



# WaxJet 510 XHD User Guide



This guide is only applicable to FLASHFORGE WaxJet 510 XHD 3D printer

Note: Please read this User Guide carefully before operating the product. Please keep this Guide properly for future reference.



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# 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 510 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](http://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](http://www.flashforge.com) and offer the software 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 510 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 510 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 part 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 WaxJet 510 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.



- ◆ FFWJ1200 part materials and FFMS3200 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). FFWJ1200 part 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 part materials. The user is solely responsible for the correct disposal of part materials.
- ◆ Please refer to the Safety Data Sheet (SDS) provided by the manufacturer for the disposal method of isopropyl ethanol (IPA) waste.

- ◆ 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 510	
Material (part / support)	FFWJ1200(part)	FFMS 3200(support)
Expiration date	5 years	5 years
Environment	Cool and dry area with good ventilation	
Temperature	16°C-27°C	
The highest storage environment	35°C	

## Machine Placement Requirements

- ◆ WaxJet 510 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  $\geq$  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 .slc .stp .step .igs 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 510 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 (64F to 75°F), and the maximum temperature must not exceed 26°C (79°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 . 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-JetPrinting), which is adopted by the WaxJet 510 3D printer. The WaxJet 510 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](http://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 510. The files are able be transferred to WaxJet 510 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



**Build chamber**  
**Touchscreen**  
**USB import**

**Material Drawer Module**

**Waste material chamber**

2.1.4 Machine Back View

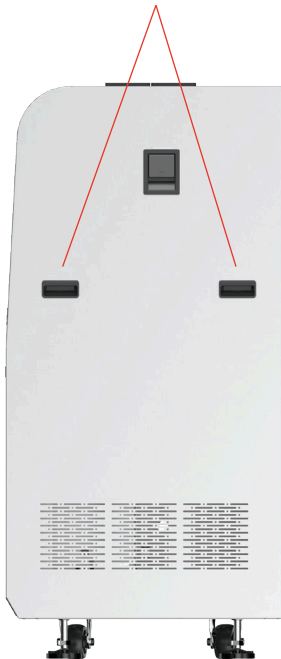


**Nameplate label**  
**Power Switch**  
**Power port**

Internet port

2.1.3 Machine side view

Side panel handles



2.2 Accessories

A packed WaxJet 510 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 510 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 0.015mm. 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, ect.

## 2.5 Terms

<b>Material density</b>	The mass per unit volume of materials in a specific volume state.	<b>Investment casting</b>	A casting process via soluble and disposable materials; an industrial process based on lost-wax casting.
<b>3D printing technology</b>	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.	<b>Log</b>	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.
<b>Build plate</b>	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.	<b>Shrink rate</b>	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.
<b>Resolution</b>	The precision of the image, WaxJet 510 uses the unit of DPI to describe.	<b>WaxJetPrint</b>	Software client, which slicing the stl file and send data to 3D printer.
<b>Waste material</b>	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.	<b>Micro Piezo Nozzle</b>	An industrial ink-jet nozzle to ensure the smooth output of liquid from the designated hole.
<b>Post-processing</b>	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.	<b>X-axis</b>	The left to right direction on build plate.
<b>Part wax</b>	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.	<b>Y-axis</b>	The front to back direction on build plate.
<b>HMS</b>	It is used to maintain the printhead.	<b>Z-axis</b>	The top-down direction on build plate.
<b>Melting point</b>	The temperature at which the solid state and liquid state of the materials are in equilibrium under a certain pressure.	<b>Support wax</b>	A material for wax base: to connect the model with the build plate, to support the suspended structure and hollow structure.
<b>Softening Point</b>	The temperature of material softens, which refers to the temperature at which the amorphous polymer starts to soften.	<b>User interface (UI)</b>	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.
		<b>.stl file</b>	A file, created by 3D solid computer-aided design (CAD) software, which is used to produce parts.



## 2.6 Parameters

<b>Printer Model</b>	<b>WaxJet 510 XHD</b>
<b>Build Size</b>	289*208*100mm
<b>Technology</b>	Multi-Jet print technology (MJP)
<b>Printhead</b>	Piezoelectric
<b>Touchscreen</b>	10.1" colorful LVDS touchscreen
<b>Resolution</b>	2900*2900*1700 DPI
<b>Layer Thickness</b>	0.015mm
<b>Printing Accuracy</b>	±0.04mm / 20mm
<b>Input File Format</b>	Input: STL/SLC Output: WJS file
<b>Part Materials</b>	"FFWJ1200 Net weight: 1.5kg/bottle (there are two material chambers per equipment, and support automatic material change)"
<b>Support Material</b>	"FFMS3200 Net weight: 1.6kg/bottle (there are two material chambers per equipment, and support automatic material change)"
<b>Power Supply</b>	AC220-240V, 50Hz, 4KW
<b>Equipment Size (Unpacking)</b>	1352*775*1600mm
<b>Equipment Size (Packing)</b>	1530*900*1837mm
<b>Weight</b>	Packing 630kg; unpacking 480kg
<b>E-Mail Notification</b>	Support
<b>Hard Drive Capacity</b>	500G
<b>Connection Method</b>	Network 10/100/1000 ethernet interface / USB interface
<b>Guest Operating System</b>	Windows 7 / Windows 10 (64bit)

Feature	condition	510 XHD Build (SKU: 68-5101)	510 XHD Support (SKU: 68-5102)
<b>Ingredients</b>		100% wax	Support wax
<b>Color</b>		Red	White
<b>Density</b>		0.79 g/cm <sup>3</sup>	0.85 g/cm <sup>3</sup>
<b>Melting Point</b>		68°C	55°C
<b>Softening Point</b>		63 °C	N/A
<b>Volume Shrink Rate</b>	SH/T 0588-1994	1.10%	N/A
<b>Linear Shrink Rate</b>		0.70%	N/A
<b>Penetration</b>	GB/T 4985-2010	9	N/A
<b>Ash</b>	GB/T 14235.3-1993	<0.01%	N/A
<b>Description</b>		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.



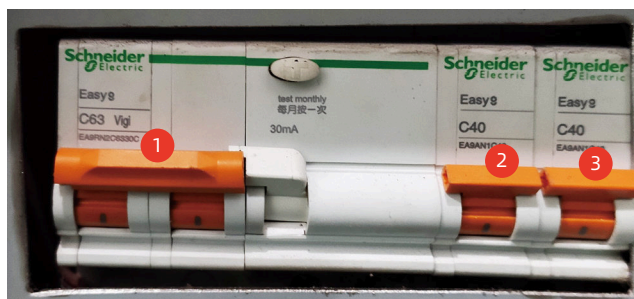
2. Plug in the 25A socket.



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 Waste Material Removal

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 Material Installation

**⚠ 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 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 Material Removal

**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.



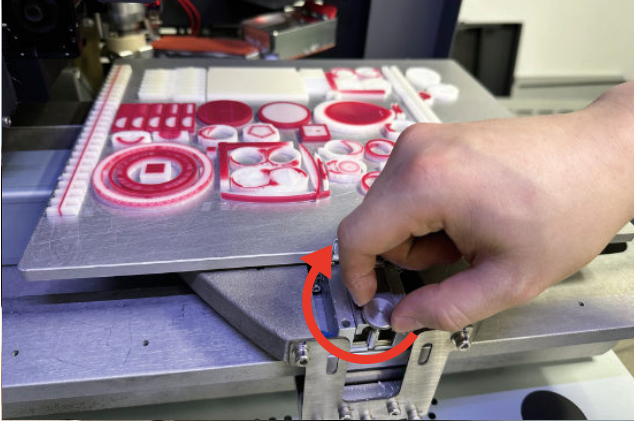
4. Pull up and release the wrench while carrying the material bottle handle to pull the material bottle out of the material slot.
5. Dispose of empty boxes in accordance with local laws and regulations.
6. Wear rubber gloves, protective arms device or laboratory clothing to protect your arms, use disposable 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.

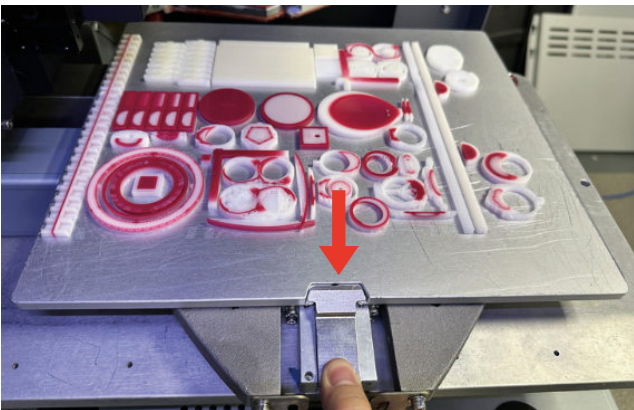


### 3.5 Removal and Installation of Build Plate

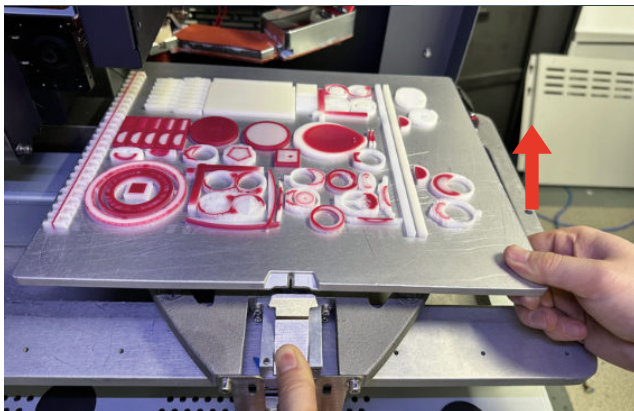
1. Make sure that the printer is turned on and that the printer status is in ready mode.
2. Open the building chamber door.
3. Rotate the pressing nut clockwise and loosen the pressing nut.



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 Machine Identification

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 510 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.

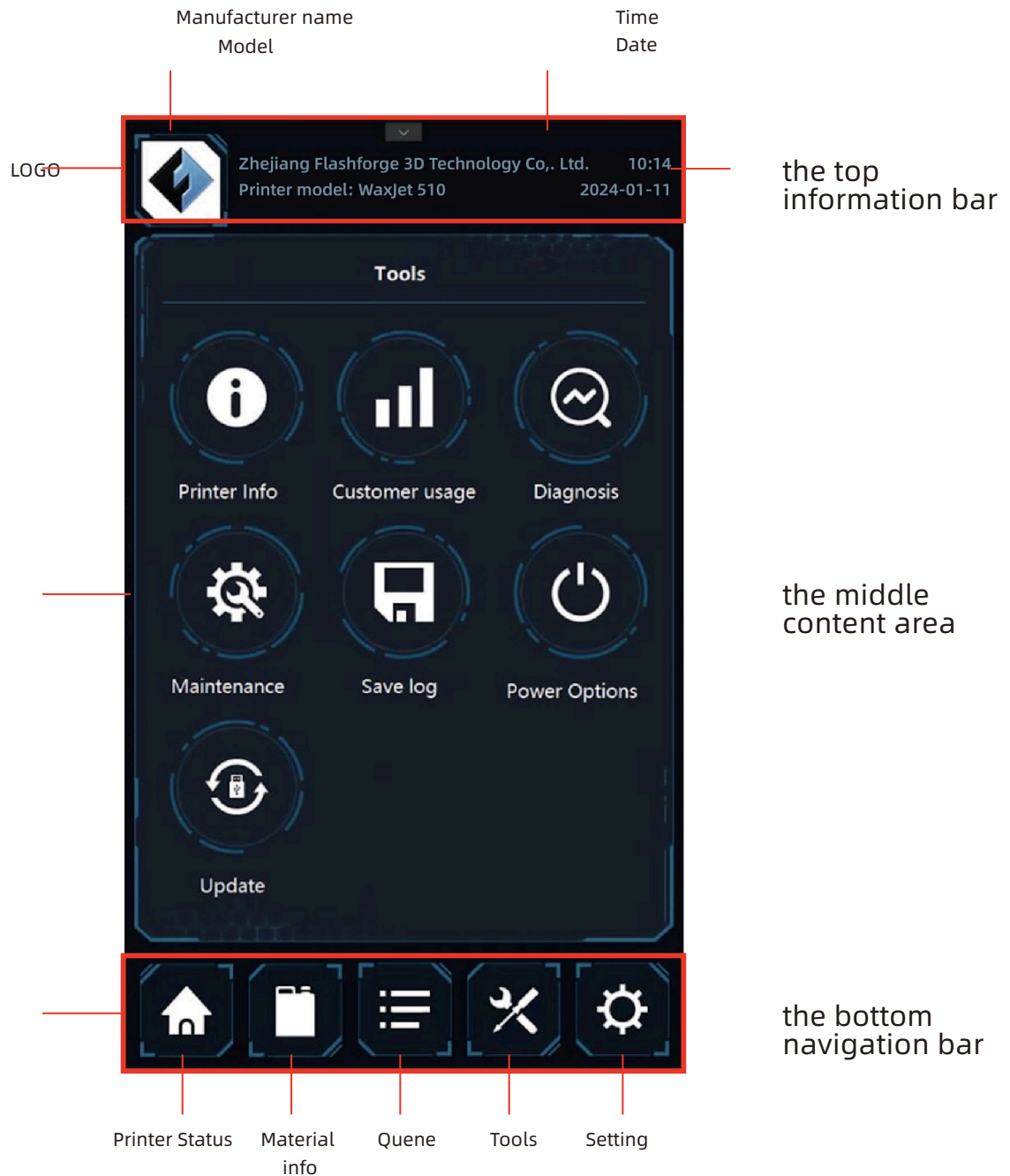
#### Network Configuration

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.

