Work Example — Batch-Producing Two-Color ABS Plates

RSD-SUNMAX Series

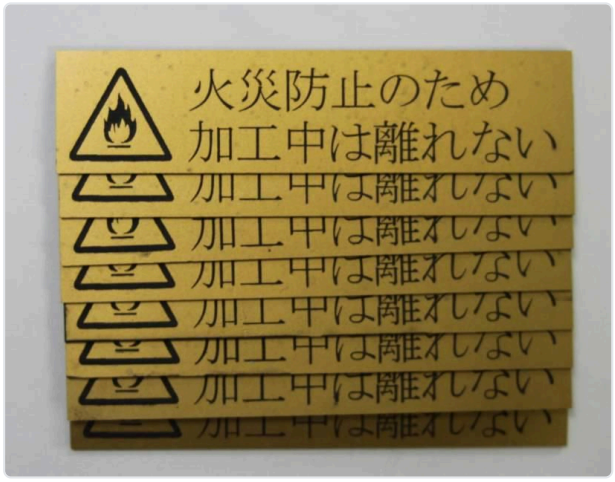
SUNMAX LASER

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 Examples — Making Multiple Two-Color ABS Plates (RDWorksV8 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 RDWorksV8, the control software for the RSD-SUNMAX series, has been installed correctly.

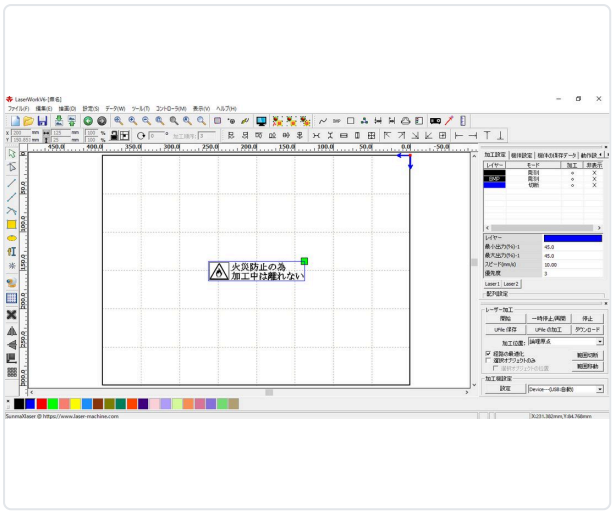
— Finished appearance of the product created by following this document —



① Create the Design

Create your design in RDWorksV8, Illustrator, or a similar application.

Use the tools shown in the "Draw" menu or the tools on the toolbar to create the design.



Note: The mark (flame) used in this example design is a bitmap. The engraving precision is determined by the resolution of the imported source bitmap. To achieve higher engraving precision, you need to use outlined data. For details, refer to "Work Examples — Making Wooden Tags (Adobe Illustrator Edition)."

(Reference) Example of a low-resolution bitmap

② Processing Settings

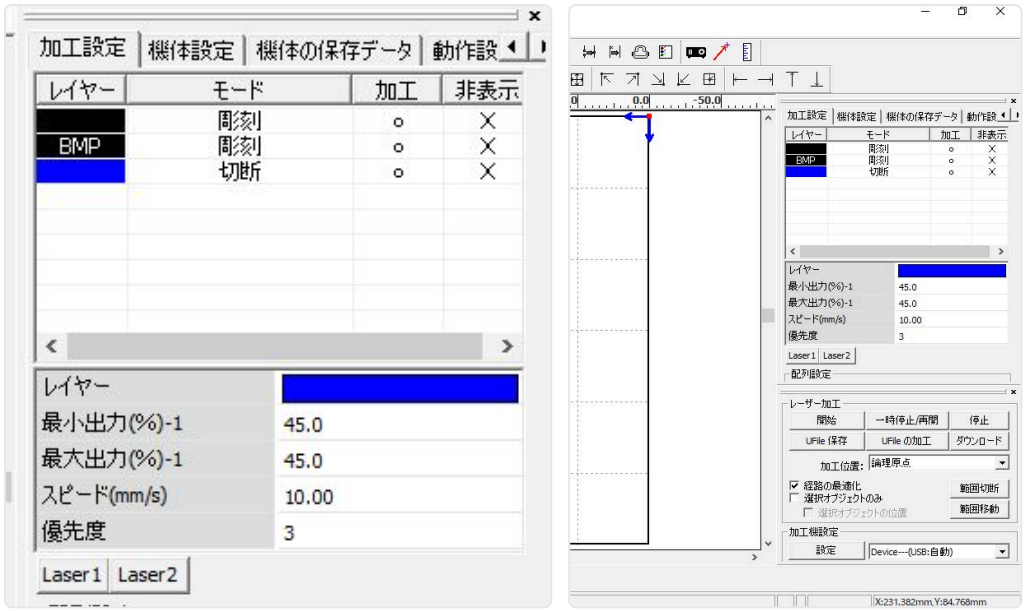
Now that the design is complete, the next step is to configure the processing settings.

2.1 Engraving Settings

In the work list at the top right of the screen, double-click the layer you want to configure.

