

Laser cutting ESR

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Materials

Genmitsu CFL55P Compressed Spot
Fixed Focus Laser Module

-5.5W diode laser.

-Wavelength 445nm

Genmitsu 3018-PROVer V2 CNC Router
Machine

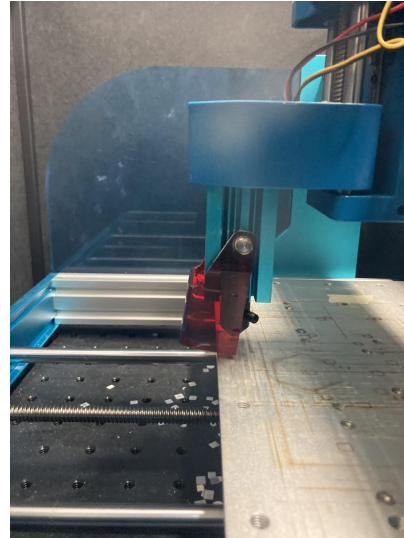
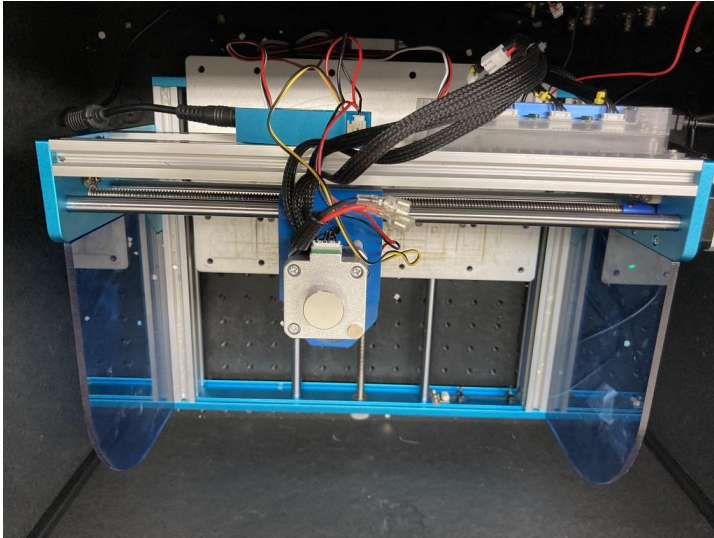
LaserGRBL Software

Fusion360 CAD Software



Set Up

Laser component attached to CNC Machine, and placed in a dark box for safety.



Safety

To prevent injury to eyes due to powerful laser:

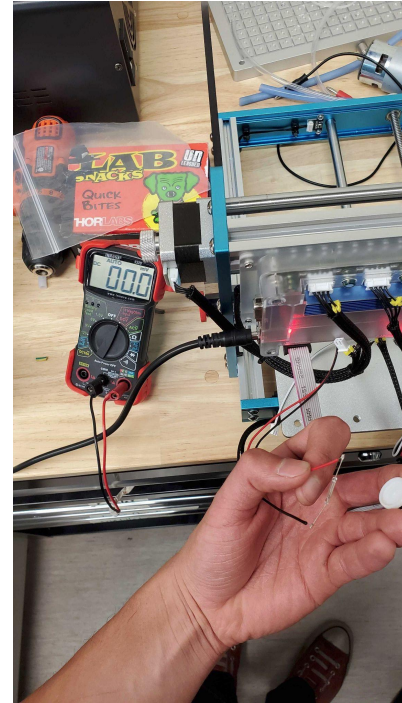
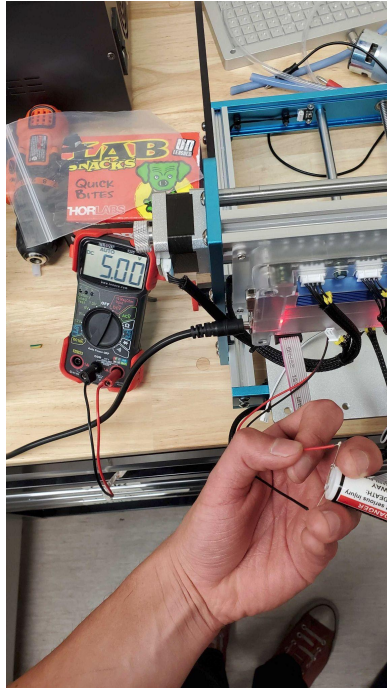
Laser will only operate if the dark box is closed completely. (When switch is pressed down: Safety Interlock System)



