

DFPS

Detector Harness Production Guide

Fibers needed:

- Big detector - Optran UV (H)
- Small detector - Optran UV (M)
- Guide - Optran WFGGe (L)

Fiber Types

GUIDE

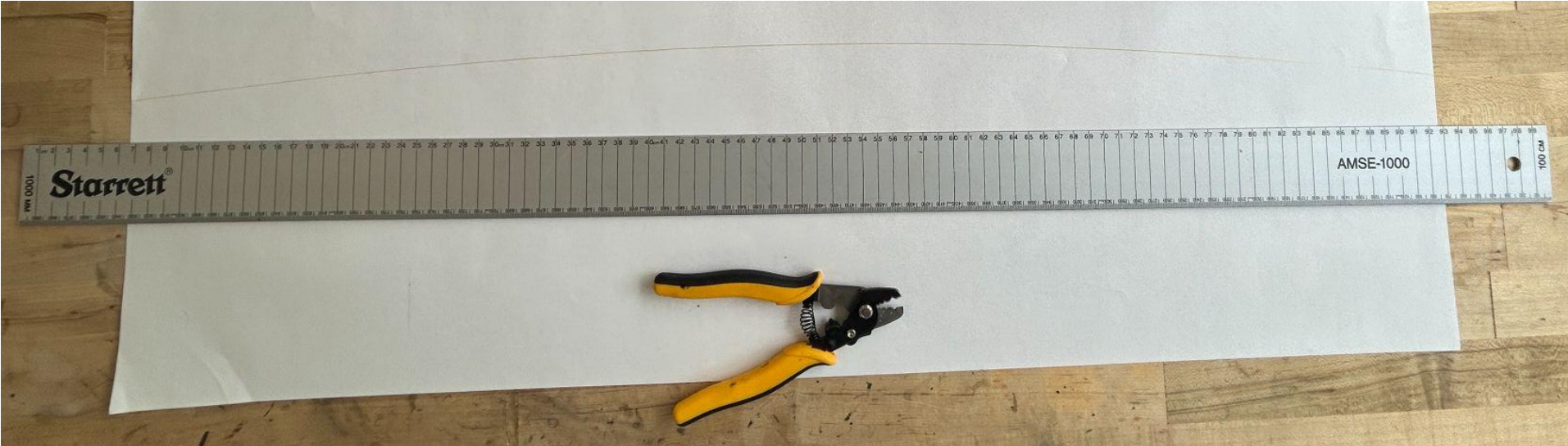
DETECTOR 1

DETECTOR 2

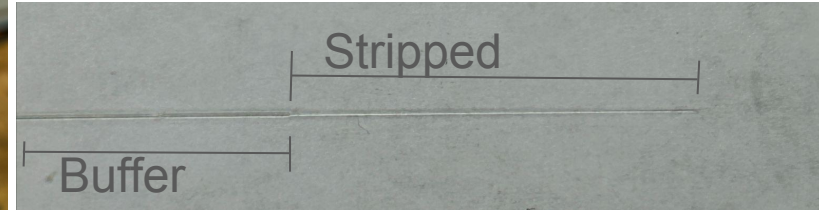
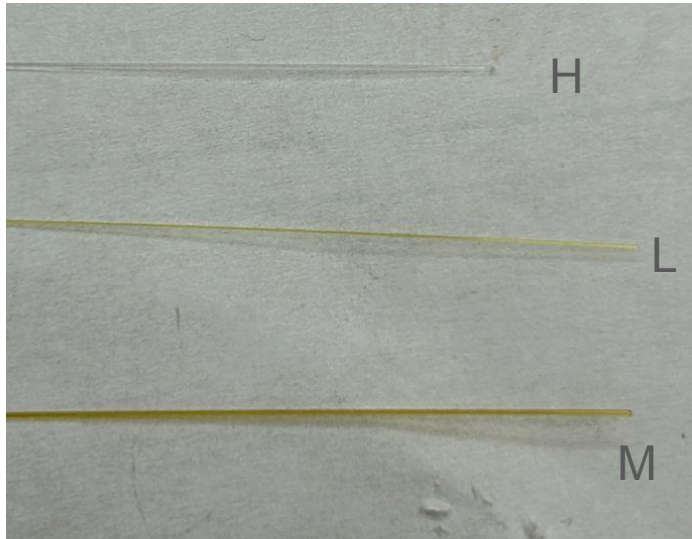


