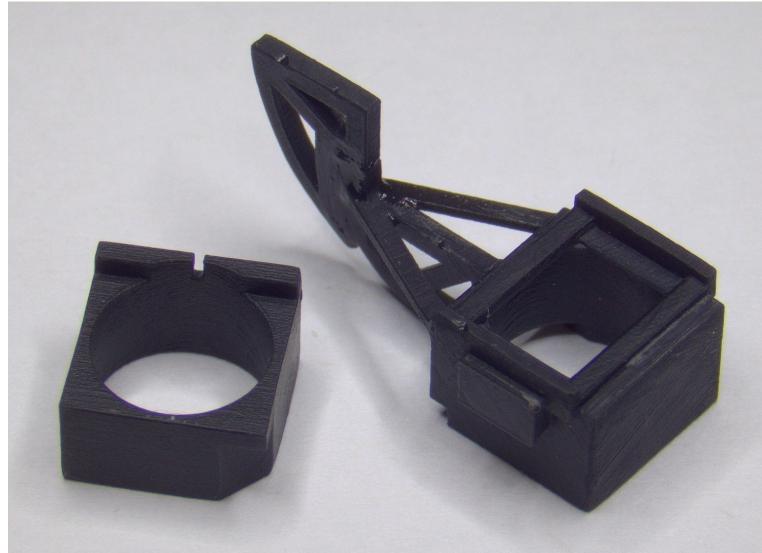


Kiloscope assembly

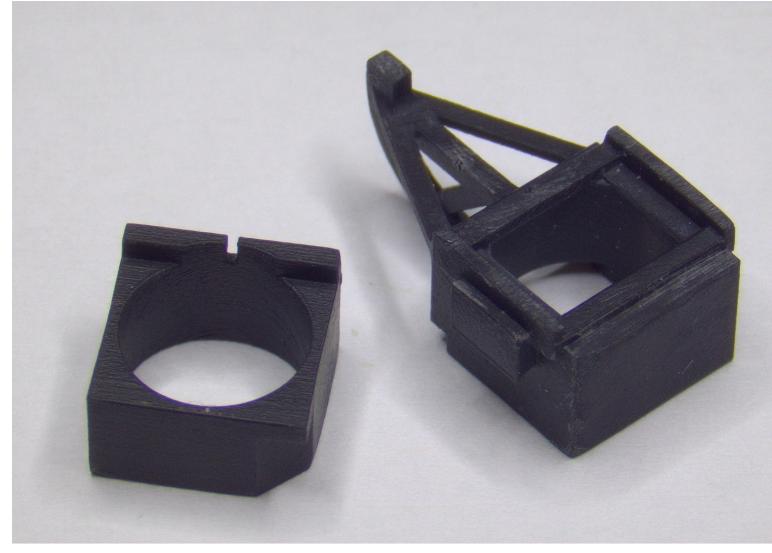
Start by locating the 3D printed components for the lower and upper subassemblies.



lower

upper

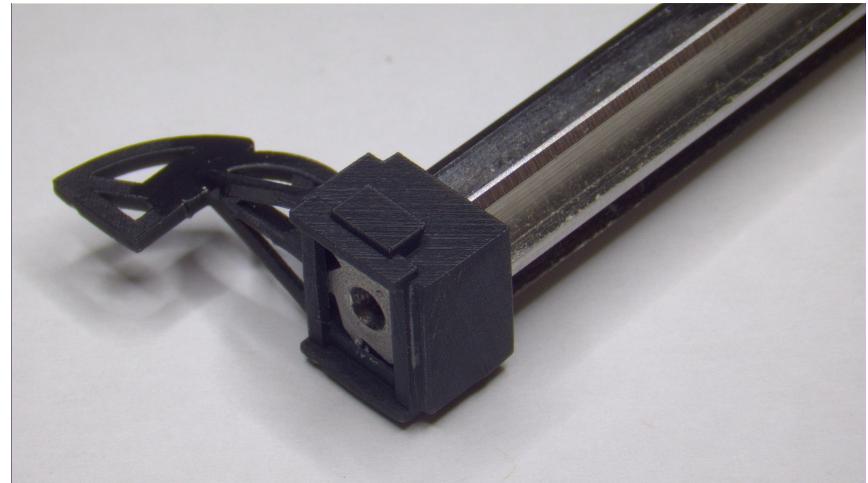
We will be using a glass multimode fiber for these instructions, so we will use an upper subassembly with an arm extension to accommodate the larger radius of curvature of the fiber (image to left)



lower

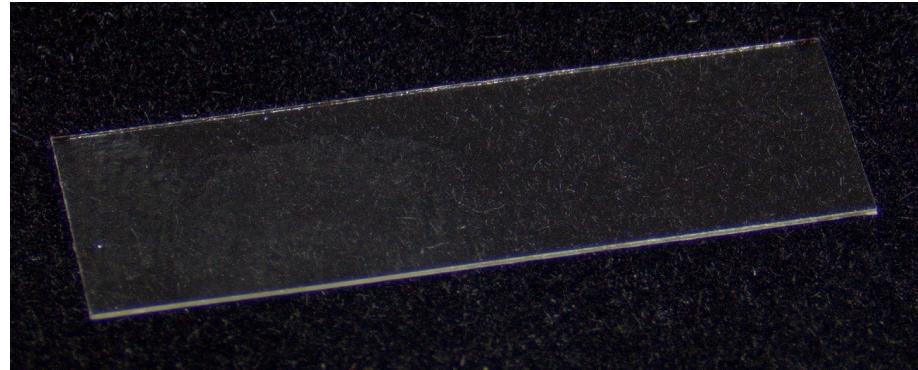
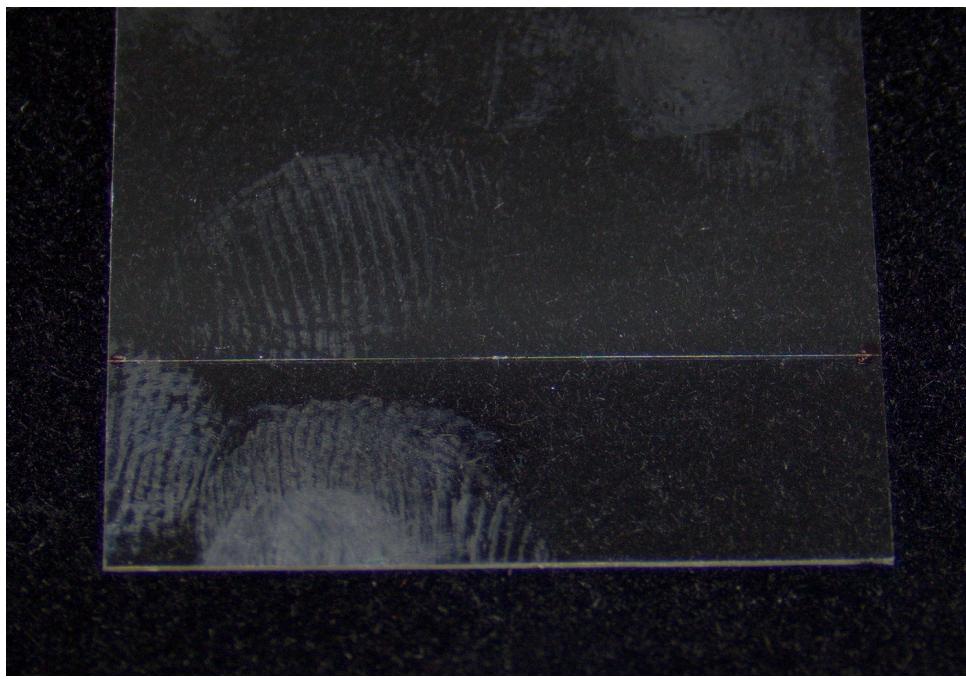
upper

Use a 0.2995" reamer to finish the holes in both subassemblies



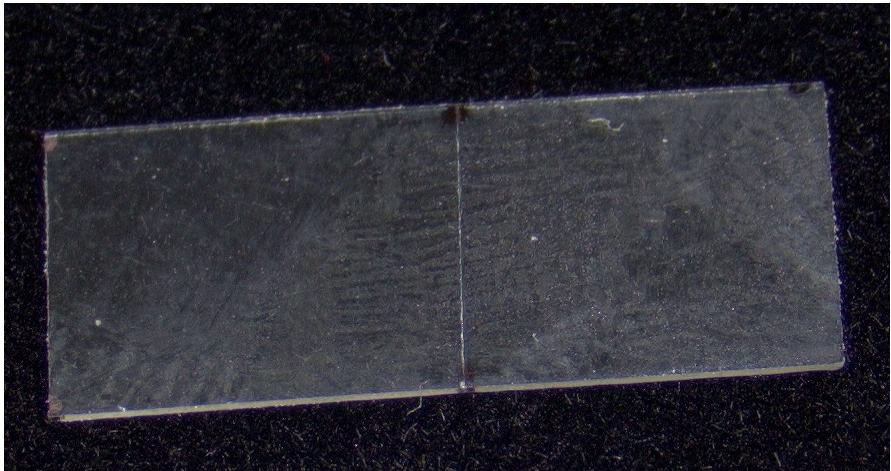
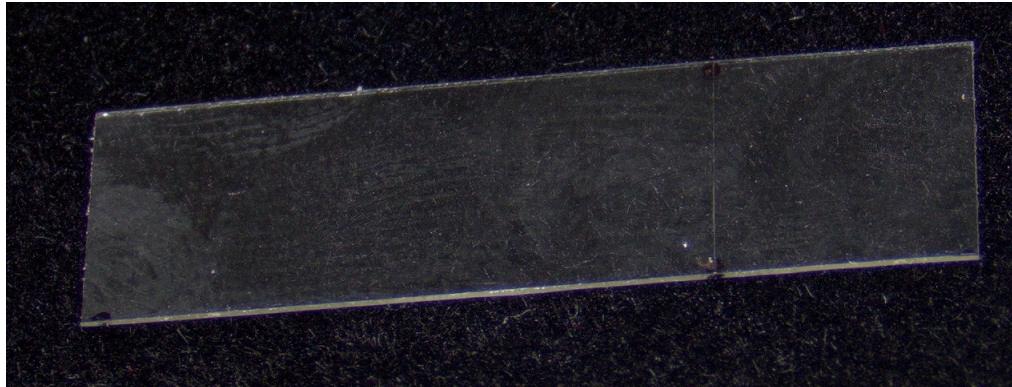
Next we will cut glass coverslips for the lower subassembly. Measure and mark 8.0 mm on both edges of the coverslip, then gently score a straight line with a glass cutting scribe.

