

The background image shows a large, industrial-grade laser cutter in a modern fabrication laboratory. The machine is primarily grey with red accents on its safety doors. A long, flexible, silver-colored extraction duct is mounted above the machine, curving upwards and outwards. The lab has large windows on the left side, providing a view of trees outside. A person is seated on the right, operating the machine. The overall scene is brightly lit, with a clean and professional appearance.

Laser Cutters

The U-SoA Fabrication Lab will foster a culture of learning through making. Its principal purpose is to serve students and faculty in existing and future research pursuits, by providing robust training and broad access to a host of digital and analog tools. The Lab aims to continually improve, incorporating new technologies and expanding its capacities, growing into a resource equal to the substantial ambitions of a top-tier architecture program.

COVID-19

University announces plan for on-campus fall semester; classes commence Aug. 17 [Read More](#)

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Academics

Resources

Admissions

Tips:

Save time and headaches by running the OVERKILL command on your DWG file before laser cutting. This will remove duplicate lines and combine line and arc segments that overlap. If your file has lines on top of lines, it can result in a much slower cutting time, or excessive charring of the edges. From the AutoCAD command line, type overkill, or from the menus, click Express, Modify, Delete Duplicate. Don't save over your original file in case something goes wrong.

Step 1:

Laser Cutting Form

* Required

Name *

Your answer

UM Email *

Must use a ".edu" email address

Your answer

Phone Number *

Your answer

File Name *

Please format your file as "LastName_Professor_A" or "LastName_Professor_B" and so on

Your answer

Special Instructions

Please note template numbers if using different size materials (match the template number to the material).

Your answer

Schedule with Link below (Please select specific machine, not "Anyone":

Below:https://outlook.office365.com/owa/calendar/U_SoA_Lasers@miamiedu.onmicrosoft.com/bookings/

Your answer

Submit

GET STARTED

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27



U_SoA_Lasers

Select service

Laser Cutting 30 Mins
30 minutes



Laser Cutting 60 Mins
1 hour



Laser Cutting 90 Mins
1 hour 30 minutes



Laser Cutting 120 mins
2 hours



July 16 with U_SoA_Red Laser 1

< > July 2020

| Su | Mo | Tu | We | Th | Fr | Sa |
|----|----|----|----|----|----|----|
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | |

Select staff (optional)

U_SoA_Red Laser 1

Anyone

U_SoA_Red Laser 1 Available

U_SoA_Red Laser 2 Available

U_SoA_White Laser Available

U_SoA_Blue Laser Available

All times are in (UTC-05:00) Eastern Time (US & Canada) ▼

Add your details

Name

Email

Phone number (optional)

Address (optional)

Please let us know if you have any special requests.
Thank you.

Notes (optional)

Book

Reservations

Faculty members and students can reserve the machines directly through the laser cutting site on theSchool of Architecture website. Users must select the time duration that they will cut within as well as which machine they will be using. Students are not limited to the amount of time they wish to use the equipment for. Students are required to fill out and submit the form online as well as the online reservation system which is attached in a link. To book an appointment follow the steps below:

Access the booking page through the School of Architecture website.

Click the amount of time you would like to schedule your cut for (e.g. 30 minutes, 60 minutes, etc) from the top row of selection boxes.

Next select a machine under the “Select Staff” box. If users do not select a specific machine and only select “anyone” their appointment will be cancelled. The four options are Red Laser 1, Red Laser 2, White Laser, Blue Laser.

Once a machine has been selected, the days and time slots available according to the length of time selected in step 2 will appear. Users should select their choice of date and time.

After choosing the date and time, fill out all additional details at the bottom of the page and click “Book”.

Appointments are only official once the student has received an email confirmation, confirming that their appointment was created. This should happen immediately, if the user does not receive this, their appointment was not booked.