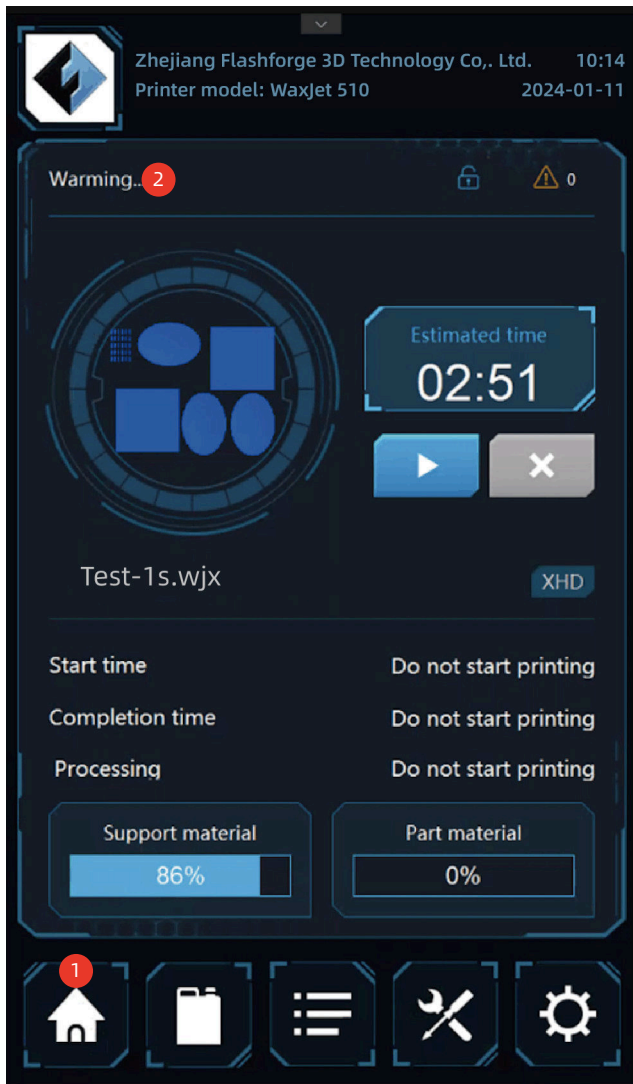
# Chapter 4 User Interface

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;

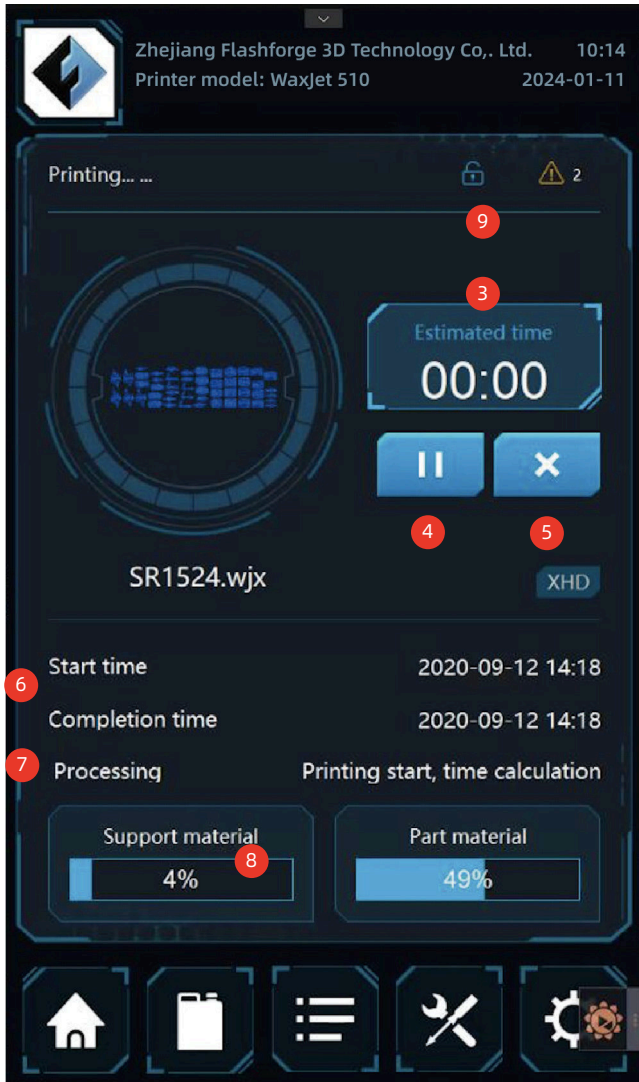
**Recovery:** The printer has failed and is attempting to recover;

**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.



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.**

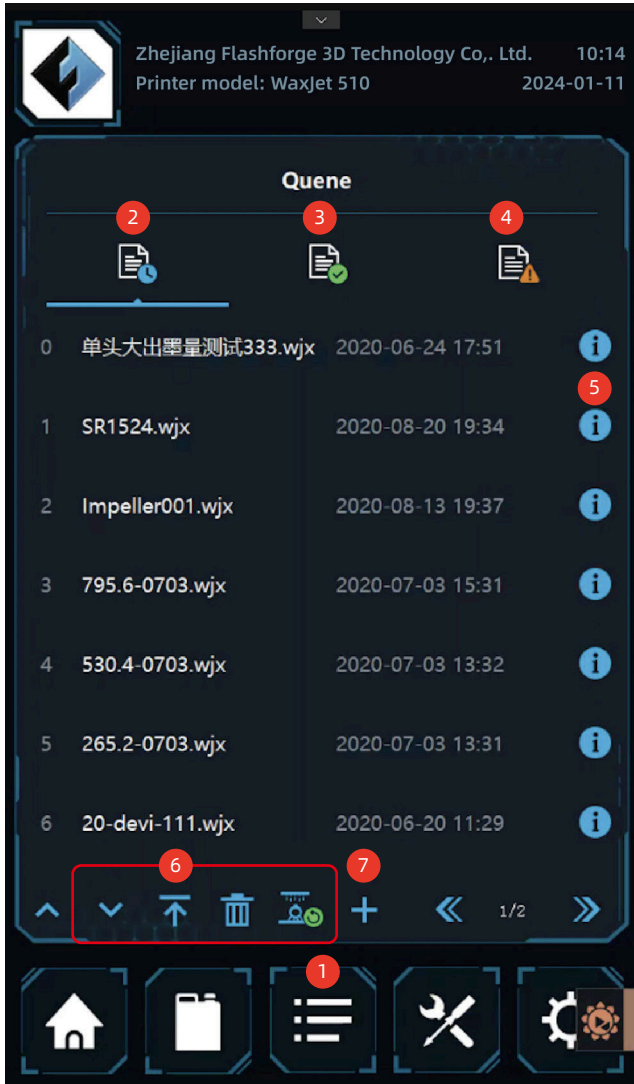
Batch: material batch and date;

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.

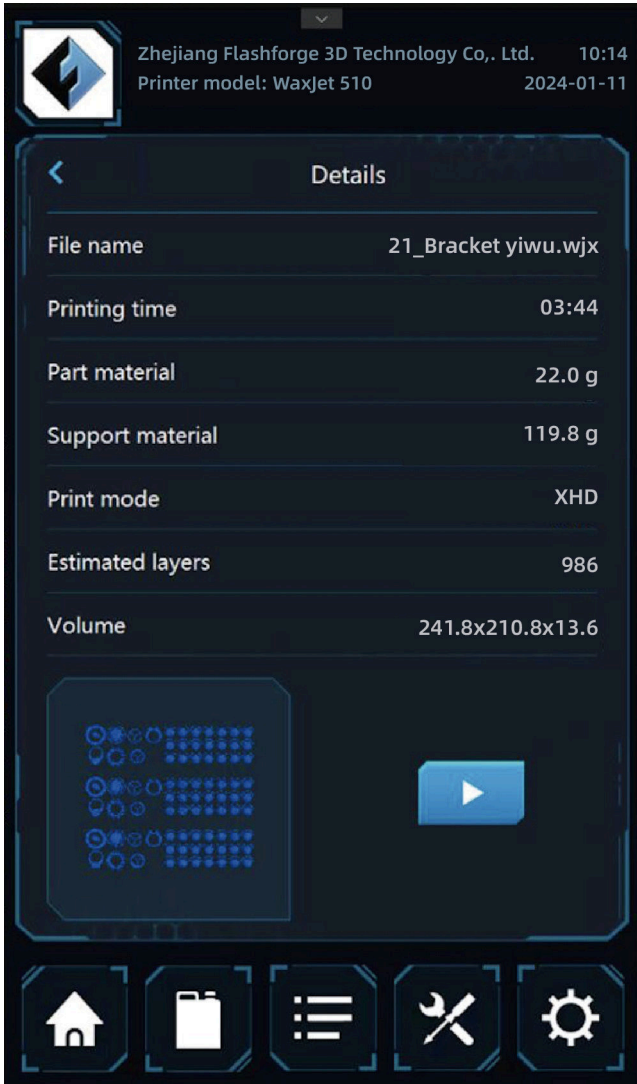
### 4.3 Printing List Interface



(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

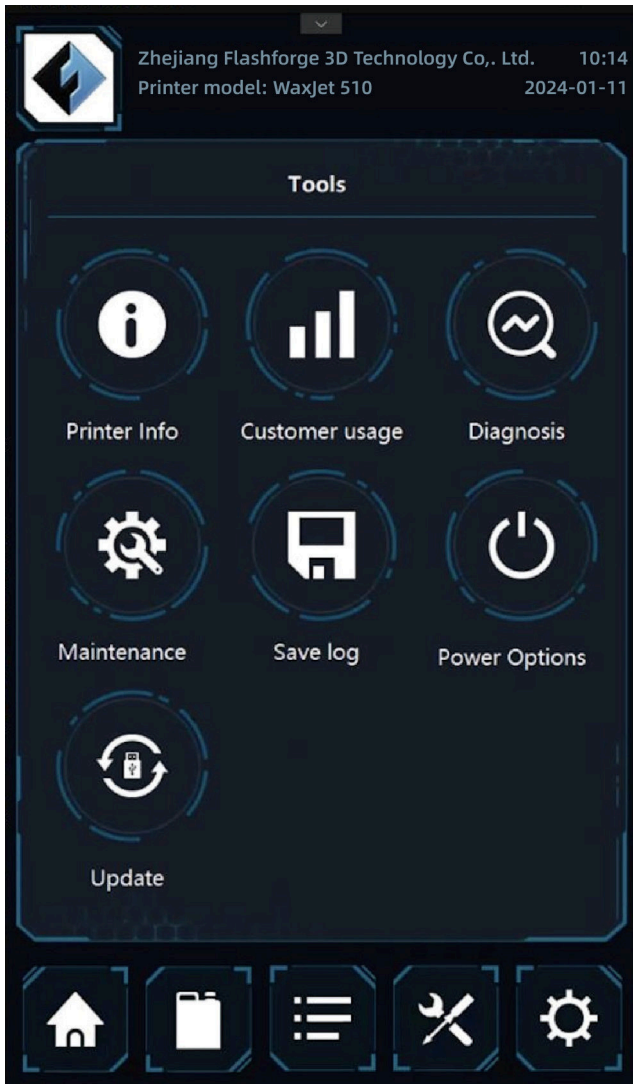
8. Copy the files into the waiting task list



(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.

