

Rounded (Kamaboko) Engraving (CorelDRAW 2020)

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.

Rounded (Kamaboko) Engraving (CorelDRAW 2020)

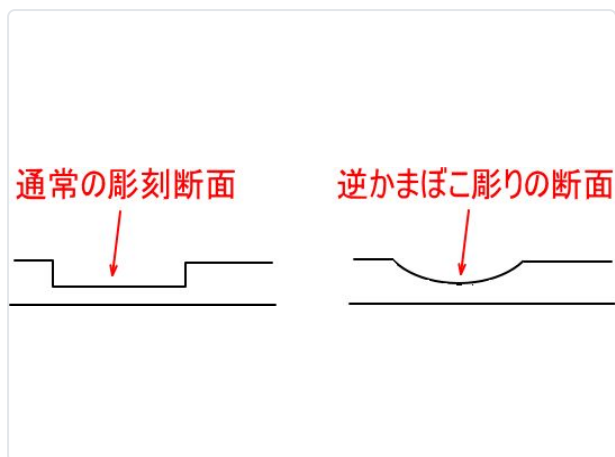
- This document assumes that the laser machine has been set up correctly.
- This document assumes that LaserWorkV6, the control software for the RSD-SUNMAX series, has been installed correctly. Hereafter, the control software LaserWorkV6 is referred to simply as LaserWork.
- This document uses CorelDRAW 2020 running on MS Windows 10. If your environment, OS, or CorelDRAW version differs, adapt the instructions accordingly. Note in advance that, depending on your CorelDRAW version, some features described in this document may not be available or the on-screen display may differ.
- This document shows one example of how to perform rounded (kamaboko) engraving. The same result may be achievable with procedures different from those described here.

What Is Rounded (Kamaboko) Engraving?

It is a machining technique that makes the engraved surface appear raised and rounded. Traditionally, it is done by hand with a carving chisel.



As a variation of rounded engraving, the shape can also be inverted (recessed).



Caution: You can create data that produces a better finish by using Adobe Photoshop together with CorelDRAW, rather than creating the data with CorelDRAW alone. If both applications are available, we strongly recommend creating your data with CorelDRAW + Adobe Photoshop. This method is also explained in this document.

About Laser Processing

The RSD-SUNMAX series does not support grayscale engraving (varying the laser output according to the shade of the fill color in the data to change the engraving depth). Therefore, rounded engraving cannot be done with ordinary data.

In this document, instead of varying the laser output, rounded engraving is achieved by rapidly switching the laser output ON and OFF to vary the amount of laser irradiation per unit area.

This is similar to halftoning (screen-toning) data, which is done when processing photographs. Normally, when halftoned photo data is processed at a power higher than the settings appropriate for laser-processing photographs, the darker areas get burned in and engraved too deeply. This document's method deliberately takes advantage of that: by intentionally engraving deeper in places and varying the engraving depth, gradation is expressed.

Data Preparation

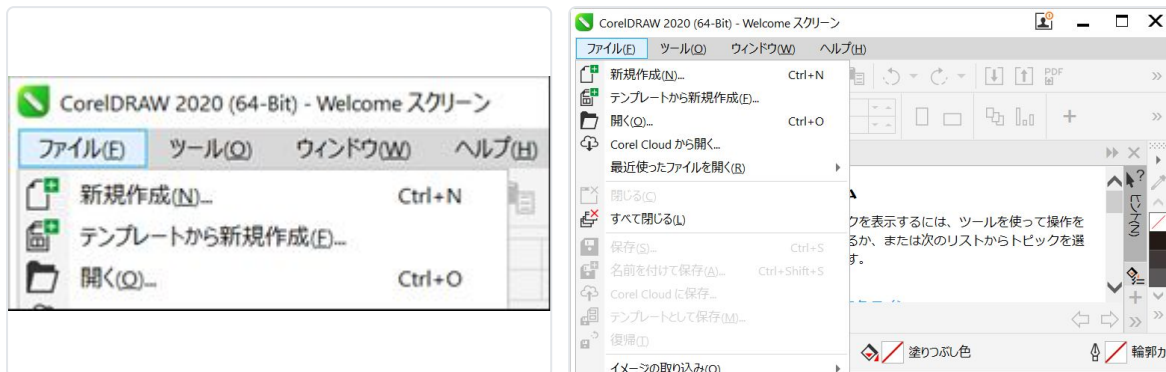
In this document, the character string "SUNMAX" will be engraved with the rounded (kamaboko) technique.

Procedure (CorelDRAW Only)

Create the data using CorelDRAW, import it into LaserWork, and run the job. Follow the steps below.

1. Creating a New Document

Start CorelDRAW and click "File" > "New" on the menu, or press Ctrl + N on the keyboard.

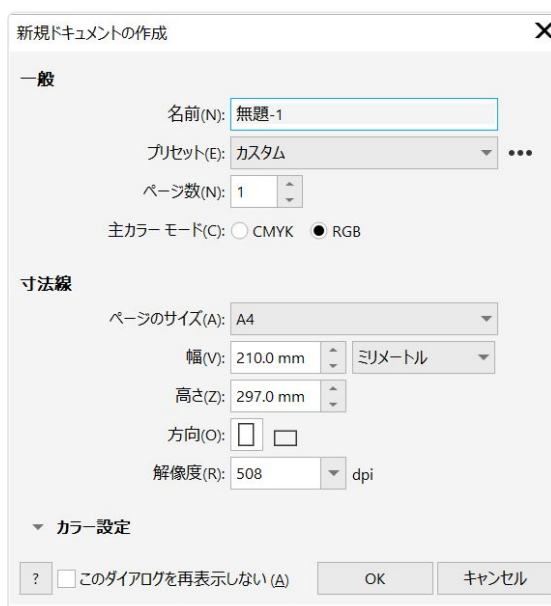


The "Create a New Document" dialog appears.

Since the file will ultimately be saved as a bitmap, the name, size, and other settings can be left at their default values. Set them as needed.

Set only the following two items:

Primary color mode	RGB
Rendering resolution	508



After configuring the settings, click OK.

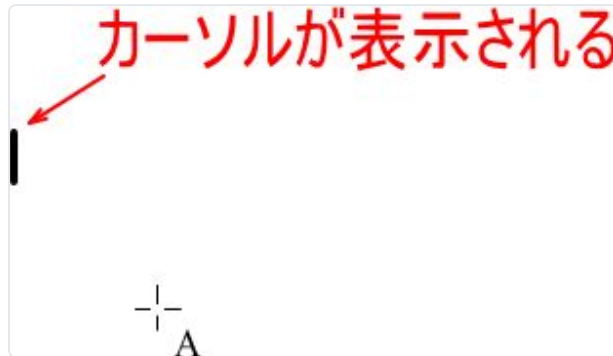
2. Creating the Text

Start CorelDRAW and create the text data. In this document, the string is "SUNMAX".

Click the "Text" tool button on the toolbar, or press F8 on the keyboard, to switch to the Text tool.

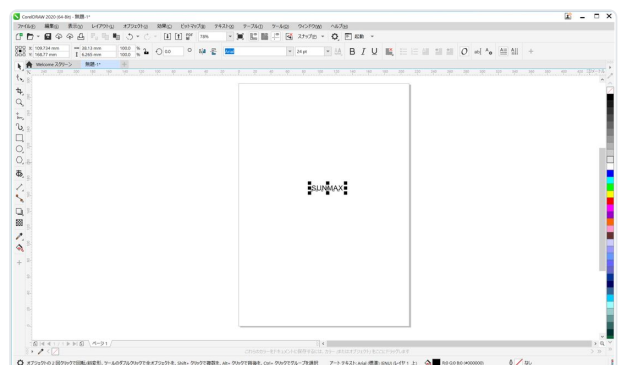
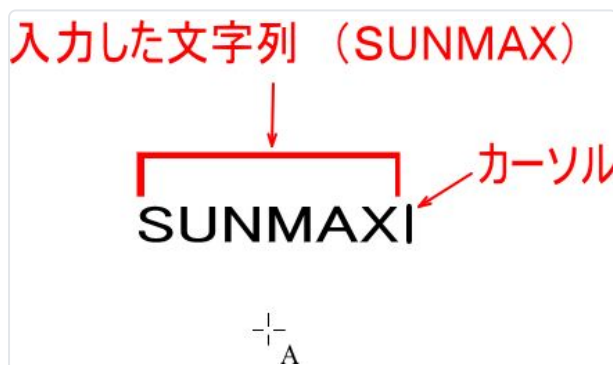


When the Text tool is active, the mouse pointer changes to the text cursor. Click anywhere inside the CorelDRAW document.



When you click, the Text tool's cursor blinks at that position.

Once the cursor appears, type the text from the keyboard. In this document, it is "SUNMAX".

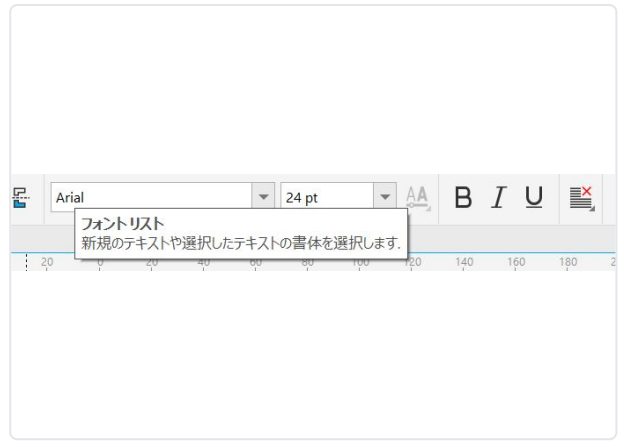
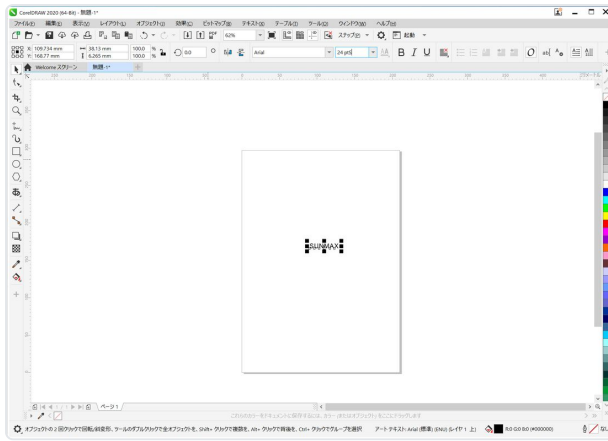


After entering the text, click the "Pick" (selection) tool button on the toolbar.

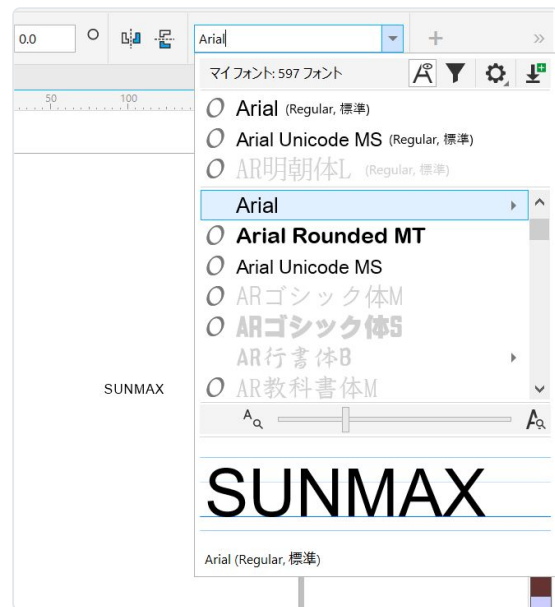
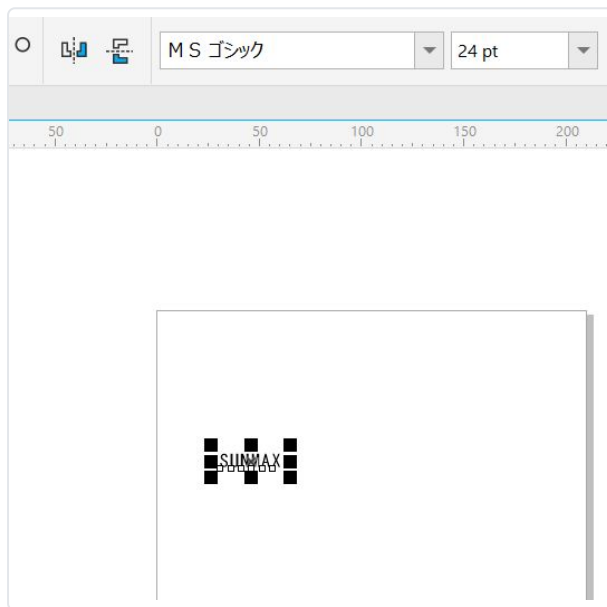
With the "Pick" tool selected, select the entered text and change the typeface using the font list.

