

# APPLICATION TIPS



Version1.3



## GLASS-CRYSTAL ETCHING WITH LASERS

### Introduction

Laser marking causes micro cracks. The micro cracks diffuse light causing a bright frosted appearance in the marked areas. This process produces stunning images, logos and even photos on glass.

### Overview

There are many types of glass and each will produce different results when processed.

**Soda Lime Glass:** The most common form of glass manufactured and produces varying results when laser processed. Because there are so many different formulas and manufactures of soda lime glass there is going to be some inconsistency laser marking it. some brands laser etch very well and some do not producing chipping and flaking. The higher the quality of soda lime glass the better the laser marking quality.

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

**Corning® Gorilla® Glass:** Engineered for a combination of thinness, lightness and damage-resistance, it is used primarily as the cover glass for portable electronic devices. 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; (High Power Density Focusing Optics), #2 1.5" Lens, #3 2.0" Lens. no other lens is recommended.

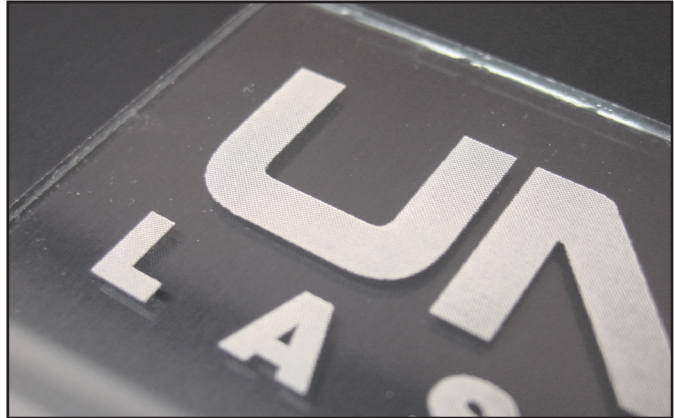
**Laser Power:** Any laser power will work on glass. Higher the laser power the better your productively.

## 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 marking glass requires the laser is perfectly focused. Deviating from focus causes the marking to chip and flake away and produces lower marking quality.



**2.** Poor quality glass can chip and flake even if focused correctly. To solve this issue when marking **larger** text and logos, the image should be 60%-70% grayscale. This will halftone the laser marking and produce a sharp frosted looking mark. A black outline can be placed around the image to sharpen the edges.

**Glass Engraving 14pt**  
**Glass Engraving 10pt**  
**Glass Engraving 9pt**  
**Glass Engraving 8pt**  
**Glass Engraving 7pt**  
**Glass Engraving 6pt**  
**Glass Engraving 5pt**  
**Glass Engraving 4pt**

**3.** For marking small text grayscale from step #2 does not work. The HPDFO lens enables laser marking down to a 4 point text, 1.5" lens down to 5 point text and a 2.0" lens to 6 point text.

To allow this small text special settings need to be adjust manually (Not using Materials Database):

### **Small Text Laser Power Settings:**

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

### **Manually adjust your Image Enhancement Settings to as follows:**

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 allow the laser mark to be paint filled.

### Glass Laser Tape:

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

*Note: Masking will improve the edges of the engraving but it will not keep flaking from occurring in the center of the image.*

Get glass laser mask from [www.jdsindustries.com](http://www.jdsindustries.com)



## GLASS WITH LASERS

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

To apply this, use the tips from Step #3 and #4 in this document together.

### **To Process:**

1. Mask the glass with a laser tape
2. Place glass into your laser system and tape the edges to avoid material moment.
3. Laser process the glass using the settings from step #4 with one exception, run your speed very low, (Example 5-10% speed on a 50 watt laser)
4. When finished, do not remove the engraved glass. 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 some material processing items to address.

Higher lead content increases the risk of cracks forming around the laser marks.

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



Lead Crystal

**7.** Laser Marking photos can be difficult on glass, but higher quality 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 contrast photos produce better laser etchings. Image quality when marking photos on glass is low due to the response to lasers so small photos on glass is not recommended.

High quality images 3"x5" or larger produce the best results 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. Laser Mark using HPDFO lens on high quality glass.



Photo on glass