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

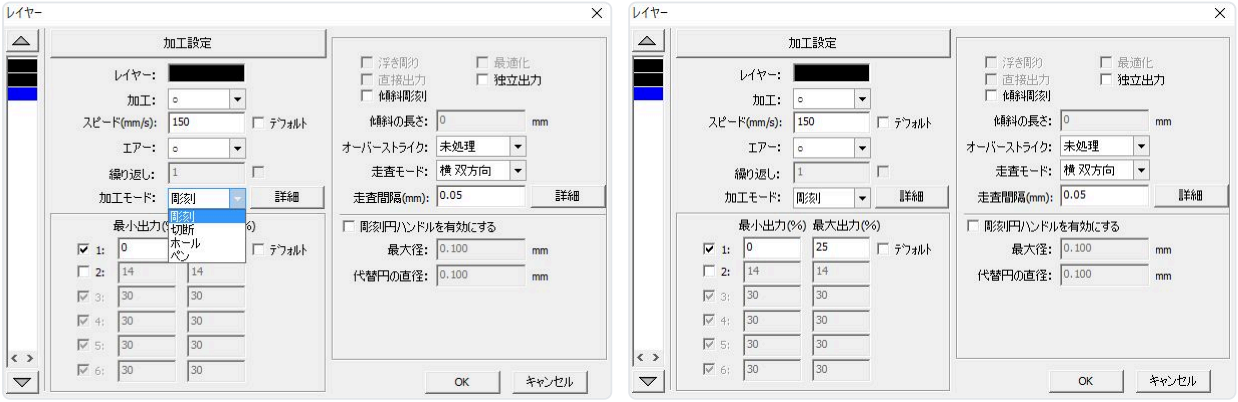
Note: Files imported as BMP files are fixed to engrave mode.



Double-click.

The Layer dialog appears.
Change the processing mode to "Engrave," or confirm that it is already set.

Click the drop-down button for the processing mode to display the list of modes, then click "Engrave."



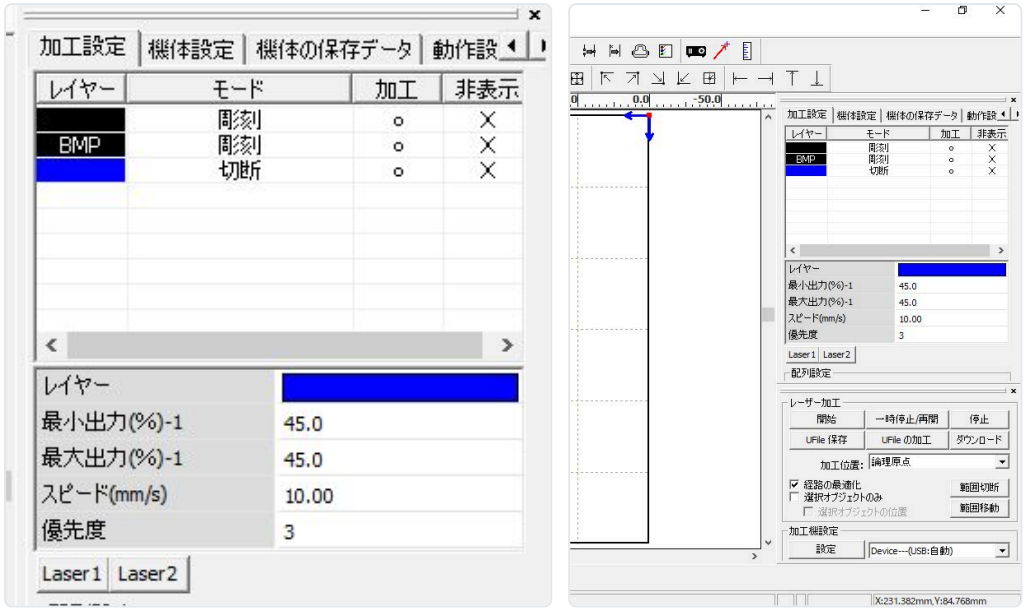
Once the mode is set to "Engrave," enter the setting values.

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

Click the OK button to complete the settings.

2.2 Cutting Settings

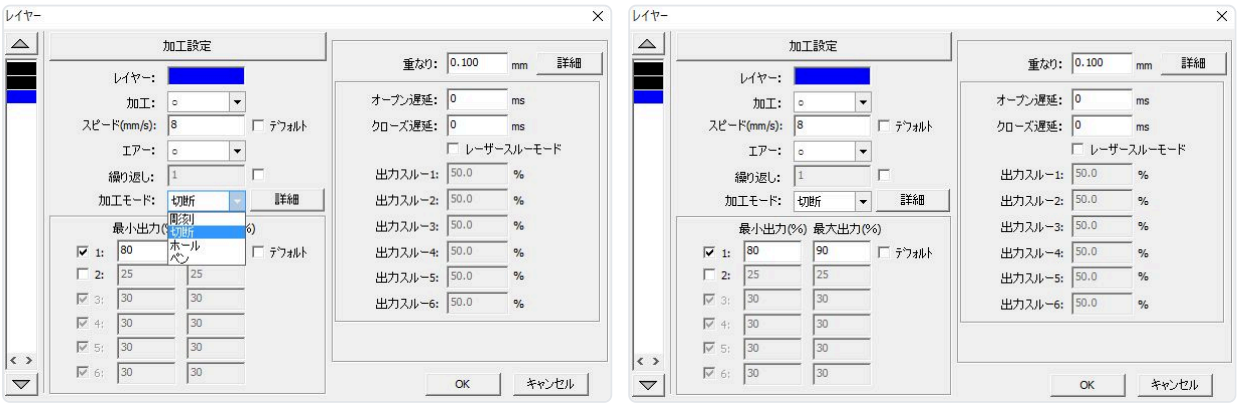
Next, set the mode of the outer frame — the shape to be cut — to "Cut." Double-click the layer you want to cut.



