

## Description

The Form 4 is a 3D printer that uses MSLA (Masked Stereolithography) to make a part. In MSLA, a matrix of UV LEDs is directed through an LCD screen (Liquid Crystal Display) into a tank of photoreactive resin, which cures a cross section of the part to form a layer of the part. The first layer adheres to the build platform, and each following layer adheres to the previous one. The finished part will be suspended upside-down above the resin tank. It has a build volume of  $200 \times 125 \times 210$  mm ( $7.9 \times 4.9 \times 8.3$  in).

The Form Wash is an automated washer that bathes the printed part in IPA (isopropyl alcohol) to wash off residual resin.

The Form Cure is a chamber that exposes a printed part to UV light to finish the curing process. This is referred to as 'post-curing.'

## Hazards

**Toxic!** Uncured 3D printer resin is toxic to you and the environment. You must wear gloves to prevent skin exposure. If you get any resin on your skin, wash thoroughly with soap and water.

**Please be conscious of resin contamination. If you get resin on your gloves, do not touch common surfaces such as computer peripherals and door handles with your contaminated gloves.**

[Link to all FormLab Resin Data Sheets](#)

Isopropyl alcohol is toxic and highly flammable – all FormLabs washing must be done in the fume hood with safety glasses and gloves.

**Laser!** SLA printers use a near-UV laser to polymerize each layer. During normal operation, users are protected from any laser scattering by the orange enclosure.

## PPE Requirements

- Nitrile gloves
- Safety glasses
- Lab coat (for working with large volumes of IPA)

