

Industrial Grade Jewelry Wax Pattern 3D Printer

# PL6100

## User Guide



**Note:** Please read this User Guide carefully before using the product. Please use this product correctly based on a thorough understanding of the content. Please keep this Guide properly for future reference.



## Copyright Notice

This manual and its contents are intended solely to provide comprehensive guidance for the safe operation and proper use of this product. The intellectual property rights are owned by **Shenzhen Plempire 3D Technology Co.,Ltd.**( Hereinafter referred to as “**Plempire**”).Without the prior written authorization of **Plempire**, no part of this manual may be reproduced, distributed,modified,or provided to any third party in any form.

## Manual Scope Description

This manual is primarily designed for the **PL6100** 3D printer. Please note that some accessories or features mentioned in this document are optional or available as upgrades, and may not be included in your specific product package. Please use the instructions that correspond to your exact model and configuration.

## Version and Update

After firmware or software upgrades, the **Device info** page in the **PL6100App Tools** menu will update the relevant software and hardware information. To click **Tools —Device Info** to view detailed information. In the event of any discrepancy between this manual and the firmware release notes,the firmware release notes shall prevail.

## Image and Parameter

The images shown in this manual are for illustrative reference only. The actual effect and features may vary due to different software or firmware versions.

## Preface

Dear Valued Customer,

Thank you for selecting **Plempire 3D** wax pattern printer and for your ongoing trust and support in our brand. At **Plempire**, our core mission is to provide high-quality products together with professional, all-round services. We focus on precision **3D** printing, continuously advancing our technologies to drive the digital transformation of jewelry manufacturing and innovate conventional production workflows.

If you have operated earlier models including the **PL2000 Plus** and **PL3000** series, we still recommend carefully reading this manual prior to operating the **PL6100**. Our technical support team stands ready to offer assistance. Should you encounter any equipment faults or operational questions, please contact us via **Whatsapp, WeChat**, after-sales hotline or email. We sincerely hope your **PL6100** printer brings improved productivity and greater business value to you.

This **PL6100** User Guide elaborates on **3D** printing principles, installation, parameter setup, operation procedures and routine maintenance. The user guide consists of 9 Chapters and 2 Appendices:

- Chapter 1: Product Introduction
- Chapters 2 & 3: Preparation before printing & Printing Operations
- Chapter 4: Post-processing
- Chapter 5: Print Quality
- Chapter 6: Regular Maintenance
- Chapter 7: Packaging and Shipping
- Chapter 8: Warranty and Service
- Appendix A: **PL3D** Print Software
- Appendix B: Printer Power On / Off Flowchart

Please note that every printer undergoes rigorous quality testing prior to shipment. A small quantity of residual wax inside the **PrintHead** or slight scratches on the build plate are normal . These will not impair printer safety, nor will they affect the final printing quality.



## Read Before Use

### ■ Safety Symbols and Definitions



#### **Wear Gloves:**

Please wear Nitrile protective gloves to use Isopropanol (IPA) to clean the maintenance parts, please wear heat-resistant gloves when touch printers hot place to avoid burns.



#### **Wear Glasses:**

In the case of possible material splashing during maintenance or repairing, please wear protective glasses with side shields to protect the eyes.

### Operation and Maintenance

- ✧ For reliable operation of the printer's internal precision mechanisms, perform routine maintenance regularly.
- ✧ Read all the instructions for the **3D** printer. The printer is only operated by personnel who have received professional training.
- ✧ Cleaning solvents including isopropanol and anhydrous ethanol must be stored separately from printer. Keep these chemicals away from direct sunlight and heat sources, and store them inside a dedicated solvent storage cabinet.
- ✧ The printer supports automatic switching between the main and auxiliary bottles. When one bottle runs empty, remove it promptly and install a new material bottle. Please do not refill empty used bottles with any other liquid materials, as this may cause printing malfunctions.
- ✧ Genuine **Plempire** official printing materials deliver the best possible printing performance for this equipment. Extensive testing has been carried out on these official materials to confirm their compatibility, safety and stable operation, ensuring reliable and superior print quality.
- ✧ Should any abnormalities occur during operation, check the alarm information displayed in the upper-right corner of the touchscreen home page. In case of a fault, please refer to Chapter 6 to confirm that routine maintenance has been completed. Then consult the SOP technical documents provided by the **Plempire** or contact **Plempire** team for technical support.

## Precautions

### ■ Printer Installation Environment

- 1. Environmental Requirements:** The printer must be installed in a clean, well-ventilated workshop. Do not place the equipment in areas prone to vibration or instability, as this can significantly compromise print accuracy. Keep the printer away from water, oil, and other liquids. Do not operate the printer during thunderstorms or typhoons.
- 2. Temperature & Humidity Standards:** Ambient temperature: Maintain between 18°C and 23°C. Relative humidity: Keep within 30% to 70%.
- 3. Space Requirements:** Printer dimensions: 1310×770×1670 mm (L×W×H). Advised minimum installation space: 3.3m (length)×2.7m (width), totaling at least 8.9m<sup>2</sup> of floor area.

### ■ Printer Power Distribution Specifications

- 1. Power Supply Specifications:** AC 220V, 50Hz. The connection must include Live (L), Neutral (N), and Protective Earth (PE) wires. The incoming power cable conductor cross-sectional area must be  $\geq 6 \text{ mm}^2$ .
- 2. Power Distribution Configuration:** Each unit must be equipped with a dedicated circuit breaker rated at  $\geq 40\text{A}$ , and use a 25A three-pin plug.
- 3. Supporting Equipment:** Install a 10 kVA voltage stabilizer to improve power supply stability.

### ■ Safety Precautions for Equipment Operation

- 1. Operator Requirements:** Do not operate the equipment under the influence of alcohol or medication. Do not touch the build plate while printing is in progress.
- 2. Component Contact Warning:** Avoid areas marked with electric shock and pinch hazard labels to prevent burns and mechanical cuts.
- 3. Emergency Handling for Molten Material Contact:** Rinse skin contaminated with molten wax with cold water immediately. If molten wax enters the eyes, flush continuously with clean water for 10 minutes and seek medical attention promptly.



## Material disposal and storage

- ✧ **PL6100 Printer** uses eco-friendly wax material as the printing raw material. This wax is specially designed for jewelry wax mold casting and forming, and must not be applied to food processing, medical devices or any other medical-related scenarios.
- ✧ Each material bottle features a product label on its side showing the production date, expiry date, batch number, manufacturer and other relevant details. A unique material identification label is fitted to the bottle top. The printer scans this label to automatically identify the material model and check the remaining material volume inside the bottle.
- ✧ Printing materials should ideally be stored in a constant temperature environment of 18~25 °C with relative humidity ranging from 55~65%. Store the materials in a sealed, dust-proof and dry location. Do not expose printing materials to direct strong light for an extended period, and keep them away from open flames and heat sources.

Support material label

Support material ID label

Part material label

Part material ID label



## Disposal Responsibilities

- ✧ **Waste Wax Material and Scrap Wax:** Innovation 3D assumes no responsibility or obligation for the disposal of waste wax materials or scrap wax. All liability and responsibility for the compliant disposal of such materials shall be borne solely by the user. Finished wax patterns may be disposed of in accordance with the standard disposal guidelines for household wax products available on the market.
- ✧ **Waste Isopropyl Alcohol Solution:** For the disposal of waste isopropyl alcohol solution, please refer to the relevant specifications provided in the Material Safety Data Sheet (MSDS) supplied by its manufacturer.

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## Use Guide



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## Quick operation steps

1. Read the instructions in **Read before use**.
2. Start first print.
3. Start the print job from **PL3D PRINT** software.
4. Post-Processing (remove support material)
5. This section outlines common print quality issues and their troubleshooting procedures, along with other typical faults and recommended remedies.

## Additional information

To learn more about our products, service and related links, please visit our corporate **WeChat** Official Account、**Plempire Wiki** ( **Plempire** knowledge base ).





## Symbol Guide



### NOTE

Supplements and interprets the main content.



### TIPS

This section provides operational optimization suggestions, efficiency methods and practical operational skills to help users operate the printer with higher efficiency.



### CAUTION

Adhere to operational precautions to safeguard print quality and printer performance. Improper operation may lead to unexpected faults, therefore please always follow the standard operating procedures.



### DANGER

Potential hazards exist. Failure to follow these instructions may result in printer's damage or personal injury to operators. Always comply with the relevant guidelines.

## Technical Support

If you experience any issues during equipment operation, please first refer to this user manual.

You may also access equipment maintenance guidelines, fault diagnosis procedures and troubleshooting solutions via our official **WeChat** service account or by visiting the company website:

[www.plempire.cn](http://www.plempire.cn).

## 3D Printing Technology

3D-printing technology produces three-dimensional solid objects from digital 3D models by sequentially adding and stacking materials. Its core principle slices 3D models into 2D cross-sections; such as nozzles or lasers to deposit or melt and solidify materials at specified locations, building complete objects layer-by-layer inside the printer. Known as additive manufacturing, it differs from traditional subtractive manufacturing that removes material. 3D additive printing employs casting wax and other binders to fabricate models via layer-by-layer stacking.

### ■ Working Principles

The working principle of the 3D printer covers model construction, layered slicing, path planning, material delivery and material deposition. The printer imports digital models in 3D formats such as STL. Slicing software converts the model into hundreds to thousands of cross-sectional layer data on a plane. The ink circuit melts the printing material and transports it to the **PrintHead**. The motion system controls the **PrintHead** to perform jet printing on the horizontal(**XY**) plane and governs its upward movement along the **Z**-axis.

**PL6100** printer adopts piezoelectric **PrintHead** and MJP multi-nozzle jetting technology, and realizes fused deposition forming using eco-friendly high-performance casting wax material. The equipment follows sliced data to control printing trajectories. The **PrintHead** jets material on the **XY** plane and builds up solidified parts layer by layer along the **Z**-axis. The whole machine consists of three major systems: Printing System, Motion System and Ink Circuit System.

### ■ Core Component

#### ◇ Printing System

**Xaar** 720npi Resolution PrintHead

Material Recirculating Unit

Roller Assembly

#### ◇ Motion System

XYZ-Axis Closed-Loop Motion Control Unit

#### ◇ Ink Circuit System

Intelligent Ink-Route Control Board



## ■ Process workflow

Please refer to the following 3D-printing workflow diagram: Model Creation、Model Edition、Model Printing、Post-processing.

### Model Creation

#### 3D Software Modeling

Create 3D models using 3D-modeling software, such as **Rhino**, **SolidWorks**, **UG**, **Onshape** and other 3D-modeling software.

#### 3D Scanner

Scan physical samples with a 3D scanner to rapidly generate 3D digital models. The Scanner can fully capture geometric data of physical parts, eliminating the tedious procedure of manual modeling from scratch and effectively shortening the product development cycle.

#### Download model files via network

Construct 3D models using online resources and obtain pre-built 3D files from dedicated 3D-model platforms. Model selection shall follow 3D-printing process design specifications. Give priority to widely-used file formats for 3D printing including STL, SLC and OBJ.

### Model Edition

JewelCAD software enables overall layout of 3D models. With built-in parametric modeling and stone-setting tools, it offers high compatibility and supports **Rhino** model import for fine-machining alignment before production. It can automatically compute gold material costs and accept STL and SLC files. Import finalized laid-out model into **PL3D Print**. Supports initial and secondary layout adjustments. Configure layout parameters, then send jobs to the printer via **PL3D Print** for printing.

### Model Printing

**PL6100** Printer Wax Pattern Forming Workflow: Model Editing & File Transfer, Material Loading & Preheating, Wax Pattern Printing

#### ① Model Editing & File Transfer

Import STL-format files into the **PL3D Print** software supplied with the workstation. Complete model placement and layout adjustment within the software. Connect the printer to the workstation PC via Ethernet cable (wireless network), and send print files to the printer through **PL3D Print**.

## ② Material Loading & Preheating

Install the wax bottle in the bottle cartridge of the material drawer for material loading. Continuously heat new material for over 6 hours to achieve full melting inside the bottles and satisfy the fluidity requirements for print forming.

## ③ Wax Pattern Printing

After the printer completes initialization(**Reset Printer**) and automatic verification without errors, and material heating is finished, the touchscreen prompts: the printer is ready. Then Enable the Air-Ink system, select a print job, and start wax pattern printing.

### Post-processing

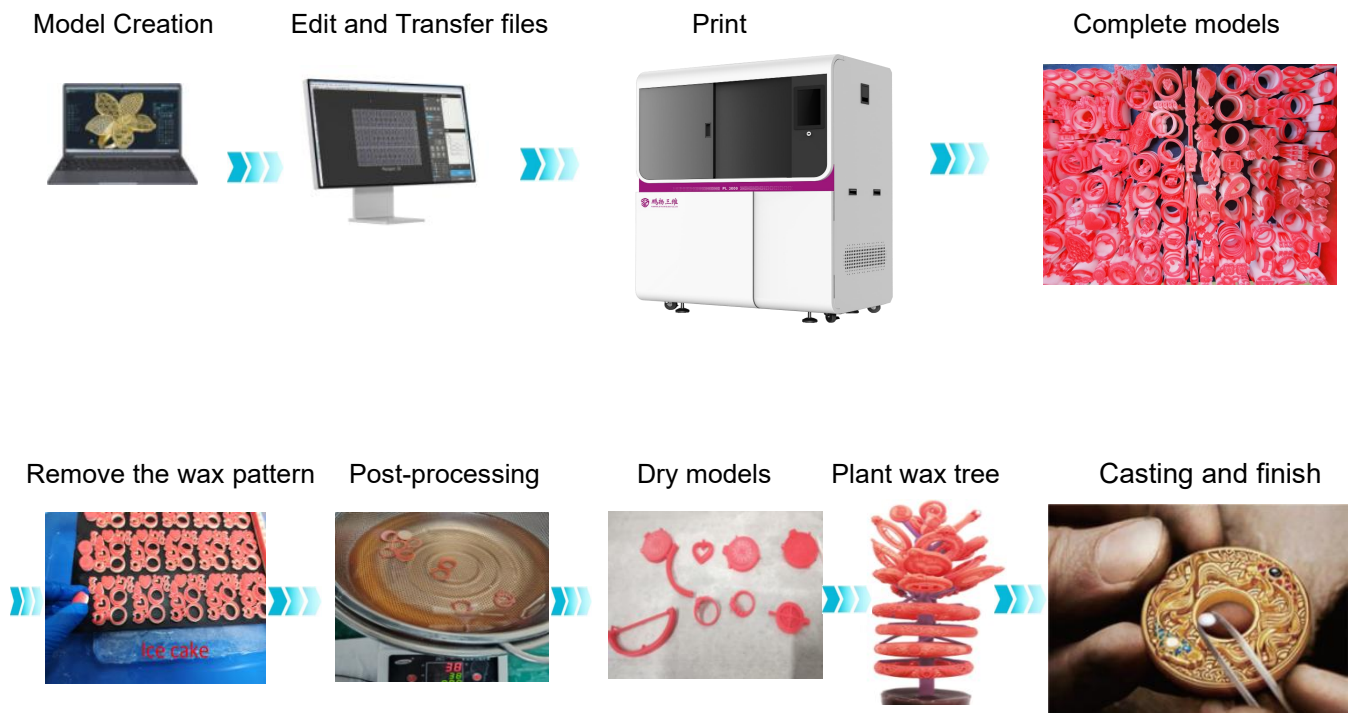
When the print job finishes, take out the formed wax pattern and immerse it in dedicated cleaning solution for soaking-washing. Thoroughly separate and remove the support white wax material on the model. For detailed wax washing, refer to **Chapter 4 Post-processing** of this document.



#### Note:

Contact **Plempire** to obtain the installation activation code for **PL3D Print** software. For installation and usage of **PL3D Print** software, refer to Appendix A **PL3D Print** Software.

### PL6100 3D Printer Wax Pattern Forming & Casting Process Diagram





## Chapter 1 Printer Introduction

### 1.1 Features & Applications

#### Features

PL6100 Printer enables ultra-thin layers down to  $15\mu\text{m}$ , specially developed for high-precision ultra-fine wax patterns. It reliably reproduces delicate textures and sharply-defined contours for jewelry. Finished parts deliver good surface smoothness with crisp, well-defined edges and corners.

#### High Resolution

Boasting an ultra-high 3D resolution of  $2900 \times 2900 \times 1700\text{dpi}$ , the **PrintHead** features 2,000 physical nozzles for high-fidelity intricate patterns and free-form geometries. The minimum layer thickness reaches  $15\mu\text{m}$  to achieve outstanding reproduction of micro-details.

#### Wide Forming Width

Both single-channel forming and three-channel synchronized printing modes are available, offering a maximum build width of 207 mm. The printer can rapidly switch between production for large-size and small-size work pieces. It supports differentiated orders of various specifications and batch sizes, providing outstanding production compatibility and flexible manufacturing capability.

#### High Cost Performance

Powered by intelligent lightweight slicing optimization technology and cost-effective printing materials, the system effectively avoids unnecessary material waste, reduces redundant material consumption from source, significantly cuts raw material usage and lowers overall producing costs.

