

Tips For Engraving and Cutting Acrylic:

Next to wood, acrylic is the most popular material to use with laser systems. It engraves and cuts very easily, comes in a wide variety of shapes and sizes, and can be relatively inexpensive.

Acrylic comes in two forms, Cast and Extruded. Cast Acrylic is used for almost all engraving purposes because the frost produced when lasered provides a nice white contrast against the clear material. Extruded acrylic remains clear when engraved and does not produce an adequate contrast. Extruded acrylic on the other hand is ideal if you are only going to vector cut. Extruded is less expensive than cast and also has a lower melting point that produces an almost flame finished edge when cut with the Legend.

Acrylic Engraving Techniques

Most acrylic is engraved on the backside to produce a look through effect from the front surface. Remove the back protective cover layer before engraving. Leave the top protective cover layer on to prevent scratching while handling the acrylic. Since you are engraving the backside of the acrylic, you will need to reverse or mirror your artwork before sending the job to the Legend. Engrave the acrylic at a high speed and low power. A small amount of power is all it takes to mark acrylic. High power levels tend to distort the acrylic when engraving. For light surface engraving, do not use any mask on the acrylic. For deeper engraving that will be paint filled, use a transfer tape or Mylar mask. There are a large number of acrylic products that are painted on one side to add color to the clear acrylic piece. You can engrave directly through the paint into the acrylic for a very nice presentation effect. Leave the speed the same as if you are engraving clear acrylic and turn up the power about 10% to get cleanly through the paint. Applying too much power to the paint will melt it and cause distortion. After engraving, remove the smoke residue with a soft cloth and acrylic cleaner.

Acrylic Cutting Techniques

Acrylic is one of the most popular vector cutting materials available. It comes in a variety of colors and thicknesses. Laser cutting produces very nice edge quality without the need for polishing or secondary clean up. Use a Vector Grid to elevate the acrylic before cutting. Air Assist will greatly reduce flaming when cutting acrylic. Vectoring acrylic is similar to vectoring other materials. First, experiment to determine the correct speed and power setting. Cutting acrylic is usually best achieved with relatively slow speed and relatively high power. This combination allows the laser beam to melt the edges of the acrylic and produce an almost flame polished edge. Acrylics generally require only a single pass to cut, but thicker acrylics may need two passes. As with engraving, it is sometimes necessary to mask and dampen the acrylic before cutting.

Warning! Never leave your Legend system unattended when vector cutting acrylic! Acrylic is very flammable.

Tips For Wood Cutting and Engraving:

Detailed graphic images and precision cuts are a breeze with a CO2 laser system. Custom lasered graphics are an ideal way to add distinction and profit to your wood products.

Wood is by far the most laser friendly material available. It can be engraved or cut very easily. When engraved, lighter colored woods like cherry or maple produce very nice contrast where the laser burns away the wood. This high visual contrast is what makes lighter woods so popular when combined with an Epilog Legend. There are many types of other wood products that are designed for use with the laser and many more that are waiting to be discovered by you. Every type of wood has it's own characteristics. Some wood is denser than other wood, with the denser, harder woods requiring more laser power to cut or engrave. Epilog recommends that when working with wood other than the ones listed in this section that you investigate the engraving and cutting characteristics before committing to use. There are woodworking shops in nearly every large city that will have a wealth of information on nearly all woods. Use the Internet to do a search on wood see what you find. The most common woods used with the Legend are Cherry, Walnut, Maple, Alder, & Oak.

These woods are considered hard woods, and have grains that work well with lasers. Grain can vary greatly in density. Cherry, Alder, Walnut & Maple all have fairly little veins of grain in them, while Oak has medium to large veins in it. For example: If a large box was engraved into a piece of Cherry and a piece of Oak, the box engraved into the Cherry would have a very uniform appearance, the area engraved or the background would be smooth with little variation in height. The Oak on the other hand would vary greatly in height and have a very non-uniform appearance. Legends can engrave in very fine detail and, if there are large variations in the material that one is engraving into, it will greatly affect the quality of the finished piece. The differences between Cherry and Alder are little. The grain, color and densities are nearly identical. The color of these two woods is a light red. We recommend stains that are clear allowing the natural color to show through. Alder isn't quite as expensive as Cherry and it is a little more readily available. Walnut is a dark brown in color and has a greater density than either Cherry or Alder. Maple is light blonde in color and has a density that is even greater than Walnut.