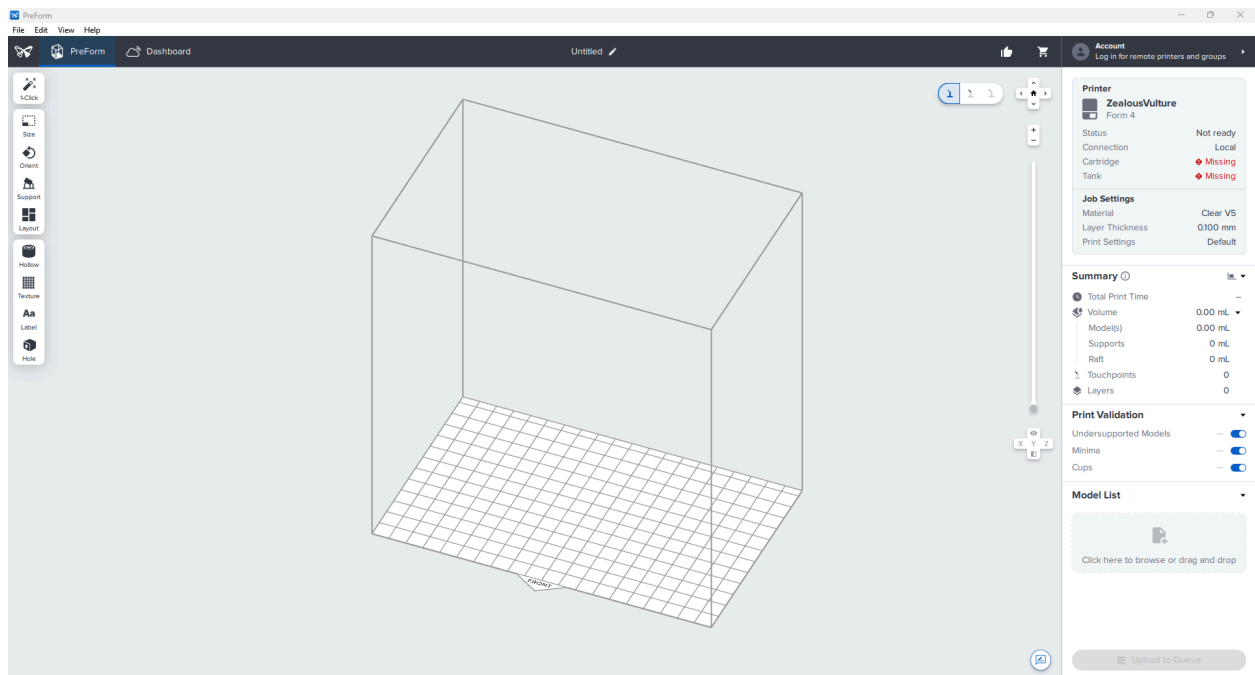
## Job Setup

## On the Computer

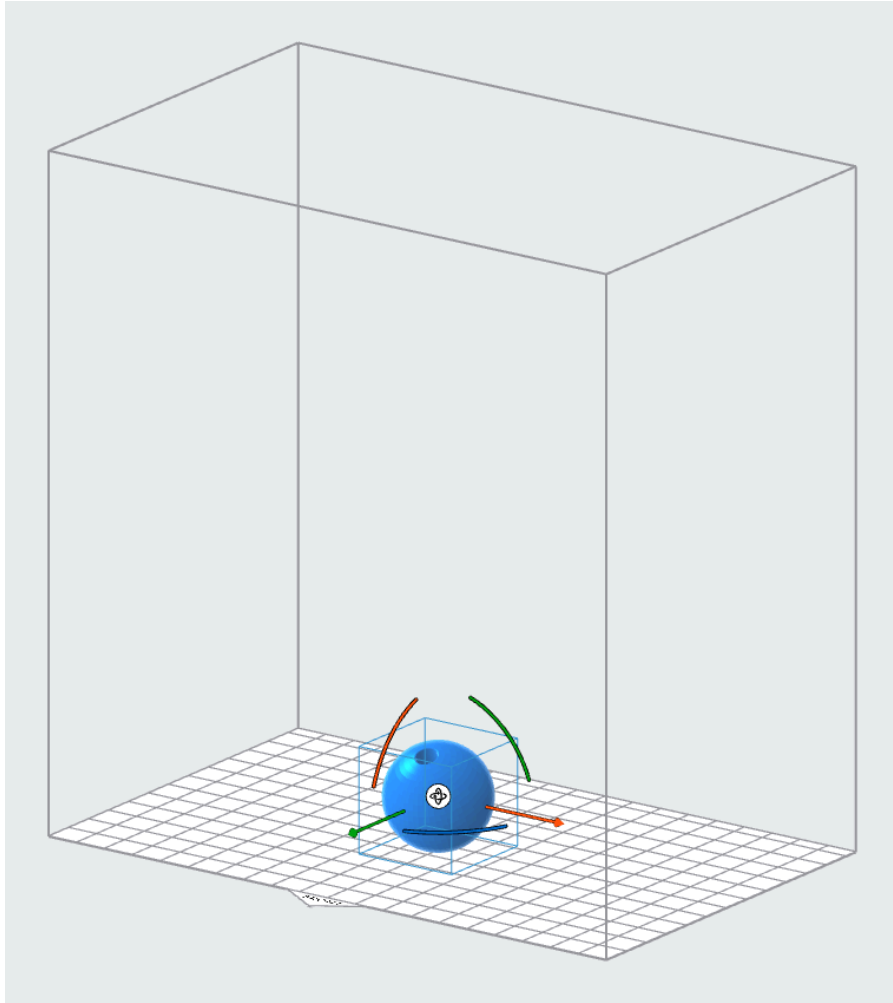
1) On the desktop computer, open the PreForm software



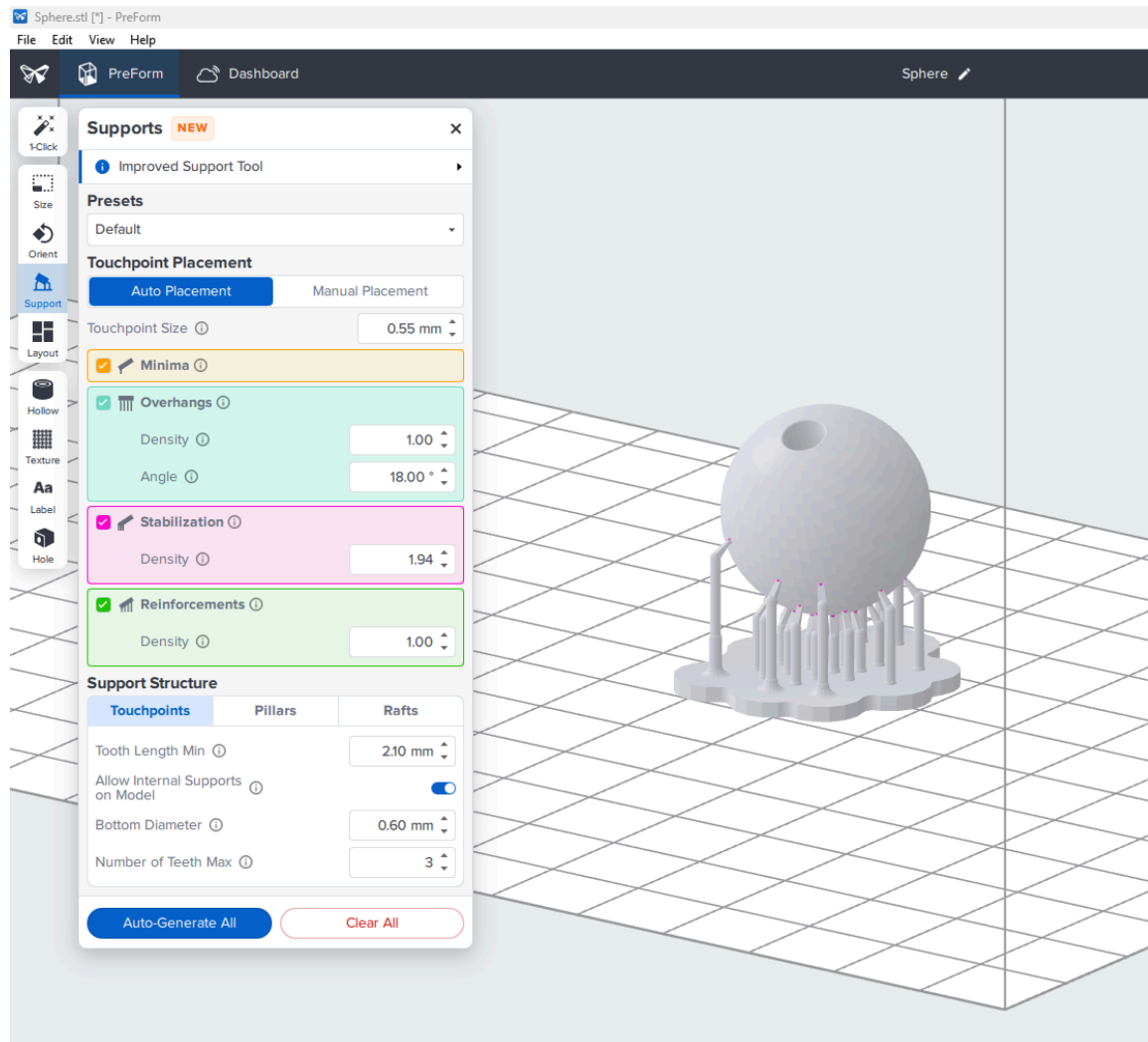
2) Start a new print, toggle to File > New in the upper left corner



3) Upload .STL file by dragging file into the 3D workspace or toggle to File > New and select the .STL file.