#### Applications

##### Full-Range Jewelry Production



##### Custom Jewelry Fabrication

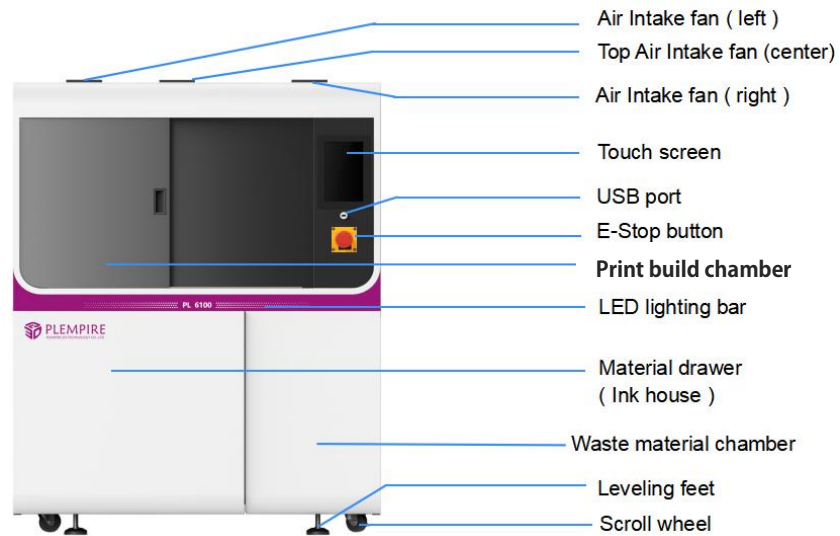


##### Cultural-Creative Models



## 1.2 Appearance & Structure

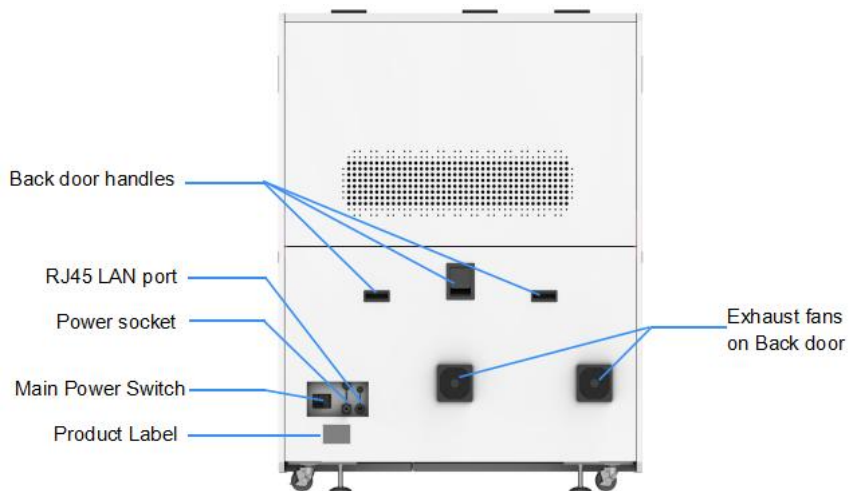
### ▪ Printer front view



### ▪ Printer side view

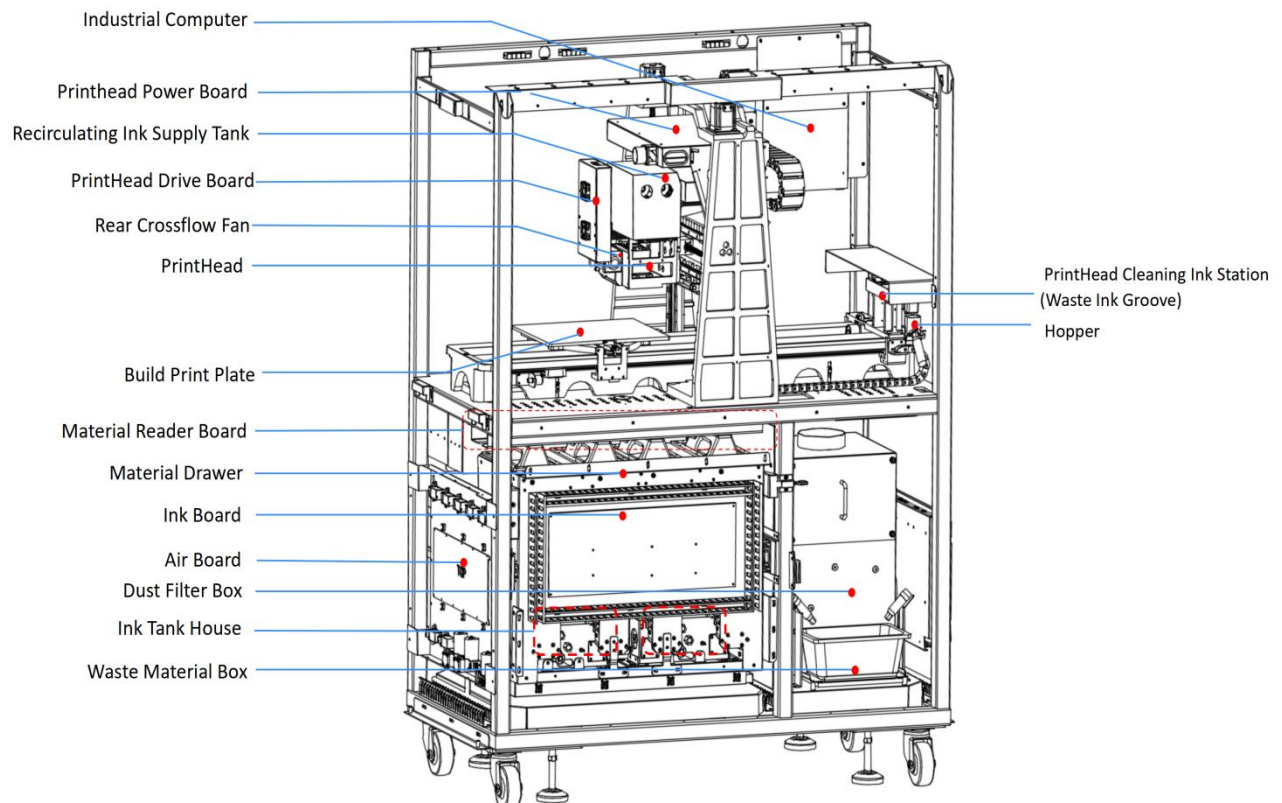


### ▪ Printer rear view

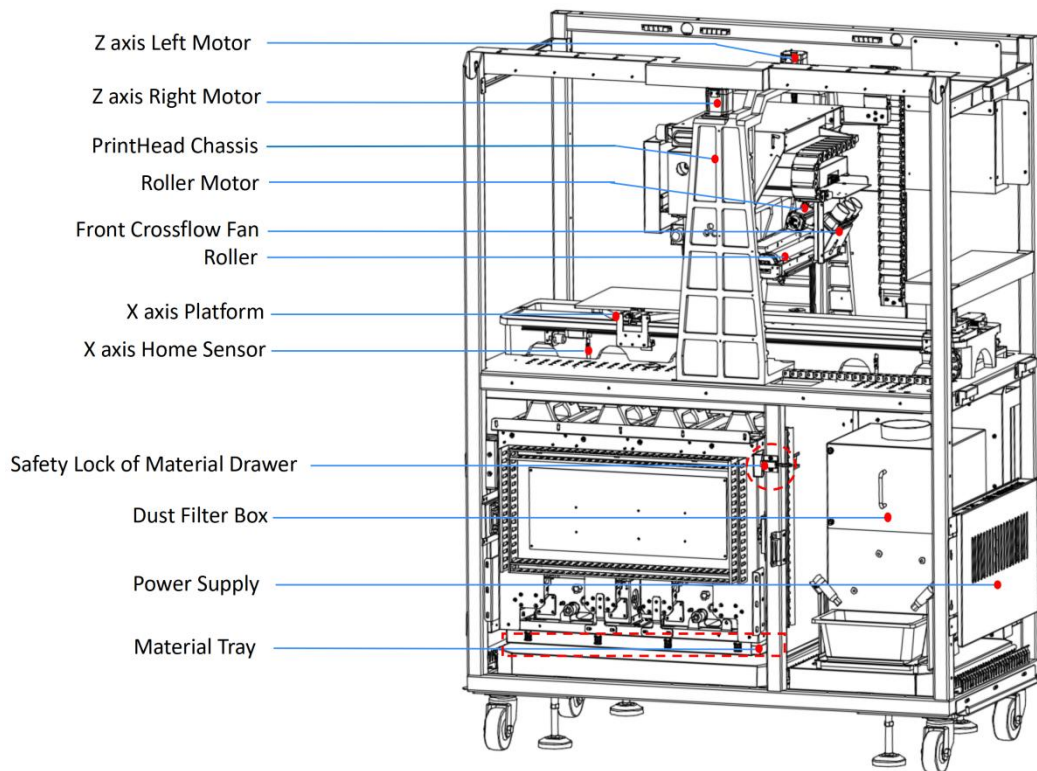




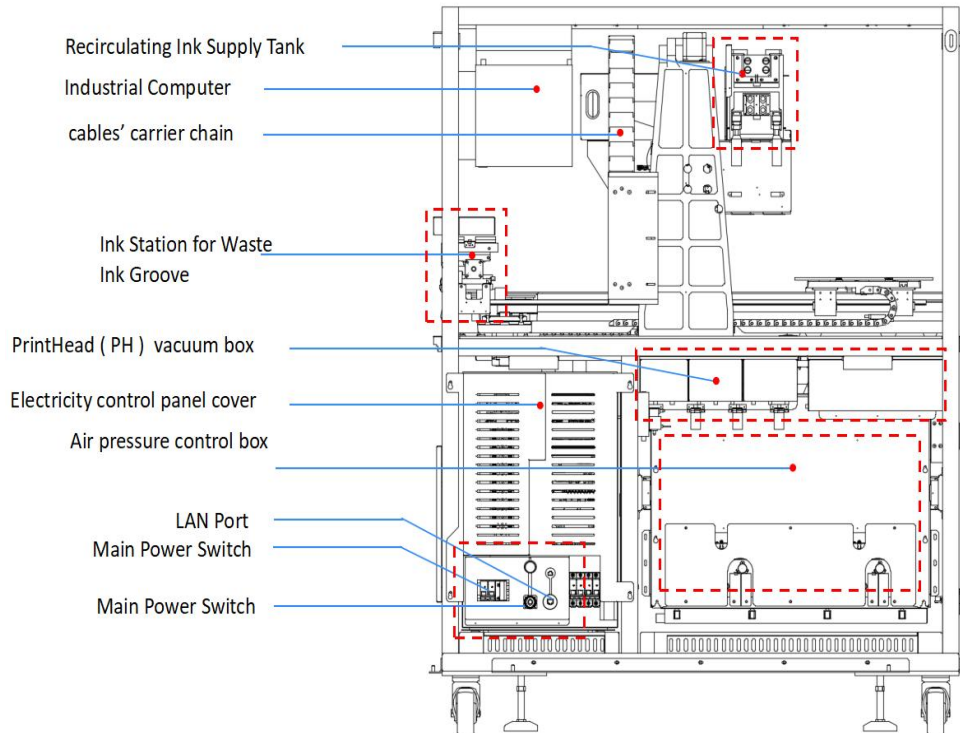
### ▪ Printer inside front view



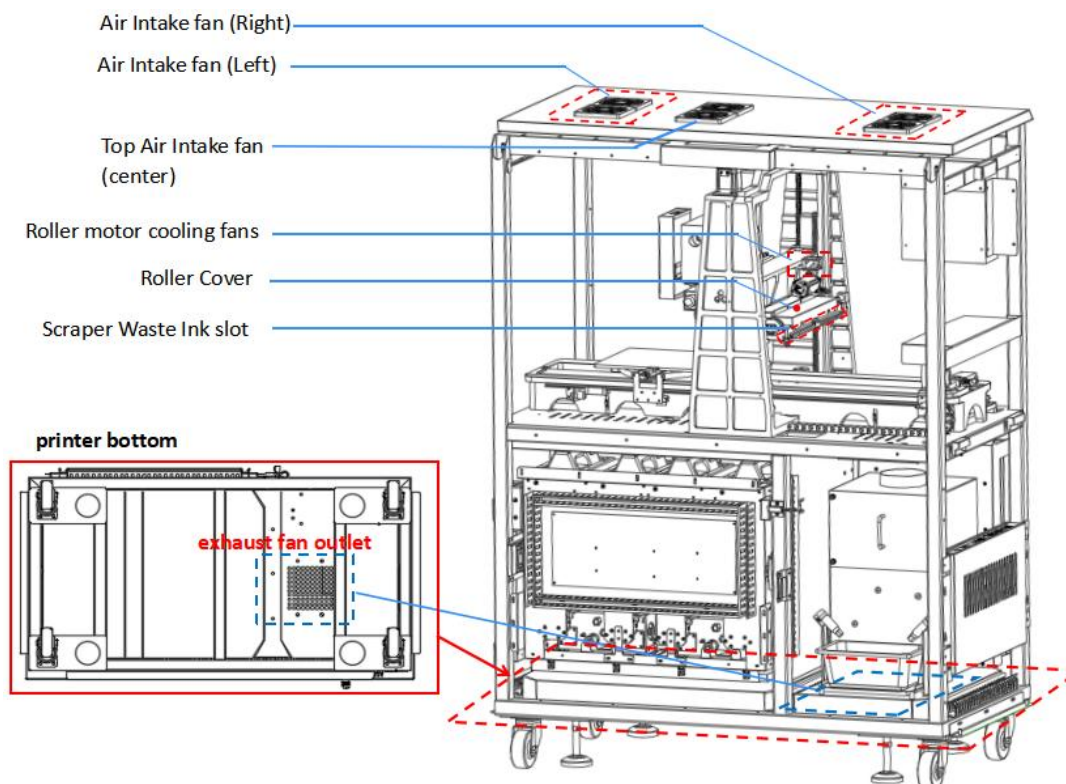
### ▪ Printer inside right view



▪ Printer inside back view



▪ Printer inside





## 1.3 Parameters & Accessories

### 1.3.1 Product Parameter

|                                           |                                                                              |
|-------------------------------------------|------------------------------------------------------------------------------|
| ◇ Print Dimension                         | 290x 207x 100 mm                                                             |
| ◇ Resolution(XYZ)                         | 2900x2900x1700 dpi, 15um                                                     |
| ◇ Accuracy                                | 0.04mm / 20 mm                                                               |
| ◇ File format                             | STL, SLC, OBJ                                                                |
| ◇ Material Package                        | Build Material (White) 1.5 kg /bottle, Support Material (Red) 1.6 kg /bottle |
| ◇ Machine size                            | 1310 x770 x1670 mm                                                           |
| ◇ Machine packing size                    | 1650 x 1000 x 1850 mm                                                        |
| ◇ Machine weight                          | Gross Weight: 630 kg, Net Weight: 480 kg                                     |
| ◇ Current and voltage                     | 220-240 VAC, 50/60 Hz, 23 A                                                  |
| ◇ Input / Output                          | 220-240 VAC, 50Hz, 23 A, have ground wire connection                         |
| ◇ Max. / Working Power                    | 5.5kW / 3kW                                                                  |
| ■ Voltage stabilizer / UPS Rated Capacity | ≥ 10 kVA                                                                     |
| ◇ Printer connection                      | Network 10/100/1000 Ethernet interface / USB interface                       |
| ◇ Operation system                        | Windows 10 (64 bit) / Windows 11                                             |

| Feature                     | Condition          | YHK-110                          | YHK-610                             |
|-----------------------------|--------------------|----------------------------------|-------------------------------------|
| Description                 | —                  | Contact-free soluble support wax | High resolution durable casting wax |
| Type                        | —                  | Wax support material             | Wax building material               |
| Component                   | —                  | 100% wax                         | 100% wax                            |
| Weight                      | —                  | 1.6 kg                           | 1.5 kg                              |
| Color                       | —                  | White                            | Red                                 |
| Density 95°C (Liquid)       | normal environment | 0.85 g/ml                        | 0.811 g/ml                          |
| Melting point               | normal environment | 55°C                             | 68°C                                |
| Softening point             | —                  | N/A                              | 63°C                                |
| Volume contraction          | —                  | N/A                              | 1.18%                               |
| Linear contraction          | —                  | N/A                              | 0.52%                               |
| Needle Penetration Hardness | —                  | N/A                              | 7.2                                 |
| Ash Content                 | —                  | N/A                              | 0.019%                              |

### 1.3.2 Supplied Accessories

- A complete packed PL6100 professional printing system include following accessories and materials.



2pc Print Build Plate  
(in spare parts box)



One Power Voltage  
Regulator



3pcs support Ink material  
boxes and 1pcs red Ink  
material boxes



One USB drive



1pc 3 meters network cable



One box of butyl rubber  
gloves



One set of hexwrenches



One scraper



One User guide



One pack of super fine dust-  
free fiber cloth



## 1.4 Unpacking and Installation

① Open the fix latches.



② Remove the fixing straps and outer packaging.



③ Assemble inclined wooden plate.



④ Raise the 4 printer leveling feet.



⑤ Push Printer down evenly from both sides.



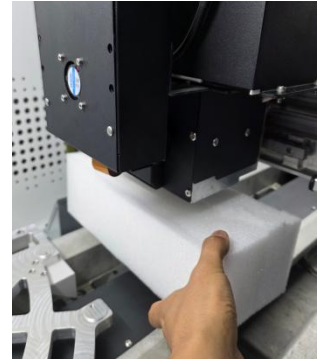
⑥ Remove the right-side door.



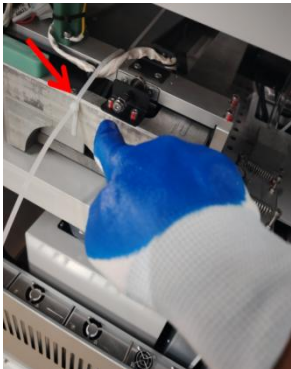
⑦ Cut off ties securing the X-axis platform.



⑧ Press down and gently pull out the **PrintHead** bottom protective cotton.



⑨ Cut ties for PrintHead cleaning Ink Station.



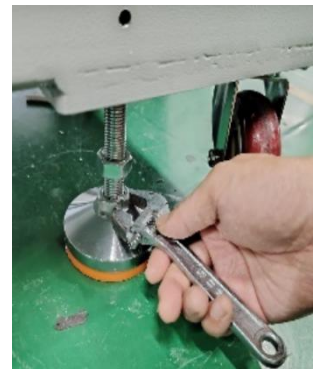
⑩ Cut ties for the waste material box



⑪ Install the build plate; adjust X-/Y-axis level.



⑫ Adjust leveling foot to adjust build plate levelness.



## 1.5 Technical Terms

| No. | Technical Term             | Description                                                                                                                                                                                                                                                                                                                         |
|-----|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Investment casting         | An industrial process based on lost-wax casting technology. A casting process via soluble and melted material.                                                                                                                                                                                                                      |
| 2   | 3D printing technology     | A technology uses support and structural materials for 3D-model printing models. The support material is wax-based, bonding the support to the build plate and providing model support. The structural material is also wax-based. Upon print completion, the build model remains attached to the build plate via support material. |
| 3   | Material density           | The mass per unit volume of materials in a specific volume state.                                                                                                                                                                                                                                                                   |
| 4   | Resolution                 | The number of pixels per inch (dpi). The key indicator of image quality.                                                                                                                                                                                                                                                            |
| 5   | Melting point              | The temperature at which the solid and condensed states of a material are in equilibrium under certain pressure conditions.                                                                                                                                                                                                         |
| 6   | Softening point            | The temperature at which a substance softens, mainly refers to the temperature at which amorphous polymers begin to soften.                                                                                                                                                                                                         |
| 7   | Support wax material       | A material for wax pattern base structure build on print build plate, which support the suspended structure and hollow structure.                                                                                                                                                                                                   |
| 8   | Part wax material          | Wax material used for model construction, which are provided to the PrintHead through umbilical as needed.                                                                                                                                                                                                                          |
| 9   | Post-processing            | The final process of removing the support material on the wax models. It's a process of cleaning models and generating smooth finished products.                                                                                                                                                                                    |
| 10  | Shrink rate                | It's used to adjust the expected shrinkage during model printing process, so that the size of the produced model can be closer to the actual size.                                                                                                                                                                                  |
| 11  | STL file                   | A file generated by using 3D modeling software such as Rhino3D, Maya, 3ds Max, etc., which can be used by 3D printer to print models.                                                                                                                                                                                               |
| 12  | Nozzles                    | The place where the nozzle sprays wax material. The printing material is extruded from the nozzles, and the material output from the nozzles directly affects the printing quality.                                                                                                                                                 |
| 13  | Test Nozzles               | It is a printing test task used to test the Nozzles' working status and printing quality of the Printhead.                                                                                                                                                                                                                          |
| 14  | X-axis                     | The direction of the print build plate's moving horizontally back and forth.                                                                                                                                                                                                                                                        |
| 15  | Y-axis                     | The front to back direction on the print build plate.                                                                                                                                                                                                                                                                               |
| 16  | Z-axis                     | The height of down-top direction of the models on the print build plate.                                                                                                                                                                                                                                                            |
| 17  | User Interface(UI)         | The user interface is located on the right side of the printer. Users can click on the UI interface to control or check multiple functions of the printer, such as print queue, printer maintenance, printer shutdown, etc.                                                                                                         |
| 18  | Print Build Plate          | A detachable plate used for building models. After printing is complete, the print build plate can be removed from the printer.                                                                                                                                                                                                     |
| 19  | Waste material             | Waste support ink material or waste part ink material produced during the Clean PH and PH maintain process and the abnormal modeling process.                                                                                                                                                                                       |
| 20  | PrintHead Cleaning Station | A device used for Cleaning Printhead. Remove all residual material from the Printhead by extruding ink and wiping with the nozzles on Printhead.                                                                                                                                                                                    |



## 1.6 User Interface

### 1.6.1 Print Menu



Figure 1-1 Printing Window

## 1.6.2 Print List Menu

- Select the **History** queue and choose the task to be printed, as shown in Figure 1-2.
  - Double-click the print task to pop up the **History Job** information bar, as shown in Figure 1-3.
- Click Add to Print **Queue**, and the task will be added to the print queue.

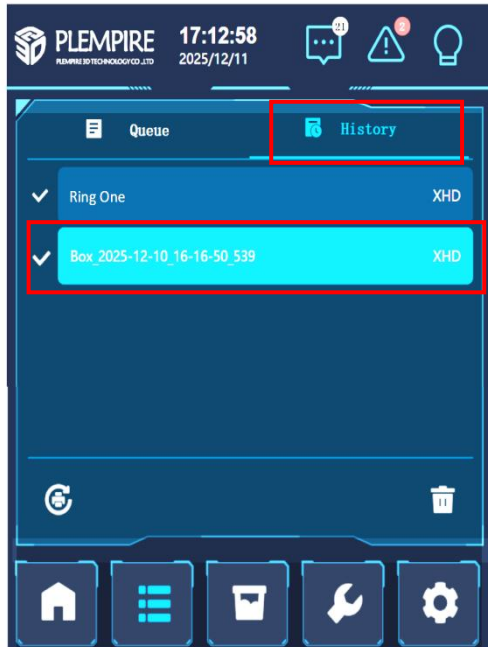


Figure 1-3 History List

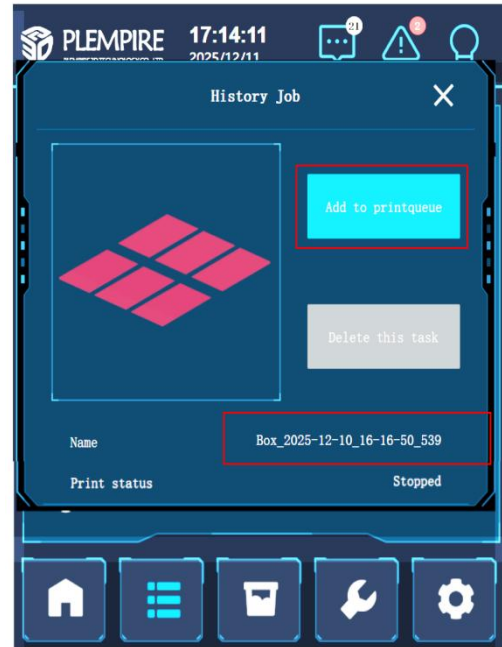


Figure 1-4 History Job Information

- The historical job is added to the print queue, as shown in Figure 1-4.
- Double-click the print task to pop up the print job information box. Click **Move to first**, as shown in Figure 1-4. The task moves to the top of the **Queue**.

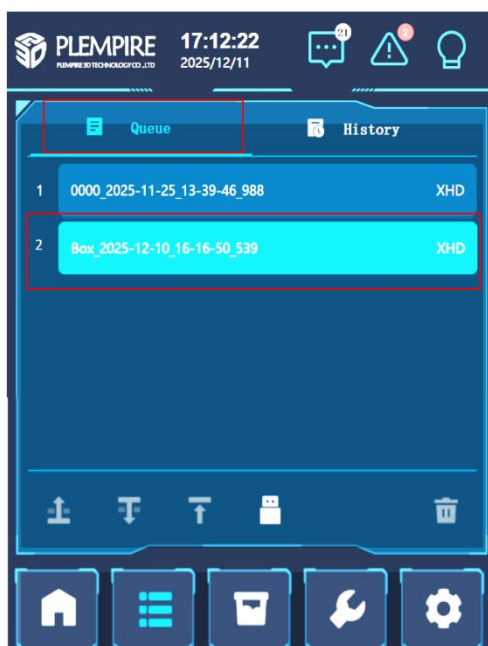


Figure 1-4 Print Queue

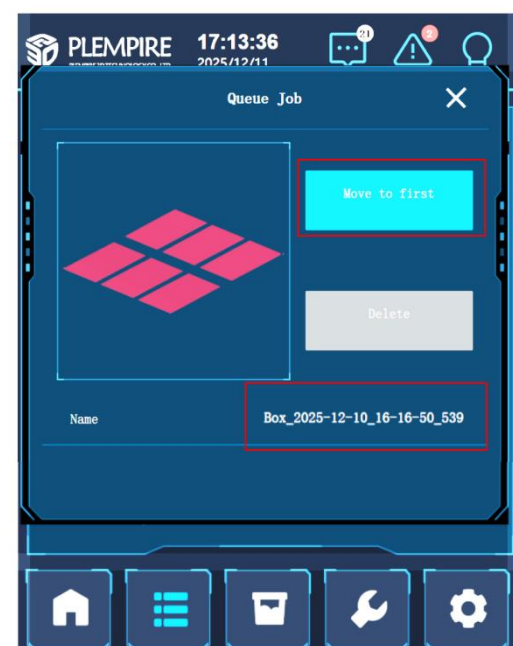


Figure 1-5 The task moves to the top



- Click the Print Menu . The print page displays task thumbnails, as shown in Figure 1-6. Click the Start button to begin printing.

