

# **Work Example — Engraving a Photo on an Acrylic Plate**

RSD-SUNMAX Series  
SUNMAX LASER

**About this document:** This is an English translation of the Japanese original prepared by SUNMAX LASER for reference purposes. In case of any discrepancy, the Japanese original shall prevail. Specifications are subject to change without notice.

# Work Example — Engraving a Photo on an Acrylic Plate

## (Adobe Photoshop Edition)

- This document assumes that the laser machine has been set up correctly.
- This document assumes that the honeycomb table is installed.
- This document assumes that LaserWorkV6 (hereafter "LaserWork"), the control software for the RSD-SUNMAX series, has been installed correctly.
- In this document, the work is performed on a 3 mm thick acrylic plate.

— Finished image of the product created by following this document —



### 1. Creating the Design in Photoshop

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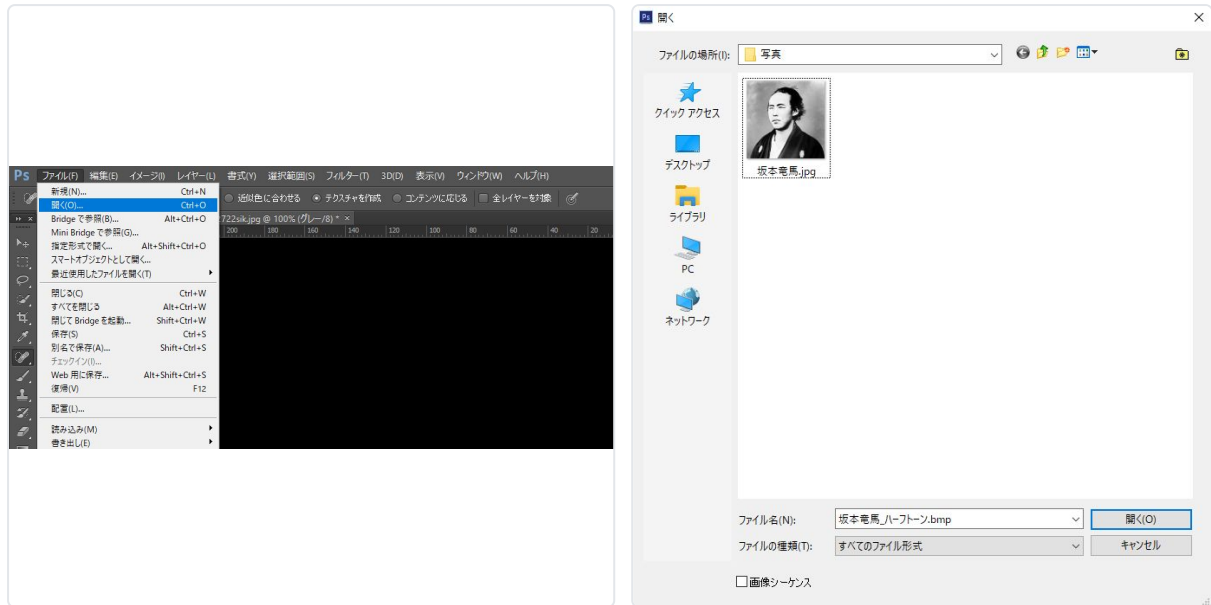
Create the engraving data using Adobe Photoshop.

You will prepare the processing data in BMP (bitmap) format, which the laser machine can read.

In this example, the design is created using a halftone (dot-screen) pattern.

(1) Open the "File" menu and click "Open."

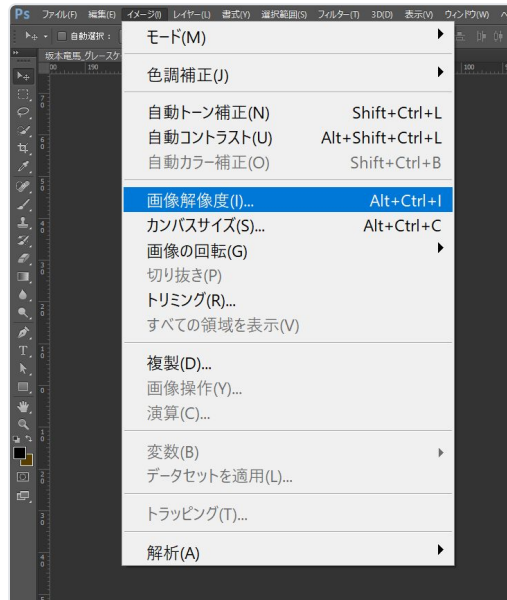
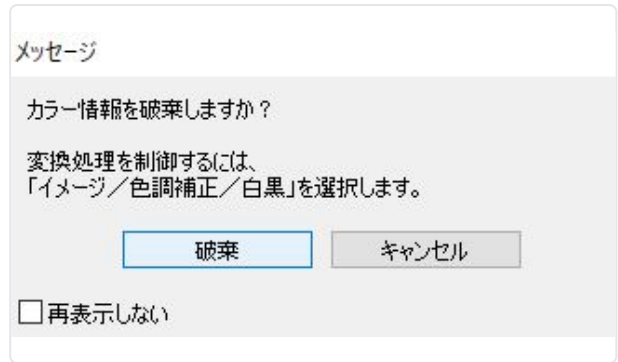
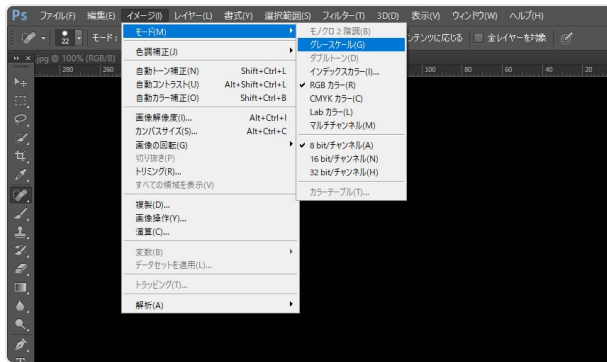
(2) The Open dialog appears; select the file and click "Open."



(3) Open the "Image" menu and hover the mouse cursor over "Mode"; a submenu opens. Click "Grayscale."

(4) If a confirmation dialog appears asking "Discard color information?", click "Discard."

(5) Scale the image down/up to the size to be processed.  
After loading the image, click "Image Size" in the "Image" menu.



(6) The Image Size dialog appears.

