

99-353 SolidWorks and Laser Cutting

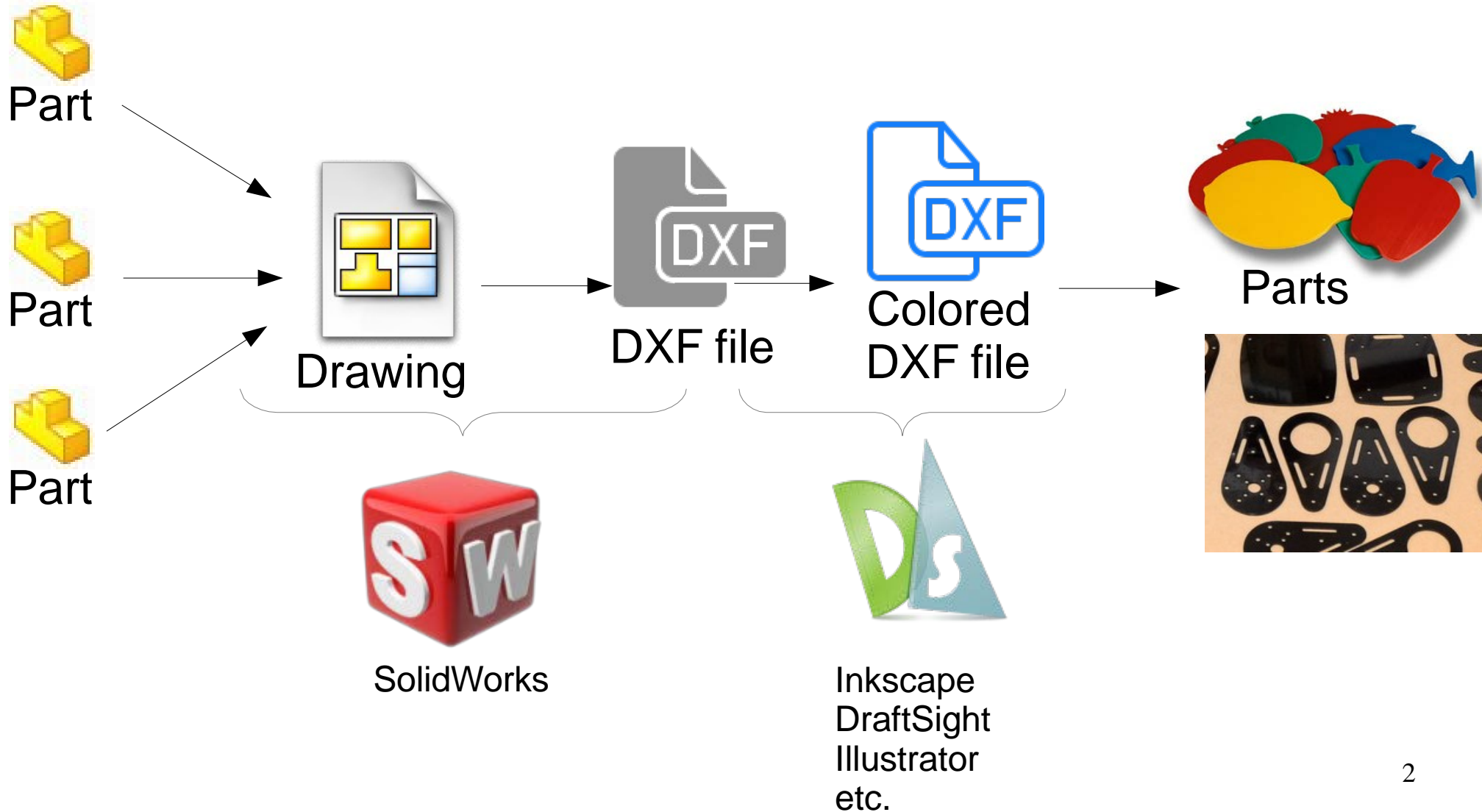
Laser Cutter Intro

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Safety

- Fire extinguisher and smoke/heat alarm.
- Remember the E-Stop button.
- Chiller temp must be below 32° F.
- Never open the door while the laser is active.
- Never cut materials not on the approved list:
 - Acrylic, Delrin, cardboard, thin wood, MDF (fiberboard), and Yupo paper are all okay.
 - Ask about other materials.
- Lots of stuff that's bad to cut:
 - ABS plastic will catch fire
 - PETG produces oily smoke that dirties the lens and mirrors
 - Anything with chlorine, e.g. styrofoam, vinyl: poison gas!