With the right scribing pressure, the glass will easily snap in half along the line with just a little bending force. You may need to try a few times before finding the correct pressure.



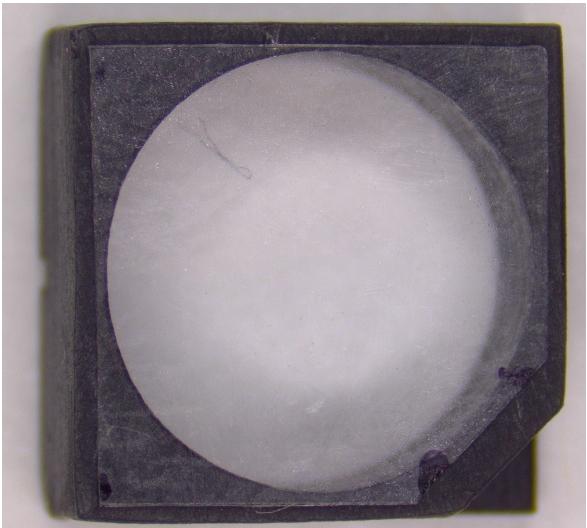
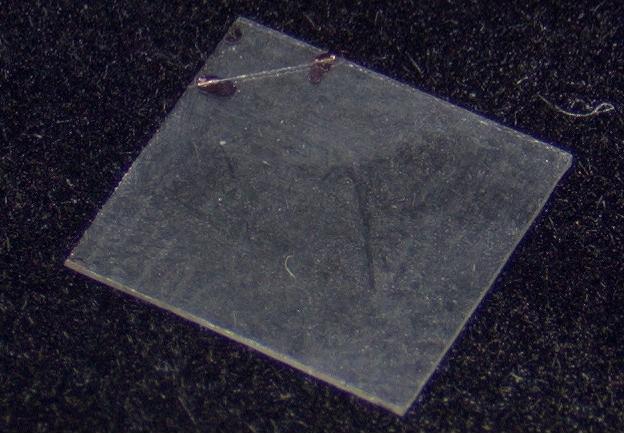
Use the same technique to scribe and snap at two more lines, 7.0 mm and 8.0 mm from the edge.

At the end of this step, you should have two glass rectangles. One 8.0 x 8.0 mm, the other 8.0 x 7.0 mm.

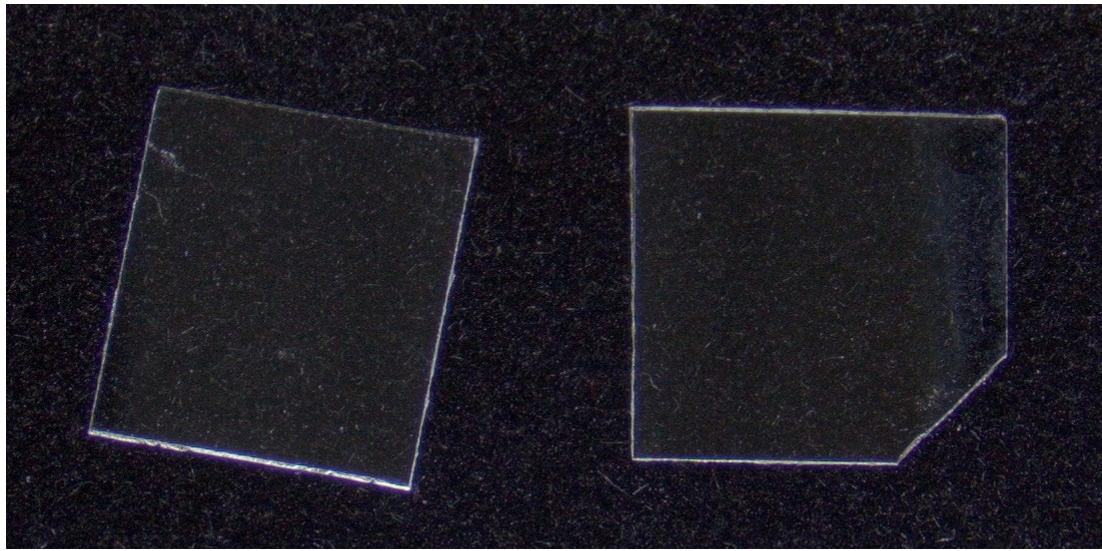


Take the 8.0 x 8.0 mm square and scribe another line diagonally across, starting and ending 2.0 mm from the same corner.

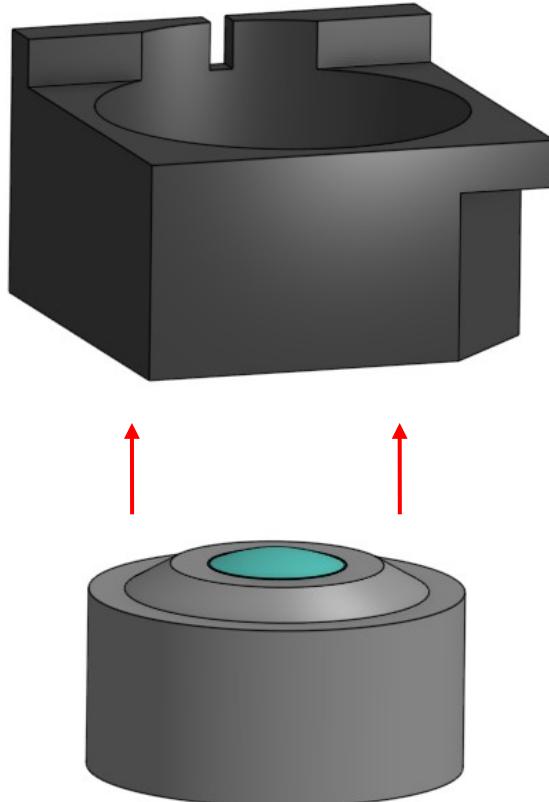
Snap off the corner and check the fit with the lower subassembly 3D print. The glass should cover the entire area of the hole without extending over any of the edges of the part.



Once you've finished cutting the glass pieces, they will be covered in fingerprints and dust. Clean them by first sonicating in Tergazyme or a similar detergent. Then rinse in isopropyl alcohol followed by distilled water and blow dry, being careful not to let water droplets dry on the glass. The finished product should be free of oils and debris in the center where light will pass through, although a little gunk at the edges is practically unavoidable.



Next, insert one of the lens assemblies into the lower subassembly 3D print as shown. Push the lens until the outer black rim is flush with the bottom face of the 3D part. Apply pressure only to the black housing and DO NOT touch any of the lens surfaces.



Lay the bottom coverslip over the lens and attach with 61 optical cement, being careful not to let cement wick onto the lens face.



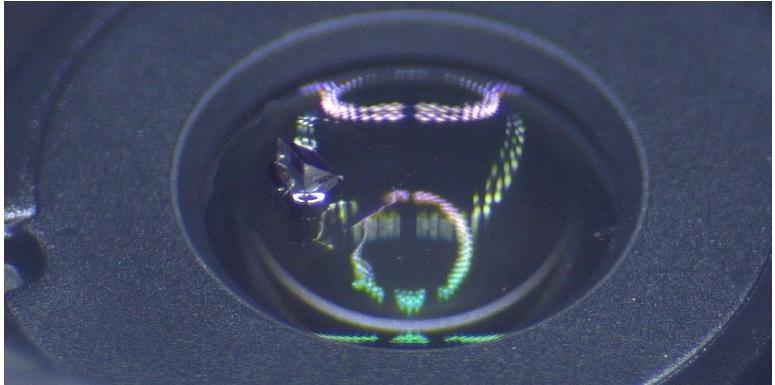
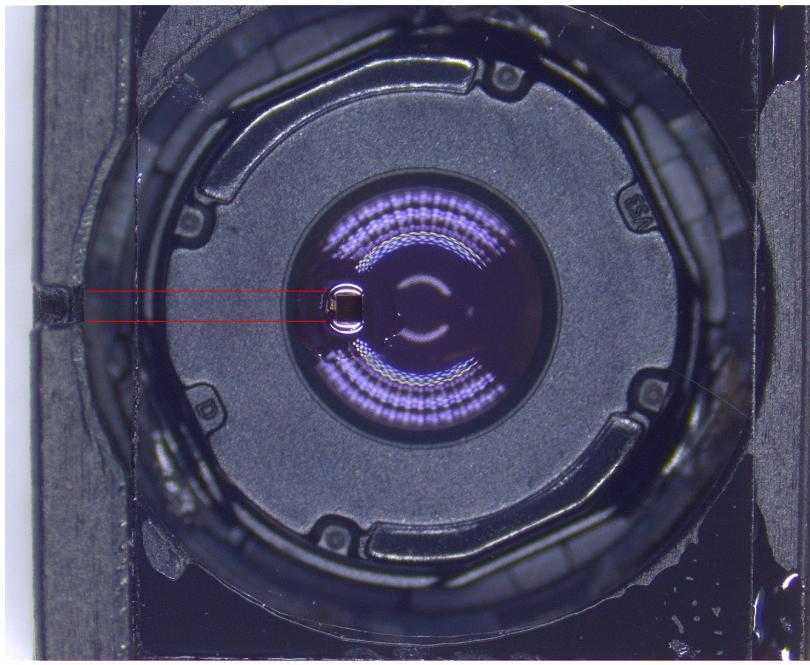
Cover the glass face with First Contact to protect it throughout the rest of the assembly process.



