

CNSI Innovation Workshop
MiiCraft 50 Resin Transfer Procedure

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Purpose: The MiiCraft 50 3D printer prints by lowering a build platform into a resin tank, which is filled with liquid resin and has a teflon bottom to let the projected light shine through and cure individual layers. The teflon sheet can become scratched or distorted, in which case a new resin tank is necessary. The resin tanks are oddly shaped and inconvenient for pouring, so the resin must be transferred manually. This document outlines the process for filling a new resin tank.

Tool Name, Location: The MiiCraft 50 3D printer is located in 2442 Elings. The spare MiiCraft resin and materials are found in cabinet E2 of 2442 Elings.

Safety Concerns:

PPE Requirements:

Safety glasses, gloves, and a labcoat are required for this procedure.

Chemical:

The uncured photopolymer resin is toxic. Wear proper PPE and follow safe chemical procedures to avoid physical contact with the liquid resin.

Avoid direct inhalation of the Isopropyl Alcohol when cleaning up.

Physical:

The teflon sheet easily collects particulates and is prone to scratching and deformation. Keep the fresh sheet in a safe and protected environment to prevent contamination or deformations.

Hazards:

Spills

Supplies:

Isopropyl Alcohol

Paper Towels and Wipes

Absorbent Pad

Plastic disposable pipettes

Empty clean Resin Tank

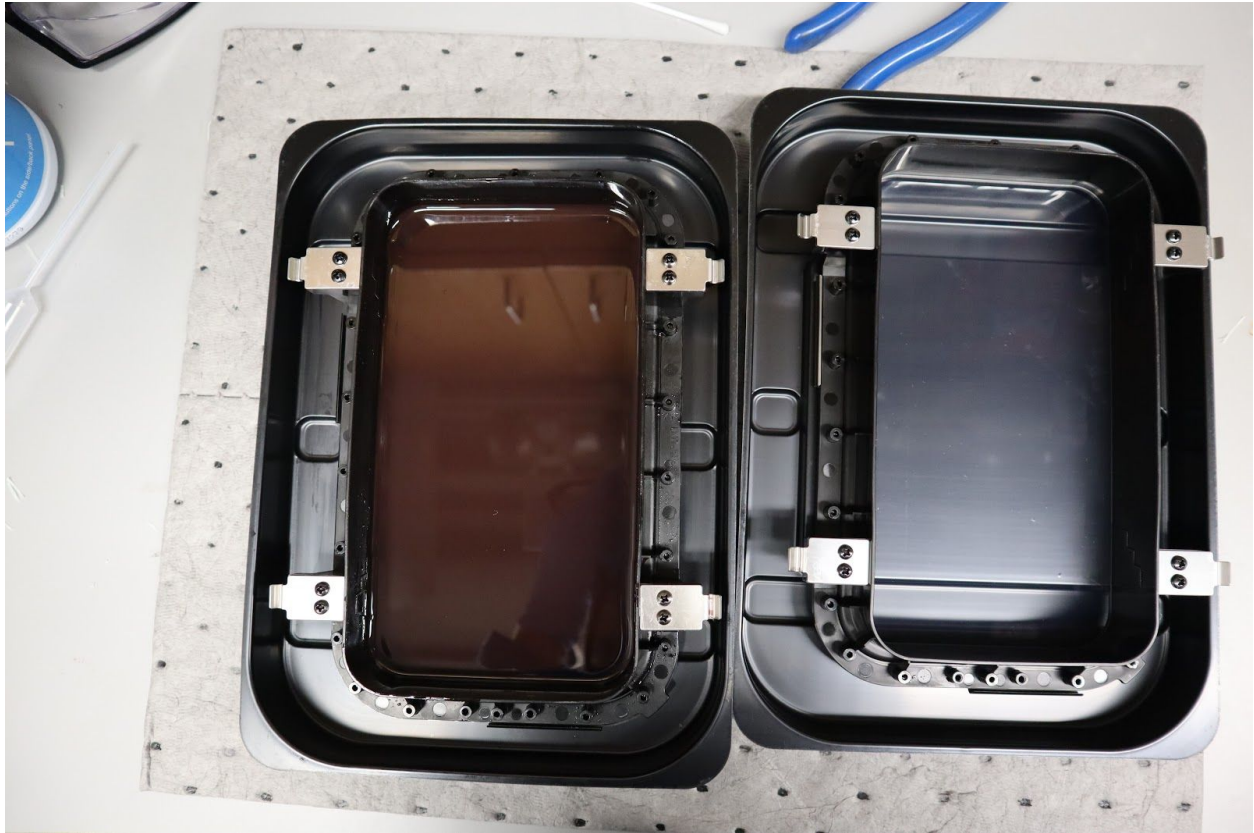
Plastic Resin Tank cover

MiiCraft Resin

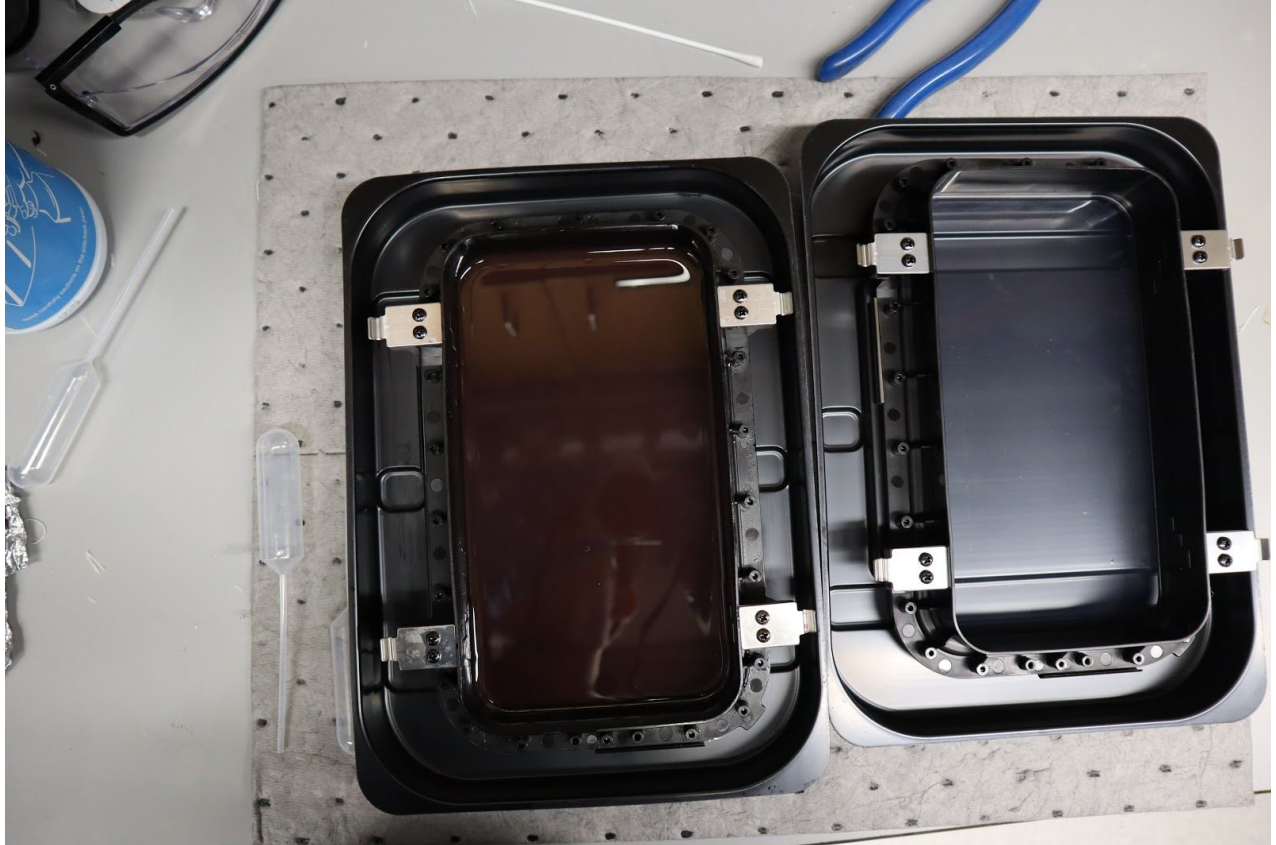
Procedural Outline:

1. Put on safety glasses, a labcoat, and gloves. Clear a work area and lay down a large absorbent pad to catch any residue stains. Lay out the bottoms of two plastic resin tank covers to support the resin tanks.
2. Gather up several wipes, a squirt bottle of IPA, several disposable pipettes, and a bottle of the desired MiiCraft resin. The MiiCraft supplies can be found in cabinet E2 of 2442 Elings.
3. Place the full old resin tank in one of the plastic covers and the empty new resin tank in the other. Make sure they are close together to prevent spillage.
4. Using pipettes, suck up the resin from the old tank and dispense it into the new tank. The larger the pipette the better, the resin is somewhat viscous and will travel slowly in a small diameter tube.
5. Repeat this process until all resin is transferred. Use two pipettes to speed up the process. Tilt the old resin tank to facilitate pipetting the resin when the levels are low. Lots of resin will congregate around the interface of the resin tank and the teflon. Be sure to pipette that resin as well.
6. The resin contains a lot of bubbles from the pipetting process. Gently agitate with a pipette bulb and let it sit so the bubbles will dissipate.
7. Carefully wipe up any resin droplets that have accumulated on the resin tank. These can transfer to the glass protective plate in the printer and worsen print quality.
8. Pick up the full resin tank by the metal latches and carefully place in the MiiCraft printer. Orient the tank so that "Front" faces towards you and secure all four latches.
9. Inspect the resin level. Fill the tank to at least the top of the second step. Note: Do not fill the tank outside of the printer, the teflon is pulled tight over the glass plate and will show a much lower resin level when not in tension.
10. Wipe the plastic resin tank covers clean with IPA to remove any liquid resin traces that would contaminate future resin tanks.
11. Gather up all the contaminated and resin soaked materials and dispose of in the yellow Hazardous Waste bin.

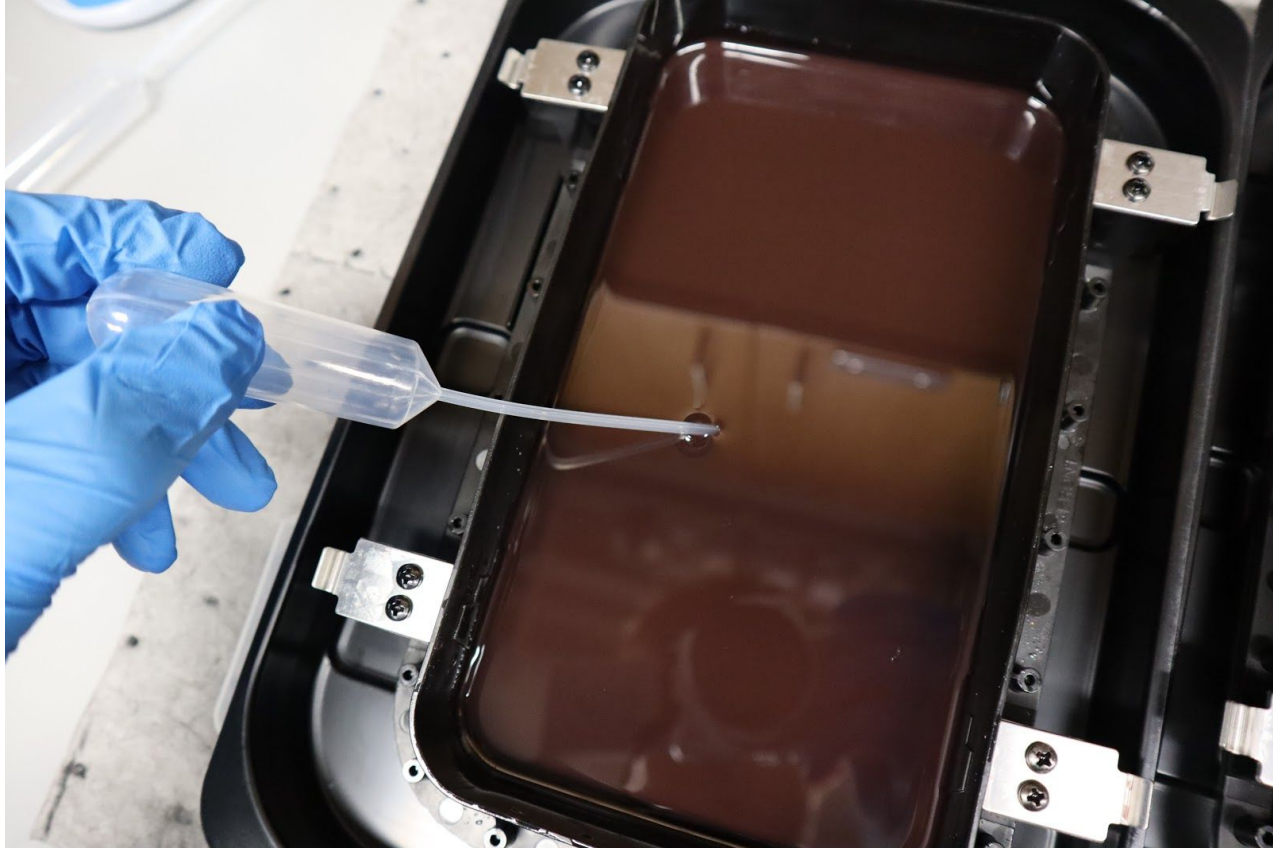
Procedure:



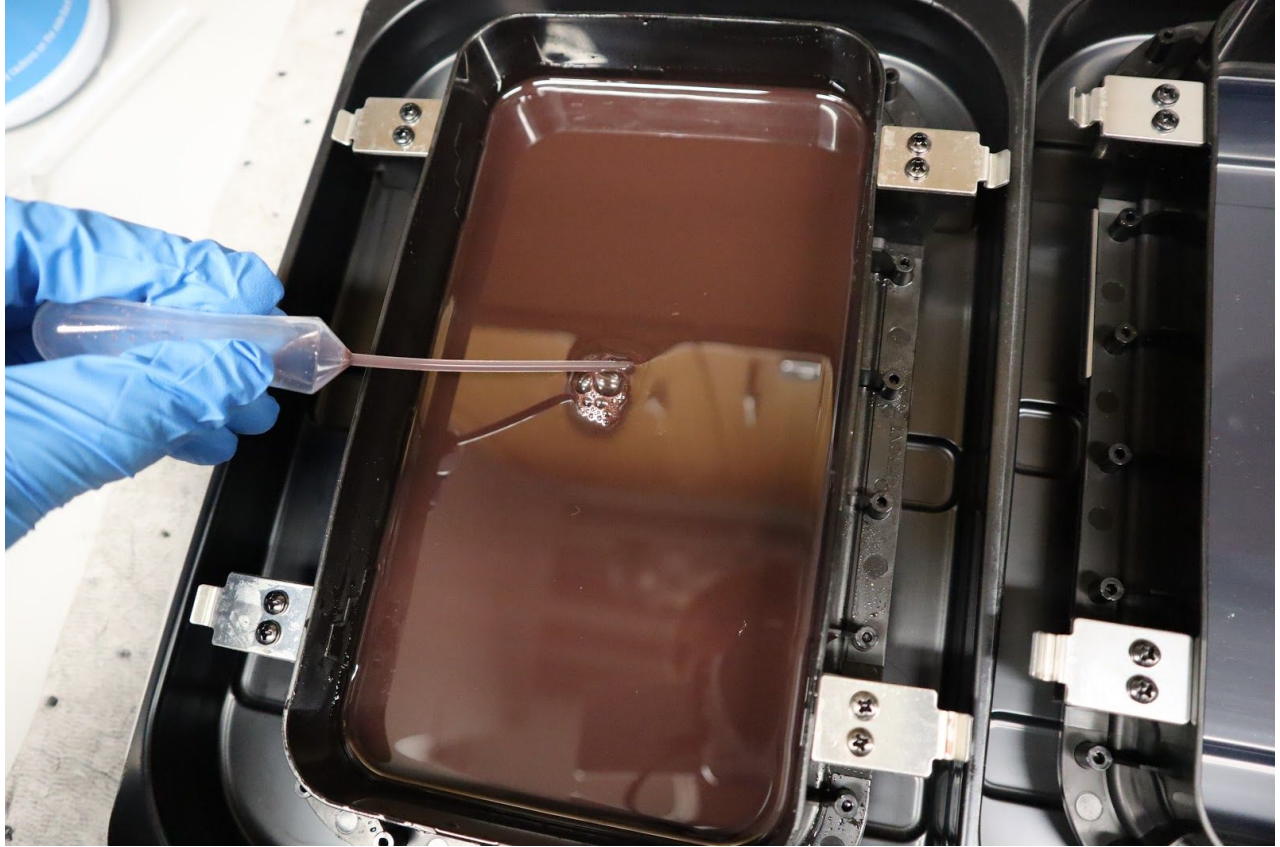
Clear a workspace and lay down an absorbent pad. This will prevent the resin from coming in contact or staining the countertop. Place the old full resin tank and the new empty resin tank in one half of the plastic tank cover so they are supported. Keep them close together to minimize spilling.



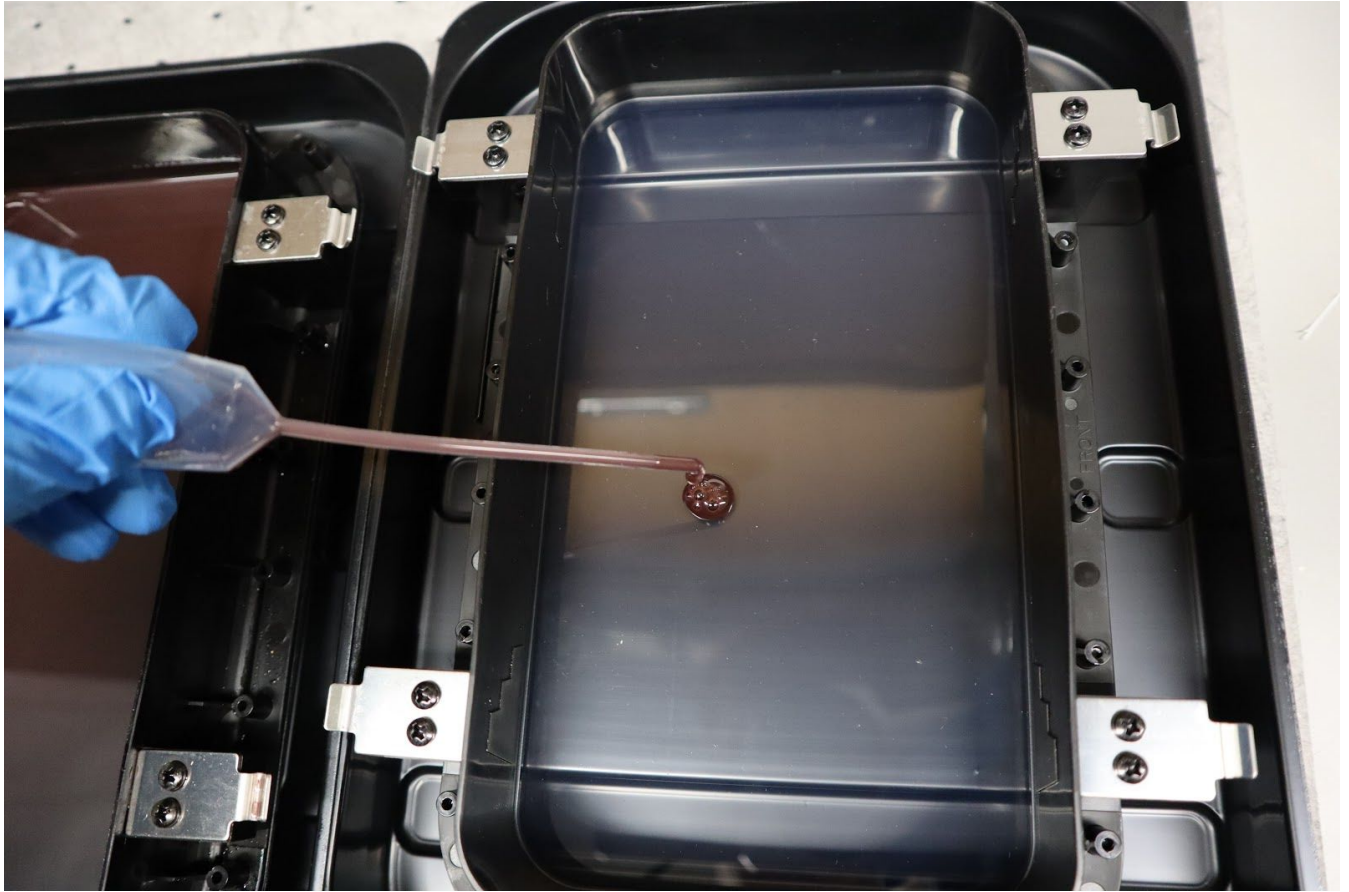
Procure a number of disposable pipettes to use for transporting the resin.