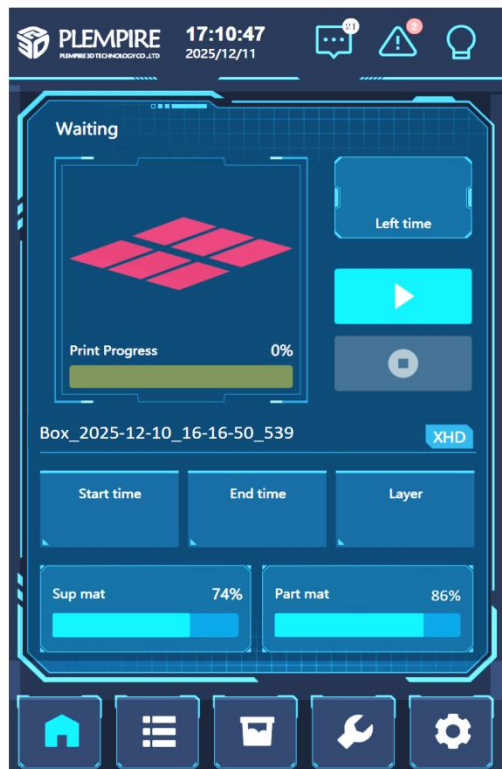
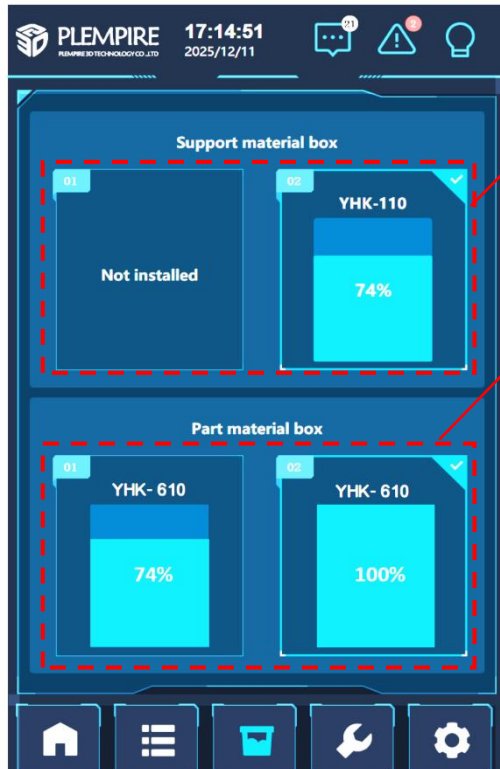


Figure 1-6 Printing Window

### 1.6.3 Material Menu



#### ■ Remaining Material

- ◇ Remaining Volume for Support material box  
Bottle-01 is for main bottle of support material  
Bottle-02 is for secondary bottle of support material
- ◇ Remaining Volume for Part material box  
Bottle-01 is for main bottle of support material  
Bottle-02 is for secondary bottle of support material

**Not Installed:** No material bottle is seated in the bottle cartridge.

### 1.6.4 Tools Menu



#### ■ Axis Position

- ◇ Current Positions of X-axis, Y-axis, Z axis and Roller
- ◇ Speed setting of X-axis, Y-axis, Z axis and Roller
- ◇ Default Setting Positions of Each Component



PLEMPIRE 17:15:59 2025/12/11

Axis position Temp Ctrl Air and ink Engineer Device Info print

| Class               | Set temp | Current temp |
|---------------------|----------|--------------|
| Sup Ink bottle1     | 90       | 90.0         |
| Sup Ink bottle2     | 90       | 90.0         |
| Sup main tank       | 90       | 90.0         |
| Sup vice tank       | 90       | 90.0         |
| Sup tube            | 90       | 90.0         |
| Part Ink bottle1    | 90       | 90.0         |
| Part Ink bottle2    | 95       | 95.0         |
| Part main tank      | 95       | 95.0         |
| Part vice tank      | 95       | 95.0         |
| Part tube           | 90       | 90.0         |
| Waste ink groove    | 95       | 93.3         |
| Waste ink hopper    | 95       | 91.8         |
| Hopper tube         | 100      | 98.9         |
| Waste box           | 120      | 119.1        |
| Scraper             | 96       | 93.4         |
| Roller              | 70       | 69.4         |
| Scraper waste ...   | 100      | 99.9         |
| PH house            | 95       | 95.0         |
| Sup return ink ...  | 85       | 85.7         |
| Part return ink ... | 85       | 84.9         |
| Sup enter ink tank  | 95       | 95.4         |
| Part enter ink tank | 95       | 94.6         |
| temp behind PH      | 0        | 32.4         |

Home Menu Print Settings

## ■ Temp Ctrl

Includes set and current temperature:

### ◇ Material Heating Part

- Sup Ink bottle 1
- Sup Ink bottle 2
- Support Main Tank (White wax main tank )
- Support Vice Tank (White wax vice tank )
- Support Tube
- Part Ink bottle 1
- Part Ink bottle 2
- Part Main Tank (Red wax main tank )
- Part Vice Tank (Red wax vice tank )
- Part Tube

### ◇ Waste Material

- Waste Ink Groove
- Waste box
- Scraper waste tube
- Waste Ink hopper
- Hopper tube

### ◇ Scraper(scraper slot) ◇ Roller

### ◇ Recirculating Tank

- PH house
- Sup enter ink tank
- Part enter ink tank

PLEMPIRE 17:16:24 2025/12/11

Axis position Temp Ctrl Air and ink Engineer Device Info print

| Class                      | Set value | Current value         |
|----------------------------|-----------|-----------------------|
| Air system                 |           |                       |
| Extrude ink pre            | 25000     | 185                   |
| back ink pre               | 4500      | 4533                  |
| enter ink pre              | 500       | 516                   |
| Air system working mode    |           | Circular working mode |
| Waste ink valve is working |           | No                    |
| Extrude ink is working     |           | No                    |
| Return ink sensor zeroed   |           | Yes                   |
| Enter ink sensor zeroed    |           | Yes                   |
| Cycle system               |           |                       |
| Sup enter ink tank level   |           | Not triggered         |
| Sup return ink tank level  |           | Trigger               |
| Part enter ink tank level  |           | Not triggered         |
| Part return ink tank level |           | Trigger               |
| Cycle pump is working      |           | working               |

switch

Auto Fill Tank ☒ Cycle air sys ☒ Connect air sys ☐ Auto Fill PH ☒

Support Ink House Ink Tank

Part Ink House Ink Tank

Manual

Extrude ink Fill sup ink Fill part ink

Home Menu Print Settings

## ■ Air and Ink

### ◇ Auto Switch

- **Auto Fill Tank**
  - Auto filling Ink from bottles to center chamber of Ink Tank
- **Auto Fill PH**
  - Auto filling Printhead from Ink Tank to PrintHead
- **Cycle air sys**
  - Air system is on Circular working mode

### ◇ Support / Part Ink House

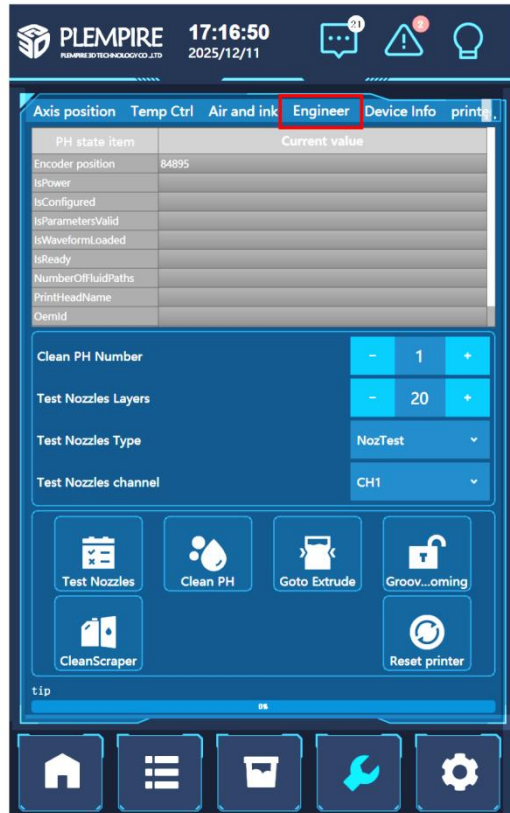
- Liquid level in the center chamber of Ink Tank

### ◇ Manual Operation

**Extrude Ink** : Purge out Ink from PrintHead

**Fill support Ink** : Re-filling material to PrintHead

**Fill support Ink** : Re-filling material to PrintHead



## ■ Engineer

### • Reset printer

- Initialize all motors and control devices.

### • Test Nozzles

- Perform nozzle printing test.

### • Clean PH

- After extruding wax, the rubber wiper automatically removes residual wax on the PrintHead jet surface.

### • Goto Extrude

- Waste Ink Groove was moved under PrintHead.

### • Groove Homing

- X-axis platform decouples the Waste Ink Groove and pushes it back to the ink station.

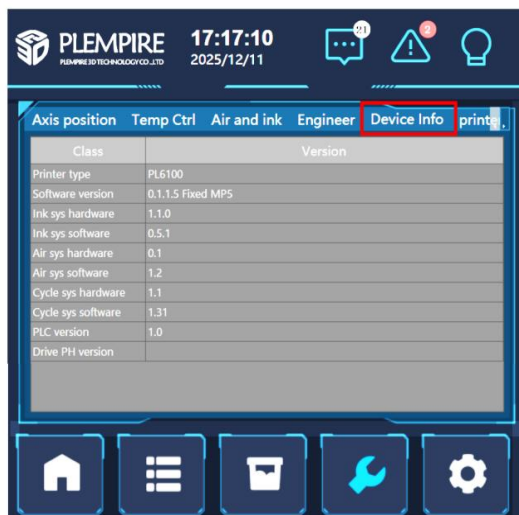
### • CleanScrapper ( Function Unavailable)

**Test Nozzles Type:** NozTest

**Test Nozzles channel:** CH1

**Clean PH Number:** 1

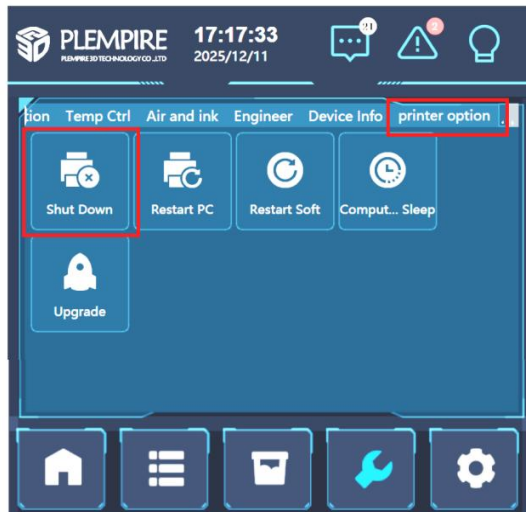
**Test Nozzles Layers:** 20



## ■ Device Info

Device Info page include hardware / software version:

- Printer type
- Software version
- Ink system hardware version
- Ink system software version
- Air system hardware version
- Air system software version
- Cycle system hardware version
- Cycle system software version
- PLC version

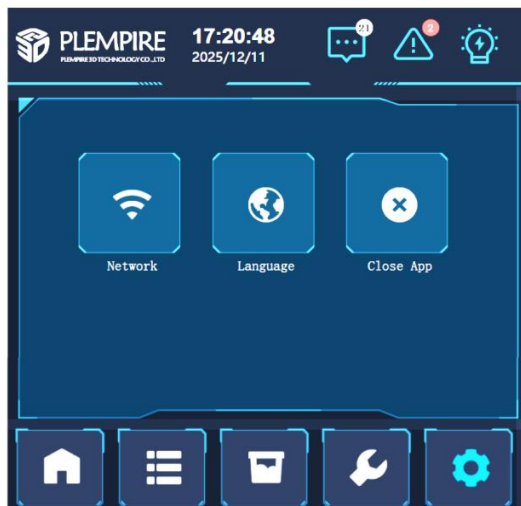


#### ■ Printer option

➤  **Tools** -> **Engineer** page, in which include:

- **Shut Down**
  - Turn off computer and touchscreen
- **Restart PC**
  - Click **Restart PC** to restart computer
- **Restart Soft**
  - Restart PL6100App
- **Computer Sleep**
  - Make computer on sleep mode
- **Upgrade**
  - upgrade software or firmware

### 1.6.5 Setting Menu



#### ■ Setting

➤  **Setting** -> **Setting** page, in which include :

- **Network**
  - Network setting in Auto or Manual methods
- **Language**
  - English and Chinese are optional
- **Close App**
  - Close PL6100App program

## Chapter 2 Preparation Before Printing

### 2.1 Installation Environment & Power Supply

#### 2.1.1 Installation Environment

- ① Keep the temperature of the printing workshop within 18~23 °C and relative humidity within 30~70%. Place a temperature-humidity meter on-site.
- ② Leave a 1 meter clearance in front of the printer. Reserve at least 1-meter access space on both left-right sides and at the rear of the printer for maintenance. Post an operation guideline notice board beside the printer for operator reference.

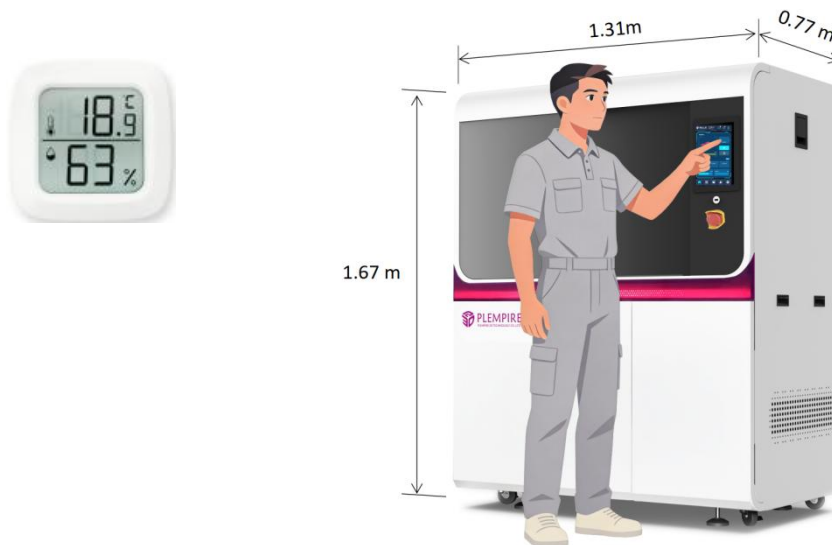


Figure 2-1 PL6100 printer dimension

- ③ Place the printer on a flat, vibration-free surface to prevent body shaking that would impair printing accuracy and reduce the risk of malfunctions.

#### 2.1.2 Power Supply Requirements

**Power Input :**Single- phase AC220 V

**Wiring Connection:** L+N+PE

**Rated Frequency:** 50 Hz

**Rated Input Power:** 3 kW **Maximum**

**Input Power:** 5.5 kW

**Rated Operating Current:** 15 A



#### **CAUTION:**

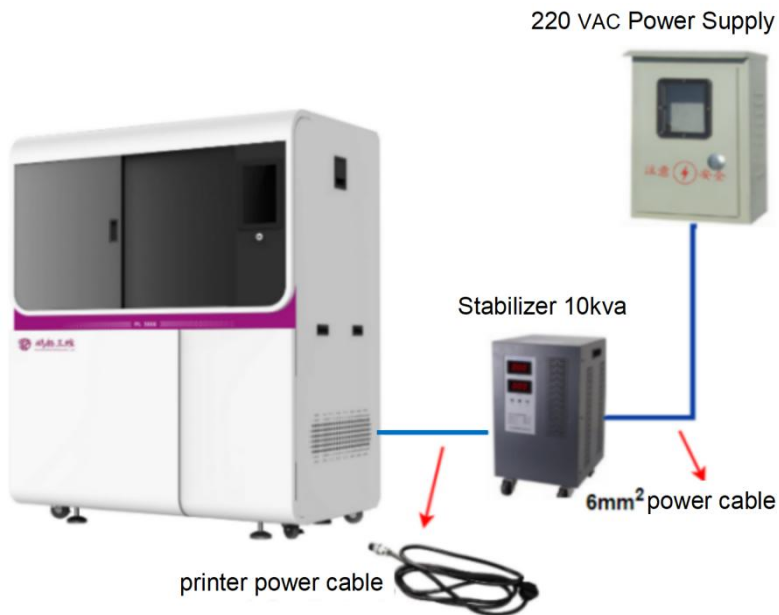
1. The neutral-to- earth voltage between N-line and PE-line shall be  $\leq 5$  V for safe printer operation;  $\leq 2$  V under ideal conditions.
2. Operation:use multi-meter AC mode; auto-range meters use AC mode directly. Connect red probe to neutral terminal and black probe to earth terminal.
3. Socket standards differ by region. Specify the target-use region at order placement to ensure proper equipment connection.



### 2.1.3 Power Supply Mode

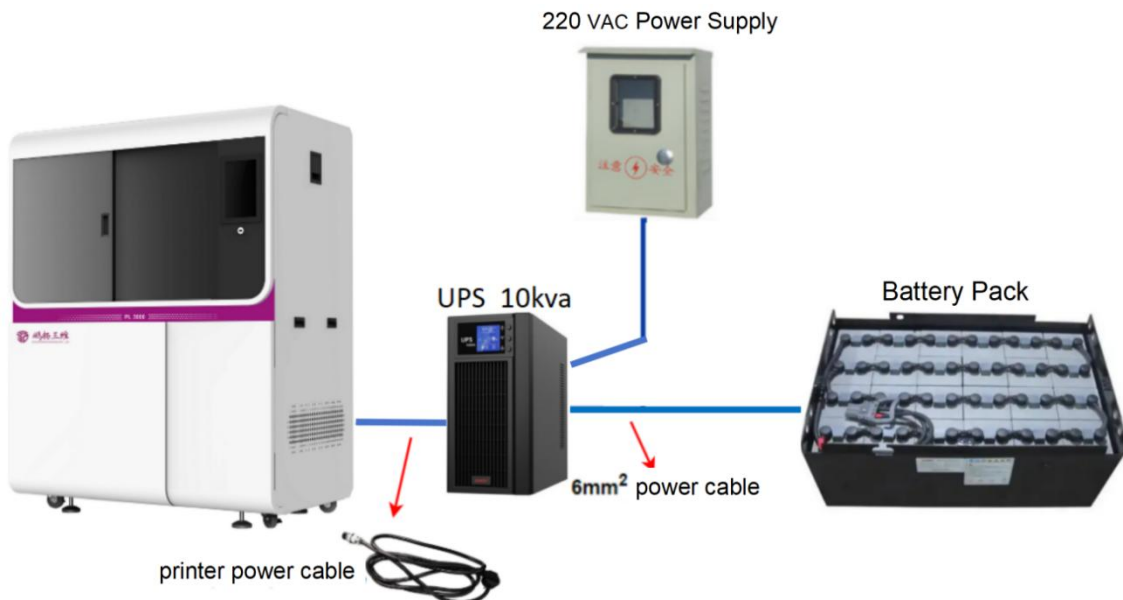
#### ■ External Power Supply Connection Method 1

Connect 10kVA **Voltage Stabilizer** to the external 220 V AC power supply, as shown in the figure below.



#### ■ External Power Supply Connection Method 2

Connect 10kVA **UPS and battery pack** to the external 220V AC power supply, as shown in the figure below.



#### **i** TIPS:

In the event of an unexpected external power outage, the UPS enables seamless millisecond-level switching to battery power mode to provide continuous power supply for the printer. It can not only effectively prevent data loss and any damage, but also reserve sufficient time to safely remove the finished wax patterns formed on the print build plate.

### 2.1.4 Power On Procedure

- ① Insert the cable connector of printer.



- ② Plug the power plug of voltage stabilizer into the power socket.



- ③ Turn on the voltage stabilizer and check the operating voltage.



- ④ Switch on the main power of the Printer.



- ⑤ After the printer is powered on, the touch screen displays the screen (see Figure 2-4).

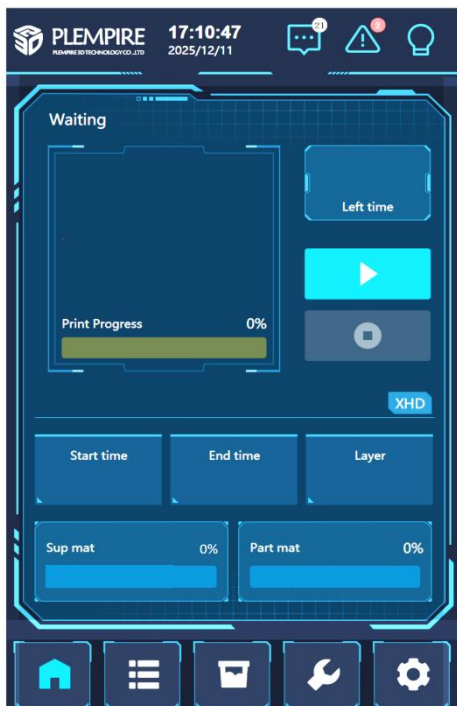


figure 2-4 print status page



## 2.2 Temperature and Ink Systems

### 2.2.1 Check Temperature

Click **Tools**, select **Temp. Ctrl**, check each heating temp. of the printer as shown in figure 2-5.

| Class               | Set temp | Current temp |
|---------------------|----------|--------------|
| Sup ink bottle1     | 90       | 90.0         |
| Sup ink bottle2     | 90       | 90.0         |
| Sup main tank       | 90       | 90.0         |
| Sup vice tank       | 90       | 90.0         |
| Sup tube            | 90       | 90.0         |
| Part ink bottle1    | 90       | 90.0         |
| Part ink bottle2    | 95       | 95.0         |
| Part main tank      | 95       | 95.0         |
| Part vice tank      | 95       | 95.0         |
| Part tube           | 90       | 90.0         |
| Waste ink groove    | 95       | 93.3         |
| Waste ink hopper    | 95       | 91.8         |
| Hopper tube         | 100      | 98.9         |
| Waste box           | 120      | 119.1        |
| Scraper             | 96       | 93.4         |
| Roller              | 70       | 69.4         |
| Scraper waste ...   | 100      | 99.9         |
| PH house            | 95       | 95.0         |
| Sup return ink ...  | 85       | 85.7         |
| Part return ink ... | 85       | 84.9         |
| Sup enter ink tank  | 95       | 95.4         |
| Part enter ink tank | 95       | 94.6         |
| temp behind PH      | 0        | 32.4         |

figure 2-5 Temp. Ctrl page

### 2.2.2 Check Air and Ink

Click **Tools**, select **Air and Ink System**, check **Air and Ink** circuit status in the following two figures.

| Class                      | Set value | Current value         |
|----------------------------|-----------|-----------------------|
| Air system                 |           |                       |
| Extrude ink pre            | 25000     | 185                   |
| back ink pre               | 4500      | 4533                  |
| enter ink pre              | 500       | 516                   |
| Air system working mode    |           | Circular working mode |
| Waste ink valve is working |           | No                    |
| Extrude ink is working     |           | No                    |
| Return ink sensor zeroed   |           | Yes                   |
| Enter ink sensor zeroed    |           | Yes                   |
| Cycle system               |           |                       |
| Sup enter ink tank level   |           | Not triggered         |
| Sup return ink tank level  |           | Trigger               |
| Part enter ink tank level  |           | Not triggered         |
| Part return ink tank level |           | Trigger               |
| Cycle pump is working      |           | working               |

switch

Auto Fill Tank ☐ Cycle air sys ☐ Connect air sys ☐ Auto Fill PH ☐

Support Ink House Part Ink House

Ink Tank Ink Tank

Manual

Extrude ink Fill sup ink Fill part ink

figure 2-6 Air-Ink Circuit Status Screen 1  
(Half capacity left )

| Class                      | Set value | Current value         |
|----------------------------|-----------|-----------------------|
| Air system                 |           |                       |
| Extrude ink pre            | 25000     | 185                   |
| back ink pre               | 4500      | 4533                  |
| enter ink pre              | 500       | 516                   |
| Air system working mode    |           | Circular working mode |
| Waste ink valve is working |           | No                    |
| Extrude ink is working     |           | No                    |
| Return ink sensor zeroed   |           | Yes                   |
| Enter ink sensor zeroed    |           | Yes                   |
| Cycle system               |           |                       |
| Sup enter ink tank level   |           | Not triggered         |
| Sup return ink tank level  |           | Trigger               |
| Part enter ink tank level  |           | Not triggered         |
| Part return ink tank level |           | Trigger               |
| Cycle pump is working      |           | working               |

switch

Auto Fill Tank ☐ Cycle air sys ☐ Connect air sys ☐ Auto Fill PH ☐

Support Ink House Part Ink House

Ink Tank Ink Tank

Manual

Extrude ink Fill sup ink Fill part ink

figure 2-7 Air-Ink Circuit Status Screen 1  
(Full bottle capacity )

## 2.3 Clean waste materials

Clean the waste box before printing. Specific steps for waste cleaning as below:

- ① Open the waste compartment door, as shown in Figure 2-8.
- ② Take out the waste box, pour the waste wax into the designated waste wax collection area.

