

Work Example — Making Wooden Tags (Adobe Illustrator)

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 — Making Wooden Tags (Adobe Illustrator)

- This document assumes that the laser machine has been set up correctly.
- This document assumes that LaserWorkV6 (hereafter "LaserWork"), the control software for the RSD-SUNMAX series, has been installed correctly.
- This document uses Adobe Illustrator CS6.

— Finished image of a product made by following this document —



1. About Wooden Tags

Ready-made wooden tag blanks are available in a variety of sizes and materials. Instead of using ready-made blanks, you can also cut tags out of a wooden board in any shape and size you like. Tags can be engraved on both sides or on one side only.

2. Precautions

When creating engraving data with Adobe Illustrator, there are two methods, depending on the data format imported into LaserWork:

- a) Save the data as an *.ai file
- b) Export the data as a monochrome bitmap file

2.1 Saving as *.ai

In LaserWork the data is handled as outline data, so a wide range of editing can be done in LaserWork: editing outline nodes, smooth scaling, rotating, assigning different parts of the data to different layers, and so on. However, there are points to keep in mind when creating the data. If these points are addressed, you can use data saved with method "a) Save as *.ai".

Caution: Keep the following points in mind when making wooden tags.

- The workpiece must be positioned precisely. Even a slight tilt or offset severely degrades the quality of the finished product and makes it unsellable. For this reason, install a positioning jig on the work table. Make the positioning jig to match the shape being processed. Note that if you cut the tags out of a large wooden board instead of using ready-made blanks, and you engrave one side only, the outline and the interior design are processed in the same job, so strict alignment is not required.
- Laser processing works by burning the material with heat. Therefore, depending on the laser power setting, light-colored materials may take on a scorched color. To avoid this, cover the material with wet paper before engraving; this reduces scorching.
- When cutting tags out of a large wooden board instead of using ready-made blanks, the outline is cut at high power, so the cut edge will be scorched. If the scorched color is a problem, sand the edge with sandpaper.

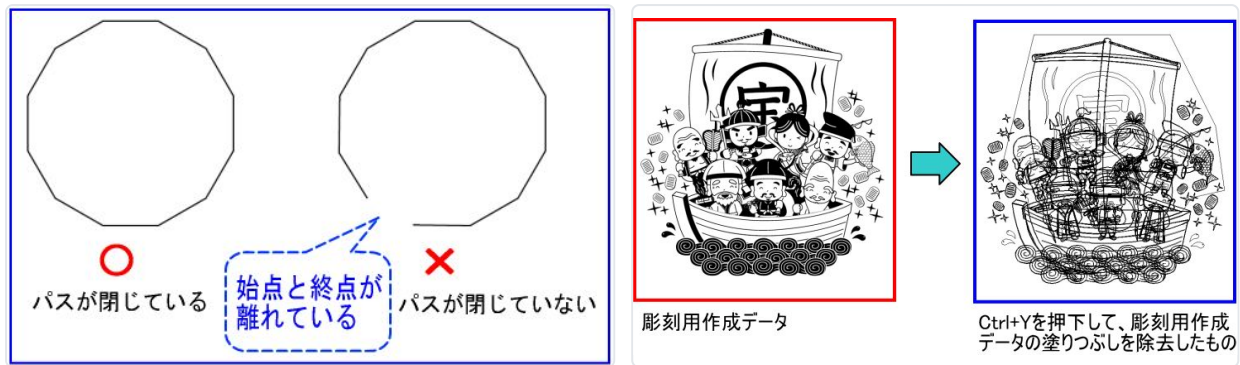
Caution: Points to note when creating data to be saved as *.ai:

- Only path data can be used in LaserWork.
- Image data placed in Adobe Illustrator and linked images are ignored.

(1) Always close outline paths

(2) Do not leave hidden path data under filled areas

LaserWork does not recognize fill data, so any outline path data hidden by fills will still be processed as-is. Paths are treated as the boundaries between raised and recessed areas, and LaserWork determines black and white automatically. To hide the fills and display only the outline path data, press Ctrl+Y in Illustrator.



The outline paths that were hidden by the fills are now displayed. LaserWork handles the data as shown in the figure above right.

(3) Next, import the engraving data you created into LaserWork



When you run "Preview" in LaserWork, the areas to be engraved are displayed in green. You can see that the result differs from the filled areas of the data created in Illustrator.

Note: The preview is run by clicking the corresponding button on the LaserWork system toolbar.

2.2 Exporting the Data as a Monochrome Bitmap File

In general, when making wooden tags, it is simpler to export the data from Illustrator as a monochrome bitmap and import it into LaserWork.

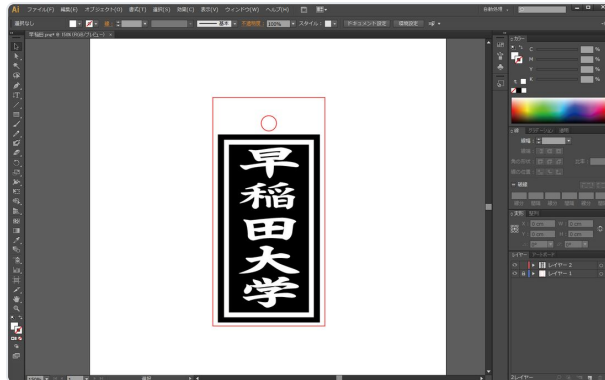
However, if you want to create a single data file and use LaserWork's layer function to vary the engraving depth, this cannot be done with monochrome bitmap data; in that case, import a properly prepared ai or dxf file instead.

3. Creating the Data in Illustrator

Create the processing data using Illustrator.