Safety

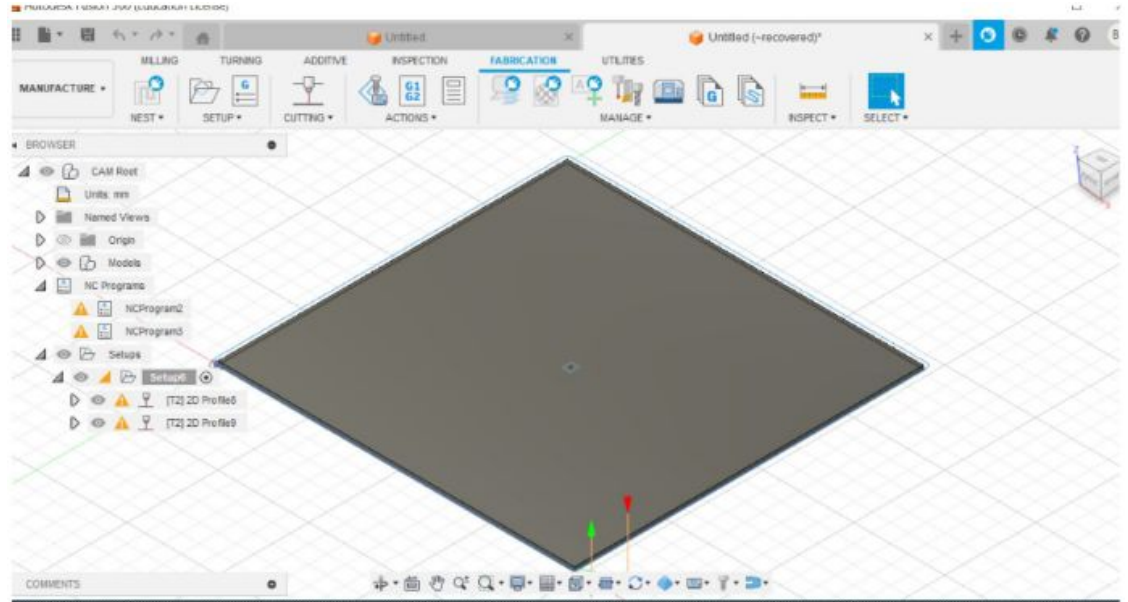
Safety Interlock System.

Works by having the emergency stop terminals on the CNC Board rewired to a switch.



