闪铸科技
FLASHFORGE

Industrial grade 3D printer 工业级3D打印机

SZ07-CN/EN-A05

WaxJet® 400/410

User Guide

用户使用说明书

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。

This guide is only applicable to FLASHFORGE WaxJet® 400/410 3D printer
本手册仅适用于闪铸科技 WaxJet® 400/410 3D打印机

Content

Preface

Note: Each device must be tested before leaving factory. If there are some residues in nozzles or some tiny scratches on the build plate, it is normal and won't affect the printing quality.

Dear Flashforge users,

Thanks for your choice of Flashforge products and thanks for your supports for Flashforge.

The Flashforge 3D printers are of high quality and excellent performance. Even if you are familiar with earlier FlashForge machines or 3D printing technology, we still recommend that please read this guide, as there is lots of important information about the WaxJet 400/410 series for you to get a better 3D experience. The entire Flashforge team is always ready to provide you with the best quality service.

The service

If the issues that are not covered by this guide while using the printer, please contact FlashForge's customer support.
Please visit the FlashForge website for contact information: www.flashforge.com and offer the firmware version of 3D printer before contacting after-service team.(see "Firmware version" on page 23) and hardware serial number (see "Identify Printer" on page 16).

Software support

If there are some software issues that are not covered by this guide, contact FlashForge's Customer Support.
Please visit the FlashForge website for contact information: www.flashforge.com and offer the softeware version of 3D printer before contacting after-service team.(see "Firmware version" on page 23) and hardware serial number (see "Identify Printer" on page 16).

Introduction

Note

· Please read《Flashforge WaxJet® 400/410 Industrial 3D printer User Guide》before operation.
· The WaxJetPrint software is constantly being updated and screenshots in the user guide are for reference only.

The WaxJetPrint software is constantly being updated and screenshots in the user guide are for reference only. The FlashForge WaxJet® 400/410 3D Printer User Guide contains the information needed for you to set up and use this device.

This User Guide including the following parts: Preface, Introduction and After-sale service.

The Preface section includes resource acquisition channel, the overall framework of the manual, and the problems that should be paid attention to while printing.

The introduction section contains the overview of 3D printing technology, equipment introduction, unpacking and installation of equipment, software installation and use.

After-sale section contains the user how to get the support and help.

Important Safety Information

Please make sure to read the following Safety guidelines carefully

Safety Symbols and Definitions

Hot surface danger:
There is a hot surface around this sign or behind the access port. Avoid touch. Hot surfaces can cause burns or fire. Make the surface cool down before touching. The access port is for maintenance only, It can be opened only certified service personnel or well-trained maintenance personnel.

Keep fingers away from sharp objects:
Putting your fingers in front of sharp objects may cause serious injury.

Wear gloves:
Please wear suitable gloves as needed. wear heat-resistant gloves when contacting hot surfaces to avoid burns.

Wear glasses:
In the case of possible leakage or splashing of structural materials, protective glasses with side shields should be worn to protect the eyes.

Risk of electric shock:
There will be high voltage near this sign or behind the access port. High Voltage Association causes severe burns or death, or fire.The access port is for maintenance only, It can be opened only certified service personnel or well-trained maintenance personnel.

Hand involvement warning:
There is a danger of gears or moving parts near this sign or behind the access port. The access port is for maintenance only, It can be opened only certified service personnel or well-trained maintenance personnel.

Note:
Used to prompt important information rather than critical information.

General

Improper use of the 3D printer system can cause personal injury.

When operating the machine, please follow the following safety guidelines:

- Read and follow all 3D printer system instructions. The printer should only be operated by professionals.
- Please follow all safety rules and pay attention to all precautions in this guide and warning.
- Do not try to open the top cover during printing.
- Do not use any materials before viewing the globally harmonized standard/safety data sheet (GHS/SDS).
- Do not attempt to use, repair or adjust before viewing the user's routine maintenance program documentation, except for trained professionals.
- Only certified maintenance personnel who have completed FlashForge maintenance training can perform tasks that are authorized and certified to allow the above personnel to complete.
- Do not ignore the warning signs issued during the maintenance operation of the 3D printer system. If an error message is displayed on the user interface of the 3D printer system, please refer to the "Troubleshooting " in this guide before resuming operation.

Precautions

Electrical

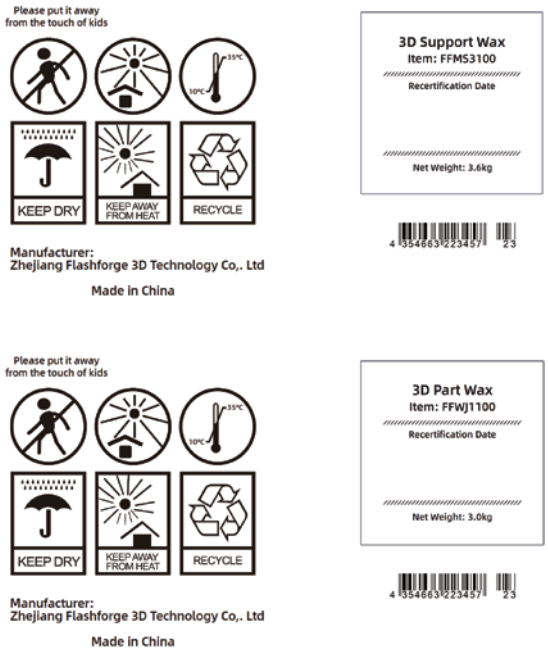
- It is the necessary and importance for the machine equipments to ground.do not modify the plug of the device. (Ungrounded / incorrectly grounded / modified plugs will inevitably increase the risk of leakage).
- Do not expose the machine to humidity or hot sun. (Wet environment will increase the risk of leakage/exposure will accelerate the aging of plastic parts).
- Do not abuse the power cable, and be sure to use the power cable provided by Flashforge.
- Bundle the power cable and communication cable at the back of the printer neatly to avoid tripping.
- Do not use the machine during thunderstorms.
- If you do not use the machine for a long time, please turn off the machine and unplug the power cable.

Safety precautions for personal operation

- Do not touch the printhead and build plate while the printer is running.
- Do not touch the printhead when the printing is just finished.
- Do not wear scarves, gloves, jewelry or other objects that are easy to get involved in the printer when operating the machine.
- Do not operate the printer after drinking or taking medicine.
- Do not touch the parts with electric shock warning signs to avoid electric shock and burning. Never try to measure the voltage value.
- Do not touch the parts with warning signs of danger on hot surface to avoid scalding.
- Wash the skin with cold water immediately if it comes into contact with melted filaments.
- Flush your eyes with plenty of water for at least 15 minutes after eye contact. If symptoms persist, please seek professional medical advice immediately.
- It is not recommended to wear contact lenses when handling liquid materials. If the liquid splashes into the eyes while wearing contact lenses, wash your eyes with cold water immediately. Make sure that the contact lenses are removed from the eyes during flushing.
- Under normal operation, the material will not enter the body by inhalation. Please always use filaments in well ventilated areas to avoid inhalation of smoke. If accidentally inhaled smoke, transfer the person who inhales smoke to an area where fresh air can be breathed. Artificial respiration or cardiopulmonary resuscitation (CPR) shall be performed if necessary. In case of dyspnea, a constant supply of oxygen is required and please seek medical advice immediately.
- The possibility of intake is very low. Please drink plenty of water and seek medical advice immediately if intake by mistake. Do not induce vomiting.

Material handling and safety

- The WaxtJet400 materials can be handled or disposed of in the same way as standard household wax products. The material shall not be used in situations that violate the intent of the material application such as medical transplantation, food or beverage processing.
- When you receive the material, check the appearance of the cardboard box. If a leak is observed, do not open the box and call the FlashForge technical support hotline.



- The "Recertification date" of the material should be checked before each use. If the material box has reached the Recertification date, a FlashForge certified partner or FlashForge technical support can help resolve issues related to materials that require re-certification.

	WaxJet® 400/410	
Material（part / support）	FFWJ1100(part)	FFMS3100(Support)
Expiration date	5 years	5 years
Enviroment	Cool and dry area with good ventilation	
Temperature	16°C-27°C	
The highest storage environment	35°C	

- FFWJ1100 part materials and FFMS3100 support materials should be stored in a storage cabinet that is close to the printer and easy to access. Storage cabinets are recommended to prevent long-term exposure of components and materials to external UV light sources, such as sunlight, overhead lighting or other UV light sources. The material storage temperature must not exceed the specified maximum of 35°C (95°F). FFWJ1100 structural materials should be stored away from strong oxidants such as hydrogen peroxide, bromine or chromic acid.
- It is very important not to tilt the material box containing the remaining material. Otherwise, the material will seep into the exhaust hole and cause blockage. This will cause damage to the material cassette and hinder subsequent printing. Place the material box containing the remaining materials in the base of the material box vertically for storage, and tighten the bottle cap.
- There are no regulatory requirements for supporting materials, which can be disposed of as ordinary office waste. Please contact your local waste recycling service provider to obtain waste disposal requirements. (The local environmental regulatory agency can provide a list of qualified suppliers.) A GHS/SDS (Globally Harmonized Standard/Safety Data Sheet) of the relevant materials should be provided to the waste recycling service provider. For SDS information on structure and support materials, please contact your local machine dealer.
- FlashForge has no responsibility or obligation for the correct disposal of structural materials. The user is solely responsible for the correct disposal of structural materials.
- Please refer to the Safety Data Sheet (SDS) provided by the manufacturer for the disposal method of isopropyl ethanol (IPA) waste.

Machine placement requirements

- WaxJet® 400/410 series printers are for indoor use only.
- The equipment needs to be placed in a dry and ventilated environment. Leave at least 60cm between the machine and the back wall, at least 100cm of space on both sides of the machine (machine maintenance space), and at least 120cm in front of the printer to open the material chamber. The space must be ≥ length x width = 3.3m x 2.5m.
- Each machine shall be separately introduced from the master switch, and each machine shall be equipped with a 40A air switch and a 3-hole 25A socket. Six square power wires are recommended.
- Every printer needs ground connections, which protects users to a certain extent.
- Before using the printer to print, you must first save or export the print data file as .stl or .slc file industrial standard format and submit it via the network.WaxJet client software can be installed on selected user workstations to facilitate users to select, preview and submit print jobs, and manage print queues.
- The WaxJet® 400/410 series printing system needs to be equipped with an Ethernet connection to transfer print jobs from the workstation to the printer.
- Please set up and start the installed TCP / IP network. The RJ45 Ethernet network connection must be installed, tested and operated at the receipt location for each printer to come. DHCP or an assigned static IP address is also allowed. The DHCP server can automatically generate the IP address; or, the network administrator can assign a permanent IP address to each printer that is to be connected to the network.
- The operating temperature of the system should be in the range of 18°C to 24°C (59°F to 86°F), and the maximum temperature must not exceed 28°C (82°F). The relative humidity should be in the range of 30% to 70% (non-condensing).
- The facility air-conditioning system of the printer operating environment should have a heat dissipation capacity of 2.0 kW, or be able to meet the temperature requirements. Make sure that any air-conditioning outlets do not directly face the 3D printer system. It is recommended to place the machine in a room with four times air changes per hour.
- The storage temperature of the system should be in the range of 0°C to 35°C (32°F to 95°F), and the relative humidity range should be 20% to 90% (non-condensing).
- The 3D printer system is equipped with a build chamber with built-in lighting and a display panel. It is necessary to provide lighting for regular areas when operating and maintaining the system. Therefore, for indoor lighting, fluorescent lamps or LEDs are the best system lighting options.Do not place the printer near windows that can be exposed to sunlight.
- The altitude should not exceed 2000 meters (6561.68 feet).

Machine use guide

- Do not leave the running equipment for a long time.
- Do not make any modifications to the equipment by yourself.
- Please operate the equipment in a ventilated environment.
- Do not use this device to conduct illegal and criminal activities.
- Do not use this equipment to make food storage products.
- Do not use this equipment to make electrical products.
- Do not put the printed model in the mouth.
- Do not use brute force to remove the printed model.
- Please keep the printer away from flammable gas, liquid and dust when working. (The high temperature generated by equipment operation may react with dust, liquid, and flammable gas in the air to cause a fire)
- Children and untrained personnel should not operate the equipment alone.

Material Requirements

Please make sure you use the FlashForge Material or the Material from the brands accepted by FlashForge. Poor quality or incompatible consumables can easily cause Printhead blockage and Printhead damage.

Project prohibited by law

- Do not copy or print any items that are prohibited by law.
- According to local laws, it is generally illegal to copy or print the following items:
  1. Guns
  2. Copy works protected by copyright. Some copyrighted works can be partially copied for "fair use". Multiple copies will be regarded as improper use. An artistic work is equivalent to a copyrighted work.
- The above list is for reference only and does not include all the content. The Flashforge is not responsible for its completeness and accuracy. If you have questions about the legality of copying or printing certain items, please consult legal counsel.

Legal Notice

- All the information in this document is subject to any amendment or change without the official authorization from FlashForge.
- The user has no right to make any modification on this user guide.The Flashforge will not be responsible for any safety accident caused by customer's disassembly or modification of the printer. No one is allowed to modify or translate this guide without the permission of Flashforge. This user guide is protected by copyright and Flashforge reserves its right of final interpretation of this guide.

Chapter 1 3D Printing Technology

3D printing technology is a technology of transforming 3D models into real 3D objects. The 3D printing technology that can realize batch printing is called MJP (Multi-Jet Printing), which is adopted by the WaxJet® 400/410 3D printer. The WaxJet® 400/410 works via selectively print liquid material through high-temperature printhead. The material are cured after cooling down, and the 3D objects are formed by stacking the material layer by layer.

1.1 3D printing process

3D printing includes 3 steps: obtain the model, edit the model and print the model.

1.1.1 Get 3D printing files

For the time being, there are the following three ways to obtain the model:

① 3D Modeling:

You can choose the 3D modeling software from the mainstream market to design your 3D model on your own. AutoCAD, Solidworks, Pro-E, SketchUp, Rhino, UG, etc are the most popular ones. Such 3d modeling methods are suitable for professional engineers or users who have a certain knowledge about modeling software. Happy 3D, 3D Tada are two non-professional modeling software for beginners.

② 3D scanning:

3D scanning is an alternative to 3D modeling. 3D scanners save files in the computer via digitizing objects and collecting their geometric data. 3D scanning can also be realized by installing the corresponding apps on the mobile device.

③ Download from Internet:

Currently, to download 3D models from the websites is the most popular and convenient way to get them. Registered users are also allowed to upload their own 3D models on the websites.

e.g: www. thingiverse.com

1.1.2 Slice 3D printing files

Users edit 3D models through specific slicing software and transform the model file into the .wjs file that can be read by 3D printers. WaxJetPrint is a slicing software independently developed by Flashforge for WaxJet series products. WaxJet-Print splits 3D models into various layers and outputs the slicing file in .wjs format that can be read by WaxJet® 400/410. The files are able be transferred to WaxJet® 400/410 through network cable and USB disk.

1.1.3 Start 3D printing

After the machine has warmed up, send the slicing file to the printer and the printer will begin to print layer by layer to transform the 3D model into objects.

1.2 The basic process of 3D printing

Printing process

Preparation for first printing

Printer Installation

start up the printer > warm up > load the filaments

Software Installation

install the software > start up the software

Daily printing

Printing models

obtain the model file > load the model > edit the model > set printing parameters > submit printing task

Post-process

Obtain the model > remove the support

Chapter 2 Machine Introduction

2.1 Machine introduction

2.1.1 Machine view

Front

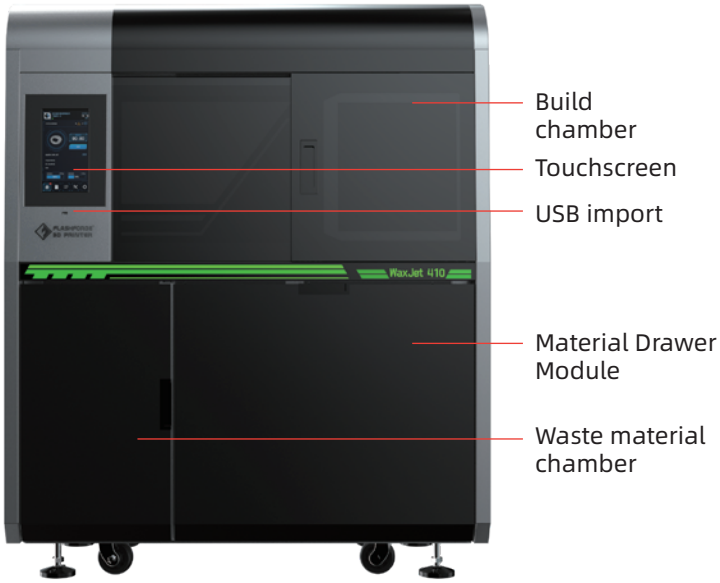
Side

Right

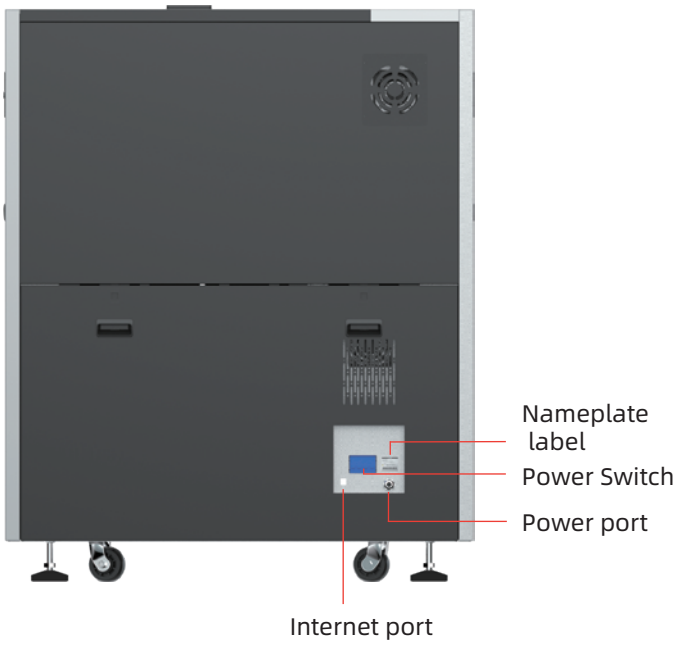
Back

Left

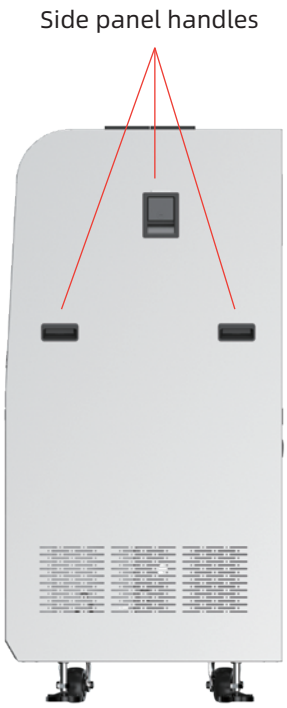
2.1.2 Machine front view



2.1.4 Machine back view



2.1.3 Machine side view



2.2 Accessories

A packed WaxJet ® 400/410 professional printing system with the following accessories and materials.

- Two build plates (in accessory box)
- A purification power supply
- Two part material boxes and two support material boxes
- A box of butyl rubber gloves
- A network cable
- A pack of dust-free cloth
- A set of hexwrenches
- A USB stick
- An after-sales service card
- A scraper knife
- A manual

2.3 Features

WaxJet® 400/410 Series 3D printers use multi-jet print technology, print high-precision wax patterns with big, printing build size. It can print many parts with flat and vertical build simultaneously.Each layer thickness is 0.016mm. With superior surface quality, fine details and superior precision, fast workflows, high-volume customization, and increased casting efficiency and productivity. The patterns can be used directly investment casting with high efficiency.

2.4 Applications

It is suitable for precision investment casting, such as precision manufacturing, jewelry, watches, aviation fields and so on.

2.5 Terms

Material density	The mass per unit volume of materials in a specific volume state.
3D printing technology	There are two materials (support material and part material)) to print a three-dimensional solid model. Support material is a kind of wax, which adhere the model to the build plate and used to support the hanging part model. The part material is also a kind of wax. Models are connected to the build plate via support material after modelling.
Build plate	Detachable platform for model building. Use the supporting material to paste the part and the build plate, and it will be removed from the printer after printing.
Resolution	The precision of the image, WaxJet® 400/410 uses the unit of DPI to describe.
Waste material	Uncured support and/or part materials produced during the modeling process. When disposing of any waste, it must wear nitrile gloves, lab coats and protective goggles.
Post-processing	The final process: to clean the support materials in the surface of the model, thus making the finished model more smooth before polish and decoration.
part wax	It is a kind of modeling wax. You must wear nitrile gloves, lab coats and protective glasses when handling any material. The materials are provided to the printhead through umbilical as needed.
HMS	It is used to maintain the printhead.
Melting point	The temperature at which the solid state and liquid state of the materials are in equilibrium under a certain pressure.
Softening Point	The temperature of material softens, which refers to the temperature at which the amorphous polymer starts to soften.
Investment casting	A casting process via soluble and disposable materials; an industrial process based on lost-wax casting.
Log	The log file is a compressed file that contains the log used by the support service. The log file will be used to solve potential problems that may produced with the 3D printer system.
Shrink rate	It is used to adjust the expected shrinkage during the printing process, so that the size of the produced model can be closer to the actual size.
WaxJetPrint	Software client, which slicing the stl file and send data to 3D printer.
Micro Piezo Nozzle	An industrial ink-jet nozzle to ensure the smooth output of liquid from the designated hole.
X-axis	The left to right direction on build plate.
Y-axis	The front to back direction on build plate.
Z-axis	The top-down direction on build plate.
Support wax	A material for wax base: to connect the model with the build plate, to support the suspended structure and hollow structure.
User interface (UI)	The user interface is located on the left side of the printer. Use UI to control or check a variety of functions, such as print job status, printer materials, printer shutdown, etc. You can also check some settings in the printer.
.stl file	A file, created by 3D solid computer-aided design (CAD) software, which is used to produce parts.

2.6 Parameters

Printer model	**WaxJet® 400**	**WaxJet® 410**
Build size	289*218*150mm	289*218*150mm
Technology	Mult-Jet print technology (MJP)	Multi-Jet technology (MJP)
Printheda	Piezoelectric Printhead	Piezoelectric Printhead
Touchscreen	10.1'' colorful LVDS touchscreen	10.1'' colorful LVDS touchscreen
Resolution	1200x1200x1600 DPI	1200x1200x1600 DPI
Layer thickness	0.016mm	0.016mm
Printing accuracy	±0.04mm / 20mm	±0.04mm / 20mm
Input file format	Input: STL/SLC Output: WJS file	nput: STL/SLC Output: WJS file
Part materials	"FFWJ1100 Net weight: 3.0 kg/bottle (there are two material chambers per equipment, and support automatic material change)"	"FFWJ1100 Net weight: 1.17kg/bottle (there are two material chambers per equipment, and support automatic material change)"
Support material	"FFMS3100 Net weight: 3.6 kg/bottle (there are two material chambers per equipment, and support automatic material change)"	"FFMS3100 Net weight: 1.3kg/bottle (there are two material chambers per equipment, and support automatic material change)"
Power supply	AC220-240V，50Hz，4KW	AC220-240V，50Hz，4KW
Equipment size (unpacking)	1352*775*1600mm	1352*775*1600mm
Equipment size (packing)	1530*900*1837mm	1530*900*1837mm
Weight	Packing 630kg; unpacking 480kg	packing 630kg; unpacking 480kg
E-mail notification	Support	Support
Hard drive capacity	500G	500G
Connection method	Network 10/100/1000 ethernet interface / USB interface	Network 10/100/1000 ethernet interface / USB interface
Guest operating system	Windows 7 / Windows 10 (64bit)	Windows 7 / Windows 10 (64bit)

Feature	condition	**FFWJ1100**	**FFMS3100**
Ingredients		100% wax	Support wax
Color		Purple	White
Density		0.76 g/cm3	0.85 g/cm3
Melting point		68℃	55℃
Softening point		63 ℃	N/A
Volume shrink rate	SH/T 0588-1994	1.10%	N/A
Linear shrink rate		0.70%	N/A
Penetration	GB/T 4985-2010	9	N/A
Ash	GB/T 14235.3-1993	<0.01%	N/A
description		High precision casting wax	Contact-free soluble support wax

Chapter 3 Machine settings

3.1 Start the machine

Printer start-up steps

1. Use pouring ac regulated power supply.

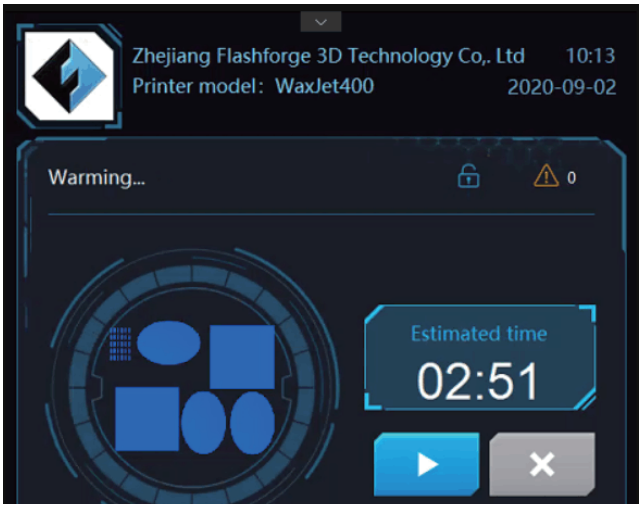
2. Plug in the 25A socket.

3. Open the pouring ac regulated power supply and wait for the voltmeter to show 220V.

4. Turn on the device power switch in the order in which the pictures show.

5.When the printer is powered on, it takes about one minute for the UI to display. When the Flashforge icon appears in one minute, the screen lights up showing the status of the printer.

6. If the printer restarts at low temperatures, 4 hours are needed for the printer to warm up before restarting a print job. During warm-up, Printer Status in the user interface will show Warm-up.



⚠ **Note: the printing file of the model can be uploaded during warm-up, but printing can only be started after the printer is completely warmed up and fully prepared.**

3.2 Clean up the waste materials

Clean the waste box before printing， please follow the next steps

1. Please wear rubber glove before open the waste box chamber
2. Remove the waste box and dispose it by following the local regulations
3. Check all the remaining waste in the waste box. If necessary, wipe off all stains with a dust-free cloth and isopropanol.
4. Put the waste box back, then close the waste box chamber.

3.3 Installation of materials

⚠ **Note: Check the material type is important before material installation**

⚠ **Note: It is necessary for preheating before open the material chamber and material installation**

If the material bottle is empty, or to change the new material bottle, please follow the next steps.
1.Get a new material box and ensure the material type is the same with the old one.

⚠ **Note: The The MDM drawer is a push/push mechanism. Push to open door , and then push to lock door.**

2. Push the door inward to open.
3. Pull the drawer out .

⚠ **Note: The procedure for installing the support material bottle is the same as the procedure for installing the part material bottle. It is important to ensure that hear the sound from the material cartridge is stuck in the position, that the material box is filled with material and keeps open, otherwise the material in the material bottle will not flow properly from the material bottle into the Valvetank.**

4. Pull up and release the wrench while carrying the material bottle handle and insert the material bottle into the ink groove.
5. Insert the material bottle down until you hear the sound of getting stuck in place, release the release wrench.

6. Turn the bottle cap anti-clockwise until its half to keep the bottle open.

7. Push the door inwards to close the MDM drawer.

8. Check the amount of materials in the interface and ensure the material bottles are ready in the materials chamber

⚠ **Note: If there is a note in the interface that the material bottle is empty but it is the wrong note, please contact the a certified reseller partner or FlashForge Customer Support. It is recommended that contact a certified reseller partner first.**

3.4 Removal of materials

⚠ **Note: Check the material type is important before material removal**

⚠ **Note: It is necessary for preheating before open the material chamber and material installation**

If the material bottle is empty, or to change the new material bottle, please follow the next steps.

⚠ **Note: The MDM drawer is a push/push mechanism. Push to open door , and then push to lock door.**

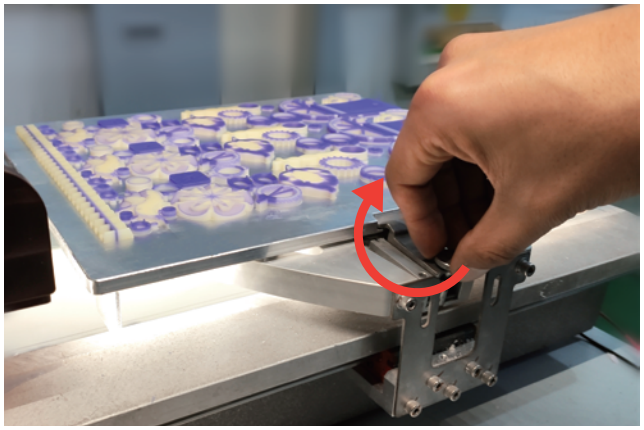
1. Push the door inward to open.
2. Pull the drawer out.
3. Turn the cap clockwise 1/2 to tighten.

4. Pull up and release the wrench while carrying the material bottle handle to pull the material bottle out of the material slot.
5. Dispose of empty boxes in accordance with local laws and regulations.
6. Wear rubber gloves, protective arms device or laboratory clothing to protect your arms, use disposable paper towels to wipe off all materials on the container seal assembly. If necessary, wipe off the residue with a paper towel with isopropyl ethanol.

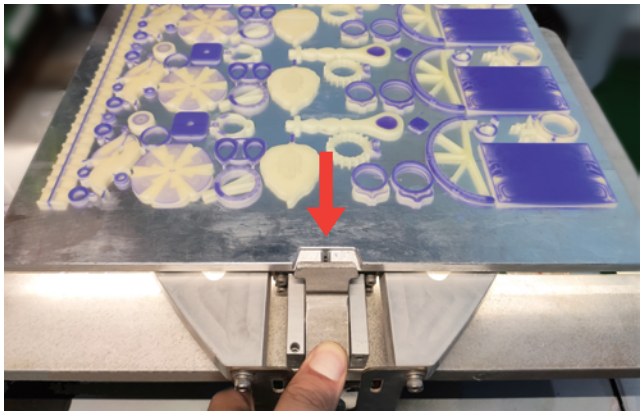
⚠ **Note: It is important to wear rubber gloves, protective arms device or laboratory clothing to protect the arm from skin before contact with the material. Skin exposure to materials may cause allergic reactions.**

3.5 Removal and installation of build plate

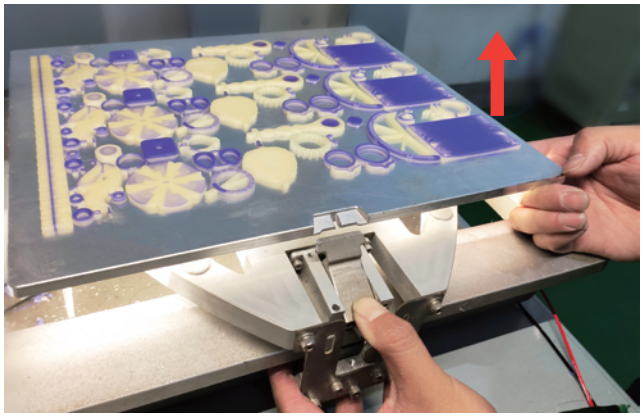
1. Make sure that the printer is turned on and that the printer status is in ready mode.
2. Open the building chamber door.
3. Rotate the pressing nut clockwise and loosen the pressing nut.



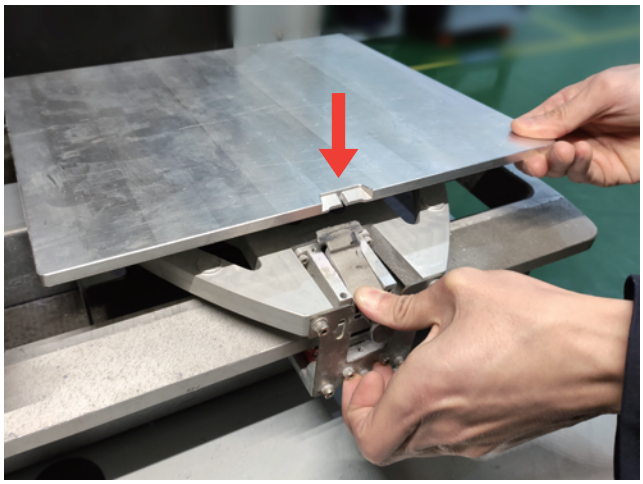
4. Press down the pressing plate until the pressing plate is out of the build plate.

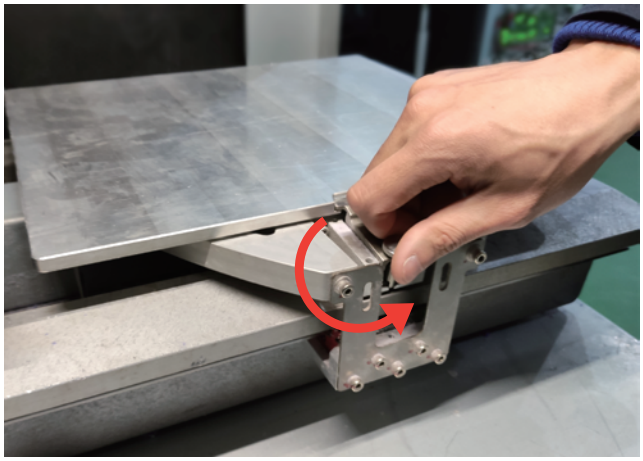


5. Lift the build plate and remove it



6. Install the new and clean build plate
7. Fasten the pressing nut and rotate the pressing nut counter-clockwise until it feels the pressing plate is pressing the build plate.





⚠ **Note: Always ensure that the build plate is clean and no dust on both sides to avoid any printing problems. Also, make sure that the build plate does not cause damage caused by any object loosing or falling. Metal objects on the build plate can touch the print extruders and cause serious damage.**

3.6 Identification of machine

Identify your printer with the following tags:
A. Serial number mark - Please offer this number when requesting service.
B. Model Mark - This mark provides the printer's model type, specifications, power requirements, voltage warnings, and FlashForge customer service contact information.

⚠ **Note: Both markings are located near the bottom on the back of the printer and are generally placed near the printer's power connection. Please offer the information on these tags when supporting customer support to confirm your printer.**

3.7 Internet connection

Processed printing files can be transferred from WaxJetPrint to WaxJet ® 400/410 series printers via the device's Ethernet network. The RJ45 network connector is located near the power connection on the back of the printer.

⚠ **Note: A 2-meter network connection cable is provided in the accessory package. If the cable provided is not long enough to connect from the printer to the factory's network connection point, purchase the appropriate cable by yourself.**

⚠ **Note: When you find that the printer and computer are not connected properly, first check that the printer is properly connected to the factory's network connection point, and then check that the printer and computer are in the same local area network.**

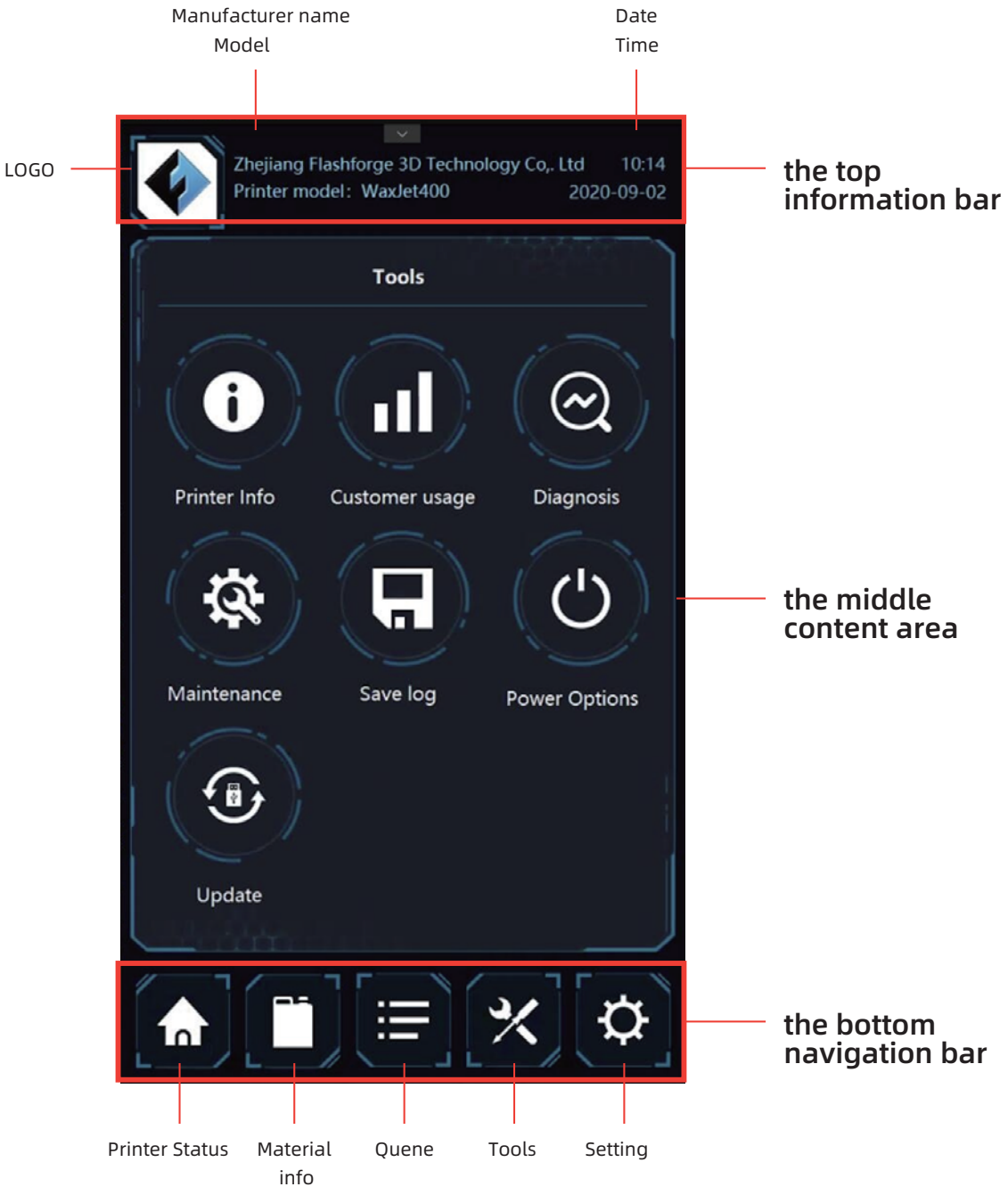
Configure the network

This section is intended to provide instructions when you need to change your network settings. Within the network page, you can configure the printer's static IP address.
Static IP address - You must enter an IP address, a subnet mask, and a gateway address for the printer. The network address configuration operation is as follows:

1. Turn on the power of the printer.
2. Tap the icons in the interface， enter the network setting page.
3. Configure the IP address, subnet mask, and gateway address, and click the 【Apply】 button to complete the configuration.

Chapter 4 User Interface

The user interface contains three sections: the top information bar, the bottom navigation bar, and the middle content area.

