# The Designer's Guide to Contour Cutting

Contour cutting uses a computer-guided cutting process to cut around the outer edge of a printed image following the contour of the design. Contour cutting can be used for custom cut shapes of vinyl stickers, floor & wall decals, foam board & pvc signs, and much more. An outline for the contour cut must be a part of the design. The outline must adhere to specific settings for the computer-guided cutter to perform the cut.

The contour cut file must be created in vector based software, and saved as a PDF. Adobe Illustrator will be used in the examples.

The contour cut will be defined by an outline with a stroke of 0.01 pt, and assigned a spot color named **CutContour**. It must be on its own layer named **CutContour**, and be the top layer.
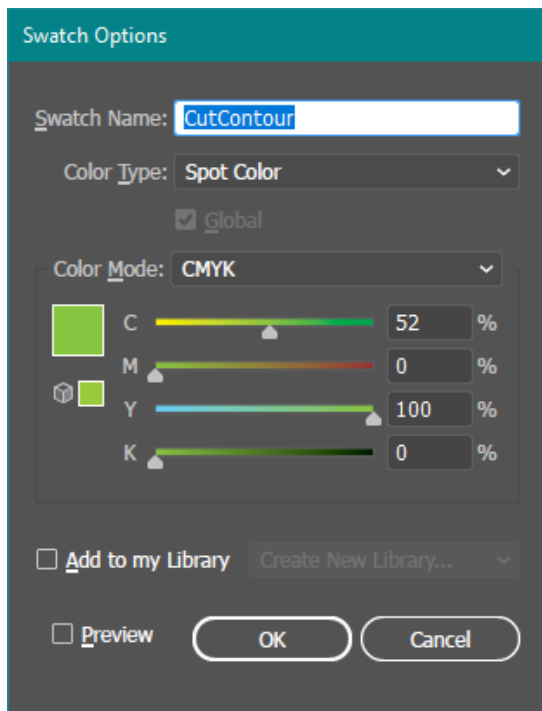
Custom Swatch named: **CutContour**
The **CutContour** swatch can be any color, but it MUST be of a Spot Color type.
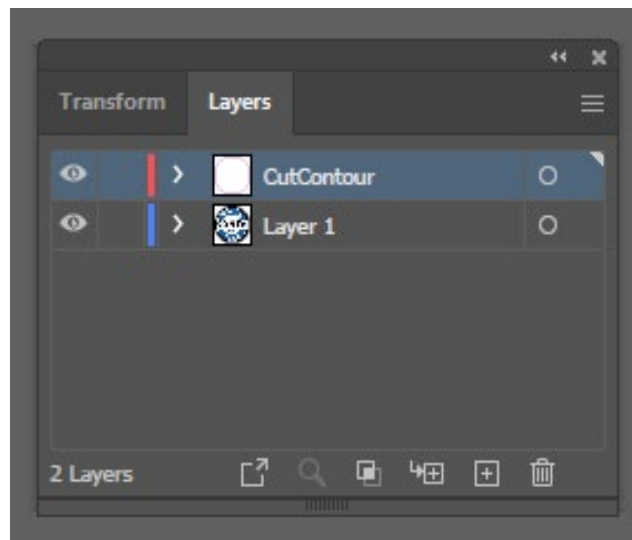
Layer named: **CutContour**
**CutContour** layer must be the top layer.

The contour cut outline should always be placed inside the graphic so that a bleed is created. The distance from the graphic edge should be a minimum amount of 0.0625 (1/16th inch). The ideal amount is -0.125 (1/8th inch).

If you are an advanced user of Illustrator, this is enough information to grasp the concept. The following information will show examples of how to create outlines for basic, complex, and very complex shapes. Tips are given throughout and at the end of the guide. This guide is not intended to be a tutorial for either Illustrator or Photoshop, but rather to demonstrate how to add a contour cut to a design that will use computer-guided cutting.

Setting up a precise contour cut for basic shapes

1. Create a new Illustrator file that is just slightly larger than the image you will be adding a contour cut outline to.

2. To ensure high quality resolution, and correct fonts are used in PDFs, always use **Place** to import an image or PDF into Illustrator.