From Design to Plastic



Rabbit Laser RL-80-1290

- 80 watt CO₂ laser
- 1200x900 mm bed
- Exhaust filter
- Chiller

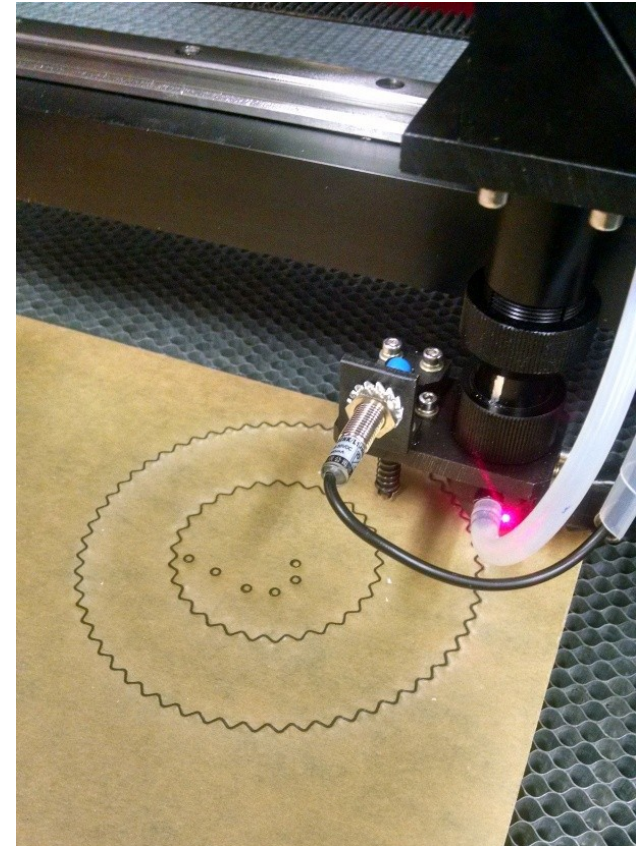


The Laser Tube



How It Works

- Pointing laser (red, low power)
- Cutting laser (invisible, high power, dangerous!)
- Coolant chiller (stay below 32° F)
- Compressed air to clear debris
- Exhaust system with filtration
- Settings based on type of material:
 - Power level (never go above 85%)
 - Cutting speed (slower speed cuts deeper)



RL-80-1290 Control Panel

Emergency Stop
(E-Stop) Button

- Leave the E-Stop on.
- Leave the key turned on.
- Use the three small buttons to turn the lighting, laser tube, and blower on or off.



RL-80-1290 Control Panel



Cutting Wood

- We're using 1/8 inch plywood.
- Recommended power settings:
 - Cut: speed 12 mm/sec, power 80%
 - Engrave: speed 80 mm/sec, power 30%
- Cover the surface with masking tape to protect the wood from scorch marks.
- To cut thicker wood (up to 1/2 inch), use multiple passes.

Lasercut53 Client Program

The screenshot displays the Lasercut53 Client Program interface. The main workspace shows a blue laser cut path for a large, complex shape. A dimension line indicates a width of 50 mm (~ 2 inches). The design includes a vertical strip on the left with four circular holes, a central wavy vertical strip, and a right-side wavy vertical strip with five circular holes. The control panel on the right includes a table for layer settings, navigation buttons, and machine controls.

layer	Mode	Speed	Power
Red	Cut	16.00	80.0
Blue	Cut	16.00	80.0

Control Panel:

- Buttons: Up, Down, All, Calculate
- Axis controls: Y+, Z+, X-, Datum, X+, Z Datum, Y-, Z-
- Options: Slow, Step, Length: 50.00
- Laser: Power: 10.00
- Times: 1, Delay: 0
- Run Box, Clip Box, Immediate
- Start, Pause, Stop
- Machine: [Dropdown], Download

Operating the Laser

- Full instructions and troubleshooting page are linked from the course home page.
- Also available in a three-ring binder in the laser room and in posters on the wall
- The laser cutter control panel has two modes. Press the Escape button on the control panel (not the computer keyboard) to switch modes.

Preparing Material to Cut

- Remove paper backing if necessary.
- Lower the bed.
- Place material on the bed and position the cutting head over the material.
- Press the Z-0 (Z-home) button to set the bed height to focus the laser.

Laser Client Program (1/3)

- Start the client program on the computer next to the laser.
- Do File→Import (not File→Open) and import your DXF file.
- Do Tools→Unite Lines and accept the default tolerance of 0.01.
- Press Escape to deselect everything.

Laser Client Program (2/3)

- Set the cut order for the colors using the Up and Down buttons. *Do this after the “Unite Lines” step.*
- For each color, program the speed and power level. Leave the corner power at 10%.
- Press the Download button to send your file to the laser cutter.
- In the dialog box, press “Delete all” and then “Download Current”.
- On the laser, press the Test button on the control panel to see the bounding box for the cut area.

Laser Client Program (3/3)

- Move the material or the cutting head so that the bounding box falls in the right place.
- Close the lid and press the Start button.
- Wait for the beep indicating cutting is done, or press the little red Stop button to stop it.
- When you're done for the day, leave the laser cutter turned on, but turn off the three small buttons.
- Clean up your mess. Don't leave junk on the bed or laying around on the tables.