

# STOP!

## Don't Connect Unless You Inspect!

For Procedure on Inspecting the Fiber, Refer to Section 6

### Verify that Instruction Sheet (408-Series) Pertains to Connector Kit Being Terminated

To Verify, Refer to Product Drawing for  
Applicable Instruction Sheet at:  
[www.tycoelectronics.com](http://www.tycoelectronics.com)  
(Search by Connector Kit Part Number,  
Click on the Part Number, Click on Product Drawing)

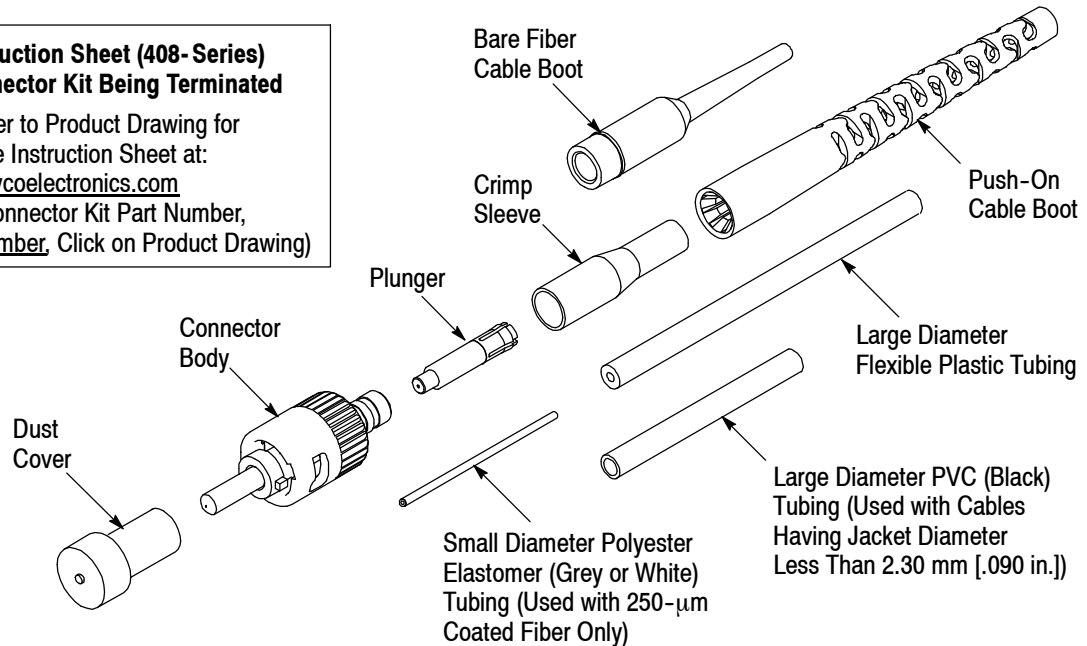


Figure 1

## 1. INTRODUCTION

LightCrimp XTC/NeXTC fiber optic connector kits are designed to be used with cable having singlemode 125-µm outside diameter fiber (ceramic ferrule connector), multimode 125-µm fiber (ceramic, stainless steel, or polymer ferrule connectors), or 140-µm outside diameter fiber (stainless steel connector). Read these instructions carefully before applying any connectors.

LightCrimp XTC/NeXTC fiber optic connectors, while being fully compatible with OPTIMATE\* 2.5mm bayonet connectors and other ST style singlemode and multimode connectors, do not require epoxy during assembly of the connector.

### NOTE



*Dimensions on this sheet are in metric units [with U.S. customary units in brackets]. Figures are not drawn to scale.*

Reasons for reissue of this instruction sheet are provided in Section 7, REVISION SUMMARY.

## 2. DESCRIPTION (Figure 1)

The connector kit consists of two cable boots (either one may be required), a crimp sleeve, plunger, connector body, larger diameter flexible plastic tubing, large diameter PVC tubing, small diameter polyester elastomer tubing, and a dust cover.

