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 × 125 × 210 mm (7.9 × 4.9 × 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

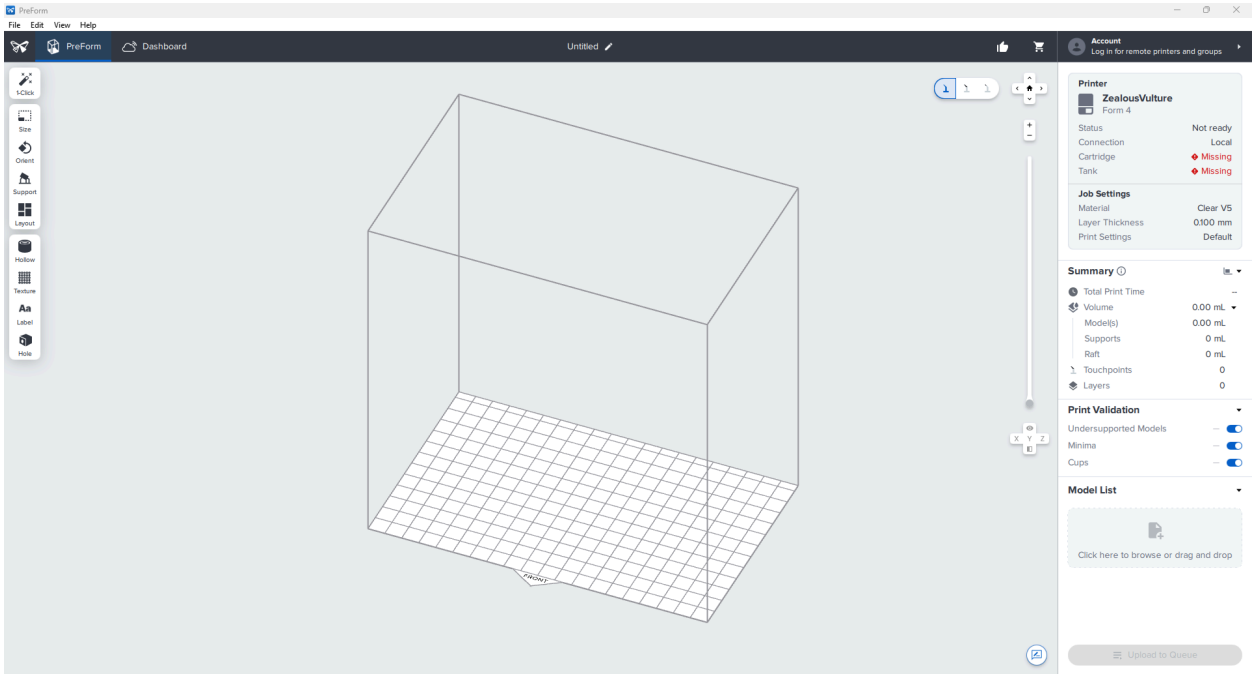
- Nitrile gloves
- Safety glasses
- Lab coat (for working with large volumes of IPA)

