User Manual

PHOTON

Dear customer,

Thank you for choosing ANYCUBIC products.

Maybe you are familiar with 3D printing technology or have purchased ANYCUBIC printers before, we still highly recommend that you read this manual carefully. The installation techniques and precautions in this manual can help you avoid any unnecessary damage or frustration.

More information please refer to :

1. http://www.anycubic.com/

ANYCUBIC website provides software, videos, models, after-sale service, etc.

Please visit our website for technical support and we are likely to answer or solve all the questions for you!

2. Facebook page and Youtube channel as shown below.

ANYCUBIC Website

Facebook page

Youtube channel

Team ANYCUBIC

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2. Safety instructions

Always follow the safety instructions during assembly and usage, to avoid any unnecessary damage to the 3d printer or individual injury

Please contact our customer service first if you have any issue after receiving the products.

Be cautious when using the scraper. Never direct the scraper towards your hand.

In case of emergency, please immediately cut off the power of ANYCUBIC 3D printer and contact the technical support.

ANYCUBIC 3D printer includes moving parts that can cause injury.

It is recommended to use protection glasses when cleaning/sanding the printed models to avoid small particles contacting eyes.

Keep the ANYCUBIC 3D printer and its accessories out of the reach of children.

Vapors or fumes may be irritating at operating temperature. Always use the ANYCUBIC 3D printer in an open and well ventilated area.

ANYCUBIC 3D printer must not be exposed to water or rain.

ANYCUBIC 3D printer is designed to be used within ambient temperature ranging 8°C-40°C, and humidity ranging 20%-50%. Working outside those limits may result in low quality printing.

Do not disassemble ANYCUBIC 3D printer, please contact technical support if you have any question.

3. Technical Specification

Printing

System	ANYCUBIC Photon
Operation	2.8-inch Color TFT Screen
Software	ANYCUBIC Photon Slicer
Connectivity	USB memory stick

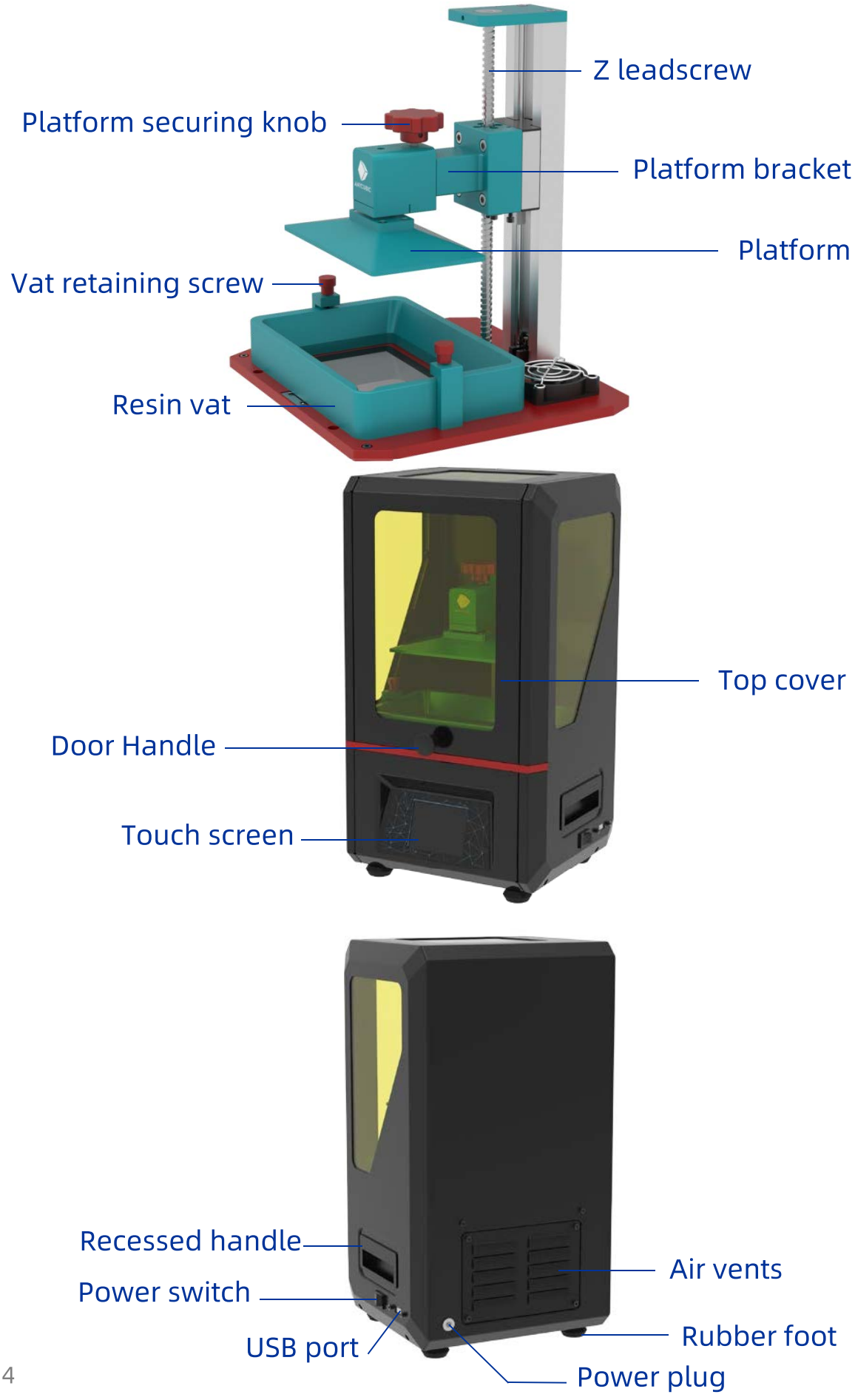
Specifications

Technique	LCD Shadow Masking
Light source	UV-LED（wavelength 405nm）
XY Resolution	0.047mm（2560*1440）
Z axis Accuracy	0.00125mm
Suggested Layer Thickness	0.01 ~ 0.2mm
Suggested Print Speed	20mm/h
Rated power	40W

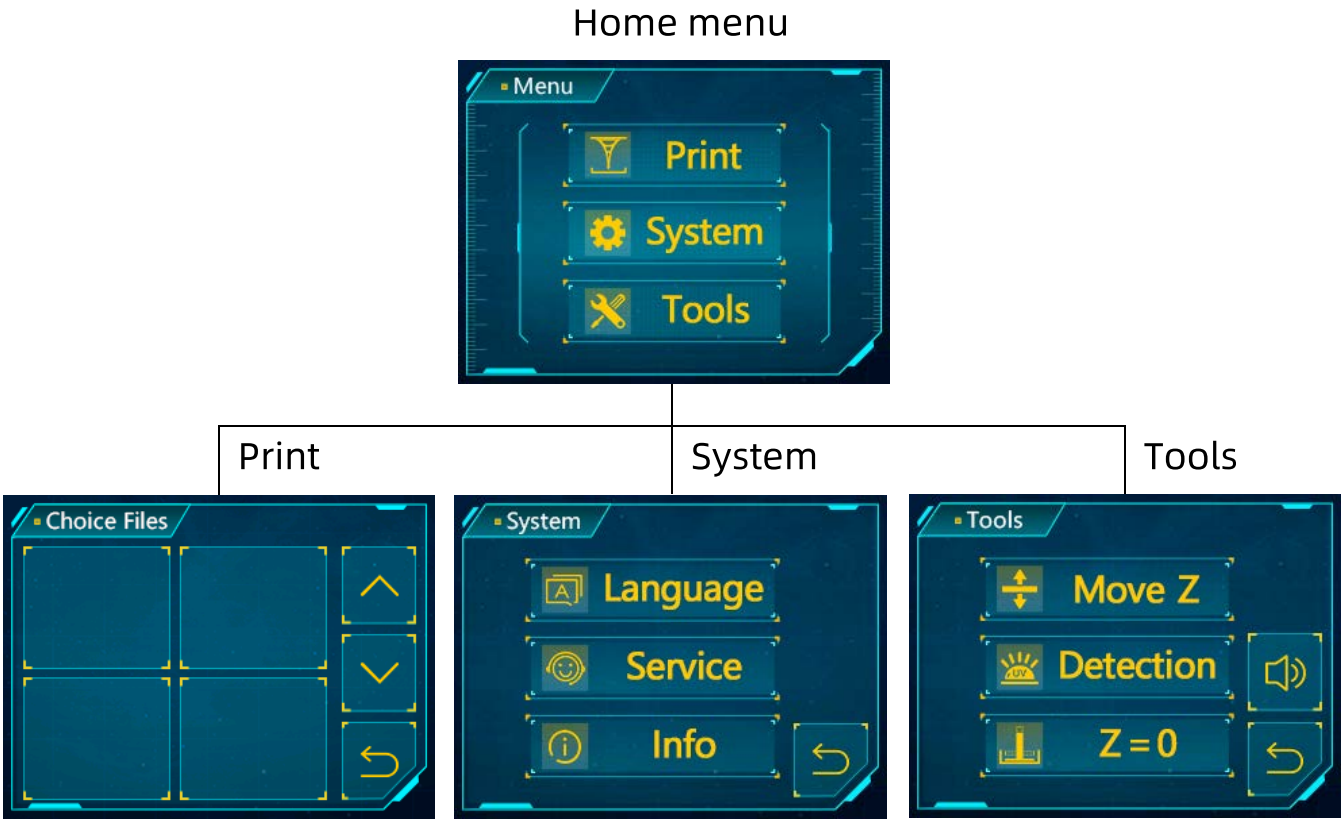
Physical Dimensions

Dimension	220mm（L）*200mm（W）*400mm（H）
Build volume	115mm（L）*65mm（W）*155mm（H）
Materials	405nm UV-resin
Net weight	~6.6kg

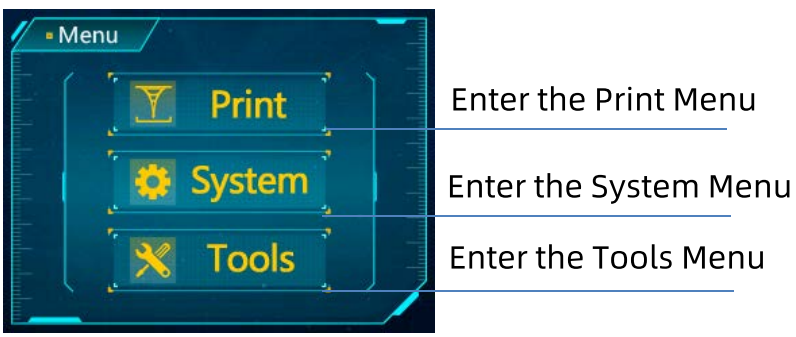
4. Product Overview



5. Menu Directory



Home menu



5. Menu Directory

Print

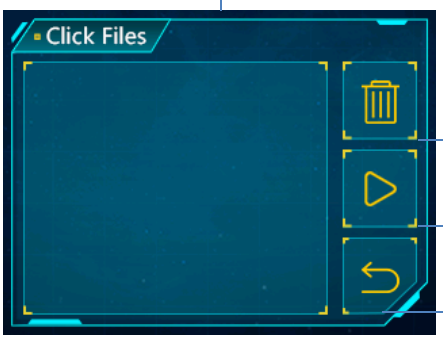
File List:

Page up

Page down

Return to the Home Menu

Click Files



Delete the current file

Click to start printing

Return to the Print Menu

System

Language: Change language(English/Chinese)

Service:

Official website

Return to the System Menu

Information:

Product system

System version

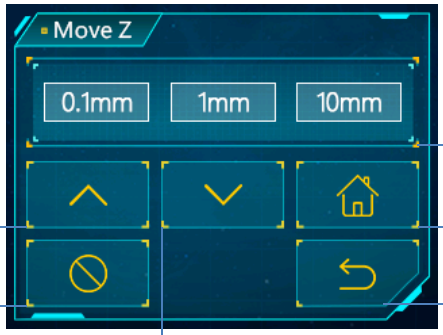
Product ID

Return to the System Menu

5. Menu Directory

Tools

Move Z:



Move Z by 0.1mm/1mm/10mm

Move the Z axis upwards

Return to Zero

Stop moving the Z axis

Return to the Tools Menu

Move the Z axis downwards

Detection:

Select one of the images to detect

Click to set the test time

Reduce the test time

Test LED and LCD for the preset time

Return to the Tools Menu

Increase the test time

Z=0: Reset the zero point

6. Assembly and Leveling instructions

1. Unpack the machine and remove the protective film outside. Then install the handle on the top cover, as shown in Fig.(1).

