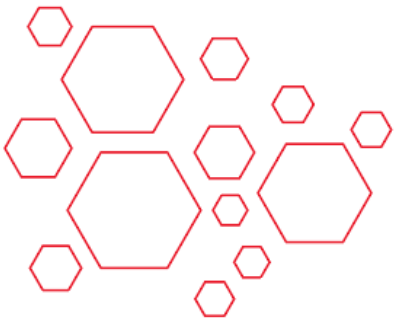
Preparing repeat patterns for Laser Cutting in Illustrator

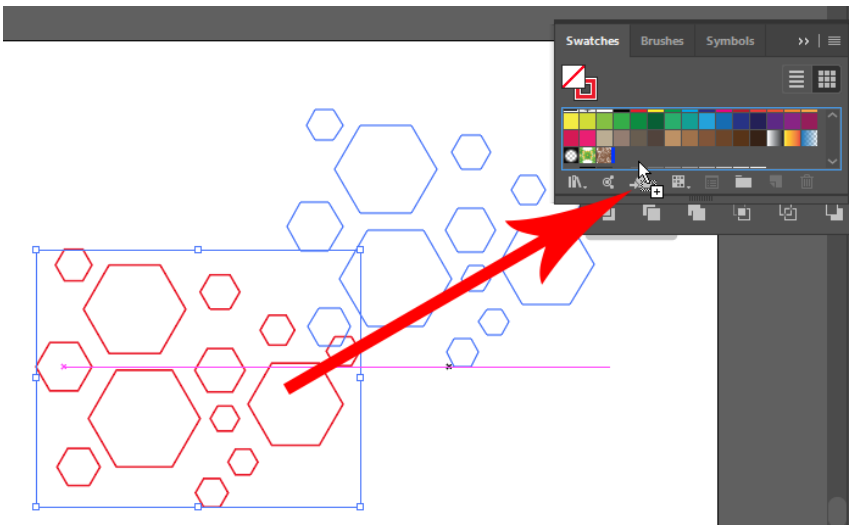
The pattern swatch tools built into illustrator are great for creating repeat patterns quickly, but care needs to be taken if using them for laser cutting, as the tool creates lots of invisible paths that will divide up your design when cut on a laser cutter.

The following steps will allow you to use the repeat pattern tools in Illustrator, if followed precisely.

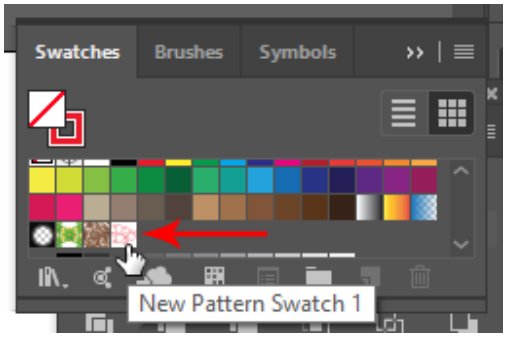
Create your motif. This can be a series of shapes, or a design you've traced. Make sure the shapes are grouped (**CTRL+G or Object -> Group**) and make sure your shapes have a stroke, and no fill. (If this makes no sense, ask a technician!)