You can apply settings such as bold and italic.

Do not change the character size.



In this document, "MS Gothic" is used as the example font.



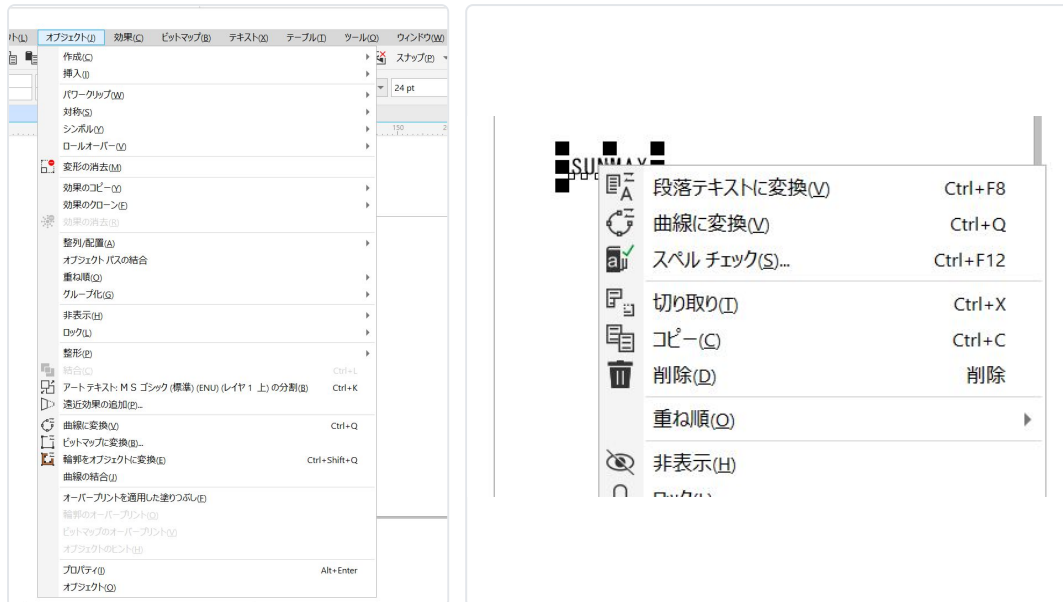
Typeface

Note: Rounded (kamaboko) engraving is best suited to typefaces with thick strokes. Fonts whose vertical and horizontal stroke widths differ, such as Mincho-style fonts, and fonts whose stroke width varies greatly from place to place, are not suitable.

3. Converting to Curves

Convert the text created in step 2 to outlines using any one of operations 1 to 3 below.

1. On the menu bar, click "Object" > "Convert to Curves".
2. Press Ctrl + Q on the keyboard.
3. Right-click the text and click "Convert to Curves" in the context menu that appears.



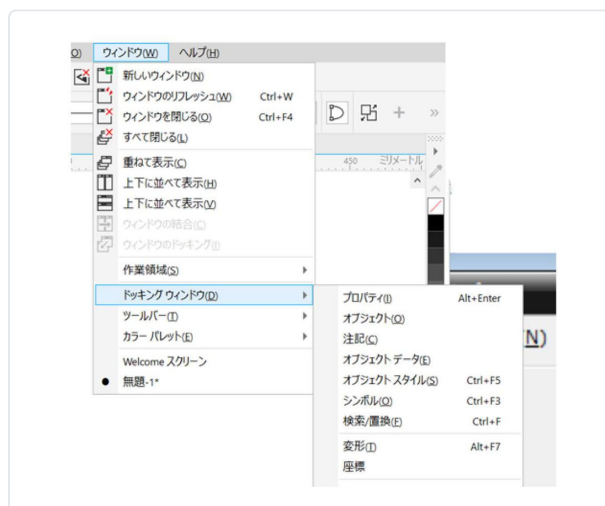
4. Properties

Set the properties of the text converted to curves in step 3.

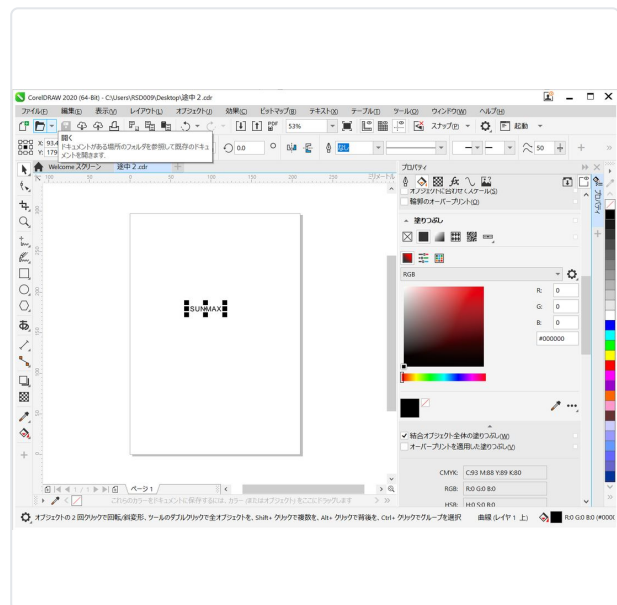
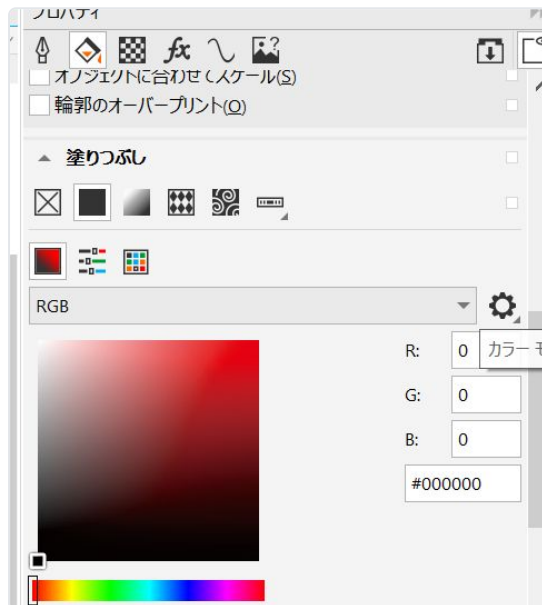
Display the "Properties" window using any one of operations 1 to 3 below. If it is already displayed, no action is needed.

1. On the menu bar, click "Window" > "Dockers" > "Properties".

SUNMAX



2. Press Alt + Enter on the keyboard.
3. Right-click the text and click "Properties" in the context menu that appears.



Properties window

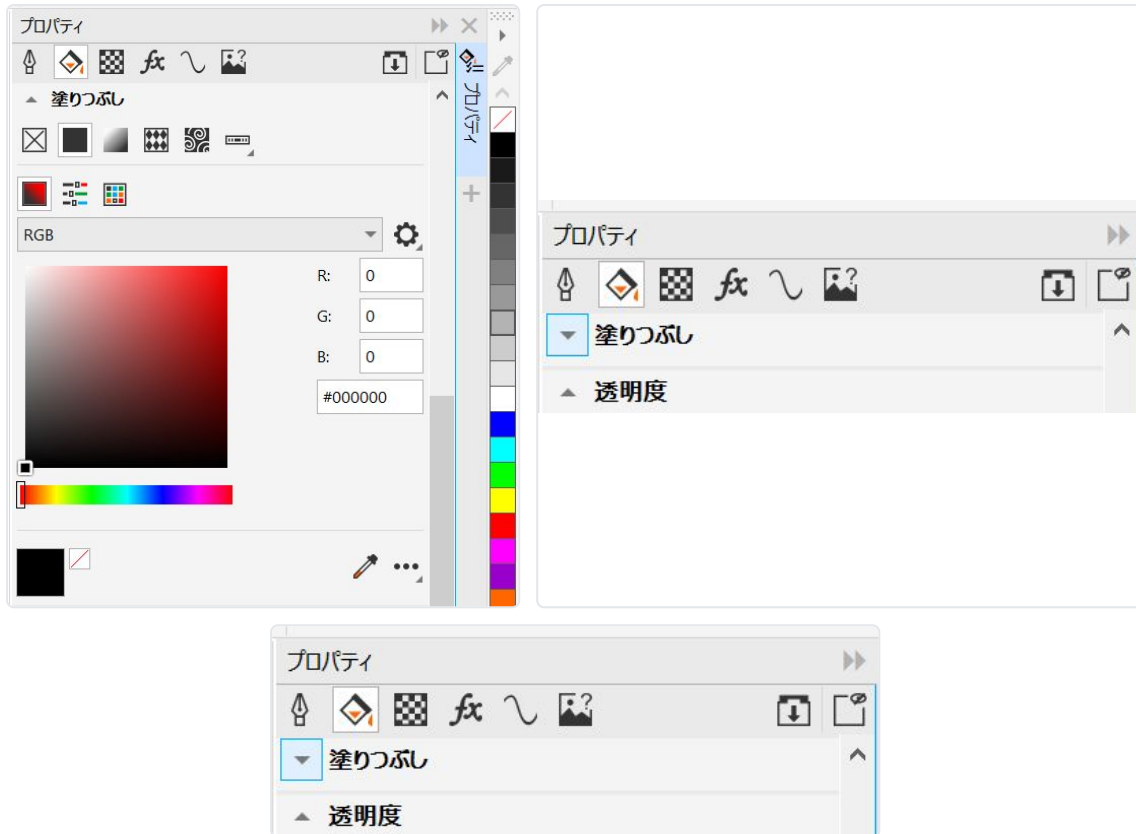
When the "Properties" window is displayed, set "Fill" and "Outline".

Fill is the initial view shown when the Properties window is opened.

If your screen differs from this, click the "Fill" tab.

Set "Fill" as follows.

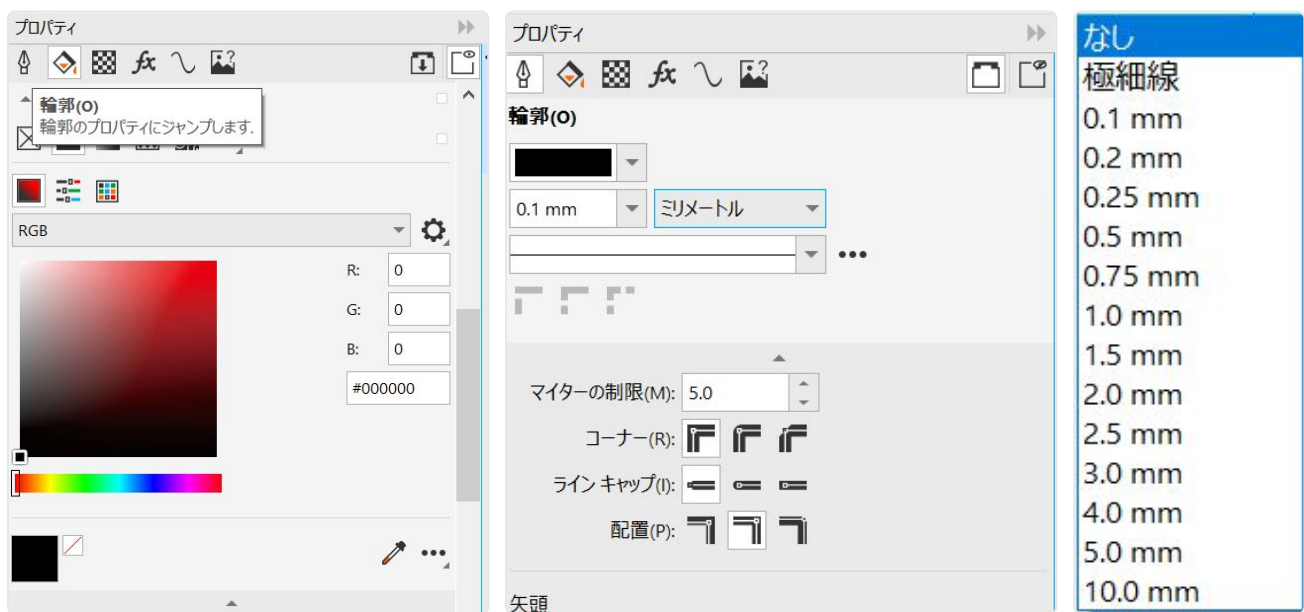
Click Uniform fill, click Color viewers, and then select the RGB tab below it.