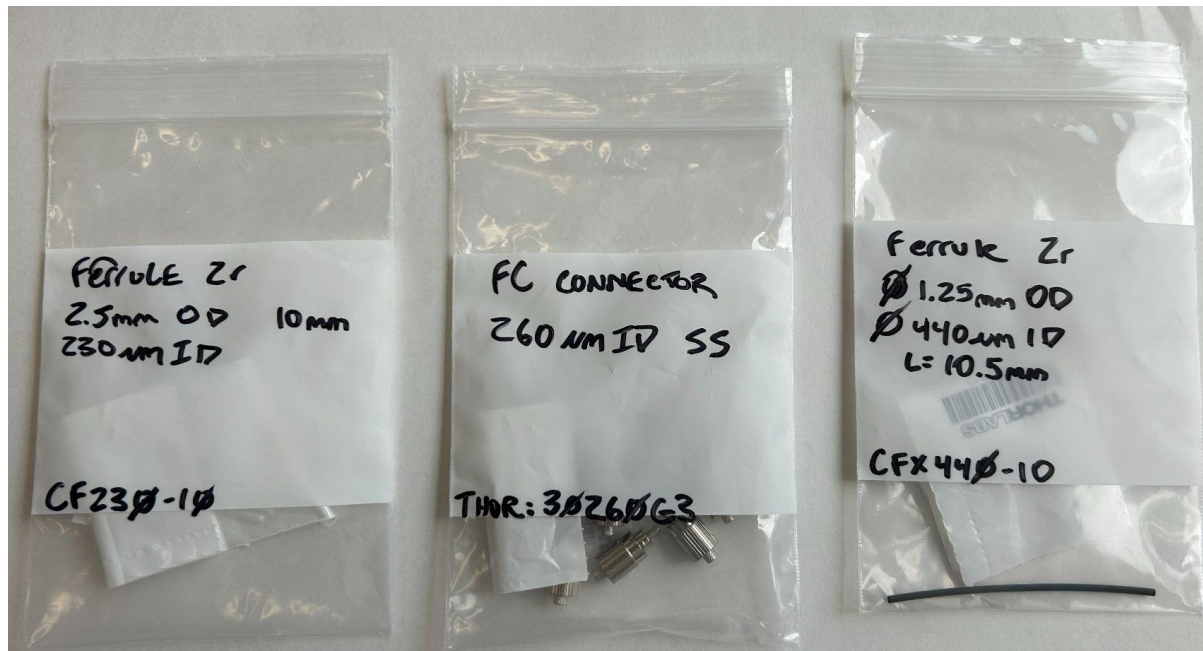
	name	jacket	core (um)	clad (um)	coat (um)	NA
H	Optran UV (1)	none	105	125	250	0.12
L	Optran WFGGe	none	100	110	125	0.37
M	Optran UV (2)	none	200	220	245	0.12

Cut each fiber to a little over a meter to give yourself extra fiber length in case it breaks



Strip 3 cm of buffer off one end of Fiber H. It will not fit in the ferrule with the two other fibers unless it is stripped.



