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Orbit™ Auto-Angle Workholder & Fiber Shaping Module



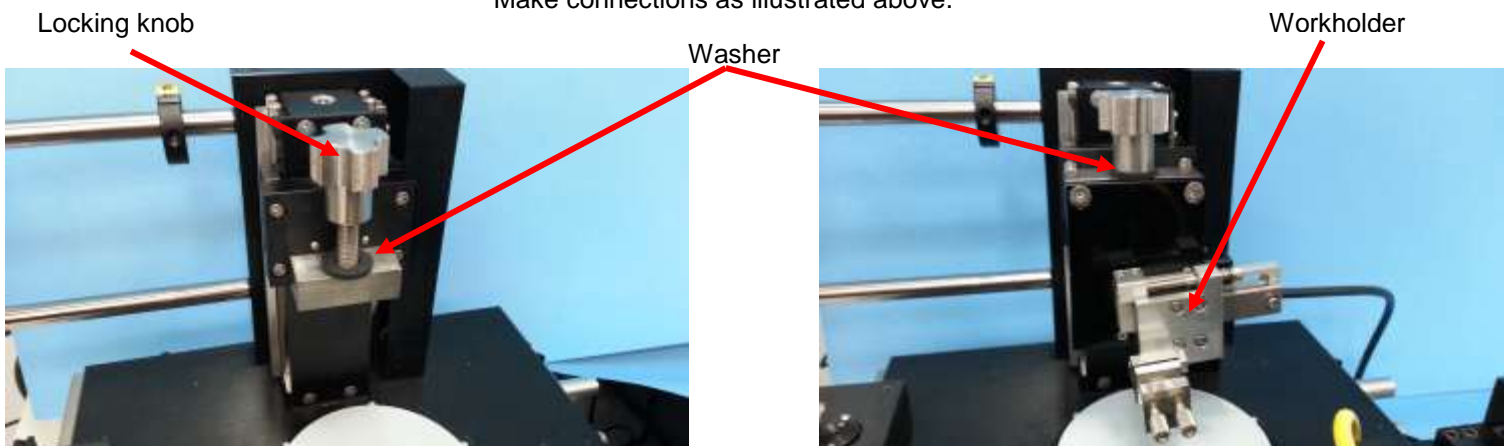
Equipment Set-Up



Auto-angle workholders require that the Z-axis rigid safety guard be replaced with a flexible version.



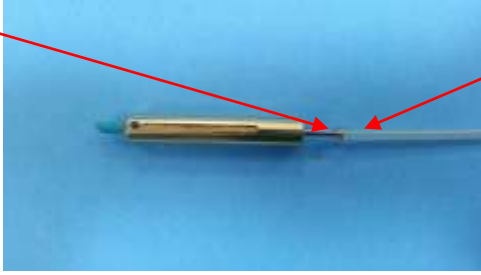
Make connections as illustrated above.



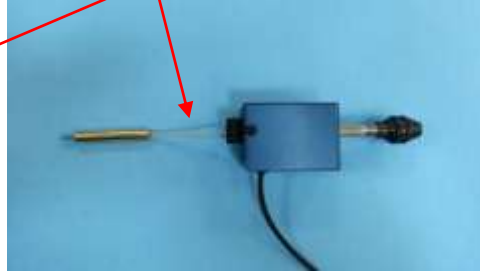
Loosen locking knob and engage auto-workholder. **Make sure the black washer sits on top of the workholder.**