These connectors accommodate buffer sizes of 250 µm and 900 µm. Jacketed fibers must be no larger than 3.10 mm [.122 in.] in diameter for proper jacket captivation.

### CAUTION



*Use of these instructions on LightCrimp XTC/NeXTC fiber optic connectors with other buffer diameters or larger jacket diameters may result in improper fiber and/or cable captivation.*

## 3. REQUIRED TOOLS AND MATERIALS

### 3.1. Tools

- Micro-Strip Stripper 492109-2 (203 µm [.008 in.])
- Fiber Optic Combination Strip Tool 1278947-1 (408-4577)

- Cable Stripper 501198-1 (408-9394)
- Scissors 501014-1
- Cable Preparation Template 503574-1
- LightCrimp Plus\* ST Die Set with Crimping Tool 492623-1 (consists of Die Set 492622-1 and PRO-CRIMPER\* III Hand Tool 2064431-1)
- Universal Cleave Tool 503705-1
- Polishing Bushing 503337-1 (metal) or Polishing Bushing 503304-1 (plastic—black) or Polishing Bushing 503304-2 (plastic—beige)
- Polishing Plate 501197-1
- Polishing Pad 504584-1 (black)
- Resilient Polishing Pad 501523-1 (white woven)
- 200× Microscope Kit 1754767-1 (includes 2.5-mm adapter)

**NOTE**

Termination Kit 503330-1 contains the preparation tools required to apply these connectors.

**3.2. Consumable Items**

- 5-μm Polishing Film 228433-8
- .3-μm Polishing Film 228433-5
- lint-free tissues
- isopropyl alcohol

**4. FIBER PREPARATION****NOTE**

These instructions are applicable only to LightCrimp XTC/NeXTC fiber optic connectors when used with unjacketed fibers, jacketed fibers, buffered fibers, or coated fibers.

**4.1. Unjacketed Fibers****DANGER**

To avoid personal injury, ALWAYS wear safety glasses when working with optical fibers.

**DANGER**

BE VERY CAREFUL to dispose of fiber ends properly. The fibers create slivers that can easily puncture skin and cause irritation.

1. If terminating unjacketed buffered fiber without using the breakout kit, slide the bare fiber boot onto the fiber. See Figure 2.
2. For 900-μm buffered fiber, slide the push-on boot onto the fiber; then slide the large diameter flexible plastic tubing onto the fiber so that the tubing fits inside the boot. See Figure 2.

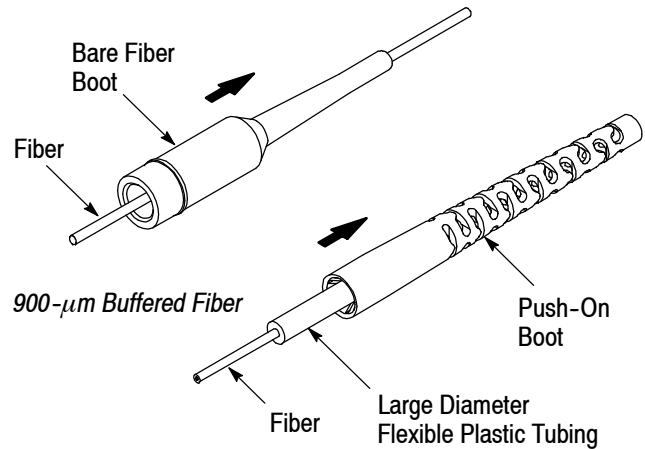
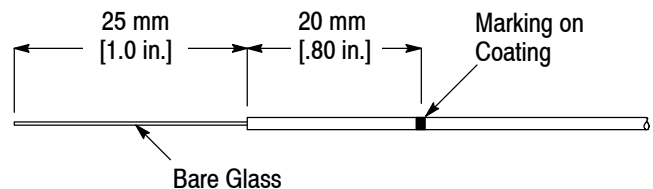
**Unjacketed Buffered Fiber (Without Breakout Kit)**

Figure 2

**Stripping Dimensions for Unjacketed Fibers**

**Note:** Not to Scale

Figure 3

Using the micro-strip stripper, remove 25 mm [1.0 in.] of the buffer and coating from the fiber. Several strips might be required to remove all of the buffer and coating.

