

FILE TYPES for WEEK 1

The Following are exported by Slicer:

DXF

AutoCAD DXF (Drawing Interchange Format, or Drawing Exchange Format) is a CAD data file format developed by Autodesk[2] for enabling data interoperability between AutoCAD and other programs.

EPS

Encapsulated Postscript Vector graphics (Adobe Illustrator) EPS is a file extension for a graphics file format used in vector-based images in Adobe Illustrator. EPS stands for Encapsulated PostScript. An EPS file can contain text as well as graphics.

For our purposes, export EPS files from Slicer (and unzip) to open in Illustrator

.AI - illustrator file (this is the file type you will need to send to the laser cutter)

SLICER FOR FUSION 360

OPEN SLICER AND IMPORT AN OBJ

Laser Cutting from Slicer

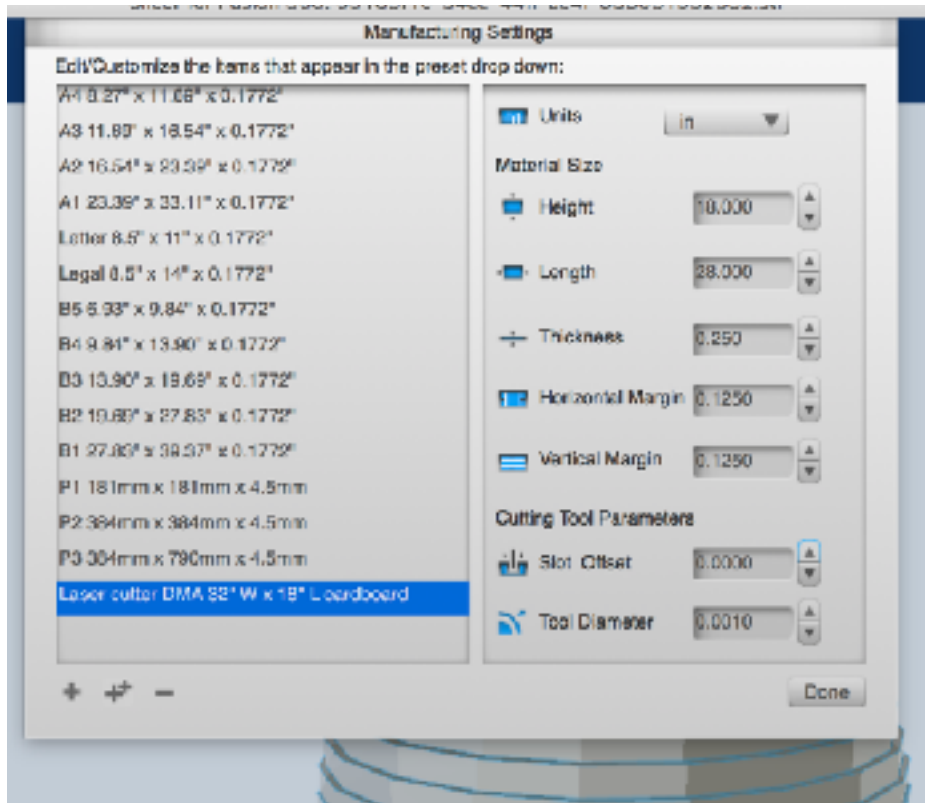
Click the Manufacturing Settings PENCIL icon to Edit/ customize size

Click plus sign to Add a material, name it something like “Laser cutter DMA 32” W x 18” L Cardboard” (you may need different custom settings for different materials with different thicknesses)- accurate thickness is very important !!!

Height = 18, Length = 32, Thickness = CHECK IT (the cardboard we have in the shop is 0.250”), Margins: 0.125”

Slot Offset = 0 (see below, you may need to test),

Tool Diameter = 0.001



Slot Offset:

“An important setting is Slot Offset: Set the cut width to determine how wide the actual cuts on your cut sheet are. The cut width is based on how much material your cutting tool (laser, saw, etc.) removes. This makes assembly easier. A slot offset of “0” creates a notch that equals the material thickness.

Depending on the material you intend to use, a Slot Offset of 0 could make assembly difficult to slide one piece through another. Decreasing the slot size will force slices to have to squeeze together (fine for cardboard), increasing it allows for “breathing room” in the notches during assembly (helpful if your material, for example plywood varies slightly in thickness).

When I did this example, my pieces were a bit tight and hard to get together. If I were doing it again with the 5.2mm thick plywood veneer, I would add a 0.02 slot offset or so.”

- Autodesk User

Former 123D make steps: <https://www.slomakerspace.com/laser-cut-a-3d-object-using-123d-make/>

Get Plans > File Type: EPS for import into Illustrator
Export to My Computer

Open Adobe Illustrator
New >

- File > New...
 - Orientation = Landscape
 - Units = Inches
 - Width = 32 in.
 - Height = 18 in.
 - Advanced > Color Mode = RGB
 - Raster Effects = Screen (72 ppi)
- Your life will be **much** easier if you use [the template](#).

