Laser Cutter Layout
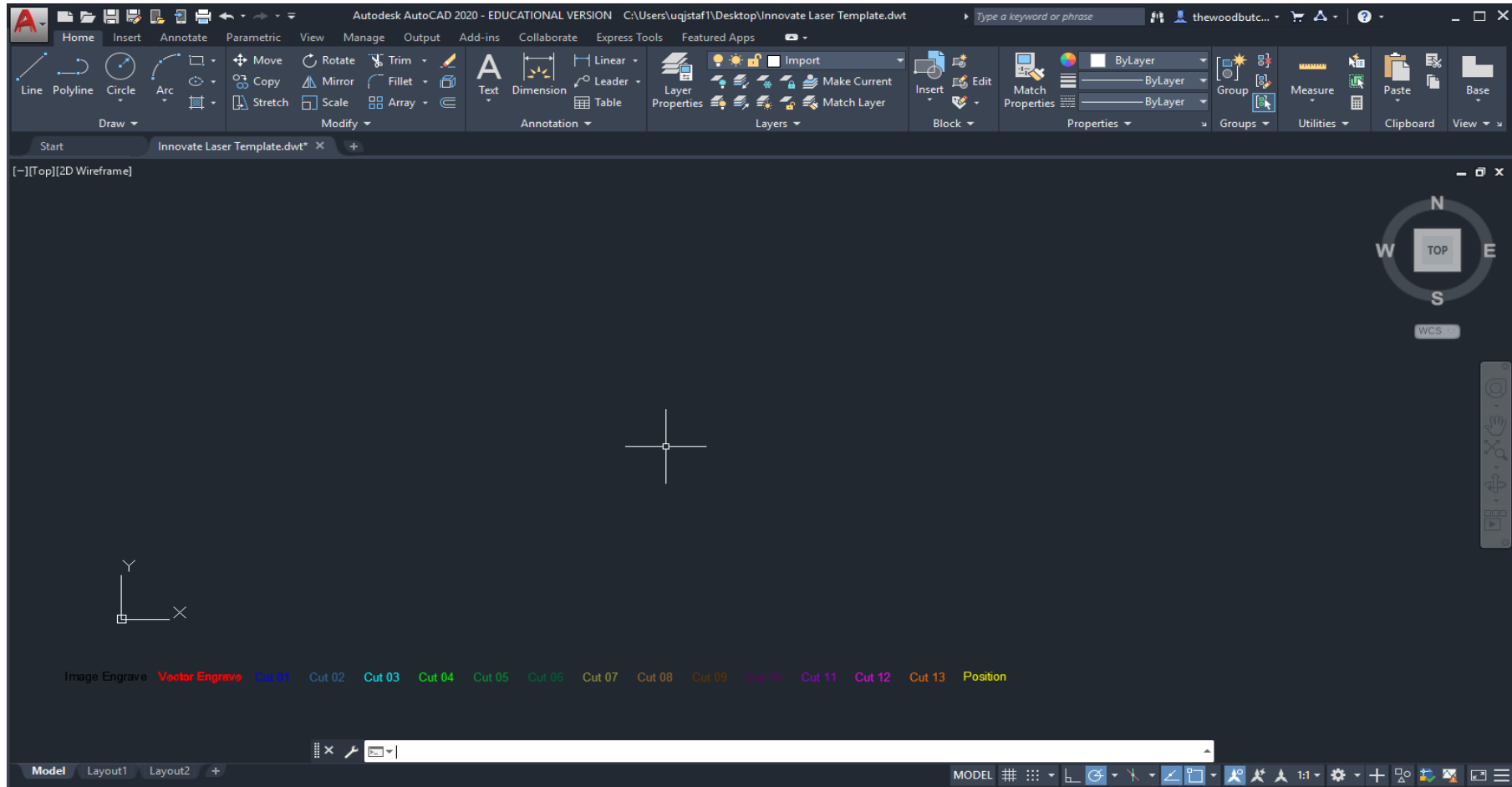
Layout of files for Laser Cutting can be confusing due to the many different Layers we have at our disposal in the Innovate Laser Template.

It is important to always use the most up to date template as this file can be subject to change. The colours are important as these tell Job Control which setting is appropriate for the layer, line weights are also important as this is how Job Control differentiates between a Vector and a Raster. Try not to get too hung up on using all the layers in fact the less you use the easier and quicker your job will be. The layers are all switched on and have been listed out below the origin so that they can be targeted when using Match Properties\MATCHPROP or Match Layer\LAYMCH.
