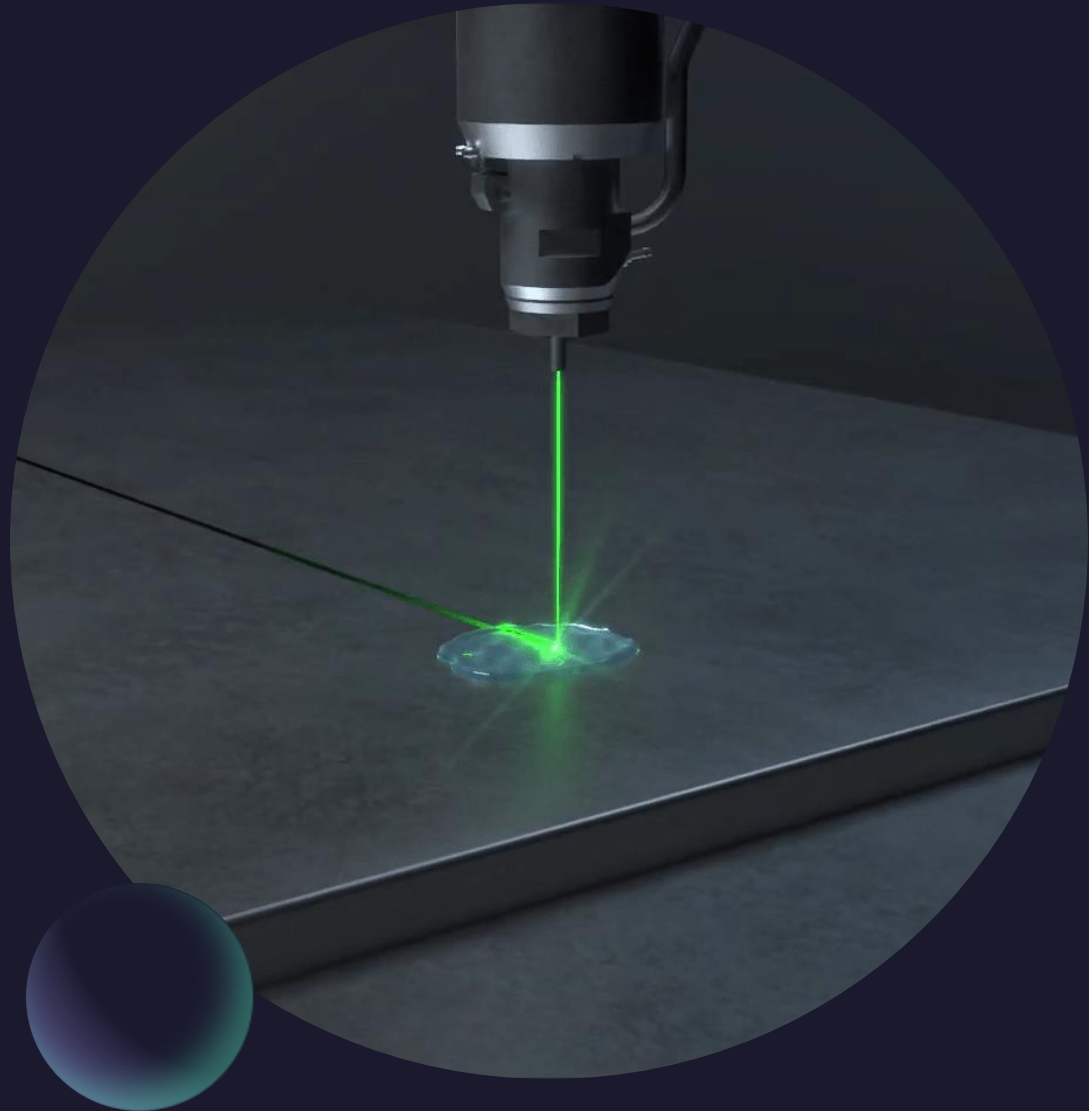


# LEARNING LAB: LASER CUTTING AND ENGRAVING

Overview:

- How to book equipment
- Meet the equipment
- Materials and Cost
- Material basics and Safety
- Additional Resources



# How do these Learning Labs work?

- We give you the basics and resources, you do the deep dives.
- More information on the [Fabrication and Robotics Lab page](#)
- This space is intended for users **13 and up**. Younger users must be accompanied by a responsible adult with the relevant badge.

How often can you reserve equipment?

- Once per day (walk-in or in advance)
- Up to 2 times per week
- For a maximum of 5 times per month

(After the limit has been met, users may still access the tools on a walk-in basis if equipment is available.)



Always clean up after yourself: clean debris tray, put away materials, turn off machines, and clean up workspace.

# CO2 Laser Materials Guide

## Approved

**Hardwood**

\*Avoid oily/resinous woods

**Wood Veneer** (Natural ONLY)

**Anodized Aluminum**

**Cardboard**

**Ceramic**

**Cork** (Natural ONLY)

**Magnetic Sheet**

**Matte Board**

**Paper/Card Stock**

**Powder-coated Metals**

**Rubber** (Natural ONLY)

**Stainless Metals**

w/ Laser Marking Spray (CerMark)

**Stone** (granite, marble, etc.)

**More to discover!**

## Caution

**Acrylic**  **STRONG ODOR!**

**Cloth/Cotton/Felt**

\*Engraving may compromise the strength of the fibers. Ask a staff member about our sublimation, vinyl, and embroidery equipment!

**Glass** (Etching ONLY)

\*Can create dangerous splinters. Wash thoroughly before leaving.