- Click Uniform fill
- Color viewers
- RGB
- All values 0

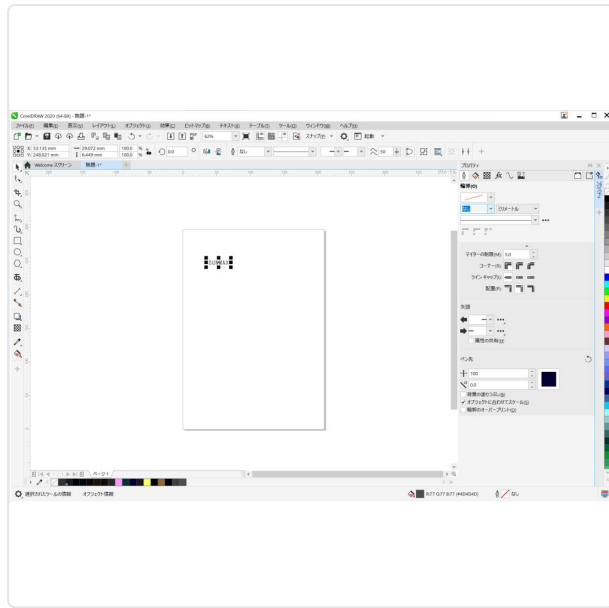
Next, set the "Outline". Click the "Outline" tab.

When "Outline" is displayed, set "Width" to "None".



- Click the Outline tab

- Set Width to "None"

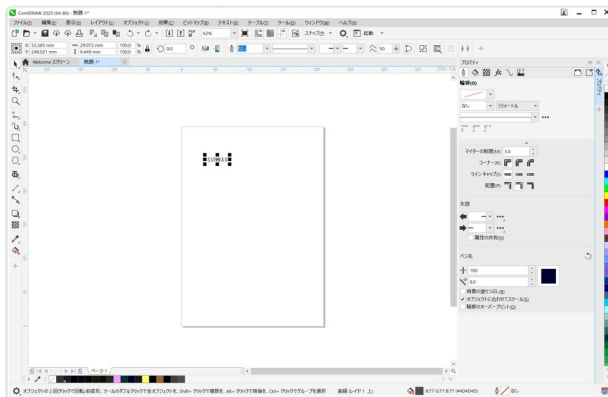


5. Changing the Size

Change the size of the text string.

Set the size to the actual dimensions to be used for laser processing.

To change the size, specify the width and height in the "Object size" fields on the CorelDRAW screen.



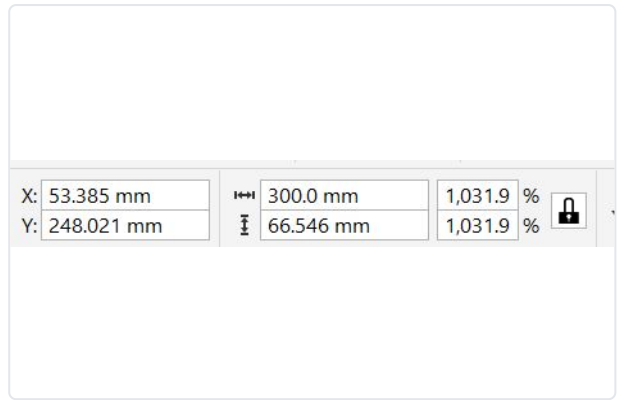
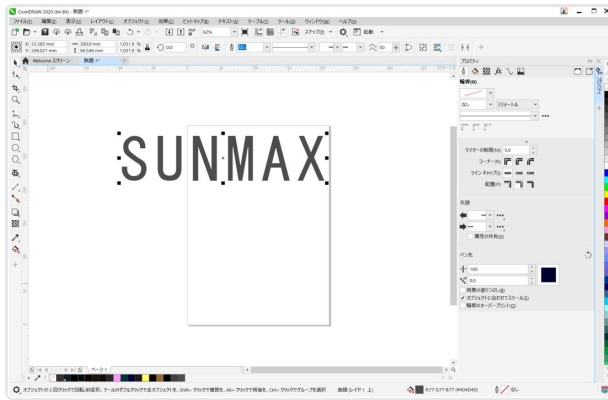
比率をロック

Preserves the original ratio of width to height when scaling and sizing the object.

Use "Lock ratio" to set whether the aspect ratio is maintained. Clicking the icon toggles between locked and unlocked.

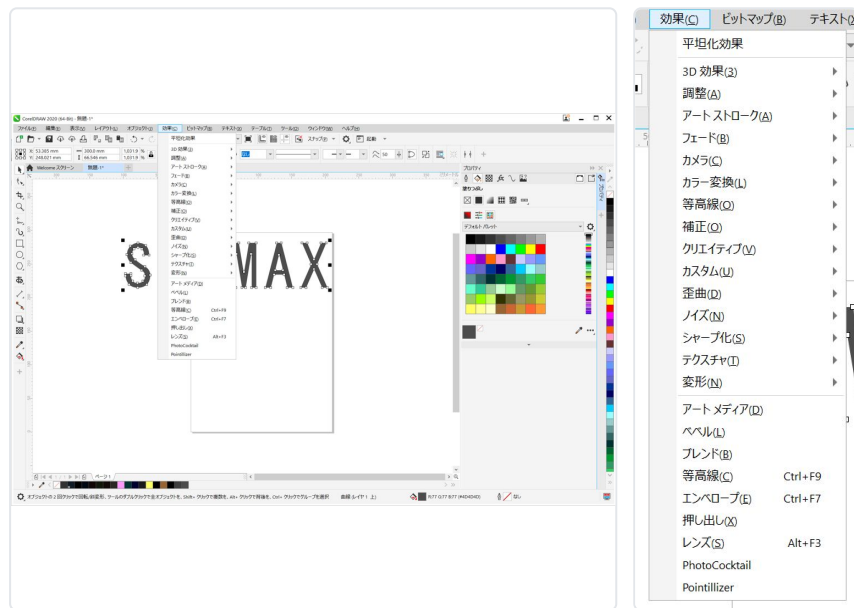
- Locked: the scale ratio is locked, and the width-to-height ratio is maintained.
- Unlocked: the lock is released, and the aspect ratio is not maintained.

Example: With the ratio locked, the width is changed to 300 mm.

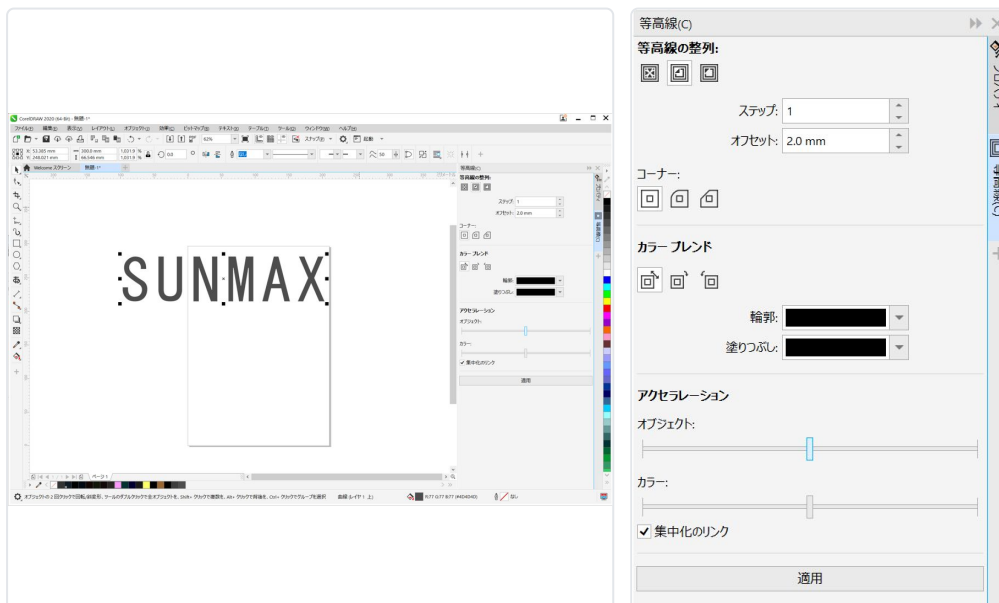


6. Contour

With the text string selected, click "Effects" > "Contour" on the menu.



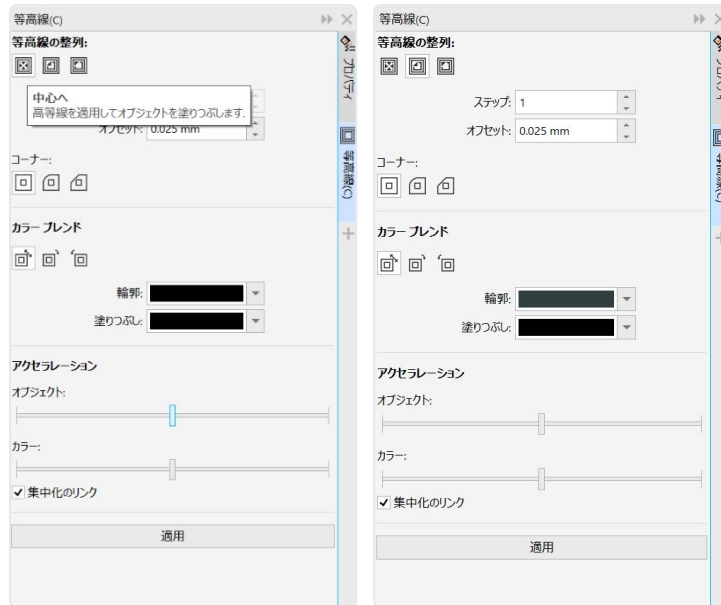
The "Contour" window is displayed.



Configure the "Contour" window as follows.

- Click "To center".
- Set the offset to "0.025".
- Click the "Contour color" button.

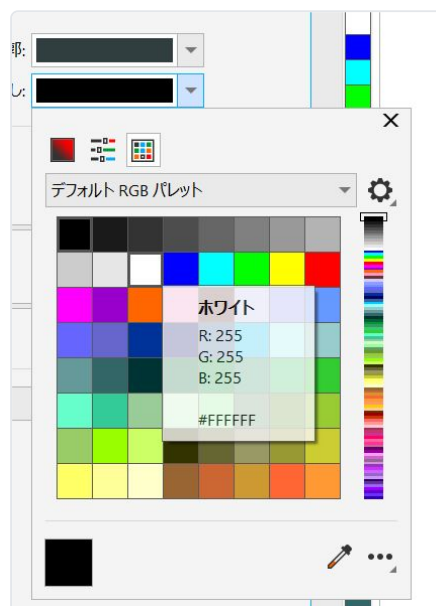
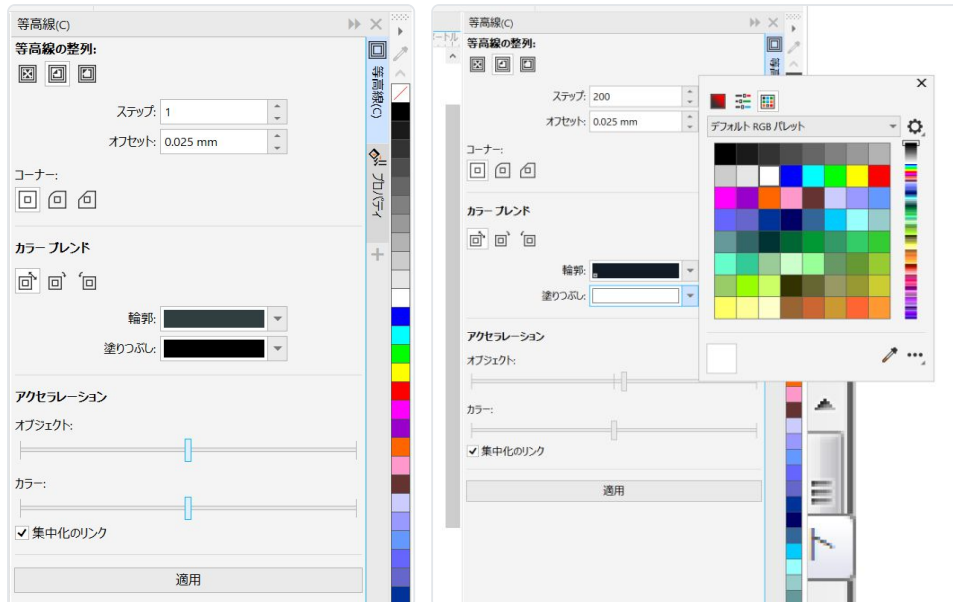
After configuring the settings, click the "Contour color" button.



