



GRAVOGRAPH NEW HERMES

Materials

1. Lasers, due to their unique blend of speed and versatility are currently used in a variety of industries to engrave and cut a variety of materials. There are many variables that can affect the cutting and engraving process such as differences in the thickness of the material, density of the material, composition of the material, and the manufacturing processes used to make the material. Please use these settings as a guideline, in most cases these settings should work out well, but sometimes may have to be adjusted to produce desirable results.

In compiling these settings, all samples were run with the resolution set at 500 DPI (except were otherwise noted). When using a lower resolution in order to achieve greater engraving speeds, remember that the resolution will be reduced which in turn will reduce quality and depth. In order to compensate for lower resolution settings, lower the speed and/or increase the power to achieve the same depth. The opposite applies for higher resolution settings.

Below is a list of the various materials that were tested. The following pages will fully describe the results of these tests and will offer helpful hints when choosing materials, setting parameters, and using different techniques to provide the best laser cutting and engraving results. Here are the most popular:

- ACRYLIC - CAST AND EXTRUDED
- ACRYLIC - MIRRORED
- ALUMINUM - ANODIZED
- BRASS - COATED
- CORK
- CORIAN / AVONITE / FOUNTAINHEAD
- DELRIN (SEAL PRESS)
- GLASS / CRYSTAL
- LEATHER
- MARBLE
- MAT BOARD
- MELAMINE
- PLASTIC - ENGRAVERS
- RUBBER STAMPS
- VINYL - SIGN
- WOOD / WOOD INLAY

WARNING

DO NOT ENGRAVE OR CUT PVC (Polyvinylchloride) BASED MATERIALS. The fumes are extremely toxic if you inhale them. The fumes are so caustic that it can chemically destroy the metal parts of the laser system. Damage to the laser system from this type of abuse **WILL NOT** be covered under warranty.

2. ACRYLIC- CAST AND EXTRUDED

Since lasers were first used for engraving, acrylic has been a favorite. Combining the beauty of glass with the durability of plastic makes it a viable option for many applications including awards, executive desk items, signage, display cases, and frames. Acrylic is manufactured in a wide range of colors, shapes and products. Acrylic can also be cut using a laser. With a 20 watt system you can cut up to 1/8" thick or thinner pieces. 1/4" pieces will cut through with a 60 watt system and for 1/2" consider 100 watts of power. Popular applications for cut acrylic include letters and a variety of shapes. Remove original factory masking from the engraving surface. Leave the masking on the non-engraved surface to prevent accidental scratches. Engrave through original masking. Engraving too deep will lose detail. For vector cutting the best results, remove the original masking on both sides. Re-mask with transfer tape. Moisten both sides with water from a spray bottle. Elevate the material at least 1/8" off of the engraving table.

ADDITIONAL COMMENTS

There are two types of acrylic available, cast and extruded. Cast acrylic turns white or frosted and extruded remains clear when engraved. Use extruded acrylic for paint filled engraving and cast for regular engraving. Cast engraves better without masking. Lightly engrave the surface to frost it with a low power setting such as the first setting listed above. If deep engraving is desired, it is necessary to mask the acrylic with transfer tape to prevent the smoke from damaging the clear surface of the acrylic. However, another problem with deep acrylic engraving is that the intense heat creates a white, crusty, deposit that accumulates along the edges of the area that was just engraved and is impossible to remove without causing damage. Engraving lightly and without masking seems to be the better all around alternative.

If only cutting acrylic, extruded works better and is less expensive than cast. The cut edges of extruded acrylic will appear to be more highly polished and clearer than cast acrylic when laser cut. When cutting acrylic, it might be necessary to remove both sides of the original masking and re-mask with transfer tape if cutting through the original masking produces flaming. The original masking is coated with wax and will not absorb water. If cutting through very thick acrylic, re-mask both sides with transfer tape and dampen the masking on both sides of the acrylic with water from a spray bottle. Elevate the acrylic off the table at least 1/8 inch, re-focus, then proceed to cut. Elevating the acrylic will allow the beam to completely pass through the material which allows the smoke and heat to escape from underneath. If cutting directly on the engraving table, the trapped heat might cause the bottom edge of the cut to pit and distort. Re-masking and dampening with water will act as a heat sink to pull the laser heat away from the cutting area resulting in less distortion or heat effected zones (HAZ). When dampening, be sure not to leave puddles of water. Puddles of water will reduce cutting depth significantly. For the best results when combining engraving and cutting on the same piece, first engrave lightly and unmasked. Then mask with transfer tape, dampen, elevate, re-focus, and cut as a second step.

