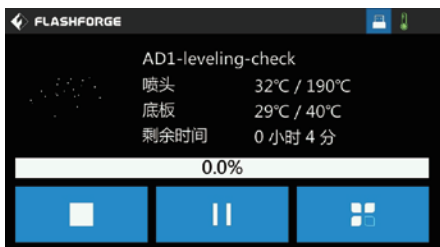
取消：取消此次打印工作；

暂停/开始：暂停打印/开始打印；

工具：打印过程中可实时查询或更改：底板温度、打印时间、Z轴坐标、丝料使用 量、打印速度、换丝设置。

喷头温度：当页面中喷头温度出现下划线时，点击可更改喷头温度。

打印速度：打印过程中可进行修改；
换丝：打印中途需要换丝时可点击 换丝按键（暂停打印后该功能可用）；
返回：取消工具命令，返回打印界面。

修改打印速度：

开始打印后，点击打印速度数值，可对个位，十位，百位分别修改设定打印速度数值，点击是保存设定值；点击否取消设定。

字壳质量与打印速度有较大关联，字壳需要冷却时间，速度过快，冷却不足会导致字壳模型坍塌，影响字壳质量。
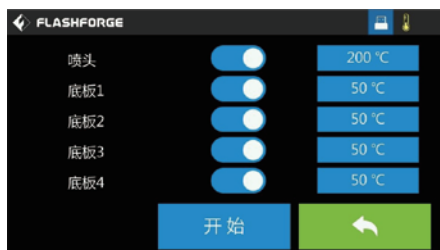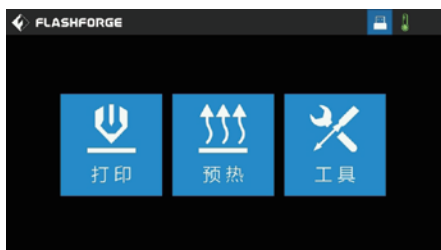
点击预热图标，进入预热界面：

1.**开/关：**打开喷头/加热平台预热功 能，关闭喷头/加热平台预热功能；

2.**温度数值：**点击该图标可进行预热 温度的设定；

3.**开始：**点击开始图标，喷头开始预 热；

4.**返回：**返回到上一界面。
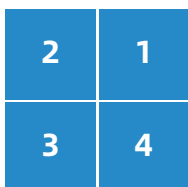
底板1，2，3，4 对应设备如图 （屏幕靠近底板4）
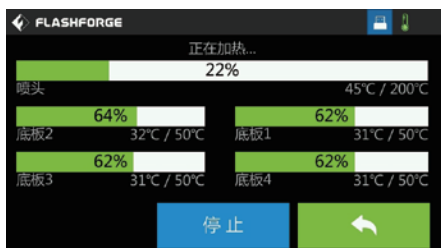
喷头/加热平台加热界面：

1.**实际温度值/目标温度值；**

2.**停止：**可暂停预热；

3.**返回：**返回上一界面。
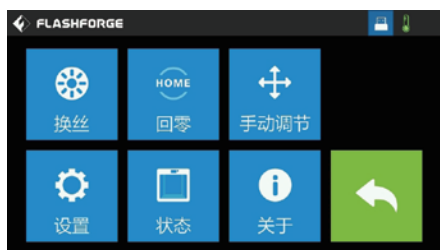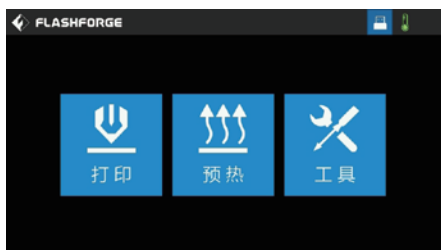
点击工具图标，进入工具界面：

1.**换丝：**进行进丝/退丝操作；

2.**回零：**使打印机 X/Y/Z 轴回到机械原点；

3.**手动调节：**手动调节 X/Y/Z 轴的位置；

4 **设置：**对打印机进行相关的功能设置；

5.**状态：**查看打印机的实时状态；

6.**关于：**查看打印机的版本信息等；

7.**返回：**返回上一界面。
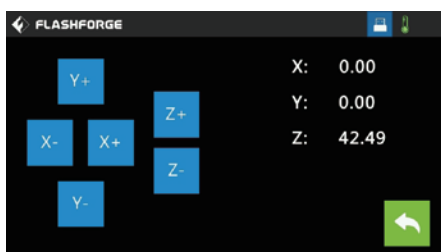
点击手动调节图标，进入手动调节模式：

1. **Y+：**喷头往 Y 轴正方向移动，即向后；

2. **Y-：**喷头往 Y 轴负方向移动，即向前；

3. **X-：**喷头往 X 轴正方向移动，即向左；

4. **X+：**喷头往 X 轴负方向移动，即向右；

5. **Z+：**平台向上移动；

6. **Z-：**平台向下移动；

7. **返回：**返回上一界面。
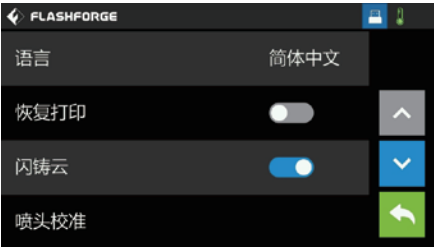
点击设置图标，进入设置界面：

1.**语言：** 设置打印机显示语言；

2.**恢复打印：** 设置断电后再开机是否继续未完成的打印，默认建议打开；

3.**闪铸云：** 关闭/开启闪铸云连接打印功能；

4.**喷头校准：** 校准喷头与平台的初始距离；

5.**保温设置：** 打印完成平台仍处于保温；

6.**Z轴补偿：** 喷头校准的扩展功能。调平后，若打印字壳时喷嘴距离平台有略高或者略低的现象，请使用该功能进行微调差异，可以直接输入数值，调整喷嘴与平台之间的间隙。不熟悉设备情况下不建议调整。

