Work Example — Engraving (LaserWork)

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 (LaserWork)

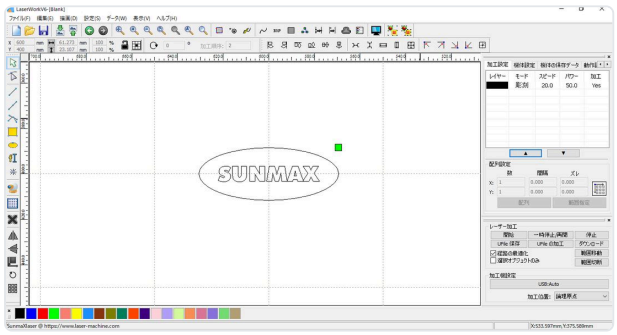
- This document assumes that the laser machine has been set up correctly.
- This document assumes that the honeycomb table is installed.
- This document assumes that LaserWork V6 (hereafter "LaserWork"), the control software for the RSD-SUNMAX series, has been installed correctly.

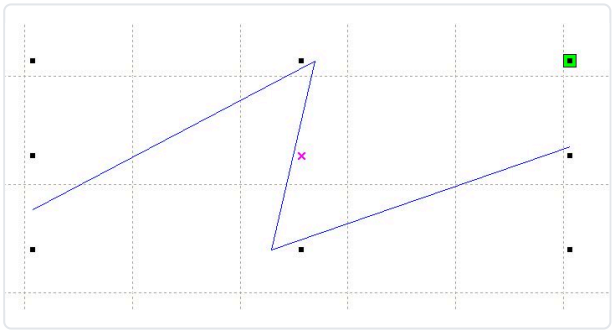
1. Creating the Engraving Design in LaserWork

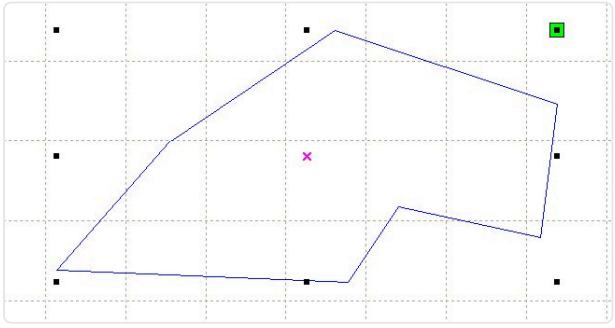
(1) Create your engraving design using the tools shown in the "Draw" menu or the tools on the toolbar.

(2) When creating data, always make sure that every path is closed.