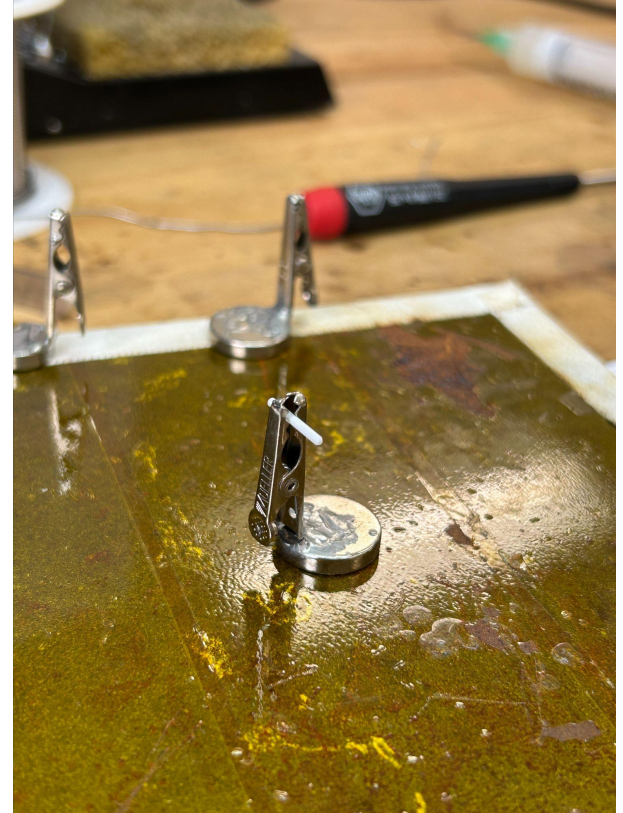


Guide fiber L will require you to remove the ferrule from one of the flanges we have in house and replace it with a 230um bore bare ferrule
#CFX230-10

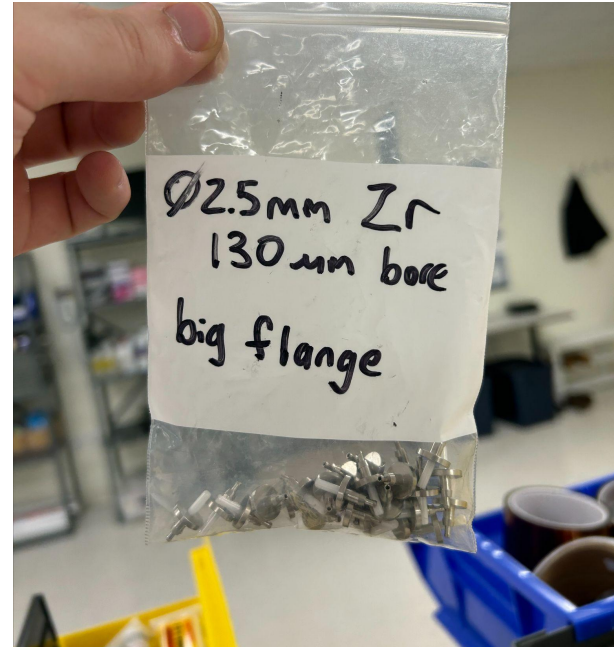
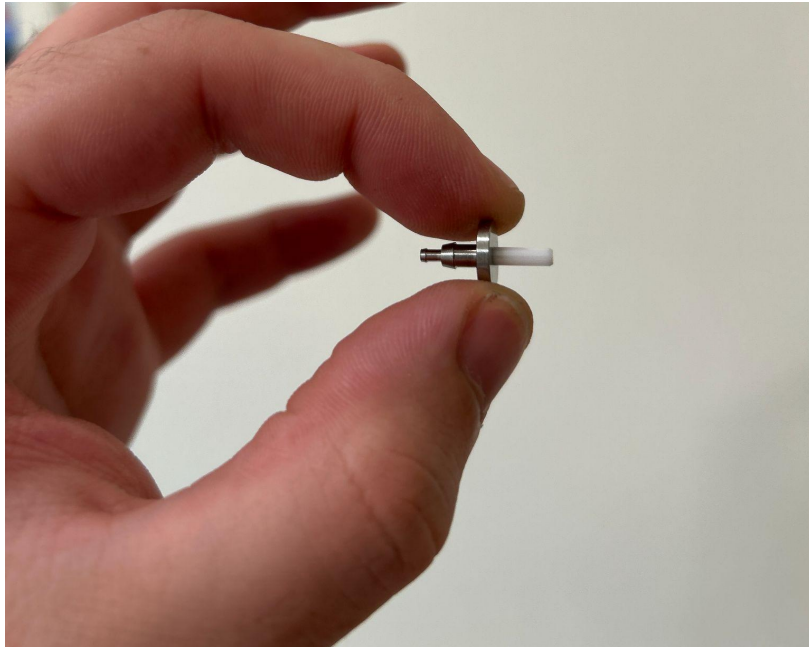
Detector fibers H and M have a 260um bore FC termination on one end
#30260G3

The opposite end of each fiber goes into the 440um bore of ferrule #CFX440-10

Hold the 440um bare ferrule in a magnet clip on one end of the steel plate, prepared for epoxy.