7. **开机声音：** 打开/关闭机器开机声音；

8. **丝盘检测：** 打开/关闭丝料检测功能；

当开启此功能时，若检测到无丝料或者丝料使用完，打印将会自动暂停。

9.**玻璃平台打印：** 打开玻璃平台打印模式后，平台不再分区加温，4个区域同时加温，防止玻璃因受热不均而破裂；

10.**静音打印：** 打开/关闭静音打印功能；

11.**恢复出厂设置：** 回到出厂时的设置；

12.**升级：** 在线升级最新的固件，若设备已连入有线网，可点击进行在线升级。
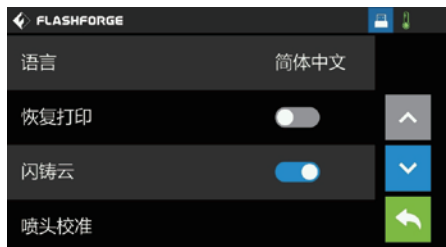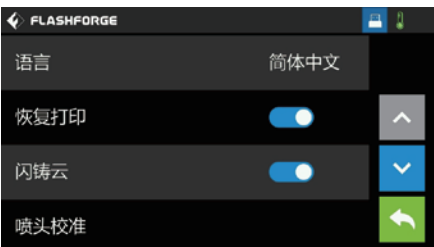
打开【恢复打印】

此时是断电续打功能开启状态，打印未完成时关机再开启，打印机会继续打印未完成的模型。

关闭【恢复打印】

此时是断电续打功能关闭状态，打印未完成时关机再开启，打印机不会继续打印未完成的模型。
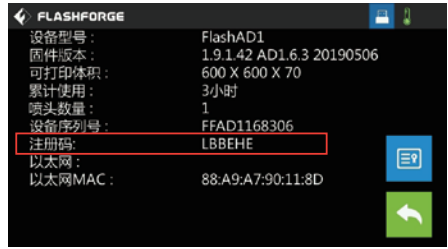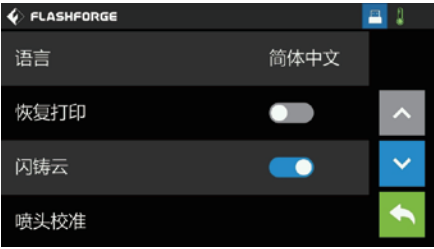
闪铸云连接

1.打开/关闭【闪铸云】

2.在【设置】-【关于】页面找到本台机器的注册码。

3.打开闪铸云（cloud.sz3dp.com），点击【添加打印机】，在弹窗中输入打印机注册码，即可将设备关联云平台。闪铸云的详细连接方法请参见下一章关于打印。

状态

点击状态按钮，可查看设备当前喷嘴预计平台的温度，以及喷嘴当前的坐标值。
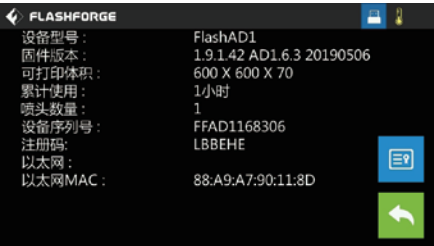
关于

显示设备基本信息，信息详情以设备实际显示为准。

可查看设备固件版本号；打印体积大小；累计的打印时长等。

以太网的IP地址：当连接上网线时，此处会显示以太网的IP地址、以太网的MAC地址。

说明：在申请售后服务时，需将【关于】中的序列号提供给售后工程师。

⚠️ **说明：设备固件定期更新，部分界面有差异属正常现象。**

第二章 设备打印

2.1 打印配套软件

　　FlashAD软件是运用在闪铸广告机上的一款软件，具有生成3D模型、导出轮廓线、生成切片文件三大功能，用于广告字的制作。

　　广告字的制作步骤：

　　1、生成3D模型；

　　2、导出轮廓线；

　　3、生成3D模型的切片文件、打印模型；

　　4、按照轮廓线切割亚克力板；

　　5、模型和亚克力板的装配。

　　在使用AD1发光字壳3D打印设备打印时，需要使用发光字配套切片软件进行字壳的文件制作，将字壳或图形设计文件转化为3D打印设备可识别的文件。

2.1.1 获取软件

获取软件途径：

随机的**U盘**可复制FlashAD软件或**请登录www.sz3dp.com**获取最新版本的软件。

打开FlashAD广告字专用软件，点击右上角用户登录按钮，点击注册云账号，将会跳转至云平台网页进行注册，或直接登陆https：//cloud.sz3dp.com，注册闪铸云账号。

2.2 获取字壳文件

FlashAD可直接生成文字，软件中自带文字输入功能；点击后，在对话框中输入所需的文字，选择需要的字体。

此处说明以软件自带文字生成举例。

· 用户可使用CorelDRAW 等软件制作的矢量设计图，导出以cdr格式的文件。将此文件导入到FlashAD 软件中。

· 点击文字按钮，输入"闪"字，自定义字体及大小（若是cdr文件输出对字体大小会更直观）

文字 　　导入

单位：mm

L 80　　W 20

镜像

顶面 ☐

底面 ☐

0.8　　1.0

20　　3.0

10°　 X 0.8　☐ 倒放

30°　 X 2

生成3D模型

轮廓线

打印

W A L 显示字壳大小，拖动可更改大小。

顶面/底面：设置后会出现不同的字样形式。

可设置字壳分层的颜色，若只设置一种颜色，默认为右边料盘的丝料打印。

默认为0.8mm，此参数不需要设置。

代表所打印字壳的厚度，默认为0.8mm，数值越高，字壳厚度越厚。

代表所打印字壳的整体高度，默认为20mm，数值越高，字壳越高，设置支持最高70mm的高度。
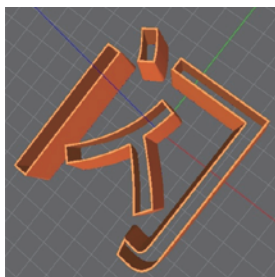
代表所打印字壳的外圈比内圈高出的高度。

