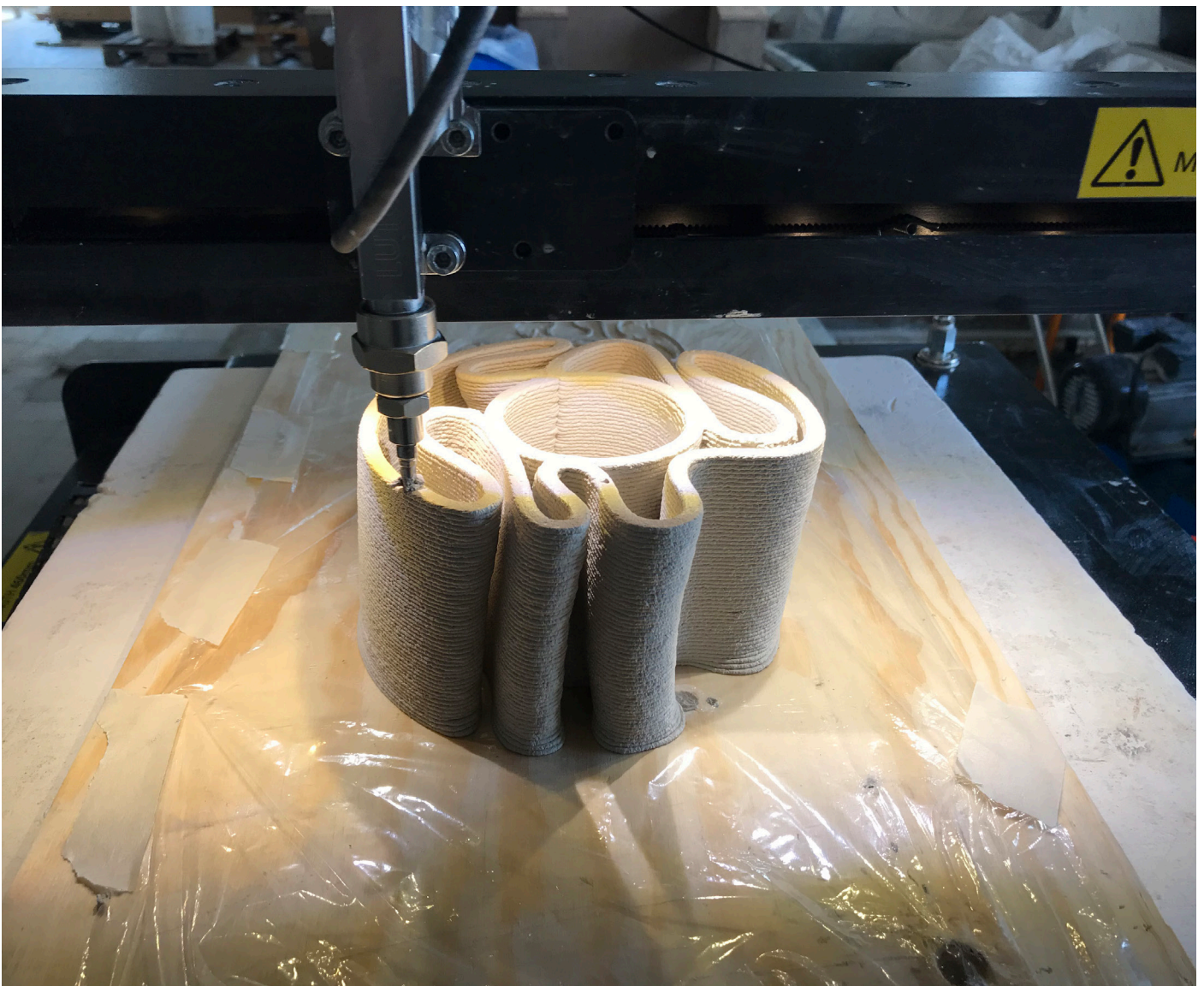


How to use the Lutum Clay Printer at A-huset, LTH





The printer is capable of printing many different clay types and other mixtures. If you are a beginner, please buy a clay type similar to the one above. You can find it in Ljungbergs Artist, Lund.

Please refrain from using clay with chamotte or mixtures with other very hard fibers, since it can damage the extruder of the printer.