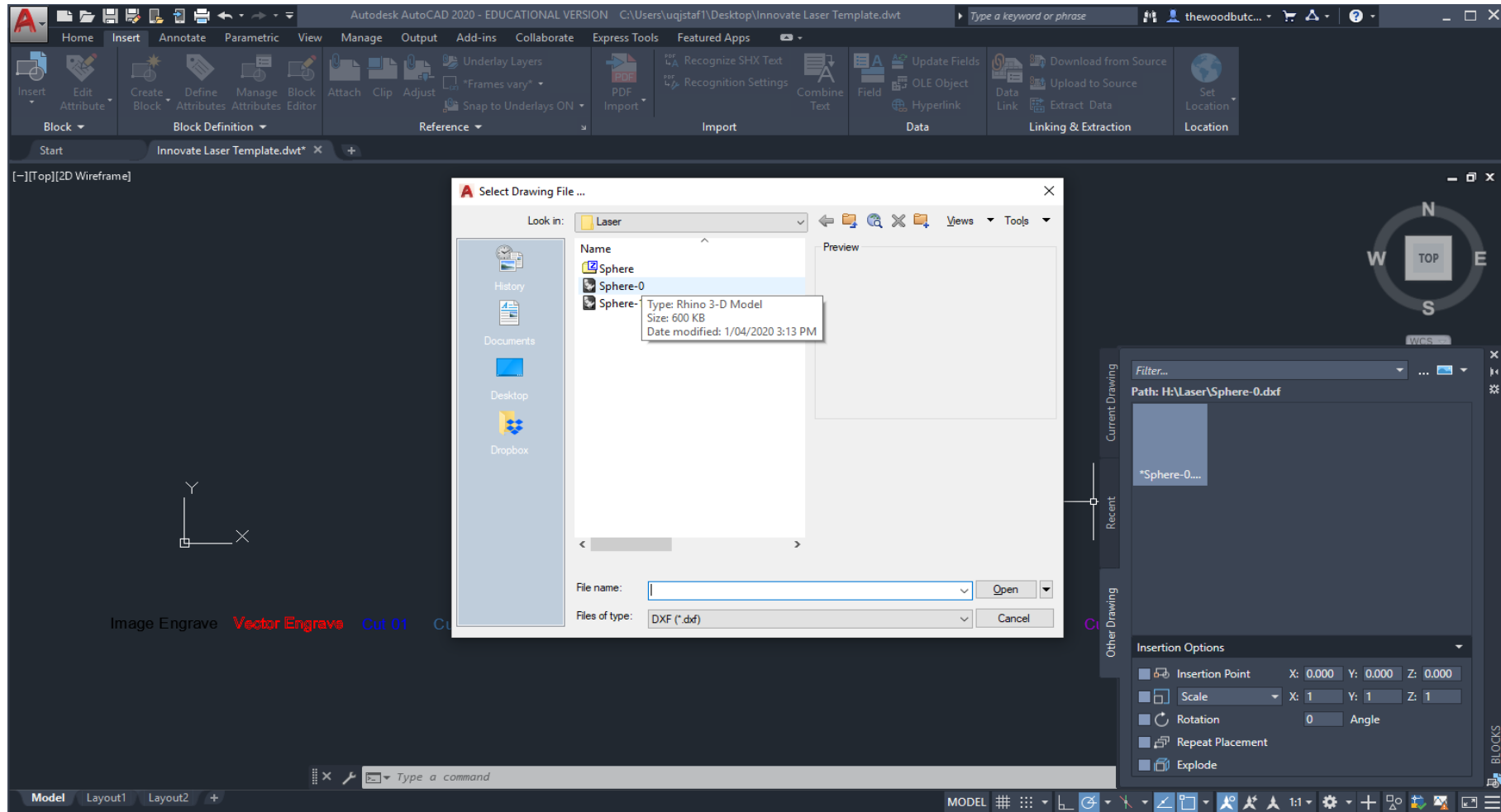
- "Image Engrave" is used for greyscale (black and white) engraving of images\bit maps (R=0 G=0 B=0).
- "Vector Engrave" is used for the tracing of figures, single line text & images (finest line weight) please use in preference to "Image Engrave" as this is more efficient (R=255 G=0 B=0).
- "Cut01" used for the innermost contours of through cutting (finest line weight) (R=0 G=0 B=255).
- "Cut02" used for the next order of contours (finest line weight) (R=51 G=102 B=153).
- "Cut03" used for the next order of contours (finest line weight) (R=0 G=255 B=255).
- "Cut04" used for the next order of contours (finest line weight) (R=0 G=255 B=0).
- "Cut05" used for the next order of contours (finest line weight) (R=0 G=153 B=51).
- "Cut06" used for the next order of contours (finest line weight) (R=0 G=102 B=51).
- "Cut07" used for the next order of contours (finest line weight) (R=153 G=153 B=51).
- "Cut08" used for the next order of contours (finest line weight) (R=153 G=102 B=51).
- "Cut09" used for the next order of contours (finest line weight) (R=102 G=51 B=0).
- "Cut10" used for the next order of contours (finest line weight) (R=102 G=0 B=102).
- "Cut11" used for the next order of contours (finest line weight) (R=153 G=0 B=204).
- "Cut12" used for the next order of contours (finest line weight) (R=255 G=0 B=255).
- "Cut13" used for the next order of contours (finest line weight) (R=255 G=102 B=0).