Fiber Adapter and Shaping Module Set-up

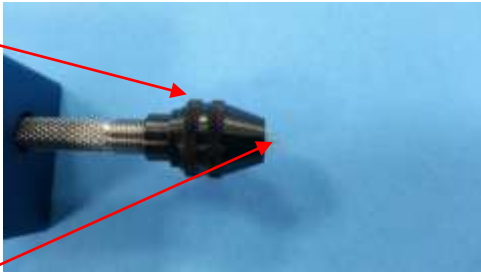
Feeder tube



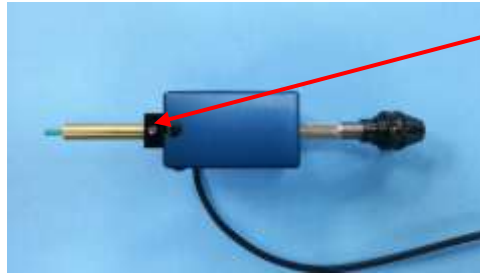
Gripper tubing



Collet



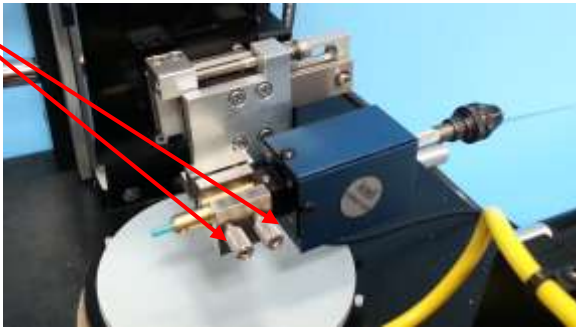
Set screw



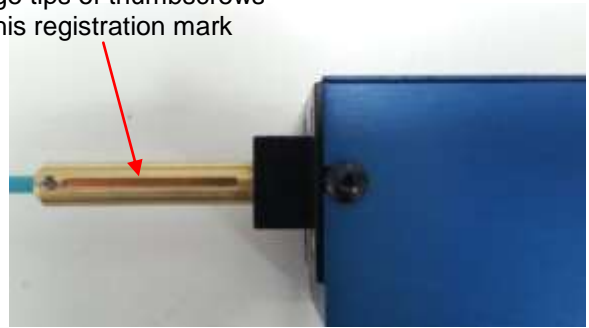
Gripper tubing

Engage the gripper tubing on the “flared” end of the metal feeder tube. Insert gripper tubing into shaping module until it protrudes from the locking collet. **NOTE: Loosen collet before insertion.** Continue to insert until the brass fiber adapter bottoms-out in the module. Secure by tightening set screw.

Thumbscrews

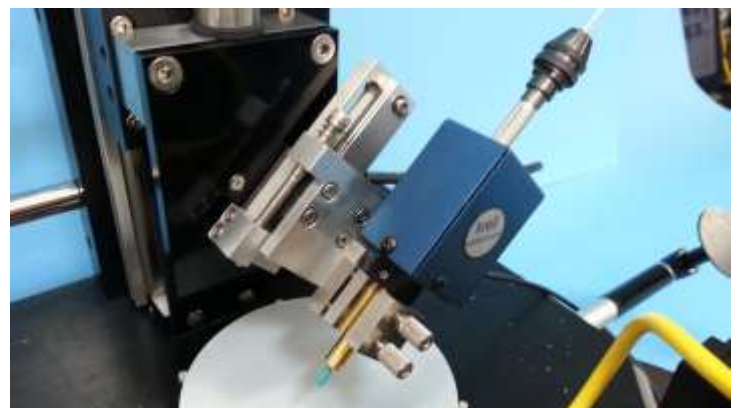


Engage tips of thumbscrews with this registration mark

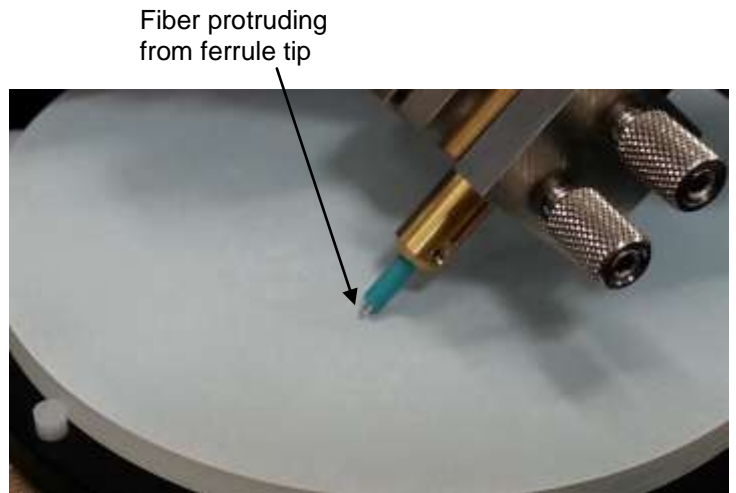
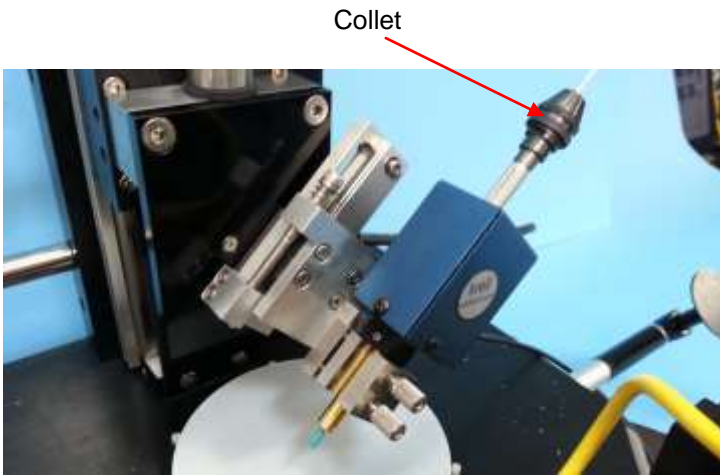