Replace the waste wax box and close the compartment door, as shown in Figure 2-9.



figure 2-8 Open the Waste Box

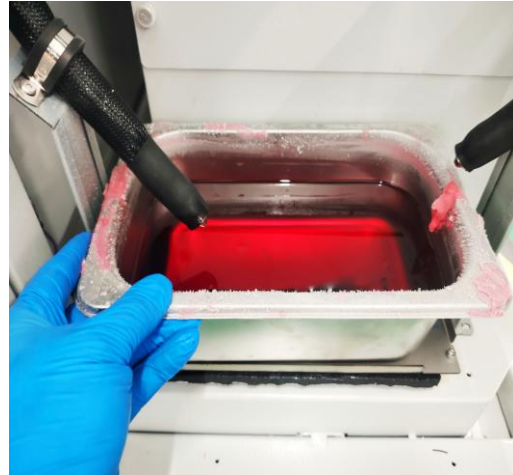


figure 2-9 Remove the Waste Material Box

**⚠ CAUTION:** The waste box is hot. Wear protective gloves before handling it to avoid burns.

## 2.4 Install and Heating Materials

### 2.4.1 Install material bottles

Material Installation Procedure

- ① Take out the material bottles and remove their outer packaging.
- ② Open the material drawer, as shown in figure 2-10.
- ③ Place 2 bottles of support white wax on the left side of the material drawer, and 2 bottles of build red wax on the right side, as shown in figure 2-11.
- ④ Close the material-drawer door.



fig. 2-10 support wax



fig. 2-11 part wax

### 2.4.2 Heating materials

- The material shall be heated continuously for 6 hours.

**NOTE:** After the material has been heated continuously for **6** hours, users may click the **Clean PrintHead** button if no alarm prompt appears on the printing interface.



■ Material Placement Procedure. Follow the steps shown in the figures below in sequence.



fig. 2-12 pull out Material drawer



fig. 2-13 Placement Material



fig. 2-14 push down Material bottle



fig. 2-15 product label on the side of material bottle

**⚠ CAUTION:**

1. After placing the material cartridge into the cartridge holder for 15 minutes and the bottle neck softens under heating, press the material cartridge into the material chamber.
2. Only original printing materials are permitted. Use of non-original consumables may cause damage to the print head and ink system.
3. Do not tear or damage the material identification label and product label on the material cartridge.

■ Material Removal Procedure: Follow the steps shown in the figures below in sequence.

① Pull up the handle.



fig. 2-16 Material cartridge handle

② Remove the Material cartridge.



fig. 2-17 Take off the Material bottle

## 2.5 Remove and Install Print Build Plate

### ■ Remove the Print Build Plate

- ① With printer in idle status, open safety door. Turn the print-platform knob clockwise. See figure 2-18.
- ② Loosen the securing knob of the print platform. See figure 2-19.
- ③ Press down the locking tab. See figure 2-20. Remove the print platform, see figure 2-21.



fig. 2-18 Turn the knob clockwise to loosen

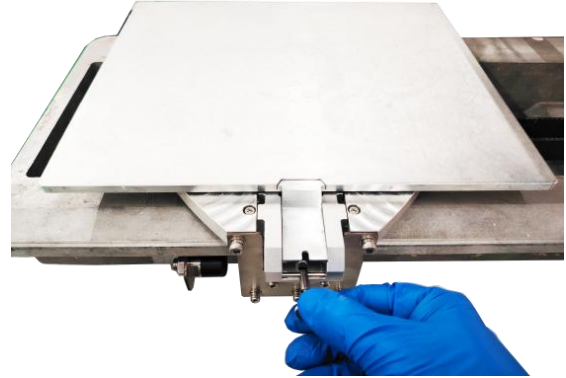


fig. 2-19 Loosen the securing knob

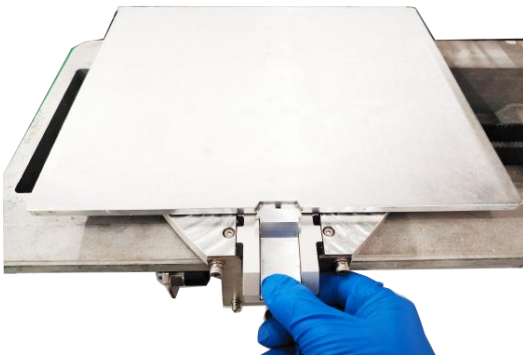


fig. 2-20 Press down the locking

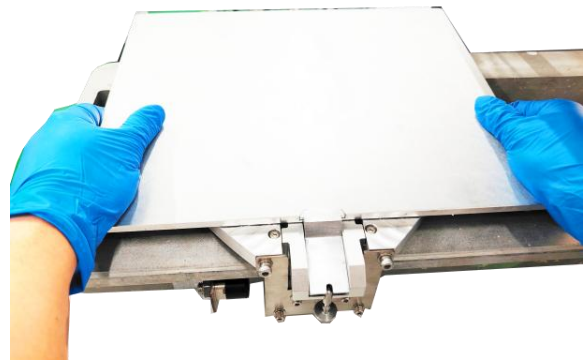


fig. 2-21 Remove the print platform

### ■ Install the Print Build Plate

- ① Ensure the print-platform surface is clean, then place it onto the X-axis platform. Press down the locking tab of the print platform to lock it in place. See figure 2-22.
- ② Insert the upper slot of the knob into the locking plate of the print platform. See figure 2-23.



fig. 2-22 Press-down locking tab



fig. 2-23 Rotate nut & insert into locking plate



- ③ Rotate the nut anticlockwise to tighten the locking plate of the print platform. See figure 2-24.
- ④ Check whether the print platform is secured. See figure 2-25.



fig. 2-24 Rotate the locking nut anticlockwise.

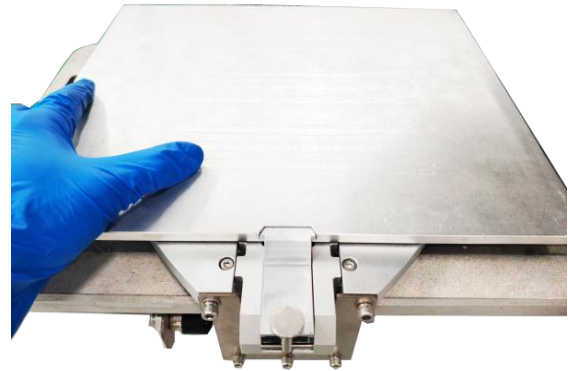


fig. 2-25 Inspect the locking plate of the print platform



**CAUTION:**

Ensure both sides of the print platform are clean. Wear nitrile gloves before cleaning the print-platform surface with isopropyl alcohol. Make sure no metal or foreign objects fall onto or adhere to the print platform. Solid wax or other objects stuck to the print platform may strike the print head during printing and cause severe damage to the print head.

## 2.6 Send Print File

### 2.6.1 Network Setup

- Connect Ethernet cable to printer network port. See figure 2-26.

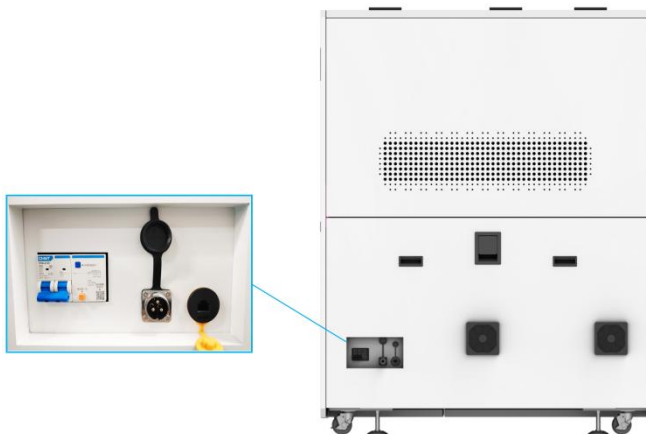


fig. 2-26 Printer Network Port Location



**Tips:**

If an incorrect connection is detected between the printer and user-host computer, verify that the printer is properly connected to the operational local area network, and confirm both the printer and computer are on the same local area network.

### ■ Auto-configuration

Connect the printer to LAN via an Ethernet cable. Click **Auto** and then **Refresh** in **Setting** menu. Printer auto-configures its IP and connects to the workstation LAN, as shown in Figure 2-27.

### ■ Manual-configuration

Connect the printer with an Ethernet cable. Enter a static IP address, then click the **Settings** button. See figure 2-28. The manually-entered network IP address must be on the same LAN as the workstation computer.



fig. 2-27 Network Auto-Configuration

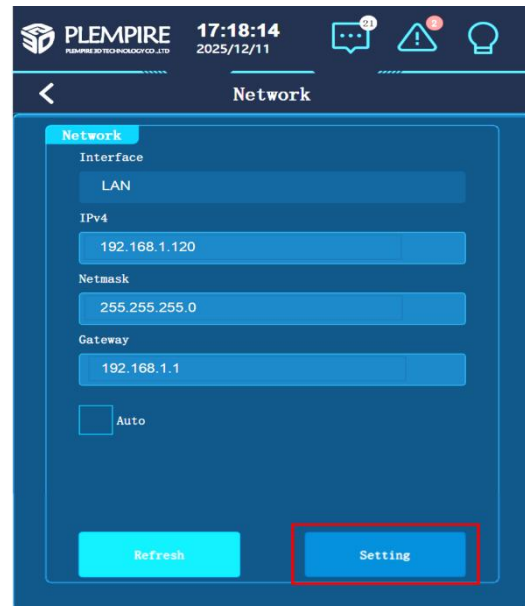


fig. 2-28 Network Manual-Configuration

### ■ Network Connection for Multiple Printers

Connect multiple printers to the workstation LAN via a router or hub. See figure 2-29.

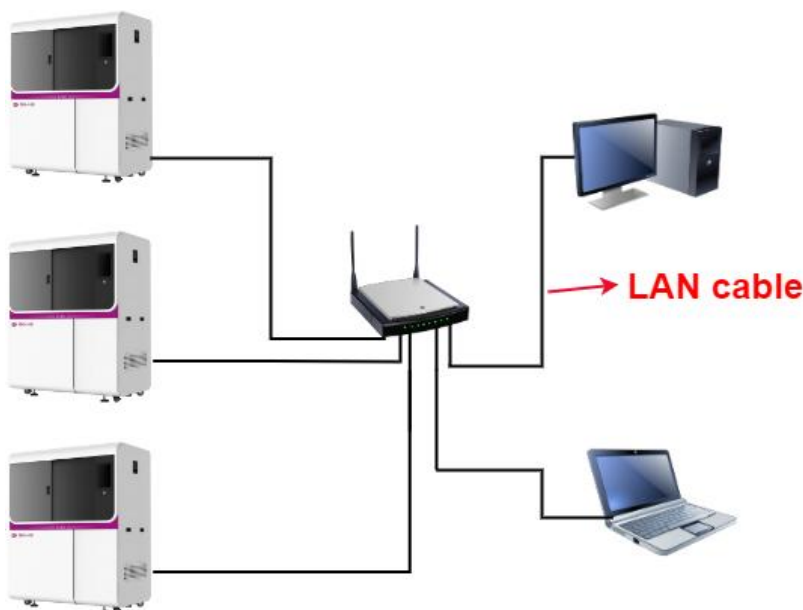


fig. 2-29 Diagram of Multiple-Printer Network Connection



## 2.6.2 Send File to Printer

- ① Double-click the **PL3D PRINT** icon  on the desktop to launch the **PL3D PRINT** software.
- ② Select **Printer**, click **Printer Settings**, choose the target printer to connect, and click the **Settings** button. See Figure 2-30.

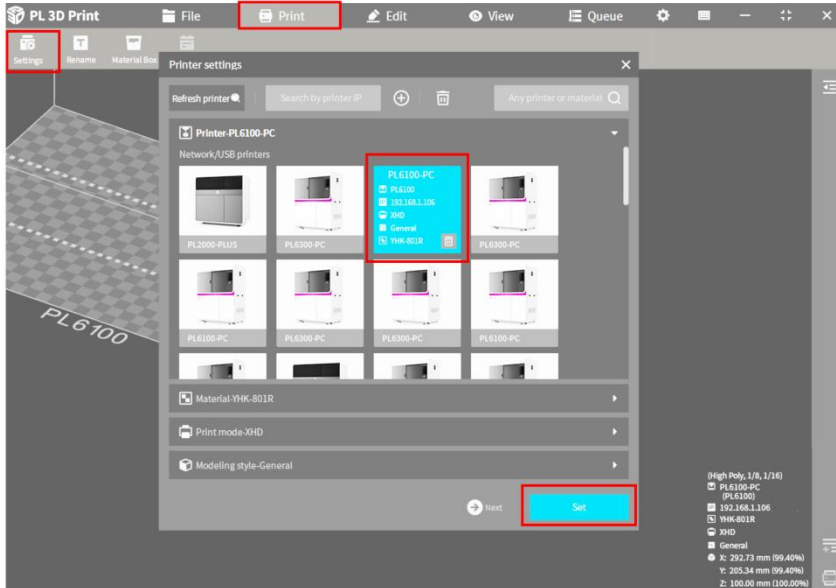


fig. 2-30 Connect Printer

- ③ Select **File** and click **Import**, to import files. Click the **Add File** on the right. Enter the task name in the **Add to Queue** dialog box. Click the **Add to Queue** button to transfer the print file to the printer. See figure 2-31.

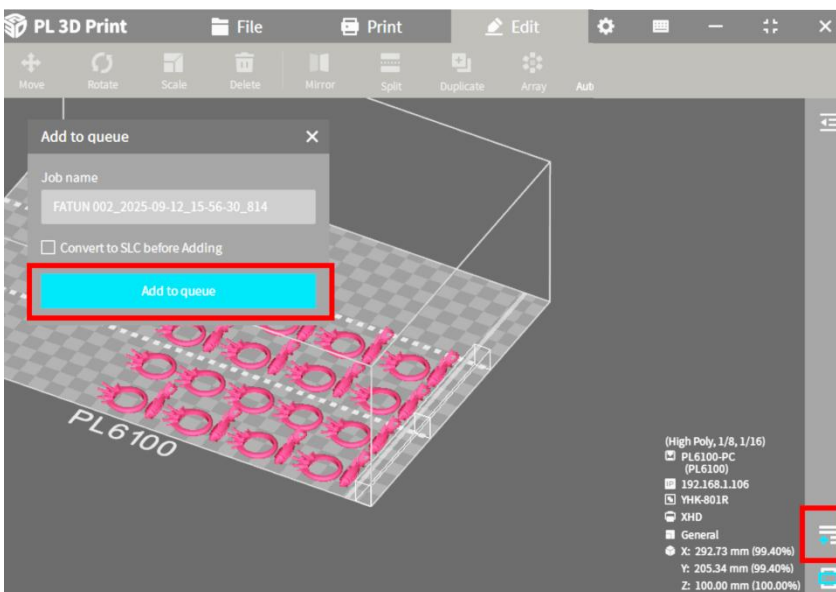


fig. 2-31 Add to Queue

**i TIPS:** For instructions on using the **PL3D PRINT** software, please refer to **Appendix A PL3D PRINT Software**.

## Chapter 3 Printing Operations

### 3.1 Ready for First Print

#### 3.1.1 Reset Printer

1. Ensure the print platform is securely and steadily mounted on the X-axis platform. See figure 3-1. Refer to **Section 2.5 Remove and Install Print Build Plate**.
2. Click **Reset Printer** in the **Engineer** option, see figure 3-2. Printer start the initialization routine.

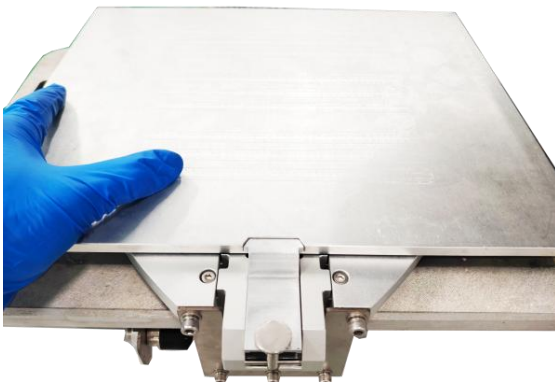


fig. 3-1 Silver color Print Build Plate

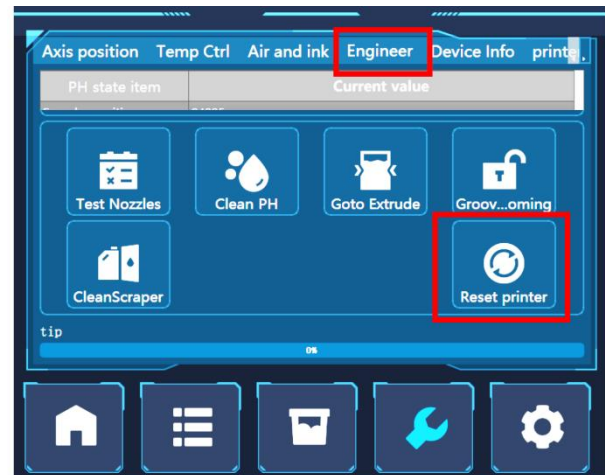


fig. 3-2 Reset Printer

**⚠ CAUTION:** Click the **Reset Printer** only when using the printer for the first time or after the printer is power on. Click **Reset Printer** if **Errorcode 9001: Device needs to be initialize** appears in the alarm .

3. Click **Reset Printer** in Engineer option, a warning message display: "**Confirm to initialize the printer ?**", as shown in figure 3-3. Click **Yes**, it will display alert information see figure 3-4.



fig. 3-3 Confirm the initializing

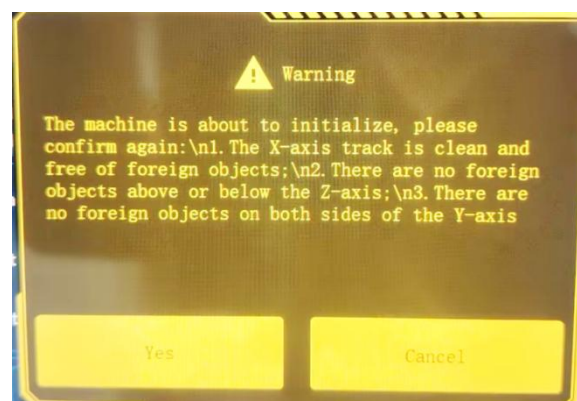


fig. 3-4 Alert Information



4. After the Printer initialization procedure is completed, the message "**Complete Init Machine** " is displayed at the bottom of the page.



fig. 3-5 Reset Printer is completed

### 3.1.2 Turn On Air and Ink System

1. The printing material requires continuous heating for **6** hours. After completing the device initialization procedure described in the previous and the material has been continuously heated to the predefined status, a pop-up prompt appears on the operation interface: "**The printer preparation is complete, Do you want to turn on the air and Ink system ?**"

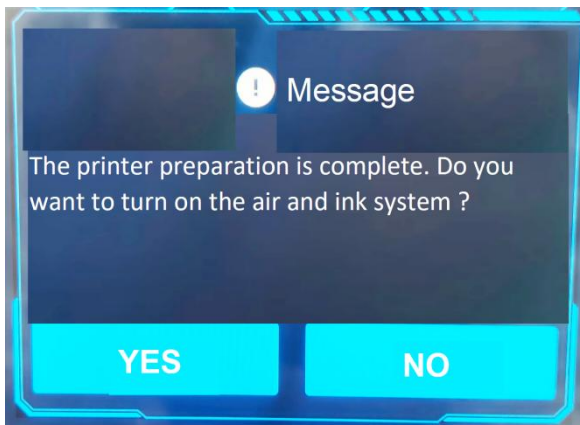


fig. 3-6 Printer preparation is complete

#### TIPS:

For initial printer use, above message confirms that material heating has finished. If the prompt does not show up, allow additional heating time.

2. Click [**Yes**] , the printer will automatically turn on the **Auto Fill Tank** and **Cycle air sys**、**Auto Fill PH**. See the shown figure below.



fig. 3-7 Printer preparation is complete

## 3.1.3 PrintHead Cleaning

On first-time printer use, it is recommended to perform PrintHead cleaning 4 times.

- ① Click **Tool** to enter the **Engineer**, set **PrintHead** cleaning count to 4, as shown in figure 3-8.
- ② Click **Cleaning PH**. It automatically runs **PrintHead** cleaning 4 times. When finished, "**PrintHead cleaning finished**" appears. Then, set the **PrintHead** cleaning Number to 1, as shown in figure 3-9.

