Approval

Approving Authority	Name	Signature	Date
Process Systems Manager	Michael Delgado	*[signature]*	12/4/14
Quality Assurance Manager	Steve Washington	*[signature]*	12/4/14
V.P. Engineering	Steve Rusconi	*[signature]*	12/4/14
Operations Manager	Steve Hansen	*[signature]*	12/5/14
President	Joseph Parisi	*[signature]*	12/9/14

Revision History

Revision #	Description of Change	Effective Date	DCR#
0	INITIAL RELEASE	12/9/2014	14013

1   Purpose

    1.1   To provide a robust documented process for operating the UM-1 Ultra-compact Laser Marking System.

2   Scope

    2.1   Operating the UM-1 Ultra-compact Laser Marking System for labeling, numbering, or adding designs to sheet metal.

    2.2   This procedure application may vary based on project and/or client requirements.

3   Responsibilities

    3.1   The following is the responsibility of the Quality Assurance Manager.

        3.1.1   Ensure appropriate use of this procedure document.

    3.2   The following is the responsibility of the Department Managers

        3.2.1   Responsible for giving permission and proper training to the engineers using this system in their area.

    3.3   The following is the responsibility of Engineering

        3.3.1   Demonstrate proper use of the procedure

        3.3.2   Demonstrate use of all necessary safety precautions when using this system

4   Procedures

    4.1   Image Creation:

    Images may be created in any program but must be saved or exported to JPEG format. The preferred programs for creating lettering are Adobe Photoshop or AutoCAD. For lettering created in AutoCAD you must print the lettering as a JPEG file with at least 4000x4000 dpi resolutions.

    4.2   Powering On:

        4.2.1   Laptop

The first step in the process is to turn on the laptop and start the appropriate software. Often times the laptop is already ready to go, you may check this by touching the mouse and seeing if the laptop is on and "Symbol Writer Pro" is running. If not, power on the laptop and open the "Symbol Writer Pro" software after the laptop is fully powered on.

4.2.2   Laser Marking System

To turn on the laser marker first turn the key switch to unlock and then there is a switch on the back top right of the machine that should be switched to the on position.

After this switch is flipped to the "on" position a green light on the front of the machine will turn on, indicating the machine is ready. Once that green light turns on, the cover can be taken off the "Laser On" button on the front and it should be pressed. This will complete the powering on of the laser.
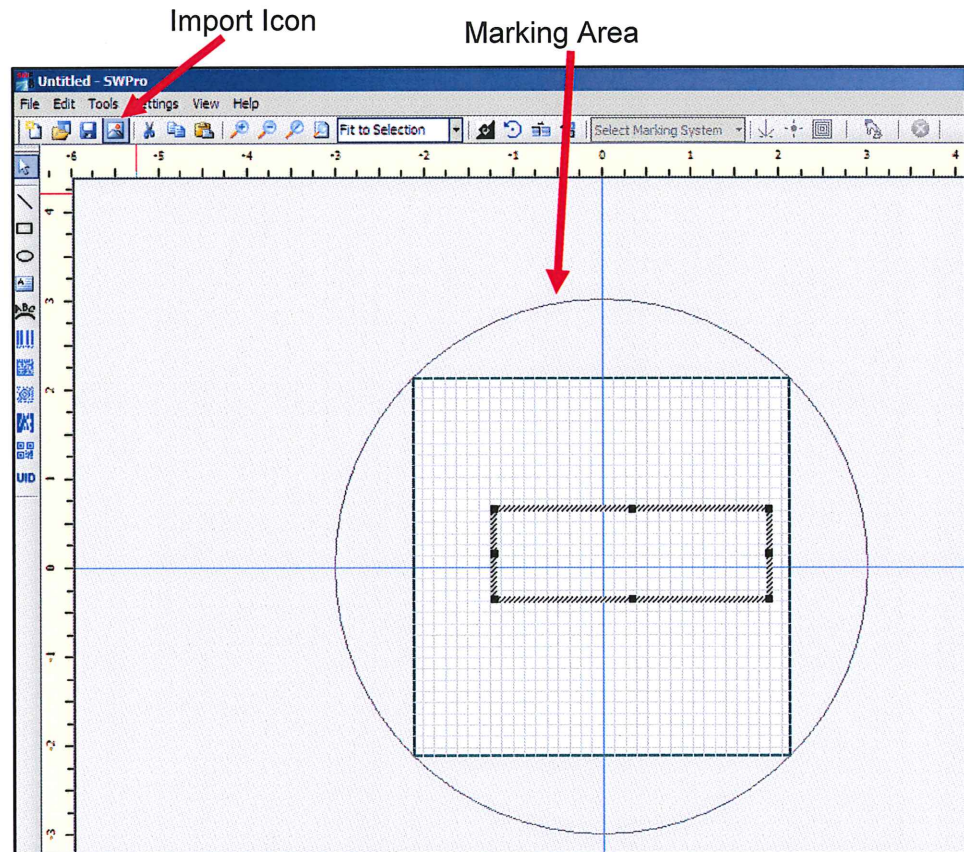
4.3   Set-Up

