

BASICS OF LASER CUTTING

CREATED BY THE DI CREW

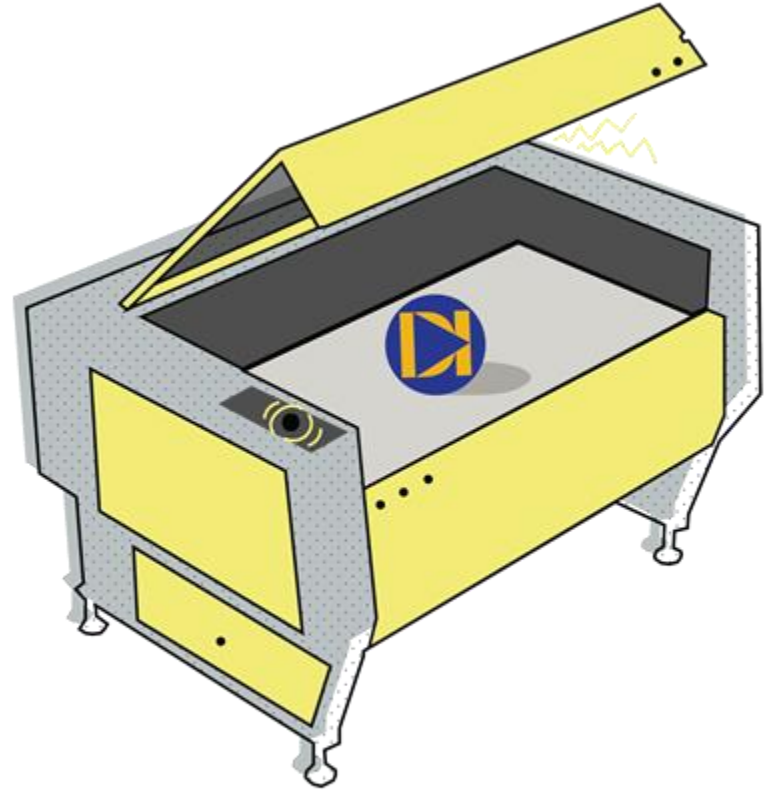


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BASIC INFORMATION



MACHINE INFORMATION

ACCESS

any DI Hub Member

*no prior/formal training required for access

COST

\$1.00 per minute for the first 10 minutes

\$0.25 per minute for minutes 11-40

\$0.10 per minute for minutes over 40

Universal Laser System PLS6.150D

Universal Laser System PLS6.150D

Wattage

150 watts

Cutting Bed Dimensions

32 x 18 in. (813 x 457 mm)

Maximum Cut Depth

½ in. (12.7 mm)

Rotary Dimensions

Max Diameter 8 in. (203 mm)

LINKS

[PLS6.150D Product Link](#)

[Product Manual Link PLS6.150D](#)



Universal Laser System ILS12.75

Universal Laser System ILS12.75

Wattage

75 watts

Cutting Bed Dimensions

48 x 24 in. (1219 x 610 mm)

Maximum Cut Depth

1/4 in. (6.35 mm)

Rotary Dimensions

Max Diameter: 10.25 in. (260 mm)

LINKS

[ILS12.75 Product Link](#)

[Product Manual Link ILS12.75](#)



Approved Materials

Library of materials

<https://www.ulsinc.com/material/materials-library>

- Make sure your material appears in one of the categories listed on the website
 - **If it doesn't, don't use it!**
- Double check your material with a DI crew member before proceeding

SETTING UP A FILE



FILE PREP: ILLUSTRATOR

1. RGB Colors (Pg 12)

Make sure file uses the correct blue, red, and blacks based on what is being done to the file

1. Stroke Weight (Pg 12)

Before sending to print, open your file in Illustrator to ensure all strokes or paths are .001 (also known as a hairline stroke)

1. File Layout (Pg 14)

Make sure the layout is correct and you have the desired size for your cut

File Prep Instructions (Illustrator)