— Path not closed (bad example) — — Path closed (good example) —



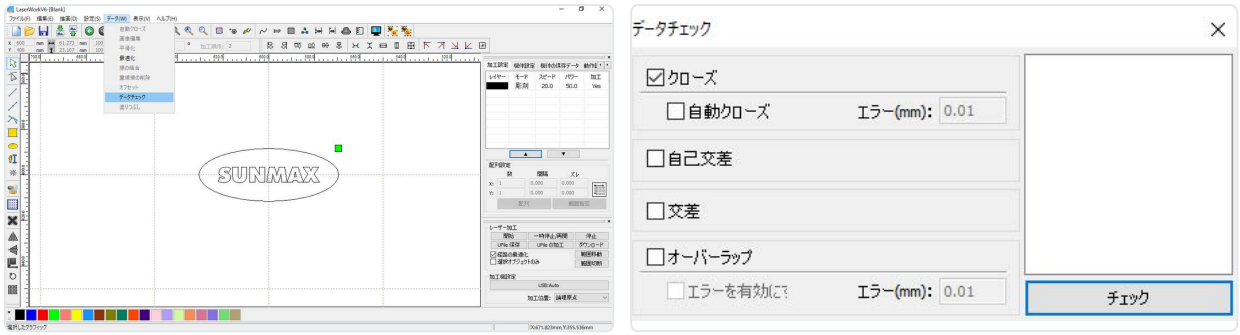


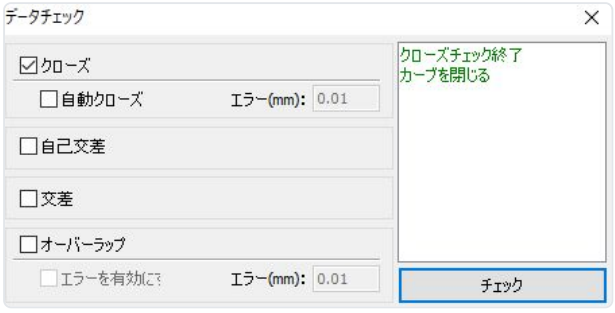


(3) LaserWork can check the integrity of your data. Click "Tools" > "Data Check" on the menu.

(4) For engraving, check only the "Close" option.

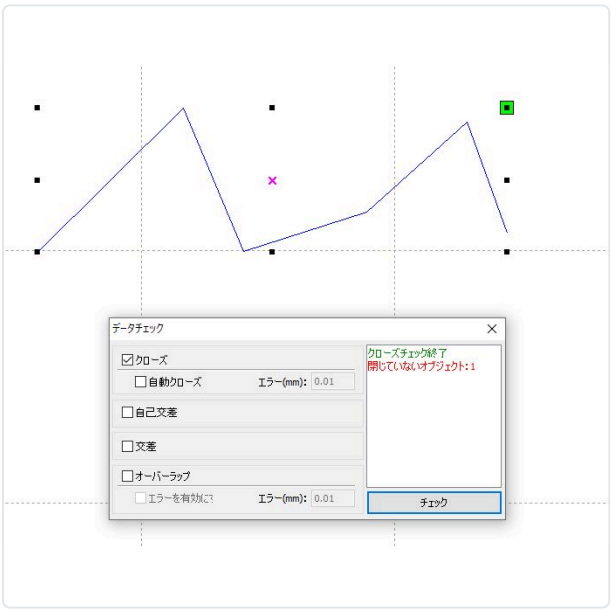
(5) Click the "Start" button to begin the data check. If "Result: 0" is displayed, the data has no problems.

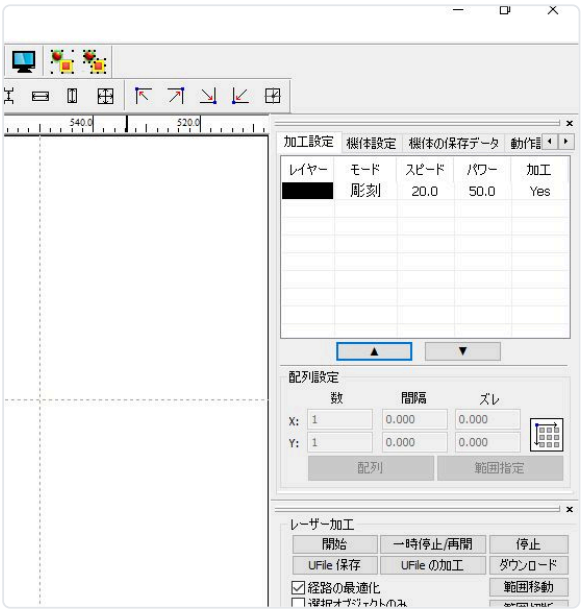


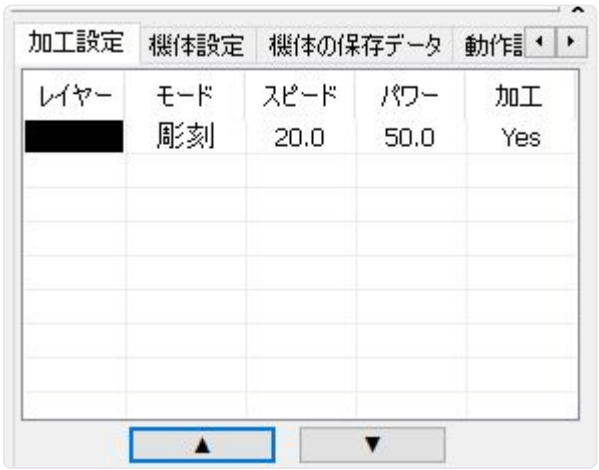


(6) If "Result: XX" is displayed with a value of 1 or more, it indicates that the data contains paths that are not closed.

