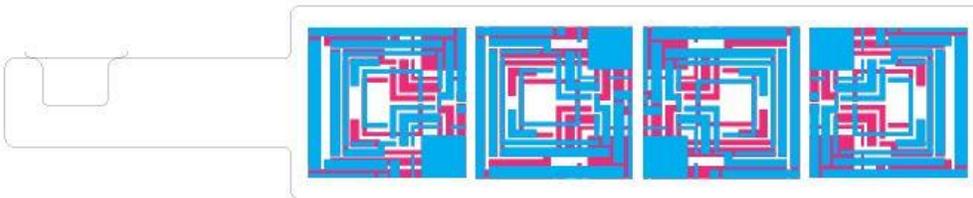


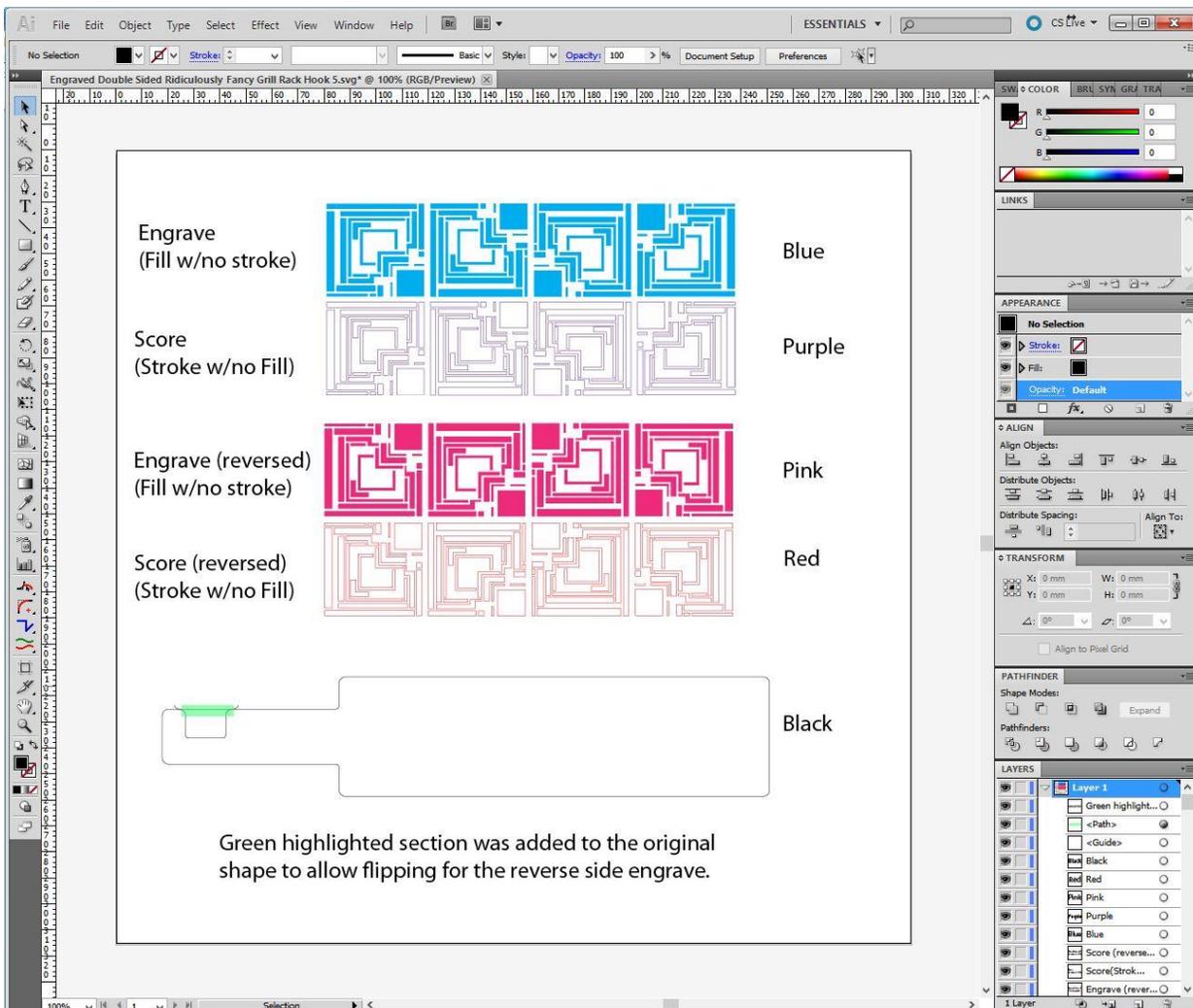
Double Sided Engraving Procedure

Double sided engraving needs to be planned from the beginning of your design. There are a few simple rules you will want to follow when you prepare the file, but they make it easy to manipulate the results in the Glowforge interface.

