

3d Printing Part 2

Printer Selection and the Process



Presented by Ken Mosny, Rock River Valley Division NMRA
FVD Meet, October 15, 2023

Today, we will introduce

- Printer hardware choices
- DYI post curing hardware
- Part rinsing supplies and usage
- Dedicated workspace preparation
- Slicing software usage

Some entry level printers

Elegoo Mars
2 Pro



Voxelab
Proxima



Anycubic
Photon



Which one should I buy?

- Lets look at some of the basic specifications.



The Printers

Elegoo Mars 2 Pro



- Build volume: 129x80x160mm
- XY Resolution: 50μ
- Screen: 6.08" 2k Mono LCD
- Z layer thickness: 0.025-0.1mm
- 405 nm light source

The Printers

Voxelab

Polaris



- Build volume: 115x65x155mm
- XY Resolution: 50 μ
- Screen: 5.5" 2k Color LCD
- Z layer thickness: 0.025-0.2mm
- 405 nm light source

The Printers

Anycubic Photon



- Build volume: 130x80x165mm
- XY Resolution: 50 μ
- Screen: 6.08" 2k Mono LCD
- Z layer thickness: 0.01-?mm
- 405 nm light source

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- Prices vary depending on the seller, time of the [day, month, year], phase of the moon and sometimes the bundle.
- I shopped the best price, which was not, in my case, Amazon, but direct from the importer.

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- For example the Eleggo Mars 4 9k, has 153.4mm, 8520 (rounded to 9000) pixels on the long axis of the screen.
- $153.4\text{mm}/8520\text{pixels}=0.018\text{mm/pixel}$ or 18μ (0.018mm) resolution. $18\mu=0.0007''$

UV post curing can



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- You can buy wash and cure stations. They can cost as much as the printer.

Building a UV curing can

- Buy a 5m long (16'), 395nm UV self adhesive light strip with an AC power supply, about \$15.



Building a UV curing can

- Find a clean 1 gallon paint can. You can buy empty paint cans at Home Depot if needed.



Building a UV curing can

- Buy a solar powered display turntable, about \$8.