****Students must be at the desk with the laser cutting within 5 minutes of their scheduled time or they will forfeit their slot to the first available user who is ready to start cutting.****



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MANUAL
29

Procedures

Laser Cutting and Engraving from AutoCAD
Red Lasers (ILS9.150D) and Blue Laser (VLS 6.60)

Before sending the file:

Make sure the laser is turned on; this can be done in UCP or using the button/switch on the laser].
Open the blast gates that connect the laser to the exhaust pipes, and make sure the fan for the laser is on.
Adjust the laser height by selecting “Z” in the menu on the Red lasers or by pressing the “Z” button on the Blue laser. Use the white plastic tool to correct the height.

Before coming to the lab, prepare the file using either the 24” x 36” for the Red lasers or the 18” x 32” template for the Blue laser, making sure to follow the layer conventions described in the example.
Once the file is ready, use **OVERKILL** to remove duplicate lines, then use the **PLOT** command or **CTRL+P** to send the file to the laser engraver.

Note: The file must be sent using the computer next to the laser in use.

Once in the **Plot** menu:

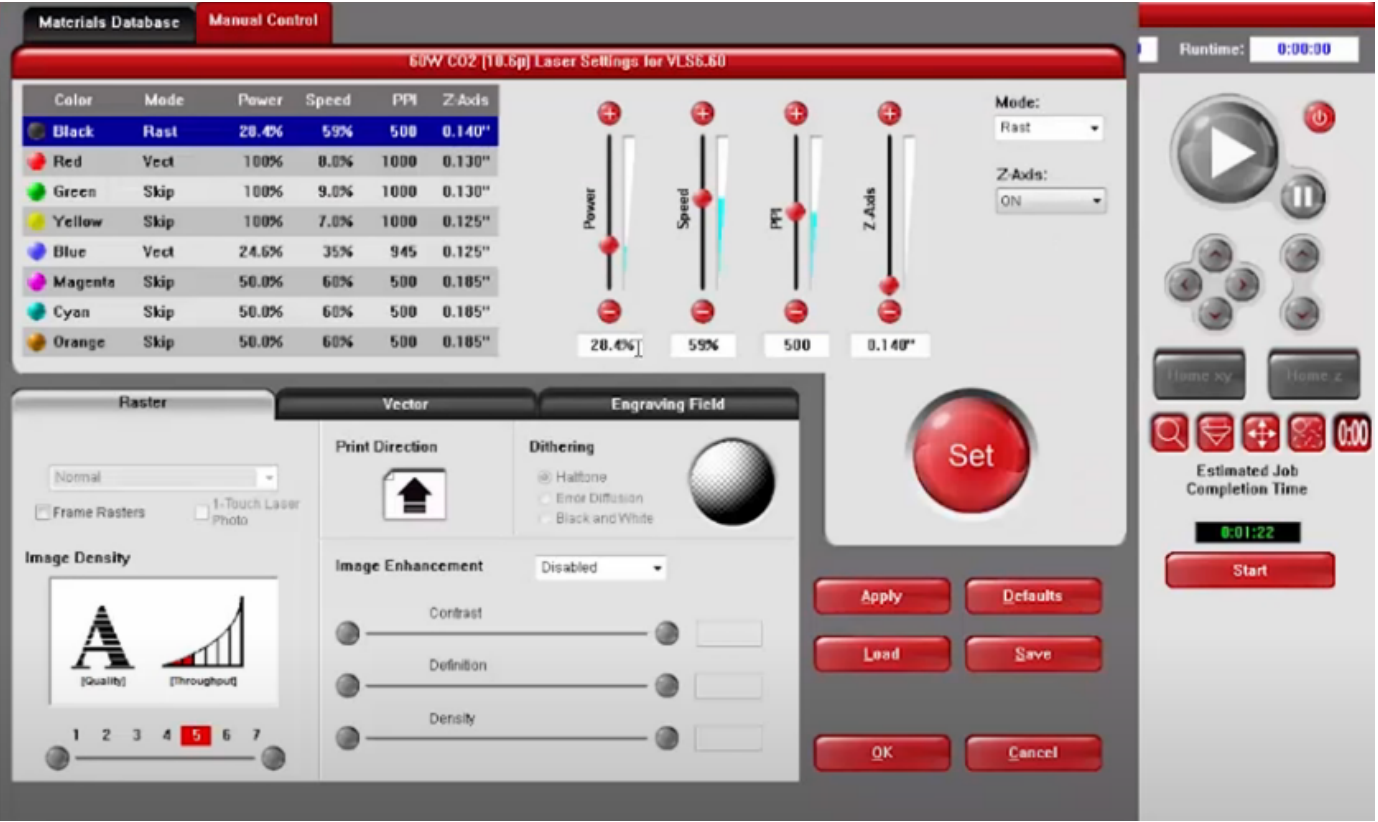
- Under **Printer/plotter**, select ILS9.150D (Red) or VLS 6.60 (Blue).
- Under **Paper size**, select “User Defined Landscape”.
- Under **Plot area** - What to plot: select “Window” and click the “Window” button to the right.
- The menu will hide to enable a box to be drawn around the box representing the laser bed.
- Select along the outermost corners of the box.
- Under **Plot scale - Scale**, select 1:1.
- Click **OK**.