- "Position" used for setting the outer border of your material plate and other non-process markings (R=255 G=255 B=0).

If you feel more confident using another CAD package the above RGB colour settings will assist you in creating a file that will be able to print directly to Job Control. Please keep in mind that UQ Innovate staff may not be able to assist you as readily when it comes to problem solving.
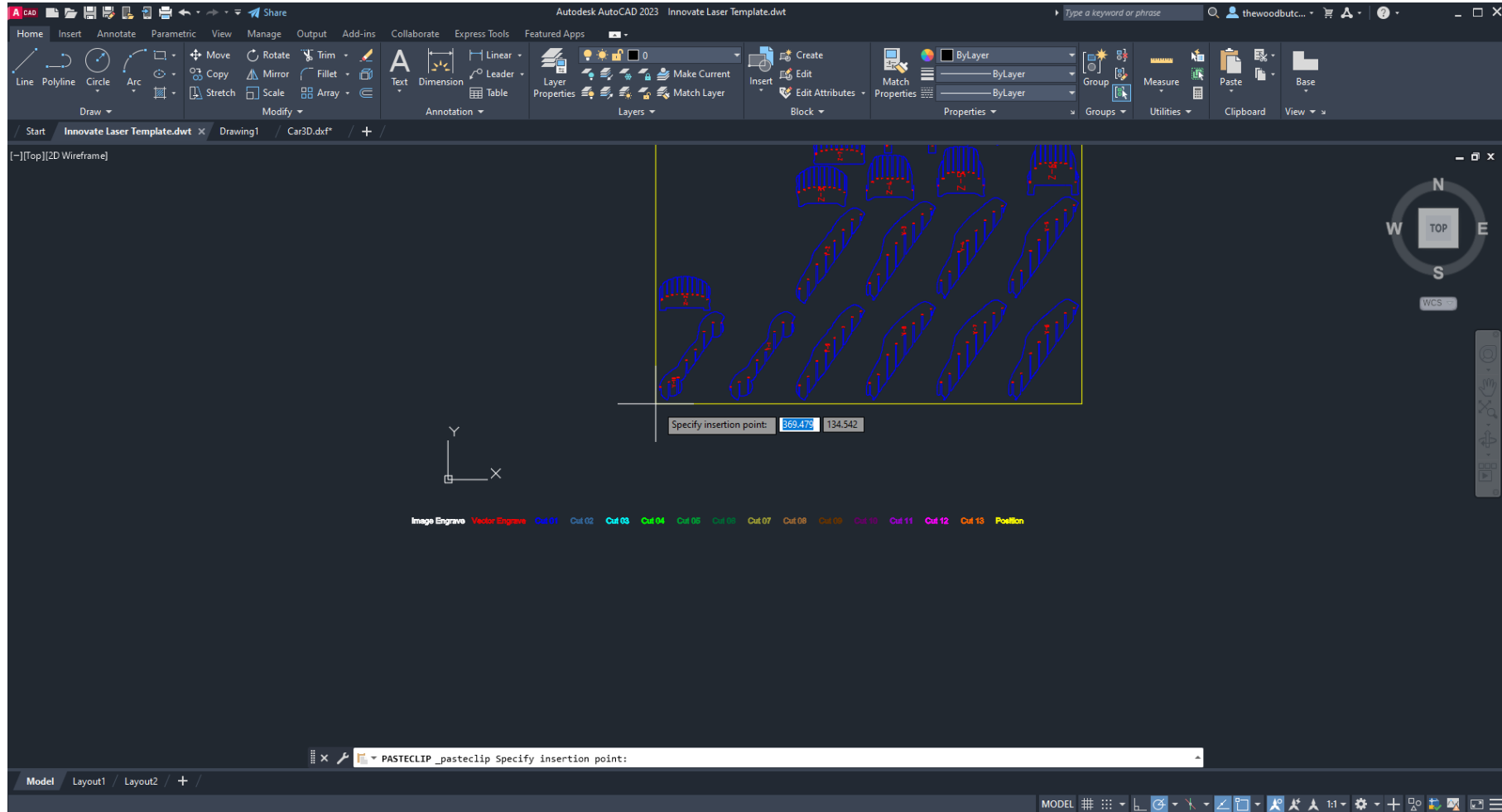
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Open UQ Innovate **Laser Cutting Template.** When using commands in AutoCAD you can hit F1 for help.

