Laser Engraver
(Epilog Laser Helix)

What to bring:
- Materials
  - Up to 18" x 24"
  - See list of prohibited/allowed materials below
  - Can engrave cylindrical objects (vases, cups, etc.)
- Artwork/Text/Design for Engraving
- Flash Drive (to save your projects)

What is provided:
- Laser Engraver/Cutter
- Rotary Attachment
- Design Software, including CorelDRAW

Instructions:

Call (330-725-0588 x5017) or email (makerspace@mcdl.info) to schedule an appointment for training.

To use the Laser Engraver you will need to…
1) Select your materials.
2) Create your artwork file in CorelDRAW.
3) Select and apply your settings.

Tips:
- Every type of material will react differently with the laser.
- Similar materials use similar settings.
- Test your material, before attempting your entire project.
- Run only one part of the file to test that your settings.
- When in doubt, start low: Remember, you can always re-run your job as long as you don't move it in the machine.

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Select Your Materials

Prohibited Materials

These materials may be hazardous to user's health and/or may damage the equipment.

Materials that will not cut successfully on the laser engraver.	
Material	**Danger**
HDPE (Milk Bottle Plastic)	Fire Hazard
Polycarbonate/Lexan (>1mm)	
Polypropylene Foam	
Polystyrene Foam	
ABS	Health Hazard – Cyanide Gas
PVC (Poly Vinyl Chloride)	Health Hazard – Chlorine Gas
Vinyl	
Pleather/Artificial Leather	
Coated Carbon Fiber	Health Hazard – Noxious Fumes
Fiberglass	
Rubber	

Materials that will not etch successfully on the laser engraver.	
Material	**Danger**
Lead Crystal	Health Hazard – Crystal Shatters

Allowed Materials

Material *Notes, Tips,* *Warnings*	Action	DPI/Freq	Power
Acrylic *Cuts extremely well, leaving a beautifully polished edge. Cutting Note: Adjusting the standard focus distance so it is closer to the lens by about .030" (.762 mm) will produce better edge quality on 1/4" acrylic and thicker. Two passes may produce better results and allow for cutting through thicker materials. There are two types of acrylic: cast is better for engraving (creates a frosted look when engraved) and extruded acrylics are better for smooth-edged cutting.*	Photo Engraving	300 DPI	90s 50p
	Text/Clipart Engraving	300 DPI	90s 70p
	Text/Clipart Engraving	600 DPI	90s 65p
	Cutting 1/8" (3 mm)	5000 f	15s 100p
	Cutting 1/4" (6 mm)	5000 f	8s 100p
	Cutting 3/8" (9.5 mm)	5000 f	3s 100p

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Ceramic Tile *Apply dry erase marker to emphasize engraving*	Engraving		
Cork *Cuts nicely, but quality of cut depends on thickness/quality of cork. Engineered cork contains glue and may not cut as well. Cut up to ¼" thick.*	Engraving	300 DPI	90s 40p
	Cutting	500f	25s 40p
Fabric *When engraving fabric, try changing the graphic to 80% gray and use the Jarvis dithering pattern.* No plastic-coated or impregnated cloth!	Engraving/Cutting		
Fabric: Cotton *Also cuts well; test a swatch first and adjust settings as needed.*	Engraving	300 DPI	90s 20p
Fabric: Denim *Also cuts well; test a swatch first and adjust settings as needed.*	Engraving	300 DPI	90s 25p
Fabric: Fleece	Engraving	150 DPI	90s 25p
	Cutting	2500f	25s 15p
Fabric: Twill	Cutting	2500f	50s 40p
Glass *Green or dark colored glass works best and produces a sandblasted look. When etching glass, try changing the graphic to 80% gray before engraving and using the Jarvis dithering pattern. You can also diffuse heat by covering the glass with a thin sheet of dish soap.*	Engraving	300 DPI	25s 100p
Leather/Suede *Leather can be cut it thinner than a belt (1/8").* Real leather only. "Pleather" poses a health hazard.	Photo Engraving	300 DPI	90s 30p
	Text/Clipart Engraving	600 DPI	90s 40p
	Cutting 1/8" (3mm)	500f	30s 70p
Magnetic Sheet *Cuts beautifully.*	Cutting		
Metal: AlumaMark	Engraving	300 DPI	90s 35p
	Engraving	600 DPI	90s 25p