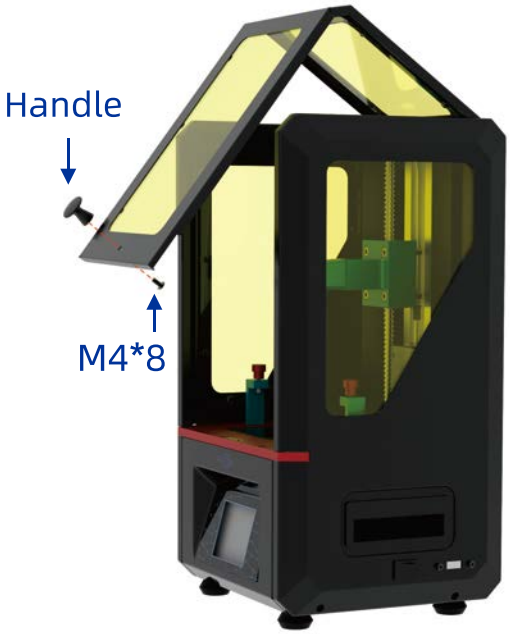


Figure.(1)

2. Take out the printing platform and other accessories inside the machine. Check and ensure the 2K LCD screen and platform are clean and free of dust, as shown in Fig.(2). Then plug in the power cord and turn on the printer.

Figure.(2)

6. Assembly and Leveling instructions

Leveling is a very critical step for printing and have a direct influence on printing success rate. Poor leveling may lead to printing failures such as model non-stick to platform or model falling off.
Strictly follow the steps for leveling.

3. Loosen the set screw on the printing platform with a Allen wrench so the platform can be rotate freely, as shown in Fig.(3).

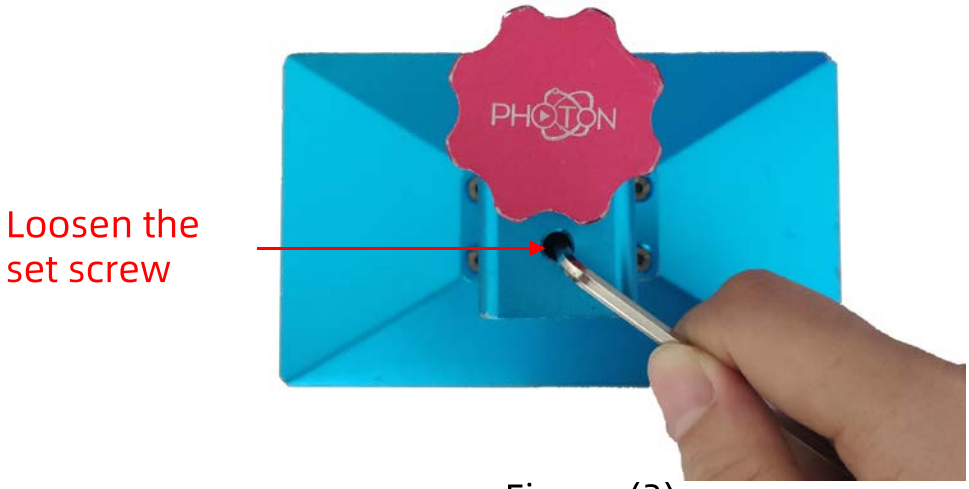
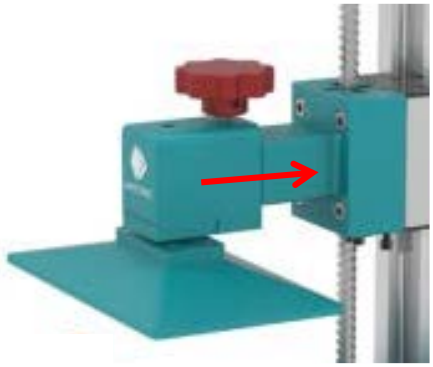


Figure.(3)

4. Install the platform onto the platform bracket (If it cannot be installed due to limited Z height, then please click and raise the Z axis by "0.1mm" or "1mm" on the touchscreen until the platform can be installed). Lastly tighten the red platform securing knob on the top.



The printing platform must be well installed to the end

Figure.(4)

5. Put a piece of A4 paper on the 2K LCD screen. Then click the “TOOLS” → “MOVE Z” → “HOME” on the color screen. Wait for the Z axis to descent and then it will stop automatically.

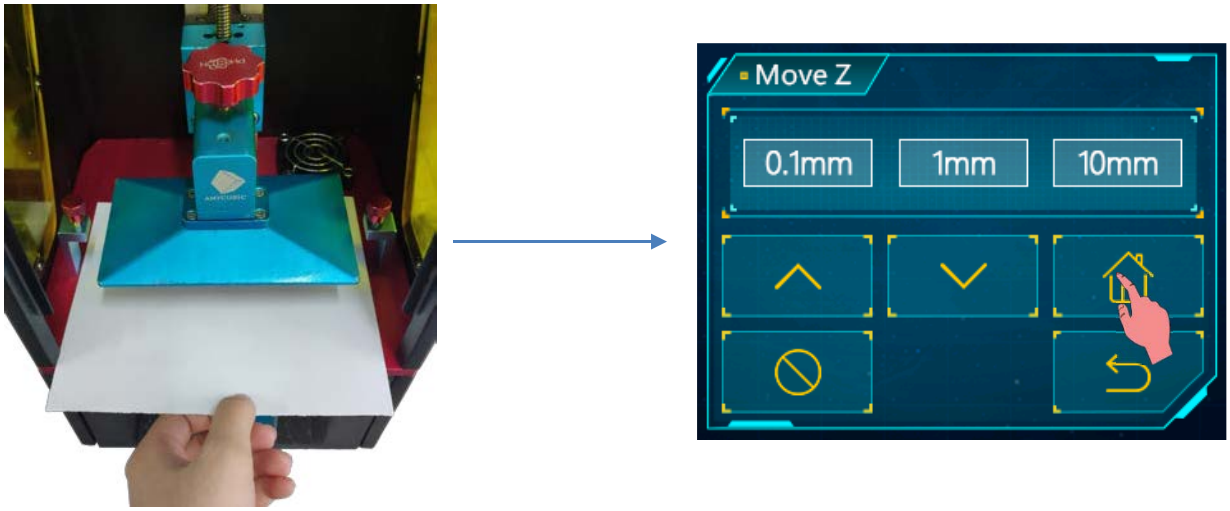
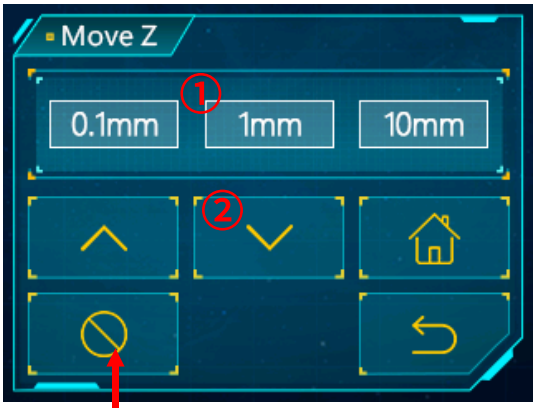


Figure.(5)

6. After the “ ”, click to lower the Z axis by "0.1mm" or "1mm" (carefully use single clicks as shown in Fig.6,) on the touch screen UNTIL you feel the resistance when pulling the paper back and forth (Do not continuously click descending to avoid platform hitting the LCD). Now finger press on top of the platform gently, to let it fit evenly on the 2K LCD screen and make sure it is aligned in every direction (Fig. 7). Then fix the set screw as tight as possible, so the platform is leveled.

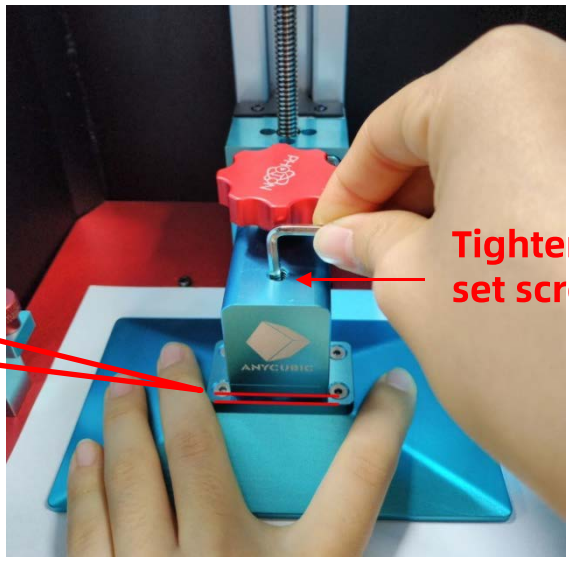


Click emergency stop if need to stop the Z axis immediately.

Figure.(6)

The platform must be aligned in every direction

The platform must be aligned and leveled, not tilted in any direction



Tighten the set screw

Figure.(7)

7. Lastly, click “TOOLS”→ “Z=0” on the touch screen, and then click “OK” on the pop-up window as shown in Fig.(9). Till now, the leveling process is finished.

Figure.(8)

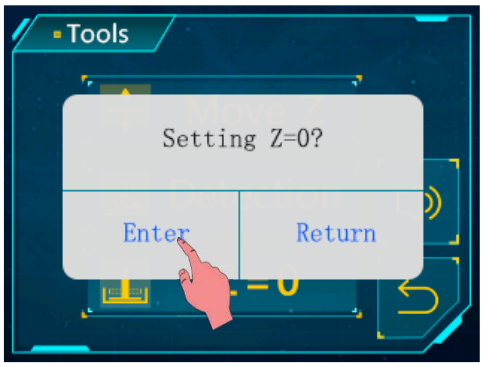


Figure.(9)

8. Function test of UV-LCD: gradually rise the platform about 120mm, then click "TOOLS"→ "DETECTION", select a image and the testing time, and then click "NEXT" on the screen as shown in Fig.(11). The 2K LCD screen should display a complete image as you selected. Otherwise, the UV light is malfunction and please contact the tech support.