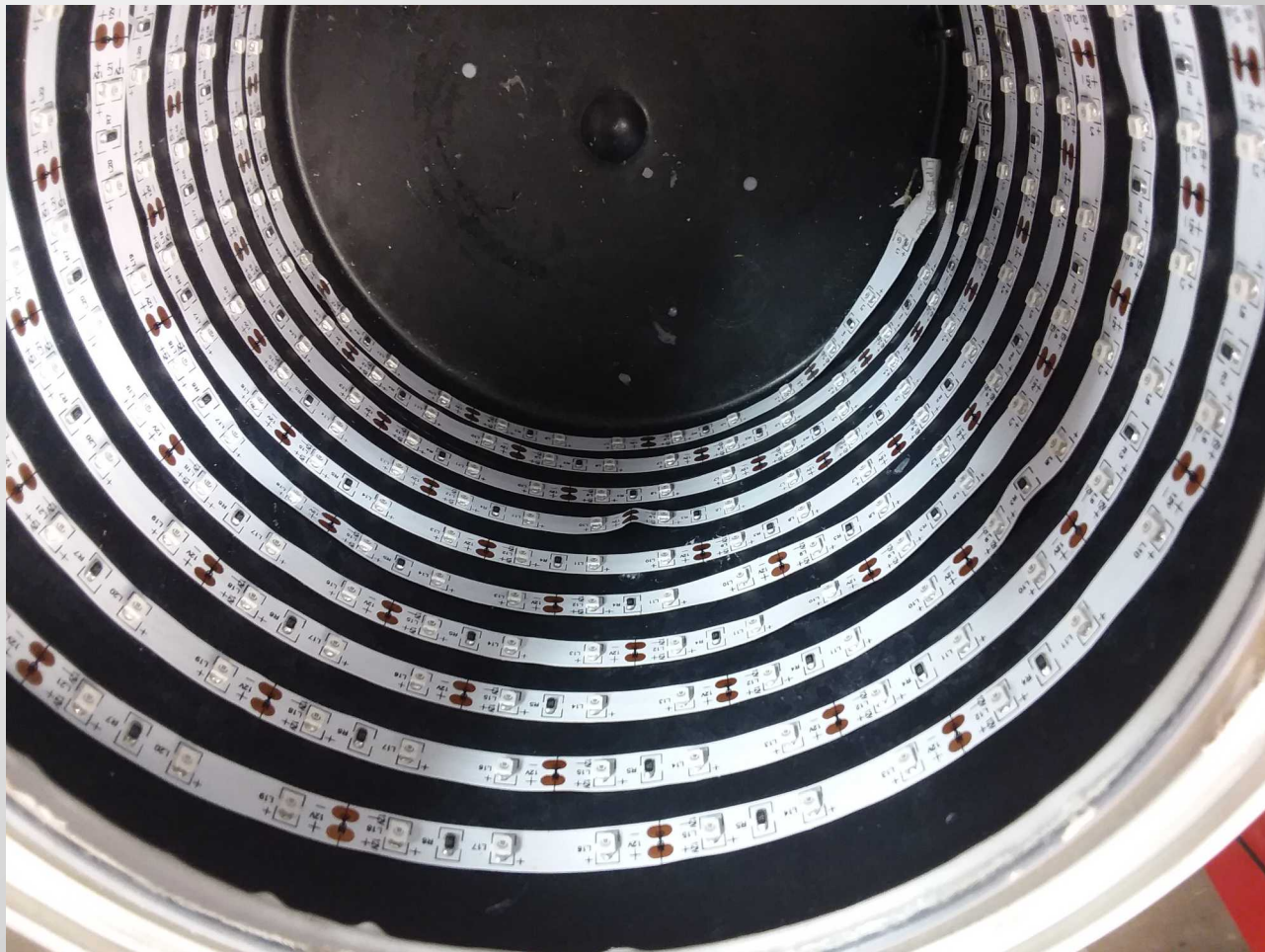
Building a UV curing can

- Find some wire ties. Surely you have some of these around.



Building a UV curing can

- Wrap and stick the UV light strip inside the can. The spacing is about an inch.



Building a UV curing can

- Drill some holes though the bottom side of the can to secure the wires with ties, and pass the wire socket through.



Building a UV curing can

- Place the solar powered turntable in the bottom of the can and the parts to be cured on it.
- The light is intense enough to operate the turntable which helps to cure the parts evenly.



Finished UV curing can

- Ready to use.



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- Nitrile gloves are a must because the uncured resin and solvents are nasty stuff.

Part rinsing

- I keep the solvent in mason jars marked 1, 2, 3 with 1 the first rinse, 2 the second, 3 the third.



Part rinsing

- I use mason jars because they are easier to open when the sticky resin glues the top on.