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Metal: Anodized Aluminum *Vaporizes the anodization away. We find when engraving anodized aluminum, text appears best at 600 DPI, but photos and clipart can be engraved with great detail down to 300 DPI.*	Photo/Clipart Engraving	300 DPI	90s 45p
	Photo/Clipart Engraving	600 DPI	90s 40p
	Text Engraving	600 DPI	90s 50p
Metal: Painted/Coated Metals *Vaporizes the paint away*	Engraving		
Metal: Painted Brass	Engraving	300 DPI	90s 45p
Metal: Stainless Steel w/ Cermark	Engraving	600 DPI	30s 100p
Paper, Cardstock *Cuts well and quickly.*	Cutting		
Cardboard *Cuts well. Watch for fire.*	Cutting		
Mat Board *Bottom-up engraving is suggested for mat board etching.*	Engraving	400 DPI	70s 80p
	Cutting	500f	20s 40p
Gator Foam *Can be cut if monitored. Foam core burned faster than top/bottom shell.*	Cutting		
Depron Foam *Must be constantly monitored. 1/4" cuts nicely, with a smooth edge.*	Cutting 1/4"		
Solid Styrene *Can be cut. Generates a lot of smoke.*	Cutting 1/16"		
Mylar *Cuts well if thin. Thicker mylar tends to warp and bubble. Gold-coated Mylar will not work.*	Cutting 1/16"		
Kapton Tape (Polyimide) *Cuts well in thin sheets and strips.*	Cutting 1/16"		
Teflon / PTFE *Cuts acceptably in thin sheets.*	Cutting (thin)		
Carbon Fiber Mats *Can be cut, very slowly. No epoxy applied. Carbon fiber that is coated is prohibited.*	Cutting		
Plastics *These settings work well with many plastics, including plastic phones and covers. Even one color plastics can achieve a great look when engraved.*	Engraving	300 DPI	90s 30p

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| Plastics: 2 Layer	Engraving	300 DPI	90s 70p
	Engraving	600 DPI	90s 60p
	Cutting 1/8" (3mm)	5000f	30s 100p
Polycarbonate Sheets < 1mm *Can be cut if very thin, but generally a poor materials to use due to discoloration.* Watch for smoking/burning.	Cutting < 1mm		
Coroplast "Corrugated Plastic" *Difficult to cut. May require multiple passes.*	Cutting 1/4"		
Stone, Granite, Soapstone, Onyx *Gets a white "textured" look when etched.*	Engraving		
Stone: Marble *Every marble is very different for settings. Start low and increase the power with a second run if you haven't used that marble before.*	Photo Engraving	300 DPI	90s 45p
	Text Engraving	600 DPI	90s 55p
Wood *When cutting wood, multiple passes may allow cutting of thicker materials. You can readjust the focus between passes down to the center point of the cut for the best results.* *MDF/Engineered woods are acceptable to use, but may experience greater charring when cut.* *Use caution with plywood/composite woods; these contain glue and may not laser cut as well as solid wood.* *Avoid oily/resinous woods.* Oily/resinous woods may catch fire.	Photo Engraving	600 DPI	50s 100p
	Text/Clipart Engraving	600 DPI	40s 100p
	Text/Clipart Engraving	300 DPI	35s 100p
	Deep Engraving	600 DPI	20s 100p
	Cutting Thin Veneer	500f	30s 14p
	Cutting 1/8" (3mm)	500f	35s 100p
	Cutting 1/4" (6mm)	500f	15s 100p
	Cutting 3/8" (9.5mm)	500f	6s 100p

Create a File in CorelDRAW

These instructions cover the basics concepts of using CorelDRAW including:

- setting page dimensions
- shape tools
- text tool

They can be applied to nearly any document you create in CorelDRAW. Understanding these features will help you build a solid foundation to continue building your CorelDRAW and Laser Engraver skills.