- 4) In the workspace you can change the size, orientation, layout, and add supports to the print



5) Apply the type of resin, printer, and layer thickness in this window



The screenshot displays the PreForm software interface. At the top, there's a navigation bar with 'PreForm' and 'Dashboard' links. The main area is divided into three sections: 'Choose Printer', 'Choose Material', and 'Choose Layer Thickness'. The 'Choose Printer' section shows a table with one printer, 'ZealousVulture', which is 'Not ready' and has 'Missing' consumables. The 'Choose Material' section shows a grid of material options, with 'Clear' selected. The 'Choose Layer Thickness' section shows three options: '0.100 mm Fastest', '0.050 mm', and '0.025 mm Finest Features'. On the right side, there's a 'Job Setup' panel with details for the printer, job settings, and printer details. At the bottom right, there's an 'Apply' button.

**1 Choose Printer**  
Choose a printer now, or set the printer type to finalize your choice of printer only when uploading the job.

Form 4  [+ Add Printer](#)

Printer	Model	Status	Consumables
ZealousVulture	Form 4	Not ready	Missing  Missing

Cannot find remote printers or printer groups? [Log In](#)

**2 Choose Material**  
Choose the material you would like to print with.

General Purpose Engineering Dental Medical Casting Form X Other

**FORM X**

Alumina 4N Black Castable W... **Clear** Clear Cast Color Color Kit Durable ESD Elastic 50A Fast Model Flame Reta... Flexible 80A Grey

High Temp Precision ... Rigid 10K Rigid 4000 Silicone 40A Tough 1500 Tough 2000 True Cast White

**3 Choose Layer Thickness**  
Layer thickness affects both the speed and the Z-axis resolution of a print. [Learn more](#)

0.100 mm Fastest 0.050 mm 0.025 mm Finest Features

**4 Choose Print Settings**  
Print settings control print speed, support tip shape, and other aspects of print performance. [Learn more](#)

[Create or Import Custom Print Setting](#)

Default v1.1 [Import Custom Print Setting](#) [Reduced Support Density](#) v2.0 [Reduced Supports Density](#) [Import Custom Print Setting](#)

**Other Settings**

**Timelapse Recording** [Customize](#)  
Create a Timelapse of your print in action. Enabling this feature may lead to increased print time and a higher risk of failure. Download the finished timelapse from your F...

**Job Setup**

**Printer**  
 ZealousVulture  
Form 4

Status Not ready  
Connection Local  
Cartridge Missing  
Tank Missing

**Job Settings**  
Material Clear VS  
Layer Thickness 0.100 mm  
Print Settings Default

**Printer Details**

Remote Print Enabled  
Camera Enabled  
Firmware 114.0  
Serial Name Form4-ZealousVulture

[Update Firmware](#)  
[Download Logs](#)

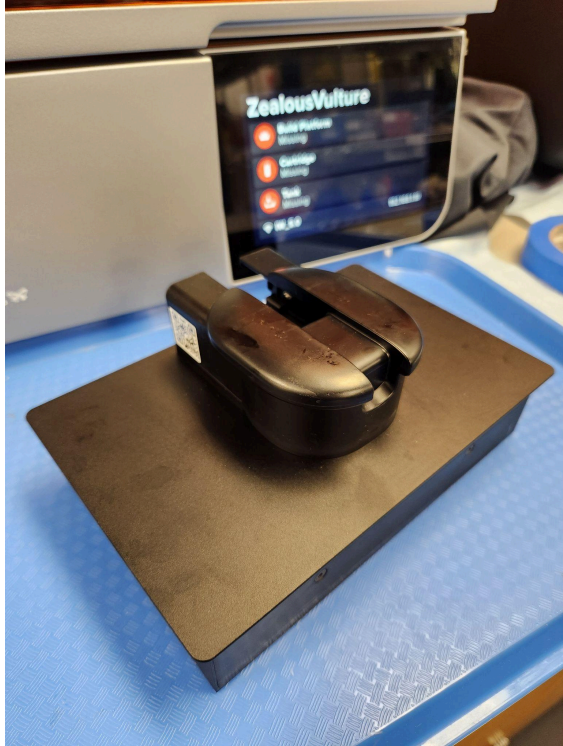
**Camera Snapshot**

[Apply](#)