Double-click.

The Layer dialog appears.

Click the drop-down button for the processing mode to display the list of modes, then click "Cut."



Once the mode is set to "Cut," enter the setting values.

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

Click the OK button to complete the settings.

③ Setting Up Multiple Copies of the Same Job

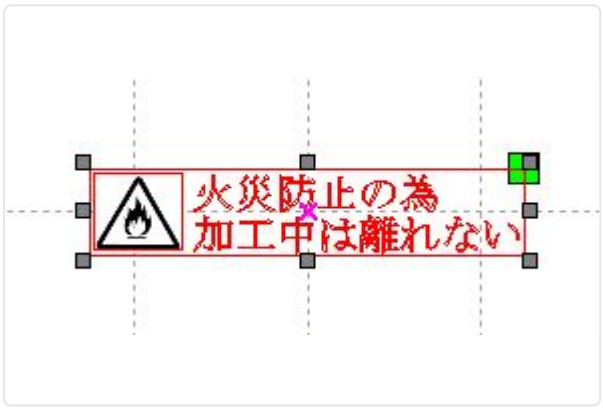
To run the same job multiple times, use either "Array Output" or "Array Copy."

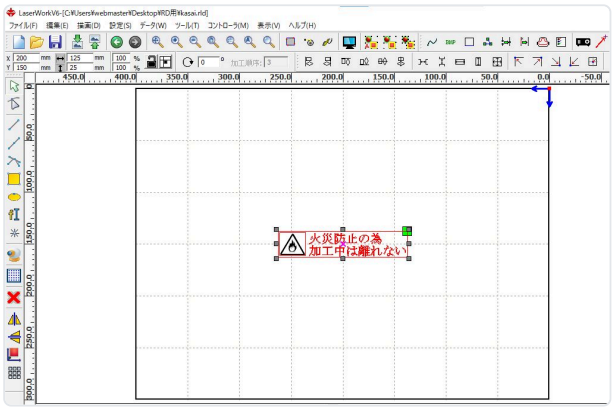
<How to Use Array Copy>

In this example, we use "Array Copy" to set up the job.

First, select all layers. Press the shortcut key "Ctrl+A," or drag with the mouse to select them.

Click "Array Copy" on the drawing toolbar to open the Array Copy dialog.

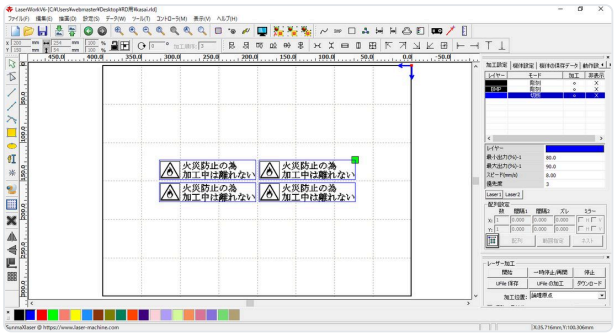




- **Array Output:** Outputs the selected objects according to the specified row and column settings. Because this is not a copy operation, you cannot reposition or edit the individual objects after the array output. However, it allows flexible automatic placement, such as specifying row and column offsets.
- **Array Copy:** Copies the selected objects according to the specified row and column settings. Therefore, after the array copy you can reposition and edit each copied object individually. In addition, objects copied in the horizontal direction are processed in a single pass, which has the advantage of shortening the processing time.

For details, refer to the RDWorksV8 user manual.

The "Array Copy" dialog appears.



Set the X number, Y number, and spacing according to the number of horizontal and vertical repetitions and the horizontal and vertical margins.

Example: To process identical pieces in 2 columns and 4 rows with a 4 mm margin, use the settings shown below.

Click the OK button to complete the settings.

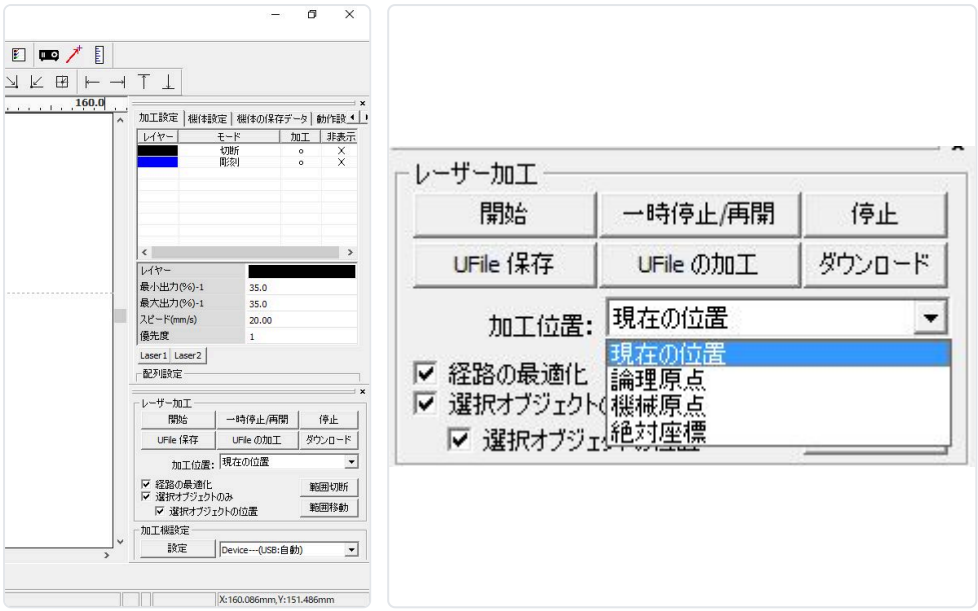
Multiple copies of the design are displayed on the screen.