Information for Pantones

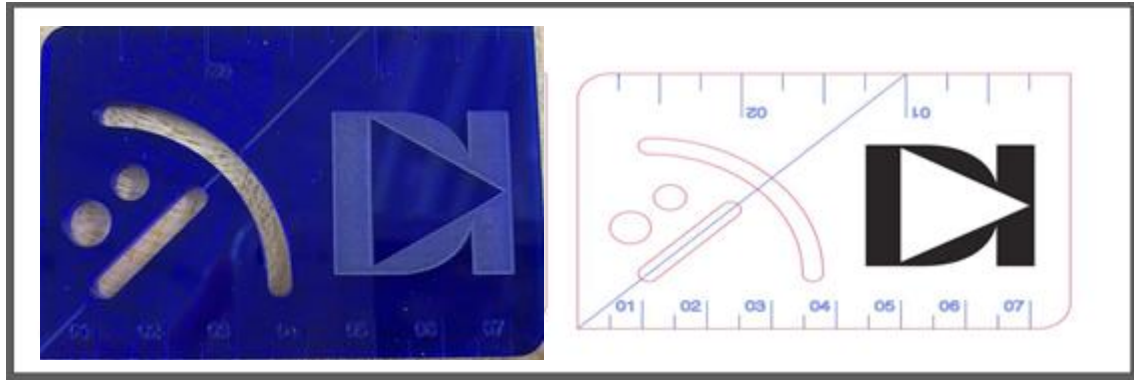
Vector Cut (Red) = R= 255, G= 0, B= 0

Vector Engrave (Blue) = R= 0, G= 0, B= 255

Raster (Black) = Grey Scale 0-100%

Stroke Weight

STROKE WEIGHT MUST BE .001



*Note: PNG files do not cut on the laser, save as JPG, JPEG, etc.

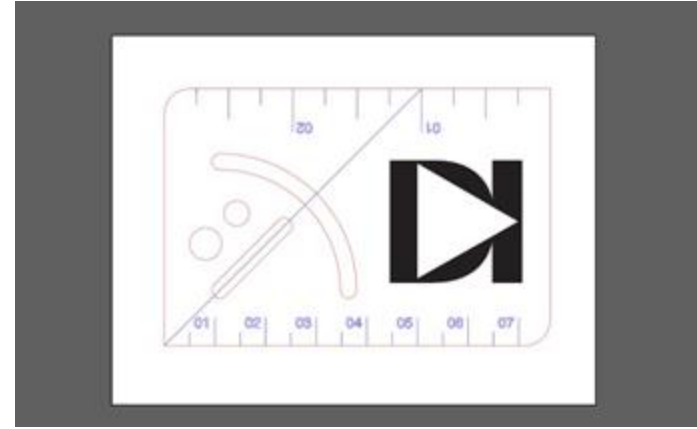
File Prep Instructions

Illustrator (cont.)

Red For Vector Cut

Blue For Vector Engrave

Black for Raster



0.001 Stroke Size



File Prep Instructions: File Layout

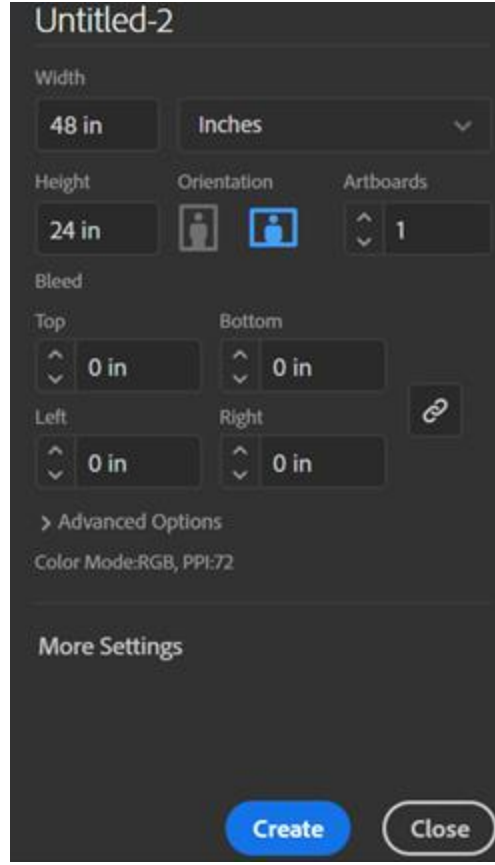
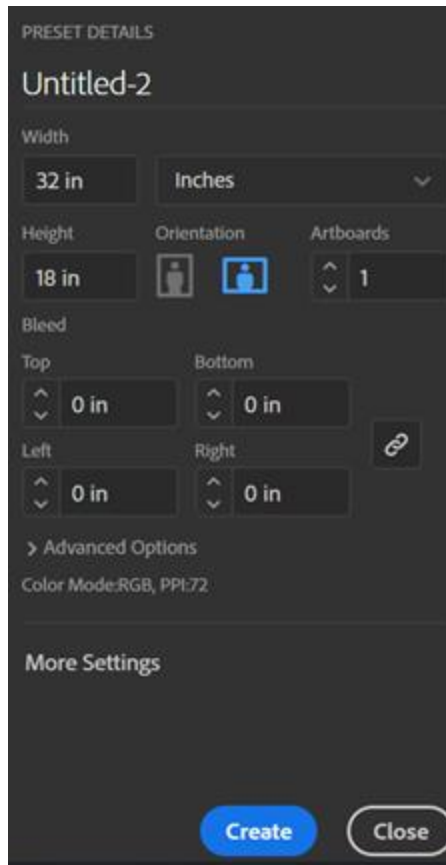
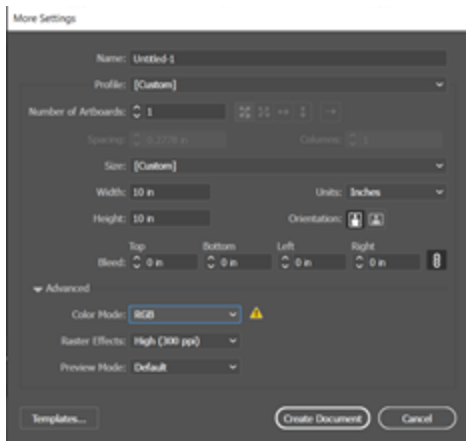
Universal Laser System PLS6.150D