代表所打印字壳的与直边字打印时的倾斜角度，即为斜边字打印，当字体大小越小时，倾斜角应设置的小，否则容易打印失败。X表示底部直边的长度。
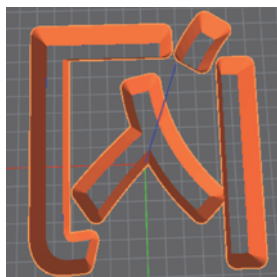
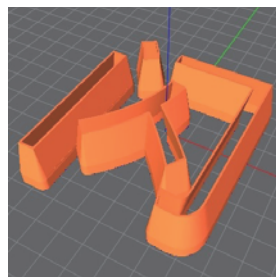代表边缘鼓起的弧度，X表示距离上下边的高度。

通过一系列需要的设置后点击生成3D模型按钮，文字将会从二维转化为三维字壳。

⚠ **注意：**

1.字壳模型倒放和镜像同时选择时，实现模型的倒立放置。
2.字壳设置为下部直边、上部斜边的字壳时，点击倒立和镜像按钮，所设置的台阶将会失效。
3.当添加底部加宽时，设置倒置镜像时，会使得字壳模型打印完成后底部加宽的部分呈现在字壳上表面。

倾斜图示
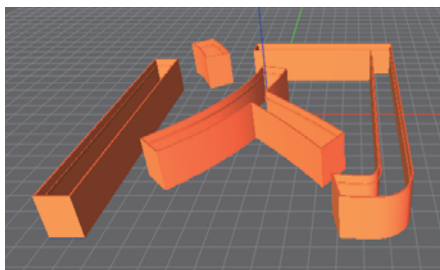

镜像与倒放图示

X值设置后，直边+斜边双重效果图示
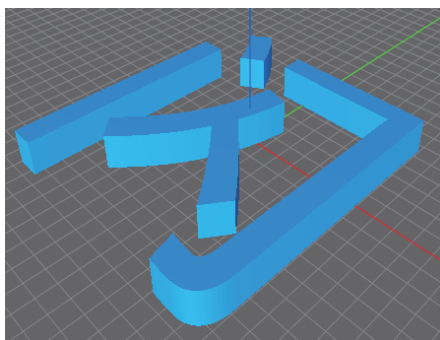
选择顶面台阶，可设置台阶距离顶面的高度，以及台阶所需的宽度。
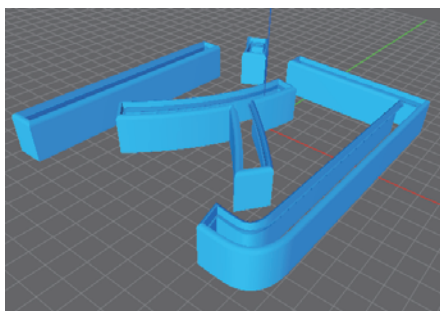

顶面台阶效果

选择顶面封闭，字壳顶部将会是一个封闭的面。

顶面封闭效果

选择顶面倒角，顶面的弧度会形成倒角，倒角大小根据自定义设置。
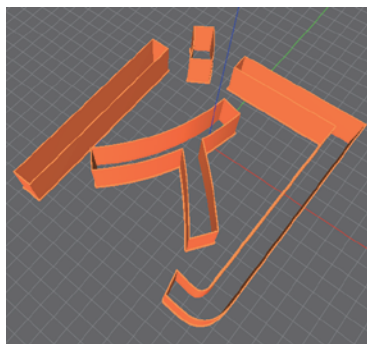

顶面倒角效果

选择底面封闭，字壳底部将会是一个封闭的面。
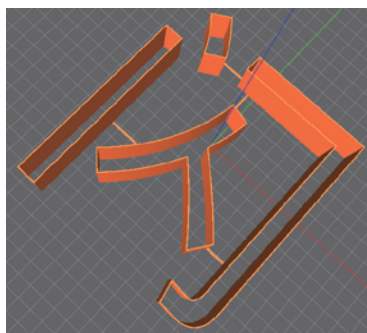

底面封闭效果

选择底面加宽，底部将会有一个外沿的部分，外沿大小按设置。
建议外延0.8，将有利于字壳粘附于平台。

底面加宽效果

选择底面支架，字壳体之间会有支架产生，有利于字壳粘连。

底面支架效果

选择底面台阶，可设置台阶距离底面的高度，以及台阶的宽度。

底面台阶效果

2.3.3 文字颜色分层设置

点击此按钮可设置字壳分层的颜色。
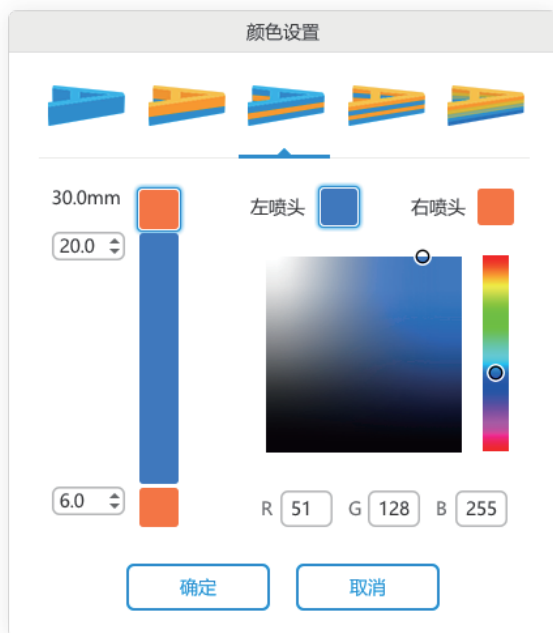
分别代表：单色打印、双色打印、双色交错、双色循环交错、双色自由循环交错

以三层分色打印为例：设置第一层为橙色（表示第一层使用右喷头打印（这里的橙色只是用于区分左右喷头，并不一定代表真实颜色），若设置总高为30，下部颜色可在框中设置高度，中间颜色框的数字为第一分色加第二分色的高度；最顶层颜色与第一分色的颜色相同；左右喷头可点击色块切换。