Manufactured Wood Products

Plywood standard building grade plywood is a material that usually does not produce an acceptable result when engraved. It is also a very difficult material to cut. Since the grain of the wood chips in the plywood run in different directions, it is difficult to obtain a consistent depth when engraving. Air bubbles within the plywood cause problems because they severely disrupt the laser beam when cutting. Because of the air bubbles it is virtually impossible to cut cleanly through standard plywood. There are specialty plywood products that can be found in hobby shops or specialty wood stores that will engrave and cut much nicer than standard plywood products purchased through your local lumber supplier.

Wood Engraving Techniques

To create a quality image on wood, contrast and depth are desired. The higher the power levels, the higher the contrast and depth will be. Speed and Power Settings - Wood is a great material to laser engrave because it discolors when engraved and the depth of engraving is greater than most materials. The downside is that it takes a lot of power to deeply engrave wood at high speeds. Most wood can be engraved using full power no matter whether you are using a 25-watt laser or a 100-watt laser. Depending on the wattage of your laser, the best approach is to set the laser power at 100% and adjust the speed to obtain the desired depth. Resolution Settings - Wood is a very easy material to work with and you can produce very nice detail with as little as 300 DPI engraving. 600 DPI engraving into wood produces fabulous results. Grey scales - Grey scales look wonderful when engraved into wood. The reason for this is that the wood will react much differently to each level of gray scale, providing amazing contrast. Experiment! Take a piece of clipart and ungroup it and change the colors so that they range from a dark color like red, to a light color like yellow, then engrave it. This will create a shading effect that is almost 3-D in its appearance.

Wood Vector Cutting Techniques

Legends are ideal for cutting through solid wood material. The thickness of the wood that you can cut varies with the wattage of the laser and the hardness of the wood, but in general you can cut approximately $\frac{1}{4}$ inch wood with a 25-watt laser and up to $\frac{1}{2}$ inch wood with a 100-watt laser. As with any application there are techniques that will greatly enhance the success of your vectoring of any material. When cutting wood of any thickness Epilog recommends using a Vector Grid and Air Assist. The Vector Grid raises the wood off of the solid metal engraving table and supports the wood on an aluminum grid. The grid greatly reduces backside burning of the wood and also provides ventilation that allows the fumes and smoke to be exhausted to the rear of the engraving cabinet. Air assist greatly reduces flaming that may occur if too much laser power is applied to the wood piece being cut. Depending on the type of wood being vector cut, it is sometimes advantageous to apply a cover of masking or transfer tape to the surface before cutting. The masking tape will reduce residue buildup on the top surface of the wood surrounding the cut line. Warning: Wood is a combustible material. Never leave your Legend unattended while vector cutting any material.

Wood Cleaning Techniques

When laser engraving or cutting wood, resin in the wood comes to the surface, mixes with the smoke, and is deposited as a residue. If the wood has a coating of polyurethane or lacquer, the coating protects the surface of the wood from the resin/smoke damage. You can remove the resin with a wet chamois or a sponge with a web cover. Some people like to use 409, Windex, or other mild cleaning products, but water works well. The chamois that Epilog recommends has a sponge in the middle of it, and is available in the automotive car wash section of any Wal-Mart or K-Mart. If the wood is not coated with polyurethane, the resin and smoke will stain the surface and you will need to sand the surface to remove the resin. Never use a paper towel to clean the wood surface. The paper towel will shred and it is impossible to get the shredded fibers out of the engraved recesses of the wood.