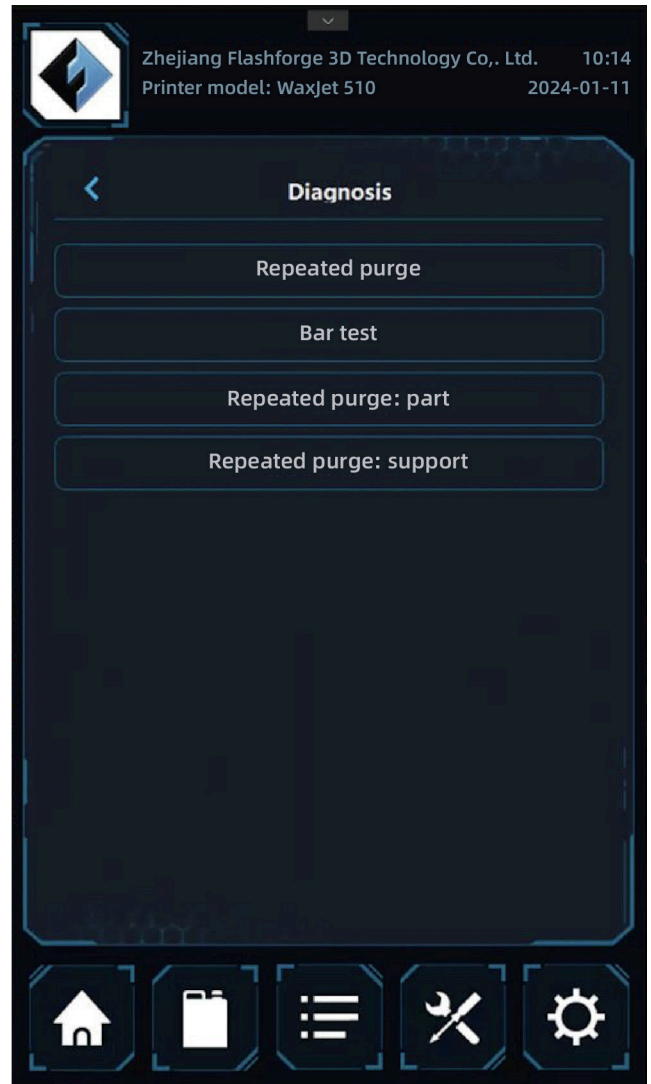


Printer information: Display information of printer and version.

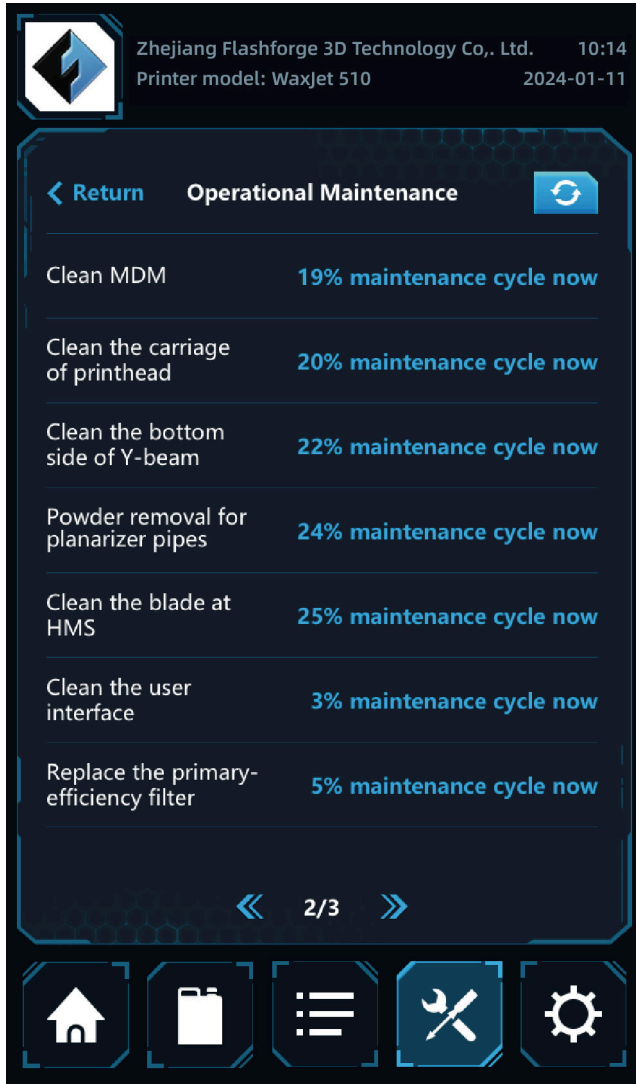




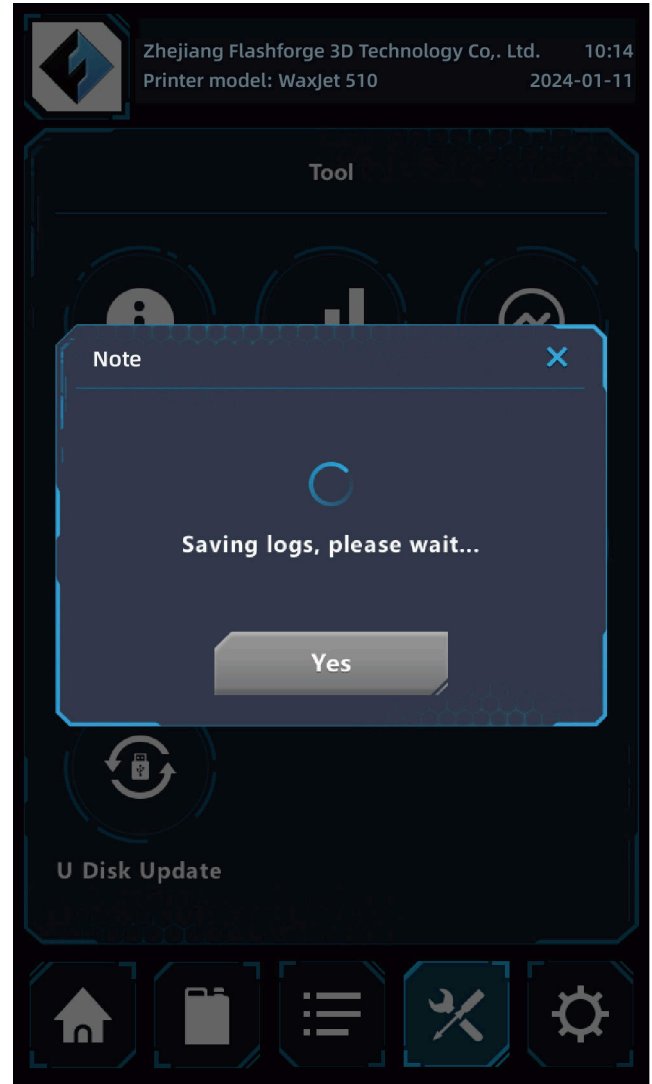
Printer usage status: display the usage info of printer.



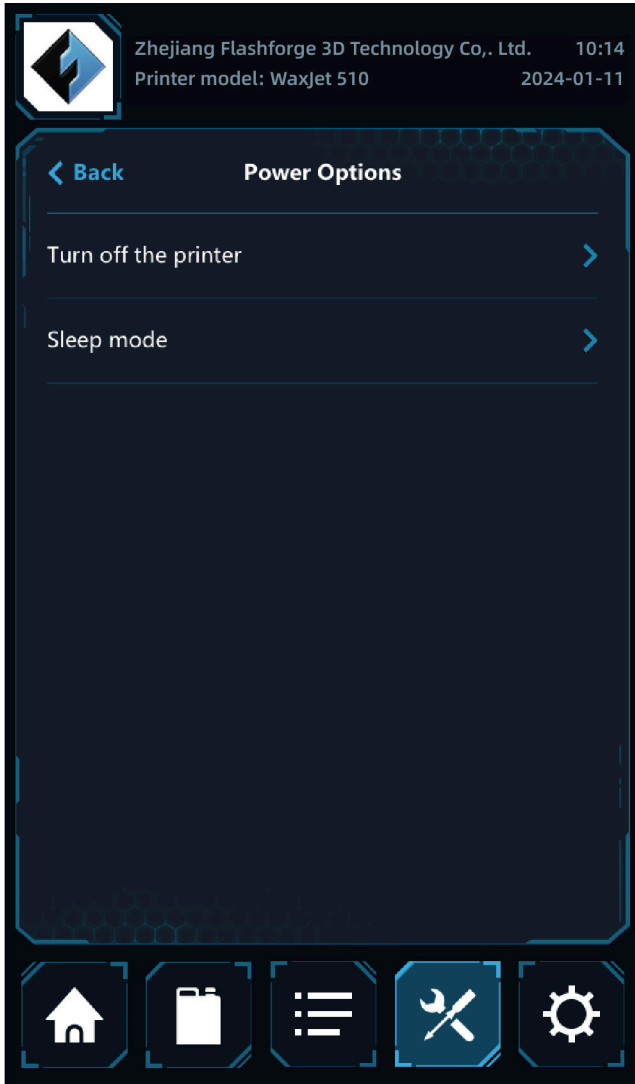
**Diagnosis:** click the <diagnosis> to enter the procedures.  
**Diagnosis Lists:** the diagnosis interface will appear after clicking the <diagnosis> under the <tools>, where users can operate and maintain the printers as requested.  
**Repeated purge:** to clear the printhead regularly.  
 Bar test: to print the part and support test bars  
**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.



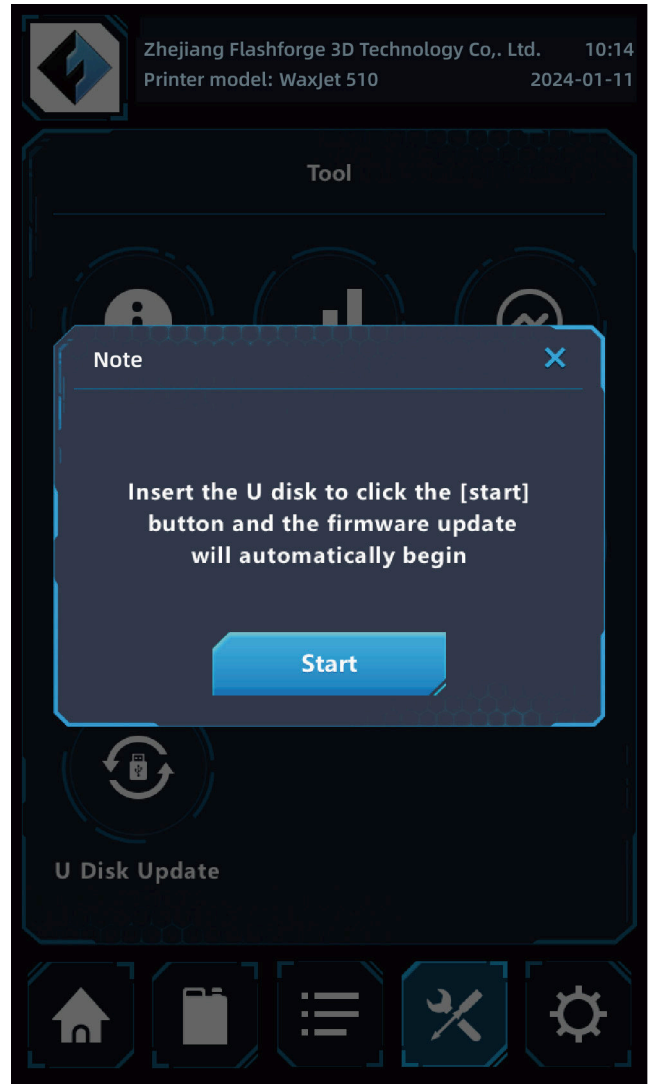
**Maintenance:** click the <maintenance> to enter the interface. Please click the maintenance project and refresh the calculator after cleaning. Before starting any maintenance project, the printer must be in preparation status and the clean printing platform must be installed.