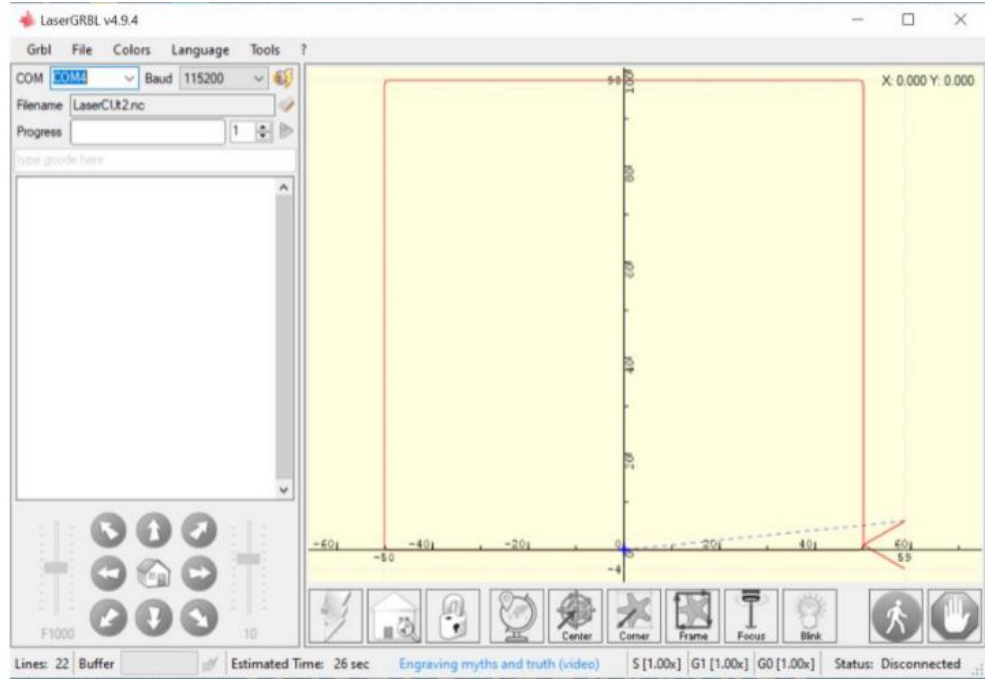
Process

All designs are made in Fusion360 CAD Software.



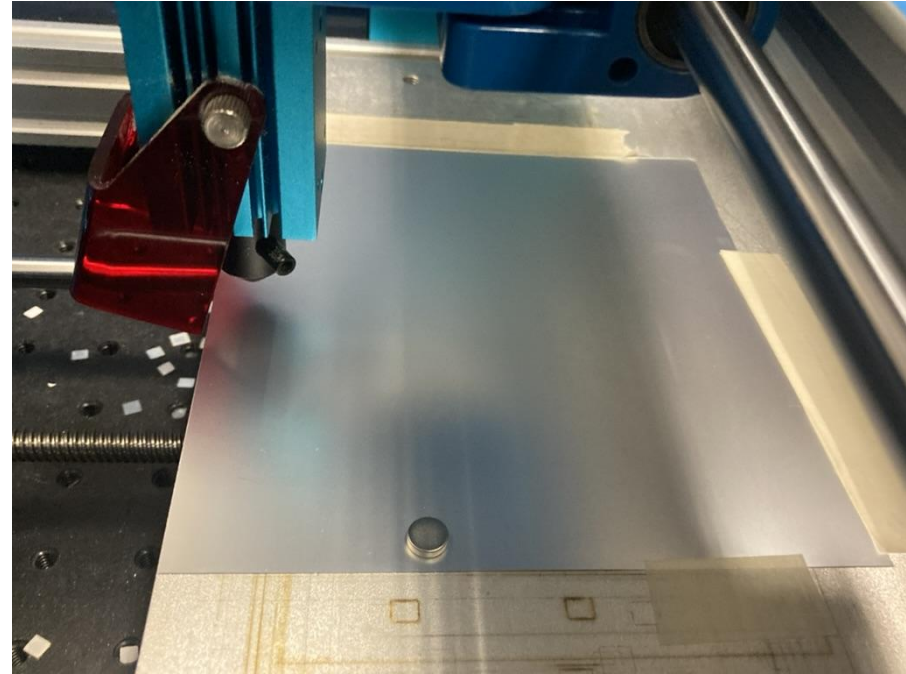
Process

On LaserGRBL, we connect to the Laser and open the design file(.nc format) to cut.