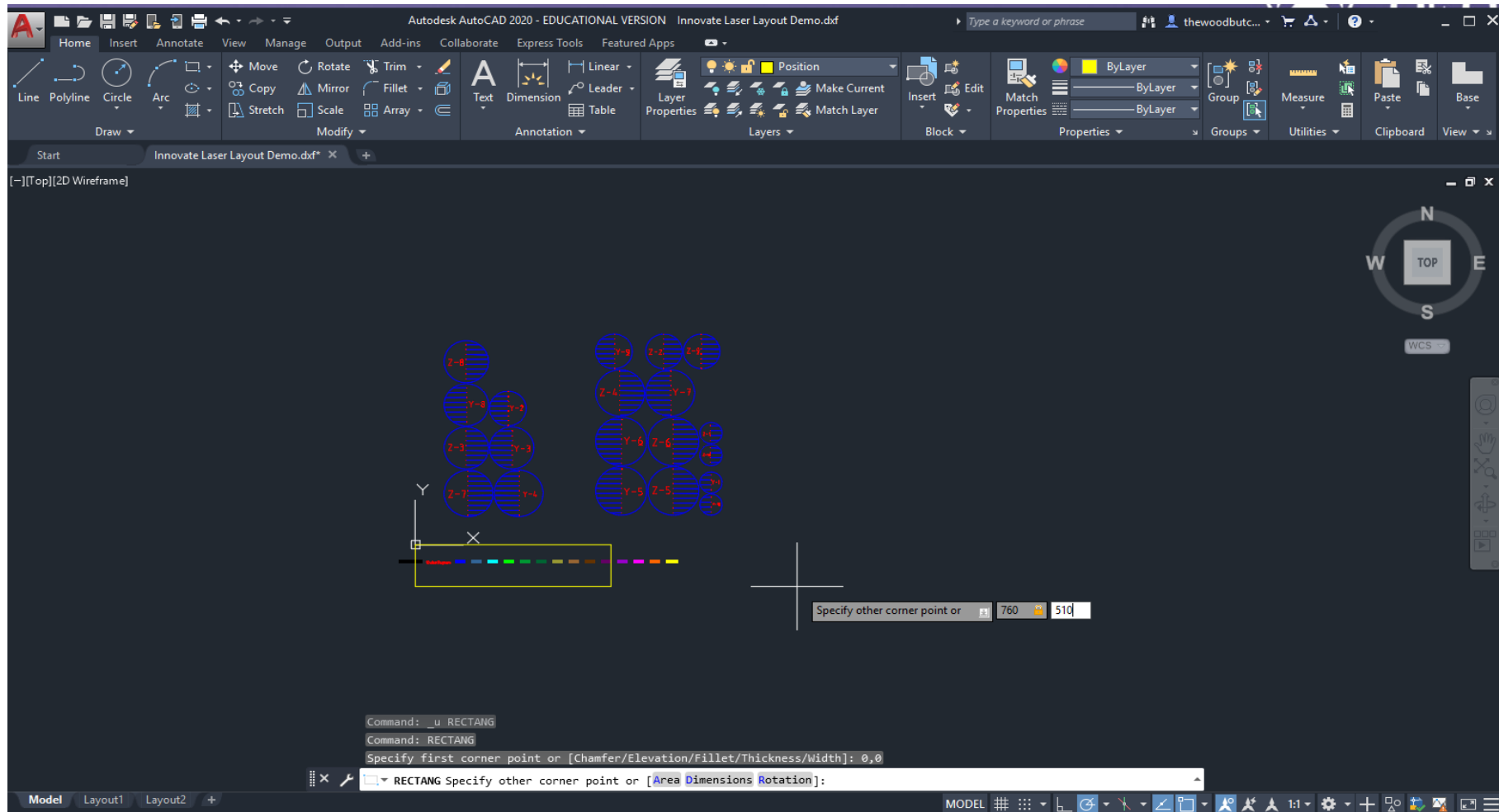Use the **INSERT** command to import previously saved .dxf files into the template.

Alternatively, you can use the **PASTECLIP** command to copy (CTRL+C) and paste (CTRL+V) from your original drawing.