Job Setup

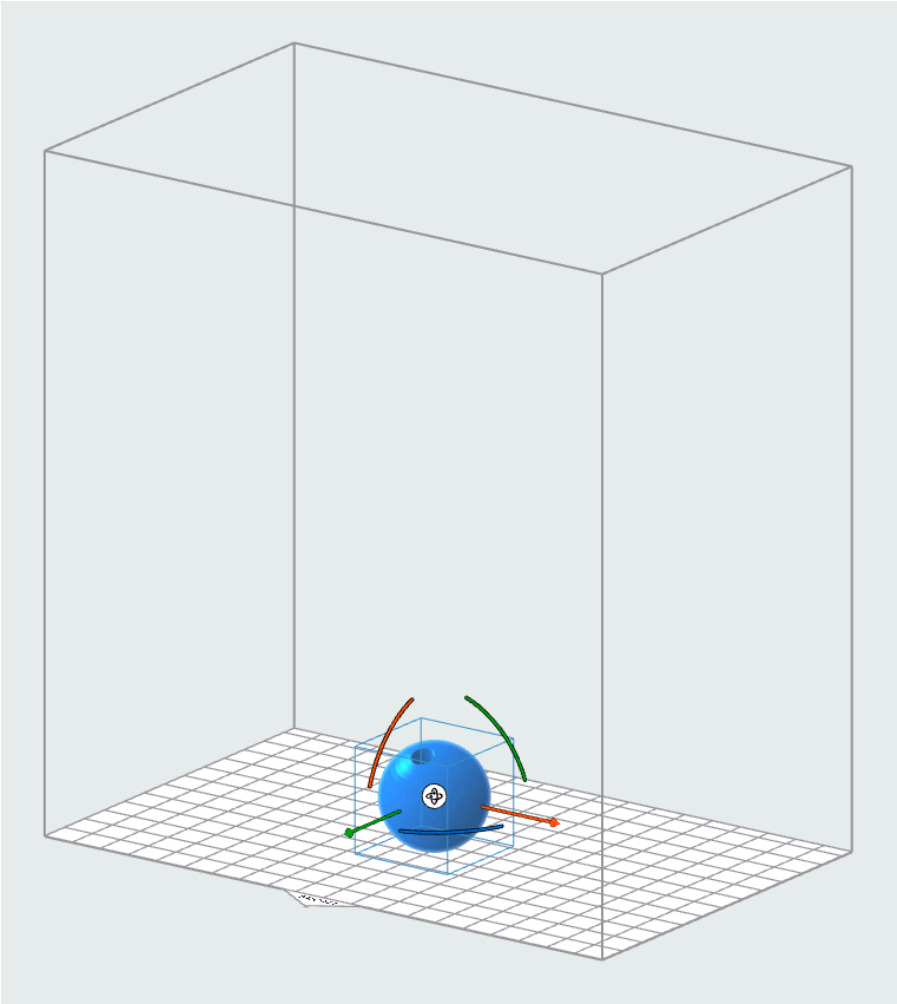
On the Computer

1) On the desktop computer, open the PreForm software

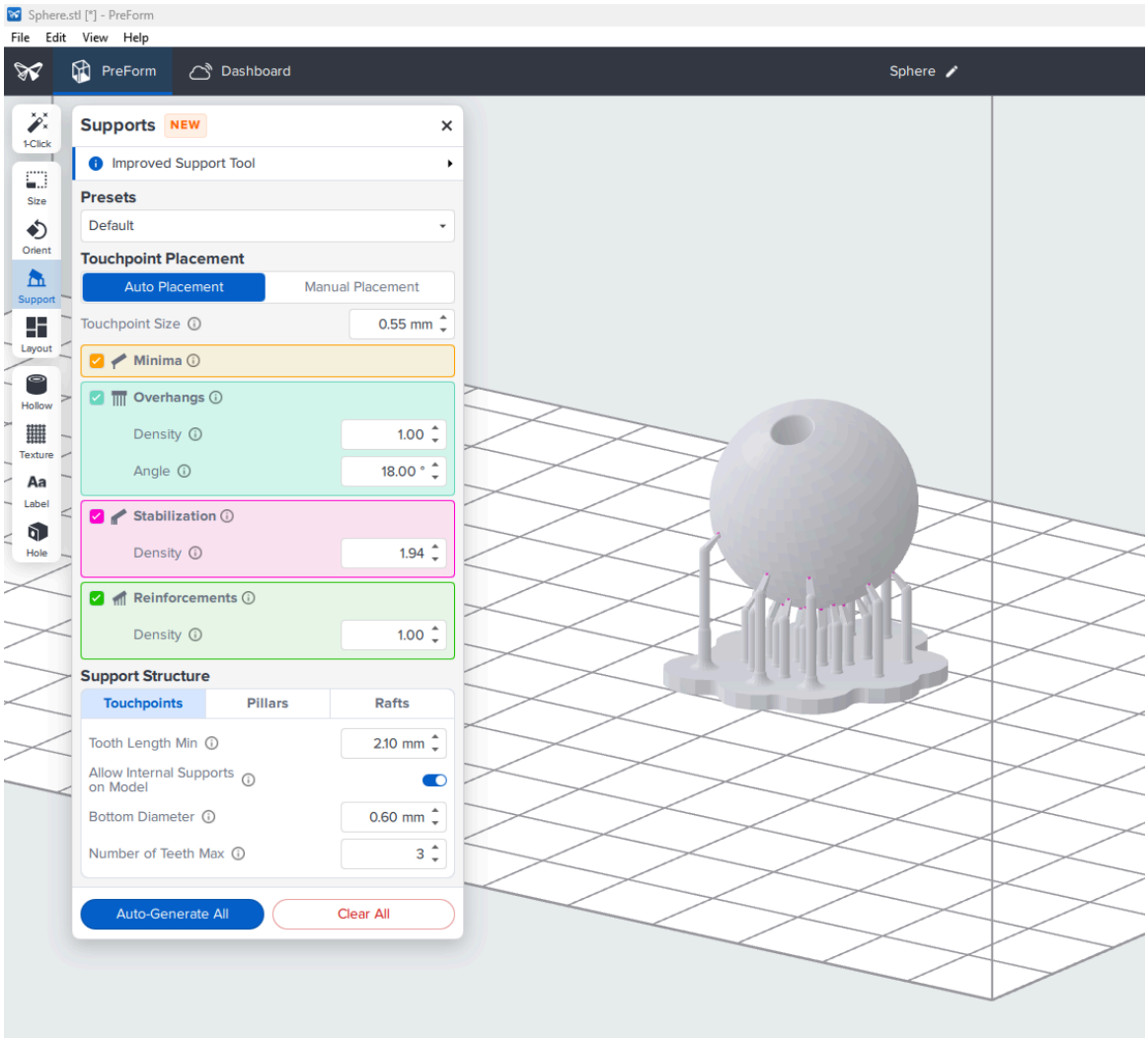
2) Start a new print, toggle to File > New in the upper left corner