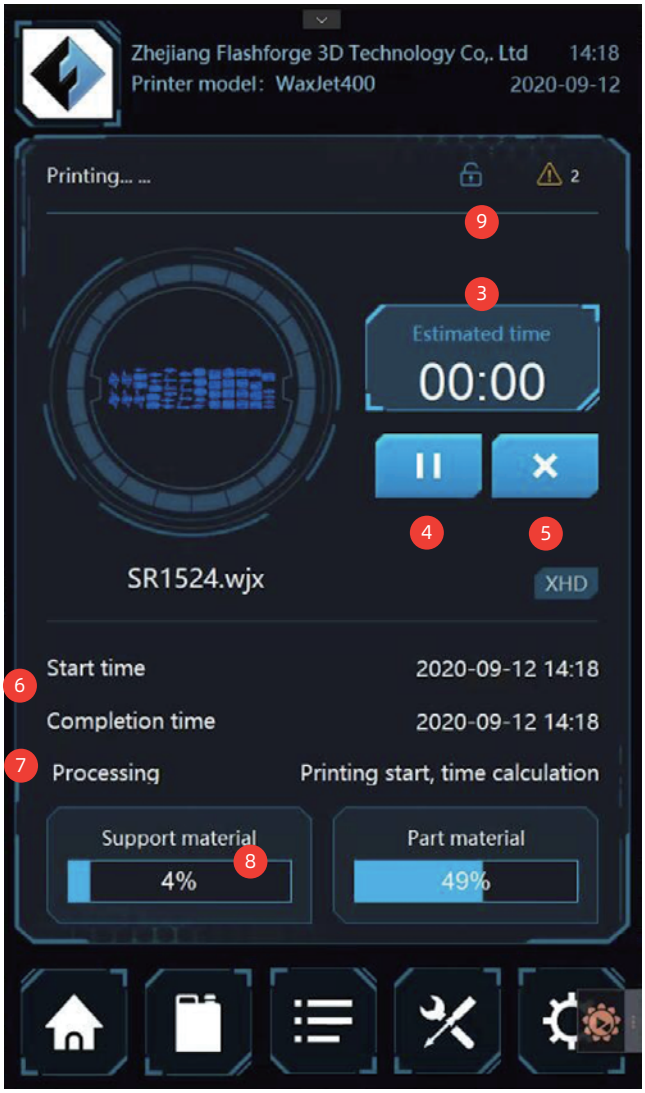


The top information bar contains manufacturer information, printer model, time and date display. The bottom navigation contains the status of the device, material information, print queues, tools and settings. The intermediate content area displays what is currently contained in the corresponding navigation based on the navigation switch.

4.1 Print status interface

1. Tap here to access the device print status interface.
2. Print status: check the status of the printer at any given time. For information on the various statuses of the printer, see below:

Ready: the printer is ready to accept printing tasks;
Load build plate: the printer status is ready and wait for installing a clean build plate;
Printing: the printer is printing now;
Busy: the printer is in maintenance;
Sleep mode: the printer is in a low power state;
Pause: Print is currently paused and can be resumed by selecting the button;
Completed: The print is currently complete and the part can be removed from the printer;
Remove the build plate: printing completed; to take down the build plate from the printer;
Interrupting/Interrupted: Current printing is interrupting /interrupted;
Warming: The printer is warming up to "ready";
The material box is warming up: the printer material bottle is warming up to the "ready" state and can still start the job by tapping the UI icon in the interface when both material bottles are warmed up at the same time, but printing will only start when the material cartridge is melted and ready for use;
Waiting for the modeling room to cool down: the printer waits for the modeling room to cool down before continuing to print;
Shutdown: The printer is shutting down, and remind the user to safely cut off the printer power at the right time;
Recovery: The printer has failed and is attempting to recover;
Diagnostics: The printer is in diagnostic mode, if needed, please contact the after-sales service;
Error: The printer is in an error state and needs to make a service call ;
Materials required: The printer needs more material to print.



3. The remaining time.
4. Pause/Continue Printing: Click to pause/continue to print the current print task.
5. Stop printing.
6. Start/finish time: Displays the print time information for the print job.
7. Print mode/layer: Displays the current layer and print mode information.
8. Remaining material information.
9. Access platform: Press this button to access the printing platform.

4.2 Material info interface

1. Tap icon in the interface to enter the material information interface.

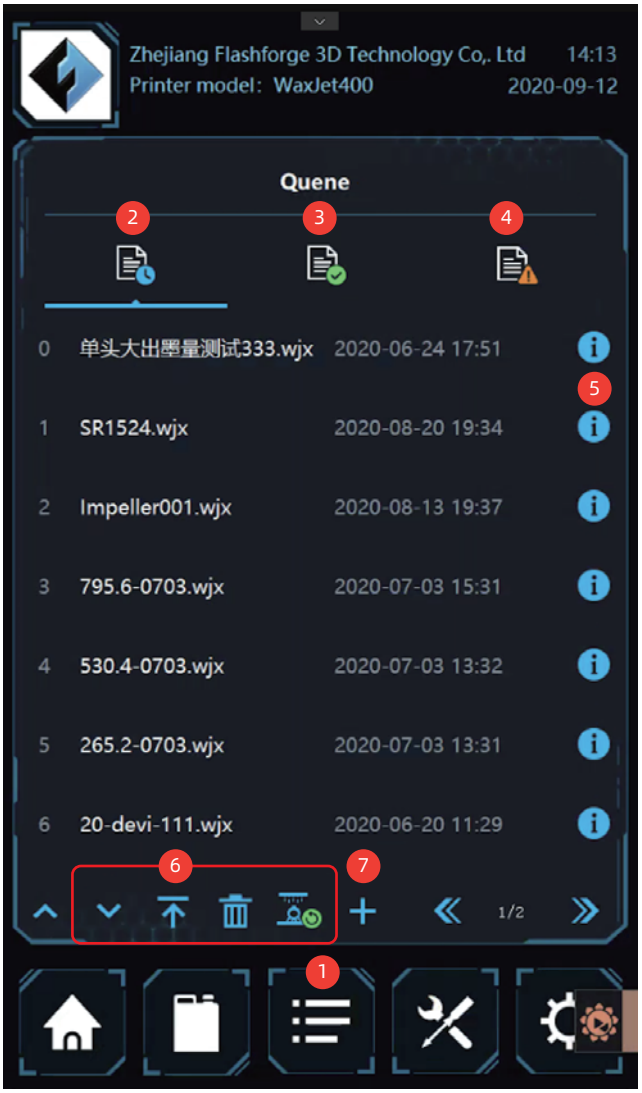
2. Material information: Click on any of the four material status in the interface to see the relevant information of the specific material bottles. The information listed here includes:
Material: material type;
Status: Current information about the material;
In use: the used material bottle currently;
Installed: Material bottle is available, but not currently in use;
Not usable: material bottle using trouble, please contact after-sales service for assistance;
Missing: Uninstalled material bottle;
Empty: The material bottle is empty;
Expired: The material bottle has expired and needs to be replaced;
Warming up: The material bottle is warming up to the ready state.

Model: material type;
Color/type: description of the material, such as color and characteristics;
Expiration date: the expiration date of the material.

⚠ **Note: the printer does not support the expired material when the expired material bottle insert the machine. If the materials is expired in the printing process, the printer will continuous to work. Then the expired material cannot use again.**

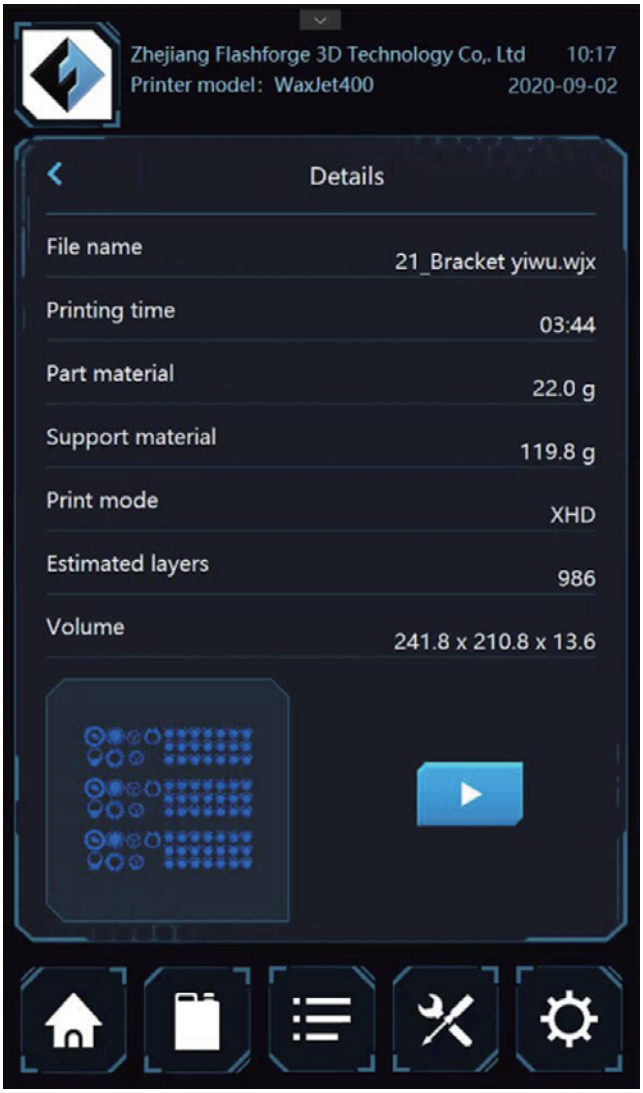
Batch: material batch and date;
Proportion: percentage of remaining material in the material bottle;
Weight: the weight of the material in the material bottle ;
Start: select and set up the material bottle for printing.

4.3 Printing list interface



(Figure 4.3.1)

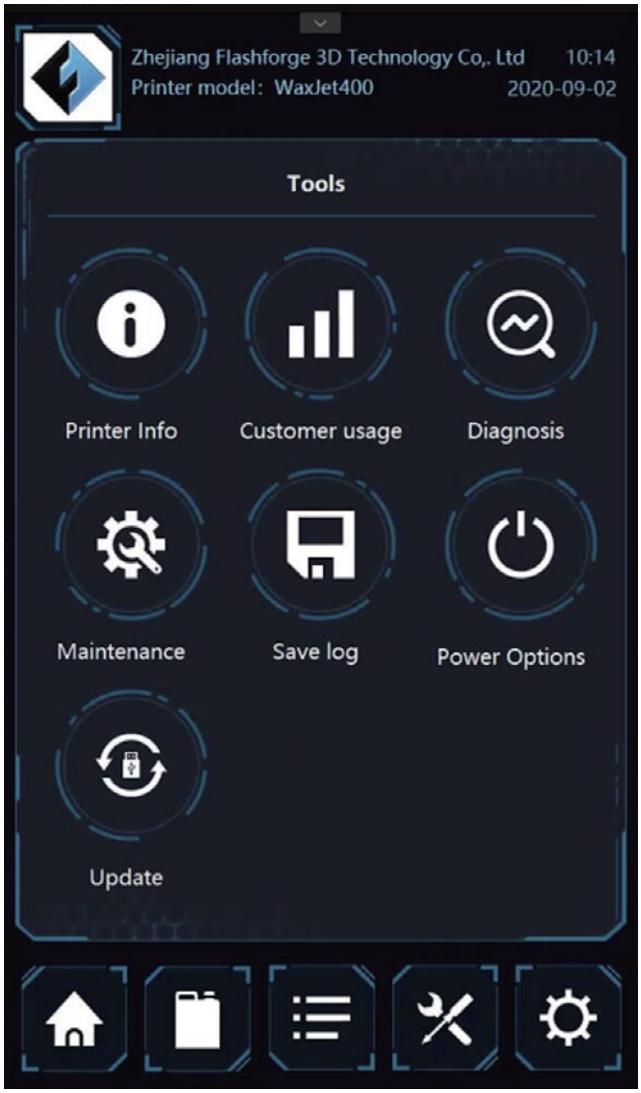
1. Tap here to enter the quene
2. The waiting tasks list
3. The completed task list
4.The fail task list
5. Tap into the details page
6. Tap to adjust the model order and remove the model
7. Add new printing tasks from places such as USB sticks, as shown in Figure 4.3.1
8. Copy the files into the waiting task list



(Figure 4.3.2)

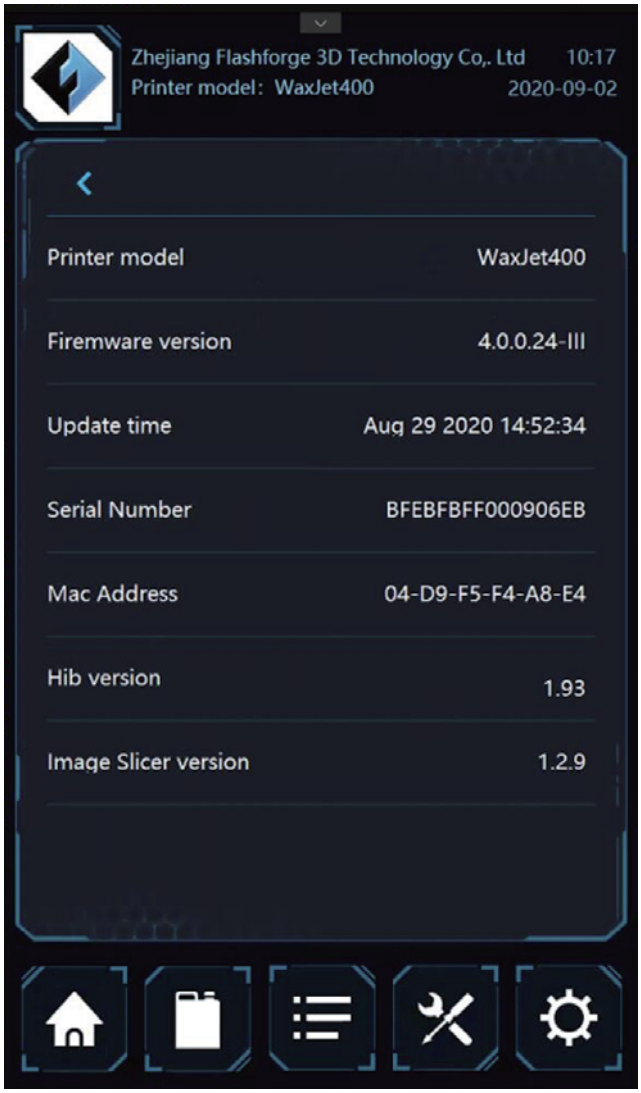
Printing file details page

4.4 Tools interface



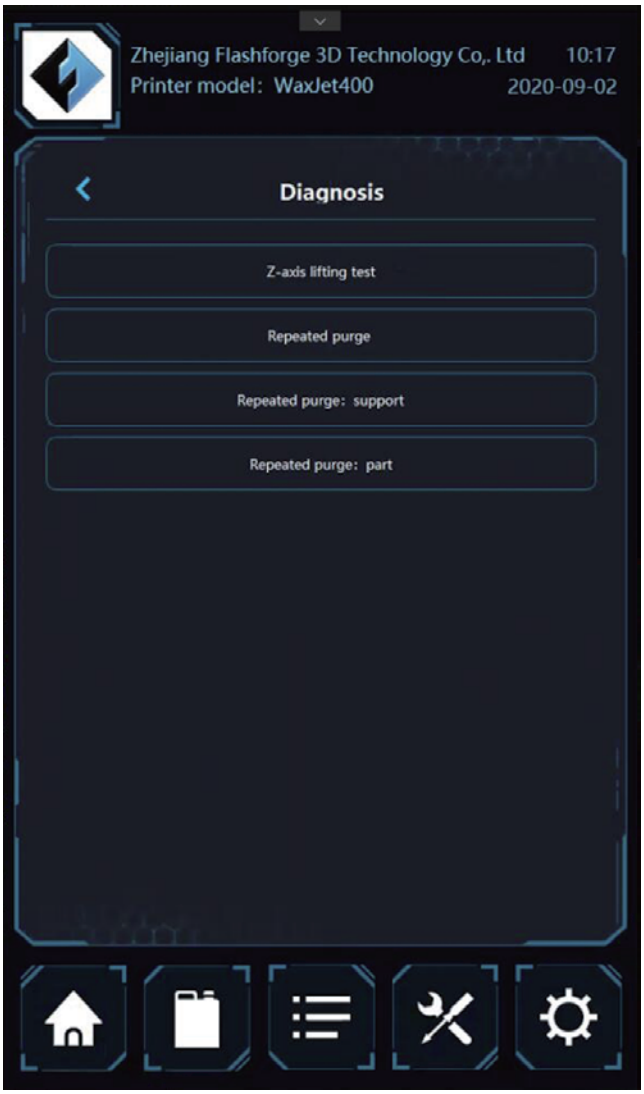
1. Tap here and enter to the tools interface

Tools interface including printer info, usage status,Diagnosis; maintenance, Save logs; USB stick update. Tap each option and enter the appropriate details page.

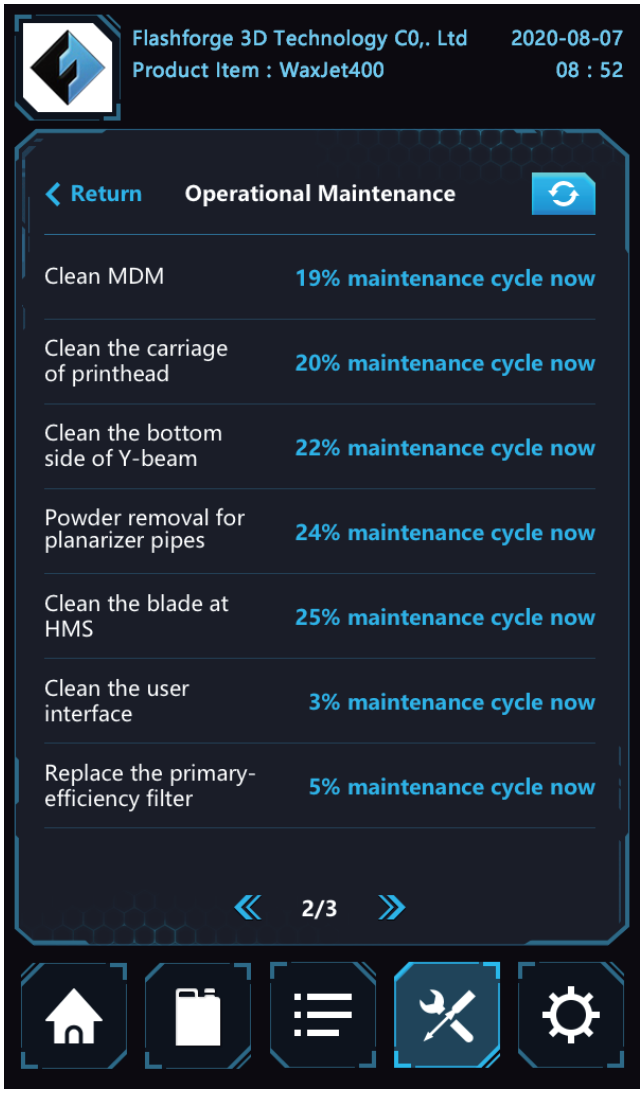


Printer information: Display information of printer and version.

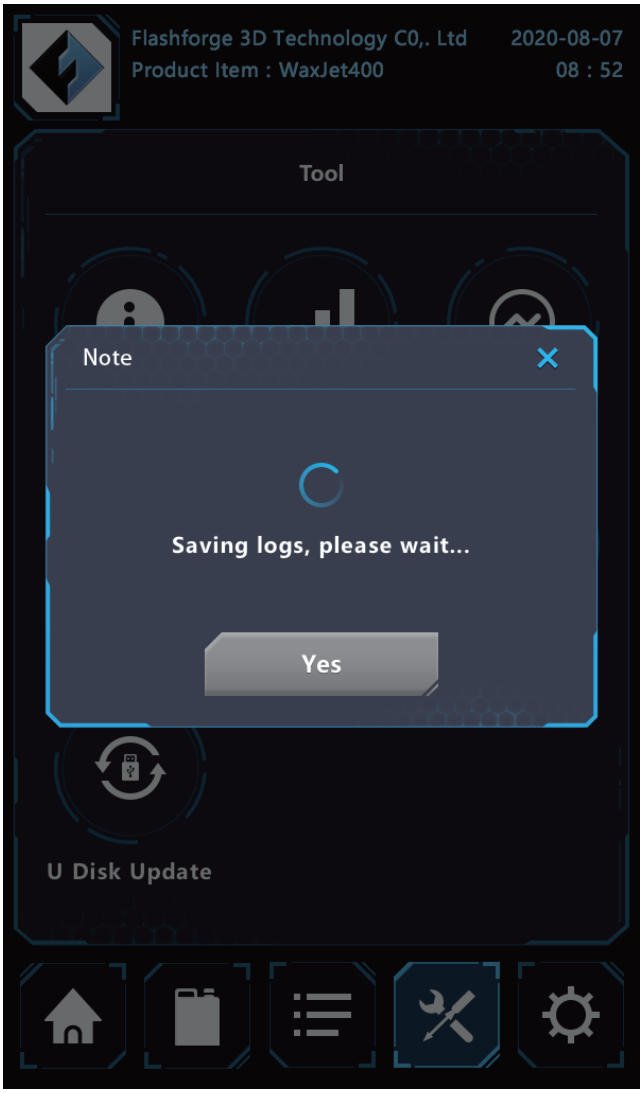
Printer usage status: display the usage info of printer.



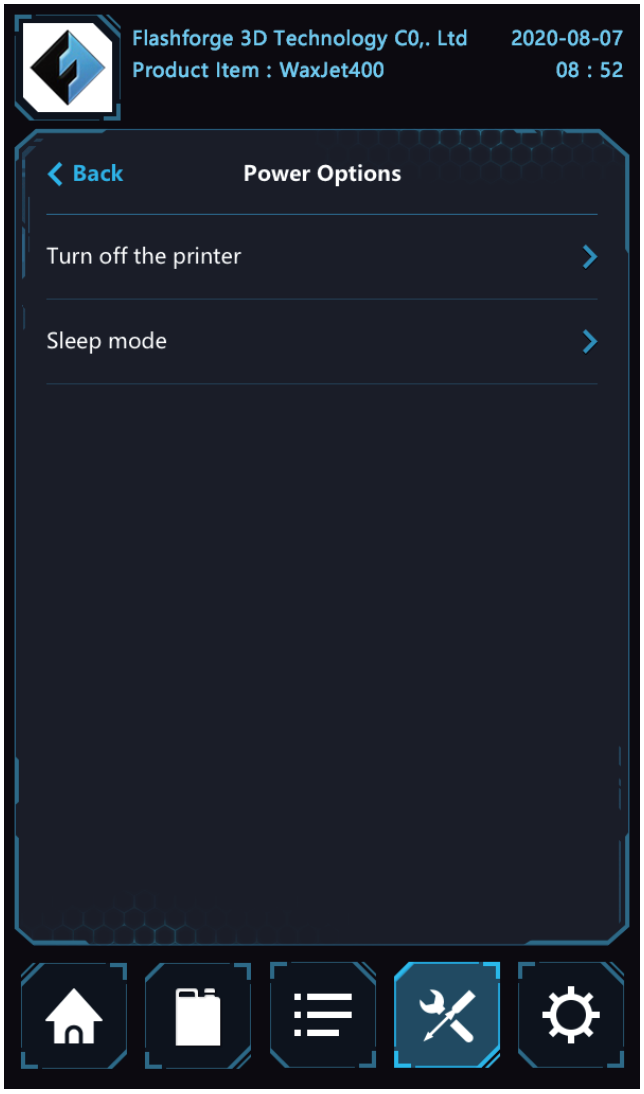
Diagnosis: click the <diagnosis> to enter the procedures.
Diagnosis Lists: the diagnosis interface will appear after clicking the <diagnosis> under the <tools>, where users can operate and maintain the printers as requested.
Z-axis lifting test: to check the normal operation of the moving parts.
Repeated purge: to clear the printhead regularly.
Repeated purge: part: Diagnostic test procedure - run after the request of after-sale representatives.
Repeated purge: support: Diagnostic test procedure - run after the request of after-sale representatives.



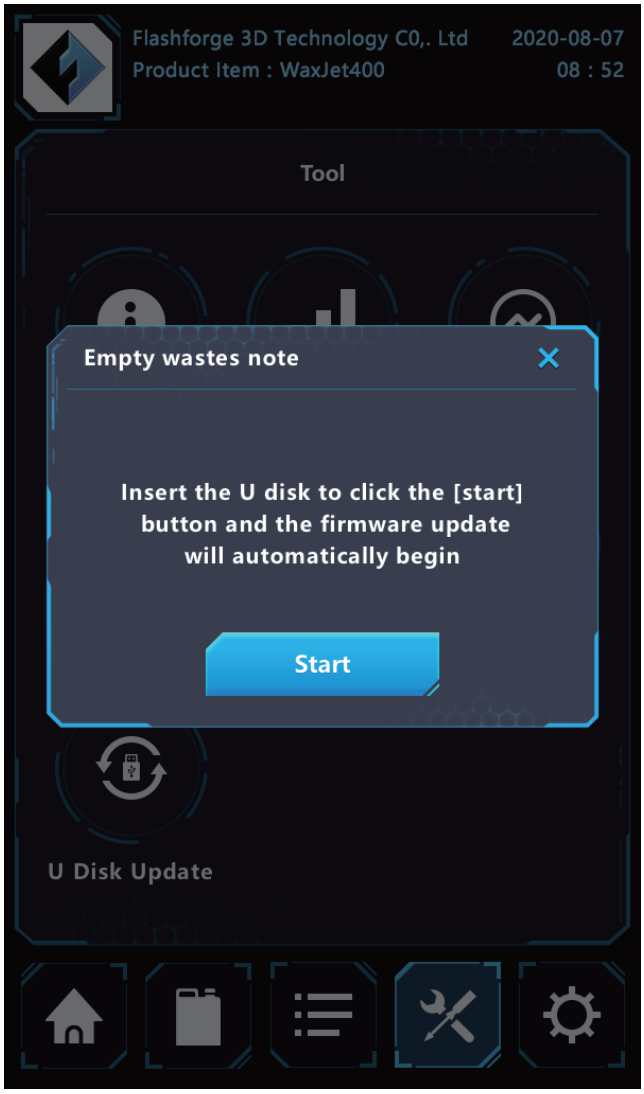
maintenance: click the <maintenance> to enter the interface. Please click the maintenance project and refresh the calculator after cleaning. Before starting any maintenance project, the printer must be in preparation status and the clean printing platform must be installed.



Save log: support save printer working log files.

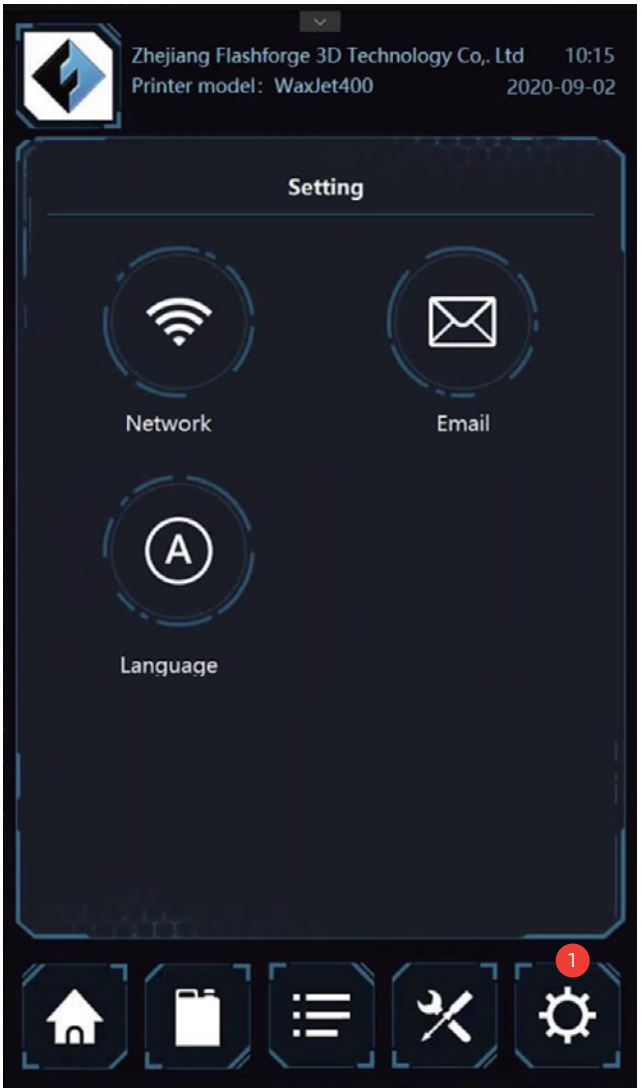


Power options: Choose "power option" button to close 3D printer or enter sleep mode. It is suggested to close the 3D printer by UI interface.



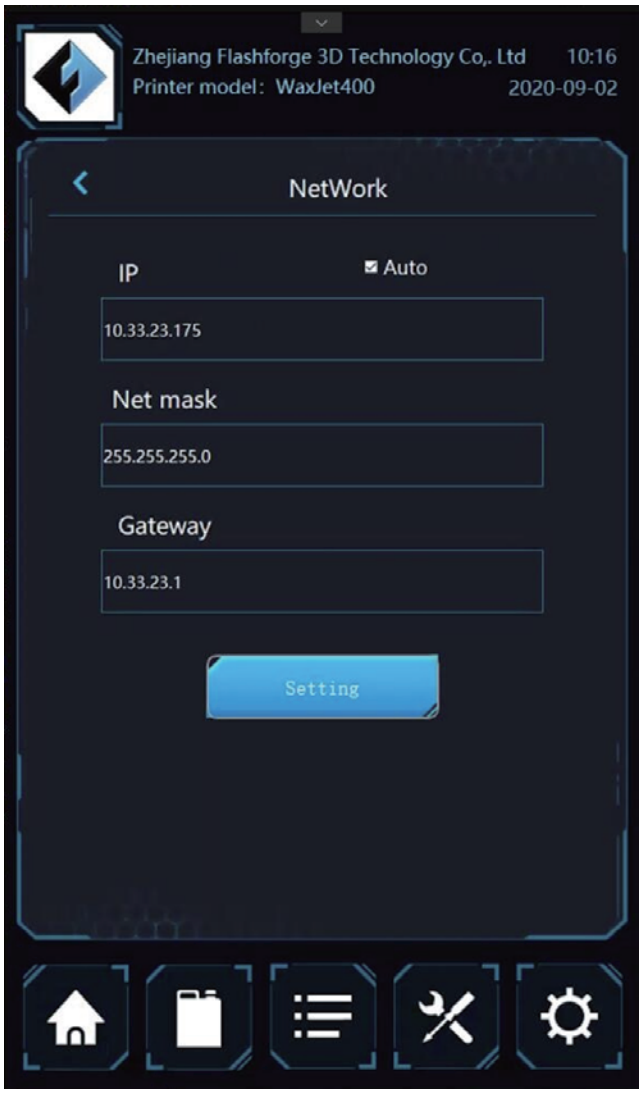
USB update: support update firmware by USB stick.

4.5 Setting interface

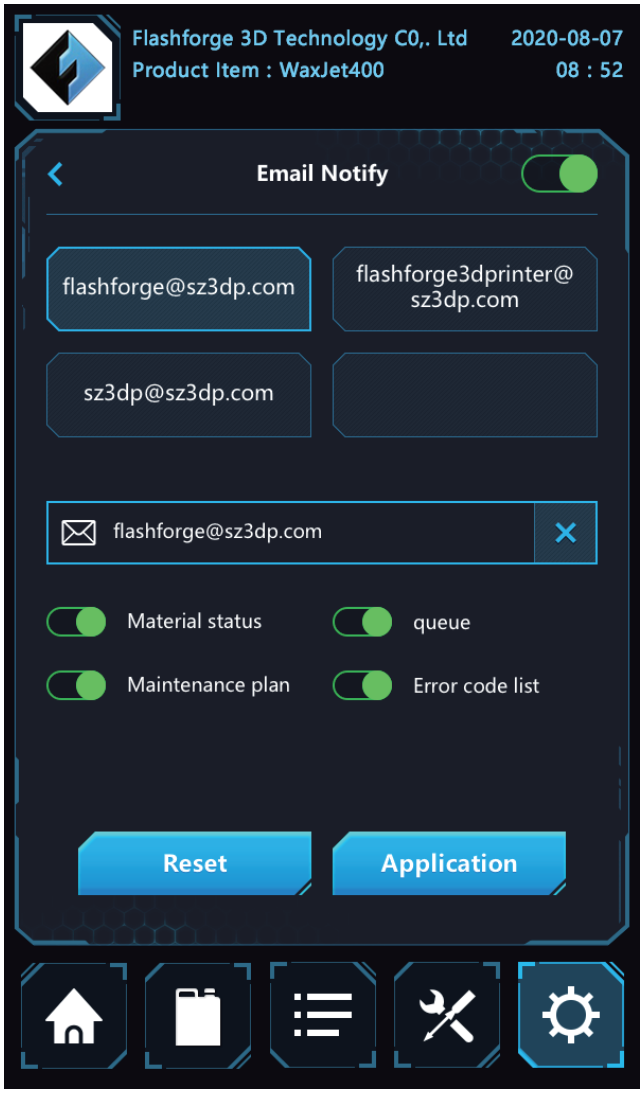


1. Tap here and enter the setting interface

Setting interface including network, email notification, language. Tap each option and enter the appropriate details page.



Network setting: set the network



Email notification: Set up e-mail notifications to receive notifications about printer events. It allowed to add up to 4 e-mail addresses.

⚠ **Note: Some e-mail clients may block access to this application during e-mail setup. If you're having trouble in email setting, make sure your email provider isn't blocking access.**

Chapter 5 WaxJetPrint Introduction

1. Software Download

There are two ways to obtain the packages of WaxJetPrint:

① Insert the USB stick from the toolkit into the computer to find the nearest updated package.

② Enter the official website of Flashforge<www.flashforge.com>, the nearest updated package can be found in the download center under the <support> button.

2. Software installation and start-up

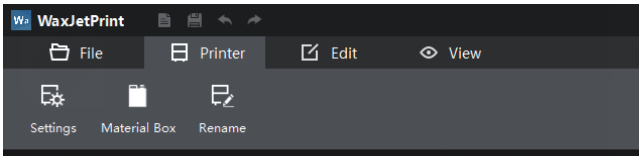
Follow the prompts and complete the installation after download. The WaxJetPrint is ready for use after installation.

3. Initialization

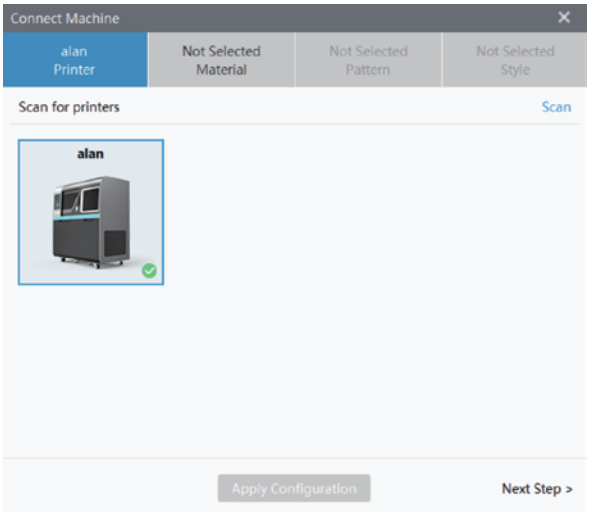
Please ensure the normal connection between the printer and computer before initialization.

⚠ **Note: when the printer cannot be connected to the computer, please first check the connection between the printer and the factory net and next check whether the printer and computer are in the same local area network. In terms of the network configuration, please refer to <network connection> on page16.**

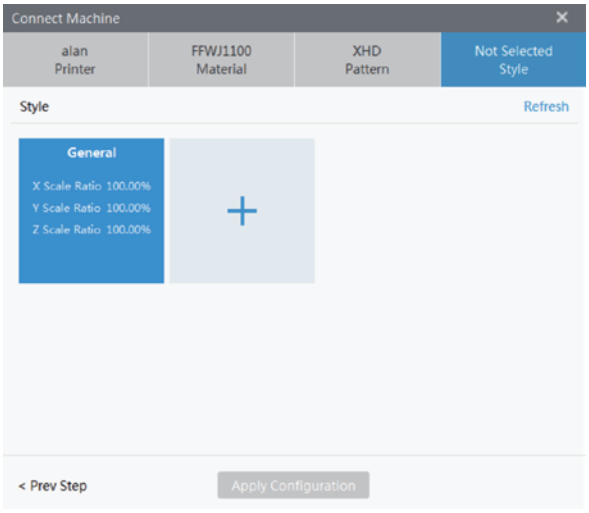
1. Open WaxJetPrint and click setting;



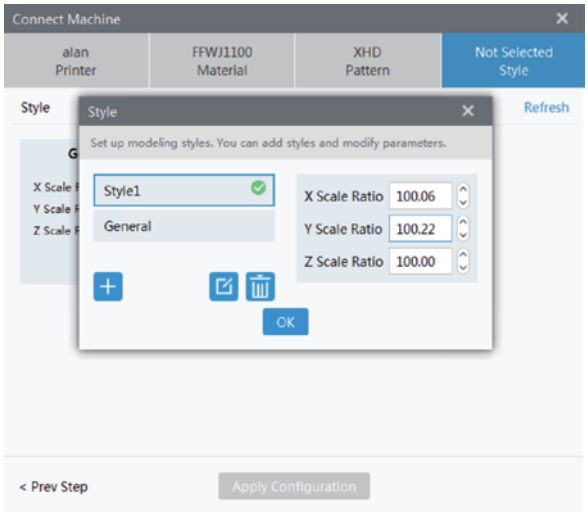
2. In setting interface, click scan and double click the targeted printer;



3. Choose the material;



4. Choose the printing mode;



5. Choose the building mode and save the setting.

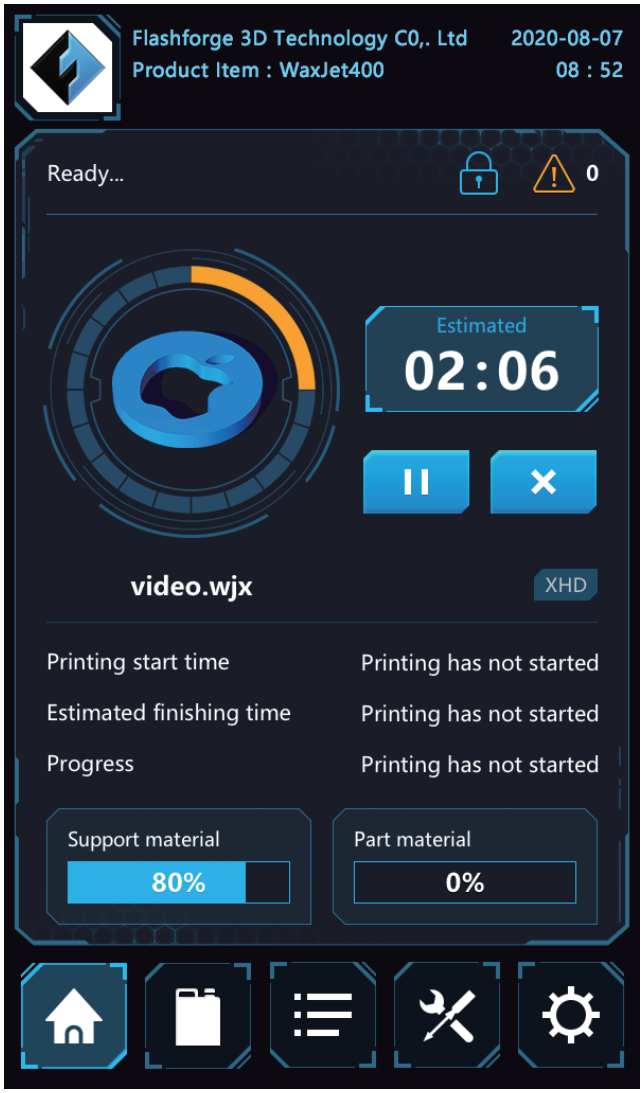
Chapter 6 Printing process

This chapter provides you with detailed guidance on how to transform a 3D model into an entity. Before printing, it is recommended that you review the process of machine start up, preheating and material installation on the chapter 3 and check the functionality and performance of the WaxJetPrint software.