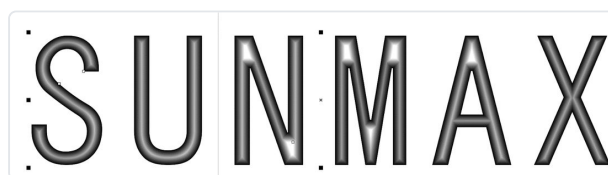
When the display changes, set the fill color to "White".

- Change the color to "White".
- Click it.
- Change the contour to "Inside contour" and adjust the number of steps so that it matches the figure below.

After changing the contour to "Inside contour" and adjusting the number of steps as shown in the figure below, click "Apply".

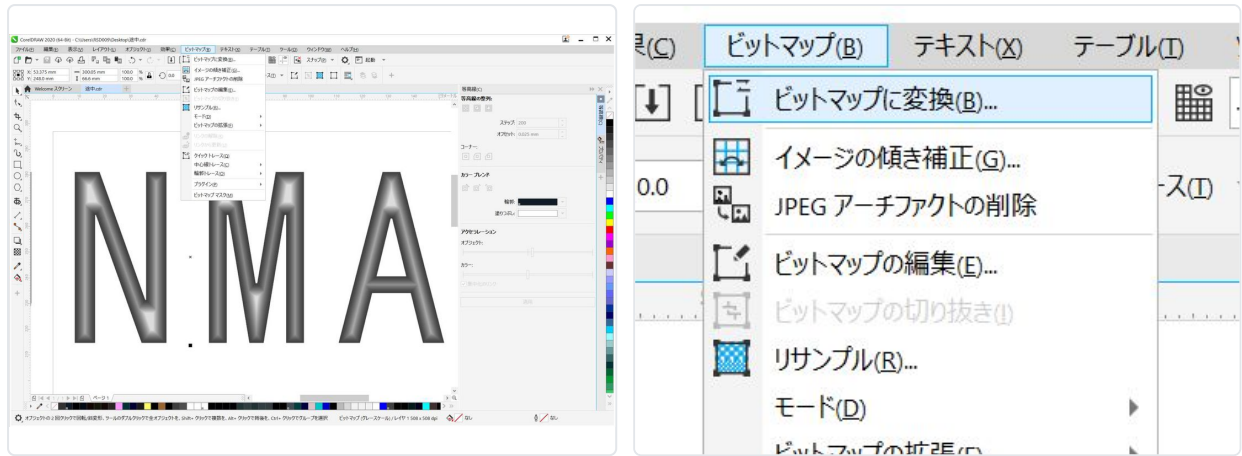


Each character now has a gradient that becomes whiter toward its inside.



7. Converting to Bitmap

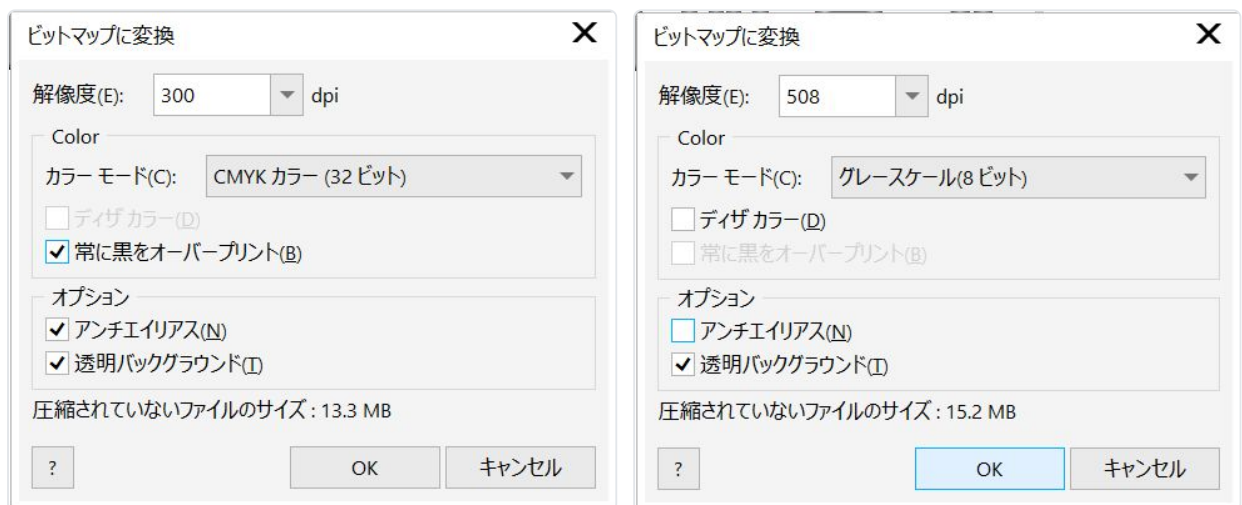
With the text string still selected, click "Bitmaps" > "Convert to Bitmap" on the menu to convert the object into a bitmap object.



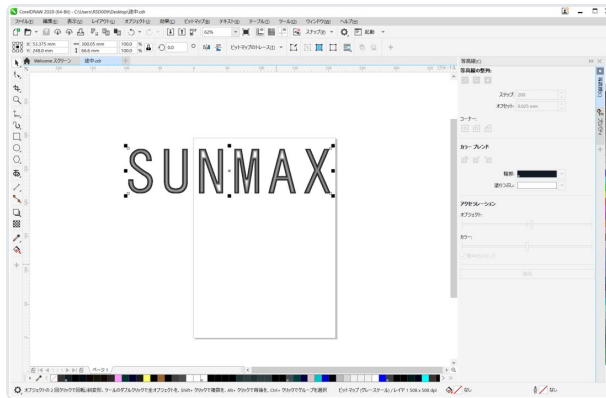
The "Convert To Bitmap" dialog appears. Configure it as follows.

Resolution	508 [dpi]
Color mode	Grayscale (8-bit)
Dithered	Unchecked
Anti-aliasing	Unchecked
Transparent background	Checked

After configuring the settings, click "OK".

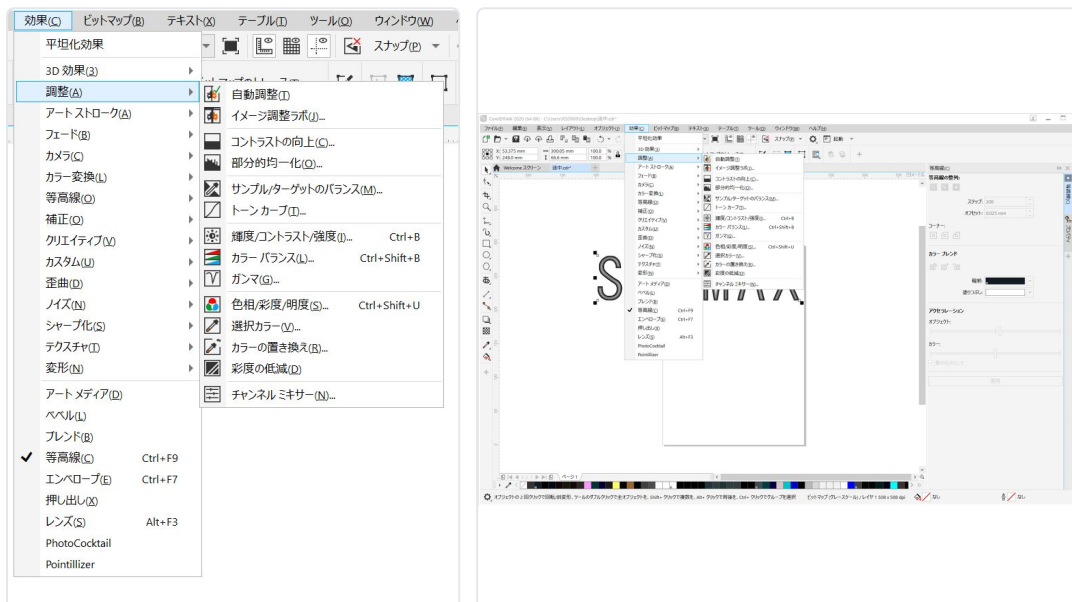


Note: The settings shown when the dialog first appears may differ from the figure at left depending on your environment.



8. Adjusting Image Quality

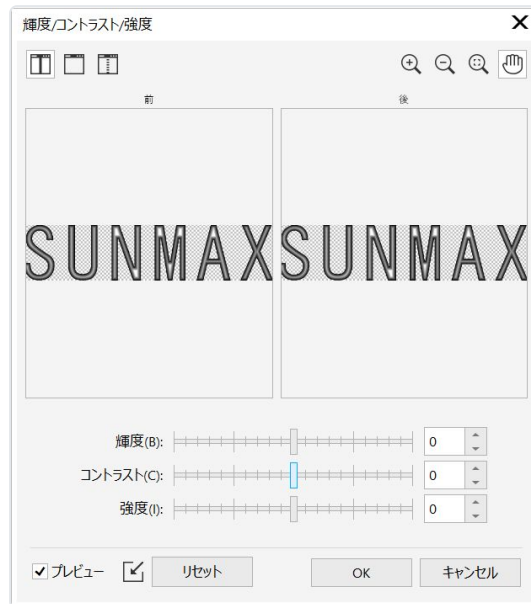
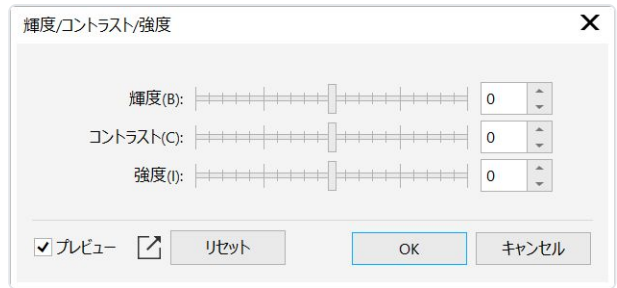
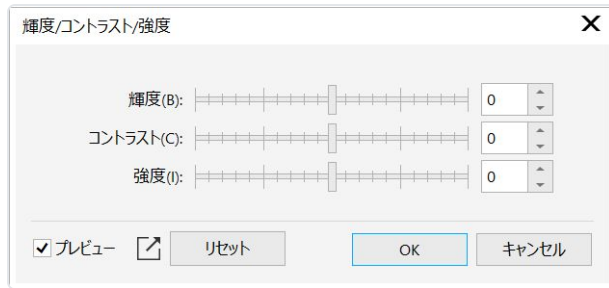
With the text string still selected, click "Effects" > "Adjust" > "Brightness/Contrast/Intensity" on the menu, or press Ctrl + B on the keyboard, to open the "Brightness/Contrast/Intensity" dialog.