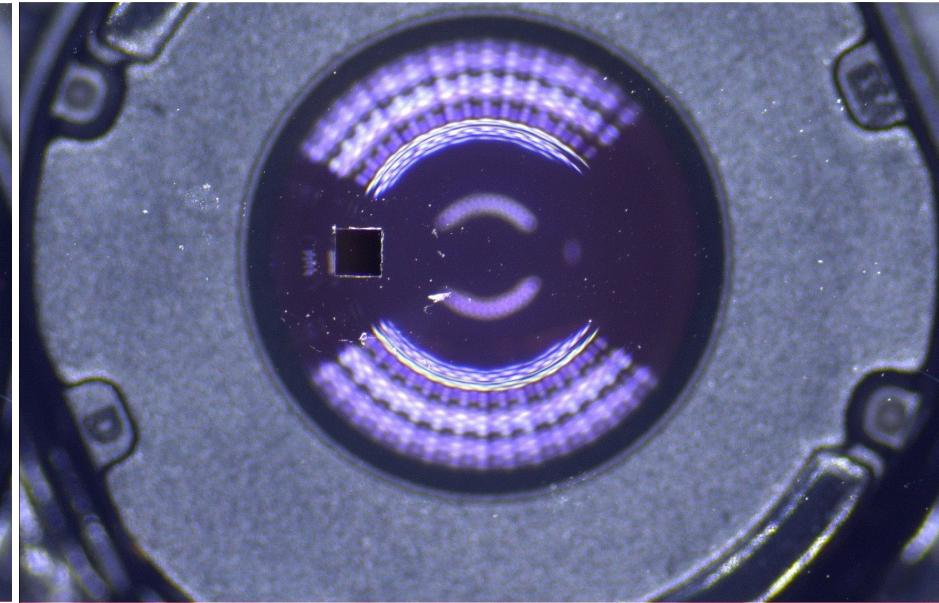
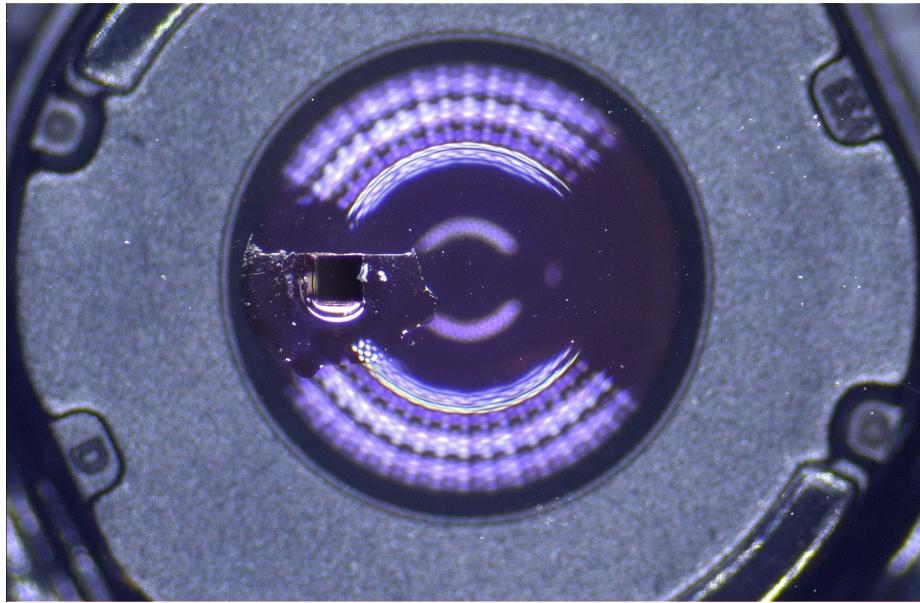
Lay the top coverslip over the top of the assembly and cement in place with 61 optical cement.



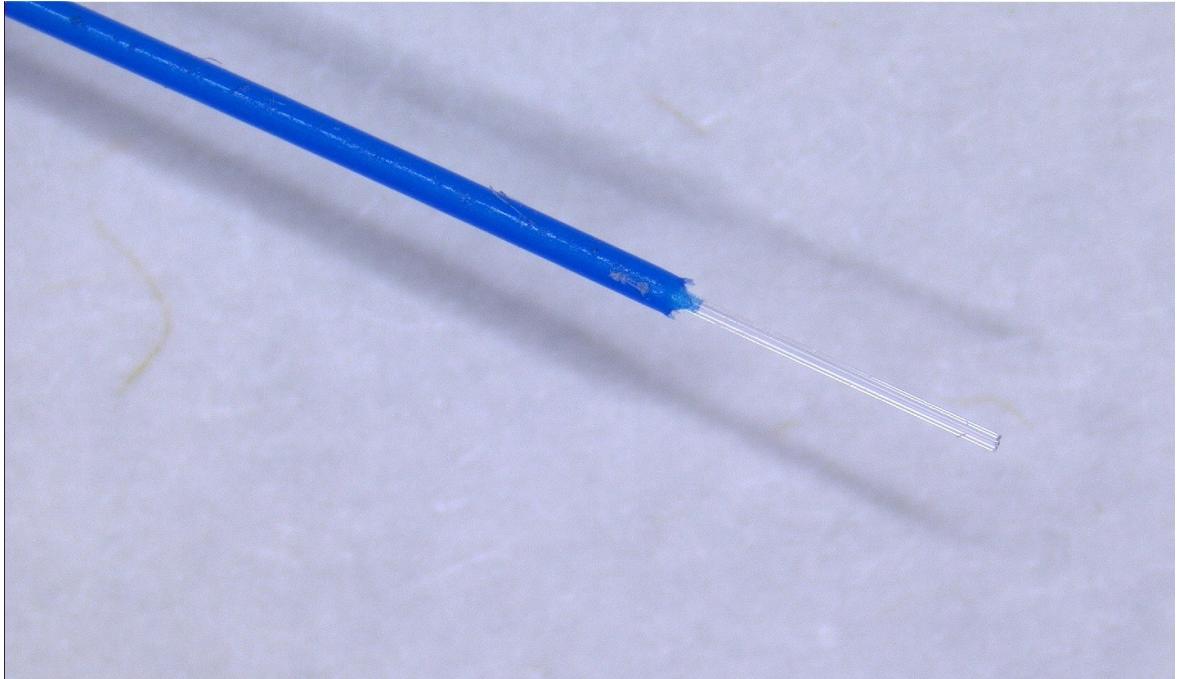
Using a small drop of 61 cement, attach a 300 micron prism to the top coverslip. Make sure the cement layer is thin enough that the prism sits flat against the coverslip. Align the prism with the notch (red lines) and space it approximately 500 microns from the edge of the lens aperture.



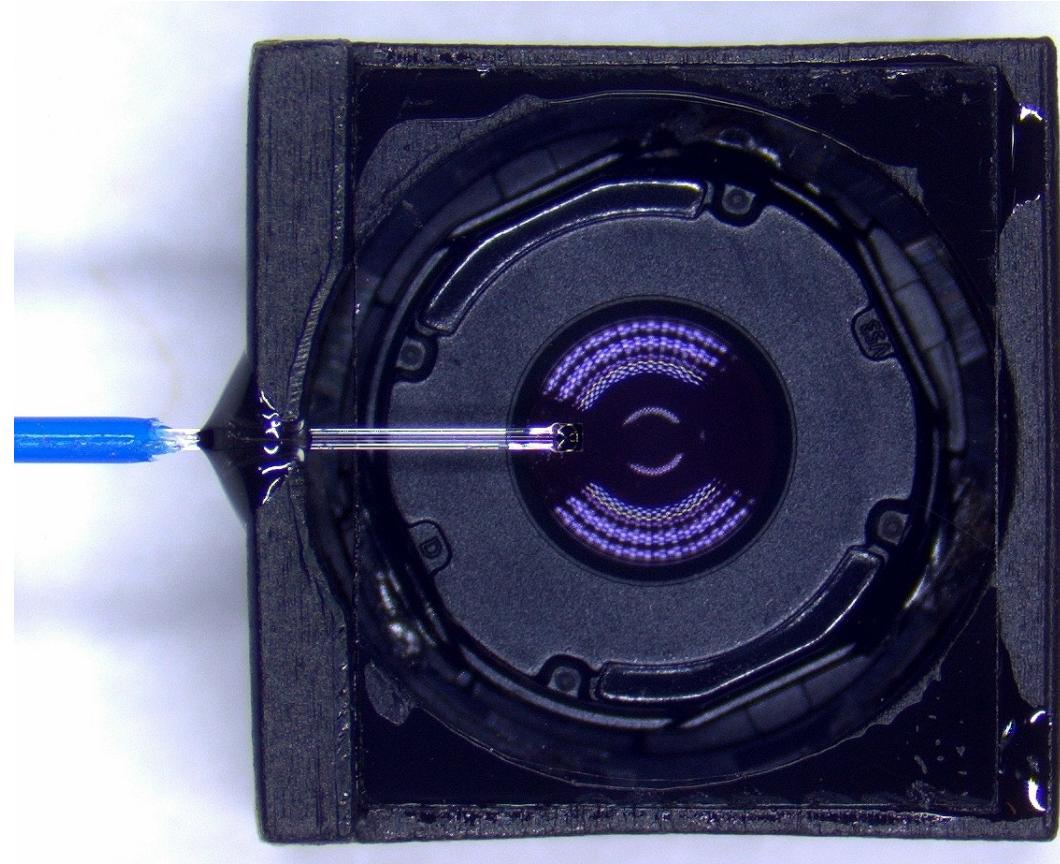
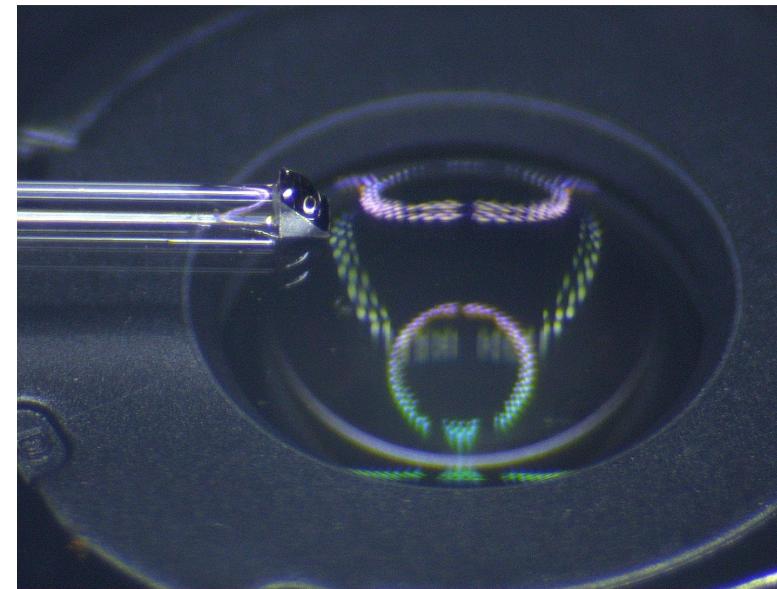
Using a scalpel, carefully cut away the excess optical cement around the prism.
Take care not to chip the edges and corners of the prism with the scalpel blade.