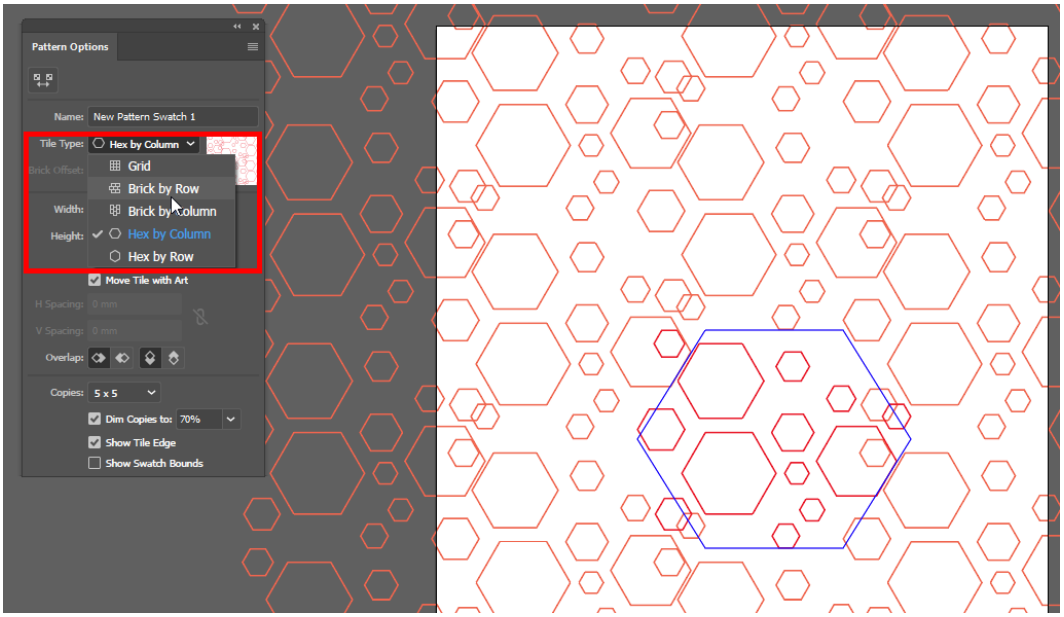
Drag your grouped design to the **Swatches Panel**. It will appear as a square swatch at the end of the row you drag it to.



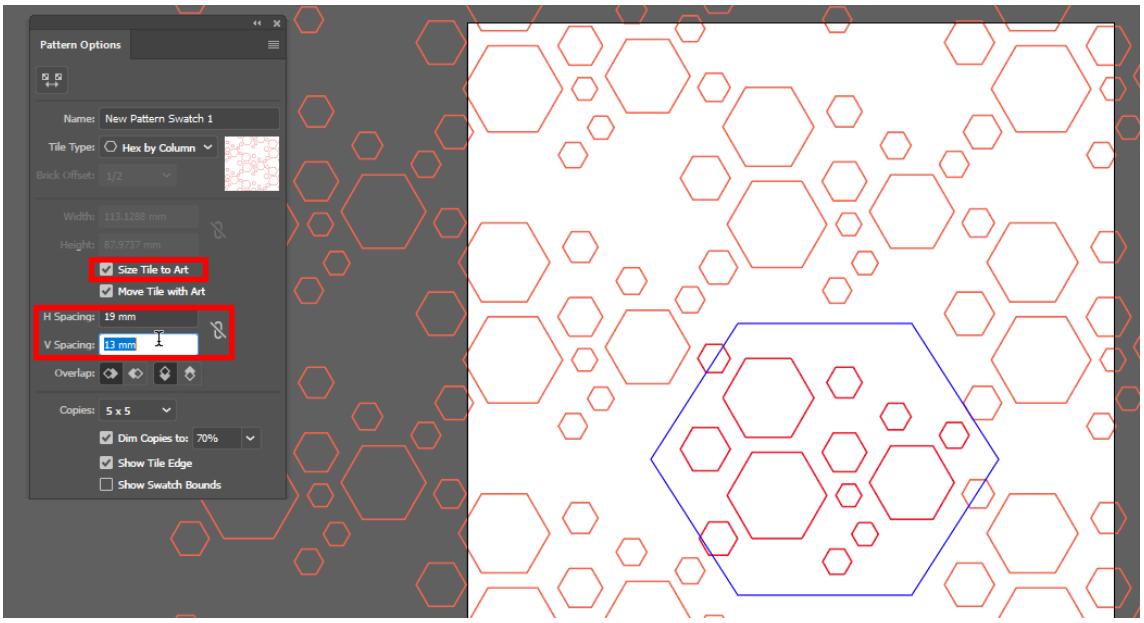
Double-click the new pattern swatch, this will take you to the repeat pattern options.