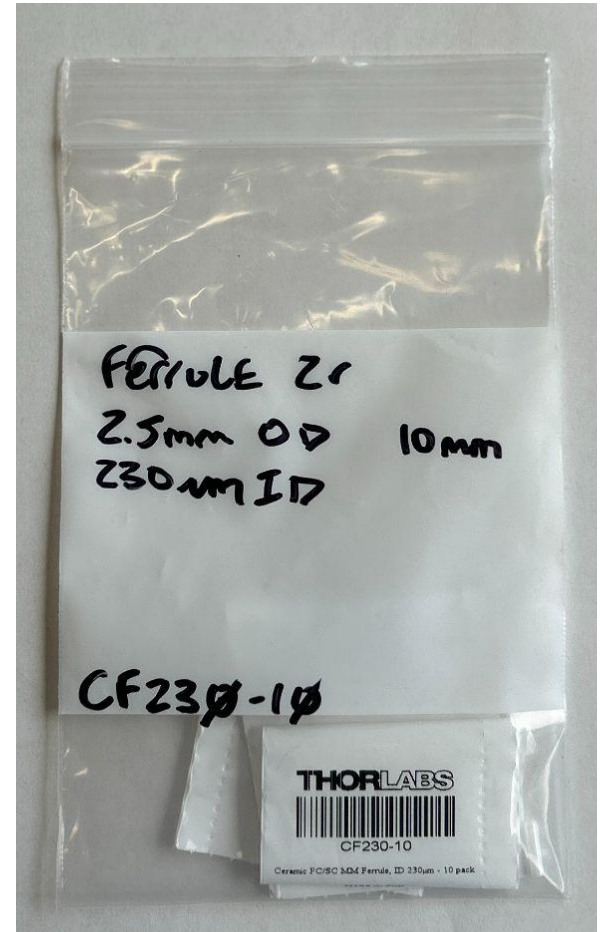
Get one of these flanges from our component library. You will need to remove the ferrule that is already in it and transfer our 230um bore bare ferrule into it.



Clamp the flanged ferrule in the vice and gently grip with pliers, being careful not to apply too much force as the ferrule can crack. Pull up while twisting and the ferrule will come out of the flange.



This is the ferrule we will be replacing the discarded ferrule with



Take the flangeless ferrule, align it in the flange, and gently press-fit it in with the vice. Hold the flange next to an untouched one to make sure the ferrule has been pressed in as far as it can go.



Put all three ferrules on steel plates held by magnetic clips, on the opposite side of the 440um bore ferrule. You are now ready for the epoxy application.



Inject JB Weld or DP270 into the flangeless ferrule with a 23 gauge syringe through end with the larger bore. Ensure that you can see epoxy coming out of both ends and then carefully slide in all 3 fibers starting with the largest and ending with the smallest. If you have trouble getting the last fiber in, gently twist and apply pressure until you can see all three fibers extruding out the tip by 1.5 cm.



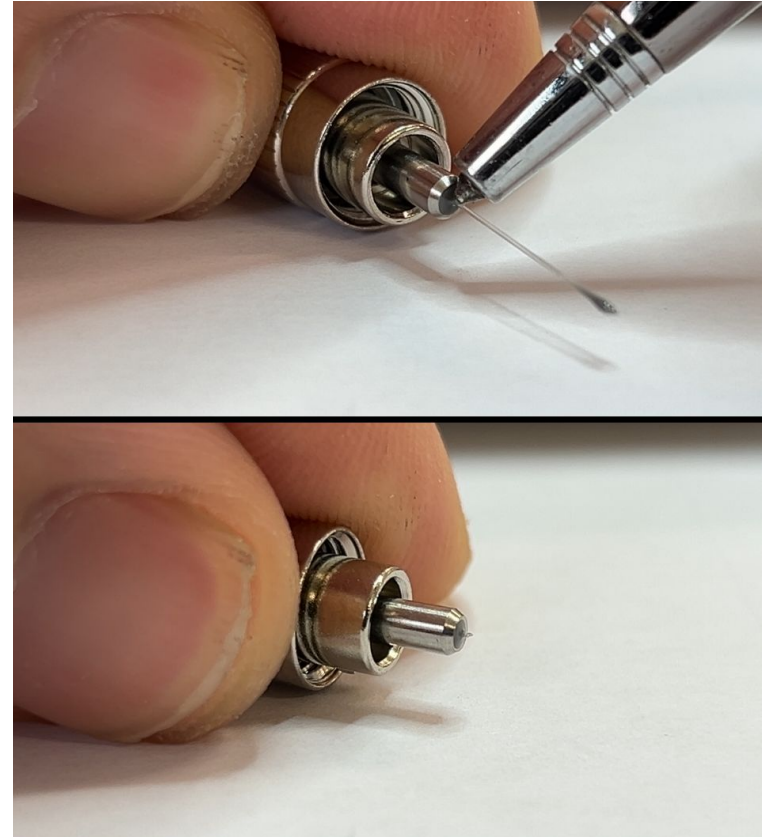
Do the same for the other three ferrules. Fill each with epoxy and slide the fibers into their respective flanges, again making sure glue comes out with the tip of the fiber. Space out the magnets so none of the fibers touch each other's epoxy. They should all slide in easily. Let them cure overnight.

