ILS 9.150D	VLS 4.60
24"x36" *(23.75"x35.75")*	**18"x24"** *(17.75"x23.75")*
100watts *(2x50watts) CO2*	**50watts** *CO2*
COST	*COST*
0.50¢/min. (cutting time)	**0.30¢/min.** (cutting time)
MATERIALS	*MATERIALS*
art paper	**art paper**
chipboard (≤0.060")	**chipboard (≤0.060")**
museum board (≤0.090)	**museum board (≤0.090)**
wood (≤0.125")	**wood (≤0.125")**
plastics (≤0.125")	**plastics (≤0.125")**
fabric	**fabric**
DO NOT CUT THE FOLLOWING!	*DO NOT CUT THE FOLLOWING!*
metal, glass, polycarbonate, PVC, styrene, thick leather	**metal, glass, polycarbonate, PVC, styrene, thick leather**

Preparing artwork:

leave 1/8"-1/4" margin: **23.75"x35.75"** *ILS*
                            17.75"x23.75" *VLS*

if cutting:
linework must be in a vector graphic format*
    stroke: **0.01** or thinnest possible
    color: **RGB black** *(0-R, 0-G, 0-B) for* SCORE
            RGB red *(255-R, 0-G, 0-B) for* CUT
            RGB green *(0-R, 255-G, 0-B) for nested* CUT
    fill: **NONE** *(check for white!)*
    text: create OUTLINES

if engraving:
image must be in a bitmap format* (.tif or .jpg)
    color: **RGB black** *(0-R, 0-G, 0-B)*

PDX Fab Lab supported software applications:
    Adobe CS6 (Illustrator, Photoshop, InDesign)
    Autodesk Suite 2014
    Rhino 5.0
    Solidworks 2014
    SketchUp files are problematic. Import them into AutoCAD and use the "Overkill" command.

ASK SHOP STAFF FOR ASSISTANCE WITH LASER CUTTING!

General Overview:

Reservations:

Patrons who have completed orientation will be sent an invitation to view the [appointment calendar](). You will not be able to see the calendar unless you are logged into your Google Calendar account.

Reservations are required to use the laser cutter and should be used for processing files ONLY! Please do not tie up the laser cutter workstations with drafting work.

Only students and faculty actively enrolled or currently teaching in Portland may obtain access to use the laser cutters. Any student or faculty member that is new to the Portland campus must complete an orientation before using the laser cutter regardless of prior completion for a similar facility in Eugene. For more information, please see [Access]().

Do not use the laser cutters to fulfill internship requirements, unless you have checked with the manager.

Safety:

There are two major safety concerns when laser cutting, **starting a fire** and **releasing toxic fumes**.

To prevent a fire, you must *watch the laser cutter while your job is processing*. If there is any doubt about flaming or excessive smoking, please pause or stop the job and get assistance.

To prevent releasing toxic fumes, you must know the composition of your material before processing. *Please provide an MSDS sheet* on the material you would like to process, and use the expertise of a lab tech when questioning uncertain materials. If there isn't a power setting, do not cut it!

Settings:

The laser cutter allows 8 different RGB colors to access 8 different power settings for cutting and engraving. The colors must exactly match the chart below in order to access the print driver accurately.

	[R]	[G]	[B]
BLACK	0	0	0
RED	255	0	0
GREEN	0	255	0
YELLOW	255	255	0
BLUE	0	0	255
MAGENTA	255	0	255
CYAN	0	255	255
ORANGE	255	102	0

The print driver will process colors in the order as they are listed here. Therefore, objects colored **BLACK** *will cut first,* **RED** *second,* **GREEN** *third, etc.*

The print driver will process multiple objects with the same color in the order in which they are drawn. For example, if multiple objects are colored **BLACK***, the laser cutter will process the object arranged furthest to the back first and the object arranged furthest to the front last.*

The shop has a folder of file settings (*.las*) which reserve BLACK for scoring/engraving and RED or GREEN for cutting. These *.las* files can be found in a folder on the desktop (PDXFAB\Universal\Engraver Settings Files\...). If your material is not cutting or excessive smoke and flame persists, please pause the job and **consult a lab tech immediately!**

Preparing artwork:

Your artwork must be as clean as possible in order to ensure efficient processing. Overlapping lines and fills will slow processing speed and may promote increased smoking and flaming.

leave 1/8"-1/4" margin: **23.75"x35.75"** *ILS*
              17.75"x23.75" *VLS*

if cutting:
linework must be in a vector graphic format
   stroke: **0.01** or thinnest possible
   color: **RGB black** *(0-R, 0-G, 0-B) for* SCORE
       RGB red *(255-R, 0-G, 0-B) for* CUT
       RGB green *(0-R, 255-G, 0-B) for nested* CUT
   fill: **NONE** *(check for white!)*
   text: create ⓄⓊⓉⓁⒾⓃⒺⓈ

if engraving:
image must be in a bitmap format (.tif or .jpg)
   color: **RGB black** *(0-R, 0-G, 0-B)*

Transferring Files:

Do not use USB drives to transfer files! The equipment is connected via USB and connecting additional USB devices causes many performance issues with the workstations.

