APPLICATION TIPS

Glass-Crystal Etching with LASERS

Introduction

Laser etching glass it heats the glass locally causing micro cracks. The micro cracks diffuse light causing a bright frosted appearance in the marked areas. This process can produce stunning images, logos and even photos on glass!

Overview

There are many types of glass and each will produce different reactions when laser processing.

Soda Lime Glass: Soda-lime glass is the most common form of glass produced and is. going to produce varying results when laser processed, because there are so many different formulas and manufactures or Soda lime glass some laser etch very well and some does not producing chipping and flaking. The higher the quality of soda lime glass the better the engraving quality.

Fused Silica: Also known as Fused Quarts containing high-purity silica in amorphous (non-crystalline) form. It is different from traditional glasses, in that there are no ingredients added to lower the melt temperature. Fused silica, therefore, has much higher working and melting temperatures and because of this it laser etches far better then soda lime glass.

Gorilla Glass: Made by Corning and engineered for a combination of thinness, lightness, and damage-resistance, it is used primarily as the cover glass for portable electronic devices. Because of its high purity and quality this produces by far the best laser etching quality.

Laser System Configurations:

Recommended Lens: Processing glass in order of quality: #1, HPDFO Lens, #2 1.5” Lens, #3 2.0” Lens, no other lens is recommended.

Laser wattage: Any wattage will work on glass but the higher the wattage the better your productively will be.

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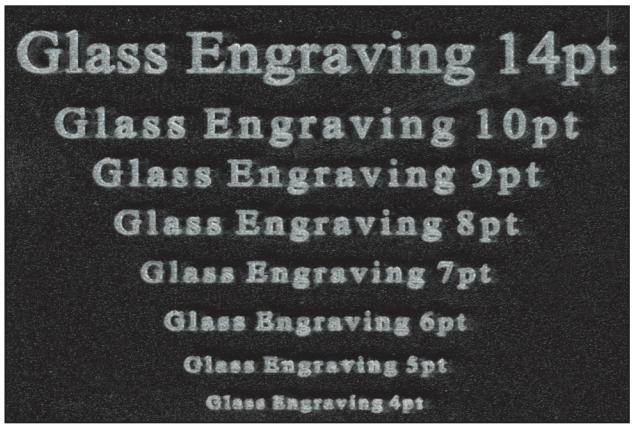
Glass with Lasers

The following is many different tips for glass depending on the effect you are looking for, Please review each process to determine the best solution for your needs.

1. Laser Etching glass requires that the laser is perfectly in focus, deviating from focus will cause the etching to chip and flake away producing a low quality engraving.

2. Poor quality glass can chip and flake even if it is in focus, 1 tips to solve this issue when etching **larger** text and logos is to convert the image to 60%-70% grayscale, this will halftone the laser etching producing a sharp frosted image. You can put a black outline around the image to sharpen the edges.



3. For marking small text grayscale does not work however with the HPDFO lens it is possible to get down to a 4 point text, 1.5" lens down to 5 point and a 2.0" lens to 6point test.

To do this run your laser using manual settings:

Power Settings
80% Power,
Speed (will depend on your laser wattage)
PPI to 1000
Image Density 6

Manually adjust your Image Enhancements:
Contrast 100%
Definition 50%
Density to 50%

For Best results test settings on scrap glass to start

4. Masking glass is another method to produce edge stability and also allow the engraving to be paint filled.

Glass Laser Tape:
1. Clean the surface of the Crystal or Glass.
2. Cut desired size of glass tape large enough for the artwork.
3. Position the laser tape onto substrate to match the area where the artwork will be lasered.
4. Using a squeegee to press out bubbles.
5. Laser substrate using glass settings
6. Paint fill if desired then remove mask to expose sharp edges.

Note: Masking will improve the edges of the engraving but it will not keep flaking form happening in the center of the image.

Get glass laser mask from www.jdsindustries.com

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Glass with Lasers

5. Producing depth into glass is possible with the higher purity glass such as the Fused Silica glass.

To do this you will need to use the tips from Step #3 and #4 from the previous page together.

To Process:
1. Mask the Glass with a laser mask
2. Place glass into your laser system and tape the edges so that the glass will not move
3. Laser process the glass using the settings from step number 4 with one exception, run your speed very low, (Example 5-10% speed on a 50 watt laser)
4. When the laser is finished, do not remove it, while in place brush engraving with a brass wire brush until glass is free from debris then run the file again.

This process can be done as many times as necessary until depth is reached.

Depth in Glass

6. Lead Crystal laser etches extremely well and does not require any special processing techniques, there are however some issues.

Higher lead contents increases the risk that heat will build up from the laser engraving process and crack the crystal as it cools down.

To reduce the chance of cracking only engrave small text and logos on crystal, only very large surface engravings run the risk of cracking


Lead Crystal

7. Photos can be difficult on glass, again the higher quality the glass the better the results will turn out. Fused Silica glass produces the best photos and if the glass is black or has a black back the contrast is greatly improved.

HPDFO Lens is recommended for any glass photos High contract photos produce better engravings. Image quality when etching photos on glass is low due to its response to lasers so small photos on glass is not recommended.

High quality images 3”x5” or larger produce the best photos on glass.

To Process:
1. Open Image into 1-Touch laser Photo software
2. Crop or size the image to your material size
3. Run the “Glass” Filter and print to the laser
4. Engrave using HPDFO lens on high quality glass


Photo on glass

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