*Align the ferrules pointing downward in the magnet clip making sure that they cannot slide out of position from the weight of the other end of the fibers.



Leave the curing steel plate on a large sheet of white paper so that people can clearly see that there are fibers curing on it. Try to put these on a desk that nobody will be using.

Now we will polish the cured fibers. All of them should be protruding from the ferrule, glued at the tip. Using a diamond scribe, gently scrape the fiber until it can be wiggled and pulled off. You must make this cut as close as possible to the face of the ferrule, preferably at a spot where there is a build up of glue as this seems to partially protect the fiber from damage. You want to avoid cracking the fiber into the ferrule.



Scoring the fiber and pulling it off on an FC connector ferrule

Once the fiber has been cut down, we “air polish” with 15um polishing paper. Hold the paper in the air in one hand and the ferrule in the other. Gently sand down the glue and fiber nub until you cannot see the fiber extruding from the ferrule, there will just be a layer of glue. If you practice enough you are able to remove the glue residue with a scalpel, exposing another 0.5mm of fiber that should be air polished down. Keep doing this until your ferrule looks like this:



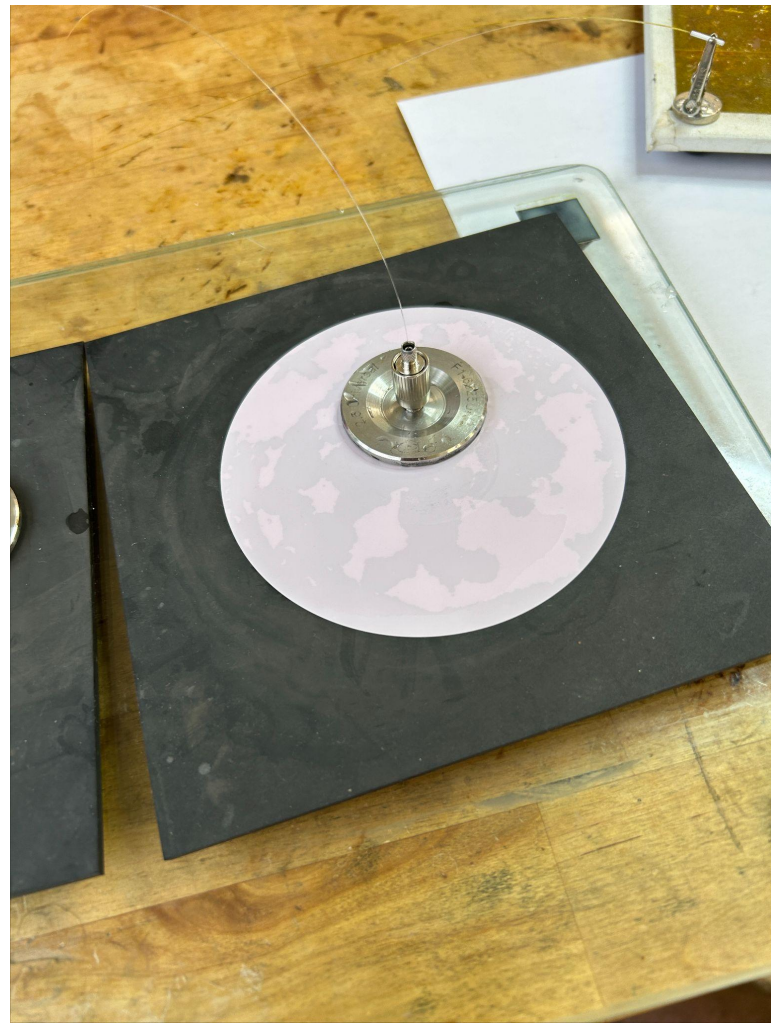
Set up your polishing station:
Two rubber pads on a piece
of glass. One will have 3um
polishing paper and the
other will have 1um polishing
paper. Get a puck and wash
it clean, and wet the
polishing paper. Once wet
the waxy side of the paper
should be put on the rubber
pads.