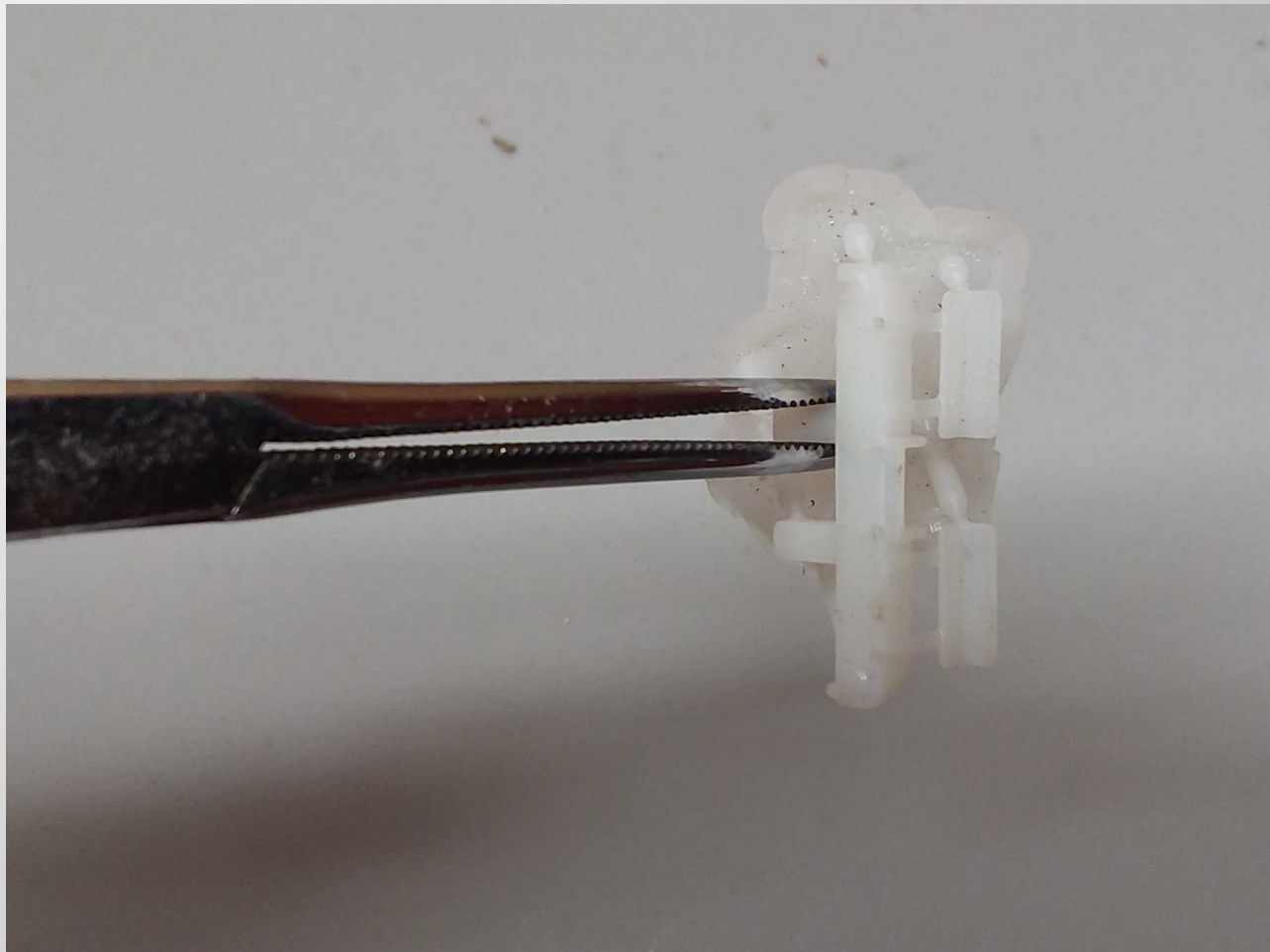
Part rinsing

- A screen basket is handy to hold multiple parts. I made this one by soldering window screen.



Part rinsing

- Be careful holding parts with tweezers or forceps. Uncured parts are soft and damage easily.



Part rinsing

- Swish rinse 1, 2, 3 and air dry.



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- **This includes water solvent if you use it. Don't just rinse it down the drain.**
- By curing and filtering the solvent, it can be reused many times.

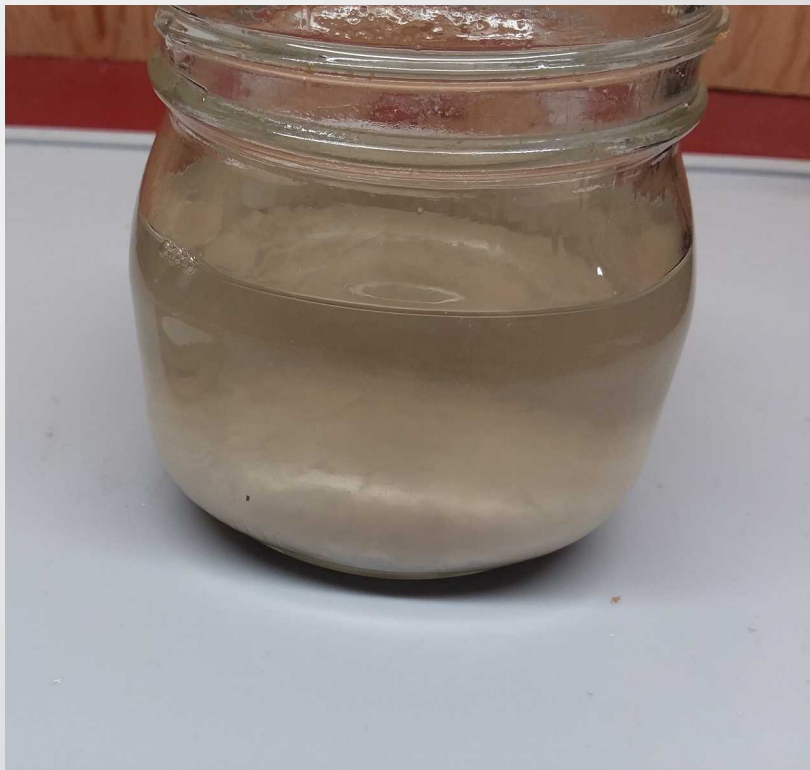
Solvent reusing

- The dissolved resin in the solvent is cured by putting put the jar in your light can or the sun.



Solvent reusing

- The cured resin will cause the solvent to look cloudy. If there is a lot of resin in the solvent, it can even make a jellied mass.



Solvent reusing

- Pour the cured solvent through a paper towel folded in a funnel. Allow the towel and residue to dry. Discard it in the trash.



Solvent disposal

- Allow the solvent to evaporate in a shallow pan outdoors in the sunlight.
- Solvent can be cured, filtered and reused many times. I have yet to dispose of used solvent.