The instructions below explain how to make a keychain in CorelDRAW on a laser engraver.

1. Open a new document on CorelDRAW.
2. Set the width and height of the page to 6" x 6".
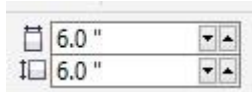
3. Go to the rectangle tool on the left side pane and select Rectangle.
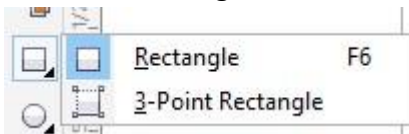
4. Draw a rectangle on the page and size it to 2.6" x 2.6".

   Make sure the lock key is off to size the rectangle exactly that size.

5. Hit "P" on your keyboard to center your object in the center of the page.
6. Use the Relative Corner Scaling tool on the ribbon to round the corners of your rectangle.
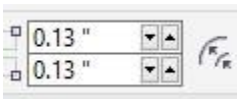
7. Use the Eclipse tool on the left pane and draw a circle.
8. Move to the top of the rectangle so it will sit on the border of the top.
9. Set the X-axis to 3" so it will exactly be in the center of the top border.
10. Make a copy of that circle by using Control + C while selecting the circle.
11. Use Control + V to paste and it will be sitting on the original circle.
12. Use the selection tool to move one circle to the side.
13. Use the selection tool to select the design that has circle and rectangle together.

14. Use Object>Shaping>Weld to weld these two pieces together.
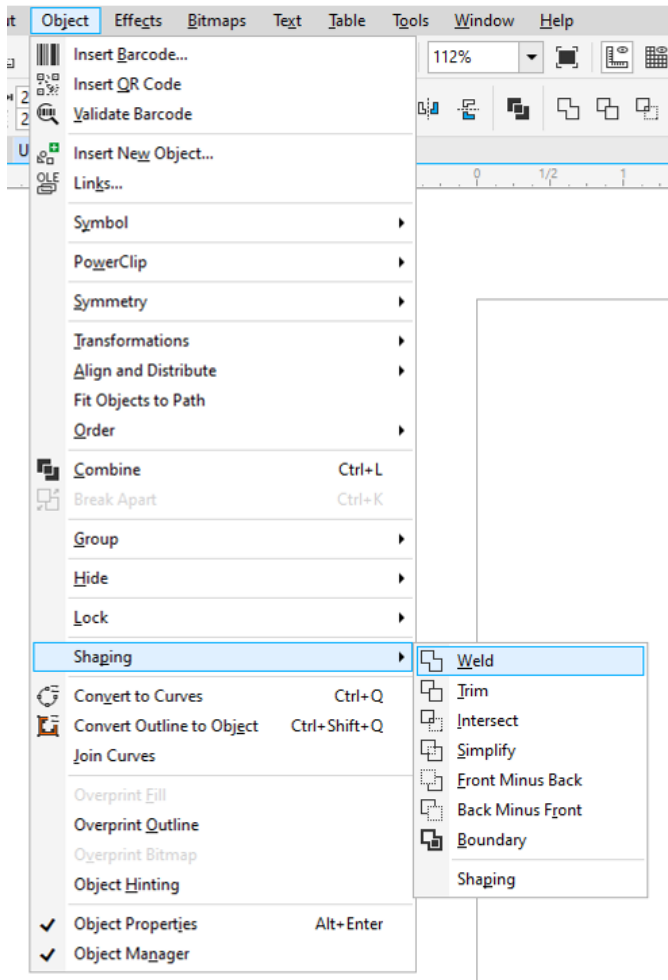
15. Move the other circle into the welded object.

16. Make it smaller by using the mouse from one of the corners and place right below from top line so the object will create a hole for a key holder.

17. Select the entire image with the selection tool and do Control + G to group as one image.

18. Click on the text box tool on the left pane and draw a text box inside the object.
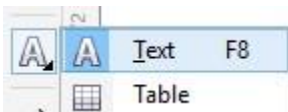
19. Change the font style and size as you wish.

   a   You can use Center tool to center your text in the object.