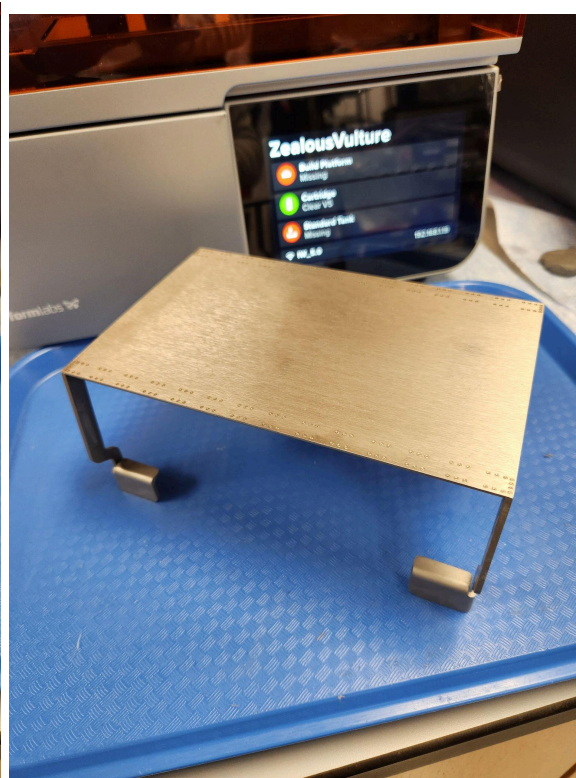
- 6) If there are no more errors and your part is to the desired quality, upload the job to the printer, and allow the printer to calibrate
- 7) Ensure to log the print into FBS under your lab group. Include the time and resin volume used in the reservation.

## Setting up printer

- 1) Open the orange cover
- 2) Grab a build platform



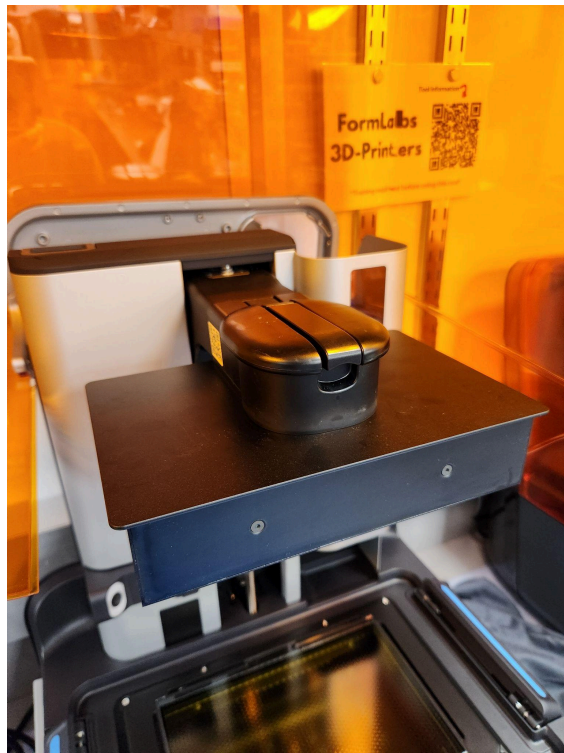
Option 2: v2





- 3) Insert the build platform ensuring to lock it into place using the lever lock