Paint filling the engraved area is possible by first masking the acrylic or leave on the original masking then engraving through the masking. Before removing the masking, brush or spray on some acrylic based or water based paint right on to the masking. When the paint is dry, remove the masking and the paint will remain in the recessed area of the engraving. Remember to use extruded acrylic when paint filling and cast acrylic when simply engraving.

WARNING

Acrylic is extremely flammable. Do not leave the laser system unattended when cutting or engraving.

3. ACRYLIC - MIRRORED

Engrave unmasked and on the backside in reverse text. Engraving on the front side of mirrored acrylic will visually produce a double image. Masking is not necessary because the acrylic is protected from smoke damage by the mirrored backing. For vector cutting Make sure both sides are masked. Dampen and elevate at least 1/8" above the engraving table. Two passes make a cleaner cut than one. Cut from the front side of the mirror to prevent heat distortion of the mirrored back surface.

ADDITIONAL COMMENTS

Engraving mirrored acrylic is similar to engraving regular acrylic. The idea is to engrave through the mirrored backing enough to begin to penetrate into the acrylic. Engraving deeply will cause, a crusty residue to form just like with non-mirrored acrylic. A double image will appear if engraving on the front side of the mirror. It is not necessary to mask the backside when engraving because the mirrored backing shields the acrylic from smoke damage. To cut mirrored acrylic, it might be necessary to remove all original masking, re-mask with transfer tape, and dampen the tape with water from a spray bottle. Next, place the acrylic in the laser with the mirrored surface facing upwards and elevate at least 1/8 inch above the table. The laser beam will not reflect off of the mirrored surface because it is absorbed by the acrylic first. Sometimes cutting the acrylic from the back side will cause the mirrored backing to distort and crack from the intense heat required to cut. If the combination of engraving and cutting is desired, our suggestion is to engrave the backing, unmasked, remove the acrylic, mask both sides with transfer tape, flip the acrylic over, dampen, elevate, re-focus, and cut from the front side. When paint filling the engraved area, make sure to use an acrylic based paint or paint that does not contain acetone or alcohol as these chemicals will crack the acrylic. Water based paints also work very well. Since the mirrored backing serves as a masking, it is not necessary to mask the back side before engraving.

4. ANODIZED ALUMINUM

The power required for raster engraving is dependent on the thickness of the anodized coating. Do not overpower because the anodized will either be dull in appearance or the engraving lines will be too thick. Different anodized coatings will require higher or lower power settings. Power must be increased if engraving at a faster speed.

ADDITIONAL COMMENTS

There is a process called Laser Color Marking which enables the color filling of anodized aluminum. First, coat or spray the aluminum with a clear acrylic finish. After the finish has thoroughly dried, laser engrave the graphic onto the aluminum. Then take a water base marker, such as those found in an art supply store, and swab on the ink into the engraved area. You can actually see the ink get absorbed into the engraved area but not the unengraved area. The ink will appear lighter in color because the white engraved area tends to lighten the shade. Use a darker tint marker to compensate for the lighter effect. Wipe off the excess with a soft, lint free cloth. Finish the piece by applying another coat of clear acrylic finish and let dry.

5. BRASS - COATED

Engrave unmasked. Use a light setting to engrave through the coating. Using 1000 PPI seems to have a cleaner removal of the coating. Some thicker coated brass will require more power. Too much power loses resolution and washes out finer detail. For vector engraving engrave unmasked. Use enough power to expose the brass. Too much power will cause thicker engraving lines.