Wood Color Filling Techniques

Color filling engraved areas of wood adds either greater contrast or a splash of color to your wood presentation. Normally, color filling is not required for lighter colored wood materials such as maple or cherry, but walnut can often benefit from adding a black color fill to provide more contrast. You will need to take some precautions when color filling wood, because if you are not careful, the liquid color fill material will absorb into the grain of the wood on the surface of the plaque where it is not wanted. The best way to add a black color fill is: 1) Apply a thin coat of Johnson's Paste Wax to the surface of the wood before you engrave it. 2) Engrave through the paste wax into the wood. Do not wipe off excess paste or residue after engraving. 3) Fill the engraved voids with Turtlewax "Color Magic" black liquid car polish. The car polish will absorb into the engraved wood grain, but will not absorb into the wood grain that is covered with paste wax. 4) Wrap a paper towel around a block of material that has a flat surface. Rub the flat surfaced paper towel over the surface of the wood to clean off the excess car polish and paste wax. The flat surface prevents the paper towel from getting into the engraved recesses. You can follow the procedure above to add different colors to wood, but instead of car polish, use water based acrylic paint (the kind in the tubes works great!) Lacquer paints may bleed into the area around the engraving.

Tips For Engraving Painted Brass:

While uncoated brass cannot be laser engraved, you can still achieve an excellent product by utilizing brass that has some sort of coating, typically paint. The laser removes the coating and exposes the brass substrate.

By far, the most popular laser brass is brass-coated steel. First, a steel substrate is coated with a thin layer of brass. Next, the brass is polished to a reflective finish and a coat of lacquer is applied to the brass. Finally, a paint coating is applied on top of the lacquer for the finished product. When laser engraving brass-coated steel, you are removing only the paint and exposing the polished brass coating that is protected by the lacquer. The lacquer prevents the brass from oxidizing and the bright reflective surface will stay bright for years. If you are unsure if the piece that you have is brass or brass-coated steel, you can test the material with a magnet. A magnet will stick readily to brass-coated steel, but since solid brass is not magnetic, a magnet will fall away from solid brass.

Engrave painted brass at high speed and low power. It takes very little power to remove the paint coating and too much power will melt the paint and distort the image. If you are producing engraving that appears to be "fat" or has a balloon appearance to it, you are probably using too much power. Reducing the power will bring back the nice sharp images that are normally produced with painted brass. Set the brass plate on the engraving table and focus on the top of the plate. Then raise the engraving table .020" (about the equivalent to 1 notch of the focus knob. This will increase the spot size slightly to provide a smoother engraving appearance. For fine detail, adjust the power on a sample piece until you see a haze of the top color coat. Then add 5% power to the setting.

It is possible to laser bare, un-coated brass and apply an oxidizing agent to the engraved area to produce a black image. This process is the same as the process used when rotary engraving brass and using an oxidizing agent. Be sure that you are using brass that does not have a lacquer coating. The laser has a very difficult time adequately removing the lacquer coating and the oxidizing agent must react with the bare brass in order to work properly. You will need to experiment to ensure that the brass that you are using can be oxidized after laser engraving as it can be difficult to determine if there is a lacquer coating over bare brass.

NOTE* - Use caution when trying to engrave brass coated pens. Many pens have a very hard epoxy paint that is completely unacceptable for CO2 laser engraving. The results are a tarnished, brown looking finish that cannot be corrected. You should only use pens that you have experimented with or that are specifically designed for CO2 laser engraving. Be aware that there are many pens that can be laser engraved with a YAG laser but these pens are usually not compatible with the CO2 laser that you are using. Use caution when trying to engrave blue painted brass. Blue paints contain very aggressive pigments that penetrate the metal surface and it can be extremely difficult to remove all of the blue color. Some manufacturers will use black paint as a base coat before applying the blue paint and this process produces a product that is acceptable for laser engraving.

Tips For Photograph Engraving:

Below are some guidelines for laser engraving photographs. Lasering photographs can sometimes take some getting used to, so try different kinds of photographs and different materials until you find the types that work well for you.