3.1 How to Save an AI File

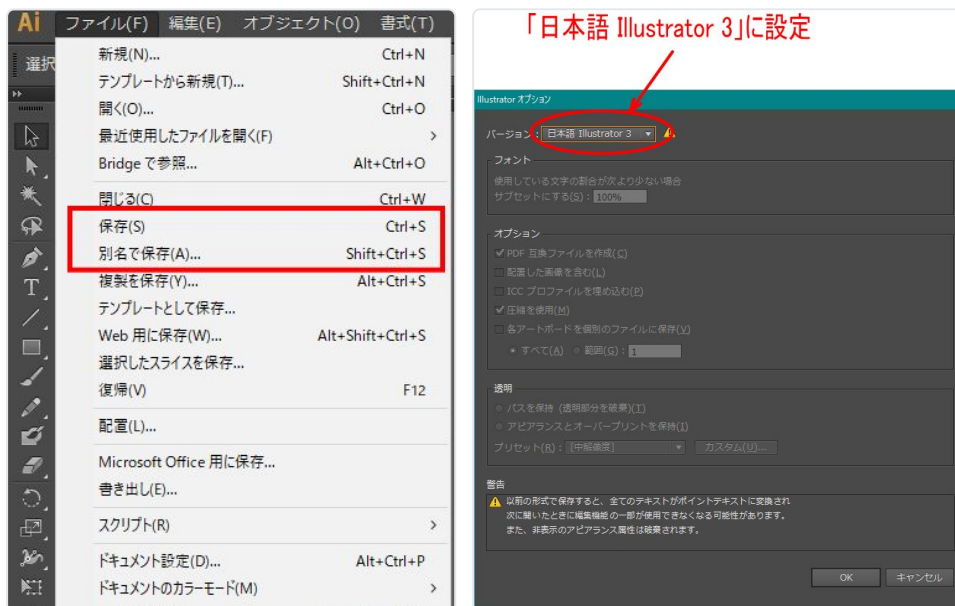
Create the data. Convert all text to outlines. The red frame is the cutting design; in this example, cutting is included in the job.



Click "File" > "Save" or "Save As" on the menu.

Caution: Always create the data in millimeters.

The "Illustrator Options" dialog appears. Set the version to "Japanese Illustrator 3".



3.2 How to Export a Monochrome Bitmap File

For a monochrome bitmap, create only the engraving design.

Note: The dashed lines are the cutting design; remove them from the design used for the BMP.



Click "File" > "Export" on the menu.

Caution: Always save the data before exporting.

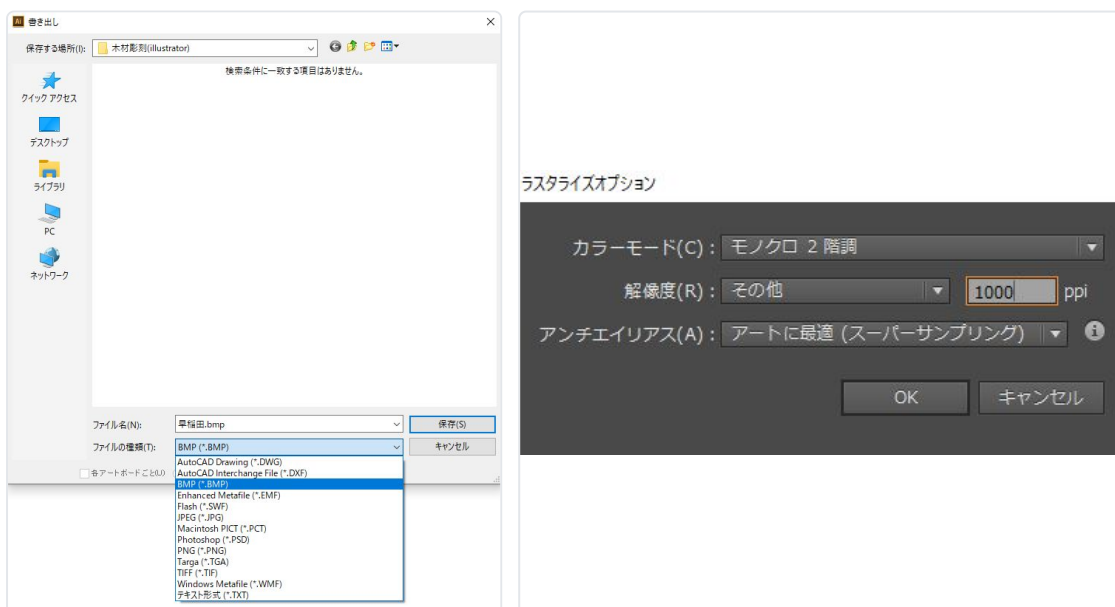
Caution: Always create the data in millimeters.

The "Export" dialog appears. Set the file type to "BMP (*.BMP)".

Enter a file name of your choice and click the "Save" button.

The "Rasterize Options" dialog appears.

1. Set the color mode to "Bitmap" (1-bit monochrome).
2. Set the resolution to Other: "1000" ppi or "1016".



Caution: Depending on the image size, the export may fail. If it fails, set the resolution to a smaller value. Also note that the image size may have become larger than necessary due to problems such as clipping masks making the image unnecessarily large or unneeded data being included. The lower the resolution value, the rougher the outline of the exported data becomes. It is acceptable to lower the resolution setting to suit the workpiece material and the content of the data.

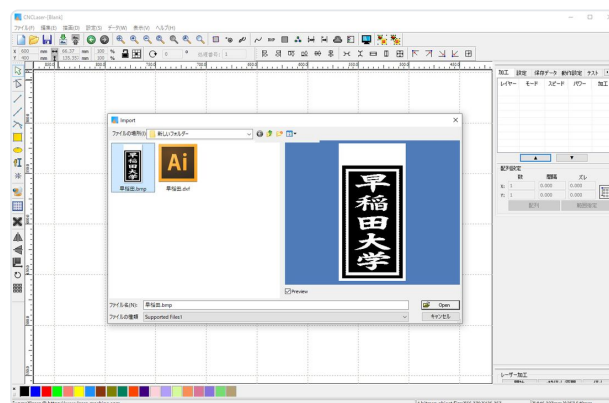
The "BMP Options" dialog appears. Click the OK button.



When you click the OK button, the monochrome bitmap file is created in the specified folder.

