

Preparing for LASER CUTTING

General:

A laser cutter is a technological equivalent to a pen plotter - only instead of moving an inked tip around the plot area, it moves a laser. Our laser cutting machine is a Euro Laser LCSM-800 of 100 watts with a cutting area of 800 x 1200 mm.

The laser cuts through cardboard, wood and acrylic plastic. **It is NOT possible to cut metal, glass or PVC plastic.** As the laser beam is not actually cutting but burning through the material, you will always get brown edges on the cut if cutting paper or wood.

The laser cutter can perform two basic operations: engraving and cutting. Engraving is similar to drawing; it involves marking the surface of a material. Cutting involves cutting completely through a piece of material.

To use the machine, students need to complete a laser cutter induction given by the Fabrication Lab Manager. **Students are not allowed to use the machine themselves** but can deliver a digital file to be loaded and laser cut by the lab assistants. The machine can be booked via an online booking system. The use of the machine is free of charge but students pay for their own material cost.

Help us be efficient, operate with safety and keep down excessive waste by following the instructions below.

Before Cutting:

- Consult and get approval by the assistant about the approximate time you will need and the type/size of the material you intend to use.
- Book an appointment @ <http://F-LAB.ClickBook.net>
- Purchase your material and arrange for transportation of your material at the lab in advance.
- Prepare your files and have them on a USB stick (see instructions below). **If your files are not up to standard then you might lose your appointment.**
- Be there on time, otherwise your appointment will be cancelled.

Prepare your files in AutoCAD

- **Check your Margins** - Our laser machine has a cutting area of 800 x 1200 mm. On every edge, we want a safety margin of 10mm, which lands you with a maximum working area of 780 x 1180 mm. This does NOT mean that all material put into the laser has to fill out the whole working area.
- **Reduce Waste** - Draw all your pieces and Pack them together as tightly as possible in rectangles of 780 x 1180 mm.
- **Flatten Your Drawings** - (Type the command "flatten" (this command will take all the geometry and place it on 0 in the Z)
- **Delete duplicate Lines** - (Type the overkill command in AutoCAD to remove duplicate lines)
- **Use Layers** - Separate cutting by engraving by placing geometry in different layers and assigning different colours. These colours have to correspond to the colours of the machine, so make sure you use the base colours "red", "blue" etc. in AutoCAD. You should use the following layers/colours:

Default/BLACK - Simulating

Cut/RED - Cut

Engrave/BLUE - Engrave

- **Create Text that can be cut or engraved** - Use Single Line Text (Fonts in the ISO "family") or convert your text into polylines (Once you go through this process you will not be able to edit the font, so make a copy). To convert text into polylines type the command "txtexp". This command will basically explode the fill of the text to create edges. This command will create polylines and some superfluous lines in the middle of text. The best way to handle this is to explode all polylines and delete any unwanted lines.
- **Draw in millimetres and make you drawing 1:1** i.e. the actual size of your pieces.
- **Do not use any lightweights**. Everything should be set to 0.00 mm
- **Export your files in *.dxf format** AutoCAD 2004/LT2004 DXF

After Cutting:

Wait a few seconds for any residual smoke to be removed and ask the assistant for clearance.

Collect your pieces and dispose any unwanted leftover material before you leave the lab. Any material that is left to the workshop will be regarded as unwanted and will be handled accordingly.

Don't forget your USB!