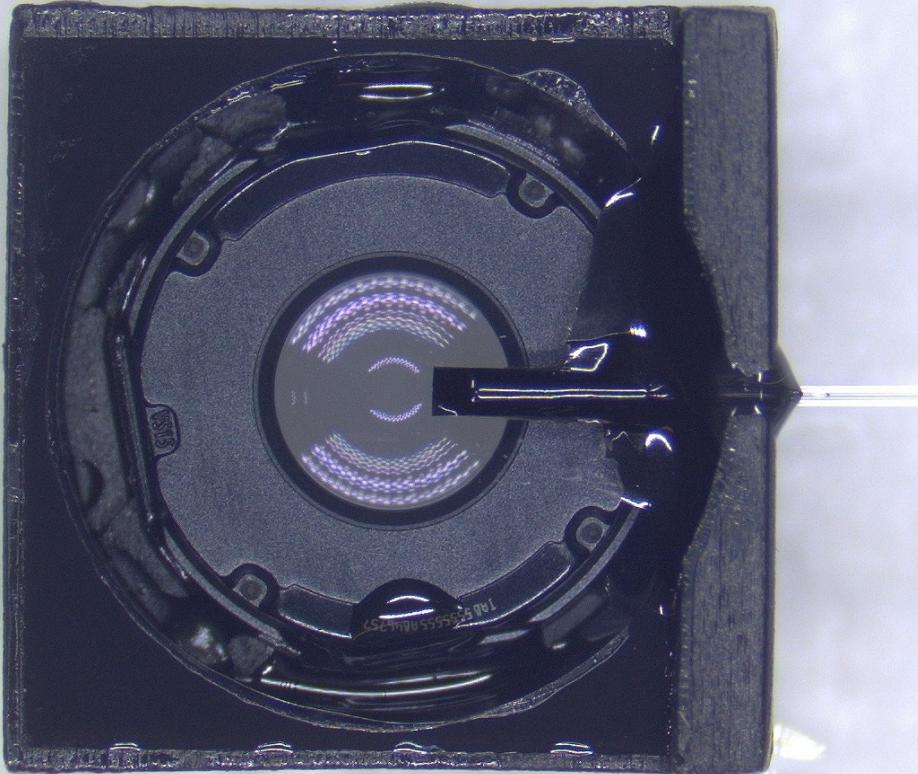


Strip about 10 mm of jacket from the 200 micron optical fiber, and then cleave the fiber using a ruby or ceramic blade leaving 5 mm of exposed fiber.



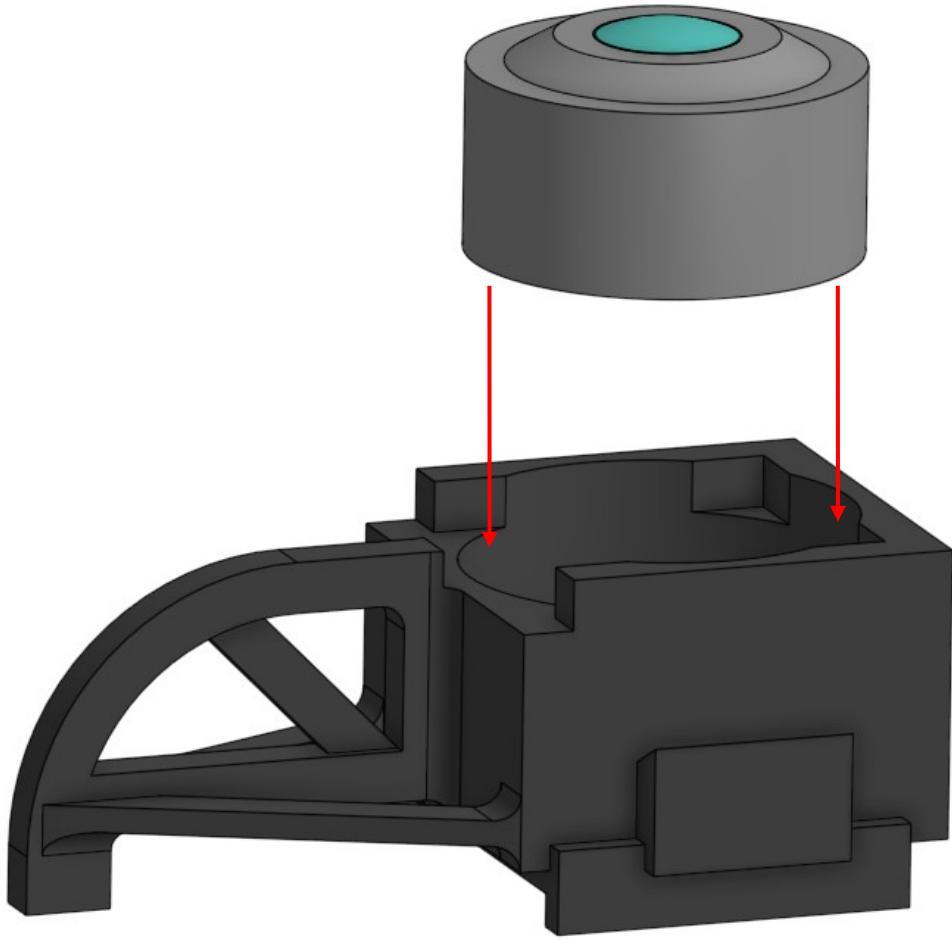
Align the fiber such that the front face is contacting the prism and the bottom is flush with the coverslip. Apply 63 cement to the notch in the 3D part, and 61 cement to the interface between the prism and fiber.



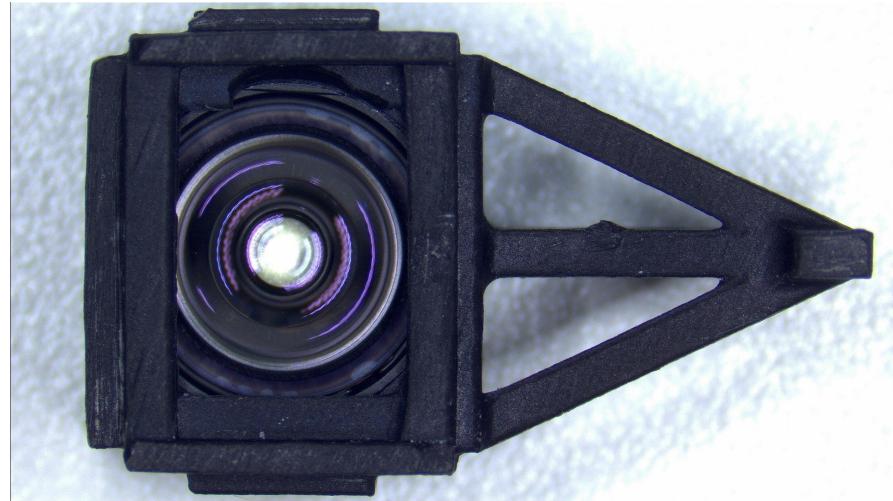
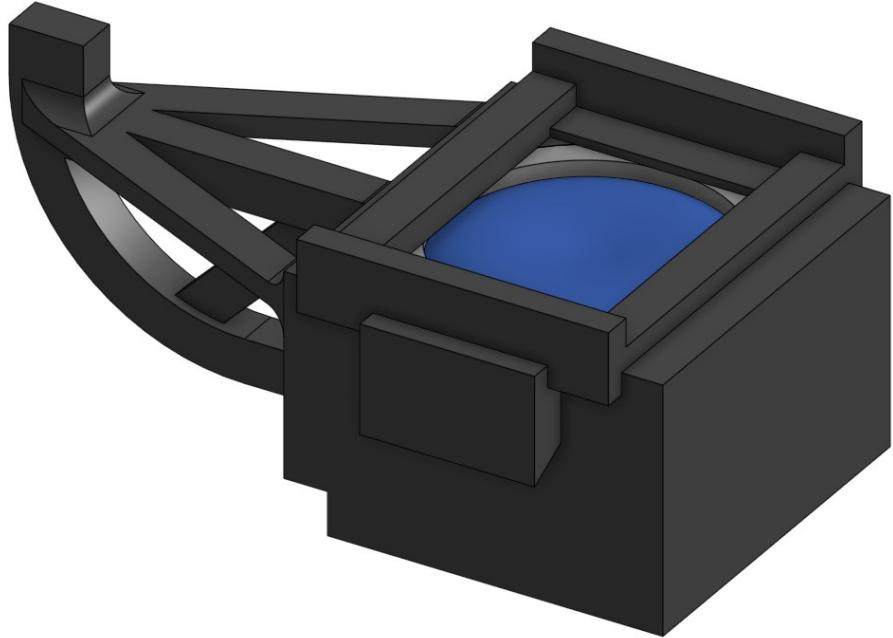