ADDITIONAL COMMENTS

The manufacturing process for coated brass varies from one vendor to another. Some of the manufacturers do not polish the brass before coating it. Since CO2 lasers at this power level do not engrave into metals when the coating is removed, the tarnished brass underneath will have a dull appearance that will need to be polished with a brass polishing compound. This type of brass is designed for mechanical engravers that actually remove the metal when engraving which gives the brass a shine without polishing. Brass that is produced for the laser engraving industry is polished, then clear coated, and finally coated with paint. When laser engraving this type of material, adjust the power so that the laser beam removes the painted coating but not the clear coating. This will expose the polished, clear coated brass without penetrating all the way down to the metal. Since the brass is already clear coated and polished, it will not require any cleanup after engraving nor will it ever oxidize. If too much laser power is used, the brass the clear coat will be removed and the brass underneath will be exposed to the heat of the laser beam causing instant tarnish. The same goes for enamel coated pens, some are polished and clear coated underneath, and others are tarnished which will require polishing after engraving. If polishing the brass, use a soft, non-abrasive cloth or tissue and good quality brass polish. Be careful not to rub too hard as this will scratch the painted coating. Do not use paper towels either because they will scratch also. Clear coated brass can also be engraved and the engraved area turned black with an oxidizer giving exceptional results. Test clear coated brass from different vendors as not all of them will work properly. If the brass, after being engraved, does not oxidize with the acid solution, apply automotive fine grit rubbing compound to the engraved area with a soft cloth. This will remove any clear coat that is remaining and will allow the brass to oxidize with the acid. Apply the same parameters and engraving techniques when using coated aluminum.

A rectangular warning box with a double red border and a grey background. The word "WARNING" is centered in bold, black, uppercase letters.

WARNING

Acrylic is extremely flammable. Do not leave the laser system unattended when cutting or engraving.

6. CORK

Engraved unmasked. For vector cutting engrave unmasked. A low PPI setting is used to prevent flaming.

ADDITIONAL COMMENTS

Cork is not very popular for engraving but it does engrave and cut nicely. Cork is mainly used for making gaskets by vector cutting the gasket patterns.

7. DELRIN (SEAL PRESS)

Engraved unmasked. Unmasked. A low PPI setting is used to prevent flaming.

ADDITIONAL COMMENTS

Making a seal using plastic is revolutionizing the industry. The laser can engrave and cut out a typical Notary Seal in less than 5 minutes. A male and female die must be made as the diagram below indicates.

8. GLASS

Many engravers have discovered that a laser can produce a light surface etch on glass that is attractive for many applications. Wine bottles, stemware, vases and picture frame glass can all be laser engraved. When engraving on glass, however, be careful. Some glass, that which has a high lead content, may be prone to shattering and/or cracking. It is always best to experiment and always ask for extra pieces when possible. Since glass will not vaporize when laser engraving, it does not require a lot of laser power.

ADDITIONAL COMMENTS

Glass engraving is different from other types of engraving. A CO2 laser cannot engrave into the glass nor can it cut glass. Instead, laser interaction with glass causes the surface of the glass to appear frosted. Sometimes, placing a piece of newspaper on the glass and dampening it with water will improve the appearance of the engraving. Another method is to apply transfer tape to the glass, wet it with water from a spray bottle, and laser engrave it. The transfer tape and water will act as a heat sink and pull the heat away from the glass as the laser system engraves it. This helps reduce chipping or flaking of the glass. Be especially careful when engraving leaded crystal. The lead in crystal conducts heat which can cause much more flaking or even the cracking of the crystal. Use a lower power setting to try to reduce the chance of damage. It is always good to have at least one extra piece to use as a test piece to get the right settings especially if you have never tried to engrave that material before. If using the optional Rotary Fixture in the Portrait Mode use the following settings to minimize the chances of the object slipping in the fixture while running at high speeds. If engraving in the landscape mode, use the settings defined at the top of this page.

9. HARD SURFACED MATERIALS (CORIAN / AVONITE / FOUNTAINHEAD)

Hard surfaced materials such as Corian can be laser engraved and are also used for a range of applications including plaques, awards, and signage. Such material engraves well and is also extremely durable. Such materials do require color filling because of the lack of contrast. Mask first before engraving if planning to paint fill.