Laser engraved photographs are one of the most dazzling displays of the remarkable capabilities of your Epilog laser system. There are many different methods of preparing your photographs for laser engraving, but we will discuss the two most popular:

Computer - If you are planning to engrave photographs on a regular basis it is highly recommended that you have a powerful computer system with lots of hard disk space and adequate RAM (128 is a good minimum). Most computers with adequate memory are very affordable today. Lots of disk space comes in handy because an 8 x 10 inch scanned color photograph can easily take up as much as 50 - 60 megabytes.

Scanner - You can buy a relatively good scanner today for as little as \$70. While these scanners are okay for light duty tasks, they will not provide the horsepower that you will need to properly process photographs. You will need to spend in the \$300 range or above to get a good scanner for processing photos. We always use HP scanners and we have found that the 5000 and 6000 series scanners do a very good job.

Photographs - Not all photographs are meant to be laser engraved. The best photographs have large amounts of gradual shading or blending of one color into another. Photos that have large areas or blocks of dark and light colors tend to look blocky when lasered. The photos with a lot of grey, or gradual blending of light and dark tend to produce a very pleasing lasered image because of the almost 3D effect that the shading produces. If you are an experienced Photoshop user you can take a "blocky" type of photograph and manipulate it to create a blended look to the photograph.

Other types of photographs that are not laser compatible are newspaper photographs and some magazine photographs. When you scan a newspaper photo or a magazine photo you pick up the dot patterns that the printers use to create the image. These dot patterns become very pronounced in the scanning process and are completely unacceptable for laser processing. Since there are several different technologies for printing magazine photos, you may get lucky and scan a magazine photo without picking up the dot patterns. The only way to find out is to experiment first. Try scanning in these photos at a lower resolution so they will not pick up the dot pattern.

Photographs do not laser well on all materials. A photograph lasered onto dark walnut usually does not look that good because there is not enough contrast between the wood surface and the lasered area. Lighter woods like cherry or alder provide much more contrast, and your chances of having a photo look good are greatly increased on these lighter woods. Experiment with different materials to see where photographs look the best.

Method 1: - Quick and Easy

Method 1 involves scanning the photograph, importing it into CorelDraw and printing.

1) Scanning - Scan your photograph at 600 DPI as either a black and white photograph or a color photograph. Adjust contrast and brightness as necessary. Save the scan as a TIFF file.

2) Printing - Import your TIFF image into CorelDraw, and add text or other graphics as required. "Print" to the engraver. Depending on your application you can print at a resolution of 300 DPI to 600 DPI. Your resolution settings produce dramatically different results, so experiment to see what works for you.

Method 2: - Stunning Results!

1) Scanning - Scan your photograph at 600 DPI and set the output from the scanner to be either "true color," "millions of colors," or "16 million colors." Different scanning software uses different terminology, but there should always be a selection for the highest quality color possible. We recommend the high end color even if you are scanning a black and white photo. Save the scan as a TIFF file.

2) Photoshop - Photoshop is the premier photo editing software in the world. The standard Photoshop package costs in the \$800 range, but Photoshop also produces an Essentials version that sells for about \$99. [Click here for more information.](#) If you do not already own Photoshop, we recommend Photoshop Essentials. It has all of the capabilities that are necessary for producing lasered photographs.

We use Photoshop to convert the scanned image from a color image to an 8-bit grayscale image, which is required later on in our process. You can also use Photoshop to Crop, Rotate, and Invert and for general photo manipulation. It is our recommendation that you use Photoshop to manipulate your scanned image because it does a much better job of manipulating photographs than any other software available.

There are two caveats with using Photoshop:

Caveat 1) A lot of people don't want to buy and learn another software package. If this is the case, you can always use Corel Photopaint to manipulate your photograph. Corel Photopaint comes free with CorelDraw and will perform the same functions as Photoshop, it's just that if you are very particular you will find that Photoshop performs these functions better than Corel. Photoshop also does a much better job of controlling file size than Photopaint, and this comes in handy when you are dealing with 50 MB files.