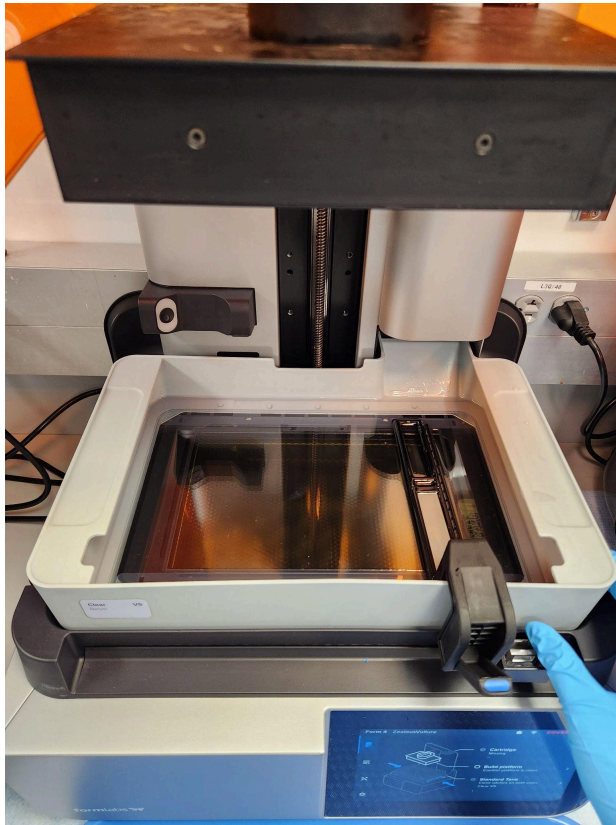




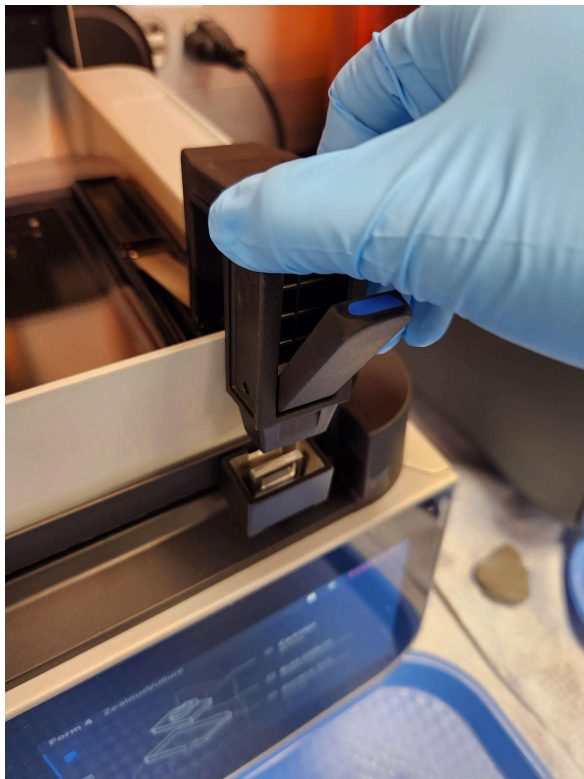
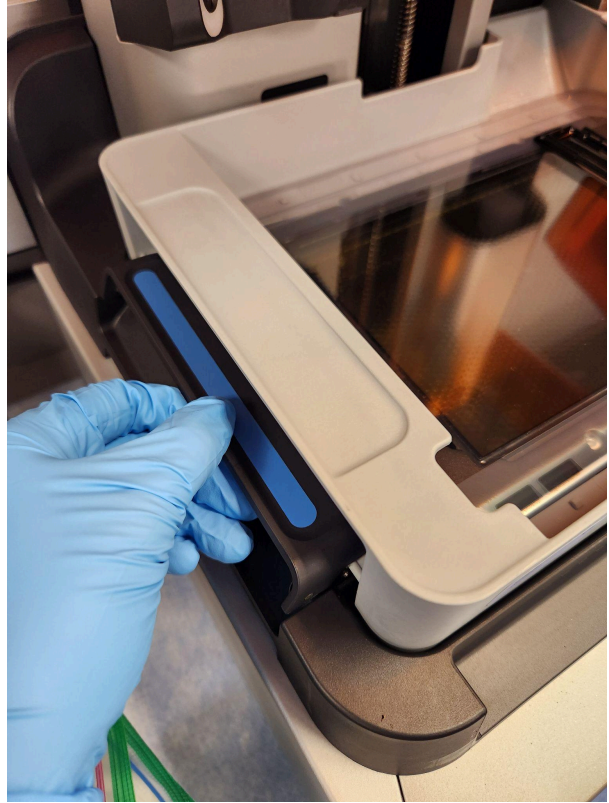
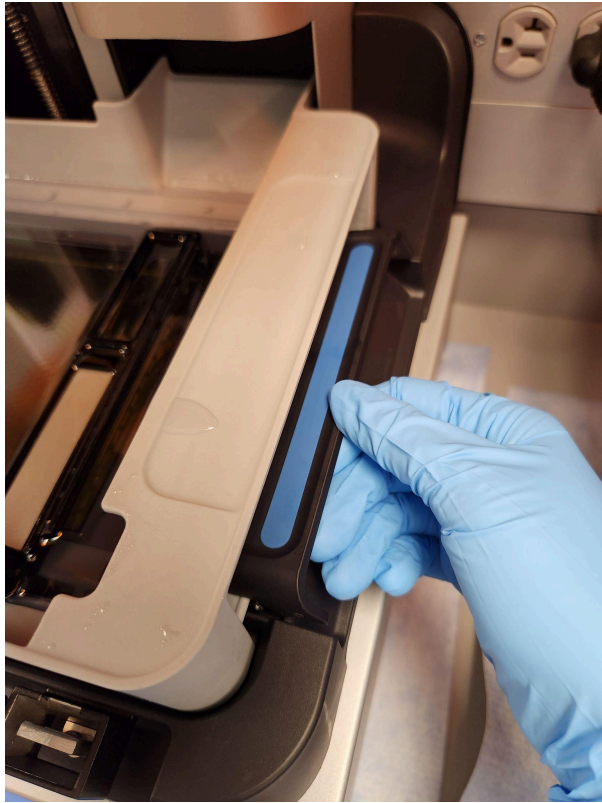
- 4) Find your desired resin cartridge in the cabinet below the printers. Find the corresponding resin tank



- 5) FIRST load tank into the bed of the printer and close the clips on the side to secure it into place





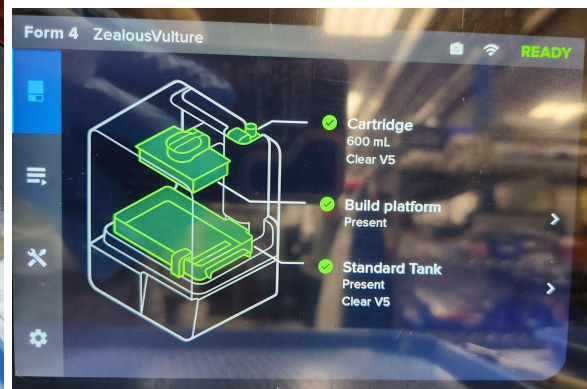
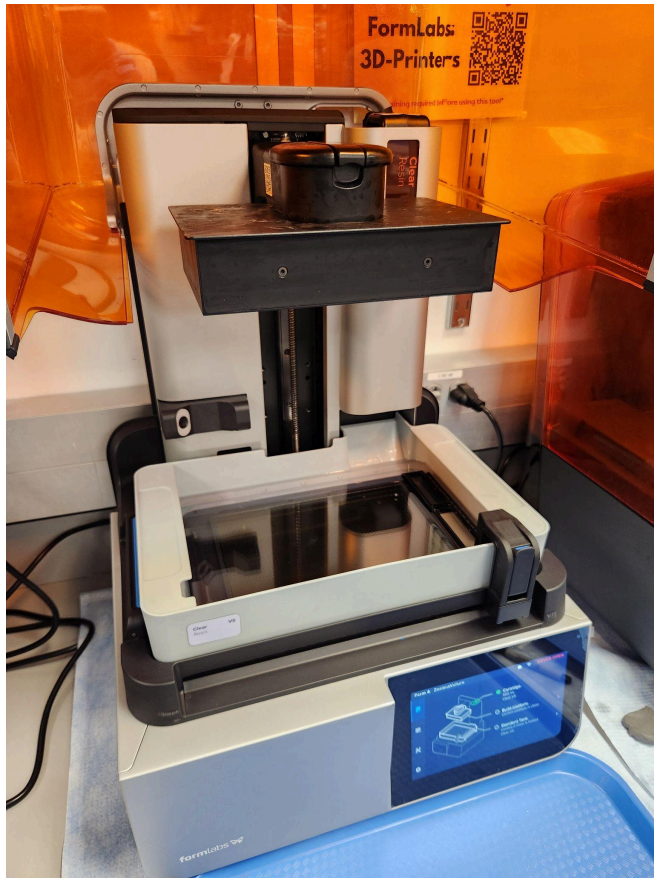