ADDITIONAL COMMENTS

Laser engraving this type of material produces spectacular results especially when the engraved area is paint filled. If paint filling, it is a good idea to mask first and then engrave through the masking. In this way, when ready to paint fill, the material is already masked. Spray painting seems to be the easiest. Using a paint brush is acceptable but time consuming. Use the paint sparingly. Excess paint can accumulate on the edges of the engraving which will make mask removal difficult and leave unsightly ridges. It is best to apply several lighter coats than one heavy coat of paint. Remove the masking after the paint has dried. Engraving this material without paint filling can work but most of the time there is very little contrast which makes the engraved area difficult to see.

10. LEATHER

Leather, when laser engraved, can produce some unique and interesting effects. Items such as belts, hats, watch bands, etc. are some of the many applications for laser engraved leather. When choosing leather for laser engraving, be aware that leather products tend to vary. Therefore, laser engraving results will also vary. It is important to experiment first and to stick with products that laser engrave well. Leather also tends to put off offensive odors when exposed to the heat of a laser. Therefore, a good working exhaust system is essential to removing the vaporized material and fumes to the outside. Deeper engraving will require masking to prevent smoke damage. If vector cutting mask top surface and use a low PPI setting when cutting.

ADDITIONAL COMMENTS

Leather is a very simple material to engrave and most types of leather engrave very well with the laser system. Simulated leather engraves well also, but the results are not as nice as with the real thing. Engraving lightly will turn the surface of the leather dark brown giving it a high contrast in appearance. Try engraving at a light power setting first. If the result is not deep enough the job can be run again over the same spot. Experiment with different depths of engraving and note the results.

11. MARBLE

Marble is another great choice for laser engravers. Its' natural beauty makes it appealing for both awards and gift ideas. When choosing marble for laser engraving, look for pieces that allow for contrast. Marble is another material that also lends itself well to the addition of color. Engrave unmasked. Too much laser power by running too slowly will engrave too deep and discolor.

ADDITIONAL COMMENTS

Most marble and polished stones will turn white when engraved. Masking is not necessary and light engraving works out better than heavy and deep engraving. Engraving deeply will cause a highly detailed image to appear washed out. The objective is to engrave deep enough to turn the marble white and provide a good contrast. Too much power can also cause the material to discolor and turn brown as if it were burned. Photographs look great when engraved on marble, especially darker marbles where the whiteness of the engraving really stands out. Avoid using marble that is very textured looking. The texture washes out the details of the engraving. Try to use uniformly colored marble and related stones. Marble can also be paint filled by using a wax base paint. Rub the paint on with a fingertip, let dry and then buff with a soft cloth. The paint will only adhere to the engraved surface and not the surrounding areas.

12. MAT BOARD

Engrave unmasked. A low PPI setting is used to prevent discoloration. For vector cutting mask on both sides and elevate above the table at least 1/8". Use a lower PPI setting to reduce discoloration of the cutting edge.

ADDITIONAL COMMENTS

Mat board (thick cardboard) is an excellent material to use for architectural modeling and for picture framing. It cuts and engraves very neatly and cleanly. It comes in a variety of shades and colors. Patterns can be engraved on the surface with a power setting for light engraving which just breaks through the very thin top layer and exposes the lighter colored underlying substrate. When engraving, a low PPI setting is used to prevent overexposure of the underlying substrate material which causes excessive dark discoloration. Masking is not necessary on the top surface when engraving. When cutting, both sides might need to be masked and the

material elevated above the engraving table. This will produce an extremely clean edge on both sides of the material.

13. MELAMINE - STANDARD ENGRAVING

Engrave unmasked.

ADDITIONAL COMMENTS

Engraving melamine is very similar to engraving regular wood with the added benefit of a consistent surface finish and uniform base material composition. Unlike regular wood which has grain patterns and density variations, melamine when laser engraved produces a flat and even engraved area. This characteristic gives this material superior engraving and paint filling qualities. Masking can be used if desired but it is just as easy to spray the engraved area with water and wipe down with a chamois cloth to remove the smoke residue. Since the top surface material is consistent in texture and color, engraving photographs or highly detailed images produces exceptional results. Refer to the next example on engraving photographs and/or ClipArt.

14. MELAMINE - PHOTO/CLIPART ENGRAVING

Engrave unmasked. Use a resolution of 500 DPI.