**Save log:** support save printer working log files.

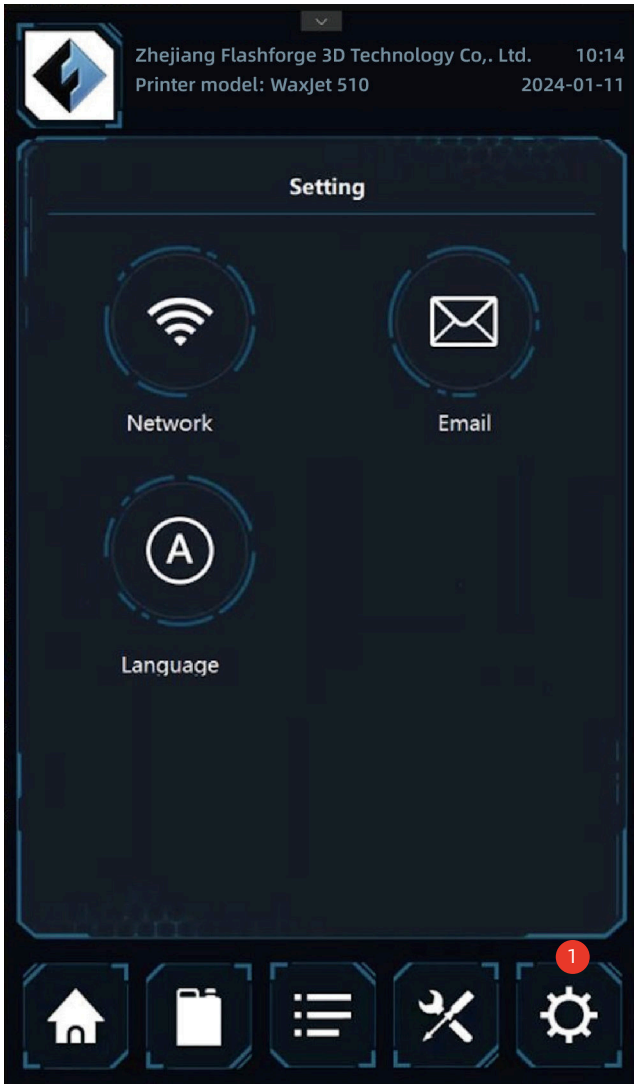


**Power options:** Choose “power option” button to close 3D printer or enter sleep mode. It is suggested to close the 3D printer by UI interface.



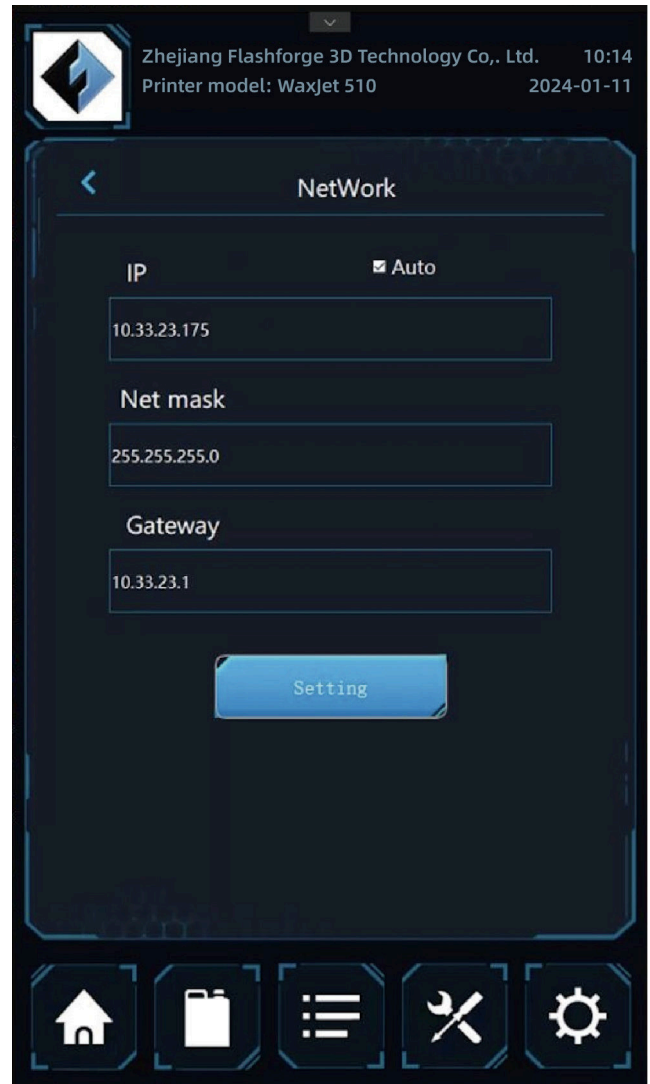
**USB update:** support update firmware by USB stick.



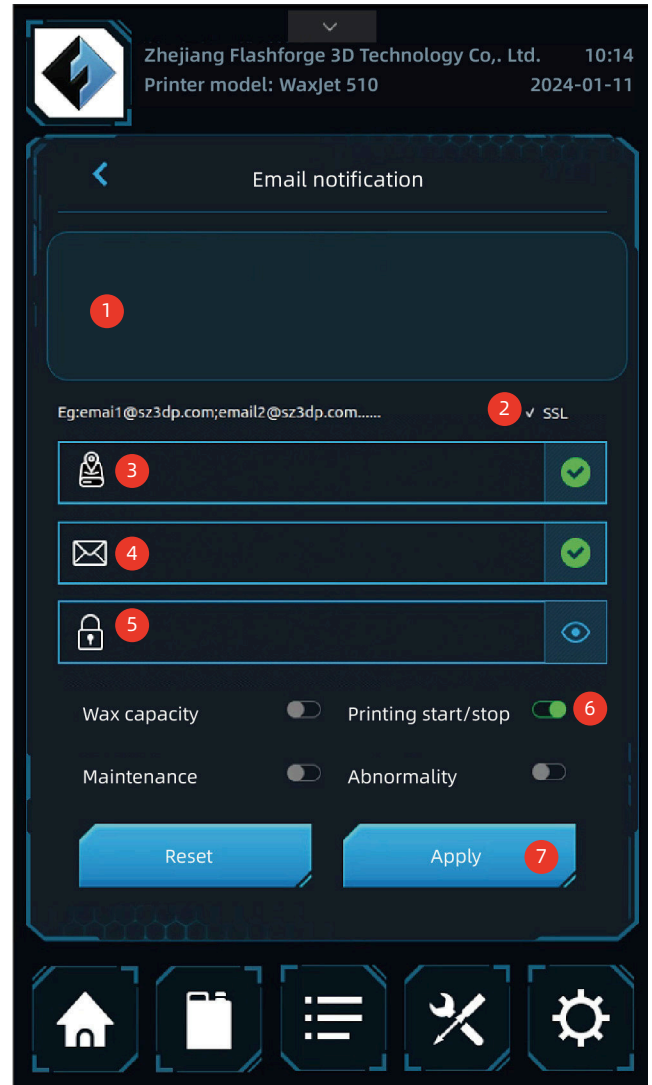
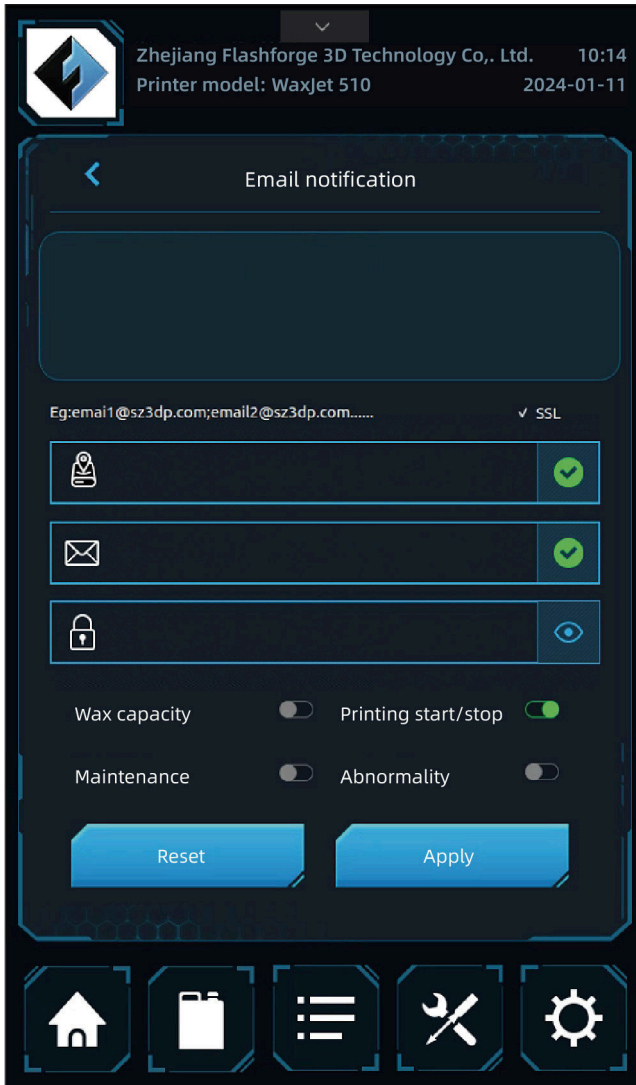


1. Tap here and enter the setting interface

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



**Network Setting:** Configure network connections



**Email notification:** Set up e-mail notifications to receive notifications about printer events.

**⚠ 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.

**Email setting steps are as follows:**

1. Enter the recipient's email addresses, separated by commas, with no limit on quantity.
2. Check [SSL].
3. Enter the host address of the outgoing mail server.
4. Enter the sender's email address.
5. Enter the sender's email login password.
6. Select the information you want to receive.
7. Click [Apply] to confirm the configuration.

# 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 software center.

## 2. Software installation and start-up

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

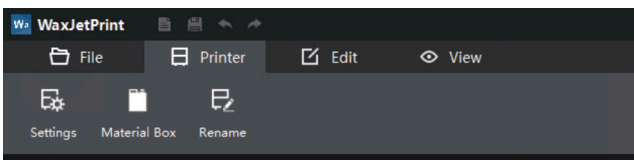
## 3. Initialization

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

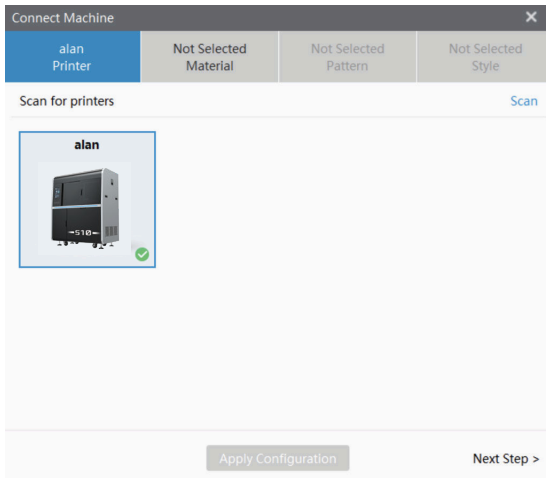


**Note: when the printer cannot be connected to the computer, please first check the connection between the printer and the factory net and next check whether the printer and computer are in the same local area network. In terms of the network configuration, please refer to <network connection> on page16.**

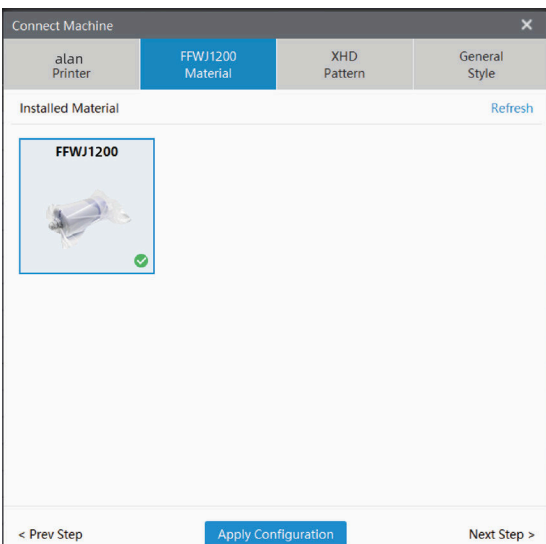
1. Open WaxJetPrint and click setting;