Caveat 2) You don't need to use Photoshop or Photopaint at all. If you have a good scanner, you can scan and save the image as an 8-bit grayscale, BMP image in the scanning software and eliminate this entire step. Lots of people do this and produce great laser engraved photographs. It's just that Photoshop provides you with a useful tool when you do need to manipulate a photograph - and we have found that a photo processed through Photoshop has a little extra sparkle that is missing with lasered photos that skip the Photoshop step.

The Photoshop process is as follows:

Step 1 - Open your scanned image in Photoshop. Go to Image, Mode, and click on Grayscale. This will convert your color scan into an 8-bit grayscale image. It will ask if you want to discard color information, click OK.

Step 2 - Next, go to Image, Adjust, and click on Auto Levels. This will "brighten" your grayscale image automatically for you.

Step 3 - Crop, Rotate, Invert or manipulate your image any way that you want to. **IMPORTANT!** - You should use Photoshop to size your photograph before proceeding further. Your next step is going to require that you process your image in PhotoGrav software. After processing the photograph in the PhotoGrav software, you cannot resize it. Resizing after processing in PhotoGrav will distort the image.

Step 4 - Click on File, Save As, then save your image as a Windows, 8-bit BMP file. You must save the photo as a BMP file at this point. You will not be able to proceed if it is any other file extension.

Step 5 - PhotoGrav is a software package that was designed specifically for producing outstanding laser engraved photographs. Basically what the software does is adjust the scanned photograph to be laser engraved onto a specific material (i.e. plastic, wood etc.). PhotoGrav takes an image and creates a dithered pattern that turns a flat photograph into an almost 3D piece of art! It is truly astonishing what PhotoGrav will do to a scanned photograph. PhotoGrav only accepts grayscale 8-bit BMP images and that is why we needed to convert the image in Photoshop.

- 1) Click the Open Image button in PhotoGrav to open your 8-bit grayscale BMP image.
- 2) Click the Select Material button and scroll down the list to the material you are going to engrave.
- 3) Click Auto Process and your image will be optimized for the material you chose.
- 4) Save the engraved image.

Step 6 - CorelDraw - Import your PhotoGrav image into CorelDraw then print at 600 DPI. That's all there is to it!

There is one important note. Once you have imported your PhotoGrav image into CorelDraw, *you should not resize it*. Resizing a PhotoGrav image will cause distortion, which in turn produces unacceptable output. If you need to size your photograph, you should size it in Photoshop prior to converting it in PhotoGrav. Refer to Section 2 above in Photoshop to resize your image.

Since we're on the subject of sizing, there is one important aspect of the resizing process that you need to be aware of. It is best to scan an image that is the size that you want to engrave it. Scanning a 2 x 2 inch image and then expanding it to a 10 x 10 inch image will usually produce a very ragged, or "blocky" looking, image. Scanning a 10 x 10 inch image and shrinking it will produce the same results, but the effect is usually not as noticeable. Photoshop provides a convenient way of resizing a photograph or other image while retaining the image's original quality. The secret to resizing is to maintain the same file size by adjusting the resolution of your image.

Tips For Glass Engraving:

The composition and quality of glass varies widely, and you cannot always predict the effect that you will achieve. It is always best to experiment with an unfamiliar glass source.

Generally speaking, flat glass tends to have a very consistent hardness throughout, and the engraved areas do not tend to have lighter and darker areas. Bottles on the other hand, tend to have soft and hard spots that will cause the engraved area to appear lightly frosted in one area and heavily frosted in another. Engraving at medium speed and high power will somewhat compensate for this, as will two or more engraving passes. While the laser beam itself is very hot, the heat does not build up easily and it should not prevent you from engraving onto full bottles of wine, champagne or other filled glass bottles. Laser engraving filled bottles is a very popular method of creating custom presentations for special occasions. The laser will not damage the liquid inside the bottle, and as long as you are not completely engraving away a large section of bottle, you have very little chance of breaking the bottle.

