• Marking on Glass with *LaserBond 100* •

There are a couple of tricks to getting good results marking on glass because the glass composition itself can vary greatly and glass cannot tolerate the thermal shock of the laser energy being absorbed by the ***LaserBond 100*** coating with the resulting rapid temperature change in order to make the chemical reaction occur between the ***LaserBond 100*** coating and the glass surface. The temperature actually rises from room temperature to more than 1500 degrees F in about 100 microseconds (1/10th of one thousandth of a second)! The glass is too brittle and delicate to withstand such a thermal shock, so you need to de-focus the glass surface about 3 - 4 mm ((0.15 inch) below the focal point of the lens as measured with the focus stick or your auto-focus (if you have that feature). De-focusing will slightly increase the size of the laser spot, but (more importantly) will decrease the power density of the laser spot - which reduces the thermal shock to the glass surface.

Under normal conditions, a CO_2 laser spot size is about 0.005" - 0.006" (about 0.1 - 0.15 mm) in diameter which means that the maximum resolution you can achieve in any graphic is about 300 dpi (dots per inch). Any higher dpi setting is basically wasted on the human eye and only adds the equivalent of more laser power to the process because the laser is firing more often than necessary for an image quality that the human eye cannot see and the dots will be overlapping (on top of each other). The resolution of the human eye is only about 0.003" - 0.004", so higher laser resolution cannot really be detected in a black and white image - color images are a different story!

The optimal laser power level for glass (depending on the type) is 8 - 12 watts (de-focused), so you should only be using a relatively small percentage of your laser's power. Also, the speed should be in the 20% - 25% range using 300 - 500 dpi; however, you should use a high pulses per inch (ppi) setting to maintain a lower peak power for each individual laser pulse.

If the CO_2 laser power is too high, the excess laser energy passes completely through the ***LaserBond 100*** coating and is absorbed by the glass - causing micro-fracturing which results in glass chips falling out of your image. Micro-fracturing creates a surface effect similar to mechanical engraving or sand blasting and none of the dark color of the ***LaserBond 100*** coating will be present because it will have chipped out as part of the micro-fractured glass chips.

A thin, even and smooth ***LaserBond 100*** coating is best. A single, thicker coating does not achieve a better result and only requires more laser power to make the chemical reaction happen - which is counterproductive; however, a second thin, even and smooth coating on top of the first one is possible and could improve the contrast and definition of your image.

I hope this information will prove to be helpful but marking on glass is a real art and will take a considerable amount of experimentation and practice. I'll be interested to hear more about the results that our customers achieve.

• Examples on Page 2 •

This Civil War picture on glass as shown at the 2017 APA Show in Las Vegas was created with ***LaserBond100***.

• Glass beer mug marked with ***LaserBond 100*** •

Courtesy of Eva's Custom Etching