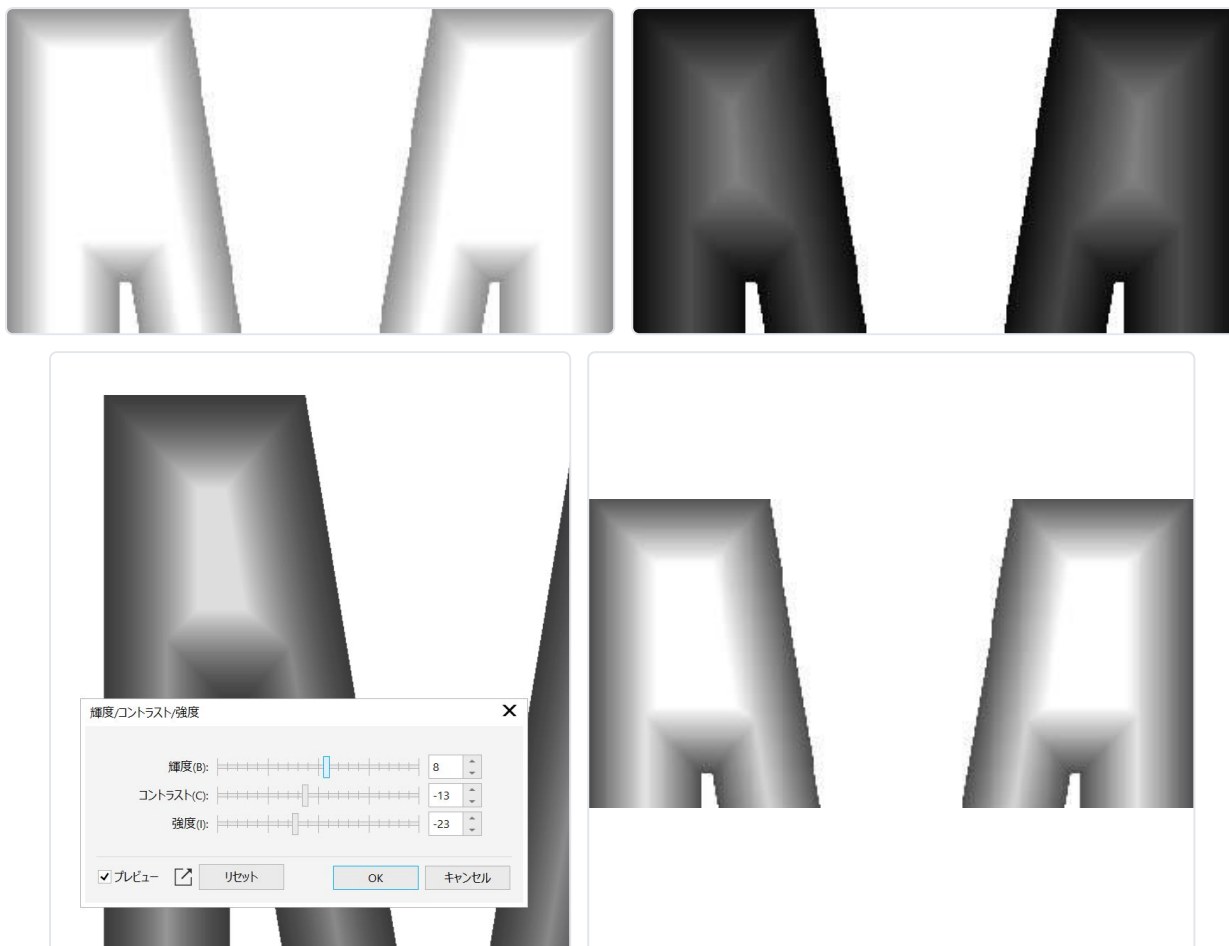
When the "Brightness/Contrast/Intensity" dialog appears, adjust the sliders. The optimal amount of adjustment varies depending on the laser machine's output power, the processing settings (speed and power), the material being processed, and so on.

As a rule, first brighten the image overall, then adjust the contrast so that the edges come out clearly.

When adjusting, it is easier to work while checking the changes by clicking the Preview button. Note, however, that depending on your PC's specifications, this can make processing quite slow.



Also, when the lines are thin it is hard to see the effect of the settings, so zoom in on the display so the lines appear thicker — the entire design does not need to be visible. Adjust so that the result looks roughly like the figure below: a white line remains at the center of each line, and the outline of each line is black.

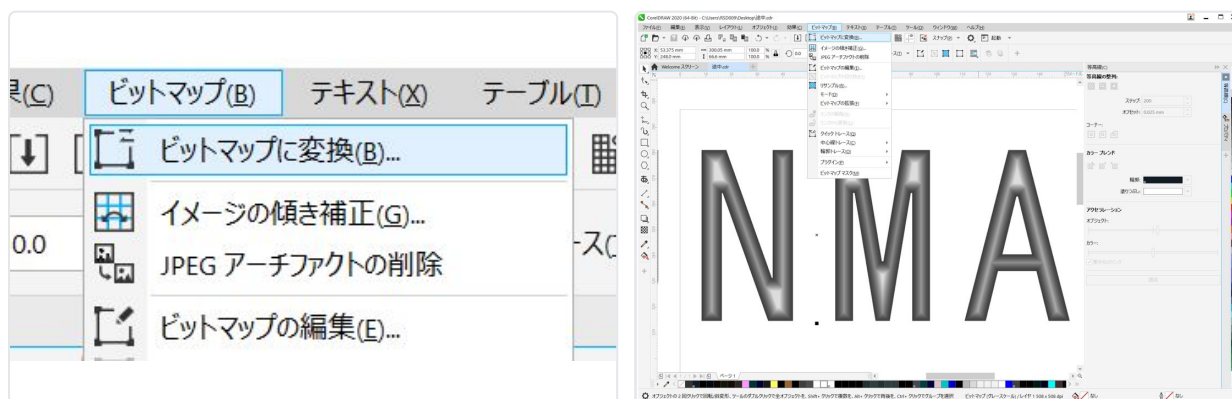


Adjustments like the following are not appropriate:

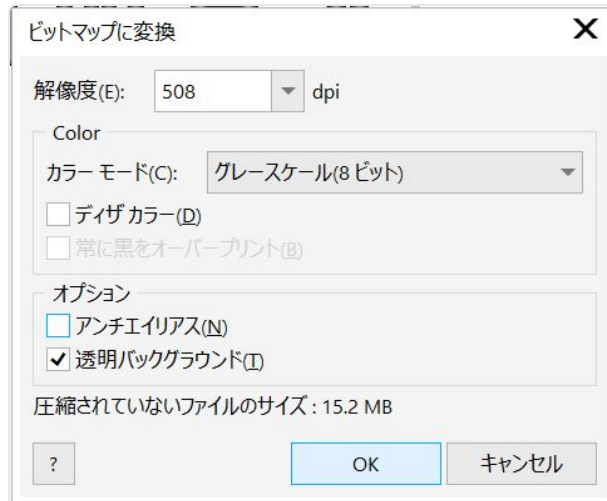
- Too light (too much white)
- Too dark (too much black)
- Large areas of pure white

9. Re-converting to Bitmap

Perform the same operation as in "7. Converting to Bitmap" to remove the background color.

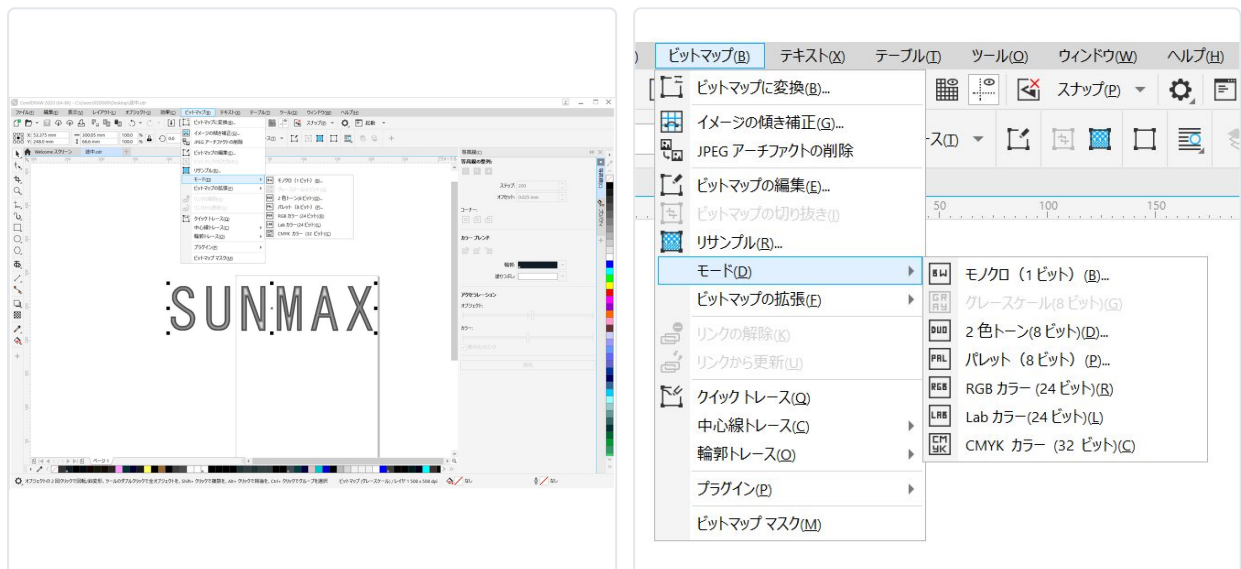


The settings in the "Convert To Bitmap" dialog are the same as in "7. Converting to Bitmap".



10. Converting to Monochrome

Click "Bitmaps" > "Mode" > "Black and White (1-bit)" on the menu.



The "Convert To 1 Bit" dialog appears.



Note: If the preview area is blank, there are no lines at the displayed location (the center of the image).
Drag the left pane with the mouse to change the displayed area so that lines become visible.

Set the conversion method to "Stucki" or "Floyd-Steinberg" (either one produces largely the same result).

Then adjust the "Intensity."

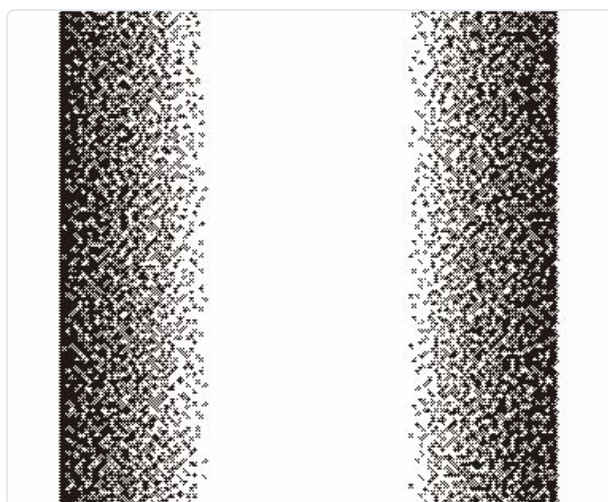
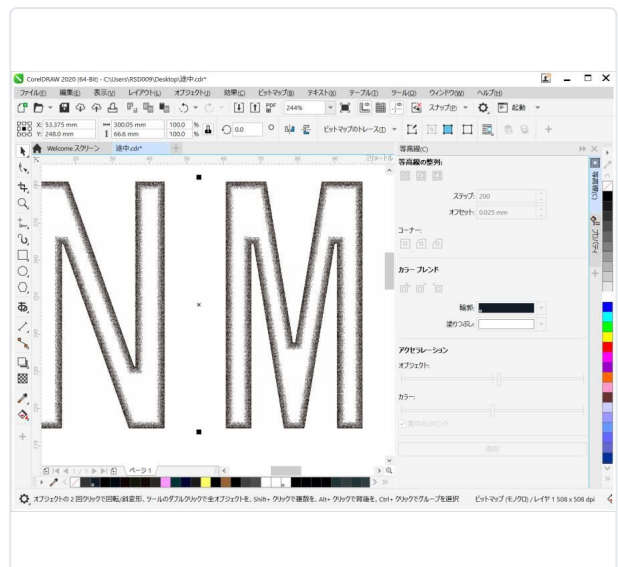
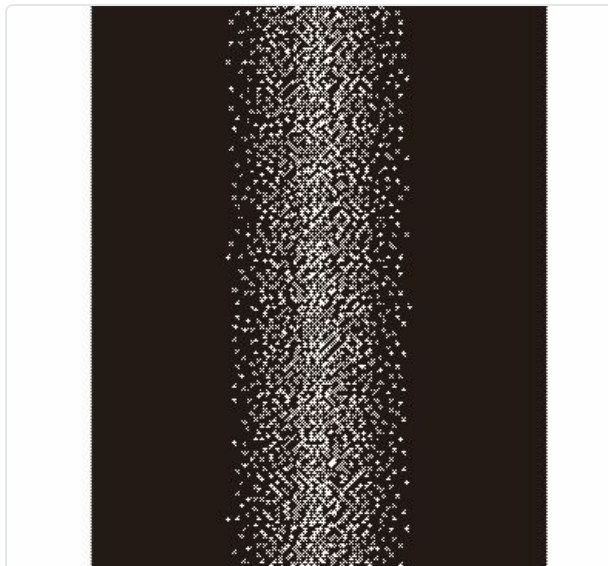
Adjust the "Intensity" so that the contrast between the white inside the lines and the black of the outlines becomes strong.