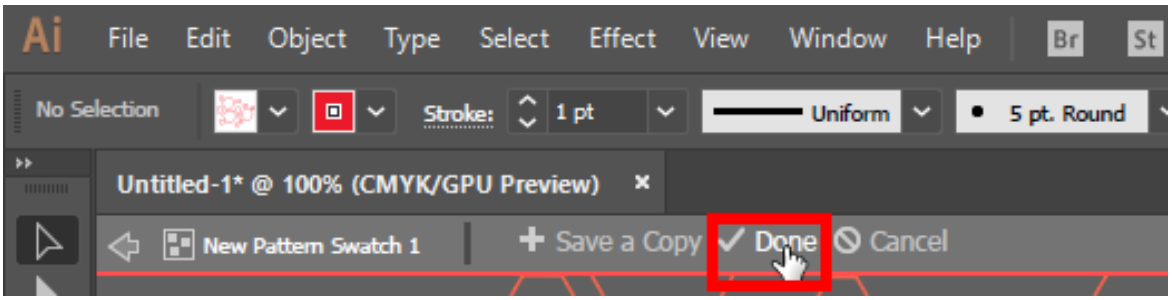
Choose the repeat options that suit your design. You can choose from any of the repeats in the drop down menu. If your pattern overlaps, you will need to adjust the spacing so that your shapes don't overlap.



As my design overlaps, I need to adjust the spacing… Click the 'Size Tile To Art' checkbox and adjust the values in the H spacing and V spacing boxes.

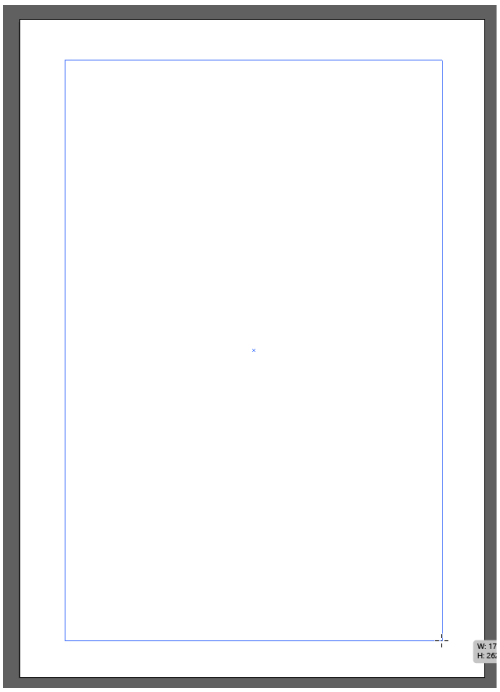


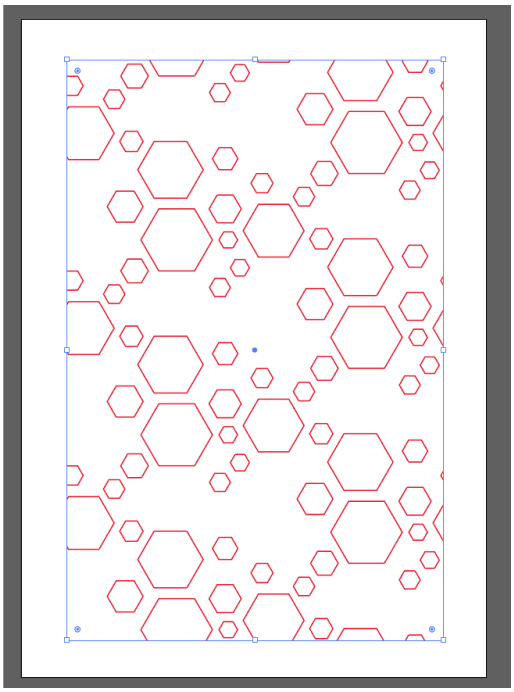
Once you have decided on your pattern spacing, you can click '**Done**' at the top of the window.



This will set your pattern fill options. To use your pattern fill, select your new swatch as the fill for a shape, and make sure the shape has **no stroke**. This is very important**. If the shape you fill with your pattern has a stroke, it will not work.** Your fill and stroke options should look something like the images below.