Mix your clay (an amount which corresponds to your needs) with water until it reaches a consistency slightly firmer than a pizza dough. Mix it in a clean bowl or container.

If you mix your clay is too dry, the printer will have a hard time extruding it. If your clay is too wet, your print will not be stable and it will shrink a lot after the printing process.

As Jonathan Keep says, it should not be too dry, not too wet. It's a learning by doing process.

Rather too wet than too dry the first time you print.



Fill up your tube (clean tube to begin with) by creating fist-size clay balls which you push into the container.

Avoid air bubbles by pushing every ball only 60-80% into the tube, then adding the next ball on top with some smack-force to press air out.

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See next page for an example of undesired air bubble.

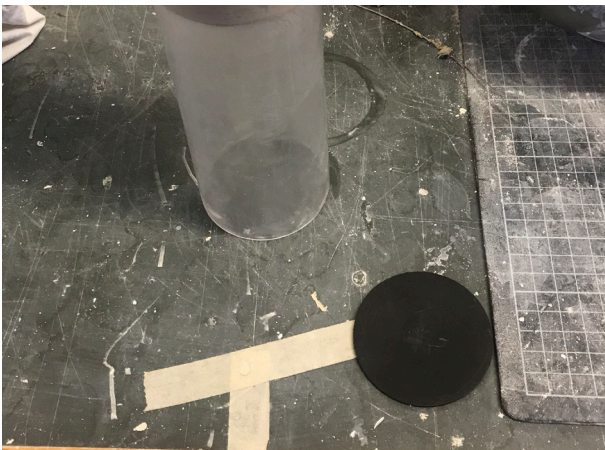


Air bubbles.

These can “explode” in you print and ruin the geometry underneath.

If you created these by accident, I would advise you to empty your tube and refill it.

4



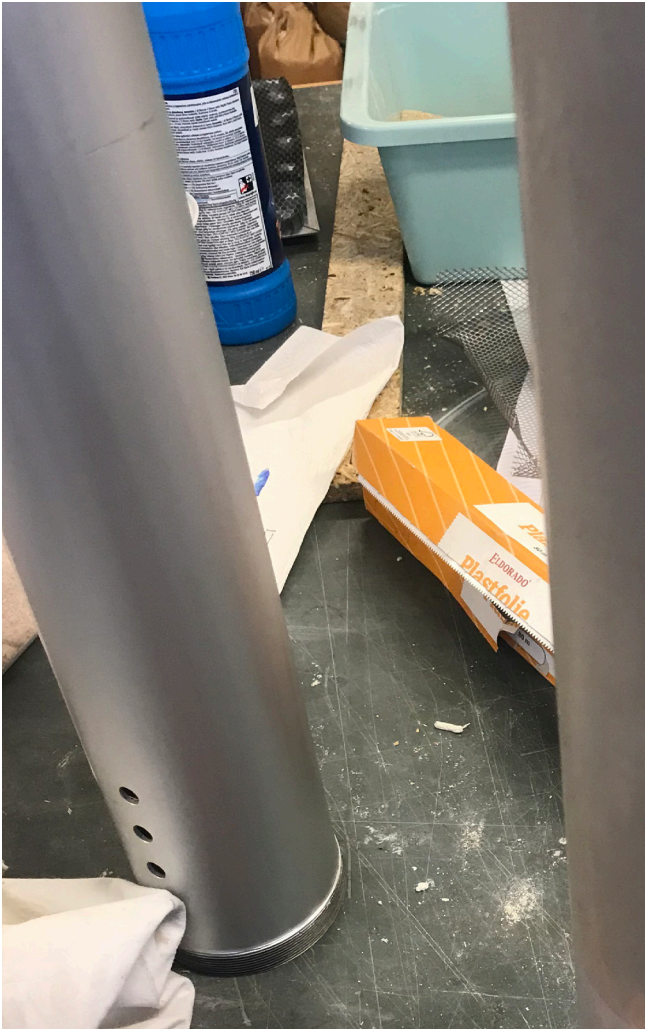
5

Add the backing surface into the tube. This surface helps the air push the clay into the extruder. When you add your tube into the container, this surface should face the air pressure.



Parts of the container before and after assembly.

The black rings should be clean and vaselined before you add them to the top and the bottom of the container.



The container is a large aluminum cylinder with a row of holes in at both ends.

You need to screw on the bottom of the container firmly.