   File > Place > select file from browser
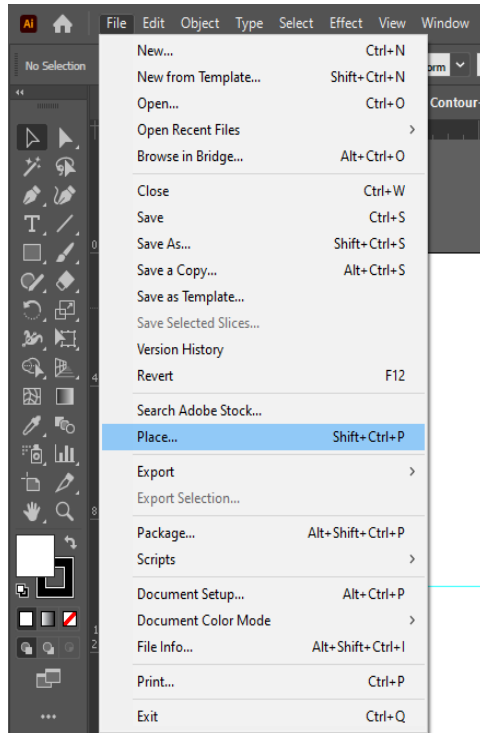
For this example the WDCB logo was *Placed* into Illustrator from a PDF file. We will want to setup a contour cut so the printed logo will be cut out as a circle.

3. Create a custom Swatch named **CutContour**. The **CutContour** swatch can be any color, but it MUST be of a Spot Color type. *See example on page 1.*

4. Create a new layer named **CutContour**. The **CutContour** layer must be the top layer.
   See example on page 1.

5. On the **CutContour** layer, use the *Ellipse Tool* to draw a circle the same size as the outer part of the logo. The circle should have a stroke of 0.01 pt, and be assigned the spot color named **CutContour**.


Note: For visual clarity a thicker stroke was used in this example.
The CutContour stroke is shown in a light green color.