1. The printer is powered on and warming up.

2. Install the materials.

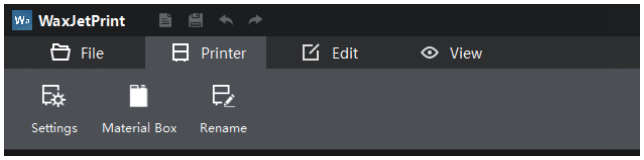
3. The printer stay warm after preheat finished.



4. Turn on the WaxJetPrint software via the shortcut on desktop.

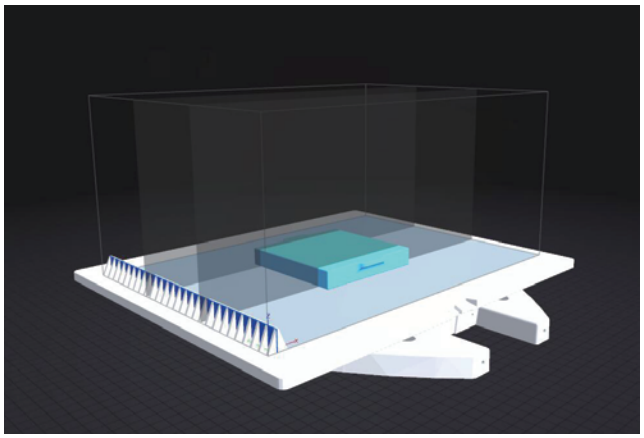
5. Connect the printer.

⚠ **Note: if it is the first time to connect the printer, please see initial setting (page 29). Click setting, choose printer. Material , printing mode, printing pattern and save the settings.**



6. Printed file layout.

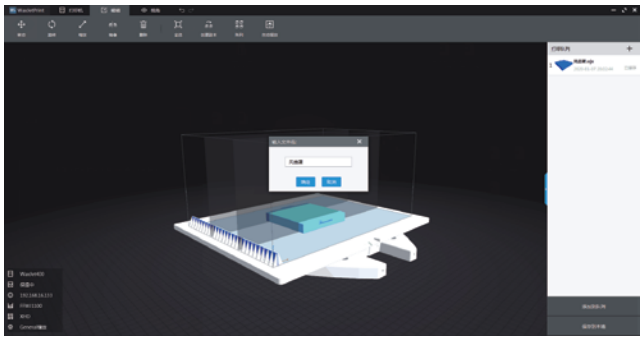
Note: during typesetting, the distance between each model shall be more than 0.5mm. If stacking prints is required, the distance between the upper and lower models shall not be less than 0.5-1 mm. Please make sure that the models are at the same level to avoid a waste of time and material.



7. Send the printing files to the printer.

A. send the files via network.

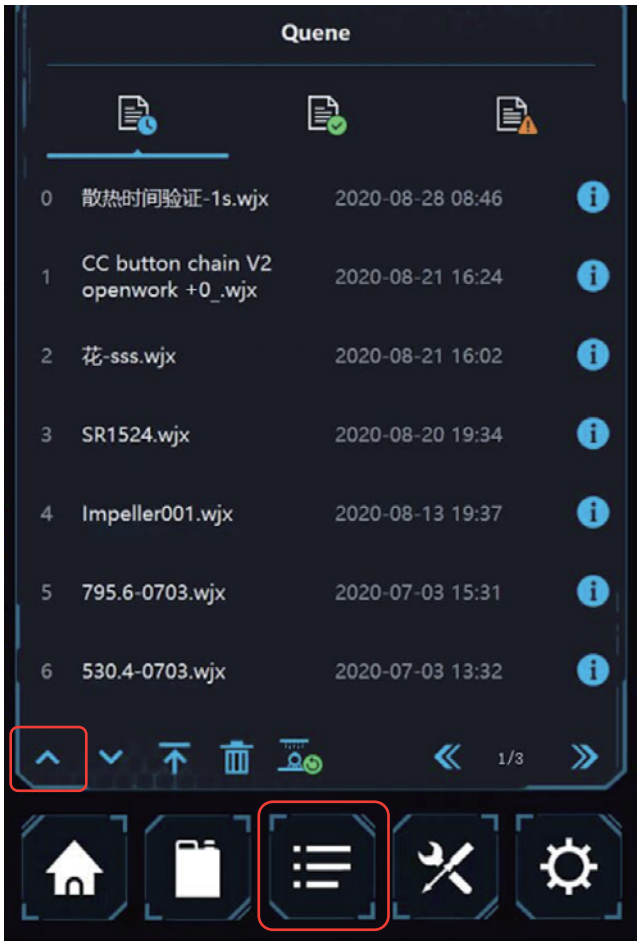
1）Click [Add to task list];
2）Enter the name and click [Yes];
3）The files appear in the printing task list after the files sending finished.



B. Copy files into the printer by USB stick.

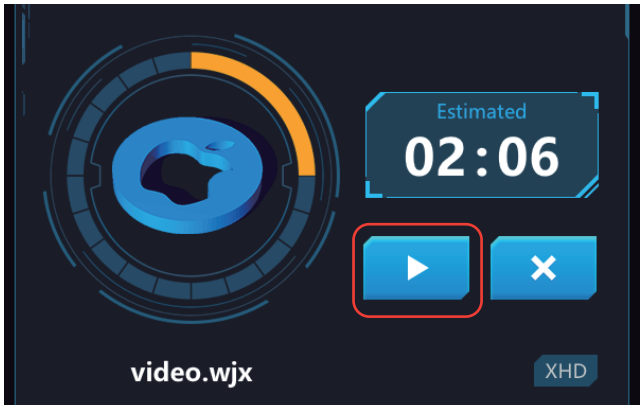
1）Click [Save to the local];
2）Modify the file name and choose the saving path;

3）Save the printing file into the USB stick;
4）Insert the USB stick into the printer first and tap the printing task list icon in the bottom of printer interface. Tap the add icon and enter the USB stick file list;

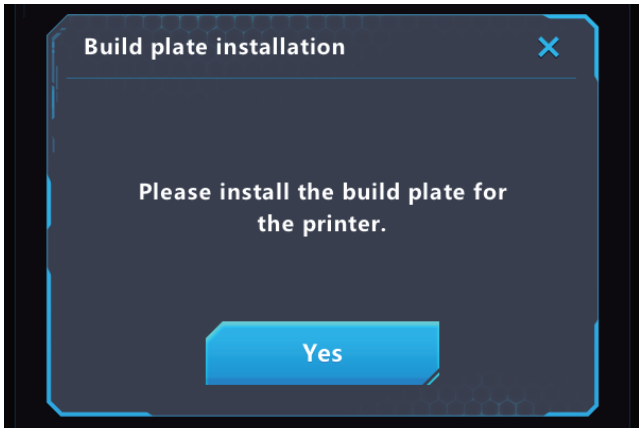


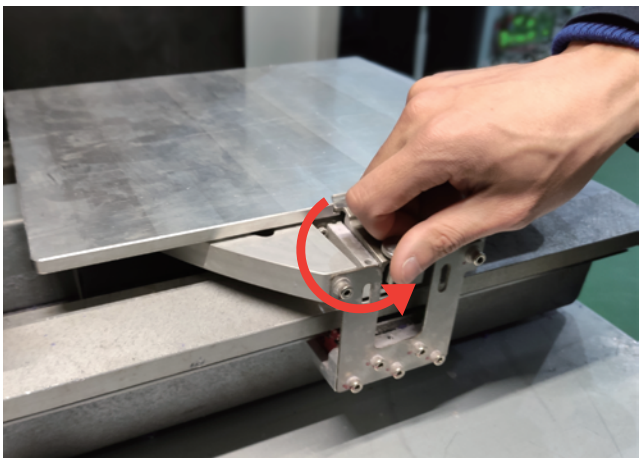
5）Choose one file and copy it into the printer by tapping the add icon.

8. Tap print icon and start printing.

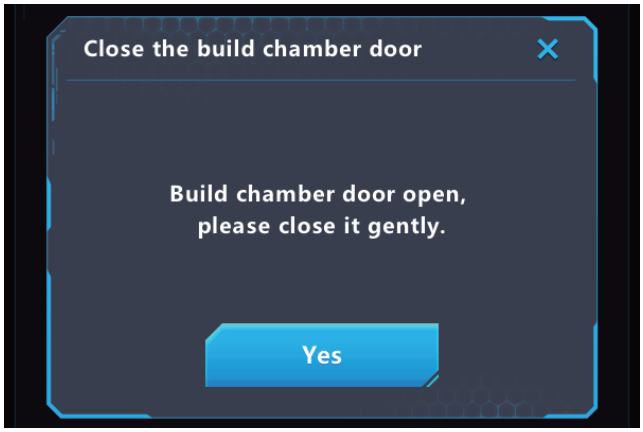


9. Install build plate: please follow the hints in the interface to install the build plate and tight the pressing nut counter-clockwise.

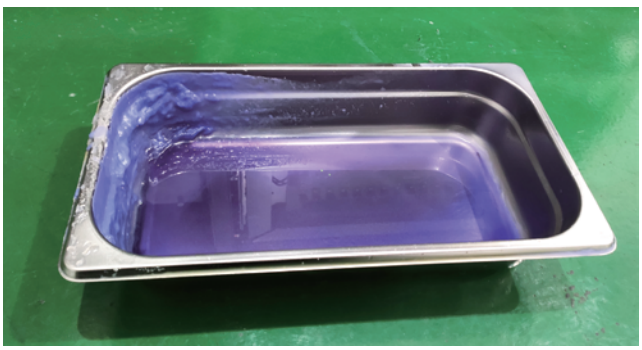




10. Close the build chamber door gently by hand.



11. Clean waste. Open the waste chamber, remove and clean the wastes box, Then put it back.



Chapter 7 After-processing Guide

7.1 Support removal

The after-processing guide is the standard guide of removing FFMS3100 support. Please prepare some The actual results may be somewhat different from the following process. Please prepare the items in the next column before the procedure. Also, make sure that the room where the execution is performed is well ventilated or that the ventilation cover is placed.

- **Magnetic agitators**
- **Beaker**
- **The net basket**
- **Isopropanol**
- **PPG400**
- **Waterless ethanol**
- **The protective glasses**
- **Dust masks**
- **rubber gloves**

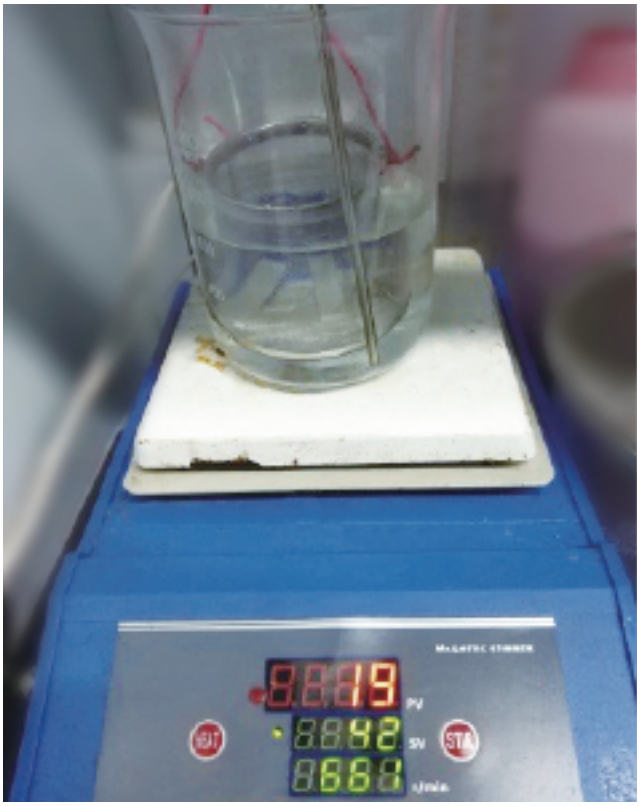
1. Place the build plate on the heated platform of the magnetic agitator. Remove the model one by one when the support material is softened.

⚠ **Note: there are a lot of thin printed objects on the build plate, please start heating from the all around to the center and remove the model carefully.**

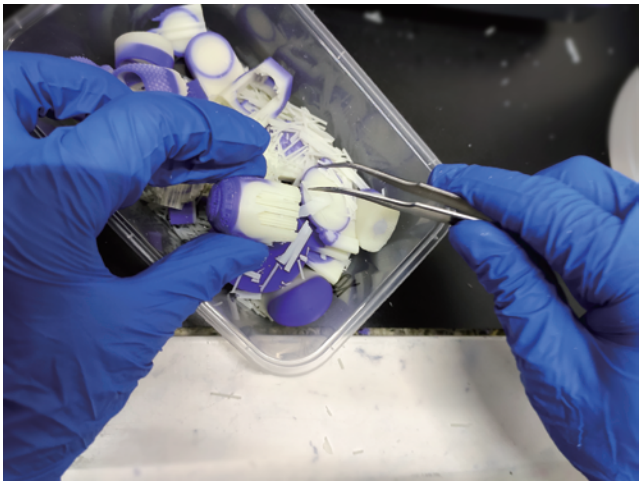
⚠ **Note: please wear protective glasses, dust masks and rubber gloves before removing the support.**

2. Pre-configure three dissolved solvents.
Dissolved solvent 1, which be used first and to wash 90% support wax.
(Ingredient，PPG400*1，ethanol*2，isopropanol*2, The pre-prepared solvent should be shaken well before use.)
Dissolved solvent II, used second to wash the remaining support wax in detail.
(Ingredient，PPG400*1，ethanol*2，isopropanol*2. The pre-prepared solvent should be shaken and mixed before use)
Dissolved solvent III, which be used to clean the remaining solvent.
（Ingredient，PPG400*1，ethanol*3，isopropanol*3)

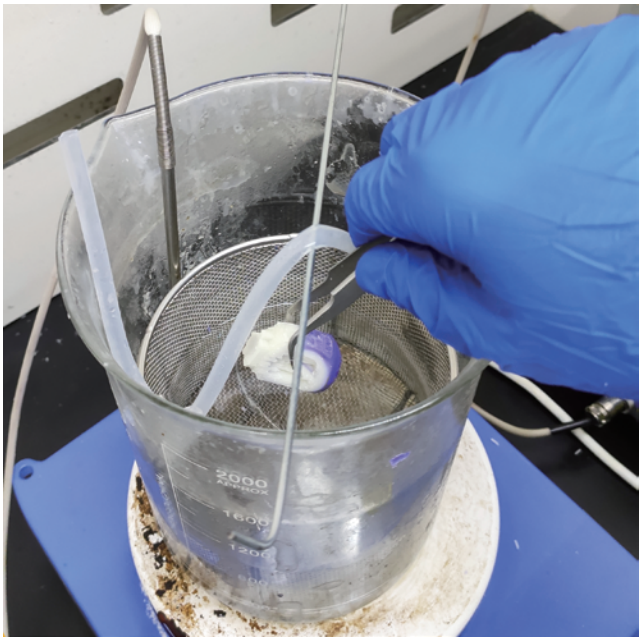
3. Put the beaker and other containers on the magnetic stirrer; add dissolved solvent I and turn on the heating to keep the temperature at 40 ℃; the temperature shall not exceed 43 ℃.



4. Remove the support materials
Before dissolving the support, part of the support material can be stripped with tweezers to reduce the support removal time.



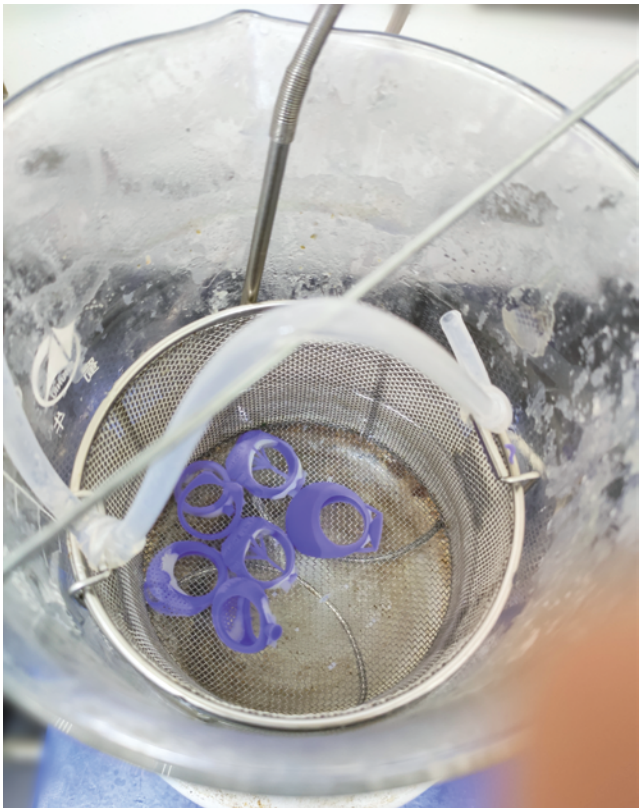
5. Put the models into the mesh basket; please do not put too many models for one time to avoid collision.



6. Put the mesh basket into the beaker and adjust its height to keep a distance from the stirrer.

7. Turn on the stirring and gradually increase the rotating speed (the fast stirring speed is beneficial to the cleaning), and the speed shall not too fast to shake the models.

8. Check the degree of dissolving of the support material every 1 minute.

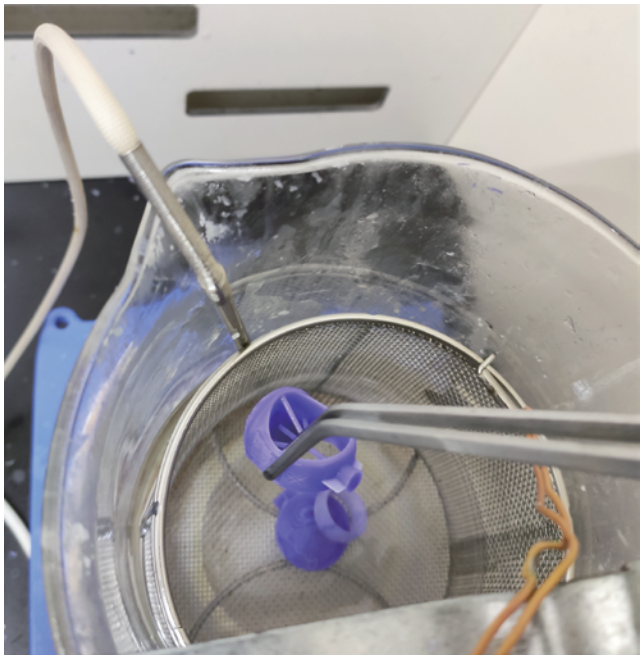


⚠ **Note: The dissolving effect of solvents decreases with the increase in the number of uses, will not easily to remove the support materials. FlashForge recommends that no more than 100-120 grams of supporting material dissolved per liter of dissolved solvent.**

9. Please take out the models on which the support material has been removed; do not let the models be immersed into the solvent for a long time.

10. Clean the solvent on the surface of the model via dissolved solvent II for 2-10min.

11. Remove the model from the mesh basket in dissolved solvent III for 20 seconds.



⚠ **Note: The wax objects can be picked up with a thin wire, or it can be picked up with a tweezers wrapped with a hose at the front.**

12. The finished models can be dry in the air on absorbent papers or things alike.

7.2 Clean up build plate

After each removal of the model, it's necessary to clean up the build plate and plug it back into the printer. Follow these steps to clean up the build plate.

Before proceeding, prepare the following items:

- **Magnetic stirrer**
- **Dust-free paper**
- **High temperature-resistant gloves.**

1. Wear high-temperature gloves.
2. Preheat the build plate with a magnetic agitator.
3. Wipe with dustless paper after surface residue material is soften.
4. When cleaning the printing platform, make sure that both sides and surroundings of the build plate are cleaned.

⚠ **Note: The build plate should remain clean before installing and using the build plate. Keep room temperature steady.**

Chapter 8 Maintenance

There are some necessary maintenances for WaxJet® 400/410 series regularly.

⚠ **Note: For routine maintenance, the printer must be on standby and a clean build plate must be installed.**

Maintain the schedule

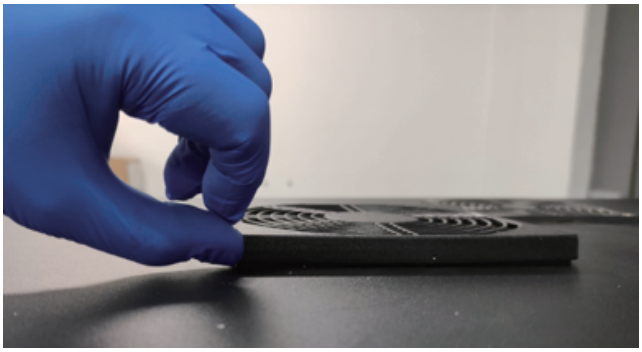
Note: Maintenance tasks must be performed regularly to ensure good operation of the equipment and the accuracy of printed objects.

Maintenance task	As needed	Every day	Every week	Every month	Every half year
Clean top fans filter			√		
Clean the primary efficient filter			√		
Replace the primary efficient filter					√
Clean the waste box	√				
Daub oil for X-axis guide					√
Daub oil for Y-axis guide and the motor screw rod					√
Daub oil for Z-axis guide and the motor screw rod					√
Clean the X-axis base		√			
Clean internal dust		√			
Clean dust around the sensors		√			
Clean the outer surface			√		
Clean build chamber		√			
Clean build plate	√				
Clean the touchscreen				√	
Clean MDM			√		
Clean the carriage of printhead			√		
Clean the bottom side of Y-beam			√		
Powder Removal for Pipes			√		
Clean the blade at HMS			√		
Clean the planarizer and its blade			√		

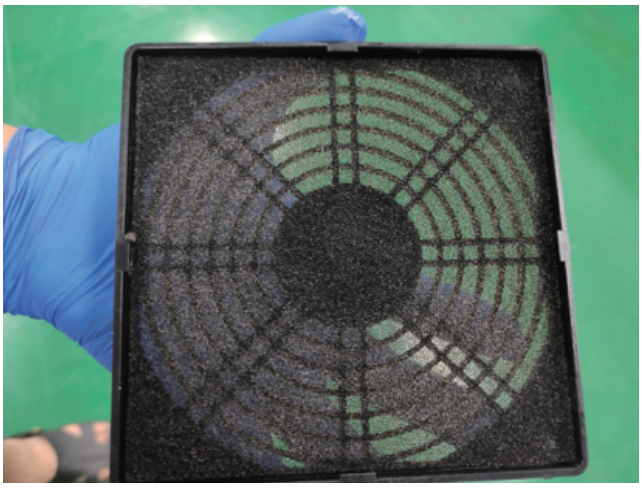
The recommended operating environment recommends operating temperature range: 18-28 degrees C (64-82 degrees F)
Recommended temperature range: 18-24 degrees C (64-75 degrees F) Recommended humidity range: 30%-70%

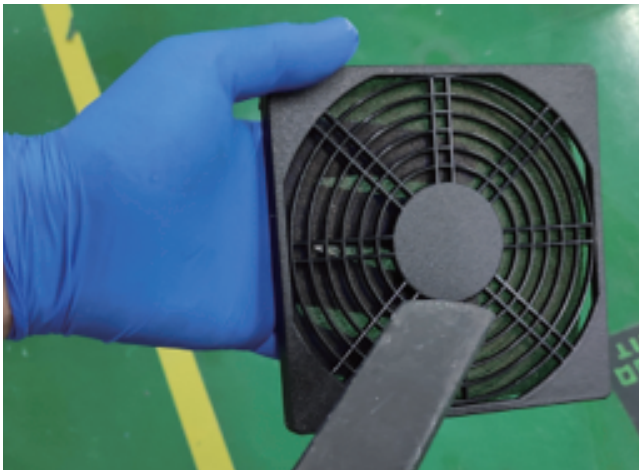
Clean top fan filter

Open the protective fan cover along the corner of the fan shield.



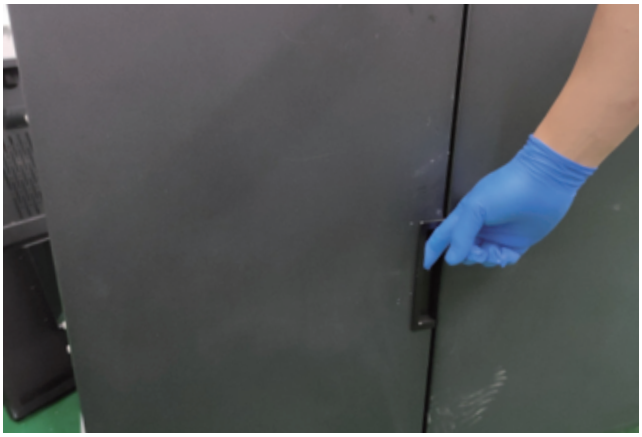
After a period of use, there has a lot of dust in the filter. Clean dust with a vacuum cleaner.

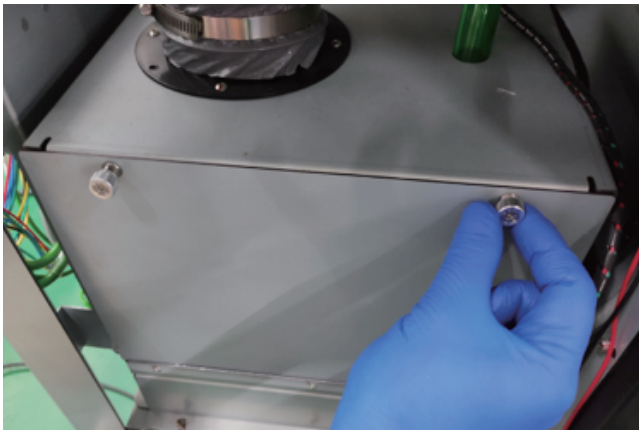




Clean the primary efficient filter

Open the left door of printer first, then loose two screws by hands.





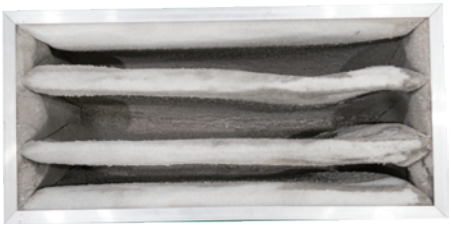
Remove the filter cover first and take out the filter.

After a period of use, there has a lot of dust in the filter. Clean dust with a vacuum cleaner.

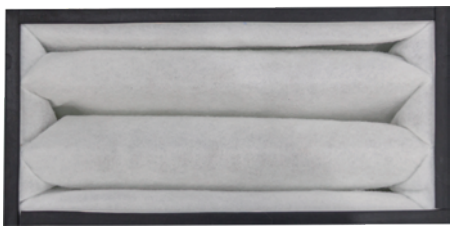
Replace the primary efficient filter

The primary efficient filter is used to remove particles, odors, and gases from the printing area.
This filter can be found behind the machine on the right. Open the door and remove the black cover and the initial filter. Replace the new filter and install the initial filter and the black cover back into place.

⚠ **Note: it is a replacement part.**
PTFE filter-P/N61000289001.



The filter that needs to be replaced

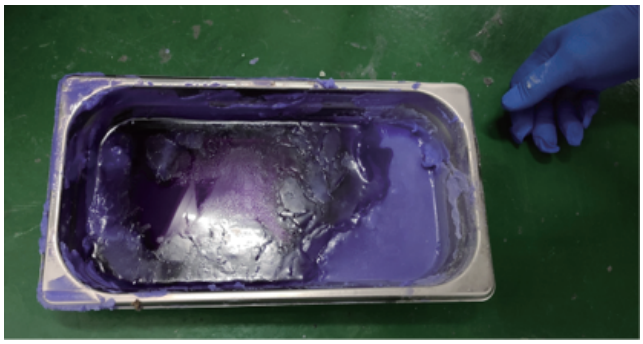


The new filter

Clean the waste box

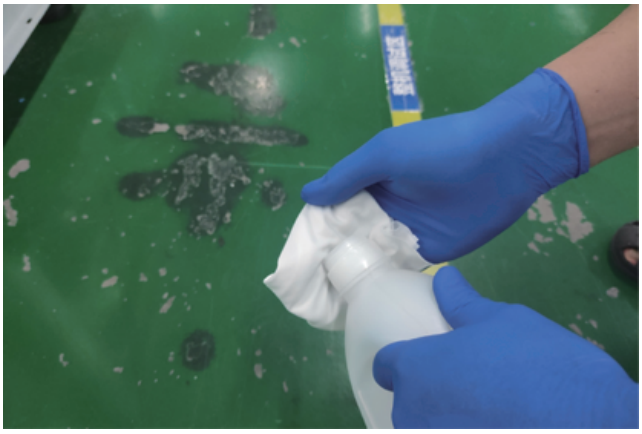
Open the left door of printer first, and take the waste box out.

The waste wax produced in the process of printing and stored in the waste box. Install the clean waste box back to the printer after cleaning the waste box.

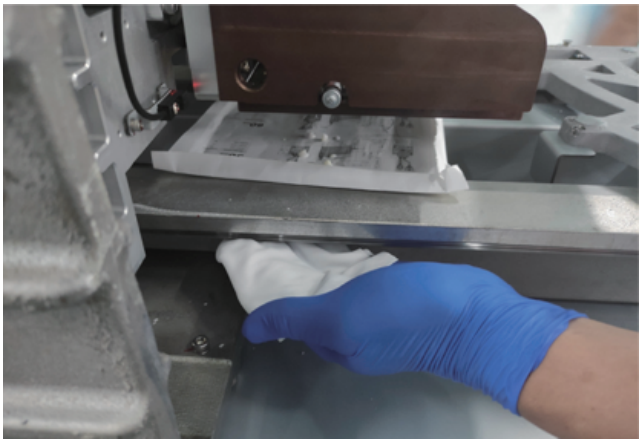


Daub oil for X-axis guide

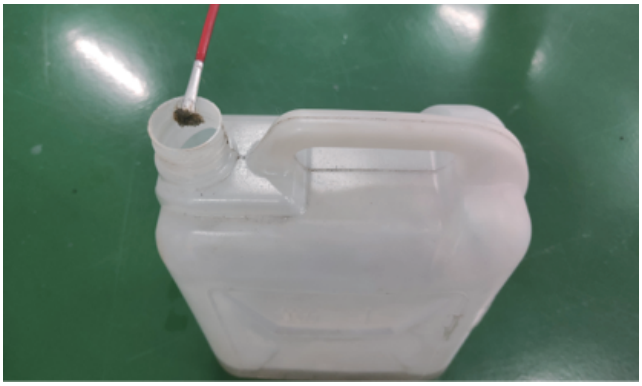
Wear the rubber glove and wet a dust-free cloth with ethanol.

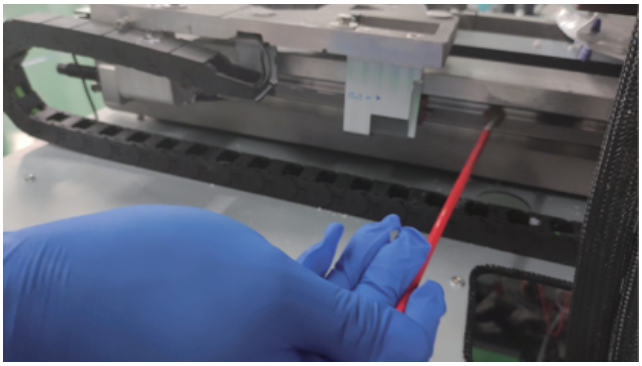


Clean the guide by dust-free cloth.



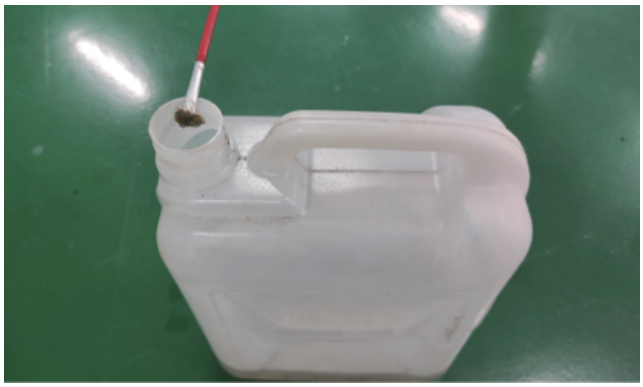
Daub oil on the X-axis guide by brush.

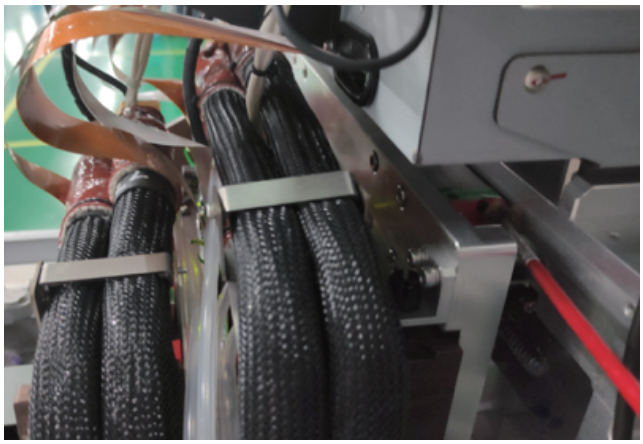




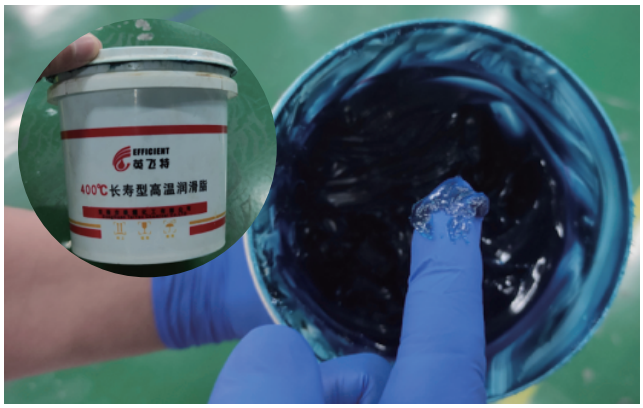
Daub oil for Y-axis guide and the motor screw rod

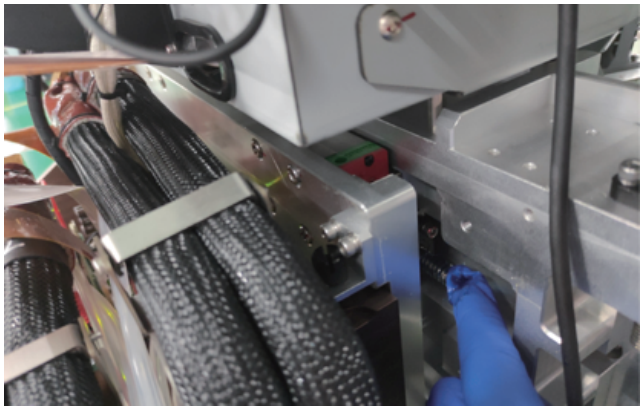
Daub oil on the Y-axis guide by brush.





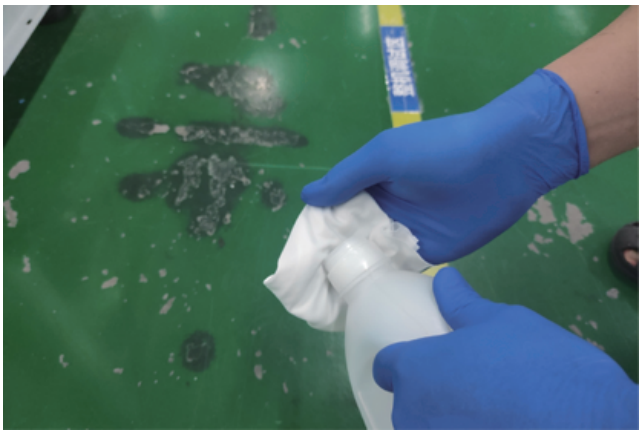
Wear the rubber glove and apply grease to the Y-axis screw rod.



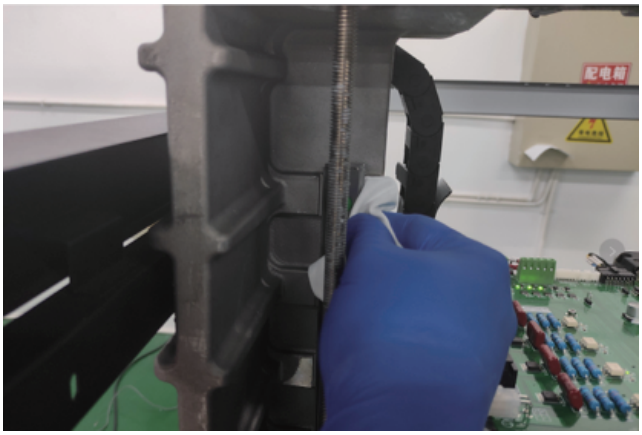


Daub oil for Z-axis guide and the motor screw rod

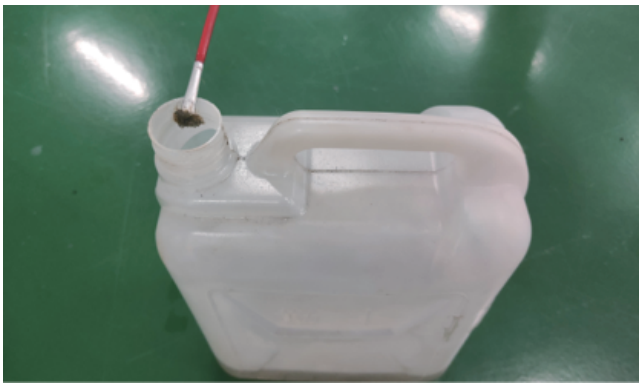
Wear rubber gloves and sprinkle with a little ethanol on a dust-free cloth.

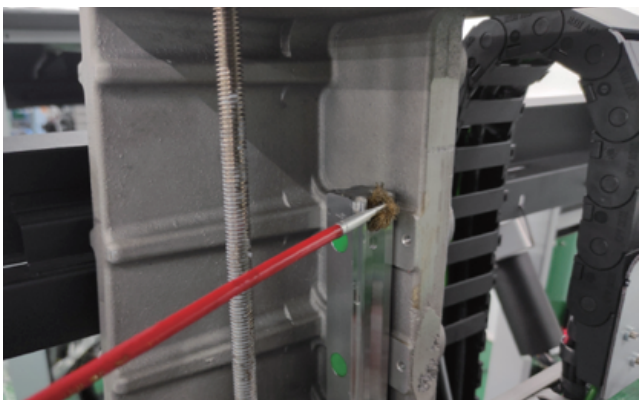


Clean the guide by dust-free cloth.



Daub oil on the Z-axis guide by brush.





Clean the X -axis base

Check that the X-axis base is clean before each printing, follow these steps to clean the X-axis base:
1. Open the right door and move the build plate to home position;
2. Use a stainless steel scraper to clean the wax drops or wax blocks on the X-axis base.

