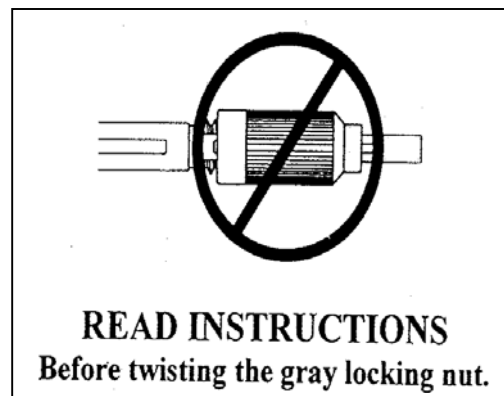


## Detailed Installation & Theory of ULTRAsplice

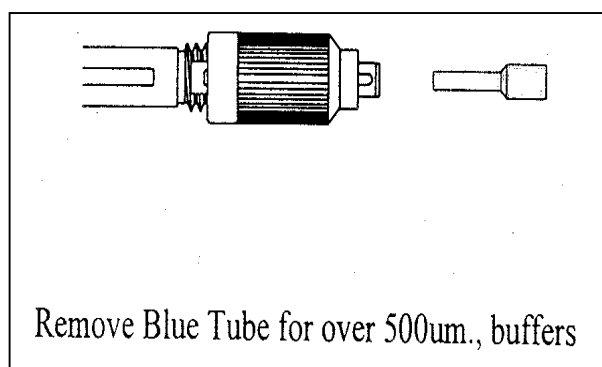
- 1) **Open Individually wrapped plastic bag.** When opening the bag, please make certain that the ULTRAsplice does not fall into any dirt, or similar form of contaminant. This will effect the quality performance of the splice.

After the ULTRAsplice has been removed, *DO NOT twist either side of the gray locking nut without reading this installation sheet in its' entirety. DO NOT TWIST THE LOCKING NUT CLOSED WITHOUT FIBER INSTALLED.*

- 2) **Start Preparation of Fiber Ends.** In order for the ULTRAsplice to work properly, the key factor is the cleave quality and length. We recommend the use of an adjustable cleaver for cleaving the fiber. **The fiber should be cleaved to about a seven (7) millimeter length.** Any longer (more than 9 millimeters), the fiber will pass through the glass capillary, and the other side will not be able to be inserted.



Clean both ends of the fiber you intend to use with general rubbing alcohol and a Tex Wipe Pad, then cleave the end(s) to the proper length of about **7 millimeters**. Place prepared fiber(s) in a safe location, away from unsanitary conditions.



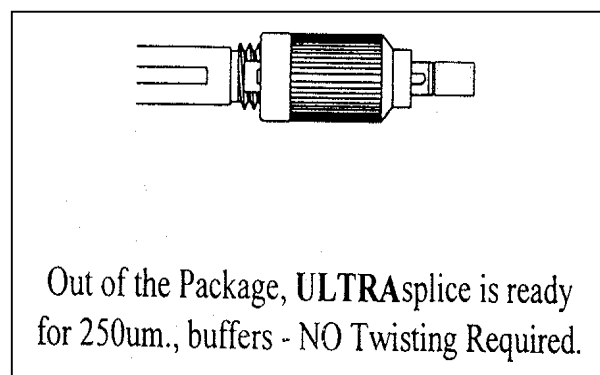
- 3) **Prepare the ULTRAsplice for use.** The ULTRAsplice comes pre-adjusted for 250 micron buffers, any other buffer sizes *WILL WORK* after properly setting the gray locking nut position. Please note that the directions apply to either end of the ULTRAsplice, since they are equivalent in the mechanics.

- a) **If working with 250 micron buffers, DO NOT TWIST THE GRAY LOCKING NUT AT ALL,** the ULTRAsplice has been set to accomodate the buffer size during factory assembly.
- b) If working with OVER 500 micron buffers, proceed as follows:
  - i) Remove the Blue Tube
  - ii) Open the Gray Locking Nut *In the counter*

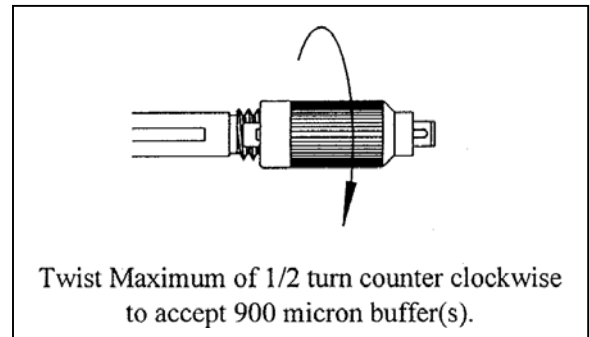
*clockwise* direction until the “bone colored” insert slightly moves back and forth. This action assures that the Collet (bone colored insert) is completely open, and is ready to accept the larger diameter buffer.