Please use [Mac-PC Exchange](#) to transfer your files. Instructions on connecting to AAAFileServer\Mac-PC Exchange can be found [here](#). Do not use PDXFAB to transfer or store files.

Transfer your file to the desktop. Do not open your file directly from the server.

Loading Power Settings:

There is a shortcut on the desktop to **PDXFAB**, which contains several folders for operating equipment in the lab.

Open the folder for the correct laser cutter you are using - *Universal ILS (red)* or *Universal VLS (green)*. You will see an *Engraver Settings Files* folder as well as a folder with *Templates* you can use to make a test cut.

Under Engraver Settings Files, you will find several *.las* files named according to material type and thickness (measure your material with the calipers). If you cannot find a match for your material, please consult with a lab tech, who will verify material toxicity and determine an appropriate power setting. Do not create and save your own material power settings!

Recommendations & FAQ:

Always perform a test cut before starting. Monitor the cutter closely while processing. When processing thicker materials >1/8", pause the cutter and verify that the material is being cut all the way through. If your materials are not being cut, consult the lab tech immediately. Maintenance is performed regulary to keep the optics clean and cutting efficiently using the preset power settings. Never adjust power settings yourself or try to perform maintenance on the optics.

Use tape to assist with holding down material and to facilitate removing small pieces from the cutter.

Store your materials flat. Warped materials can not be processed.

Beware of "scrap" materials. Unless you know exactly what it is, do not cut it!... especially polycarbonate!!!

If it does not cut through on the first run, you can not run the job again. Double cuts are not allowed! Beware of double linework in your file. Do not allow the cutter to process linework twice. Use "Overkill" in AutoCAD to remove any redundant geometry.

If your colors and linework do not appear correct in the UCP panel preview, you have an issue with either the color settings of your document, the width of your linework, or the color of your linework. Copying your artwork into one of the "test cut" files provided in the Templates folder prevents this from occurring.

Remove the top protective sheet when cutting acrylic. You may leave the bottom sheet as a backing to protect the acrylic from scorch marks.

Always set the format of your page in the software application you are using to match the physical dimensions and orientation of the cutting table you are using. Virtually everything should be laid out the same way they will appear and be processed physically by the machine.

GREEN has been added as a cut setting to assist with nested cuts. RED linework will be cut first and GREEN will be cut second. Nest RED linework inside GREEN linework before processing.

Student evaluation versions of AutoCAD place a BLACK watermark within your document and will scale your file to fit on the page. You can turn off BLACK from the print command settings in AutoCAD before sending your file to the UCP panel. If you need to score linework, you may use YELLOW, BLUE, MAGENTA, CYAN, or ORANGE. The power settings for these colors have been set to match BLACK. If confused, please consult a lab tech to receive assistance with setting this up.

Please be careful when placing and removing materials from the laser cutter. The optics can be easily damaged if brushed or bumped by your material. Remove materials before "punching out" cut pieces.

You are charged for your finished cuts. Test cuts are free and encouraged.

Clean up thoroughly after yourself - the cutting table, the desktop of the workstation, and the lab.

Prepare your page settings for printing:

open your document (see appendices for specific applications)
open the **test_cut** template using the same application (\\aaafileserver\PDXFAB\Universal\templates..)