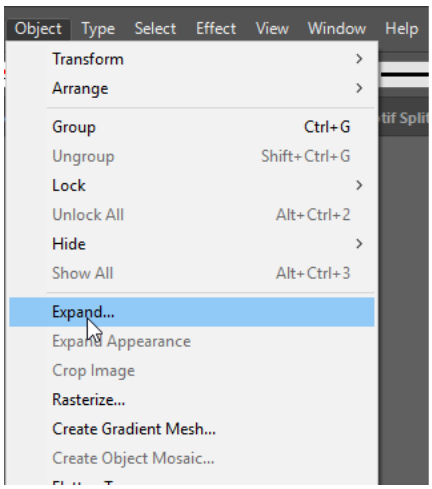
Now you can draw a shape you wish to fill with your pattern. Any shape will work, so long as it fits on the artboard (if not, make your artboard larger, or your shape smaller!).

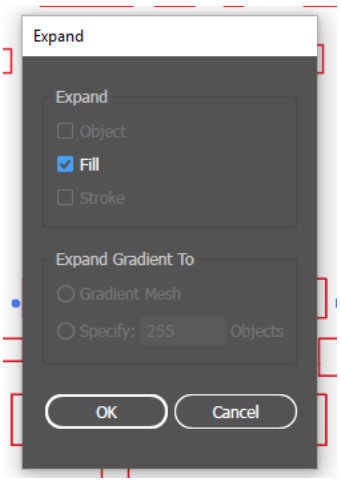




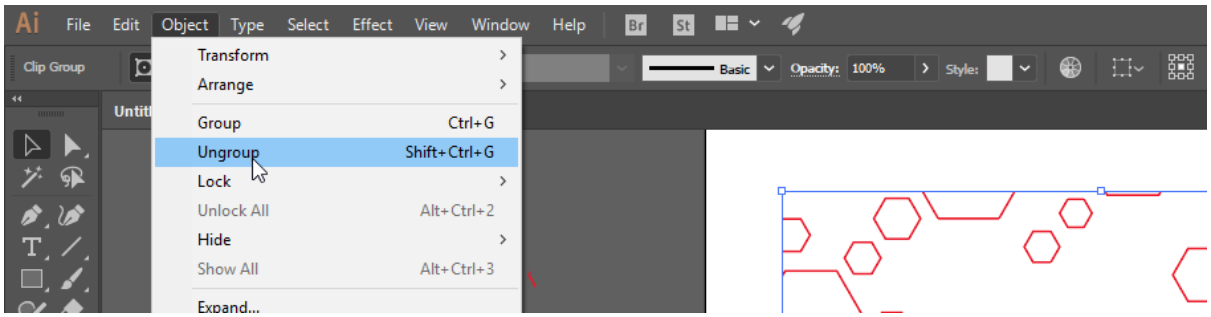
Now we can prepare the pattern for laser cutting. **The following steps must be followed exactly**.

Make sure your filled shape is selected and go to **Object -> Expand**. You will be greeted with an options widow, make sure **Fill is ticked** and everything else is greyed out. Click **OK.**