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



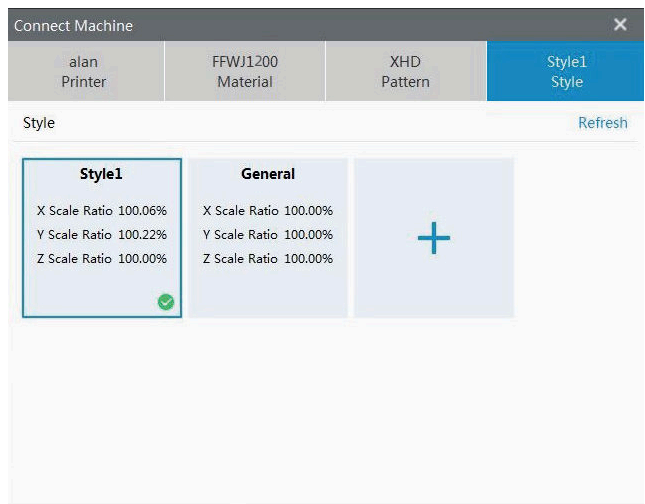
3. Choose the material;



4. Choose the printing mode;



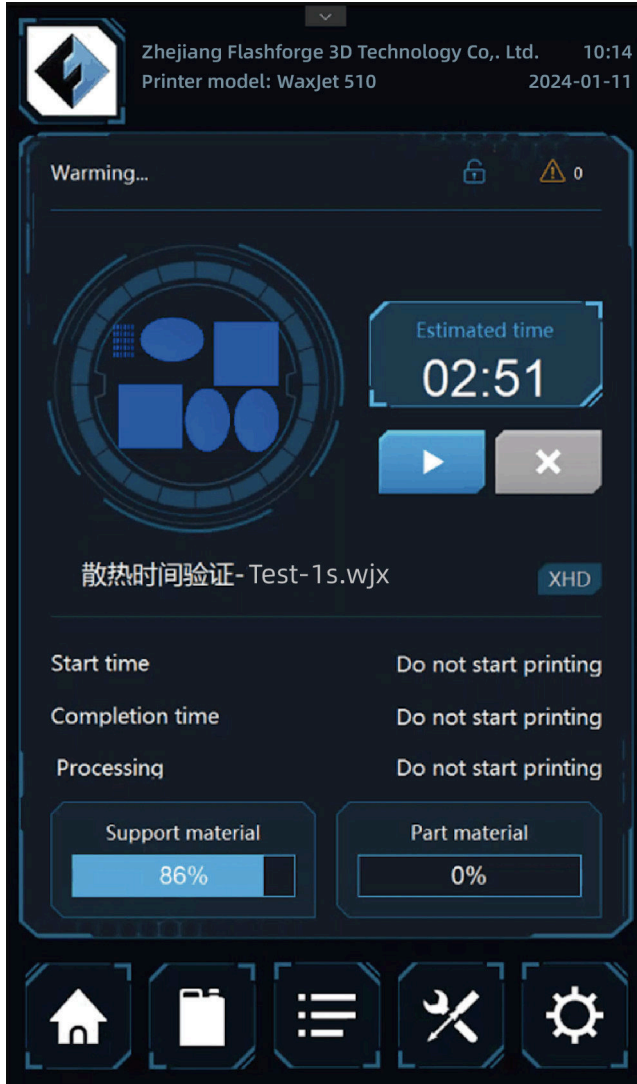
5. Choose the building mode and save the setting.



# 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.

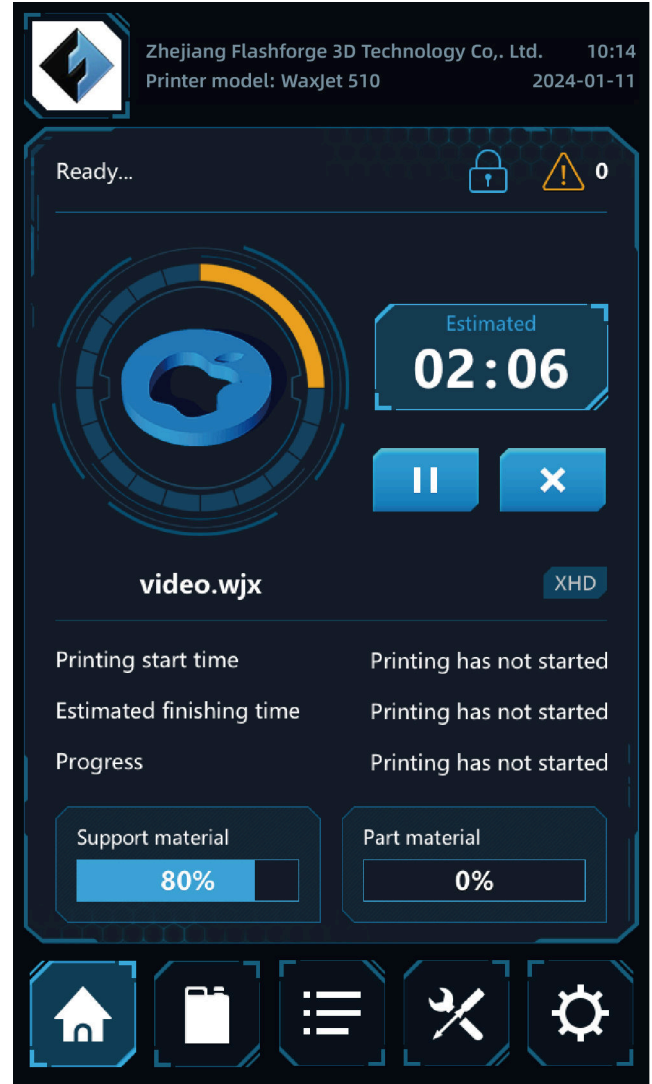
1. The printer is powered on and warming up.



2. Install the materials.



3. The printer stay warm after preheat finished.

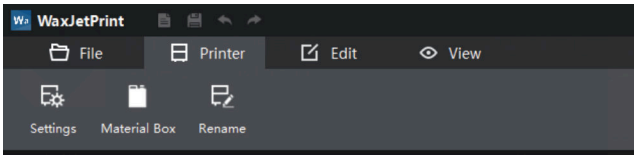


4. Turn on the WaxJetPrint software via the shortcut on desktop.



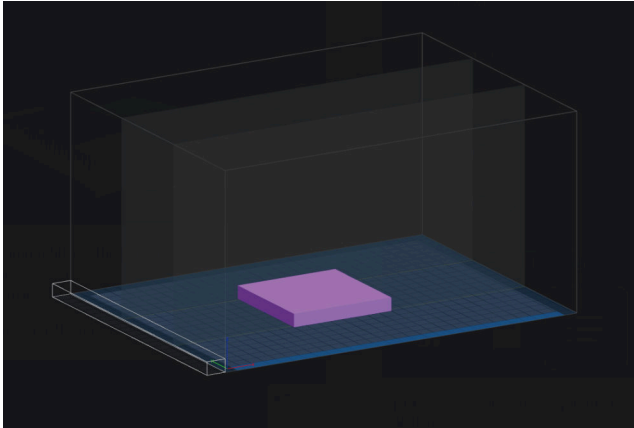
5. Connect the printer.

**⚠ 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.

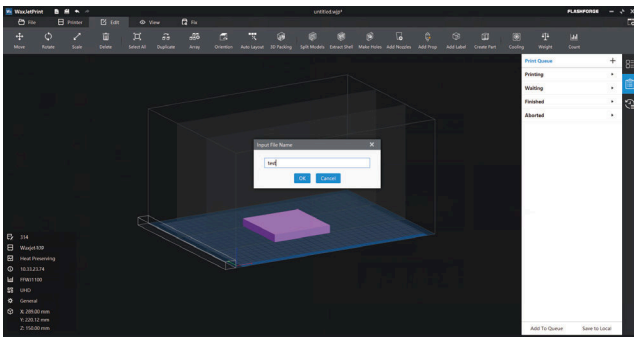
**⚠️ Note: during typesetting, the distance between each model shall be more than 0.5mm. If stacking prints is required, the distance between the upper and lower models shall not be less than 0.5-1 mm. Please make sure that the models are at the same level to avoid a waste of time and material.**



7. Send the printing files to the printer.

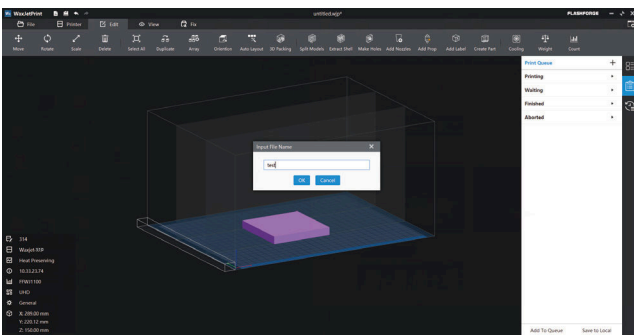
A. send the files via network.

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

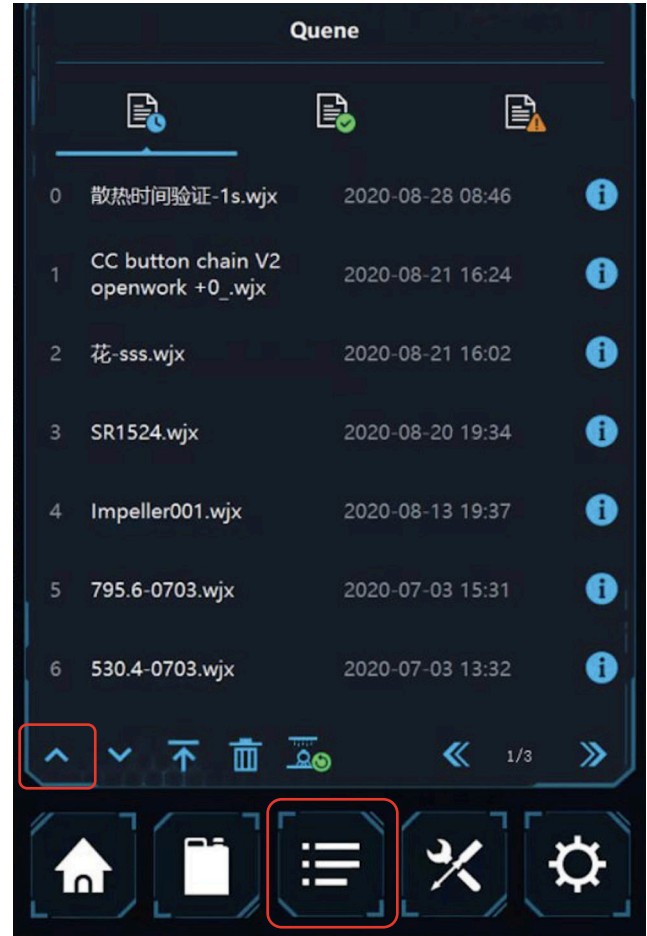


B. Copy files into the printer by USB stick.

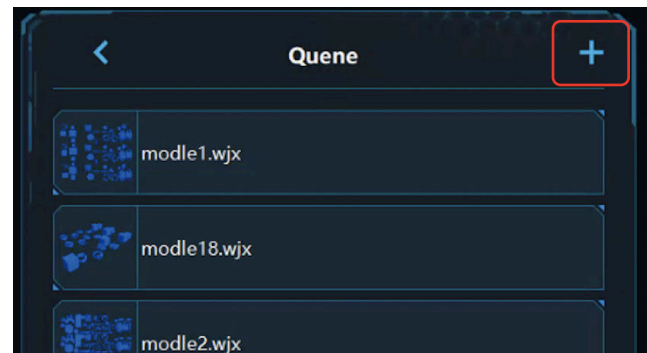
- 1) Click [Save to the local];
- 2) Modify the file name and choose the saving path;



- 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.