Open **UCP** [check the desktop or the taskbar to find the program].

Click the **Settings** button in the bottom right corner.

In the **Manual tab**, click the **Load button**. The File Explorer should open with settings for the available materials; make sure to select the correct thickness.

Procedures (cont.)



After selecting the material, click the **Apply** button, then **OK**.
The Green “Play” button in the top right should be lit. **Click** to begin the engraving.

Other UCP Functions:

Zoom: The “” button allows the user to zoom in on details of the drawing before sending.

Focus View: The “” button allows the user to select a new position for the laser while the door is open.

Move: The “” button allows the user to move the drawing in UCP.

Duplicate: The “” button allows the user to duplicate the drawing.

Time Estimate: The “” button allows the user to view a time estimate based on the drawing.

Procedures

In the Settings Window:

Power: Adjusting the power of a specific line color can increase/decrease the intensity of the laser.
Speed: Adjusting the speed of a specific line color can increase/decrease the speed of the laser.
A combination of higher power and lower speed may correct issues with cutting through materials (Ask for help).

Editing Layers:

Creating Dashed Lines: This is useful for indicating fold lines on materials. While on the desired engraving layer in AutoCAD, select the Layer Properties button in the Layers section. When the properties window opens, click the Linetype of the current layer and change it to DASHED to create a dashed line. Keep the lineweight the same.

White Laser (X-660)

Before sending the file:

Make sure the laser is turned on; this can be done in UCP or using the button/switch on the laser].
Open the blast gates that connect the laser to the exhaust pipes, and make sure the fan for the laser is on.

Adjust the laser height by pressing the **“Z” button** on the laser. Use the white plastic tool to correct the height.
Before **coming to the lab**, prepare the file using the 18” x 32” template for the White/Blue laser, making sure to follow the layer conventions described in the example.
Once the file is ready, use **OVERKILL** to remove duplicate lines, then use the **PLOT** command or **CTRL+P** to send the file to the laser engraver.

Note: The file must be sent using the computer next to the laser in use.

Once in the **Plot menu**:
Under **Printer/plotter** - Name, select **X-660**.
Under **Paper size**, select **“User Defined Landscape”**.
Under **Plot area** - What to plot: select **“Window”** and click the **“Window” button** to the right.
The menu will hide to enable a box to be drawn around the box representing the laser bed.
Select along the outermost corners of the box.

Follow the same steps in UCP from the Red/Blue Lasers above.

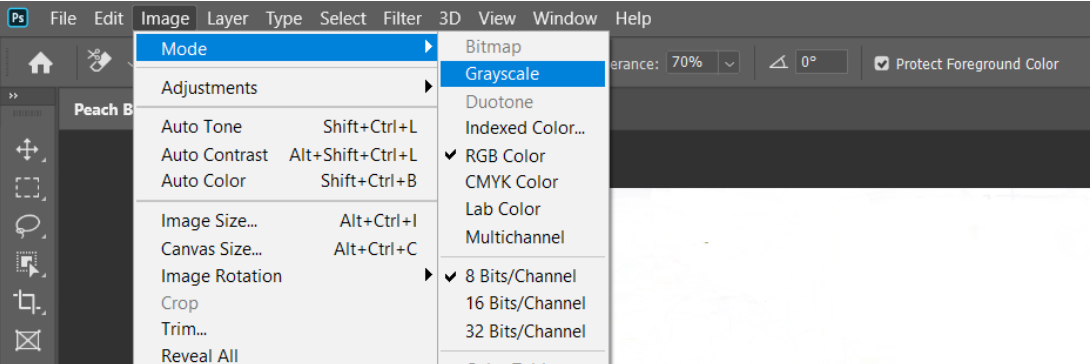
Procedures (cont.)

