



How Do I Prepare for Laser Cutting my Architectural Model?

A step-by-step guide By: Eng. Mohammed Akilah
Instructor of Architectural Engineering Department

Step #1: Decide on Your Model Scale.

- 1/50? 1/100? 1/200? 1/500?
- Chose your scale depending on the size of your building. Make sure your model is not too small and not too big either so you can carry it around.
- Remember the larger your model, the more detail is expected for your model to have. I.e., a 1/50 scale model is expected to have more details than a scale 1/200 model.
- Once you have decided on your model scale, you will need to draw your model pieces based on the scale you have chosen.
For example, if I want to cut my 10m*10m floor slab and I have chosen the scale of 1/100 for my model then I will need to draw my slab as 0.1m*0.1m or 10cm* 10cm or 100mm*100mm*. Because the machine reads your drawing as a 1/1 scale.
- You have the freedom to chose whatever unit you like to use: m, cm or mm. However, don't mix units and remember your unit choice for later as when to import your drawing into the laser cutting machine.

Step #2: Decide on Your Model Materials.

- The machine we have in our lab can cut or/and engrave various materials as shown in Figure #1.
- Once decided, go ahead and purchase the material sheets from stationary shops.
- Our machine can cut up to 3mm thick sheets, so do not purchase any material thicker than 3mm.
- Our machine have a large work area of 1.9m*1.0m. So, you will not need to worry if the sheet you are purchasing is too large most of the time.

LASERABLE MATERIALS					
MATERIALS	CUT	ENGRAVE	MATERIALS	CUT	ENGRAVE
PAPER	✓	✓	MYLAR	✓	✓
CARDBOARD	✓	✓	PLASTIC	✓	✓
PRESSBOARD	✓	✓	SILICON WRISTBANDS/BRACELETS	✓	✓
FOAM BOARD	✓	✓	RUBBER (Gum elastic or India rubber)	✓	✓
CORK	✓	✓	DELRIN	✓	✓
MATTE BOARD	✓	✓	ACRYLIC	✓	✓
MDF (Pressed cardboard)	✓	✓	CORIAN	✓	✓
TEMPERED HARDBOARD	✓	✓	MELAMINE	✓	✓
PLYWOOD (Pressed Wood)	✓	✓	FIBER GLASS	✓	✓
WOOD VENEER	✓	✓	GLASS (TEMPERED) AND CRYSTAL	✓	✓
WOOD	✓	✓	CERAMICS	✓	✓
FABRIC, DENIM	✓	✓	MARBLE, ONIX and STONES	✓	✓
FELT, TACKLEWILL	✓	✓	TILE	✓	✓
COTTON FABRIC AND MIXED FIBERS	✓	✓	PAINTED METALS	✓	✓
FABRIC WITH THICK SYNTHETIC FIBERS	✓	✓	COATED METALS	✓	✓
LYCRA AND OTHER SYNTHETIC FABRICS	✓	✓	ANODIZED ALUMINUM	✓	✓
NATURAL AND SYNTHETIC LEATHER	✓	✓	BARE METALS	✓	✓
SUEDE, FLEECE.	✓	✓			

Figure #1 Laserable Materials



Step #3: Prepare Your Drawing File.

- The machine we have in our lab can read various file formats as Shown if Figure#2. However, the best file format to use is DXF.

Graphic format supported	BMP, JPG, GIF, JPEG, and JPE.
Vector format supported	ai, cut, dsb, dst, dxf, nc, oux, out, plt, smc, yln, ymd, saw, dat.

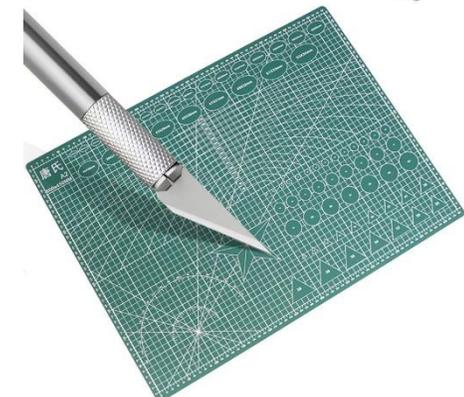
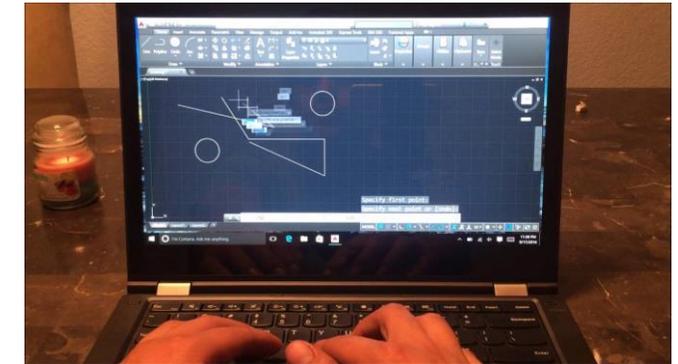
Figure #2 File Formats Supported

- How do I get a DXF file?
Simply prepare your file by drawing the individual pieces of your model in AutoCAD. Once your drawing is done then, save as “DXF”.
- How to prepare my drawing on AutoCAD ?
 1. Measure the dimensions of the material sheet you have purchased and draw the border of your sheet.
 2. Draw your individual pieces to scale inside the border of your purchased sheet.
The above two steps will help you to know if your sheet is enough or you will need to purchase more sheets.
 3. You can align your pieces next to each others sharing the same line as not to waste material. However, make sure there are no multiple lines drawn above each other or the laser will go over that line multiple times which may burn your material. You can use the AutoCAD command “OVERKILL” after you have finished drawing which will automatically delete all overlapped lines.
 4. If there are lines that you would like to engrave only and not to cut (for example engraving your name), then make sure these lines are on a separate AutoCAD layer. Give the layer a different color and call it “engrave”.
 5. If you have cuts within cuts, then it is recommended to separate using different layers. For example: I want to cut a circle inside a square, then separate the circle in a layer and call it “priority 1” and the square in another layer and call it “priority 2”. This step will help telling the machine to cut inside pieces first. Otherwise, the square might move, and the location of the circle will not cut as intended.
 6. After done with categorizing your lines in separate layers, you can use the command “PURGE” to delete all unused layers.
 7. Last step: save your DWG file for if you will need to do some modifications later and don't forget to save as “DXF” as mentioned above as to be able to import it into the laser cutting machine.



Step #4: Laser Cutting.

- Once ready, Book an appointment for laser cutting by sending an email to Makilah@Alfaisal.edu
- In your email, indicate for what course you're doing the laser cutting for and the name of the course instructor.
- What to bring with me during laser cutting day?
 1. A flash memory with your DXF file in it.
 2. Your Laptop with AutoCAD installed on it. Because sometimes you will figure out that you did a mistake in your drawing and you will need to correct.
 3. A ruler or a scale ruler, to check if scale is correct.
 4. A cutting mat (the larger the better) and a surgical knife. Sometimes the laser will cut like 90% through the thickness of your sheet, so you can use the surgical knife to complete uncompleted cuts.
 5. You can bring the glue of your choice with you as well if you plan to assemble your model in the lab. We have tables for you to work.





Digital Fabrication Lab BC-10

The lab is located in the basement next to the ramp of student's garage carpark

thank
you