Epilog laser cutter

Suitable materials for laser cutting:

- Wood: solid wood, plywood, medium-density fibreboard (MDF), high-density fibreboard (HDF), …
- Acryl
- Card board, paper
- Textile, leather…

Preparing the file:

- For the cutting, you need vector file in a format that can be opened with Adobe Illustrator (dxf, dwg, svg, pdf, eps, ai etc.).

- For engraving grayscale, images are preferred.

- Lines what you want to cut must be 0.01 mm thick. Other lines and areas are understood as areas to be engraved. Line weight is adjusted in Adobe Illustrator.

Step-by-step instructions:

1. Focusing the laser

Before cutting, the laser must be focused. Place the material you are using on laser's work surface. You can find tape, weights etc. from the metal cabinet next to the laser cutters. Focusing happens using the cutter's control panel (Fig. 1). Use the up and down arrows to select focus from the list.

Fig 1: Control panel in focus mode

After that place the focusing tool (metallic triangle found from the cup at the left corner of the cutter) to its place according Fig.2 and adjust the height of the platform so that that the focus is right using the joystick. Focus point of the laser is in the tip of the tringle. Focus is adjusted right when the focus point is in the middle of the material.

Fig 2: Focusing triangle at right height for 6 mm plywood

After focusing, take the tringle away and put it back to its place.

2. Set the origin

Set the origin or the reference point. This is the point on the material that corresponds to the upper left corner of the document containing the artwork to be cut or engraved. (When center engraving, the origin should be set in the center of the material's surface to be engraved.) Procedure for setting the origin:

Place the material to be cut or engraved in the upper left corner of the table (or anywhere on the table).

*Select **JOG** on the laser machine's control panel using the **arrow keys**.*

Fig 3: Control panel in JOG mode

Use the **joystick** to move the lens carriage to the desired position.

When the origin was chosen, press the joystick to **set the origin (it will show on the control panel's screen +0.02 +0.02**).

3. Editing the artboard

Measure the size of your material if not known beforehand (you can find measuring tape from the metal cabinet next to the laser cutters). Open your file in Adobe Illustrator using File → Place. This maintains your document settings and panels (if you have a non-illustrator file and you open it from File → Open, it removes your document settings). Adjust your artboards size to match your material size. To do this select "document setup" from the upper panel shown in Fig 4.

Fig 4: Top panel when program is started

Then select "edit artboards" from the window presented in Fig 5.
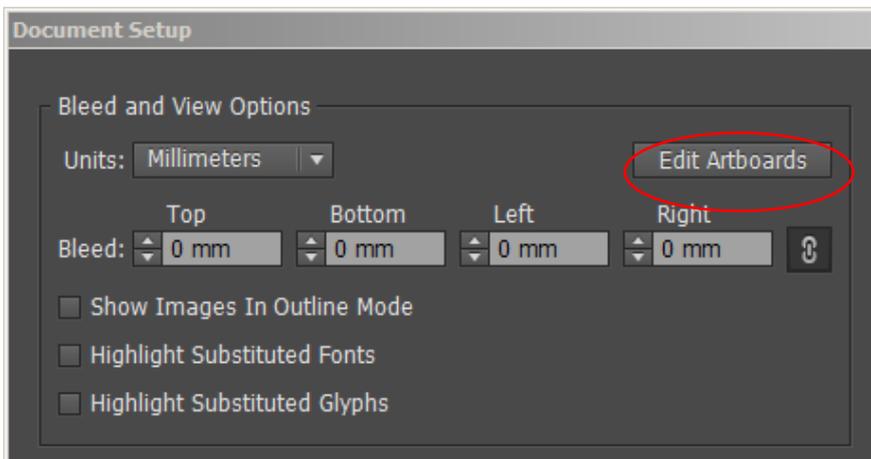

Fig 5: Document setup

Edit artboard's size by adjusting W and H values presented in Fig 6.

Fig 6: Artboard setup

Adjust lines that you want to cut to 0, 01 mm thick (line colour does not matter) (Fig 7.).

Fig. 7 adjusting the line thickness.