3. Close the door.

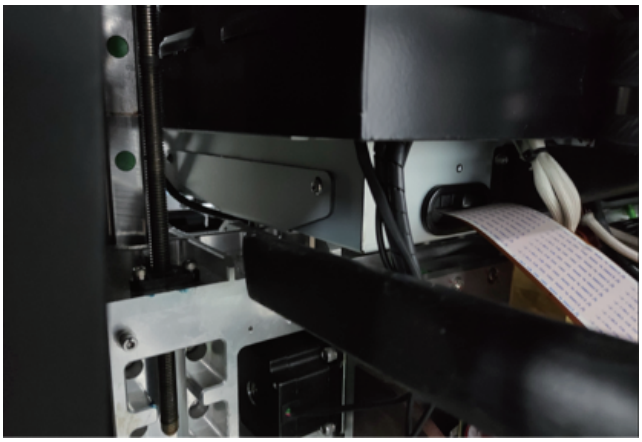
Clean internal dust

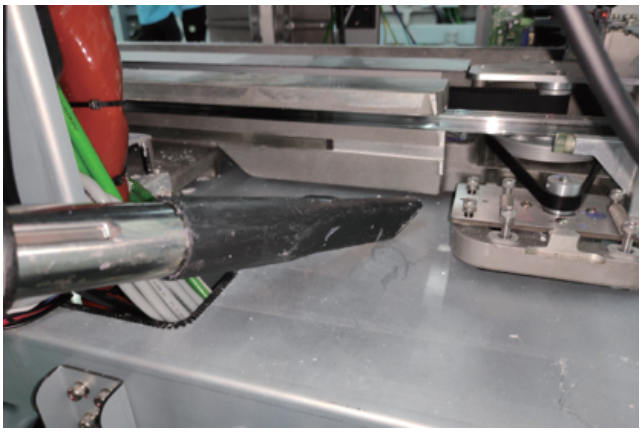
⚠ **Too much dust inside the equipment or failure to clean up the internal dust for a long time can cause nozzle damage, please follow these steps to clean up the internal dust:**

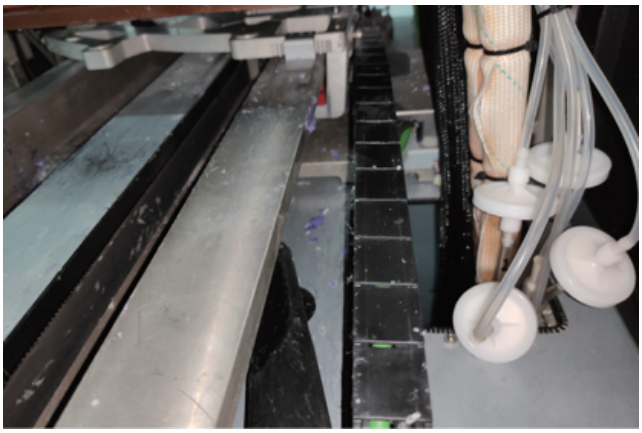
Use a vacuum cleaner to clean the wax dripping on the X-axis base.

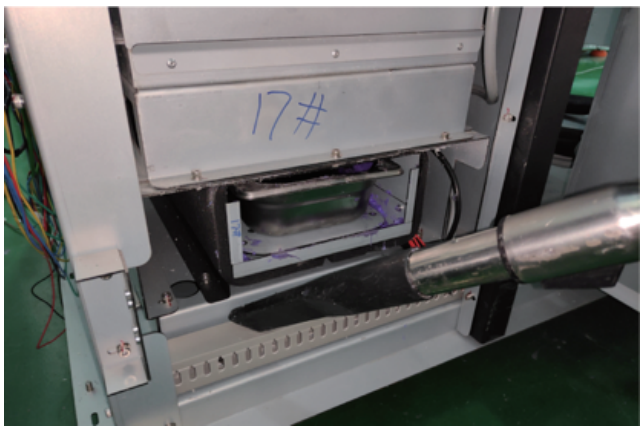
Use a vacuum cleaner to clean the dust on the filter.

Use a vacuum cleaner to clean the internal dust of the printer.









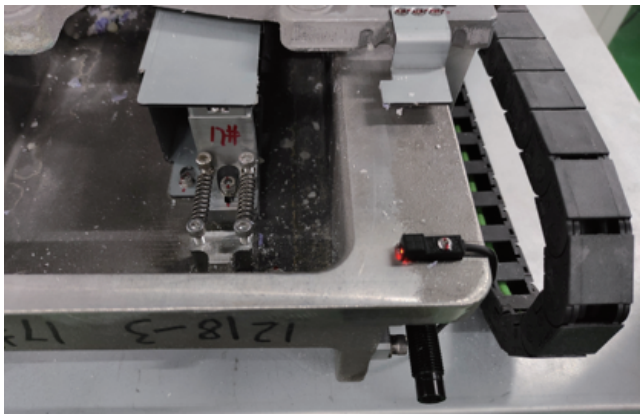
Clean dust around the sensors

After long-term use, dust is deposited near the sensor and cleaned up. Follow the procedure below to clean.

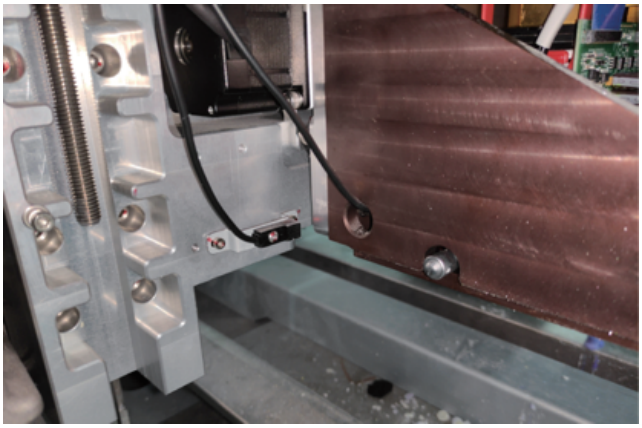
⚠ **Always wear rubber gloves when cleaning the proximity sensor.**

1. Open the printing chamber.
2. Find the home sensor and the maximum position sensor.

Clean photoelectric switch in the front of X-axis.

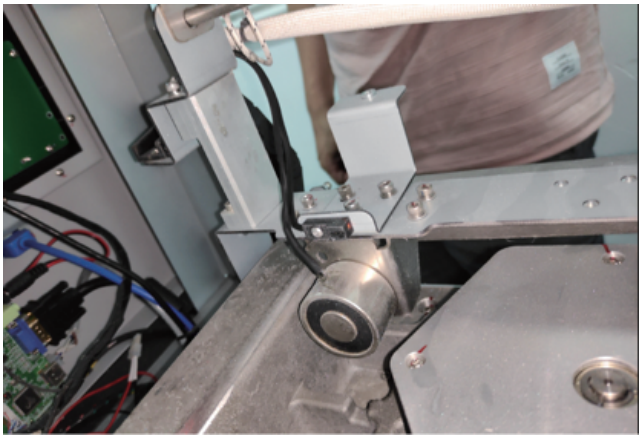


Clean photoelectric switch in the front of Y-axis.



Clean photoelectric switch in the front of Z-axis.

Clean photoelectric switch in the back of X-axis.



3. Use a cotton swab to extract isopropyl ethanol and gently wipe all dust around the sensor.

4. After removing any dust around the sensor, close the printing chamber.

Clean the outer surface

Note: The device must be on standby before cleaning to avoid disruption of printing.

Do not remove any external panels while cleaning the printer. The panel can only be removed by a qualified FlashForge technical support representative.

Note: Only use non-abrasive, non-ethanolic cleaners to clean the surface. Never use multi-purpose cleaners that contain crude oil-based polishes such as wax water.

Wipe with a dry, clean, lint-free cloth to remove dust from the outside surface of the printer. Spray the clean cloth with a multi-purpose cleaner and gently wipe away the dust and oil stains on the outside surface of the printer.

Clean build chamber

Use a dust-free cloth to extract isopropanol to clean the building door. Gently wipe off the dust from the surface using a damp cloth.

Clean build plate

Note: before installation and use, please keep the build plate clean and keep the room temperature steady.

After each finish of printing, it is suggested to clean up the build plate and reinsert it into the printer. Follow these steps to clean up the build plate:

1. Use a flat blade or greased knife to remove excess auxiliary material from the build plate surface.
2. Spray the build plate with isopropanol (IPA) and wipe it with a paper towel.
3. Make sure that both sides of the build plate are cleaned.

Clean the touchscreen

Remove all printed parts before cleaning the screen. Prevents any operation on the printer from accidentally pressing the control key.

Spray water-based solvents, dust-free cloths, and never wipe or spray detergent directly onto the touch screen with a dry cloth.
Gently wipe with a clean, dust-free cloth containing amino glass cleaners to remove dust and structural material residue from the touch screen.

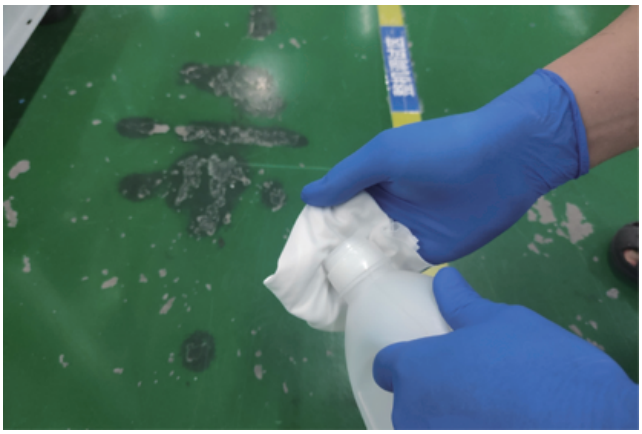
Note: The following cleaning products will cause damage to the touch screen, do not use!
· Dry cloth;
· any cleaning product containing acetone, butronone or ethanol ;
· Any abrasive cleaning product.

Clean MDM

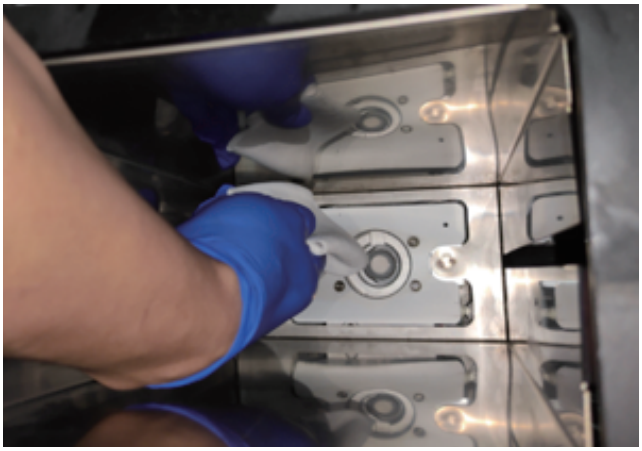
⚠ **Note: When replacing the material box, there may be material that leaks into the feed silo socket after removing the box. If there is a large amount of material (the bottom is covered and touched to the box wall), do not place a cleaning material box in the socket, contact your dealer or FlashForge Account Manager.**

⚠ **Note: The material chamber is kept warm and avoid touching the side of the base during cleaning. Wear heat-resistant gloves and goggles.**

Wear rubber gloves and sprinkle with a little ethanol on a dust-free cloth.

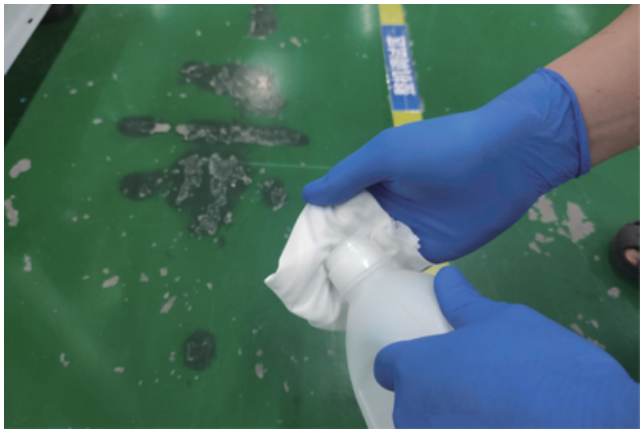


Wipe the wax and dust from the nozzle mounting plate with a dust-free cloth.



Clean the carriage of printhead (not the nozzles work area)

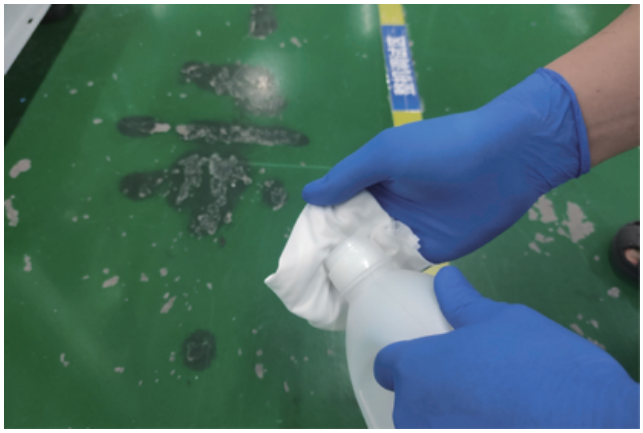
Wear rubber gloves and sprinkle with a little ethanol on a dust-free cloth.



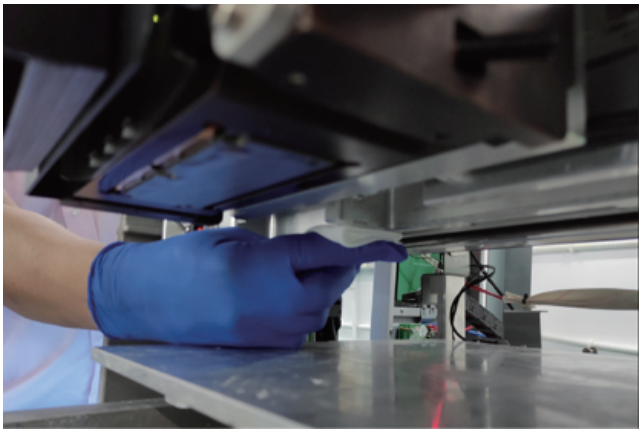
Clean the wax and dust on the installation board of the printhead with the dust-free cloth.

Clean the bottom side of Y-beam

Wear rubber gloves and sprinkle with a little ethanol on a dust-free cloth.

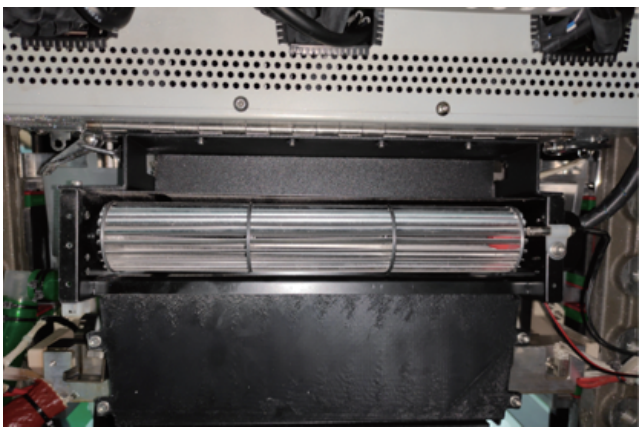


Wipe the wax and dust on the whole Y-beam with the dust-free cloth.

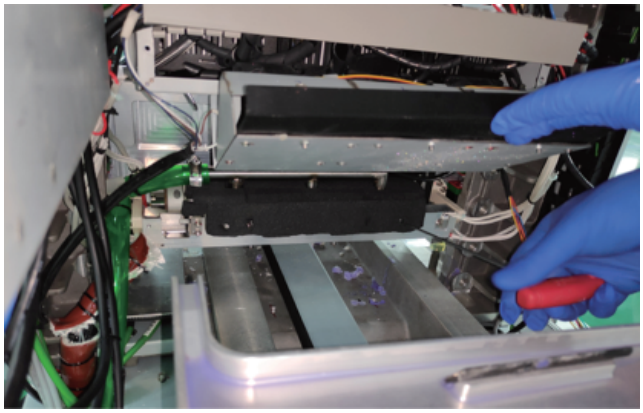


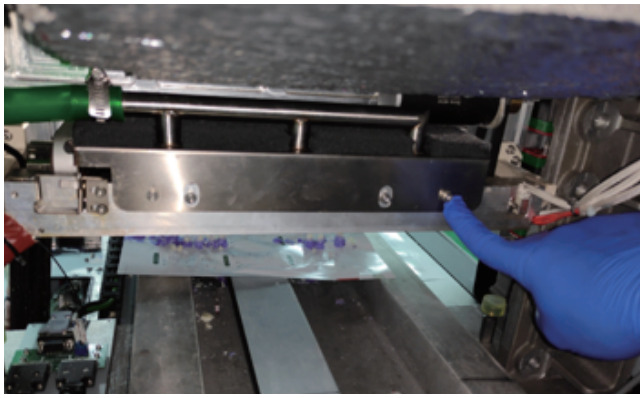
Powder Removal for Pipes

Release the hook on both sides of the rear fan.

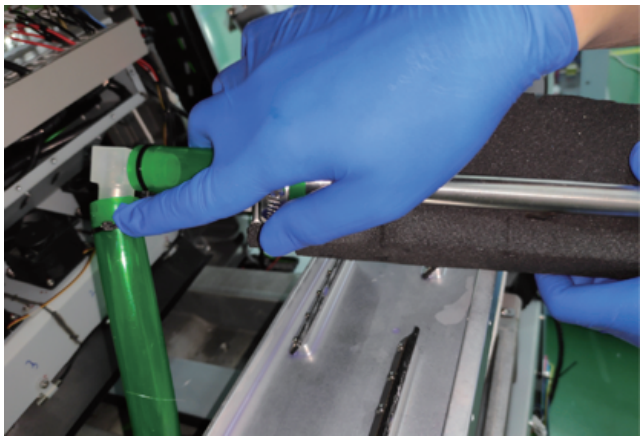


Unload two fixing screws on the cover of the planarizer.

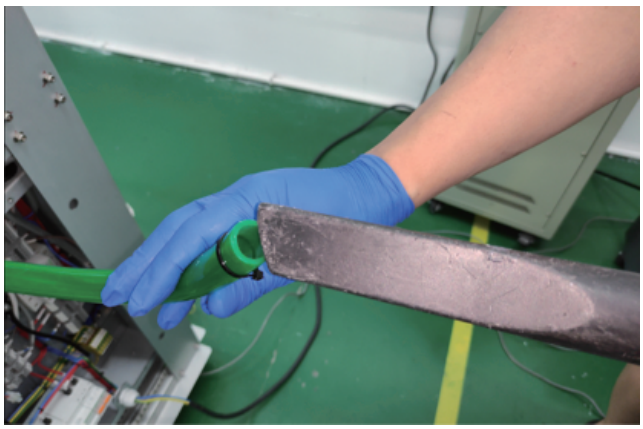




Unload the rubber pipe from the direct connection.

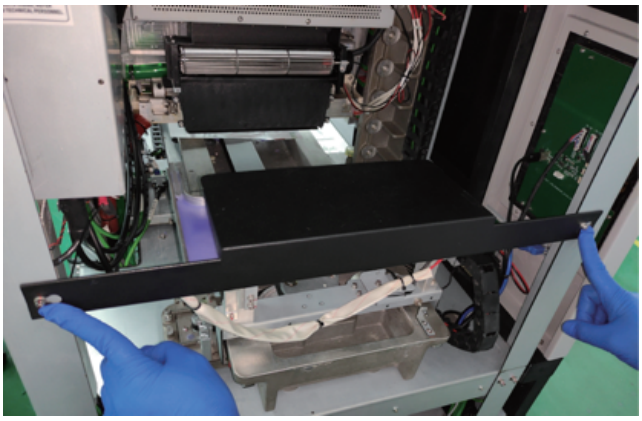


Clean up the dust in the pipe via the vacuum.

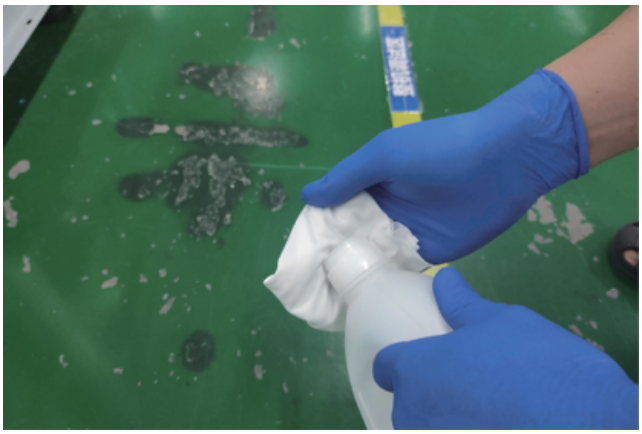


Clean the blade at HMS

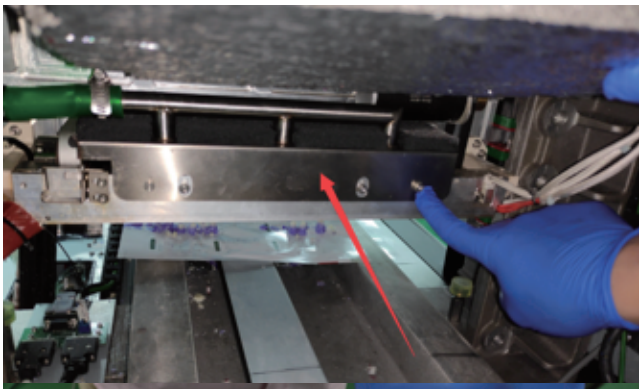
Unload two fixing screws on the cover of HMS.

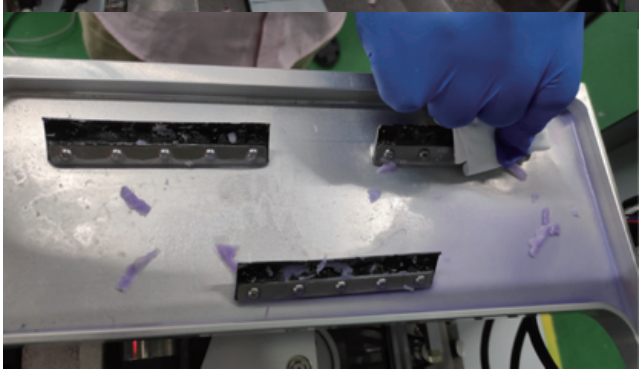


Wear rubber gloves and sprinkle with a little ethanol on a dust-free cloth.

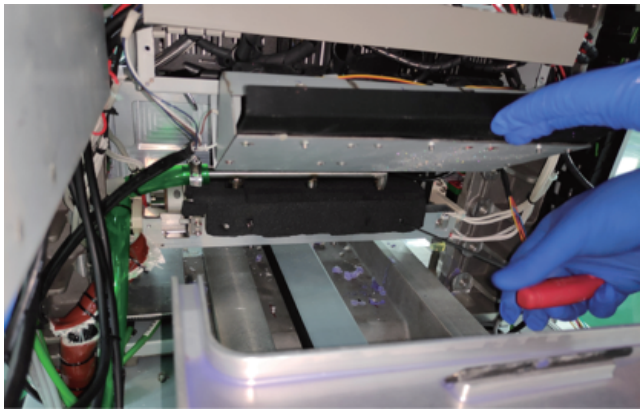


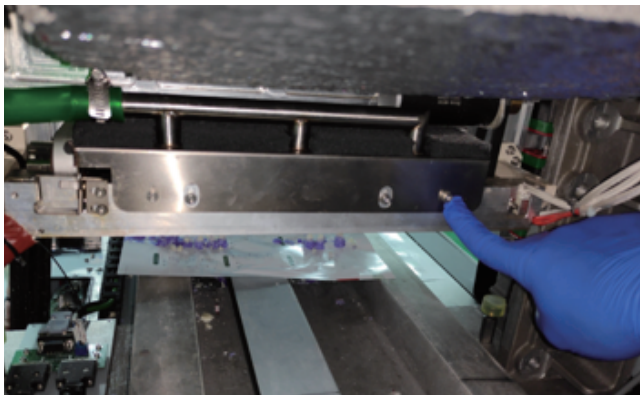
Clean the rubber blade with the dust-free cloth.



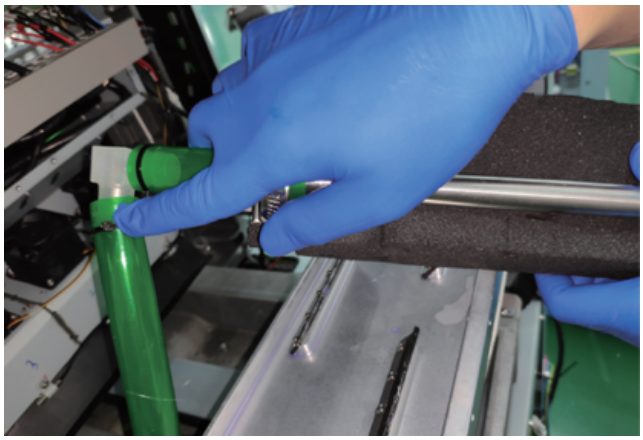


Unload two fixing screws on the cover of the planarizer.





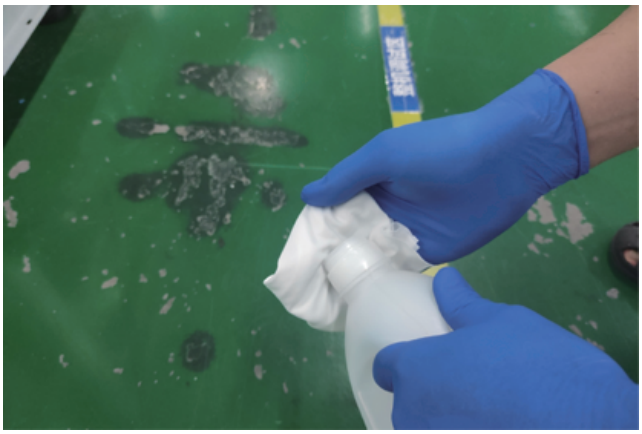
Unload the rubber pipe from the direct connection.



Clean up the dust in the pipe via the vacuum.

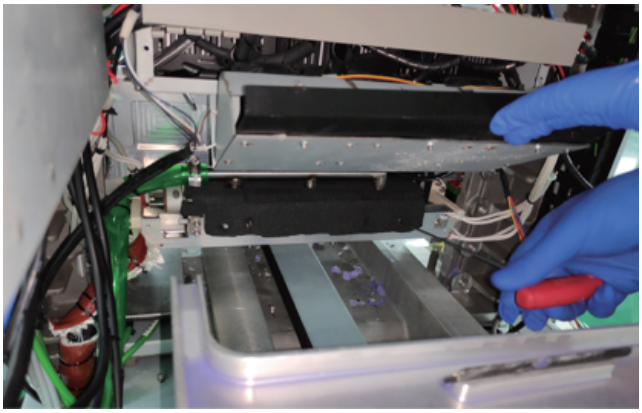
Clean the planarizer and its blade

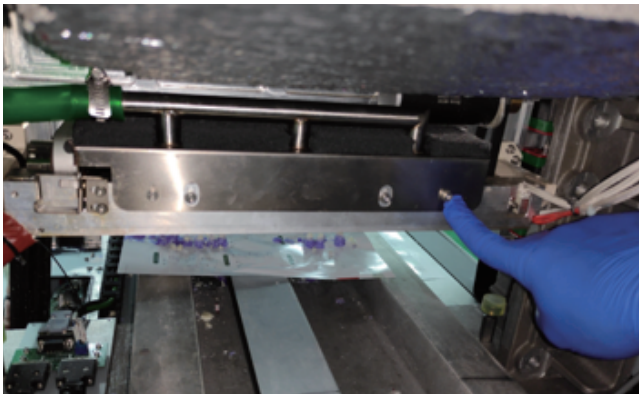
Wear rubber gloves and sprinkle with a little ethanol on a dust-free cloth.



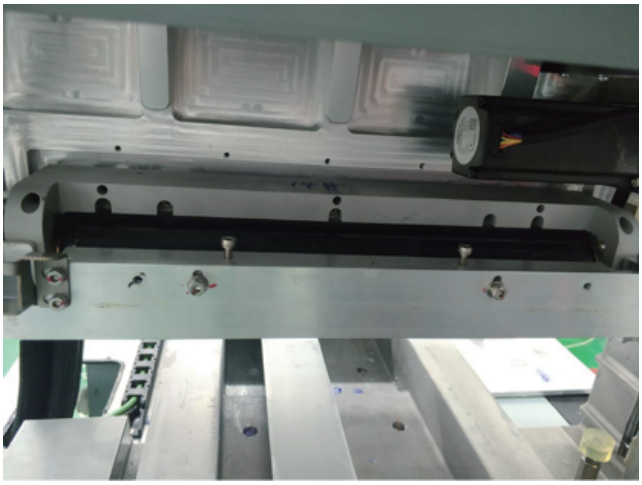
Release the hook on the both sides of the rear fan.

Unload two fixing screws on the cover of the planarizer.



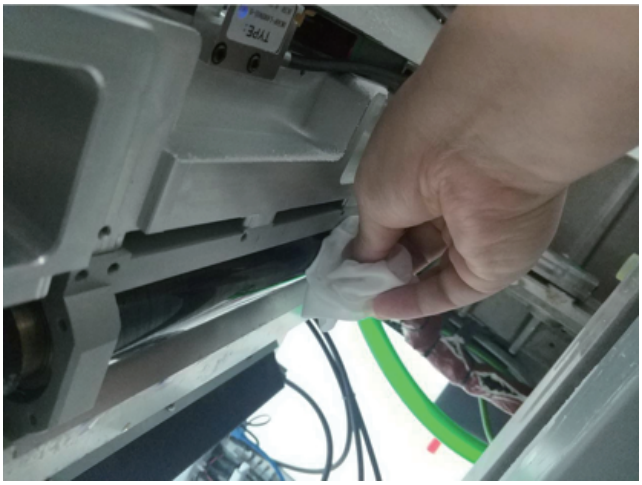


Unload the cover for powder filter.



Clean the blade with the dust-free cloth in ethanol.

Clean the planarizer from the back lower side of the printhead carriage with the dust-free cloth in ethanol.



Chapter 9 Troubleshooting

If the printer detects an issue that may affect printing, it is indicated in the alert information page. This chapter introduce the trouble-shooting and follow the steps to solve the main failures of ® WaxJet 400/410.
If there are some issues not covered by this guide, or if you need to order replacement parts, contact your dealer or FlashForge Account Manager.

9.1 Shrink compensation

During the phase change from liquid to solid state, the thermoset material shrink.
WaxJetPrint client software provides shrink compensation function to improve the accuracy of the model.
The following are the shrink compensation defaults for all materials ® WaxJet (as of 2020501). The default values may be adjusted at any time without a software update notification.

Printer	Material	X	Y	Z
WaxJet® 400/410	FFWJ1100	100.9%	100.6%	100%

Use the CAD program to check the exact X and Y dimensions of the model.
· Most CAD programs and simple .stl file viewers will provide a way to view the model and its dimensions .
· Record the actual X and Y dimensions as XCAD and YCAD.

Print and post-process the model and measure the printed objects.
· It is recommended to measure the important dimensions of the geometry, measure in multiple areas and average it.
· Measurements can be made using a caliper or better measurement method.
· Record the X and Y dimensions of the printed model and mark it as XPART and YPART.

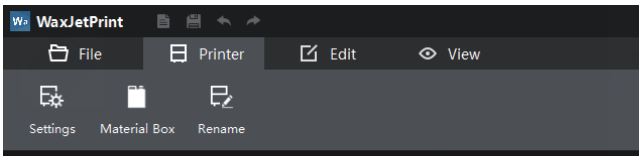
Determines the shrink scale

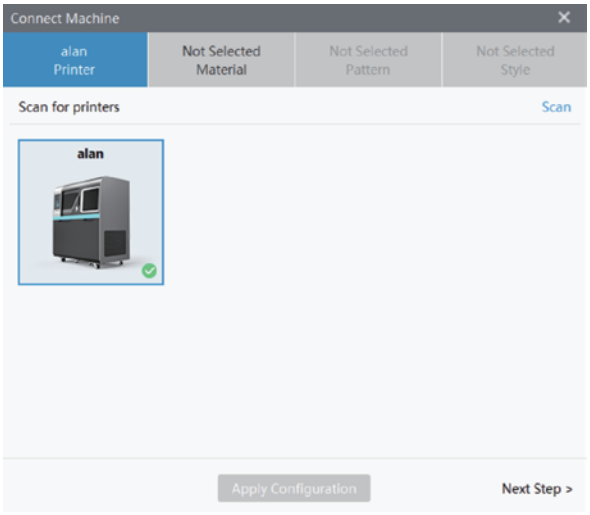
Use the following formula to calculate the scale:
X-scale factor = 100% + (XCAD - XPART) / XPART x 100 (%)
Y-scale factor = 100% + (YCAD - YPART) / YPART x 100 (%)

Example:
The X dimension of the CAD model = 3.000"
The Y dimension of the CAD model =5.000"
The X-size of the printed part = 2.998"
The Y-size of the printed part = 4.989"
X-scale factor = 100% + (3.000 - 2.998) / 2.998 x 100 = 100.067%
Y-scale factor = 100% + (5.000 - 4.989) / 4.989 x 100 = 100.22%

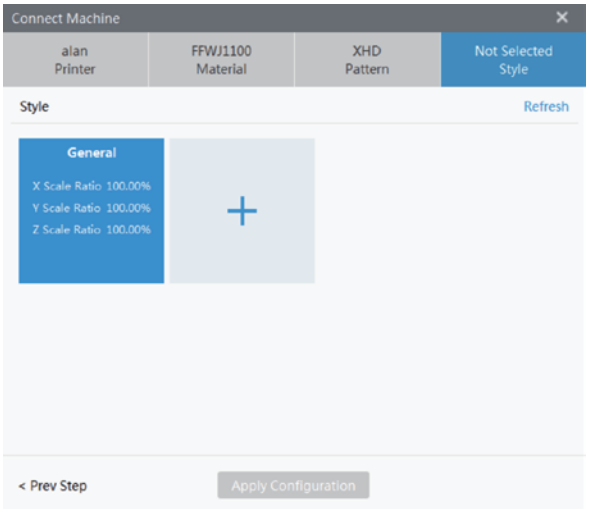
Set the shrink scale

1. Open the WaxJetPrint client software and select Print > Setting >Connect machine.

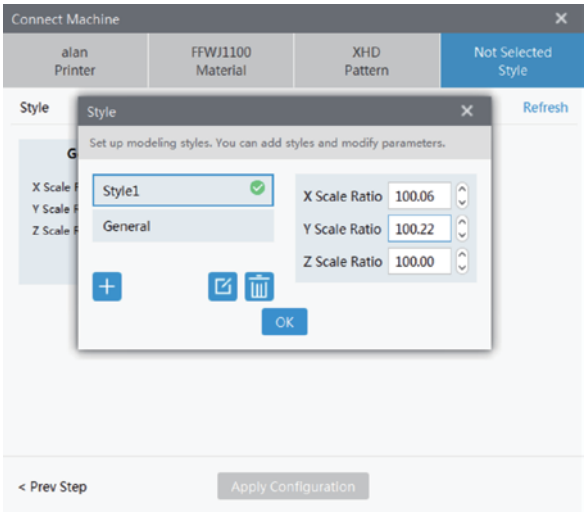




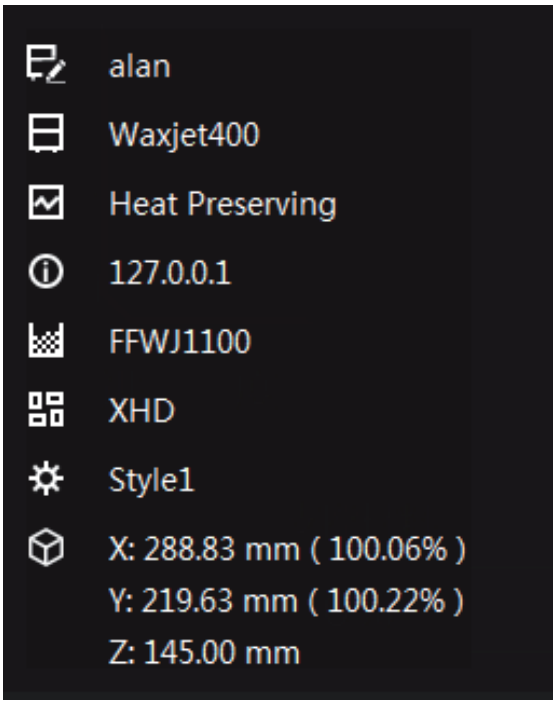
2. Choose the printing mode.



3. Click + to add a new model, enter the new XYZ, then click yes and save the setting.



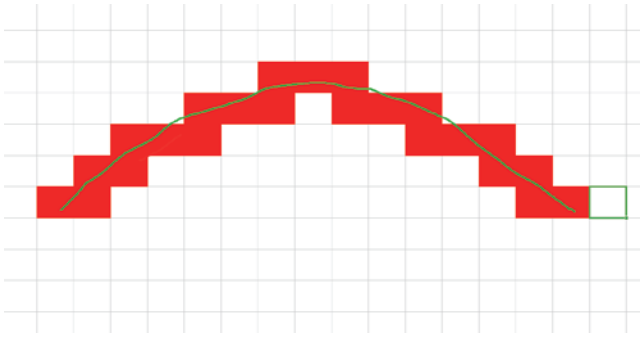
4. The printer has defaulted to a new set of shrink compensation values. The information window in the lower right corner shows the corresponding new maximum printable dimensions for the XYZ based on each shrink compensation values. You can now use these shrink compensation values when loading jobs and printing.



9.2 Layout Guide for Models

9.2.1 Model slicing principle

- Based on Cartesian Coordinate System, the XY plane images are riped according to the 1200DPI grid and Z axis is layered with 0.0158mm thickness.
- After riped, each pixel has only two states, with or without data.
- During the RIP, 50% will be adopted as the standard to judge whether the pixel is valid. If the model in a single pixel occupies more than 50%, the pixel will be determined as a valid one for printing. Otherwise it will be judged as invalid and will not be printed.
- As shown in the following figure: the green line is the edge of the 3D model, and the red grid is the valid data after RIP.



- It can be seen that the data presents jagged fluctuations after RIP, which is inevitable. The larger the radian is, the more obvious the jagged fluctuations are. This is the point where attention should be paid to when placing or designing models.

9.2.2 Layout Rules

1. Basic Layout Rules

- WaxJet400，the printing time depends on the height of model.;
  WaxJet410，the printing time depends on the height of model and the number of occupied lane;
  please reduce the height as much as possible to reduce the printing time.
- Try to place the models in one lane to avoid the doubled printing time in multi-lanes.
- Increase the distance between models spacing if space allows.
- A larger spacing is required for larger models than for smaller models.
- The printing effect of model surface is sorted in decrease turn: XY > XZ > XY. Please adjust the model surfaces in this order if necessary.
- The printing effect of non-support surface is superior to that of surface with support.

2. Layout for models in large curved surface

A certain angle from 10°to 25°shall be formed between the large curved surface of models and the flat surface of Coordinate System so as to aviod the jagged fluctuations after RIP.

3. Layout for models in large flat surface

For heat dissipation and other reasons, a lurch of 10 to 15 degrees between the flat surface and x-axis or y-axis can be created to improve the end results.

4. Stacking

Though possible, please avoid cascade printing as far as possible. If cascade printing is to be adopted, please ensure the number of layers is less than four. Besides, the printing result of lower layers will be worse than that of the top layer.

5. Cross-lane Layout

Avoid cross-lane layout as far as possible. If it's a must, please choose those models with low accuracy requirements.

9.3 Printhead Maintenance

9.3.1 Pepeated purge

1. introduction

Repeated purge is an automatic routine maintenance procedure. The blockage is to be removed from printhead after cleaning the flow channel and nozzles via the purged material. After purged the material, the HMS will clean up the residual material with the wiper and finally dump the waste material into the waste material basin.