Note: If this is displayed, correct the data.







2. Processing Settings

Double-click a layer to display the Layer dialog.

Note: The "Mode" column shows "Cut" in the figure below, but depending on the state of LaserWork, a different mode name may be displayed.

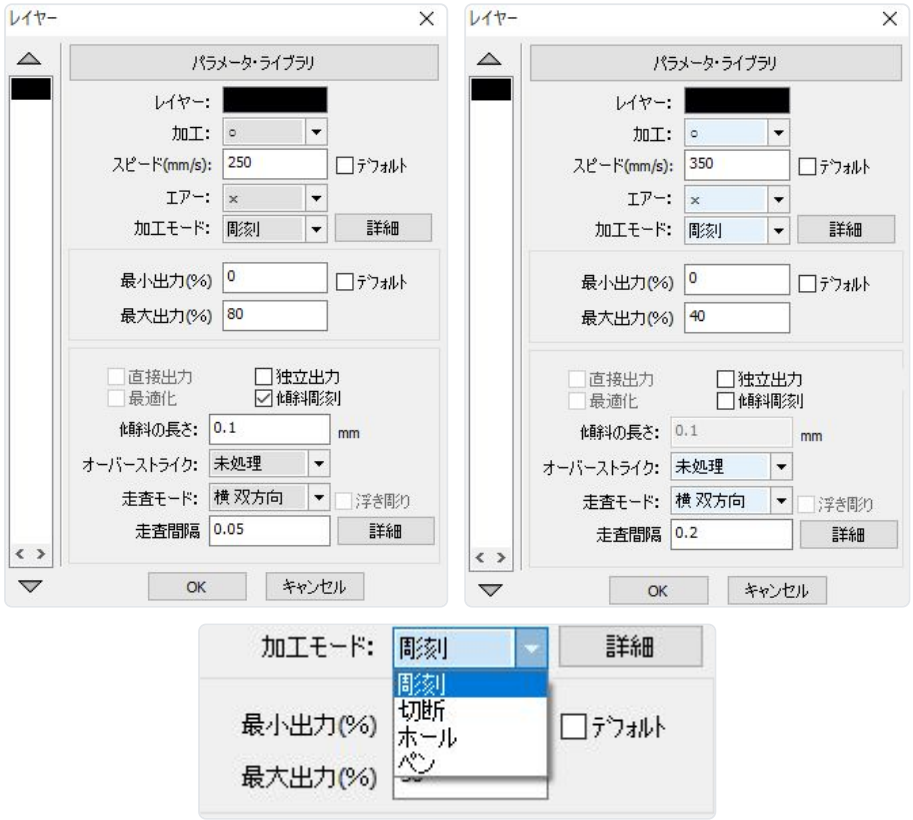
Note: The settings for each mode are remembered, so the values you set last will appear as the defaults the next time you create data.

Double-click here

The Layer dialog is displayed. Select "Engrave" as the processing mode.

The list of modes is displayed; left-click "Engrave."

You can configure the processing details in the Layer dialog.



Speed: Sets the processing speed. The unit is [mm/s]. For engraving, set the processing speed (mm/s). It varies depending on the work content, the material, the processing mode, and so on. For engraving, values up to about 600 are typical. Increasing the value makes the laser head move faster, which shortens the processing time but makes the engraving shallower.

Max Power: Sets the maximum laser output. The unit is [%], and the setting range is 0–100. Decimal values can also be entered. Increasing the value makes the laser output stronger and the engraving deeper. To limit the load on the laser tube, it is generally kept to a maximum of about 90 [%].

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 may serve no purpose. Larger values shorten the processing time. If you want to speed up production even at the cost of a coarser finish, raising this value reduces the production time. For example, if a job engraved at 0.05 is changed to 0.1 and engraved again, the production time is cut in half.