4.3.1   Importing

To import your image, click the "import" icon shown in the top left of the screen. This will open a browse window that will allow you to choose your image file from where it is saved on the computer or a memory stick. Next, position your image so it fits inside the marking area represented by the circle shown below.

Import Icon   Marking Area

4.3.2   Element Properties

The "Element Properties" that vary from project to project are **width** and **height**. These should be set to the desired dimensions of the final marking.

4.3.3   Marking Properties

For "Marking Properties" the options should be set as shown above. **Pulses**, **Q switch frequency**, and **step size** are all variable by project. If no specific values have been given for a job, 15, 6, and 20, respectively, are the default values.
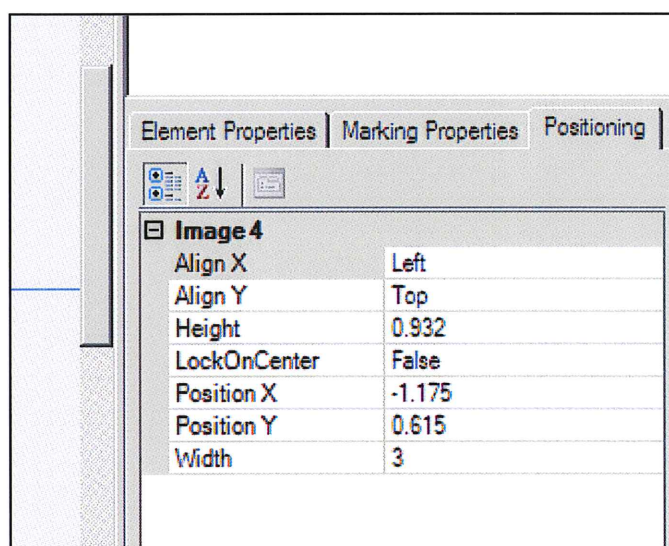
4.3.4 Sample Prep

Before placing the part in the marking chamber, be sure to wipe down the surface with an IPA wipe to remove any fingerprints, dust, etc.

4.3.5 Positioning

Element Properties	Marking Properties	Positioning

Image 4

Align X	Left
Align Y	Top
Height	0.932
LockOnCenter	False
Position X	-1.175
Position Y	0.615
Width	3

On the position tab, the first thing to check is that the **width** is set appropriately to the width of your design.

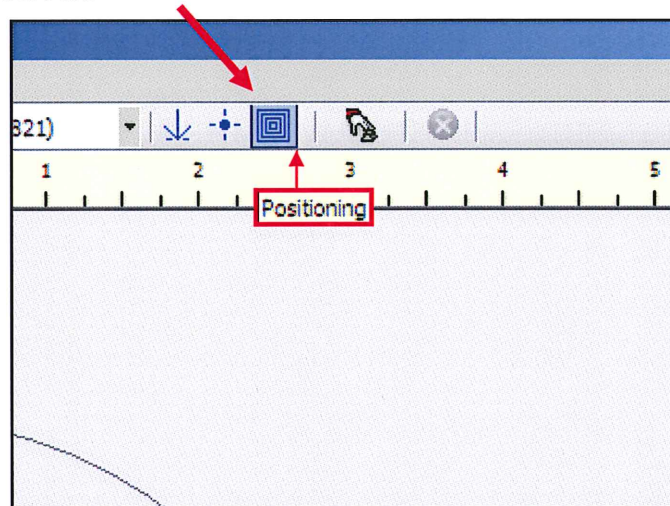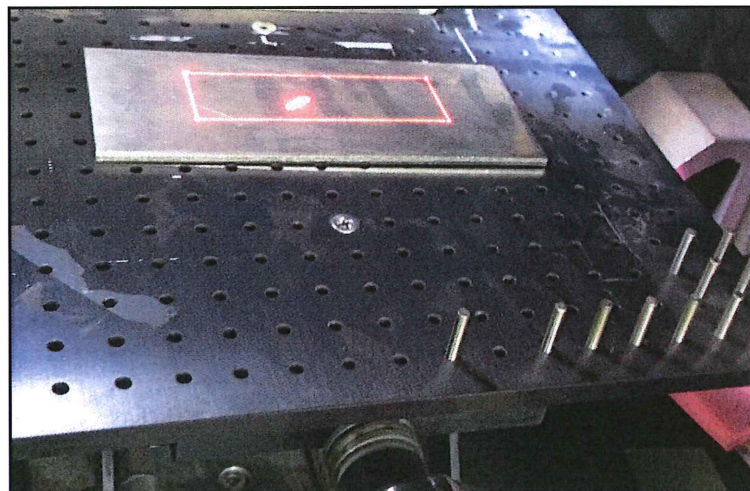Next, insert the surface you will be marking into the laser system chamber. Then, click the "Positioning" icon at the top of the screen.