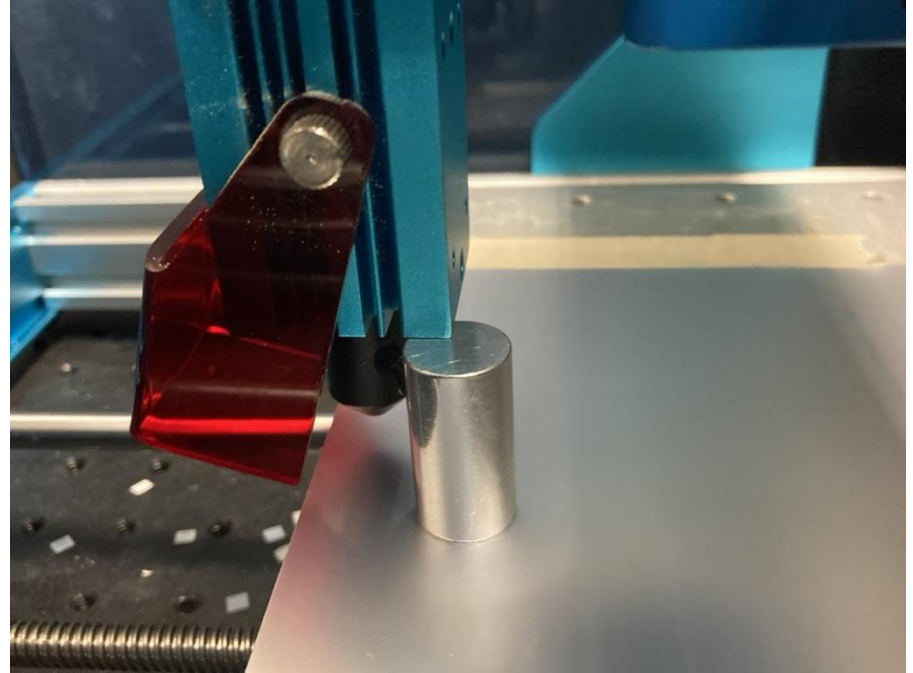
Process

The ESR Foil is held down with tape and/or magnets.



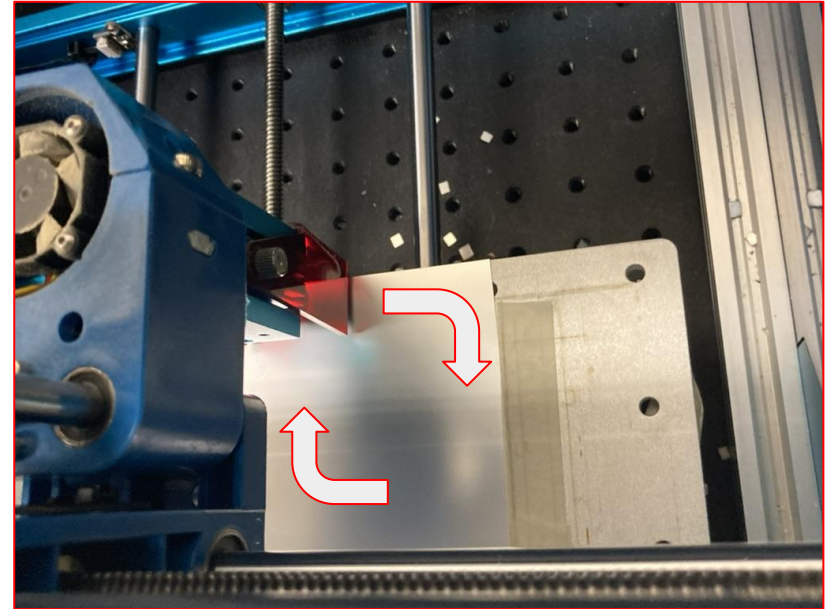
Process

A measurement object is placed to check that the laser is the correct distance for optimal focus/cutting.



Process

Using LaserGRBL. We check to ensure the area the laser will cut is within the proper range.



Process

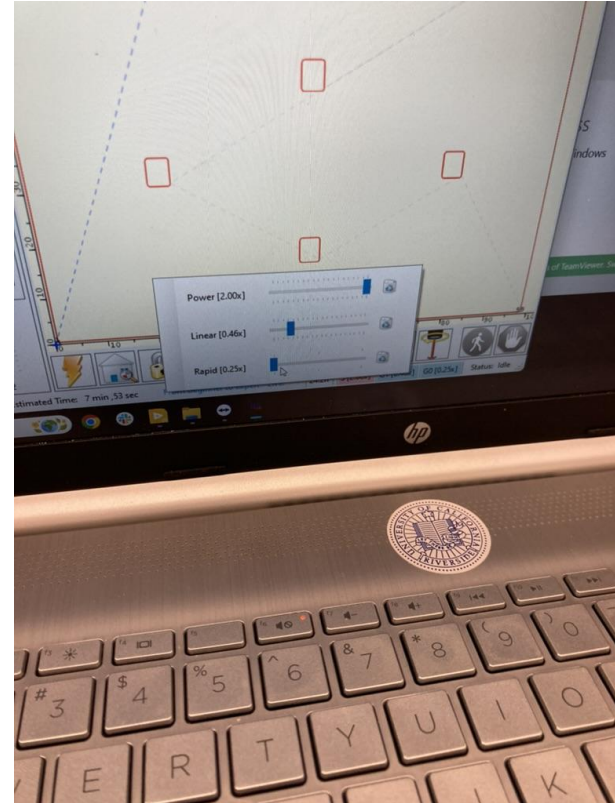
On LaserGRBL

the power is set to 2.00x.