To produce a smooth frosted finish follow this procedure: Using your finger or a paper towel, apply a thin coat of liquid dish soap - any kind will do - over the area to be engraved. Cut a piece of newspaper or paper towel a little larger than the area to be engraved. Completely soak the paper with water then wring out the excess water. Apply the paper to the glass and smooth out the paper so that there are no wrinkles. Place the glass into the engraver and laser through the paper while it is still wet. Remove the glass, discard the remaining paper, and clean the glass. If necessary, gently polish the glass with a ScotchBrite pad.

NOTE* - You need to be especially careful when laser engraving leaded crystal. The lead in the crystal expands at a different rate than the crystal does and this can cause cracking and breakage of the crystal. Using a lower power setting can help this problem, but we always recommend having a spare in case of breakage.

Laser Engraving and Sand Blasting

Combining the best of both processes, you can use your laser to engrave the artwork then use sandblasting to provide a deep etch into glass. Using the laser to create the artwork mask is an ideal process for one-of-a-kind custom pieces, as well as large production runs. This eliminates the photo process usually associated with sandblast mask. Apply an adhesive backed mask material to the glass that you are going to engrave. Laser completely through the mask and into the glass. Remove the glass from the engraver and sandblast to the desired depth. You now have a sandblasted glass presentation with the detail of laser engraving!

Tips For Engraving and Cutting Plastics:

Engraving and cutting plastics have changed greatly in the past few years. Specialty plastics for engraving and cutting have made the finished products more refined.

Before lasers, plastic manufacturers designed plastic for rotary engraving systems. A rotary engraving system uses a mechanical spinning bit to remove material. Plastic manufacturers have developed a broad range of plastics that have thinner cap sheets that are .002 to .003 inches thick and provide much better engraving and cutting characteristics. These plastics are commonly referred to as Micro Laminates, Micosurfaced, or simply laser engraveable plastics. Because there is such a broad range of plastics, it is necessary to experiment to determine if a particular type of plastic is laser compatible. Different color plastics, even if they are from the same manufacturer will have unique speed and power settings. Use the guidelines in your manual as a starting point when determining the correct speed and power settings. If you do not get acceptable initial results with the recommended speed and power settings, start experimenting by first changing only the power setting. If adjusting the power setting does not work, start over and adjust only the speed setting. Once you have acceptable results, record those settings for that particular plastic so that you do not have to repeat the experimentation process.

Plastic Engraving Techniques

Always remove the clear protective cover layer before engraving. Once you have the correct speed and power settings, you can improve your engraving results even more by taking the focus lens out of focus (lower the table) by about 1/16 of an inch. This technique enlarges the focus beam and provides more beam overlap on each pass of the laser. The greater the overlap, the smoother the engraved surface on the plastic. With some plastics it is best to engrave using two passes. The first pass cuts through the cap layer and the second pass cleans away the residue that some plastics leave behind. Another technique that can be useful is to mask the plastic before engraving with transfer or masking tape. This will prevent a buildup of residue on the plastic surface. Misting the transfer tape with water will reduce heat buildup and melting on sensitive plastics. Remove any smoke residue with acrylic cleaning solutions or citrus based cleaners.

Plastic Vector Cutting Techniques

Use a Vector Grid to elevate the plastic before cutting. Air Assist will greatly reduce flaming when cutting plastic. Vectoring plastics is similar to vectoring other materials. First, experiment to determine if the plastic can be cut with the laser. Plastics that are up to 1/16 inch thick can usually be cut in a single pass. Thicker plastics may need two passes. As with engraving, it is sometimes necessary to mask and dampen the plastic before cutting. Even masking and wetting both front and backsides of the plastic is desirable on sensitive plastics that have very low melting points. Warning! Never leave your Legend unattended when vector cutting plastics! Plastic can be very flammable. Do not engrave PVC (Polyvinyl Chloride). PVC will destroy the optics and mechanics of your Legend. Cutting or engraving PVC will void your warranty.

Tips For Engraving Anodized Aluminum:

Anodized aluminum is aluminum that has a finishing coat applied to it. It provides the most durable, corrosion resistant finish available for aluminum. When engraved, the anodized coat is removed, leaving the bare aluminum. Anodized aluminum comes in a variety of colors and can usually be easily engraved with a CO2 laser.