This button will turn on a red targeting laser that gives a visual outline of the marking area on your material.

Move the sample in the chamber until the red rectangle lines up with the area on the material you want marked. At this time, adjust the height of the table using the knob on the front until the mark in the center is centered within the image window. Alternately, you can measure dimensions of projected rectangle to confirm they match settings in "Element Properties."

If, because of size or other restrictions, you cannot move your material, you can move the positioning of the laser by adjusting the "Position X" and "Position Y" fields on the positioning tab accordingly. For example, if you want the marking to be 2 inches to the left, you would subtract 2 inches from the current "Position X" value. Once the "Position X" and "Position Y" values have been adjusted accordingly, unclick and re-click the positioning icon to view where the marking area has been moved to. Repeat this process until the red outline is positioned on the correct area of the material.

4.4 Final Marking

After the positioning is complete, wipe the marking area clean with IPA wipe to remove dust and finger prints. Be sure part is secure so it will not move while marking, close the chamber with your material in it and click the "Engrave" icon. This will initiate the engraving process.
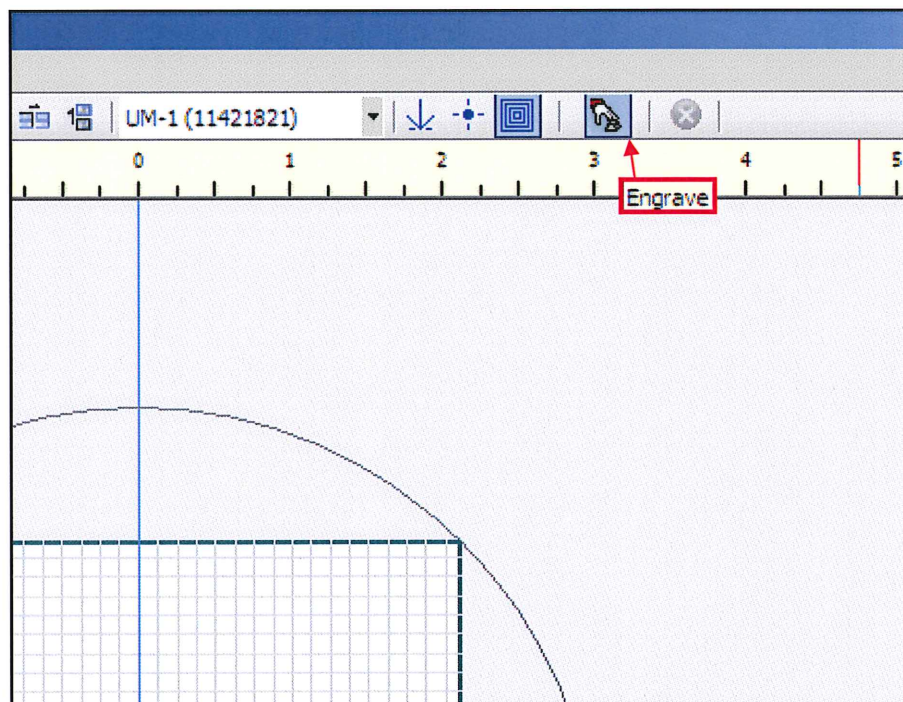
After the engraving is done, open the chamber and remove your material. Repeat this process with all materials you need engraved. If you have another material that is the same size and needs marking in the same spot, it is always a good idea to insert pegs or another guide around where your material was so you know where the next piece should go. This can save significant time in the positioning portion of the process.