2. Procedure

The procedure starts automaticly before printing. If the printheads are not in good conditions, please adopt the 【Repeated purge】 on the 【Diagnosis】interface. Manual cleaning can also be done on the X-Tools interface for clogged

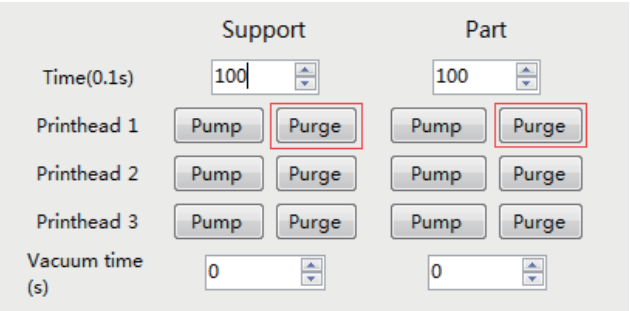
3. X-Tools Interface

Based on the above automatic steps, operation under X-Tools mode is to be performed manually step by step, making it applicable to seriously clogged printheads.

9.3.2 Printhead Dredging

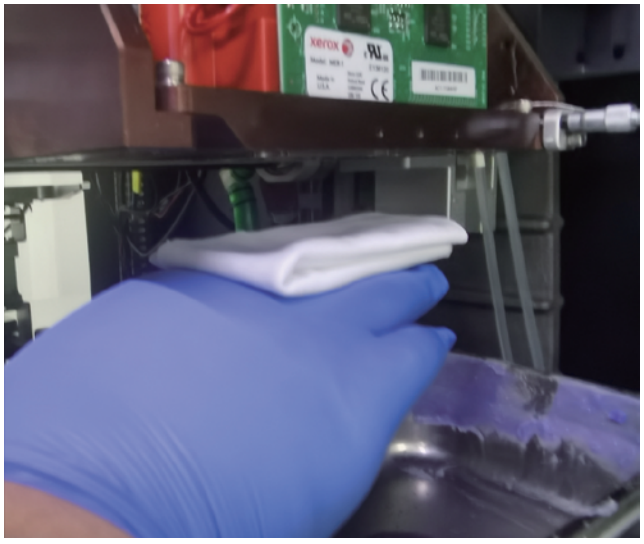
Feel free to dissolve the blockage in the nozzles with the dust-free cloth wetting by isopropanol if the printheads are seriously clogged. The specific steps are as follows:

Steps for isopropanol pad application:
1. Raise the Y-beam to a height convenient for operation;
2. Wipe the printhead carriage and periphery via the dust-free cloth with isopropanol;
3. Cover the dust-free cloth with isopropanol and fold it into a strip slightly larger than the nozzle area, and then pad it at the nozzle for about 5-10 seconds without any movement;
4. Manually purge the printhead for 2-3 times and set the time to 10 seconds.



5. Cover the dust-free cloth with isopropanol and pad it at the nozzle again, and then purge the printhead. Repeat this step for 2-3 times;
6. Print the test points or test strip to check the nozzle status;
7. Start the 【Repeated purge】if the nozzle does not operate well and confirm the nozzle status again.

⚠ **Note: Please wear latex gloves during the whole process and ensure the cleanliness of isopropanol containers.**



9.3.3 Printhead Maintenance

1. The negative pressure will be utilized to keep the LOM of printhead to aviod the material dropping when 3D printer are inready status or working. As the negative pressure might inhale the impurities which can cause clogged nozzles, please keep the working environment clean as far as possible.
There will be residual material around the printhead. Material are volatilized and crystallize after being exposed to the air for a long time, which can cause clogged nozzles. If necessary, wipe the nozzles with a dust-free cloth dipped in anhydrous ethanol.
Please note that the nozzle area can only be wiped perpendicularly while the other areas can be wiped horizontally.

2. Please perform the 【shutdown】 on the machine if it is not used for a long period of time, for the material might deteriorate if being heated for a long time, which affects the service life of the printheads.

3. Please clean the wiper on HMS regularly via ethanol and dust-free cloth. Clean out the material residue first if there is any onto the wiper.

4. Occasionally there are material residue in the nozzles after HMS performed the cleaning. In this case, please clean the nozzles surface with a dust-free cloth and check to adjust the HMS wiper.

5. The printhead are parts in high precision which can not be cleaned with tools in high hardness or disassembled by non-professional personnel. As the printhead are sensitive to temperature, please clean the areas outside the nozzles regularly via a soft brush.

9.4 Printer failure recovery

1. Printing is interrupted

Problem description:
An error occurred in the printer or the working delay exceeded 30 minutes.

Troubleshooting steps:
Check the alarm information page for errors that may cause delays, and solve main problems.

2. abnormal build plate sensor

Problem description:
The sensor of the build plate may be stained and needs to be cleaned.

Troubleshooting steps:
2.1 Open the printing chamber;
2.2 Find the home sensor and the maximum position sensor;
2.3 Use a cotton swab dipped in isopropyl ethanol, gently wipe around the sensor to remove dust;
2.4 After removing the dust, close the printing chamber;
2.5 If the problem is not resolved, please contact your local service provider.

3. The planarizer motor stops rotating

Problem Description:
If the build plate installed incorrectly or there are materials at the bottom of build plate, the build plate may be in high position, even a slight influence will cause the motor to stop.

Troubleshooting steps:
3.1 Open the printing chamber;
3.2 Remove the build plate;
3.3 Check the induction sensor and clean the surface and surrounding dust;
3.4 Replace the build plate;
3.5 Close the printing chamber and restart the printer;
3.6 If the problem is not resolved, please contact your local service provider.

4. Supply support/part materials problem

Problem description:
The printer detects that the ink bottle has ink but cannot supply wax to the valvetank normally.

Troubleshooting steps:
4.1 Check the abnormal material bottle ;
4.2 Check the remaining material ;
4.3 Check the installation place;
4.4 Unscrew the cap of the material bottle counterclockwise 1/2, and the material has been removed.

5. Abnormal material delivery

Problem description:
insufficient materials.

Troubleshooting steps:
5.1 The ink bottle contains materials;
5.2 The ink bottle install right;
5.3 Unscrew the cap of the ink bottle 1/2 counterclockwise, and the material has been removed.
If the material bottle has just been inserted and is in a cooling state, it may take 60-90 minutes to warm up to working temperature.

6. The build chamber is overheated

Problem description:
Problem Description: The temperature of the build chamber is higher than the optimal temperature. If the temperature continues to be too high, the printer will suspend printing until the temperature drops.

Troubleshooting steps:
6.1 Check the ambient temperature, the best temperature range is 18°-24°C;
6.2 Check whether the PTFE filter and the air inlet filter are blocked. If necessary, please replace it;
6.3 Make sure that the printer is not placed beside a window in direct sunlight;
6.4 Make sure there is a distance of 30cm between the back of the printer and the wall.

7. The printer touch screen went dark

Problem description:
The touch screen went dark, and the printer does not make any sound.

Troubleshooting steps:
7.1 Turn off the printer switch and wait for 30 seconds;
7.2 Unplug the power cord and wait for 10 seconds;
7.3 Make sure the printer switch is off;
7.4 Plug in the power cord and wait for 2 seconds.
7.5 Turn on the printer switch.
The touch screen should be powered on, and the printer will start beeping for initialization in the next minute. If the problem is not resolved, please contact your local service provider.

8. The printer is powered on and the touch screen does not respond

Problem description:
The printer is powered on, the screen UI is displayed (not a blank screen), but there is no response.

Troubleshooting steps:
8.1 Turn off the printer switch and wait for 30 seconds;
8.2 Unplug the power cord and wait for 10 seconds;
8.3 Make sure the printer switch is off;
8.4 Plug in the power cord and wait for 2 seconds;
8.5 Turn on the printer switch.

The touch screen should be powered on, and the printer will start beeping for initialization in the next minute. The touch screen should be ready and communicate with the printer in about 2-3 minutes. If the problem is not resolved, please contact your local service provider.

9. The printer is powered on and the user interface is blank

Problem Description:
The printer is powered on, the user interface is blank, and there is noise of fan and machine.

Troubleshooting steps:
9.1 Turn off the printer switch and wait for 30 seconds;
9.2 Unplug the power cord and wait 10 seconds;
9.3 Make sure the printer switch is off;
9.4 Plug in the power cord and wait 2 seconds.
9.5 Turn on the printer switch.
The touch screen should be powered on, and the printer will start beeping for initialization in the next minute. The touch screen should be ready and communicate with the printer in about 2-3 minutes. If the problem is not resolved, please contact your local service provider.

10. Residues in valvetank

Problem Description:
There are residues in valvetank.

Troubleshooting steps:
10.1 Do not install materials;
10.2 please contact your local service provider.

11. Cannot insert material bottle

Problem Description:
Bottle shall not be inserted into the valvetank.

Troubleshooting steps:
11.1 Warm up the printer for 20 minutes;
11.2 Insert the material bottle, check whether the ink bottle is fully inserted, and click the material bottle in place;
11.3 If the problem is not resolved, please contact your local service provider.

12. Leaked material from material bottle

Problem Description:
The material leaked, when the material bottle was removed from the printer.

Troubleshooting steps:
12.1 Before removing the material bottle, turn the cap clockwise to close it;
12.2 Pull up the release wrench, and then pull up the material bottle. Please note that pulling up the release wrench when pulling out the material bottle may cause material to leak from the material bottle;
12.3 If you find residual material at the bottom of the valvetank, please contact your local service provider.

13. The ink bottle is inserted, but the printer does not recognize the material bottle.

Problem Description:
The material bottle is inserted, but the material bottle is not detected. The material identification label may be missing or damaged.

Troubleshooting steps:
13.1 Confirm that the identification label above the handle of the material bottle is complete;
13.2 Insert the other material bottles with the same material type into the material socket;
If the printer detects the material bottle, there is a problem with the RFID tag of the undetected material bottle. Please replace the material bottle. If the new material bottle do not detected, please contact your local service provider.

14. The noise of printer is loud

Problem Description:
The printer occasionally makes a loud, rapid "click" noise.

Troubleshooting steps:
This is normal. The material delivery system is supplying materials throughout the printer.

15. No build plate detected

Problem Description:
The build plate is installed but not detected.

Troubleshooting steps:
15.1 Open the build chamber;
15.2 Remove the installed build plate and reinstall it. Make sure that the build plate is flat in the printer.
If the problem is not resolved, please contact your local service provider.

16. The printer emits an odor

Problem Description:
After printing for a period of time, the printed part material will emit odor.

Troubleshooting steps:
16.1 Replace the PTFE filter of the printer;
16.2 Increase the ventilation frequency of the environment;
16.3 Move the printer to an area with better air circulation.

9.5 Model quality problem recovery

1. Missing print

Problem Description:
If the missing print is at the same location in multiple lanes and form from left to right in the X-Aixs .

Troubleshooting steps:
1.1 Perform printhead maintenance procedures;
1.2 If the problem is not still recovery after three times, please contact your local service provider.

2. Extra materials on the model surface: the part material are beyond the part itself.

Problem Description:
Extra materials on the model surface: the part material are beyond the part itself.

Troubleshooting steps:
2.1 If there are materials dropped from the bottom side of printhead carriage, please wear the nitrile gloves to clean the residues near the printhead and planarizer.
2.2 If there are extra materials on the bottom side of the spray truck, please contact your local service provider.

3. Material gap

Problem Description:
Problem description: There exists a material gap at the 1/3or 2/3 of the finished three channel model.

Troubleshooting steps:
The printer needs calibration, please contact your local service provider.

4. Drop wax

Problem Description:
The material drips onto the model or into the printing area.

Troubleshooting steps:
The planarizer of the printer needs maintenance, please contact your local service provider.

5. Material uplift

Problem Description:
A bulged or folded part is created at the 1/3or 2/3 of the finished three channel model because of extra materials.

Troubleshooting steps:
The printer needs calibration, please contact your local service provider.

6. Snow-like material in build chamber:

Problem Description:
The formation of snowflake-like materials in build chamber is normal.

Troubleshooting steps:
6.1 Increasing the frequency of printer maintenance can effectively reduce the appearance of snowflake-like materials in printing chamber.
6.2 If the printed model is damaged due to accumulation of snowflake-like materials, please contact your local service provider.

7. The model curls during printing

Problem Description:
The model is bent or curled, and the plane is not flat, curling occurs on the Z axis (vertical direction) of the printing platform.

Troubleshooting steps:
7.1 Check the environment temperature, the best temperature range is 18°-24°C (64°-75°F).
7.2 Check whether the PTFE filter and the air inlet filter are blocked. If necessary, replace it.
7.3 Make sure that the printer is not placed near a window exposed to direct sunlight.
7.4 Make sure there is a distance of 30cm between the back of the printer and the wall.

8. The part cannot be attached to the build plate.

Problem Description:
The support material cannot be attached to the build plate.

Troubleshooting steps:
8.1 Before installing the build plate, please remove all dust from the printer.
8.2 Before using the build plate, please clean it up.

Chapter 10 After-sales Service Policy

The quality assurance of the WaxJet® 400/410 3D Printer (henceforth the Equipment) is directly provided by its original manufacturer Zhejiang Flashforge 3D Technology Co,. Ltd (henceforth the Flashforge) or the distributors authorized by the Flashforge. This after-sales service card is applicable to all Flashforge 3D printers delivered after June 1st, 2019.

In the event that You purchased Your 3D Printer directly from Flashforge as an authorized servicing reseller or an end customer in which Flashforge continues to directly provide service on that 3D Printer, this warranty is provided to You directly from 3D Flashforge.

Alternatively, if You are an end customer which purchased Your 3D Printer from an authorized servicing res eller that is providing You service on that printer or Your service has been transferred from Flashforge to an authorized servicing reseller, this warranty is provided to You from such authorized servicing reseller.

Please note also the following:

1. The warranty will start at the earliest of (i) the date of installation of the WaxJet® 400/410 3D Printer or (ii) three hundred and sixty five (365) days after the WaxJet® 400/410 3D Printer is shipped from Flashforge to You or to the reseller that sold the WaxJet® 400/410 3D Printer to You, and the warranty will continue for twelve (12) months. The warranty includes no additional coverage beyond the general coverage discussed above.

2. For all end users, please submit the Flashforge After-sales Service Request if any equipment damage occurs because of product quality problems within the warranty period. According to the problems reflected in the Flashforge After-sales Service Request, the corresponding after-sales engineer will take the initiative to contact you and solve the problem regarding the Equipment. If you are unable to offer a complete After-sales Service Request, the Flashforge reserves the right to reject offering the warranty service.

3. One thing to be noted for end users is that your warranty service may be transferred to the distributors authorized by the Flashforge. Please contact the Flashforge After-sales Department in advance to make sure your warranty service.

4. Before the first use, please acquire the Equipment Operation Certificate, or employ a staff who has been trained by the Flashforge and has acquired the Equipment Operation Certificate to ensure the normal operation of the Equipment.

5. This After-sales Agreement applies only to the core machine and machine housing components of Our proprietary 3D Printers, such as their electronics modules and elevator assemblies (the "Equipment") and excludes all software and consumable parts, including the plastics, resins, powders, binders, infiltrants or related compounds used to create models and prototypes.

6. The following accessories are not within the guarantee range: Build plate, USB stick, Part Material、Support Material、Nitrile gloves、Spatula、dust-free cloth、Power Supply、Magnetic stirrer、Heating table、Stainless steel basin、Stainless steel colander、tray、Measuring cup、Stainless steel tweezers、Oxygen pump、Water bath、Waster Bag、wrench、filter、filter sponge、fuse、kit and in-bag tool.

7. The following are beyond the guarantee range:

① You are unable to provide a valid after-sales card or the item of the equipment is inconsistent with the one listed on the after-sales card.

② The equipment and its components are beyond the warranty period.

③ The mechanical faults caused by events external to the Equipment (floods , electrical surges or the like).

④ Parts other than Genuine 3D Parts have been used . "Genuine 3D Parts" are those parts, components, materials,and consumables manufactured by the Flashforge

⑤The Equipment has been modified, maintained, or assembled by any party other than the Flashforge, Our direct subcontractors, or a reseller that We have authorized to service the Equipment.

⑥The equipment is not used in accordance with our After-sales Training and the user's manual.

⑦ Equipment failure or damage caused by wrong installation and improper use.

⑧ Equipment failure or damage caused by the use of equipment in non specified working environment.

⑨ Equipment failure or damage due to personal misuse such overload).

⑩ Equipment failure or damage caused by improper maintenance (moisture, mildew or exposure to extreme weather).

⑪ Normal wear, aging or appearance scratch or defect caused by operation.

8. The replacement parts mentioned in this after-sales service,which maybe new or refurbished. The company ensures the complete function of the replacement parts. Any replacement parts provided for the Equipment will be warranted only for the remainder of the original warranty period.

9. Flashforge or Our authorized servicing reseller, as applicable, will be responsible only for those defects or other non-conformities then under warranty and which have been reported in a timely manner. Liability under the warranty is limited to bringing the Equipment into compliance by repairing or replacing the defect using either new or refurbished Genuine 3D Parts.

10. Please send the defective parts in original packing to a repair depot at the location specified by the Flashforge or Our authorized servicing reseller,as applicable. If the original packing has been missing, please turn to the Flashforge for the packing standard and pack the goods as required. You must send it to the applicable depot using a delivery method that ensures receipt within thirty (30) calendar days of the date You were sent the advance shipment.

11. If you adopt the wrong packaging, or we haven't received the defective parts within the specific time period, or the damage is not consistent with what you submitted, we Flashforge have the rights to refuse your request for warranty service and you are supposed to purchase the new parts for repair.

12. this warranty is the only warranty provided for the equipment. software is subject to separate warranty under an applicable end user license agreement. to the maximum extent permitted by law, flashforge expressly disclaims all other warranties for the 3d printer and each of its components, whether those warranties are express, implied,or statutory including warranties of non-infringement, merchantability, and fitness for purpose.

13. Warranty freight clause.
When the spare parts within the warranty are confirmed by the company's after-sales engineers to return to the factory for repair, both parties shall share the freight according to the following conditions:
① The Flashforge bears the round-trip freight if the delivery period is within 1-6 months.
② The Flashforge bears the delivery freight and the terminal customer bears the return freight if the delivery period is within 6-12 months.
③ The end customer shall bear the round-trip freight if the spare parts are beyond the scope of warranty and are confirmed to be returned to the factory for repair.

Chapter 11 Help and support

⚠ **Note: It is suggested to contact the dealer first when you need help.**

If the certified partner cannot provide assistance, you can call the Flashforge customer support hotline. Before calling customer support for questions, please get the following information in advance:

· WaxJet® 400/410 printer serial number:

The printer serial number is printed on the label on the back of the printer. You can also check the serial number in the user interface， tap the interface Tools> Printer Information.

· A brief description of the problem, including accurate error message content.

· The time of the problem occurred. For example, when starting or ending printing and submitting a job, or when restoring the state before shutdown, etc.

Customer Support Hotline: 400-886-6023

After-sales customer service QQ: 2850862986 / 2850863000 / 2853382161

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目录

前言

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。

服务

如果您在使用打印机期间遇到此指南未涵盖的问题，请联系 FlashForge 的客户支持。
请访问 FlashForge 网站获得联系信息：**www.sz3dp.com**
致电寻求服务时，请务必准备好打印机的软件版本（请参阅第 74 页上的“ 固件版本”）和硬件序列号（请参阅第 68 页上的“ 识别打印机”）。

软件支持

如果您遇到此指南未涵盖的软件问题，请联系 FlashForge 的客户支持。
请访问 FlashForge 网站获得联系信息：**www.sz3dp.com**
致电寻求服务时，请务必准备好打印机的软件版本（请参阅第 74 页上的“ 固件版本”）和硬件序列号（请参阅第 68 页上的“ 识别打印机”）。

简介

注释

· 在使用本产品之前，请先阅读《闪铸 WaxJet® 400/410 工业级3D打印机使用说明书》

· 本用户指南介绍的 WaxJetPrint 软件在不断更新，截图仅作参考。

闪铸科技 WaxJet® 400/410 产品使用说明书涵盖3D打印知识、软硬件操作、操作界面及设备维护等信息，旨在帮助闪铸用户能够更好地体验闪铸产品。

该用户使用手册包括三大板块，分别是前言板块、说明板块及售后板块。

前言板块包括闪铸资源获取渠道、使用手册的整体构架以及用户在打印前、中、后应该注意的问题。

说明板块包含对3D打印技术的介绍、设备的简介、设备的打印操作、软件的安装与使用等。

售后板块包含用户如何获取闪铸团队的支持和帮助、机型基本问题解决等。

安全说明

请确保认真阅读以下安全提示

安全标识及定义

热表面危险：
在这个标志周围或在检修口后面存在热表面。避免接触。热表面会引起烧伤或火灾。在接触之前要使表面冷却。检修口仅供维修使用，只有经过认证的服务人员或训练有素的维修人员才能打开。

保持手指远离尖锐物体：
将手指放在尖锐物体前可能会导致严重伤害。

佩戴手套：
请根据需要佩戴合适的手套。当接触热表面时，为避免灼伤，应佩戴防热手套。

佩戴眼镜：
在部件材料可能发生泄漏或迸溅的情况下，应佩戴带有侧护板的防护眼镜，以保护眼部。

电击危险：
在这个标志附近或检修口后边将有高压电。高压电会引起严重烧伤或死亡，或火灾的发生。检修口仅供维修使用，只有经过认证的服务人员或训练有素的维修人员才能打开。

手卷入警告：
本标志附近或检修盖后有齿轮或运动部件危险。检修盖仅供维修使用，应由授权的维修人员打开。

注意：
用来提示重要信息而非关键信息。

通用

3D打印机系统使用不当会对人员造成伤害。
操作打印机时，请遵循以下安全指南：

- 阅读并遵守所有 3D 打印机系统说明。打印机只应由专业人员操作。
- 请按照所有安全规则进行操作，并注意本指南中的所有注意事项和警告。
- 切勿尝试在打印过程中打开顶盖。
- 在查看全球统一标准/安全数据表 (GHS/SDS) 之前，请勿使用任何材料。
- 在查看用户例行维护程序文档之前，不得尝试使用、维修或调整打印机组件或执行任何程序，经培训的专业人士除外。
- 只有已完成 FlashForge维修培训且经过认证的维修人员 方可执行经过授权和认证、允许上述人员完成的任务。
- 请勿忽略在 3D 打印机系统维修操作期间发布的警告标志。 如果 3D 打印机系统用户界面上显示错误消息， 则在恢复操作前根据错误参考本指南中的“故障排除部分”。

注意事项

用电操作安全

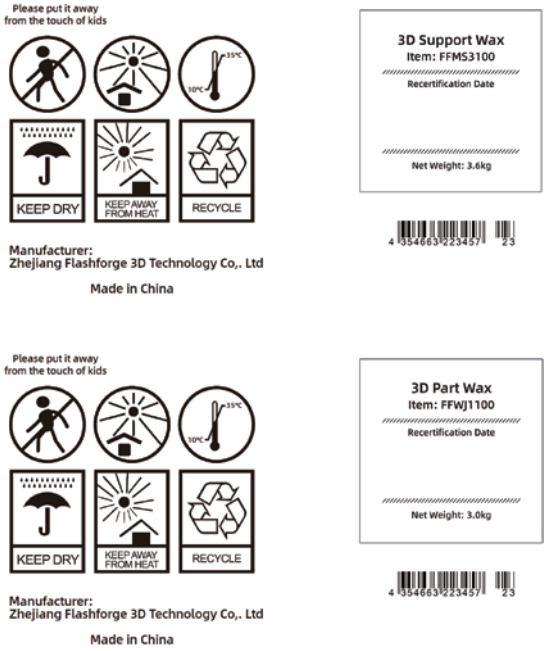
- 请务必将设备接地；切勿改装设备的插头。（未接地/未正确接地/改装插头必然会增加漏电风险）
- 请勿将设备暴露在潮湿或烈日的环境中。（潮湿的环境会增加漏电的风险/暴晒会加速塑件老化）
- 请勿滥用电源线，务必使用闪铸科技提供的电源线。
- 将打印机后方的电源线和通信电缆捆扎整齐，以避免被绊到。
- 切勿在雷雨天气使用设备。
- 如长时间不使用设备，请关闭设备并拔下电源线插头。

个人操作安全

- 在设备运行时，请勿触碰喷头、平台等位置。
- 在打印完成时，请勿触碰喷头。
- 在操作设备时，请勿穿戴围巾、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。
- 有电击危险警示标志的地方不要触碰，避免触电以及灼烧。千万不要尝试去测量其电压值。
- 有热表面危险警示标志的地方不要触碰，以免烫伤。
- 皮肤一旦接触熔化的材料，应立即用冷水冲洗。
- 眼部接触立即用大量清水冲洗眼部至少 15 分钟。如果症状持续，请即刻就医。
- 处理液体材料时，不建议佩戴隐形眼镜。如果在佩戴隐形眼镜的情况下材料溅入眼部，应立即用冷水冲洗眼部。确保在冲洗过程中将隐形眼镜从眼睛中取出。
- 常规操作下，材料不会以吸入方式进入体内。应始终在通风良好的区域使用材料并避免吸入烟雾。将吸入烟雾者 转移到可呼吸新鲜空气的位置。根据需要，施以人工呼吸或心肺复苏 (CPR)。如出现呼吸困难，应进行供氧。并立即就医。
- 摄入的发生率极低。一旦误食，请大量饮水并立即就医。不可催吐。

材料处理和安全

- 成品部件可按照与标准家用蜡质产品相同的方式处理或处置。该材料不得用于医疗移植、食品或饮品处理等违反材料应用意图的情形。
- 收到材料时，检查纸板箱外观是否存在损坏和泄漏迹象。如观察到泄露现象，切勿开箱并拨打 FlashForge 技术支持热线。



- 每次使用前均应检查材料的“重检日期”。如果材料盒已达到重检日期，则 FlashForge 认证合作伙伴或 FlashForge 技术支持可帮助解决需要重新认证的材料相关问题。

	WaxJet® 400/410	
材料（结构/支撑）	FFWJ1100（结构）	FFMS3100（支撑）
保质期	5年	5年
环境	阴凉干燥区域，通风良好	
温度范围	16℃至27℃	
最高储存温度	35℃	

- FFWJ1100 结构材料与 FFMS3100 支撑材料应存储于距离打印机较近且易于取放的储藏柜中。推荐使用储藏柜，以防止部件和材料长期暴露于外界 UV 光源，如日光、顶部照明或其他 UV 光源。材料存储温度不得超过指定最大值 35°C (95°F)。FFWJ1100 结构材料应存储在远离过氧化氢、溴或铬酸等强氧化剂的位置。
- 请勿倾斜放置装有剩余材料的材料盒，这点至关重要。否则材料将渗入排气孔，造成堵塞。这将导致材料盒损坏，妨碍后续的打印工作。将装有剩余材料的材料盒垂直放置材料盒底座中存放，并拧紧瓶盖。
- 对支撑材料尚无监管要求，可作为普通办公废料来处置。请联系当地的废料回收服务商，获得废料处置要求。（当地环境监管机构可提供有资质的供应商名单。）应为废料回收服务商提供一份有关材料的 GHS/SDS（全球统一标准/安全数据表）。有关结构和支撑材料的 SDS 信息，请联系当地设备经销商。
- FlashForge 对于部件材料的正确处置没有任何责任或义务。正确处置部件材料的责任由用户独立承担。
- 有关异丙醇 (IPA) 废液的处置方法，请参阅由制造商提供的安全数据表 (SDS)。

设备放置要求

- WaxJet® 400/410 系列打印机仅限室内使用。
- 设备需要放置于干燥通风的环境中。在机器与后墙之间至少留有60cm的距离，在机器两边至少留有100cm的空间（机器维护空间），在打印机前方至少留有120cm，以便打开材料舱。空间必须≥长x宽=3.3m x 2.5m。
- 每台设备单独从总空开引入，并每台机器带40A的空开和带3孔25A的插座 ，建议布线采样6平方电源线。
- 打印机都需要与主电源保护接地（地面）的连接。这为用户提供了一定级别的保护（基本绝缘）。
- 使用打印机进行打印之前，必须先将打印数据文件保存或导出为工业标准 .stl 或 .slc 文件格式，并通过网络进行提交。WaxJet 客户端软件可安装在所选用户工作站中，从而方便用户选择、预览和提交打印作业，以及管理打印队列。
- 需为 WaxJet® 400/410 系列打印系统配备以太网连接，以将工作站中的打印作业传输至打印机。
- 已设置并启用安装的 TCP / IP 网络。必须在接货地点为即将安装的每台打印机安装、测试并运行 RJ45 以太网网络连接。打印机可使用 DHCP 或分配的静态 IP 地址。DHCP 服务器可自动编写 IP 地址；或者，网络管理员可为即将连入网络的每台打印机分配永久 IP 地址。
- 系统操作温度应介于 18°C 到 24°C （59°F 到 86°F）范围之间，最高温度不得超过 28°C (82°F)。相对湿度范围应为 30% 到70%（非冷凝）。
- 打印机运行环境的设施空调系统应具备 2.0 kW的散热能力，或者能够达到温度要求。请确保任何空调出风口不会直接面向 3D 打印机系统。建议把机器放置在每小时有4次空气更替循环的房间里。
- 系统存储温度应介于 0°C 到 35°C （32°F 到 95°F）范围之间，相对湿度范围应为 20% 到 90%（非冷凝）。
- 3D 打印机系统配备内置照明的建模室，以及带有显示装置的背光操作控制面板。操作和维修系统时需要为常规区域提供照明。因此对室内照明而言，荧光灯或 LED 是最佳的系统照明选择。 请勿将打印机放置在可受到阳光照射的窗户旁边。
- 海拔不应超过 2000 米（6561.68 英尺）。

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。

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。市场上耗材鱼龙混杂，质量良莠不齐。质量低劣或不兼容的耗材很容易造成喷头堵塞及喷头损坏。

法律禁止项目

- 请勿复制或打印法律禁止复制的任何项目。
- 根据当地法律，复制或打印以下项目一般属于违法行为：
  1、枪支
  2、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。
- 以上列表仅作参考，并不包括所有内容在内。对于其完整性及准确性，本公司概不承担负责。如果您有与复制或打印某些项目的合法性相关的问题，请咨询法律顾问。

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。

第一章 3D打印技术

3D打印机技术即将三维模型转化成实物的技术。能实现批量的3D打印技术被称为MJP(Multi Jet Printing)，即多喷嘴喷射打印技术，WaxJet® 400/410 型3D打印机的应用技术即MJP。其工作方式是通过高温喷嘴选择性喷射液体耗材，耗材降温后固化，通过耗材逐层叠加形成立体物品。

1.1 3D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。

1.1.1 获取模型

就目前的模型获取的方式而言，大体有以下3种模型获取方式：

① 3D建模：

您可以使用市场上的3D建模软件来自主设计3D模型，较为常见的3D建模软件有AutoCAD、SolidWorks、Pro-E、Sketchup、Rhino、UG等。这些建模方式适用于专业设计工程师，或者是对使用建模软件有一定基础的用户。Happy 3D、3D TADA是两款非专业建模软件适用于初学者使用。

② 3D扫描：

扫描物体是3D建模的一个替代方法。3D扫描仪通过把物品数字化，收集它的几何数据，然后保存为文件储存到电脑当中。在移动设备上安装相应的APP也可以实现3D扫描。

③ 网络下载：

目前获得3D模型最流行也最简便的方式就是从网站上下载，网站允许注册用户上传他们自己设计的3D模型。

例如：www. thingiverse.com

1.1.2 处理模型

用户通过特定的切片软件对3D模型进行处理。将模型文件翻译成3D打印机可以读取的 .wjs 文件。WaxJetPrint 是闪铸科技针对 WaxJet 系列的产品自主研发的切片软件。WaxJetPrint 通过把3D模型分割成许多层并以 .wjs 格式输出切片文件，文件格式可以被 WaxJet® 400/410 读取。文件可以通过网线、U盘方式传输到 WaxJet® 400/410 中。

1.1.3 打印模型

等待设备预热完成后，将切片处理的模型导入打印机，设备就会开始逐层排列耗材以进行3D模型的实体转化。

1.2 3D打印基本流程

打印流程

首次打印准备

设备安装 **开机 > 设备预热 > 安装耗材**

软件安装 **安装软件 > 启动软件**

日常打印

模型打印 **获取模型 > 载入模型 > 调整模型 > 设置打印参数 > 下发打印任务**

打印后处理 **取下模型 > 去除支撑**

第二章 设备简介

2.1 设备介绍

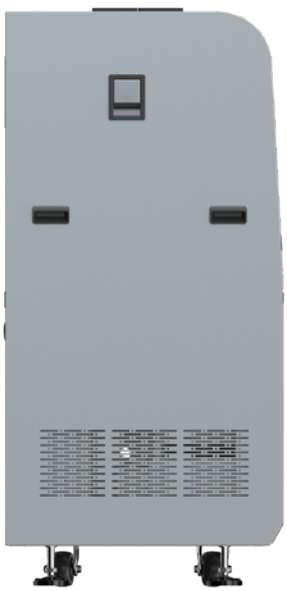
2.1.1 设备视图

正面图

侧面（右）

右侧图

背面图



左侧图

2.1.2 正面构造视图

2.1.4 背面构造视图

2.1.3 侧面构造视图

2.2 随机配件

一台装箱 WaxJet® 400/410 专业打印系统，包含以下配件和材料。

- 两个建模平台（装在配件盒中）
- 一台净化电源
- 两个结构材料盒和两个支撑材料盒
- 一盒丁腈橡胶手套
- 一根网线
- 一包无尘布
- 一套内六角扳手
- 一件U盘
- 一份售后服务卡
- 一把铲刀
- 一份说明书

2.3 功能特点

WaxJet® 400/410 系列3D打印机采用多嘴喷射技术，打印高精度蜡型，打印空间大，可以平面和垂直叠同时打印多个部位，每层厚度达到0.016mm。带有卓越的表面质量、极精细的细节以及卓越的精确度，能够实现快速工作流、大批量定制，并提高铸造室效率和生产率。可以直接融蜡铸造，提高铸造效率。

2.4 应用领域

适用于精密制造、珠宝首饰、钟表、航空等精密熔模铸造领域。

2.5 术语说明

材料密度	耗材在特定的体积状态下，单位体积的质量。
打印工艺	打印机打印的三维实体模型包含两种材料（支撑材料和结构材料）。支撑材料属于蜡基材料，起到与打印平台粘贴的作用，同时也用于制作模型所需的支撑物。结构材料也是一种蜡质材料。建模完成后，模型通过支撑材料粘贴于打印平台上。
打印平台	用于构建模型的可拆卸平台。利用支撑材料粘贴结构与打印平台，打印完成后即从打印机中清除。
分辨率	图像的精密度，WaxJet® 400/410 使用DPI的单位来描述。
废料	在建模过程中产生的未固化支撑和/或结构材料。在处理任何废料时，应始终佩戴丁腈手套、实验服和防护眼镜。
后处理	用于清除模型表面支撑材料的最终流程，在表面抛光和涂饰前，清洁部件生成光洁成品。
结构材料	用于模型的蜡质材料。在处理任何材料时，应始终穿戴丁腈手套、实验服和防护眼镜。耗材通过保温墨管按需提供给打印头的过程。
墨站	用于清洁打印头，通过冲洗（使用废料仓承接）与擦拭来清除打印头上所有的残留材料。
熔点	在一定压力下，耗材的固态和液态呈平衡时的温度。
软化点	物质软化的温度，主要指的是无定形聚合物开始变软时的温度。
熔模铸造	使用可熔性一次模和一次型使铸件成形的方法。是一种净形生产金属零件的先进工艺。
日志	日志文件为压缩文件，包含服务所使用到的日志，此类服务将用于解决3D打印机系统可能产生的潜在问题。
收缩率	用于调整构建过程中的预期收缩，使制作的模型尺寸能更接近于实际的尺寸。
WaxJetPrint	客户端软件，用于创建模型并向打印机发送数据。
微压电打印头	工业级喷墨打印头的一种，是给压电晶体加一个脉冲电压，结构中存储液体装置的体积发生变化，从而让流体从固定的小孔中喷出的一种装置。
X轴	建模平台上部件由左至右的指向。
Y轴	建模平台上部件由前至后的指向。
Z轴	建模平台上部件高度的指向。
支撑材料	一种蜡基材料，起到与打印平台粘贴的作用，支撑朝下放置的表面和部件中的镂空体积。
用户界面 (UI)	用户界面位于打印机左侧。利用UI可控制或检查多种功能，如打印作业状态、打印机材料、打印机关机等，还可以检查打印机中的某些设置。
.stl文件	由三维实体计算机辅助设计 (CAD) 软件创建的文件。此类文件用于生产部件。

2.6 设备参数

打印机型号	**WaxJet® 400**	**WaxJet® 410**
打印尺寸	289*218*150mm	289*218*150mm
技术基础	多喷嘴喷射技术 (MJP)	多喷嘴喷射技术 (MJP)
打印头	压电打印头	压电打印头
屏幕	10.1英寸彩色 LVDS 触摸屏	10.1英寸彩色 LVDS 触摸屏
分辨率	1200x1200x1600 DPI	1200x1200x1600 DPI
层厚	0.016mm	0.016mm
打印精度	±0.04mm / 20mm	±0.04mm / 20mm
输入文件格式	输入：STL/SLC 输出：WJS文件	输入：STL/SLC 输出：WJS文件
结构材料	FFWJ1100 净重：3.0 kg/瓶（每台设备两个料仓，自动换料）	FFWJ1100 净重：1.17kg/瓶（每台设备两个料仓，自动换料）
支撑材料	FFMS3100 净重：3.6 kg/瓶（每台设备两个料仓，自动换料）	FFMS3100 净重：1.3kg/瓶（每台设备两个料仓，自动换料）
电源	AC220-240V，50Hz，4KW	AC220-240V，50Hz，4KW
设备尺寸（拆箱）	1352*775*1600mm	1352*775*1600mm
设备尺寸（装箱）	1530*900*1837mm	1530*900*1837mm
设备重量	装箱 630kg；拆箱 480kg	装箱 630kg；拆箱 480kg
邮件通知	适用	适用
硬盘容量	500G	500G
连接方式	Network 10/100/1000 ethernet接口 / USB接口	Network 10/100/1000 ethernet接口 / USB接口
客户操作系统	Windows 7 / Windows 10 (64bit)	Windows 7 / Windows 10 (64bit)

特性	条件	**FFWJ1100**	**FFMS3100**
成分		100% 石蜡	蜡型支撑材料
颜色		紫色	白色
密度		0.76 g/cm3	0.85 g/cm3
熔点		68°C	55°C
软化点		63 °C	N/A
体积收缩率	SH/T 0588-1994	1.10%	N/A
线性收缩率		0.70%	N/A
针入度	GB/T 4985-2010	9	N/A
灰份	GB/T 14235.3-1993	<0.01%	N/A
描述		高精度铸造蜡	免接触可溶解型支撑蜡

第三章 打印机设置

3.1 设备开机

设备开机步骤

1. 准备好稳压电源。

2. 插头插入25A插座。

3. 向上打开稳压电源背部的电源开关，等待电压表显示220V。

4. 按顺序打开设备电源开关，开机。

5. 打印机接通电源后，UI需要约一分钟时间显示，一分钟左右 Flashforge 图标出现，随即显示状态屏幕。

6. 如果打印机已经关机，并在低温状态下启动，则应等待 4 小时，使打印机预热，然后再开始打印作业。预热期间，用户界面中“打印机状态”将显示“预热中”。

⚠ **注意：预热期间可以上传打印模型，但只有在打印机预热并准备完毕后才能开始打印。**

3.2 清理废墨盆

每次打印之前请清理废墨盆，按照以下步骤进行：

1. 请佩戴防护丁腈手套，然后打开废料仓。
2. 取出废料盆，并根据当地规定进行丢弃处置。
3. 检查废墨盆中的所有剩余废料。如有必要，用无绒布和异丙醇擦掉所有污渍。
4. 放回废墨盆，然后关闭废墨舱。