4. Importing the Data File

Click the "Import" button on the LaserWork system toolbar.



The Open File dialog appears. Select the ai or dxf file created in Adobe Illustrator, or a monochrome bitmap file.

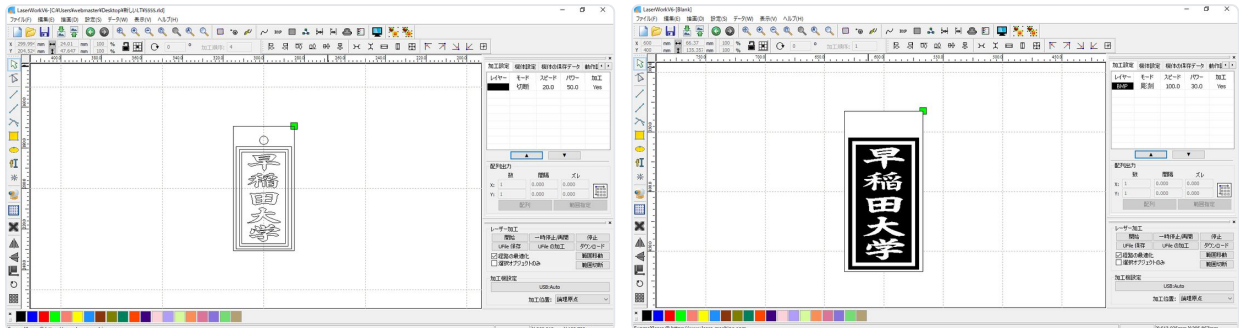
Because this job is engraving that includes cutting, we import the DXF file.

- **Preview check box**
- **Preview pane:** when a file is selected, its contents are displayed.

5. Displaying the Data

The data created in Illustrator is displayed.

— For an ai or dxf file —



— For a monochrome bitmap file —

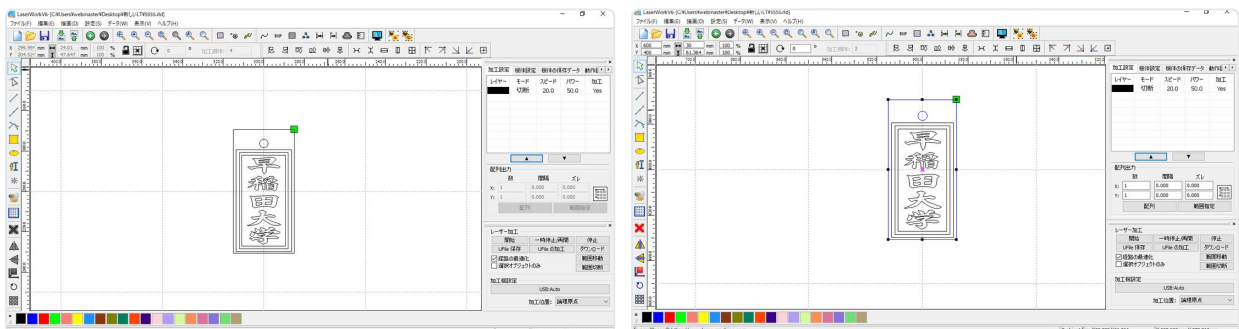
From this point on, this document describes the case where an ai file has been imported. If you are using a monochrome bitmap, adapt the steps accordingly.

6. Selecting and Configuring the Processing Mode

After importing the ai file, configure the processing settings.

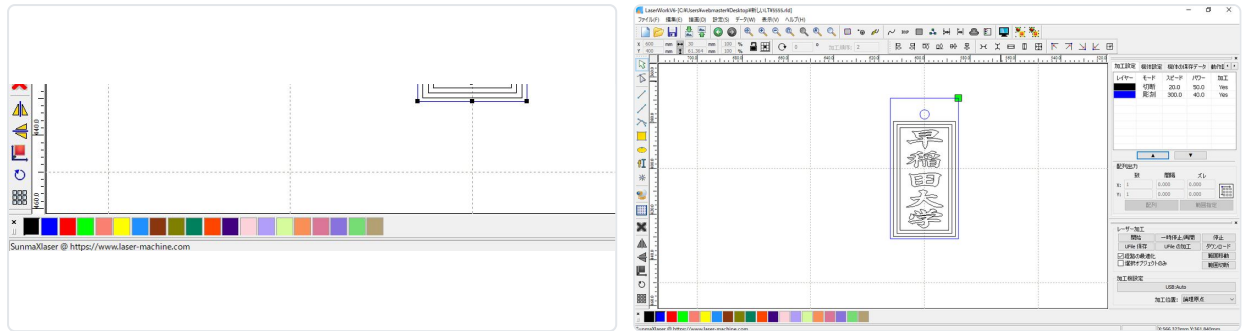
6.1 Creating Layers

1. At this stage, the engraving portion and the cutting portion are combined in a single layer.



2. Assign the cutting design — the outer frame and the circle — to a cutting layer. Use "Select" to select the outer frame and the circle.

3. Once the objects are selected as shown above, choose any color (other than black) from the "Layer toolbar" at the bottom of the screen.



4. The cutting layer (blue) has now been added to the processing settings.

Note: The processing mode and processing contents retain the values from the previous job, so the display may differ depending on the layer color.