3. For 250-μm coated fiber, using the combination strip tool, remove 25 mm [1.0 in.] of the coating from the fiber. Then, mark the coating 20 mm [.80 in.] behind the end of the buffer as shown in Figure 3.

**CAUTION**

Make sure the combination strip tool removes the clear coating from the fiber. If the coating remains on the fiber, the prepared fiber will stub in the connector and will not pass through.

4. Remove debris from the fiber by wiping the stripped fiber with a lint-free tissue dampened with isopropyl alcohol.

**4.2. Jacketed Fibers**

1. Slide the push-on boot onto the cable as shown in Figure 4.
2. If the jacket diameter of the cable is less than 2.30 mm [.090 in.], slide the PVC tubing over the cable jacket. See Figure 4.

**NOTE**

If the exact jacket diameter is unknown, use the PVC tubing if it slides easily over the jacket.

3. Using the cable stripper, remove the cable jacket to the dimension given in Figure 5 or use the cable preparation template.

4. Using the scissors (making sure that it is sharp), trim the strength members to the dimension given in Figure 5.

5. Using the micro-strip stripper, remove the buffer and the coating from the fiber to the dimension given in Figure 5. Several strips might be required to remove all of the buffer and coating.

**CAUTION**

Make sure the micro-strip stripper removes the clear coating from the fiber. If the coating remains on the fiber, the prepared fiber will stub in the connector and will not pass through.

6. Slide the crimp sleeve onto the cable and position the sleeve so that it captures the strength members in a "bent-back" position. See Figure 6.

**5. ASSEMBLY****5.1. Termination Procedure**

1. For 250- $\mu$ m coated fiber, insert the small diameter tubing (grey or white) into the back of the plunger. See Figure 7. The tubing is properly seated when approximately 6.0 mm [.24 in.] of the tubing remains outside of the plunger.

2. Insert the plunger into the rear of the connector body until it stops. See Figure 8, Detail A.

3. Feed the prepared fiber (jacketed or unjacketed) through the rear of the plunger (and connector body) until it stops. To insert the fiber easily, hold the fiber at the buffer/fiber interface, and rotate the connector slowly while inserting the fiber. See Figure 8, Detail B.

**NOTE**

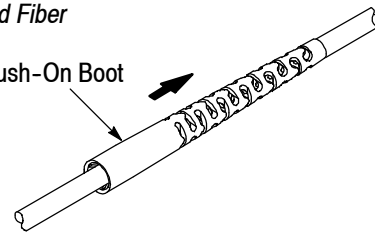
Pay special attention to cables with loose jacket material. It is important that the buffer strip length is maintained during the feed and not be pushed back into the cable jacket.

**NOTE**

The bare fiber should protrude from the connector ferrule not more than 12.7 mm [.50 in.]. If the fiber does not protrude, it broke or was improperly prepared. Prepare the fiber again, making sure that any broken fiber pieces are removed from the connector.

For Jacketed Fiber

Push-On Boot



For Cable Having Jacket Diameter Less than 2.30 mm [.090 in.]

PVC Tubing

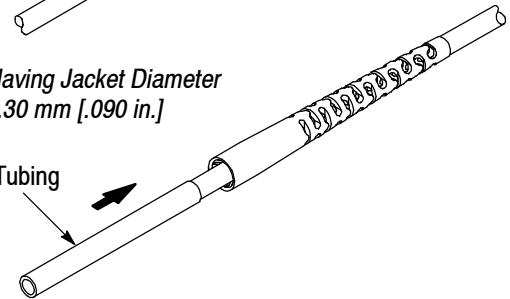
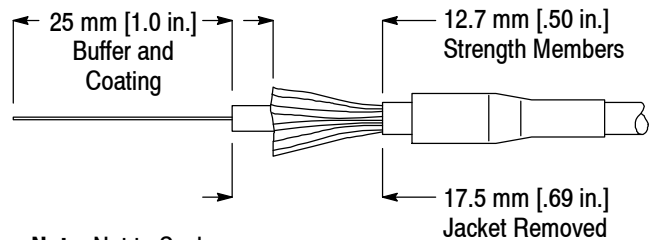