**Leather**  **STRONG ODOR!**  
(Engrave/Vegetable-tanned ONLY)

**Masking Tape**

\*Tapes ignite easily. Consider running a pass at low-power, then the main engraving/cut separately.

**Plywood**

\*Negative space within wood may create undesirable results. Consider the veneer quality and ply count when purchasing wood.

## Prohibited

**ABS Plastic** \*Emits cyanide gas

**Vinyl/PVC** \*Emits chlorine gas

**Leather** (Vegan/Chrome-tanned)

**Carbon Fiber**

**Delrin (POM)** \*Better for CNC

**Epoxy, Resin, Fiberglass**

**Milk Bottle Plastic (HDPE)**

**MDF/Engineered Wood**

**Mylar (Polyester)**

**Polycarbonate**

**Polystyrene Foam**

**Corrugated Plastic (PP)**


**Teflon (PTFE)**

**Synthetic Rubber**

**Glass/Metal** (No cutting)

Due to serious health & safety implications, materials not listed above must be pre-approved by a staff member. Failure to follow laser guidelines will result in serious consequences.





**When working with a new material always make sure it is an approved material. When in doubt ask staff.**

# Fumes

1. Always turn fume extractor to 50% for Epilog. At least 75% for Glowforge.
2. Enable extra room filter if needed.
3. NEVER CUT PVC or VINYL (it emits chlorine gas!)
4. No treated woods or wood with glue/adhesives such as MDF. (The chemicals can be TOXIC and are more likely to ignite a fire)
5. No Artificial/Vegan leather (almost always vinyl!)
6. No Carbon Fiber
7. No PVB (safety glass)
8. No ABS plastic (it will emit cyanide gas!)
9. NEVER attempt to cut glass or metal

# What do we have here?

## Epilog Zing 24



- 40 watts
- 12"x24" Print Area
- 8" Clearance
- Adobe Illustrator + Epilog Job Manager
- Rotary attachment
- Fume extraction!!
  - Air Assist + Filter Box
  - Usually turned to 50% but higher for acrylic

## Glowforge Pro



- 45 watts
- 19.5"x 10" (or forever)
- 2" Clearance (1/4" for passthrough option)
- [Glowforge App](#)
- Camera placement
- Fume extraction!!
  - Filter Box
  - Usually turned to 75%

Always turn on additional room air filter when running extended projects or working with odorous materials!

# What file do I need? Where can I find it?

## Where can I make it?

Raster images such as **.JPEG** and **.PNG** files can be engraved!

Cut lines MUST be saved in a vector-friendly format such as **.AI**, **.PDF**, or **.SVG File** (standard vector graphic).



Vector images can actually be engraved, cut, and even scored!

### Where to find **.SVG** files:

- Glowforge (Search for FREE with our Glowforge Premium Account)
- 3Axis, Xtool Projects, Etsy
- Epilogue Free Sample Club
- Maker Case, Boxes PY, SVG Puzzle Generator

### Design programs available in Mac Lab:

- Adobe Illustrator, Inkscape (open-source)
- Adobe Lightroom, Adobe Photoshop
- Canva (Web based)

# Getting started with the Epilog Zing 24

Resources are your friend!!



- Fayetteville Public Library [website](#)
- [Center for Innovation playlist](#) on YouTube

BEWARE FORBIDDEN MATERIALS!

Pre-plan your CUT lines (.001 stroke)

VECTOR=CUT    RASTER=ENGRAVE

Don't forget the Air-Assist to help suppress fires

**Look around the room for reference guides and examples!**



# Getting started with Glowforge Pro



Step One

Upload your file into the [Glowforge App](#)

Step Two

Select lines for cutting and select material to be used in the settings menu

Step Three

Place material into machine and close lid before checking placement via camera in the app

Step Four

Press PRINT button in app when your file is ready

Step Five

Press button on Glowforge once it is glowing



# More helpful links:



- Book online [HERE](#)
- Glowforge [Help Page](#)
- Epilog Zing [Video](#)
- [Epilog Zing 24 Manual](#)
- [Safety Orientation](#) for Fab Lab



# What if there is a fire?

## **Don't Panic**

1. Stop laser cutter by pressing stop button or open lid briefly to engage auto-stop
2. Keep lid closed and shut off air assist. Many fires will go out on their own
3. Grab fire blanket and extinguisher
4. Small fires that persist can be put out with blanket
5. Larger fires that are growing can be put out with extinguisher

\*If you must do this, call facilities and/or fire department\*





**These things are dangerous!**

**Don't be AFRAID.**

**Be INFORMED.**

1. Fires
2. Fumes
3. Burns
4. Eye Contaminates
5. Cuts

For real...be careful. Some things in the Fabrication Lab can seriously injure or kill you...and by *things* I mean LASERS.

# Important Takeaways

- Lasers are serious business, please do not use them if you do not feel safe
- Safety is priority and proper use of equipment is a close second
- Be cool and don't lose your Fab Lab privileges
- Use the guides we've made for you; they are all over the Fab Lab
- When in doubt, please ASK! This is a library, and we like questions!
- Scrap materials are FREE while new materials are limited and cost \$\$





A dark blue background featuring three glowing geometric shapes: a sphere in the upper left, a cube in the middle left, and a large torus (donut shape) in the lower left. All shapes have a teal-to-blue gradient and a soft glow.

## Ready to start lasering?

Head to the front desk and request your laser badge.

## Need some more time to learn?

Sign up for another Learning Lab and/or the Maker Mingle to learn from peers!

More questions? Email [centerforinnovation@faylib.org](mailto:centerforinnovation@faylib.org)