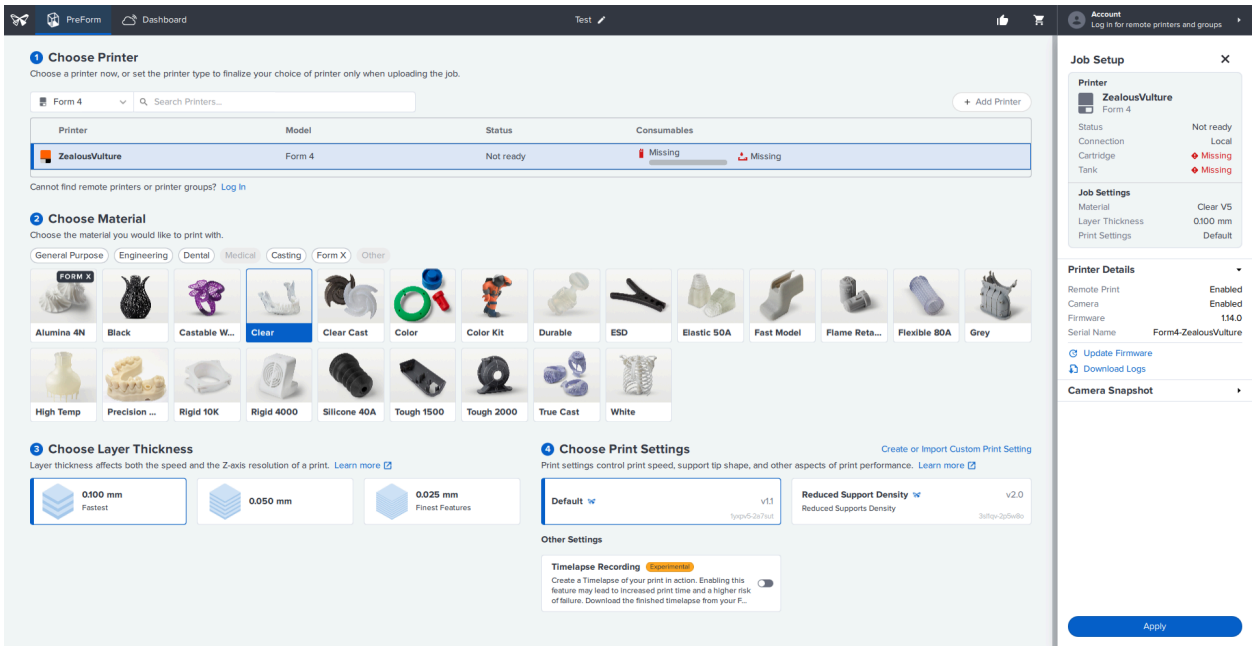
3) Upload .STL file by dragging file into the 3D workspace or toggle to File > New and select the .STL file.



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



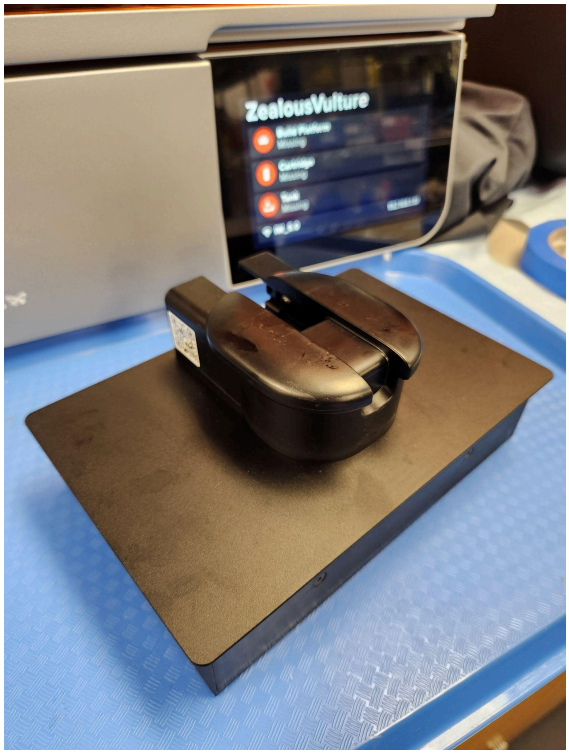
5) Apply the type of resin, printer, and layer thickness in this window



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.