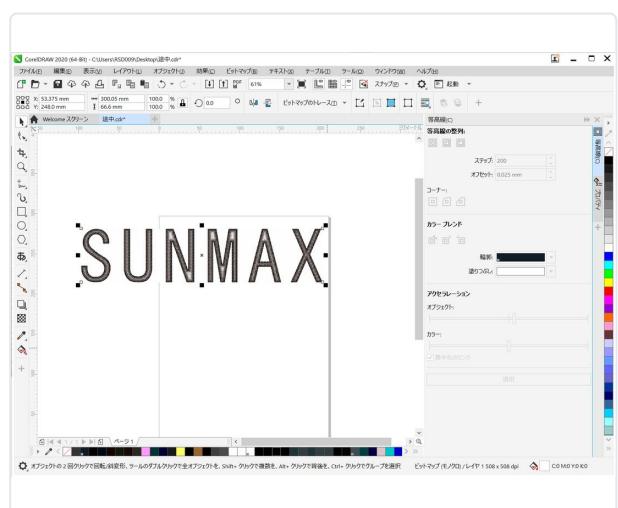
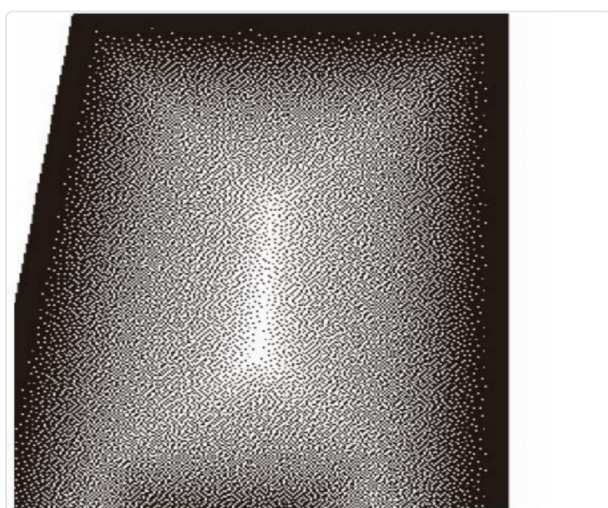
Problem Examples

If the white areas are too thick, the laser will not reach those spots, so they will remain flat.

Conversely, if the image is too black, the outlines become too thick and the result no longer looks like rounded (kamaboko) engraving.



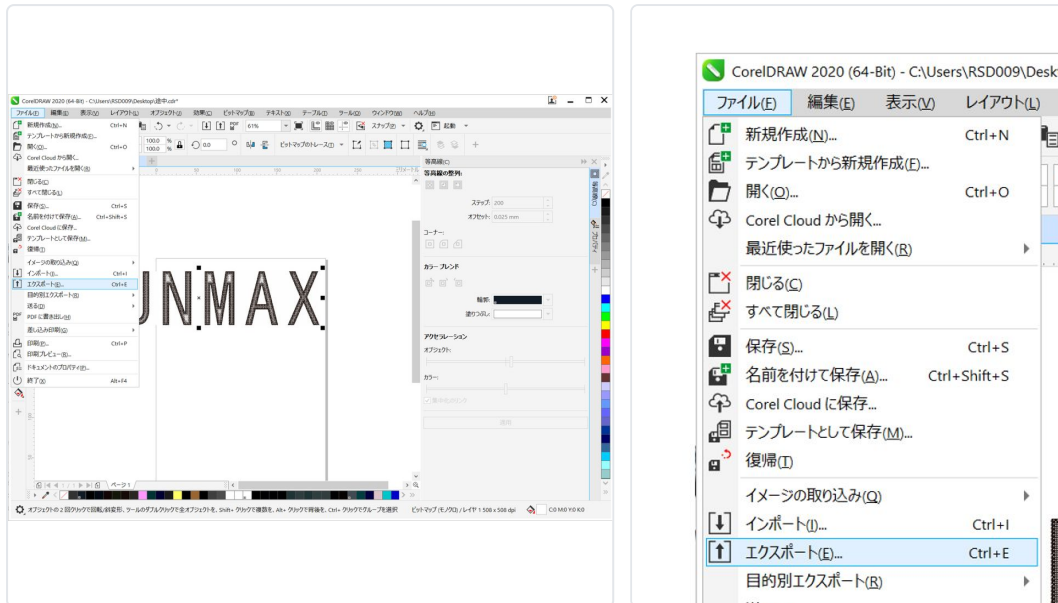
If you cannot achieve a good contrast between the outlines and the centers of the lines, go back to "8. Adjusting Image Quality" and try again.



11. Export

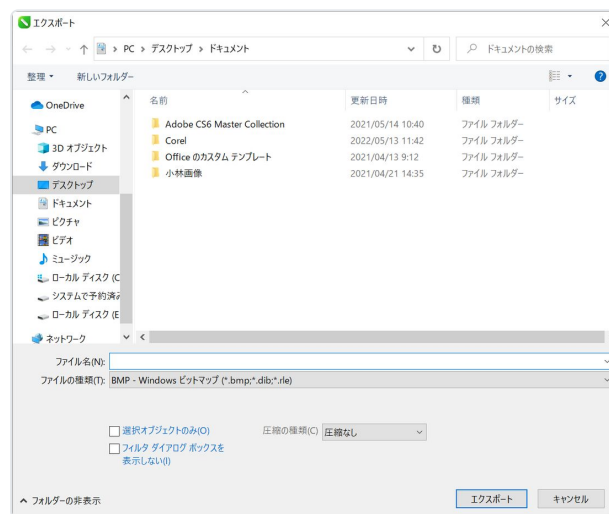
Save the data as a monochrome bitmap file that LaserWork can load.

Click "File" > "Export" in the menu, or press Ctrl + E on the keyboard.



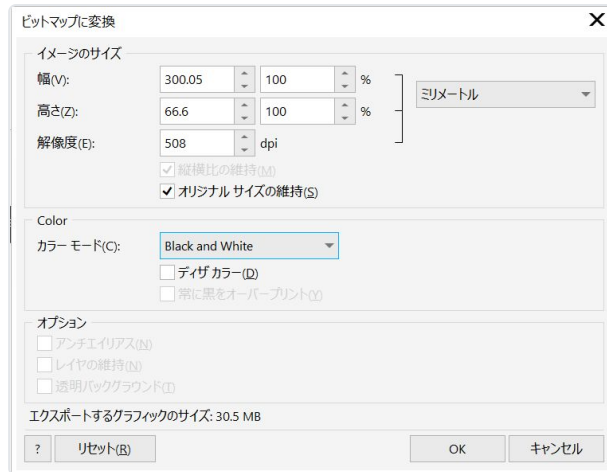
When the "Export" dialog appears, set the file name and other options.

For "Save as type," select "BMP - Windows Bitmap (*.bmp; *.dib; *.rle)."



- Enter the file name.
- Set the file type to BMP - Windows Bitmap (*.bmp; *.dib; *.rle).
- Set the folder where the file will be saved.
- Set compression to "None."

The "Convert to Bitmap" dialog appears; set "Color mode" to "Black and White." The image size was already set earlier in the procedure, so do not change it.

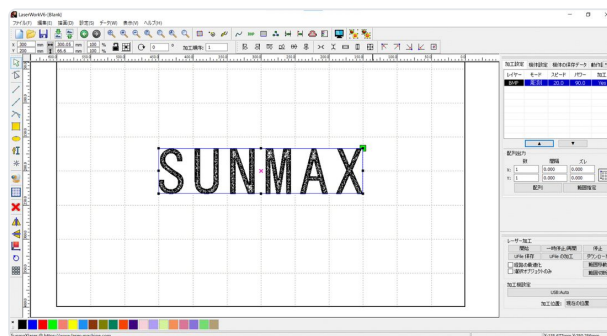


After setting the color mode to "Black and White," click OK.

Select "Black and White."

12. Import

Start LaserWork and "Import" the bitmap file you saved in "11. Export."



After importing, configure the processing settings as follows.

Processing mode	Engraving
Scan interval	0.05

Set the speed (mm/s), maximum power (%), and other parameters yourself according to the data content and the material being processed.

13. Processing



Procedure (CorelDRAW + Adobe Photoshop)

The preceding procedure explained how to create the data using CorelDRAW alone.

When you actually run the job, you will often find that the engraving does not come out as well as expected. In practice, you can still achieve a reasonable finish by adjusting the processing settings, reworking the data, and running trials.

However, if you create the data using Adobe Photoshop in combination with CorelDRAW rather than CorelDRAW alone, you can reduce the likelihood of a failed job.

This section explains how to create the data using CorelDRAW and Adobe Photoshop.

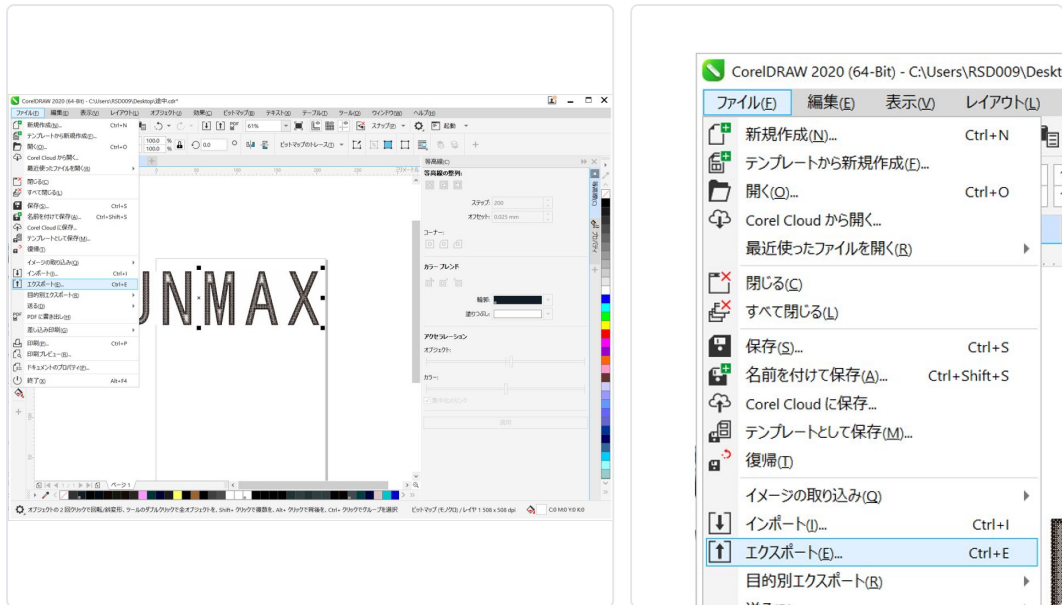
1. CorelDRAW

Perform steps 1 through 6 of the preceding "Procedure (CorelDRAW Only)."

2. Export

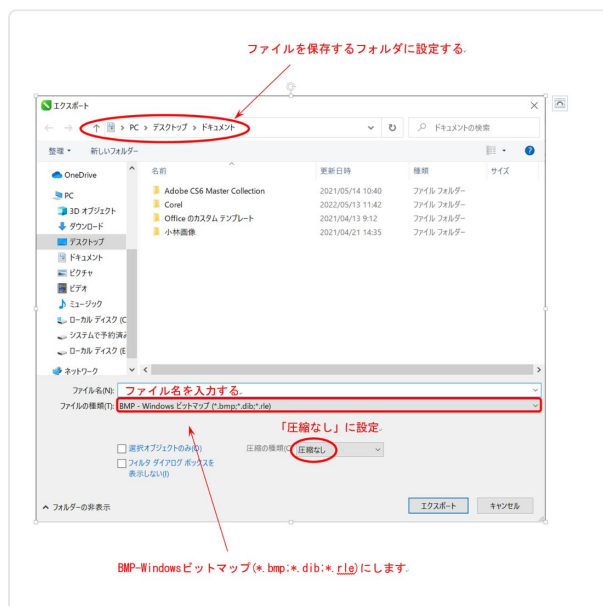
After completing "6. Contour," export the data to a file.