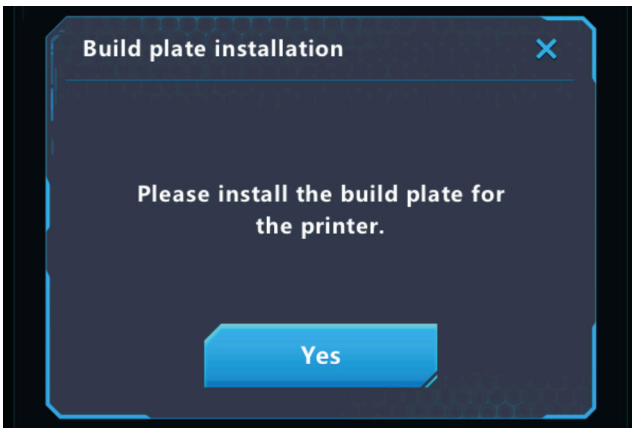




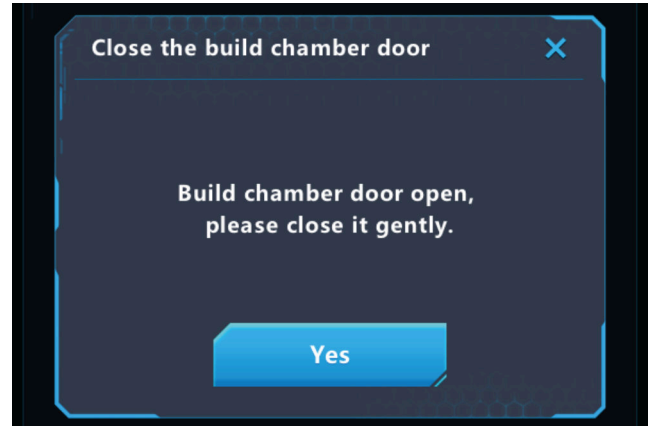
8. Tap print icon and start printing.



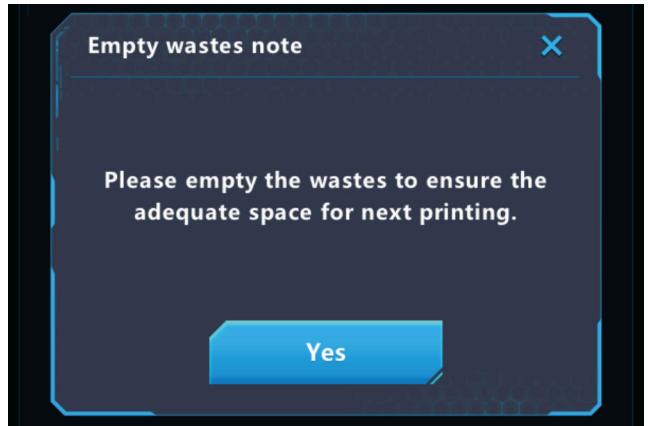
9. Install build plate: please follow the hints in the interface to install the build plate and tight the pressing nut counter-clockwise.



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 Post-Processing Guide

## 7.1 Support Removal

The post-processing guide is the standard guide of removing support material. 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
- Wire mesh basket
- Isopropanol
- Dust masks
- Waterless ethanol
- Protective glasses
- 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. Prepare separate 3 baths of 99% isopropl alcohol in 3 separate beakers with a heated magnetic stirrer.

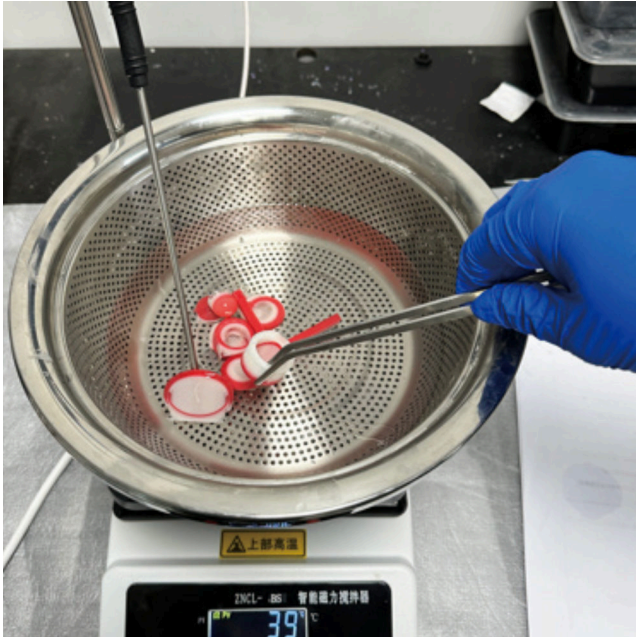
The alcohol temperature in all three baths should be set to 37 degrees Celsius

The first bath is used to remove all of the support material from your models. The second and third baths are used to rinse and clean the models.





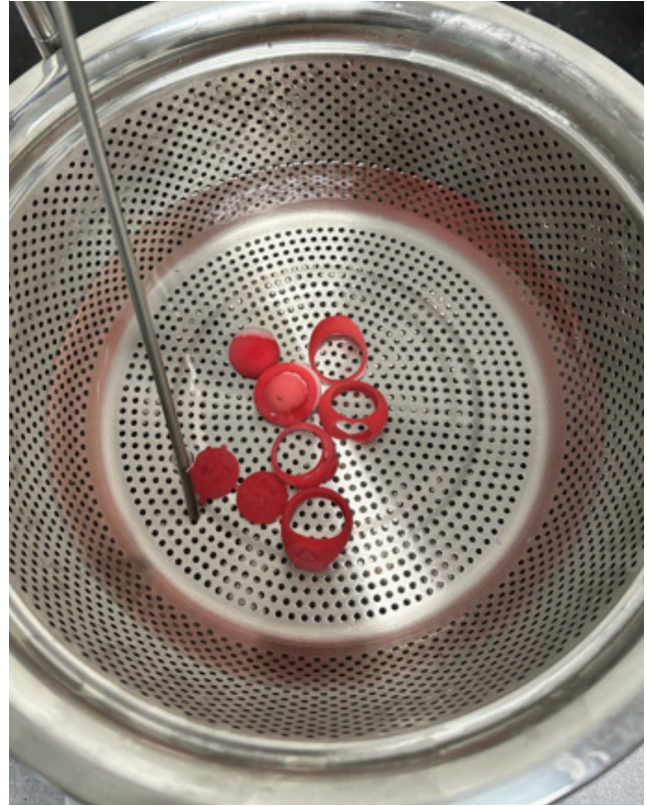
3. Put the models into the mesh basket. Do not put too many models in the basket at once time to avoid collision.




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

5. 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.

6. 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. It is recommended that no more than 100-120 grams of supporting material dissolved per liter of dissolved solvent.

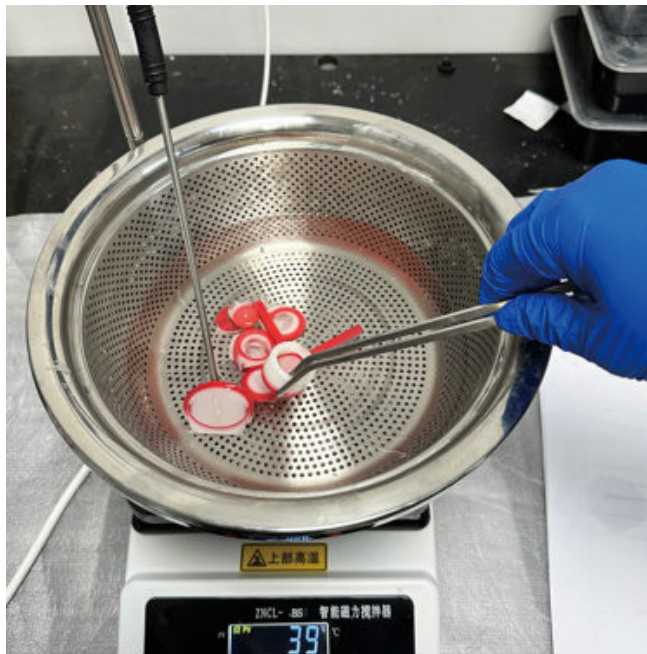
7. Please take out the models on which the support material has been removed; do not let the models be immersed into the solvent for a long time.



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



9. 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.

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

## 7.2 Build Plate Clean Up

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 stirrer.
3. Wipe with dustless paper after surface residue material is softened.
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

Some routine maintenance for the WaxJet 510 XHD is necessary.



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

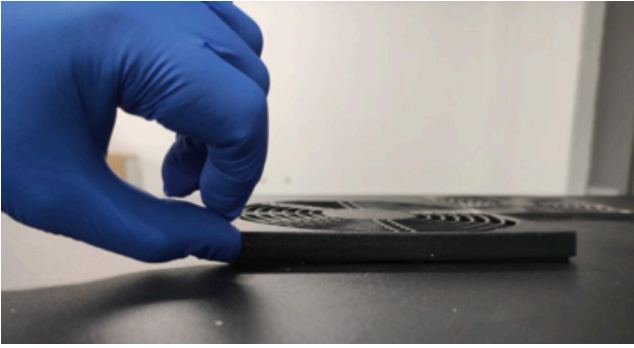
## Maintain the schedule

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

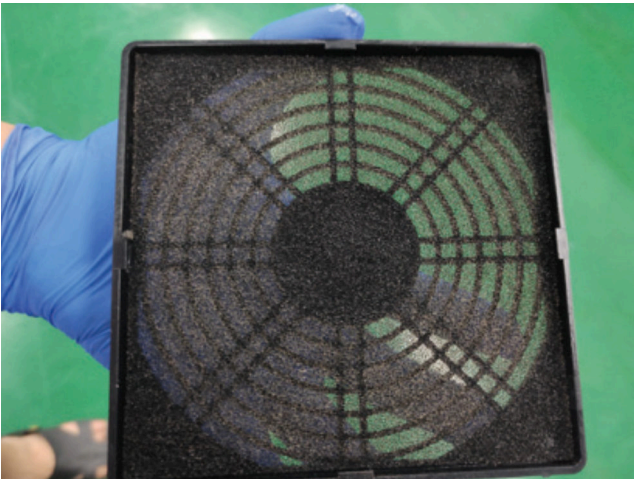
Maintenance task	As needed	Every day	Every week	Every month	Every half year
Clean top fans filter			✓		
Clean the primary efficient filter			✓		
Replace the primary efficient filter					✓
Clean the waste box	✓				
Daub oil for X-axis guide					✓
Daub oil for Y-axis guide and the motor screw rod					✓
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 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: 18-26 degrees C (64-79 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 an extended period of use, dust will build up in the filter. Remove the dust build up with a vacuum cleaner.

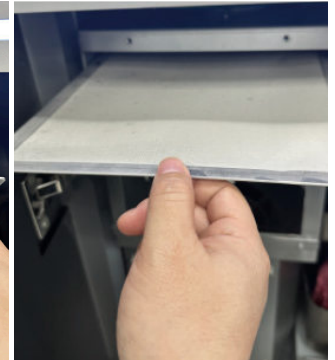


### Clean the primary efficient filter

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

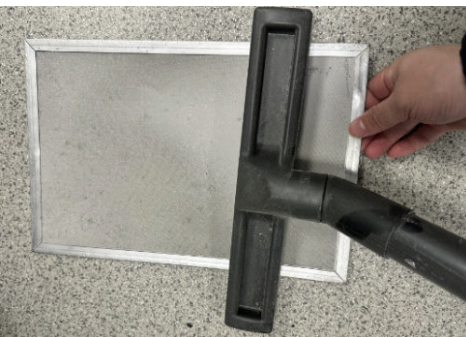


First remove the filter cover, then uninstall the filters.





