

DXF Files

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1. What the colors mean to a laser cutter

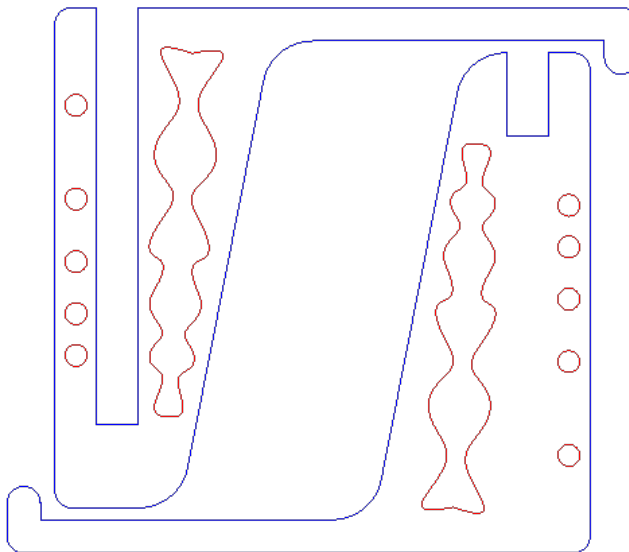
On older laser cutters, the color meanings are fixed:

- Red means “cut”
- Black or blue means “engrave”

Whether a laser cuts or engraves is a function of the power setting of the laser and the speed with which it moves. On modern laser cutters, the user can define powers and speeds for each available color. You can also specify the order in which colors are cut.

The general principle is to **engrave first, cut interior holes next, and cut the outline last.**

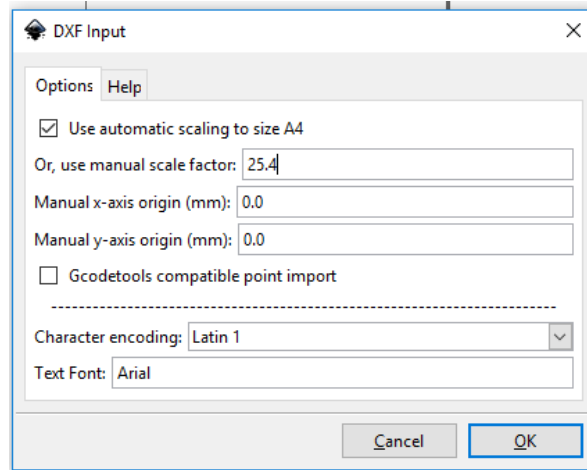
In the drawing below, both the red and the blue lines would have power and speed set for cutting, but all the red lines would be cut first followed by the blue lines. This ensures that the parts do not move before the final cuts are made.



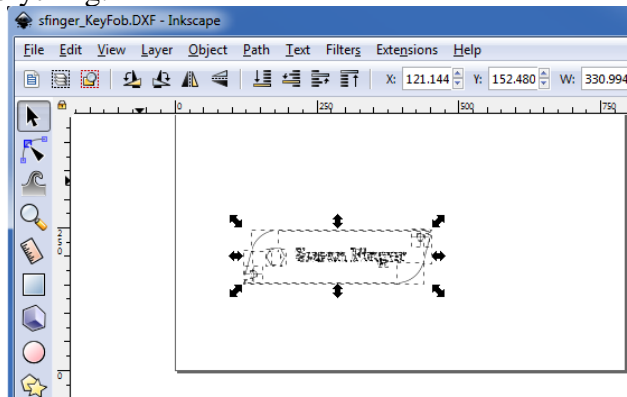
2. Coloring Your DXF file

First, start **Inkscape** and open `andrewid_KeyFob.DXF`.

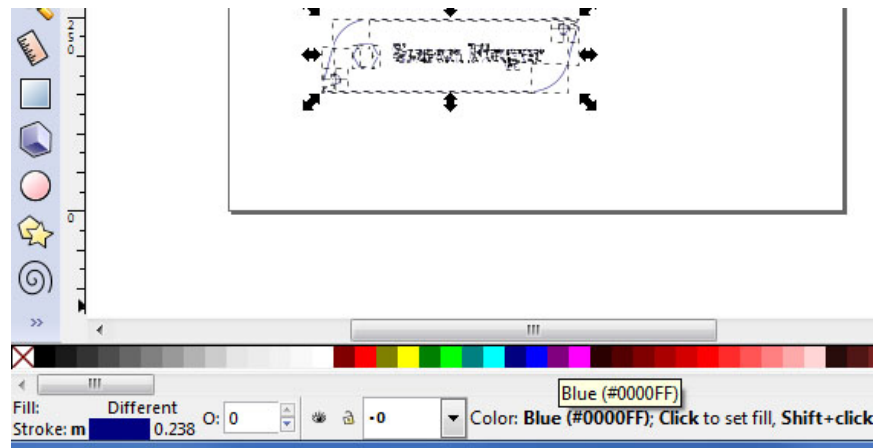
Remember that DXF files do not have units. So we need to set the manual scale factor to 25.4. (The number of millimeters in an inch).



Type **ctrl-a** to select everything.



Hold the shift key and click on blue to set stroke color. You can check in status bar at the bottom to see that the stroke color is set to blue. If you forget to press the shift key, Inkscape sets the fill color instead. Click on the X in the dialog box to remove the fill.



Press escape to deselect. All the lines in your part should now be blue. Blue means etch and we only want our name to be etched. Next we will set the fill color to red for the interior holes and the hexagon.

Use the + key to zoom in to make it easier to click on the different elements in your drawing. Click and drag to select the hexagon, then use the shift key to perform a multiple select of the interior holes.



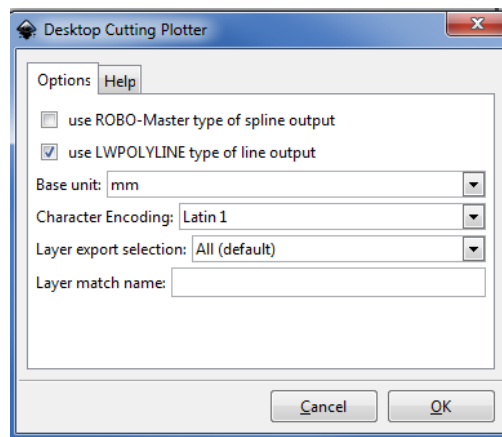
Change the stroke color to red. (Shift click red in the bottom color bar). Press Escape to deselect.



Finally, let's set a different color for the last outline cut. Since it doesn't matter, you can pick any color. I picked green. Remember you have to select the elements first and then set the color. Be sure you select all of the lines that make up the outline.



Now save the file as a DXF. The file type will say something like Desktop Plotter AutoCAD DXFR14. In the dialog box, set the output units to mm (not points).



Save your file to a flash drive or email it to yourself.

3. Assignment for today

1. Customize your key fob design.
2. Laser cut your key fob.
3. Email your SLDprt and DXF files to **laser-micro@ideate.cmu.edu**. This will upload them to a common box folder, so be sure your andrewid is part of the file name so I can tell them apart.
4. Post a picture of your key fob to Piazza.