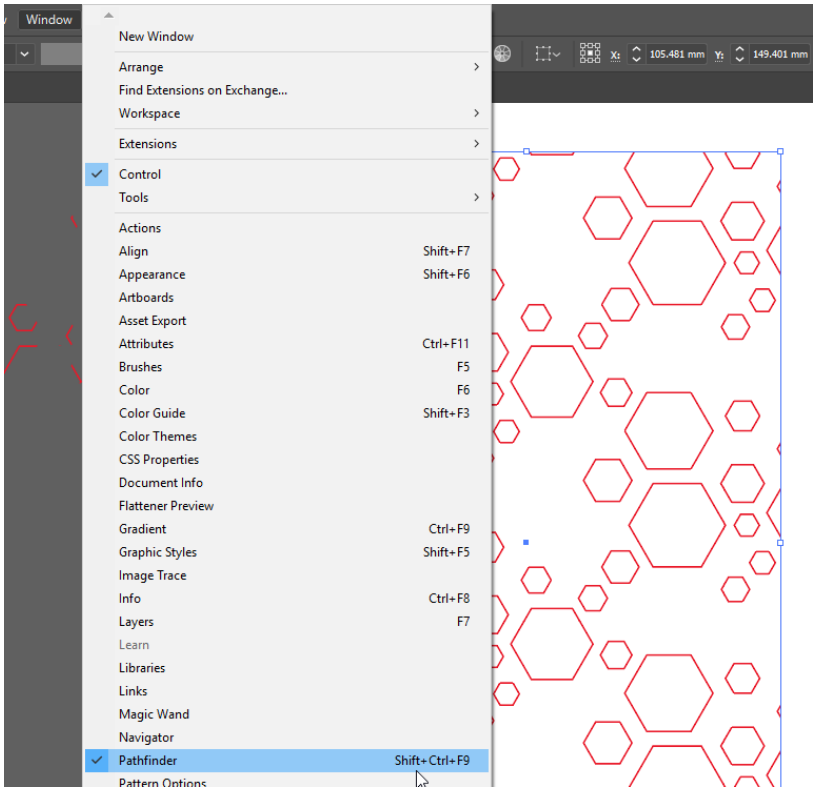




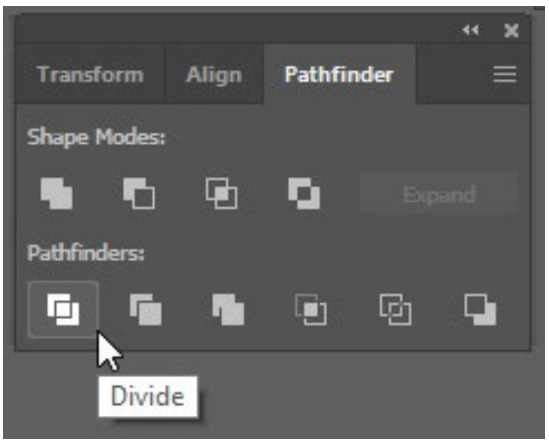
Now go immediately to **Object -> Ungroup** without clicking anywhere else in between.