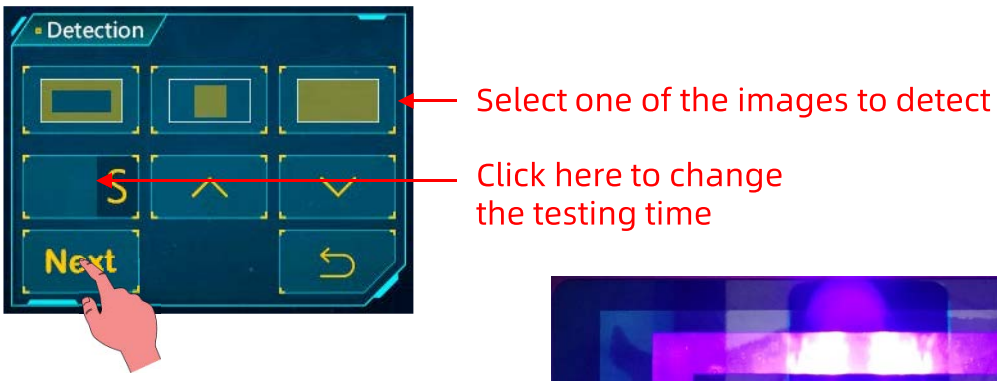


Figure.(10)

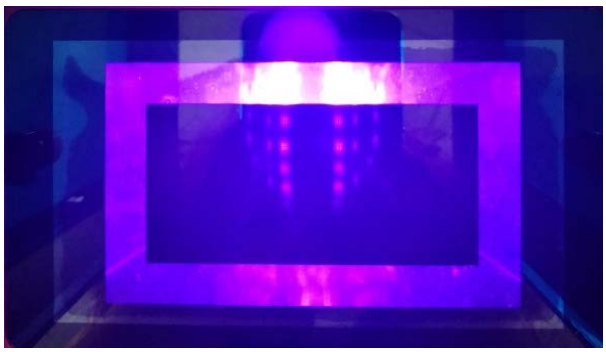


Figure.(11) The detection result of selecting the first rectangular box

9. Please check if the FEP film on the resin vat is tight, and you may hear a drum sound if gently give it a flick with finger. If the FEP film is not tight, please tighten the 8 screws on the bottom of the resin vat to fix the FEP film. Make sure the resin vat is nice and clean, then install the resin vat till it aligns with the two limit-screws on the panel, as shown in Fig. (12). Finally tighten the red adjustable nut on both sides to secure the vat.

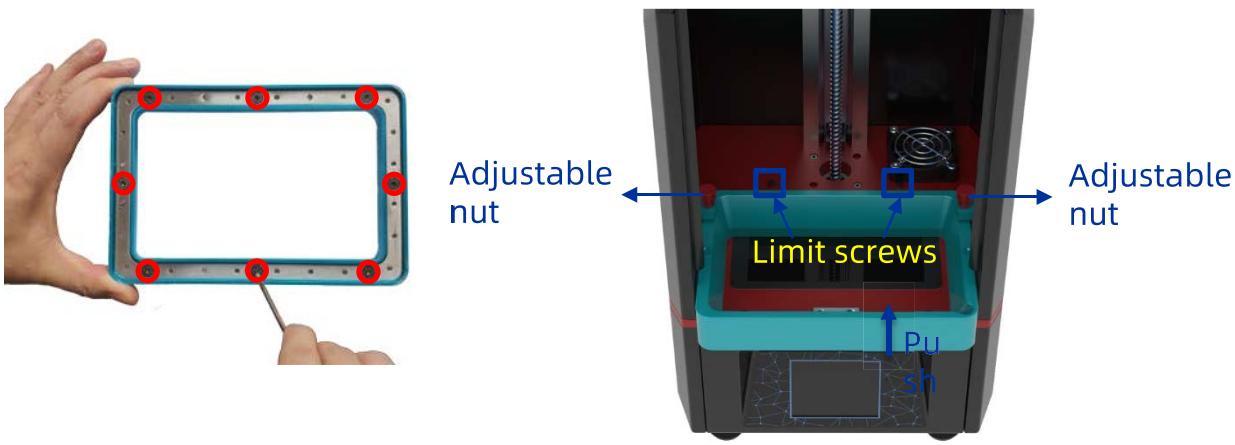
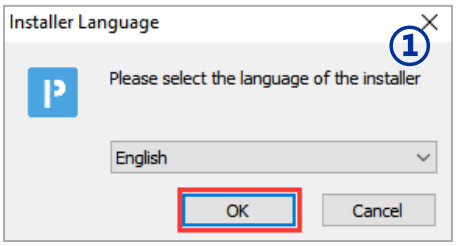


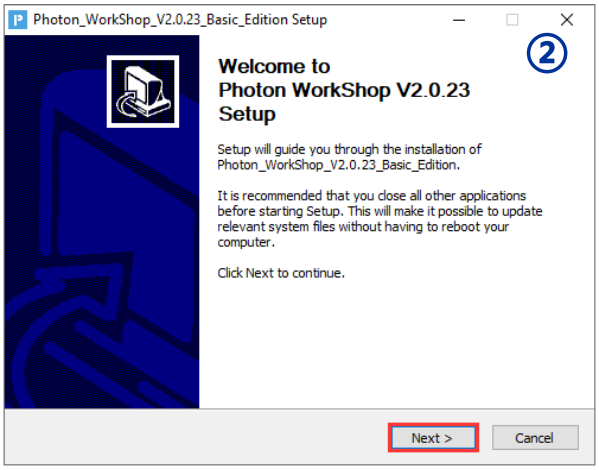
Figure.(12)

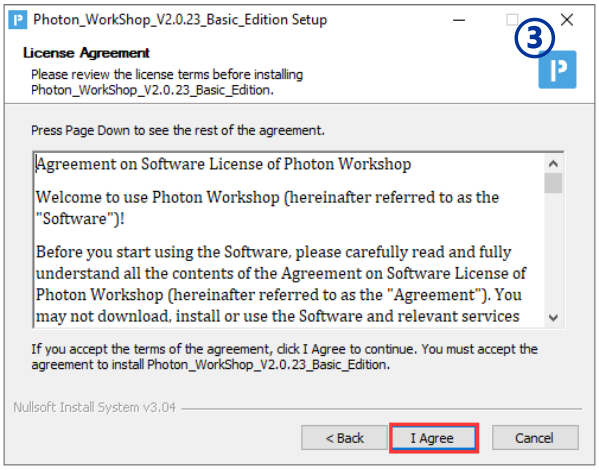
7. Software installation

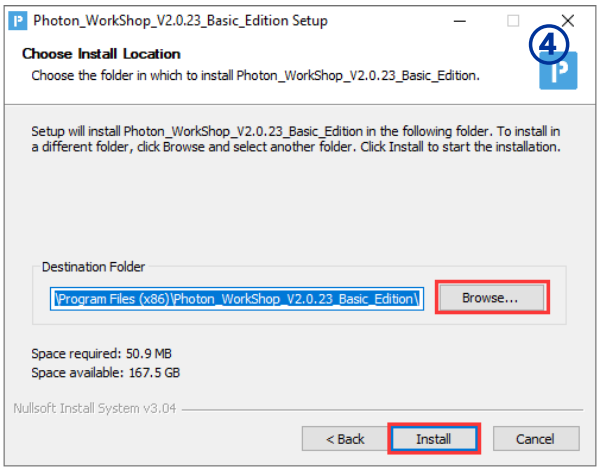
7.1 Slicing software installation

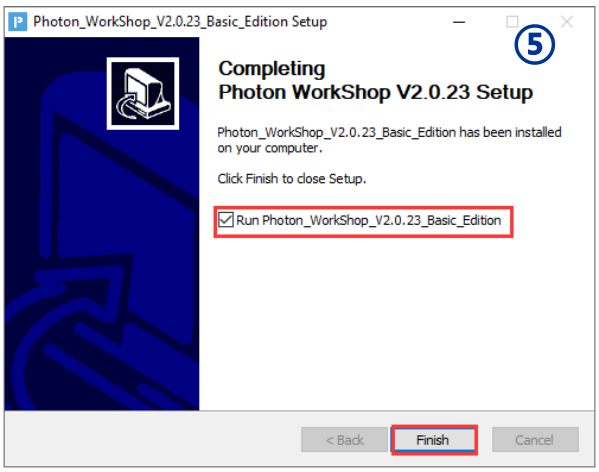
Here Windows PC is taken for example. Slicing software is located in memory stick: “File_English_Photon” → “Photon slicing software”. (You may have to close the anti-virus software before installing the slicing software.) Double click “Photon_WorkShop_V2.0.23_Basic_Edition.exe”, and then follow the installation guide as shown below:











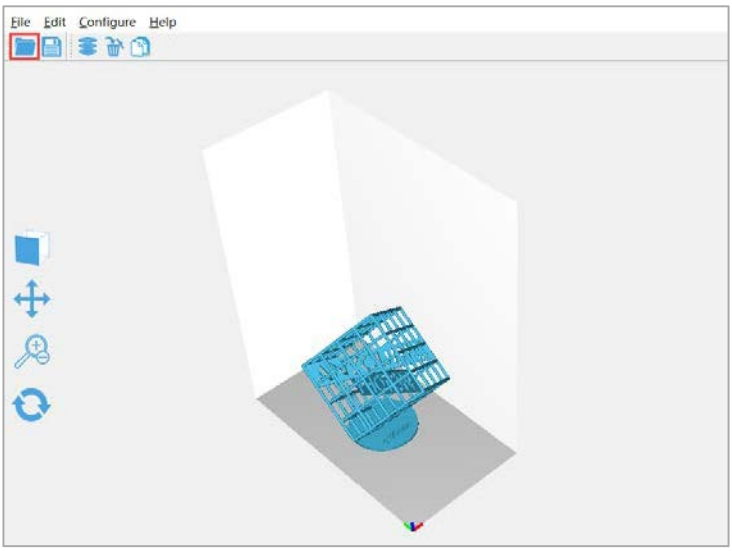
Double click “Photon_WorkShop_V2.0.23_Basic_Edition_20190803.dmg” to install the slicing software in Mac PC.

Note: ANYCUBIC may update the software and firmware without notice. Please visit www.anycubic.com for any updates.

7.2 Manipulate 3D model in Photon Slicer

(1) Model Importing

After software has been installed, please run it for the first time. On the menu bar, click “File”→ “Open file” (or click the “Open” icon at the top left (red square)) to import your own three-dimensional format model, i.e. STL file or OBJ file. Or you may input the Test (PHOTON.stl) file in the memory stick.



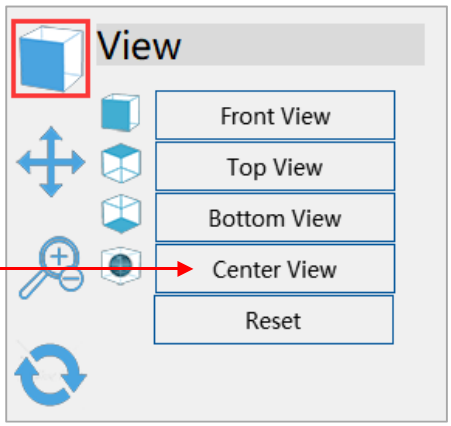
Note: click “configure”→”Language...”on the menu bar to choose the language.