Black anodized aluminum is great to work with because it turns white when lasered. Black anodize provides the best contrast of all of the colors of anodized aluminum. Some colors of anodize - red for instance - will not turn completely white when laser engraved. Red anodize will produce a light pink color. Some improvement can be seen by performing a second pass but usually a slight shadow of color will remain. Engrave anodized aluminum at high speeds and low powers for crisp, clean images. Too much power applied to the anodize will distort the engraving and tends to over-burn the image, giving it a fuzzy or out of focus look.

After engraving you can wipe the engraved area with a damp cloth. Since the process of laser engraving the anodized aluminum removes the color coating, it leaves the engraved area open to accepting new color. Brush on aniline dyes or felt tip markers for color filling the engraving.

Tips For Engraving Marble:

Laser engraving on marble will bleach out the color and reveal a white colored stone underneath. A light engraving will show considerable detail and looks striking against a solid black marble.

Start with placing the black marble on the engraving table. Focus the laser directly on top of the marble piece. A standard or 2" lens is recommended. Set the power and speed to the recommended settings from your manual. Examine the engraving without moving the marble piece. If the engraving color is not white enough, run the job again. The marble will engrave fine with a wide range of power settings. Too much power will cause the graphic to look washed out.

The laser will engrave about .005" into the marble which can be filled with gold inks to achieve a different look. After engraving, brush on the gold ink and wipe off the excess with a soft cloth. For deep engraving, use the laser to make a sandblasting mask by engraving through a Mylar mask.

Tips For Engraving Spectrum Lights Laminate:

The Spectrum Lights laminate is a thin sheet of a base color with a micro surface of a top color applied. A strong adhesive on the back side gives this product a multitude of applications. The laser can easily remove the top coating to reveal solid colors underneath. After engraving the laser can cut out the engraved piece giving it a smooth finished look. Frequently this product is mistaken for etched metal!

For adding personalization to a corporate gift or similar item, it is simpler to cut off a piece of the material and apply it to the gift item. Then laser engrave the logo or text. After engraving, vector cut around the engraving and the job is complete.

For creating a large number of badges or plates, tape a piece of the material down to your engraving table. First engrave the text for all of the plates. Then cut out each of the plates. You can create scalloped edges and even cut the holes for a screw to look like a metal plate.

NOTE*-Spectrum Lights engraves at very low power. Too much power will cause it to warp. Engrave a test sample and lower the power until there is a slight shadow of the top color. Then add 5% to your power setting.

Tips For Using Cerdec Metal Marking Solution:

The Cerdec Metal Marking Solution will create black engraving on metal using a Co2 laser. The process works like ceramic glaze in that the laser heats the Cerdec Solution and causes it to change color and soak into the metal surface. The solution is a thick liquid that can be brushed or sprayed on to the surface. Solid black engraving can be created by applying the Cerdec Solution to stainless steel, tool steel, chrome and other uncoated metal surfaces. The solution is available in ½ lb. and 1 lb. containers. ½ lb. of solution will cover approximately 1000 square inches of area.

Start with clean, uncoated metal. Remove any oil or grease with alcohol or spirits. Thoroughly stir and mix the Cerdec Solution (the active ingredients will settle to the bottom of the container). Brush or spray the Cerdec Solution on the metal. It is better to apply a medium and consistent coating rather than a thick and heavy coating. A foam brush from the hardware store works well as an applicator. Allow 15-20 minutes for air drying of the coating on the metal. It will dry a light tan color. Engrave the coated metal area using settings of 100% power and a speed setting equivalent to your lasers' rated power. For example, if you have a 25 watt laser system, use a speed of 25%; if you have a 50 watt system, use a speed of 50%.

Over time, the Cerdec Solution may tend to dry out. The active ingredients are still present and you can thin the solution by adding denatured alcohol or water. The Metal Marking Solution will not work with metals that have a clear coat on them.