Scan Mode: Select horizontal bidirectional. The laser fires on both passes of the scan; if bidirectional is not selected, the laser fires in one direction only. With horizontal unidirectional scanning, the processing quality may improve in some cases, but the processing time doubles.

Air: Not supported on the RSD-SUNMAX series.

Advanced: Not normally used.

For details, refer to the cutting settings section of the LaserWork V6 User Manual.

3. How to Determine the Setting Values

The engraving settings must be adjusted according to the material, the desired depth, and the required quality. Setting values cannot be applied uniformly across different materials. For example, even when engraved with identical settings, cedar and ebony produce completely different engraving depths because of the difference in the hardness of the wood. Rubber and glass also engrave to different depths depending on their composition. In addition, for materials that melt (are melted by the laser beam and then solidify as they cool), such as resin, the finish varies depending on the balance between the engraving speed, max power, and scan interval settings. Basically, you need to engrave repeatedly while checking the finish, changing the conditions each time, until you find settings that meet the required quality.

An efficient way to determine the settings is as follows.

Materials that burn easily include wood, rubber, paper, leather, resin, and fabric.
Materials that do not burn easily include stone, glass, ceramic, and metal.

For materials that burn easily, it is efficient to start with a fast engraving speed and low max power, gradually increase the max power, and then reduce the engraving speed, checking the finish as you work out the settings.

For materials that do not burn easily, it is efficient to start with a slow engraving speed and high max power, gradually increase the engraving speed, and then reduce the max power, checking the finish as you work out the settings.

4. Setting the Origin

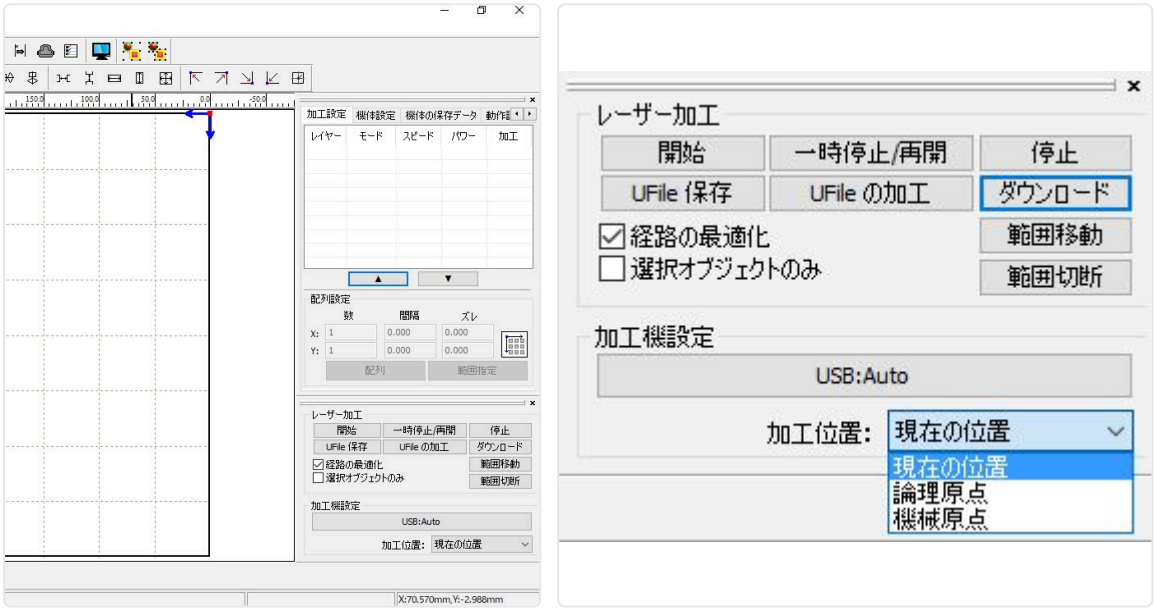
Before starting processing, you need to check and set the processing origin.

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

When you process from LaserWork's machine control pane, the origin position for processing changes depending on settings such as the "Position" setting described below.