**HINT:** *You should only have to twist the gray locking nut about 1/2 turn to achieve the correct size required for 900 micron buffers. As a rule of “thumb”, if your thumb is on top of the gray locking nut, it should end up on the bottom.*

**THEORY:** The gray locking nut and collet have the same mechanical workings as an ordinary hand drill. When the gray locking nut is twisted in the counter clockwise direction (left), the internal collet “opens” in order for larger diameter buffer sizes to be accommodated. When twisting the gray locking nut towards the clockwise direction (right), it “closes” the internal collet onto the buffer, this action “grabs” the buffer (NOT THE FIBER) and has an average of 2.2 pounds of fiber retention. Twist the gray locking nut hand tight, until it cannot be easily twisted any further.



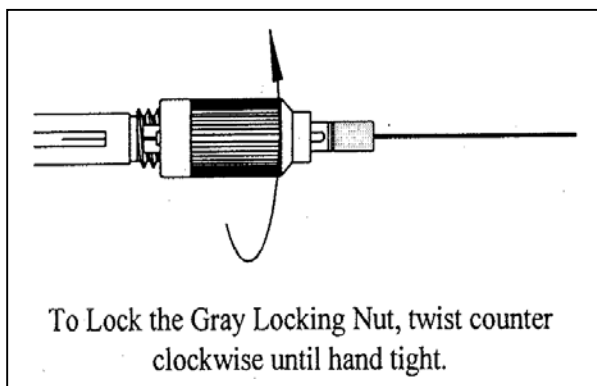
iii) The **ULTRAsplice** can easily accommodate any combination of buffer sizes between 250 micron and 900 micron. The reason we set the **ULTRAsplice** to accommodate 250 micron fibers is due to the popularity of that certain buffer size. 250 micron buffers, we found, are more commonly used versus larger diameter buffers, however, since there are no special tools or fixtures required for installation, it is easy to adjust the splice to meet any buffer size range between 250 to 900 microns.



4) **Using the ULTRAsplice.** Now that your fiber end(s) are cleaved, and the **ULTRAsplice** is set to accommodate your required buffer size (if 250 micron buffers are being used, no adjustment should have been necessary), the **ULTRAsplice** can now be installed.

Hold the **ULTRAsplice** with the Visible Glass Capillary (in the middle of the splice) facing toward you. Retrieve the previously cleaved fiber, and begin to insert it into the splice by placing the fiber into the Blue Tube (If UNDER 500 micron is used) OR the “bone colored” Collet (If OVER 500 micron buffer is used). Gently insert the fiber through the hole of the Collet (or Blue Tube), you should be able to feel the buffer being “grabbed” \*.

\* **THEORY: ULTRAsplice** has a molded in “spring arm” that “grabs” the buffer upon insertion. This arm only touched the buffer (NOT the fiber). At any given time, you can retract the fiber from the splice using a limited amount of force (unless the collet is closed) and the arm will continue to “grab” any other buffer size you insert, allowing for multiple quantity of use per splice.



Once you feel the buffer being grabbed, the fiber end is close to the entrance of the glass capillary. You should be able to see the fiber end through the visible glass capillary.

If cleaved to the proper length of 7 millimeters, the buffer stops “automatically”, THE FIBER SHOULD BE IN THE MIDDLE OF THE GLASS CAPILLARY, or as close as possible to the center. Once the fiber is in the middle, twist the gray locking nut closed (clockwise direction) until the gray locking nut is hand tight. Proceed to the other end.

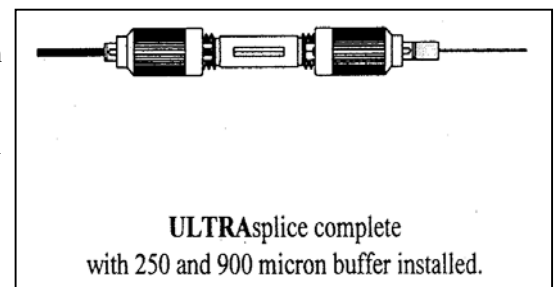
Start inserting the other fiber end in the same manner as the first end, however, make sure careful attention is given in the following:

- a) The pre-loaded index matching gel acts like a Hydraulic Piston when the other fiber is being inserted, therefore, insert the second fiber carefully, giving the gel enough time to “mold” itself around the fiber.
- b) The fiber should stop automatically, however, depending on the accuracy of the cleave length, the fiber could be too long, and possibly break if pushed too hard. WATCH THE FIBER BUTT UP TO THE OTHER FIBER END, through the visible capillary.