Loosen the two workholder thumbscrews and insert brass fiber adapter. Position with the “registration mark” towards the thumbscrews so they will seat within the groove upon tightening. Position the module against the stainless steel gimbal mount and lightly tighten thumbscrews into contact with the brass fiber adapter.

Conical Fiber Tip Polishing



Select the “Stage Polish Control” tab, and using the keyboard the enter the angle to which the workholder is to be positioned. Select “Set Polish Angle” and the workholder will rotate to the desired angle alignment.

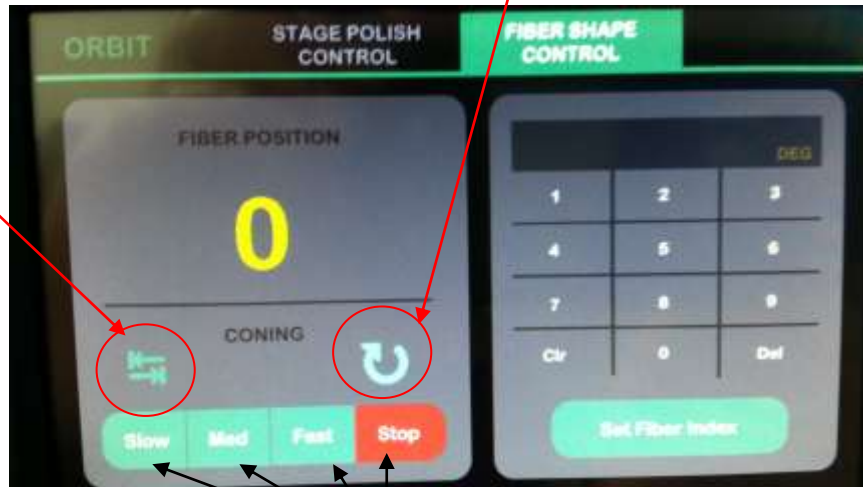


Loosen the collet and insert the fiber into the gripper tubing until it protrudes from the ferrule tip. As a general rule, the fiber protrusion should be equivalent to approximately 2 to 4 fiber diameters. This protrusion can be observed by viewing the ferrule tip with the profile videoscope. Lightly tighten collet to secure fiber.

Use this for standard and continual fiber rotation in one direction.

Rotates the fiber >180 degrees, and then automatically reverses direction for >-180 degrees.

This motion can be used for heavier and longer fibers to avoid twisting and torque on the assembly.



Controls for fiber rotation speed and stop.

Select the "Fiber Shape Control" tab. Fiber spinning for the coning process can now be controlled as illustrated above.