7



Lower the tube of clay into the container and use a tool to push the clay forwards, into the bottom of the container.

You do this in order to wait a little less when you start your first print.

It should look like the bottom left image when you are done.

8



Lower the tube of clay into the container and use a tool to push the clay forwards, into the bottom of the container.

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9



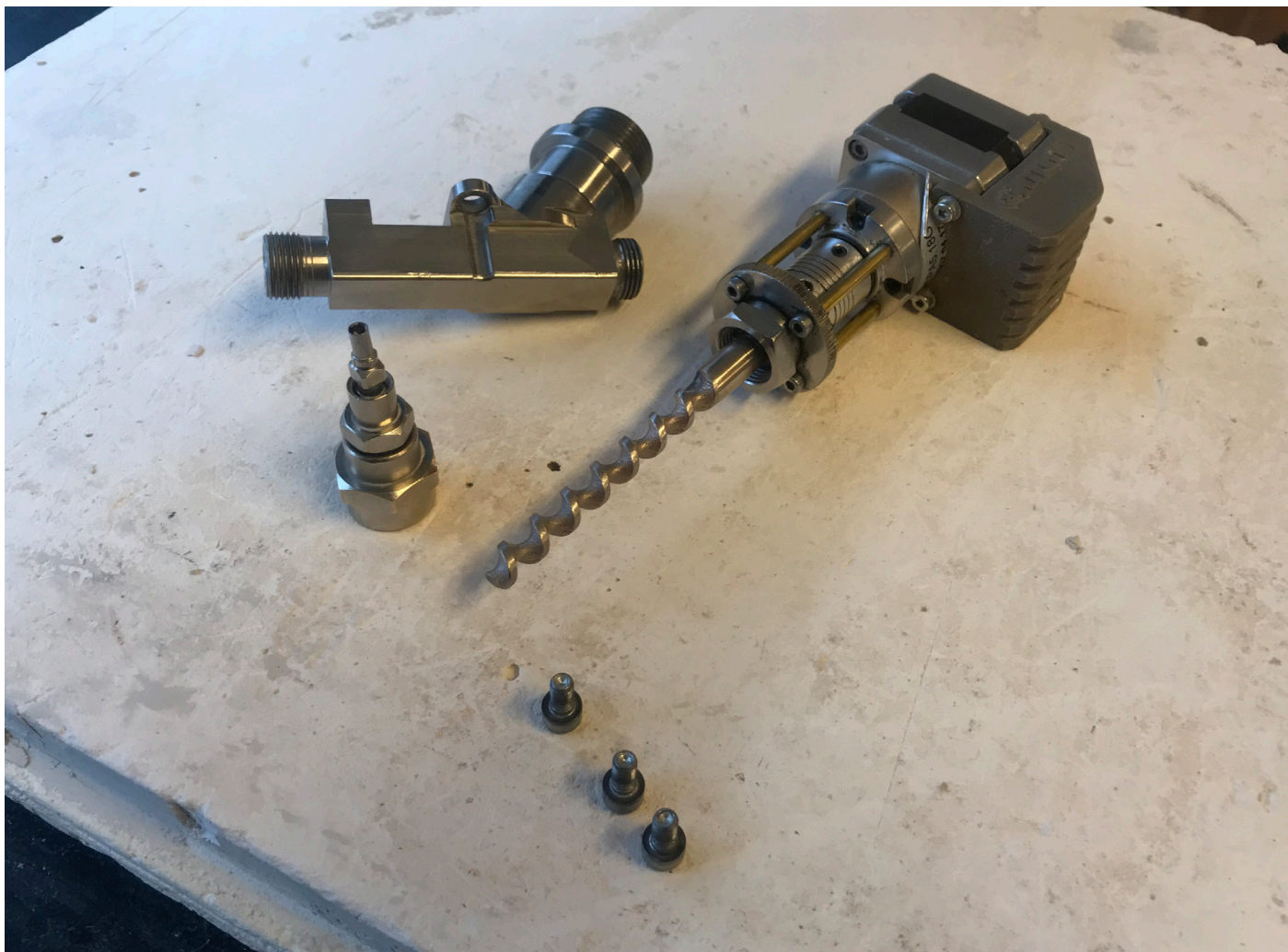
Now screw the top on the container on.

This is a tricky one.