- 6) THEN Load cartridge in the back of the printer. Ensure to open the cap. The name tag for the type of resin should be visible from the front. This order is important to reduce the possibility of a resin leak into other areas of the printer



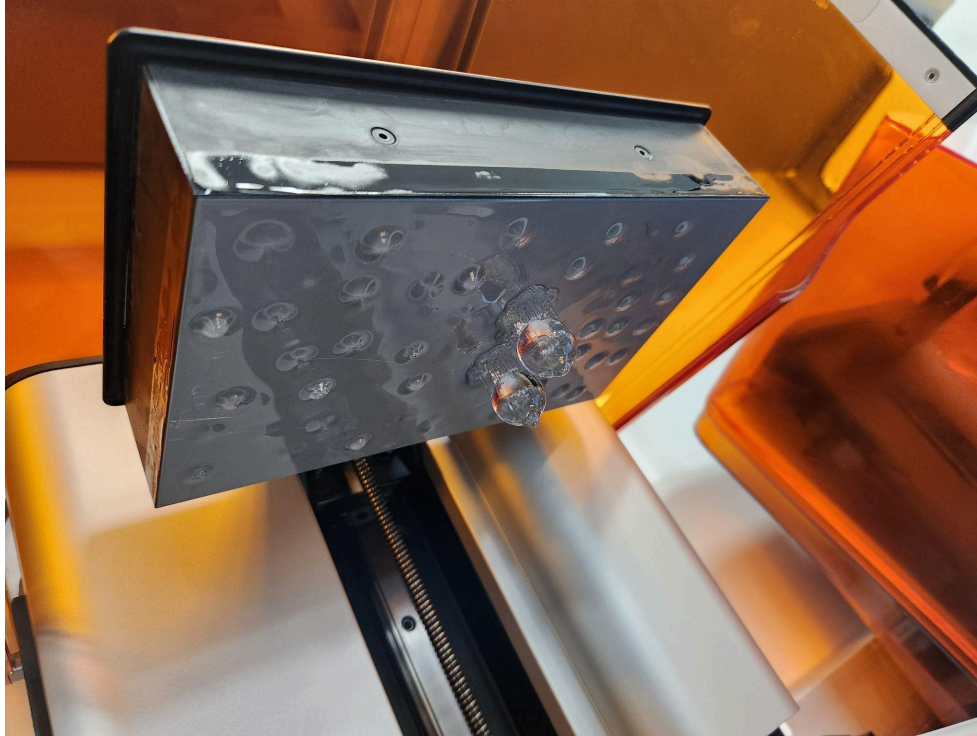
- 7) Check the touchscreen display to confirm that the printer detects the tank, cartridge, and build platform. The Form 4 will only detect each part if they are fully inserted. The image below displays the desired setup ready for printing. Finally, close the orange cover



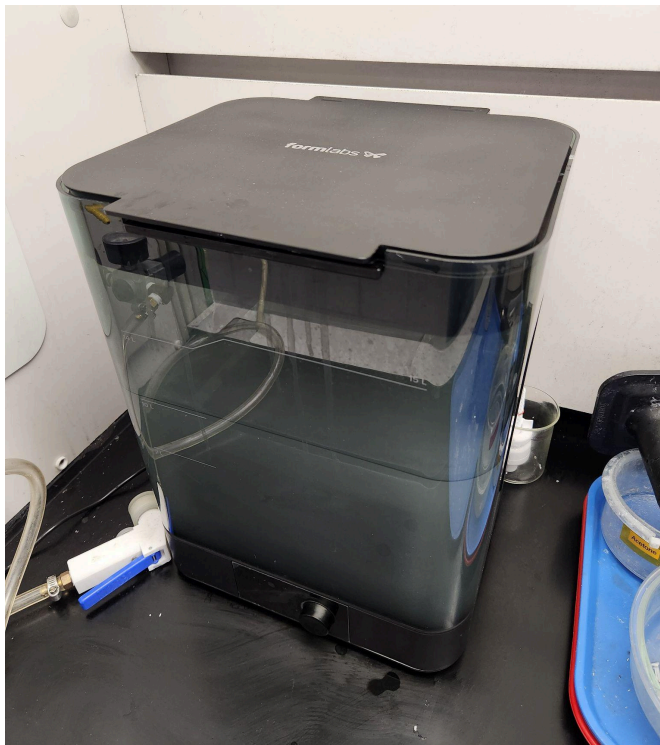
## Post cure using Form Wash

- 1) Once print is complete, open the orange cover and slide out the build platform. Be careful not to drip resin over the workspace.