Use the pipettes to suction up the resin. The resin travels slowly in small pipettes and is hard to suction, use a large pipette when possible.



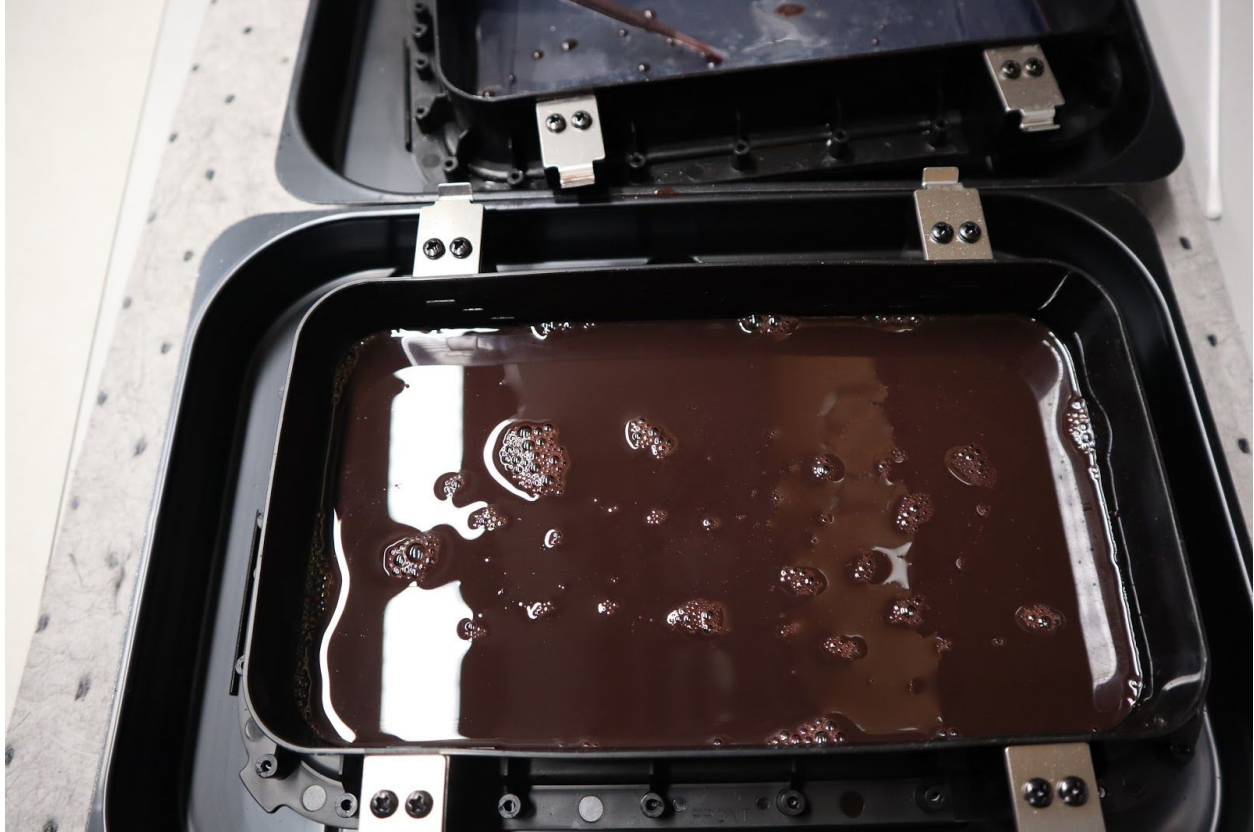
Picture demonstration of sucking up the resin



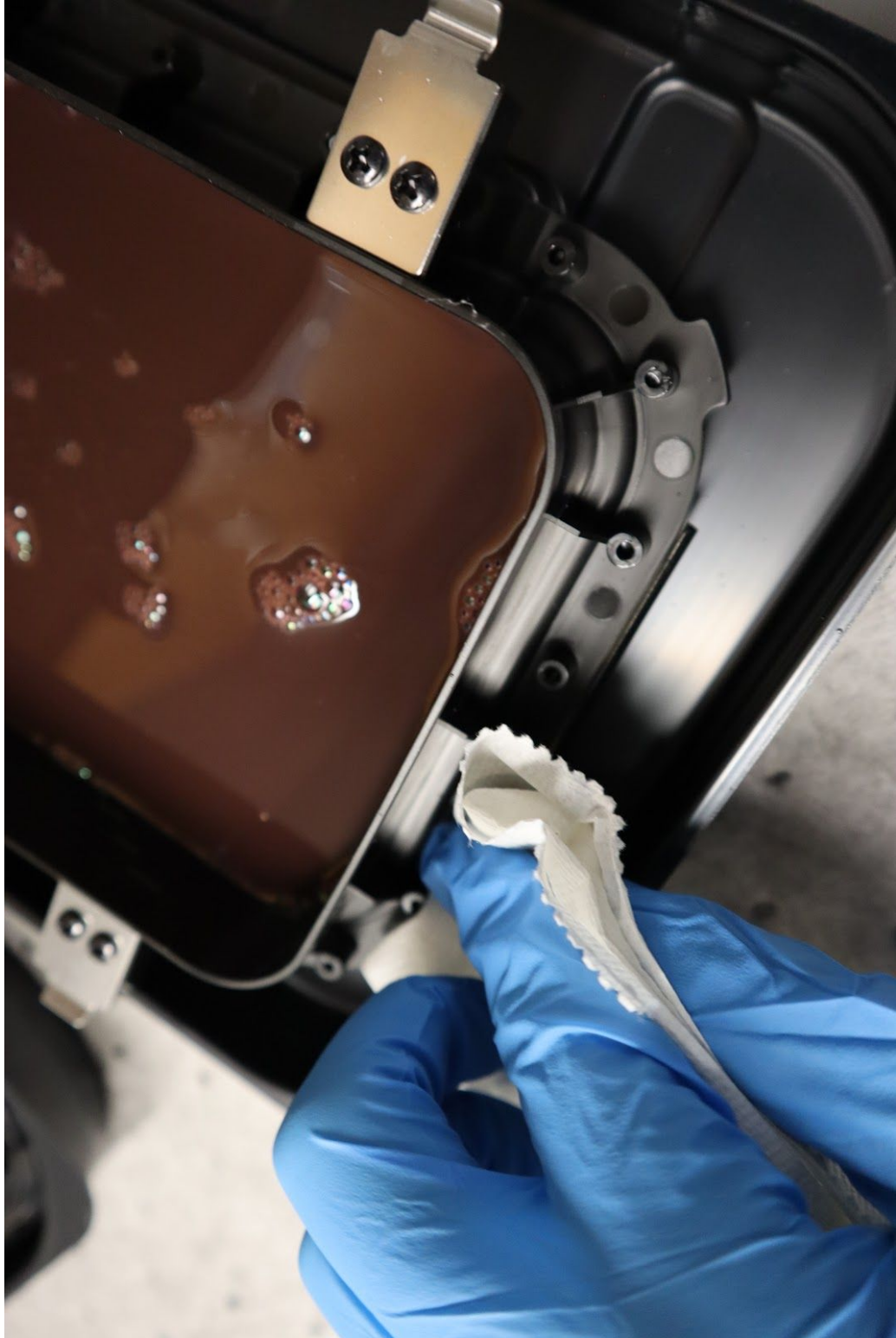
Dispense the resin into the clean new resin tank. The resin will be aerated and bubbly from the air due to suctioning. Use two pipettes to expedite the process.