Linear speed is set to 0.46x.

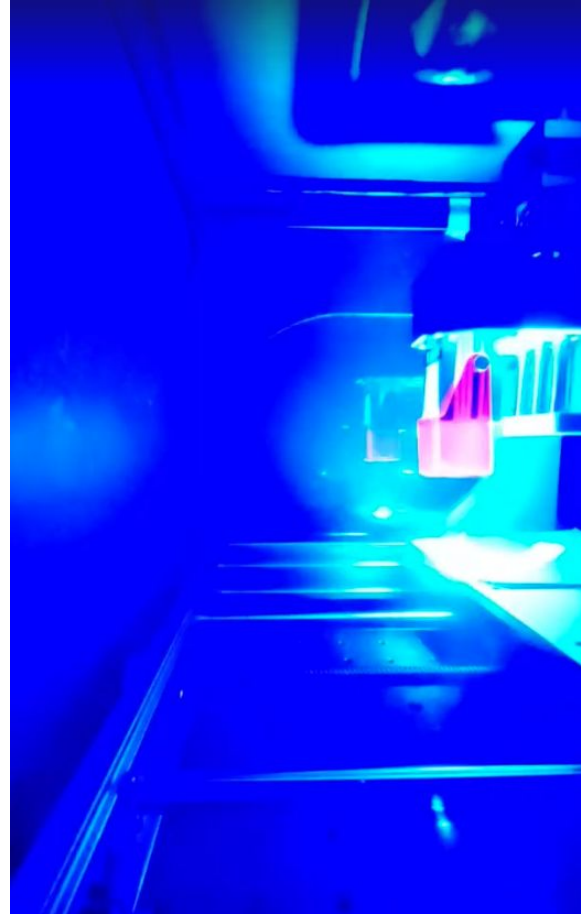
and Rapid is set to 0.25x.

Then START.



Process

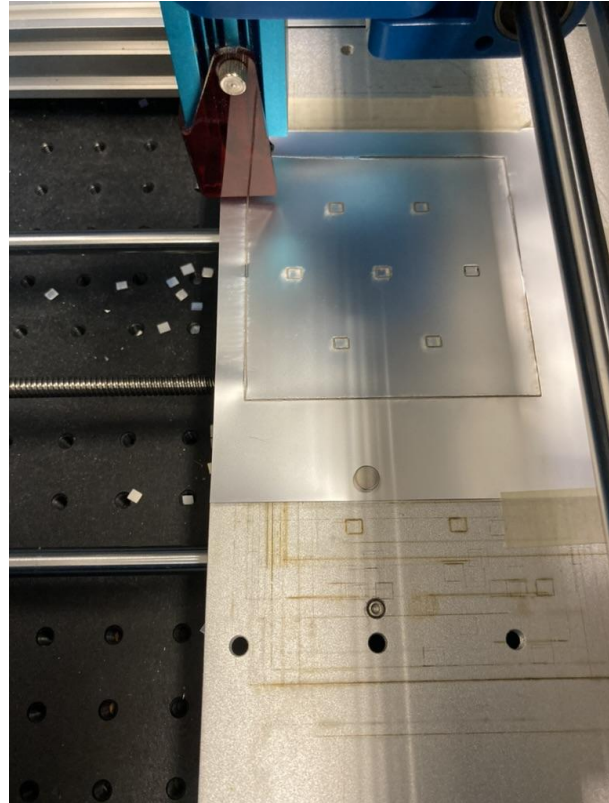
Laser begins cutting through foil.