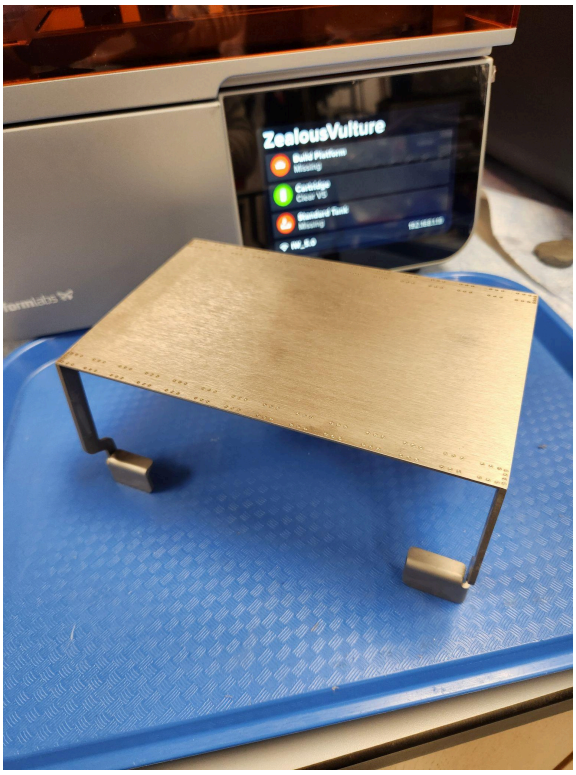
Setting up printer

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

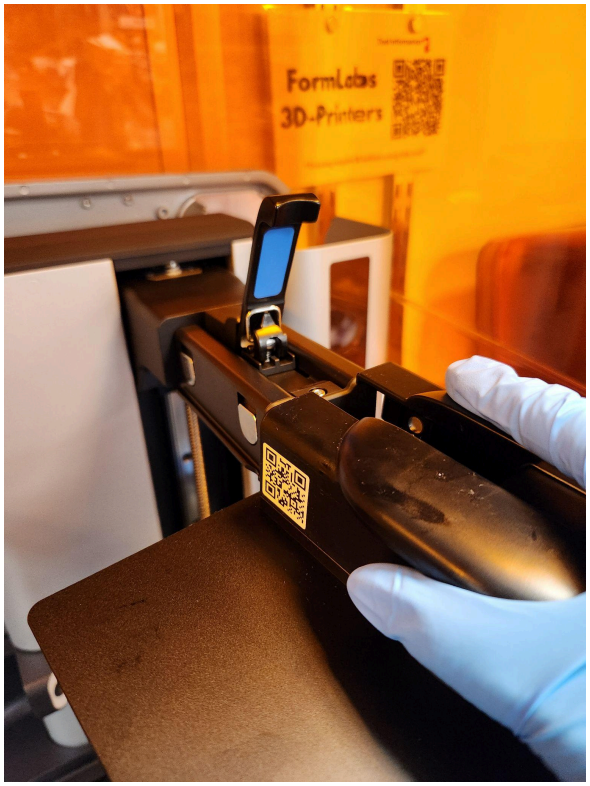

ZealousVulture

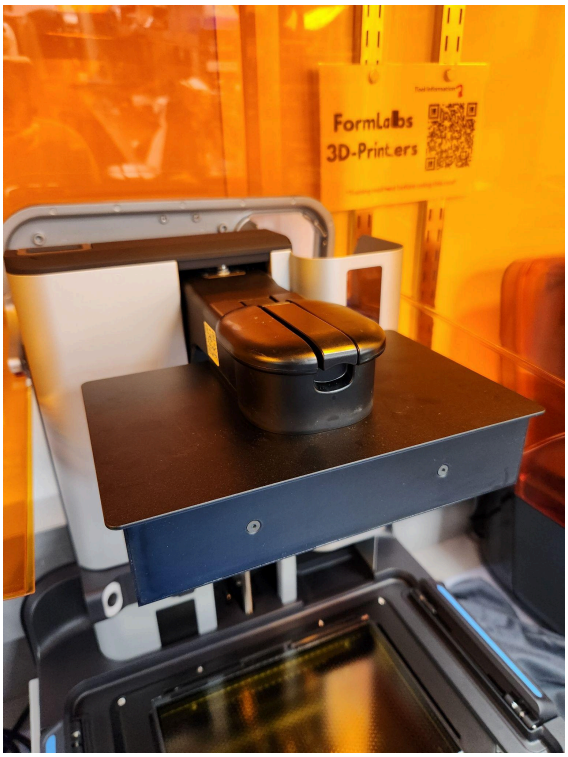
ZealousVulture

Option 2: v2


ZealousVulture
formlabs

ZealousVulture

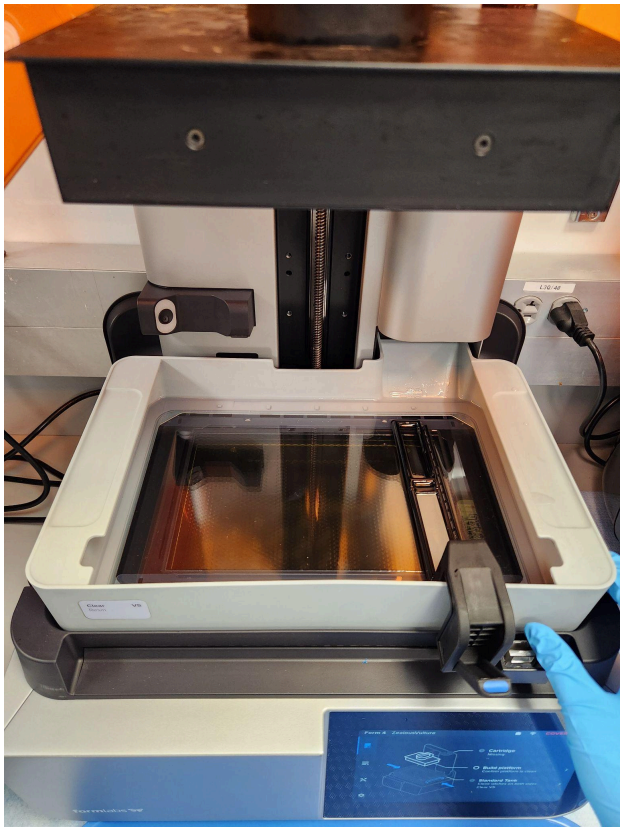
3) Insert the build platform ensuring to lock it into place using the lever lock