4.1 Processing Position

The processing start position differs depending on the processing position setting. You can select it from the "Position" options shown in the "Laser work" panel at the bottom right of the screen.



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

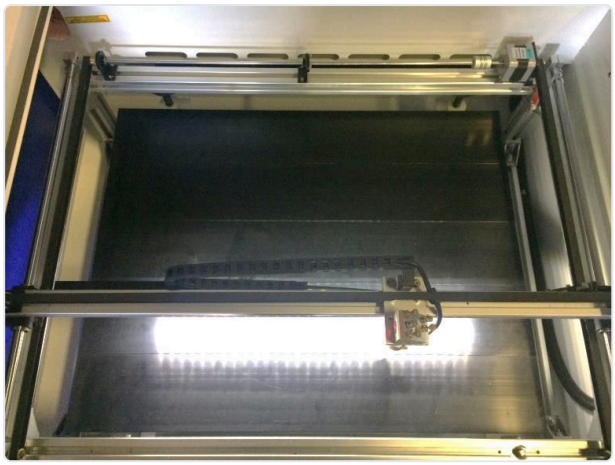
Current Position

When "Current position" is selected, clicking "Start" performs processing using the current position of the laser head as the data origin.

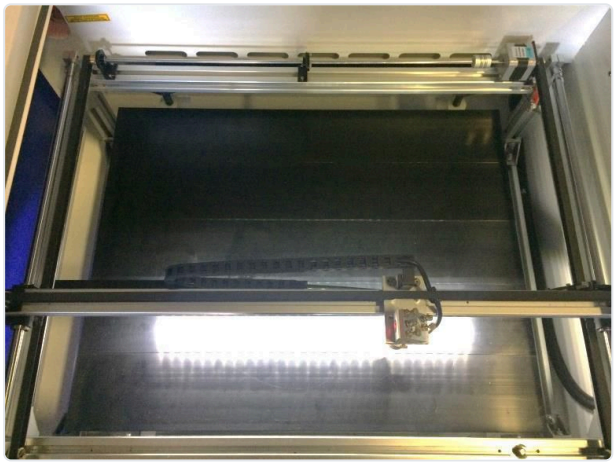
Logical Origin

When "Logical origin" is selected, clicking "Start" performs processing using the logical origin position — set with the laser machine's "Origin" button — as the data origin.

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



Even if you move the laser head, clicking "Start" moves the laser head to the logical origin and processing begins there.

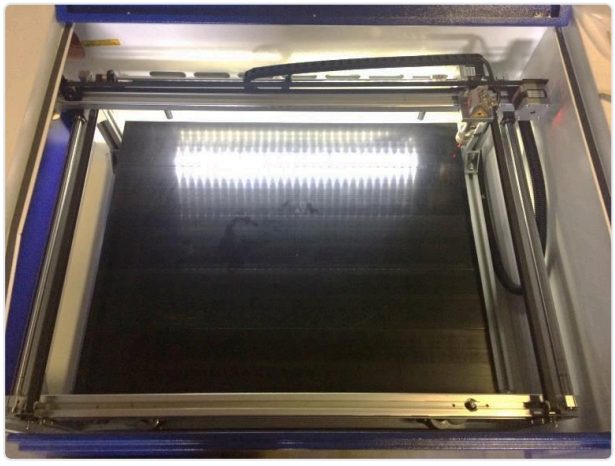


Machine Origin

When "Machine origin" is selected, clicking "Start" performs 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 you click the "Start" button, the laser head moves to the machine origin and processing begins.