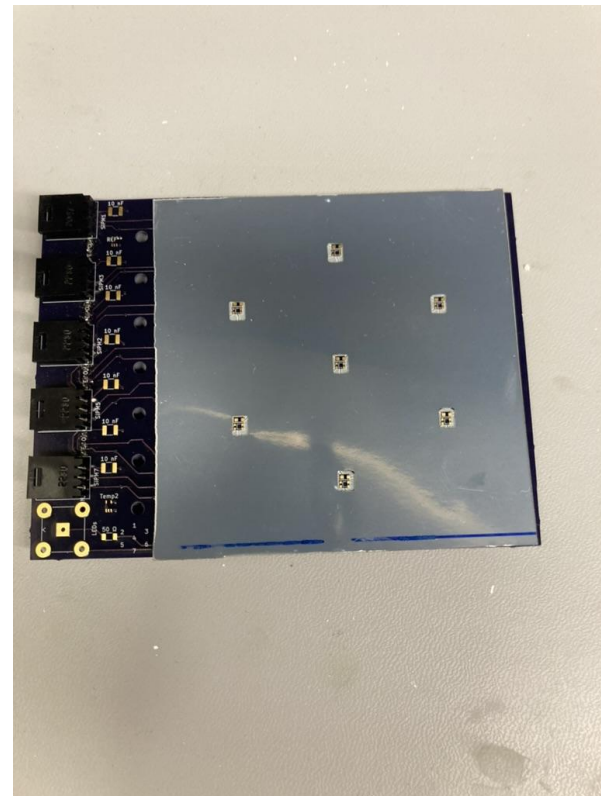
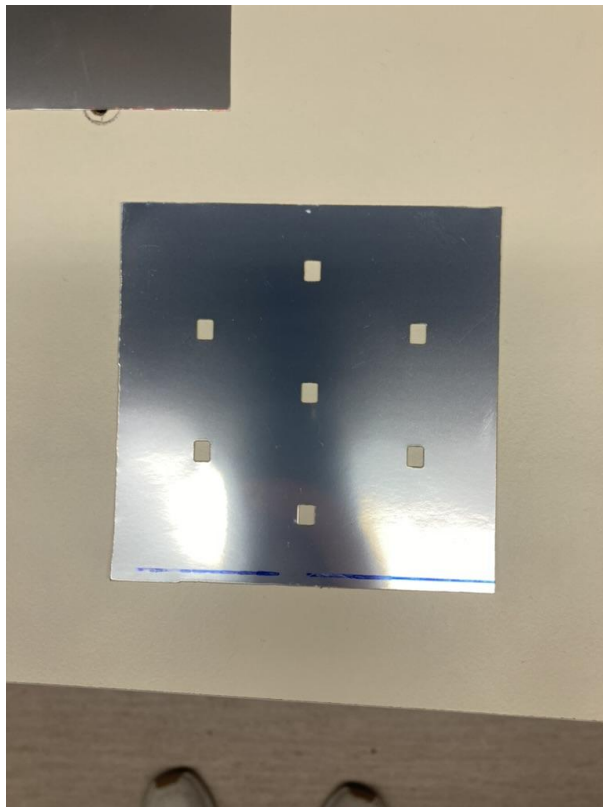
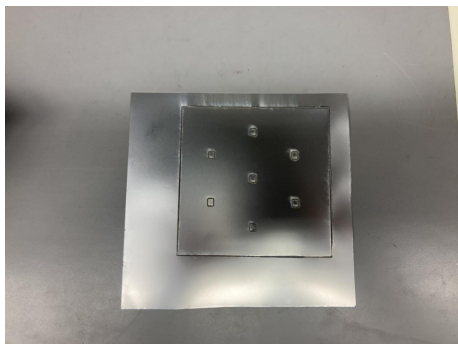
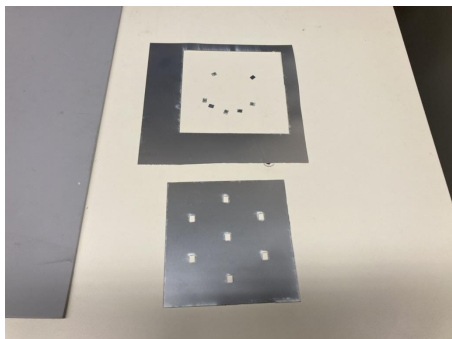
Process

The time it takes to cut this foil is 17 minutes.

If it appears that the laser has not cut properly, the process is repeated, without moving the foil.



Final Results



Future Plans:

Use the laser and attempt to make half cuts to create bends in the foil.