Process a test cut with your material:

under page setup select either ILS9.150D or VLS4.60 as the destination printer
click "preferences" or "properties", next to the printer name
click the "Manual Control" tab *(Fig. 1a)*
click the "Engraving Field" tab *(Fig. 1c)*
click "max size" *(Fig. 1b)*
click "load" *(Fig. 1d)*
choose the appropriate .las file
click "ok" *(Fig. 1e)*
verify that the page is in landscape format
page size should be either 24"x36" for the ILS or 18"x24" for the VLS
preview the print file
click "print"
follow the instructions **"Process your PRINT file on the laser cutter"**
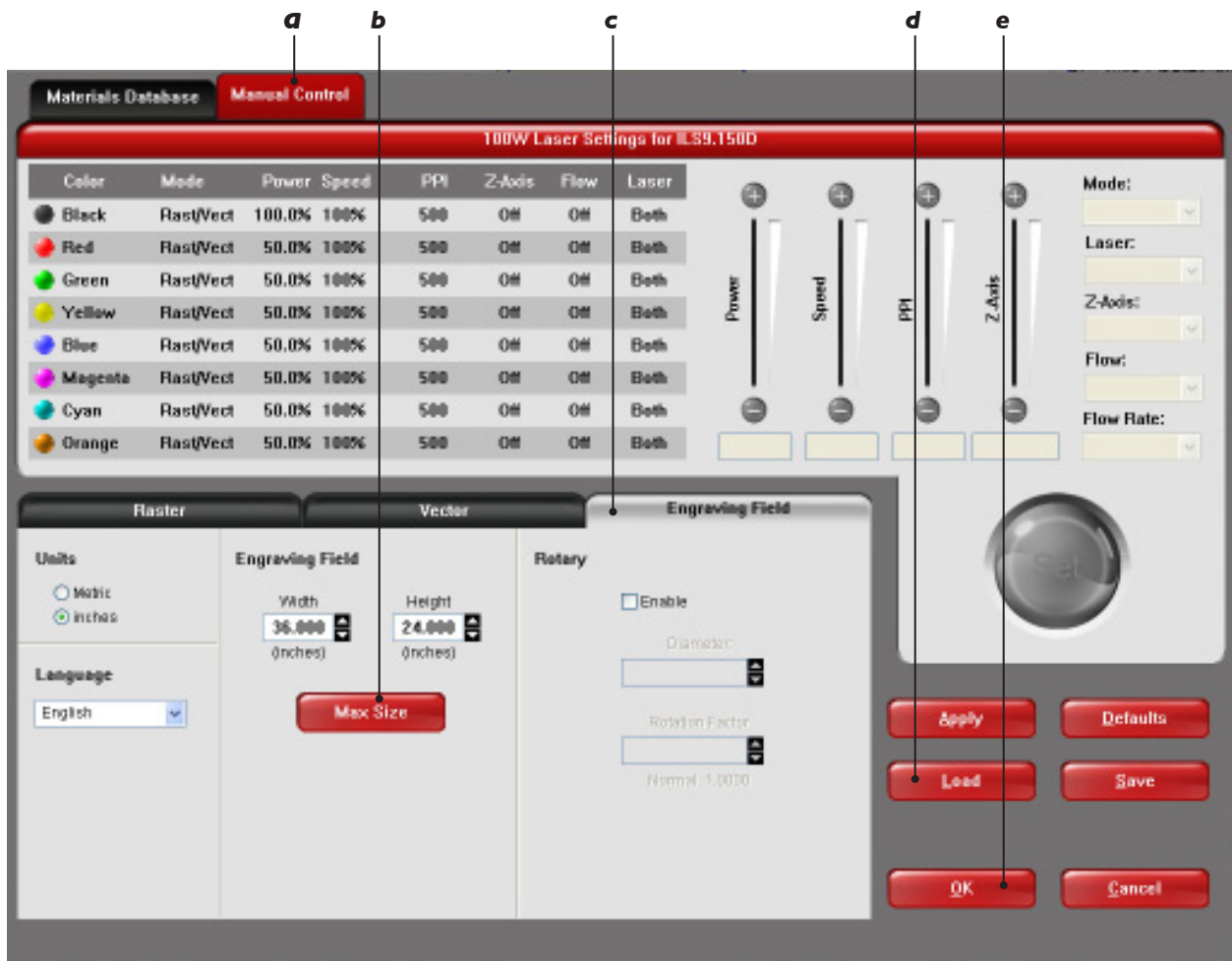after printing a **test_cut**, follow the same procedure to prepare and print your artwork

Fig. 1

Process your PRINT file on the laser cutter:

load your material carefully on the honeycomb bed
turn on the exhaust fan and laser cutter
open Universal Laser Systems Control Panel *(Fig. 2k)*
click "viewer" *(Fig. 2a)*
> your file should be loaded under "file" *(Fig. 2b)*

position your artwork using "relocate view" *(Fig. 2d)*
click "settings" *(Fig. 2j)*
click the "Manual Control" tab *(Fig. 2c)*
verify that your settings are appropriate for your material
> if not, click "load" *(Fig. 2h)* and select the appropriate .las file (PDXFabShare...\Engraver Settings Files)

click "ok" *(Fig. 2i)*
click "play" *(Fig. 2e)* and watch carefully for excessive smoke or flames
click "pause" *(Fig. 2f)* if you see flames