6. Next we need to make the contour cut outline fit inside of the black circle in the logo. The ideal amount is -0.125" (1/8th inch), and the minimum amount should be - 0.0625" (1/16th inch). To fit the outline the correct distance inside the shape, and keep proportions exact, it is easiest to use the Offset Path feature.

The Offset Path feature will make a copy of the original object inside of the original object with perfect proportions, and perfect spacing. It would be easy to also use the scale tool to resize the original shape to fit in the logo, but when you are working with complex shapes, scaling doesn't fit the contour of the original proportionately. Using the Offset Path feature will always work perfectly, and will save time and frustration.
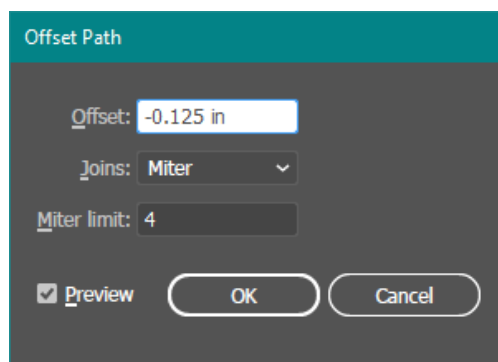
To use the Offset Path feature, select the object you are making a copy of and offsetting (in this case, the CutContour outline), and from the menu select: Object > Path > Offset Path
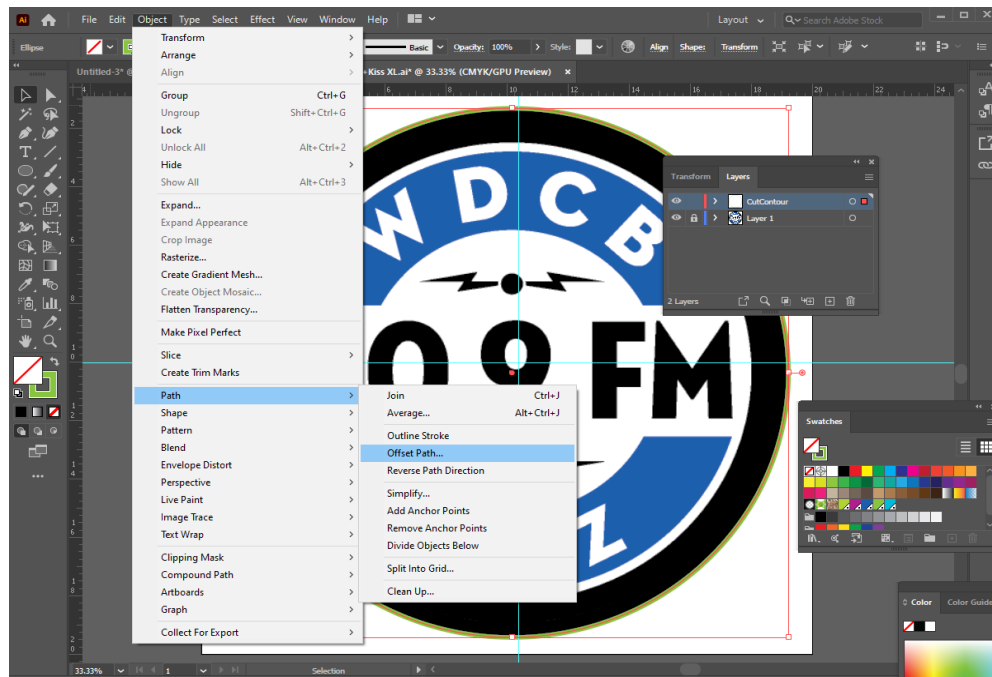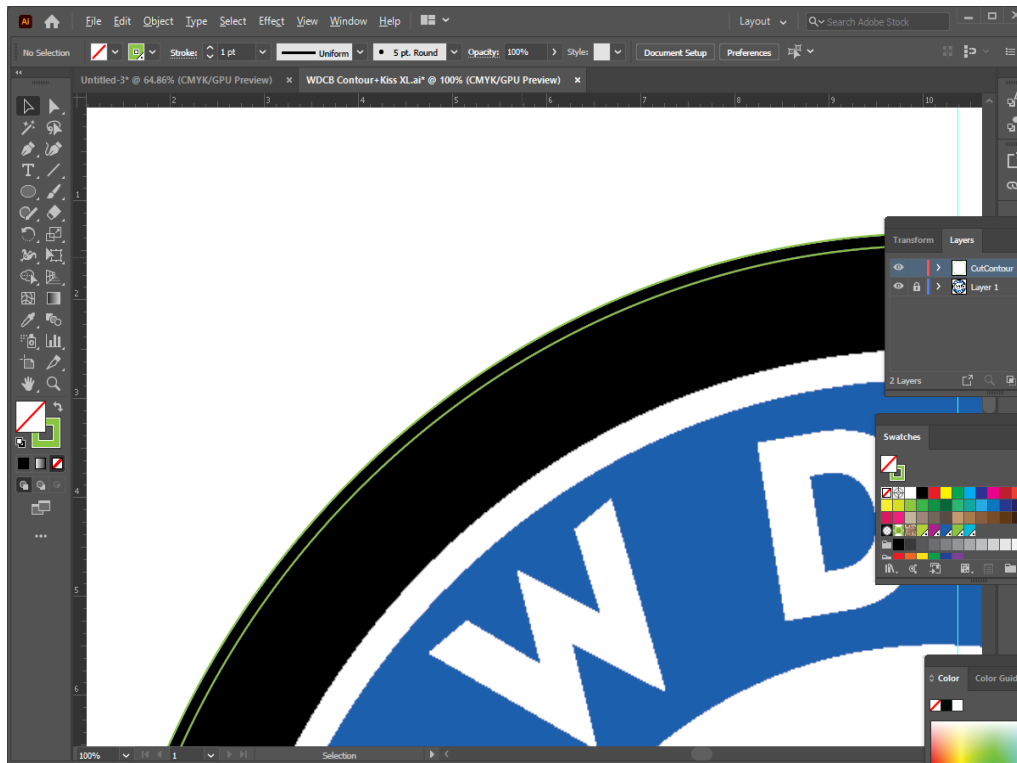