例如： 模型总高30mm，第一分色设置6mm，第二分色设置20mm，则说明第一分色高度为6mm，第二分色高度为14mm，第三分色高度为10mm；
其它分层原理与此类似。
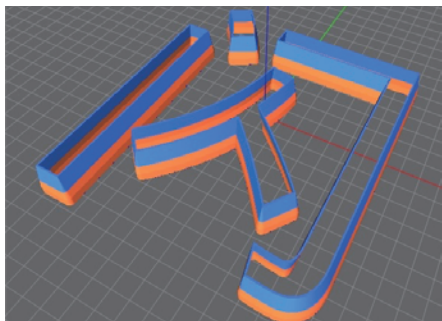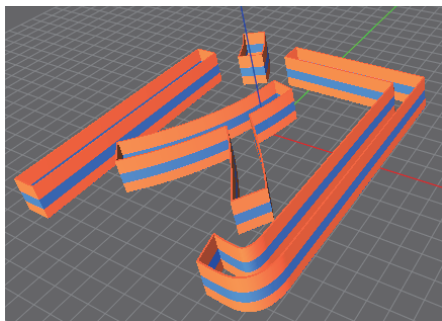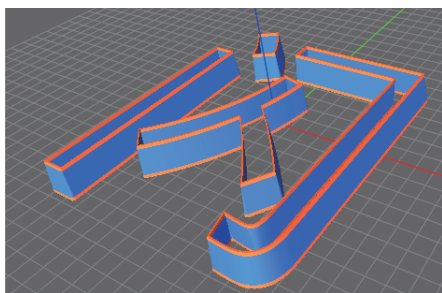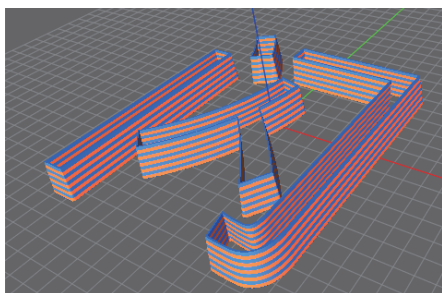
文字颜色分层效果

2.3.4 移动旋转缩放设置
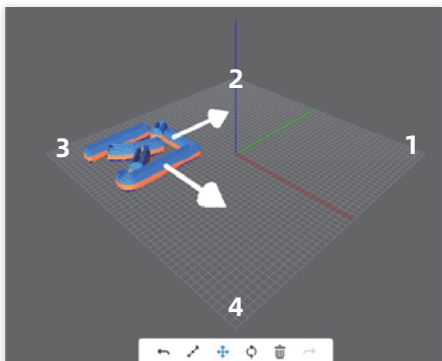
选择移动按钮，字上出现箭头，点击箭头或者直接拖动文字可将其拖动放置在合适位置。**选择平台区块，对应底板1/2/3/4，默认放置的底板区域为3号区域，当单字打印时可节省平台加热的时间。**
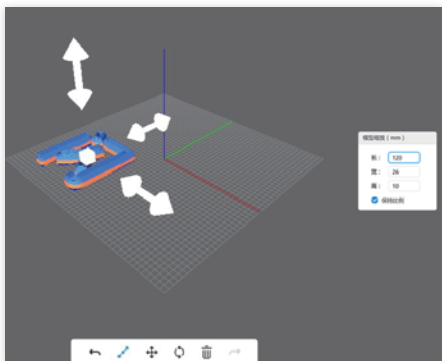
选择缩放按钮，可更改字体大小；点击箭头为单方向缩放，点击方块为整体缩放。

运用FlashAD软件生成3D文字模型方法：

点击"轮廓线"，"轮廓线"弹窗显示。3D模型分为顶面内部、顶面外部、底面内部，底面外部4
类轮廓线，为了实现不同的需求可设置轮廓线的缩放系数（数值范围：-5%～5%的两位小数）。
完成设置，点击"确定"，保存轮廓线。

点击轮廓线： 将会导出所需要雕刻面板的文件，该文件可导入激光雕刻机中，雕刻面板。

⚠️ **针对轮廓线和亚克力板的制作，可能遇到的问题及其解决方法，在此举例说明。**

导出轮廓线具体说明

· 生成含有"台阶"模型时，为防止脱落，建议台阶的高度稍大于亚克力板的厚度。
如：亚克力板的厚度为2mm，台阶设置为3.0mmX1.6mm，如图。

• 一些文字的轮廓间隙较小，在生成3D模型后，存在重合封闭现象，导出的轮廓线会有交叉、中断现象。如图：
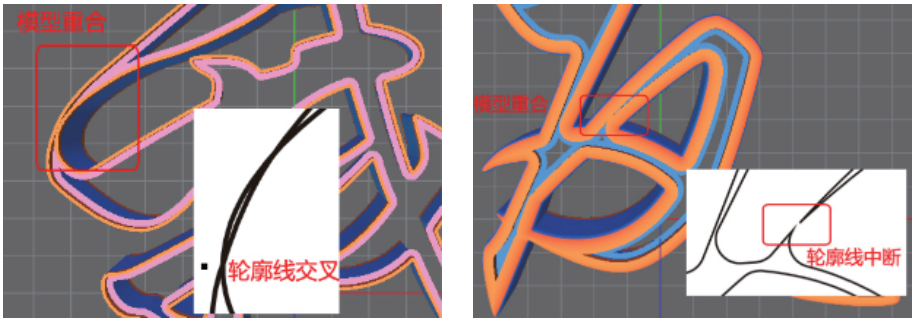
• 含有倒角效果时，顶面外部的轮廓线不存在；顶面封闭时，顶面的轮廓线不存在；底面封闭时，底面的轮廓线不存在。

切割亚克力板具体说明

　　轮廓线导出为plt格式，在相关的软件中打开或导入查看是否完整、无误。一般从CorelDRAW软件中导入轮廓线。另外，市面上的切割机种类很多，为了保证精度，建议采用激光切割机，切割时对准轮廓线进行切割。激光切割机种类很多，此处介绍普遍采用的火焰切割机。

• 由于火焰切割机温度不够均匀，所以亚克力板表面的温度会高一些，收缩率也比较高，切割面是斜面。为了使亚克力板装配到3D模型时更容易一些，请先将轮廓线进行水平镜像，再进行切割。