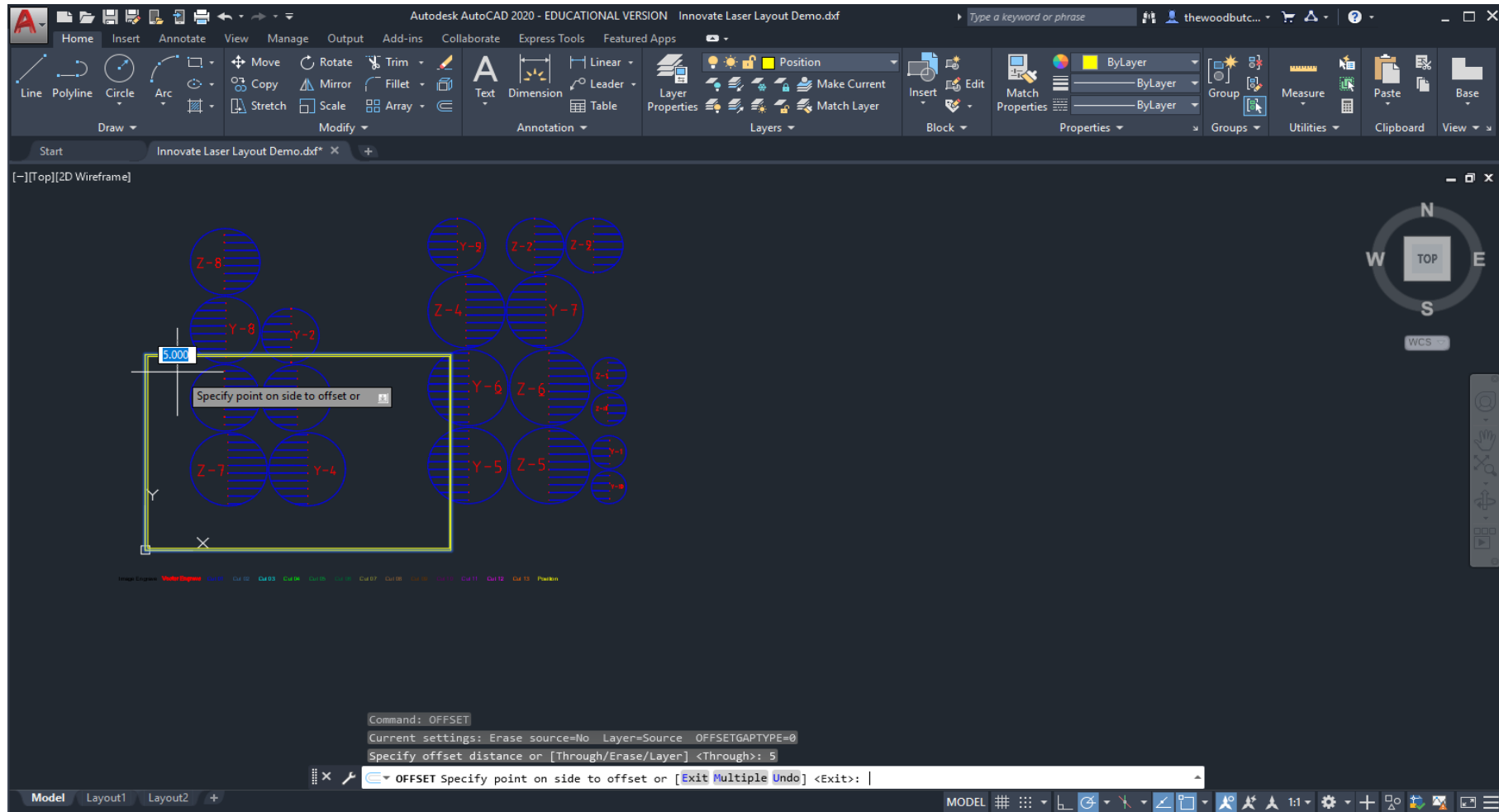
Create a rectangle using the RECTANG command that represents the boundary of your material size. My personal preference is to put the first one directly on the origin (x=0, y=0, z=0) if you need more just Copy them across to the right (again personal preference) also notice that I have made the longest side in the x direction not my preference this is the way the machine is laid out (always in landscape).
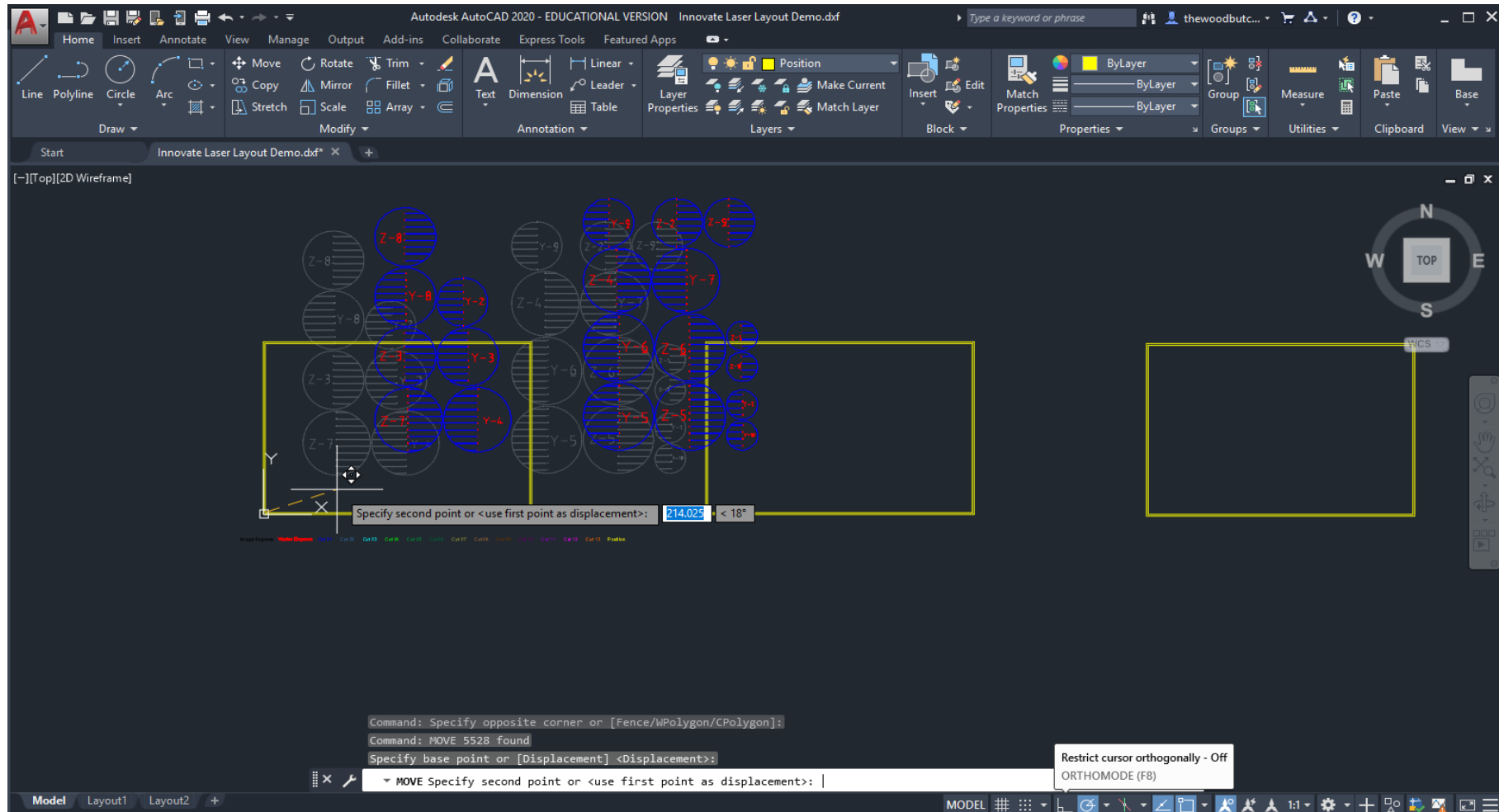
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Use the **OFFSET** command to create a