Set offset amount as a negative number

Minimum amount should be - 0.0625 (1/16th inch)

Ideal amount is -0.125 (1/8th inch)

A copy of the original shape is made inside of the original with perfect proportions.

7. Since we want the cut to be made inside of the logo, the outline shape that was used to create the offset path, needs to be deleted. Select and delete it.

   You should have only one shape left on the **CutContour** layer, and it should have a stroke of 0.10 with the spot color named **CutContour.**

8. Be sure the **CutContour** layer is the top layer, and save the file as a PDF.

That's all there is to it! The **CutContour** outline will appear in the PDF file, but the wide format printer will not print the outline. The **CutContour** outline will be read by the cutter only.

Image Trace Feature for Complex Shapes

For complex shapes, the Image Trace feature in Illustrator can be used. The next examples will not go into great detail, as this guide is not a tutorial on Illustrator or Photoshop, but they will give you an idea of how to work with complex shapes in Illustrator.
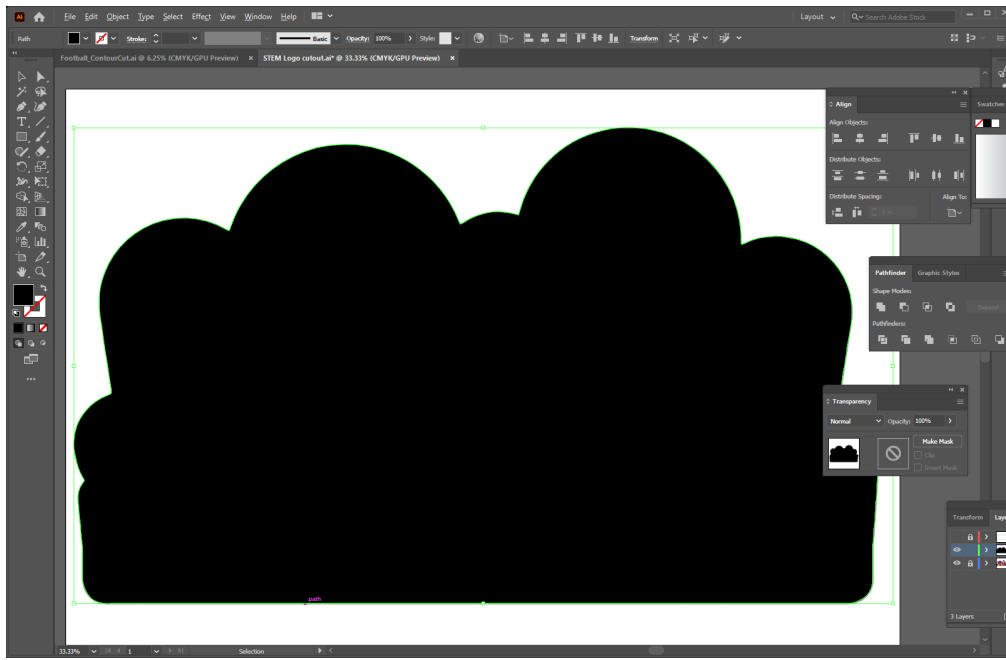
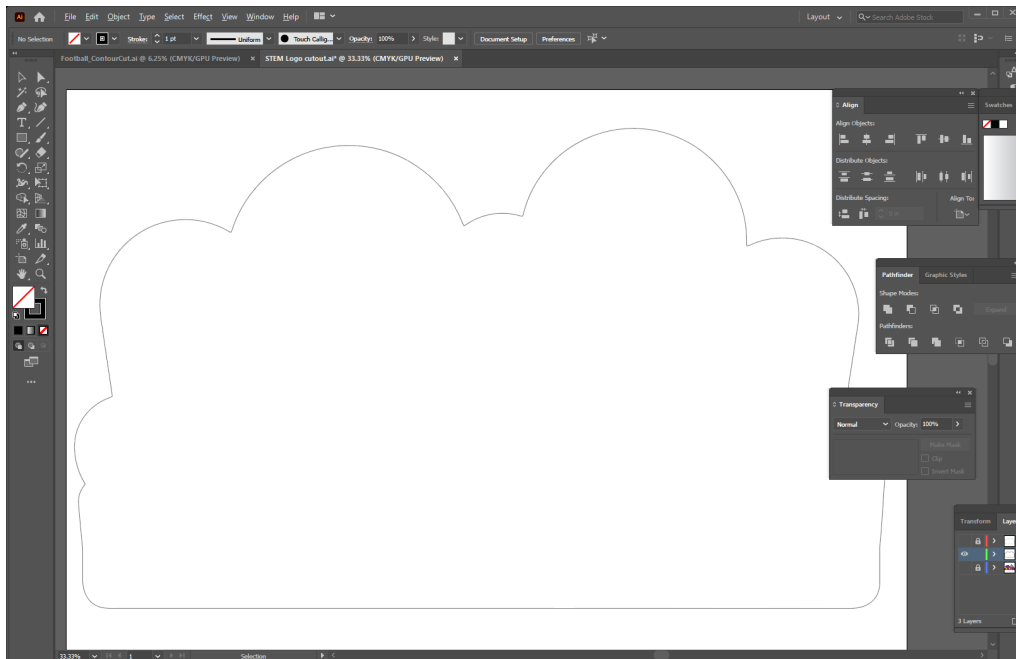Here a PNG image is placed into Illustrator.
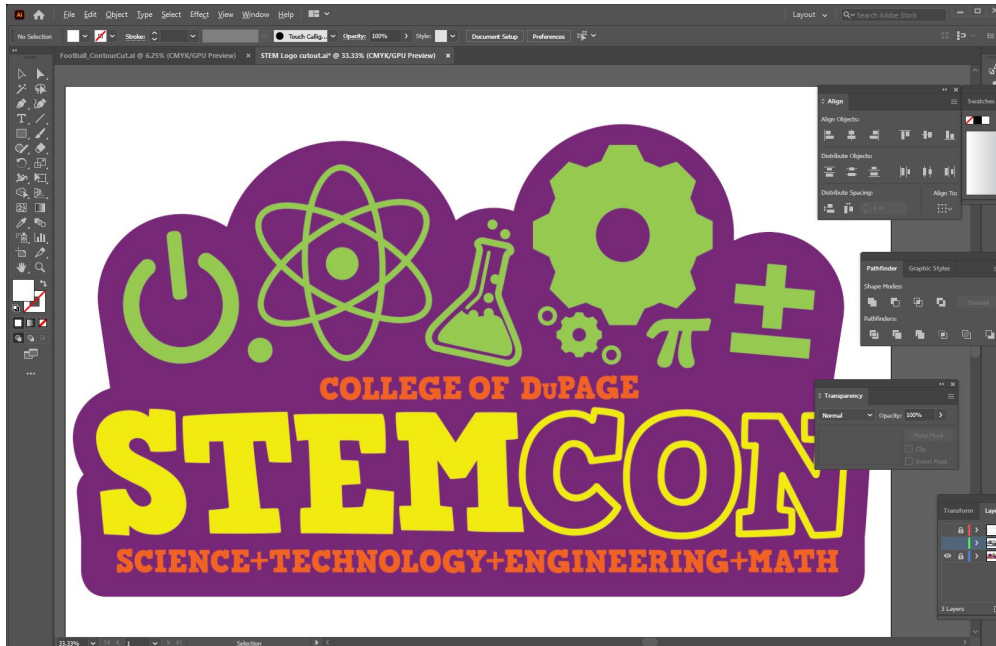
The image was copied and the **Image Trace** feature was applied.
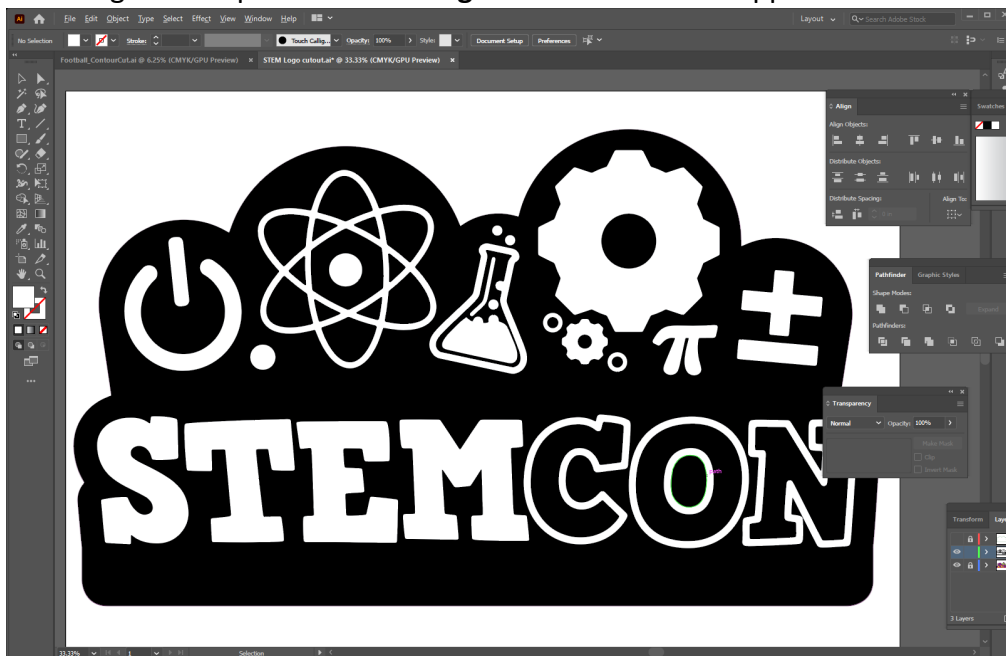
Use **Pathfinder** to **Unite** objects.