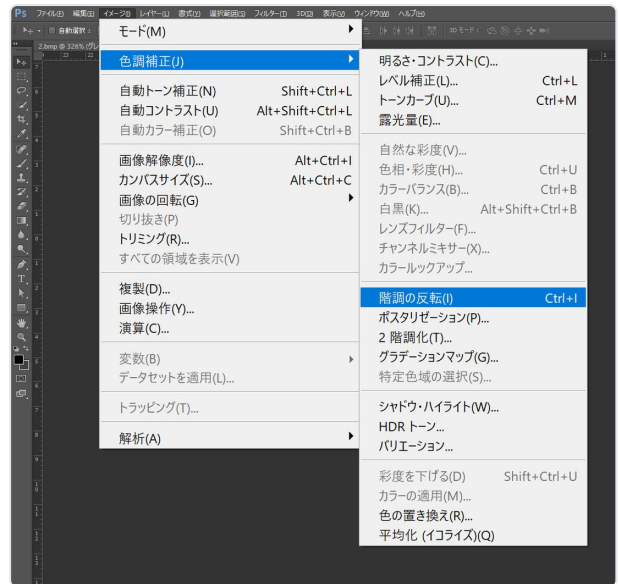
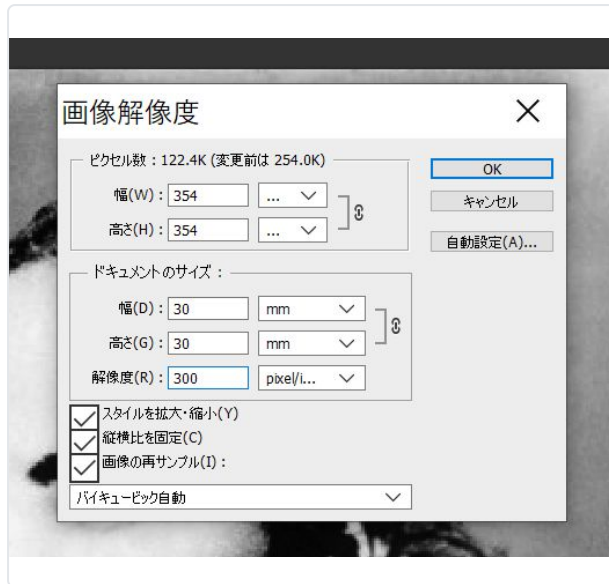
Enter the desired size (width and height).

\* Enter a resolution of approximately 300–350 as a guideline.

(7) From the "Image" menu, open "Adjustments" and click "Invert."

\* This is not possible unless the image has been converted to grayscale (monochrome).

— After inverting the tones —



(8) From the "Image" menu, open "Image Rotation" and click "Flip Canvas Horizontal."

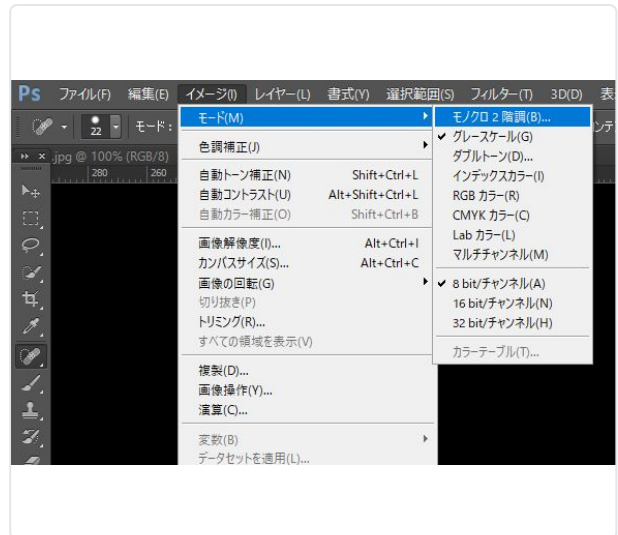
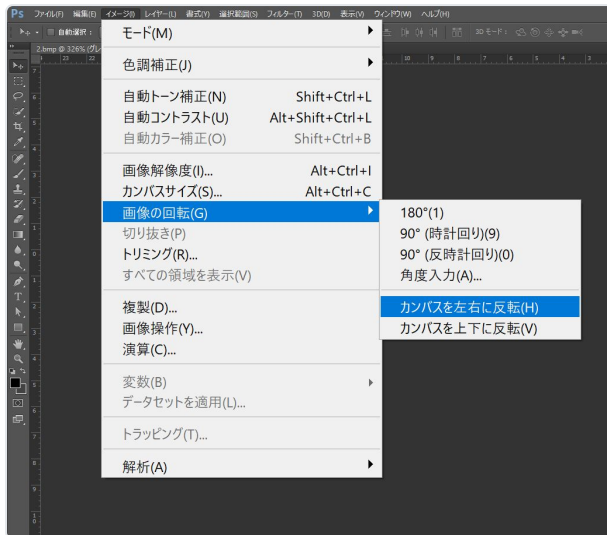
— After flipping horizontally —

(9) Open the "Image" menu and hover the mouse cursor over "Mode"; in the submenu you can now select "Bitmap." Click it.

(10) The settings dialog appears. Configure it as shown in the figure below and click "OK."

### [Guideline]

|        |                  |
|--------|------------------|
| Output | 1000 pixels/inch |
| Use    | Halftone Screen  |



(11) The "Halftone Screen" dialog appears. Configure the settings and click "OK."  
In this work example, the settings below were used.

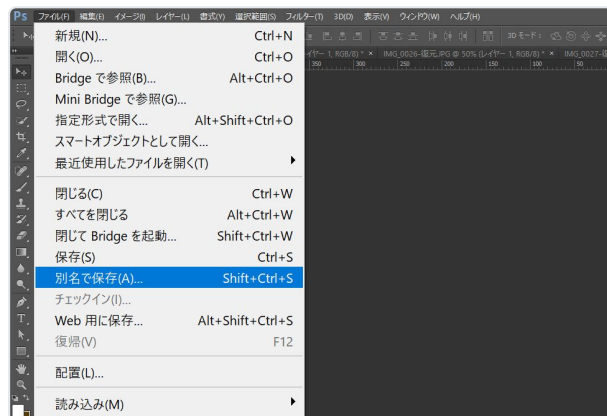
### [Guideline]

|           |            |
|-----------|------------|
| Frequency | 50–90      |
| Angle     | 45 degrees |
| Shape     | Round      |

\* The settings above are only a guideline. You will need to run trials and adjust the settings while checking the finished result.

Use the Zoom tool to magnify the image and confirm that it has been converted to halftone dots.