20. Once the object and the text is all set up, use the Select Tool to select the entire object with text box inside and use Control+G to group.

a   With the group selected change the Outline Width to Hairline so the Laser knows it's a cut.

21. Move the entire object to top left corner.

22. While selecting the entire object, go to Edit>Step N Repeat.

23. Set the measurements on right pane to make a duplicate on the right. Click on Apply.
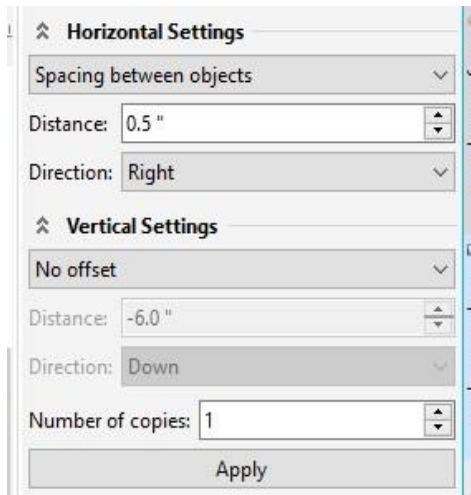
24. You will see another duplicate copy on the right.

25. Select both images with selection tool. Set the Horizontal settings to No Offset

26. Set the Vertical Spacing between objects as .1" and direction Down and click on Apply.

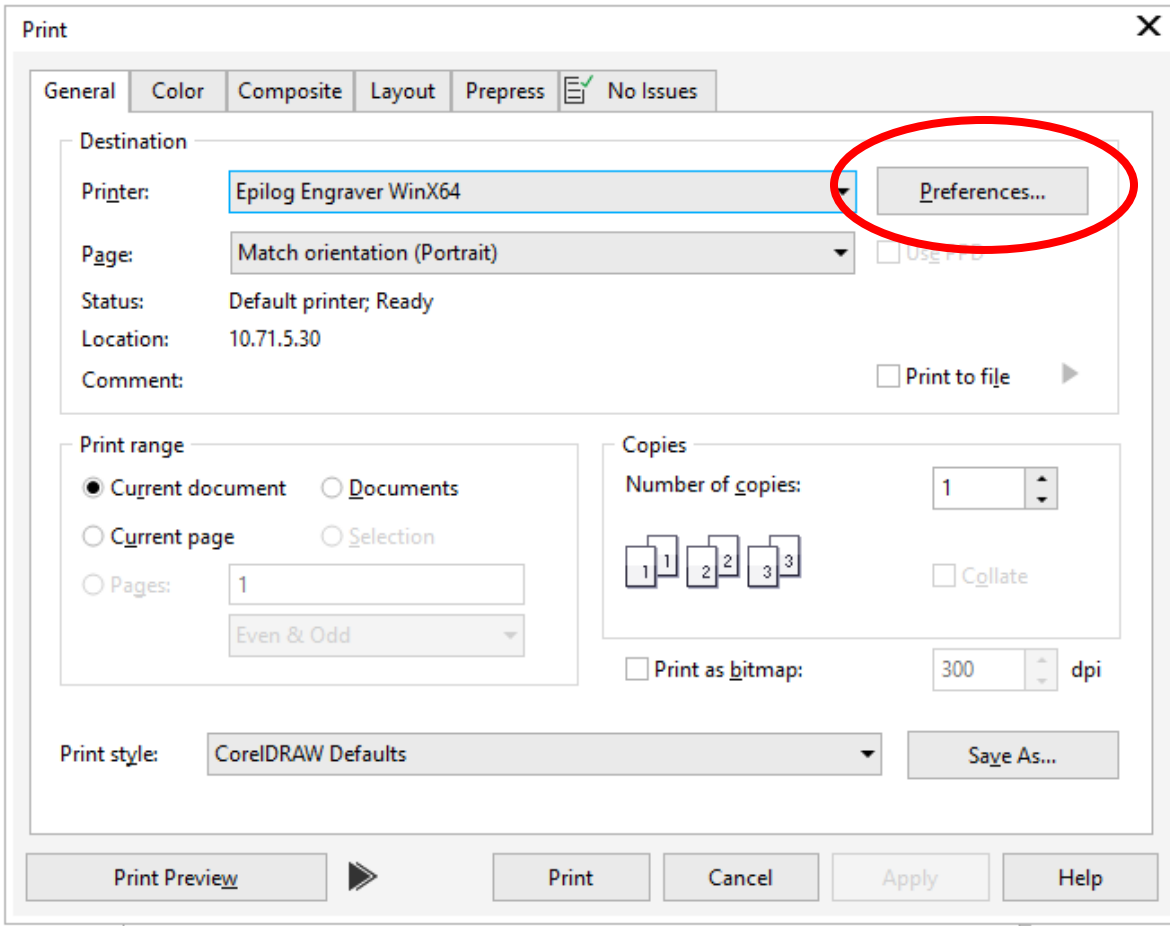27. Move the objects around so it looks like the example below.