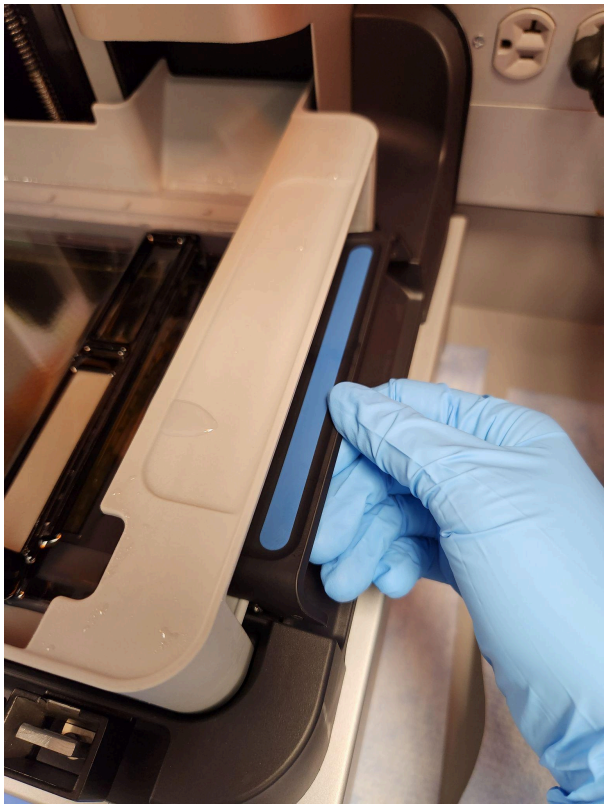


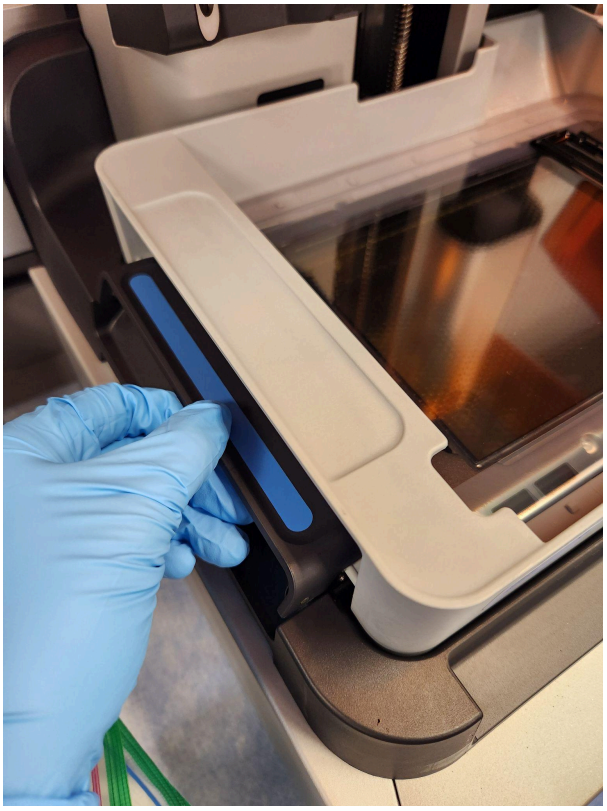


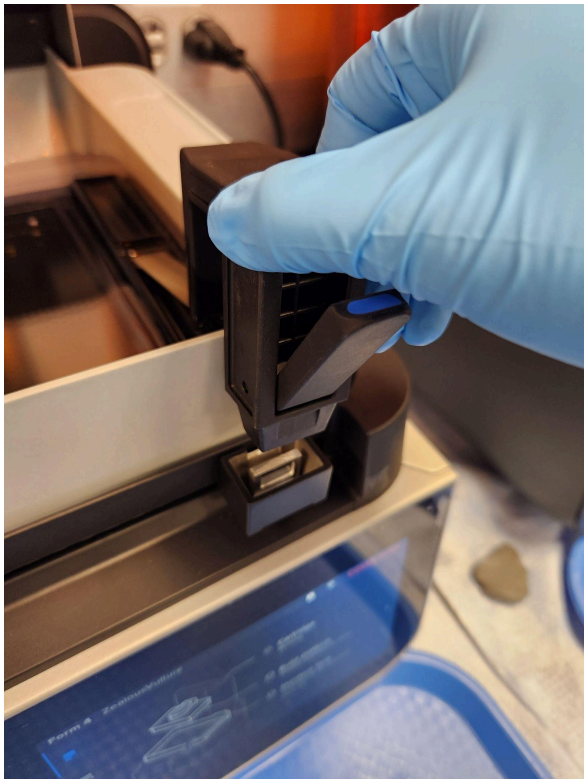
4) Find your desired resin cartridge in the cabinet below the printers. Find the corresponding resin tank