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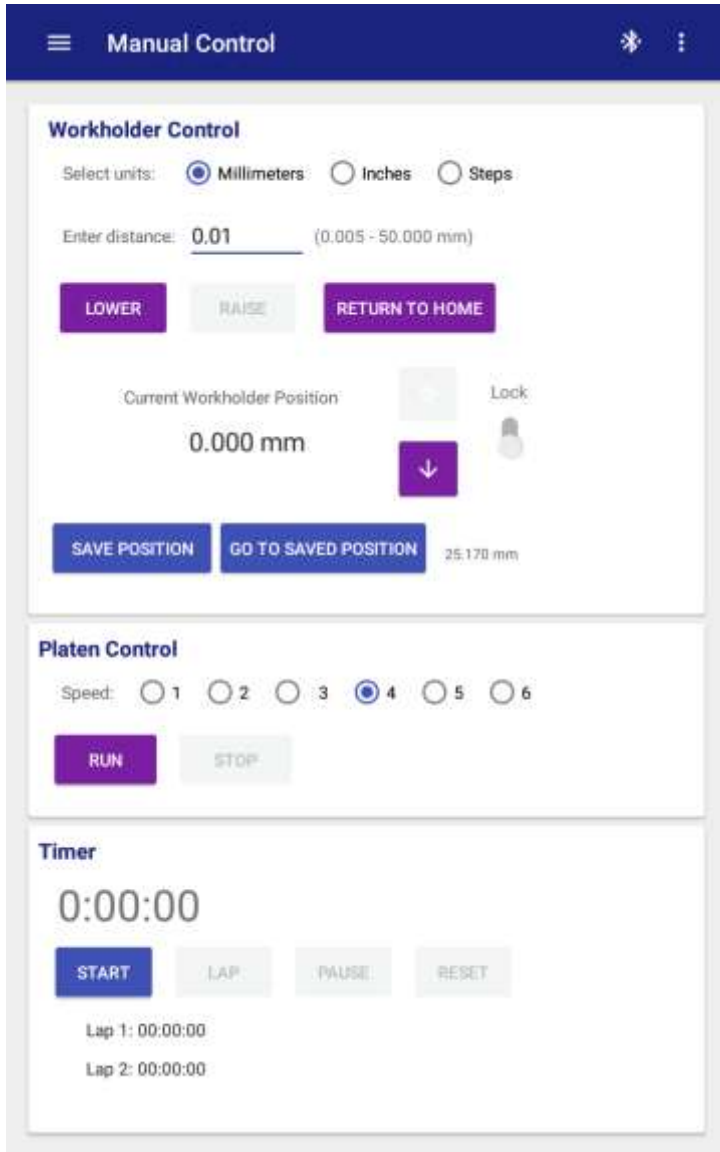
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Typical Progression of Cone Formation



Begin with a cleaved fiber tip.



Place fiber tip into contact with rotating film.



Partially formed cone tip.

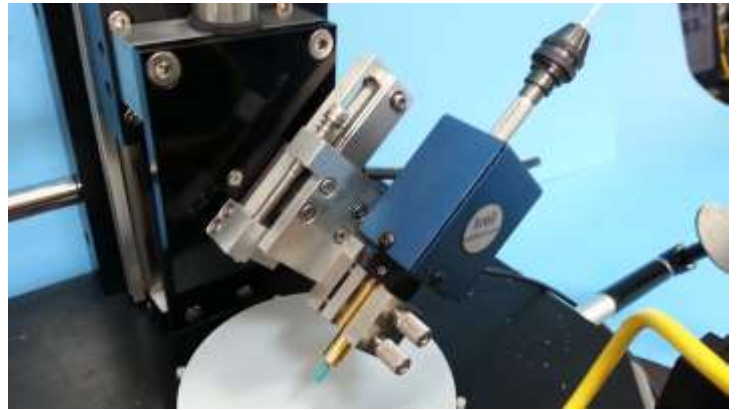


Completed conical tip.

Gradually lower the fiber to the polishing surface while observing contact using the profile videoscope.

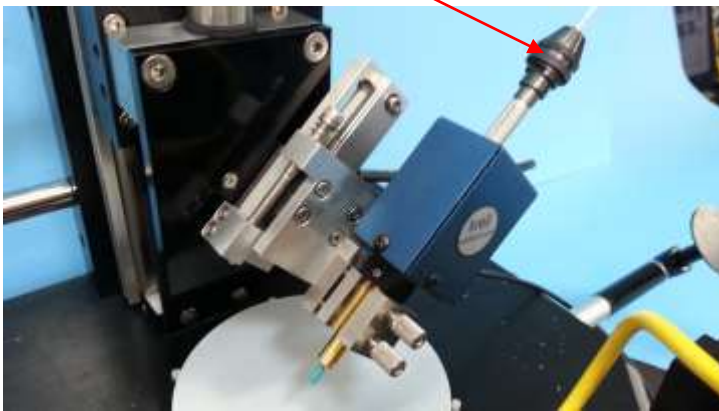
Above controls explained in the “Manual Control” section of the NOVA operation manual.