• 3D模型打印时，边角部分有丝料堆积增厚现象，为了加大模型和轮廓线的匹配度，所以FlashAD导出轮廓线时设置了0.8mm的圆角。如果切割机的精度不够，可能会视为直角。这时可对亚克力板的边角做修剪，也可根据切割机的精度，在CorelDRAW软件中自行修改轮廓线的圆角。如图：
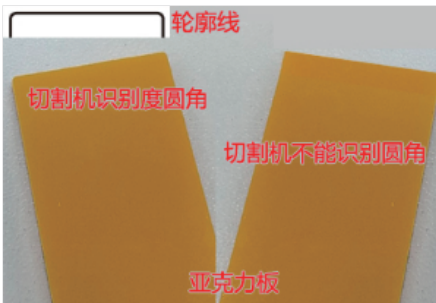
如上所述，轮廓线存在交叉、中断、间隙过小，切割时会出现断开，这是不可避免的。

• 如果不是激光切割机，在切割时请考虑刀具半径的补偿，例如：刀具的直径为4mm，切割时应对准轮廓线向外或向内2mm的半径补偿。

亚克力板装配

　　装配时，模型在下，亚克力板在上，边角对齐，整体按压，以不脱落、不透光为准，再涂上胶水加强牢固。

有关说明：
• 边角和弯曲的位置丝料堆积和变形程度不同，尤其是弯曲程度比较大和有倾斜效果的模型。会遇到按压不进的情况，需要细节的用力挤压或亚克力打磨处理，也可修改轮廓线。如图：

• 如上所述，模型有重合，轮廓线和亚克力板有中断现象，需要分开装配，效果如图，中断部位将不会透光。
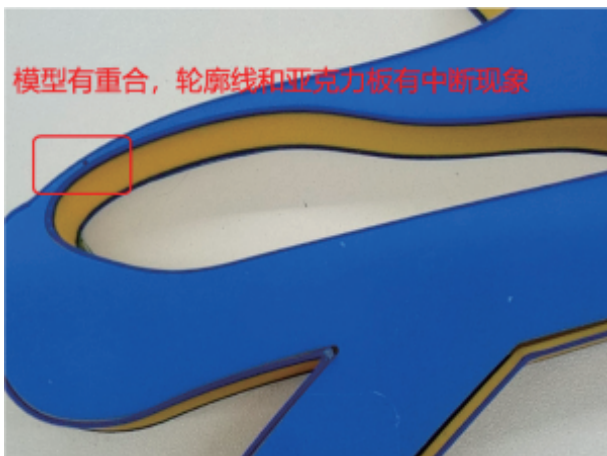
切割机存在多种参数，参数不同，精确度不同，会产生不同的误差；耗材不同，收缩率也不同，模型打印时同样会产生误差。所以，请在使用前做好轮廓线的校准工作。

校准方法：

1. 打开FalshAD，"金"，字体：stxingka，宽度：253mm，倒角：高度5mm，生成模型，导出顶面内部的轮廓线；"历"，字体：Yuanti，长度：212mm，台阶：3.0mmX1.6mm，倾斜：10，生成模型，导出顶面内部的轮廓线。

2. 分别打印模型，沿着轮廓线切割亚克力板，装配亚克力板，根据匹配程度，调整轮廓线的缩放比例。若出现亚克力板偏大，加大缩放比例，如从-0.5%调整到-0.8%；相反，缩小缩放比例，如从-0.5%调整到-0.2%，直至亚克力正好卡扣到模型内，不脱落，不透光。

2.3.6 添加打印机设置

点击打印，页面跳转到打印界面。
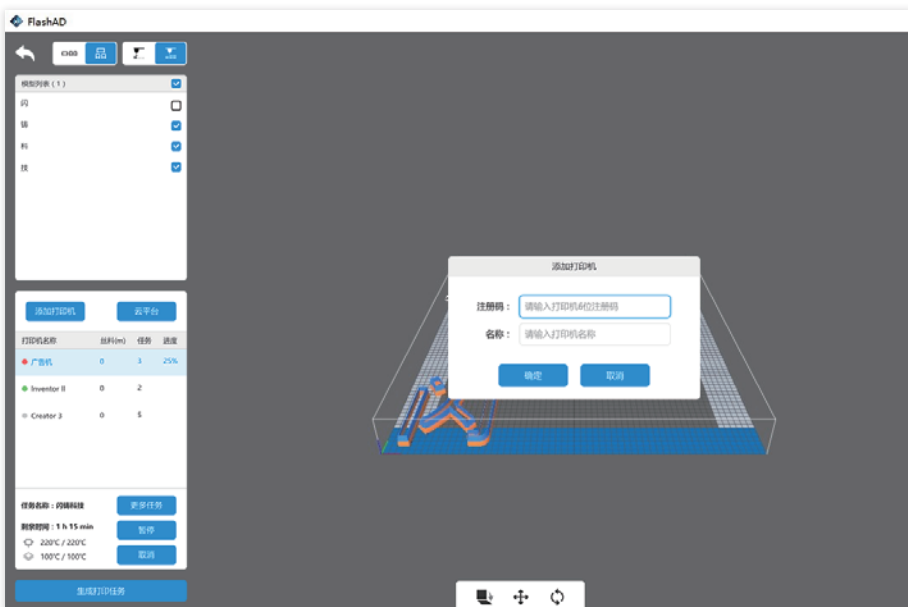
点击添加打印机，将设备关联到FlashAD以及云平台。

在设备关于页面中找到注册码，输入到对话框中。将设备名称输入，名称可自行定义。点击确认设备即被关联。当设备未插入网线时，当前会显示离线状态，当设备插入网线后，设备会处于在线状态。在线状态时，设置好的文件可直接发送至打印机打印。

字壳解体打印，字壳分体，均为一笔画打印，例如闪字会被自动分隔成4个字壳部分。选择该模式打印，模型表面更光滑，模型表面没有接缝，更加美观。简单的字壳形状（圈状字壳）建议使用该模式打印。
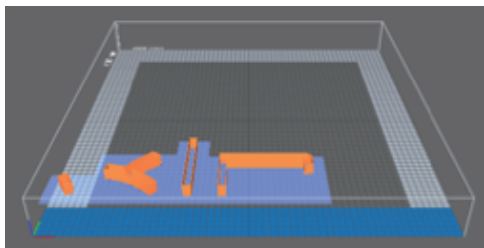
整字打印，按单个字体进行整体打印，打印完整个字壳后再打印下一个字体，当选择这个选项时，底面会出现蓝色高亮标志；打印先后顺序为打印完第一个字壳部分后，开始打印第二个字壳部分。该打印模式可以将先打印完成的字壳先取下制作。