Trash disposal

- Any paper towels, gloves or other trash with resin on it needs to be cured.
- Cure the resin on the items in a curing light or sunlight and throw out in the trash.



The printing workstation

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- It must be out of the sunlight.
- You should have a slop sink nearby.



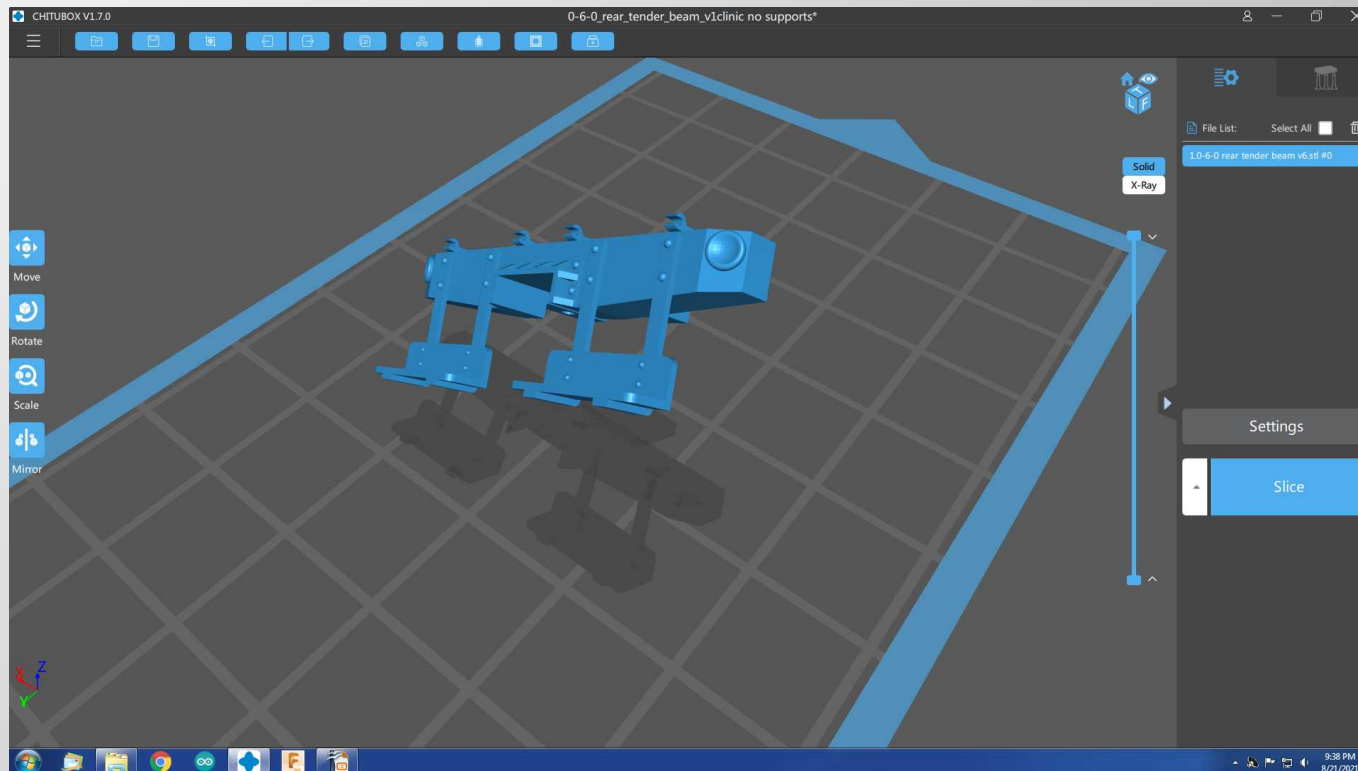
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- You need a jug of hand cleaner.