The max. Illustrator file size for the PLS6.150D is 32 x 18 in

Universal Laser System ILS12.75

The max. Illustrator file size for the ILS12.75 is 48 x 24 in

More Settings:
Color Mode-RGB



FILE PREP: Printer Info

1. Print Illustrator File (Slide 22)

Print to PLS6.150D. After hitting print your file will go to the UCP software, then go and open up UCP.

1. Open UCP Software (Slide 22)

If the file will not open, check and make sure the stroke lines are at .001

1. Go Through Settings (Slide 23-24)

Make sure you have selected the right material from the Settings tab. Then input the material thickness.

PREPARING FOR THE LASER



POWERING ON THE MACHINE

1. Turn on Machine (Slide 16)

The power switch is located on the keypad of the machine next to the emergency button

1. Position Material (Slide 16)

Line up with where you will be cutting

1. Level Laser & Position Laser (Slide 17-19)

See auto level/manual level. Make sure that the laser has been positioned on the computer and is positioned overtop of the material within the machine. Check the lowest point of your work, the highest point, and the ends on both sides to ensure it is on the material.

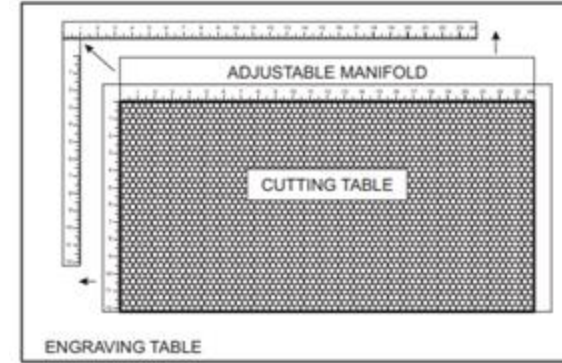
1. Clean Trays (Slide 20)

Trays located under the honeycomb

LASER SETUP

Loading and Positioning the Material

Open the door and position your material against the rulers to the correct placement. This will typically be in the top left corner of the cutting table.



The Keypad

The keypad includes: power button, start and pause buttons, arrow buttons, homing button, back button, and an emergency stop button.

When you have finished initializing and homing, and if all the doors are closed, the red light on the keypad will be illuminated and ready to run a file.



LASER SETUP (CONT.)

Z-Axis Setup- Auto Level



Use the arrow keys to navigate to the z-axis setting

Hit check mark to select



Press and hold the homing button until process begins

NOTE: THE AUTO HOME FUNCTION FOR THE Z-AXIS IS IN THE **CENTER** OF THE BED - Be sure to move your material for homing, before moving to your desired location if necessary.

If needed, the laser can be moved on the machine or the computer software.

LASER SETUP (CONT.)

Z-Axis Setup- Auto Level

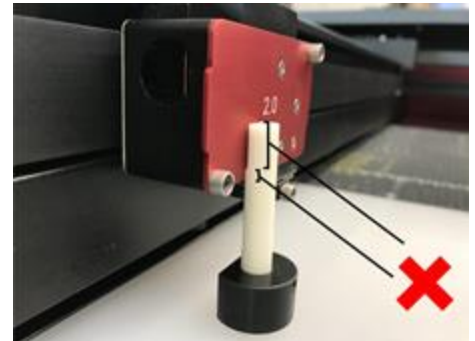
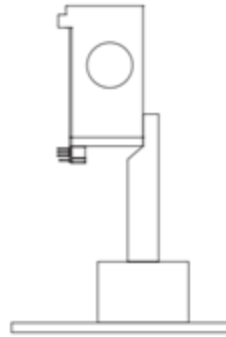
When the machine is done auto-leveling it will go back to the upper right corner

Press the back button to exit out of the auto-leveling

Then just press (Do not hold) the homing button and it will go back to the center

Place the focus tool against the black lens plate (focus carriage) so that the flat edge of the focus tool rests against the front side of the focus carriage.