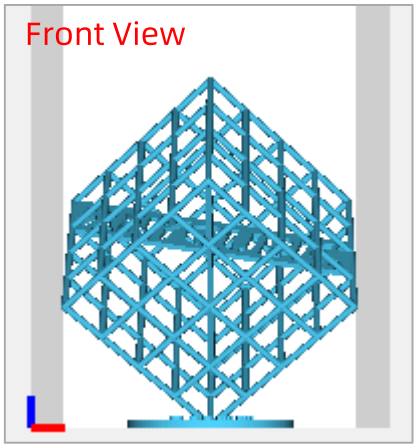
(2) View Changing

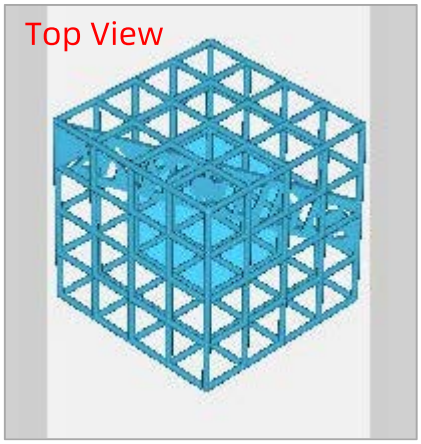
① View changing by mouse

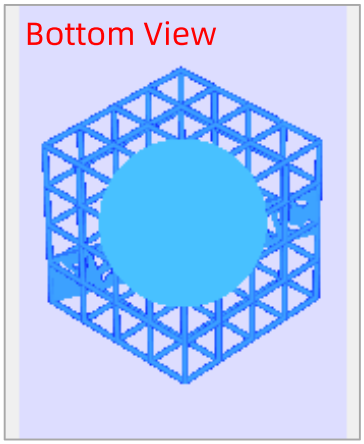
- Zoom in/out: scroll the mouse wheel.
- Position change: left click the platform, hold on and move the mouse.
- Change view angle: right click the platform, hold on and move the mouse.

② View changing by interface controls

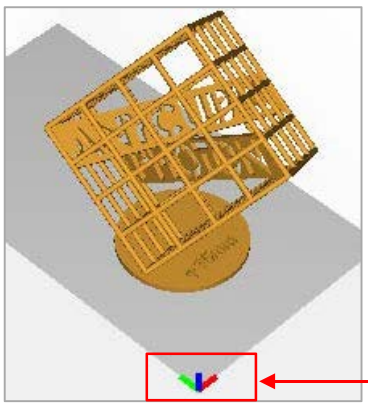








(3) Model Changing



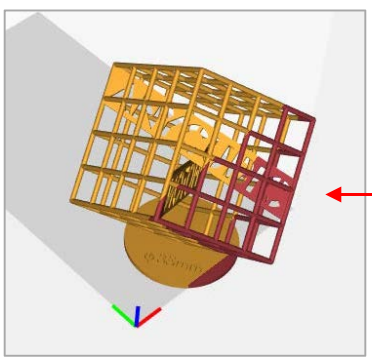
X axis: red
Y axis: green
Z axis: blue

Click to highlight the model (yellow for selected state), and then operate it by the interface controls.

Move: click “move” icon，input a number or left click the model can move the model. You also can center or reset the model.

Scale: click “scale”icon，input a number or percentage can scale the model.

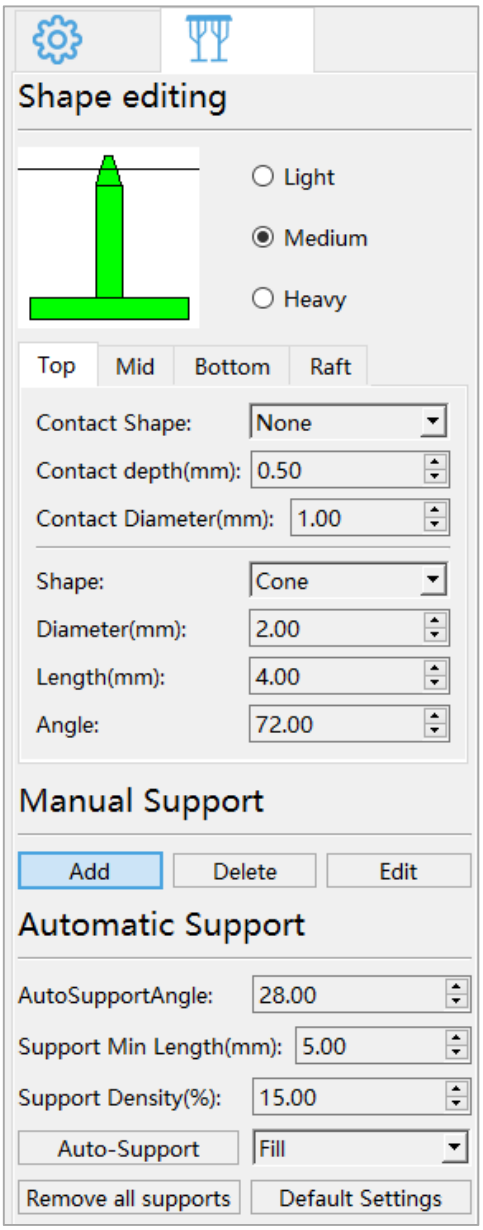
Rotate: click “rotate” icon，input a number or left click the model can rotate the model. You also can reset the model.



NOTE: The part of the model that is outside the print range will be red.

(4) Support Settings (optional)

When the model has obvious suspended parts or the contact area with the printing platform is small, it needs to add support, therefore the model can firmly attach to the platform and minimize the print failure. Click on the Support tab, and you can edit the support for the model, as shown below.



Before adding the support, you can edit the shape of the support. The type of support can be divided into Light, Medium and Heavy. Each choice has a corresponding parameter setting.

Light: Contact area between the support and model is small, easy to remove the support;

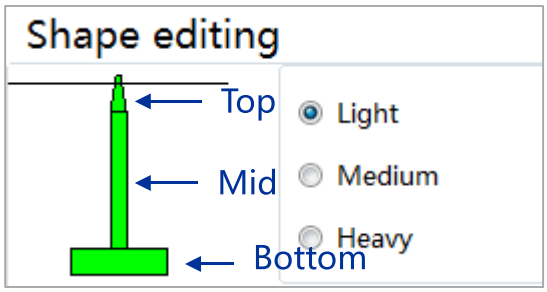
Heavy: Support contact with the model area is large, solid.

It is recommended to try the "Medium" first, and using the default settings.

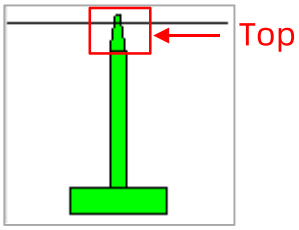
If you don't want the default support type of software , you can choose one of the default types at will, and then edit its shape to achieve the desired support shape effect.

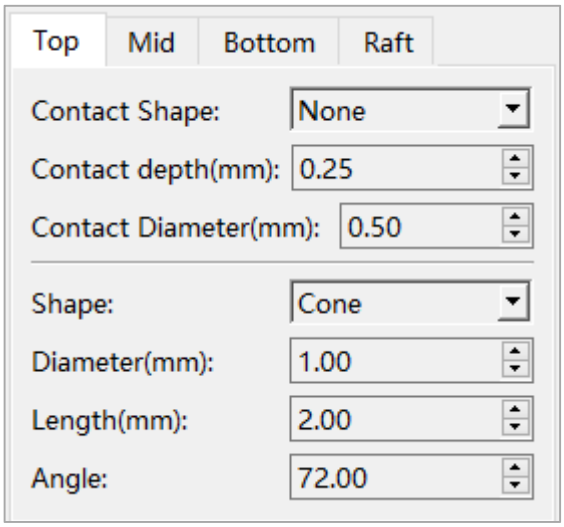
Step 1: Shape editing

Click on one of these types, such as Light. As shown in the right figure, the support is divided into three parts, namely "top", "middle" and "bottom". The settings of those three parts are described in detail below.

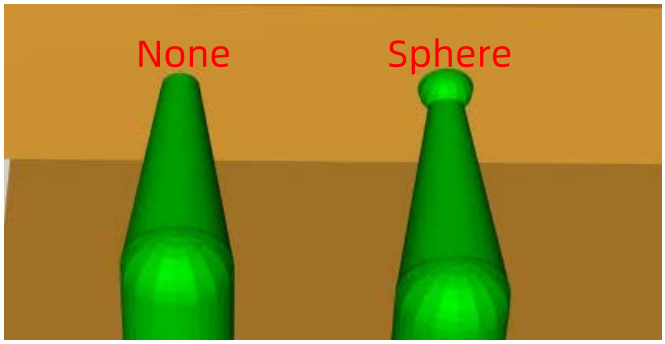


① **Top:** Set the various parameters on the top of the support.

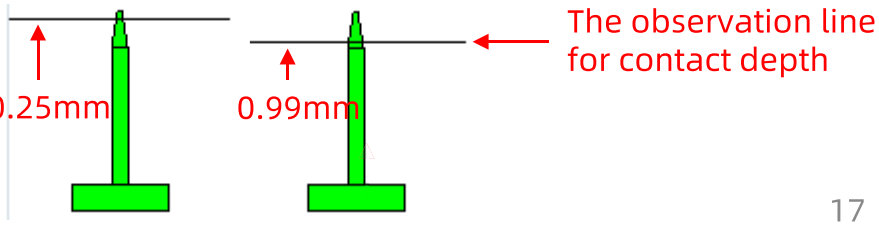


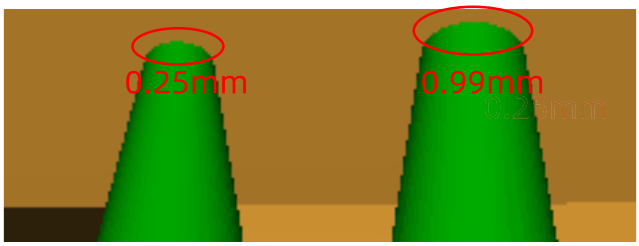


Contact Shape: Select the "Sphere" as the contact point between the top and the model can increase the contact surface between the support and the model.

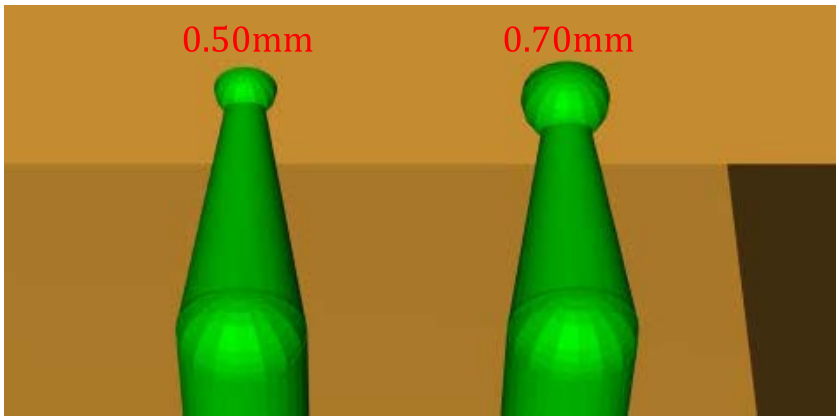


Contact depth: The contact depth between the support top and the model.