margin around your material outline this is to allow for an 1\8" border from AutoCAD's print margin and also to allow for the alignment of your material with the laser.
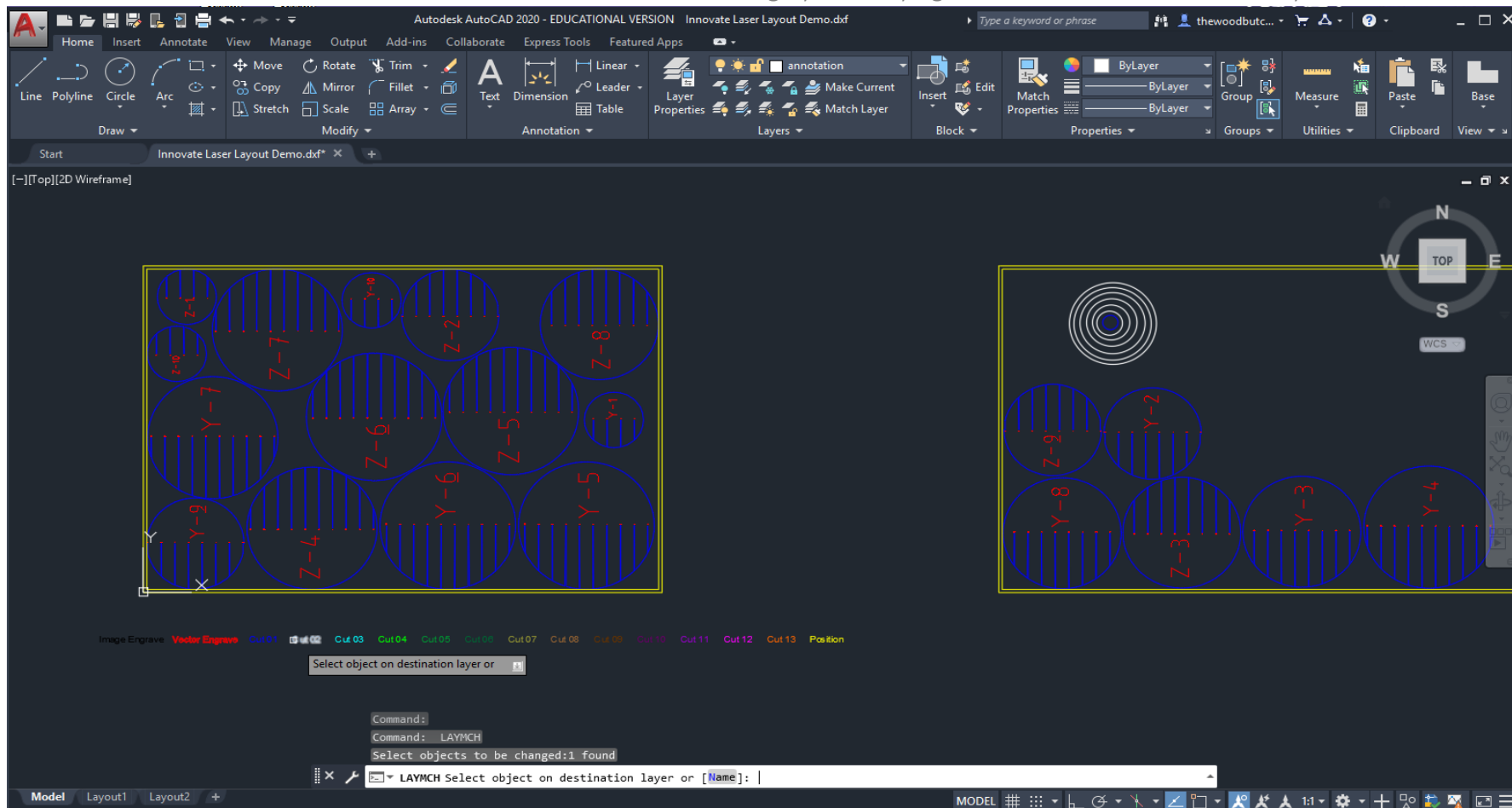
I like to **MOVE** all my objects out of the way and then nest them inside the material outline one by one. It is important to leave at least ~2mm between geometries to reduce the risk of fire. This is also why we try to not cut anything smaller than 2mm as it will most likely go up in flames. When doing tasks like this I find things work better with **OSNAP\(F3)** Off.