Apply nail polish to prism-fiber assembly

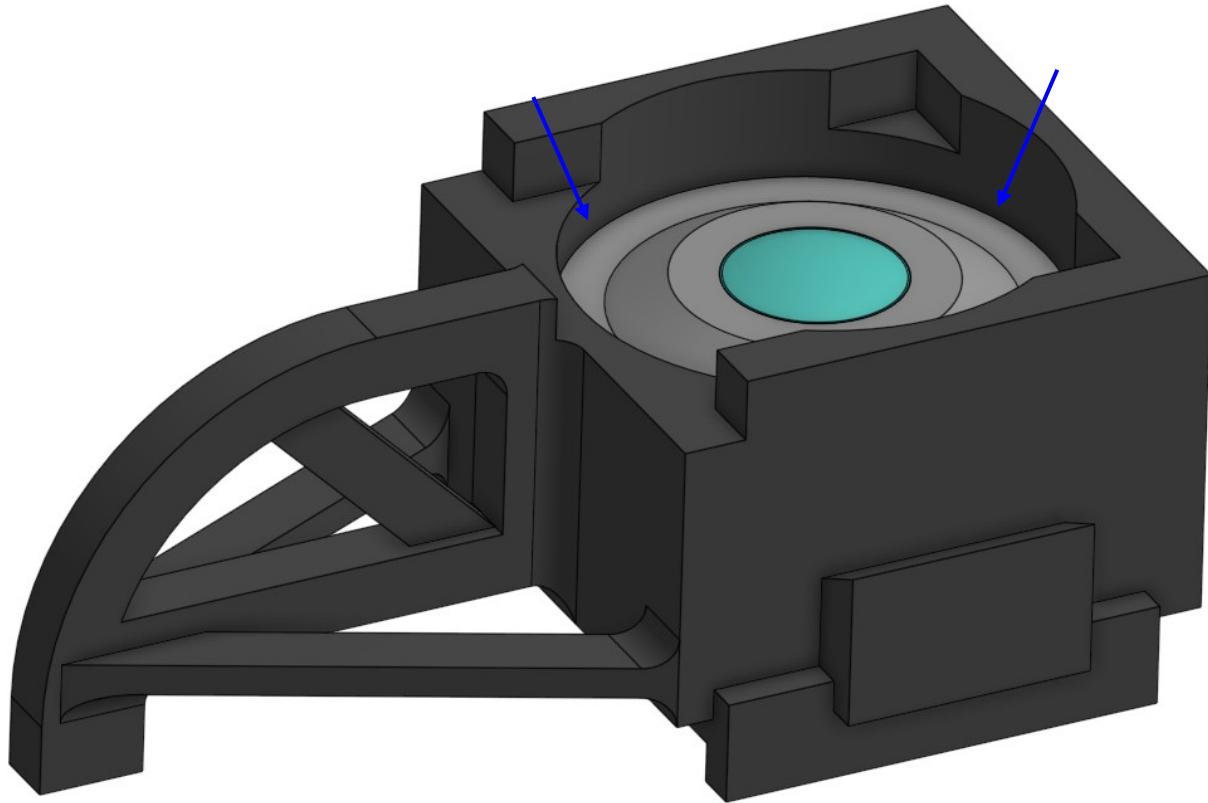
Trim nail polish using scalpel to leave ~500 micron wide strip



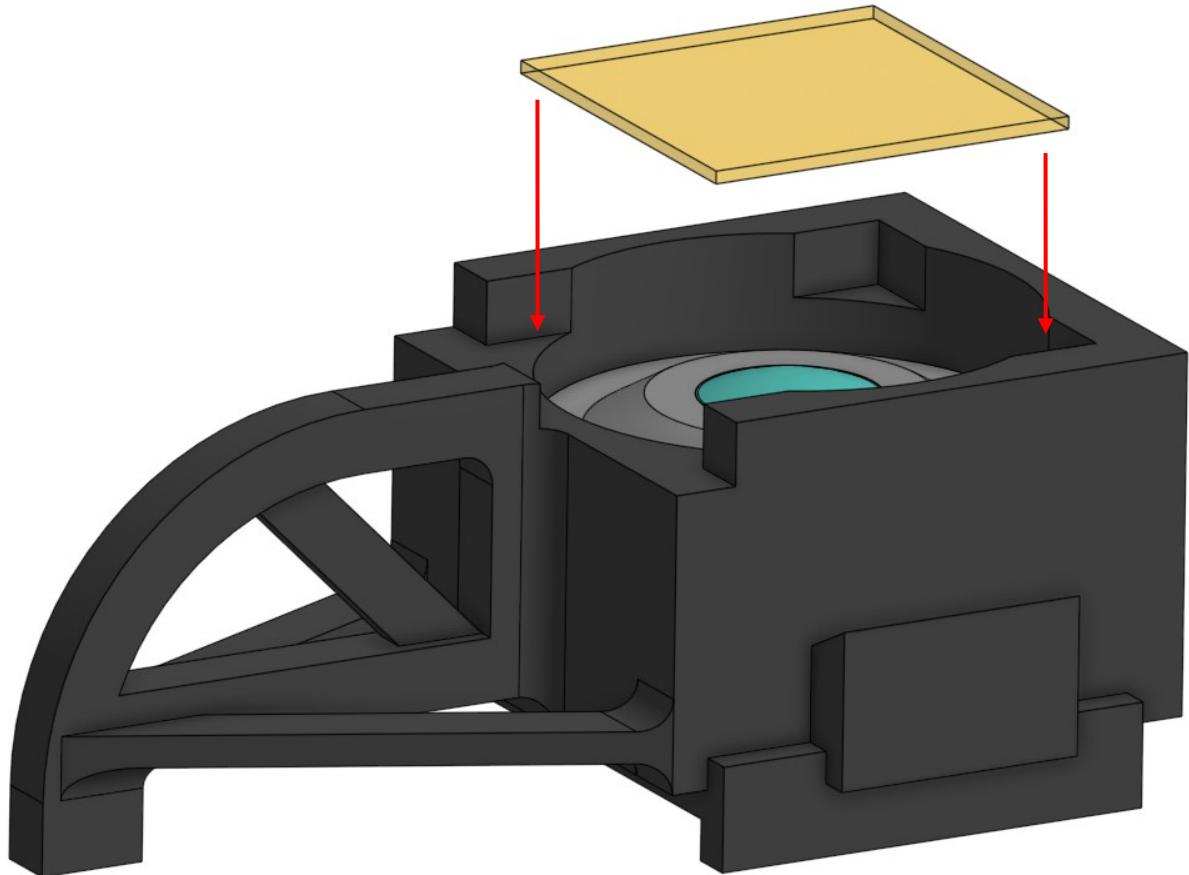
Ream the hole in the upper assembly being careful not to punch through the top lens stops.
Insert tube lens into upper subassembly



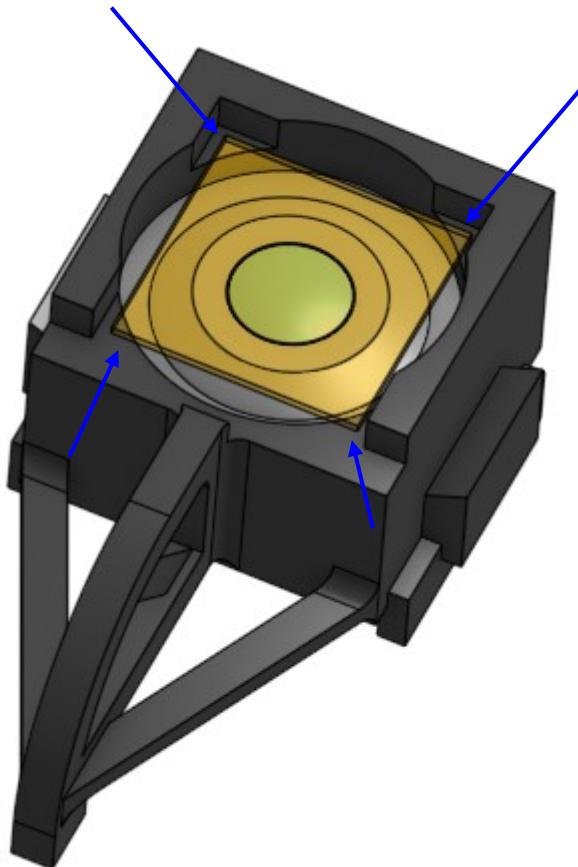
Ensure edge of lens assembly is
flush with inner lip