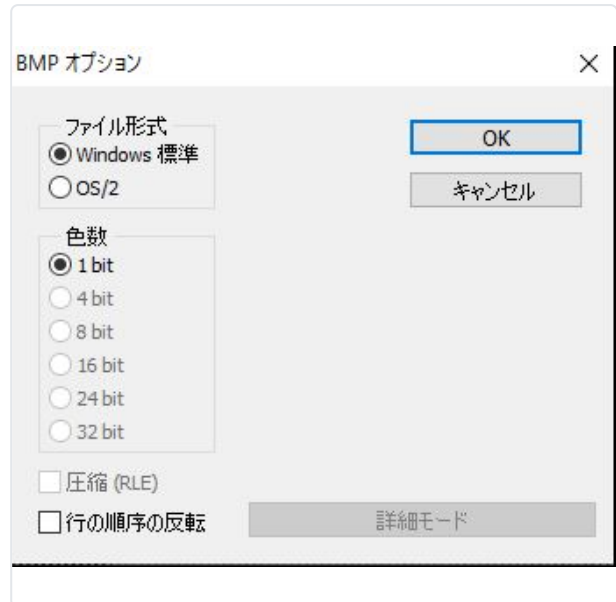
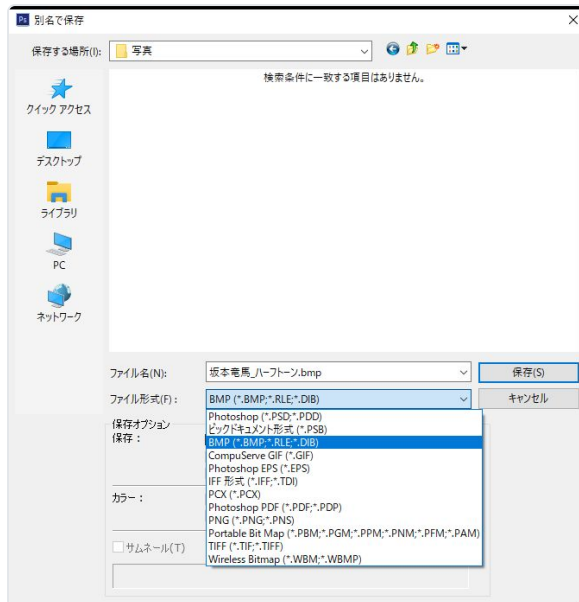
(12) Save the created data in the same way as with the grayscale image. Open the "File" menu and click "Save."



(13) The Save dialog appears; select BMP (\*.BMP;\*.REL;\*.DIB) as the file format.

(5) Enter a file name and click the "Save" button. The "BMP Options" dialog appears; set the file format to Windows (standard) and the depth to 1 bit, then click the "OK" button.

**Caution:** Do not edit this image data from this point on. If you scale it up or down or make similar changes, it cannot be processed properly.

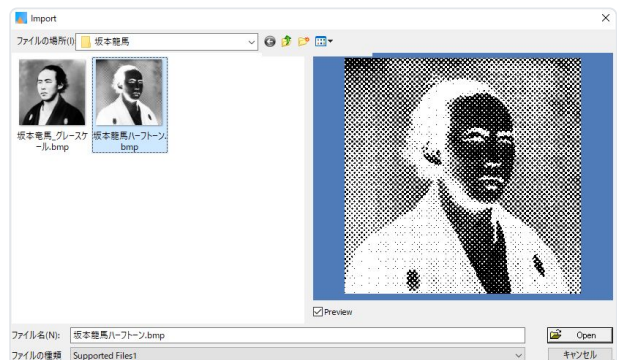
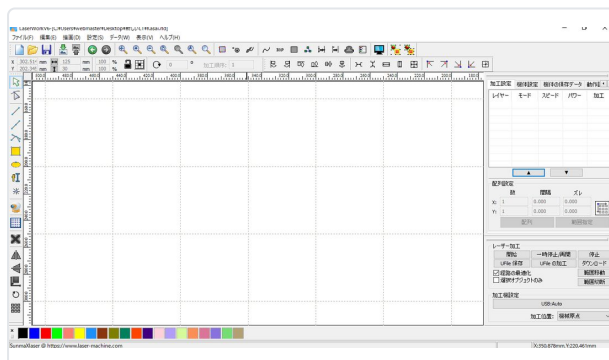


## 2. Editing the Data in LaserWork

### 2.1 Importing the Data

- (1) Start LaserWork and click "Import" on the system toolbar.
- (2) The file open dialog appears; select the file you prepared in Photoshop and click "Open."

Confirm that the image has been imported.



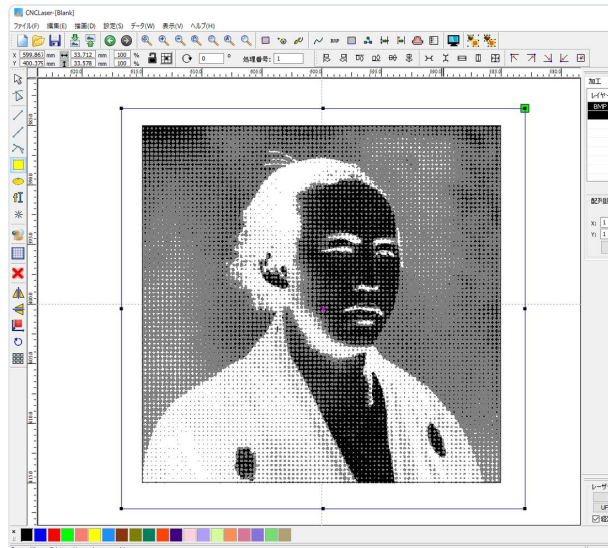
### 2.2 Cutting Design

- (1) Select (left-click) the rectangle as the drawing object for cutting the material.

The mouse cursor changes to the rectangle-drawing cursor. Click two points to draw a rectangle.

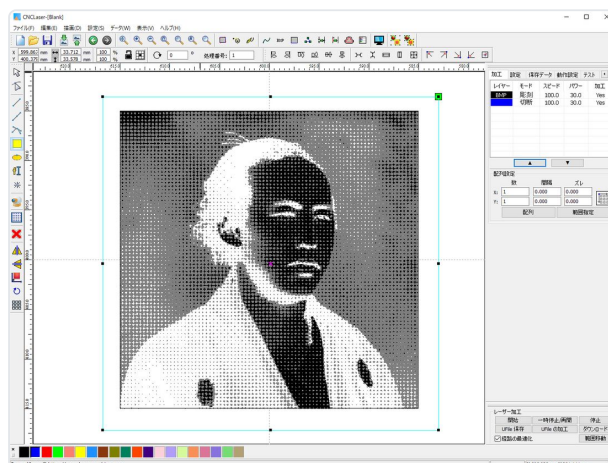
To create the cutting rectangle on a new layer, select a layer different from the image layer (here, blue) on the layer toolbar.

Drag to create the rectangle.



(2) Confirm that a rectangle layer has been created as a new layer.

Adjust the size of the rectangle object in the same way as for the image. Change the size using the X-direction length and Y-direction length fields in the properties toolbar. In this example, the rectangle is set to 35 mm x 35 mm.