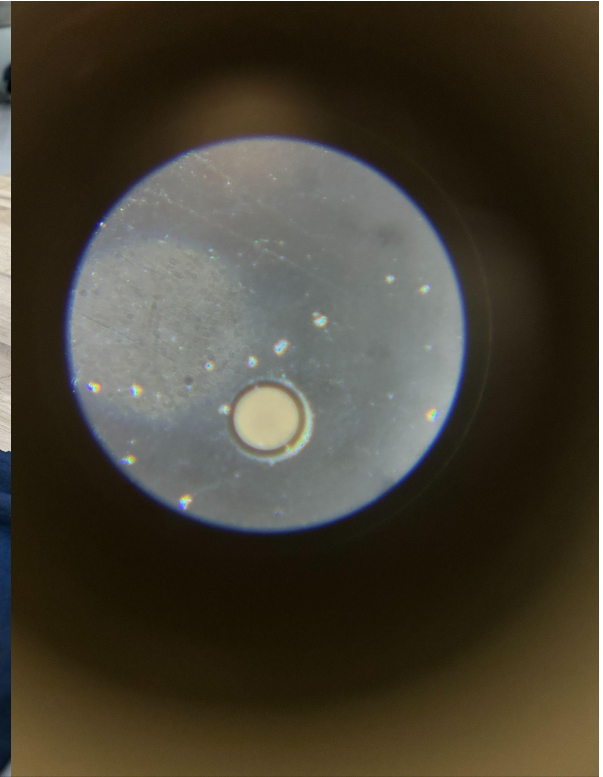
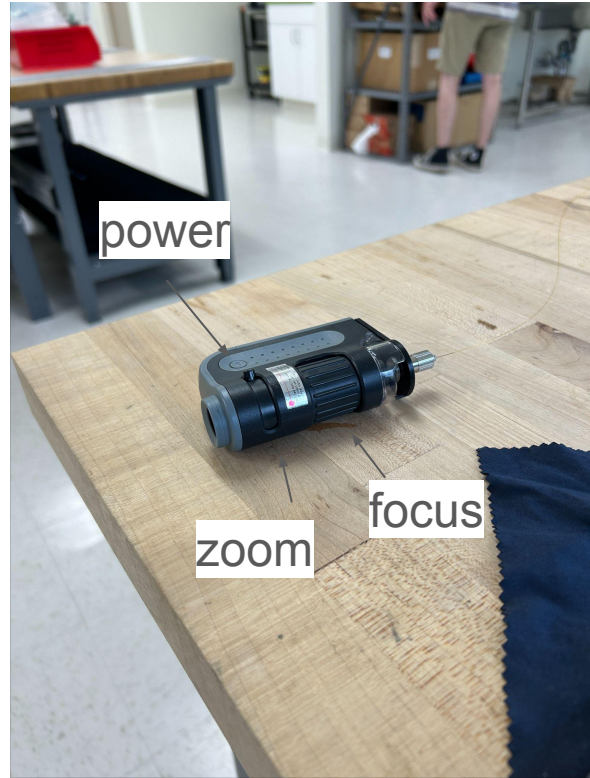
Whenever you switch from 3um to 1um polishing paper, the puck must be washed and blown with the air compressor. Because of this, if you're polishing several fibers it makes more sense to polish all of them to 3um, wash the puck, and then polish them all to 1um. Wash off the paper and puck when they get gross.