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

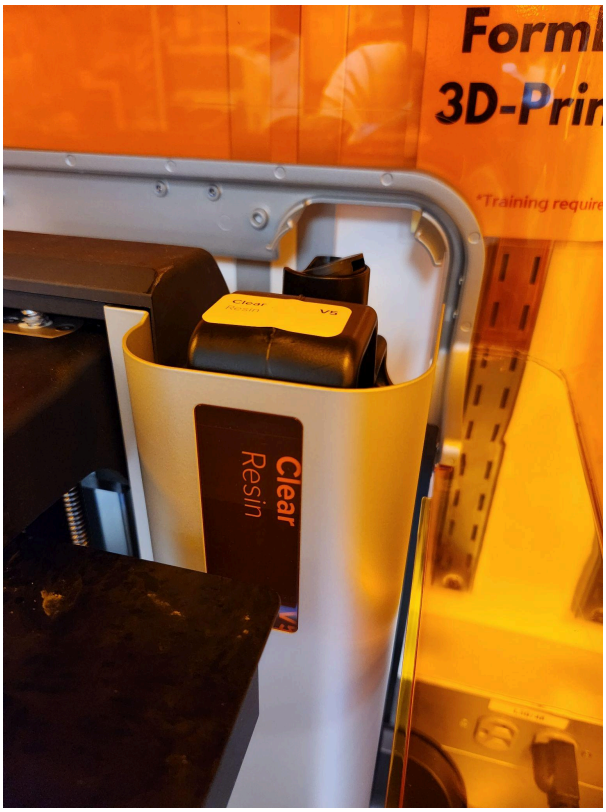




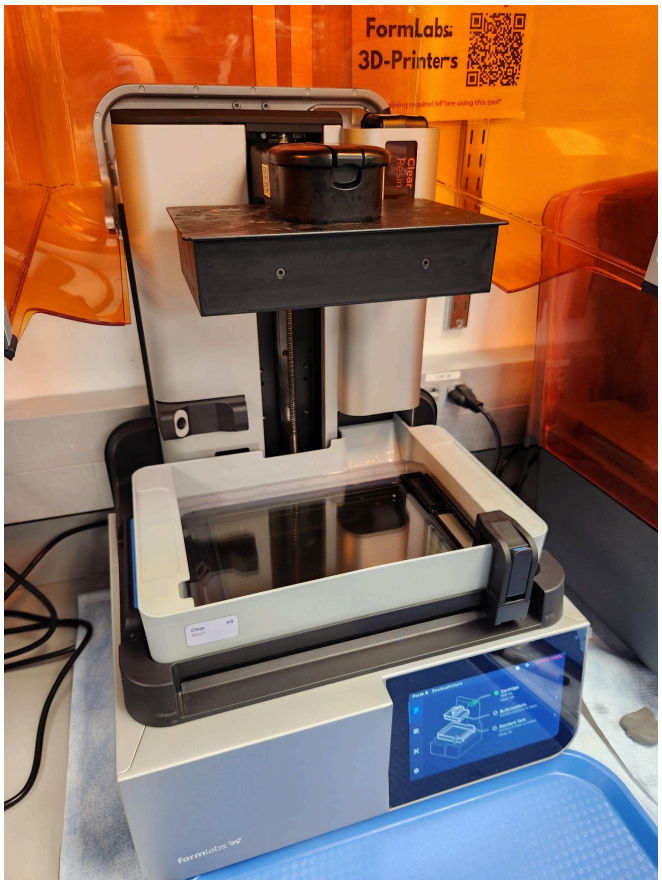


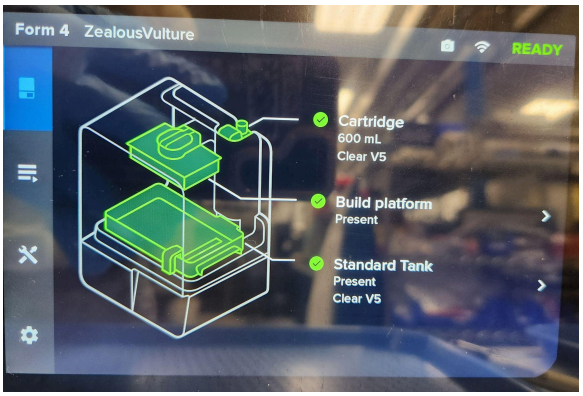


6) THEN Load cartridge in the back of the printer. Ensure to open the cap. The name tag for the type of resin should be visible from the front. This order is important to reduce the possibility of a resin leak into other areas of the printer



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