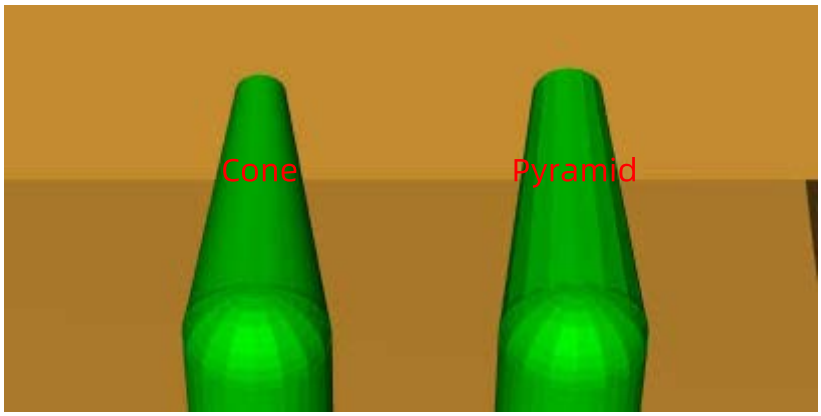




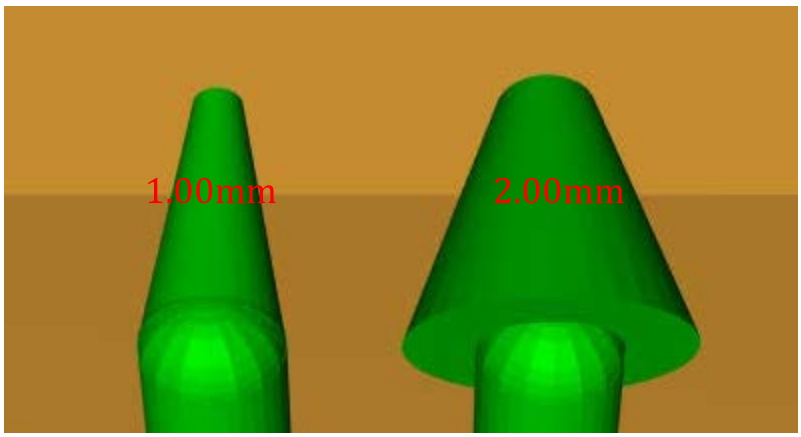
Contact Diameter: The contact diameter is valid when the contact shape is "Sphere".



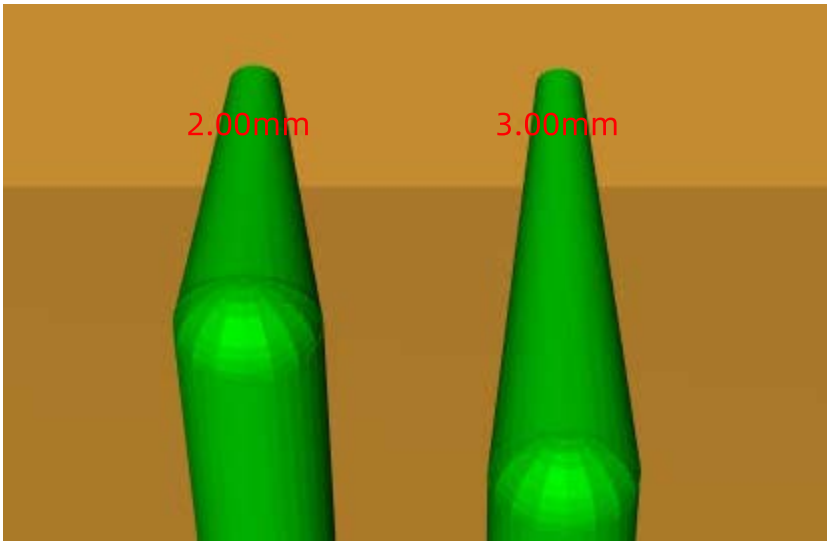
Shape: There are 2 options for the top shape, "Cone" and "Pyramid".



Diameter: You can input the number to change the top diameter.

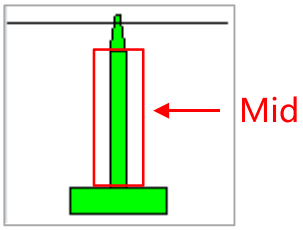


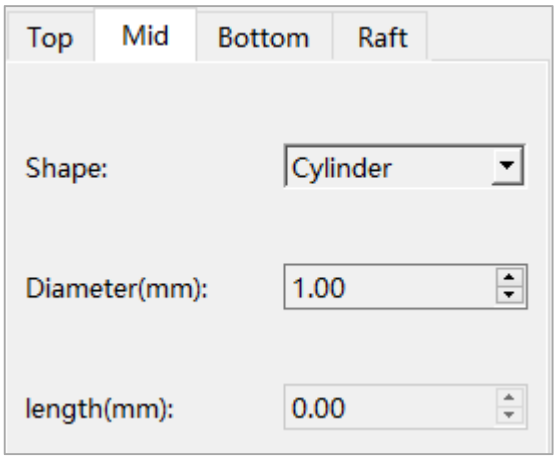
Length: You can input the number to change the top length.



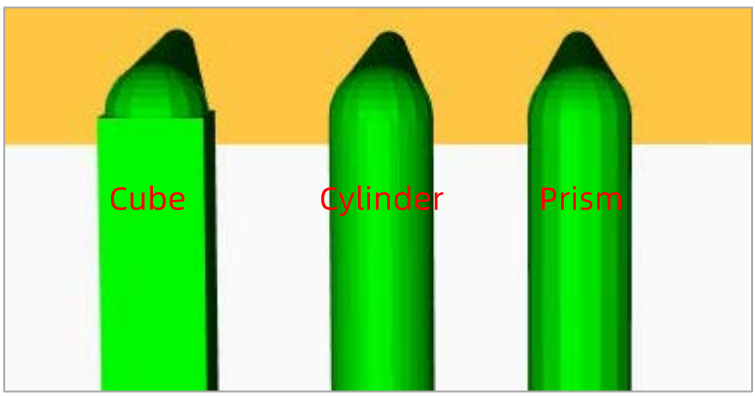
Angle: The default parameter is OK.

② **Mid:** Set the various parameters on the mid of the support.

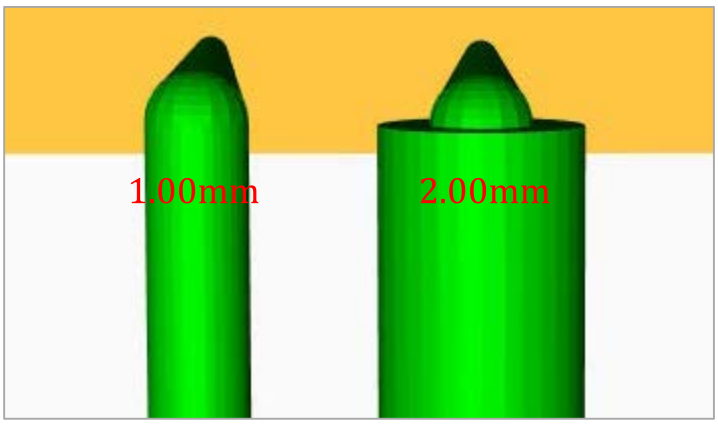




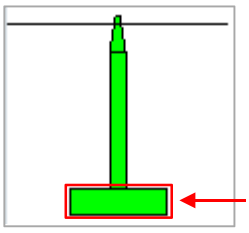
Shape: There are 3 options for the mid shape, "Cube", "Cylinder" and "Prism".

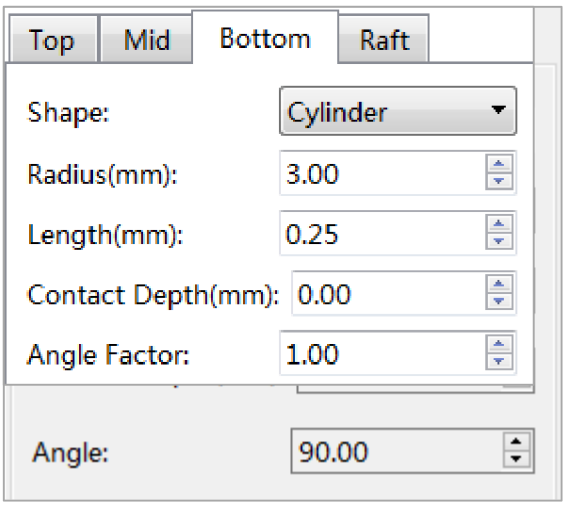


Diameter: You can input the number to change the mid diameter.

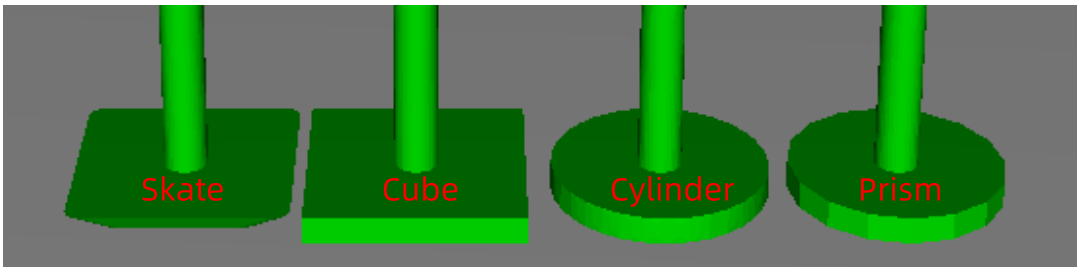


③ **Bottom:** Set the various parameters on the bottom of the support.

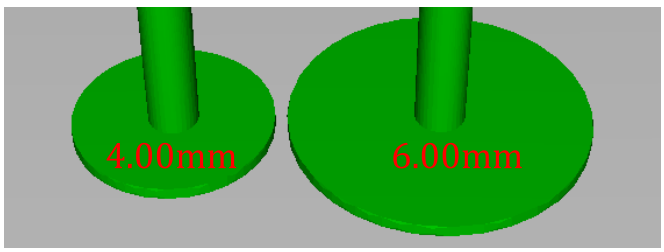




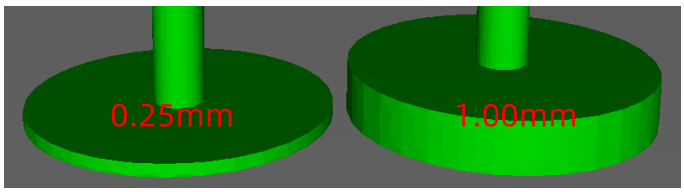
Shape: There are 4 options for the top shape, "Skate", "Cube", "Cylinder" and "Prism".



Diameter: You can input the number to change the bottom diameter.



Length: You can input the number to change the bottom length.



Contact Depth: The depth of contact between the bottom of the support and the model when the support is added inside the model.

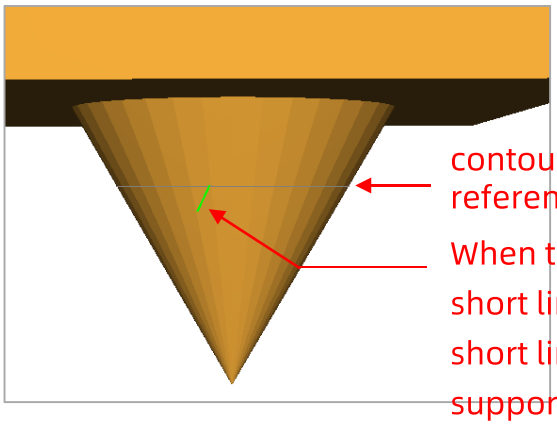
Angle: The default parameter is OK.

Step 2: Support adding

You can add the support to the model manually or automatically after setting up the shape of the support.

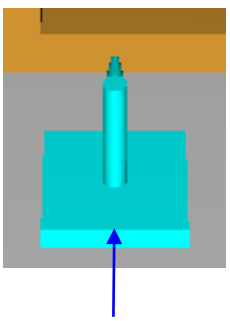
① Manual Support

Add: Only click the "Add" button can you add the support to the model.