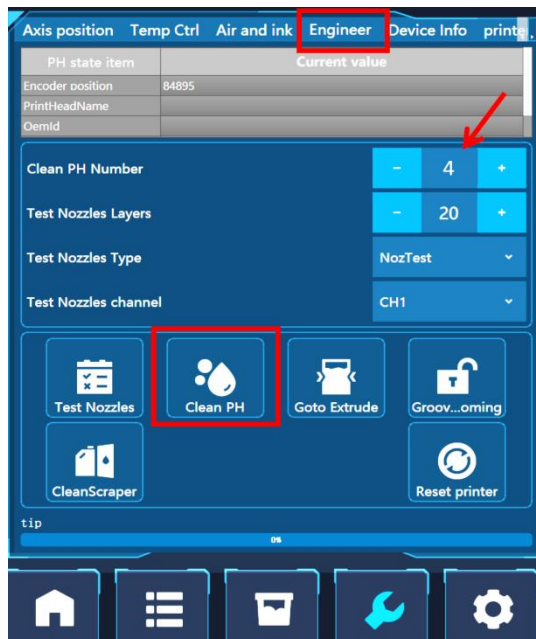


fig. 3-8 Clean PH Number 4

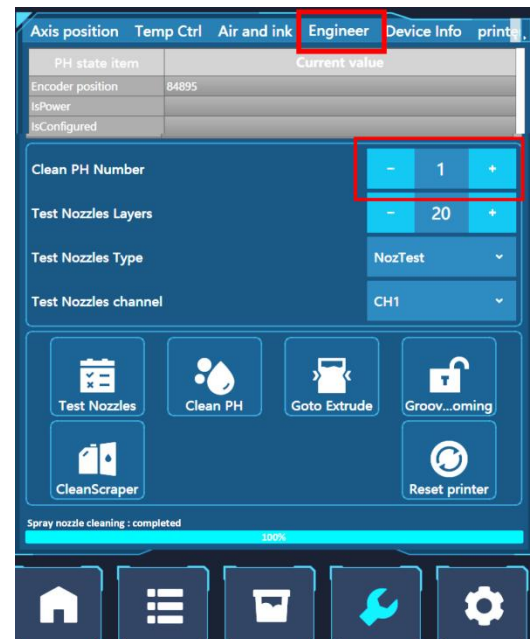


fig. 3-9 Printer preparation is complete

## 3.1.4 Test Nozzles

- ① Click **Test Nozzles** in **Engineer** page, it will perform **Test Nozzle** print, as shown in figure 3-9.
- ② After the **Test Nozzle** print completes, uniform and continuous white and red lines appear on the build plate, as shown in figure 3- 10.

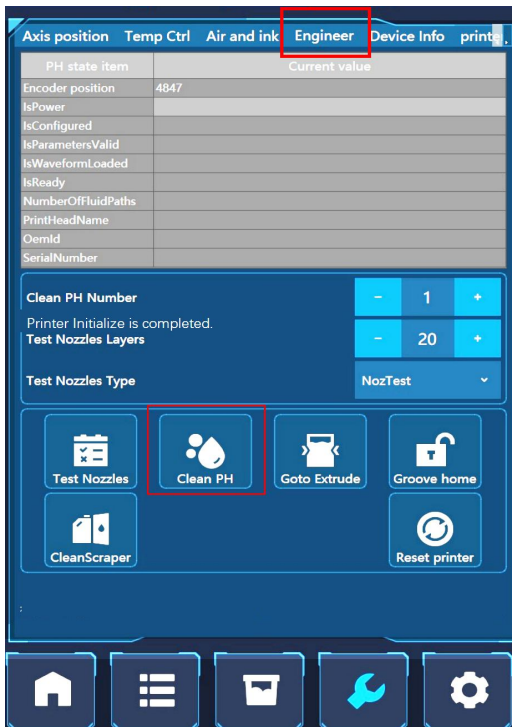


fig. 3-10 Test Nozzles

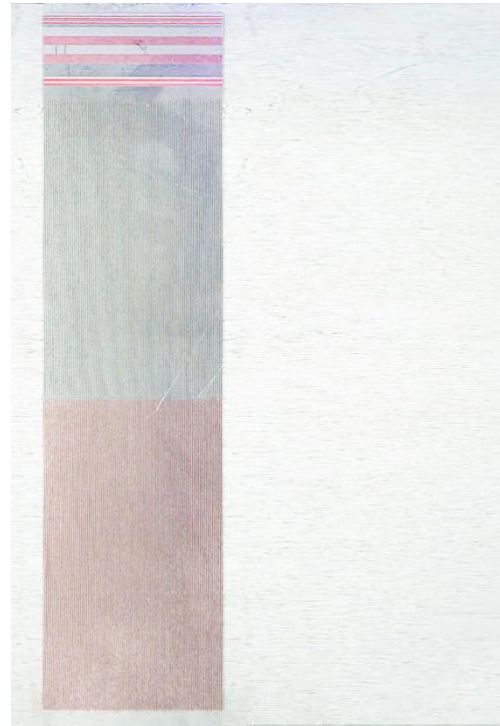


fig. 3-11 Test Nozzles Print



**Note:** The actual output of the **Test Nozzles**' test lines depends on the printer's operating condition at the time; partial missing lines may occur.

## 3.2 Print Operations

### 3.2.1 Queue Print

- ① Go to **Print Menu** to display the **Print Queue** list, as shown in figure 3-12. Select a print job and click **Move to Top** as shown in figure 3-13, or user can click move up icon . The selected print job moves to the top of the **Print Queue**. By default, the printer prints the top job in the print queue.
- ② Clicking **Delete** removes the selected print job. Click **Close** to exit the print-job page.

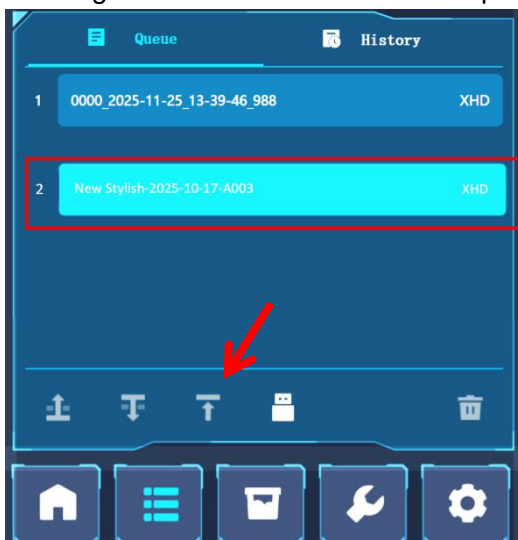


fig. 3-12 Print Queue List



fig. 3-13 Print Job information

### 3.2.2 History Print

- Tap the **History** list in Print menu. Select the historical job to be reprinted and click **Add to Queue**. The selected historical job will be auto-added to the **Queue** print list. See the figure below.



fig. 3-14 Print job information

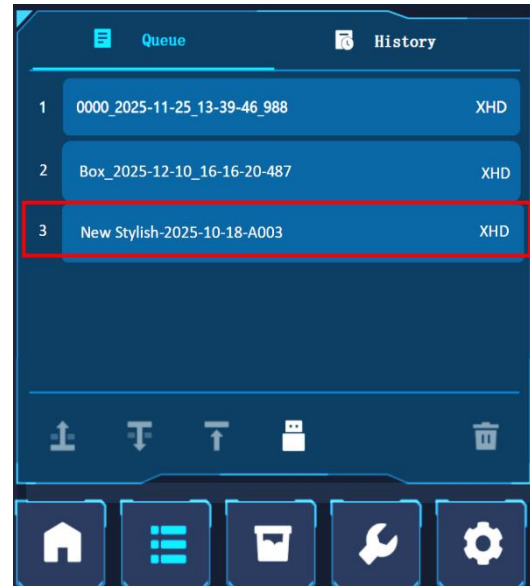


fig. 3-15 Print jobs list

### 3.2.3 Start Print

- Click to return to the **Print** menu. Click Start button  to begin printing, as shown in figure 3- 16. Printer prints the job at the top of the **Print Queue**. To pause or stop printing, click **Pause** or **Stop** button, as shown in figure 3- 17.

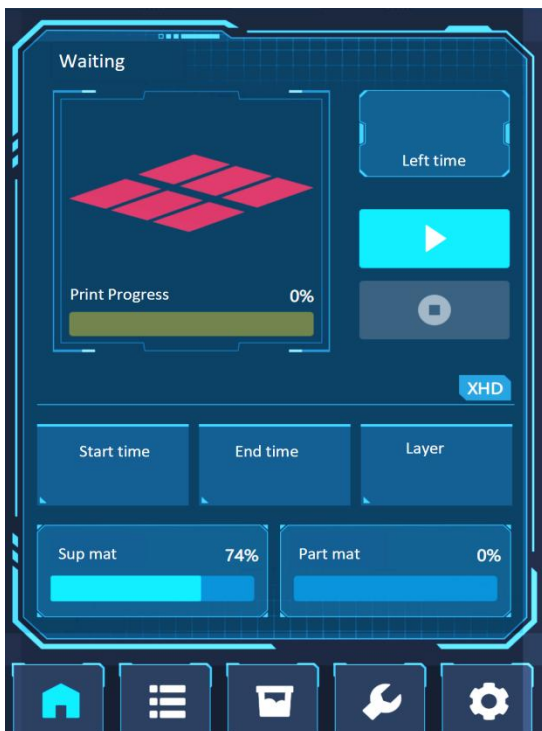


fig. 3-16 Print menu



fig. 3-17 Pause and Stop



### 3.2.4 Print Complete

- Print job is complete, and the touchscreen shows: **Print task completed, please take away the board from device.**

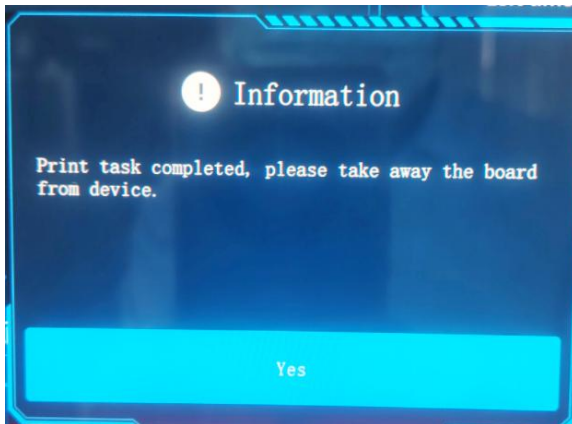


fig. 3-18 Print task completed

- Print job is complete, X axis platform move back to its home position. Slightly take out the print build plate with wax patterns and proceed to the next **Post-processing** procedure.



fig. 3-19 Print Build Plate stop position after printing

## 3.3 Replenish Materials

### 3.3.1 Insufficient Material Indication

- If the **Material** menu shows a missing / low material alarm, , as shown in figure 3- 20. Pull out the material drawer and check the remaining volume in the material bottles.
- Replace empty bottles promptly. See **section 2.4.1 Install material bottles** for material installation steps.

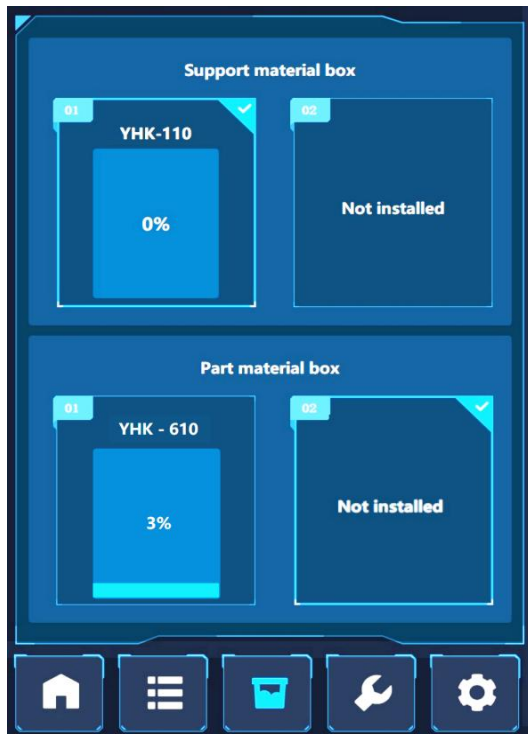


fig. 3-20 print material insufficient

**TIPS:**

If the bottle has enough material but the screen shows no material installed, reinstall the bottles and fully close the material drawer. Check the ID label on the top of bottles, swap main (primary) bottle and vice (secondary ) bottle to retry.

### 3.3.2 Load Material

- Replenish material timely according to printing consumption. After completing new bottles' heating, the popup alerts information: It will turn on **Auto Fill Tank** for material refilling. **Please confirm whether the material inside the bottle has melted ?**
- Pull out Material drawer, verify material is full melting and tap **Yes** for material Auto-filling, as shown in figure 3-21.

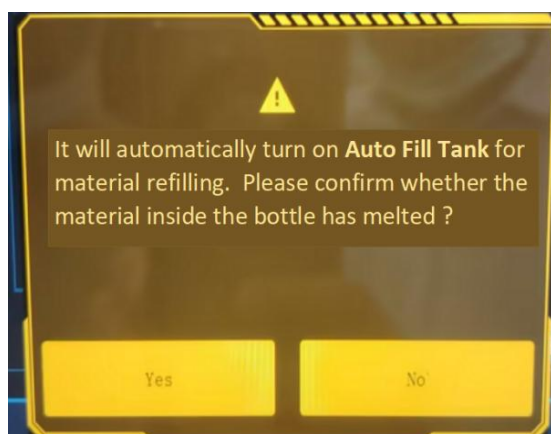


fig. 3-21 Auto-fill tank prompt

**CAUTION:**

Pour residual wax into a melted new support bottle. Empty bottles are non-reusable and shall be disposed of at designated industrial waste recycling facilities.



### 3.4 Remove Wax Patterns

- Take out the **build print plate** with molded wax patterns, separate the wax patterns from build print plate, then carry out **Post-Processing** procedures.



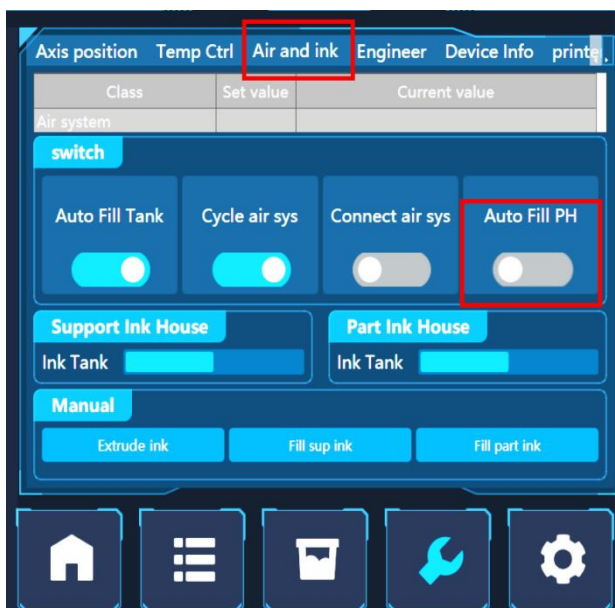
#### CAUTION:

Don't touch the print build plate while the printer is running. After the print job terminates, wait until the print engine rises to **Z-axis** home position and the touchscreen shows the prompt "**Print task completed. Please take away the board from device.**"

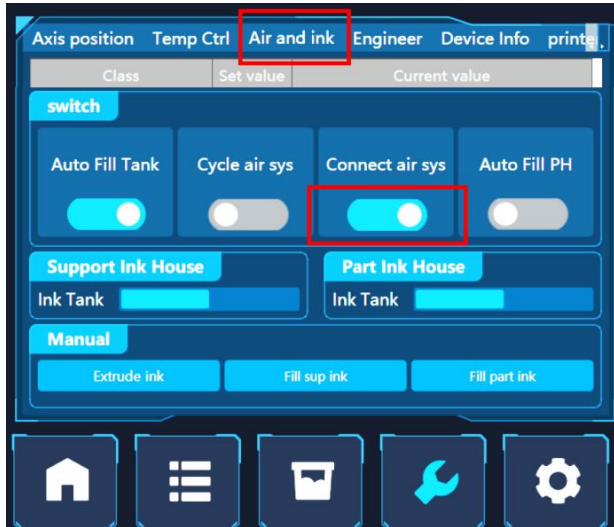
### 3.5 Printer Power Off

#### 3.5.1 Precaution Before Power-off

- ① Verify the **Print Engine( Printhead )** is raised to **Z-axis** home position.
- ② Click **Air and Ink** in Setting menu, turn off **Auto Fill PH**.



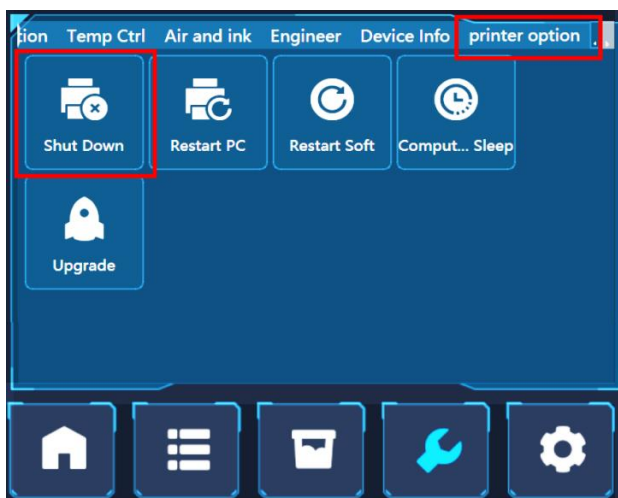
- ③ Turn on **Connect air sys** button and disable **Cycle air sys**.



- ④ Clean wax dust from the print build plate and underneath the **PrintHead**.



- ⑤ Click **Shut Down Printer** in **Printer Option**, wait until the touchscreen has powered down.





- ⑥ After the shutdown completes, turn off the printer's external main power.



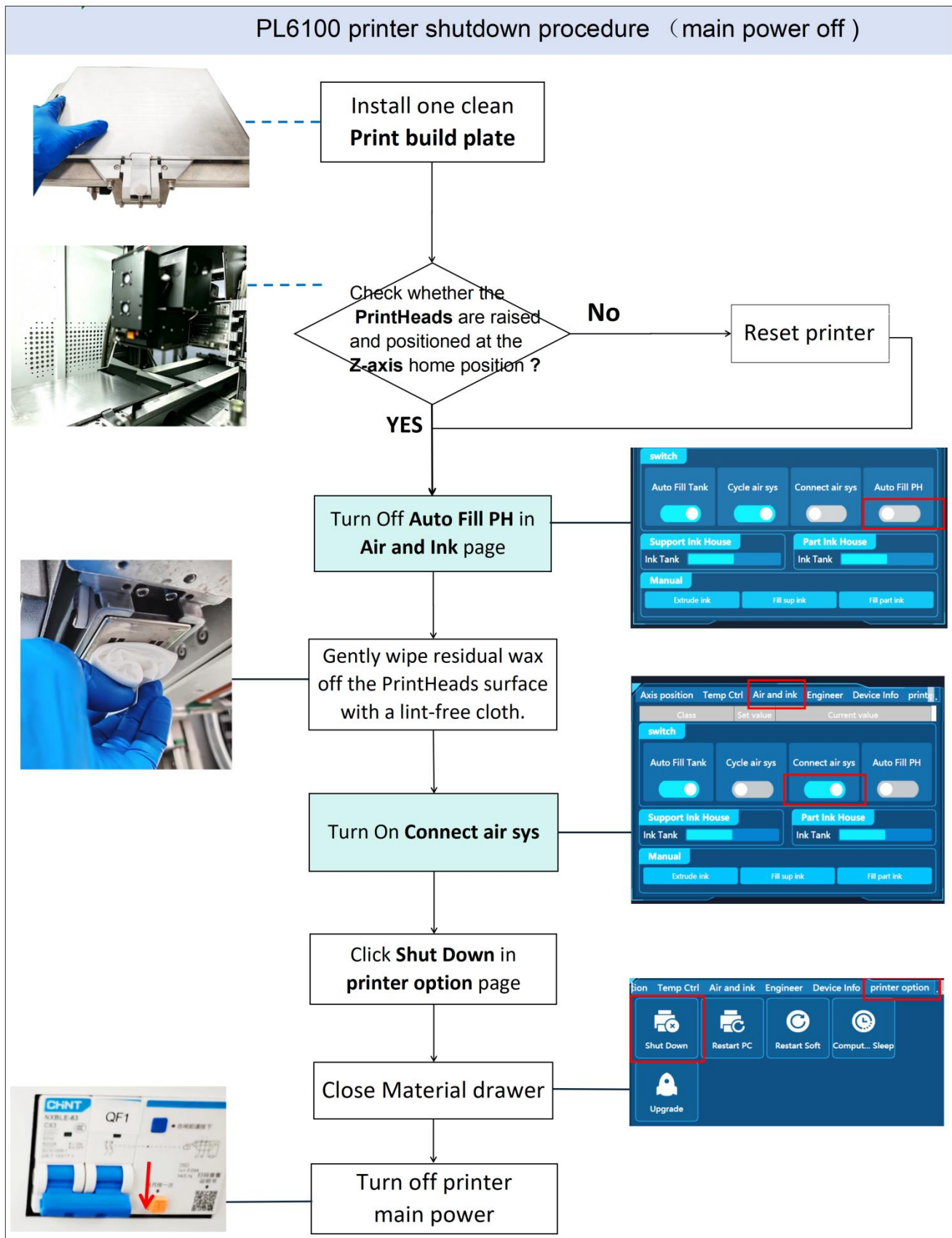
- ⑦ Use a vacuum cleaner to remove wax dust from the printing chamber and waste-chamber filter. Then close the safety door.



**CAUTION:**

Click Shut Down on the Printer Options page. This only powers down the industrial computer and touchscreen; the material drawer will be remain heated. Switch off the main power supply to discontinue the material heating.

### 3.5.2 Shutdown Procedures





## Chapter 4 Post-processing

### 4.1 Preparation

#### ➤ Tools preparation

- Prepare the tools of post processing, those tools include :

electromagnetic stirrer, stainless steel pot, Mesh sieve, measuring cup, rectangular tray, colander, plastic tweezers, small handmade hook.