Make sure it's on straight, it can go skew pretty easily. It needs to be quite firm, you might need to use a tool or ask a strong friend if you are not very strong. I am not, always need a tool or help.

If it's not on tight enough, the air will slip out of the tube when you print and the air pressure will be too low.

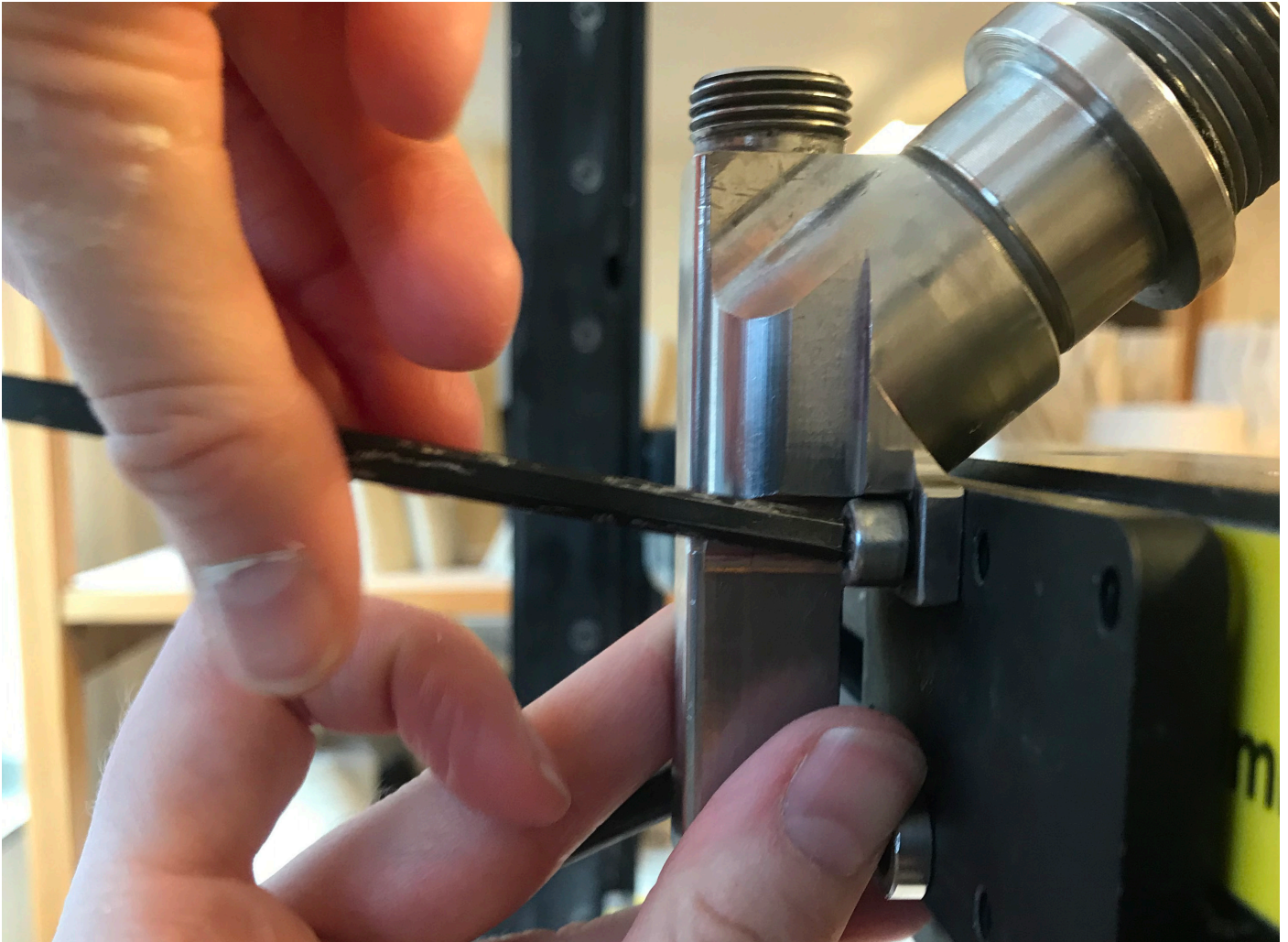
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Assembly of the extruder.

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These are the parts of the extruder before assembly.