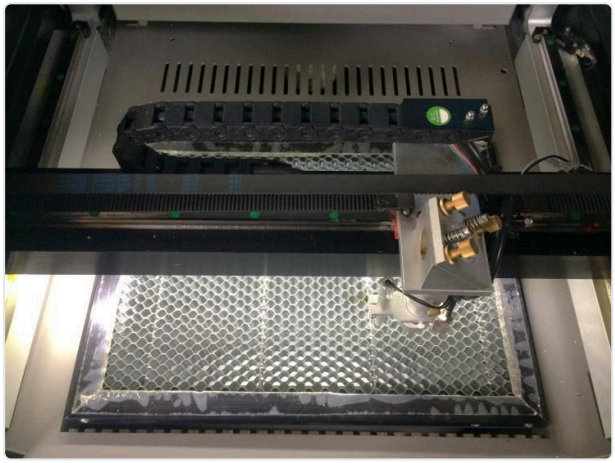
⑤ About the Origin

Before starting the job, you need to check and set the processing start position.

When you start the job from the machine's operation panel, the logical origin is always used as the processing start position.
Refer to "Machine Operation Panel" — "About the Logical Origin" in the separate RDWorksV8 user manual.

When you start the job from RDWorksV8, you can choose from four origin options depending on the setting.





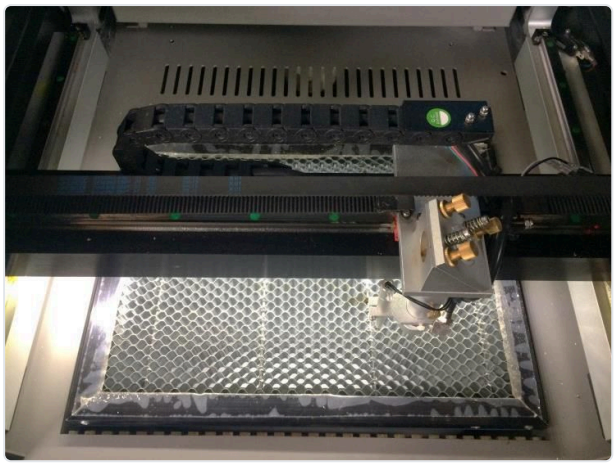
5.1 Current Position

When "Current position" is selected, clicking the "Start" button in RDWorksV8 runs the job using the current position of the laser head as the position of the data origin.

- Processing origin -

5.2 Logical Origin

When "Logical Origin" is selected: if you click the "Start" button in RDWorksV8 to run the job, the machine processes the data using the logical origin — the position set with the "Origin" button on the laser machine — as the data origin.



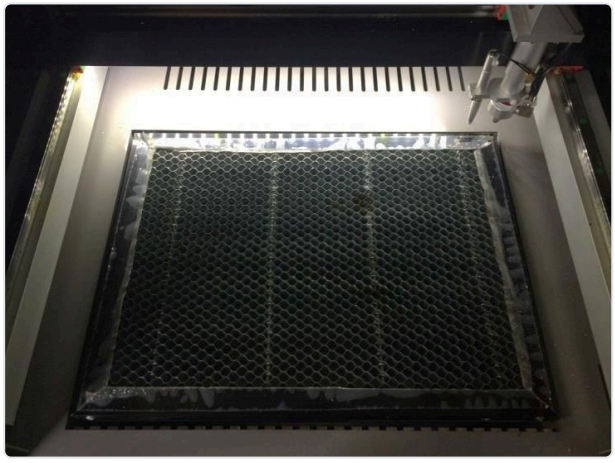
Even after moving the laser head, press the "Origin" button on the machine's operation panel.

When processing starts, the laser head moves to the logical origin and begins processing.

5.3 Machine Origin

When "Machine Origin" is selected: if you click the "Start" button in RDWorksV8 to run the job, the machine processes the data using the machine origin position (rear right — the position the machine homes to when the laser machine starts up) as the data origin.

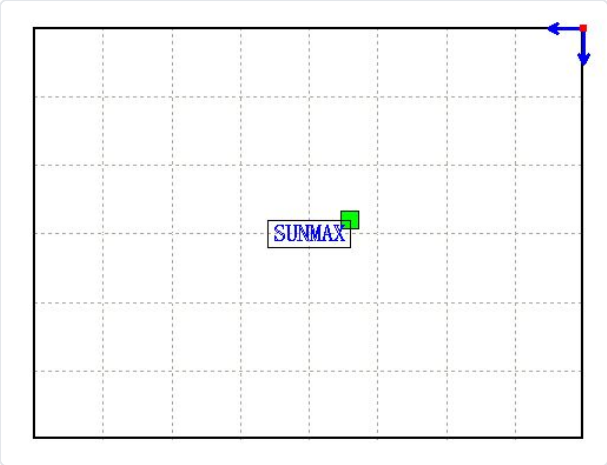
When processing from the machine origin, only cutting is possible.