1#Electromagnetic stirrer



2#Stainless steel basin



3#Stainless mesh sieve



4#Measuring cup



5#stainless filter sieve



6#Ultrasonic cleaner



7#Rectangular Tray



8#Plastic tweezers



9#Small soft brush



10#Handmade hook



11#Butyl rubber glove



12#Protective glasses & mask



#### ➤ Solvent preparation

- PPG400 (Poly propylene glycol)
- Ethyl alcohol (waterless ethanol)
- Isopropyl Alcohol (IPA)



➤ Solution Ratio / Temperature setting / Stir-Bar Speed

| Wax-Pattern<br>Cleaning | Solution | PPG400 | Anhydrous<br>Alcohol | Isopropyl<br>Alcohol | Temperature | Stir-Bar speed | Functions of Cleaning                                        |
|-------------------------|----------|--------|----------------------|----------------------|-------------|----------------|--------------------------------------------------------------|
| First Time              | Ratio    | 1      | 1                    | 2                    | 38°C~40°C   | 600-800        | Remove dissolvable support wax from the wax-pattern          |
| Second Time             | Ratio    | 1      | 8                    | /                    | 38°C~40°C   | 600-800        | Remove residual dissolvable support wax from the wax-pattern |
| Third Time              | Ratio    | 1      | 8                    | /                    | 38°C~40°C   | 600-800        | Remove fine support-wax powder from the wax-pattern surface  |

**Cleaning time:** The cleaning duration for wax-patterns varies according to work-piece specifications. Please monitor the cleaning status. Longer cleaning time is required for wax-patterns with complex structures or larger dimensions.

## 4.2 Wax Pattern Removal

### ▪ Ice Remove

Prepare an ice block with dimensions similar to an A4 sheet, as shown in fig.4-1. Put the print build plate on the Ice block and frozen the support structure of wax patterns, as shown in fig.4-2. After a while, take off all those removable wax patterns on the print build plate.



fig. 4-1 ice block



fig. 4-2 build plate on ice block

### ▪ Heating Remove

Prepare the electronic hot plate device, as shown in fig.4-3. Place the finished printing print build plate on the hot plate and heating all wax patterns' the base support for few minute, as shown in fig.4-4.. Take off all those wax patterns from the print build plate after a while.



fig. 4-3 electronic hot plate device

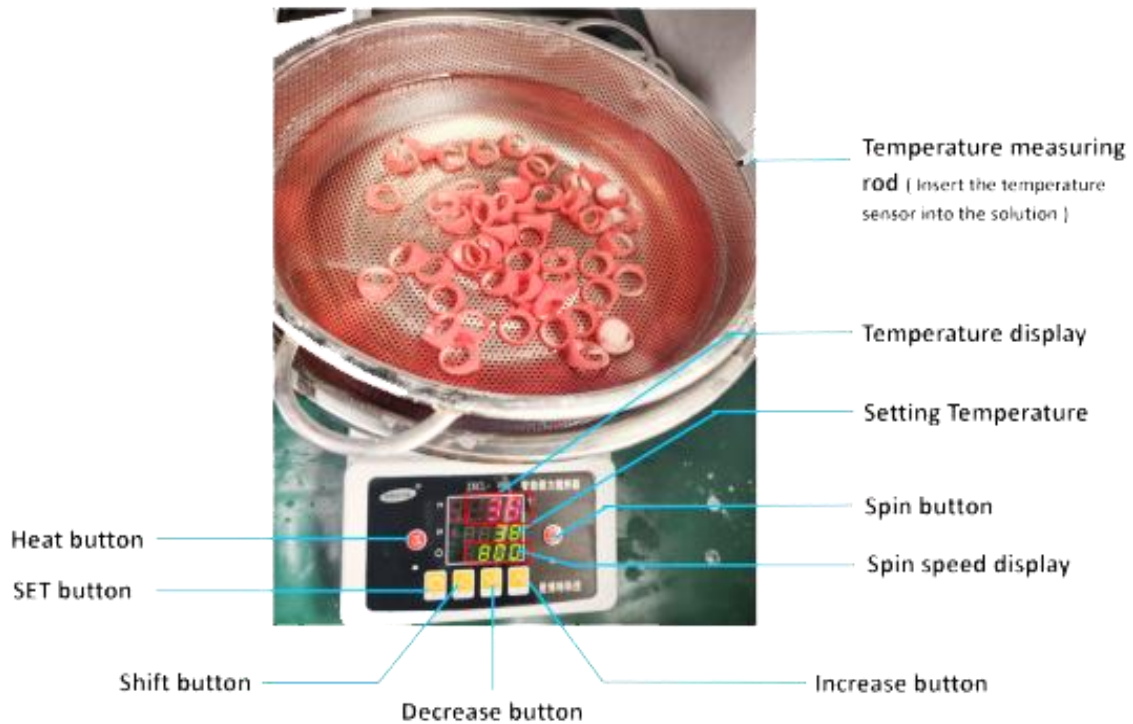


fig. 4-4 print build plate on hot plate



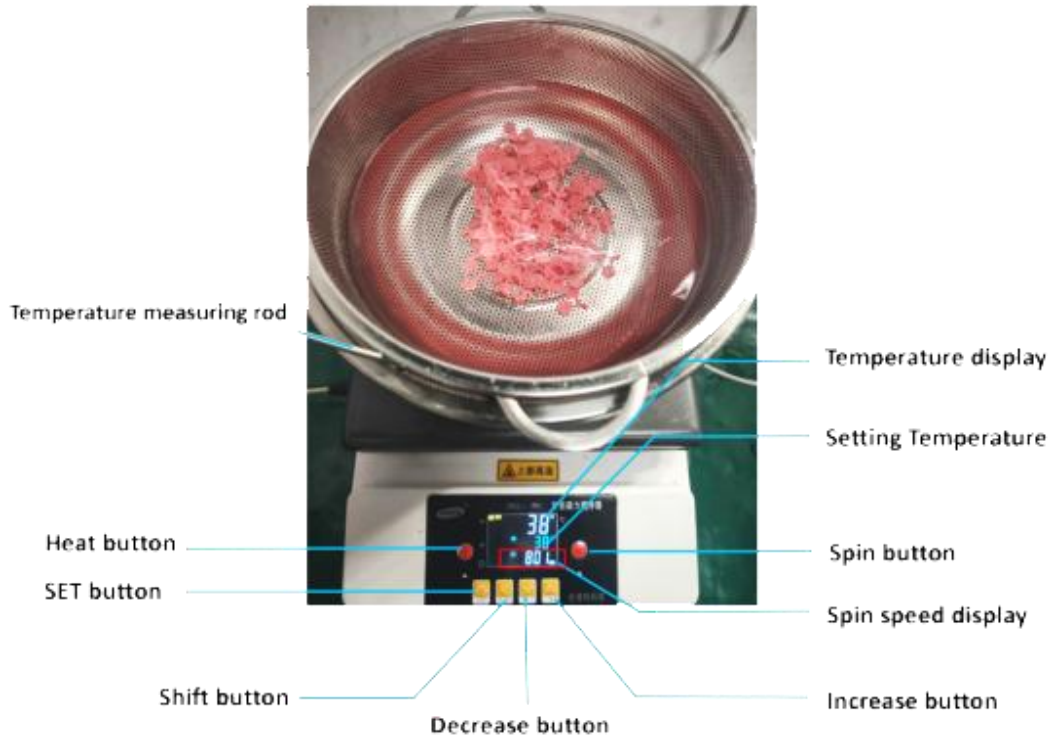
## 4.3 Wash wax procedure

### 4.3.1 First time wash



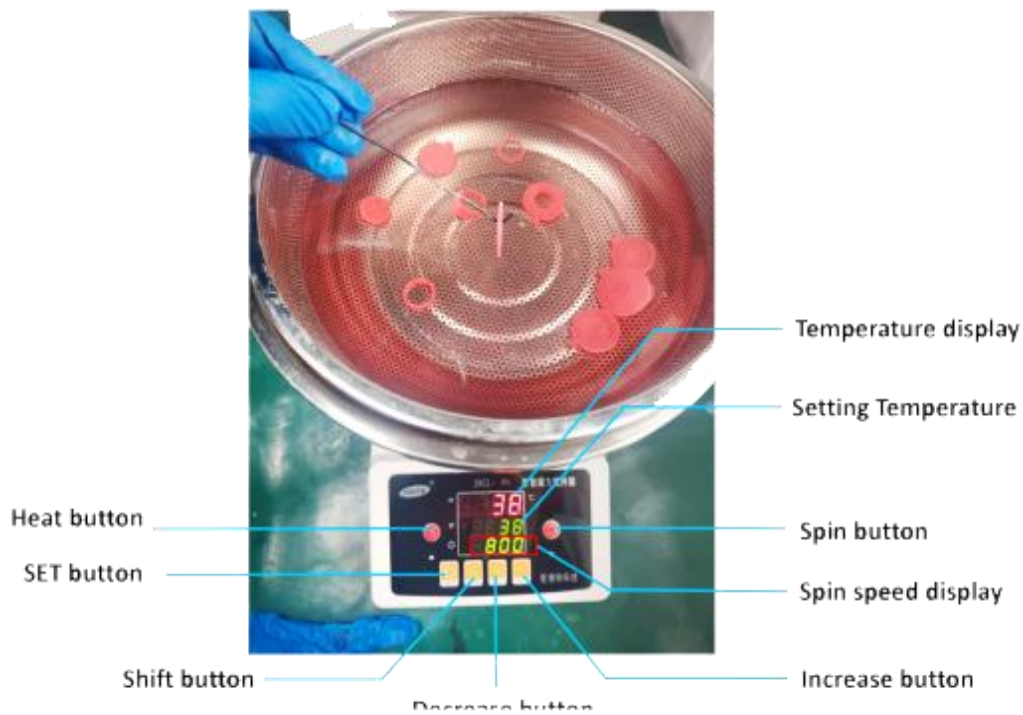
- First-Time Solutions Ratio is **PPG400 : Anhydrous Alcohol : Isopropyl Alcohol = 1:1:2**.
- Magnetic stirrer Heating button and set the heating temperature **at 38 °C**.
- Place wax patterns individually; do not stack them. Switch on the magnetic stirrer to agitate the solution. Inspect the parts during the initial cleaning phase. Immediately lower the stirring speed if excessive fluid movement causes the wax patterns to vibrate.

### 4.3.2 Second time wash



- Second-Time Solutions Ratio is **PPG400 : Anhydrous Alcohol = 1 : 8.**
- Magnetic stirrer Heating button and set the heating temperature at 38 °C.

### 4.3.3 Third time wash



- Third-Time Solutions Ratio is **PPG400 : Anhydrous Alcohol = 1 : 8.** (same as 2<sup>nd</sup> time wash )
- Magnetic stirrer Heating button and set the heating temperature at 38 °C.



**i TIPS:** The Third-round cleaning supplements the second-round process. Its solution formulation and cleaning procedure are identical to the second-round cleaning. Replace the solution promptly when substantial white-wax solids form and the solution darkens, indicating excessive dissolved wax. Recommended capacity: 150 g white wax per 1 L of solution.

#### 4.4 Collect finished models



**i TIPS:** Use plastic hooks or hand-fabricated miniature hooks to take wax-patterns out from the cleaning solution gently and set them on the wax-patterns collection tray.



**i TIPS:** If numerous workpieces or small-sized wax patterns hinder single-piece picking, slowly lift the wax-pattern-loaded filter screen out of the cleaning solution in one piece. As wax patterns remain soft at this stage, let them sit for 30 minutes to dry and harden prior to individual removal.



**i TIPS:** Spread the cleaned wax-patterns evenly on dust-free paper of the tray. Either let them air-dry for over 30 minutes or employ a fan for forced-air drying. Afterwards carry out overall packaging before transferring to the next working procedure.



**i TIPS:**

- ① If residual white wax remains on the model surface, dip a soft-bristle brush in a small amount of absolute ethanol and gently brush off leftover wax.
- ② If surface whitening occurs on finished wax-patterns after cleaning, it is generally caused by excessively long cleaning duration or an over-high proportion of absolute ethanol in the solution. Reduce the mixing ratio or dosage of absolute ethanol accordingly.



## Chapter 5 Print Quality

### 5.1 Quality Inspection

#### 1. Surface has missing lines (streaks )?

Clean the **PrintHead**, perform **PrintHead** maintenance. Clean Roller surface.

#### 2. Cracks on the model surface?

Check the ambient temperature. Ensure the top fan is turned on and the front and rear fans of the **PrintHead** are functioning properly to prevent the model from undergoing severe cold contraction deformation.

#### 3. Surface scratches on the model?

Inspect if the roller surface is clean. Clean the roller surface and perform a wax coating test. Clean the bottom of the **PrintHead**. Remove wax dust from the front, rear, left, and right sides of the roller bottom and **PrintHead** carrier structure.

#### 4. White wax is present on the model surface after cleaning?

Inspect the roller surface for cleanliness, verify the scraper is correctly aligned and tightly fitted against the roller surface.

#### 5. The cleaned wax patterns are connected together?

During the model layout process in **PL3D Print** software, if the gaps or spacing are sufficient, slightly increase the distance between models as needed ; verify the integrity of the **STL** file.

#### 6. Model printing warping?

- Monitor the workshop ambient temperature; the recommended operating temperature is kept within 18°C to 23°C (64°F to 73.4°F).
- Check whether the primary efficient filter and the intake air filter are clogged. If clogged, clean or replace them immediately; Ensure that the PL6100 printer is not placed near a window or exposed to direct sunlight; Ensure there is at least a 1 meter clearance behind and on both sides of the printer.

#### 7. The support material cannot adhere to the printing platform?

Please clean the **print build plate** and ensure it is dry before use.

Before using the **print build plate**, please clean the dust inside the printer's print chamber.

## 8. The wax patterns surface has wax dust, dust, or wax drips, and there are scratches on the model surface?

- Clean the bottom of the **PrintHead**, the areas around the **PrintHead** and roller, and the dust on the bottom of the Y-axis crossbeam.
- Remove the dust from the internal construction chamber of the printer.

## 5.2 Models Layout Guidelines

- ① Total printing time depends on the maximum **Z**-axis height of placed parts. Reduce model placement height during layout arrangement to shorten printing duration.
- ② Place parts uniformly along the **Y**-axis so that **PrintHead** can cover the models, which increases contact area between work pieces and the roller.
- ③ For layout on the **XY**-plane, maintain a minimum gap of 0.5 mm between models; the recommended **Z**-axis clearance is at least 1 mm. Expand the spacing if sufficient space is available.
- ④ If vertical-printing mode is adopted, verify the model posture within slicing software to ensure true vertical alignment.
- ⑤ According to nozzle-arrangement rules, models can be placed with a horizontal offset of **45°** inside software depending on part structures.
- ⑥ Surface quality decreases in the order: **XY**-plane > **XZ**-plane > **ZY**-plane. Orient high quality required surfaces following this rule and adjust the coordinates of curved surfaces when necessary. Since **X**-direction jetting serves as a core printing process, global model placement shall start along the **X**-axis preferentially.
- ⑦ When importing models into **PL3D Print**, files shall have consistent formats. Loading files of different formats simultaneously for printing may impair printing quality.
- ⑧ Before importing model files into **PL3D Print**, verify key indicators including geometric integrity, consistent facet normals and model closure via such as **Rhino**, **ZBrush** (abbreviated as **ZB**) or other **3D**-modeling software.



### 5.3 Shrink Compensation

During printing, environmental conditions and inherent material properties cause the wax material to shrink by a certain percentage, which brings slight discrepancies between the actual printed part dimensions and digital-file sizes. Furthermore, material loss also occurs during the procedure of investment-casting. Consequently, proper dimensional compensation for the model before printing is critically essential.

#### ✧ Method One

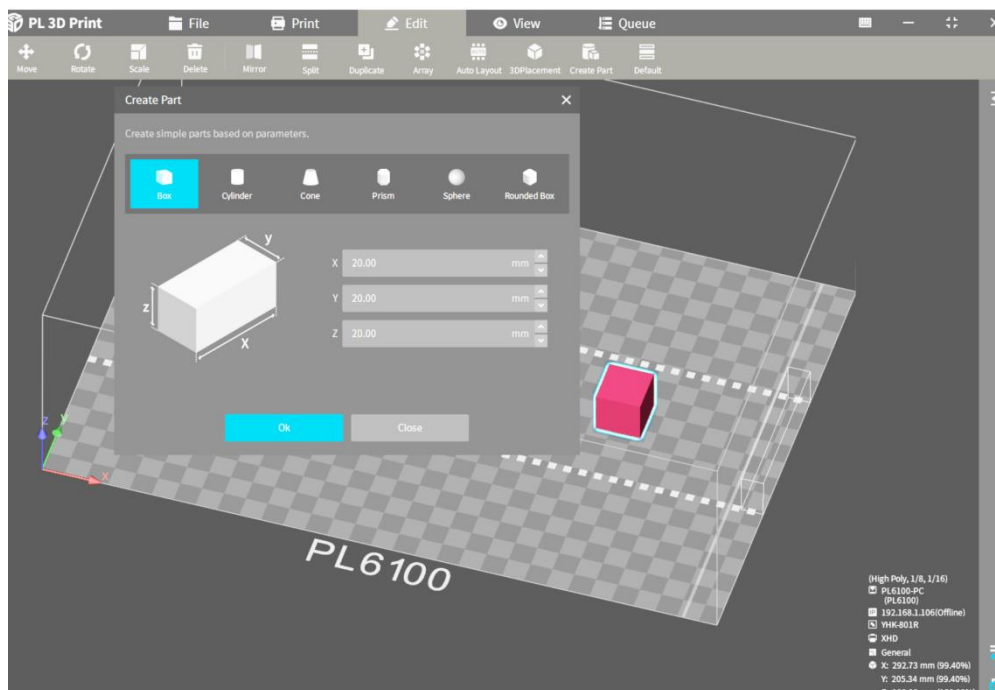
Employ **Rhino** or alternative 3D modeling software to obtain and log the precise **X**-, **Y**- and **Z**-axis dimensions of models, defined as  $X_{CAD}$ ,  $Y_{CAD}$ ,  $Z_{CAD}$ . Once the support-wax removal and wax-washing process finishes, measure and document the **X**-, **Y**- and **Z**-axis dimensions of printed specimens and mark them as  $X_{PART}$ ,  $Y_{PART}$ ,  $Z_{PART}$ .

#### ✧ Method Two

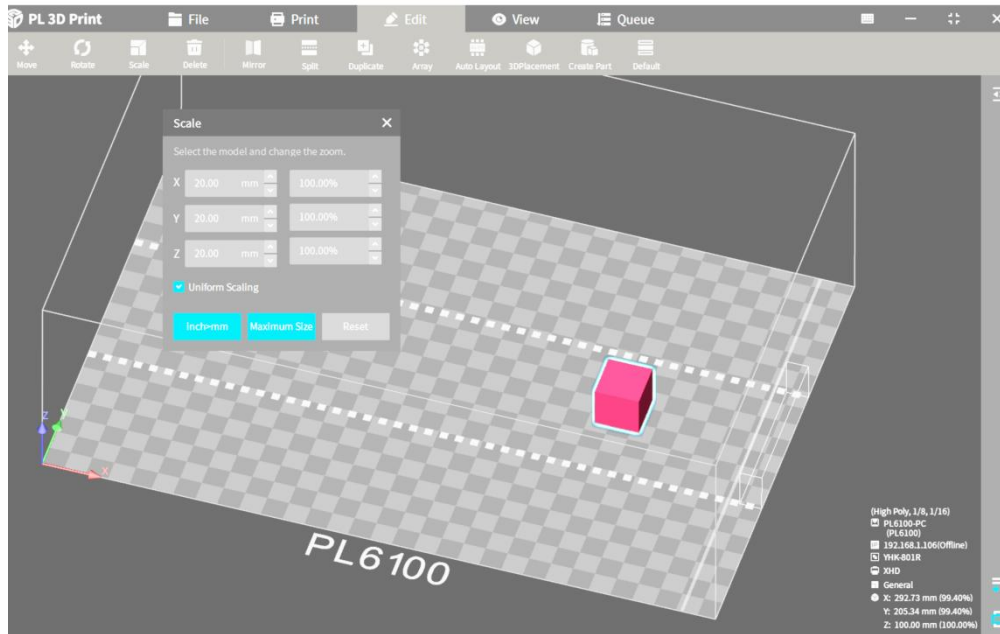
Create cubic or rectangular specimens via **PL3D Print** software, then record their theoretical CAD dimensions as  $X_{CAD}$ ,  $Y_{CAD}$ ,  $Z_{CAD}$ . After completing support-wax stripping and wax-cleaning operations, measure actual dimensions of printed parts and record values as  $X_{PART}$ ,  $Y_{PART}$ ,  $Z_{PART}$ .

Calculation of Shrinkage Scaling Factors:

- Create cubic



- Scale factor



## 5.4 PrintHead maintenance

- Use the dust-free cloth or no-dust napkin with isopropanol( **IPA** ) and pad it on the nozzle surface of **PrintHead**. Wait several minutes and change new dust-free or no-dust napkin with **IPA** to pad on the nozzle surface of **PrintHead**, repeat this procedures 3 times. Steps are as follows.

- ① Put into ipa, take it out and press out extra ipa
- ② Padding **PrintHead** nozzles'face for 10 secs.





③ Padding it on PH for 2 minutes, repeat 3 times



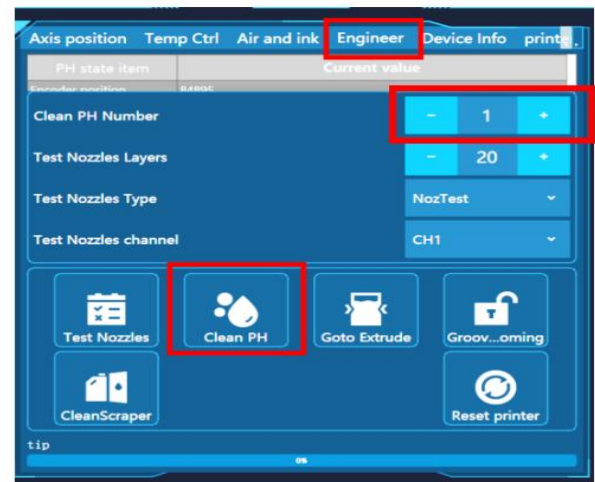
④ Use dust-free cloth slightly wipe nozzles



⑤ Remove extra ink drops



⑥ Click **Clean PH**.



## Chapter 6 Regular Maintenance

There are some necessary maintenance guides for PL6100 printer. Please read those maintenance guide carefully. Please perform maintenance operations regularly. Regular maintenance is beneficial to printer's printing quality and good protection for the using parts of printer.