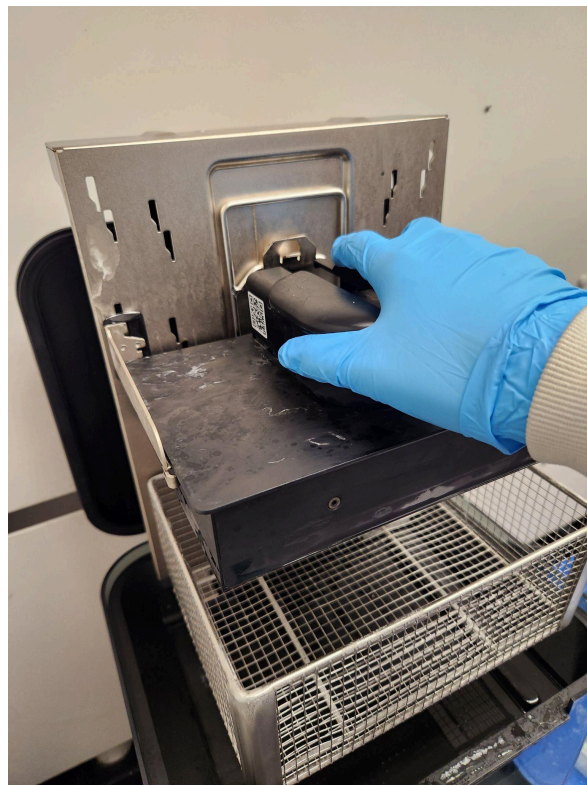
2) Transport the build platform with part attached to the black Form Wash in the fume hood



3) Select 'Raise' using the knob



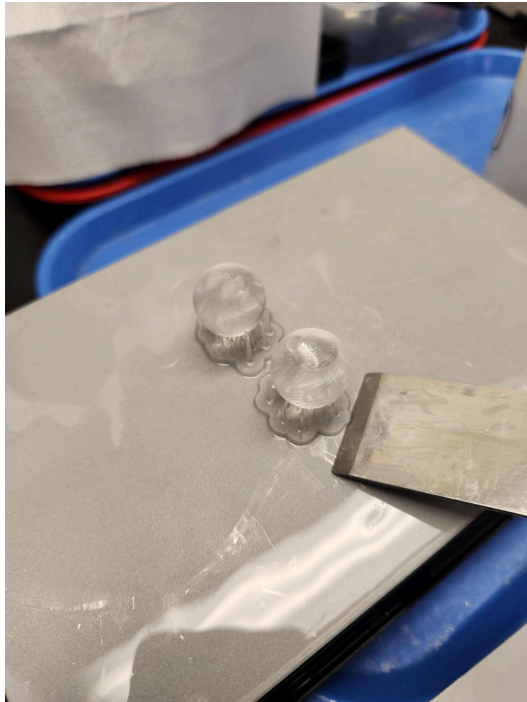
- 4) Slide the build platform into the tray. You may need to adjust the placement of the tray bars



- 5) Adjust the wash time
- 6) Press 'Start'
- 7) Once the wash is complete, press 'Open' and retrieve build platform
- 8) Press 'Sleep' to close the Form Wash

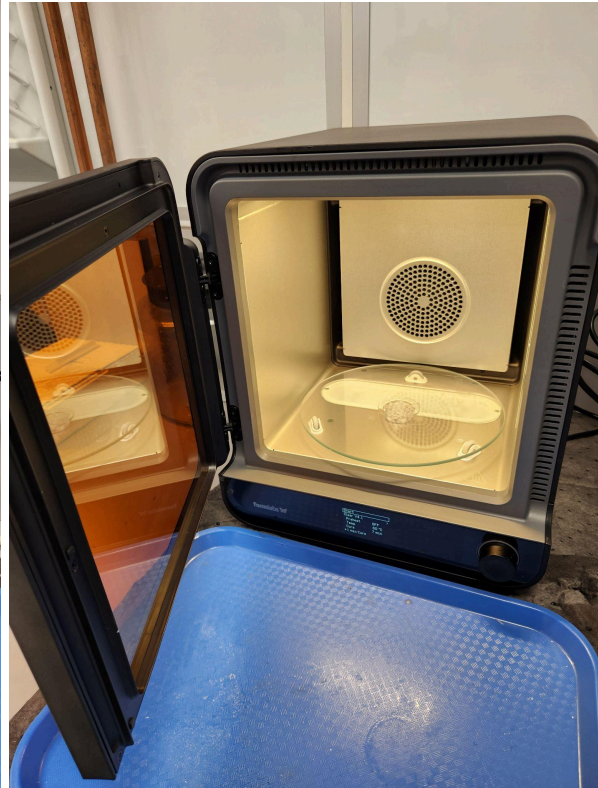
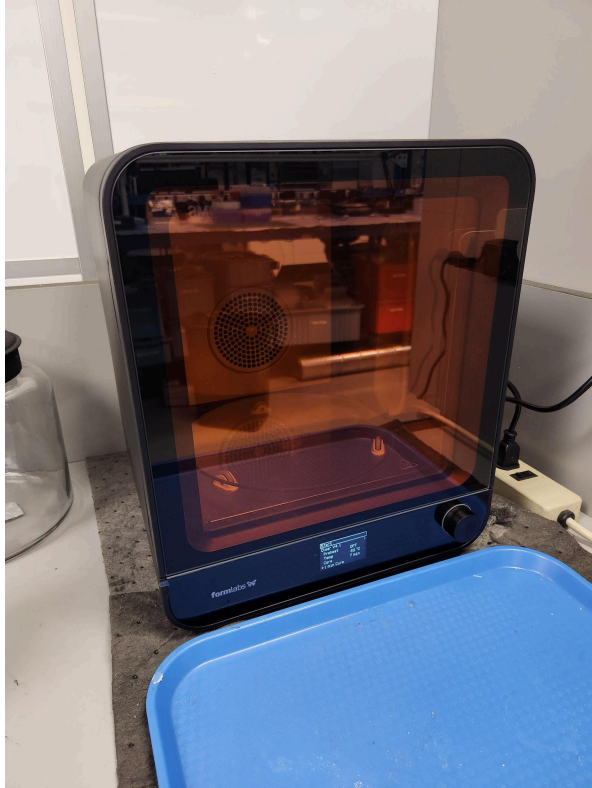
## **Post cure using Form Cure**