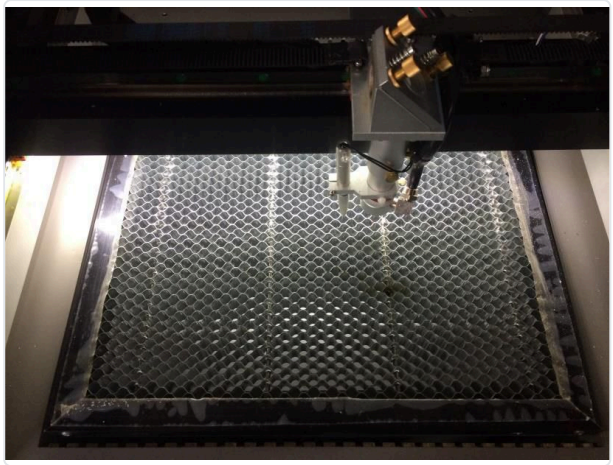


When processing starts, the laser head moves to the machine origin and begins processing.

5.4 Absolute Origin

If you check "Absolute Origin", the logical origin set with the "Origin" button on the operation panel and the processing-position setting used when starting a job from RDWorksV8 are both ignored, and processing is performed at the position shown on the RDWorksV8 design screen.





Place the objects in RDWorksV8.

When processing starts, the laser head moves to the same coordinates as on the RDWorksV8 design screen and begins processing.

⑥ Downloading the Data

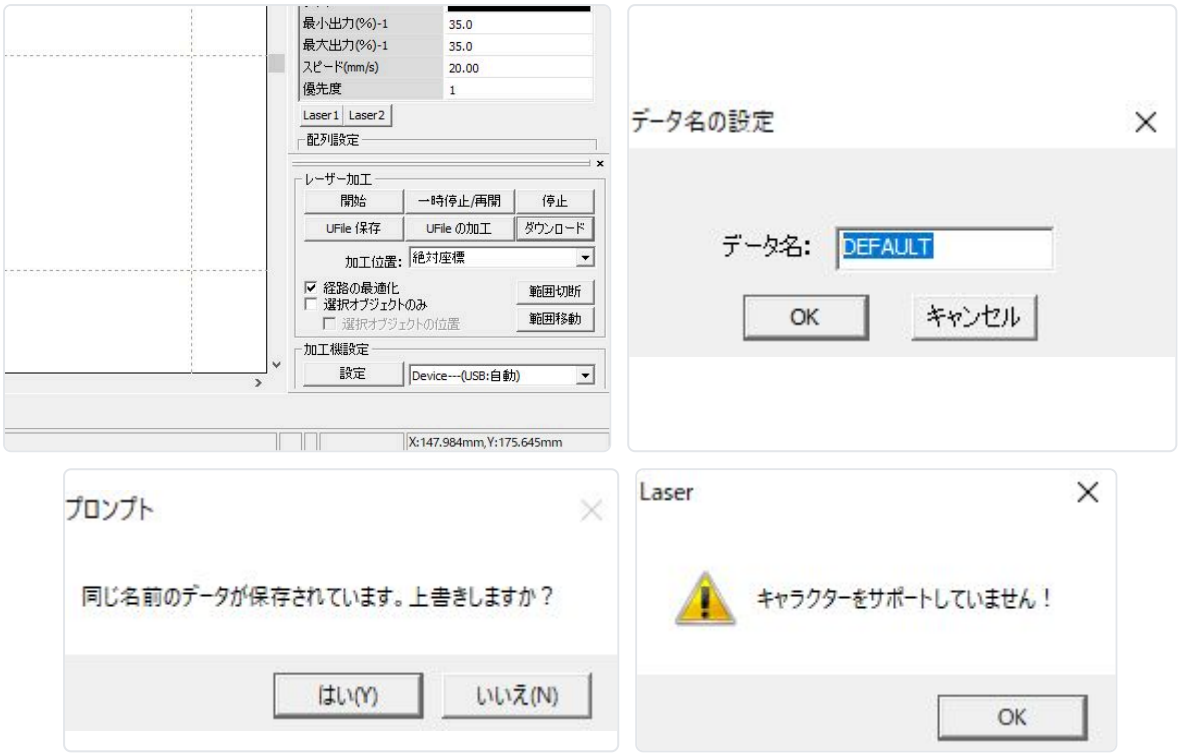
Once the processing settings and the processing-position settings are complete, send the processing data to the laser machine.

When you download the data and run the job, you start it from the operation panel, so the processing start position is always the logical origin position.

Note: If you run the job with the "Start" button in the machine-control pane of RDWorksV8, no data download is performed.

Click "Download" in the "Laser Work" pane at the bottom right of the screen.

Clicking the Download button displays the "Set data name" dialog. Enter a name of your choice.



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

Note: Only single-byte alphanumeric characters can be used. Entering Japanese characters causes an error.

Starting the Download

Clicking starts the data download.

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

Note: If you have created a large data file, this step may take some time.

Download Complete

When the progress reaches 100%, a download-complete dialog appears.

Click the OK button.