Advanced Uses

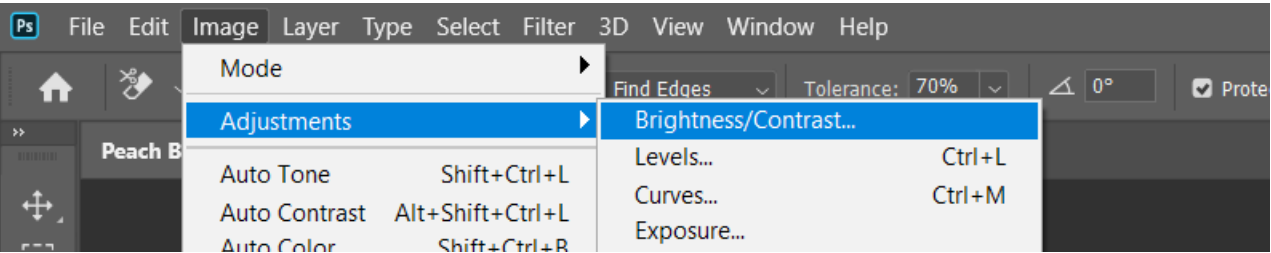
Raster Engraving

Although the template provided includes options for Deep/Light Engraving and Interior/Exterior Cuts, the lasers are capable of engraving photos and images (See example below). The file is sent to the lasers the same way, but the file preparation differs:
Choose or Take a high quality image to edit in Photoshop, Illustrator, or another program of choice; an image of a single subject is the most simple to edit.

Remove the background of the image, and convert the colors to grayscale.



Increase the sharpness of the image and adjust the contrast. High contrast images, or images with clear gradients will appear the best. This may take several attempts; sending the file to UCP after editing will provide an idea of the final product.

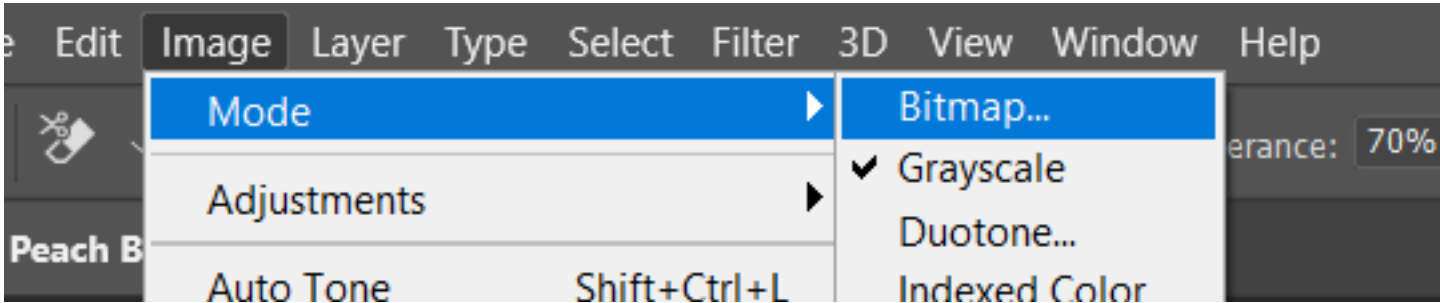


Once the edits are complete, convert the file to a bitmap (.bmp), and insert that file to the AutoCAD laser cutting template.

Change the layer of the image to **“Grayscale (RASTER).”**
Scale the image to the desired dimensions, and send to the laser (see above directions).
When adjusting the material settings, make sure that the settings for the Black lines are changed to **“RAST,”** and adjust the Power, Speed, and PPI settings to match those of the Green settings (small adjustments can be made to match preferences).