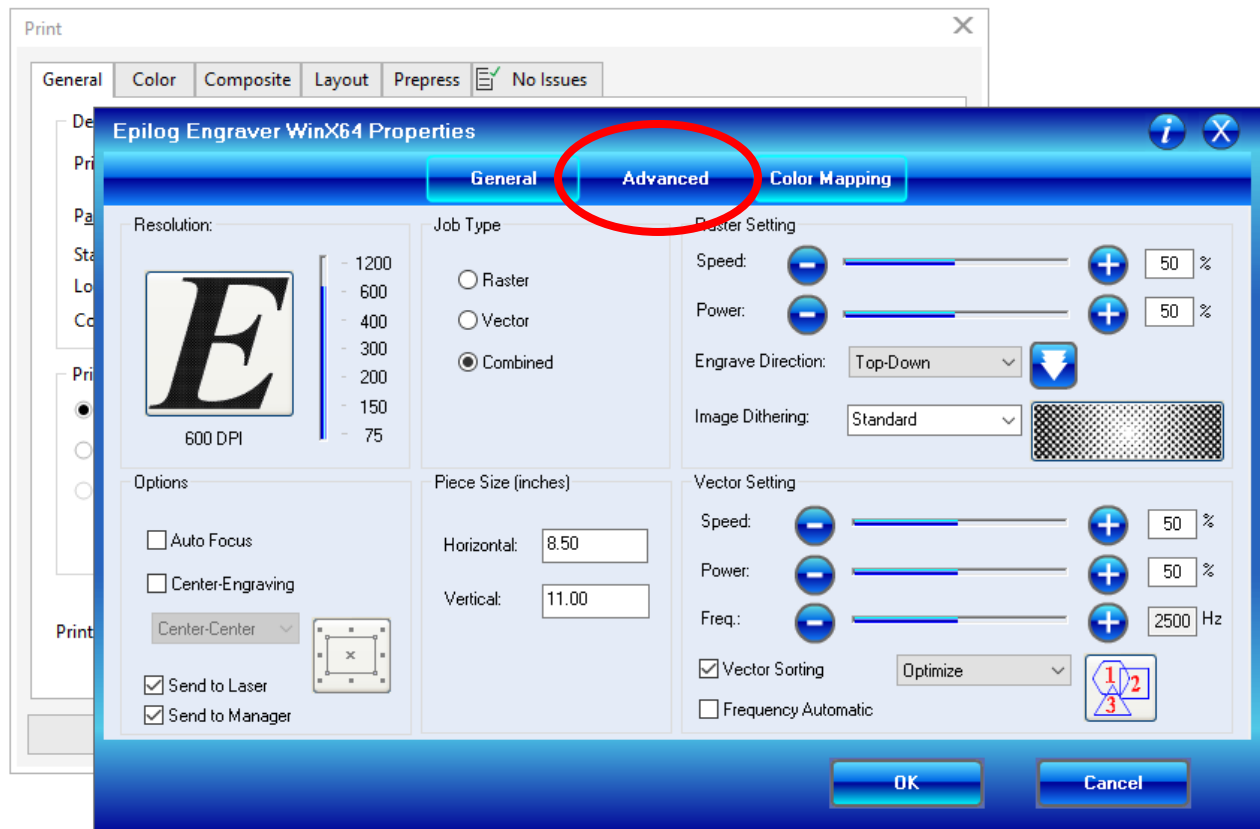28. Save as a CorelDRAW file on a flash drive.