Go straight to the **Window** menu and select **Pathfinder**

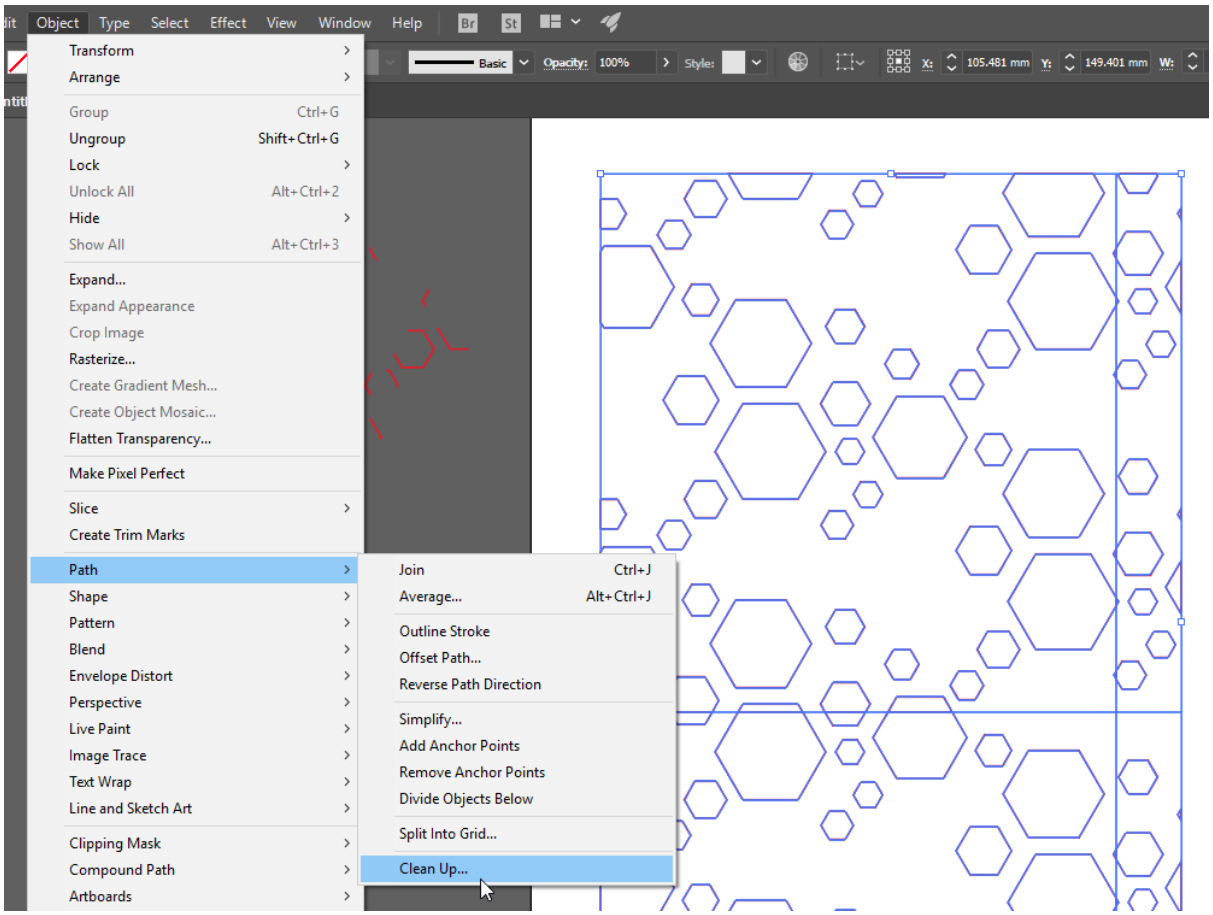


In the Pathfinder palette, click the **Divide** button, as shown here:

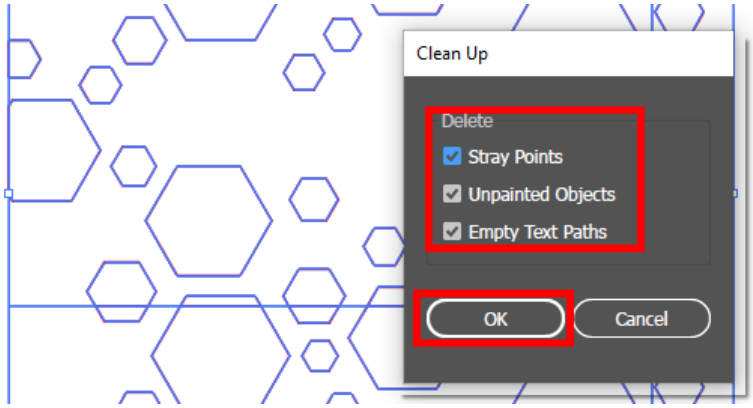


Doing this will reveal all the hidden paths that will ruin your design and they will need cleaning up.

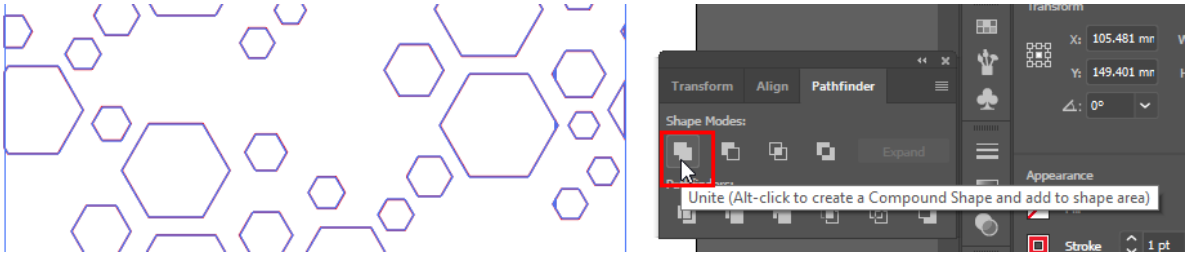
With everything still selected, go to **Object -> Path -> Clean Up…**