字壳一体式打印，不会将一个字拆分成几部分。该模式打印时生产效率较高，但字壳表面会产生接缝。

⭐ **字壳放置说明：**

字壳默认放置于底板3的位置，软件放置的区域为3-4-1-2；用户可自行移动字壳位置。
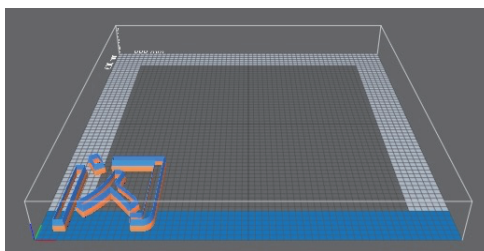
字壳将按层打印，先打印第一个字壳的第一层，再打印第二个字壳的第一层，再打印第三个字壳的第一层。依次按层逐渐将字壳全部打印完成。该打印模式需要全部字壳都打印完成才能取下字壳。

模型列表可以选择当下字壳打印或者不打印，点击勾选或者取消，当不勾选时，模型隐藏，且不会被打印。
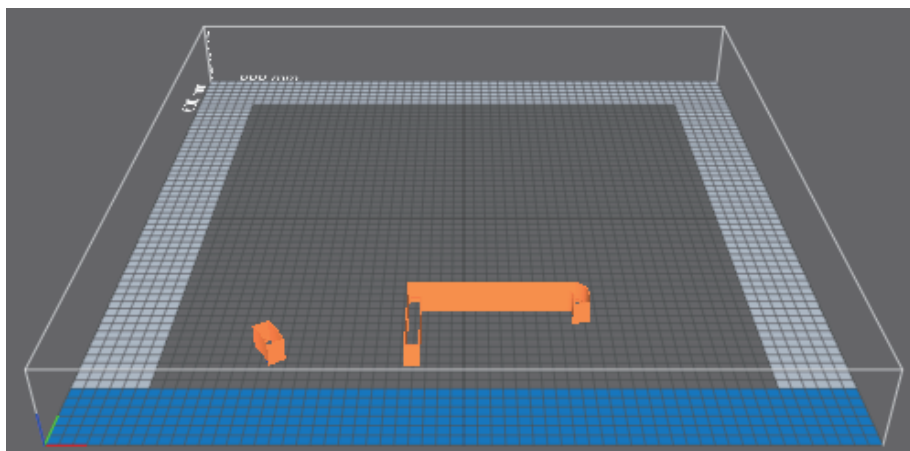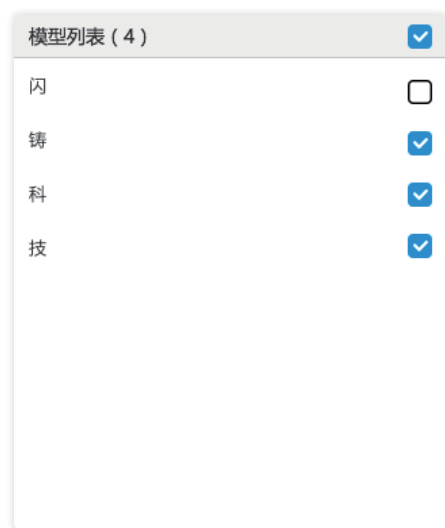
点击生成打印任务，将会出现弹窗。

打印设置		打印设置

标准打印设置 ▲

高级模式设置 ▶

文件名称： 可更改文件名，以便后续区分。

打印质量： 可选择低/标准/高，质量越低，打印速度越快，质量越高，打印速度越慢，建议选择标准模式。

打印材料： 选择广告耗材时，底板和喷头温度默认95℃和230℃；打印耗材选择广告PLA时，底板和喷头温度默认50℃和220℃；也可根据实际情况进行更改，参数设置对应字壳设置请查看2.3.10打印字壳大小以及字壳壁厚对应参数设置方法。

底板网格： 帮助底板的粘附，需要底部特殊花纹时，可增加此选项，打印时间将会增加，一般情况下不建议选择。该功能也可用于分散字壳间的连接，字壳取下时不会分体，也可以用于做灌胶字，灌胶是分体的字壳不会偏移，若是用于连接，可将密度设置的小一些。

△ 形成三角形状的结构体；▩ 形成六边形状的结构体；〰 形成波浪形状的结构体；密度：表示纹理的密集程度。

路径模式切片： 软件默认选择切片模式为路径，将有更好的打印质量。

V型边： 选择V型边时会在字壳外边缘打印一圈V字型的边，增大与平台的粘附；当打印大于200mm 的字壳时建议将此设置勾选，能大幅的提升打印成功率，防止由于字壳未能粘附到平台上的打印失败。〰〰〰

高级： 高级模式开放了更多的参数供用户设置。

层高： 用户可自定义速度与层高。层高越高，层与层之间越分明；打印时长越短；建议设置层高0.25-0.3mm。

出丝量： 出丝量越大，喷嘴吐出的丝料越多，成型的字壳会变厚，起点速度建议为慢速。

打印速度： 建议一般打印按40-50mm/s的速度打印，对应不同字壳设置，在下一页面中将有详细的建议说明。

空走速度： 未打印模型时，设备运行的速度。

Z轴抬升： 空走时Z轴抬升的高度。

首层出丝量： 首层出丝量的增加有利于第一层粘附于平台。

首层速度： 第一层打印的速度，建议设置10-20mm/s，第一层速度若太快，丝料无法粘附在平台上，容易打印失败。

回抽速度： 表示喷头抬升时，丝料反抽回喷头的速度，增加回抽速度有利于较少拉丝现象。

回抽长度： 表示喷头抬升时，丝料反抽回喷头的长度，增加回抽长度有利于较少拉丝现象。设置较大回抽长度，会导致缺丝。

补偿速度： 回抽后的补偿，回抽时速度要快，补偿回来的速度要慢。

补偿长度： 对应回抽后对丝料的补偿长度，是为了防止字壳缺丝（若未有缺丝现象则可以不设置）。

换色模式： 选择换色墙，可选择输入换色墙坐标，也可默认设置；换色时，在打印第二个颜色前将会先打印换色墙，然后再打印第二个颜色；以增加不同颜色之间材料的粘附。换色长度建议大于300mm。