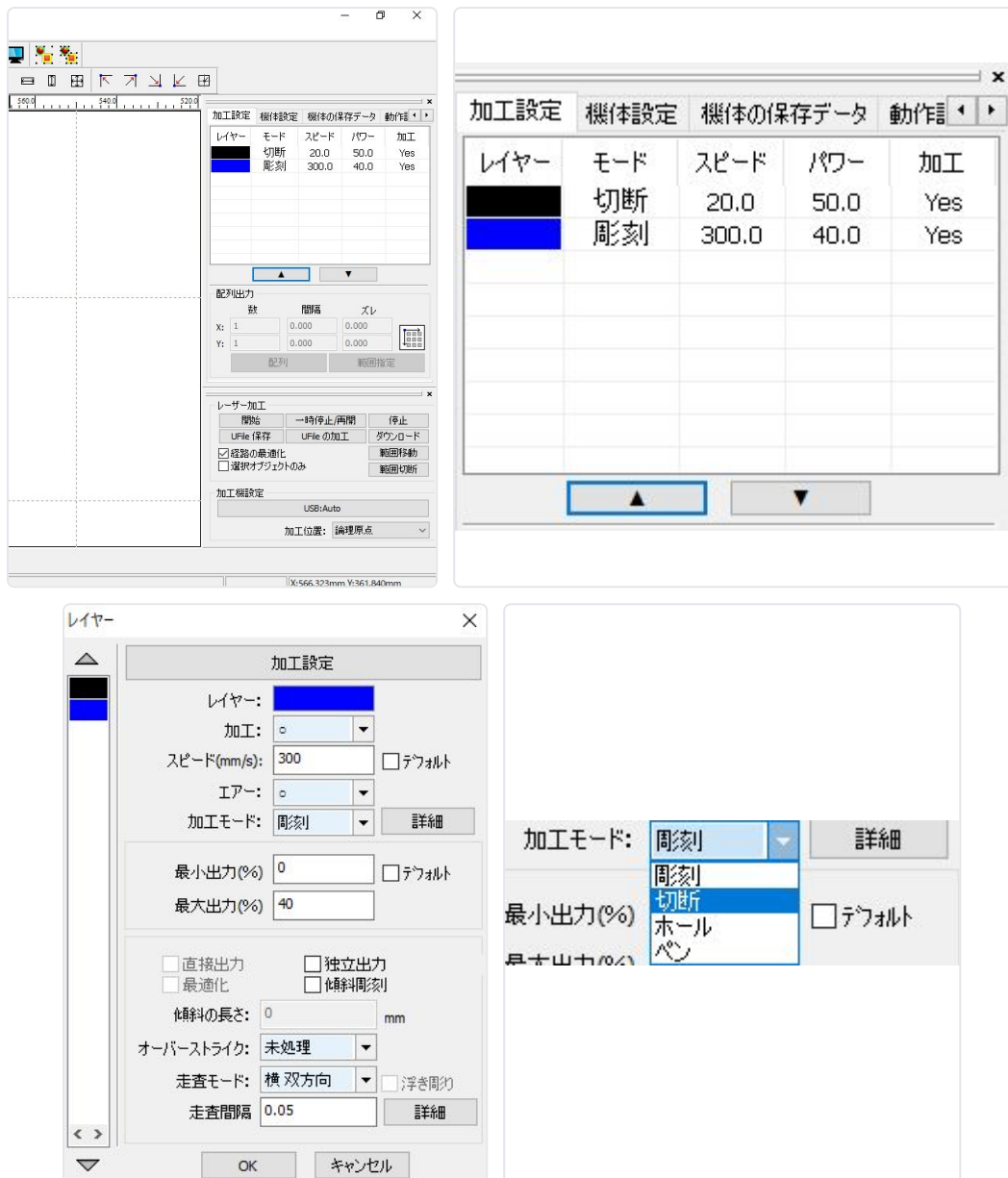
6.2 Processing Settings for the Cutting Layer

1. Now that the cutting layer has been added, continue with the processing settings. Double-click the cutting layer in the processing settings to open the processing dialog.

Note: The "Mode" column reads "Cut" in the figure below, but other mode names may be displayed depending on the state of LaserWork.

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

Note: The settings are the same for monochrome bitmap files.



Double-click.

2. The layer dialog appears. Change the processing mode to "Cut".

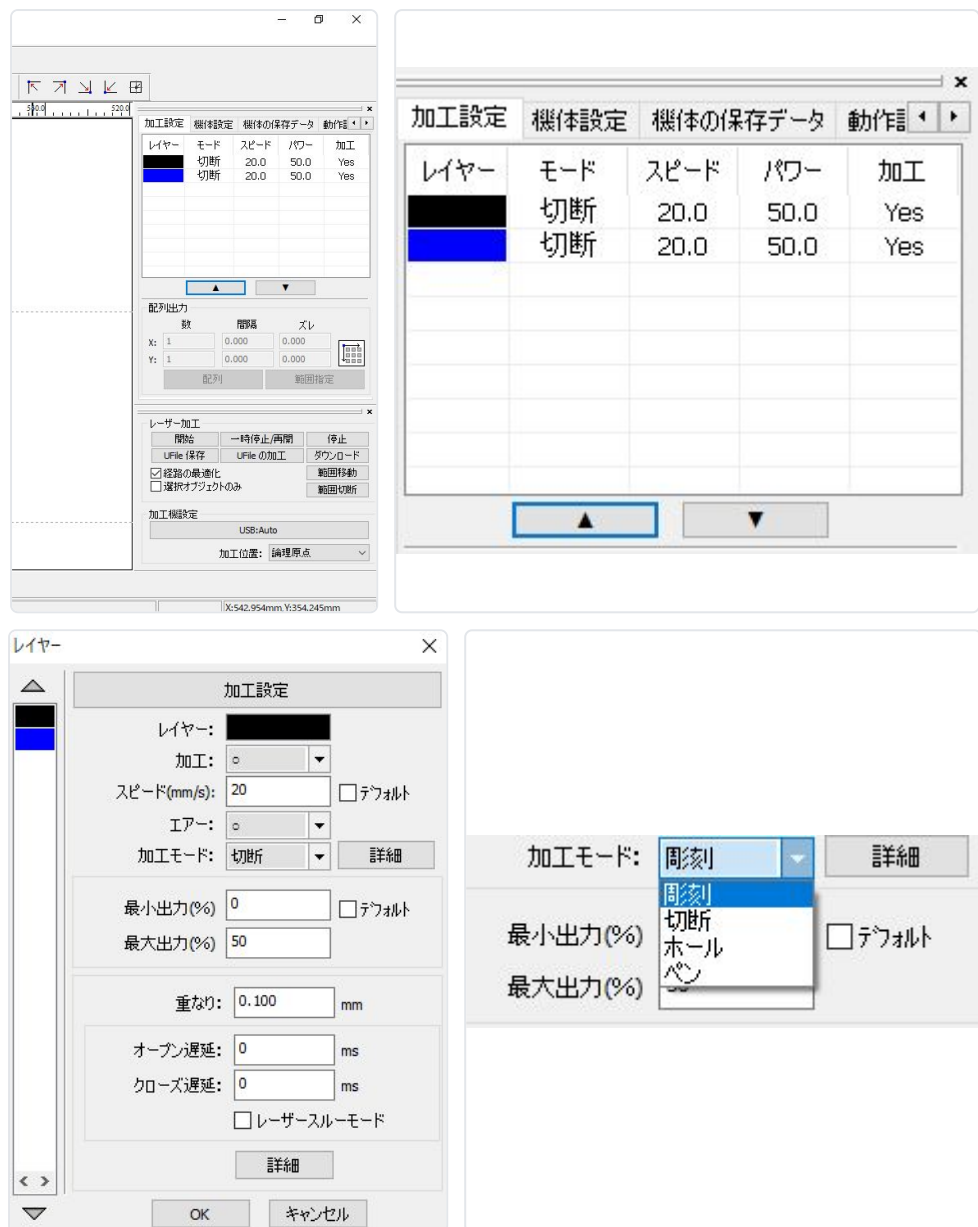
The mode list is displayed; select "Cut".

