



Screw Mates



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Summary

Inner screw and outer structure that seems like it should not allow passing through. All structures are interchangeable

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Inspired by RJ Design's Impossible Vortex and Pyramid, but redesigned from scratch here with my own pitch, lobes and external shapes and models. ALL of these are my own design from OnShape with no measurements or copies or work taken from any other models or reference.

Many outer shapes with different inner shapes that all are interchangeable and workable with each other. Inverted or upright. Ball, cone, pillar, pyramid, triangle and octagon shapes as well as free form wood slat support shape.

I would print INNER structures at 0.20mm and OUTER at 0.16mm to help resist tendency to bind or ratchet locked when on same pitch (I've also had 0.22mm and 0.18mm work quite well). There is plenty of gap (0.45mm offset on shapes) to make these fit quite well, just be sure to use good elephant foot compensation if you have a lot of first layer squish. It also looks best to print the OUTER and INNER structures in different color

(additional challenge to print all the outer at once and inner at once as another session). I've used ABS and ASA, but PLA and PETG work as well. Silk Multicolor and sparkly are very nice. These all fit interchangeably with each other and fit upside down or right side up. The Hour Glass and Screw Outer are probably the most challenging to print without supports, but it can be done and they look great, just have a good first layer (also, you should likely use scarf seams, precise walls and minimum wall length of 1mm to eliminate some small slicer artifacts where the holes emerge and walls get thin on the outer structures). I would recommend getting a very good adhesion for the outer prints, especially, as any lifting of the sharp points will ruin the fit. I personally found a 5mm mouse ear with 0.15mm model spacing worked EXCEPTIONALLY well to keep those sharp narrow inner points from lifting and still easily were trimmed. I printed the balls 0.5mm below the bed surface to get just a slight flat area, and used very small amount of traditional support to get them better curved/surface quality. Or, if you like/want a half sphere, try splitting the model in half on the bed.

I'm working on additional more elaborate paid content outer and inner structures (like the slat outer, which I love). I've added a outer screw and mirror screw model too and am working on another "wave" model, but that currently requires supports.

Model files



octagon-outer.stl



cone-outer.stl



slat-outer.stl



pyramid-outer.stl



cone-inner.stl



double-hourglass-outer.stl



pyramid-inner.stl



triangle-inner.stl



double-hourglass-inner.stl



sphere-inner.stl



octagon-inner.stl



solid-screw.stl



triangle-outer.stl



screw-outer.stl



mirror-screw-outer.stl

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