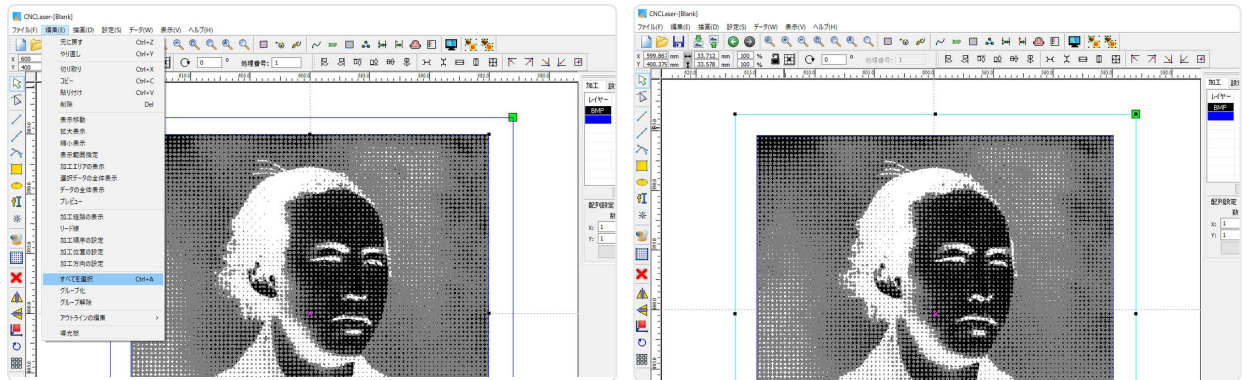


Note: The size cannot be changed unless the layer you want to modify is selected.

Adjust the positions of the two objects, and the design is complete.

(3) From the "Edit" menu, choose "Select All" (Ctrl+A) to select both objects.

Note: When the objects are on separate layers, both cannot be selected unless you use "Select All" (Ctrl+A).



(4) Click "Centering" on the alignment toolbar.

Confirm that the centers of the rectangle and the image have been aligned and the objects are centered on each other.

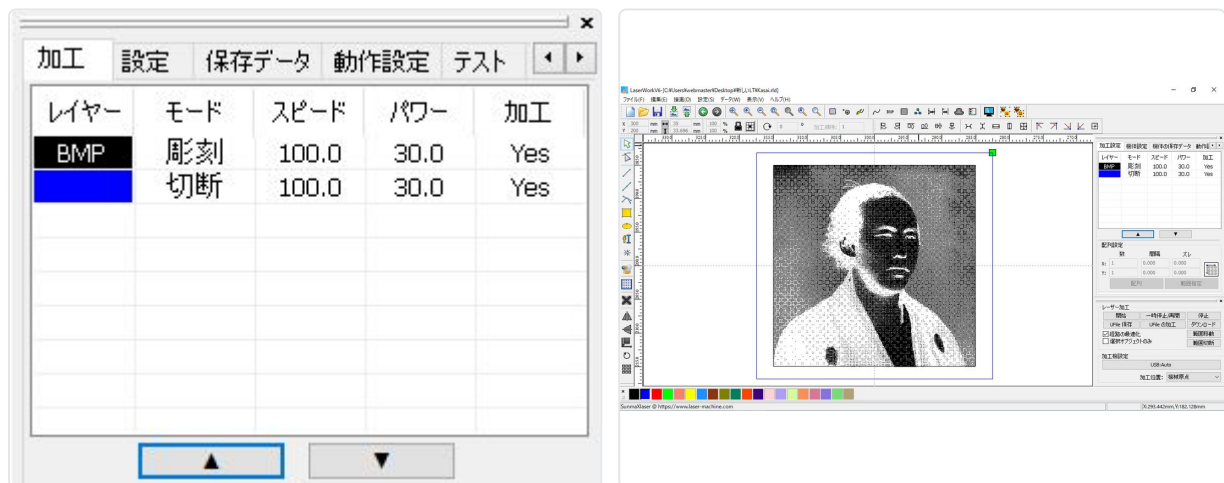
### 3. Processing Settings

Configure the settings for engraving and for cutting.

Note: The engraving settings differ depending on whether grayscale or halftone is used.

#### 3.1 Engraving Settings

(1) Double-click the BMP layer to display the processing dialog.

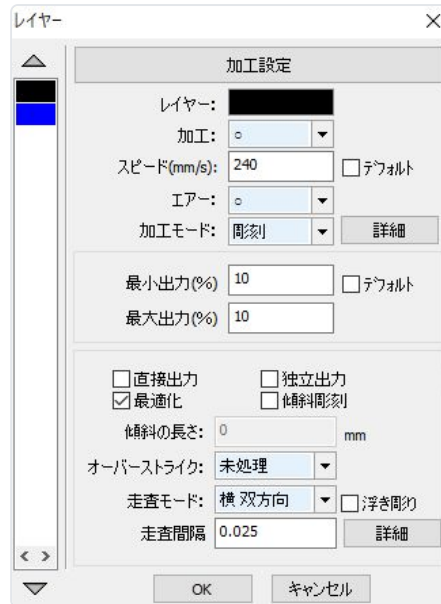


Double-click here.

(2) The layer dialog appears; configure it for engraving.

Note: BMP (bitmap) data is fixed to the engraving mode and cannot be converted to any other processing mode.

Note: The settings for each mode are remembered, so the values you set last are displayed as the defaults the next time you create a job.



Set "Engraving Speed," "Max Power," and "Scan Interval" according to the coating thickness of the material to be marked and the required quality.

The "Advanced Engraving Settings" displayed by clicking the button normally do not need to be changed. For details on these settings, refer to the LaserWorksV6 user manual.

Click the "OK" button to complete the settings.

When engraving with a 40 W machine, use the following settings as a reference and adjust as needed:

|               |                          |                               |
|---------------|--------------------------|-------------------------------|
| Speed         | 240                      | (approx. 0-600 for engraving) |
| Max Power     | 12                       | (0-100 [%])                   |
| Min Power     | 12                       | (0-100 [%])                   |
| Scan Interval | 0.025                    | (mm)                          |
| Scan Mode     | Horizontal bidirectional |                               |