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



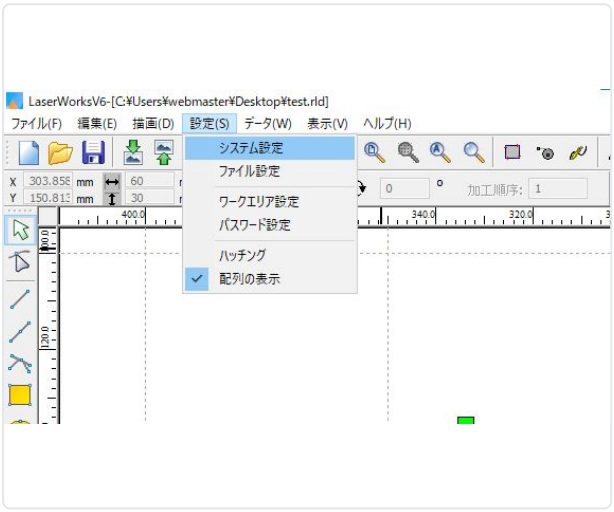
4.2 Absolute Coordinates

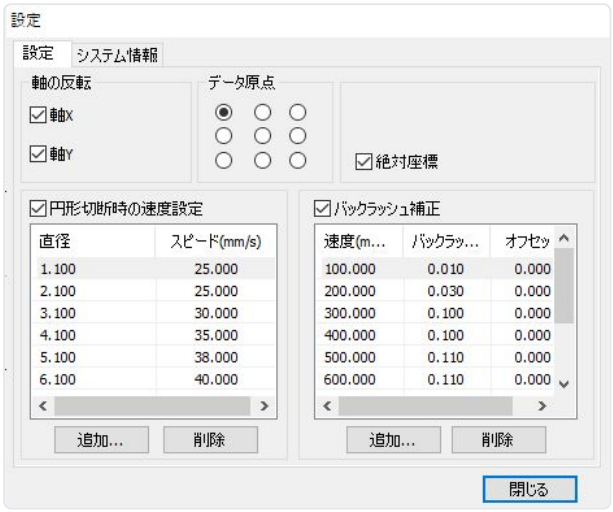
When "Absolute origin" is checked, the logical origin set with the panel's "Origin" button and the "Position" setting used when processing from LaserWork are both disabled, and processing is performed at the position of the objects on the design screen.

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

Setting Procedure

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





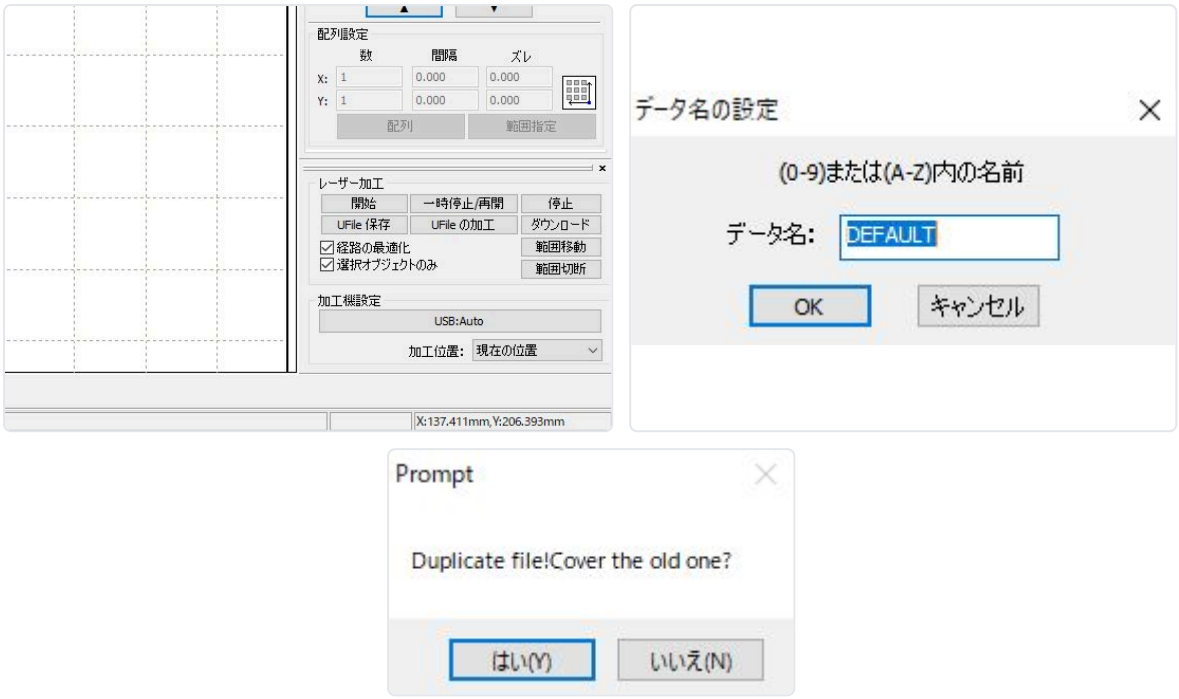
The settings screen appears. Check the "Absolute coordinate" checkbox to enable this setting.