Chisel Fiber Tip Polishing

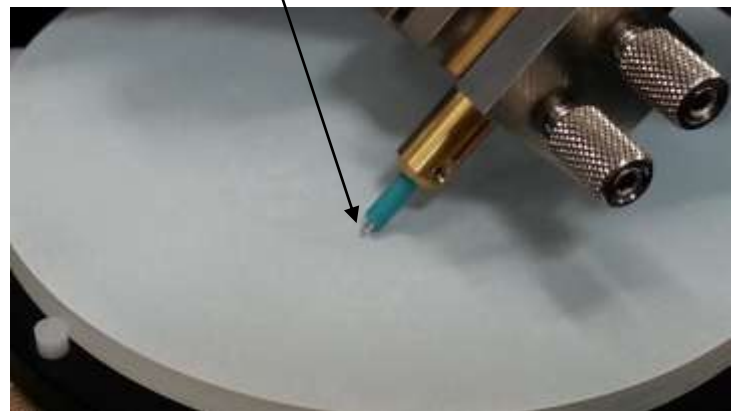


Select the “Stage Polish Control” tab, and using the keyboard the enter the angle to which the workholder is to be positioned. Select “Set Polish Angle” and the workholder will rotate to the desired angle alignment.

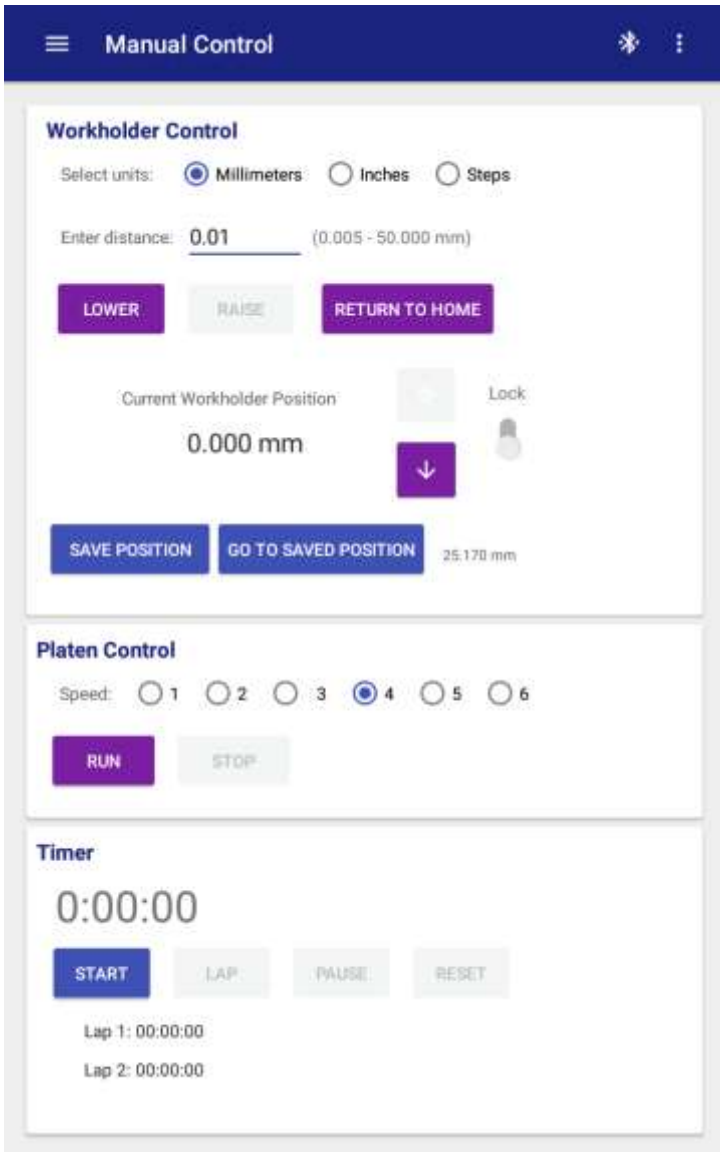
Collet



Fiber protruding from ferrule tip



Loosen the collet and insert the fiber into the gripper tubing until it protrudes from the ferrule tip. As a general rule, the fiber protrusion should be equivalent to approximately 2 to 4 fiber diameters. This protrusion can be observed by viewing the ferrule tip with the profile videoscope. Lightly tighten collet to secure fiber.



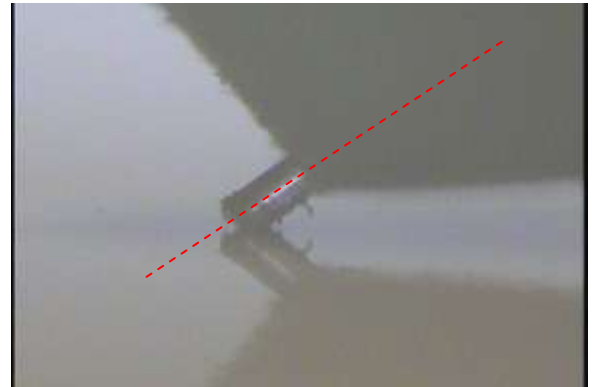
Gradually lower the fiber to the polishing surface while observing contact using the profile videoscope.

Above controls explained in the “Manual Control” section of the NOVA operation manual.

Typical Progression of Chisel Formation



Begin with a cleaved fiber tip.



Place fiber tip into contact with rotating film.

Polish until the front-edge of the endface facet angle crosses the fiber axis.

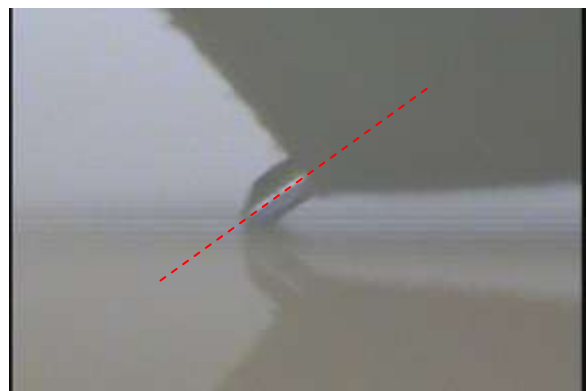