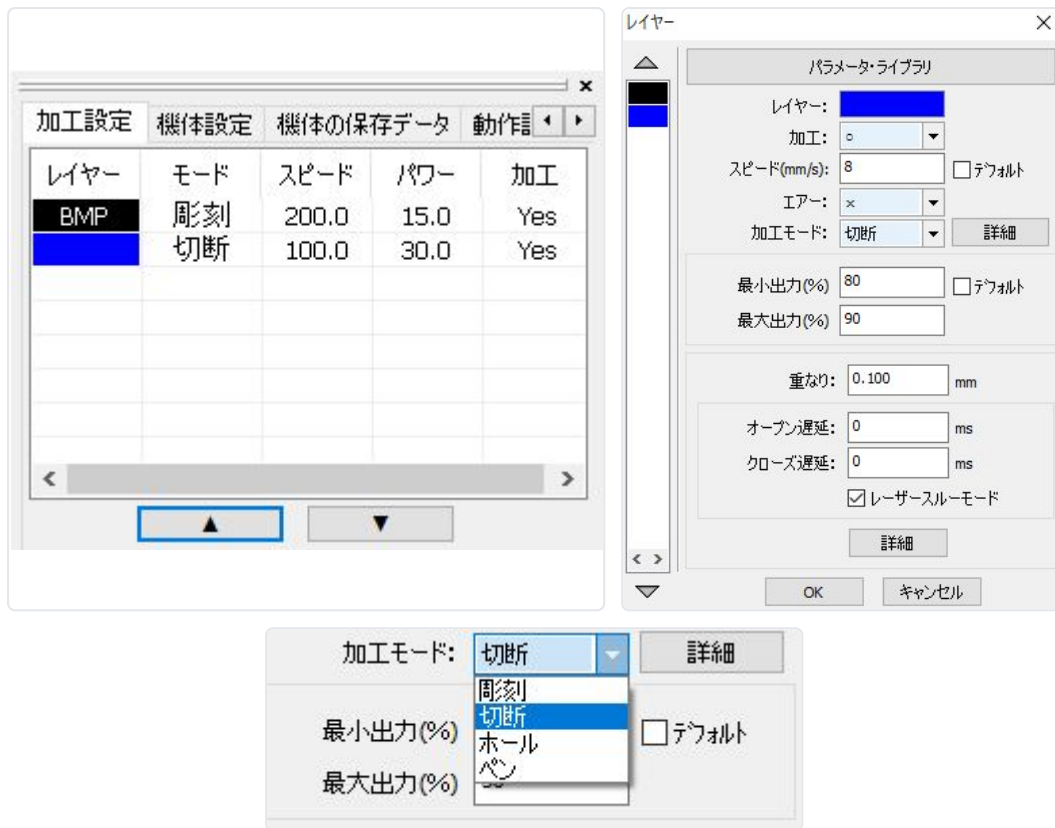
Note: The RSD-SUNMAX series does not support air control, so this setting is not required.

Check the "Optimize" checkbox. This function automatically optimizes the scan interval setting to match the image content. For example, when the laser output is switched ON/OFF in rapid, fine succession — such as when a halftoned (screened) image has been scaled down — moire may appear in the processing result; turning optimization ON can reduce this moire.

## 3.2 Cutting Settings

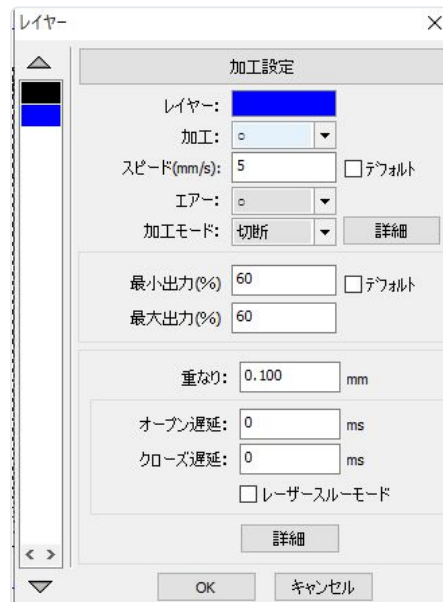
(1) Double-click the layer you want to cut to display the layer dialog.

(2) The "Layer Settings" dialog shown below appears; change the processing mode.



Double-click here. The mode list is displayed, so click "Cut."

(3) The layer dialog appears; configure it for cutting.



Set the "Speed," "Max Power," and "Min Power" values according to the thickness of the acrylic and the required quality.

When cutting acrylic, adjustments are generally made by varying the speed.

The RSD-SUNMAX series does not support air control, so this setting is not required.

The "Advanced Cutting Settings" displayed by clicking the button normally do not need to be changed. For details on these settings, refer to the LaserWorksV6 user manual.

Click the OK button to complete the settings.

When cutting 3 mm thick acrylic with a 40 W machine, use the following settings as a reference and adjust as needed:

|           |     |                            |
|-----------|-----|----------------------------|
| Speed     | 10  | (approx. 0-20 for cutting) |
| Max Power | 90  | (0-100 [%])                |
| Min Power | 90  | (0-100 [%])                |
| Overlap   | 0.1 | (mm)                       |

Note: The RSD-SUNMAX series does not support air control, so this setting is not required.

## 4. Setting the Origin

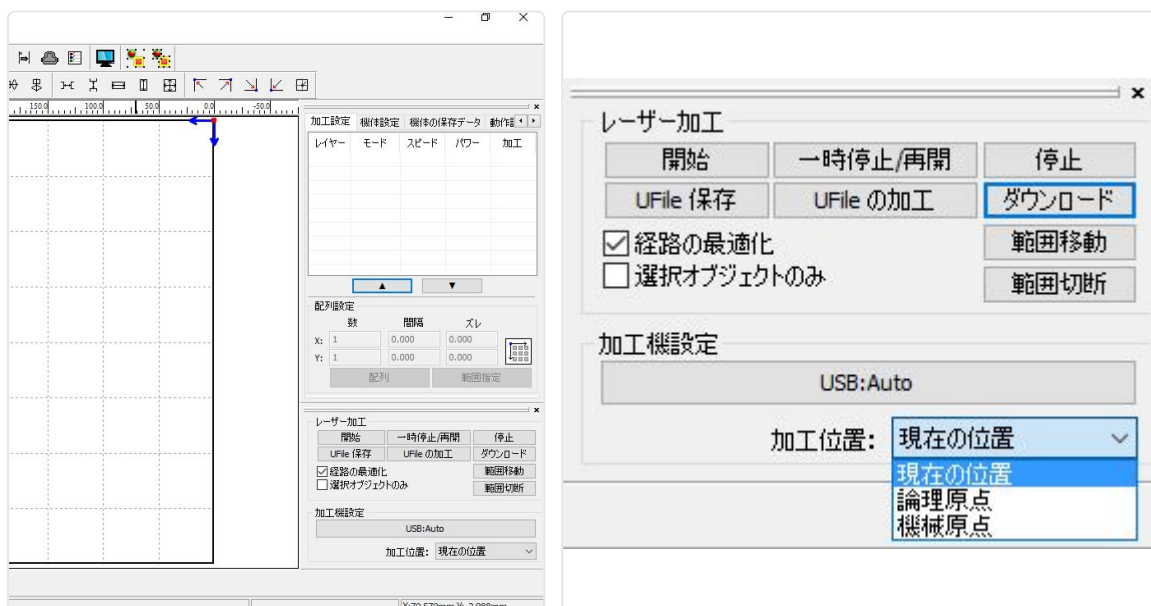
Before starting processing, you need to check and set the processing origin.