ADDITIONAL COMMENTS

Engraving photographs can be challenging at first but becomes easier once there is an understanding of what to look for and how to achieve the desired results. In an image processing software, scan the image in at 300 DPI. Adjust the brightness and the contrast to brighten the light colors and darken the dark colors. The photo might look better by using a sharpening filter to sharpen up the image slightly. The next step is to select a halftone pattern. Usually, imaging software gives the choice of using different halftone patterns including frequency of lines per inch and pattern angles. Use a line frequency above 20 and below 100. The size of the dots decreases as the line frequency increases. Experiment to see which pattern looks the best. Big dots look good on some materials and small dots look better on others. If it is not possible to assign a halftone pattern in the imaging software, the printer driver will automatically default to a predetermined pattern based on **RESOLUTION**.

15. METALS

While engraving on bare metals has always been a challenge when using a CO2 laser engraving system, coated or painted metals do engrave well using this type of laser. In fact, today's laserable coated metals are attractive to the laser engraver because they are polished and lacquered prior to applying the outer layer of paint. This results in engraving that is crisp and ready immediately after engraving. The lacquering also prevents the engraved area(s) from oxidizing. Today's laser engravable coated metals come in a wide range of metals, shapes, colors, and designs that can be used for a wide range of applications.

Additionally, there is now an option for engraving on some bare metals. Dmc2, (formerly Cerdec) offers a spray, which when applied to certain bare metals, prior to engraving, will fuse with the metal and allow the laser beam to produce a dark permanent mark. While this does not work on all applications, it does allow some metal products to be engraved with a CO2 laser.

16. PLASTIC

There are a variety of plastics that both laser engrave and laser cut with great results. Manufacturers of plastic materials have created a new generation of laserable plastics with thin outer layers that are easily removed by laser. This has resulted in less melting, scorching, and discoloration associated with earlier laser engraving of plastic materials. Today's laser engravable plastics come in a range of colors and patterns and are used for signage, plaques, nametags, and ad specialty items.

17. PLASTIC - ENGRAVERS MICROSURFACED

Remove original masking and leave unmasked. Use enough power to remove the surface material and expose the underlying substrate. On thicker plastics, remove the original masking and leave unmasked. Set the power high enough to assure the full removal of the top surface and to remove some of the substrate material. Sometimes it may be better to make two passes a lower power setting. For vector cutting remove original masking. Mask with transfer tape on both sides. Dampen both sides with water and elevate off the table. Make 1 to 2 more passes when cutting thicker plastics.

ADDITIONAL COMMENTS

Engravers plastic comes in many different colors, thickness, coatings, and surface textures. About 75 % of the available engravers plastic, including ADA signage materials, will engrave and cut well with the laser system. Microsurfaced plastics seem to work the best because there is less surface material to remove to uncover the substrate. Since most plastics have low melting points, a low PPI setting is used when cutting to reduce the possibility of melting. Masking and dampening with water also helps to reduce melting and keeps the plastic clear of smoke residue. Always remove the original clear masking from the plastic because it does not react well with the laser. Since there are so many types of engravers plastics, the only true way to find out if a particular brand and type will work well with the laser is to experiment. Use these power settings as a guideline for experimentation and adjust as necessary. Be creative when engraving this type of material because amazing results will be produced that cannot be reproduced with a mechanical engraver.

18. RUBBER STAMPS

Different blends and densities of rubber will engrave to different depths. Test the rubber first to determine the correct power settings. For vector cutting keep the PPI low to prevent flaming while cutting.

ADDITIONAL COMMENTS

Our rubber stamp option is revolutionizing the rubber stamp industry. With special electronics and a special system driver, it is possible to engrave rubber stamps with a profile and cut out the stamp in one easy step. The machine produces a taper on each character so that the base of the character is wider than the top printing surface giving greater stability when stamping. If trying to engrave stamps without this option, the letters will not have a profile, be very thin and flimsy, and will collapse while stamping them. If you do not have this option and would like to add it to your system, please contact one of our engineers in the sales department for current pricing. All laser systems can be upgraded to have this extraordinary feature. In the above example, only one pass is necessary to achieve a deeply engraved rubber stamp. When cutting out the rubber stamp, we recommend using a very low PPI setting. This setting spreads the laser pulses far enough apart that they just touch at the edges. The result is a perforated cut that allows the rubber stamp to remain attached to the entire sheet but easily removed by simply tearing it off. The advantage to this is that the possibility of distortion or melting while cutting

is virtually eliminated and the entire sheet of rubber stamps can be removed from the machine at one time instead of having to pick them up one by one. Some blends of rubber produce a powdery residue when engraved. Using compressed air and blowing off the residue usually will clean the rubber effectively, but please clean the rubber outside of the laser system.