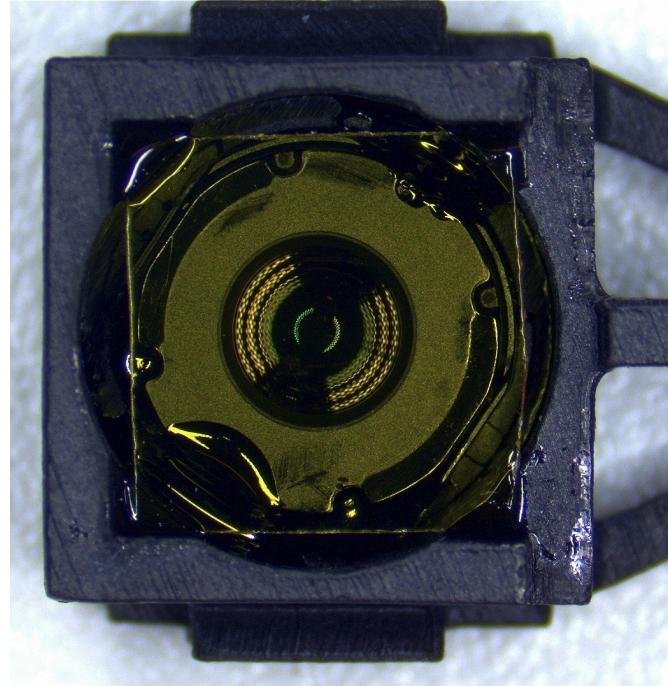
Apply 63 cement to interface

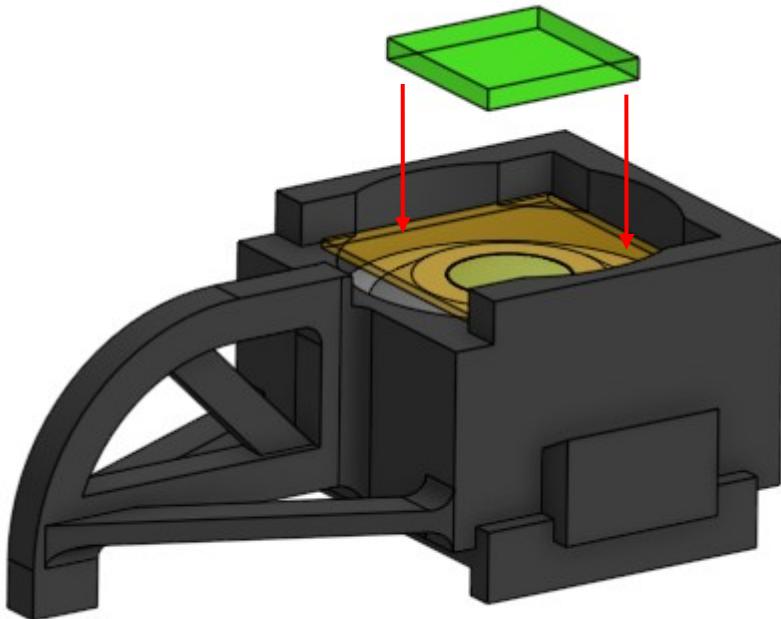


Cut wratten filter from large sheet. Align wratten filter with body

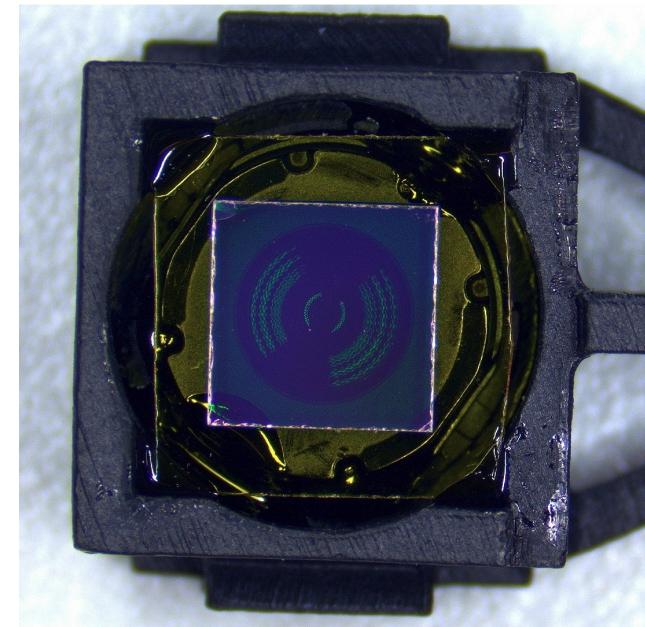


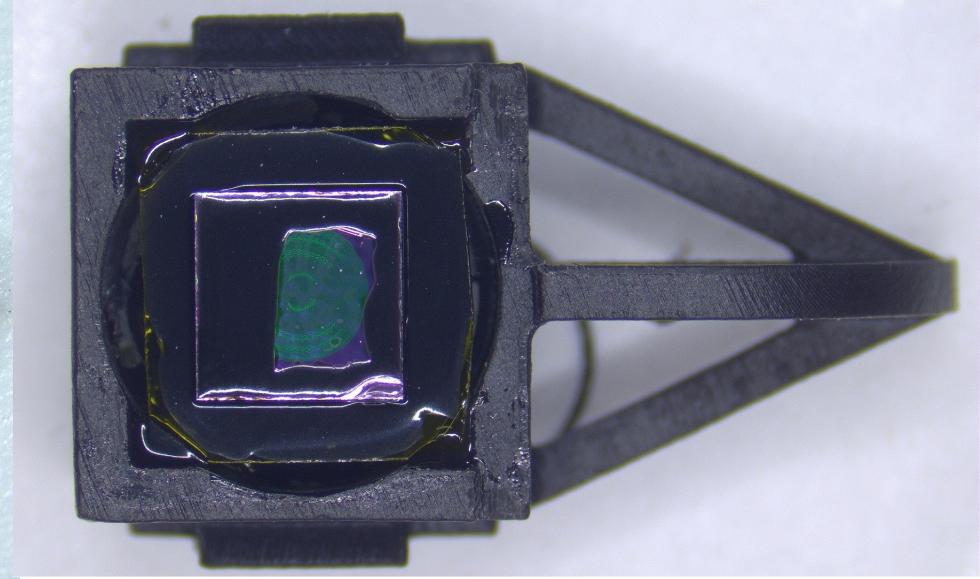
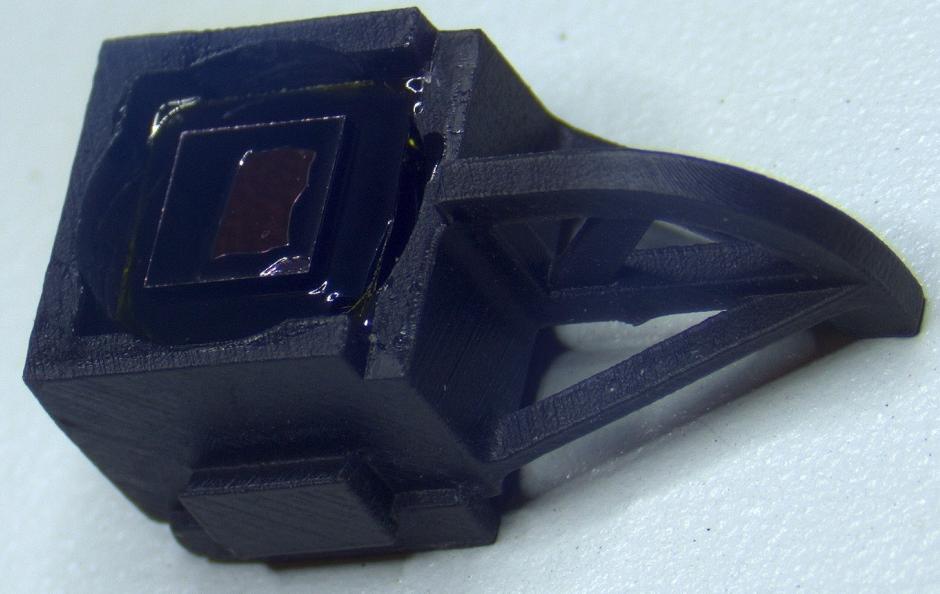
Apply 63 cement to corners



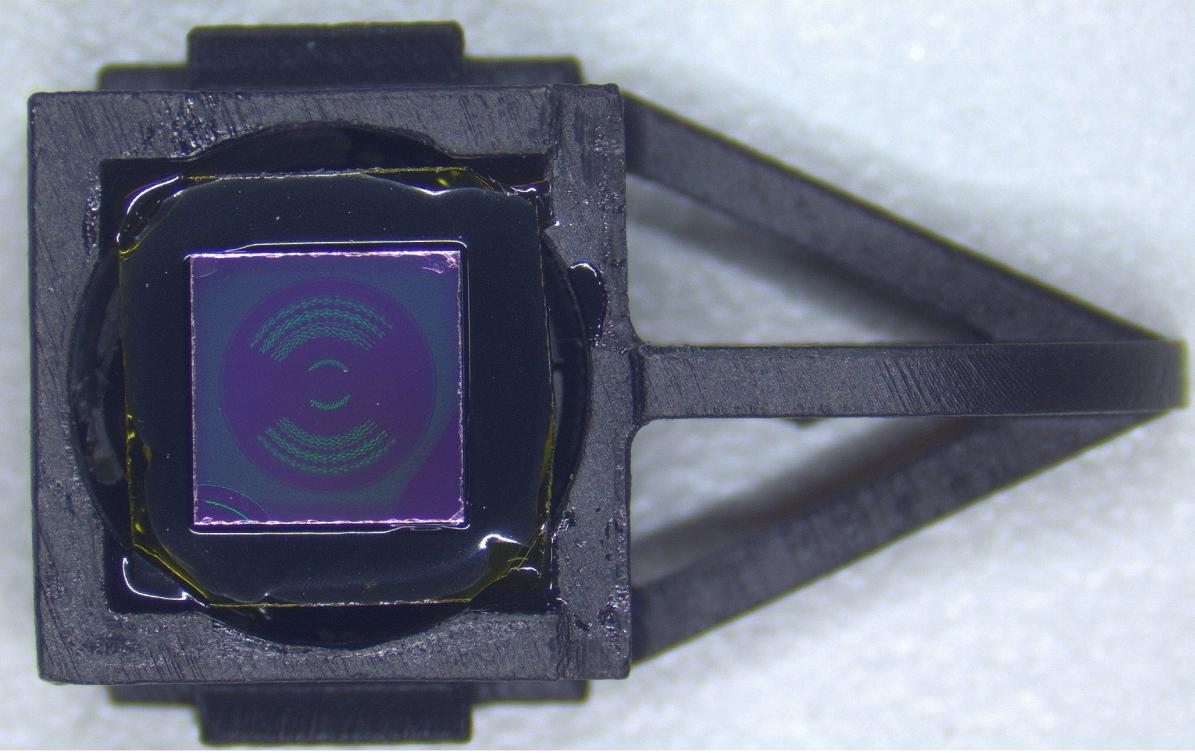


Align dielectric filter with lens aperture. The coating should face away from the wratten filter. Adhere with 61 cement