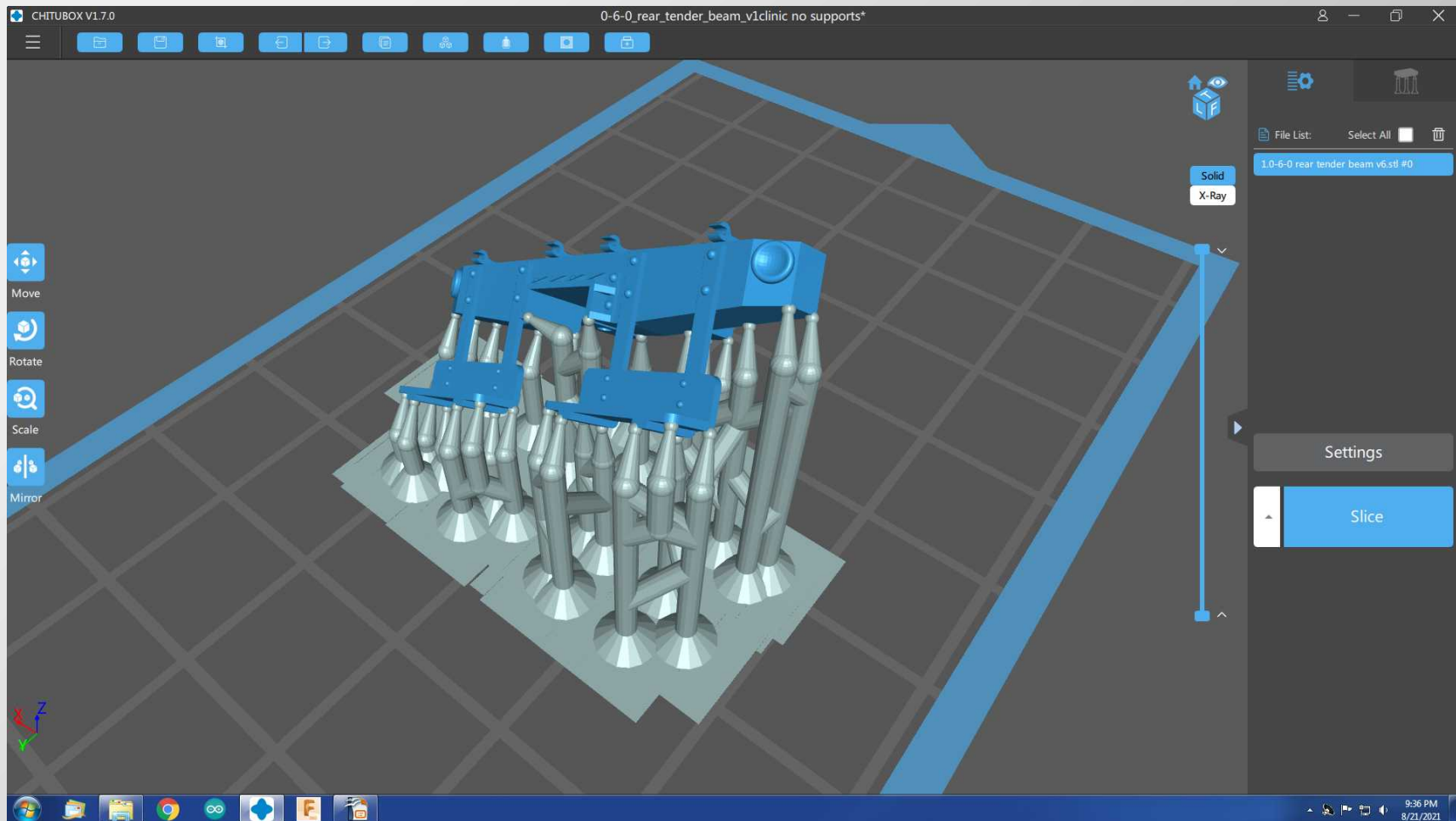
Slicing--Chitubox

- Once the model is complete, you will import it into a slicing program like Chitubox. As the model is imported, a percent scale is assigned. For example, S scale is 1/64 or 1.56%