Configure the "Cut settings" as shown in the figure below.

Item	Description
Speed	Sets the cutting speed. The unit is [mm/s]. For cutting, this is generally up to about 20. Increasing the value makes the laser head move faster and shortens the processing time, but reduces the thickness of material that can be cut.
Air	Not supported on the RSD-SUNMAX series.
Min Power	Sets the low laser power. Set it to a value no higher than the Max Power setting. Normally, the same value as the Max Power setting is fine. The unit is %, and values from 0 to 100 can be set.
Max Power	Sets the laser power used during normal operation. The unit is %, and values from 0 to 100 can be set.
Overlap	If a closed design cannot be cut properly (the piece does not drop out) due to the properties of the material or mechanical error, enter a correction value. Normally a value of about 0.1 [mm] is set.
Open Delay	Sets the delay time for turning the laser output ON when laser firing starts (at the start of processing, or when firing resumes after moving between objects). Normally set to zero.
Close Delay	Sets the delay time for turning the laser output OFF when laser firing ends (at the end of processing, or before the head starts moving between objects). Normally set to zero.
Laser Through Mode	When Laser Through Mode is checked, the laser head stops while the laser output ON/OFF is in the delay state defined by the Open Delay and Close Delay settings.
Advanced	Clicking "Advanced" opens the "Cut — Advanced Settings" dialog, where seam compensation can be configured. For details, refer to the cut settings section of the LaserWorkV6 user manual.

6.3 Processing Settings for the Engraving Layer

1. Now that the cutting layer has been configured, continue with the processing settings for the engraving layer. Double-click the engraving layer in the processing settings to open the processing dialog.



Double-click.

2. The layer dialog appears. Change the processing mode to "Scan" (engraving).

The mode list is displayed; left-click "Scan".

Configure the "Cut settings" as shown in the figure below.

Item	Description
Speed	Sets the processing speed. The unit is [mm/s]. For engraving, this value sets the processing speed (mm/s). It varies with the work content, the material, the processing mode, and so on. For engraving, it is generally up to about 600. Increasing the value makes the laser head move faster and shortens the processing time, but makes the engraving shallower.
Max Power	Sets the maximum laser power. The unit is [%], and the setting range is 0 to 100. Decimal values can also be entered. Increasing the value makes the laser output stronger and the engraving deeper. Considering the load on the laser tube, the setting is generally kept to about 90 [%] at most.
Scan Interval	Specifies the scan interval for engraving. The unit is [mm]. The minimum value is 0.025 [mm], and settings are basically made in increments of 0.025. In general, smaller values improve the mechanical processing accuracy, but depending on the material and the data, making the interval too fine serves no purpose. The larger the value, the shorter the processing time. If you want to speed up production even at the cost of a rougher finish, increasing this value shortens the production time. For example, if a job engraved at 0.05 is changed to 0.1 and engraved again, the production time is halved.
Scan Mode	Select horizontal bidirectional. The laser fires on both directions of the scan; if bidirectional is not selected, the laser fires in one direction only. Horizontal unidirectional scanning may improve processing quality, but the processing time is doubled.
Air	Not supported on the RSD-SUNMAX series.
Advanced	Not normally used. For details on this function, refer to the cut settings section of the LaserWorkV6 user manual.

How to Determine the Setting Values

The "Engraving settings" must be changed according to the material, the depth, and the required quality. Setting values cannot be determined uniformly for every material. For example, even when engraved with identical settings, cedar and ebony come out at completely different depths because of the difference in hardness of the wood itself. Basically, you need to engrave repeatedly while changing the conditions and checking the finish, until you find settings that meet the required quality.

When making wooden tags, use the following settings as a reference and adjust from there:

Speed	400
Max Power	80
Scan Interval	0.05 (0.025 for fine patterns)