⑥ Processing

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

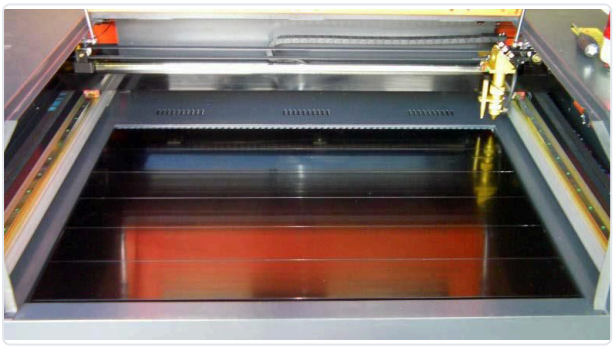
6.1 Installing the Table

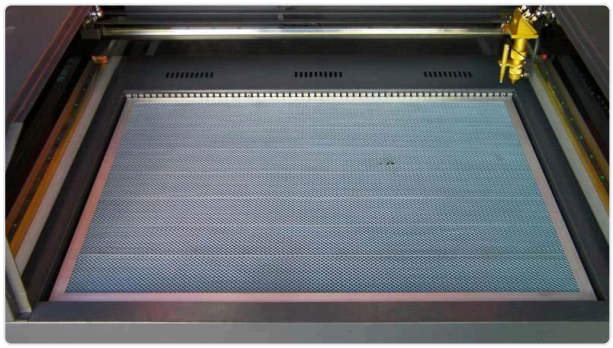
The RSD-SUNMAX series can be used with three types of processing tables.

Engraving Table

With the engraving table, no attachment is used — the material is placed directly on the laser machine's lift table for processing.

- As a rule, use it for engraving only. Do not use it for cutting. During cutting, the laser beam must pass through the bottom surface of the material, but because the engraving table is a flat plate, the beam cannot pass through. It is therefore used for engraving.
- Cutting on the engraving table becomes possible if you raise the material on spacers to create a gap between the table and the material. In general, a gap of about 2–5 mm between the table and the material is required.
- The engraving table is well suited to holding and processing thick materials.





Honeycomb Table

The honeycomb table is used by placing it on the lift table. Both engraving and cutting are possible. In addition, by connecting an exhaust blower to the honeycomb table box, the material is suctioned from underneath, so even light materials such as cloth and paper can be held firmly in place.

Cutting Table

In addition to the honeycomb table, the RSD-SUNMAX series comes with a cutting table.

By installing the supplied cutting-table parts on the table, you get a cutting table that produces less scorching and melting on the back of the material from laser reflection than the honeycomb table does. When the cutting table is installed, autofocus cannot be used; focusing is adjusted with the cylinder on the laser head.

In this work example, we use the honeycomb table.

For how to install and remove each table, refer to the machine's instruction manual.

6.2 Focusing

The distance to the laser head differs for each workpiece.

You can either focus using autofocus, or adjust the height manually using the focus gauge.

> **Caution:** Always refocus whenever the height of the workpiece changes. When using the cutting table, autofocus cannot be used — focus manually.

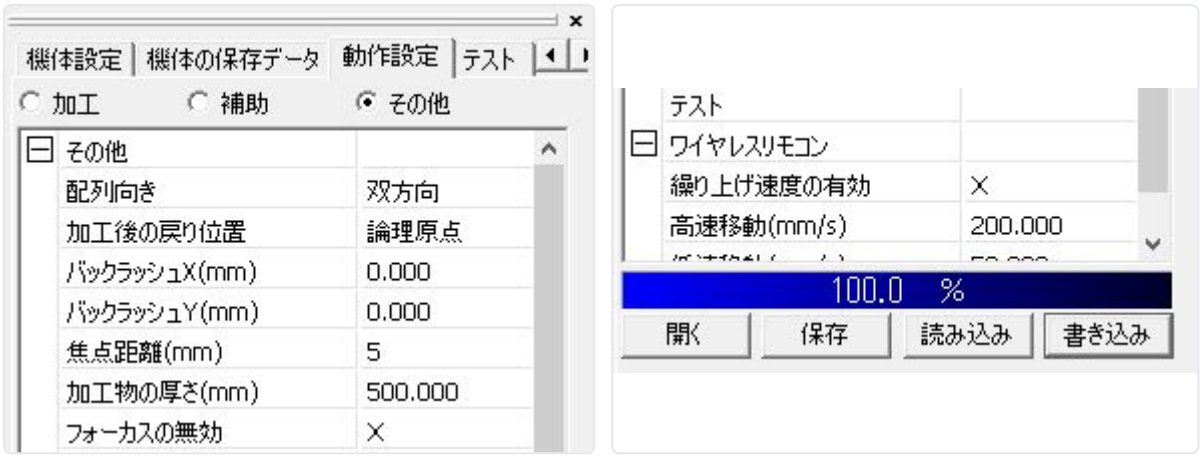
Using Autofocus

Autofocus automatically adjusts the focal distance by means of the autofocus switch mounted on the machine.

<Adjustment Method>

The autofocus focal distance is set by entering a value in RDWorksV8 under "Operation settings" → "Other" → "Focus distance"; this value sets the autofocus return amount. Use the focus gauge to adjust the value so that the correct position is obtained.

After entering the setting value, write the data to the machine.



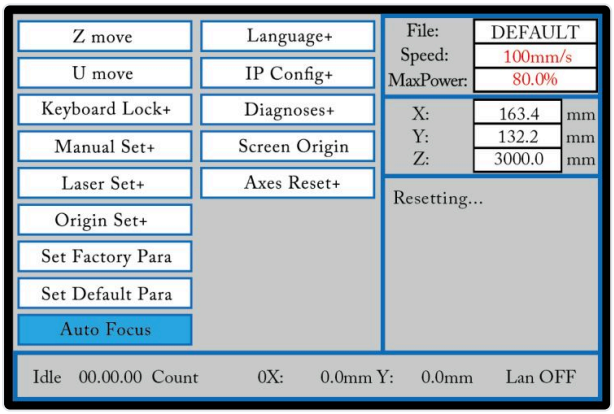
Press the "Z/U" button on the machine's operation panel to display the option screen.