- 1) Still in the fume hood, release the part from the build platform using a scraper.
- 2) Ensure all unpolymerized resin is washed off of your part(s). This may require manual cleaning with the spray bottle or in the ultrasonic bath.



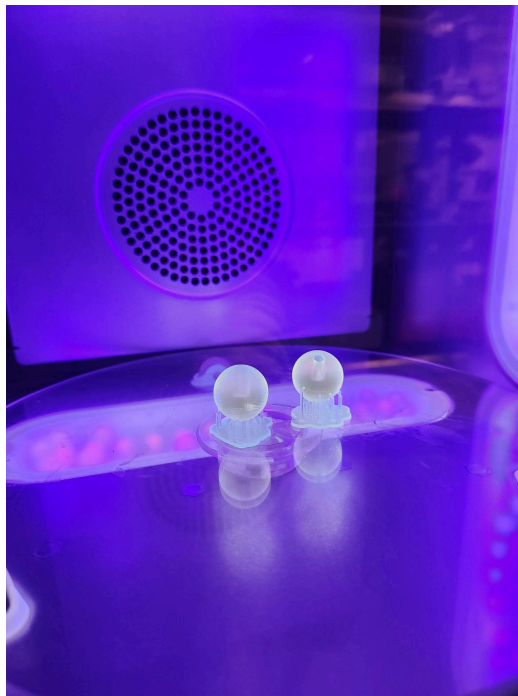
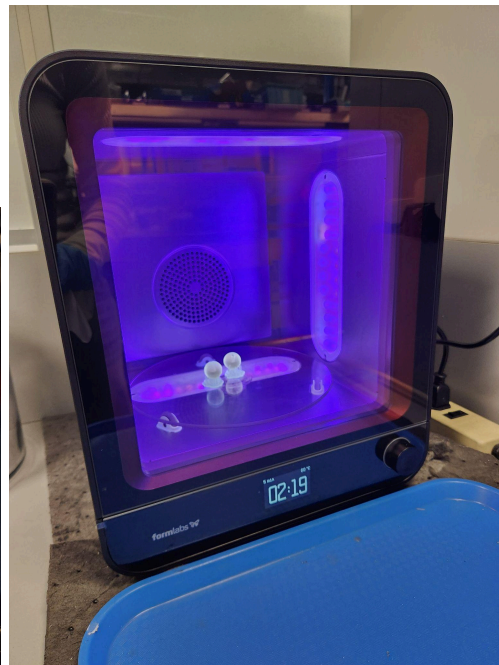
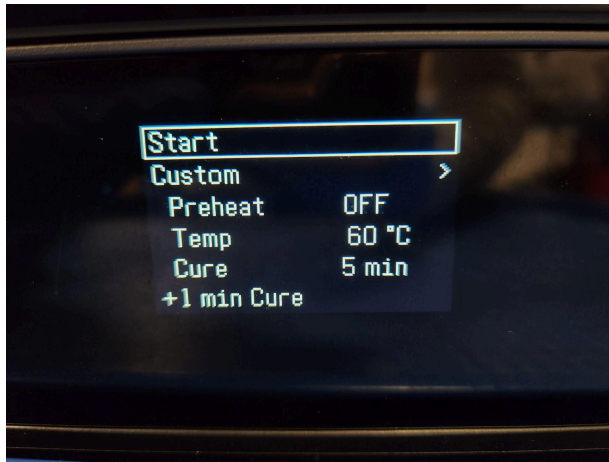
- 3) Take part from the fume hood to the Form Cure
- 4) Open the Form Cure and place part(s) in the turntable, then close the door





- 5) Adjust the curing time and temperature. Curing settings are dependent on which resin is used, refer to the reference sheet or the [FormLabs cure recommendations page](#)

6) Press 'Start'



7) Once the post-curing is complete, lift the cover and remove the part

## Post Processing

1) Utilize snips, tweezers, or X-acto blades to remove supports from the part. Use caution when utilizing sharp blades





- 2) Use abrasives such as sandpaper or files to remove any marks left by touch points of the supports until the surface is satisfactory



Congratulations! You have successfully printed using the Form 4

## **Maintenance**

Clean the build platform of excess resin using IPA in the fume hood and return the platform to its bin inside the cabinet. The build trays should be cleaned well-enough to touch them with your bare hands. If they are insufficiently cleaned, they will contaminate the tanks and cause print issues.