When starting processing from the laser machine's control panel, the "logical origin" set with the "Origin" button on the control panel becomes the origin position for processing.

When processing from the "machine control pane" in LaserWork, the origin position for processing varies depending on settings such as the "processing position" described below.

### 4.1 Processing Position

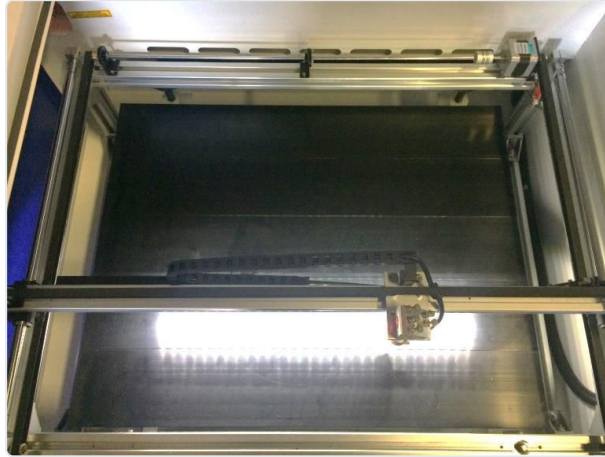
The processing start position differs depending on the processing position setting. You can select it from the processing position options shown under the laser processing section at the lower right of the screen.



The processing position can be selected from the following three options.

### **Current Position**

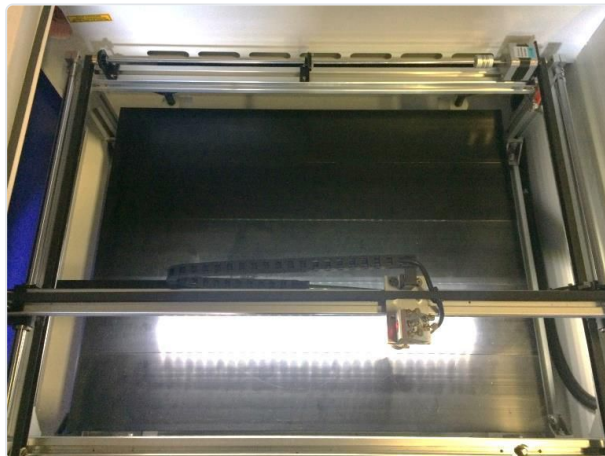
When set to "Current Position," clicking "Start" performs processing using the current position of the laser head as the data origin position.



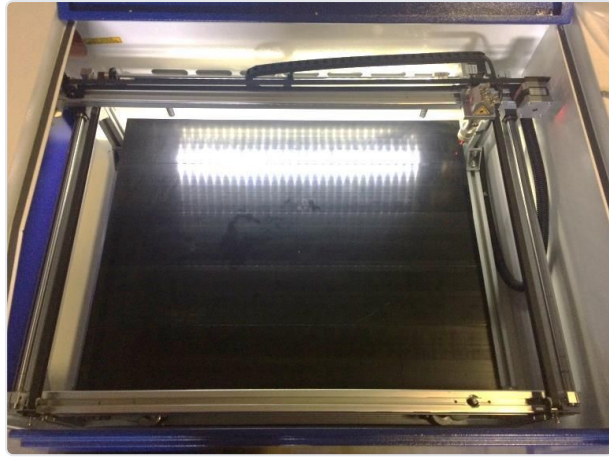
### **Logical Origin**

When set to "Logical Origin," clicking "Start" performs processing using the logical origin position — set with the "Origin" button on the laser machine — as the data origin position.

Processing origin. Press the "Origin" button on the machine's control panel.



Even if the laser head has been moved, clicking "Start" makes the laser head move to the logical origin and begin processing.



When you click the "Start" button, the laser head moves to the machine origin and processing begins.

### **Machine Origin**

When set to "Machine Origin," clicking "Start" performs processing using the machine origin position of the laser machine (rear right: the position the machine returns to when homing at startup) as the data origin position.

When processing from the machine origin, only cutting is possible.

## **4.2 Absolute Coordinates**

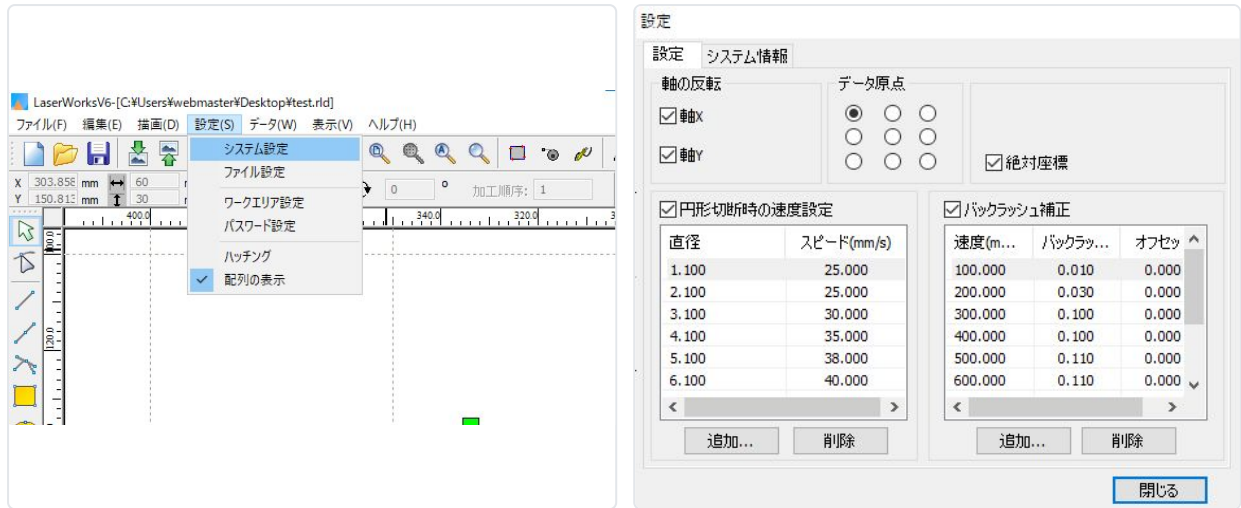
When "Absolute Coordinate" is checked, the logical origin set with the "Origin" button on the control panel and the "processing position" setting used when running a job from LaserWork both become invalid, and processing is performed at the position of the objects on the design screen.

Use this setting when you want to process at a specific position.

### **How to Set It**

From the tabs at the top of the screen, open "Config" → "System Setting".