Click "File" > "Export" on the menu, or press Ctrl + E on the keyboard.



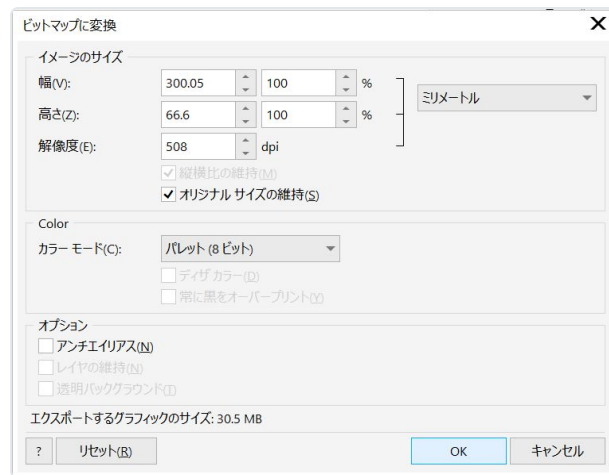
When the "Export" dialog appears, set the file name and other options.

For "Save as type," select "BMP - Windows Bitmap (*.bmp; *.dib; *.rle)."



When the "Convert to Bitmap" dialog appears, click OK.

Do not change any of the parameters.



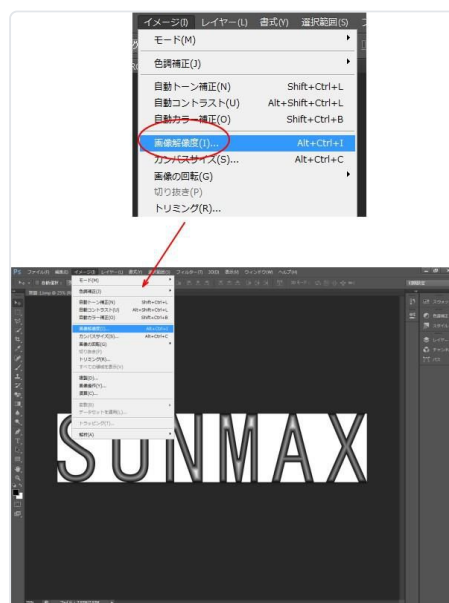
3. Open in Photoshop

Open the bitmap file saved in step 2 above in Photoshop.



4. Image Size

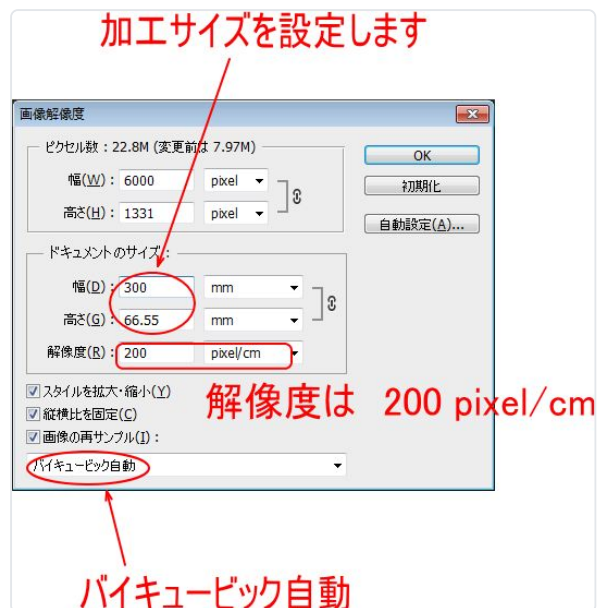
Click "Image" > "Image Size" on the menu, or press Alt + Ctrl + I on the keyboard.



When the "Image Size" dialog appears, enter the finished engraving size in "Width" and "Height."

Then set "Resolution" to 200 [pixel/cm].

Set the resampling algorithm to "Bicubic Automatic."



After entering the settings, click OK.

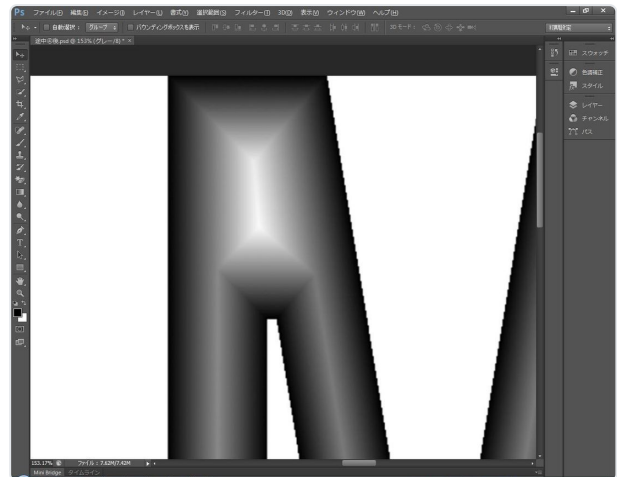


5. Brightness/Contrast

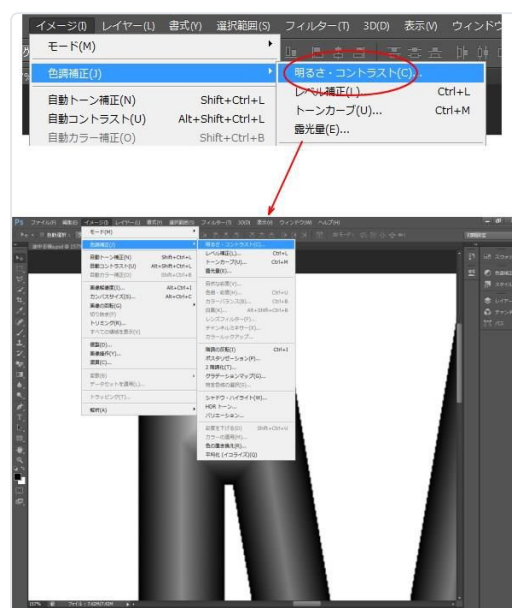
There is no need to inspect the entire image, so zoom in on the image to make the color of the lines easier to see.

Display the area of the image with the largest white region.

If possible, choose a view where you can also check thin lines at the same time.



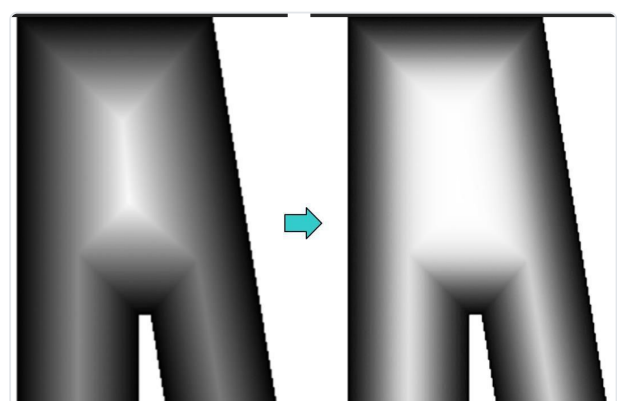
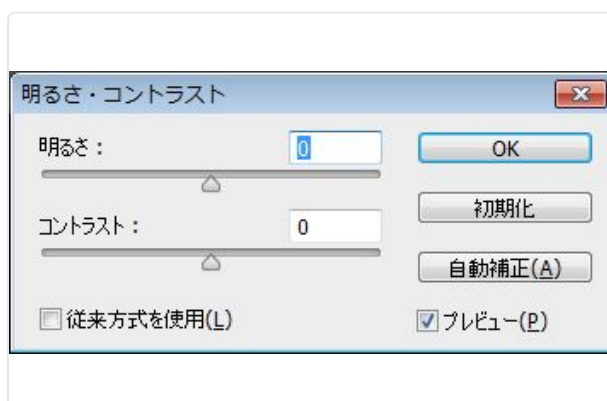
Click "Image" > "Adjustments" > "Brightness/Contrast" on the menu.

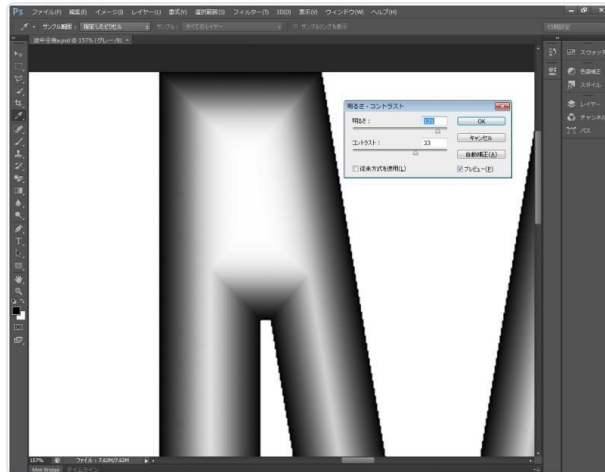


The "Brightness/Contrast" dialog appears. Adjust "Brightness" and "Contrast".

Modify the rounded (kamaboko) engraving data so that it looks like the figure below.

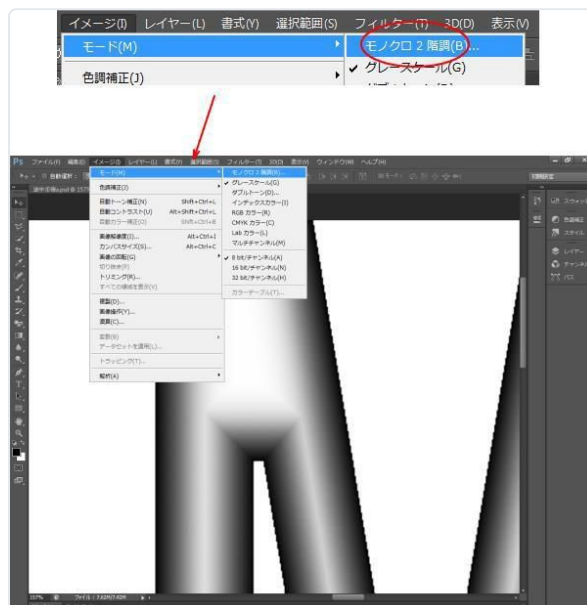
The darker the area, the deeper the engraving; the lighter the area, the shallower. Unlike CorelDRAW, in Photoshop you do not need to worry much about the balance — it is acceptable even if some of the white areas are slightly blown out.





6. Bitmap Mode (2-Level Monochrome)

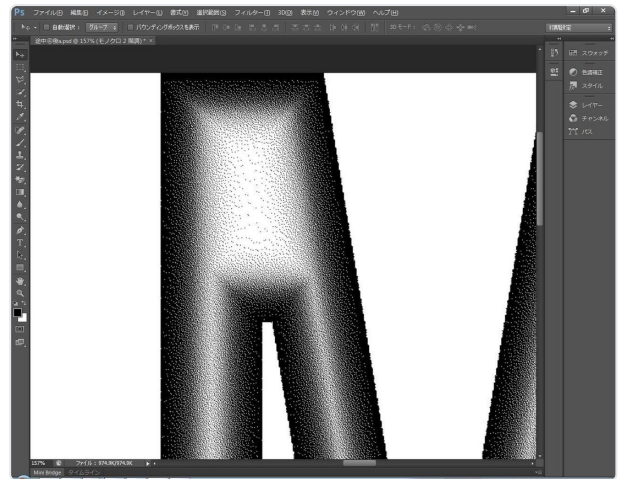
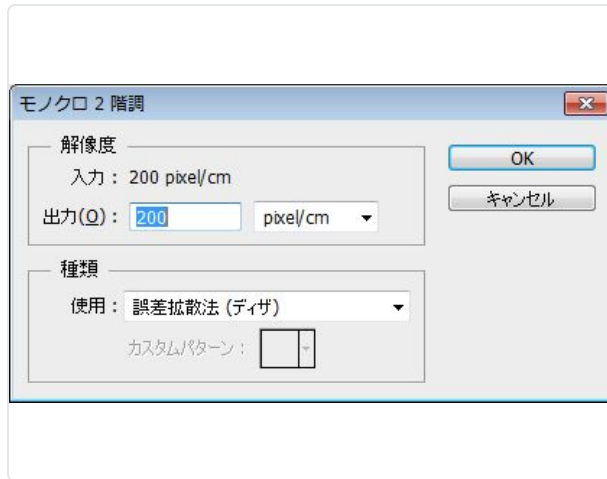
Click "Image" > "Mode" > "Bitmap" on the menu.