Take note of the fit of the focus tool (it should snugly fit between material and carriage)



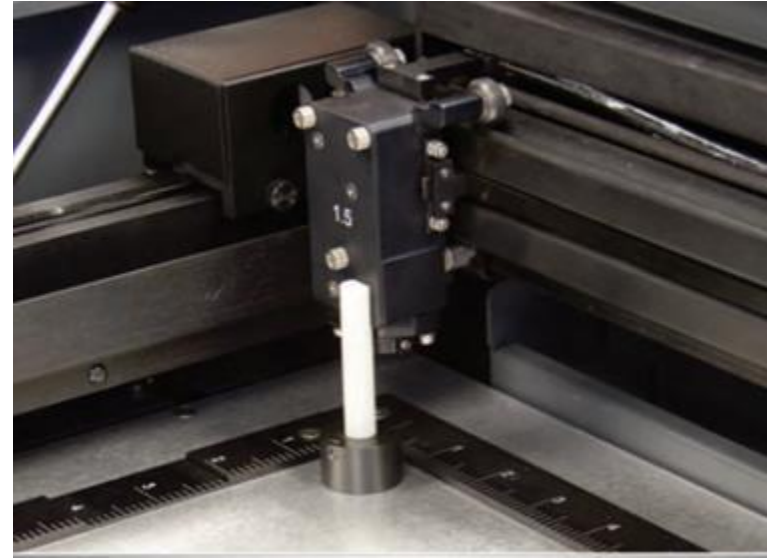
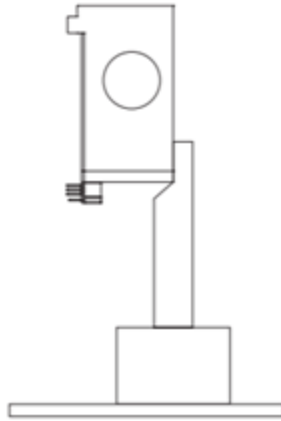
LASER SETUP (CONT.)

Z-Axis Setup- Manual Level

Follow the first step of the auto-level function but instead of holding the homing button just press and release

Using the upper left corner, move the focus carriage by hand to every corner and take note of any differences between the fit of the focus tool compared to other corners.

Adjust height until bed sits snug on all four corners. If able to tilt leveling piece left or right, please notify DI Helper before moving forward.



LASER SETUP (CONT.)

Cleaning Honeycomb Tray

Empty the two trays below the honeycomb before
AND after using laser.

**⚠ Heavy latch, please open carefully, and don't
let it drop.**



LASERING

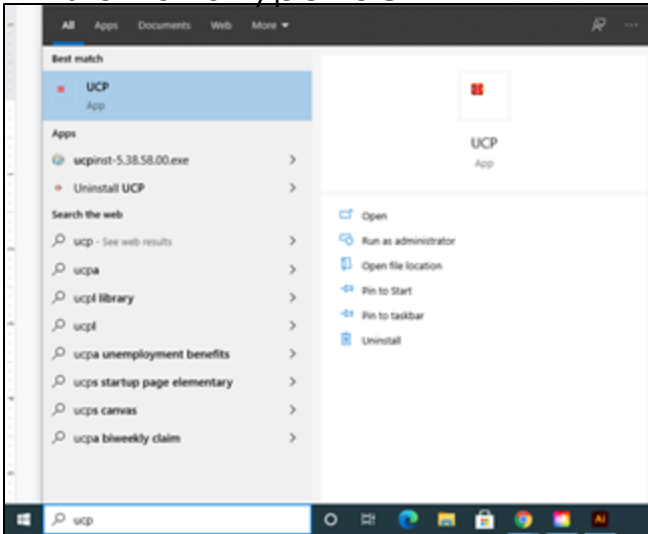


UCP Software

Uploading Your File

Make sure the Laser cutter software is running on the PC next to the cutter you wish to use

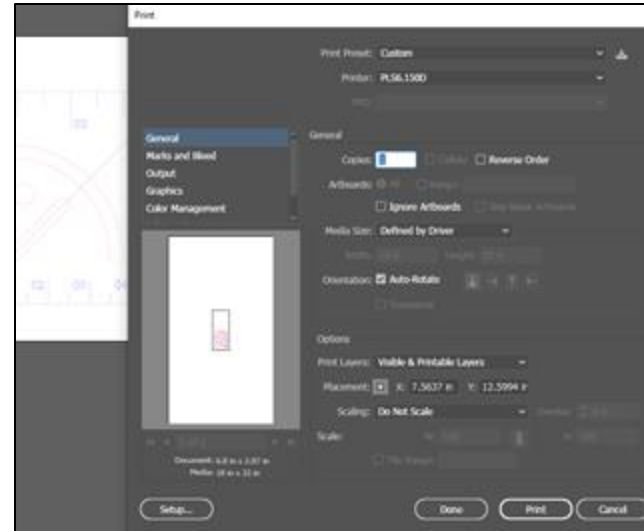
Hit start and type “UCP”



After saving your Illustrator file onto a flash drive, open it on the PC. Go to the File tab and select Print.