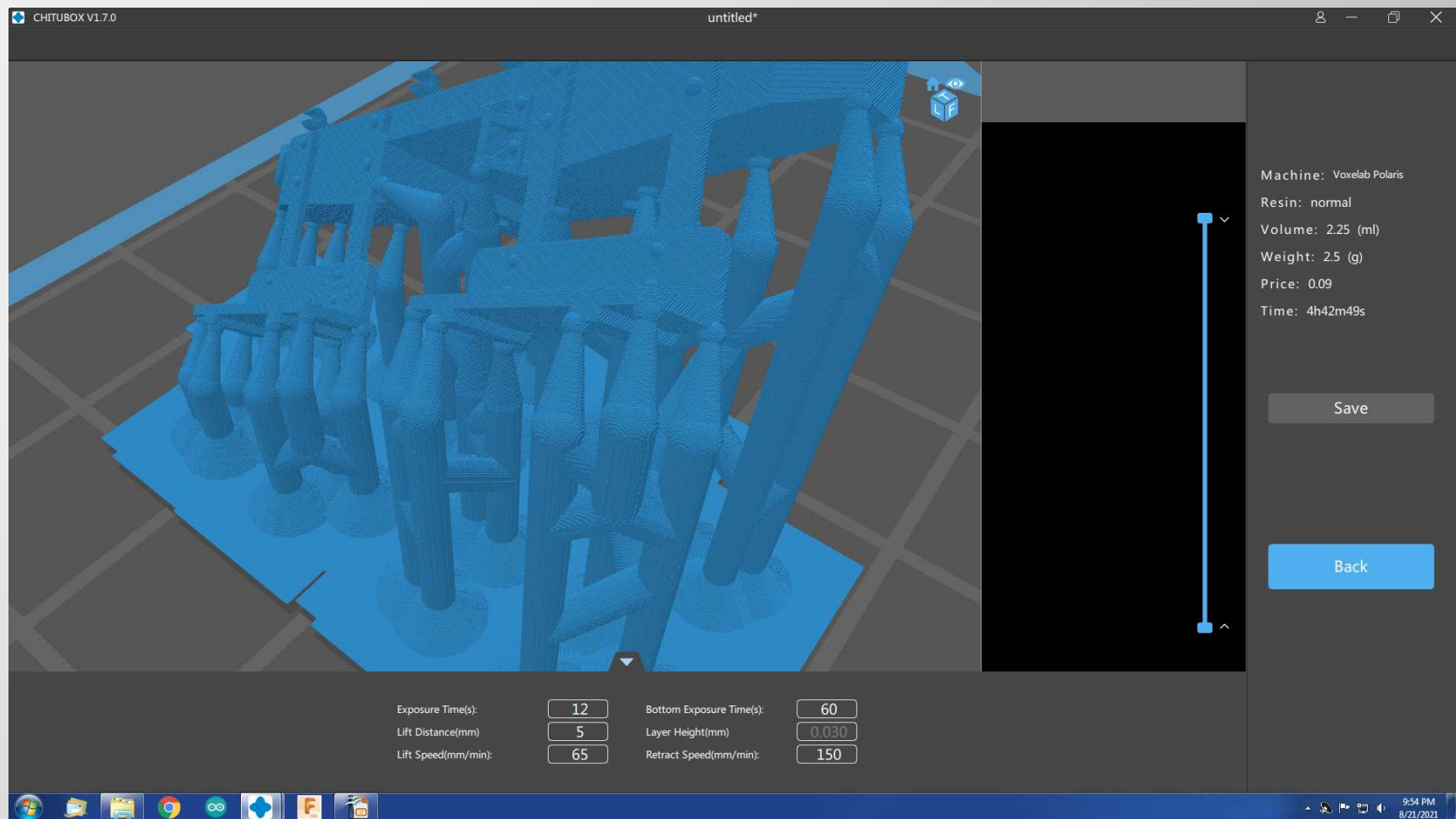
Slicing--Chitubox

- Then a raft and supports are added.