When your file is finished processing:

turn off the exhaust fan *(unless someone else is cutting!)*
open lid carefully and remove all material from the cutting table
record the runtime *(Fig. 2g)*

After your last job:

total your runtimes and close all applications
turn off the laser cutter and exhaust fan
clean the laser cutting bed and delete files from the workstation
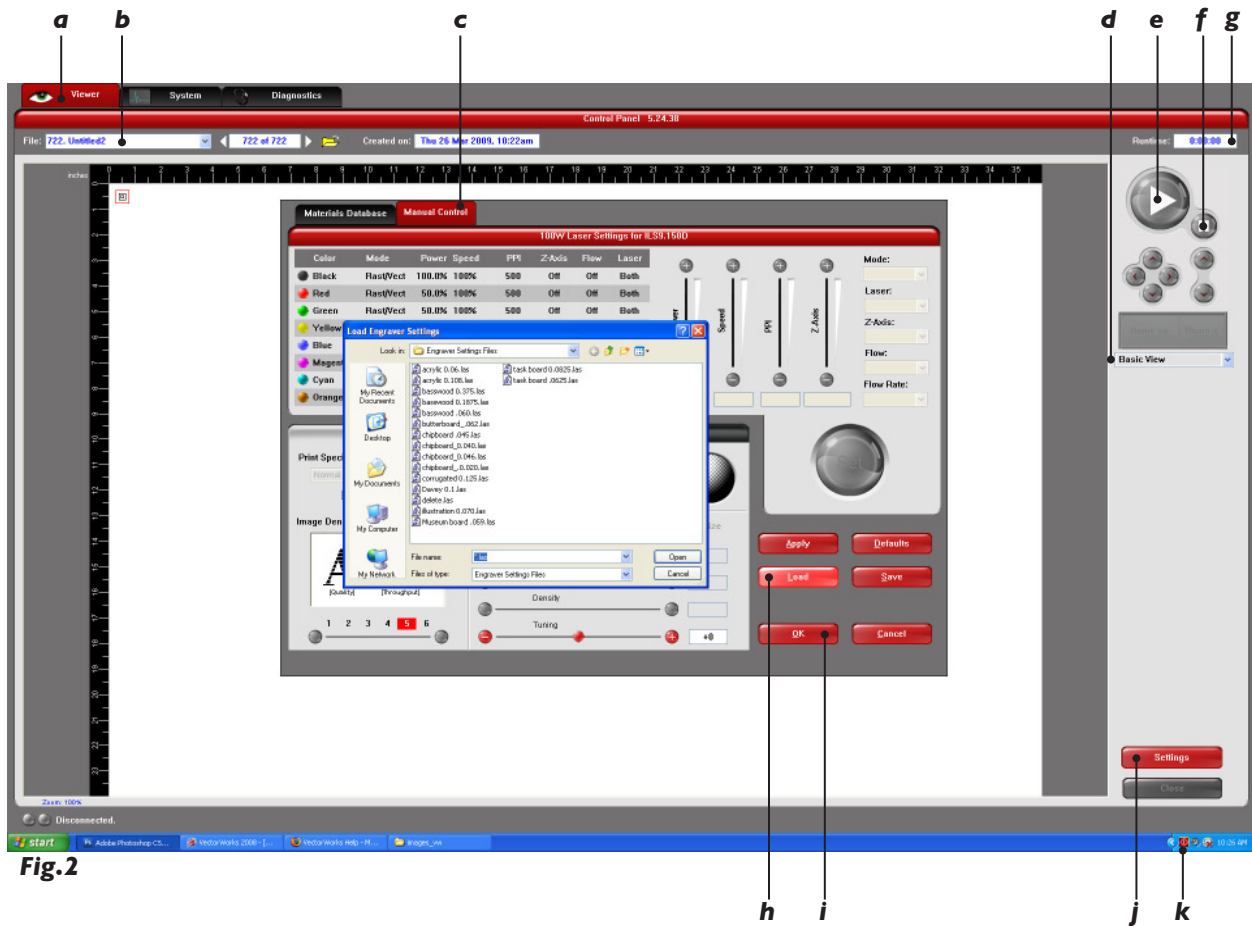check out with the lab tech

Fig.2