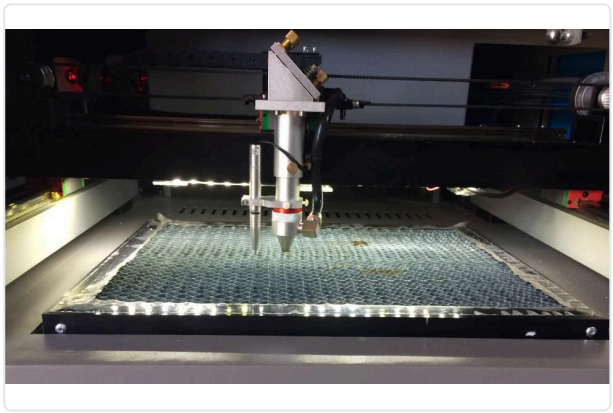
- Operation panel -

Press the button.

Use the arrow buttons to select "Auto Focus" and press "Enter"; the autofocus operation is then performed.

- Operation panel screen -





① Select ② Press

The lift table rises until it touches the autofocus switch, and the focus is automatically adjusted to the focal-distance value you set.

Manual Focusing (Using the Focus Gauge)

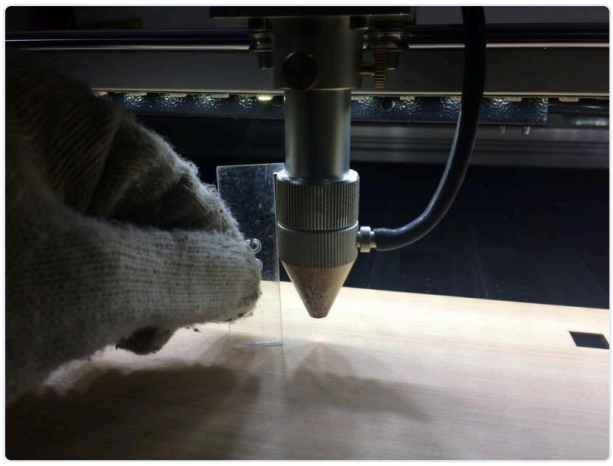
In the manual method, you raise and lower the lift table by hand and set the focus using the focus gauge. This allows the focus to be set more accurately than with autofocus.

- Focus gauge -

<Adjustment Method>

Insert the focus gauge between the laser head and the workpiece.

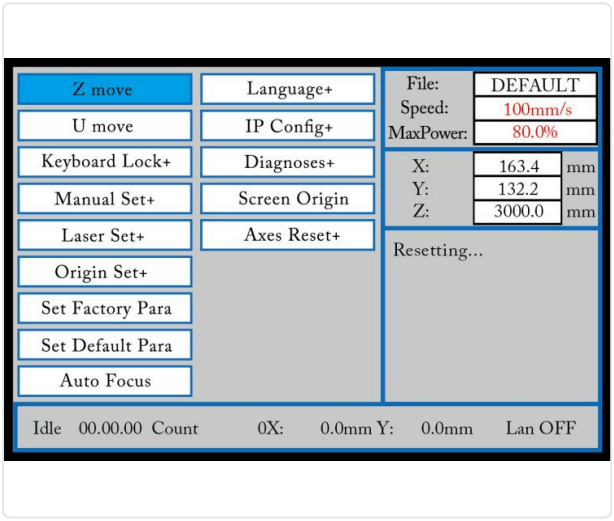
Press the "Z/U" button on the operation panel to display the option screen.

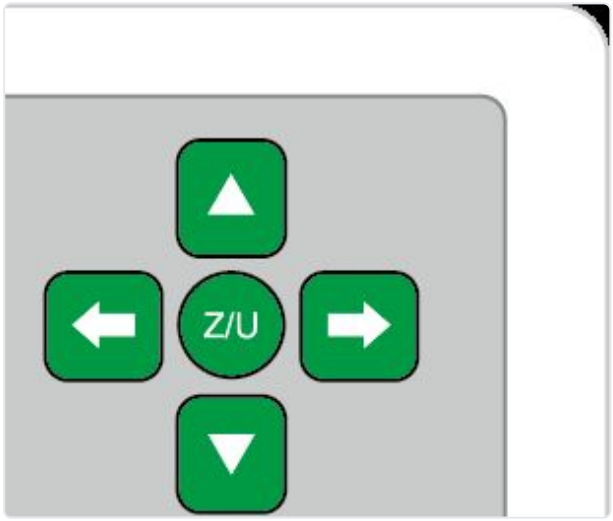


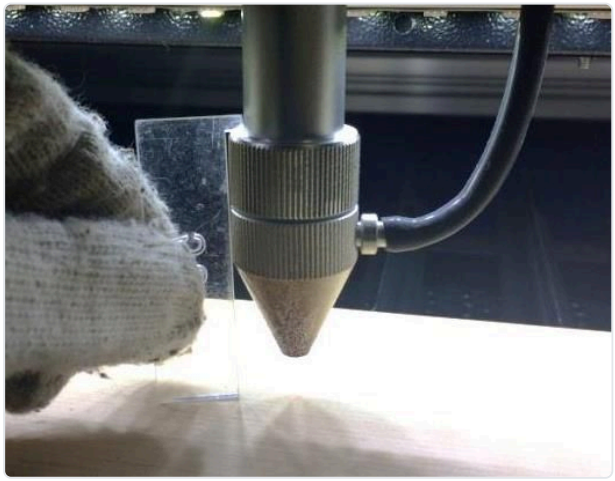
- Operation panel -

Insert the focus gauge. / Press the button.