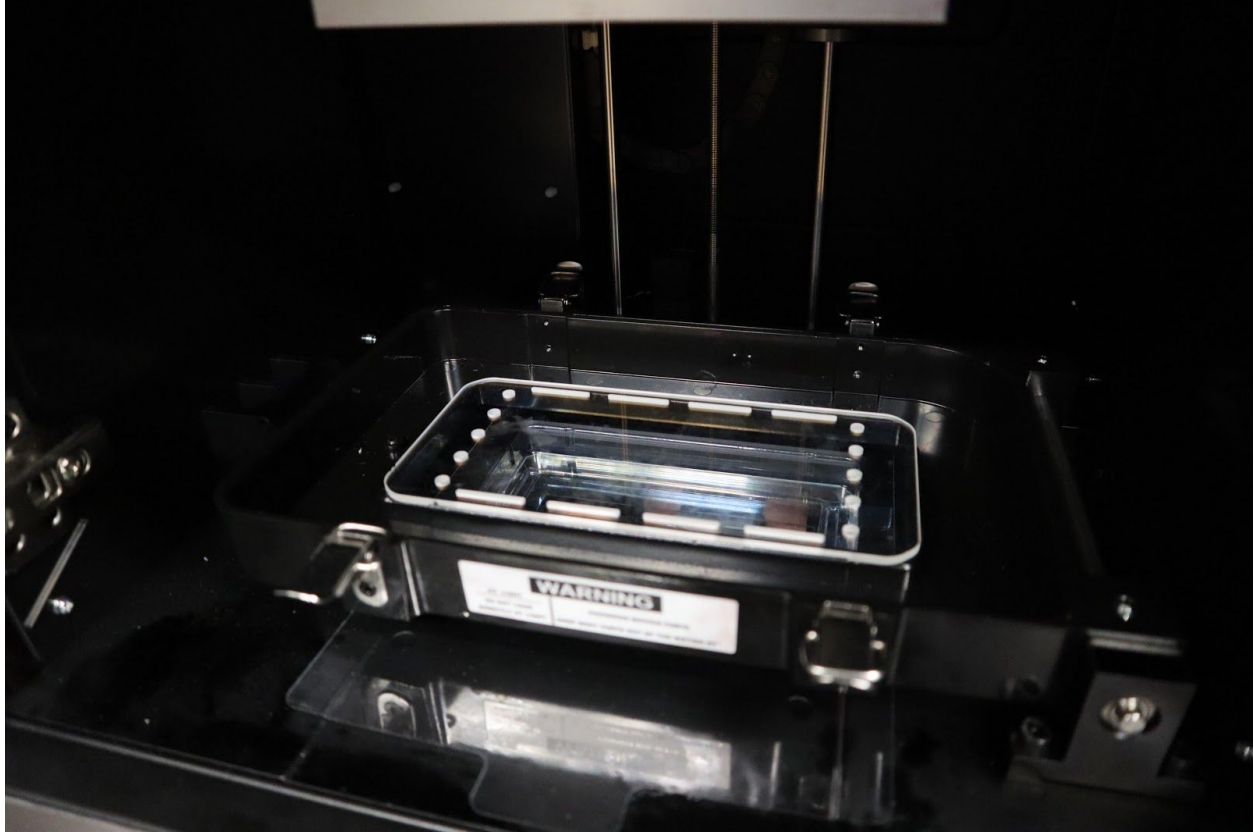
Continue this process until the old resin tank is empty. Tilt the resin tank to get the resin droplets trapped in between the tank and the teflon.



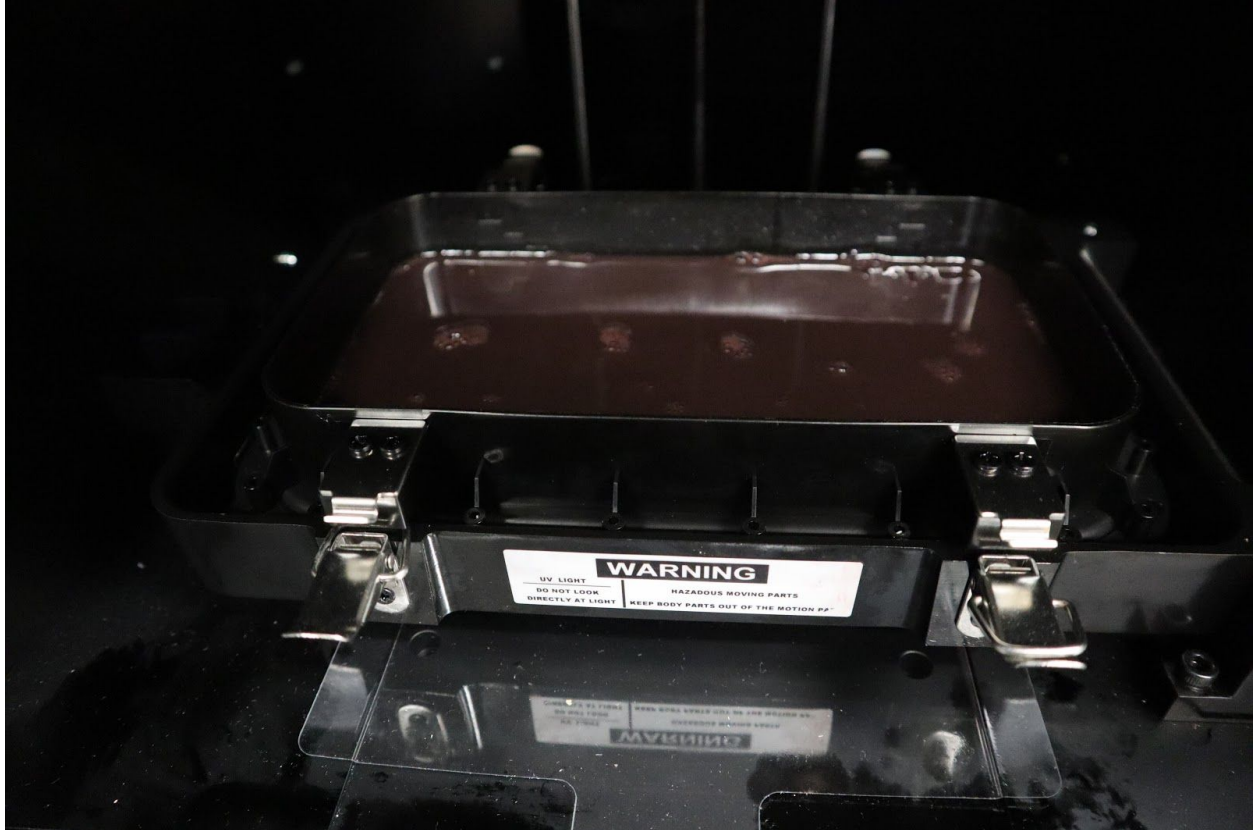
The pipettes inject lots of bubbles into the new resin tank. Stir with the end of a pipette bulb to dissipate the bubbles, gently so as not to scratch the teflon.