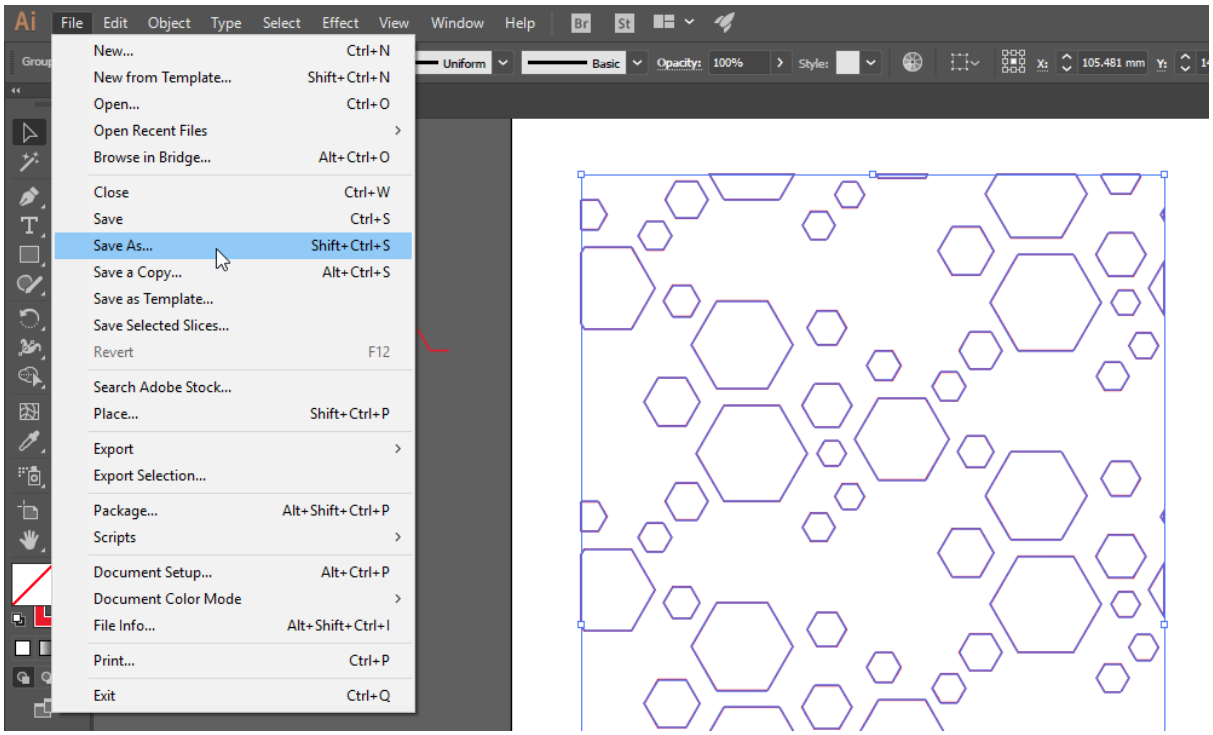
Ensure all of the tick boxes are selected in the options that pop up and click **OK.**



This will remove most of the unwanted paths created by the repeat Pattern tool, but some of your shapes my still be split. To recombine them, make sure everything is still selected and click the **Unite** button in the **pathfinder** palette. This will re-join your shapes that have been split.



Your pattern is now ready to be saved for laser cutting as an **Illustrator File**.



When saving for laser cutting, ensure you select **Illustrator CS2** from the version drop-down menu and untick **Use Compression** and **Embed ICC Profiles**.

This file can then be taken to either of the laser resources in Bonington, or Waverley, or loaded onto the Ethos Template for the BON205 Laser cutter.