

12 - PDMS Preparation

PDMS is a chemical which when hardened, shall take a form of a rubber transparent surface that covers the VAT glass. This surface will allow the model to detach much easier and fill the void with a new layer of material. With your Ilios HD Kit you shall find enough supply of PDMS to create many new surfaces on your VAT and replace them when needed. Over time or if a model was unsuccessful your PDMS surface may degrade and a new one should be created. Below is an example of how to mix, pour and remove the PDMS layer. The example is demonstrated on the Small VAT but the process is the same for the large one as well with the exception of a larger mixture.

Creating a new layer

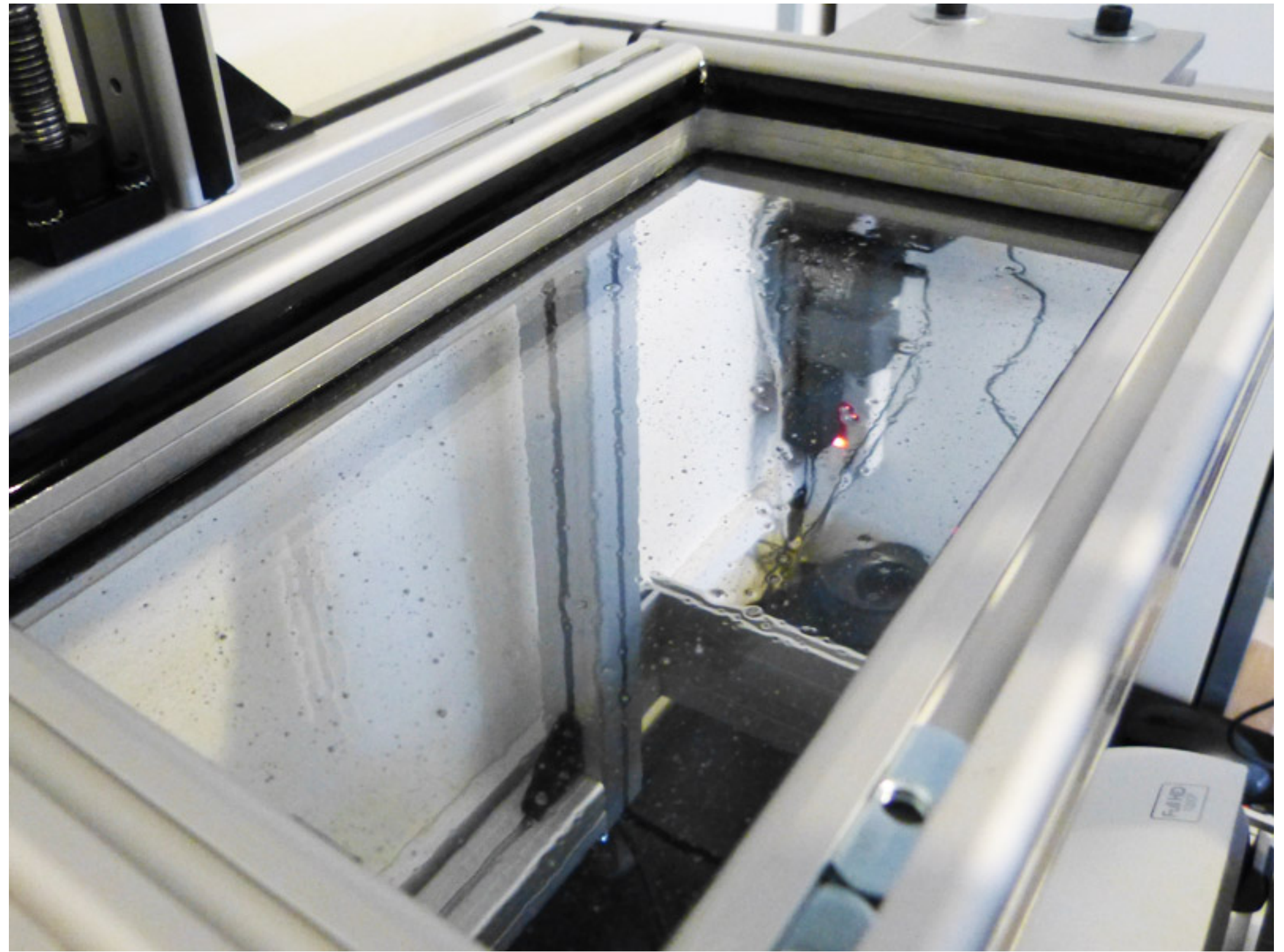
The PDMS resin is consisted of the chemical itself and its hardener. The mixture of the two is 10:1, meaning that for every 10gr of PDMS you need 1gr of hardener.