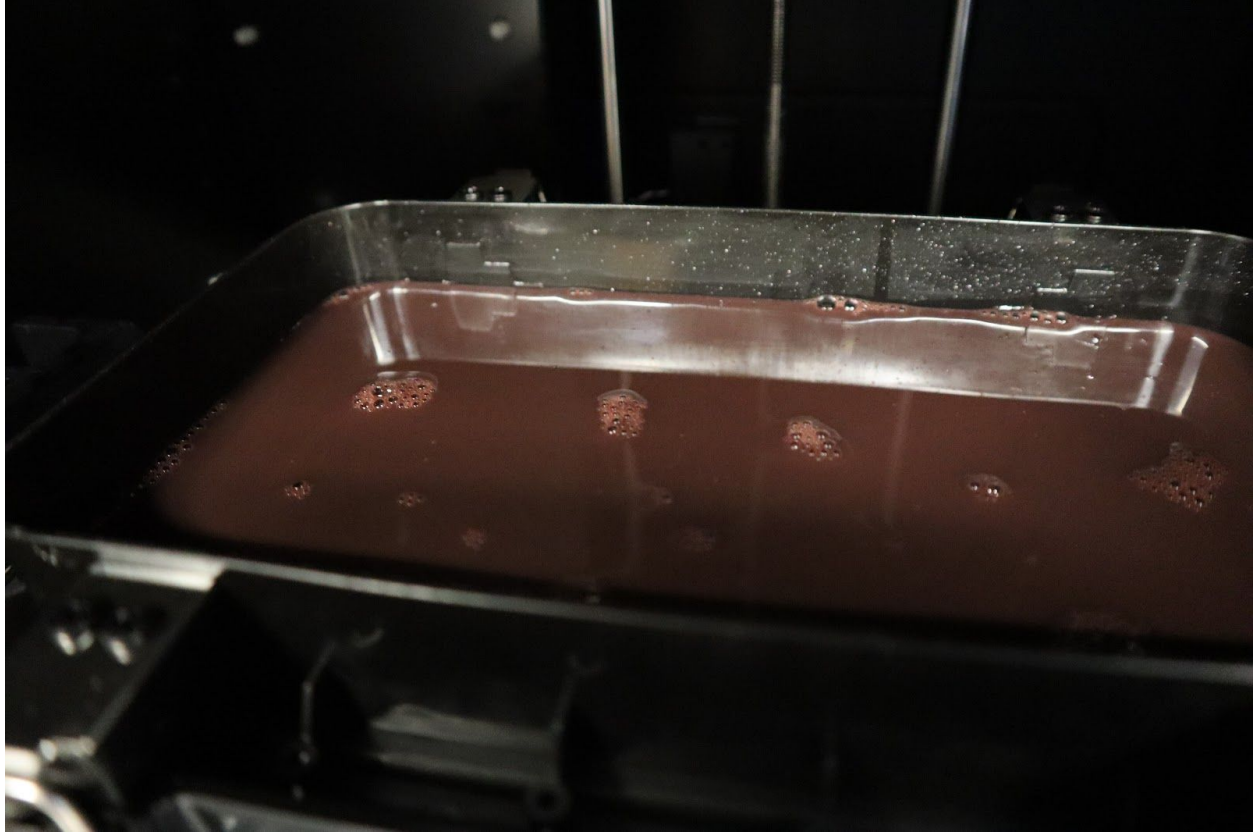
Use IPA and paper towels to clean up any resin droplets that may have spilled onto the resin tank. The resin tank has to be clean to prevent resin from contaminating the glass projector cover plate. Change paper towels frequently to clean the resin rather than smear it.



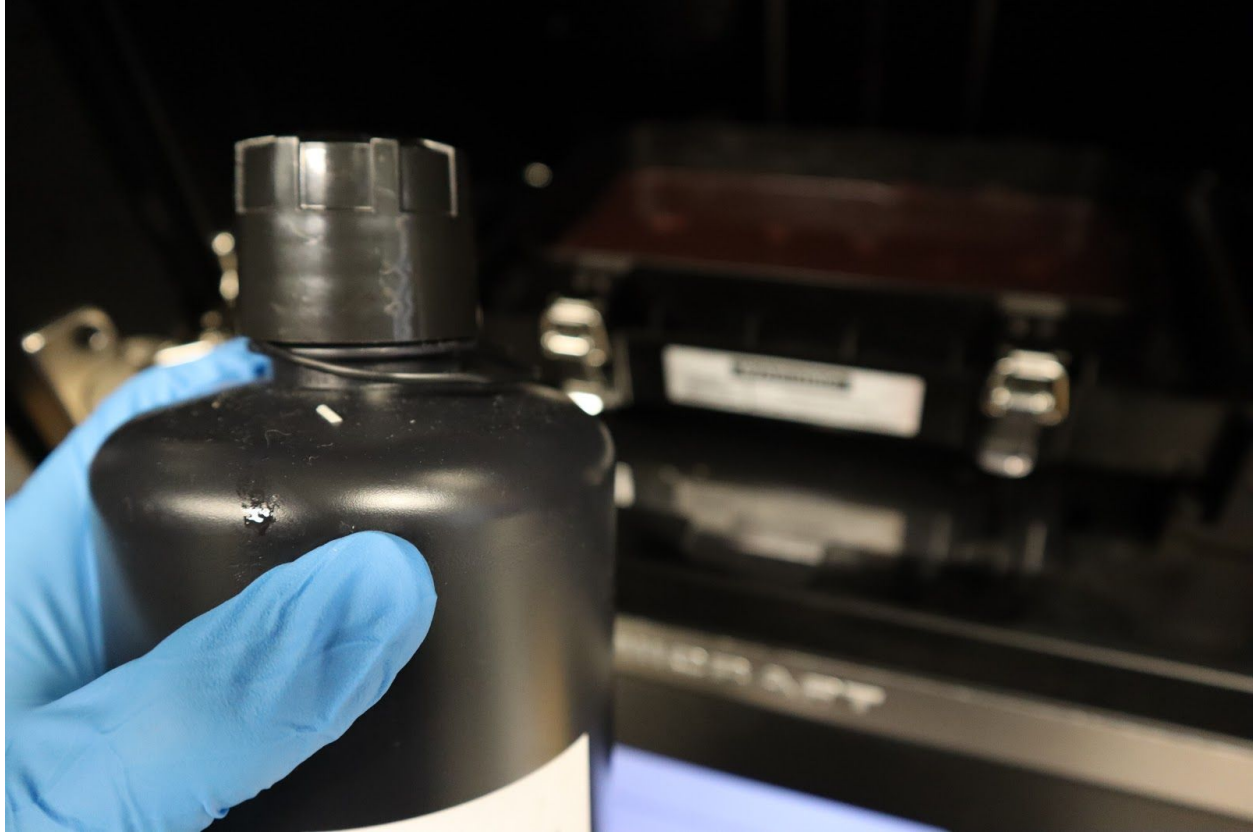
Inspect the glass projector plate to make sure it is clean and free of resin before installing the resin tank.