5. 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 only when you start processing from the laser machine's control panel. It is not necessary when processing from the machine control pane in LaserWork.

(1) In the "Laser work" panel at the bottom right of the screen, click "Download".



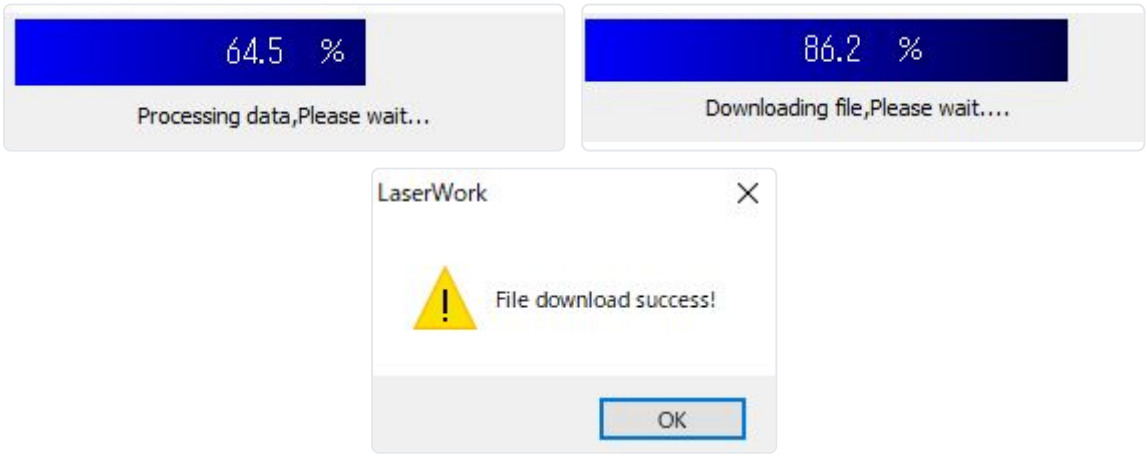
(2) When you click the "Download" button, the "Set data name" dialog appears. Enter a name of your choice.

Note: If a file with the same name already exists on the laser machine, a dialog asking whether to overwrite it appears.

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

(3) Start the download. Clicking it starts the data download.

First, the design data is converted into a format the machine controller can handle. If you have created a large data file, this step may take some time.



When the conversion reaches 100%, the download then begins.

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

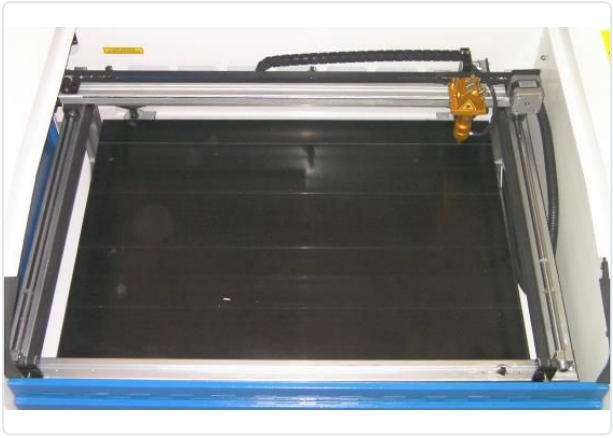
(4) At 100%, a download-complete dialog appears. Click the "OK" button to finish.