19. SIGN VINYL

These parameters are for engraving vinyl on wood. Apply the vinyl to the wood and squeegee out air bubbles. Mask with transfer tape. Engrave deep enough to go through the tape, vinyl, and into the wood. Make a second pass to go deeper. Engraving at a slower speed might cause the vinyl to melt. For vector cutting unmasked, cuts through vinyl and not the backing. Thicker vinyl requires more power and thinner ones require less. Adjust as necessary.

ADDITIONAL COMMENTS

Sign vinyl comes in a wide variety of colors, patterns, thickness, finishes, and reflectivity. There are a few methods for using sign vinyl with the laser system. One method is to vector cut (unmasked) through the vinyl but not through the backing. This technique provides results equivalent to a vinyl cutter machine. Once the vinyl has been cut, remove the excess vinyl, apply transfer tape and use a squeegee to remove trapped air bubbles. The transfer tape can then be lifted off and the vinyl lettering or objects that were vector cut will stick to the transfer tape and maintain their correct spacing with respect to each other. Now apply the tape to the desired surface and squeegee, peel off the transfer tape, and the lettering will remain adhered to the surface. The other method is to apply a piece of vinyl to the desired surface (unmasked) and adjust the laser power so as to cut through the vinyl without engraving into the material below. Another popular example of the use of vinyl is to cover the entire surface of a wooden plaque with vinyl, use a squeegee to remove all air bubbles, and then mask the entire surface with transfer tape to protect the vinyl from smoke damage due to the wood engraving involved. In the graphics software, color the background one of the eight driver colors and place white filled text on top of the colored background. Since the laser system does not engrave white filled objects, the background will be engraved and the lettering will be untouched. Then peel off the excess vinyl and transfer tape to reveal the final product. The lettering will be raised and vinyl coated.

20. WOOD

Laser engraved wood still produces results that are popular for a variety of purposes including trophy bases, desk accessories, plaques, awards, and bats. Make sure you look for woods that provide contrast when engraved. Favorites include oak, walnut, maple, cherry, and mahogany. There are also a variety of exotic woods available, too. When purchasing wooden products for laser engraving, look for products that are sold as “laser engravable”. This will ensure that any stains, bleaches, oils, etc. used in finishing the wood will not cause adverse reactions when exposed to the heat of a laser.

ADDITIONAL COMMENTS

When engraving wood with a laser, a brown, maple syrup like residue will deposit on the surface of the wood. This is normal and impossible to eliminate by **POWER, SPEED, or DPI** changes. More residue will be present when engraving deeper and/or slower. This residue washes off with water and a sponge. We recommend using a kitchen sponge with a nylon string mesh wrapped around it. Dampen the sponge and wipe off the residue. A damp chamois cloth works well also. Do not use paper towels or a regular sponge because these materials will get lodged in the engraved area when wiping and are extremely difficult to remove. A method to avoid cleanup is to mask the wood with transfer tape and peel off the tape after engraving. If

desired, after engraving and before peeling off the tape, spray paint can be applied to color fill the engraved areas. After the paint dries, peel off the tape. If an intricate drawing has been engraved and there are many small pieces of tape to remove, it may be easier to flood the masking, after engraving, with water. This will loosen the tape and it can be easily removed by rubbing it off by hand. In the vector cutting example, the wood was elevated from the table to let smoke and heat escape from underneath. If elevating the wood, mask and/or dampen the bottom side of the wood very lightly and the water acts as a heat sink to prevent the underside from flaming and charring. Elevating the wood also helps to determine whether the laser has passed completely through since the cut pieces will fall through to the table when cutting is finished. If raising the wood, set up the drawing so that the inner pieces of the drawing are cut first, otherwise pieces may fall through at the wrong time. Not all wood finishes are created equal. When ordering wood from a supplier, be sure to specify that it is being used for laser engraving. Some finishes cannot handle the heat from the laser and will bubble, blister, and possibly turn white. For engraving softer woods such as pine or balsa, reduce the power settings to acquire the best depth. Engraving too deep on soft woods will reduce quality. Every type of wood will engrave differently. Experiment with different types of wood and note the results. It is better to engrave woods that are finished. If engraving unfinished wood and it is not masked with transfer tape, the smoke residue tends to embed in the wood and is impossible to remove without sanding. To prevent this, mask all unfinished wood with transfer tape.