3.3 打印耗材的安装

⚠ **注意：执行这些步骤之前，检验当前供料仓中材料的类型非常重要。**

⚠ **注意：无法从冷却的打印机中安装材料盒。打印机必须经过预热才能打开舱并安装材料盒。**

如果材料盒为空且需要更换，或需要将未装满的材料盒更换为已装满的材料盒，请执行以下程序。

1. 获得新墨瓶，确保其中的材料与当前供料仓中安装的材料一致。

⚠ **注意：供料仓是一种推弹碰门锁机制。推动以打开供料仓，再推动将供料仓锁上。**

2. 向内推动仓门打开供料仓。
3. 将供料仓拉开。

⚠ **注意：安装支撑材料盒的步骤与安装部件材料盒的步骤相同。必须确保听见墨瓶卡入位置的声音，墨瓶中盛装有材料且瓶盖通风良好；否则墨瓶中的墨水无法正常从墨瓶流入供墨阀体中。**

4. 向上拉起释放扳手，同时手提墨瓶把手，将墨瓶插入墨槽中。
5. 向下插入墨瓶，直到听到卡入到位的声音时，松开释放扳手。

6. 逆时针旋转1/2瓶盖，保证每个墨瓶通风。

7. 向内推动仓门关闭供料仓。

8. 检查UI上材料选项卡中的材料水平，以确保材料盒已正确放入供料仓中并做好打印准备。

⚠ **注意：如果 UI 持续报告墨瓶为空，但实际上墨瓶中有材料且已正确装入供料仓，请联系认证经销商合作伙伴或 FlashForge 客户支持。建议优先联系认证经销商合作伙伴。**

3.4 打印耗材的移除

⚠ **注意：执行这些步骤之前，检验当前供料仓中材料的类型非常重要。**

⚠ **注意：无法从冷却的打印机中安装材料盒。打印机必须经过预热才能打开舱并安装材料盒。**

如果材料盒为空且需要更换，或需要将未装满的材料盒更换为已装满的材料盒，请执行以下程序。

⚠ **注意：供料仓是一种推弹碰门锁机制。推动以打开供料仓，再推动将供料仓锁上。**

1. 向内推动仓门打开供料仓。
2. 将供料仓拉开。

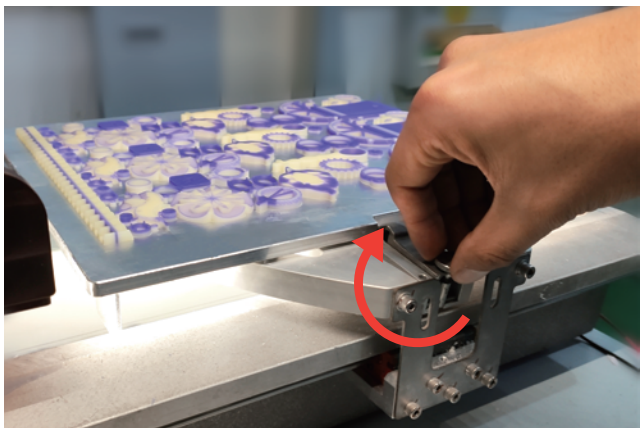
3. 将瓶盖顺时针转1/2以拧紧。

4. 向上拉起释放扳手，同时手提墨瓶把手，将墨瓶从墨槽中拉出。
5. 根据当地法律法规处置空盒。
6. 请佩戴丁腈手套并穿好 护臂或实验服以保护胳膊，使用一次性纸巾来擦去容器密封装配件上的所有材料，如有必要，可使用蘸有异丙醇的纸巾来擦去残留材料。

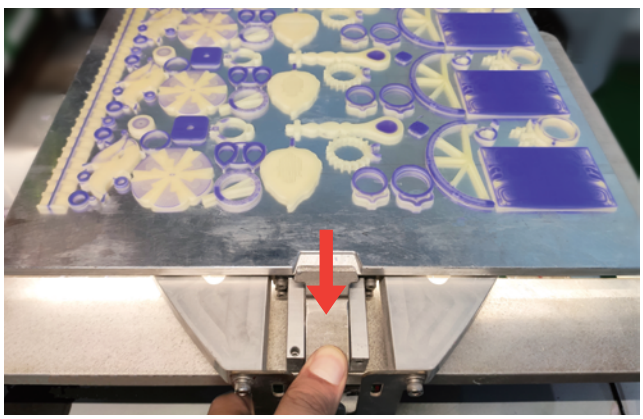
⚠ **注意：与材料接触之前，必须佩戴丁腈手套并穿好护臂或实验服来保护胳膊，避免让材料沾到皮肤，这点非常重要。皮肤接触到材料可能会产生过敏反应。**

3.5 打印平台的移除与安装

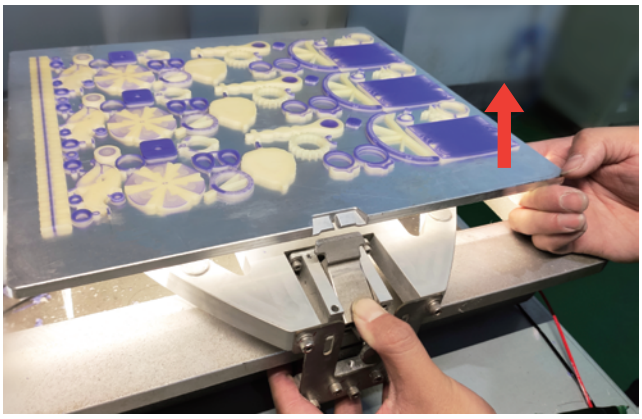
1. 确保打印机已打开，且打印机状态为待机模式。
2. 打开建造仓门。
3. 顺时针旋转压紧螺母，并松开压紧螺母。



4. 向下按压平台压板，直到压板脱离平台。



5. 抬起平台以将其移除。



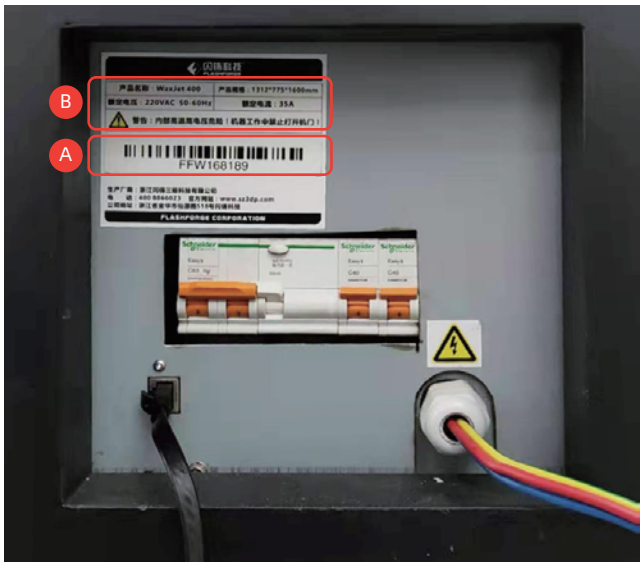
6. 安装清洁打印平台。
7. 扣上压紧螺母，逆时针旋转压紧螺母，直到感觉压板压紧平台。

注意：始终确保安装的打印平台在两面均洁净无杂质残留，以避免出现任何打印问题。此外，确认打印平台不会因任何物体滴落或跌落而造成损坏。平台上凸出的金属可能会触碰到打印头并造成严重损坏。

3.6 识别打印机

使用以下标记识别您的打印机：
A. 序列号标记 - 请求服务时请参阅此号码。
B. 型号标记 - 此标记上提供打印机的型号、规格、电源要求、电压警告以及 FlashForge 客服联系方式。

注意：这两个标记都位于打印机背面靠近底部的位置，一般放在打印机电源连接的附近。在向客户支持确认您的打印机时，请使用这些标记上的信息。



3.7 网络连接

经过处理的作业文件可通过设备的以太网网络从 WaxJetPrint 传输到 WaxJet® 400/410 系列打印机。RJ45 网络连接器位于打印机背面的电源连接的附近。

注意： 附件包中提供的一根 2 米的网络连接线缆。如果提供的线缆不够长，无法从打印机连接到工厂的网络连接点，请自行采购适当的线缆。

注意：当发现打印机和电脑无法正常连接时，首先检查打印机是否正常接入工厂的网络连接点，其次再检查打印机和电脑是否在同一个局域网内。

配置网络

本部分用于在您需要更改网络设置时提供说明。在网络页面内，可以配置打印机的静态IP地址。
静态IP地址—必须为打印机输入IP地址、子网掩码和网关地址。网络地址配置操作如下：

1. 打开打印机的电源。
2. 点击触摸屏中的 设置- 网络，进入网络配置页面。
4. 配置IP地址、子网掩码和网关地址，并点击【应用】按钮以完成配置。

第四章 用户界面

用户界面包含顶部信息栏、底部导航栏和中间内容区域共三大板块。

顶部信息栏包含闪铸科技公司信息，打印机型号，时间和日期显示。底部导航里包含设备运行状态，材料信息，打印队列，工具和设置。中间内容区域会根据导航的切换显示当前对应导航里包含的内容。

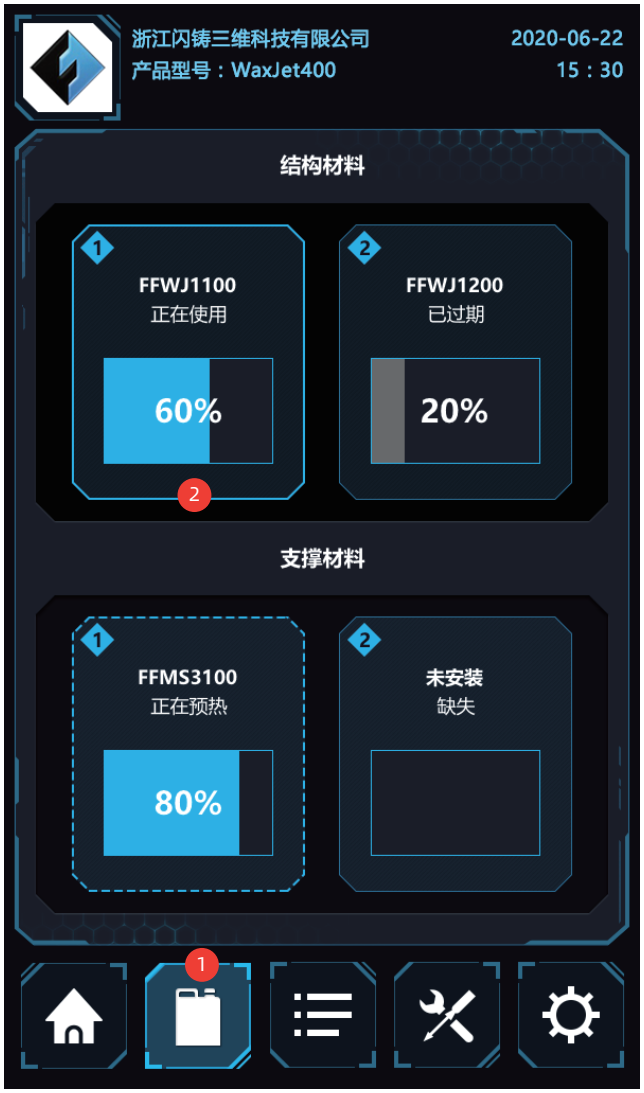
4.1 设备运行状态界面

1. 点击此处进入设备运行状态界面。
2. 打印状态：此区域可在任意给定时间确定打印机所处状态。有关打印机各个状态的信息，请参阅下文：

保温：打印机已准备就绪，可接受打印任务；
装载打印平台：打印机已准备就绪，等待安装干净的打印平台；
正在打印：打印机正在打印；
忙：打印机正在执行维护；
睡眠模式：打印机处于低功率状态；
暂停：当前打印已暂停，可通过选择 按钮恢复打印；
完成：当前打印已完成，可从打印机中移除部件；
移除打印平台：打印已完成；访问打印平台取下部件；
正在中断/已中断：当前打印正在中断/已中断；
正在预热：打印机正预热至“准备就绪”状态；
材料盒正在预热：打印机材料盒正预热至“准备就绪”状态在两个材料盒同时预热的情况下，仍可以使用 UI 启动作业，但只有当材料盒已熔化、使用准备就绪时，才会开始打印；
等待建模室冷却：打印机在继续打印前等待建模室冷却；
正在关机：打印机正在关机，并提醒用户适时安全切断打印机电源；
恢复：打印机出现故障并正在尝试恢复；
诊断：打印机处于诊断模式，如果需要请联系售后服务；
错误：打印机处于错误状态下，需要拨打服务电话；
需要材料：打印机需要更多的材料才能打印。

3. 剩余时间。
4. 暂停/继续打印：点击可暂停/继续打印当前打印任务。
5. 停止打印。
6. 开始时间/完成时间：显示打印作业的打印时间信息。
7. 打印模式/层：此区域显示当前层和打印模式信息。
8. 剩余材料信息。
9. 访问平台：按下此按钮可访问打印平台。

4.2 材料信息界面



1. 点击此处进入材料信息界面
2. 材料信息：单击四个材料状态屏幕中的任意一个，可看到具体材料盒的相关信息框。此处列出的信息包括：

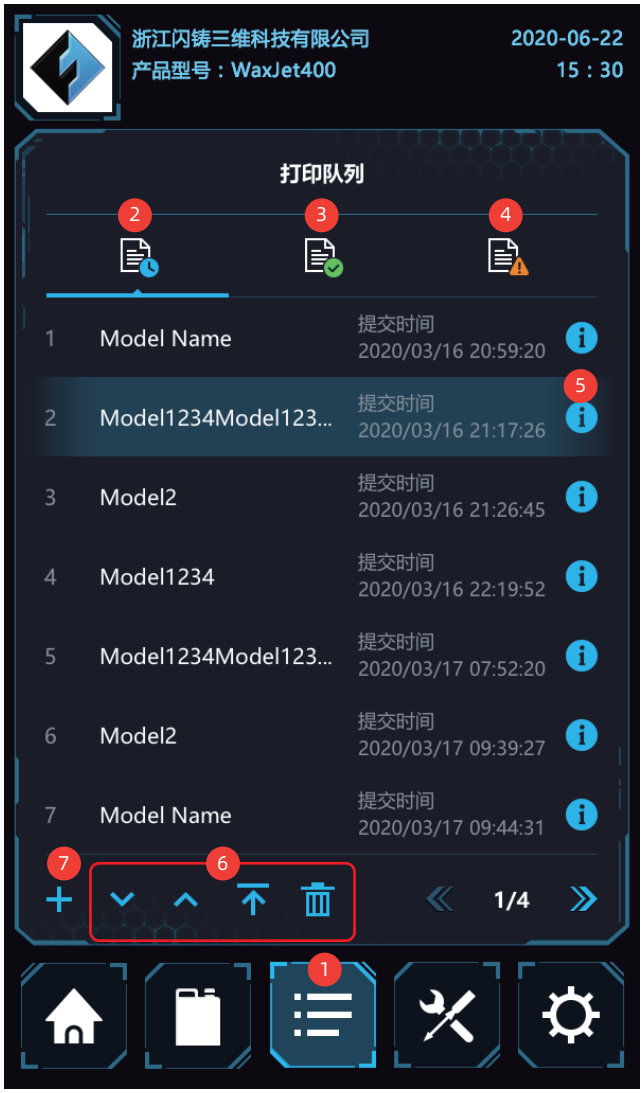
材料：盒中材料类型；
状态：材料的当前信息；
使用中：当前用于打印的材料盒；
已安装：材料盒可用，但当前未使用；
不可使用：材料盒故障，不可使用，请联系售后服务获得帮助；
缺少：未安装材料盒；
空：材料盒为空；
已过期：材料盒已过期，需要更换；
正在预热：材料盒正预热至“准备就绪”状态。

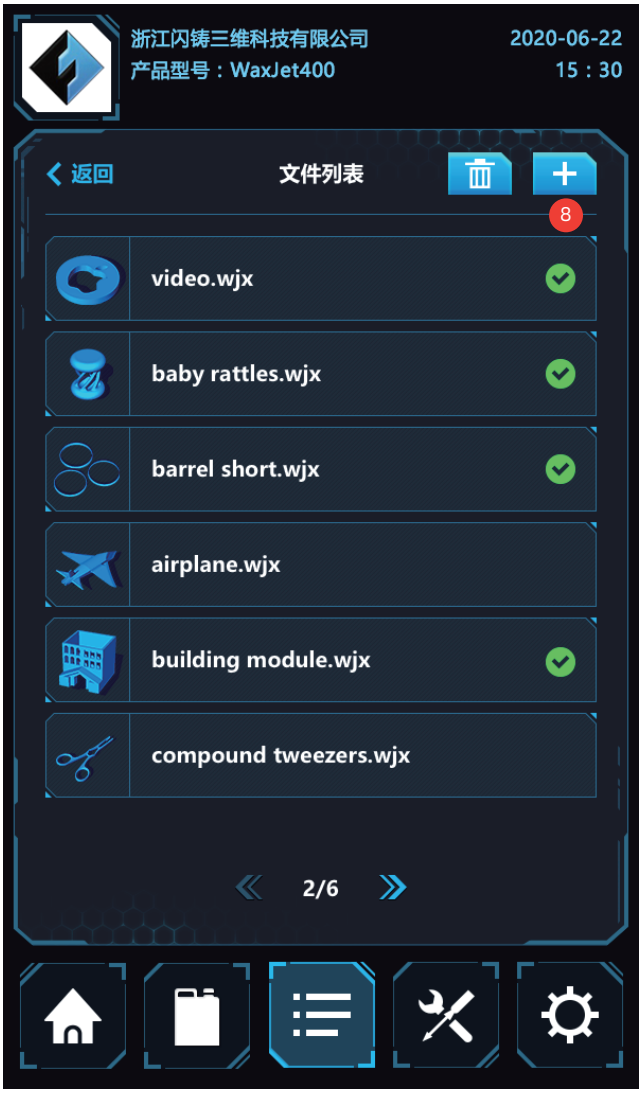
材料：盒中材料类型；
颜色/类型：材料的说明，如颜色和特性等；
过期日期：材料过期日期；

⚠ **注意：当插入过期的材料盒时，打印机会拒绝。如果材料盒过期时有打印作业正在进行，打印机会继续完成该作业，之后指明材料盒已不再可用。**

批号：材料的生产批次日期；
剩余比例：材料盒中剩余材料的百分比；
剩余重量：材料盒中材料的重量；
启动：将材料盒设置为当前用于打印的材料盒。

4.3 打印队列界面





（图4.3.1）

1. 点击此处进入打印队列界面
2. 等待打印的任务列表
3. 已打印完成的任务列表
4. 打印失败的任务列表
5. 点击进入详情页
6. 点击可调整模型顺序，删除模型
7. 从U盘等地方添加新的打印任务，如（图4.3.1）所示
8. 复制所选文件到打印队列


浙江闪铸三维科技有限公司
产品型号：WaxJet400
2020-06-22
15：30
模型详情
模型名称
video.wjx
打印时间
23:45
结构材料
1080.0 g
支撑材料
52.0 g
打印机模式
XHD
层数
1230
体积
30 x 30 x 8 mm

（图4.3.2）

模型详情页

4.4 工具界面

1. 点击此处进入工具界面
工具页面包含：打印机信息；客户使用情况；诊断；操作人员维护；保存日志；电源选项；U盘更新。点击每个选项进入相应的详情页面。

打印机信息：显示打印机和版本信息等。

客户使用情况：显示客户的打印机使用情况。

诊断：可通过“诊断”按钮运行许多诊断程序。
诊断菜单：选择工具选项卡下的诊断按钮将显示诊断屏幕，用户可在此屏幕上执行运行和维护打印机的例行程序。
Z轴升降测试：选择次例行程序来检查运动机构是否正常。
打印头循环维护：此例行程序用于定期清洁打印头。
结构喷头循环维护：诊断测试程序。在售后服务代表提出请求时运行此测试。
支撑喷头循环维护：诊断测试程序。在售后服务代表提出请求时运行此测试。
检查测试点：诊断测试程序。在售后服务代表提出请求时运行此测试。
检查测试条：诊断测试程序。在售后服务代表提出请求时运行此测试。

操作人员维护：选择“操作人员维护”，随即显示维护调度程序。完成清洁后，确保单击维护项目并重置计数器，否则将显示维护已过期的消息。在执行任何例行维护程序之前，打印机必须处于准备就绪状态，且必须安装清洁的打印平台。

保存日志：提供访问打印机日志的服务。

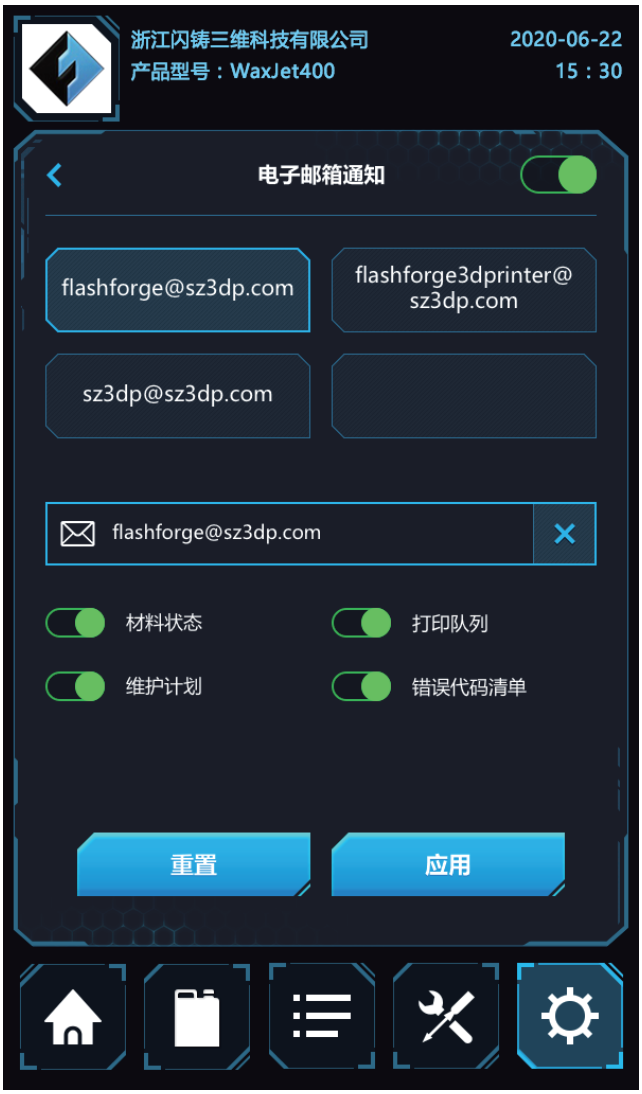
电源选项：选择“电源选项”按钮可关闭打印机和进入睡眠模式。如需关闭打印机，建议始终通过 UI 关闭打印机。

U盘更新：可使用 U 盘更新打印机固件。

4.5 设置界面

1. 点击此处进入设置页面
设置页面包含：网络；电子邮箱通知；语言。点击进入相应的详情页。

网络设置：网络设置页面



电子邮件通知：设置电子邮件通知以接收有关打印机事件的通知。最多允许添加 4 个电子邮件地址。

⚠ **注意：一些电子邮件客户端在电子邮件设置期间可能会阻止访问此应用程序。 如果您在设置电子邮件提醒时遇到问题，请确保您的电子邮件提供商未阻止访问。**

第五章 WaxJetPrint介绍

一、软件获取

您可以选择以下2种方式获取 WaxJetPrint 软件安装包：

方式1： 将工具包中的U盘插入电脑，找到最新的软件安装包。

方式2： 打开浏览器输入 www.sz3dp.com 进入闪铸中文官网，进入首页后将鼠标悬停在技术支持选项上并在下拉菜单中点击下载中心，选择您需要的软件版本点击Download进行下载。

二、软件安装启动

下载后，开启安装程序并按照提示完成安装。安装完成后，启动 WaxJetPrint 程序开始使用。

三、打印机初始化配置

执行打印机初始化配置前，请先确保打印机和电脑正常连接。

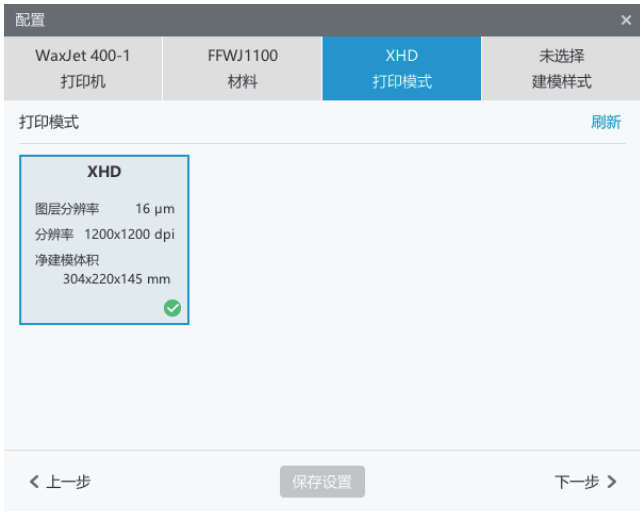
⚠ **注意：当发现打印机和电脑无法正常连接时，首先检查打印机是否正常接入工厂的网络连接点，其次再检查打印机和电脑是否在同一个局域网内。配置网络，请参阅第 68 页的“网络连接”。**

1. 打开 WaxJetPrint 软件，点击配置；

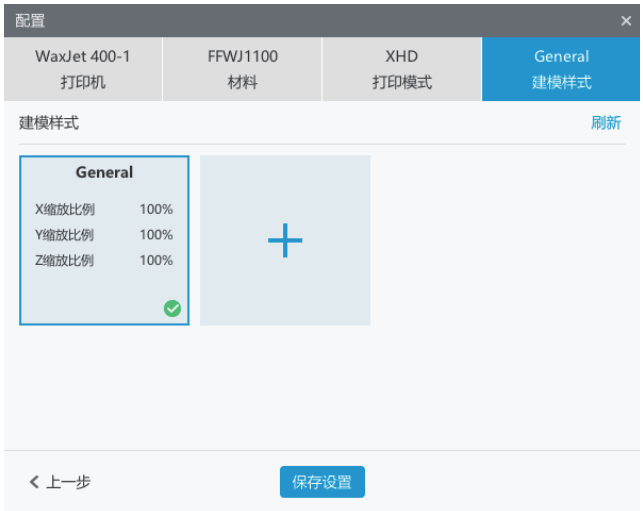
2. 在配置弹窗中点击扫描，扫描完成后双击需要连接的打印机；

3. 选择材料；

4. 选择打印模式；



5. 选择建模样式，点击保存设置。



第六章 打印步骤

本章为您提供如何将3D模型转化成为实体的详细指导。打印之前，建议您回顾第三章提到的设备开机，设备热机和装载耗材，检查WaxJetPrint软件的功能和性能。

1. 设备开机预热。

2. 放入墨瓶。

3. 设备完成预热后自动进入保温。

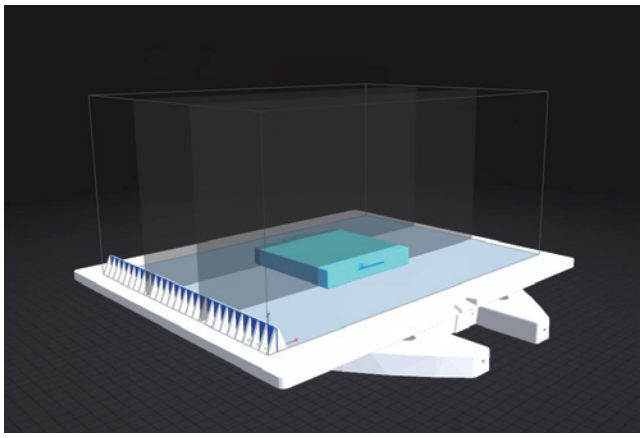
4. 使用桌面快捷方式打开 WaxJetPrint 软件。

5. 连接打印机。

⚠ **注意：如果是首次连接打印机，请参见第 80 页打印机初始化配置。点击配置，选择打印机、材料、打印模式以及建模样式，并保存设置。**

6. 模型排版。

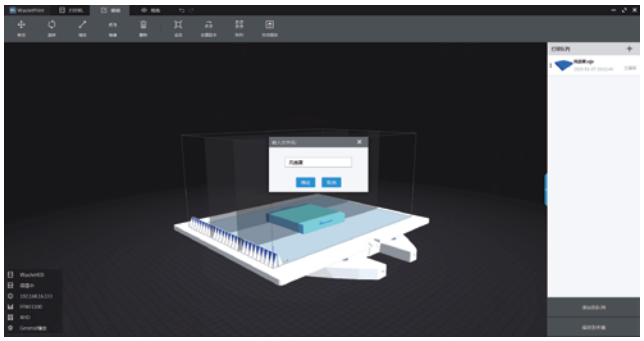
⚠ **注意：在排版过程中要注意每一件版之间的距离不能少于0.5mm。如果需要层叠工作，上下版之间的距离不能少于0.5-1mm。注意每一件版是否都在水平位，如果有版不在水平位会造成浪费支持蜡或者增加工作时间。**



7. 发送文件到打印机。

A. 通过网络发送到打印机。

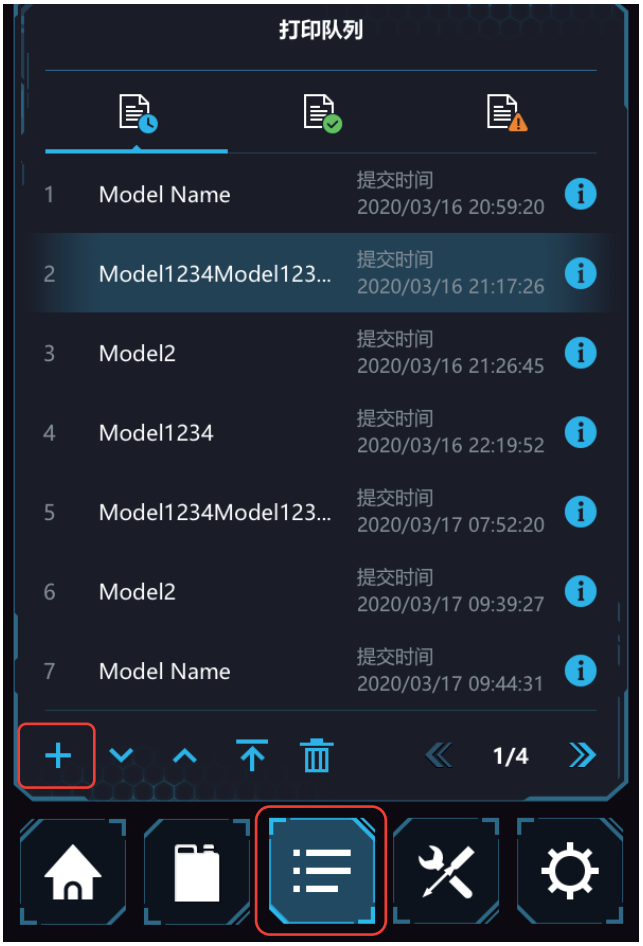
1）点击【添加到队列】；
2）输入文件名，点击【确定】；
3）自动上传到打印机中，传输完成后，文件在右侧打印队列中可见。



B. 通过U盘拷贝到打印机。

1）点击【保存到本地】；
2）修改文件名并选择保存路径。

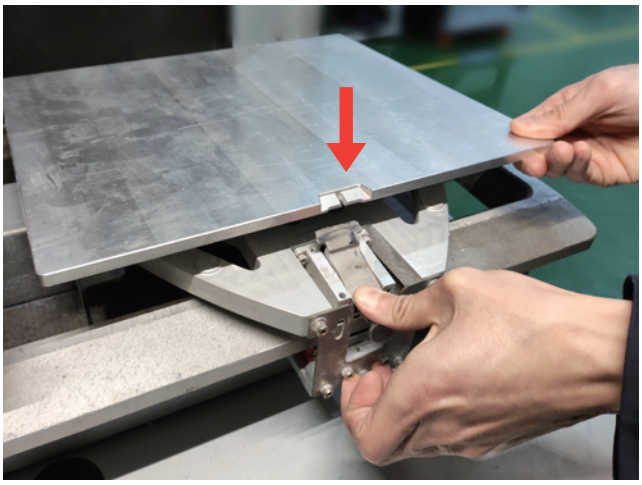
3）将保存好的文件拷贝到U盘。
4）在打印机上插入U盘，点击底部导航中的打印队列按钮进入打印队列页面，点击左下角的【添加】图标，进入U盘目录。

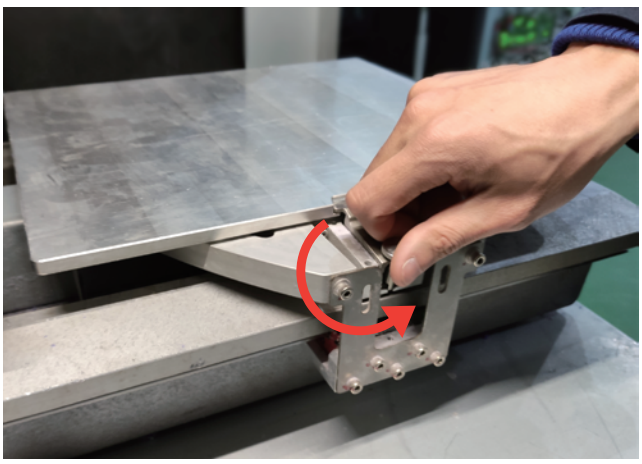


5）选择文件，点击右上角的【添加】图标即可拷贝文件到打印机。

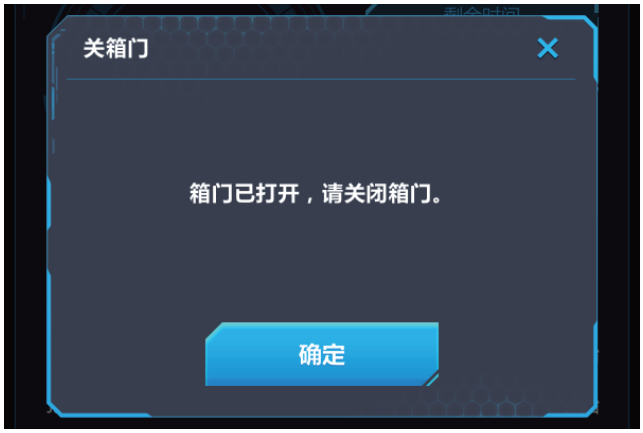
8. 执行打印，点击打印按钮后开始打印。

9. 安装平台：根据界面提示，放入铝板，逆时针拧紧压紧螺母。

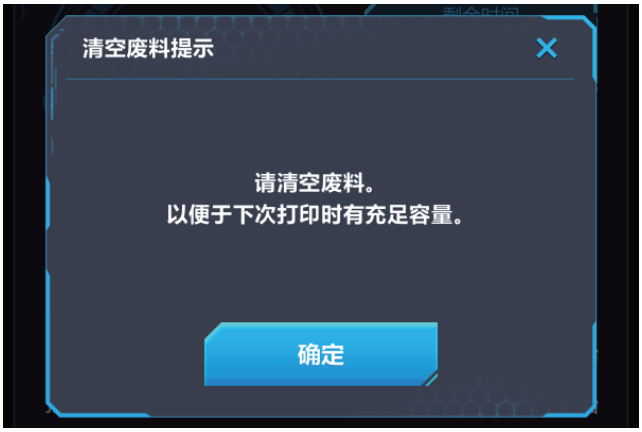


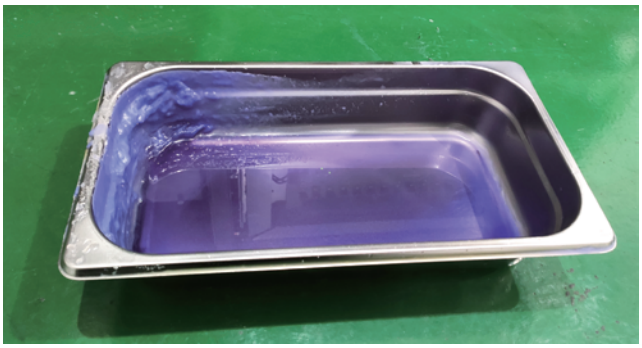


10. 关箱门，用手轻轻关闭打印机箱门。



11. 清理废料。打开废料仓，取出废料盒清理干净并放回。





第七章 后处理指南

7.1 支撑去除方法

以下操作流程旨在为客户处理 FFMS3100支撑材料提供常规指导。实际结果与以下过程可能存在一定偏差。在操作步骤前，请准备好下列物品。此外，确保执行过程所在室内通风良好，或上置通风罩。

- **磁力搅拌器**
- **烧杯**
- **网篮**
- **异丙醇**
- **PPG400**
- **无水乙醇**
- **防护镜**
- **防尘口罩**
- **橡胶手套**

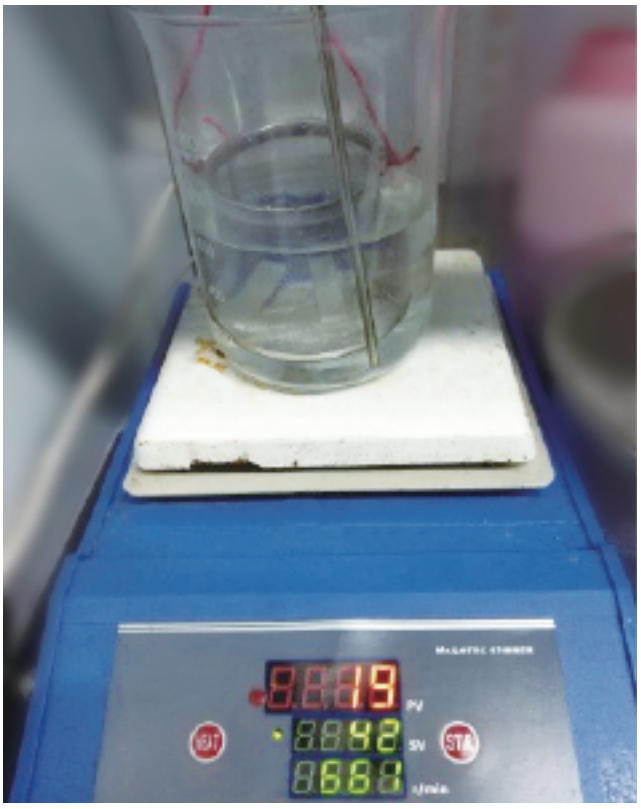
1. 将打印平台置于磁力搅拌器的加热平台上。待支撑材料软化时，逐个取下模型。

⚠ **注意：当打印平台上有许多并且细小的模型，取出时要从边角开始往中心预热，一边热一边小心取蜡模。**

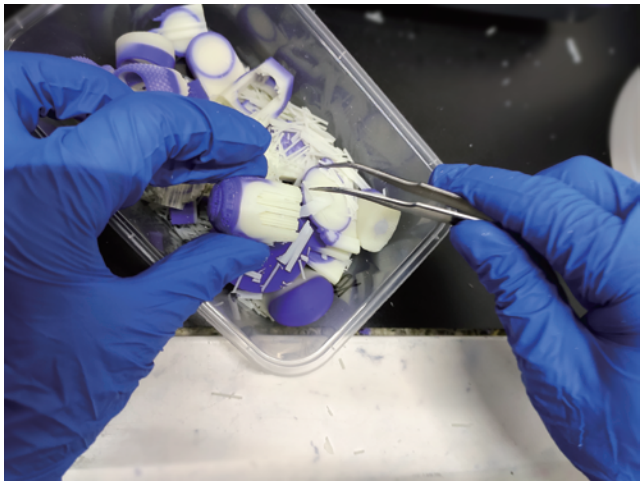
⚠ **注意：进入以下程序前，请佩戴防护镜、防尘口罩和橡胶手套。**

2. 预先配置两份洗蜡溶剂。
洗蜡溶剂一，用于第一次清洗90%支撑蜡。
（配方乙醇 二份，PPG400 一份，异丙醇 二份混合均有即可）
洗蜡溶剂二，用于第二次清洗支撑蜡，清洗孔洞等极小缝隙处残留支撑蜡。
（配方乙醇 二份，PPG400 一份，异丙醇 二份混合均有即可）
洗蜡溶剂三，用于清除残留的溶剂
（配方乙醇 三份，PPG400 一份，异丙醇 三份混合均有即可）