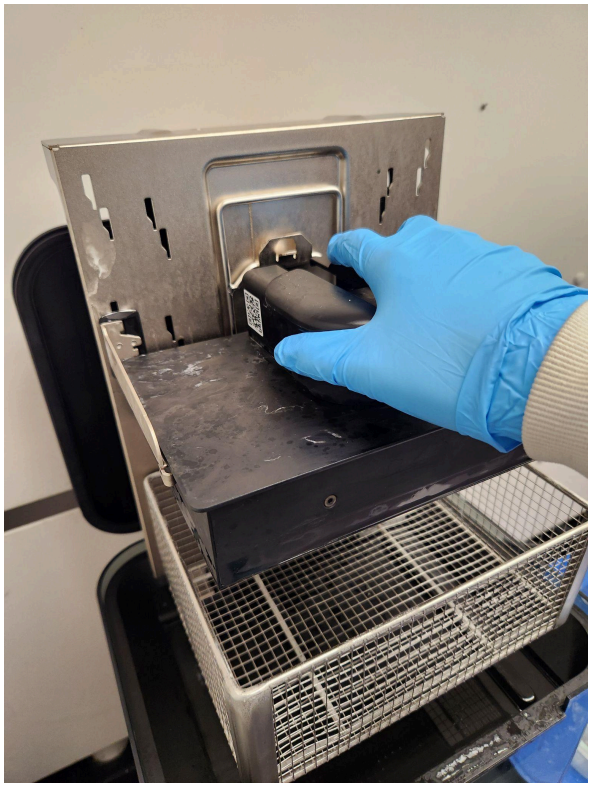
Post cure using Form Wash

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

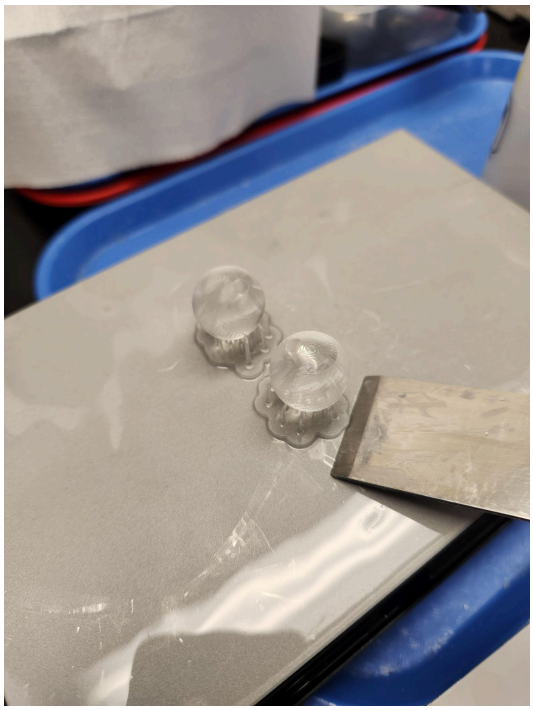
4) Slide the build platform into the tray. You may need to adjust the placement of the tray bars



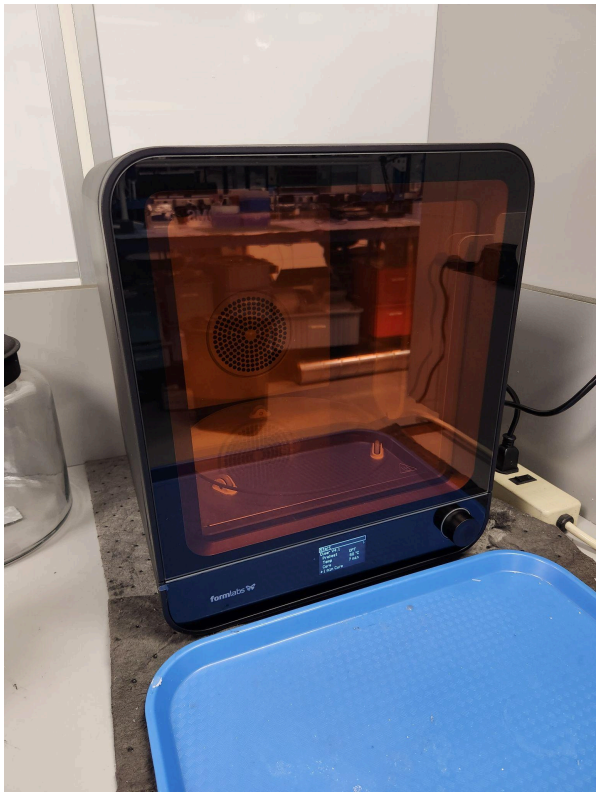
5) Adjust the wash time
6) Press ‘Start’
7) Once the wash is complete, press ‘Open’ and retrieve build platform
8) Press ‘Sleep’ to close the Form Wash