6. Processing

The processing data is now stored on the laser machine, so you can carry out the processing. Start processing by following the steps below.

6.1 Installing the Honeycomb Table

— Attaching the honeycomb table —



If the cutting table is installed, remove it so that the machine is set up with the engraving table.

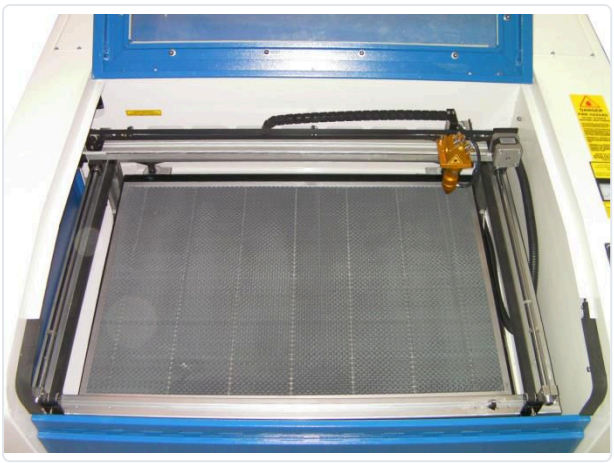
Carefully place the honeycomb table on top of the engraving table.

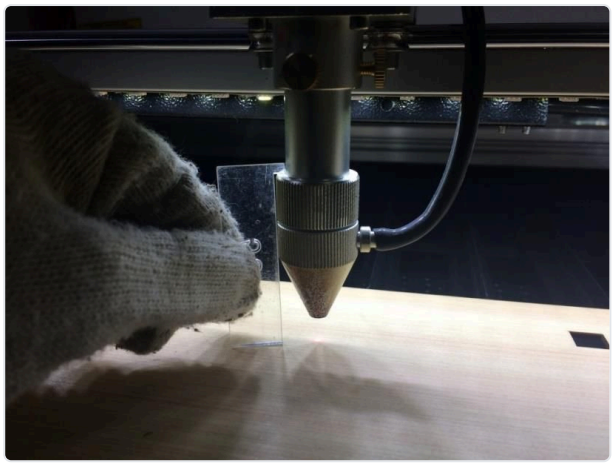
To create enough space to place the honeycomb table, use the table elevation handle. Turn it counterclockwise to lower the Z axis.

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 grazes the workpiece.

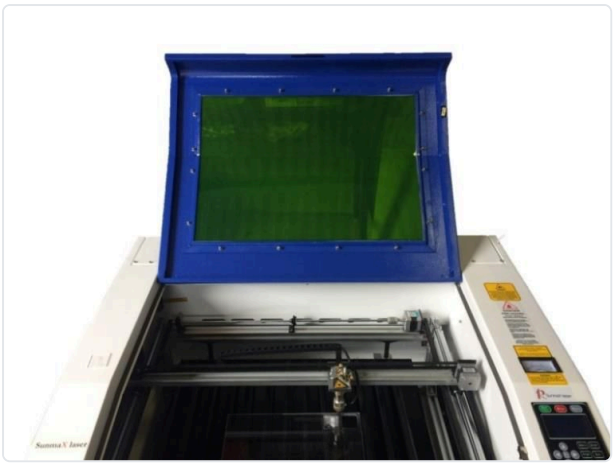
(Turning the handle clockwise raises the table; turning it counterclockwise lowers it.)

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

6.3 Starting Processing

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

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



(2) Close the top door.

Note: The laser will not be emitted while the top door is open.

(3) After closing the top door, turn on each piece of external equipment (blower, water chiller, and compressor).

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

(5) When processing is finished, the laser machine beeps. Open the top door and remove the processed material.

7. Other

[To make multiple copies of the same engraving]

Click "Array Copy" in the LaserWork drawing toolbar and configure it there, or configure it with "Array Output".

Array Copy copies the selected objects according to the specified row and column settings. Therefore, after an array copy, you can reposition and process each copied object individually.

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

Note: For details, refer to "Difference between Array Copy and Array Output" in the LaserWork V6 User Manual.