After an extended period of use, dust will build up in the filter. Remove the dust build up 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.**



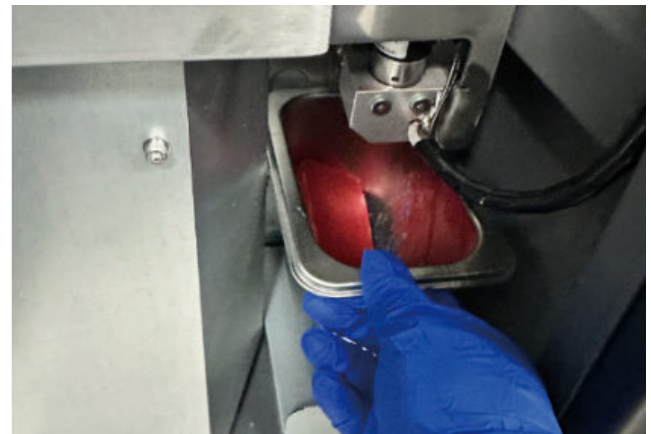
The filter that needs to be replaced



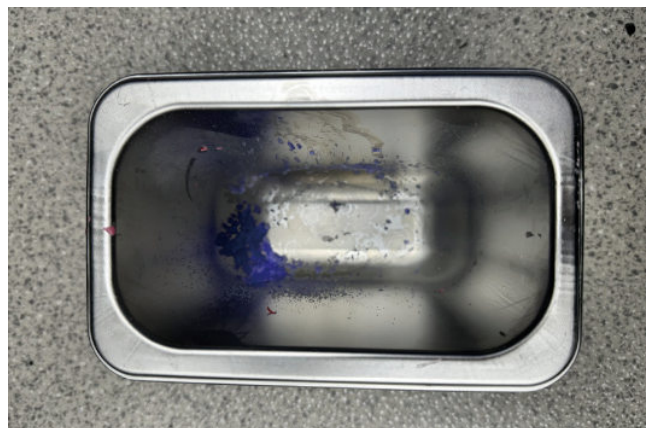
The new filter

### Clean the Waste Box

Open the left door of printer and remove the waste box



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.





### Apply oil on the X-Axis Guide

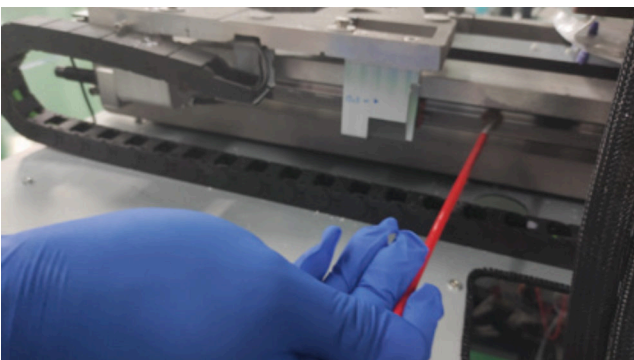
Using rubber gloves, apply a small amount of ethanol to a lint-free cloth.



Clean the guide with a lint-free cloth.



Apply oil to the X-Axis guide via brush.

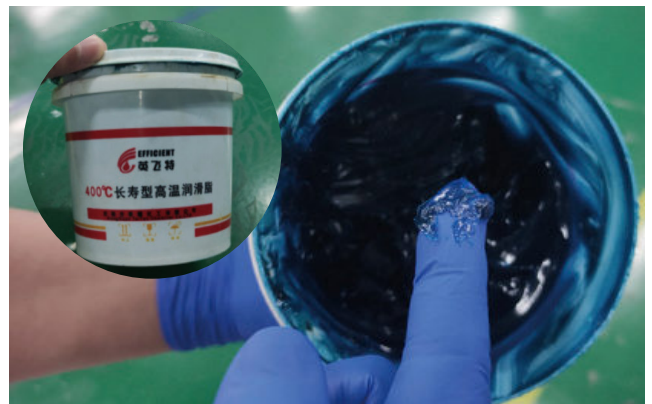


### Apply Oil to the Y-Axis Guide and the Motor Screw Rod

Apply oil to the Y-Axis guide via brush.



Use rubber gloves to apply grease to the Y-axis screw rod.



### Apply Oil to the Z-Axis Guide and the Motor Screw Rod

Using rubber gloves, apply a small amount of ethanol to a lint-free cloth.



Clean the guide using a lint-free cloth.



Apply oil to the Z-axis guide via 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 an extended period of time can cause nozzle damage, please follow these steps to clean up the internal dust:**

Use a vacuum cleaner to clean the residual wax from the X-axis base.

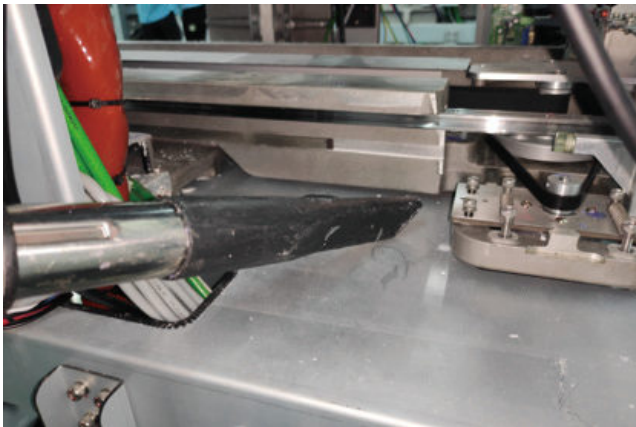




Use a vacuum cleaner to clean the dust from the filter.



Use a vacuum cleaner to remove the dust from inside the printer.



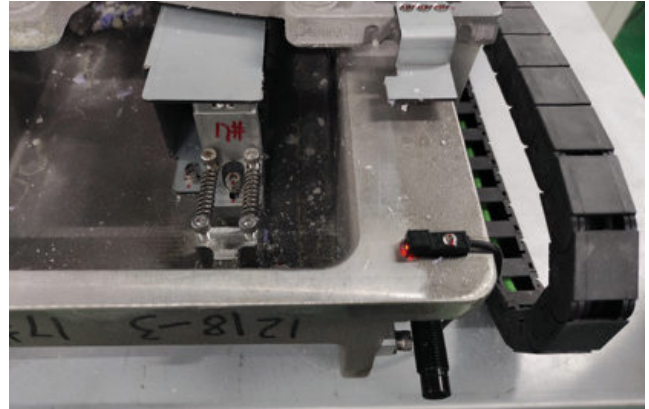
### Clean dust around the sensors

After long-term use, dust will accumulate near the sensor and must be cleaned up to ensure proper operation. Follow the procedures 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 away all dust surrounding the sensor.

4. After removing any dust from 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.

Using rubber gloves, apply a small amount of ethanol to a lint-free cloth.



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

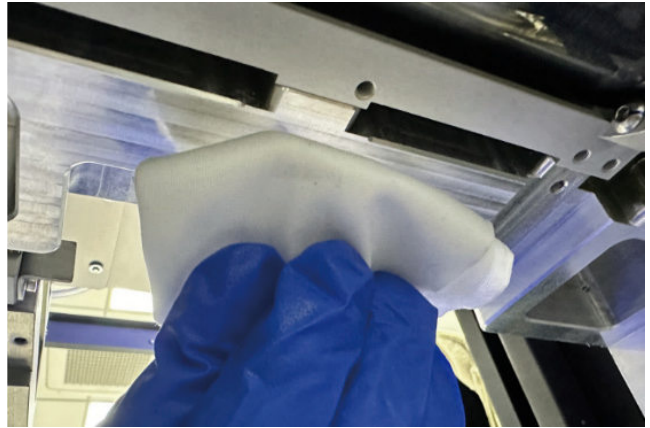


## Clean the Bottom Side Of Y-Beam

Using rubber gloves, apply a small amount of ethanol to a lint-free cloth.

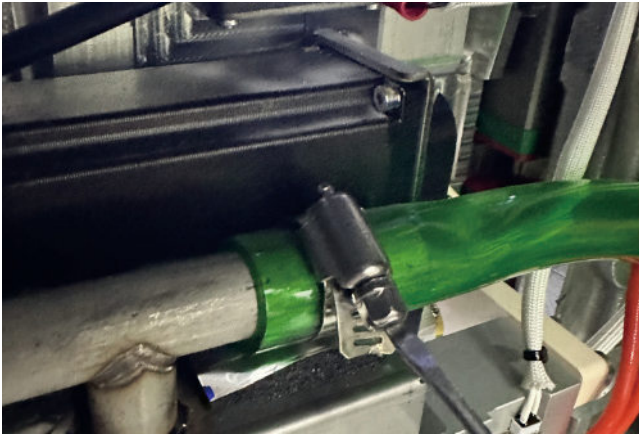
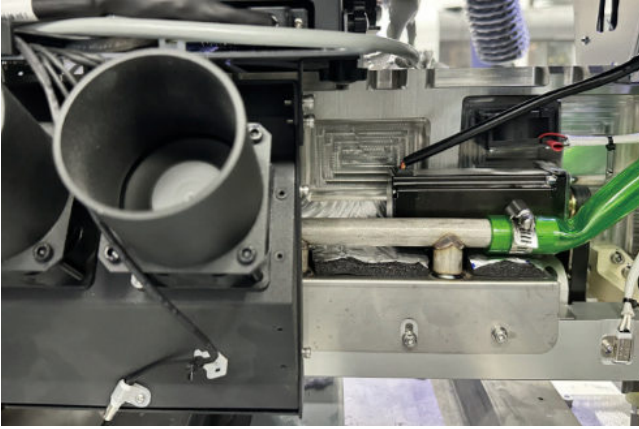


Remove the wax and dust on the whole Y-beam with the lint-free cloth.



### Powder Removal for Pipes

Unload the rubber pipe from the direct connection.

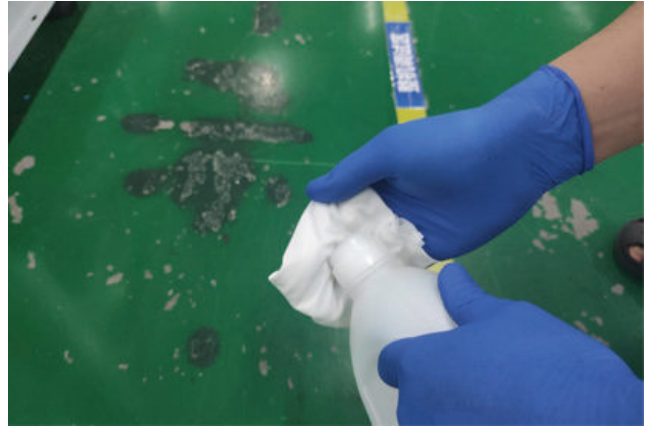


Clean up the dust in the pipe via the vacuum.



### Clean the Scraper

Using rubber gloves, apply a small amount of ethanol to a lint-free cloth.



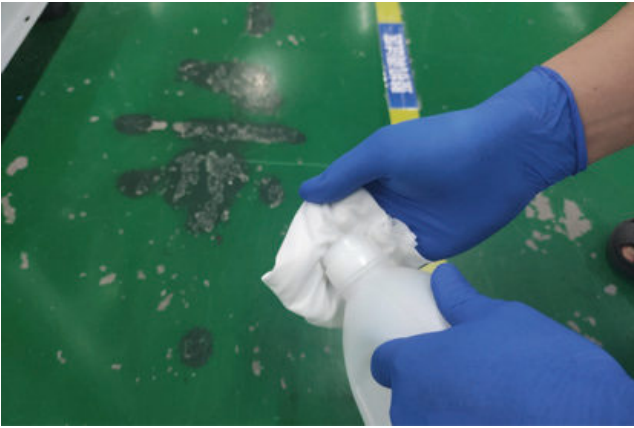
Wipe the rubber scraper clean with the cloth.



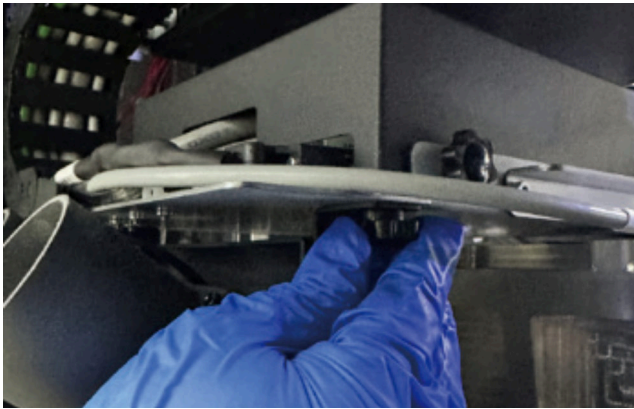


### Clean the Planarizer and Its Blade

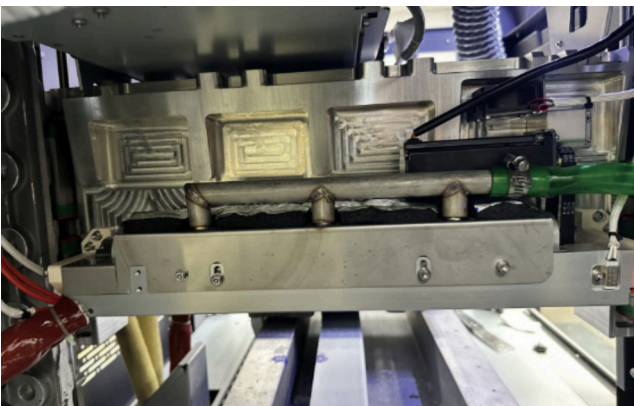
Using rubber gloves, apply a small amount of ethanol to a lint-free cloth.