21. WOOD INLAYS - VENEERS

Create a drawing with no outlines, only filled areas. Engrave the filled areas almost as deep as the thickness of the veneer (usually about .003 inches (.1 mm) or less). With some water and a nylon brush, remove all residue from the engraved area. When cutting veneers make sure they are lying absolutely flat. In the drawing, give the objects an outline of .001 inches (.1 mm) and remove the fill. Adjust the power so that there is just enough power to cut completely through the veneer. Overpowering the cut will cause too much material removal and the fit will not be snug. Some software programs allow outline offsetting to compensate for the thickness of the beam. This is called contouring and is optimal if planning to do this type of work. Usually, a contour to the outside of the vector line of .006 inches provides a tight fit. Remember, if using more power to cut through the veneer, compensate for the thicker width of the laser cut by contouring a little further to the outside. Another method, which we believe is a better way, is to first create your graphic and fill it with the color black. Then give it a white outline of .012 inches (.3 mm). If you look at the graphic when you add the outline, you will see that it appears to shrink. Now raster engrave the graphic to a depth slightly shallower than the thickness of the veneer. When the engraving is finished, place the veneer into the laser system. Take the graphic on screen, remove the black fill and change the outline to the color red. Also make sure that the red outline thickness is set to .001 inches (.1 mm) so that it will vector cut. Cut out the veneer with the laser system, add glue to the veneer, apply the veneer into the engraved area of the other piece of wood, and let dry. After the glue has thoroughly dried, sand the veneer until it is flush with the base wood. A good veneer to use are those with an adhesive backing. Once cut, place the veneer into its proper place on the engraved wood block and with a clothes iron, iron the veneer into the engraved wood. This melts the glue and causes the veneer to stick to the engraved area. Finish the wood as you desire and the finished product will look fantastic. The veneer can now be sanded flush with the surface and a finish coat applied.

22. CONCLUSION

Laser processing lends itself to a range of versatile materials, with more constantly being developed. Don't forget to always experiment for best results and use trade shows, trade journals, and online searches to keep up with new possibilities. This way, you can continue to provide your customers with the latest materials that the industry has to offer.

Suggested Start Settings For Laser Engraving

Adjustments may have to be made for your Laser

Material		Power	Speed	DPI
Acrylic-.025 Thick	Raster	40	100	500
	Vector Engraving	5	4	500
	Vector	75	0.8	500
Anodized Aluminum	Raster	40	100	500
	Vector Engraving	10	4	500
Enameled Brass	Raster	30	100	1000
	Vector Engraving	15	4	1000
Corian	Raster	100	50	500
	Vector Engraving	50	4	500
Cork	Raster	75	100	500
	Vector Engraving	10	4	500
	Vector Cutting	50	1.6	100
Delrin	Raster	100	60	500
	Vector Cutting	75	3.2	200
Glass	Raster	100	100	500
	Vector Engraving	8	4	500
Leather	Raster	45	100	500
	Vector Engraving	5	4	500
	Vector Cutting	50	2	200
Marble	Raster	100	100	500
	Vector Engraving	20	4	500
Mat Board	Raster	30	100	250
	Vector Engraving	20	4	250
	Vector Cutting	55	4	200
Melamine	Raster	100	70	500
	Vector Engraving	20	4	500
Rubber Stamps	Raster	100	30	500
	Vector Cutting	40	1.6	150
Sign Plastic Sheet .060 Thick	Raster	30	100	500
	Vector Cutting	60	1.6	150
Sign Vinyl .003 Thick	Raster	100	50	500
	Vector Cutting	2	4	250
Wood – Walnut .125 Thick	Raster	100	70	500
	Vector Engraving	40	10	500
	Vector Cutting	50	1.6	250