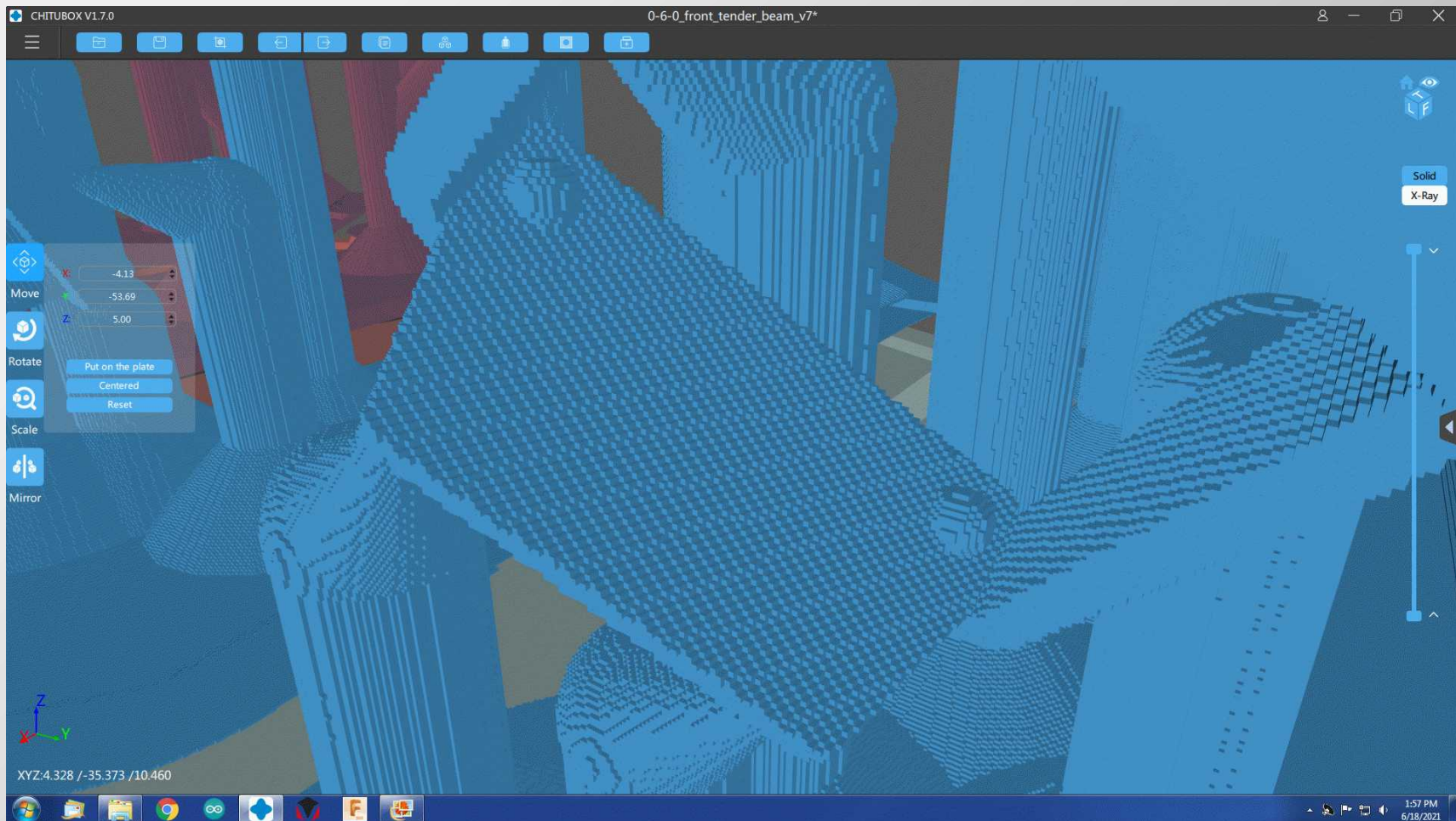
Slicing--Chitubox

- And the model is sliced



Slicing--Chitubox

- Close up of sliced model



Chitubox Demonstration

Postlude summary

3d printing steps

- Obtain a solid model.

Postlude summary

3d printing steps

- Obtain a solid model.
- Prepare the model for printing by adding supports and slicing.

Postlude summary

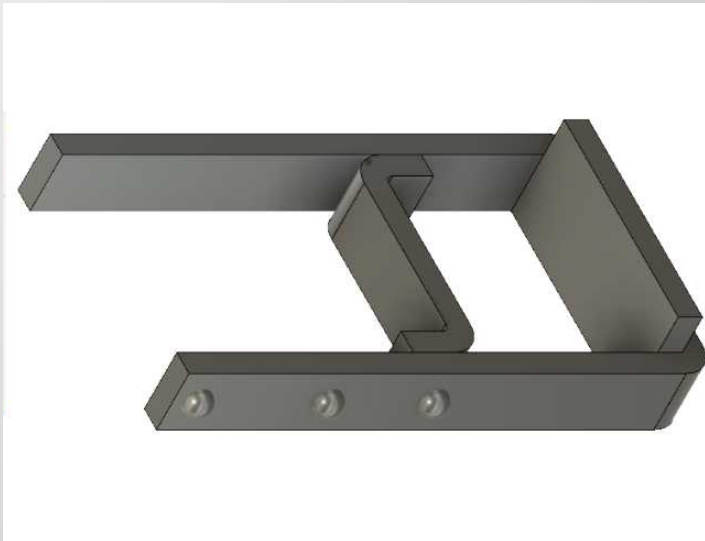
3d printing steps

- Obtain a solid model.
- Prepare the model for printing by adding supports and slicing.
- Print the model.

Postlude summary

3d printing steps

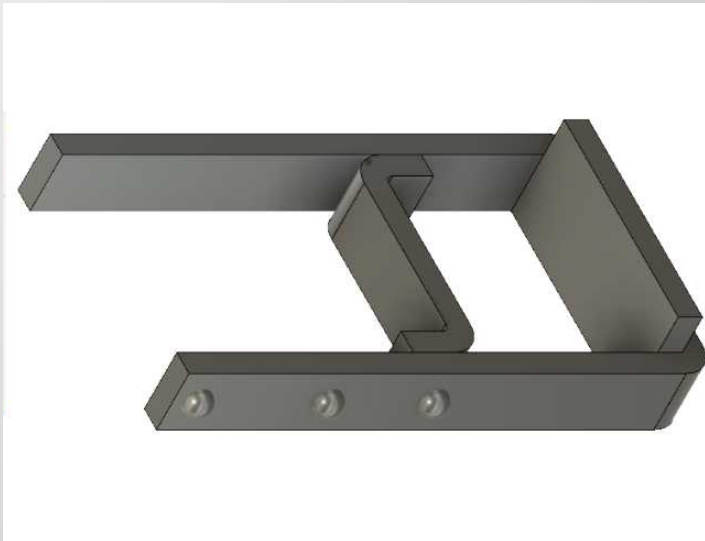
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 - You can learn to use solid modeling software and create them yourself.