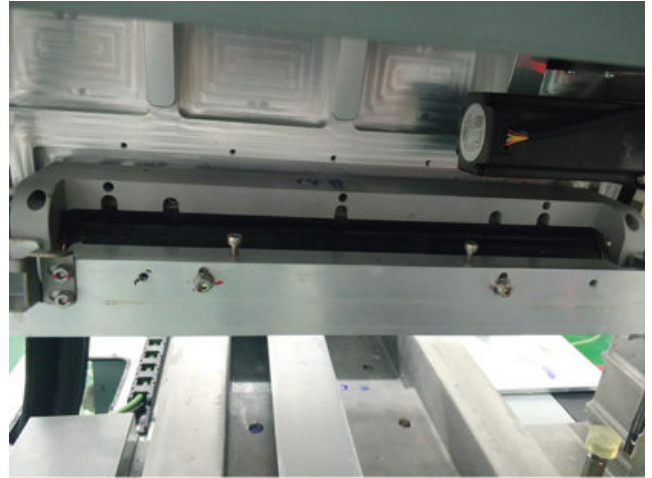
Loose the rear fan fixing screws



Remove the rear fan.



Unload the cover for powder filter.



Clean the blade with a lint-free cloth with ethanol applied.



Clean the planarizer from the back lower side of the printhead carriage using a lint-free cloth with ethanol applied.



# Chapter 9 Troubleshooting

If the printer detects an issue that may affect printing, it is indicated in the alert information page. This chapter introduces the troubleshooting and follows the steps to solve the main failures of ® WaxJet 510 XHD.

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 shrinks.

WaxJetPrint client software provides a 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 510	FFWJ1200	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:

$$\text{X-scale factor} = 100\% + (\text{XCAD} - \text{XPART}) / \text{XPART} \times 100 (\%)$$

$$\text{Y-scale factor} = 100\% + (\text{YCAD} - \text{YPART}) / \text{YPART} \times 100 (\%)$$

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"

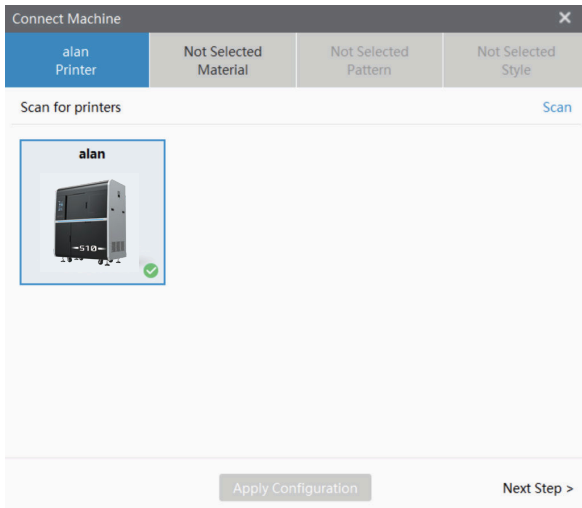
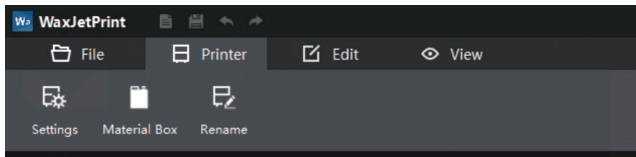
The Y-size of the printed part = 4.989"

$$\text{X-scale factor} = 100\% + (3.000 - 2.998) / 2.998 \times 100 = 100.067\%$$

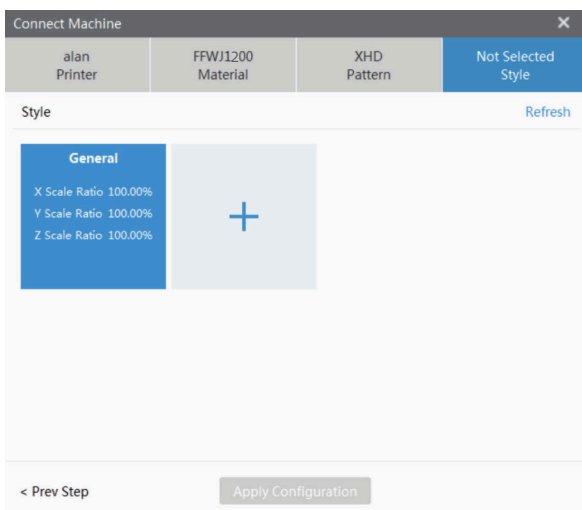
$$\text{Y-scale factor} = 100\% + (5.000 - 4.989) / 4.989 \times 100 = 100.22\%$$

## Set the shrink scale

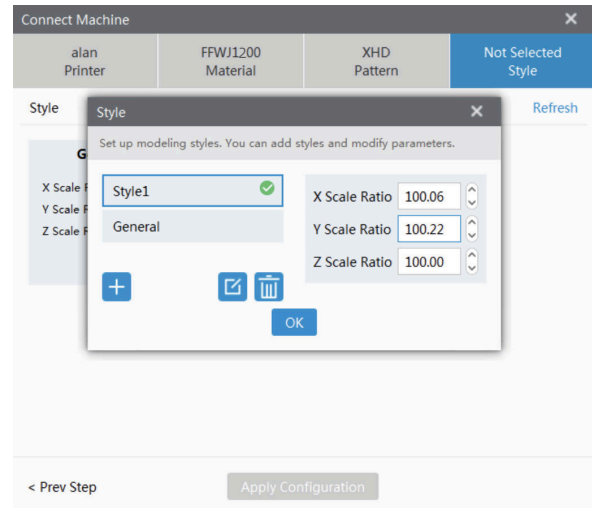
1. Open the WaxJetPrint client software and select Print > Setting > Connect machine.



2. Choose the printing mode.



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



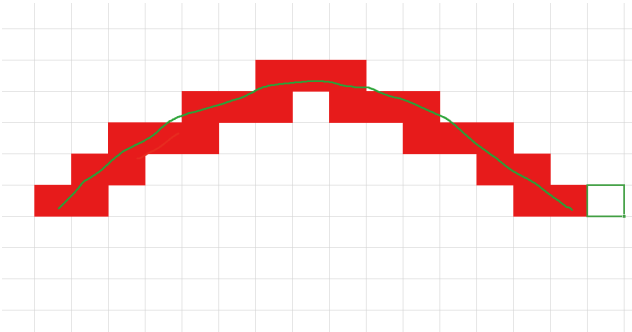
4. The printer has defaulted to a new set of shrink compensation values. The information window in the lower right corner shows the corresponding new maximum printable dimensions for the XYZ based on each shrink compensation values. You can now use these shrink compensation values when loading jobs and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



## 9.2 Layout Guide for Models

### 9.2.1 Model Slicing Principle

- ◆ Based on Cartesian Coordinate System, the XY plane images are ripped according to the 1200DPI grid and Z axis is layered with 0.015mm thickness.
- ◆ After ripped, 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

- ◆ WaxJet510, 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 avoid 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 Repeated 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 automatically 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 printheads.

#### 3. X-Tools Interface

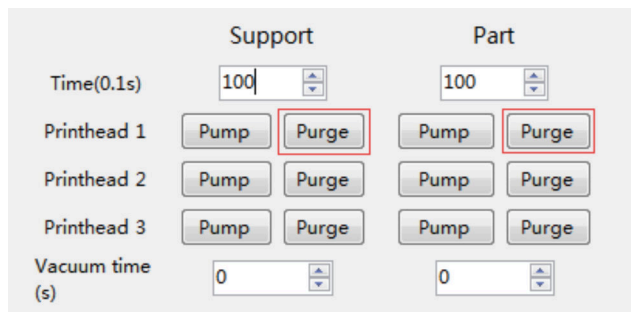
Based on the above automatic steps, operation under X-Tools mode is to be performed manually step by step, making it applicable to seriously clogged printheads.

### 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 avoid the material dropping when 3D printer are in ready 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.

### 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-Axis .

#### 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 510 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 February 1st, 2024.

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 reseller 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. For all end customers, the warranty period will be 365 days from the installation date of the WaxJet 510 printer. Apart from the general coverage discussed below, this warranty does not include additional protection.

2. End customers should note that your warranty service may have been transferred to our authorized distributors. Therefore, it is advisable to contact our after-sales service team in advance to confirm your warranty scope.

3. Before using our equipment for the first time, you should have obtained an equipment operation certificate or employed staff who have been trained and certified to operate the equipment through our training program to ensure proper startup and use of the equipment.

4. This after-sales service agreement only applies to the main components and machine casing components of the 3D printer, such as its electronic modules and lifting components. All software and wearing parts are not included, including materials used for printing models.

5. The following accessories are not covered by the warranty: build plate, USB flash drive, printing materials, nitrile gloves, scraper, dust-free cloth, stabilized power supply, magnetic stirrer, stir bar, constant temperature heating plate, stainless steel basin, stainless steel slotted ladle, tray, measuring cup, stainless steel tweezers, oxygen pump, water bath, plastic bag, Allen wrench, filter, filter screen, filter cotton, fuse, open-end wrench, tool kit, and tools within the kit.

6. The following situations are not covered by the warranty:  
① Inability to provide a valid after-sales service card or inconsistency between the equipment serial number and the after-sales service card.

② The warranty period of the entire machine and parts has expired.

③ Defects or disqualifications caused by external events (including floods and power surges).

④ Use of non-original 3D accessories. "Original 3D accessories" refer to parts, components, materials, and consumables manufactured by our company.

⑤ Modification, repair, or assembly of the equipment by any party other than our company or our authorized distributors who repair equipment.

⑥ Failure to use the equipment according to our after-sales training content and user guide.

⑦ Equipment malfunction or damage caused by incorrect installation or use by you.

⑧ Equipment malfunction or damage caused by use in non-specified working environments.

⑨ Equipment malfunction or damage caused by misuse (including exceeding workloads) or abuse by you.

⑩ Equipment malfunction or damage caused by improper maintenance (moisture, mold, or exposure to extreme climates) by you.

⑪ Normal wear and tear, aging, or appearance scratches or defects caused by operation of the equipment.

7. Our after-sales service scope includes parts for replacement that may be non-new parts. But we ensure that the parts function normally. Any replacement parts provided for the equipment are only covered by the remaining time of the original warranty period.

8. Our company or our authorized distributors are only responsible for defects or other disqualified products reported in a timely manner during the warranty period. Warranty liability is limited to repairing or replacing defective parts with new or refurbished original parts.

9. Please send defective parts with the original packaging to our designated repair station. If the original packaging is lost, you can request packaging standards from us and package the parts following the standards. You must use express delivery that ensures we receive the defective parts within thirty days and ship them to our designated repair station.

10. If you use incorrect packaging or we do not receive defective parts within the specified time, or if the parts are damaged upon receipt and do not match the reported defects, we reserve the right to refuse to provide warranty service, and you will be responsible for purchasing replacement parts.


11. This after-sales service agreement is the only warranty term for the equipment. Software enjoys separate warranty under applicable end user license agreements. To the maximum extent permitted by law, our company expressly disclaims all other warranties for the 3D printer and its components, whether express, implied, or statutory, including warranties of non-infringement, merchantability, and fitness for a particular purpose.

12. Warranty shipping terms:

When spare parts within the warranty period need to be returned to the factory for repair as confirmed by our after-sales engineers, we will bear the round-trip shipping costs. If spare parts out of the warranty scope need to be returned to the factory for repair as confirmed by our after-sales engineers, end customers shall bear the round-trip shipping costs.



# 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 510 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: **631-573-7746**

After-sales customer service email: [support@romanoff3d.com](mailto:support@romanoff3d.com)

# ***ROMANOFF3D***

***3D PRINTING SPECIALISTS, LLC***

After-Sales Service: [support@romanoff3d.com](mailto:support@romanoff3d.com)