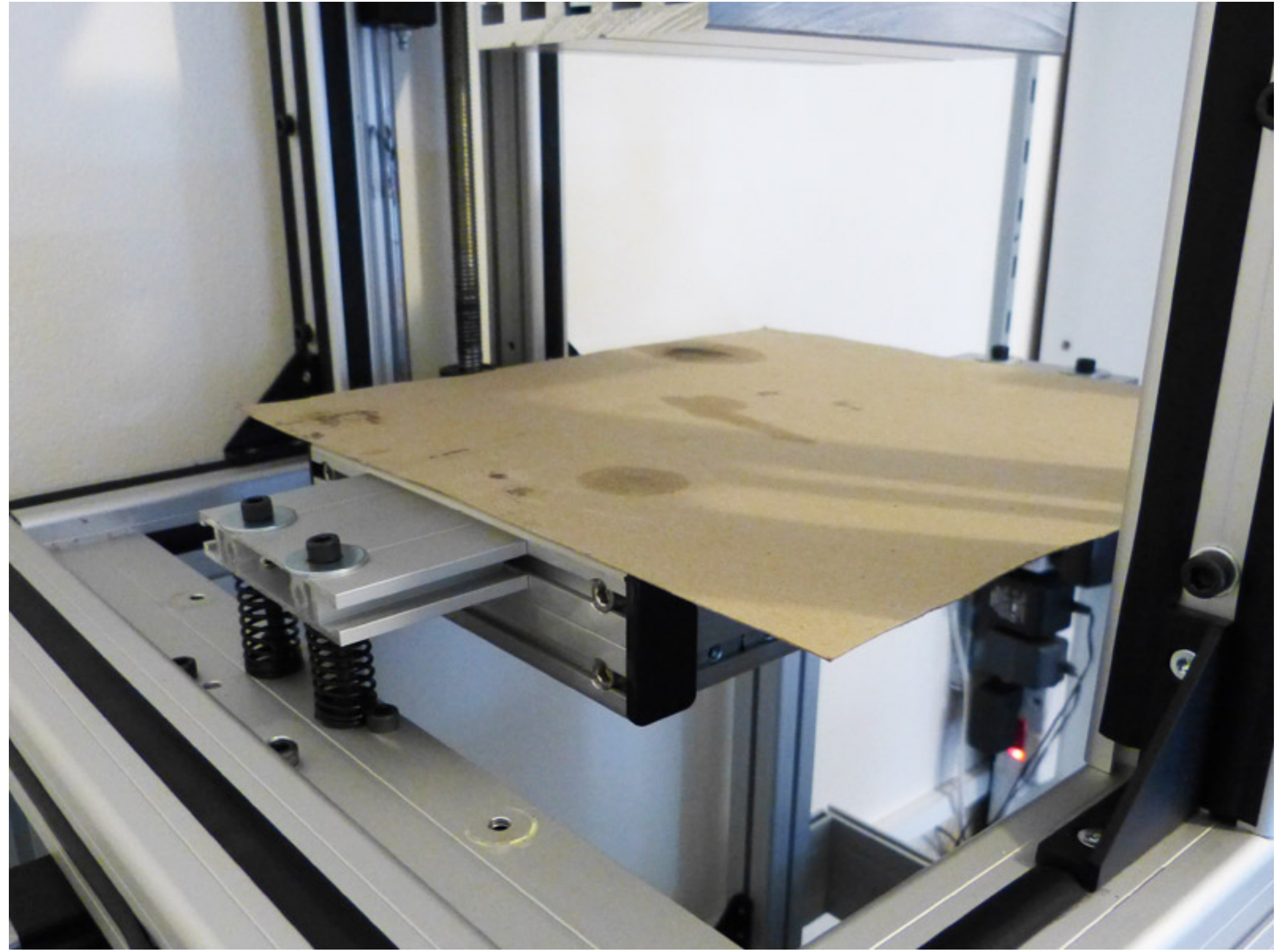
For this demonstration we use 132gr in TOTAL for the Small VAT. This comes to 120gr of PDMS and 12gr of hardener. Mix the two well for not less than 15 minutes before pouring into the VAT. The chemical reaction of the PDMS will take a long time to complete so you have at least 2 - 3 hours before it starts to settle. Do not worry about the air bubbles as they shall come out on their own later.