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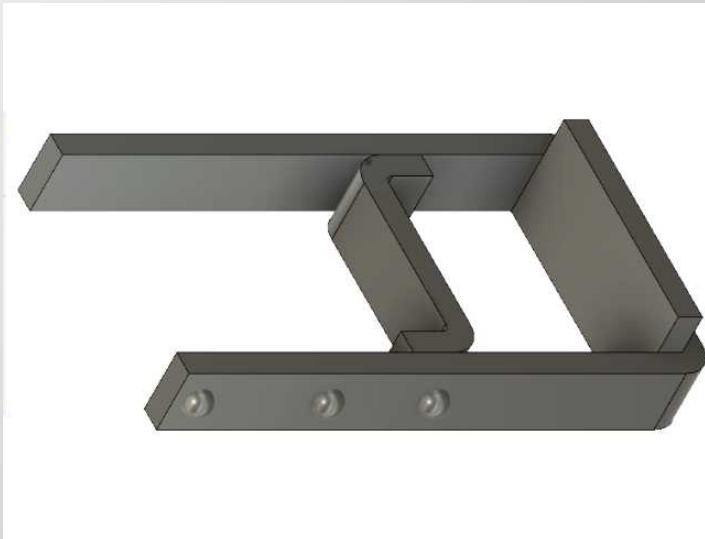
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 - You can download a solid model from the internet.



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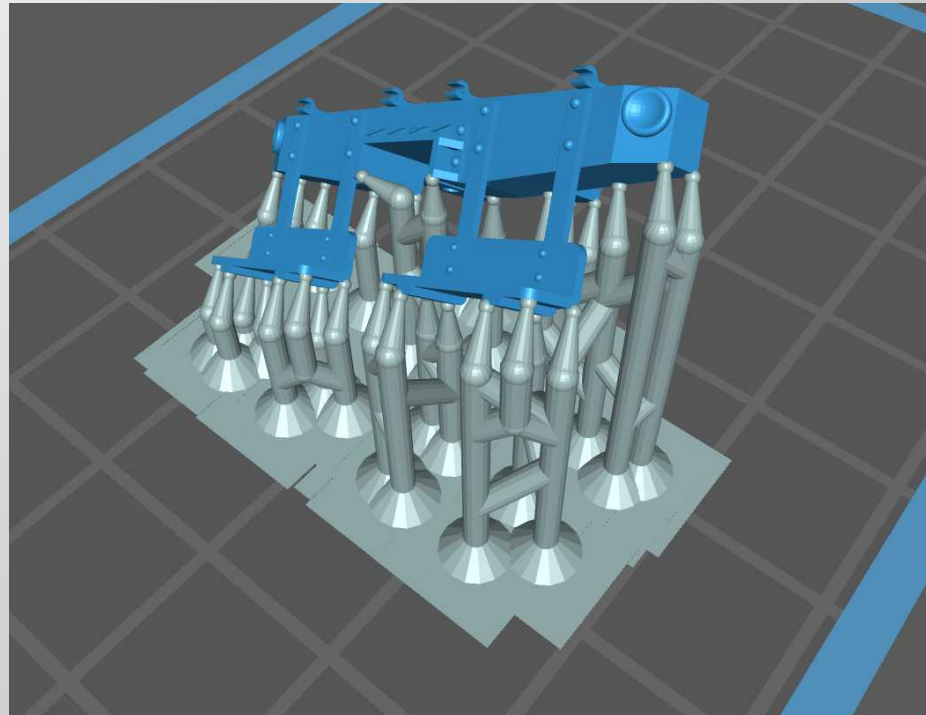
- Obtain a solid model.
 - You can learn to use solid modeling software and create them yourself.
 - You can download a solid model from the internet
 - You can talk a friend into making the custom solid model you want.



Postlude summary

3d printing steps

- Prepare the model for printing
 - Learn to use a slicing program. These are fairly easy to learn.
 - A print service will do this for you.



Postlude summary

3d printing steps

- Print the model.
 - Invest in a 3d printer and learn to use it.



Postlude summary

3d printing steps

- Print the model.
 - Invest in a 3d printer and learn to use it.
 - Use a print service like Shapeways.





The End