Start by screwing on the connector for the container and the extruder. Use all available 3 screws.

12

It should look like the image on bottom left.



Screw on your desired nozzle.

This a 3-part one which is easy to use, we have a few different nozzle widths which you can attach to the bottom if it.

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Please, when you assemble the nozzle, make sure that all bits are screwed on tightly.



Time to attach the extruder.

Screw it on until all the way down, but it will still be semi-loose,

Make sure the Ethernet-adaptor faces like illustrated. Use a tool to firmly attach the nut. The nut needs to secure the extruder from spinning, but do not tighten too much, since it can break the construction.



Plug in the Ethernet cable.

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Screw the container onto the assembly, not too firm, just all the way to the bottom.



Prepare a print bed. Use an MDF board or such, cloak it with cling film which you attach with tape. Please tense the cling film.

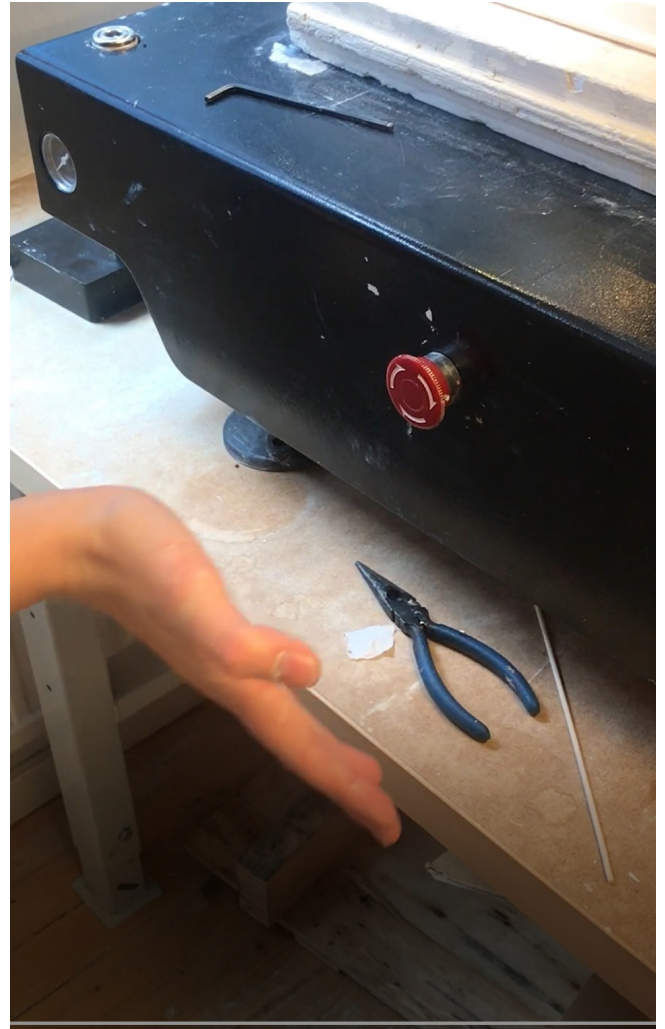
Put on the printer, but higher up than this one shown. About 3-4 cm higher. Ignore the hole in this print bed, that is not a correct procedure.



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Put your G-code into an SD card.

Put the SD card into the Lutum controller.