Procedures

It is recommended that several tests are done to ensure that the image quality and engraving depth match expectations. Ask for help if needed.



Reliefs:

This process is very similar to Raster Engraving, however the powers will need to be adjusted from the green settings to something closer to blue. This may take trial and error, and thicker materials are recommended. Remember to ask staff members if a particular material/thickness is safe to engrave.

Troubleshooting:

Lines not appearing in UCP/“This file contains no data...”

Use the PROPERTIES tool to ensure that the properties of all lines in the drawing are labeled “By Layer.”

Use the Layers from the original Laser Cutting Template. Custom layers may not contain the information needed to send the file to the laser.

Splines often need to be joined for some shapes to appear properly

Laser Not Cutting Through Material:

Alert staff before adjusting laser settings; an employee can confirm any desired changes in power or speed settings.

If changing settings does not work, double check the stage height.

Finally, the lens may need cleaning or replacing; an employee will have to switch the lens.

Cutting Lines Across Material

The laser has about a quarter-inch margin around the perimeter of the material. Thus, vertical and horizontal lines may not reach the full width or length of the board.

Importing Line Art from Other Programs (Photoshop, Illustrator, etc.)

Line Art from Illustrator, etc. not appearing in UCP/“This file contains no data...”

Before importing to AutoCAD and sending a file to print:

Make sure the lineweight in the original program matches that of the layers in AutoCAD (use Layer properties to check).

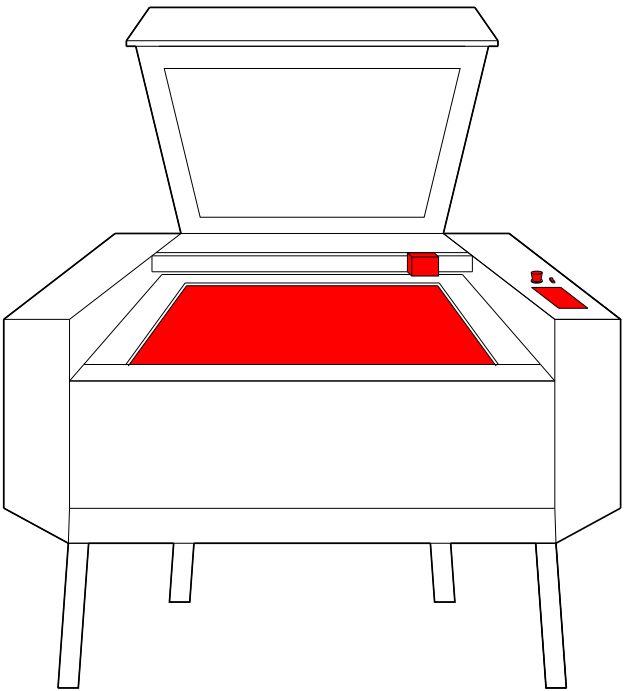
Use the RGB color swatches to match colors in Illustrator to the layers in AutoCAD

RGB Blue color swatch for cuts, Green for deep engraving, etc.

Don’t forget to run overkill before starting!

The first section under Troubleshooting also applies

Safety



The laser cutters are relatively safe pieces of equipment as they will not operate when the machine is open, however there are some important safety measures to follow.

-Never run the machine with the lid open.

-Be cautious of finger and limb locations when closing the lid.

-Do not slam the lid shut.

-Do not stare directly at the laser while it is cutting as this may damage your eyes.

-Always watch the machine while it is running, as there is a small risk of fire.

-If your material generates a lot of smoke or colored gas, do not open the lid. Immediately shut the machine off and notify the lab monitor. The off gas may be toxic and should be vented through the exhaust system and not exposed to the room.

-If your material combusts but is not showing any signs of toxic gasses being released, open the lid and spray the material with the spray bottle located immediately adjacent to the equipment. Most laser fires are extremely small and under alert monitoring should be able to quickly extinguished.

-If the fire combusts quickly into a large flame, alert the lab monitor and evacuate the room.