Remove the fill and leave the outline.

Use Object > Path > Simplify to remove extra anchor points from the outline.

Be sure to have the outline on its own layer named **CutContour**, and use a stroke with the spot color named **Cutcontour**.

Use the Offset Path feature as explained in the previous example to offset the contour cut outline on the image.

As stated in the previous example, scaling the outline to make it fit inside the image does not work with complex shapes. Below shows an example of a complex shape scaled to fit inside. Notice the outline (in green) does not have equal spacing all around the image.
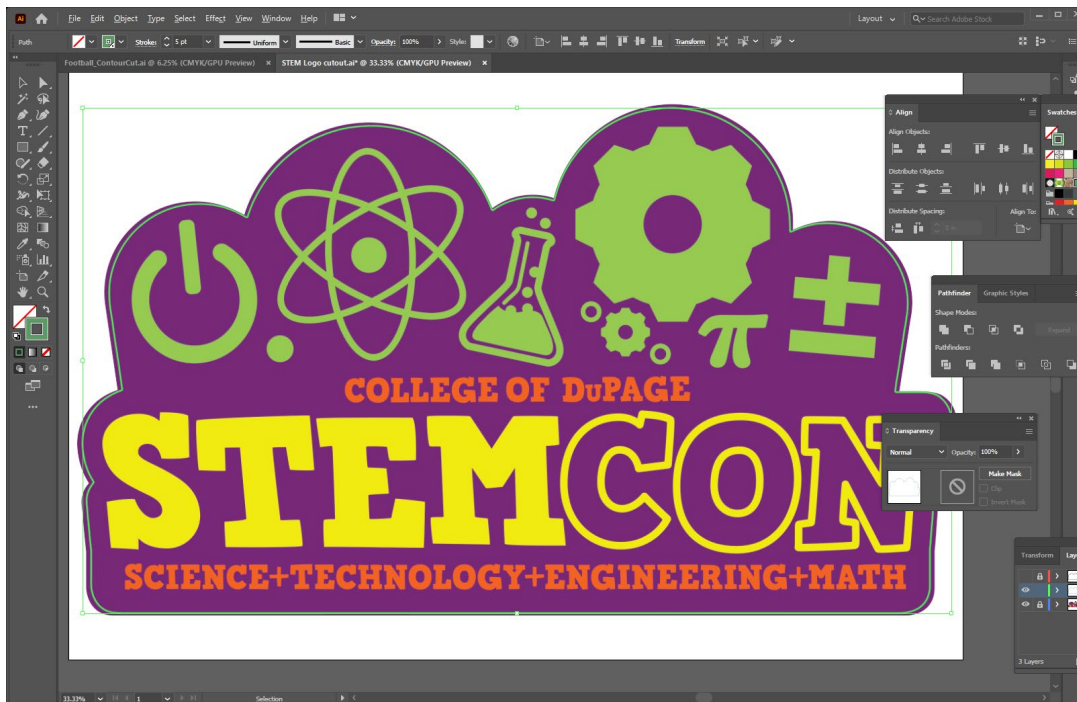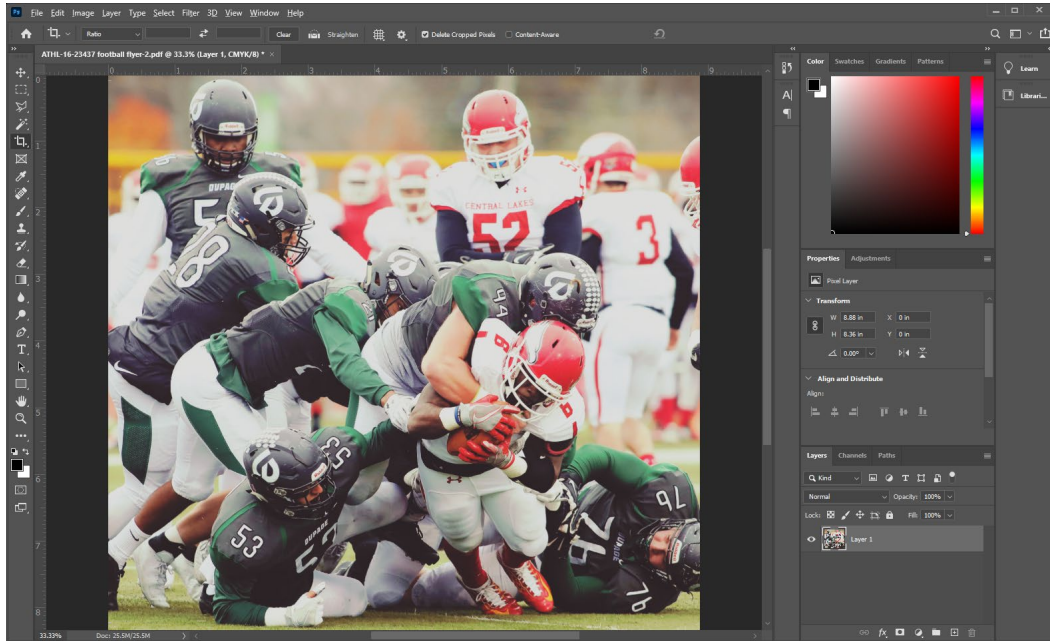

Here Offset Path was used. Notice the spacing is even around the entire image.
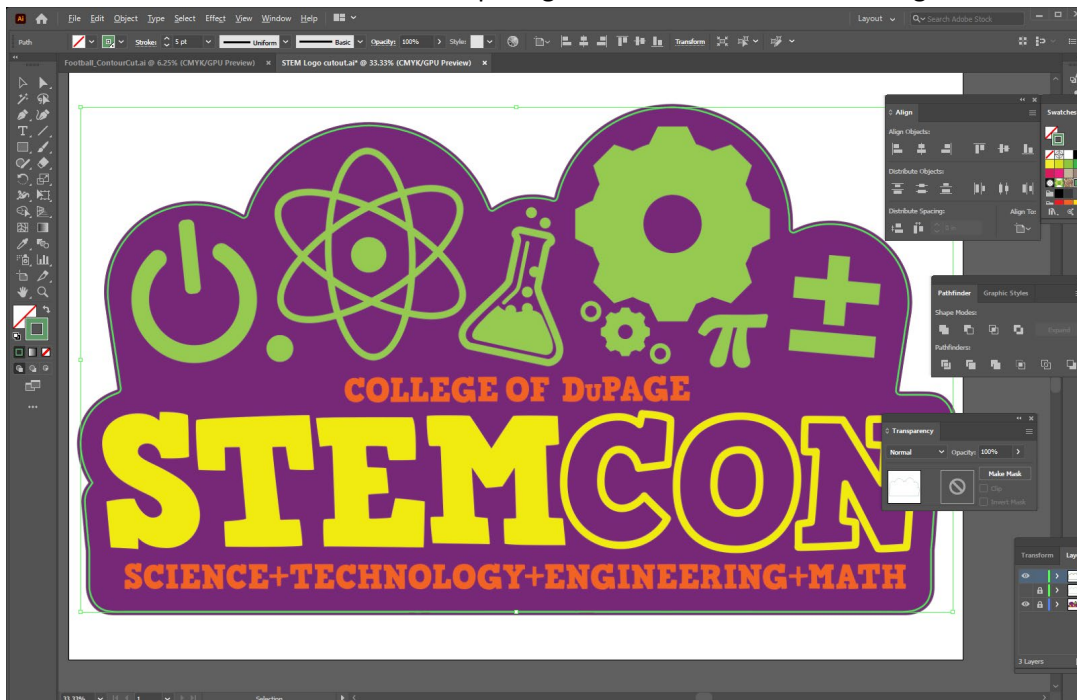
Very Complex Shapes