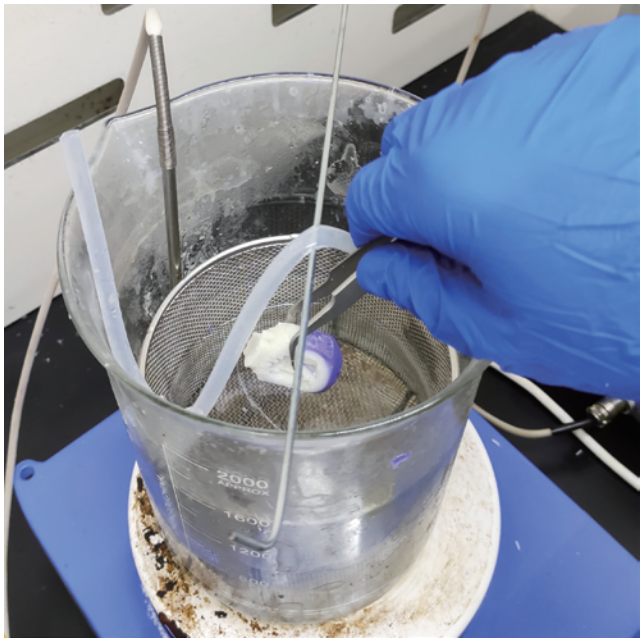
3. 将烧杯等容器放在磁力搅拌器上，加入洗蜡溶剂一，开启加热，温度40℃，控制超温不要高于43℃。



4. 剥离支撑材料
在使用溶剂溶解支撑蜡前，可以使用镊子剥离部分支撑材料，以缩短支撑去除时间。



5. 模型放入网篮内，注意不要放入过多模型，避免模型堆叠碰撞。



6. 将网篮放入烧杯内，并调整高度，不要碰到搅拌器转子，使模型完全浸没。

7. 开启搅拌，并逐渐提高转速（加强搅拌有利于清洗速度），但搅拌不应使模型晃动。

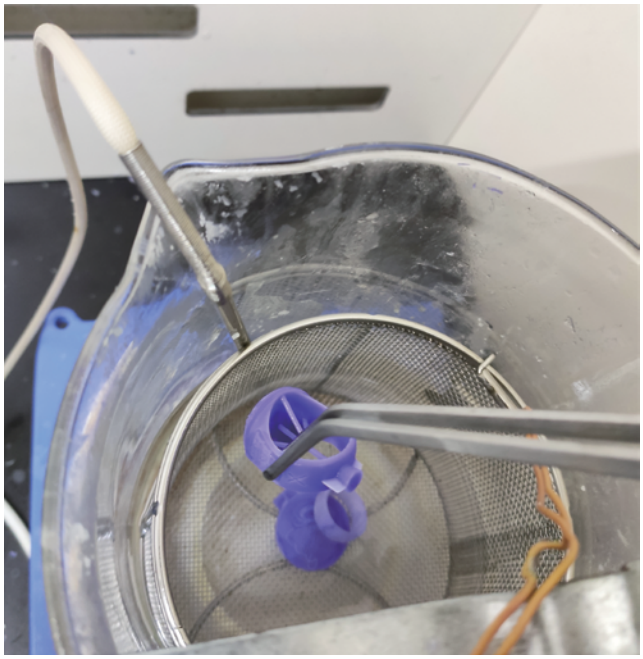
8. 每隔1分钟观察部件支撑材料的溶解程度。

注意： 随着洗蜡次数的增多，洗蜡溶剂最终会蜡浓度饱和，无法有效去除支撑蜡质材料。FlashForge建议每升洗蜡溶剂中溶解的支撑蜡不超过 100-120 克。

9. 当模型上的支撑蜡洗掉后，应及时拿出，不要长时间浸没在溶剂内。

10. 此时模型表面容易有一层洗蜡溶剂附着，应使用洗蜡溶剂二，再次按上面几步骤，清洗2-10min。

11. 从网蓝中取出模型，在洗蜡溶剂三中浸泡20秒钟取出。



注意：拾取模型可以用细铁丝勾取，也可使用前端包裹有胶管的镊子夹取。

12. 清洗好的模型，放置于纸巾等吸水物品上，晾干或吹干。

7.2 清理打印平台

每次加工完零件以后，最好将打印平台清理干净并将其重新插入打印机中。请按以下步骤清理平台。

在操作步骤前，请准备好下列物品：

· 磁力搅拌器　　· 无尘纸　　· 耐高温手套

1. 佩戴耐高温手套。
2. 使用磁力搅拌器预热打印平台。
3. 等待表面残留材料出现软化时，使用无尘纸擦除。
4. 在清理打印平台时，务必确保平台的两面和四周都进行清理。

注意：在打印机中安装和使用平台前，打印平台应保持清洁并保持室温状态。

第八章 维护

本章描述用户需要对 WaxJet® 400/410 系列定期执行的各种维护任务。

⚠ **注意：如需例行维护，打印机必须处于待机状态，且必须安装洁净的打印平台。**

维护时间表

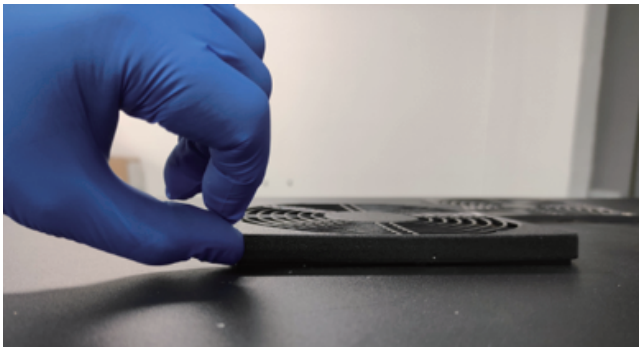
注意：维护任务必须定期执行，才能保证设备的良好运转和制成品的加工精度。

维护任务	根据需要	每日	每周	每月	每半年
清洁顶部风扇的过滤棉			√		
清洁初效过滤器			√		
更换初效过滤器					√
清洁废墨盆	√				
X轴导轨上油					√
Y轴导轨和电机丝杆上油					√
Z轴导轨和电机丝杆上油					√
清洁X轴底座		√			
内部粉尘清理		√			
接近传感器除尘处理		√			
清洁外表面			√		
清洁建造舱门		√			
清洁打印平台	√				
清洁用户界面				√	
清洁供料仓			√		
清洁喷车底板非喷头底板安装区域			√		
清洁Y梁底面			√		
辊筒吸粉管道除粉			√		
清洁墨站刮刀			√		
清洁整平辊及整平辊刮刀表面			√		

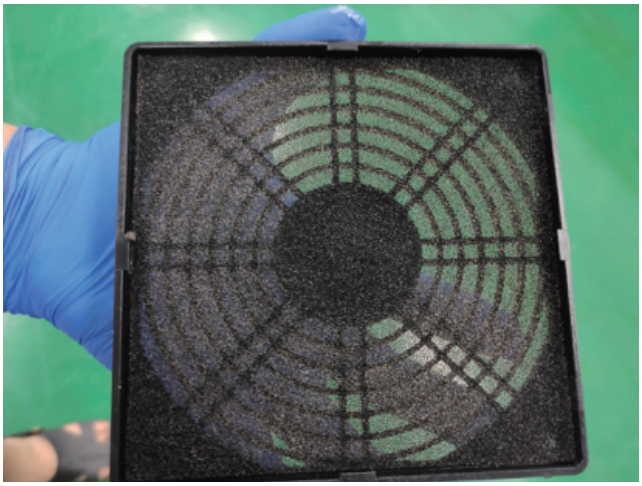
最佳性能的操作环境建议　工作温度范围：18-28°C (64-82°F)　最佳温度范围：18-24°C (64-75°F)　湿度范围：30%-70%

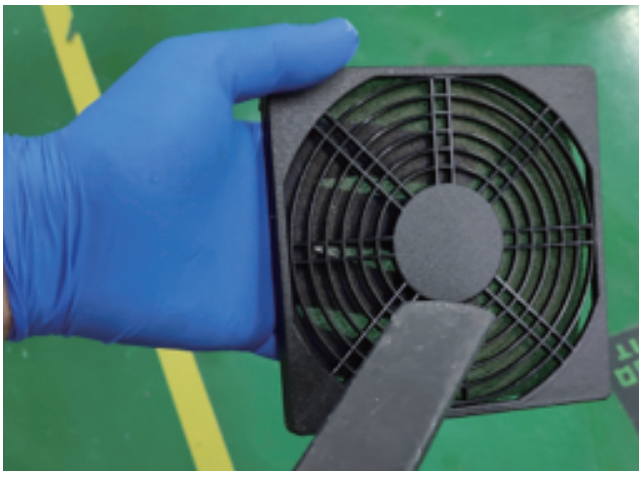
清洁顶部风扇的过滤棉

沿着风扇保护罩的一角把风扇保护罩打开。



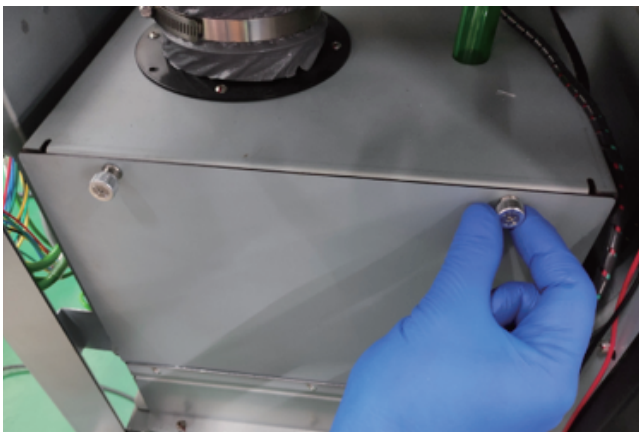
经过一段时间的使用，过滤棉上会残留很多粉尘，用吸尘器对着过滤网，把粉尘吸干净。





清洁初效过滤器

打开机器的左前门，松开2个手拧螺丝。



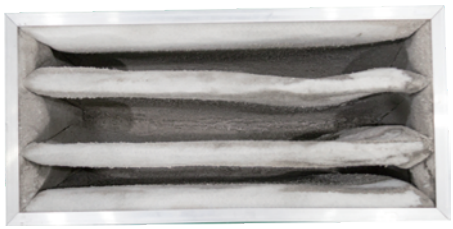
把初效过滤盖板取下，抽出里面的初效过滤网。

经过一段时间的使用，初效过滤网上会残留很多过滤网，用吸尘器对着过滤网，把过滤网吸干净。

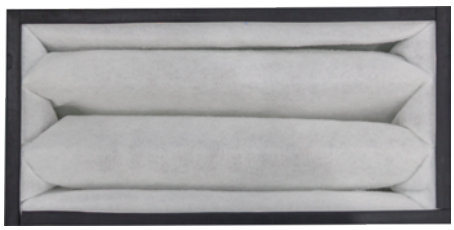
更换初效过滤器

初效过滤器用于清除建模区域中的微粒、异味和气体。
可在右侧的机器后方找到此过滤器。打开门，将初效过滤器上方的黑色盖板和初效过滤网移除。更换新的过滤器，然后将初效过滤网和黑色盖板安装回原位置。

⚠ **注意：这是客户的可替换部件。**
PTFE过滤器-P/N61000289001。



需更换的过滤器

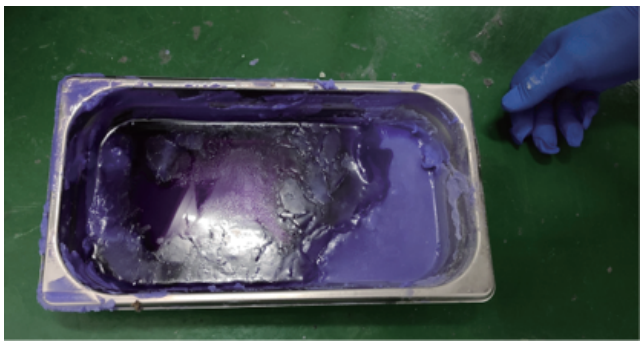


全新的过滤器

清洁废墨盆

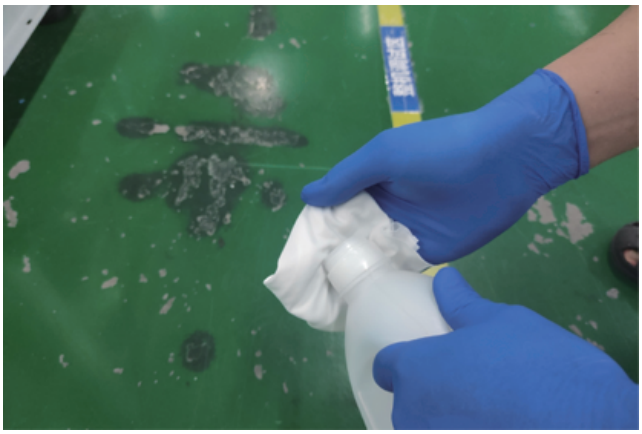
打开机器的左前门，抽出废墨盘。

打印产生的废墨储存在废墨盘里，清理废墨，然后将干净的废墨盘装回打印机中。

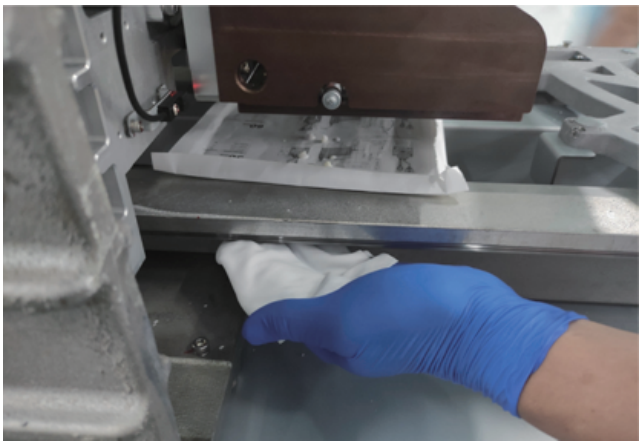


X轴导轨上油

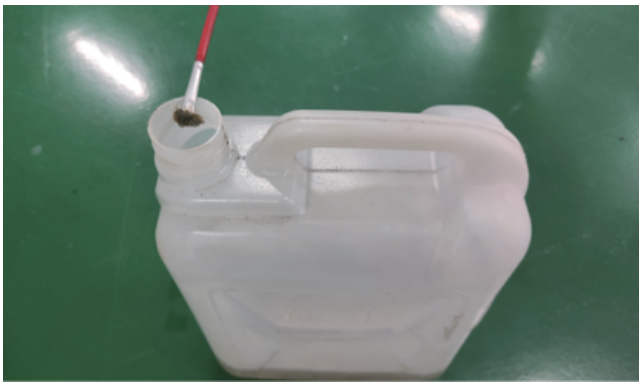
带上橡胶手套，用无尘布沾上少许酒精。

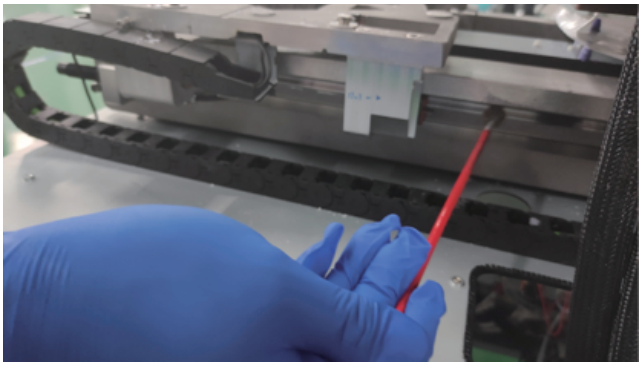


用无尘布把导轨表面清理干净。



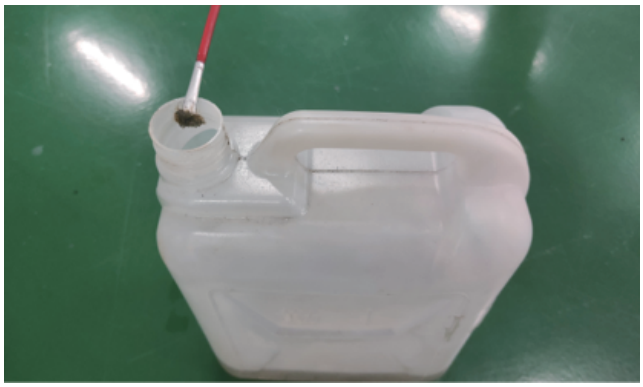
用毛刷沾上导轨油涂抹在X轴导轨上。

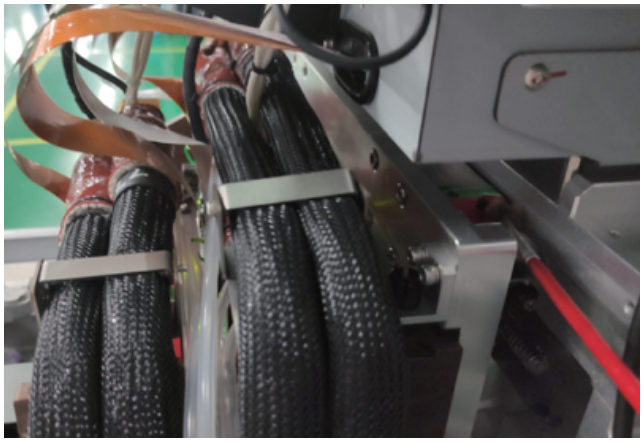




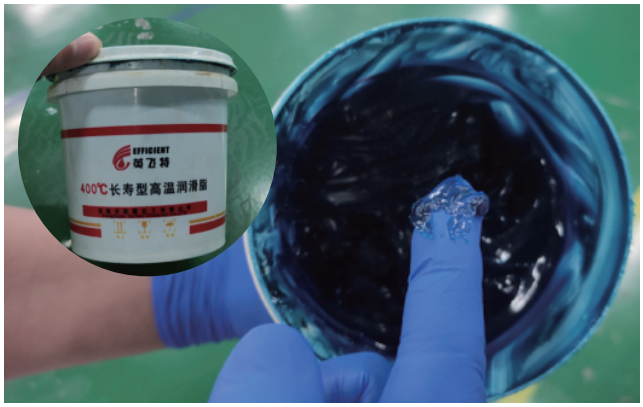
Y轴导轨和电机丝杆上油

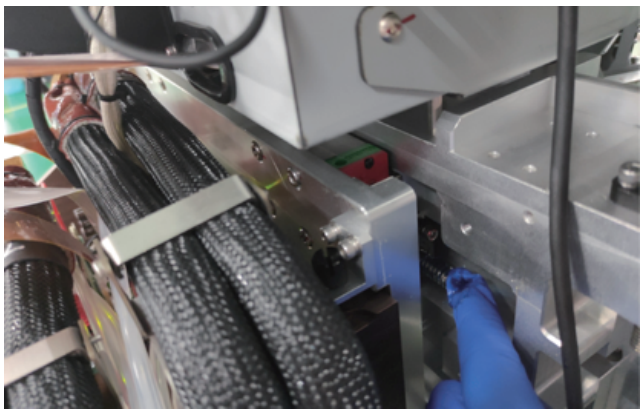
用毛刷沾上导轨油涂抹在Y轴导轨上。





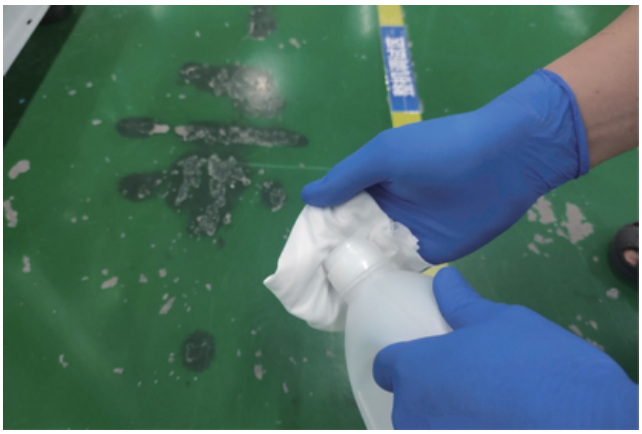
带上橡胶手套抹上少量丝杆专用润滑脂，把润滑脂涂在Y轴丝杆上。



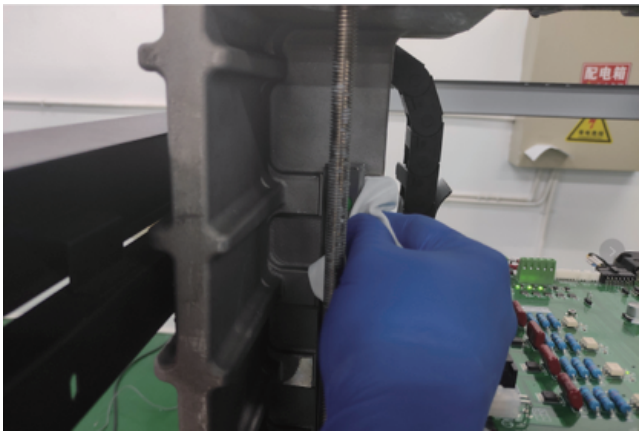


Z轴导轨和电机丝杆上油

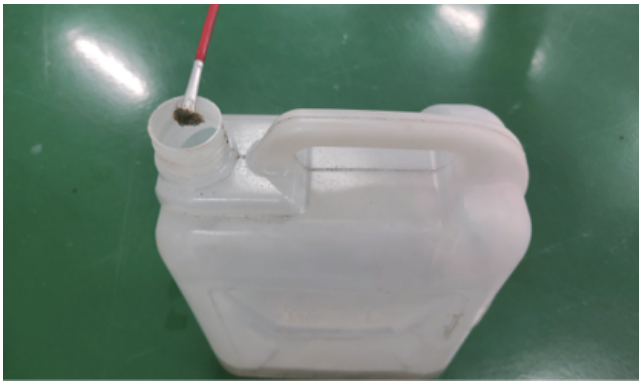
带上橡胶手套，用无尘布沾上少许酒精。

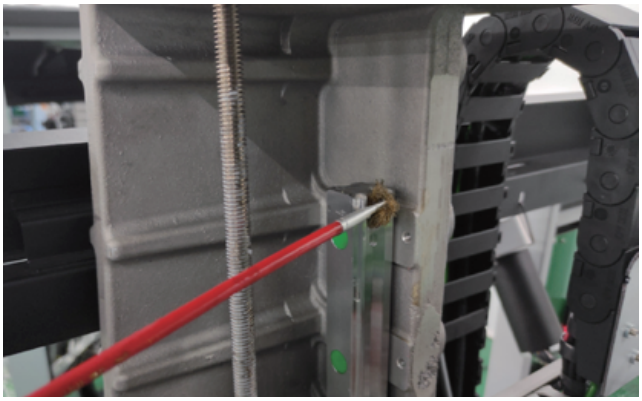


用无尘布把Z轴导轨擦拭干净。



用毛刷沾上导轨油涂抹在Z轴导轨上。





清洁X轴底座

每次打印前先检查X轴底座是否洁净，请按以下步骤清洁X轴底座：
1. 打开右侧门，把打印平台移动到零位；
2. 使用不锈钢铲刀清理X轴底座上的蜡滴/蜡块。

3. 关闭右侧门。

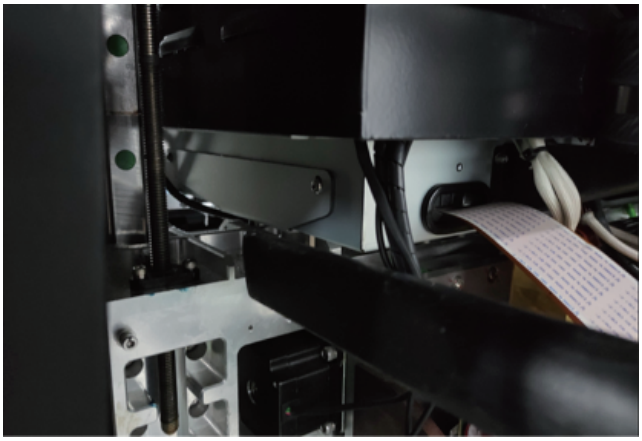
内部粉尘清理

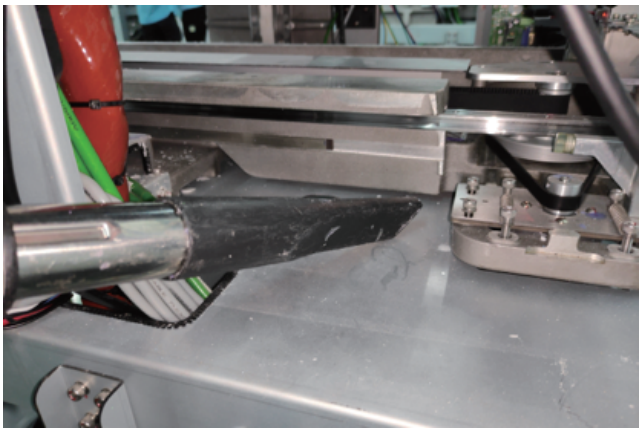
注意：设备内部粉尘过多或者长时间不清理内部粉尘会导致喷头损坏，请按照以下步骤清理内部粉尘：

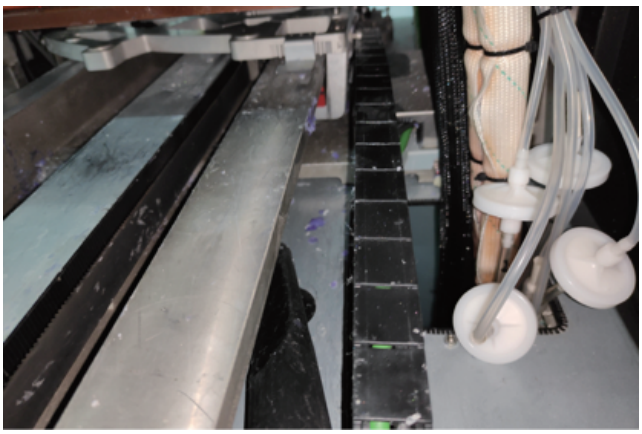
用吸尘器清理滴在X轴底座上的蜡。

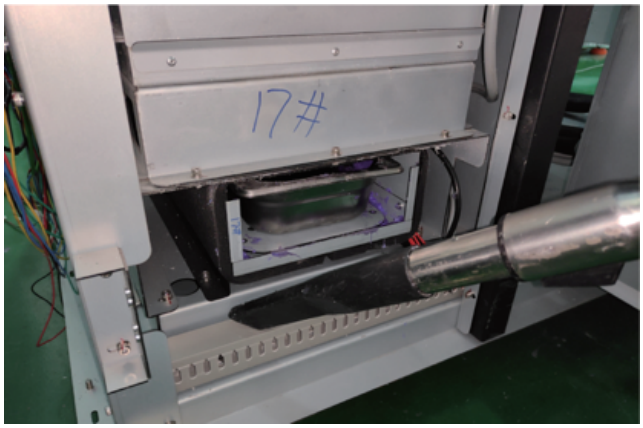
清理过滤器上的粉尘。

清理机器内部的粉尘。









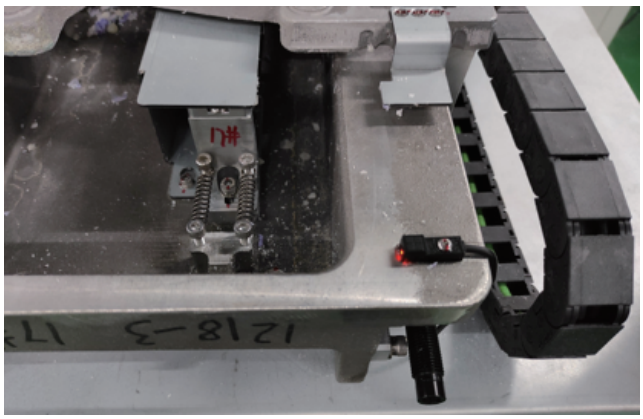
接近传感器除尘处理

长期使用接近传感器上会沉积粉尘，须进行清理。请遵照以下程序清理接近传感器。

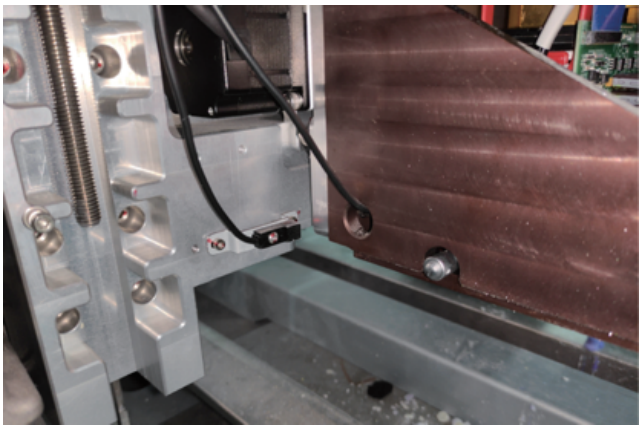
⚠ **在清洁接近传感器时，请始终佩戴丁腈手套。**

1. 打开建造舱门。
2. 找到零位传感器和最大位置传感器。

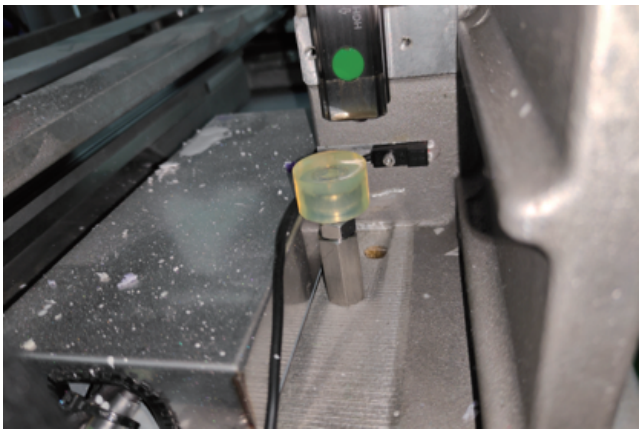
清理X轴前光电开关。



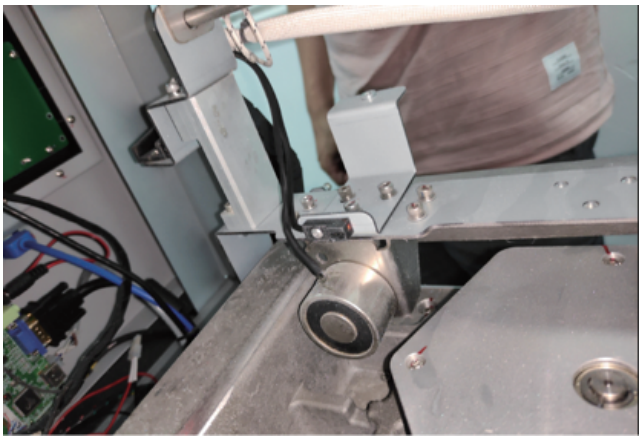
清理Y轴光电开关。



清理Z轴光电开关。



清理X轴后光电开关。



3. 使用棉签蘸取异丙醇，轻轻擦拭接近传感器周围清除所有粉尘。
4. 清除传感器周围的所有粉尘后，关闭建造舱门。

清洁外表面

注意：在清洁之前，设备必须处于待机状态以避免建模被中断。

清洁打印机时，请勿拆卸任何外部面板。面板只能由具备资质的FlashForge技术支持代表拆卸。

注意：只能使用非磨蚀性、不含酒精的清洁剂来清洁表面。切勿使用含有蜡水等原油基抛光剂的多功能清洁剂。

使用干爽、洁净的无绒布擦拭，清除打印机外表面的灰尘。向洁净布料上喷洒多功能清洁剂，然后轻轻擦除打印机外表面上的灰尘和油渍。

清洁建造舱门

使用无尘布蘸取异丙醇来清洁建造舱门。使用湿布轻轻擦去表面的尘屑。

清洁打印平台

注意：在打印机中安装和使用平台前，打印平台应保持清洁并保持室温状态。

每次打印完零件以后，最好将打印平台清理干净并将其重新插入打印机中。 请按以下步骤清理平台：

1. 使用扁平刀片或油灰刀将平台表面上多余的辅助材料刮除。
2. 向平台喷洒异丙醇（IPA）并用纸巾擦除。
3. 在清理打印平台时，务必确保平台的两面都进行清理。

清洁用户界面

在清洁用户界面前移除所有已打印部件。防止意外按下控制键而启动打印机的任何操作。

将水基溶剂（如新波绿）喷洒到柔软的无尘布上；切勿使用干燥布料擦拭或直接将清洁剂喷洒到触摸屏上。
请使用含有氨基玻璃清洁剂的洁净无尘布轻轻擦拭，除去触摸屏上的灰尘和部件材料残留。

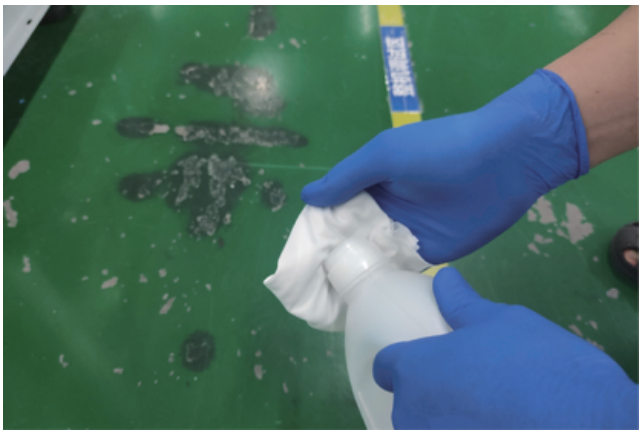
注意：以下清洁产品会对触摸屏造成损坏，请勿使用！
- **干布；**
- **任何含丙酮、丁酮或酒精的清洁产品；**
- **任何磨蚀性清洁产品。**

清洁供料仓

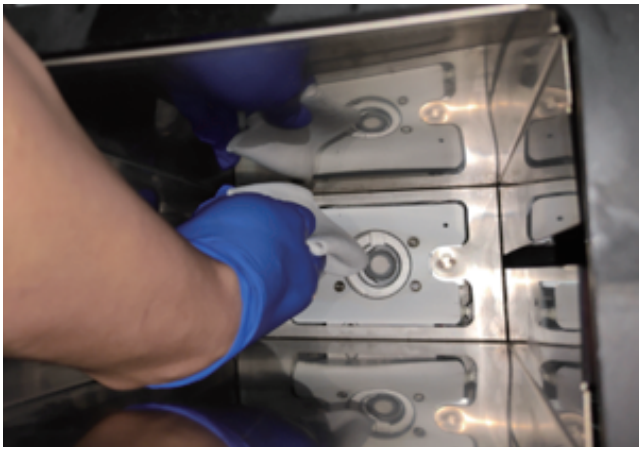
注意：更换材料盒时，可能会有材料在移除盒子后漏到供料仓插座中。如果存在大量材料（底部已被覆盖，且已触碰到盒壁），不要在插座中放置清洁材料盒，请联系您的经销商或FlashForge客户经理。

