How to laser cut & engrave External engraving laminate from
908 Ltd

As found at
http://www.908ltd.co.uk/webshop?page=shop.browse&category_id=19

Being both a supplier and user of laser engraving materials. We get asked so many times, what is the best way to laser cut and engrave laminates using a CO2 laser?

So we decided to compile this blog to detail how we work our External Engraving Laminate. It should be said that we are not claiming to be experts in this field, but we do have considerable experience. We have spent and will no doubt carry on spending, many enlightening hours trying to maintain and perfect the process, to obtain a quality, laser cut and engraved plate. As we manufacture labels and signs ourselves we also have given considerable thought to the obligatory clean up procedure, which always follows these processes.

This guide has been laid out in a series of steps. To show, you how we undertake every job which requires laser cutting and engraving.

Firstly, it is important that you realise how this material is constructed:

![Diagram of laminate construction](image.png)

**0.2mm thick - Modified Acrylic Cap & Base**

**2.7mm thick Modified Acrylic Core (3.2mm thick laminate sheets)**

**1.1mm thick Modified Acrylic Core (1.5mm thick laminate sheets)**

**Step 1 - This is a very important step and should not be overlooked, if you don’t want to waste valuable material and time!**

Test the whole process first on a piece of scrap material before commencing the full job.
**Step 1a**
The first thing we do is vector (cut) the plate. Making sure to **leave the clear protective coating on both sides of this laminate**. As this process generally produces the most amount of smoke and residue. Leaving the coating in place helps to minimise on the amount of time you will need to spend, to clean up the plate(s) once completed.

**Step 2**
Regardless of thickness, we can generally cut this material in one pass. We use a 50 watt machine and the settings used are as follows:

- Power 83% and speed of 14% on the 1.5mm thick material
- Power of 83% and speed of 7% on the 3mm thick materials.

Now, whilst we doubt our settings will work on your machine. We recommend that you experiment* to find your best parameters.

**We highly recommend you do not use 100% power for this process.** As on plastics we have found that when you put too much power through the beam, it causes a very sticky residue which is difficult to remove.

It can sometimes be better to reduce the speed a little as opposed to increasing power.

**Step 3**
Once you are satisfied that the material has been cut through. **Remove the protective coating from the surface of your cut plate.** Avoid lifting the cut plate off the bed to ensure the location remains the same for the second part of the process.

If your plates are small and likely to move, when stripping the coating. We suggest you invest in a re-useable **Seklema Multi Matt**, which will hold the material firmly in place.

**Step 4**
Spray a fine layer of furniture polish over the surface of the plate and lightly buff. This will put a fine wax layer onto the surface of the material. Not only will the polish remove the sticky residue caused by the protective coating. But it will form a thin barrier on the plate to help prevent the smoke residue sticking to the surface, thus making it easier and quicker to clean afterwards.
**Step 5**
Set the machine to raster (engrave). We use a 50 watt machine and use the following settings on both thicknesses of material.

- **Power**: 50%
- **Speed**: 80%

Now, whilst we doubt our settings will work on your machine. We recommend that you experiment* to find your best parameters.

**We highly recommend you do not use 100% power for this process.** As the more power you use, the more residue will be created. Also you will cause the material to melt badly. It tends to be a common misconception that the more power you can use the better it will be. This is not the case.

You will get a cleaner sharper image by using less power and reducing the speed.

If, your laser machine is equipped with an extraction unit that is located at the top of the machine bed. We recommend engraving from the bottom of the plate, upwards. We do this because as you laser engrave, your material will become sticky with the heat produced by the laser. Engraving from the bottom upwards allows the smoke to be dragged over a surface which as yet does not have any of the sticky residue, which ultimately traps the smoke and causes the discolouration of the engraving.

We also recommend, if possible, to reduce the flow of the air assist. You need only enough air to protect the lens. Too much air will simply blow the smoke residue back into your engraved letter and cause discoloration.

**Step 6**
Certain colours within this product range (Red, Blue, Green, Burgundy & Brown) will generally require a second pass to simply remove the discoloration caused by the smoke. We have found that the second pass can be speeded up, simply by altering the Image Density from 5 to 3.

This is how our Image Density setting looks on our software:
Step 7
At this stage the laser engraved letters should be crisp and clean. Remove the finished plate from the laser bed. Remove the protective coating from the back of the plate. A final wipe over with a clean cloth and a small amount of Laser Clean should remove any remaining residue.

We hope that you will find the above information to be useful.

*Tips on how to find the correct settings for your machine*

Normally your machine will be supplied with a list of the manufacturers recommended settings, for various materials e.g. Plastic, Wood, Rubber, Paper etc. This information can sometimes be found within the machine software or in an Instruction Manual.

If you do not get desired results using the manufacturers recommended speed and power settings, do not panic! Remember these settings are only guidelines. All laser machines and materials react differently.

The key to unlocking your machine’s settings is quite simply, experimentation. Get to know your machine. Start from the manufacturers recommended settings and then alter the power setting either up or down, depending upon your initial test result.

If adjusting the power setting does not work, start over and adjust only the speed setting.

Once you have the required results, make a note of those settings for that particular plastic so that you do not have to repeat the experimentation process again.

Before starting work on any job we always recommend that you run a small test piece first.