

Escher's Birds and Fish Tesselation

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VIEW IN BROWSER

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Summary

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Escher's Birds and Fish.

I created this in 2016 because I just had to have a bas relief of this work on my wall. My final mural is about 180cm (71 inches) wide, and was created by taking silicone molds of each of the four pieces printed at 150% scale and then casting them in resin with hollow glass microspheres added to reduce the weight. Of course, I could have printed them, but that would have taken a long time using my printer from that era.

The final parts were then primed, spray painted, and glued on to a wooden panel. LED lighting added the final effect.

About the design:

Initially I tried tracing a photo of the original mural after dewarping it in Photoshop, but the parts didn't tessellate very well at all. I then located an earlier Escher drawing that the mural was based on and started the design again.

One thing I discovered is that Escher's tiles would vary slightly across the drawing, as he was creating them by hand, so I had to massage the outlines a bit to get to a tighter tessellation.

I traced in Photoshop; exported as a .ai file; converted that to an .svg; and then extruded the drawings. The CAD was all done in Tinkercad (I smirked when I remembered that) and Meshmaker (which I used to create the rounded bodies from simple extrusions).

Printing:

Adaptive layer height is advised to smooth out the steps on the shallow curved top areas. When used, make sure you use a minimum top shell thickness to avoid pillowing (or even gaps) over the infill.

Alternatively print with a low layer height, and sufficient top shell layers.

Update: added a photo showing a set printed with adaptive layer height: 0.2 - 0.05mm. As bridging of infill with very thin layers can be a problem, I enforced a 2.2mm min top shell thickness, in conjunction with a 13% rectilinear infill. This was after getting some holes with 1.6mm top shell on 10% infill.

Model files

Birds and Fish Tesselation 4 files

- **escher-fish-left-solid.stl**
- **escher-fish-right-solid.stl**
- **escher-bird-right-final-solid.stl**
- **escher-bird-left-final-solid.stl**

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