After stirring well the mixture, pour it on to the CLEAN surface of the VAT glass. Don't forget to clean it well with alcohol and try to avoid as much dust as you can. Start pouring from the middle and make your way to the edges. Do not worry about not covering the entire surface, it shall even out on its own after 30 minutes.



Do not worry about the air bubbles. Most of them shall come out on their own in 30 - 40 minutes. Cover the VAT with a piece of cardboard or something else to prevent dust from gathering on the surface and leave for about 1 hour.



Don't be impatient. Let it do its job for at least 1 - 1 and a half hours before you check it again. Try to avoid raising the cover too many times so that no foreign particles come to contact with the fresh layer of PDMS.

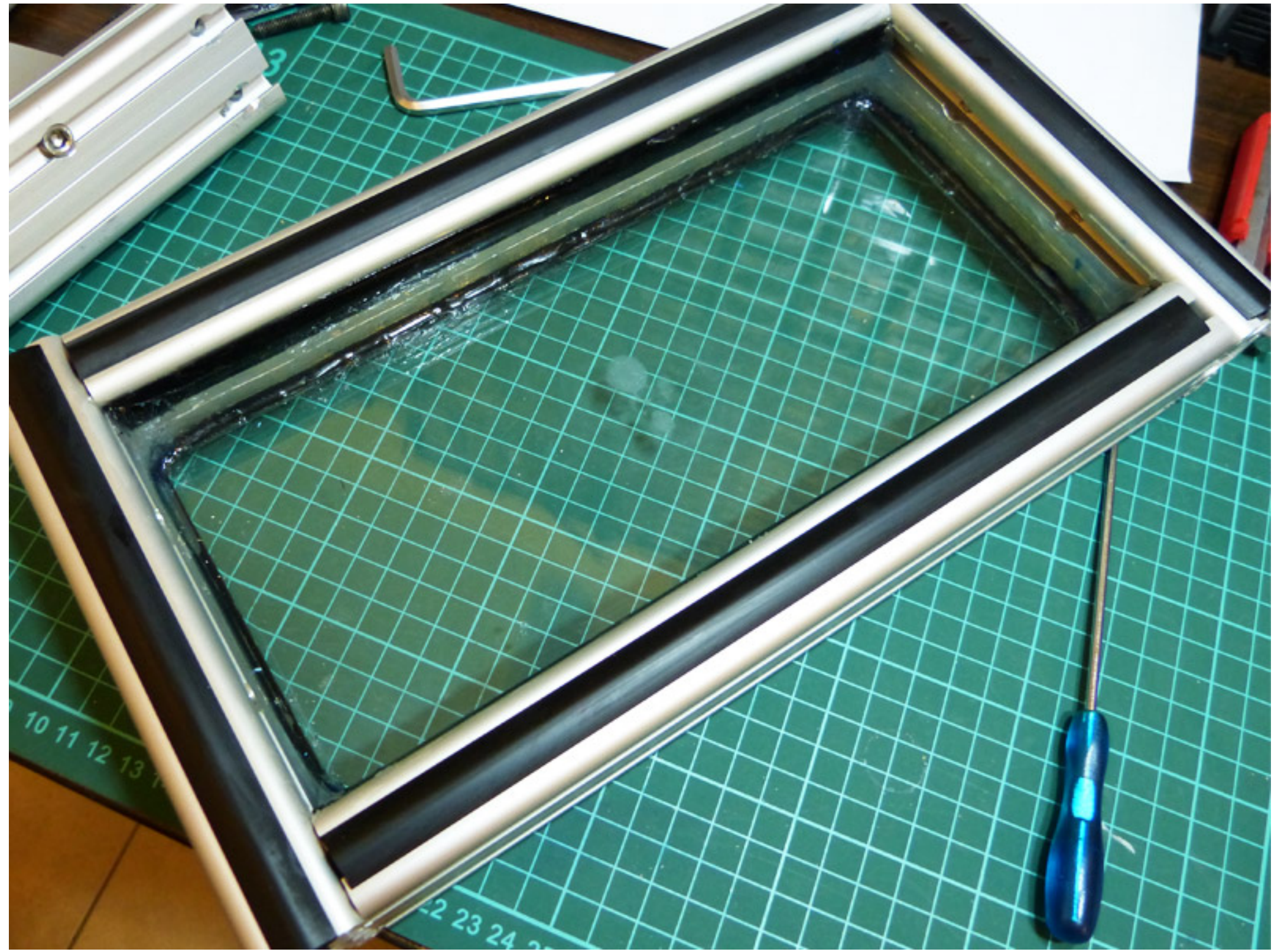


After 1 or 1 and a half hours check the surface. It should be almost clear of any air bubbles. If some remain (there won't be many) puncture them with something sharp gently and close the VAT back to let it fully cure.