Be sure to double check that the laser cutter you wish to use is the selected printer

Hit Print

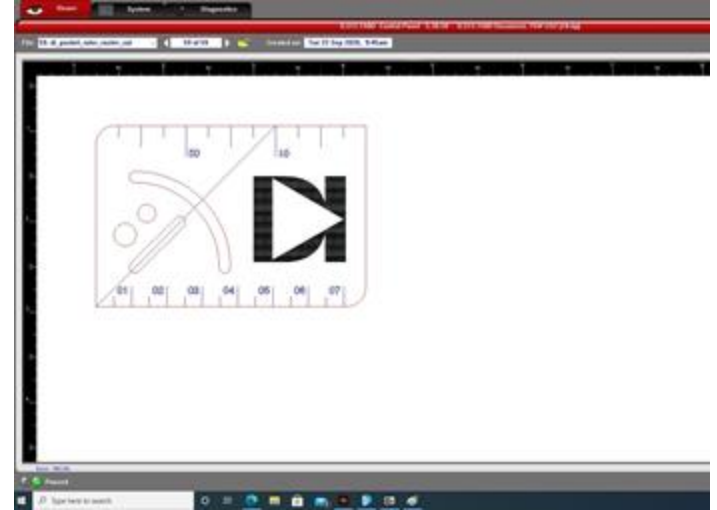


Putting your File in UCP

Last Check for red/blue/black!

After you print from Illustrator, the file will open in UCP automatically. After that is done, this is your last chance to make sure your red/blue/black illustrator file translated correctly into the UCP. If it did not, the laser will not cut correctly.

If the red/blue/blacks do not show up, you will have to go back into Illustrator and fix it, and then print the file again.



UCP Software

Repositioning your file

Use this function to position your drawing around the software. The placement of your file must correspond with where the material is placed on the cutting table.

The artboard is scaled to match the bed size of your selected printer.