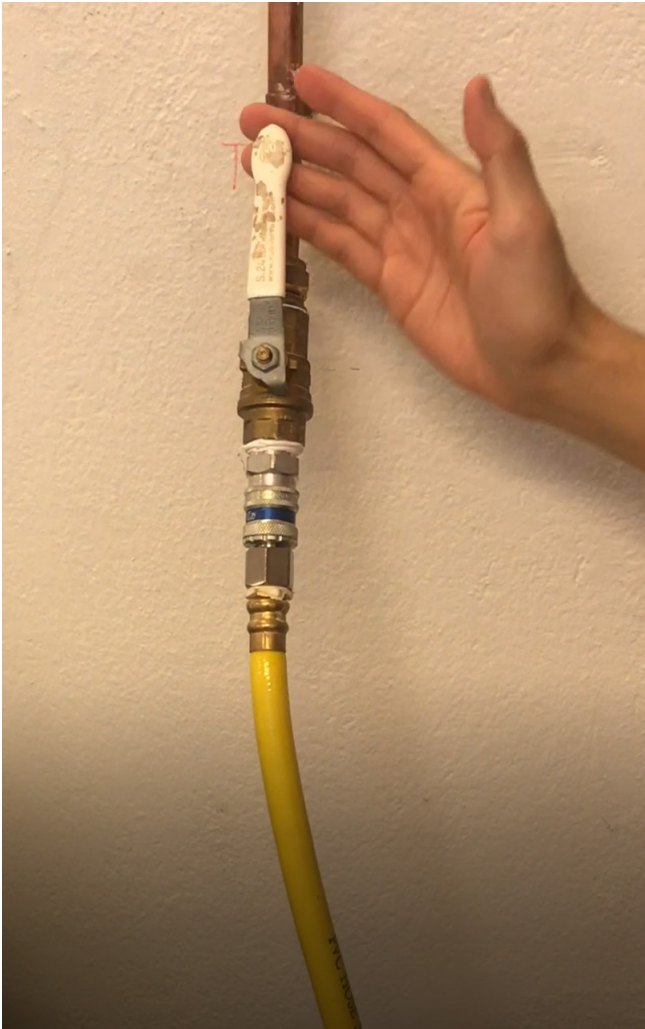


Attach the air pressure tube into the container.

To remove the tube, press down gently on the black ring which surrounds the hole at the top of the container and remove carefully. DO NOT remove this tube by force, it will break the top-lid of the container.

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Turn the printer on with this bottom, press it and turn as the button indicates.



After the printer is on, apply air pressure by turning the vault handle upwards.

Check the vault (follow the air, you will end up at the vault) to check that the pressure is around 3.8-4. This is what you need to be able to print.

If the printer container is leaking, you will feel it when you run your hands by the container holes. A leak will cause the pressure to drop and make it more difficult to print.

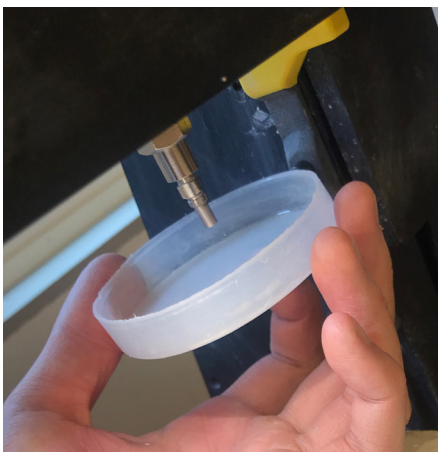
A small leak is ok, as long as the pressure is minimum 3.8.

But if its leaking even more, you either need to clean the top lid of the container or tighten it.



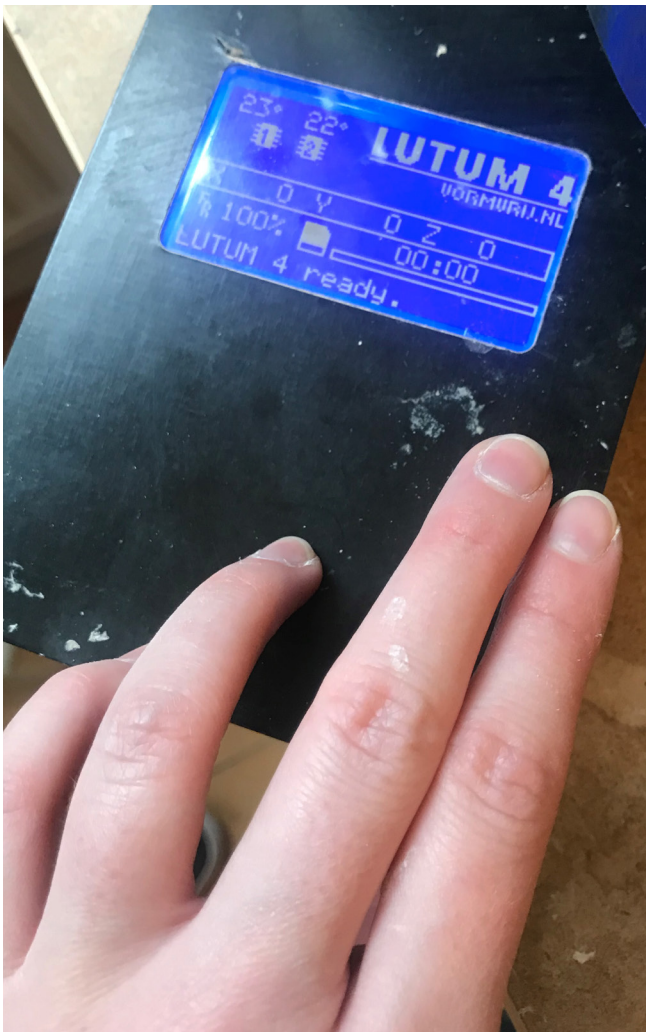
Levelling the print bed. If someone hasn't left the bed perfectly aligned for you, you need to level it.