Figure 4

**Stripping Dimensions for Jacketed Fibers**

Note: Not to Scale

Figure 5

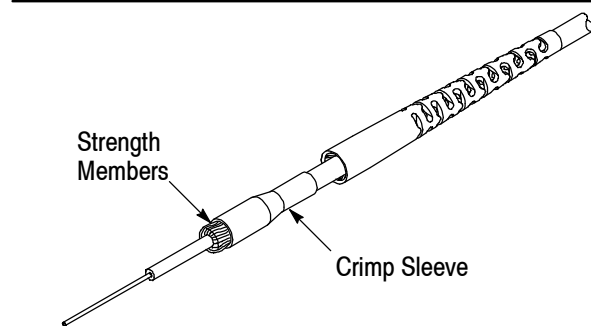


Figure 6

For 250- $\mu$ m Coated Fiber

6.0 mm [.24 in.]

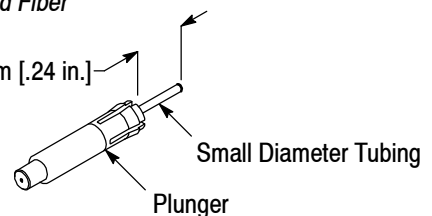


Figure 7

4. Open the dies of the tool fully. If the ratchet is engaged, squeeze the handles together until they release.

**NOTE**

*The crimping tool is marked with "XTC/NeXTC" and has two hexagonal crimping chambers.*

5. Gently close the dies of the tool until you hear one click from the ratchet. Position the connector assembly in the dies so that the shoulder of the die is located between the plunger and the folded-back strength members. Make sure that the connector assembly is aligned with the direction of the arrow on the dies, and the eyelet and strength members are positioned in the large-width pocket. See Figure 9.

**NOTE**

*BE CAREFUL not to break the fiber while inserting the connector into the tool.*

*For 900- $\mu$ m buffered fiber, make sure that the fiber is fully inserted into the connector during crimping.*

*For 250- $\mu$ m coated fiber, make sure that the mark on the buffer (see Paragraph 4.1, Step 3) is visible at the edge of the small diameter tubing before crimping.*

6. Slowly squeeze the tool handles together until the ratchet releases, then release the tool handles and allow them to open fully.

7. Carefully remove the crimped connector from the tool.

**NOTE**

*BE CAREFUL not to break the protruding fiber while removing the connector from the tool.*

8. For jacketed fibers, perform the following steps:

**NOTE**

*DO NOT perform the following steps for unjacketed fibers.*

- a. While holding the connector, carefully slide the crimp sleeve away from the connector body to release the strength members. See Figure 10.
- b. Slide the crimp sleeve over the back end of the connector, covering the evenly-spread strength members. For cable with a jacket diameter of less than 2.30 mm [.090 in.], slide the PVC tubing under the crimp eyelet until the tubing bottoms.

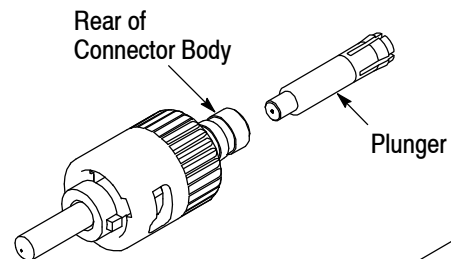
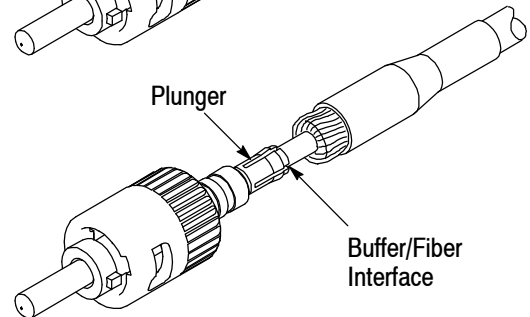
**Detail A****Detail B**