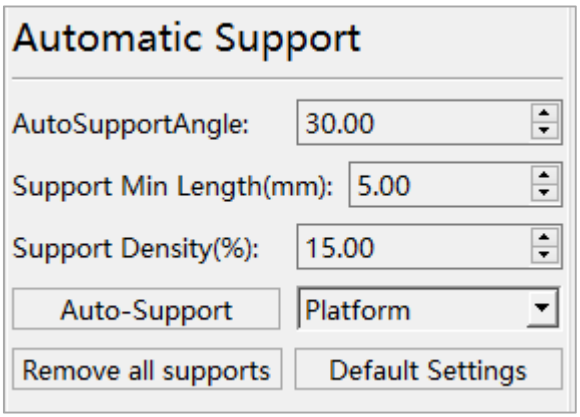
Delete: Click the "Delete" button firstly, and then click the support on the model and click "Delete" button to remove the support.

Edit: The support can be edited after clicking the “Edit”button. Click on the support, it will become blue. Its shape can be changed through editing the top, mid and bottom. Besides, left click the model, hold on and move the mouse can change the position of the support.

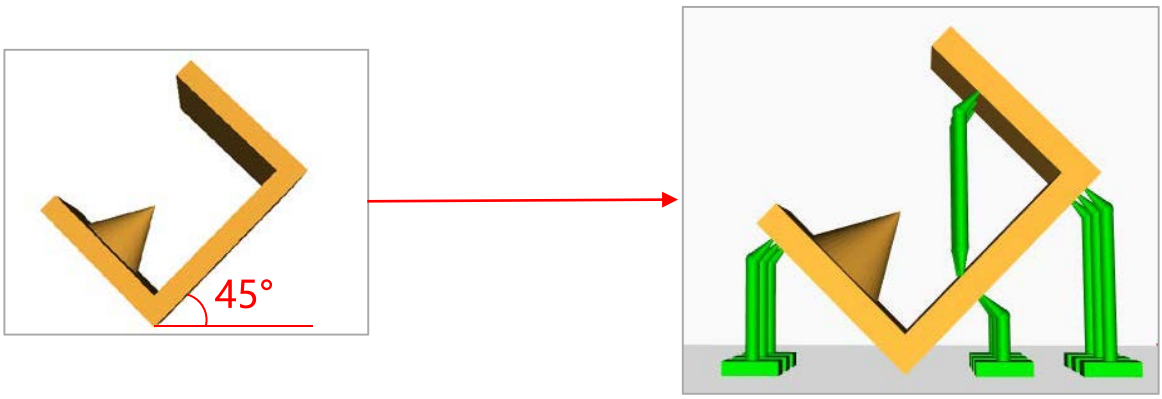


② Automatic Support

Setting up "Auto Support Angle", "Support Min Length" and "Support Density", click "Auto-Support" can automatically add support for the model.



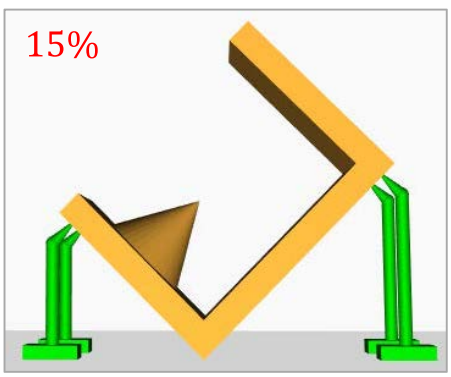
Auto Support Angle: The angle between the triangular facets of the model and the print platform. Triangular facets of the model that is less than this set angle will automatically adds support.

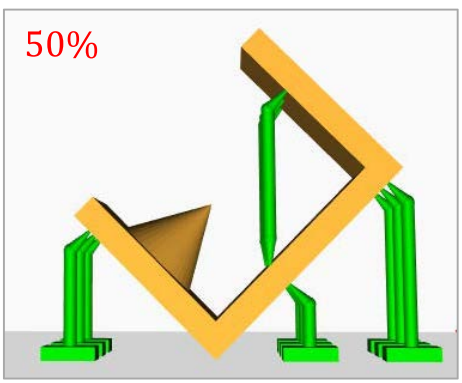


When the automatic support angle is set to 45 or greater, click the "Auto-Support" button, and the effect is shown in the figure on the top right. When the automatic support angle is set to be less than 45, such as 44, the included Angle on the model is greater than this set parameter, and click "Auto-Support" is invalid.

Support Min Length: The default parameter is OK.

Support Density:

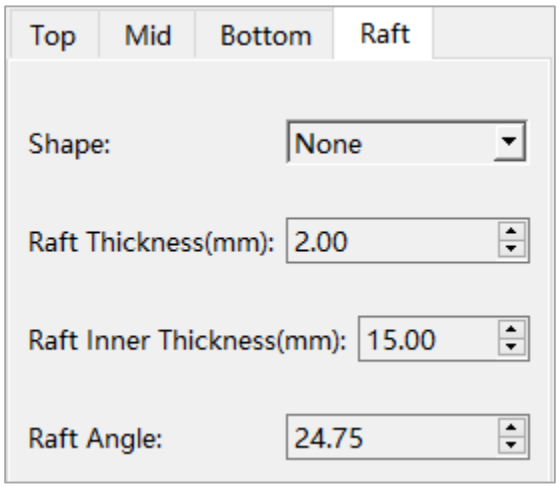




③ Raft

In addition to the three types of support set by software, raft can also be added to the model. Adding raft will increase the adhesion between model and build platform, thereby minimizing the model falling or warping risk.

Select the shape of the raft as "Skate" and click "Auto-Support" to add the raft and support.

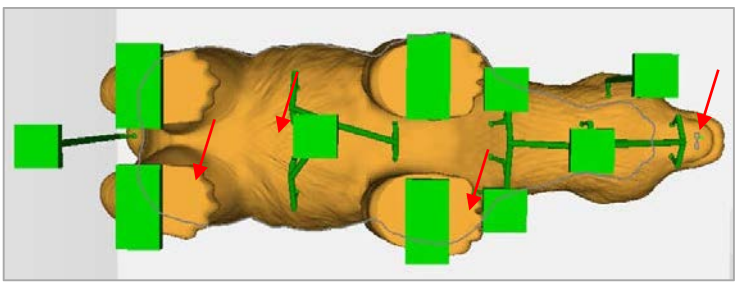


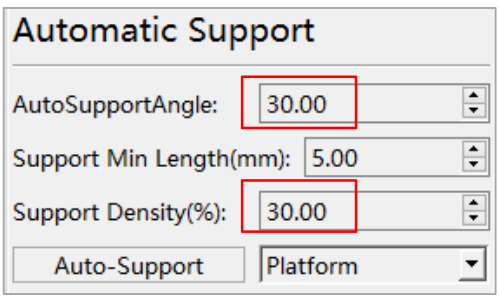
Note: before adding the raft, you need to lift the model up a certain height in the z-axis direction.

④ Automatic support adding skills (improve print success rate)

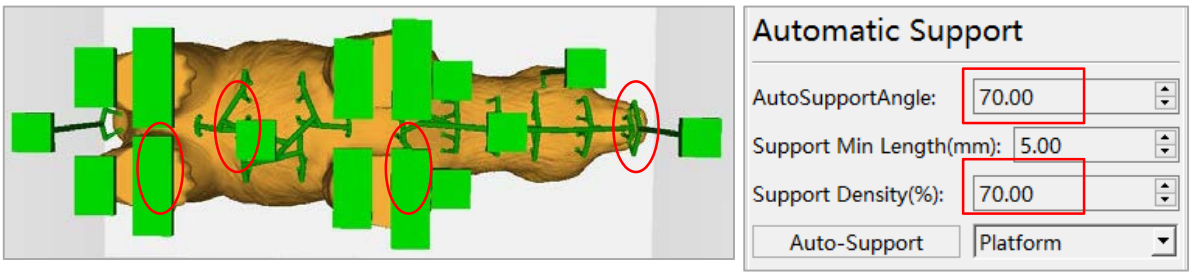
Tip 1: Properly increasing the support angle and density can optimize the support results and deliver better print quality.

As shown below, when browsing on the model, observing the contour circle, it can be found that the model still has some weak points that has not been adding supports properly (highlighted by red arrows).

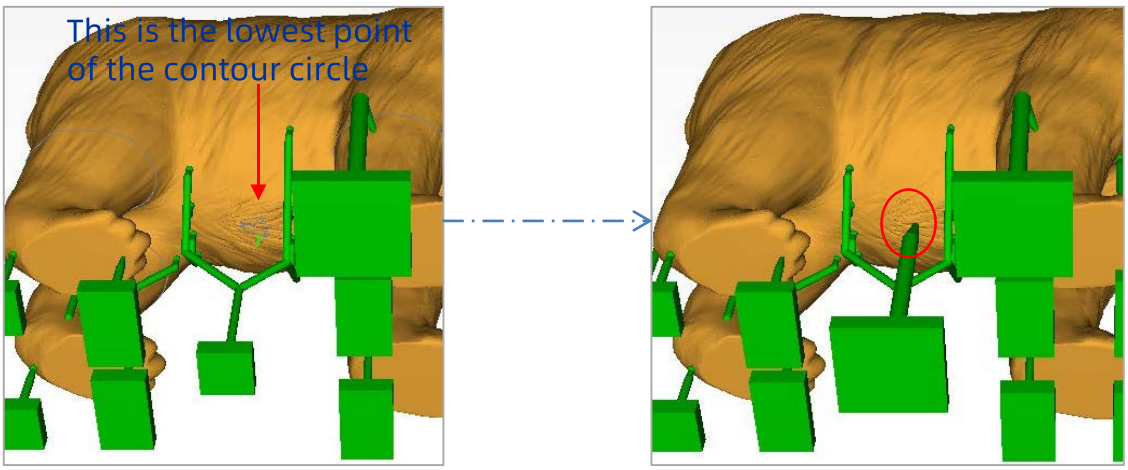




If we increasing the automatic support angle and support density (highlighted by red square), we can see from the picture below that more supports have been added to some of the weak points.



Tip 2: **Manual support after Auto support** (use the contour to find the weak points, add support to the local lowest point by check on the contour circle)



(5) Parameter Settings

① Slice Settings

Layer thickness: It is suggested to set it to 0.05mm (range: 0.01 ~ 0.2mm). The thicker the layer thickness, the longer the exposure time per layer needed.

Normal exposure time: Setting range: 6~20s, the exposure time is set according to the thickness of each layer, the details complexity of the model and the resin materials.

Off time: The UV light interval between each layers is ranged 3~6s.

Bottom Exposure Time: Setting range: 30~80s, the longer the bottom exposure time, the more easier for the bottom layer of the model to stick onto the build platform.

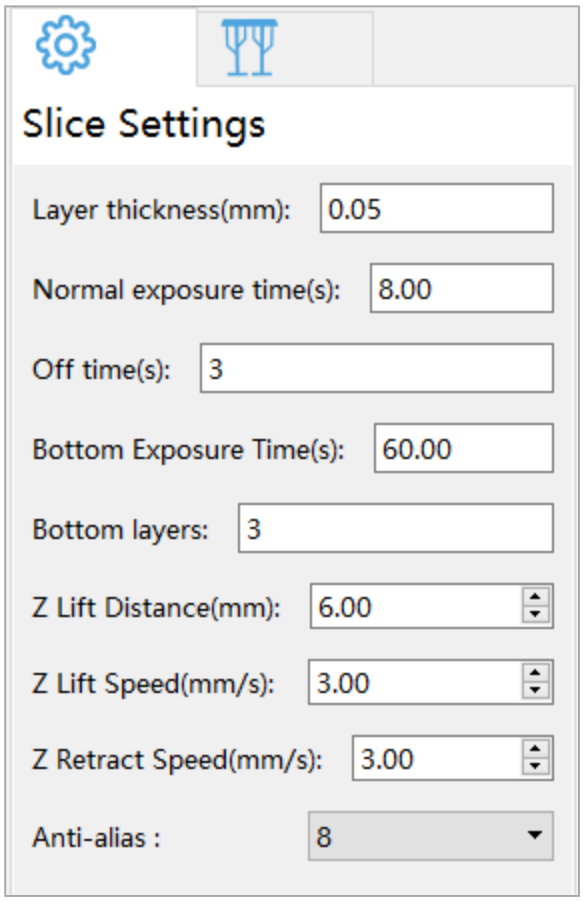
Bottom layers: Setting range: 3~6.