For highly complex shapes, it helps to use Photoshop to create an outline.
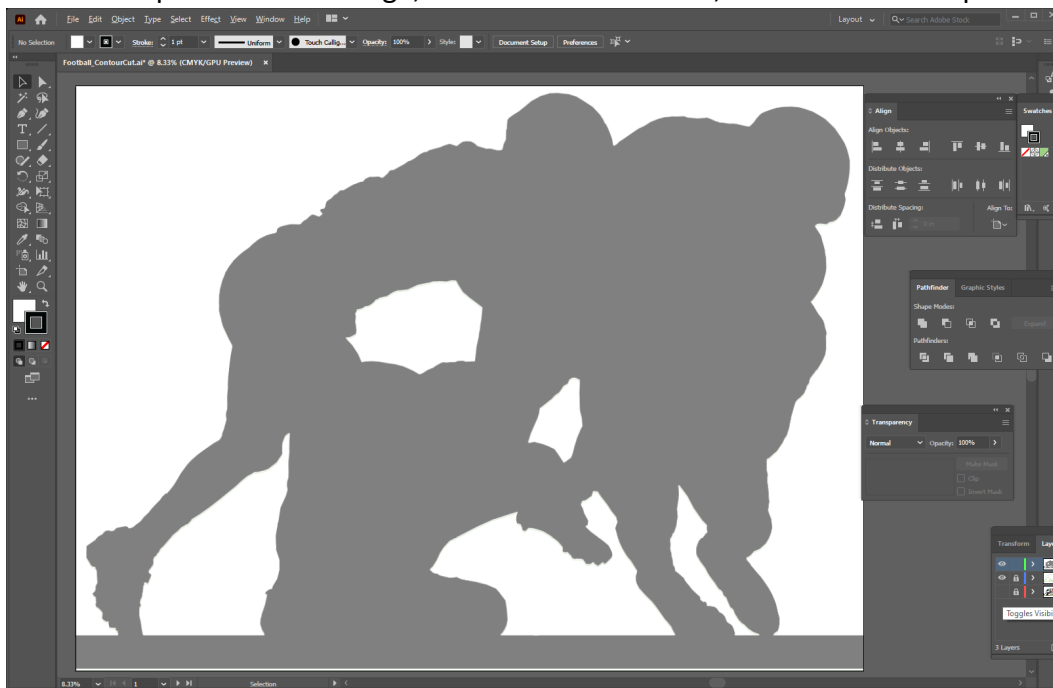
Original image:

Final printed and contour cut piece (55"x42"):

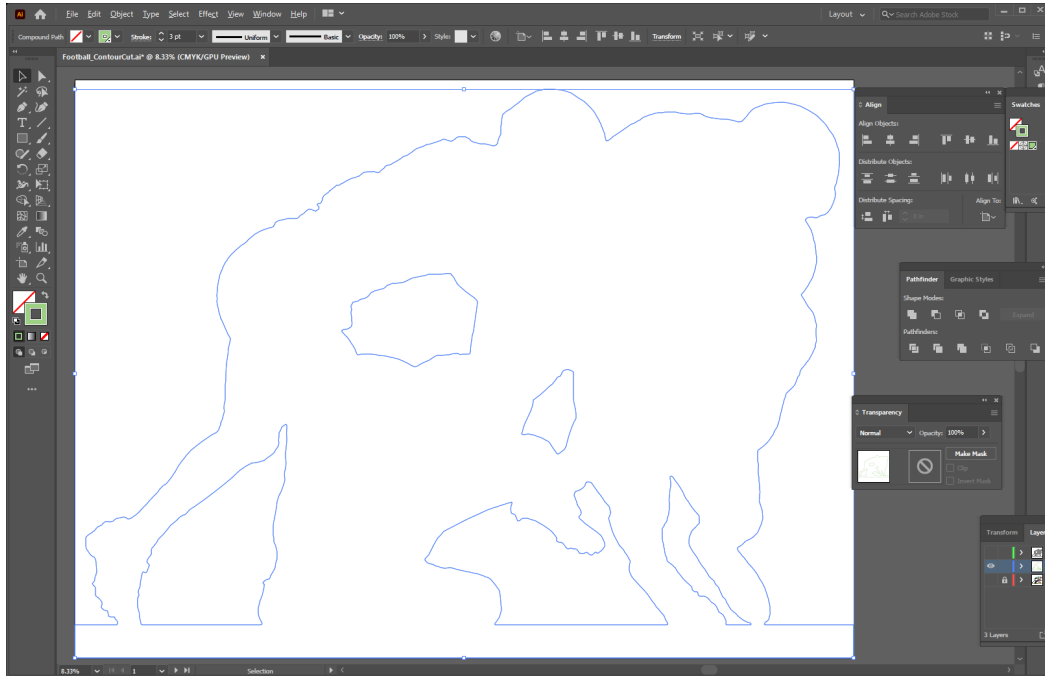In Photoshop remove the background, and save the image.