注意：供料仓处于保温状态；在清洁过程中避免触碰底座的侧面。请佩戴耐热手套和护目镜。

带上橡胶手套，用无尘布沾上少许酒精。

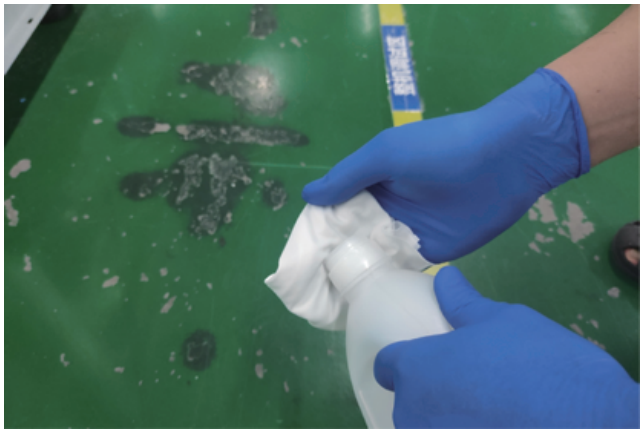


用无尘布擦拭阀岛上的赃物。



清洁喷车底板非喷头底板安装区域

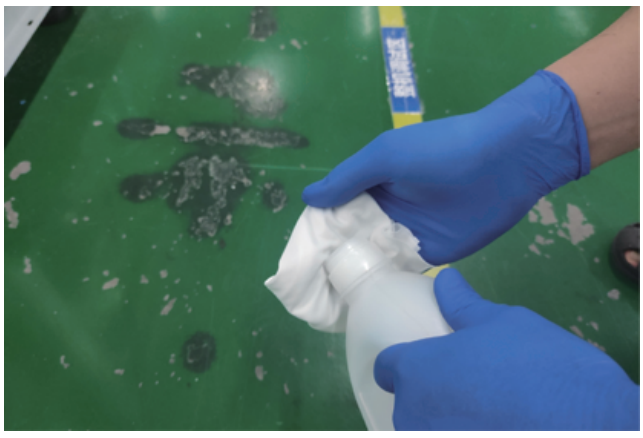
带上橡胶手套，用无尘布沾上少许酒精。



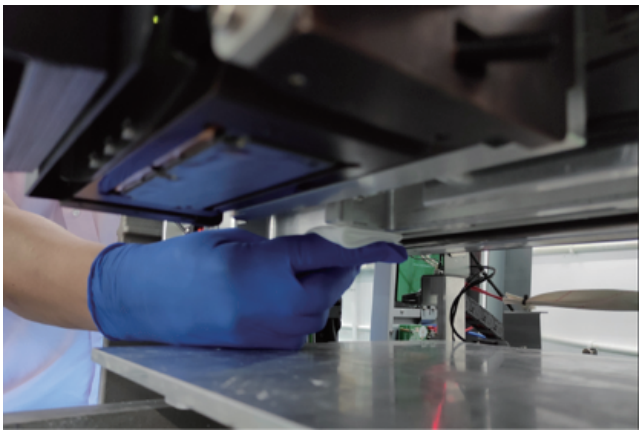
用无尘布擦拭喷头安装板上的蜡及粉尘。

清洁Y梁底面

带上橡胶手套，用无尘布沾上少许酒精。

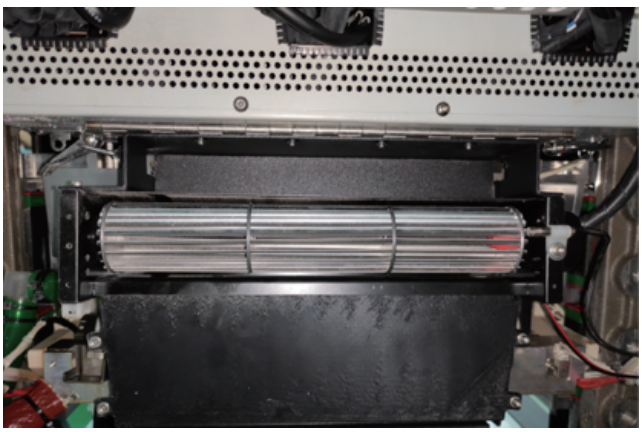


用无尘布擦拭整个Y梁上的蜡及粉尘。

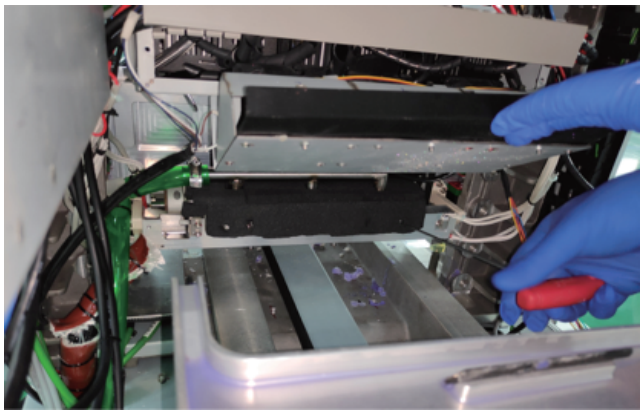


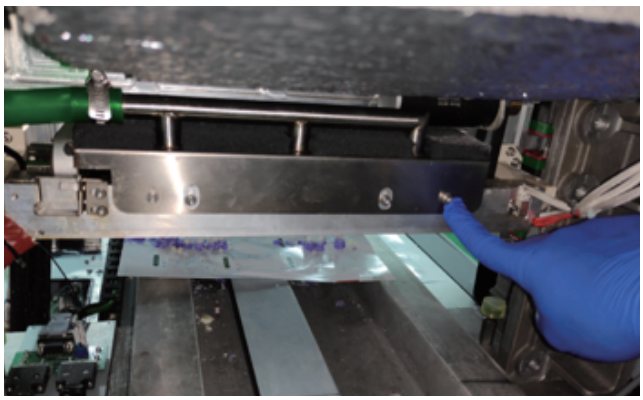
辊筒吸粉管道除粉

松开后风扇一侧挂钩，松开后风扇别一侧挂钩。

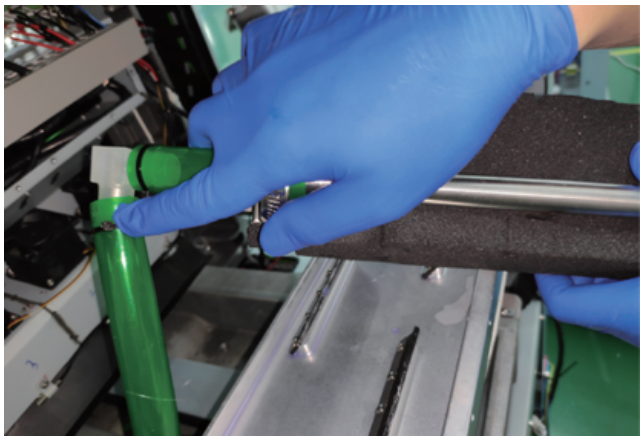


卸下2个固定整平辊吸粉盖板的螺丝。

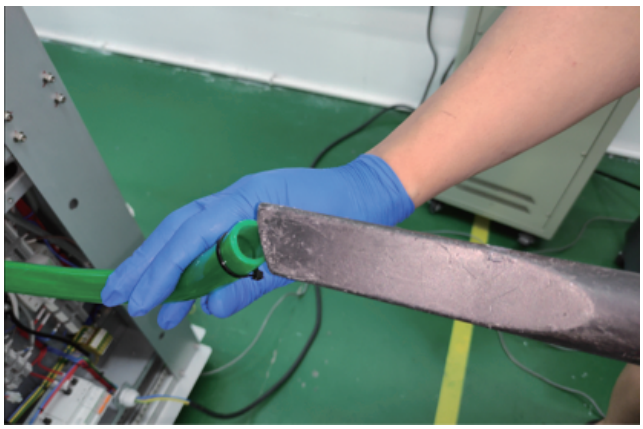




把橡胶管从直接接头处拆下。

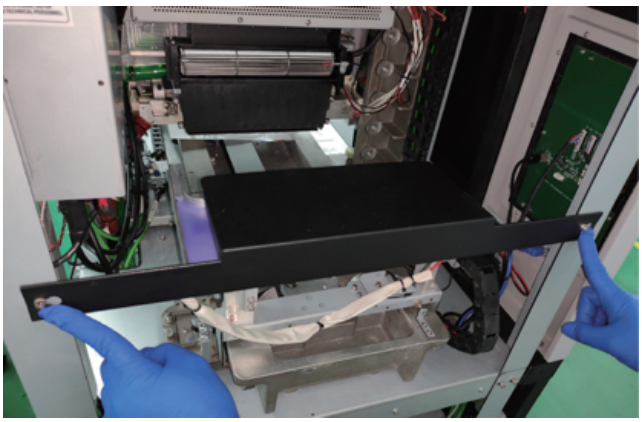


用吸尘气把管子里的灰尘吸干净。

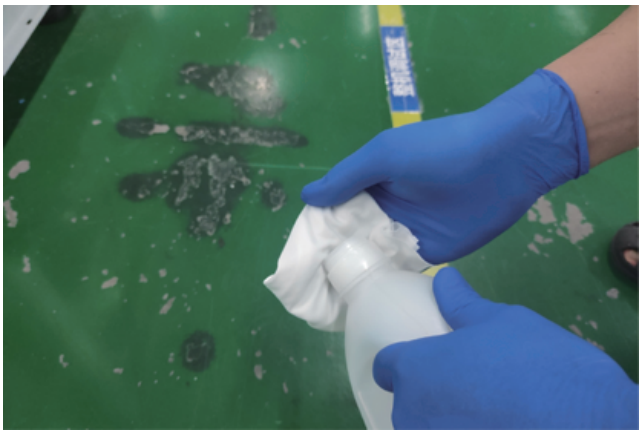


清洁墨站刮刀

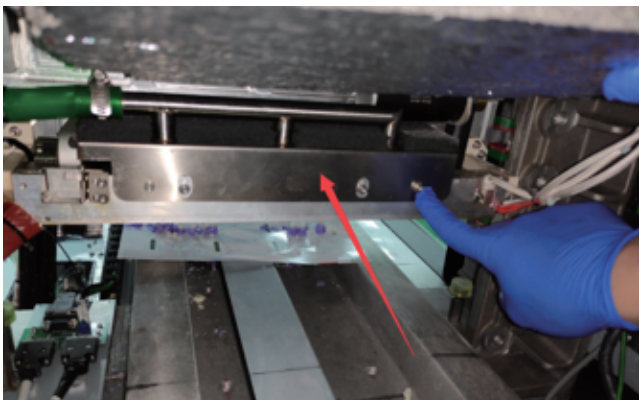
卸下固定墨站防尘盖板的2颗螺丝。

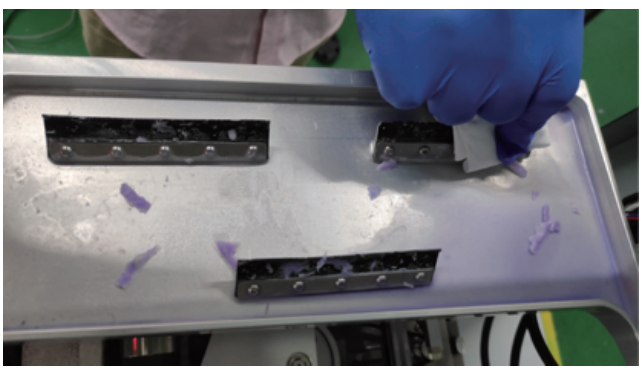


带上橡胶手套，用无尘布沾上少许酒精。

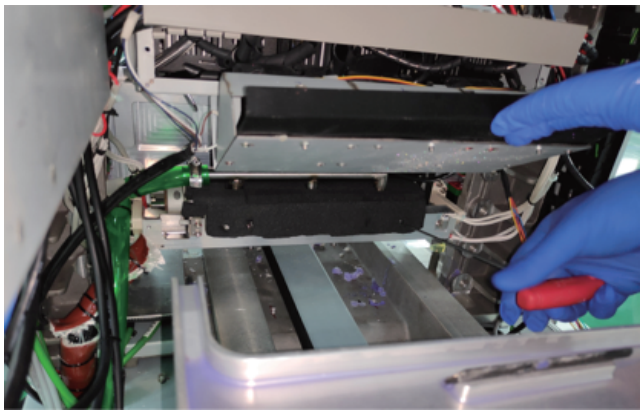


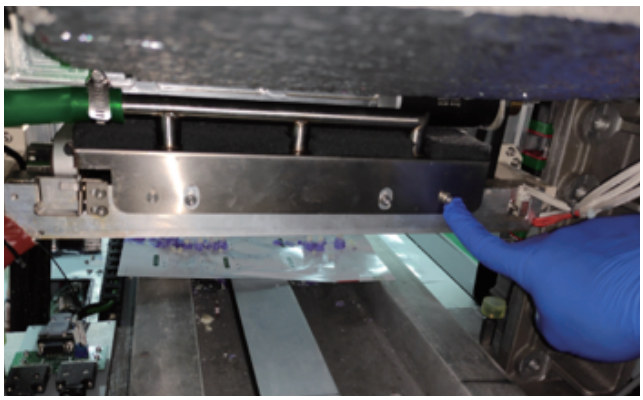
用无尘布把橡胶括刀片擦拭干净。



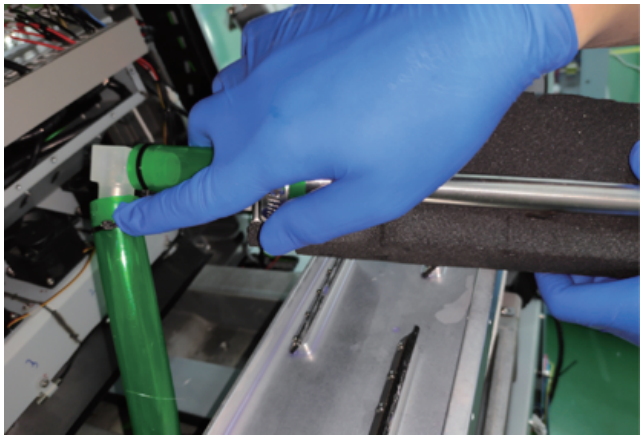


卸下2个固定整平辊吸粉盖板的螺丝。





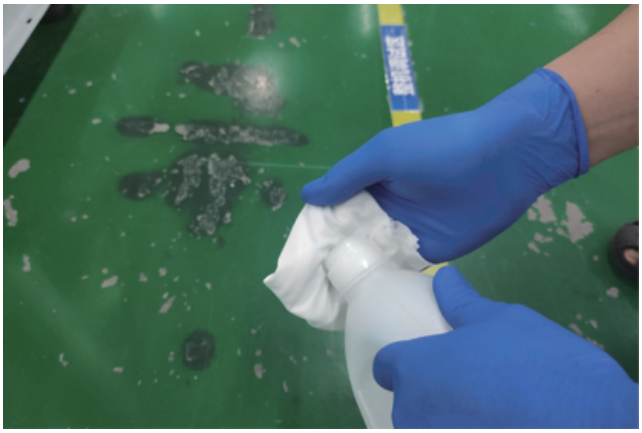
把橡胶管从直接接头处拆下。



用吸尘气把管子里的灰尘吸干净。

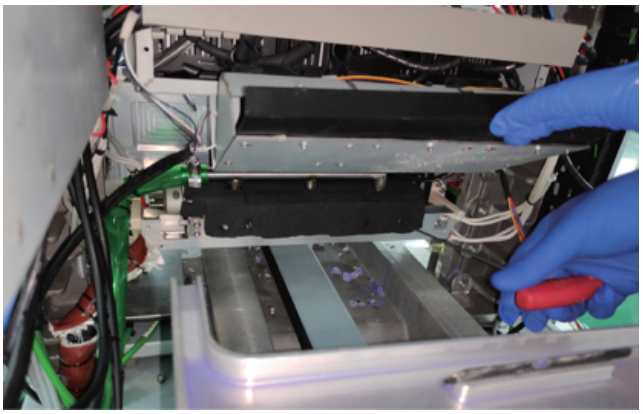
清洁整平辊及整平辊刮刀表面

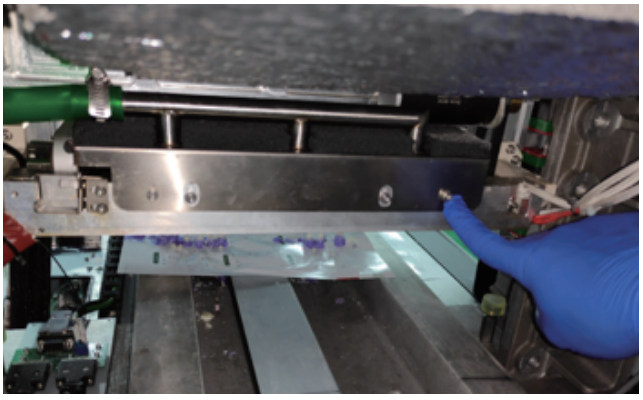
带上橡胶手套，用无尘布沾上少许酒精。



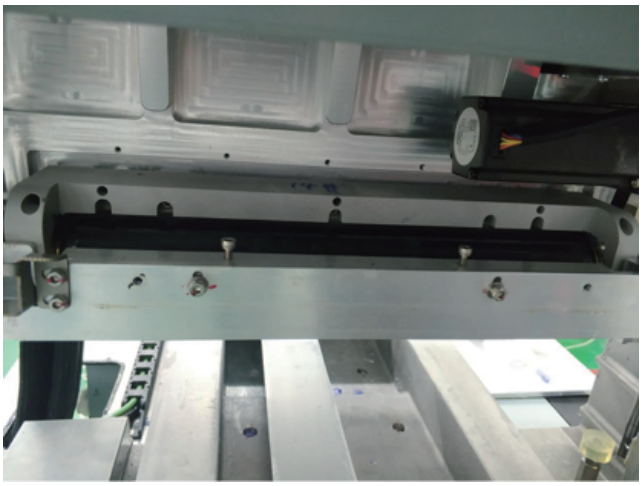
松开后风扇两侧挂钩。

卸下2个固定整平辊吸粉盖板的螺丝。



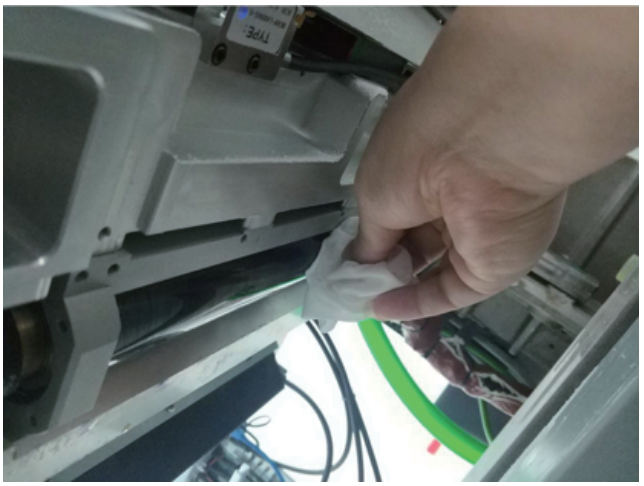


移除吸粉钣金盖壳。



用沾有酒精的无尘布擦拭刮刀表面。

用沾有酒精的无尘布从喷车下后方擦拭辊体表面。



第九章 故障排除

如果打印机检测到可能会影响成型的问题，则会在告警信息页面中给出指示。本章描述故障排除的步骤，执行这些步骤以纠正 WaxJet® 400/410 出现的基本问题。
如果打印机或打印机的材料存在此指南未涉及的问题，或者您需要订购更换用零件，请联系您的经销商或FlashForge客户经理。

9.1 收缩补偿

在从液态过渡到固态的相变过程中，热固性材料会发生材料收缩。
WaxJetPrint客户端软件为用户提供对材料进行收缩补偿的功能，可对模型的精度进行微调。
以下是 WaxJet® 400/410 所有材料（截至 20200501）的收缩补偿默认值。默认值可能在未发布软件更新通知的情况下随时调整。

设备	材料	X值	Y值	Z值
WaxJet® 400/410	FFWJ1100	100.9%	100.6%	100%

使用CAD程序确定模型的精确X和Y尺寸。
· 大多数CAD程序和简单的.stl文件查看器将提供查看模型及其尺寸的方法。
· 将实际X和Y尺寸记录为XCAD和YCAD。

对模型进行打印和后处理，并测量已完成的模型。
· 建议对几何形状的重要尺寸进行测量，在多个区域进行测量并取平均值。
· 可使用卡尺或更高级的测量方法进行测量。
· 记录已打印模型的X和Y尺寸，并将其分别标记为XPART和YPART。

确定缩放比例

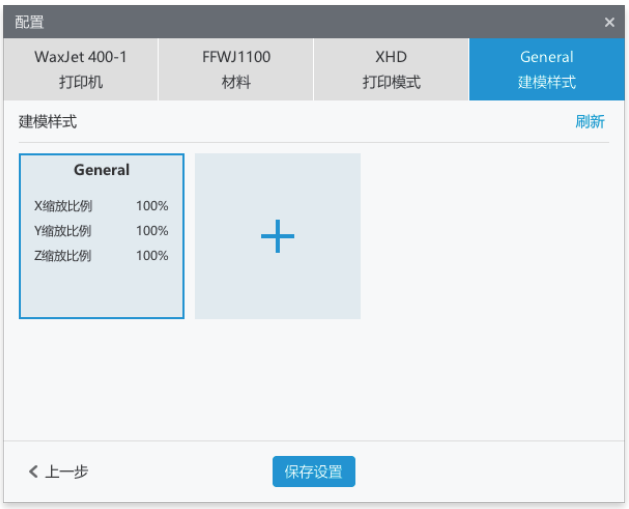
使用以下公式来计算缩放比例：
X 比例系数 = 100% + (XCAD - XPART) / XPART x 100（计算结果为百分比形式）
Y 比例系数 = 100% + (YCAD - YPART) / YPART x 100（计算结果为百分比形式）

示例：
CAD 模型的 X 尺寸 = 3.000"
CAD 模型的 Y 尺寸 = 5.000"
已打印部件的 X 尺寸 = 2.998"
已打印部件的 Y 尺寸 = 4.989"
X 比例因子 = 100% + (3.000 - 2.998) / 2.998 x 100 = 100.067%
Y 比例因子 = 100% + (5.000 - 4.989) / 4.989 x 100 = 100.22%

设置缩放比例

1. 打开 WaxJetPrint 客户端软件并选择 打印 > 配置 > 连接机器。

2. 选择建模样式。



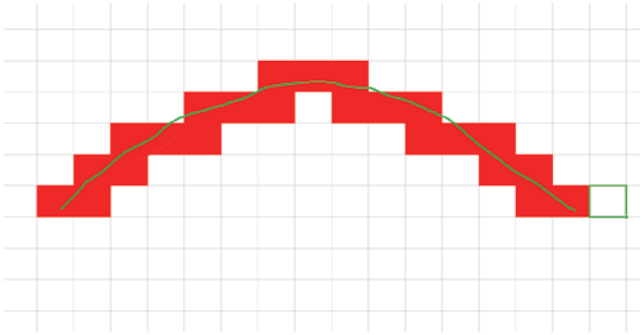
3. 点击 + 号新建建模样式1，输入新的 XYZ 值，然后单击确定并应用配置。

4. 现在，打印机已默认采用一组新的收缩补偿值。右下角的信息窗口将根据每个收缩补偿为 XYZ 提供相应的新的最大可打印尺寸。现在，您可以在加载作业和打印时使用这些收缩补偿值。

9.2 模型摆放指南

9.2.1 模型切片原理

- 模型切片是基于笛卡尔坐标系为基础坐标,按1200DPI的网格采样XY平面图像,Z轴以0.0158mm的厚度分层。
- 栅格化后的每一个像素点只存在有或无数据两种状态。
- 在栅格化时,会按50%的标准判定是否为有效像素,如果单个像素方格中模型占比大于50%则判定这个像素为有效像素,进行喷射填充,如果小于50%则判定为无效,不进行喷射。
- 如下图: 绿色线条为三维模型的边,而红色方格是栅格化后的有效数据。



- 可以看到栅格化后,数据是存在锯齿状,这也是不可避免的,弧度越大,则锯齿状越明显,所以在模型摆放和设计时需要注意这点。

9.2.2 摆放规则

1. 基本摆放原则

- 对于WaxJet400,打印时间是由模型层高决定的;
- 对于WaxJet410,打印时间是由模型层高和占用的通道数量决定的;
- 建议摆放时降低模型摆放高度，这样可以缩减打印时间;
- 尽量将模型摆放在一个通道,多通道打印时间会成倍增加;
- 如果空间允许,尽量拉开模型间距;
- 体积较大的模型需要比小模型更多的模型间距;
- 模型表面效果,以如下次序递减XY>XZ>XY,可以将需要表面效果好的面按此次序摆放;
- 非支撑面效果优于支撑结合面;

2. 大弧面模型的摆放

模型的大弧面需要与坐标系平面成一定夹角摆放,这个夹角在10°~25°范围内.这样可以避免像素化后的阶梯现象.

3. 大平面模型

大平面因为散热等问题,可以尝试将大平面以X轴或Y轴倾斜10°~15°摆放.这样效果会更佳.

4. 层叠摆放

层叠打印是可以的,但尽量避免,如果需要层叠数量尽量不要超过4层.并且层叠后除了顶层,层叠后下层的模型效果会差于顶层.

5. 跨通道摆放

尽量避免跨通道摆放,如果必须,则摆放对精度要求不高的模型.

9.3.1 喷头清洗

1. 功能介绍

清洗功能是一种日常自动维护喷头的流程,使用正压将喷头内部的材料挤出,同时将堵塞物带离喷头.挤蜡完成后,墨站会利用刮片将喷头底面残余的材料清理干净,最后将废蜡倾倒至废蜡盆。

2. 程序

喷头在每次打印前会自动进行清洗工作,在喷头状态变差后,也可以使用设备界面上的清洗功能。如果喷头严重堵塞，可以使用工程师界面手动进行清洗。

3. 工程师界面操作介绍

工程师界面操作基于上面自动的操作步骤,只是可以分步手动操作,适用于较为严重的堵塞现象。

9.3.2 喷头疏通

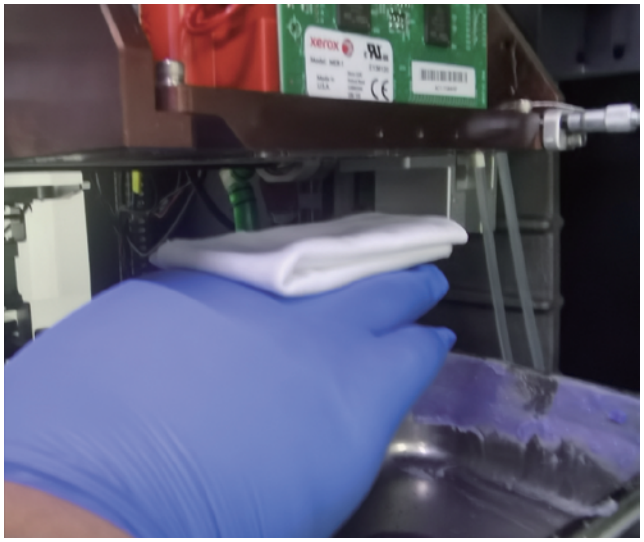
如果喷头严重堵塞，可以尝试使用无尘布与异丙醇垫喷头,让异丙醇溶解喷嘴里的堵塞物,具体操作如下:

异丙醇垫喷头操作方法:

1. 喷头升到方便操作的高度;
2. 使用无尘布加异丙醇，擦拭喷头底板，以及外围;
3. 使用无尘布沾满异丙醇，叠成比喷嘴区略大的长条，垫在喷嘴处不要动（不能擦拭）约5-10秒;
4. 使用工程师界面点击挤蜡2-3次，喷射时间设置为10s。

5. 再次使用无尘布沾满异丙醇垫喷头，然后再挤蜡，如此重复2-3次;
6. 打印测试点，或测试条，检查喷嘴状态;
7. 若状态不佳，走自动清洗，再次确认喷嘴状态。

⚠ **注意: 操作过程中全程带乳胶手套，盛装异丙醇的容器也要注意洁净。**



9.3.3 喷头保养

1. 在待机以及工作时会使用负压维持喷头液位，保证喷头不滴蜡。在负压作用下会有一定概率吸入杂质喷头导致堵塞，所以请尽量保持设备使用环境的洁净。
喷头周围会有蜡材残留,暴露在空气中会有挥发,长时间暴露后产生结晶,这些结晶也会造成堵塞。建议定期使用无尘布蘸无水乙醇擦拭喷头及周围区域。
请注意擦拭喷嘴区域时请不要横向擦拭,只可以垂直于喷嘴面垫,而喷嘴区域外可以横向擦拭,这点很重要!

2. 设备长时间不使用时,请执行设备上的关机功能。因为长时间蜡材处于加热状态,蜡材有几率会变质,从而影响喷头使用寿命。

3. 墨站上的刮片需要定期清洗,可以使用无水乙醇和无尘布擦拭,如果刮片上有蜡材残留,请先清理干净。

4. 在偶然情况下,墨站执行完清洗工作后,喷嘴仍然会有蜡材残留,此时请用无尘布垫干净喷嘴面,同时检查与调整墨站刮片。

5. 喷头为精密部件,不可以使用硬度高工具清理,并且非专业人员不可以拆装喷头. 喷头对温度敏感,请定期使用软刷子清理除喷嘴区域外的其他部位。

9.4 打印机故障恢复

1. 打印中断

问题描述：
打印机出现错误或延时超过30分钟。

故障排除步骤：
查看告警信息页中是否存在可能导致延时的错误，解决突出问题。

2. 打印平台传感器异常

问题描述：
打印平台的传感器可能存在污渍，需要进行清理。

故障排除步骤：
2.1 打开建造舱门；
2.2 找到零位传感器和最大位置传感器；
2.3 使用棉签蘸取异丙醇，轻轻擦拭传感器周围，清除粉尘；
2.4 清除粉尘后，关闭建造舱门；
2.5 如果问题未解决，请联系您的当地维修服务商。

3. 整平装置电动机停转

问题描述：
如果打印平台安装错误或底部存在材料，则会使打印平台比打印机默认其所在的位置高，即使轻微的影响也会导致电动机停转。

故障排除步骤：
3.1 打开建造舱门；
3.2 取下打印平台板；
3.3 检查感应传感器并清理其表面和周围的粉尘；
3.4 更换打印平台板；
3.5 关闭建造舱门，重启打印机；
3.6 如果问题未解决，请联系您的当地维修服务商。

4. 支撑/结构材料供墨异常

问题描述：
打印机检测墨瓶有墨水但是无法往阀岛正常供蜡。

故障排除步骤：
4.1 检查供墨异常的墨瓶；
4.2 墨瓶带有材料；
4.3 墨瓶已完全插入；
4.4 墨瓶瓶盖逆时针旋松1/2，并且已将材料清除干净。

5. 无法维持喷头正常供墨

问题描述：
材料不足。

故障排除步骤：
5.1 墨瓶带有材料；
5.2 墨瓶已完全插入；
5.3 墨瓶瓶盖逆时针旋松1/2，并且已将材料清除干净。
如果墨瓶刚刚插入且处于冷却状态，则可能需要 60-90 分钟预热至工作温度。

6. 建造舱过热

问题描述：
建模室温度已高于最优温度，如果温度持续过高，打印机将暂停打印，直到温度降低。

故障排除步骤：
6.1 检查环境温度，最佳温度范围为18°-24°C；
6.2 检查PTFE过滤器和进风过滤网是否发生堵塞。如有需要，请进行更换；
6.3 确保打印机未放置在阳光直射的窗边；
6.4 确保打印机背面与墙壁之间留有30cm的距离。

7. 打印机触摸屏无法通电

问题描述：
触摸屏处于关闭状态，且打印机没有发出任何声音。

故障排除步骤：
7.1 关闭打印机开关，等待30秒；
7.2 拔下电源线，等待10秒；
7.3 确保打印机开关处于关闭状态；
7.4 插入电源线，等待2秒。
7.5 打开打印机开关。
触摸屏应通电，且打印机将在下一分钟开始发出启动初始化的声音。
如果问题未解决，请联系您的当地维修服务商。

8. 打印机已通电，触摸屏无响应

问题描述：
打印机已通电，屏幕UI显示（不是空白屏幕），但没有任何响应。

故障排除步骤：
8.1 关闭打印机开关，等待30秒；
8.2 拔下电源线，等待10秒；
8.3 确保打印机开关处于关闭状态；
8.4 插入电源线，等待2秒。
8.5 打开打印机开关。
触摸屏应通电，且打印机将在下一分钟开始发出启动初始化的声音。
触摸屏应准备就绪，并在大约2-3分钟内与打印机通信。
如果问题未解决，请联系您的当地维修服务商。

9. 打印机已通电，用户界面黑屏

问题描述：
打印机已通电，用户界面黑屏，并存在风扇和机器噪音。

故障排除步骤：
9.1 关闭打印机开关，等待30秒；
9.2 拔下电源线，等待10秒；
9.3 确保打印机开关处于关闭状态；
9.4 插入电源线，等待2秒。
9.5 打开打印机开关。
触摸屏应通电，且打印机将在下一分钟开始发出启动初始化的声音。
触摸屏应准备就绪，并在大约2-3分钟内与打印机通信。
如果问题未解决，请联系您的当地维修服务商。

10. 阀岛中有残留材料

问题描述：
阀岛中有残留材料。

故障排除步骤：
10.1 请勿插入墨瓶；
10.2 请联系您的当地维修服务商。

11. 无法插入墨瓶

问题描述：
阀岛中不允许插入墨瓶。

故障排除步骤：
11.1 将打印机预热20分钟；
11.2 插入墨瓶，检查墨瓶是否已完全插入，应将墨瓶卡入到位；
11.3 如果问题未解决，请联系您的当地维修服务商。

12. 墨瓶泄露材料

问题描述：
将墨瓶从打印机中移除时，发生材料泄露。

故障排除步骤：
12.1 在移除墨瓶之前，顺时针旋转瓶盖将其关闭；
12.2 向上拉起释放扳手，然后向上拔取墨瓶。请注意，在拔出墨瓶时拉起释放扳手可能会导致材料从墨瓶中泄露；
12.3 如果在阀岛底部发现残留材料，请联系您的当地维修服务商。

13. 墨瓶已插入，但打印机未识别墨瓶

问题描述：
墨瓶已插入，但并未检测到墨瓶。材料识别标签可能丢失或损坏。

故障排除步骤：
13.1 确认墨瓶把手上方的识别标签是否完整；
13.2 将使用相同材料类型的不同墨瓶插入到材料插座中；
如果打印机检测到墨瓶，则未检测到的墨瓶的RFID标签存在问题。
请更换墨瓶。如果未检测到新墨瓶，请联系您的当地维修服务商。

14. 打印机“咔嗒”噪音大

问题描述：
打印机偶尔会发出大声、急促的“咔嗒”噪音。

故障排除步骤：
这属于正常的现象。材料传送系统正在整个打印机中移动材料。

15. 未检测到打印平台

问题描述：
已安装但未检测到打印平台。

故障排除步骤：
15.1 打开建造舱门；
15.2 取下已安装的打印平台，然后重新安装。确认平台平坦放置于打印机中。
如果问题未解决，请联系您的当地维修服务商。

16. 打印机散发气味

问题描述：
打印一段时间后，已打印的结构材料会散发气味。

故障排除步骤：
16.1 更换打印机PTFE过滤器；
16.2 提高打印机所在环境的通风频率；
16.3 将打印机移动至空气流通更顺畅的区域。

9.5 模型质量问题恢复

1. 缺少喷嘴

问题描述：
模型从前往后的方向上缺少材料的如果在多个打印通道中，同一位置都缺少材料。

故障排除步骤：
1.1 执行喷头清洗程序；
1.2 如果尝试三次后喷头仍不清洁，请联系您的当地维修服务商。

2. 模型表面飞边，结构材料延伸到部件之外

问题描述：
模型的一部分结构材料超出模型范围（方向从前往后）。额外的材料被称为飞边。

故障排除步骤：
2.1 通过在水平方向上查看整个喷车底面位置。如果材料垂落下来，请佩戴丁腈手套，清理打印头周围和整平辊边缘的残留材料。
2.2 如果有滴落或累积的材料残留在喷车底面，请联系您的当地维修服务商。

3. 材料缝隙

问题描述：
已打印的三通道模型在其1/3或2/3处存在材料缝隙。

故障排除步骤：
打印机需要校准，请联系您的当地维修服务商。

4. 滴蜡

问题描述：
材料滴落到模型上或打印区域中。

故障排除步骤：
打印机需要维护整平辊机构，请联系您的当地维修服务商。

5. 材料隆起

问题描述：
已打印的三通道模型在其1/3或2/3处存在额外材料形成隆起或褶皱。

故障排除步骤：
打印机需要校准，请联系您的当地维修服务商。

6. 建造舱内的雪花状材料

问题描述：
建造舱中形成雪花状材料，属于正常现象。

故障排除步骤：
6.1 提高打印机的维护频率，能有效减少建造舱中出现雪花状材料的现象。
6.2 如果打印模型因雪花状材料累积而损坏，请联系您的当地维修服务商。

7. 在打印时模型卷曲

问题描述：
模型弯曲或卷曲，且平面不平整，打印平台的Z轴（垂直方向）上发生卷曲。

故障排除步骤：
7.1 检查环境温度，最佳温度范围为18°-24°C (64°-75°F)。
7.2 检查PTFE过滤器和和进风过滤网是否发生堵塞。如有需要，请进行更换。
7.3 确保打印机未放置在阳光直射的窗边。
7.4 确保打印机背面与墙壁之间留有30cm的距离。

8. 部件无法附着在打印平台上

问题描述：
支撑材料无法附着在打印平台上。

故障排除步骤：
8.1 安装打印平台之前，请清除打印机上的所有尘屑。
8.2 打印平台使用前，请清理干净。

第十章 售后服务政策

WaxJet® 400/410 三维打印机设备（以下简称“本设备”）的质保服务由 WaxJet® 400/410 三维打印机设备的原制造商浙江闪铸三维科技有限公司（以下简称“本公司”）或其授权服务的经销商直接提供。本售后服务卡适用于本公司2019年6月1日后发货的3D打印机。

如果您是直接从本公司购买的 WaxJet® 400/410 三维打印机系统，本公司将为您的3D打印机提供质保服务。

如果您是从本公司授权服务的经销商处购买的 WaxJet® 400/410 三维打印机系统或者您的质保服务已由本公司转移到授权服务经销商，则由该授权服务经销商为您的3D打印机提供质保服务。

另请注意以下事项：

一、对于所有终端客户，保修期将从 (i) WaxJet® 400/410打印机的安装日期开始，或 (ii) Flashforge 将 WaxJet® 400/410 打印机发货给您之日起 或 闪铸授权经销商将WaxJet® 400/410 打印机销售给您之日起的三百六十五天，以二者中最早发生的日期为准，保修将持续十二 (12) 个月。除下面讨论的一般保障范围外，本保修不包含额外保障。

二、对于所有终端客户，质保期内若设备出现因产品质量问题导致的损坏，您需提交《闪铸科技售后服务申请单》。我们将根据《闪铸科技售后服务申请单》安排售后工程师对接并处理设备问题。如果您无法提供完整的售后服务申请单，则本公司有权拒绝向您提供质保服务。

三、终端客户需要注意的是，您的质保服务可能已经转移给了本公司的授权经销商，因此您可提前联系本公司售后服务部确认您的质保范围。

四、首次使用本公司的设备前，您应当已获得设备操作证书，或雇佣已经过闪铸培训并获得操作资格证书的员工操作本设备，以确保设备的正常开机和使用。

五、本售后服务协议仅适用于3D 打印机的主要部件和机器外壳组件，例如其电子模块和升降组件。所有软件和易损部件均不在此之列，包括用于打印模型的耗材。

六、以下配件不列入质保范围： 打印平台、U盘、打印耗材、丁腈手套、铲刀、无尘布、稳压电源、磁力搅拌器、搅拌子、恒温加热台、不锈钢钢盆、不锈钢漏勺、托盘、量杯、不锈钢镊、氧气泵、水浴箱、托盘、塑料袋、内六角扳手、过滤器、过滤网、过滤棉、保险丝、开口扳手、工具包及包内工具。

七、以下情况不在质保范围内：
1、您无法提供有效的售后服务卡或设备编号与售后服务卡不一致。
2、您的整机及部件已经超过质保有效期。
3、由设备外部事件（包括洪水、电涌等）引起的缺陷或不合格情况。
4、设备使用了非原装 3D 配件。“原装 3D 配件”是指由本公司制造的配件、组件、材料和消耗品。
5、设备由本公司、本公司授权维修设备的经销商以外的任何一方进行了改装、维修或组装。
6、没有按照我们的售后培训内容及用户使用手册的方式使用设备。
7、您由于错误安装、使用而造成的设备故障或损坏。
8、设备在非产品规定的工作环境下使用而造成的设备故障或损坏。
9、您由于滥用（包括超出工作负荷）、误用而造成设备故障或损坏。
10、您由于维护不当（受潮、发霉或暴露在极端气候）造成的设备故障或损坏。
11、设备正常磨损、老化或因操作造成的外观划痕或瑕疵。

八、本售后服务范围包括更换零部件可能为翻新件，本公司确保更换配件的功能完好。为设备提供的任何更换零部件仅在原始质保期的剩余时间内享受质保服务。

九、本公司或其授权经销商仅对质保期内及时报告的缺陷或其他不合格产品负责。质保责任仅限于使用全新或翻新的原装部件修理或更换缺陷零件。

十、请使用原包装将有缺陷的零件寄到本公司指定的维修站。如果原包装已经遗失、可以向我们索要包装标准，并以此标准包装货物。您必须在三十天以内，使用确保我们能够收到货的快递方式将缺陷零件寄到本公司指定的维修站。

十一、如果您使用错误的包装或者我们没有在规定的时间内收到有缺陷的零件或者在收到零件时，零件损伤与您的提报缺陷不符，我们有权拒绝向您提供质保服务，维修破损的零件由您采购。

十二、本售后服务协议是设备享受的唯一质保条款。根据适用的最终用户许可协议，软件享有单独的质保。在法律允许的最大范围内，本公司明确表示不对 3D 打印机及其各组件提供所有其他担保，无论这些担保是明示、暗示还是法定的，其中包括对不侵权性、适销性和针对特定用途的适用性的担保。

十三、质保运费条款。
质保期内的零配件经由本公司售后工程师确认需要返厂维修时，双方按以下情况分担运费：
1、出厂周期1-6个月，本公司承担来回运费。
2、出厂周期6-12个月，本公司承担寄出运费，终端客户承担回寄运费。
3、非质保范围的零配件经由本公司售后工程师确认需要返厂维修时，终端客户承担来回运费。

第十一章 帮助与支持

⚠ **注意：遇到困难或问题时，最好先直接联系经销商。**

在认证合作伙伴无法提供帮助的情况下，可拨打客户支持热线。在致电客户支持进行问题咨询之前，请事先了解以下信息：

· WaxJet® 400/410 打印机序列号：

打印机序列号印于打印机背面铭牌上，还可以通过用户界面，选择工具 > 打印机信息查看序列号。

· 问题的简要描述，包括准确的错误消息内容。

· 出现问题的时间。例如，在开始或结束打印提交作业时，或在恢复停机前状态时等。

客户支持热线：400-886-6023

售后客服QQ： 2850862986 / 2850863000 / 2853382161

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