Z Lift Distance: It is suggested to set it to 6mm.

Z Lift Speed: It is suggested to set it to 3mm/s.

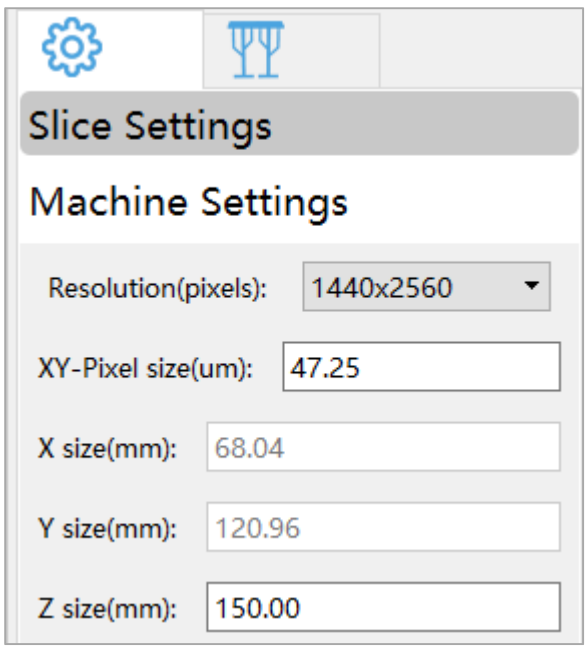
Z Retract Speed: It is suggested to set it to 3mm/s.

Anti-alias: A higher grade of anti-alias value could enhance the ability to smooth the edges for each layer during printing, thereby resulting better surface finishing of the printed objects. A higher grade of anti-alias also means longer slicing time and larger files. The suggested value is 8.



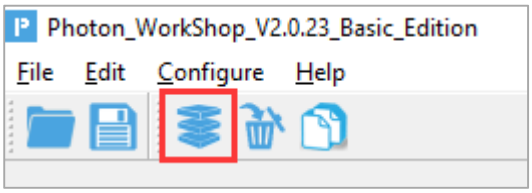
② Machine Settings

These parameter does not need modification usually. But if the printed model shows big dimensional error along a particular axis (X,Y or Z), you can modify the corresponding values for that axis proportionally.



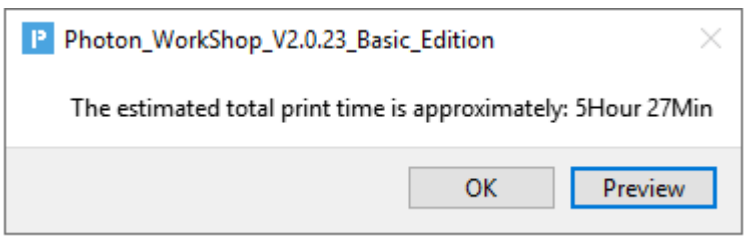
(6) Slicing and Save the Photon files

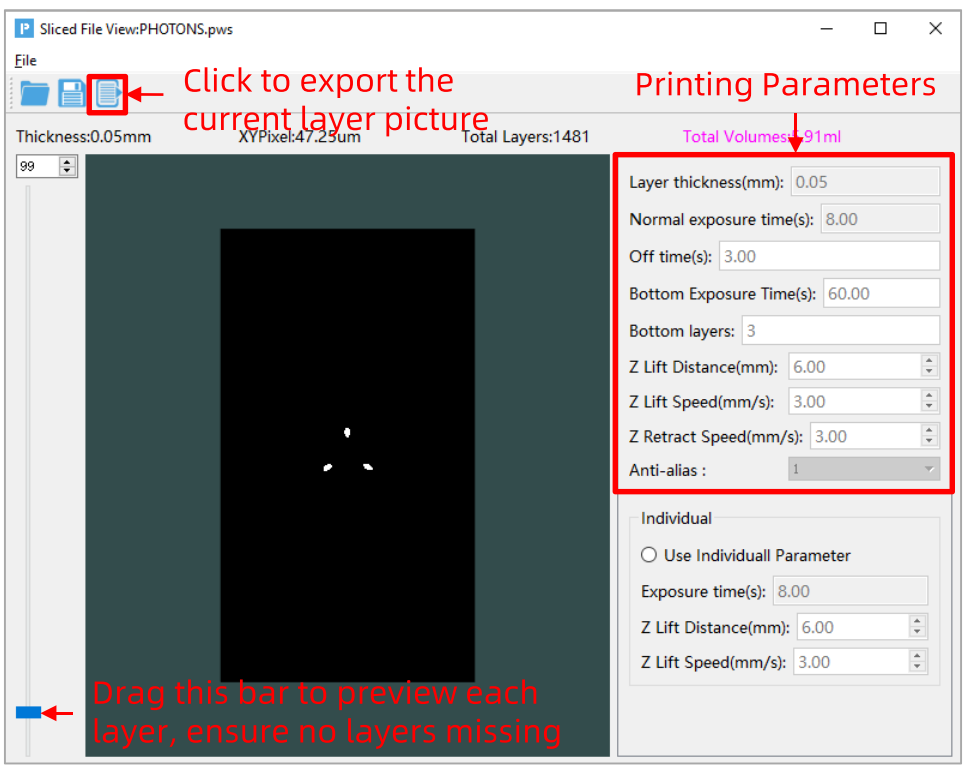
After confirm the slice settings, click the “Slice” icon at the top left (red square).



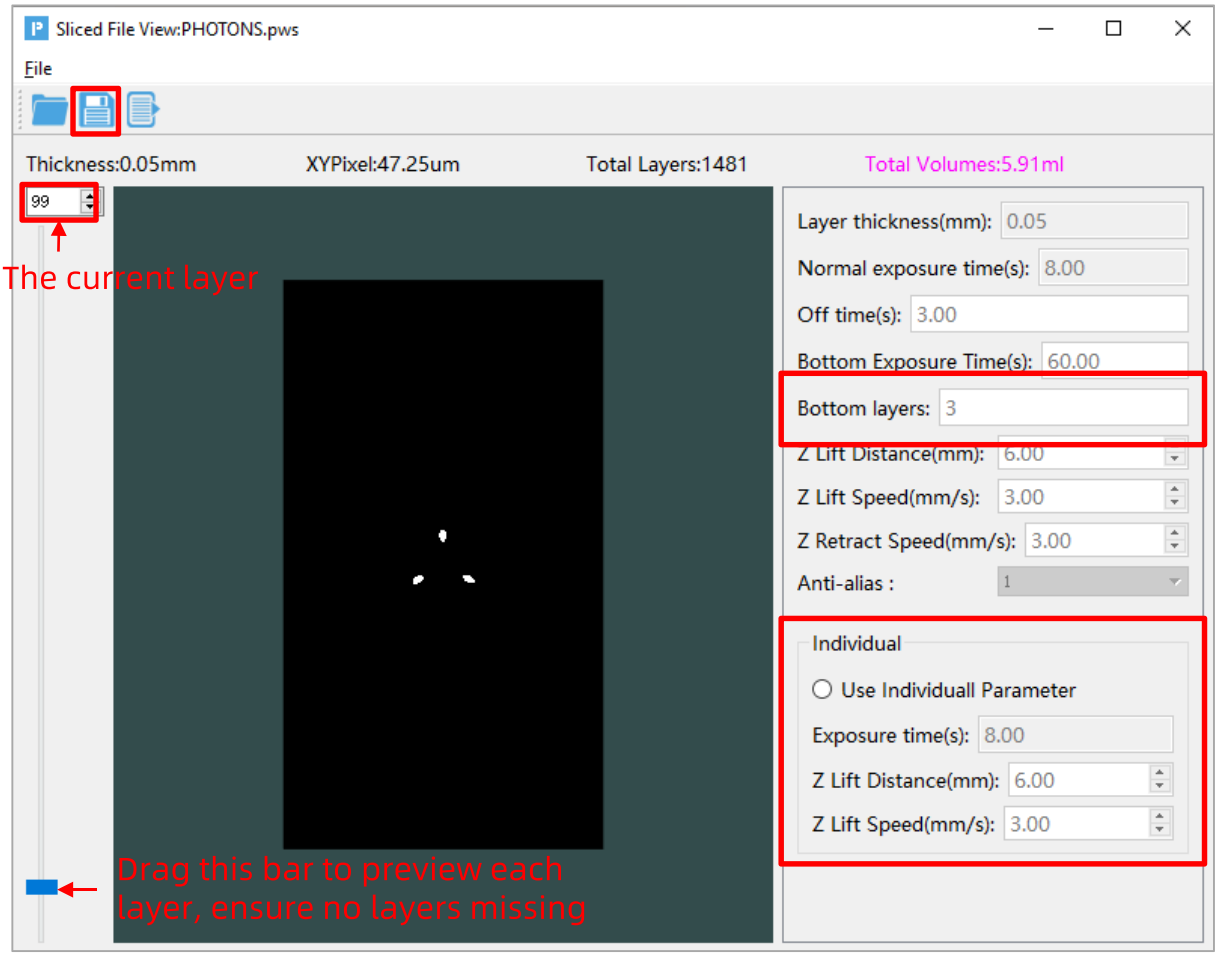
The are two types of file format, ".pws and .photon". Specifically, ".pws" is default, while ".photon" format is compatible with the original Anycubic Photon. In this case, we need to save the sliced file as ".pws" so the Photon S would recognize the file.

Choose the file directory and save the ".pws" file in the memory stick and then start slicing, and click OK to complete. You may click "Preview" to check each layers and the corresponding parameters.





7. Software installation



In the Sliced File View interface, after checking "Use Individual Parameter", you can set the exposure time, Z Lift distance and Z Lift speed of the current layer according to personal requirements. Upon finished, click the upper left corner to save as a new sliced file.