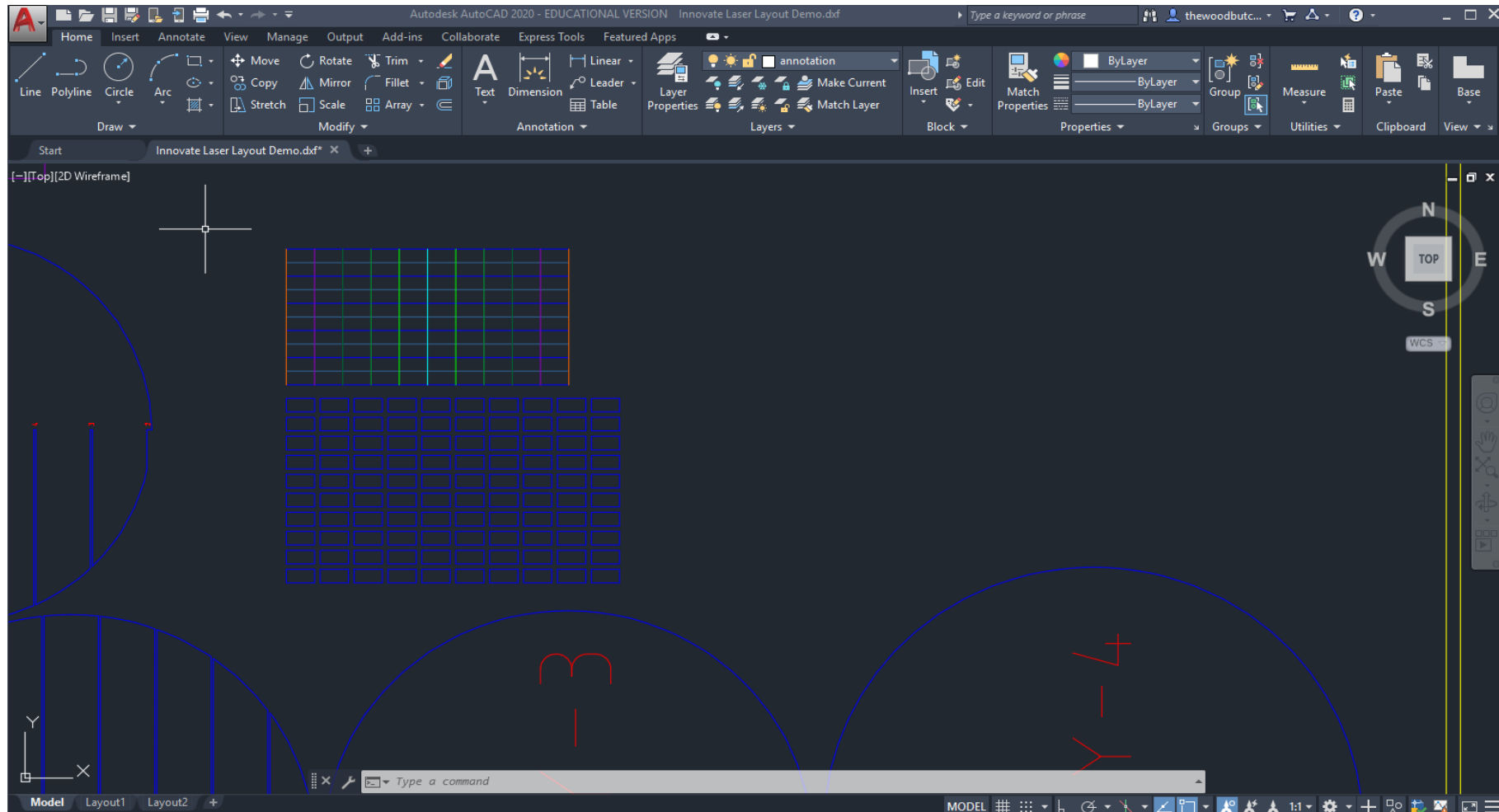
Order of Cutting

If you have concentric geometries, it's a good idea to cut the innermost ones first. The air assist on the laser can blow pieces out of place before the file has finished with cutting. This would be a good reason to use the extra layers. We use the different layers to order cuts. Another reason is to reduce localised thermal buckling by diversifying heat loads across the various layers.