- 1) Carefully unscrew the end stop trigger (yellow) - do not let it fall down.
- 2) Move the end stop trigger down to desired level, the elongation of the end stop trigger nut should approximately be 1mm under the nozzle end after performing Auto Home on the controller (how do use controller is explained on step 21).



How to use the controller to prime the extruder. Be ready with a container for this step!

- 1) Press down on the button
- 2) Press prime extruder 1
- 3) Wait for clay to extrude. Sometimes you need to prime twice or trice. If nothing comes out after the 3rd time, some of these things might be wrong:
 - Air pressure too low
 - Clay too dry
 - Nozzle not clean and clogged with old dry clay



How to start printing.

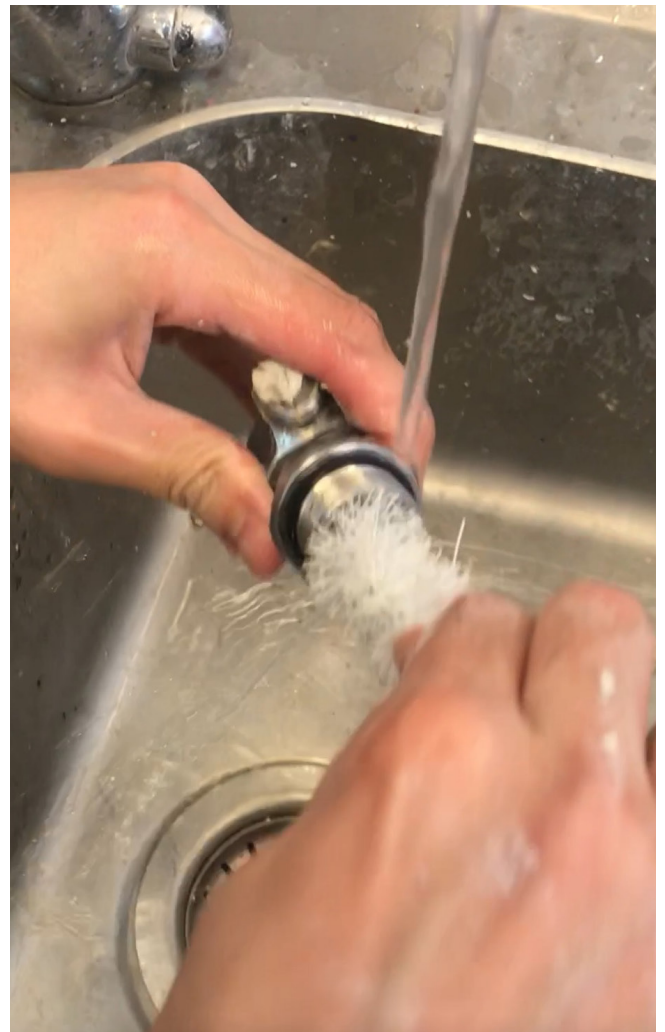
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- 1) Go to "Print from SD" on your control panel.
- 2) Find your file and click on it!



How to start printing.

After you've printed, cut the cling field loose around your print. This will allow the clay to shrink whilst drying without the first layer being stuck to the film and deforming the shrinkage.



Cleaning! This is crucial!!

If you are going to print again in the morning, the only thing you need to do is to turn of the air pressure and make sure that you airtight the nozzle with cling film.

BUT, if someone else is doing this after you, clean.

Gather all of the dirty bits in a container and carry it to the next room, were you clean it in a sink called "CLAY".

Do not run any water along the motor! Clean the screw carefully.

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Dry everything off with a cloth or paper.

GOOD JOB! Now clean the lab a bit :)

Thanks!