The video measurement software can be used to draw a “reference” cursor along the fiber axis.



Raise the fiber just above contact with the film.

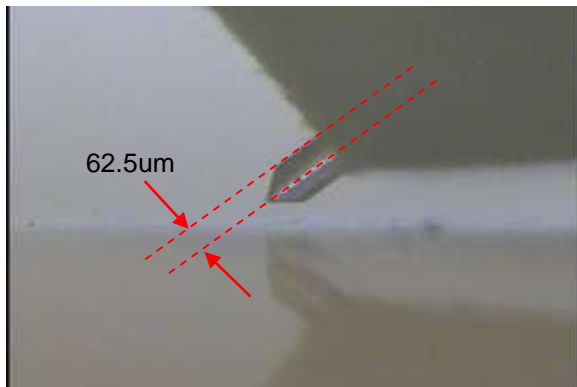


With the “Fiber Shape Control” tab activated, enter “180” deg and select “Set Fiber Index”. This action will rotate the fiber tip 180 degrees. This new rotated position will be confirm beneath the heading “Fiber Position”.



When the fiber tip has been rotated, lower the fiber back into contact with the polishing film until the second facet is formed and meets the first facet.

Several iterations of this process may be necessary to create equal facets that meet together at the fiber axis. Each subsequent selection of “Set Fiber Index” will rotate the fiber per the entered index value.



The video measurement software can be used to confirm the centration of the chisel and the chisel angle (125um diameter fiber illustrated as an example).

By using different values for the “Fiber Index”, it may be possible to create complex shapes on the fiber tip. For example, setting “Fiber Index” to “90 deg”, could create a four-side “pyramid” shaped fiber tip.

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