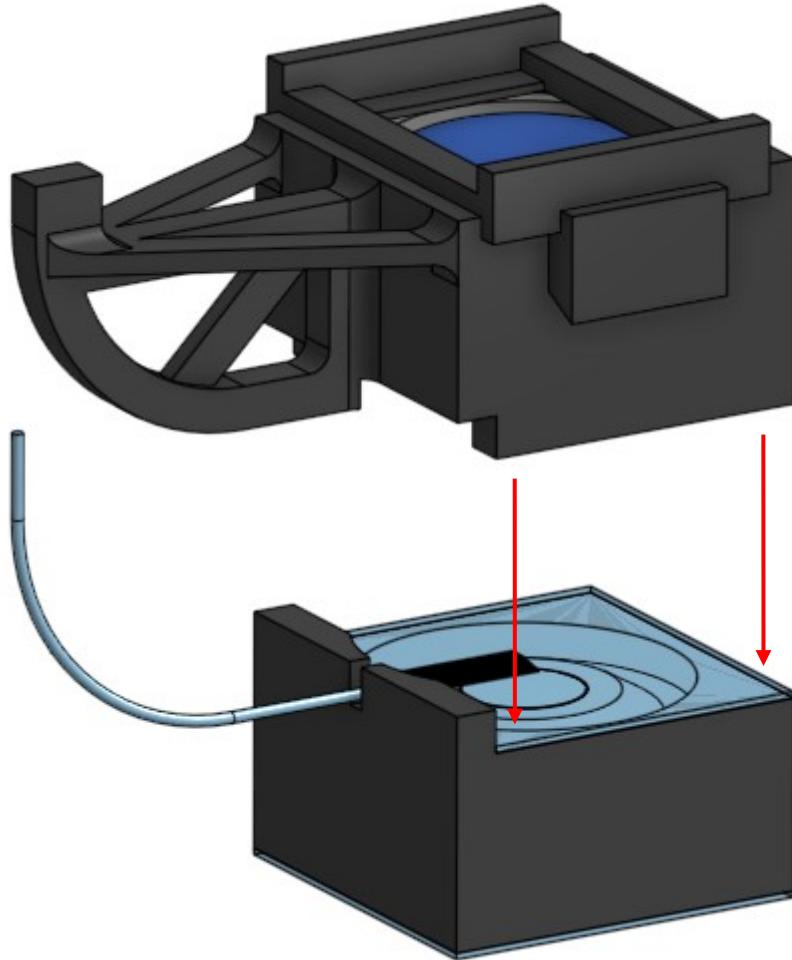




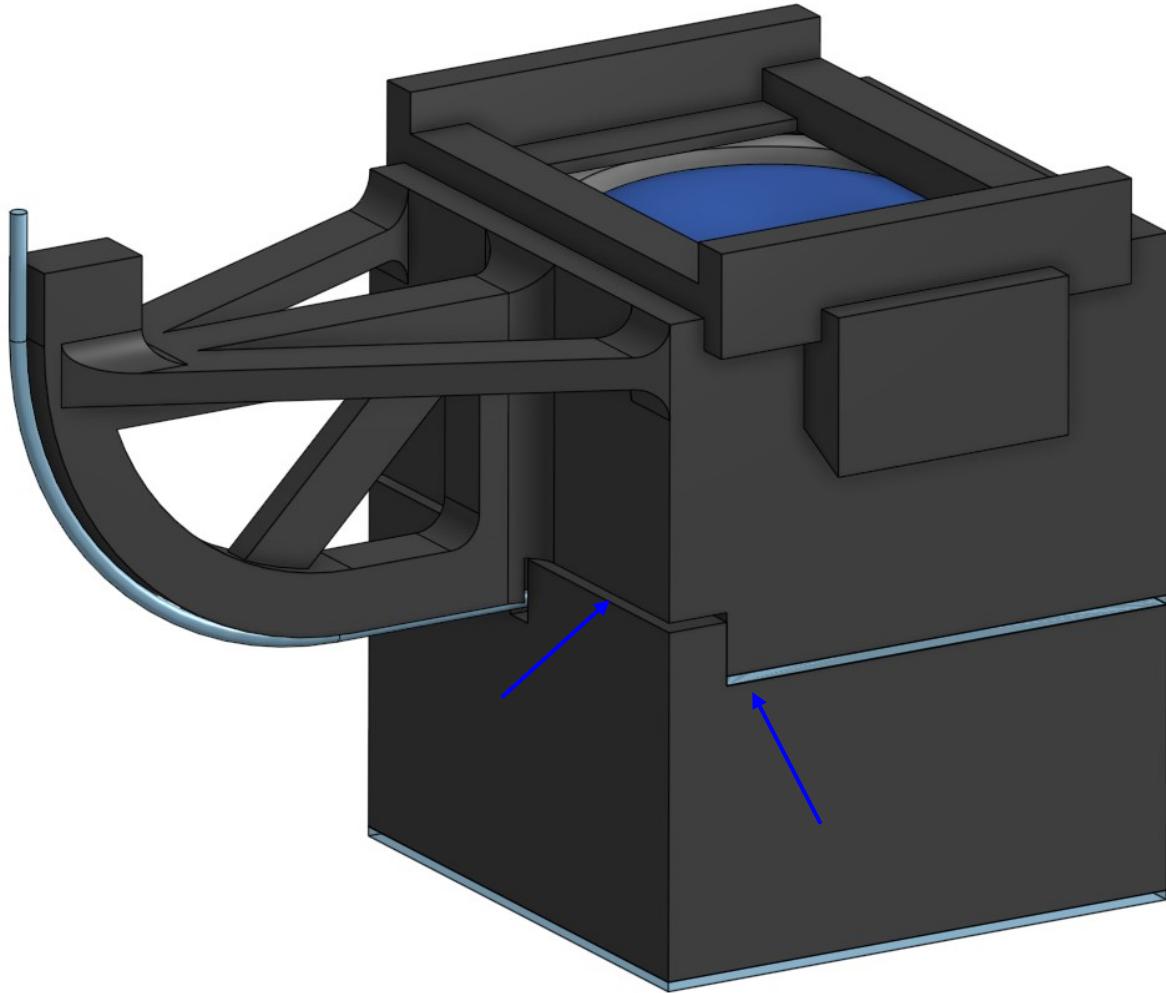
Apply first contact to top face of
dielectric filter and let dry, then
coat sides of filter with nail
polish



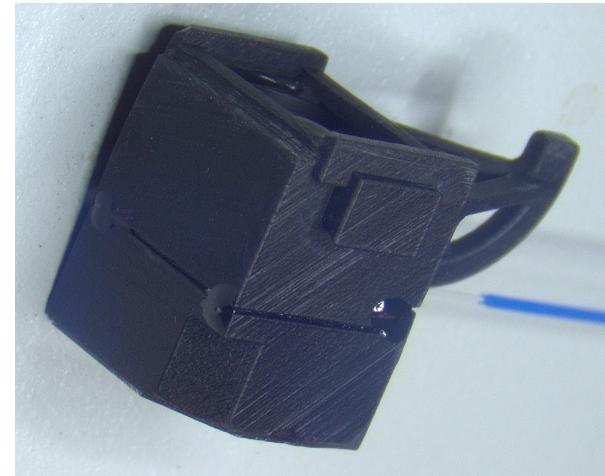
After nail polish has dried,
remove first contact from filter