7. Setting the Origin

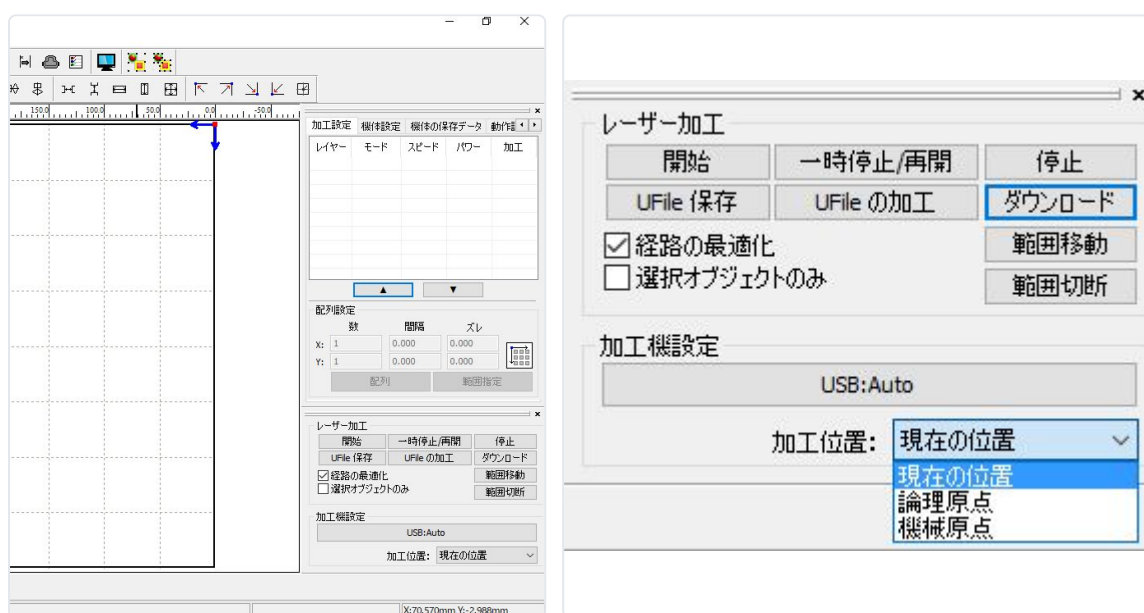
Before starting processing, you need to check and set the processing origin.

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

When processing from the machine control pane in LaserWork, the origin position for processing changes depending on settings such as the "Position" (processing position) setting described below.

7.1 Processing Position

The processing start position differs depending on the processing position setting. You can select the processing position from the laser processing area displayed at the lower right of the screen.



You can choose the processing position from the following three options.

Current Position

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

Logical Origin

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

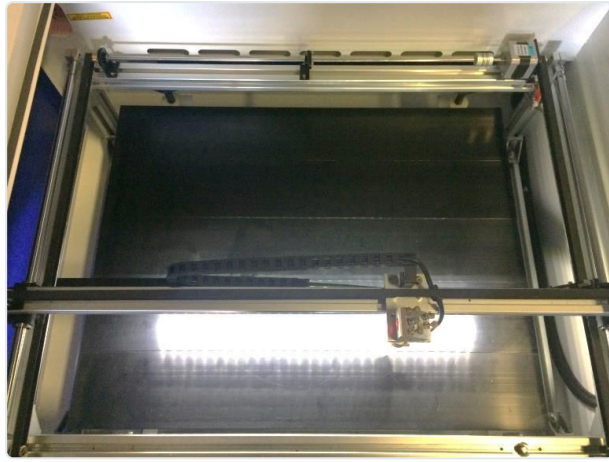
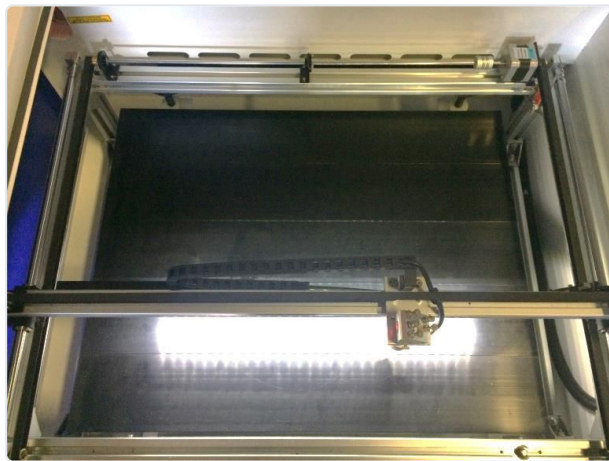


Figure labels: Processing origin / Processing origin / Press the "Origin" button on the machine's operation panel.



Even if the laser head has been moved, clicking "Start" moves the laser head to the logical origin and starts processing.

Machine Origin

When set to "Machine origin," clicking "Start" begins processing using the laser machine's machine origin position (rear right: the position the machine homes to when the laser machine starts up) as the data origin.

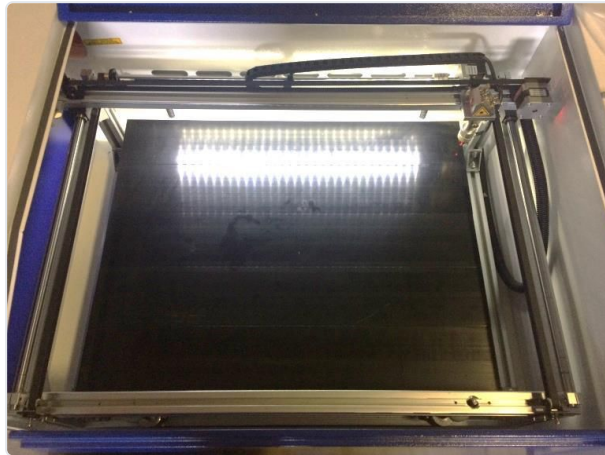
When clicking the "Start" button, the laser head moves to the machine origin and starts processing.

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

7.2 Absolute Coordinates

When the absolute coordinate checkbox is checked, the logical origin set with the "Origin" button on the operation panel and the "Position" setting used when processing from LaserWork are disabled, and processing is performed at the position of the objects on the design screen.