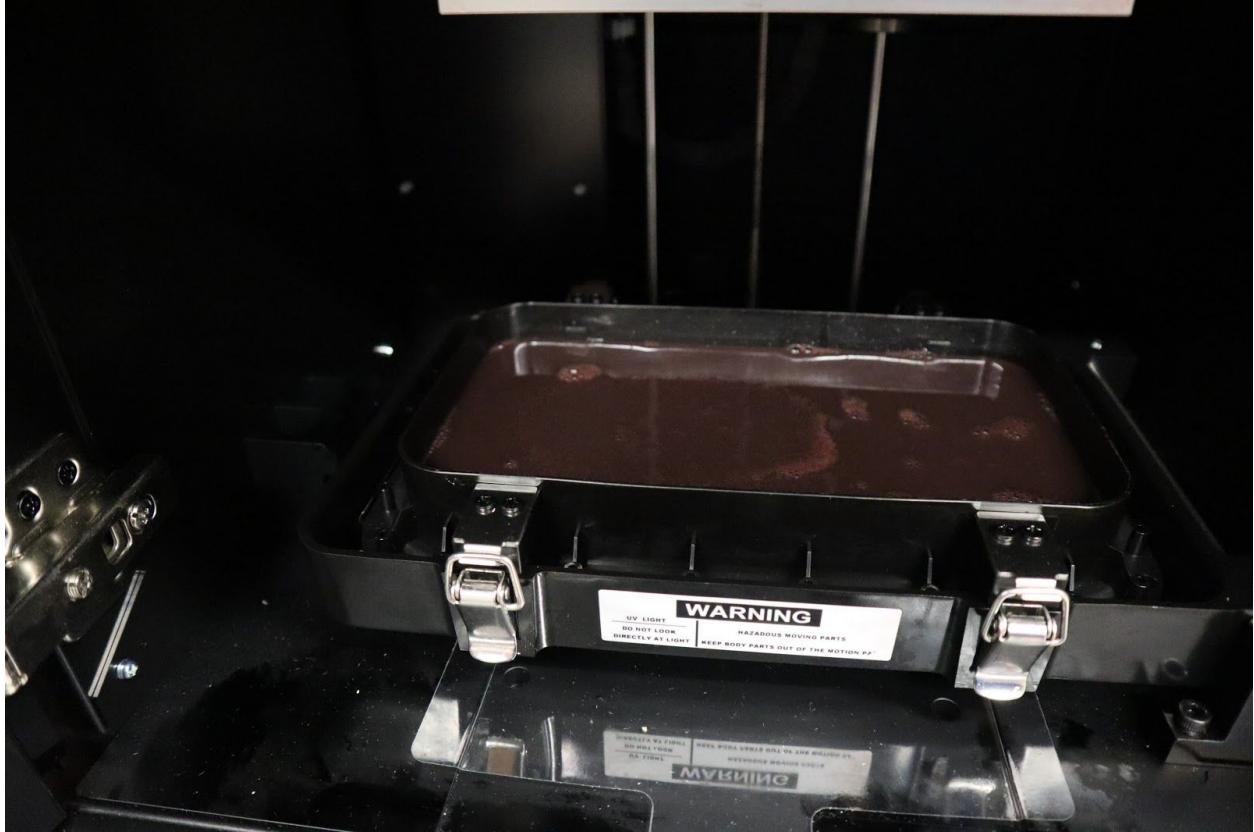
Carefully insert the resin tank into the printer, make sure that **FRONT** is visible on the front of the resin tank. Latch and lock down the clamps to secure the resin tank and stretch the Teflon over the glass bottom plate.



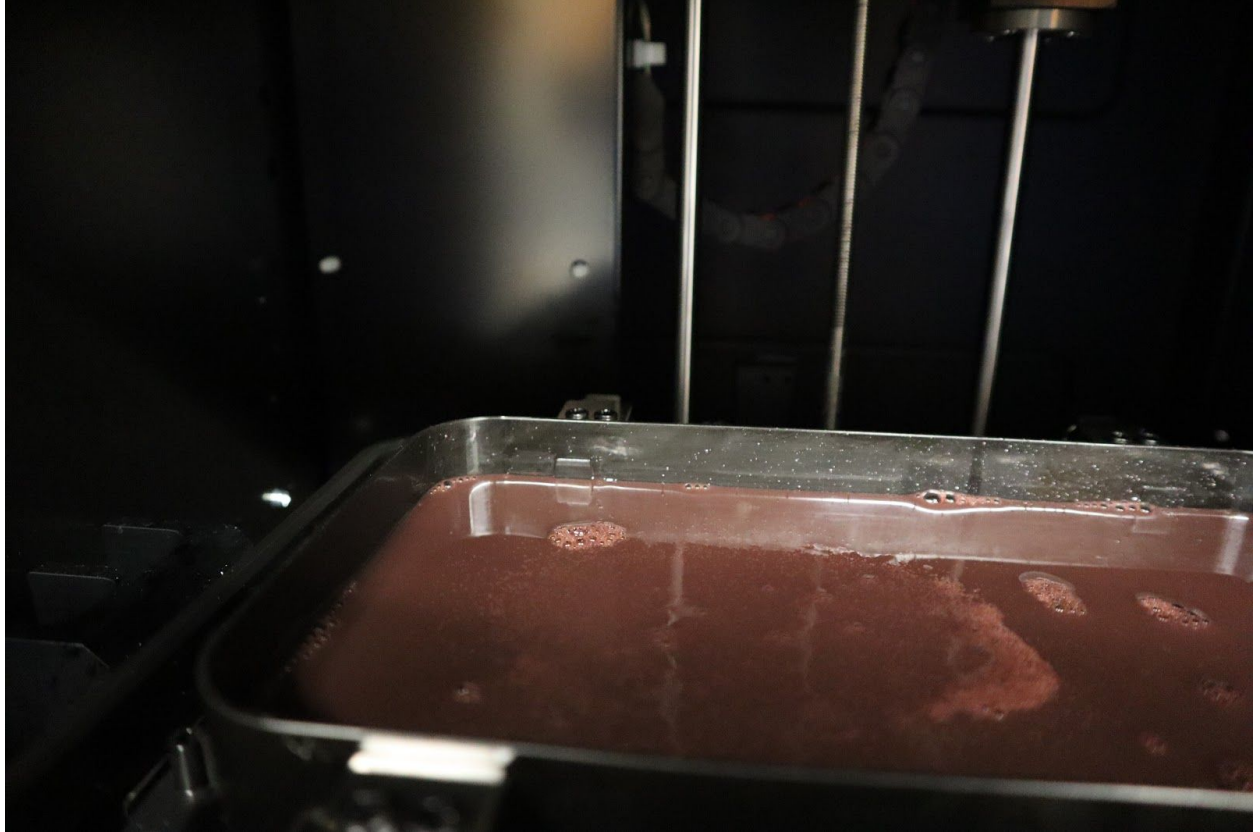
Inspect the resin level. The layer should be at least at the second step to provide enough fluid pressure for the resin to circulate between print layers.