换色减速： 指当两种颜色切换时，切换的颜色第一层的打印速度与常规打印速度的比例，速度降低有利于材料间的附着。

换色长度： 两种颜色切换前，设置预吐丝的长度，当设置数值为0时，换色时不吐丝；当设置数值为40时，则遇到换色层时另一个颜色将会先吐出40mm 的丝料（该功能防止换色时耗材粘附不佳，开换色层开裂的问题）。

换色高度： 指喷头更换颜色会进行吐丝的高度。

换色偏移： 选择换色吐丝模式，设置偏移量，吐丝时喷头移开当下打印模型，移开距离为设置的偏移距离。

换色位置X/Y： 选择换色墙模式时两种颜色切换时，喷头将移到设定的X/Y坐标位打印围墙。

减速面积： 当较大字壳和较小字壳同时打印设置较高的速度，会导致小字壳冷却不充分，影响字壳质量，设置该值表示当字壳运行的路径小于该值时，设备自动降低打印速度，以确保小字壳的打印质量。

起点速度： 在一体式打印的模式下，起点速度太快容易造成起点处缺丝，因此设置较慢的起点速度，有利于保证字壳质量。该设置的值为常规打印速度的百分比。

起点距离： 即设置起点速度后，对应运动的路径长度。

悬挂速度： 打印台阶时的速度，速度越慢越利于台阶的粘附，建议设置30-50% 的值，悬挂速度的计算方式为百分比乘以打印速度，不建议超过30mm/s。

XY加速度： XY轴的运动加速度，加速度设置越高，提速越快。

Z轴速度： Z轴抬升时的速度。

Z轴加速度： Z轴的运动加速度，加速度设置越高，提速越快。

建议按默认值打印，客户可以根据自身需求进行参数微调。

设置完成点击确认后，会生成切片文件，若设备已绑定且联网，文件可直接传输至打印机。或者将文件存储到U盘，通过U盘打印。

打印字壳大小	打印速度	打印温度（广告PLA）
<15 cm	30-40 mm/s	210-220 ℃
15-20 cm	40-50 mm/s	215-220 ℃
20-30 cm	50-55 mm/s	215-220 ℃
30-40 cm	55-60 mm/s	220 ℃
50-60 cm	60-70 mm/s	220-225 ℃
备注：当打印字壳大小越小时，建议使用较低的打印速度，以便字壳有更好的冷却效果；表面纹理更光滑。		

字壳壁厚	设置方法（喷嘴直径与壁厚）
0.6 mm	喷嘴直径：0.6 壁厚：0.6 设置出丝量：100%
0.8 mm	喷嘴直径：0.8 壁厚：0.8 设置出丝量：100%
1 mm	喷嘴直径：0.8 壁厚：0.8 设置出丝量：125%
1.2 mm	喷嘴直径：0.6 壁厚：1.2 设置出丝量：100%（路径将打印两圈）
2 mm	喷嘴直径：0.8 壁厚：2 设置出丝量：125%
备注：字壳壁厚与设置的喷嘴直径以及壁厚设置以及喷嘴的出丝量有关，该设备默认选择0.8/0.8/125%的参数设置；即约1mm 的壁厚； 存在的对应关系为：字壳壁厚=喷嘴直径*出丝量*（设置壁厚/喷嘴直径） 当希望打印字壳壁厚为1，喷嘴直径0.6mm，壁厚1mm时打印时将为打印两圈，因此打印时间将会加长；当设置喷嘴直径0.8，壁厚设置0.8，出丝量设置125%，只打印一圈。	

如上描述为理论计算，实际厚度有所偏差，如下数据为实测值，供参考：

（1）0.6壁厚参数：0.6喷嘴，0.6壁厚，100%出丝量，但容易出现小孔，建议出丝量120%，实际为0.7的壁厚。

（2）0.8壁厚参数：0.6喷嘴，0.6壁厚，130%或140%的出丝量

（3）1.0壁厚参数：0.6喷嘴，0.6壁厚，160%的出丝量

（4）1.2壁厚参数：0.6喷嘴，0.6壁厚，200%的出丝量；0.8喷嘴，0.8壁厚，150%的出丝量

（5）1.5壁厚参数：0.6喷嘴，1.2壁厚，100%的出丝量（两层，适合小模型）；1.0喷嘴，1.0壁厚，150%的出丝量(单层，适合大模型)

（6）1.8壁厚参数：0.6喷嘴，1.2壁厚，120%的出丝量（两层）

（7）2.4壁厚参数：0.8喷嘴，1.6壁厚，130%的出丝量（两层）；0.6喷嘴，1.8壁厚，120%的出丝量（三层，适合小模型、台阶和倒角模型）

2.3.11 切片文件传输设置

打印切片 ✕

文件名称：闪.g

打印时间：0.0 小时

打印材料：0.0 米

正在切片，请稍等...