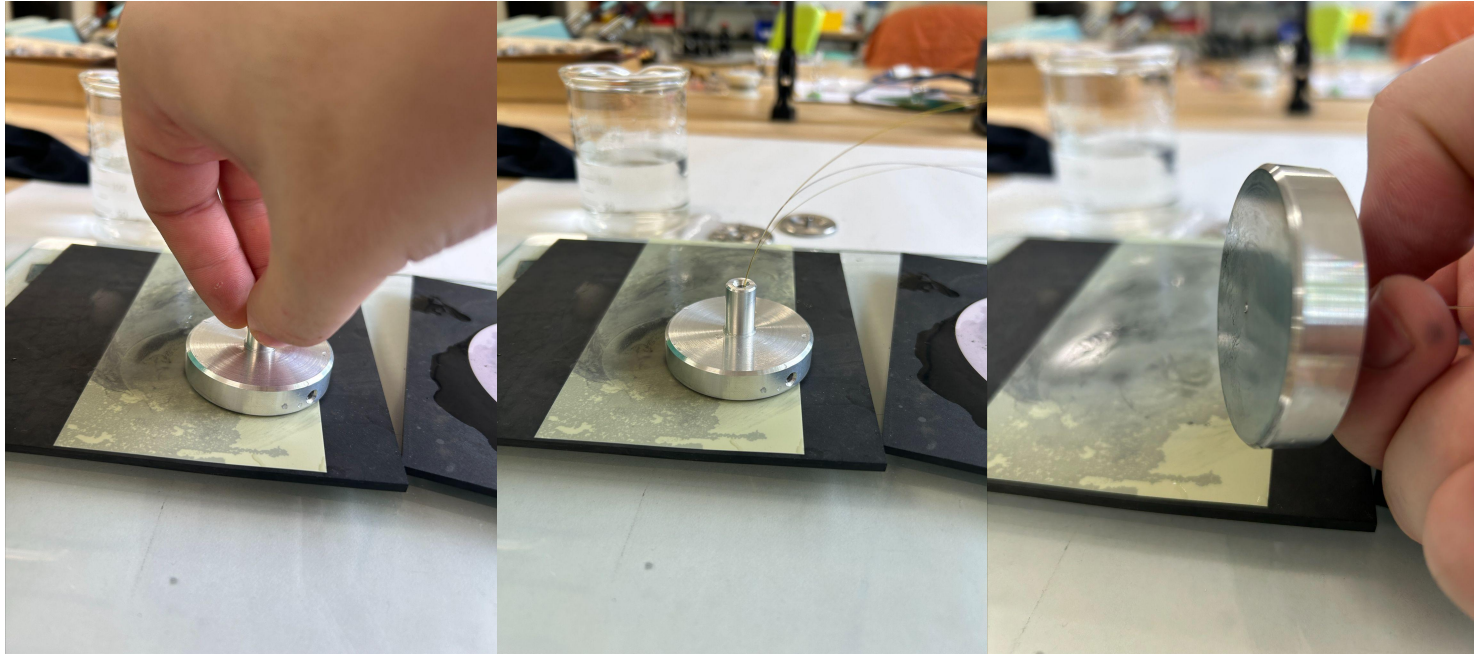
Place the flanged ferrules in the 2.5mm puck, making sure that the face of the ferrule is flush with the 3um polishing paper. Sand it down in a figure eight motion, 20-30 times. At this point you don't need to worry about breaking the fiber during polishing. Once you do all of the 2.5mm ferrules, wash them and repeat the process for the 1um paper. After washing again, the face should now be shiny. You can inspect the fiber tips with a 20x loupe and you may be able to see imperfections. A polished ferrule looks like this, but you must conduct a more thorough inspection with a fiberscope.