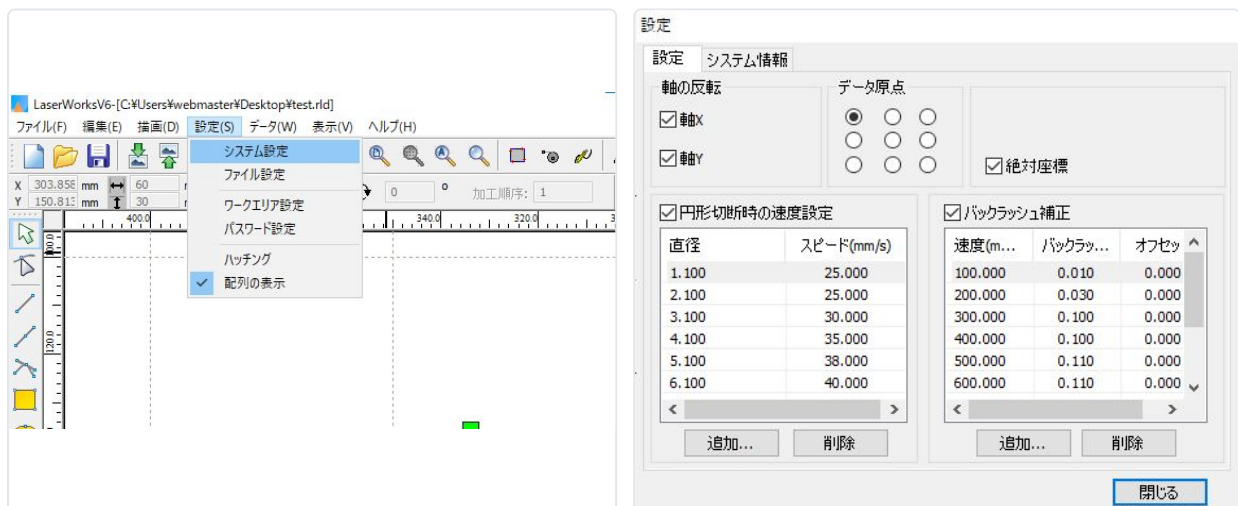
Use this setting when you want to process at a specific position.



How to Set It

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

The settings screen appears. Check the "Absolute coordinate" checkbox to enable it.



8. Downloading the Data

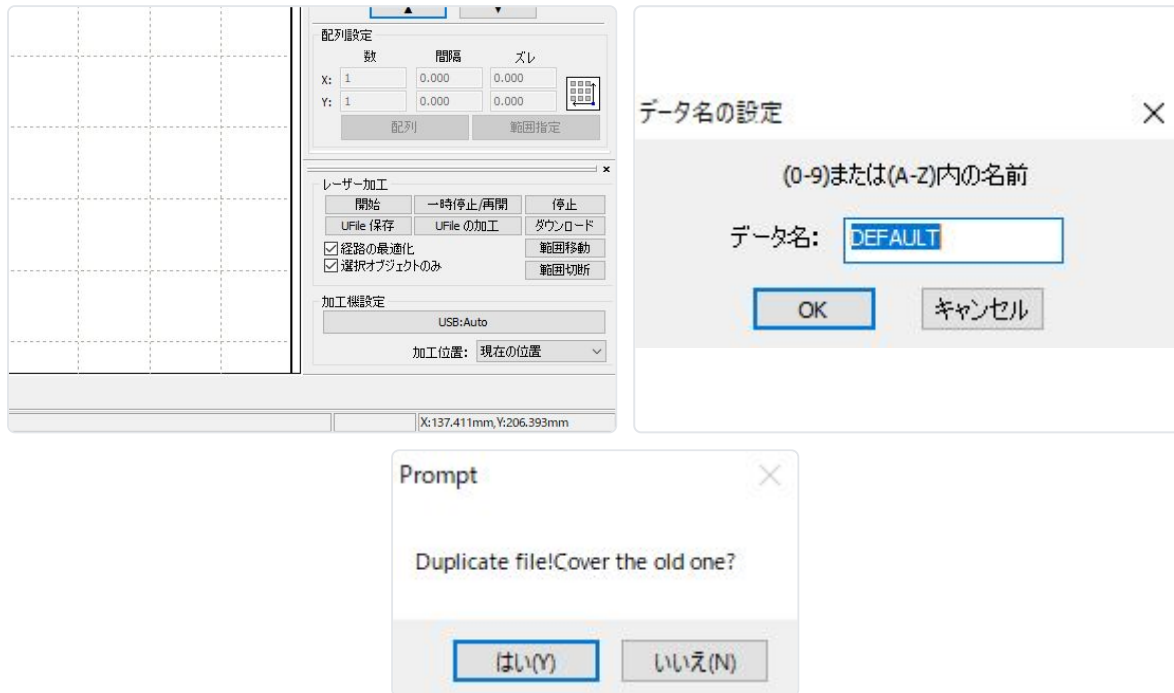
Once you have configured the processing settings and the processing position, load the data into the laser machine.

Note: Downloading the data is required when starting processing from the laser machine's operation panel. It is not necessary when processing from the machine control pane in LaserWork.

1. Click "Download" in the laser processing area at the lower right of the screen.
2. When you click the Download button, the "Set data name" dialog appears. Enter any name you like.

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

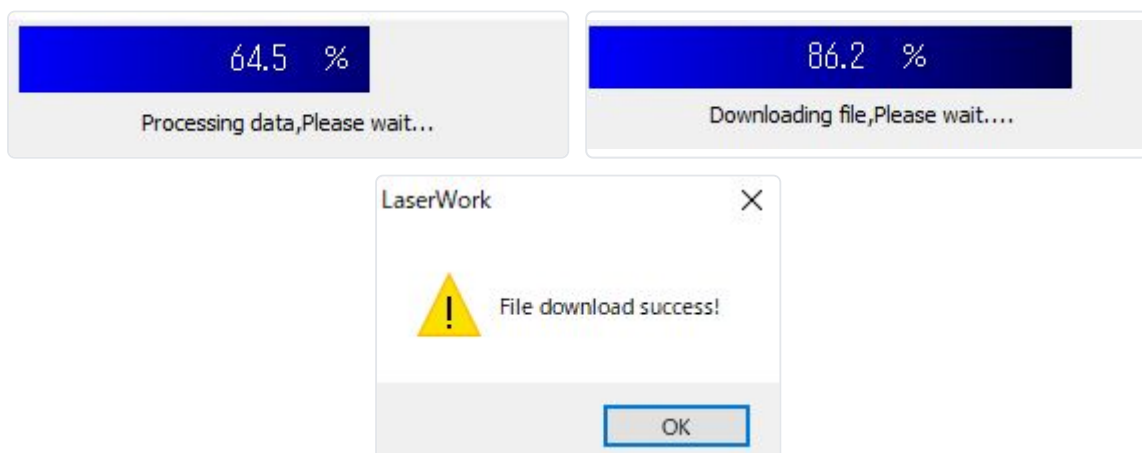
Note: Only single-byte alphanumeric characters can be used.