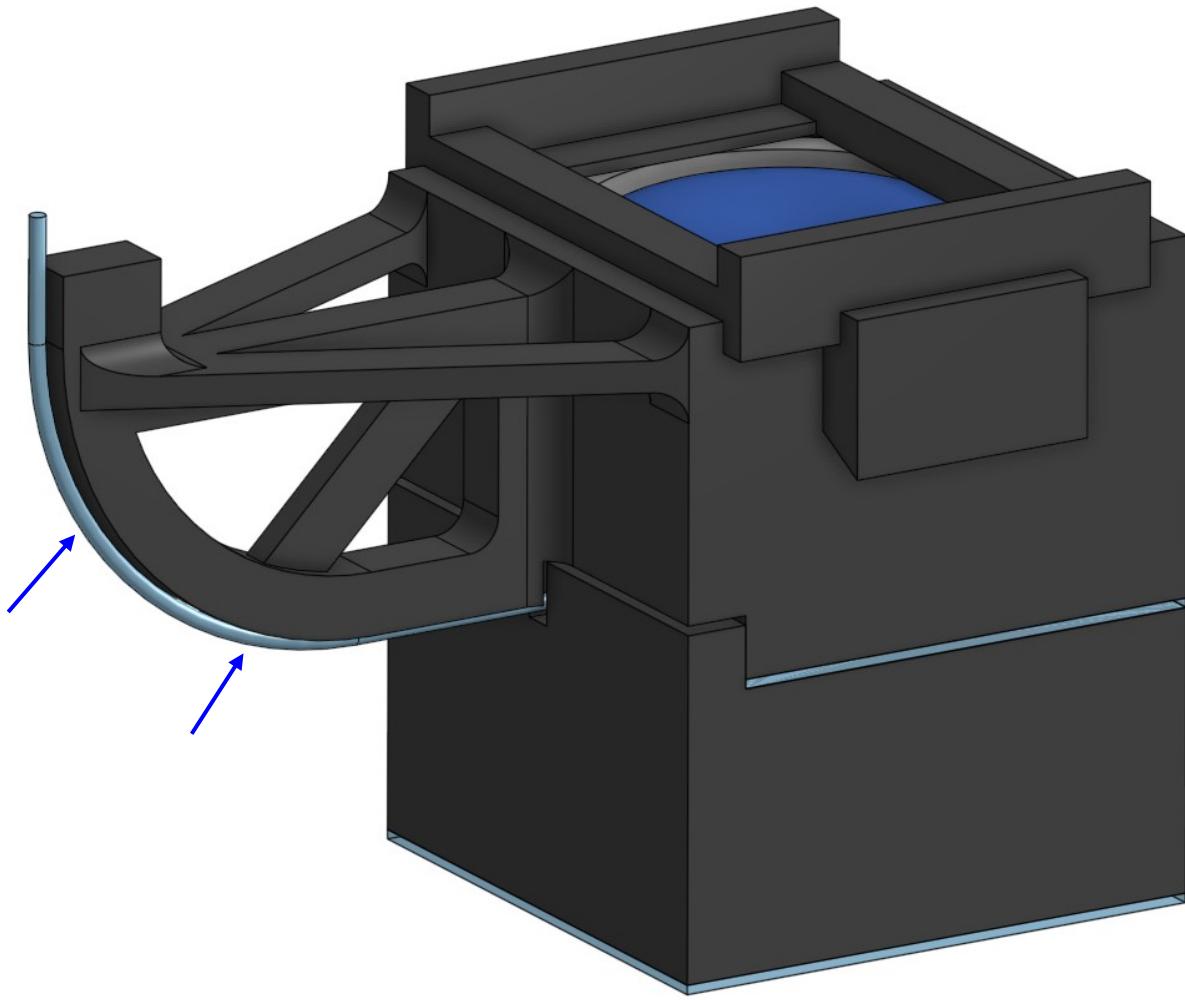


Align the upper and lower
subassemblies

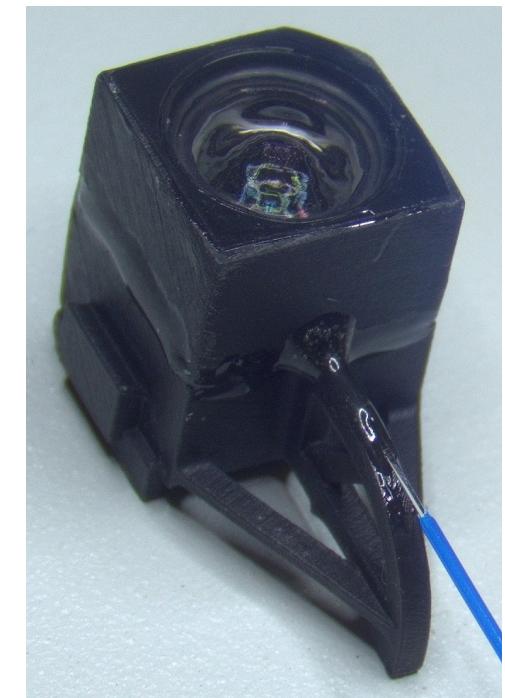


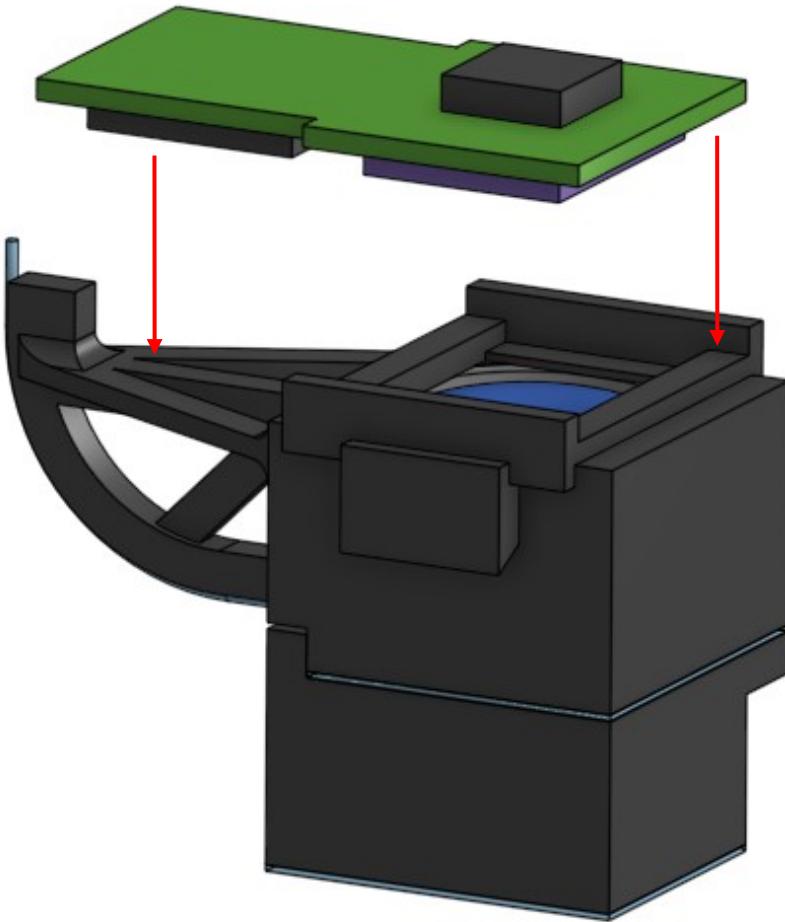
Apply 63 cement along the entire length of the interface between subassemblies



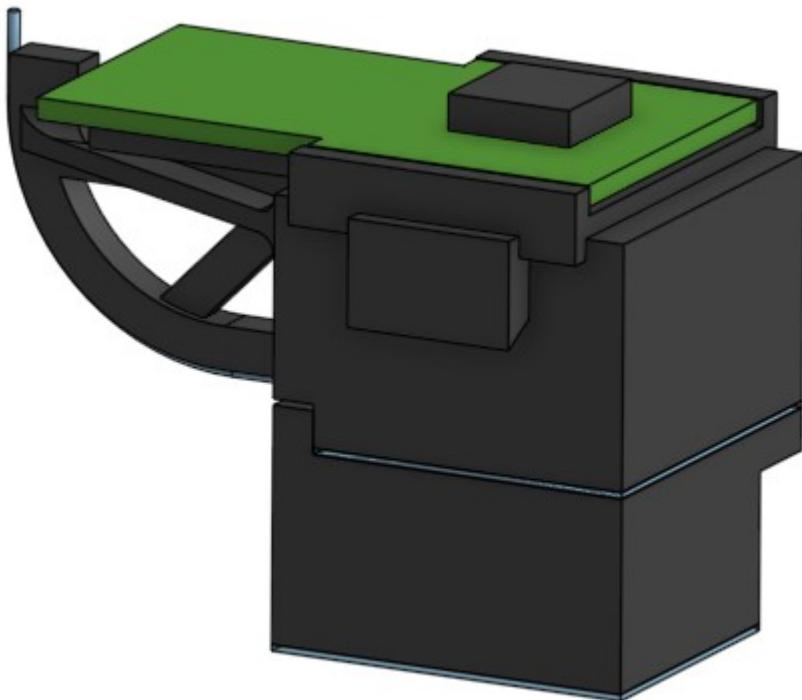


Cover fiber-support interface
with 5 minute epoxy

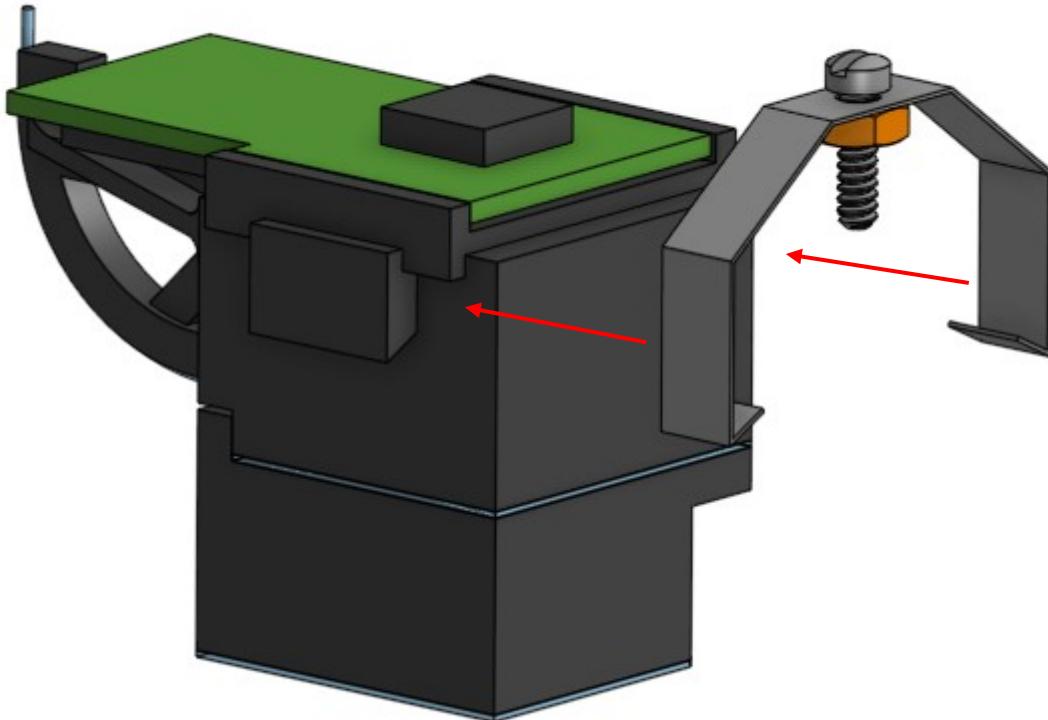




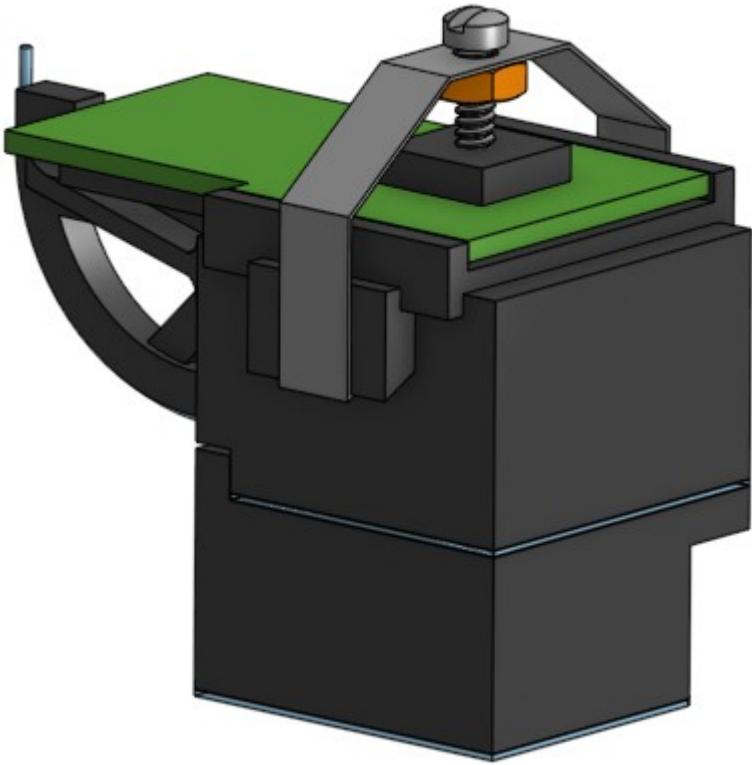
Align PCB with body



After installation



Slide focus bracket onto side ledges



Assembly complete