1. As always, for engraving a filled area, create your fills as Compound Paths, or by subtracting one shape from another. (Do not use a white shape on top of a colored shape to create the appearance of a window or hole inside of a shape. The Glowforge interface will see it as solid fill. You want to create empty (null) fill areas where you do **not** want engraving to happen.)
2. Fills for engraving need to be **just** Fill, with no Stroke color assigned to it.
3. If you want to Score around an engraved fill area, duplicate the shape and put the Score lines on a separate layer, aligned over the original.
4. Score and Cut Lines should have no Fill.
5. Use a different color for each set of Score Lines, the Cut Line, and each of the engraved Fills.



Using the rules above, I designed a rack hook file that looks really complex, but breaks down very simply. I'll post the steps taken to create it, engrave it and cut it in the Glowforge. In your design software:



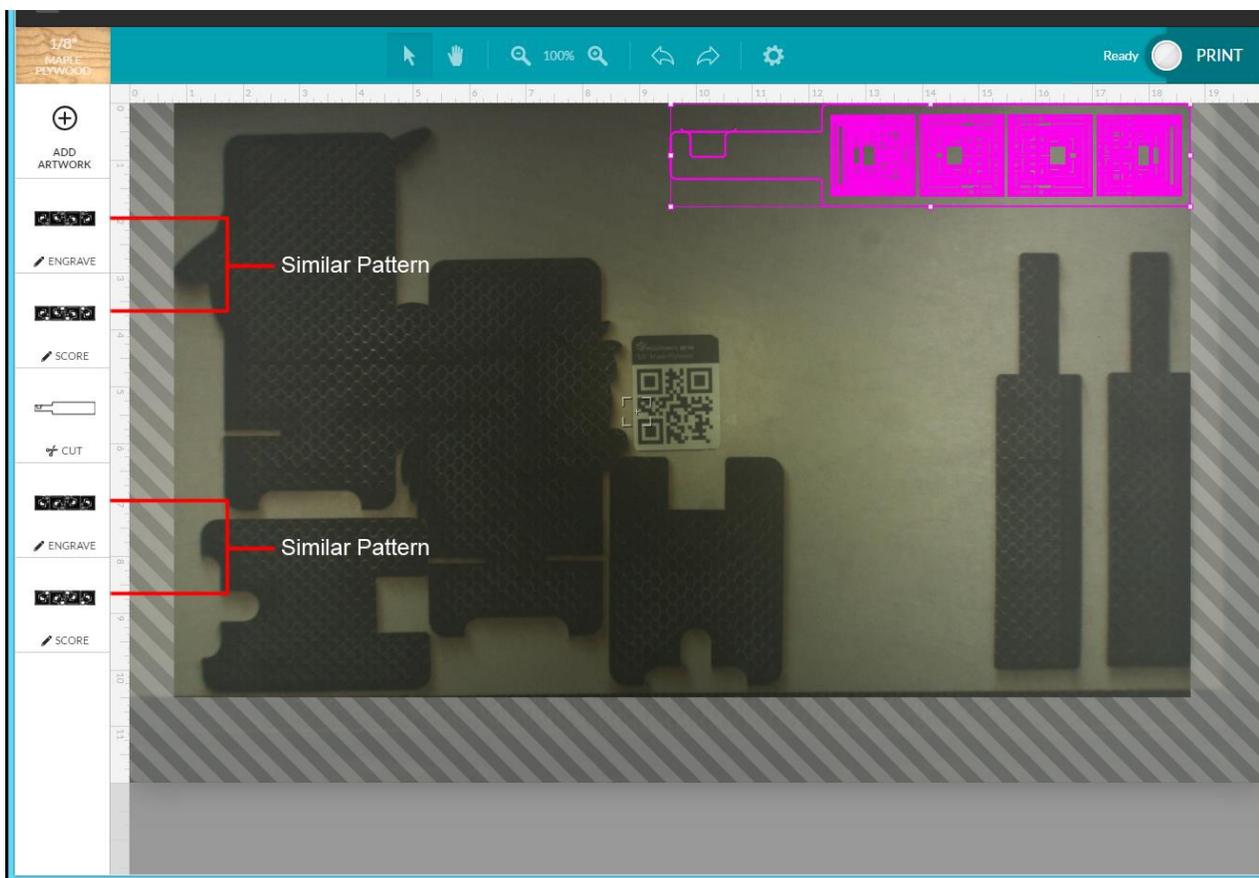
The file is basically four groups and a cutline. The deconstructed image above shows how the engraving and scoring will be achieved through the setup of the fills and strokes.

One thing to watch for...the original shape would not have allowed me to flip the rack hook over for the second engrave if I had not cut off the section around the notch. So a second line where the green highlight is shown was added.