4. Preparing printing

Select print. You should see window presented in Fig 8. For the printer select "Epilog Engraver WinX64 Fusion". After that, select "Setup…" and then "Continue".
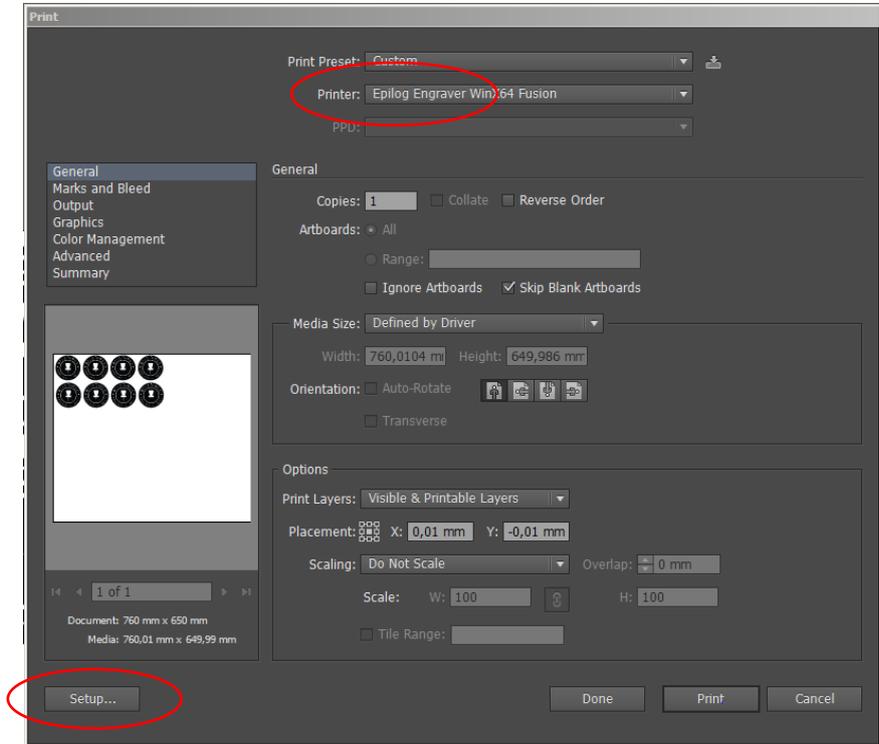

Fig 8: Illustrators print window

You should see window presented in Fig 9. Select "Epilog Engraver WinX64 Fusion" and then "Preferences".
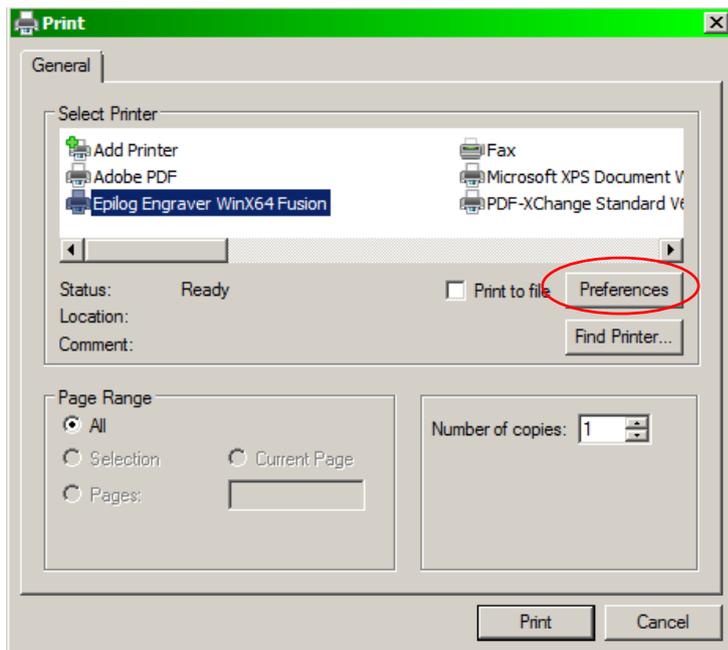

Fig 9: Print setup

Printing preferences window opens up (Fig 10). All the cutting and rasterizing settings are set in this window. Preferences that must be adjusted are the following:

- Job type
    - Raster
        - engraving pictures (line weight anything but 0.01)
    - Vector
        - cutting or drawing (line weight of 0.01)
    - Combined
        - Lasers first the rasterized areas, then vector areas
- Piece size
    - Size of your art board in Adobe Illustrator
- Raster Settings
    - speed, power, frequency and image dithering can be looked from examples
- Vector Settings
    - speed, power and frequency can be looked from example materials
    - for thick materials, multiple cuts might be necessary
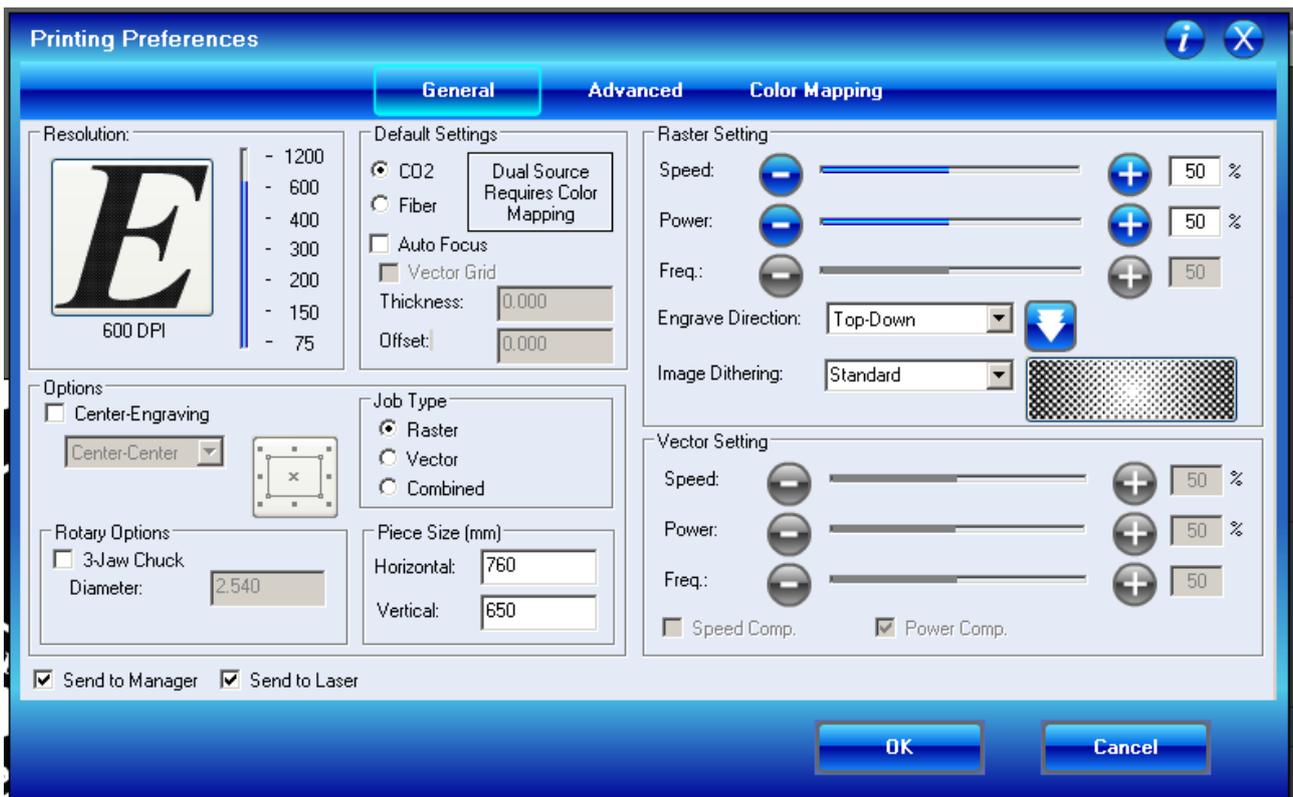- Engrave direction
    - When rasterizing, choose bottom-up

