



Laser Cutting File Creation Guide

This guide is designed to help you decide which file formats will best work with our laser cutting processes and/or to help you create your own files that are ready for laser cutting and etching. If you are unsure about the correct file type for your job, just send us the file and we will either give you the okay or instruct you on how to get the file laser-ready.

We do have the ability to create and draw your parts using our own CAD and graphics programs but our hourly rates for file creation will apply. File creation is \$60/hour with a \$15 minimum.

File Types

The best laser cutting or etching results will be achieved when using a vector-format file. A vector-format file is one that is made of up lines, curves, and shapes rather than a raster-format that uses pixel arrays.

We use Adobe Illustrator to draw and laser-cut parts. We can also use files from a variety of other programs as long as you can export or save as one of the following vector-format file types: DXF, DWG, CDR (CorelDRAW), AI (Adobe Illustrator), EPS (Adobe Illustrator), SVG, PDF. We might be able to use other vector drawing file formats not listed above. We will be happy to try your file and will let you know if we cannot open it.

If your job is purely laser etching (and not cutting) raster-format files (JPEG, BMP, GIF, PNG, etc) can be used, this is often the case with photo etching projects. With raster-format files, size and resolution of the graphic is important to the resulting quality of the etching. We recommend that your file be at least 400 dpi at the image size that you desire. Feel free to send us your file if you are unsure, we will let you know if we have concerns.

File Setup - Cutting

If you would like to create a laser cutting file for your parts using a program such as CorelDRAW, Adobe Illustrator, TurboCAD, AutoCAD, or Open Office Draw, please set up your files as follows:

- Cut lines – Draw thin black lines where you want the laser to cut; the laser will cut down the center of your lines. In CorelDRAW, the lines should be “Hairlines”. In TurboCAD, the line thickness should be 0. In other programs, be sure the cut lines are 0.003 inches wide or less.

- The part layout area should be a maximum of 24” x 18” which is our maximum cut and etching area. Be sure to leave at least 0.05" between adjacent parts in your layout and leave at least a 1/8" border all the way around the edge of the layout area.
- Small details should be no smaller than the material thickness. For example, if you are cutting a part from 1/8” material, the thinnest members should be no thinner than 1/8”. We can attempt to cut thinner pieces than this general rule of thumb allows, but the part may warp and be very fragile.
- Text should be converted from a font to line art. This is often called “breaking apart text to lines or polylines” in CAD, or “converting text to curves” in other drawing programs. Otherwise, if we do not have the font you are using, our programs will substitute your font with a different one.
- (Advanced) Adjust for kerf – You may want to adjust for the kerf (the thickness of the laser beam), which is about 0.010". The laser centers itself on the lines you draw and takes off about 0.005" of material from either side of the lines. For example, if you would like the hole in your part to have a diameter of roughly 1.0", you should draw a hole with a diameter of 0.990". If you would like a circular part with a diameter of about 3.0", draw a circle with a 3.010" diameter. These numbers are approximate and can vary depending on the material and its thickness. If your parts require this type of exact geometry, we will work with you to get the correct width of the kerf.

File Setup - Etching

Please note the following when setting up your files for engraving:

- Vector engraved lines should be indicated with different RGB colors (each color indicating a different engraving depth).
- Raster-engraved areas in your file should *not* have a thin, black outline around it (otherwise the laser will cut along that outline). The depth of the engraving is specified by the gray-scale color of the pixel (black gets engraved the deepest, gray is engraved to medium depth, and white is left un-engraved). Please specify the depth of the black (deepest) portions of your image and color everything else with the appropriate grays (50% black will get engraved about half as deep as the black portion).
- Engraving depths – We can vary the laser speed and power to change the raster engraving and vector engraving depths. If you just want your engraving to be clearly visible, we recommend that you allow us to select the appropriate engraving depth. This is usually very shallow, just scratching the surface of the plastic enough to leave an attractive,



clearly visible engraving. If you must have particular depths, please let us know the rough depth you would like. We will try our best to achieve the depths you specify by playing with the laser speed and power, but note we cannot guarantee any particular accuracy with engraving depths. Raster and vector engraving are best for making cosmetic markings and are not suitable for making mechanical grooves and features with precise depths.

- We can laser cut, vector engrave, and raster engrave a part all as a single job. All images, lines, text, etc. to be raster engraved or vector engraved should be a part of the same file as the cutting file. You do not need to split the cutting and engraving among different files.

Programs for drawing laser-cut parts

If you need a program to draw your parts in vector-format, here are a few free trials or completely free programs to try:

- Open Office Draw: This free vector-graphics drawing software is part of a free office suite, OpenOffice.org. You will have to download the entire suite of programs to use Open Office Draw. Please save files in PDF format.
- Inkscape: This free vector-graphics drawing software is available at www.inkscape.org. Please be sure to include a 1" square size reference in your SVG file generated from Inkscape, as sometimes there are scaling issues when opening SVG files.
- CorelDRAW trial version: You can download a free trial of this vector-graphics drawing software (with capabilities similar to Adobe Illustrator) at www.corel.com. Please save your files in CDR format (default).
- TurboCAD professional trial version: You can download a free trial of this CAD software at www.turbocad.com. Please save your file as a DXF (compatible with AutoCAD version 2004 or earlier). You can access this option in TurboCAD in the "Save As" window under a "Setup" button or tab. Please see accepted file types above to learn about certain restrictions on the file for larger parts.