### 6.1 Maintenance Checklist

 **CAUTION:** Before performing printer maintenance, set the printer to idle status(no printing ) or power it off. Install a clean build plate before carrying out maintenance.

| #  | Maintenance Task                                 | As Needed | Daily | Weekly | Monthly | Half year |
|----|--------------------------------------------------|-----------|-------|--------|---------|-----------|
| 1  | Clean print build plate                          |           | ✓     |        |         |           |
| 2  | Clean wiper on Waste Ink Groove                  |           | ✓     |        |         |           |
| 3  | Clean X axis platform                            |           | ✓     |        |         |           |
| 4  | Clean internal dust in build chamber             |           | ✓     |        |         |           |
| 5  | Clean wax dust on the sensors                    |           | ✓     |        |         |           |
| 6  | Clean waste box                                  |           | ✓     |        |         |           |
| 7  | Clean material drawer tray                       | ✓         | ✓     |        |         |           |
| 8  | Clean the bottom of print engine                 | ✓         |       | ✓      |         |           |
| 9  | Clean X-axis base                                |           |       | ✓      |         |           |
| 10 | Clean the X/Y -axis linear encoder               |           |       |        | ✓       |           |
| 11 | Clean front Crossflow fans                       |           |       | ✓      |         |           |
| 12 | Clean dust Crossflow fans                        |           |       | ✓      |         |           |
| 13 | Clean top fans: fan1/fan2/fan3                   |           |       | ✓      |         |           |
| 14 | Clean the primary efficient filter               |           |       | ✓      |         |           |
| 15 | Clean the IPC (computer)                         |           |       | ✓      | ✓       |           |
| 16 | Clean the dust fan                               | ✓         |       | ✓      |         |           |
| 17 | Clean Material drawer                            |           |       | ✓      |         |           |
| 18 | Clean the Touchscreen                            | ✓         |       | ✓      | ✓       |           |
| 19 | Replace the primary efficient filter             | ✓         |       |        | ✓       |           |
| 20 | Replace Roller belt                              | ✓         |       |        |         | ✓         |
| 21 | Replace Rubber pipe on Roller cover              | ✓         |       |        |         | ✓         |
| 22 | Daub grease on X-axis guide                      | ✓         |       |        |         | ✓         |
| 23 | Daub grease on Z-axis guide and motor screw rods | ✓         |       |        |         | ✓         |
| 24 | Daub grease on Y-axis guide and motor screw rod  | ✓         |       |        |         | ✓         |



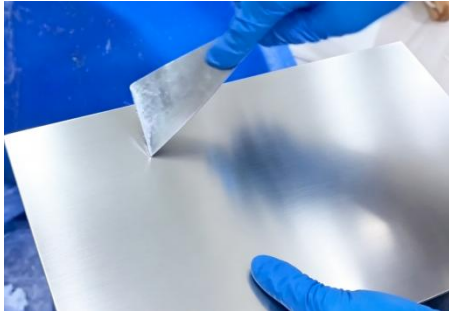
## 6.2 Maintain Content

### 6.2.1 Printer Daily Maintain

#### 1. Clean print build plate

- ① Slightly tilt the scraper to remove the residual wax on the build plate.
- ② Use dust-free cloth or napkin with Isopropyl Alcohol (IPA) to clean build plate surface.

①



②



#### 2. Clean rubber wiper on Waste Ink Groove

- ① Open right side door of printer.
- ② Push the Waste Ink Groove(Clean PrintHead Ink Station) to the left side of printer.

①



②



- ③ Clean the wiper by moistening lint-free paper or cloth with a small amount of isopropyl alcohol.
- ④ Push back the Waste Ink Groove to its original position.

③

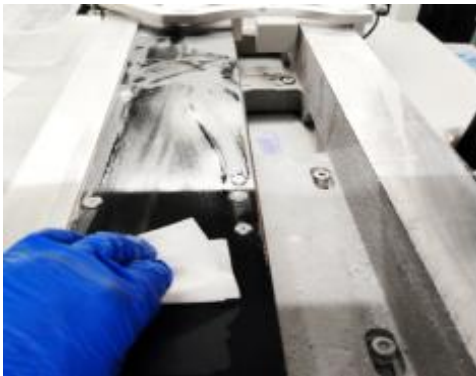


④



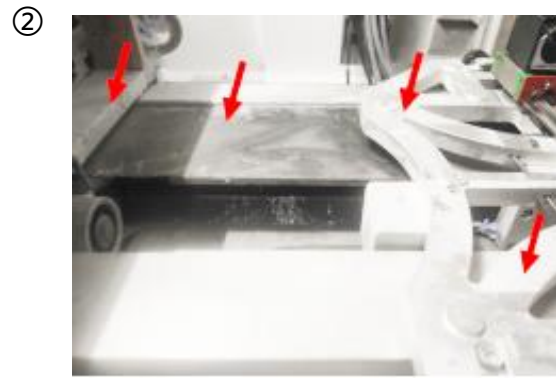
### 3. Clean X axis platform

- Make sure printer is idle status(no printing ) , open the safety door of printer. Use lint-free paper or cloth with Isoproply Alcohol(IPA) to clean build plate surface.



### 4. Clean internal dust in build chamber

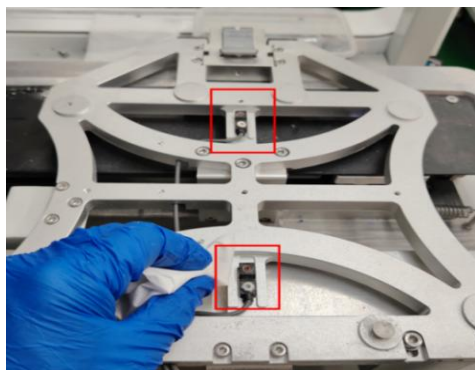
- ① Shutdown printer and use vacuum cleaner to clean the exhaust fans on the roof .
- ② Make sure the printer is idle status or power off status. Use dust-free cloth or napkin with IPA to clean build plate surface , clean the wax dust on the X axis base bracket of the print build plate.



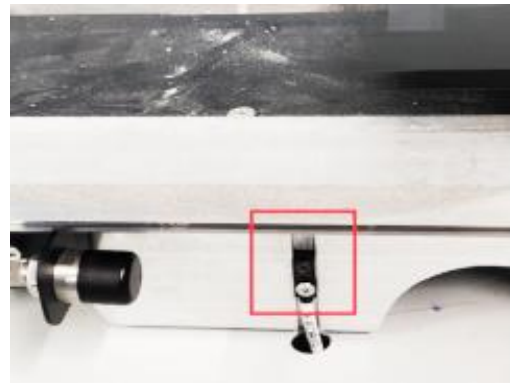
### 5. Clean wax dust on the sensors

- Make sure the printer is idle status power off status. Use lint-free paper or cloth with Isoproply Alcohol to the sensors surface.

- ① Sensors on the X axis platform



- ② Limit sensor on X axis





- ③ Build plate detect sensor on Waste Ink Groove

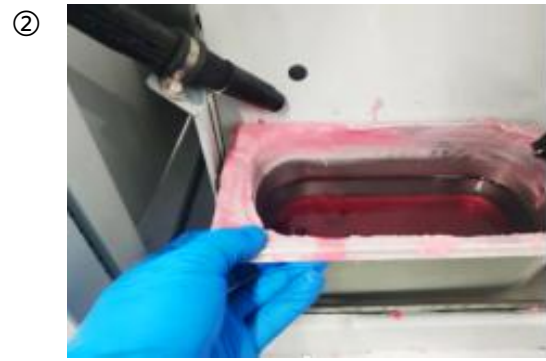


- ④ Limit sensor on Y axis



## 6. Clean waste box

- ① Open waste material chamber door.
- ② Wear protective gloves. Gently pull out the waste box and drain the hot liquid wax. Then reinstall the waste-material box.



## 7. Clean material drawer tray

- ① Pull out material drawer.
- ② Take out material drawer tray, remove the residual material on the tray. Then push it back.



## 6.2.2 Printer Weekly Maintain

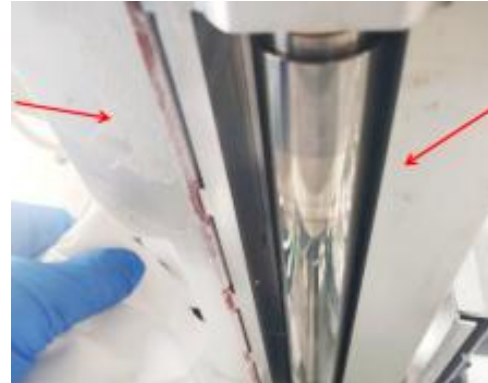
### 8. Clean the bottom of print engine

- Use lint-free paper or cloth with IPA to clean the wax dust on the **Printhead** bottom and print engine bottom.

①

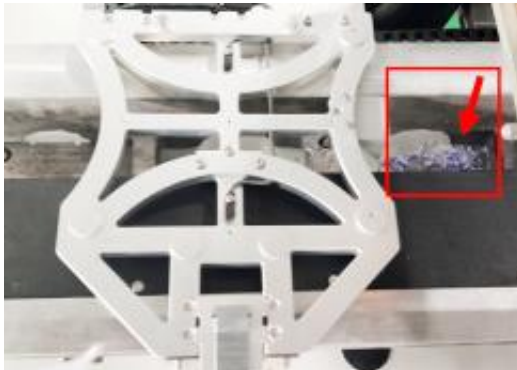


②



### 9. Clean X-axis base

- Check the X-axis base is clean before printing and follow below steps to clean the X-axis base :
- ① Open safety door. Use plastic scraper or stainless steel scraper to clean the wax drops and wax substance on the X-axis base. Use vacuum cleaner to clean the wax dust on the X-axis base.
  - ② Use dust-free cloth or napkin with Isopropyl Alcohol to clean the X-axis platform.





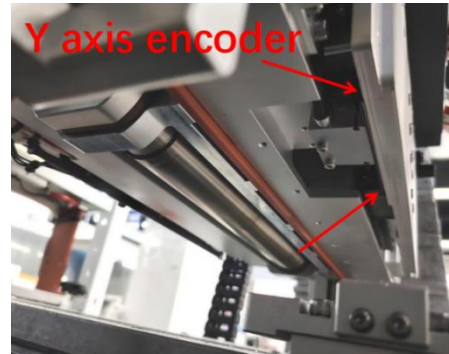
## 6.2.3 Printer Monthly Maintain

### 10. Clean the X / Y -axis encoder (linear encoder)



**Note:** The latest-version printers may not be equipped with a Y-axis encoder.

- Use dust-free cloth or napkin with Ipa or waterless ethanol to clean the X-axis encoder.
- Use air gun slightly blow the gap between Y axis encoder and its encoder reader if have.



### 11. Clean front Crossflow fans

- Please make sure the printer is shutdown and power off. When fans stop running, use vacuum cleaner or banister brush to clean each fans and clean outlet of the front crossflow fan.

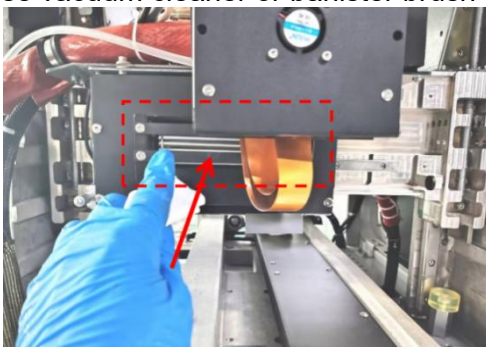


**Note:** User can take off the crossflow fans kit by removing the 2 fixed nut on it. Please hold the front crossflow fans by hand when unscrew the 2 fixed nuts.



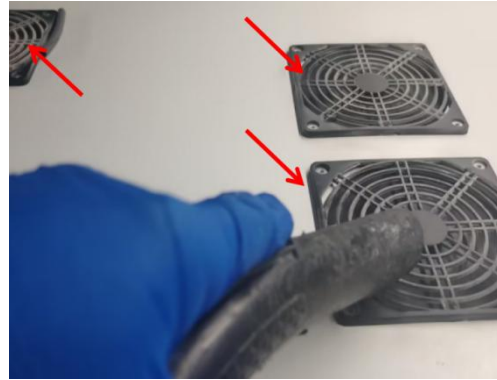
### 12. Clean rear Crossflow fans

- Use vacuum cleaner or banister brush or user dust free cloth to clean it.



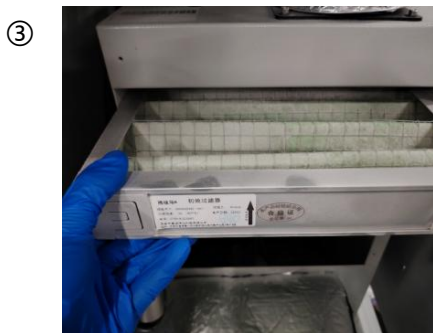
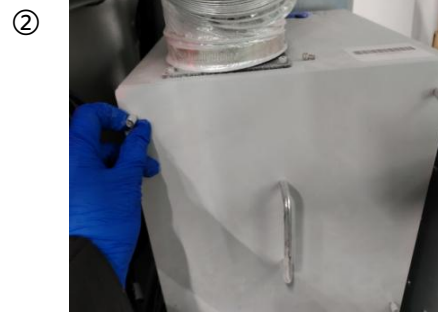
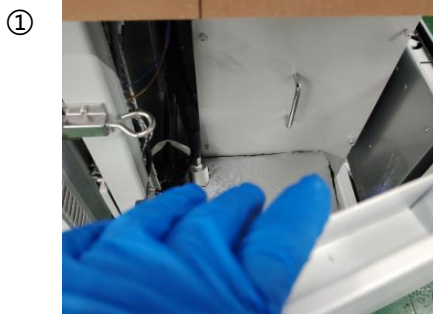
### 13. Clean top fans: fan1/fan2/fan3

- Please make sure that printer is shutdown and power off. When the fans are stop running, use vacuum cleaner or banister brush to clean the fans.



### 14. Clean the primary efficient filter

- ① Open waste material door.→② Unscrew 4 screws on filter box.→③ Take out primary efficient filter.
- ④ Take it outdoor and use vacuum cleaner or air gun to remove the dust .



### 15. Clean the IPC

- Please use vacuum cleaner or banister brush to clean the wax dust on IPC, clean the exhaust outlet.





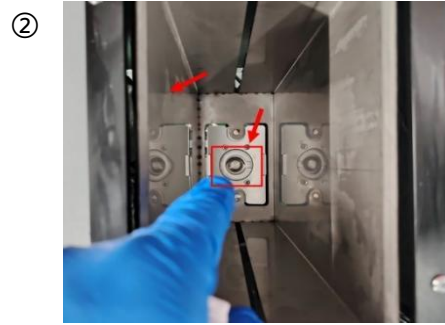
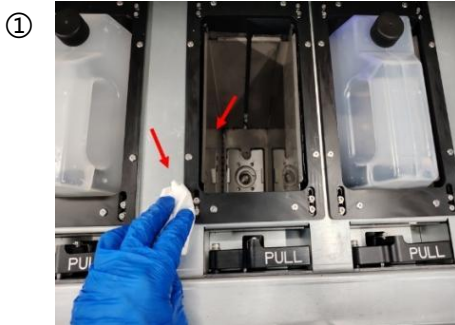
## 16. Clean the dust fan

- Go to the waste material chamber, go to the dust fans on the bottom. Please make sure that printer is shutdown and power off. When the fans are stop running, use vacuum cleaner or banister brush to clean the wax dust on fans.



## 17. Clean Material drawer

- ① Use dust-free cloth with IPA clean the surface and inner side of tank of material drawer.
- ② Wipe the wax and dust on the valve core head with a dust-free cloth.



**⚠ CAUTION:** The material tank is hot and avoid touching the inner side of the chamber during cleaning. Please wear Heat-resistant gloves before cleaning. We recommend shutdown and power off printer and waiting material drawer temperature is cooling down before cleaning material drawer.

## 18. Clean the touchscreen

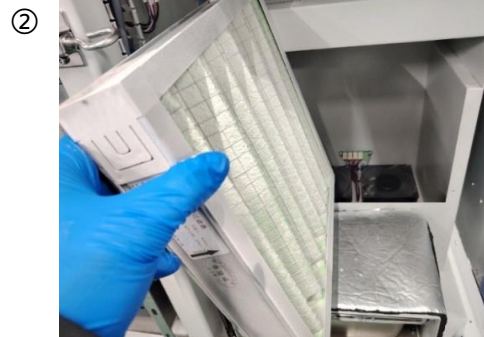
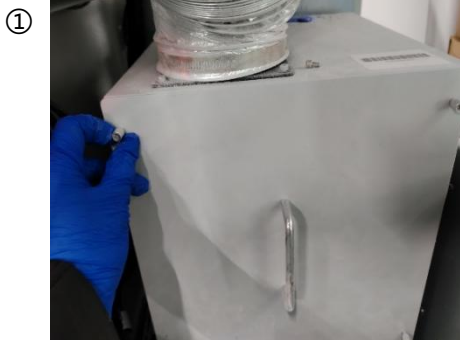
- Please use vacuum cleaner or banister brush to clean the wax dust on touchscreen.



## 6.2.4 Printer 6 months Maintain

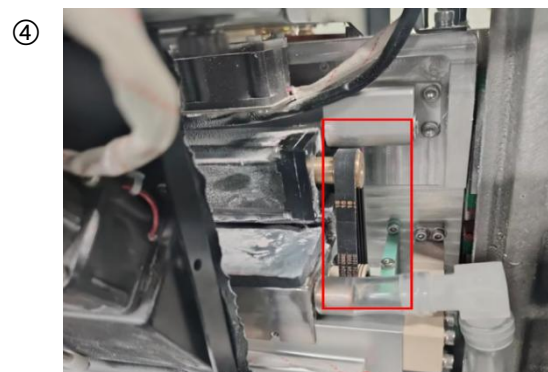
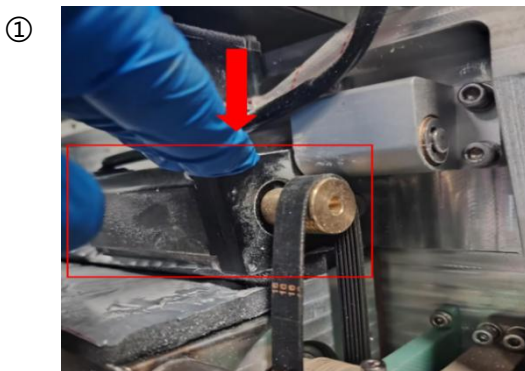
### 19. Replace the primary efficient filter

- ① Open the waste material chamber door and open the filter box by removing the 4 screws.
- ② Take out the primary efficient filter. Replace new primary efficient filter after using 6 months.



### 20. Replace Roller belt

- Please make sure the printer is in idle status or power off printer before replacing the roller belt.
- ① Remove rear cover and right door of printer, remove the front Crossflow fans, press down roller motor.
  - ② Carefully remove out the roller belt from roller motor pulley.
  - ③ Remove the 2 screws on the fixed parts of the roller heater, take out the green fixed parts, take out belt.
  - ④ Install new roller motor belt, fix back the green fixed parts on the roller heater.





## 21. Replace Rubber pipe on Roller cover

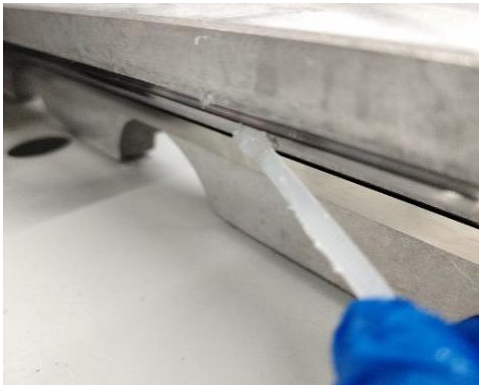
- Remove rubber pipe from roller cover, replace or clean wax dust with vacuum cleaner or replace it .



**⚠ Note:** Make sure printer is on standby or shutdown. Then user can disconnect the rubber pipe connected to Roller cover.

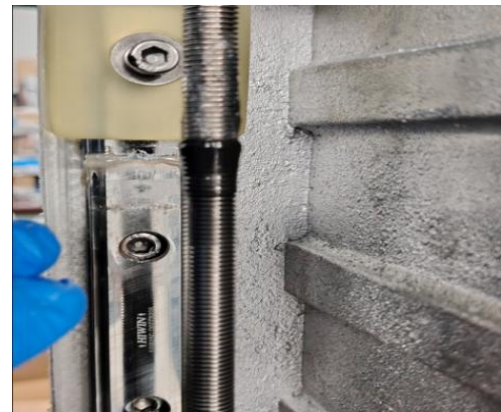
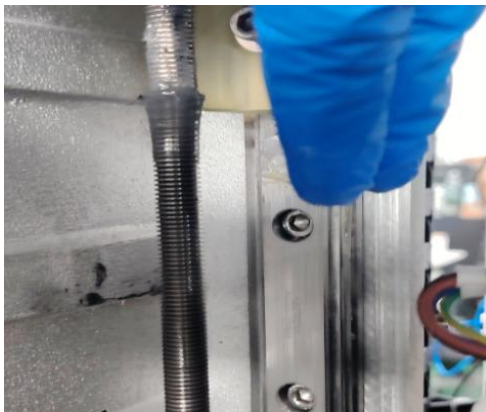
## 22. Daub grease on X-axis guide

- Evenly Daub the rail guide with grease on surface of the left and right side of X-axis rail guide .

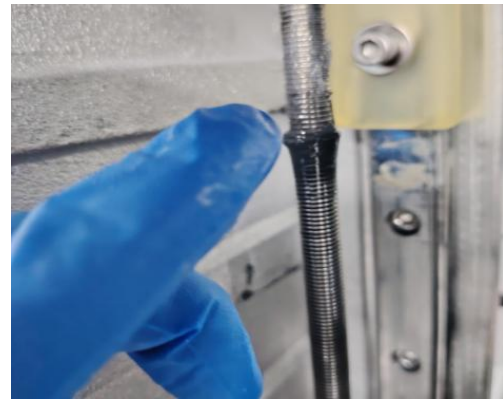
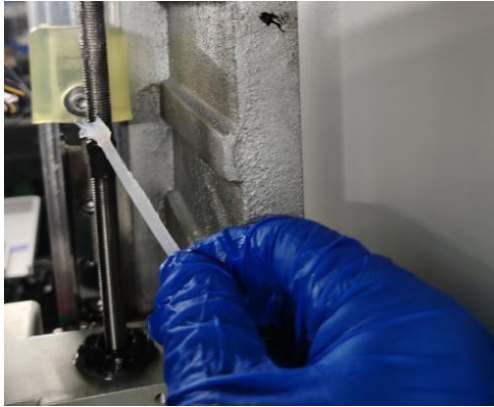


## 23. Daub grease on Z-axis guide and motor screw rods

- Evenly Daub the rail guide with grease on surface of the left and right side of Z-axis rail guide .



- Evenly daub the rail guide use grease on left side and right side of Z-axis motor screw rods.