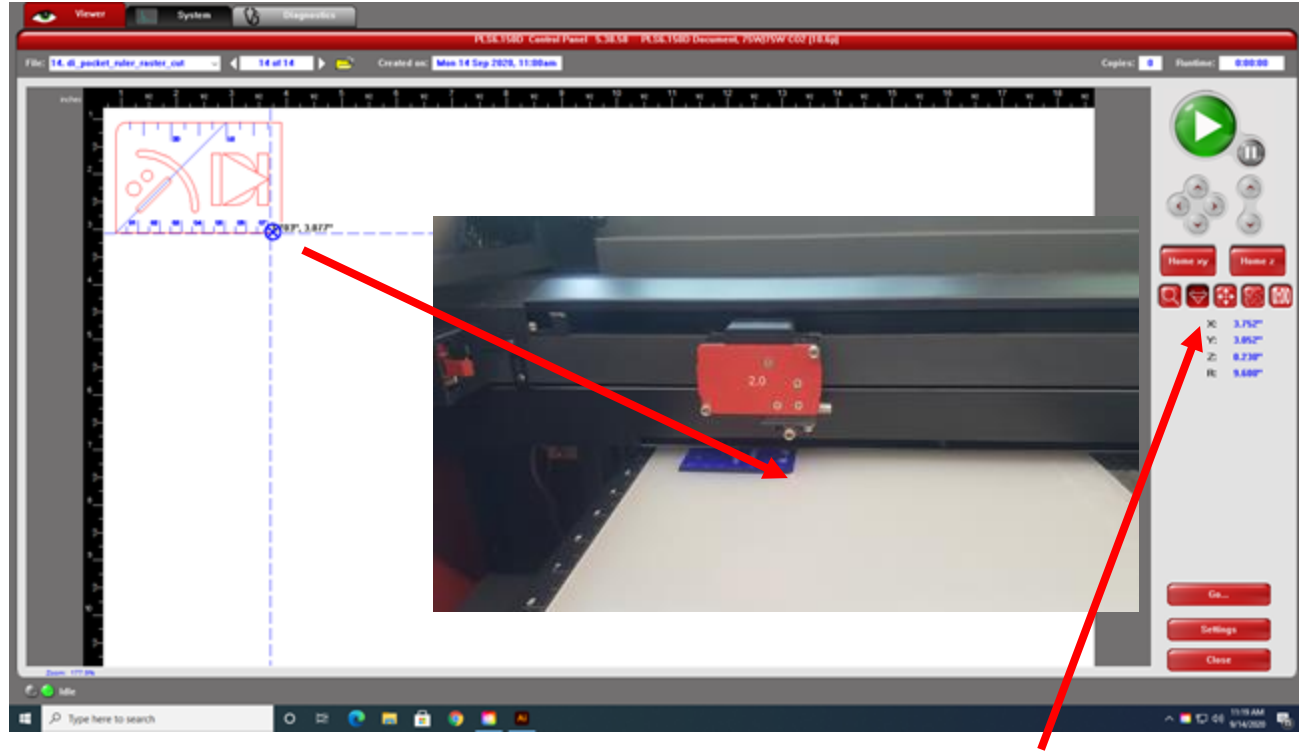
UCP Software

Manually Positioning the Laser

This tool is to check that the laser matches up with the corners of the file.

As you select the corners, the laser will move to show you where it will cut on the material.

Use arrows or left click on desired position to move laser to desired point.



UCP Software

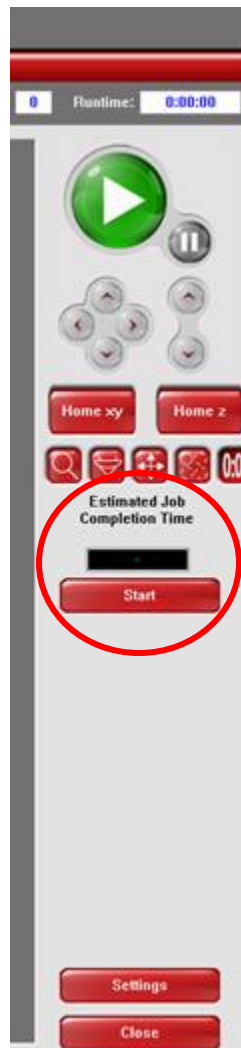


Make Copies

Select this to make copies of object you are printing.

Zooming

UCP Software



Timing

Use this function to check the estimated time calculated for the machine to finish your piece

Remember it is very important that you stay and watch the piece for the ENTIRETY of the cut

UCP Software

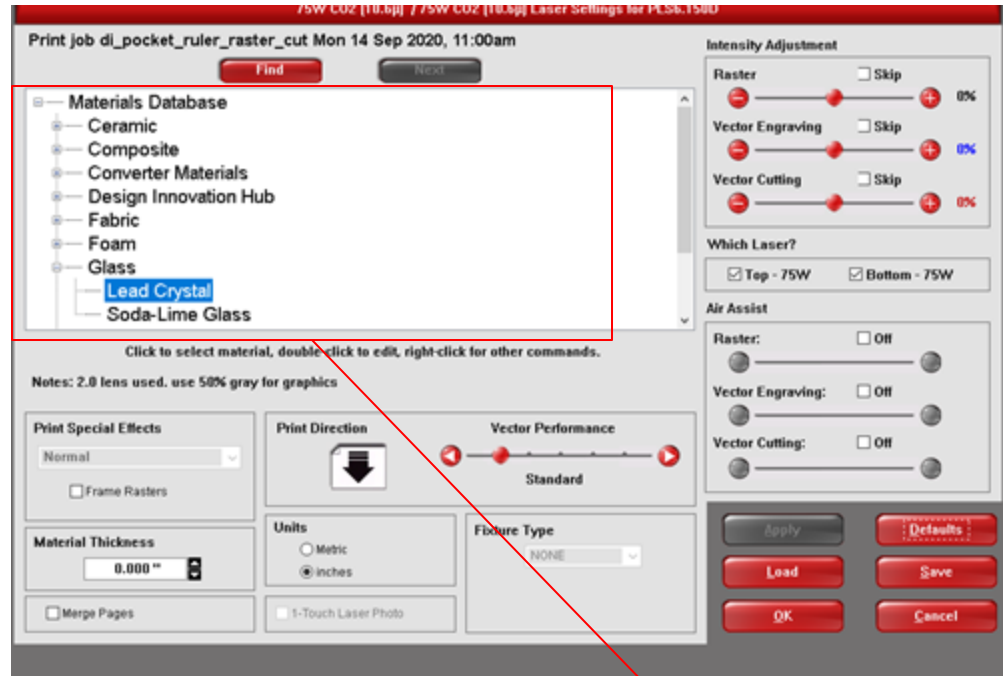


Settings

You must set the settings for every new file that you upload!

Under settings, you will find the material database, the units, and the material thickness adjustment.