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Select and Apply Your Settings

In the CorelDRAW Print Dialog window, select "Epilog Engraver WinX64" as your printer. Then click "Preferences."
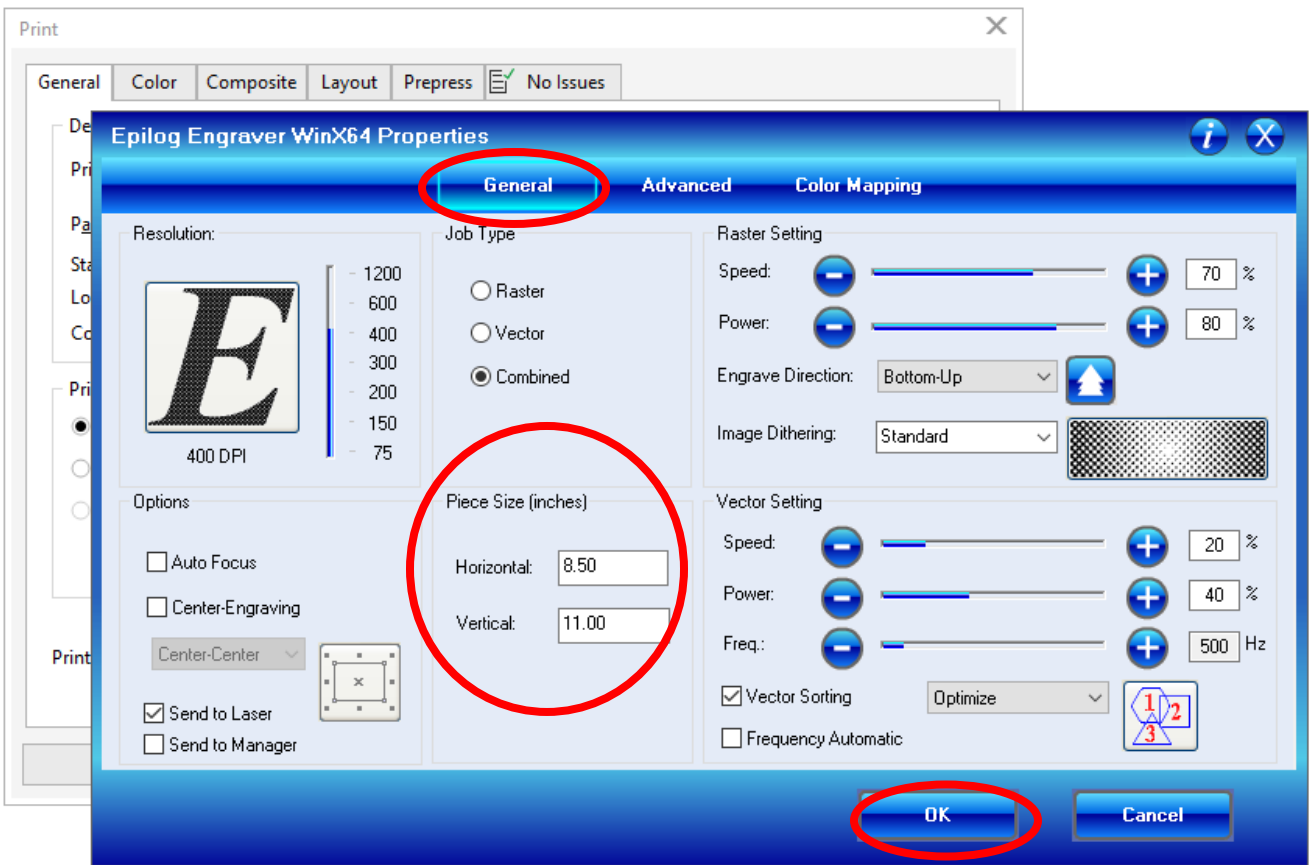
Once the Epilog Engraver WinX64 Properties window opens, click on "Advanced."

