Boss Laser 150 W SOP

Design Softwares

This process requires a **.dxf** file, which can be obtained through any software that produces vector graphics. "Vector graphics" are a type of digital file that uses a mathematical formula to produce an image. It can be resized infinitely without a decrease in quality, as opposed to "raster graphics," which become pixelated when enlarged. Many vector softwares produce .svg files, which can easily be converted into .dxf files through an online file converter. All softwares listed below are free or acessible through William and Mary

1. Inkscape: https://inkscape.org/
   a. Open-source software, free for all to download
   b. Great for converting images into laserable graphics
2. Adobe Illustrator
   a. Available through the Media Center at William and Mary
   b. Advanced options for converting images into laserable, vector graphics
3. AutoCAD and Fusion 360
   a. Student Liscence available through William and Mary: https://software.wm.edu/
   b. Create .dxf sketches
   c. Best for engineering and architectural projects
4. CorelDraw
   a. Available at the Makerspaces Laser Lab, Small Hall Room 269
   b. Similar capabilities to Adobe Illustrator

RD Works

RD Works is the software that we use to create files to run the Boss Laser system. This process sheet assumes basic understanding on creating designs.

1) Orienting: The gridded canvas represents the bed of the Boss Laser.
   a) Shape, line, and editing tools are located on the left panel
   b) Laser settings and layers are on the right panel
   c) The top panel has additonal configuration settings
2) Click "file", the "import" to add your .dxf to the canvas
3) After the design is created, assign different processes to each component by clicking on the line and assigning it a color from the color bar at the bottom of the program. Each color will group that portion of the design into a particular process.
4) Choose that process by double clicking on the color on the menu on the right hand side of the screen. Here, you can assign the speed and power of the laser for the process. Only the box next to 1, where you set the power for 1, should be checked, because we only have one laser head.
   a) Select cut if you plan a cutting operation, and scan if you plan an engraving operation
      Common Material Cutting/Scanning Values
      This laser is **150 Watts:** https://www.bosslaser.com/laser-settings/
   b) To change the laser frequency, select **Advance…** next to processing mode. This will allow you to change the frequency at which the laser fires pulses.
5) Snap your design to the upper right hand corner by selecting the **Top Right** ↗ icon. This will help you minimize material waste, while also giving you a better idea of where

on your material you will be cutting.   Resize your material to the proper length and width using the length and width icons on the upper left hand corner (measured in mm)

6) Export your file to a format the laser can read by selecting **SaveToUFile** below this menu on the right. The file should be saved to a flash drive so that it can be copied to the laser memory.

Running the Laser

1) Take machine out of emergency stop and use key to turn the system on. At this time, you should also turn on the coolant next to the machine: it will beep at you for a few seconds, and then stop.
2) Place your stock on the laser bed aligned with the slats or edge of the diamonds, if using the mesh bed. Lift the laser head above the material using the **z-> z move**, and then focus it above the material using **auto focus**
3) After the z-axis is aligned, move the laser head to the upper right hand corner of the material. Set this as your origin by pressing **Origin**
4) Insert your flash drive and import your file by selecting **File**, then using the arrows to navigate to *Udisk*, toggling to select your file, and copy to memory. Press **Enter** to copy to memory. After your file is imported, press **Esc** until you leave the file screen and then **File** to select your file (pressing **Enter** to select it) to ensure that you are reading the file from the machine's memory, rather than your external flash drive.
   a) If you need to change any of your speed or power settings, press enter twice and use z to toggle between settings
5) Press **Frame** to ensure that you are lasing over the expected area of your material. Please try to minimize material waste by always cutting from the edge.
6) Turn Blower on by pressing the left arrow once. After a few seconds, it should begin to produce a loud sound. Give it a few seconds to turn on fully.
7) Press **Start**. Please watch your cut and be prepared to stop it if there appear to be any issues.
8) After the process is complete, lift the lid part way and hold it for 5+ seconds to ensure that all material is sucked back by the blower to avoid inhaling any particulates.
9) Remove your material from the bed, turn blower off by pressing right arrow once, turn off laser by taking out key and pressing emergency stop button, and turn of chiller.

Note: Before running your file, you may want to run the test circle program to ensure you have the correct speed and power for your operation. To do this, select the *testcirc* file and change the settings by pressing **enter** and using **z** to toggle between the different parameters. Values are changed by using the left and right arrows to reach the decimal value you want to change, and using the up and down arrows to increase or decrease the value.