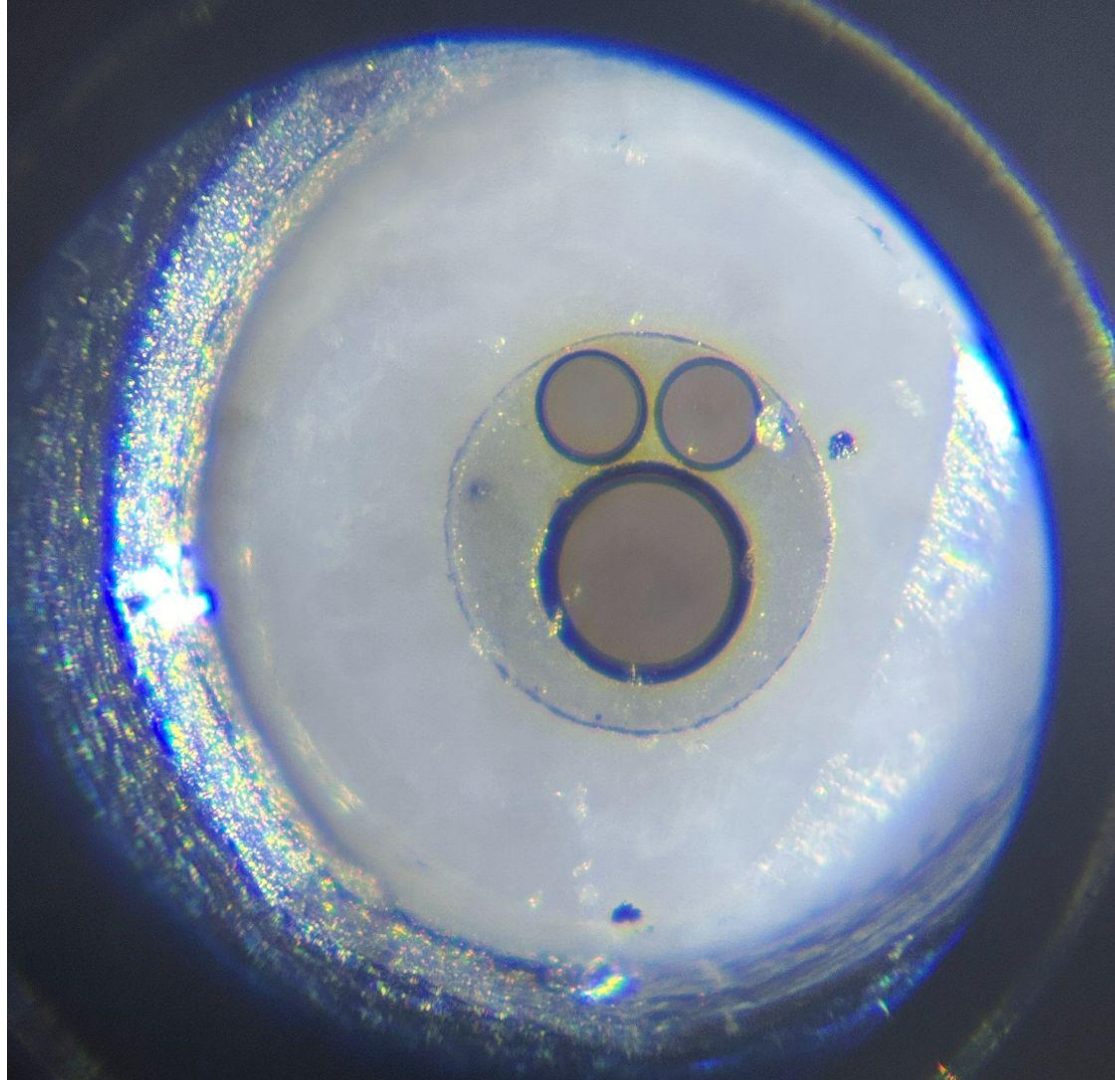


To use the fiberscope, insert the ferrule into the fiberscope and press the button. A perfect fiber will have no scratches or cracks through the core.



The 1.25mm ferrule is more difficult to polish since it does not have a flange. You must use a special puck for ferrules without flanges. Carefully feed the ferrule through the top of the puck until you can see it protruding from the bottom face. Tighten the set screw to keep it in place, and hold this puck by the cylindrical middle piece. Do not touch the fibers, and keep their other ends elevated to avoid straining fibers.





Feed the fiber through a mast that is mounted to the cell support PCB. Once it comes out the other end, apply 1/16" heat shrink to the ferrule and make sure it fits snug when you push it back into the mast. Apply Quik-Cast to the mast tip and seat the ferrule in the mast. Make sure that the ferrules all stick out the same distance.