In "Advanced," scroll through the available material profiles until you locate the material type with which you are working. Click on the material you are using, then click "Load."
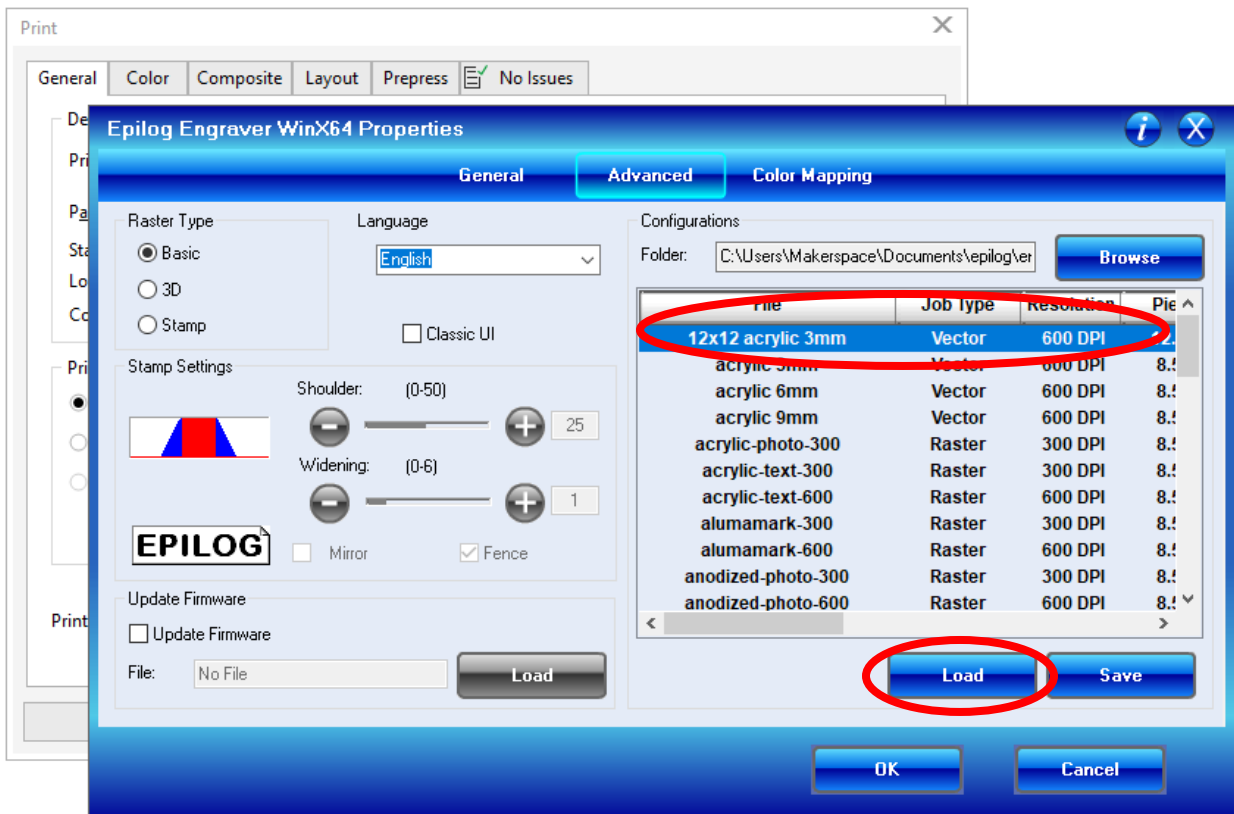
Once the profile has loaded, click on "General." Verify/enter the correct size of the piece you want to engrave/etch.

After verifying the size of your material, click "OK." You'll be returned to the main Print dialog window.

Verify that there are "no issues" (see tab at right), then click "Apply" and click "Print." Your job will then be sent to the Epilog Laser queue and is available for release on the Epilog Laser.