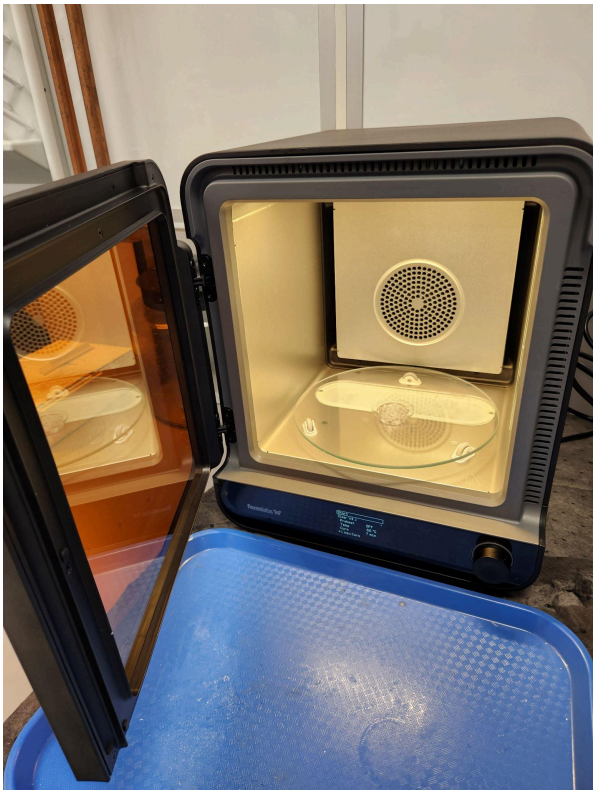
Post cure using Form Cure

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.



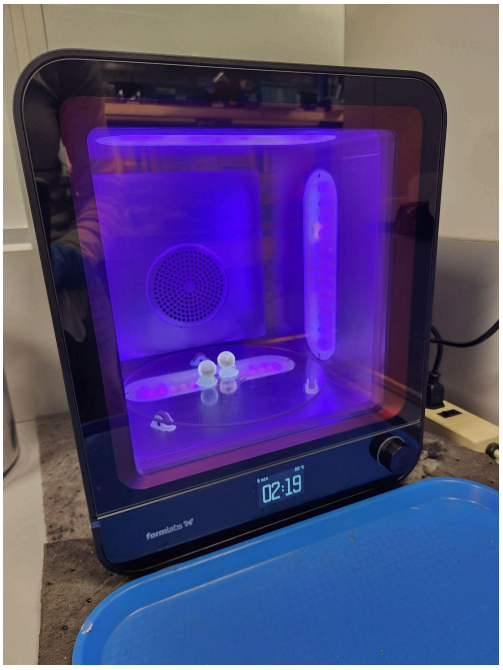
3) Take part from the fume hood to the Form Cure
4) Open the Form Cure and place part(s) in the turntable, then close the door

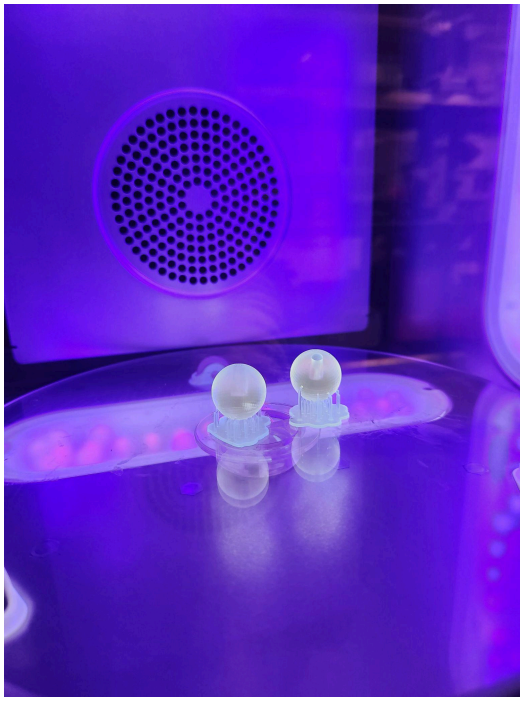




5) Adjust the curing time and temperature. Curing settings are dependent on which resin is used, refer to the reference sheet or the FormLabs cure recommendations page

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.