(Tip: Because a laser will remove additional material if it passes over a place where it formerly passed, instead of making it start at that spot where the short line starts, I simply closed the original shape and made the notch, with the two little tails, be the second cut. It worked very well, there was no deformation at the start of the notch.)

All you have to do is align the four groups over the top of each other, align those over the base cut shape, and then save the file as an SVG.

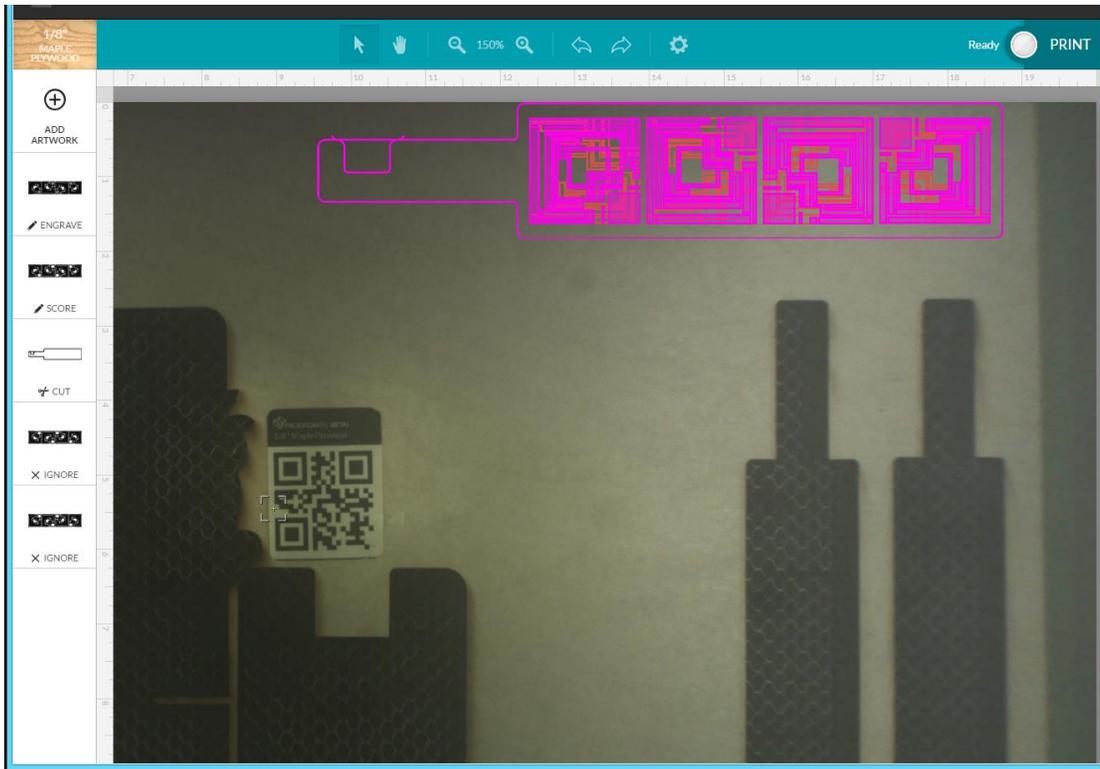
In the Glowforge Interface:



1. Upload the SVG file to the interface. It will interpret any unfilled Strokes as Cut lines, and any un-stroked Fills as areas to be Engraved.
2. There will be two Cut options that look just like the two Engrave options. **Change the Cut options to Score immediately for these.**
3. Looking closely at the thumbnails, and hovering over the thumbnail to highlight the parts, you will see that the patterns are similar for one **Score** and one **Engrave**.
Order these with the **Engrave first**, and the **Score second**.
4. Do the same for the other similar patterns, with the **Engrave first** and the **Score second**.

It is necessary to maintain a consistent order for these, because in the next step, you are going to turn them off and **you need to know which is which**. The thumbnails are identical. But the treatment of them won't be, if you accidentally assign the wrong operation to the thumbnail.

5. Order the actual **Cut** between the two sets of **Engrave/Scores**.
6. Set the shade you want for the Engravings.
7. Set the bottom Engrave and bottom Score to **Ignore**.
8. Send the file to be cut and engraved on the first side. **(Print)**.



9. When the print is finished, open the lid, remove the notch cutout (a pick works well for that), and flip the hook over. Do not move the base material.
(Tip: Tape the base material down at the edges before you start for double sided engravings.)
10. Set the top three operations to **Ignore** in the thumbnails.
11. Set the thumbnail directly under the Cut operation back to **Engrave**.
12. Set the bottom thumbnail to **Score**.
13. Send the file to be engraved and scored on the back side. **(Print)**



That's all there is to it. We just engrave and score one side, cut it out, flip it over and engrave and score the other side.