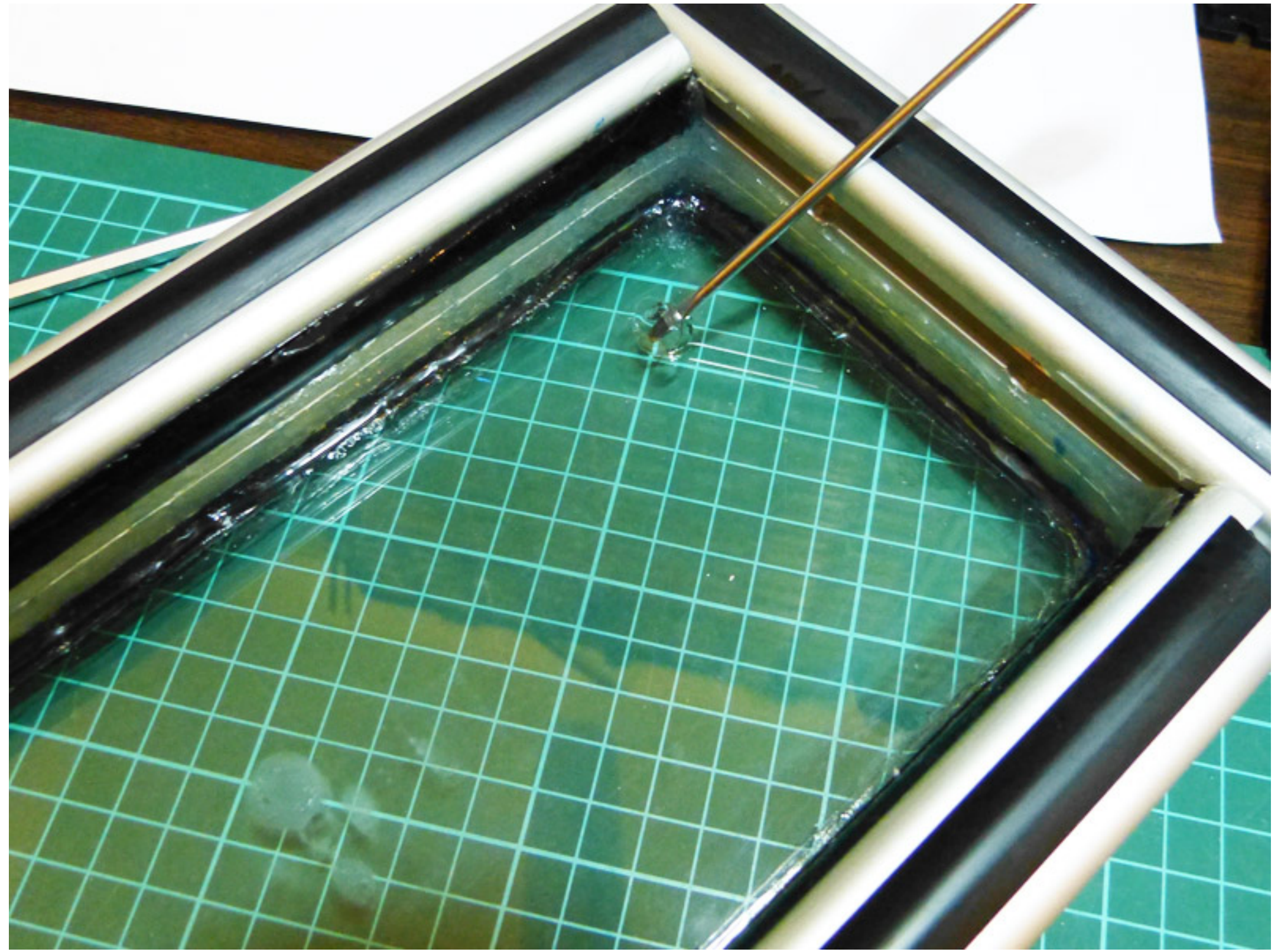
PDMS will cure in not less than 72 hours (3 days) so don't keep checking it every day to see if it is done. When cured, it shall have a rubbery feel to it. Try not to touch it with your hands but with a micro-fiber cloth and always clean with Acetone or Alcohol. (Acetone works best for me and it is easy to find) All resins in the shop shall dissolve in Acetone so it is perfect for cleaning all your equipment with it.