Create a duplicate of the image, fill it with a solid color, and save it as a separate file.

Place both images into Illustrator on separate layers.

Use Illustrator's Trace feature to create an outline for the contour cut.

Use Object > Path > Simplify to remove extra anchor points from the outline. The least amount of anchor points in an outline, the better it will cut.

As in the previous examples, use the Offset Path feature to create your contour cut outline.

Remember to always have the outline on its own layer named **CutContour**, and use a stroke with the spot color named **CutContour**.


Final piece printed and contour cut 55"x42"

Tips:

- Use a stroke of 0.01 pt for the contour cut outline.

- Remember you MUST use a spot color named **CutContour**.

- Remember the contour cut outline MUST be on its own layer named **CutContour**, and it MUST be the top layer.

- Use the Image Trace feature in Illustrator for complex shapes.

- In Illustrator use Object > Path > Simplify to remove extra anchor points from the outline. The least amount of anchor points in an outline, the better it will cut.

- When using foamboard, coreplast, or any thicker media, inside cuts less than 3/8"wide should be sharp points, and not rounded corners.

  The example below shows arrow #1 is pointing to a rounded inside corner. The cutting blade does not handle small inside rounded corners well on thick media. Any round inside corners less than 3/8" wide, should be made into sharp inside corners, like arrow #2 points to.
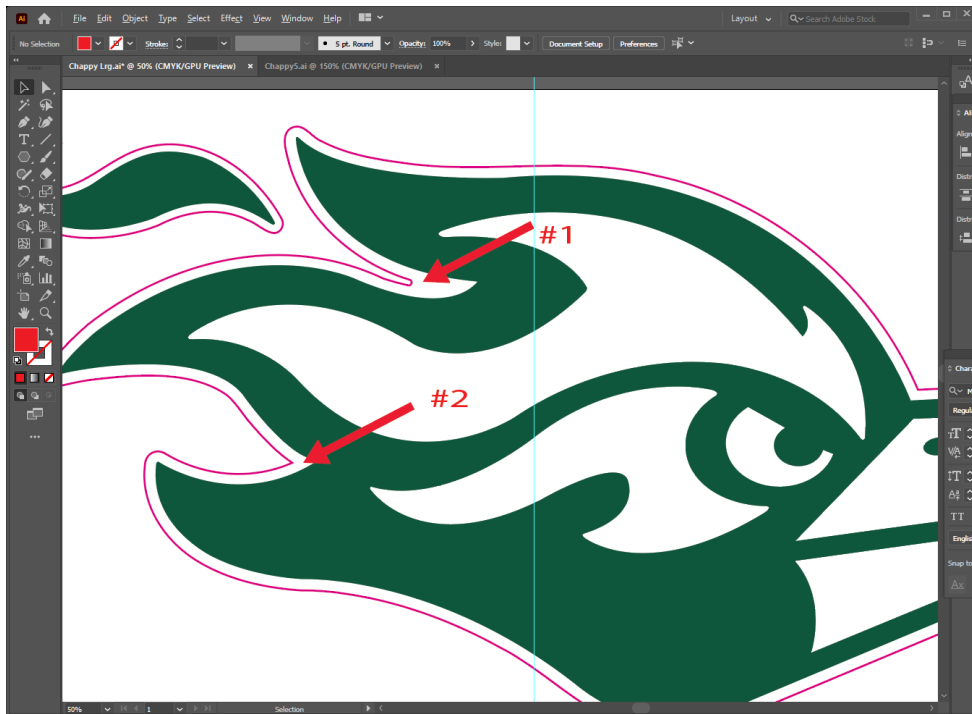
- Be creative and let your imagination run wild with the possibilities of contour cutting.