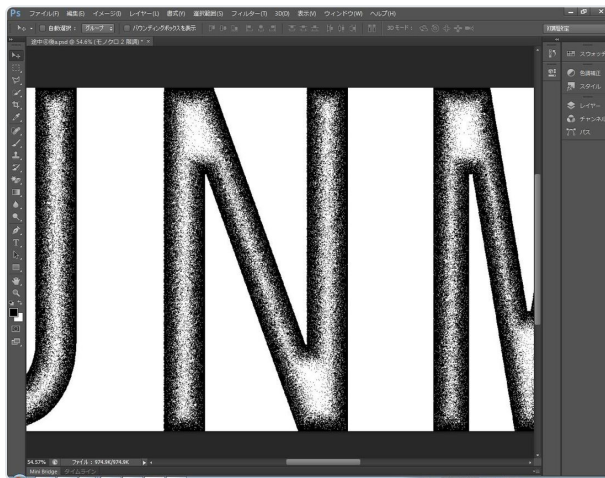
The "Bitmap" dialog appears.

Confirm that "Output" is set to 200 [pixel/cm].

For "Method", set "Use" to "Diffusion Dither".

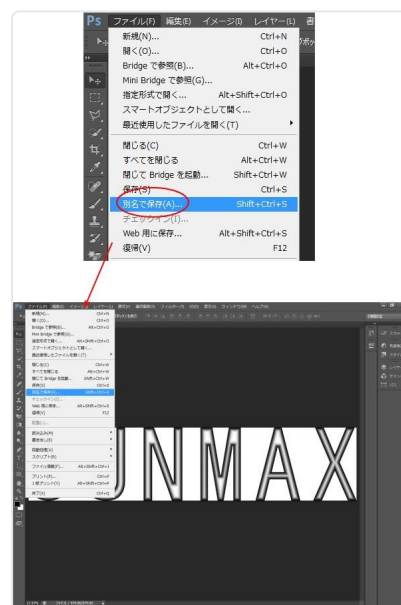


After configuring the settings, click OK.



7. Save As

Click "File" > "Save As" on the menu, or press Shift + Ctrl + S on the keyboard.



When the "Save As" dialog appears, set the folder and the file name.

The file format is "BMP (*.BMP; *.RLE; *.DIB)".



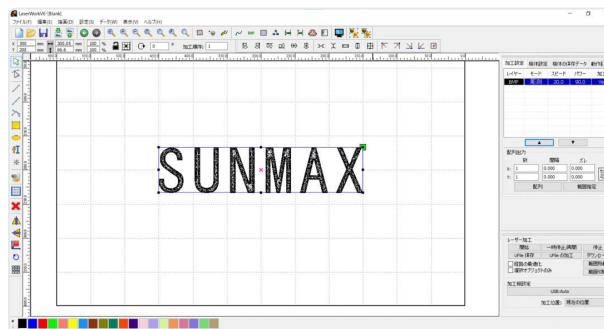
After configuring the settings, click "Save".

When you click "Save", the "BMP Options" dialog appears; click OK.



8. Import

Start LaserWork and "Import" the bitmap file you saved in "7. Save As."



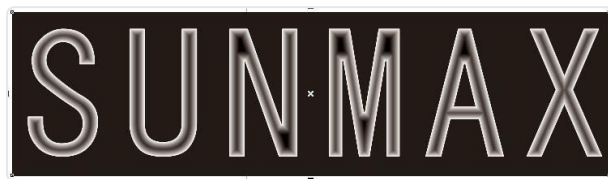
After importing, configure the processing settings as follows.

Processing mode	Engraving
Scan interval	0.05

Set the speed (mm/s), maximum power (%), and other parameters yourself according to the data content and the material being processed.

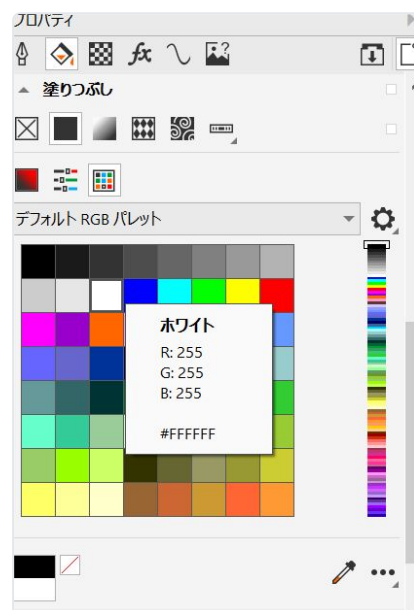
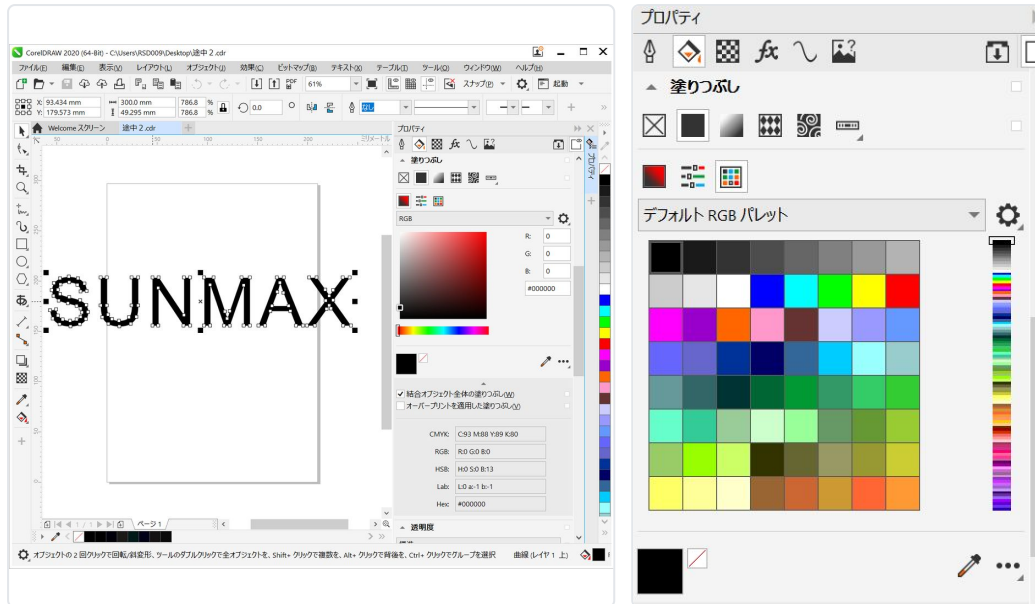
About Inverted (Reverse Kamaboko) Engraving

Inverted kamaboko engraving reverses the black and white of the gradient in the data.



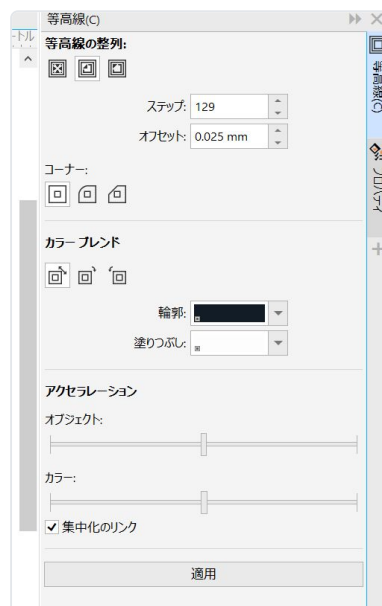
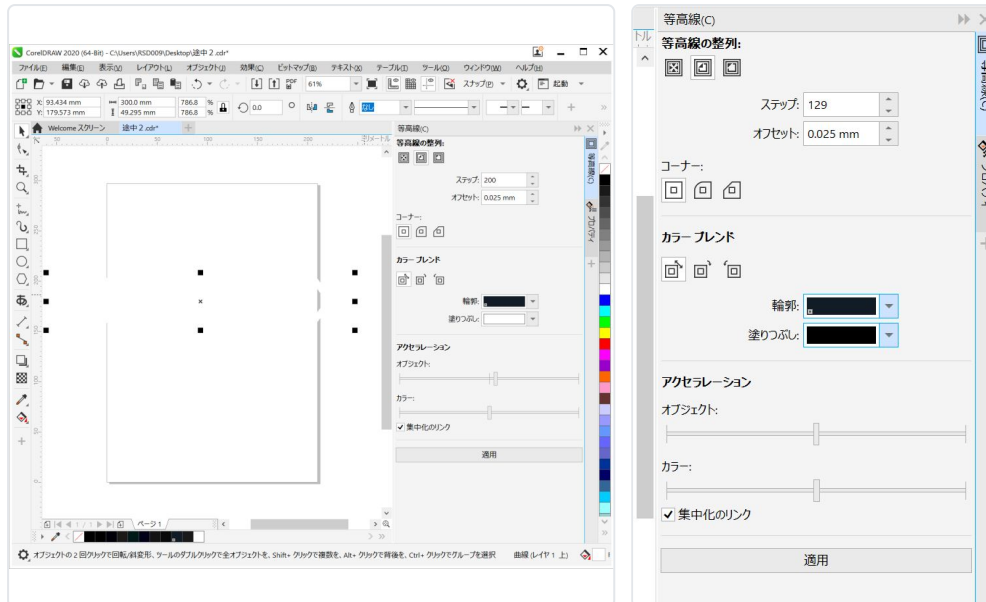
To do this, change the colors when performing "6. Contour."

First, in the object properties, change the fill color from black to white.



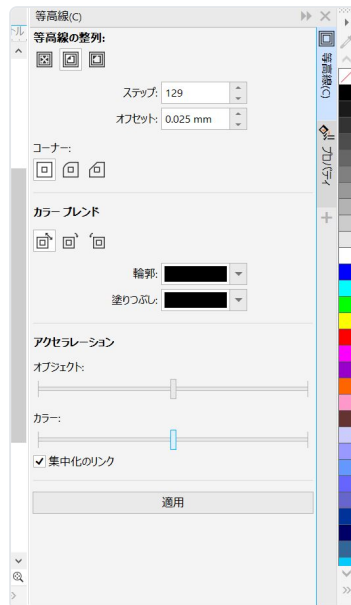
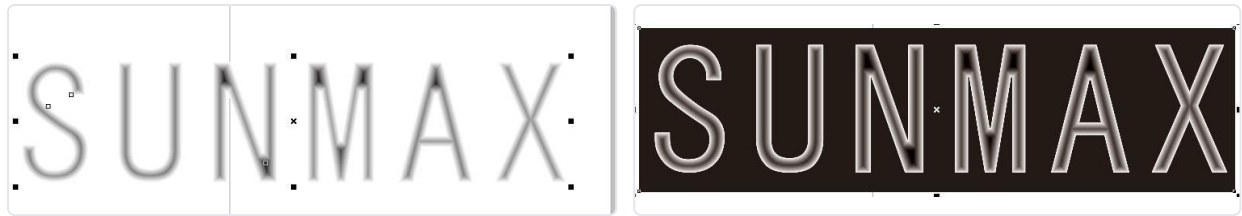
Change from black to white

Next, change the contour fill color from white to black.



Change from white to black

Change the contour to "Inside contour" and set the number of steps so that it looks like the figure below. When you click "Apply", the gradient is inverted.



Change to "Inside contour" and adjust the number of steps as shown in the figure below.

From this state, continue creating the data by proceeding to "7. Converting to Bitmap" (or "2. Export" if you are using CorelDRAW + Adobe Photoshop); the result will be an inverted kamaboko engraving.

If you want the inverted kamaboko engraving to stand out in relief, place a black-filled object behind it.