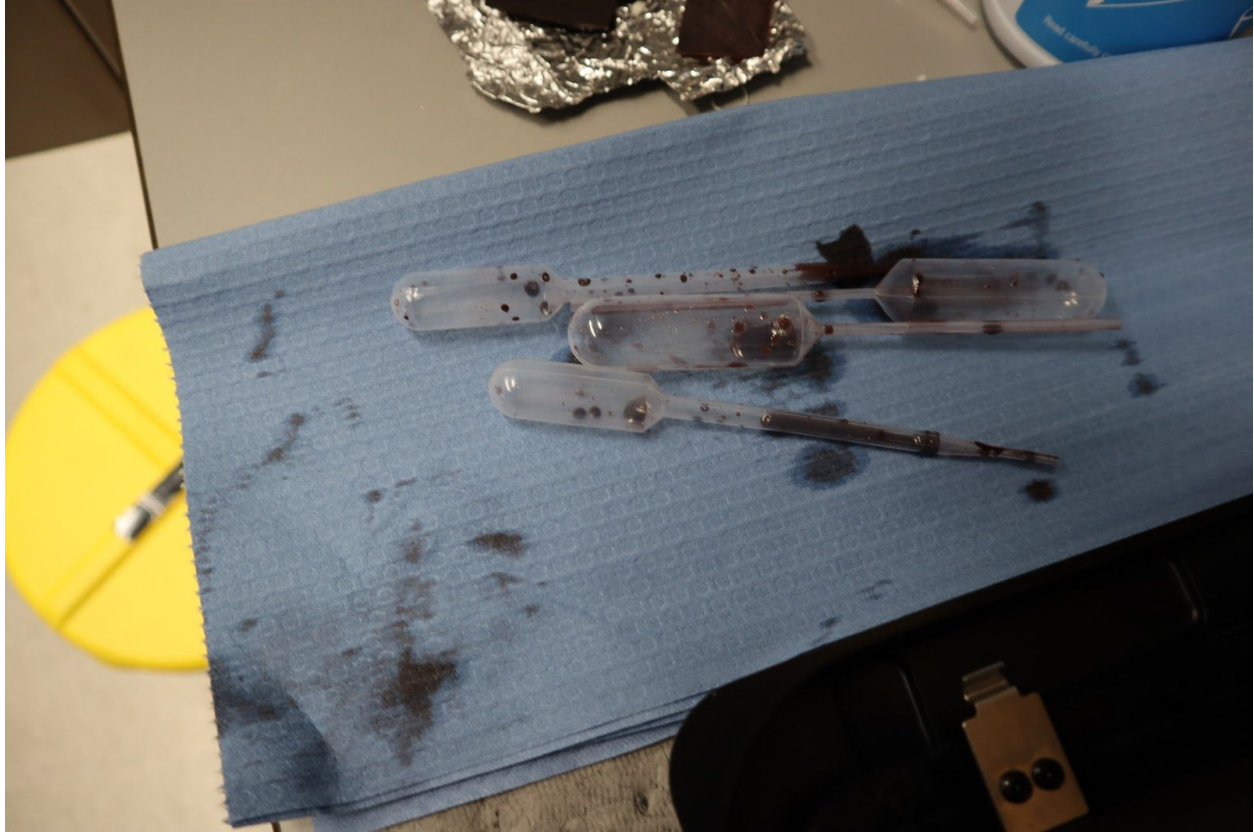
With the resin tank locked down in the printer, fill it with resin. Do not fill the resin tank with resin outside of the printer, the teflon will stretch and you will overfill the resin tank.



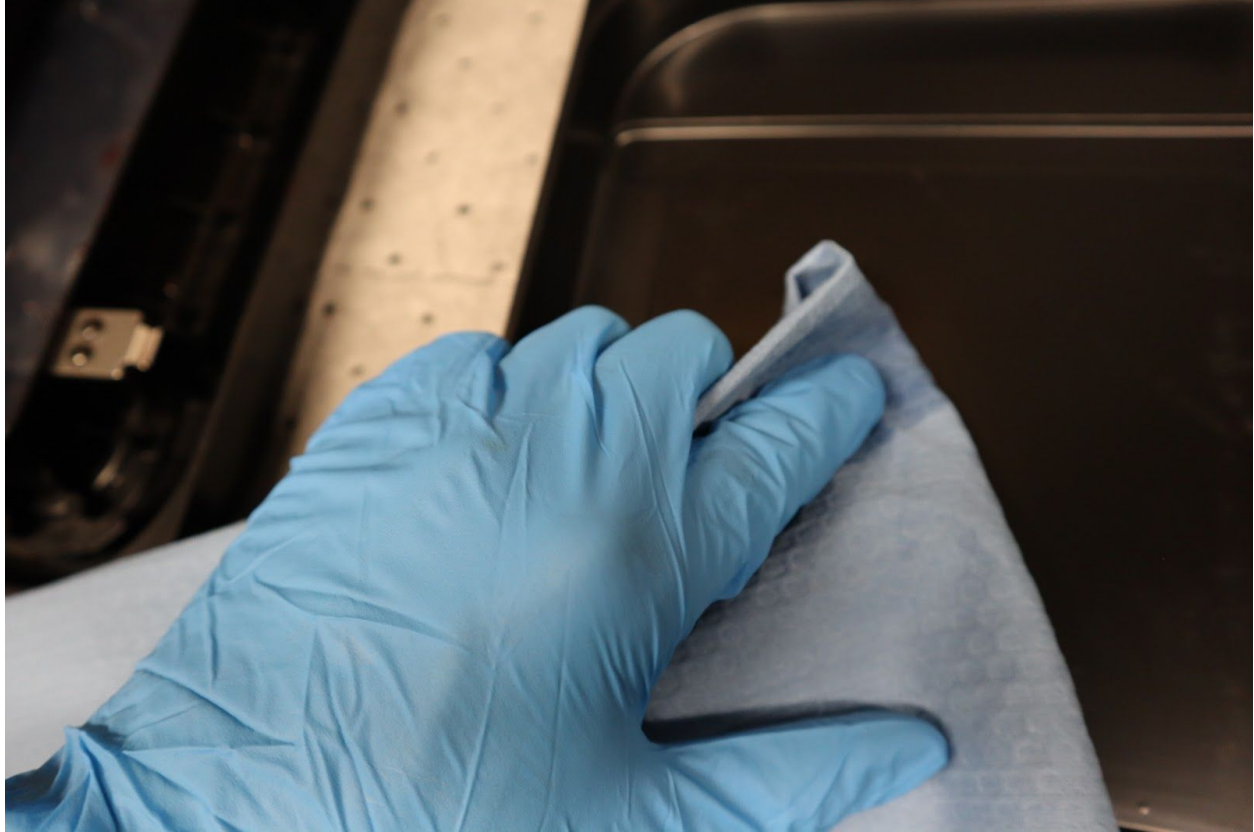
Picture of the topped off resin tank.



Resin level filled up to the second step (indication level of resin).



Collect resin contaminated waste and dispose of in the hazardous waste container. The liquid resin is toxic and must be disposed of as hazardous waste.



Clean the resin tank cover with IPA to prevent future contamination of resin tanks with old resin.