#### 24. Daub grease on Y-axis guide and motor screw rod

- Evenly Daub the rail guide with grease on the surface of the Y-axis rail guide and Y motor screw rod.





## Chapter 7 Packaging and Shipping

### 7.1 Overview

This Chapter defines three standardized packaging requirements, material specifications, pre-packaging preparation, labeling rules and packaging inspection standards for **PL6100** printer. It applies to all industrial 3D printer models for cross-border transportation, international logistics, overseas delivery and foreign customer handover. Standard export packaging effectively protects printer from vibration, extrusion, moisture, dust and corrosion during long-distance ocean, air and land transportation, and complies with international logistics and export customs inspection norms.

### 7.2 Printer Pre-Packaging Preparation

Finish all 3D printer shutdown and reset steps before packing and transit:

- ① Take out material bottles inside bottle tanks in the material drawer.
- ② Place a clean square protective pad beneath the **PrintHeads**. Click the Z-axis down button in **Utility Manager** to lower the print engine. Halt Z-axis descent as soon as the **PrintHead** lightly press against the protective pad.
- ③ Shutdown Printer. Disconnect power cords, LAN cable. Please strictly follow Shutdown procedures as session **3.5.2 Shutdown Procedure**.
- ④ Use zip-tie to fix the **X platform** and **Waste Ink Cleaning Station, Waste Material Box**.
- ⑤ Check the printer appearance, screen, check waste dust chamber to confirm no loose parts. Record the printer model, serial number and appearance status for subsequent arrival verification.

### 7.3 Standard Packaging Requirements

All 3D printers are packaged with customized professional shockproof and anti-collision materials. The outer package adopts eco-friendly sturdy wooden crates that comply with international shipping standards for reinforced protection and secure fastening. Large-format industrial 3D printers are packed in wooden crates reinforced with steel strapping to improve structural stability during transportation.

The Standard shipping labels shall be affixed to the exterior of the carton, featuring warning symbols such as **FRAGILE, THIS SIDE UP ( KEEP UPRIGHT )**, **KEEP DRY** and **NO STACKING**. All labels must be clearly printed and securely attached without fading or peeling off. Below are pictures of the printer packaging.

Internal Packaging Photos



External Packaging Photos



WARNING SYMBOLS

|                                      |                                                                                                          |
|--------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>FRAGILE</b>                       | Remind handlers the internal precision equipment is fragile; handle gently, no impact or heavy pressure. |
| <b>KEEP UPRIGHT [↑THIS SIDE UP ]</b> | This label means keep the package upright as the arrow indicates; no inversion or flat laying.           |
| <b>KEEP DRY</b>                      | Keep package dry to protect electrical components from moisture damage.                                  |
| <b>FRONTAGE</b>                      | Marks machine front with delicate screen and print head; protect from impacts.                           |
| <b>DO NOT TILT</b>                   | Prohibit tilting; keep the crate vertical during transport and handling.                                 |



## **7.4 Transportation Requirement**

### **7.4.1 Storage Placement**

Only place wooden crates in a single layer. Do not stack any goods on top.

### **7.4.2 Storage & Transport Environment**

Avoid direct sunlight, low temperature and outdoor storage. High temperature deteriorates consumables while low temperature causes pipeline clogging. Use extra waterproof film for transportation in rainy seasons or coastal areas.

### **7.4.3 Logistics Selection**

Choose full-truck dedicated delivery instead of LTL with multiple transfers. Avoid bumpy rural roads and prioritize highway transit to reduce repeated loading and unloading.

### **7.4.4 Loading & Unloading Operations**

Lift the Wooden packing crate only by its load-bearing base at the bottom. Handle gently with a lifting drop distance under 10 cm; no throwing, dragging or tipping. When using a forklift, fully insert forks under the base to prevent printer deformation from unilateral stress.

## Chapter 8 Warranty and Service

**Plempire** is committed to delivering high-quality products and premium after-sales services to ensure customers enjoy a satisfying and seamless printing experience. Below are our product warranty policy and after-sales service guidelines.

### 8.1 Warranty Policy

#### 8.1.1 Warranty Period

- ✧ **Plempire PL6100** printers come with a standard 1 year warranty starting from the date of equipment acceptance. Within the warranty period, customers are entitled to free repair or complimentary replacement of covered spare parts for quality defects that are not caused by human error or improper operation.
- ✧ The actual warranty coverage varies by printer model and purchase contract. Extended factory warranty may be offered under specific purchase agreements, and optional extended warranty service is also available for customers.

#### 8.1.2 Covered Parts & Free Services

Free repair or spare part replacement is available under warranty. Free accessories exclude replacements resulting from accidental damage or improper operation. Details are subject to the contract. Main standard replaceable parts and free services under warranty (for reference only) are as follows:

##### ■ Standard warranty replaceable parts

- ✧ **Mechanical Motion Parts** : Motors belts, limit sensors.
- ✧ **Electrical Control Components** : Solenoid valves, Cooling Fans, Original Signal cables, etc.
- ✧ **Core Printing Modules** : Air Filter, Liquid Level Sensors, etc.
- ✧ **Auxiliary Components** : Exhaust fan, Silicone vacuum pipe.

##### ■ Free service

- ✧ Free official software upgrades
- ✧ remote troubleshooting and technical consultation

#### 8.1.3 Exclusions (Not Covered Under Warranty)

- Printing consumables are wearing parts and are generally not covered by the printer warranty. The standard printing consumables are listed as follows:

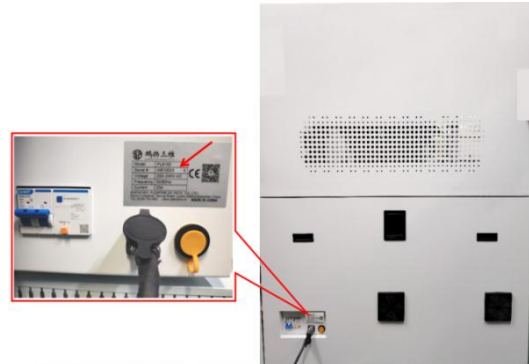
Timing belts, Wiper, Slider, Air Filters, sealing rubber rings, Printing Materials, Print Build Plate, etc.



## 8.2 After-sales service policy

### 8.2.1 How to Apply for Warranty Service

- To apply for warranty service, please prepare the printer **serial number**, detailed fault description and purchase voucher. The serial number is printed on the back of the machine. Our customer service team will troubleshoot the equipment based on your purchase information and guide you through follow-up procedures.
- If encounter any problems, please contact **Plempire** via our customer service hotline, send emails to **sales@plempire.net**, or scan the corporate **WeChat** QR code on official website **www.plempire.cn**.



### 8.2.2 Printer Installation and Operation Training

#### ❖ Self-Installation by Users

Follow the steps below for self-installation:

##### ① Printer Unpacking Inspection

After receipt, check the wooden crate for dents and water seepage. Unpack and count all accessories against the packing list. Contact after-sales service immediately for registration if any parts are damaged or missing.

##### ② Site Placement Requirements

Place the printer on a flat, dust-free, shaded and well-ventilated indoor surface with sufficient space for heat dissipation and operation. Ensure ambient temperature and humidity meet operating standards. Keep the unit away from heat sources and strong magnetic fields, and confirm the surface load capacity matches the printer weight.

##### ③ Step-by-Step Installation

Complete build plate leveling, wiring and material loading sequentially following illustrated instructions in the user manual. Proceed to the next procedure only after verifying each step is completed correctly.

#### ④ Initial Power-On & Test Print

After full installation, power on, load materials and run **Reset printer**. Let the printing materials melt for **6** hours. Tap **"Yes"** on the touchscreen prompt **"Printer is ready. Please turn on Air & Ink system?"** to continue. Complete **Test Nozzle** print to verify printing quality, then transfer print files. The self-installation is finished once the test print output meets standard quality.

### ❖ On-site Installation by Engineers

#### Booking Procedure for On-site Service

If users require professional on-site installation, they may submit an application via customer service hotline, corporate WeChat or email, providing the printer model, delivery address and preferred appointment time. Our after-sales staff will verify purchase information and assign a corresponding technical engineer.

#### Standardized On-site Installation

Upon arrival, the engineer will assist users with unpacking inspection, equipment handling and placement, full machine assembly, electrical wiring, horizontal calibration, software and driver installation, as well as test printing. All professional installation and commissioning work will be completed in a single visit.

### ❖ On-site Operation & Maintenance Training by Engineers

#### ① Basic Printer Operation Training

We demonstrate core operations: power on/off printer, touchscreen and **PL6100** program interface, file transfer, print job selection, **Test Nozzle** print, print start/pause/stop, remove print build plate and wax patterns, post-processing and support removal in solvent.

#### ② Routine Maintenance Training

Cover inspection, cleaning and replacement cycles of consumables (timing belts, scrapers, rollers, sealing O-ring, dust filters, etc.); standard cleaning steps for **PrintHeads**, build print plate, **PrintHeads** and rollers; guidance on periodic calibration, lubrication and dust cleaning; rules for material storage, refilling and recovery.

#### ③ Basic Troubleshooting Training

Explain quick fixes for typical printing issues: streaks(missing lines), layer marks, warping, material leakage and layer separation. Trainees will learn to check alarms, read error codes and reset minor faults.

## 8.2.3 Technical Support & On-site Maintenance

### ■ Technical Support

During the warranty period of PL6100 3D printer, **Plempire** technical staff will provide scheduled



online technical support via remote access through instant messaging tools including **WeChat**, **WhatsApp** and **Line**, etc. Users shall connect the printer to internet, launch **ToDesk** on the printer touchscreen, and send the ToDesk remote access code to our technicians.

#### **ToDesk icon on touchscreen**



#### ■ **On-site Maintenance**

On-site service by technicians will be arranged according to actual on-site faults. The specific service scope will be determined by **Plempire** technicians based on the printer's real condition to guarantee uninterrupted equipment operation.

##### ✧ **Equipment Troubleshooting**

Inspect hardware and software faults on site, repair and replace damaged parts including new print heads and electrical control components.

##### ✧ **Whole Machine Commissioning & Calibration**

Calibrate printing accuracy, maintain **PrintHeads**, Waste Ink clean capping station, and restore the printer to standard operating status.

##### ✧ **Periodic Maintenance**

Standard maintenance including full machine dust removal, guide rail lubrication, timing belt inspection, print head maintenance and material system cleaning.

##### ✧ **Operation Training & Guidance**

Provide on-site training for operators on printer operation, daily maintenance and simple fault troubleshooting.

#### **8.2.4 Warranty Freight Terms**

When our after-sales engineers confirm warranty parts need returning to the factory for repair, shipping costs shall be shared by both parties as stipulated below:

- ① For spare parts excluded from warranty coverage that require factory repair upon our after-sales verification, the end customer shall cover all inbound and outbound shipping costs.
- ② Within the valid warranty period, if component replacement is required as a result of accidents or improper manual operation, the user shall be responsible for both outgoing and return freight charges.

## Appendix A PL3D PRINT Software

### ■ PL3D Print Software Setup

- Install **PL3D Print** to Drive **D** or **E** only on user computer (see fig. A-1).
- Enter the activation code in the input field after finishing software installation (see fig.A-2).

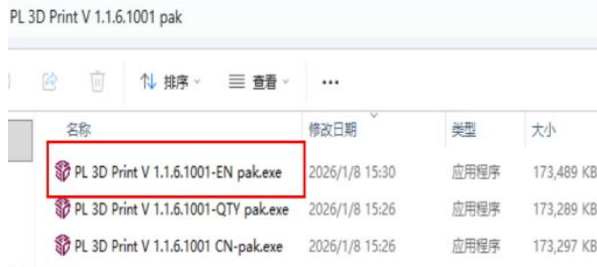


fig. A-1 install PL3D Print

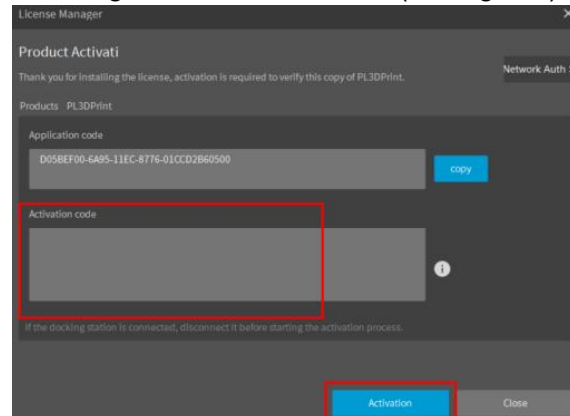


fig. A-2 Input Activation Code

### ■ PL3D Print software using

- Double-click the **PL3D Print** desktop icon to launch the software(fig.A-3).  
Click **Print > Settings > Refresh** , select your printer, then click **Set** to connect (fig.A-4, fig.A-5)

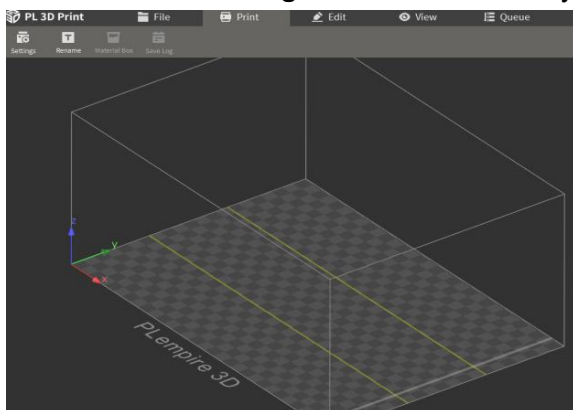


fig. A-3 run PL3D Print program

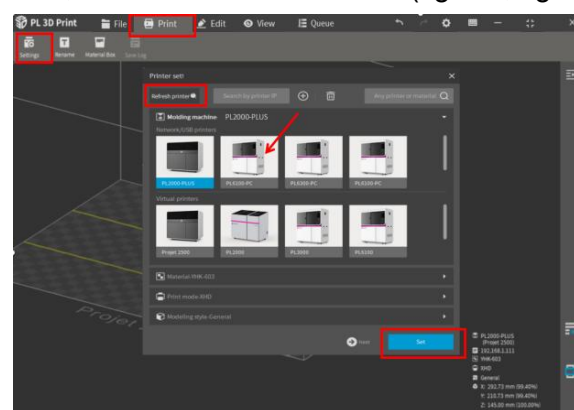


fig. A-4 Connect Printer

- Import the **.stl** file via **File > Import**, click **Add to Queue**, enter a filename, click **Add to Queue** again to send it to the printer, and it appears in the **Print Queue** waiting list (figs. A-5, A-6).

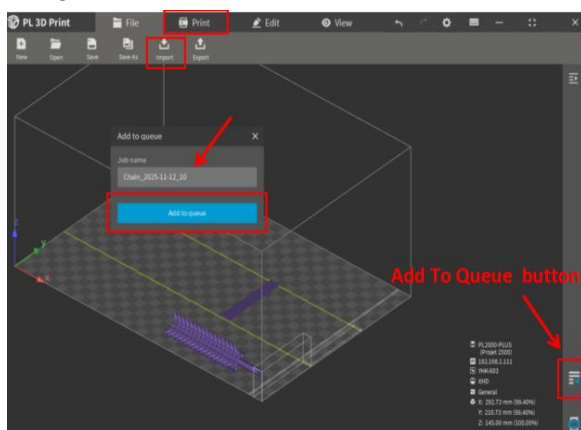


fig. A-5 Add to Queue

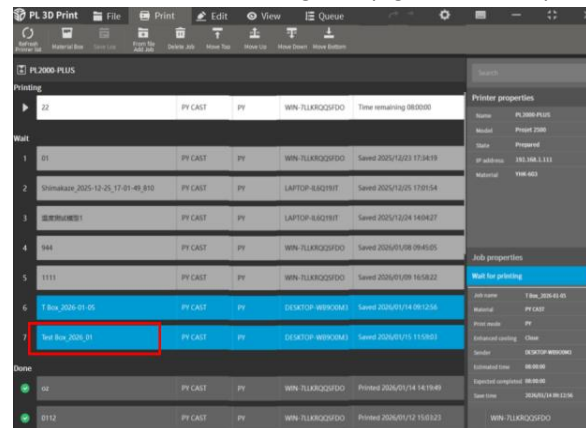
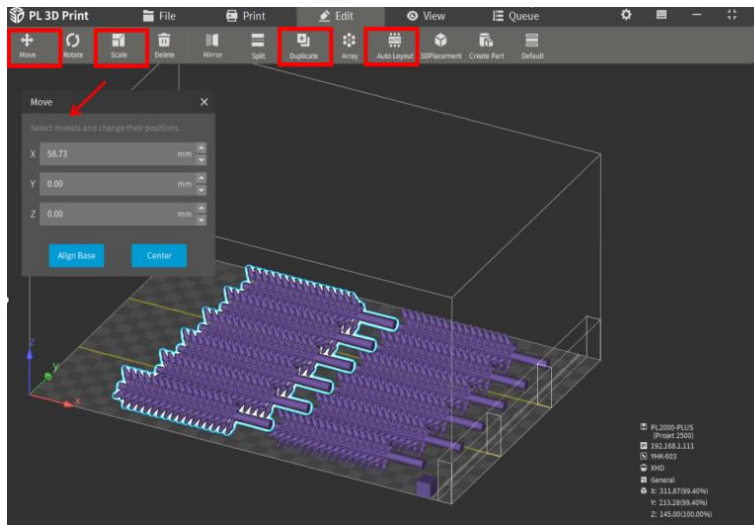


fig. A-6 sent file Auto-Save to Print Queue



## ■ Print file Edit

Click **Edit** to modify and arrange models via built-in tools. Common functions include Move, Rotate, Scale, Mirror, Split, Duplicate, Auto Layout, 3D Placement, Create Part, etc.



**Move** : manual move models or change coordination to move auto.



**Rotate**: Change model placement angles.



**Scale**: Magnify or Scaling down model size.



**Mirror**: Create symmetrical shapes along axis of symmetry.



**Split**: Separate the models in group.



**Duplicate**: Copy models quantities.



**Auto Layout**: Automatically place the model on the XY plane.



**3D placement**: Auto place models on stacking.

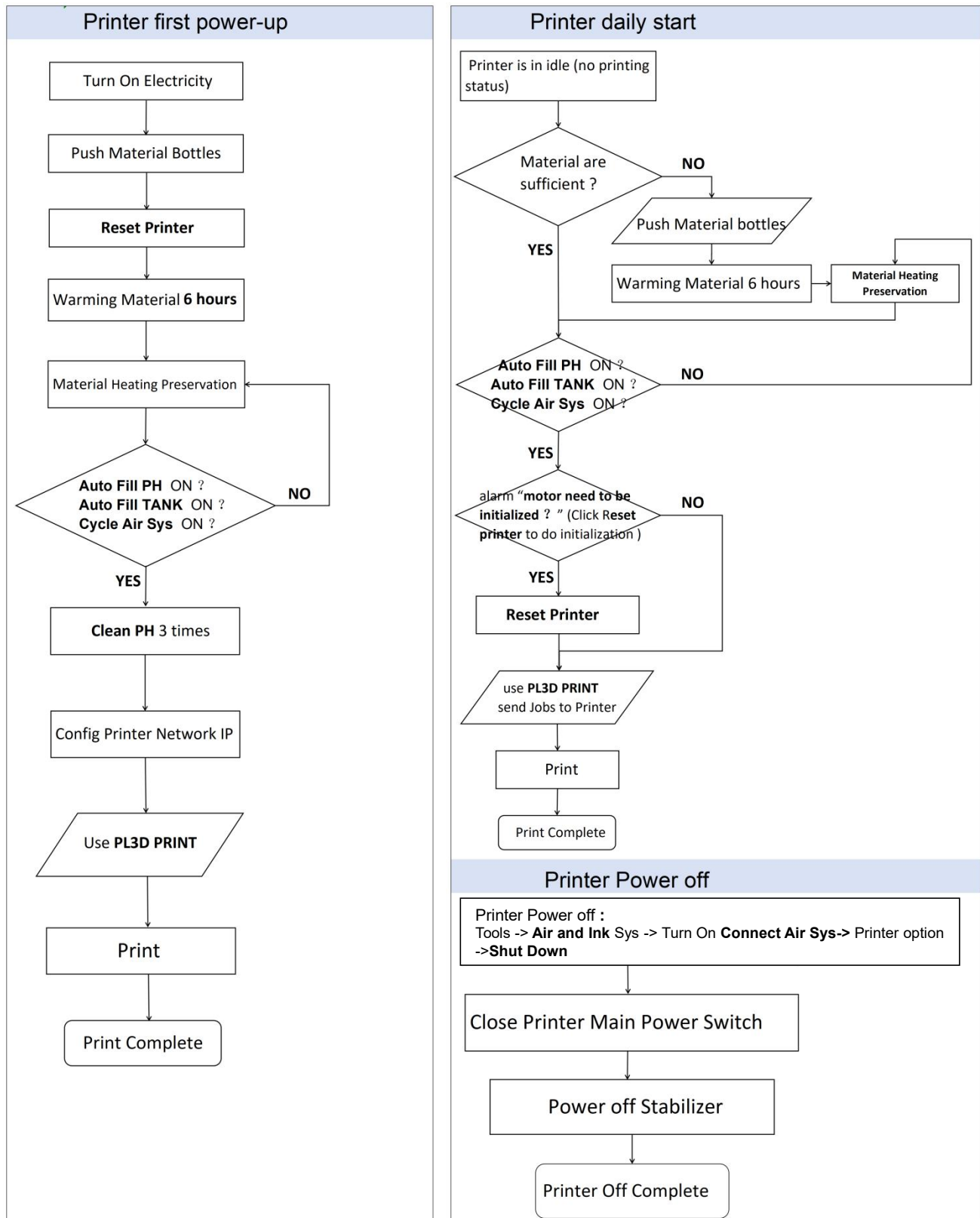


**Create part**: Create geometric cube.



**NOTE**: Contact **Plempire** team to obtain the activation code for **PL3D PRINT** software.

## Appendix B PRINTER POWER ON / OFF FLOWCHART





**Precision—Efficiency—Service**

**Shenzhen Plempire 3D Technology Co.,Ltd.**

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**Contact No.:** +86 135 6072 4387

**Hotline :** 4008-700-990

**After-sales email :** [sales@plempire.net](mailto:sales@plempire.net)

**Website :** [www.plempire.cn](http://www.plempire.cn)

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**Add:** 1/F, Bldg 5, Reservoir New Village Industrial Zone, Taining Road, Luohu District, Shenzhen, China.