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

When it reaches 100%, the download itself begins. The data download is complete when the download progress bar reaches 100%.

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



9. Processing

Now that the processing data is stored on the laser machine, carry out the processing. Start processing by following the steps below.

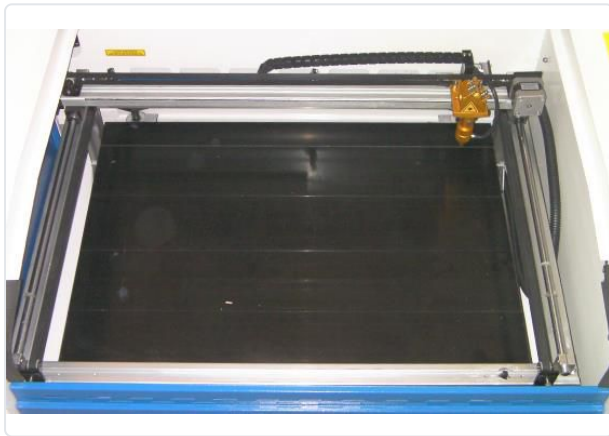
7.1 Installing the Honeycomb Table

Attaching the honeycomb table

If the cutting table is installed, remove it so that the machine is in the engraving-table configuration.

To create enough space to install the honeycomb table, use the table elevation handle. Turn it counterclockwise to lower the Z axis.

Carefully place the honeycomb table on top of the engraving table.



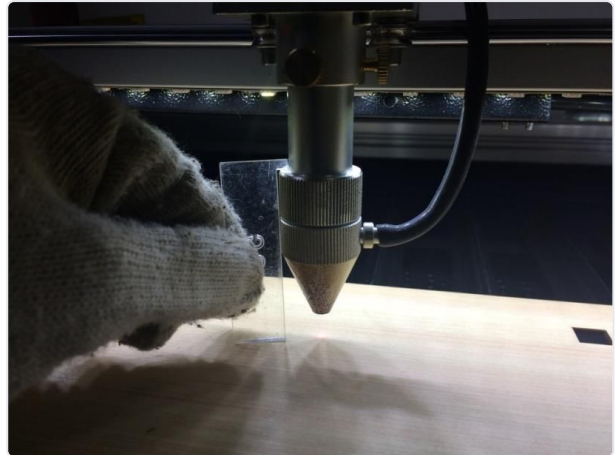
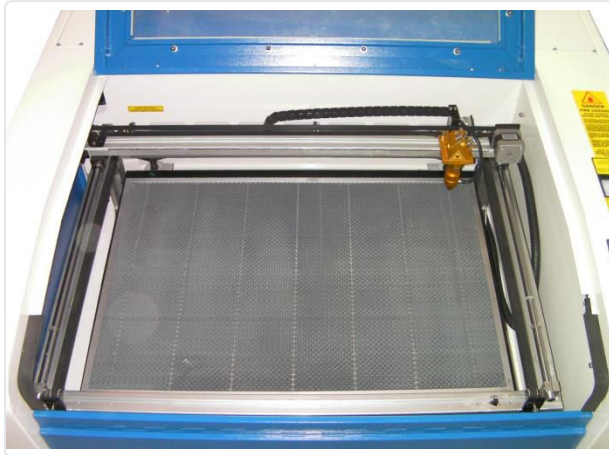
Make sure the honeycomb table is installed in the proper position.

7.2 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 grazes the workpiece.

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



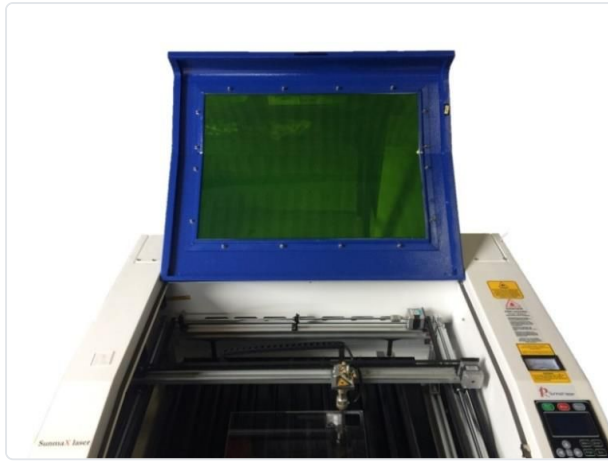
7.3 Starting Processing

Now that everything is ready, start processing. In this example, processing is started from the operation 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 lid.

Caution: The laser will not fire while the top lid is open.

3. After closing the top lid, turn on the power to each of the external units (blower, water chiller, compressor).



エアーコンプレッサ



水冷機



送風機

4. Press "Start/Pause" on the operation panel to start processing.
5. When processing is finished, the laser machine sounds a beep. Open the top lid and remove the processed material.

This completes processing.



10. Other

[When you want to make several identical engravings]

In the LaserWork drawing toolbar, click "Array Placement" and configure the settings, or configure them with "Array Output".

配列出力			
	数	間隔	ズレ
X:	3	20.000	0.000
Y:	2	30.000	0.000
配列		範囲指定	

Array Placement copies the selected object according to the specified row and column settings. Therefore, after array placement you can reposition or process each of the copied objects individually.

Array Output outputs the selected object according to the specified row and column settings. Because these are not copies, you cannot reposition or process the individual objects after array output. However, it allows flexible automatic placement, such as specifying row and column offsets.

* For details, refer to "Difference between Array Placement and Array Output" in the LaserWorkV6 user manual.