Fig 10: Printing preferences window

5. Printing

When settings are correct press "OK" and then "Print". After this, you should be back at the window in the Fig 6. Check that the preview image looks right. If not, try to press, "Done" and then choose again "Print" from the "File"- menu. When everything is ready press "Print". File is now sent to the cutter.

Check that your material is in the left-top corner of the printer. If the material is bent, it is possible to use weights. If using weights, makes sure that the weights are outside the printing area and the laser will not hit the weights at any point of the cutting. This is also the last chance to focus the cutter.

When everything is ready, select Job from the control panel (Fig 11) with arrows. Make sure that your file has completely transferred (the data light stops flashing). You can choose files from the list using the joystick; the latest file has the largest number. When you have the correct file in the screen press the green "GO" -button. Cutting will start. Remember to stay near the cutter at all times so if something goes wrong you can stop cutting.

Fig 11 Choose Job from control panel and make sure that the Data light has stopped flashing.

If something goes wrong, the laser can be stopped by opening the lid or pressing the "Stop"-button. Note that opening the lid only turns the laser off but does not stop movement of the lens. Printing can be continued after pressing stop by pressing the "GO"- button again.

6. Finishing and cleaning up

- Remove any remaining stock material from laser's working surface
- Take all the materials you have used back to the metal cabinet
- Do not turn off the power from the laser
- In the evening if you are the last user of the day, allow ample time for the laser to cool down after working, before turning it off
    - 15 minutes for short, under 30 min jobs
    - 45 minutes when the laser has been on all day

7. Never cut these materials:

Not allowed material	DANGER!	Cause/Consequence
PVC (Poly Vinyl Chloride)/vinyl/pleather/artificial leather	Emits chlorine gas when cut!	Do not ever cut this material, as it will ruin the optics, cause the metal of the machine to corrode, and ruin the motion control system.
Thick (>1mm) Polycarbonate/Lexan	Cuts very poorly, discolors, catches fire	Polycarbonate is often found as flat, sheet material. The window of the laser cutter is made of Polycarbonate because *polycarbonate strongly absorbs infrared radiation!* This is the frequency of light the laser cutter uses to cut materials, so it is very ineffective at cutting polycarbonate. Polycarbonate is a poor choice for laser cutting.
ABS	Melts	ABS does not cut well in a laser cutter. It tends to melt rather than vaporize, and has a higher chance of catching on fire and leaving behind melted gooey deposits on the vector cutting grid. It also does not engrave well (again, tends to melt).
HDPE/milk bottle plastic	Catches fire and melts	It melts. It gets gooey. Don't use it.
PolyStyrene Foam	Catches fire	It catches fire, it melts, and only thin pieces cut. This is the #1 material that causes laser fires!!!
PolyPropylene Foam	Catches fire	Like PolyStyrene, it melts, catches fire, and the melted drops continue to burn and turn into rock-hard drips and pebbles.
Fiberglass	Emits fumes	It's a mix of two materials that cant' be cut. Glass (etch, no cut) and epoxy resin (fumes)
Coated Carbon Fiber	Emits noxious fumes	A mix of two materials. Thin carbon fiber mat can be cut, with some fraying - but not when coated.