The settings screen appears. You can enable the option by placing a check mark next to "Absolute Coordinate".



## 5. Downloading the Data

Once the processing settings and the processing position have been configured, load the data into the laser machine.

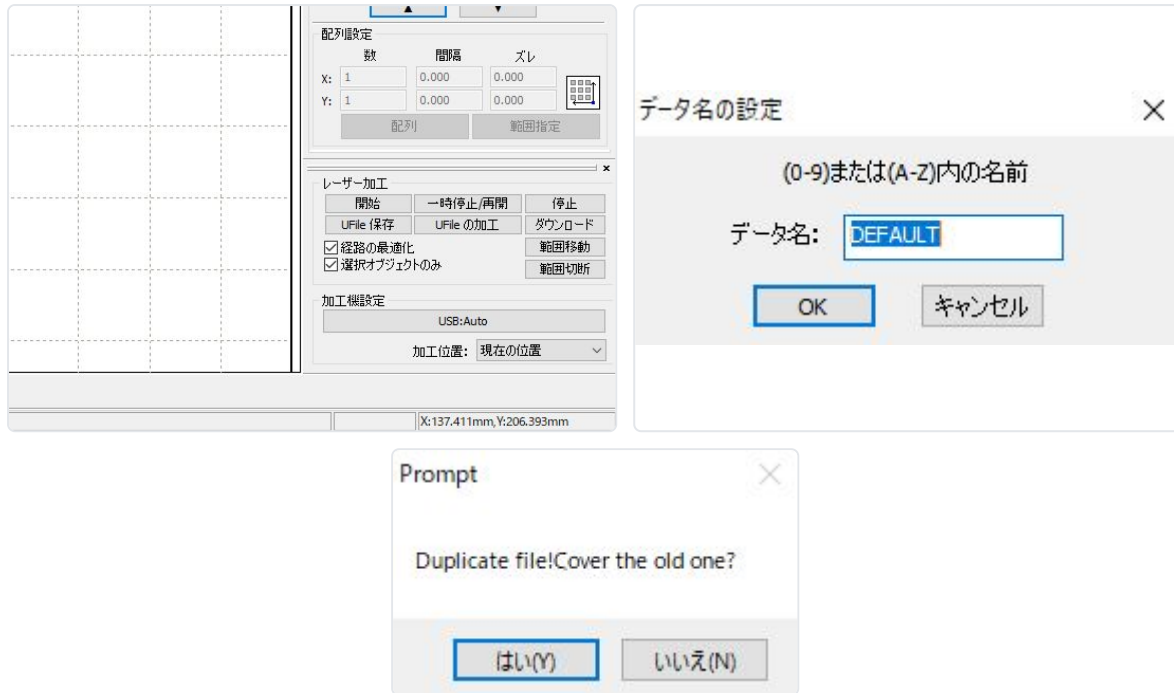
Note: Downloading the data is performed when you start processing from the laser machine's control panel. It is not necessary when you run the job from the "machine control pane" in LaserWork.

(1) At the lower right of the screen, click "Download" in the laser processing section.

(2) When you click the Download button, the "Set data name" dialog appears. Enter a name of your choice.

Note: If a file with the same name already exists on the laser machine, a dialog appears asking "Overwrite?".

Note: Only single-byte alphanumeric characters can be used.

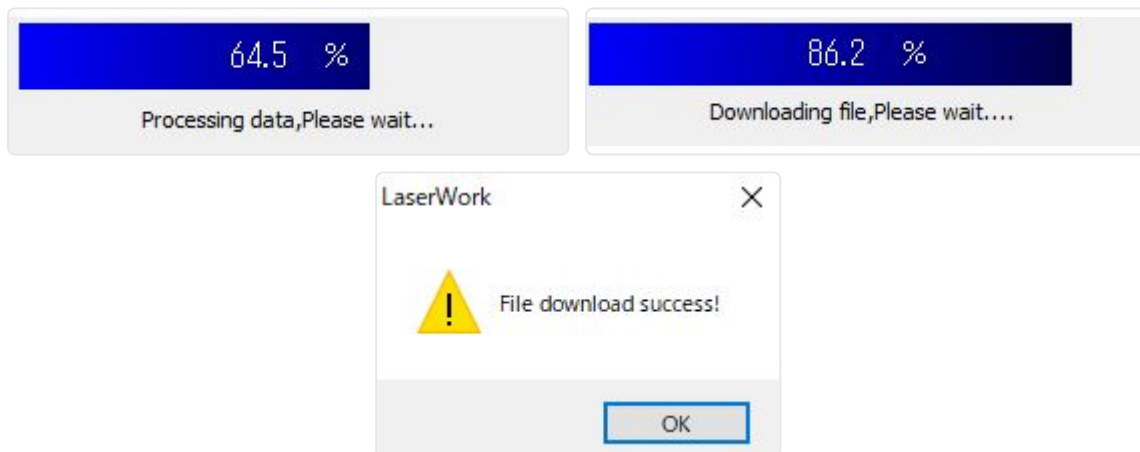


(3) **Start the download.** Clicking begins the data download. First, the design data is converted into a format the controller can handle. If you have created a large amount of data, this step may take some time.

When it reaches 100%, the download itself begins.

When the download progress bar reaches 100%, the data download is complete.

(4) When it reaches 100%, the download-complete dialog is displayed. Click the OK button to finish.