25%

发送到打印机　导出切片文件

弹出打印切片窗口，切片完成后，可发送至打印机以及导出切片文件至U盘。
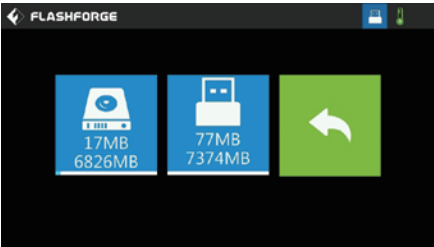
在设备中插入U盘，点击U盘中的文件，点击复制按钮，将GFZ文件复制到内存中，再返回点击内存中的文件进行打印。复制到内存后的文件后缀为.g可被设备识别，打印。

在任务界面中可查看打印打印机是否忙碌，当打印机未忙碌时，直接发送文件后可直接打印。若当前打印机在忙碌状态，新的文件将会排入到任务列表中，当前一个字壳打印完成后可继续点击打印。

该界面中显示任务的名称，剩余打印时间，喷头和底板温度，更多任务查看任务列表。

暂停：暂停当前打印任务

取消：取消当前打印任务

⭐ **特别说明：**

FlashAD软件功能按一定周期更新，该设备说明书不会实时更新，软件更新时将会有更新说明；可在官网（www.sz3dp.com）获取最新的FlashAD软件。

第三章 维护与支持

3.1 拷贝日志

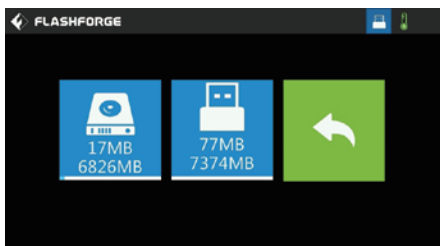1.插入U盘，在设备的触摸屏右上角会出现 图标。

2.快速点击 图标3下，图标会跳动一下，说明日志已拷贝到U盘中，拔掉U盘。

3.把U盘插入电脑，打开U盘文件夹找到log文件。

4.请把日志文件与设备序列号发给闪铸客服。

3.2 维护与检修

问题	原因	改正措施
耗材无法粘附到平台	平台不平，或喷头校准值有偏差	请按说明书中校准喷头与平台的操作执行，平台调平与喷头校准；其它简便方法：可以使用蓝色胶带进行补偿，间隙较大的地方贴蓝色胶带进行补偿。增加第一层的出丝量可以增大粘附。
耗材无法正确挤出	查看喷头是否堵塞	将喷头进行预热，手动推动丝料是否可以将丝料挤出；若不行，按压气管接头的黑色弹片，取出导丝管，使用通针工具打喷头进行通塞处理。
喷头无法回到原位	1.限位开关线路故障；2.有障碍物阻挡运行	查看限位开关的状态，设备运动时有无碰撞到限位开关，如果未碰撞到查看周边有无障碍物阻挡。确认限位开关功能是否失效。若是请联系售后服务。
屏幕黑屏，点击没有响应	1.电源可能未上电；2.屏幕故障	确认电源完好通电的情况下若开机屏幕一直无响应，此时进行设备断电。使用螺丝刀将屏幕盒拆开，小心抽出屏幕重新插拔屏幕排线，再上电查看屏幕有无点亮。若此时屏幕仍然无法点亮请联系售后服务。
喷头加热部件下方全是鼓出的丝料	铜喷嘴的螺纹没有拧到位，导致了漏丝	需要先加热清理残留的丝料，并重新装配铜喷嘴，可以联系售后服务索取需要的操作视频，根据操作视频进行清理安装。
打印时噪音很大	打印速度过快	降低打印速度，或降低加速度的参数。
x/y轴无法移动	驱动芯片损坏/或电机线损坏。	请联系售后人员。

3.3 日常保养与维护

1.日常不使用设备期间，请盖上顶盖，关闭前门，避免设备落灰。长期未使用者，建议使用原厂包装封存。

2.定期给运动部件上润滑油（通用润滑脂）。使用频繁者，至少每隔两周添加一次润滑油（脂）；长期不使用者，至少每4个月添加一次润 滑油（脂）。

3.每次打印结束，请及时清理打印平台上的轮廓线和其他杂物，避免影响下次打印的模型质量。

4.打印贴纸为消耗品，当打印平台贴纸附着力下降，或者破损；请及时更换打印贴纸。以免影响打印效果。

5.首次使用设备或更换打印耗材后，请使用闪铸官方耗材，直到喷嘴挤出耗材与装入耗材颜色一致。

6.设备若不打印，请注意防尘摆放。

3.4 帮助与支持

闪铸专业的售后及销售团队随时为您待命。我们非常乐意为您解决您在使用AD1过程中遇到的任何问题。如果您无法从此用户手册中找到解决问题的方法，您可以访问我们的官方网站搜索解决方法，当然您也可以通过电话或QQ联系我们。

在我们的官网中，您可以找到一些常见问题说明和解决方法。在视频栏中可找到对应产品的操作视频。您的许多问题都可以在这里得到解决：http://sz3dp.com。

您可以在每周一到周六的上午8:00~下午5:00工作时段通过电话和QQ来联系闪铸的售后团队为您解决问题。如果您在非工作时段联系我们，我们会在工作时段第一时间给您回复和反馈，解决您的问题。若造成不便，我们万分抱歉。

注：由于更换不同的丝料，会有少量杂质残留在喷头中造成喷头堵塞，疏通后即可，不属于质量问题，不在400小时寿命范围内，若用户使用时存在该问题请联系售后或当地经销商，并在售后的指导下完成疏通工作。
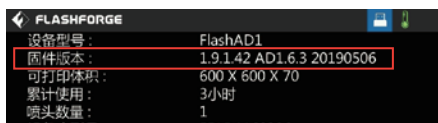
售后服务热线：400-886-6023
售后邮箱：flashforge@flashforge.zohodesk.com / support@flashforge.zohodesk.com
售后客服QQ：2850862986 / 2850863000 / 2853382161
3D爱好者QQ群：149550566 / 206773820
公司地址：浙江省金华市婺城区仙源路518号

* 联系售后时，请提供机器的序列码，也就是设备的条形码以及固件版本号，以便售后排查异常 *

S/N: FFGB******

FLASHFORGE
设备型号：FlashAD1
固件版本：1.9.1.42 AD1.6.3 20190506
可打印体积：600 X 600 X 70
累计使用：3小时
喷头数量：1
设备序列号：FFAD1168306

浙江闪铸三维科技有限公司
FLASHFORGE CORPORATION

售后专线：**support@flashforge.com**   **After-Sales Service: support@flashforge.com**

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Tel: +86 579 82273989   Web: www.flashforge.com   Add: 2/F, No.518, Xianyuan Road, Jinhua, Zhejiang, China