Select "Z move" and press the left/right arrow keys on the operation panel; the lift table then moves up and down.







- Operation panel screen -

Adjust the height until the focus gauge just grazes the workpiece.

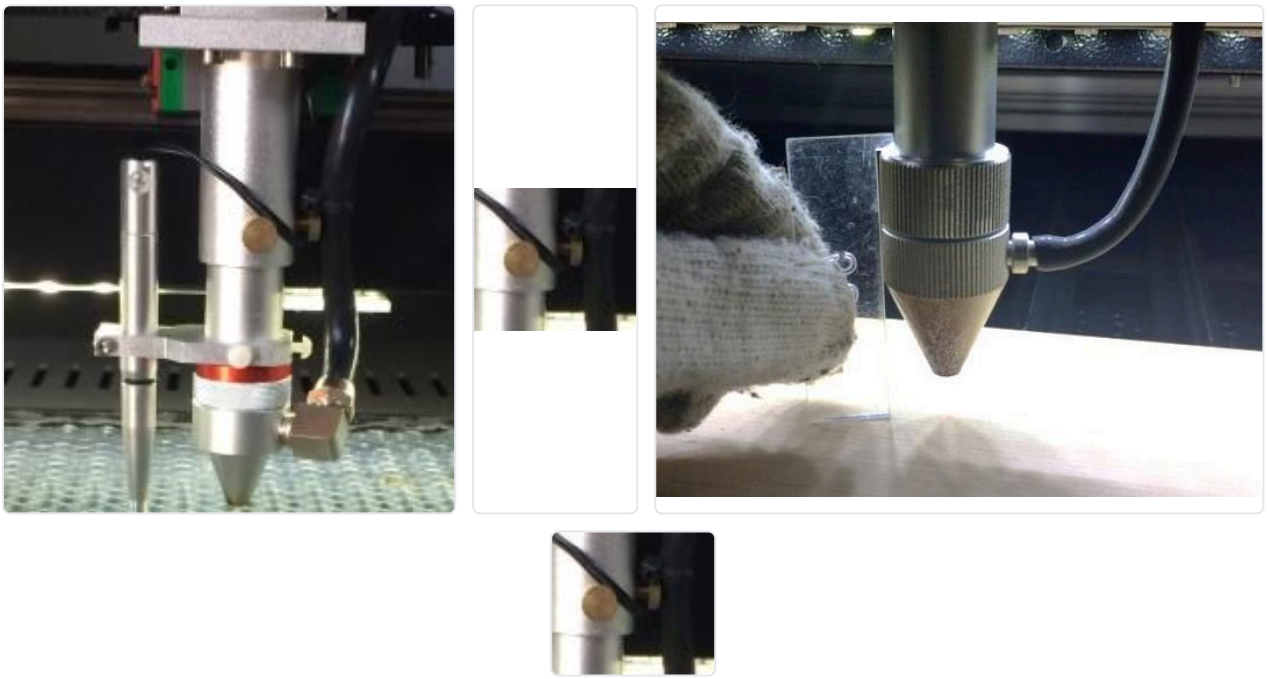
Up / Down — until the gauge just grazes the surface.

When Using the Cutting Table

When the cutting table is in use, the lift table cannot be raised or lowered. The focus must be set manually, using a procedure that differs from the normal manual adjustment method.

<Adjustment Method>

Loosening the screws on the laser head allows the length of the head to be adjusted. (There are two screws.)



Turn counterclockwise to loosen, clockwise to tighten.

After loosening the screws, insert the focus gauge between the head and the workpiece, adjust the height until the gauge just grazes the surface, and then tighten the screws.

Once the height is set with the focus gauge, tighten the screws.

6.3 Scorch Prevention

As a scorch-prevention measure, cover the surface of the material with wet newspaper or similar. Use your hand or a brush so that it adheres evenly to the material.

6.4 Cover

Once preparation is complete, lower the top door.

> **Caution:** The laser will not fire while the top door is open.

6.5 Powering On External Equipment

After closing the cover, turn on the power to each piece of external equipment (blower, automatic water chiller, and air compressor).

6.6 Starting the Job

Press "Start" on the operation panel to begin processing.

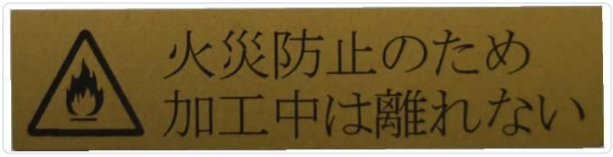
When processing is complete, the laser machine sounds a beep. Open the cover and remove the processed material.

6.7 After Processing

When processing is complete, the laser machine sounds a beep. Open the top door and remove the processed material.

In this work example, scorch-prevention treatment was applied. For comparison, the finished results with and without scorch-prevention treatment during processing are shown below.

[Finished Result]



- With scorch-prevention treatment - *- Without scorch-prevention treatment -*