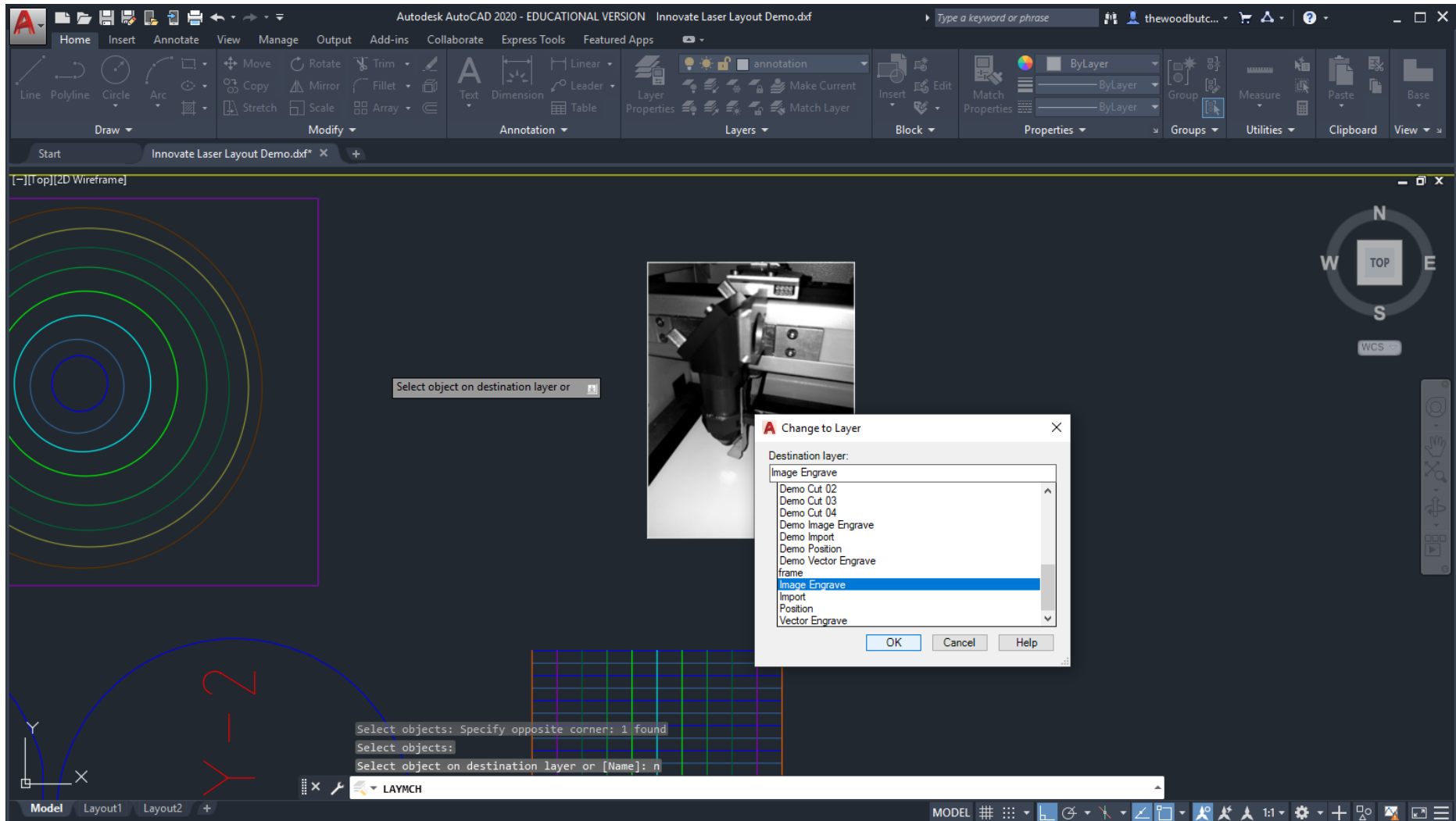
If you want a series of rectangles you could cut them out with 2mm spaces or do them as a grid of straight lines....I know which one I would choose. 😊 Using the layers means you can control which cut happens first giving you not only the ability of when things get cut but also by spreading heat evenly through your material. This is very important with acrylic.

Putting Images in a drawing is easy just drag and drop the image and then assign it to the Image Engrave layer using either Match Properties\MATCHPROP or Match Layer\LAYMCH commands.

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Before we go to plot our file the last thing to do is run the OVERKILL command. We really don't want to be cutting over lines more than once as this can pose a fire hazard. You should now be ready to plot your file.