Removing an old layer of PDMS

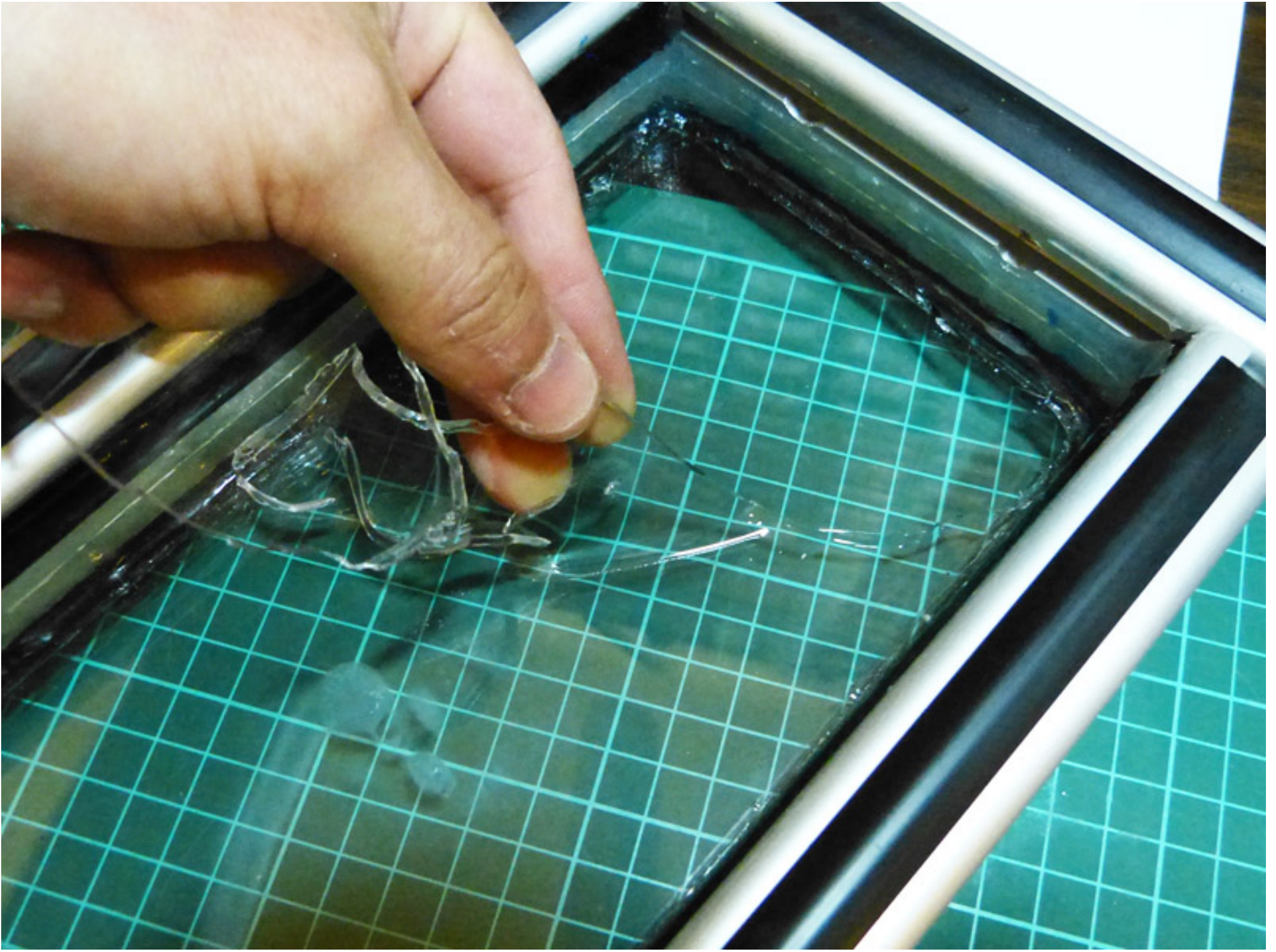
Over time, your layer of PDMS may get damaged from too much contact on the same spot, some material left over and cured will also cause the material to stick to PDMS and damage it. However, removal is quite simple and shouldn't take too much time.



Lay down your VAT on the table and find something sharp to pry the initial surface. Something like a thin screwdriver or a knife will do although you should be careful not to scratch the glass.



Start from a corner and puncture the PDMS layer. In reality the PDMS never adheres to the glass but just is stuck to it from vacuum so it is very simple to remove it. Also the resin used to seal the VAT does not stick to PDMS so it shall not be damaged when you peel away the layer.



Continue peeling off the layer until none is left. Dispose of it and clean the glass surface well with a Micro-Fiber cloth and Acetone or Alcohol. If you pause before applying a new layer of PDMS, make sure to cover the glass so that no dust settles on top of it.

Congratulations ! :) You now know how to make a new PDMS layer and how to remove it. Never use too much of it since the thinner the layer is the better. Also remember that once the PDMS cures, your VAT surface shall be perfectly flat and level, so try not to disturb it again or reposition the VAT after it is fixed on the machine and PDMS is fully cured.