In Illustrator, you may need to check / change your Units

File > Preferences > Unites > Stroke > Inches

File > Open > YOURFILE.eps

If you reversed your height / length in Slicer, you may need to rotate the orientation in illustrator

To change your EPS file, **right click > Ungroup** all vector lines

Select a line that is a color that needs to be changed (see below), then choose

Select > Same > Stroke Color

In the stroke color, if there are question marks you've selected more than one color

In the stroke color, if it is red or blue change it to purple for now by double clicking

Then select another color that needs to be changed, change blue to red or red to blue, then select your purple strokes and change them to the correct color as well

Highlight and change Stroke of Vector lines to match these guidelines:

All vector lines that you want **cut** through all the way should be:

Red (R = 255, G = 0, B = 0), Stroke = 0.001" (transparent fill)

All vector lines you want to be **engraved** (shallow incision):

Blue (R =0, G =0, B=255), Stroke = 0.001" (transparent fill)

All full shapes you want to **raster etch**:

Black (0,0,0) fill with transparent stroke

MAKE SURE there is a minimum of 0.125" of space between vector lines and EDGE of art board

Delete elements that aren't needed - the more you keep, the longer (and more expensive), your laser cut job will be. To delete certain items that may be connected, you may need to

Right click > Isolate Selected Compound Path

Then delete what you want, then

Right click > Exit Isolation Mode

**** If you're using the 28" cardboard, still make your illustrator dartboard 32"**

But use **View > show rulers** to drag a guide from the left Y-axis ruler to 28" on the X axis

Save and follow the rest of these guidelines:

- * uncheck pdf compatibility when saving
- * Keep dartboard at 32x18
- * Make sure scaling is "DO NOT SCALE" in File > Print options
- * WORKING WITH KERF: http://support.dma.ucla.edu/fablab/?page_id=176
- * DMA Laser cutter file prep: http://support.dma.ucla.edu/fablab/?page_id=116

SLICER CONSTRUCTION TECHNIQUES

Stacked Slices

Creates stacked slices to be assembled by laying atop each other (least economical in terms of material, but closest approximation for profile cutting as opposed to 3D cutting)

slice direction is important option

Other options: Dowels, dowel diameter, and shape of dowel cut (for aligning panels)

Interlocked Slices

Creates two axes of interlocked slices

Options / parameters: Method (by count or distance) - to determine number of slices in 1st axis and 2nd axis

Notch factor - distance of notches from center of edge they are on

Notch angle - angle of bevel of notches

Relief TYPe

Slice Direction

Curve

Creates two axes of interlocked slices - curve and intersecting

Options / parameters: Method (by count or distance) - to determine number of slices in 1st axis or curve

Notch factor - distance of notches from center of edge they are on

Notch angle - angle of bevel of notches

Relief Type

Slice Direction

RADIAL SLICES

Creates two axes of interlocked slices - radial extended from center, and horizontal
Options / parameters: Method (by count or distance) - to determine number of slices in 1st axis or Radial axis

Notch factor - distance of notches from center of edge they are on

Notch angle - angle of bevel of notches

Relief Type

Slice Direction

FOLDED PANELS

- Import model (the more complex, or the more polygons, the harder this model will be to use for this surface technique)
- Add/Remove custom seams based on practicalities, then click DONE on the bottom
- For fabrics, choose Joint Type: Seam or Ticked
 - **Gear**: for gears (sometimes works, but cuts / etches may be reversed)
 - **Diamond**: has small outside diamond tabs for folding and gluing (paper, maybe cardboard)
 - **Laced**: Holes in edges for outside sewing / lacing (moccasin style)
 - **Multitab** has rectangular tabs, and negative spaces for tabs (you see this used with acrylics / plastics often) - requires glue usually
 - **Puzzle** is similar to multi-tab but tabs flare out for puzzle-lock press fit
 - **Rivet** has tabs and rivet holes
 - **Seam** includes a cutting /sewing margin and darts for pinning
 - **Tab** is like multitab but tends to be smaller squarer tab joints
 - **Ticked** is good for sewing or general gluing / taping construction. It includes a margin (or scales up slightly) and numbered lines for alignment
 - **Tongue** has tabs without empty negative spaces — instead has 2 slits to slide tongue-like tabs into - best for paper

You will often be in the red for most of these with smaller models, because the joints are spaced too frequently

- The model should be BLUE
- If you're having trouble getting any of these to work, use Seam or Ticked, and create your own tabs in illustrator or construct in a way that they are not necessary
- **I highly recommend making your own custom joint type based on TICKED, as Slicer doesn't have a construction animation for folded panels**

3D SLICES

Models cuts / assembly for 3D-cuts in slices (closes to original 3d model / almost 3d printing technique of slicing), but does not create exportable files for these slices

No Plans available