UCP Software (Material Database)



Settings

Under Settings you will find the **material database information**. Once you select a category, a variety of material types will appear to the right of the category section. Find appropriate material option and input material thickness on bottom left.

Once settings are complete, hit apply and OK.

⚠ Make sure to not change settings that you do not understand.

UCP Software (settings)



Intensity adjustments



Material Thickness

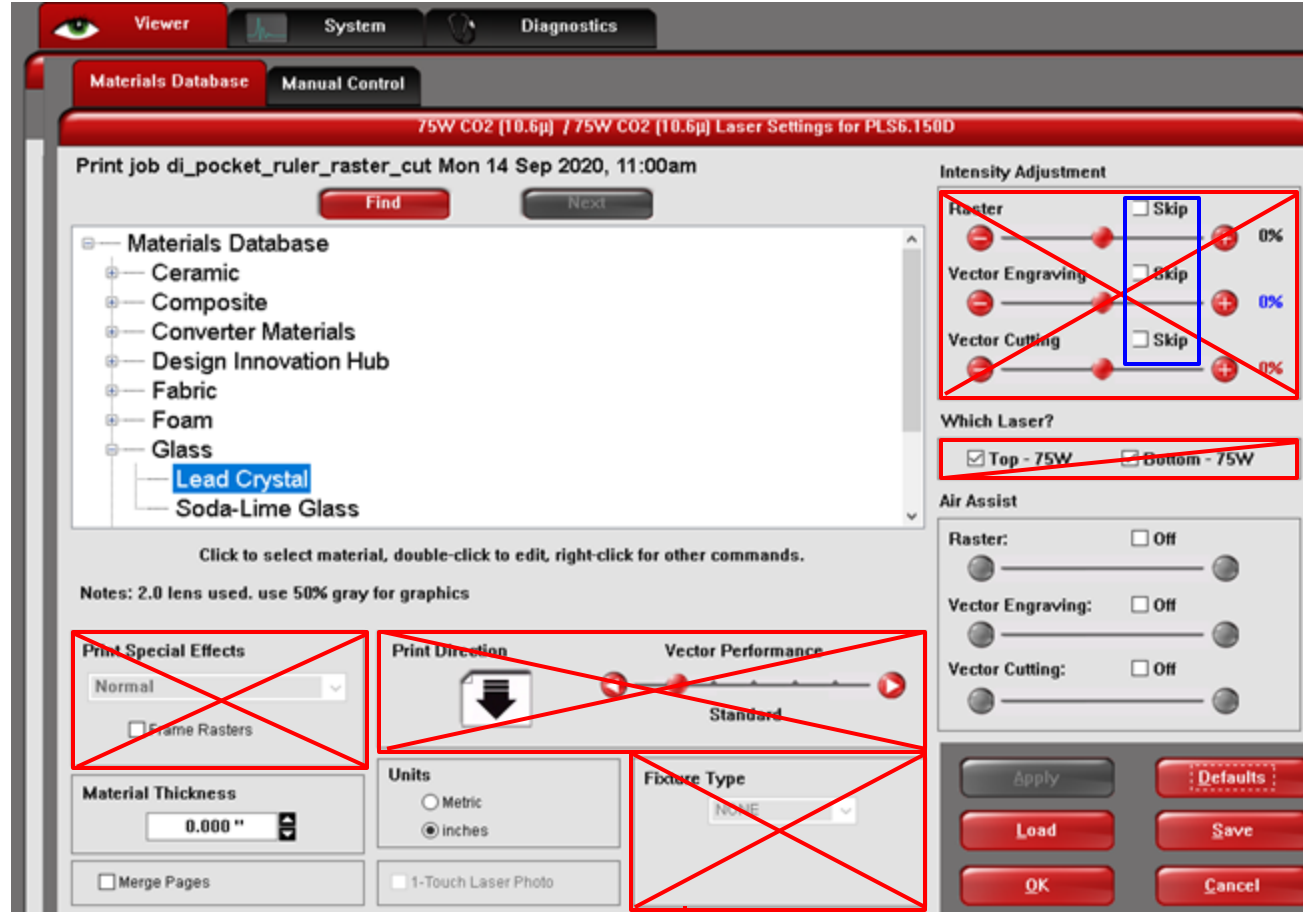
Adjust material thickness based off of measurements taken with a digital dial caliper. Add .03 to the caliper reading and enter into UCP.