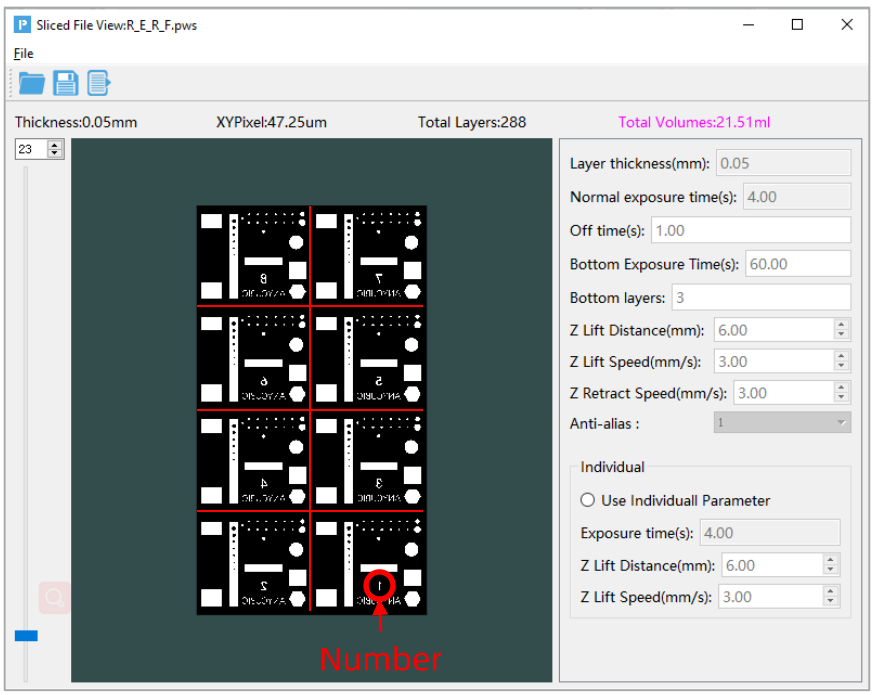
Note:

1. This function is invalid for the bottom layers. Do not use this function to bottom layers.
2. After changing the individual layer settings, the exposure parameters of the new file cannot be modified again via the printer touch screen during printing. Even if it has been modified, the change would only be valid for the current layer.

(7) R_E_R_F

"R_E_R_F" is an abbreviation for "Resin Exposure Range Finder". This function is used to find out the optimal exposure parameters for different resins.

Import the "R_E_R_F.pws" file into the slicing software.Specifically, in the R_E_R_F mode, the 2K LCD screen will be divided into 8 areas and each area is numbered, as shown in the picture.



The exposure time for Area No.1 is equal to "normal exposure time (s)" in the slicer settings (exclude Bottom Exposure Time), and the exposure time for other areas will be increased by an increment of "1s" subsequently.

For example, when "Normal Exposure Time (s)" is set to 3s in the slicer, the exposure time for Area No.1 is 3s, the exposure time for Area No.2 will be 4s, and so on, and the exposure time of Area 8 will be 10s.

You can modify the exposure time of Area No.1 by modifying the "Normal Exposure Time (s)" parameter, and this action is also valid during printing.

7. Software installation

The normal exposure parameter of "R_E_R_F.pws" file attached to memory stick is 4, and users can print this file directly for testing. After printing, take down the model and observe. The exposure parameters of the model with the best printing effect are the best exposure parameters of the resin.

Note:

DO NOT change the file name of “R_E_R_F.pws”, because the Photon S can only recognize THIS file name to run this function. Also, do not name other unrelated file as “R_E_R_F.pws”.

8. First print instructions

Before printing, to minimize the first time frustration, please ensure (1) Z axis is working fine; (2) the platform is well leveled and fit with 2K LCD screen; (3) the UV light is functional properly.

8.1 Print

Insert the USB memory (or the SD card with card reader) into the USB port. **Then wear masks and gloves**, slowly pour the resin into the vat until it reaches 1/3 volume of the vat. After that, close the door.

Take off the gloves, select the "PHOTON.pws" test files or your own files (as shown in Fig.(14) ①②③), and start printing. **During printing, avoid direct sun light and keep the printer flat without shaking.**

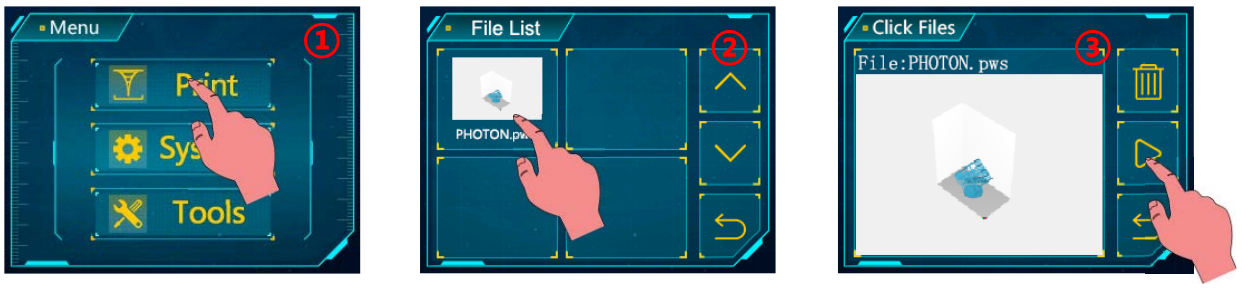


Figure.(14)

If you think the resin is insufficient to finish an ongoing print (or you wish to change the resin color), you can click “Pause”, the platform will rise, and you can slowly pure (or change) the resin into the vat. After that, press “Start” to resume, as shown in Fig.(16).

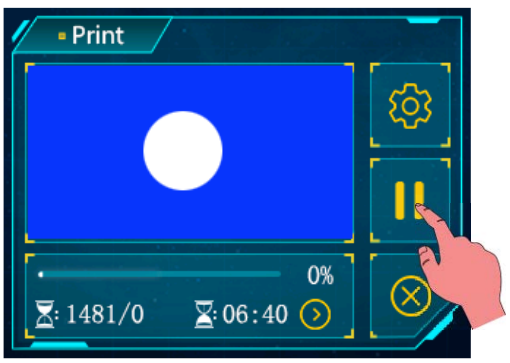


Figure.(15)

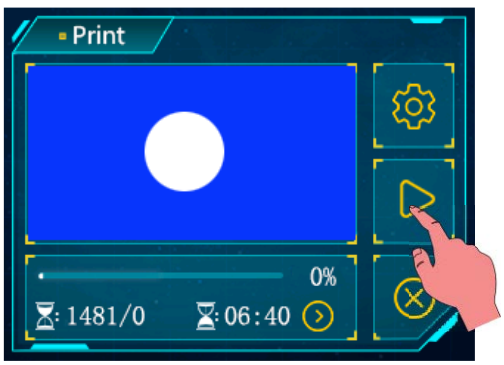


Figure.(16)

8.2 Handling models and residues

After printing, waiting until the resin stop dropping from the platform and then unscrew and remove the platform. As shown in **Figure (17)**, the model can be removed by scrapper carefully. The removed model should be washed with ethanol 95vol% concentration. The printed model may need post curing to achieve better hardness by direct **sunlight** or UV-curing box.

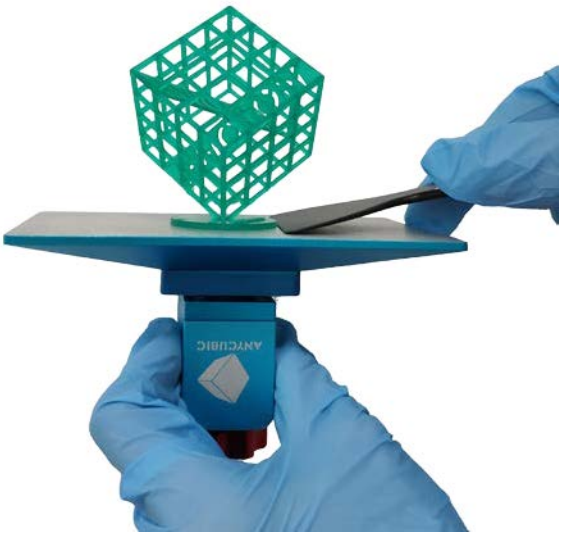


Figure.(17)

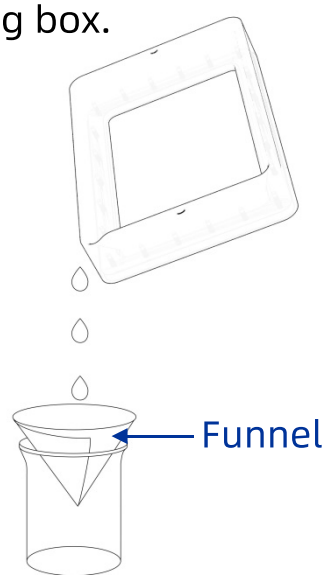


Figure.(18)

【**IMPORTANT**】 Inevitably, in case of incomplete curing or failed prints, there might be some resin residues left in the vat. Then, please filter the resin by a funnel (shown in Fig.18) and store the resin in a sealed container. For the residues left in the vat or on the platform, please use paper towel or plastic scrapper to carefully get rid of that.

Before each prints, please ensure there is no solid residues in the vat or on the platform, otherwise the 2K LCD screen may be impacted and broken during printing or leveling.

9. FAQ and Machine Maintenance

9.1 FAQ

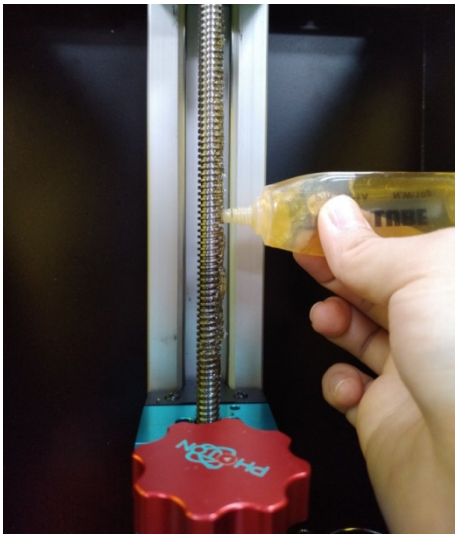
(1) Model not sticking to platform

- Bottom exposure time is insufficient, increase the exposure time.
- Contact area between the model and platform is small, please add raft.
- Bad leveling

(2) Layer separation or splitting

- The machine is not stable during printing
- FEP film in the vat is not tight enough or it need a change for new one
- The printing platform or vat is not tightened

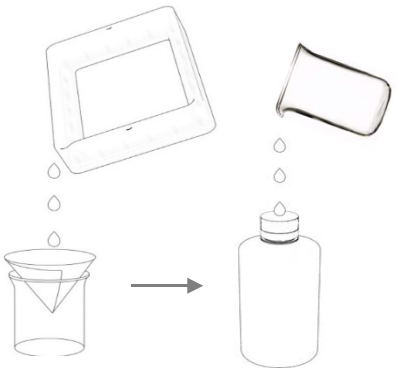
9.2 Machine maintenance



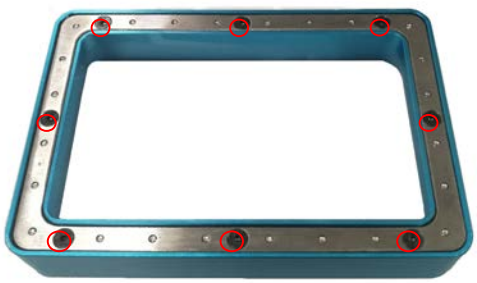
(1) If Z axis make noisy sound, please apply lubricant to Z lead screw.

(2) Do not use sharp objects to scrape off the residues on the FEP film.

(3) Be careful when remove the platform, do not let it fall onto the 2K LCD screen.



(4) Do not left the resin in the vat for over two days if not using it. Please filter and store the resin properly.



(5)The FEP film may lose the tension over time and usage. Please adjust the tension by tightening the screws at the bottom of the resin vat.

(6) After printing, please clean up the platform **(wipe clean with paper towels or wash with alcohol),** and ensure no residue left before next print **(filter the residue with funnel).**

(7) If the outside of printer is stained with resin, use alcohol to wipe clean.

(8) To switch the resin colors, please clean the original resin vat first.

Thank you for purchasing ANYCUBIC products! Under normal usage and service, the products have a warranty period up to one year. Please visit ANYCUBIC official website(www.anycubic.com) to report any issues with ANYCUBIC products. Our professional after-sale service team would response within 24 hours and solve the issue.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