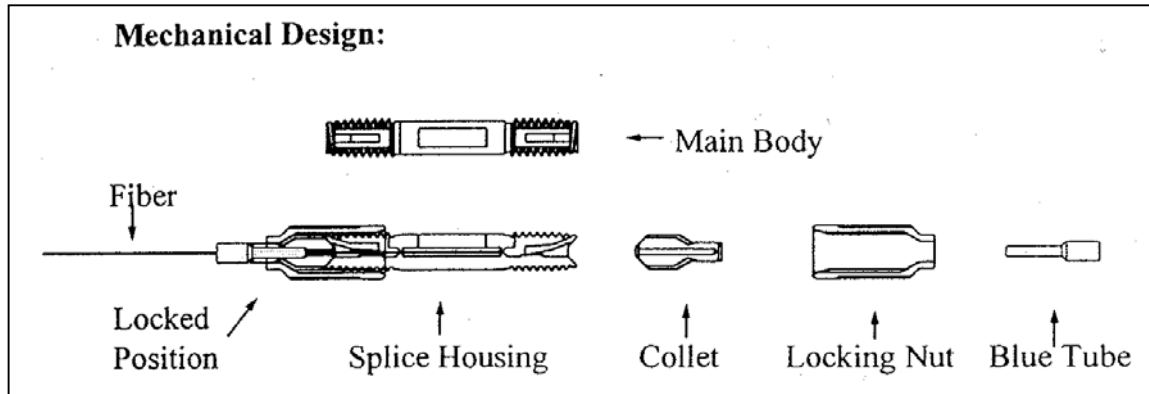
Once you have inserted the second fiber to your satisfaction, twist the gray locking nut closed (clockwise direction) – and the **ULTRAsplice** installation should now be complete.

5) **Tuning.** If you are unsatisfied with the loss you may be achieving, you can simply “Tune” the **ULTRAsplice** as follows:

- a) Twist ONE END OPEN (counter clockwise direction) – not more than 1/2 turn.
- b) Gently pull back (slightly) and twist the buffer, possibly even pushing it closer to the other fiber, until an achieved loss is obtained. If you open both ends, and push the fibers together (back and forth), you can possibly damage your cleave. It is recommended that ONLY ONE end is loosened while tuning.
- c) Twist the Gray Locking nut closed (clockwise direction until hand tight).



# TROUBLESHOOTING



**Question (Q):** My loss is higher every time I try to re-insert my fiber(s)?

**Answer (A):** The index matching gel is running out. Every time the fiber is retracted from the **ULTRAsplice**, the gel is being withdrawn from the glass capillary, thus not leaving enough for proper filling of "gaps".

**Solution (S):** Use another **ULTRAsplice**, or add more index matching gel (ACA Part # WFN1CCIMG is recommended).

**Q:** My fiber keeps breaking before I get it into the glass capillary?

**A:** There are a variety of answers to this question:

- 1) If using Singlemode Fiber, is a Singlemode (yellow body) **ULTRAsplice** being used? – And if using Multimode 125 micron fiber, is a Multimode (orange body) **ULTRAsplice** being used?
- 2) Is the Collet (gray locking nut) adjusted properly to your buffer size(s)? – (Described in section 3)
- 3) Is the cleave length of your fiber(s) about 7 millimeters in length?
- 4) If working with different buffer sizes (i.e. 900 micron) did you open the gray locking nut too far? – This action prevents the collet from guiding the fiber into the glass capillary, and generally the fiber breaks because it has nowhere to go, and therefore, it hits the side-wall of the splice body.
- 5) Are you treating the **ULTRAsplice** as a copper splice and forcing the fiber? – Especially on the second fiber being installed, you have to insert the fiber with care. (As described in section 4).

**Q:** When and Why should I use the Blue Tube?

**A:** The Blue Tube has no other mechanical purpose except to aid in guiding smaller diameter buffers into the glass capillary. This includes generally anything under 500 micron in buffer size. Some buffers are out of tolerance or larger for the Blue Tube, if this occurs, simply remove the Blue Tube, and try inserting the buffer in that manner (also described in section 3).

**Q:** Do I need to add Index Matching Gel when I get the splice?

**A:** NO – The **ULTRAsplice** comes pre-loaded with index matching gel, ready to use.

**S:** The **ONLY** time that you need to add index matching gel is when the splice is re-used more than four (4) times. The reason is because every time the fiber(s) are withdrawn, gel is also being removed, thus gel needs to be replenished.

➤ There are also a variety of supporting products available for the **ULTRAsplice**, including a Lighted Workstation, Holders, and other user friendly products to make the splice easy to install and operate. if you require any further information, please contact your local Distributor, or us in any of the following convenient ways:

**Thorlabs, Inc.**

Phone: (973) 579-7227

Fax: (973) 383-8406

Email: [www.thorlabs.com](http://www.thorlabs.com)