Intensity Adjustments and Skip Function

The top right in settings shows the intensity adjustments

USE the skip function to tell machine to do operate specific mode functions

UCP Software (settings)

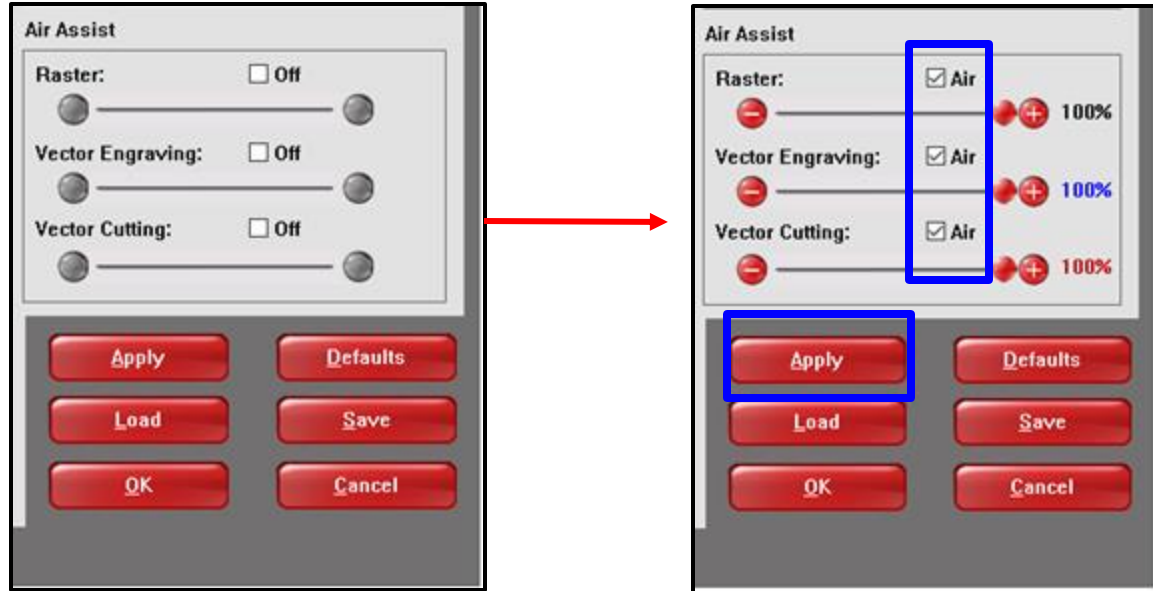


Don't touch these settings.

UCP Software (settings)

Make sure to check the boxes under the Air Assist settings so that the Raster, Vector Engraving, and Vector Cutting are at 100%.

Then click **Apply**.



Final Check!

Make sure to have someone from the DI Crew look over your file before running the file.

Double-check that you have reviewed everything on this checklist:

- ☐ Stroke color and weight
- ☐ Z-axis setup → auto/manual focusing
- ☐ Material settings in UCP
- ☐ Material thickness in UCP
- ☐ Ventilation on
- ☐ File run time

UCP Software

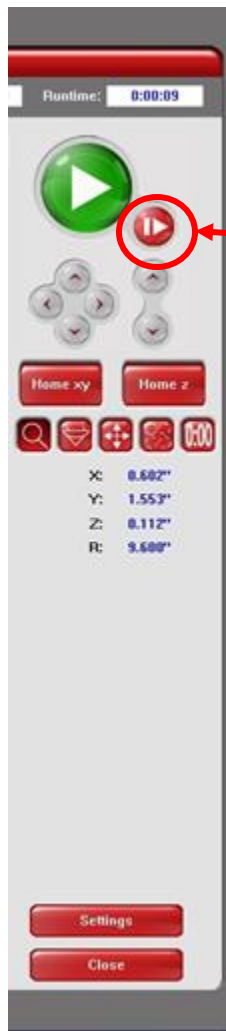


Print!

You should now be ready to print - be sure to Check with a DI 'Helper' to confirm that your file and the machine is ready to go.

Once it's ready, press the green button and watch the magic happen!

Resume vs. Print



Resume button will appear here

Make sure that you press "resume" and not print while the machine is paused. If you press print, it will start over from the beginning again!

POST LASERING



FINISH AND CLEAN UP

1. Clean Out Trays

Clean out trays located below the honeycomb

1. Wipe Down

Wipe down all machinery (spray the cloth, not the machine)

1. Follow COVID Safety Guidelines

Wipe down all surfaces

FINISH CUT and CLEAN UP

Cleaning Honeycomb Tray

Empty the two trays below the honeycomb before AND after using laser.

⚠ Heavy latch, please open carefully, and don't let it drop.



Additional Resources

Generate box designs:

<https://www.makercase.com/#/>

Understanding kerf:

<http://www.cutlaser-cut.com/resources/tips-and-advice/what-is-laser-kerf>

Generate Puzzle designs:

<https://draradech.github.io/jigsaw/index.html>