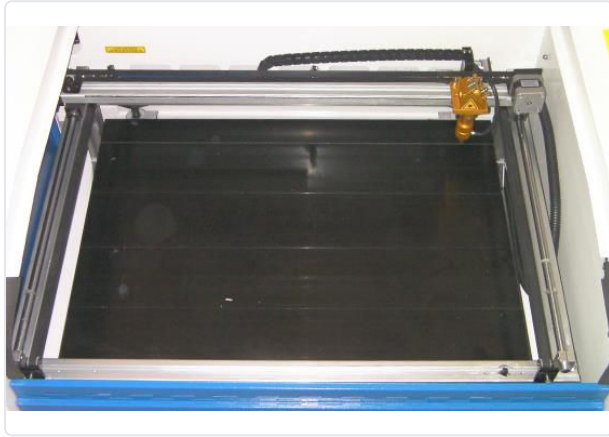
## 6. Processing

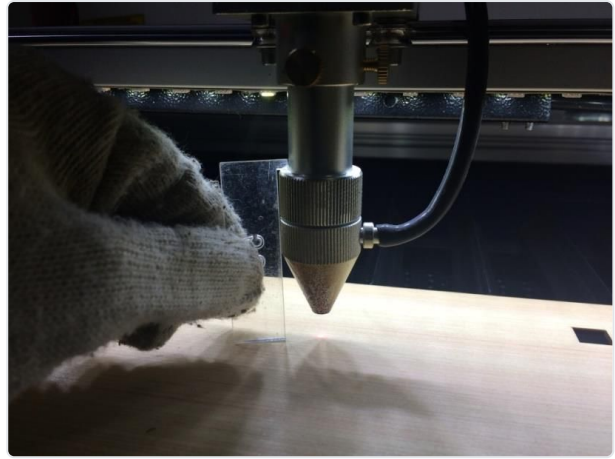
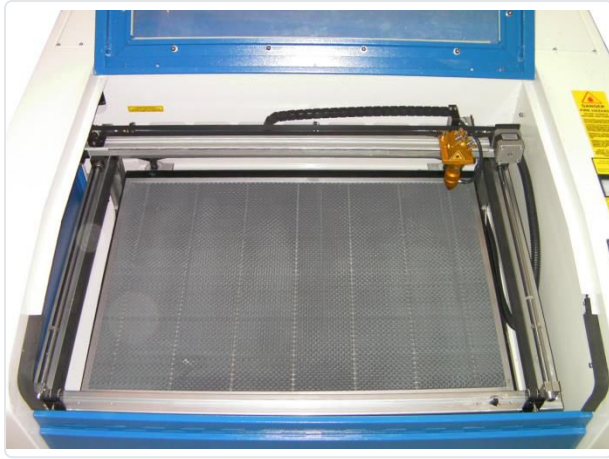
Now that the processing data has been saved to the laser machine, run the job. Start processing using the following steps.

## 6.1 Installing the Honeycomb Table

— Installing the honeycomb table —

- If the cutting table is installed, remove it so that the machine is in the engraving-table configuration.
- Carefully place the honeycomb table on top of the engraving table.
- To make enough space for the honeycomb table to be installed, use the table elevation handle. Turn it counterclockwise to lower the Z-axis.





Be sure to install the honeycomb table in the proper position.

## 6.2 Focusing

Adjust the focus.

Use the supplied focus gauge to check whether the table height is appropriate.

Using the table elevation handle, adjust the height until the bottom of the focus gauge lightly brushes against the workpiece.

(Turning the handle clockwise raises the table; turning it counterclockwise lowers the table.)

## 6.3 Starting the Job

Preparations are now complete, so start processing. In this example, the job is started from the control panel.

(1) Move the laser head to the position where you want to process, and set the processing origin with "Origin".

(2) Close the top cover.

**Caution:** If the top cover is open, the laser will not fire.

(3) After closing the top cover, turn on the power of each external device (blower, water chiller, compressor).



(4) Press "Start/Pause" on the control panel to start processing.

(3) When processing finishes, the laser machine sounds a beep. Open the cover and remove the processed material.



## 6.4 Processing Results

The processing results are described below.

### Halftone

Compared with the grayscale version, processing is faster and the engraving is sharper.

For engraving with a bitmap (BMP) image, we recommend halftone processing.

| Processing settings (engraving) |                          |
|---------------------------------|--------------------------|
| Speed                           | 240                      |
| Max Power                       | 10                       |
| Min Power                       | 10                       |
| Scan Interval                   | 0.025                    |
| Scan Mode                       | Horizontal bidirectional |
| Processing time                 | 4:39                     |

### When Processed in Grayscale

Note: When processing in grayscale, check "Output direct".

Note: When processing in grayscale, set the scan mode to horizontal unidirectional.

Because "Output direct" is checked, the intermediate tones between white and black are adjusted by shading between the maximum power and the minimum power. Because the scan mode is set to horizontal unidirectional, the processing time is roughly twice that of halftone. The reason for using unidirectional scanning is to avoid the effects of backlash compensation.

| Processing settings (engraving) |                           |
|---------------------------------|---------------------------|
| Speed                           | 200                       |
| Max Power                       | 15                        |
| Min Power                       | 5                         |
| Scan Mode                       | Horizontal unidirectional |
| Scan Interval                   | 0.025                     |
| Output direct                   | Yes                       |
| Processing time                 | 10:53                     |



## 7. Processing Precautions

**Warning:** When processing at high laser power and extremely low speed — for example, when cutting thick acrylic — the acrylic material may catch fire. Always keep the machine under constant observation while it is working, and stay alert for fire.

## 8. Other Notes

In this work example, Adobe Photoshop was used for the halftone processing of the image.

LaserWork can also perform halftone processing of images, but the processing quality may be lower than when Photoshop is used. We therefore recommend processing the image in Photoshop.

For reference, the image-processing results and the engraved output obtained with Photoshop and with LaserWork are shown below.

### (Reference) Image-Processing Results and Engraved Output with Photoshop and with LaserWork

#### Adobe Photoshop

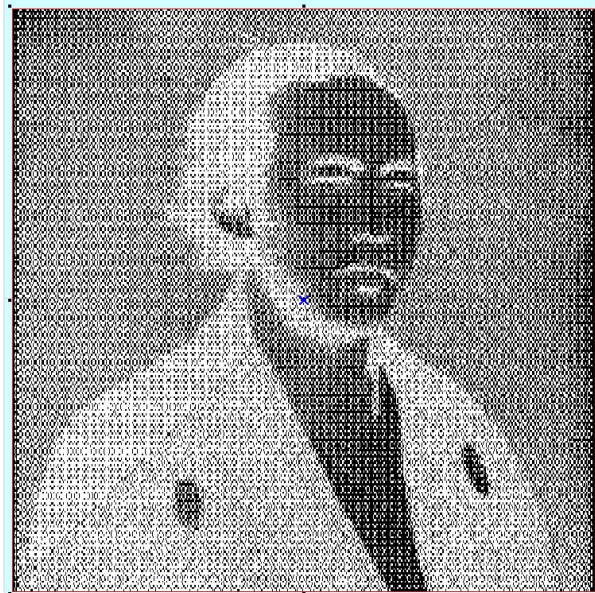
| Image processing: Halftone Screen |               |
|-----------------------------------|---------------|
| Frequency                         | 60 lines/inch |
| Angle                             | 45 degrees    |
| Shape                             | Round         |

| Engraving settings      |       |
|-------------------------|-------|
| Speed                   | 200   |
| Power                   | 15%   |
| Scan Interval           | 0.025 |
| Bidirectional engraving | Yes   |

## LaserWork

| Image processing: Net graphic (halftoning) |     |
|--------------------------------------------|-----|
| Size                                       | 1   |
| Scan Interval                              | 0.1 |

| Engraving settings (same as above) |       |
|------------------------------------|-------|
| Speed                              | 200   |
| Power                              | 15%   |
| Scan Interval                      | 0.025 |
| Bidirectional engraving            | Yes   |



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Work Example — Engraving a Photo on an Acrylic Plate — SUNMAX LASER / TEL +81-58-294-7333 /  
lasermachine.com@gmail.com