Figure 8

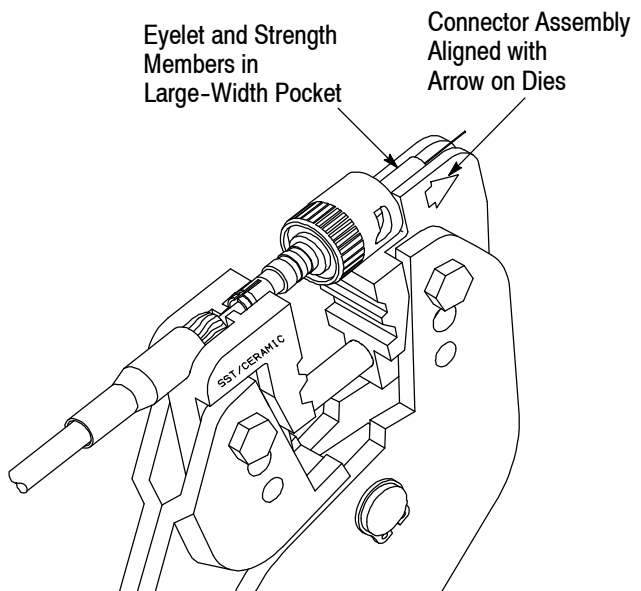


Figure 9

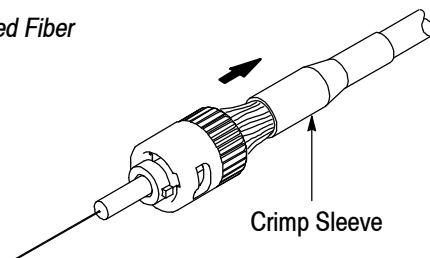
**For Jacketed Fiber**

Figure 10

- c. Using the crimping tool, place the larger cavity around the larger diameter (closest to the connector body) of the crimp sleeve. See Figure 11.
- d. Squeeze the tool handles together until they release.
- e. Move the crimping tool to the smaller diameter of the crimp sleeve and, using the smaller cavity of the tool, squeeze the tool handles together until they release. See Figure 12.
- f. Slide the cable boot over the crimp sleeve to complete the connector assembly. See Figure 13.

## 5.2. Cleave the Fiber

### **DANGER**



*ALWAYS wear safety glasses when working with optical fibers. BE VERY CAREFUL to dispose of fiber ends properly. The fibers create slivers that easily puncture the skin and cause irritation.*

1. Insert the connector into the side of the cleave tool so that the protruding fiber is guided through the slot in the tool. See Figure 14.

### **NOTE**



*Make sure that the fiber extends beyond the edge of the cleave tool. If it does not, proceed as follows:*

1. Using Sapphire Scribe Tool 504064-1 or similar scribe tool, gently brush the tool blade across the fiber at a 3 to 5° angle (about the diameter of one fiber from the ferrule surface). See Figure 15. Do not apply force on the fiber with the blade while scribing since excessive force may fracture the fiber making the connector useless.
2. Grasp the protruding fiber lightly between the thumb and forefinger, then gently pull it in line with the connector. The fiber should cleave cleanly at the scribe producing a mirror-like surface. If the fiber does not cleave easily, re-scribe the fiber, and try again. A proper cleave, close to the ferrule surface, is essential for obtaining a successful fiber polish.

3. Push the ferrule into the bore until the connector stops at the screw.

### **DANGER**



*To avoid possible injury, hold the connector away from your face when pushing the actuator button.*

### **NOTE**



*Hold the cleaving tool and connector inverted over a container or a piece of masking tape with the sticky side facing up. This method holds the cleaved fiber end and any fiber debris for safe disposal.*

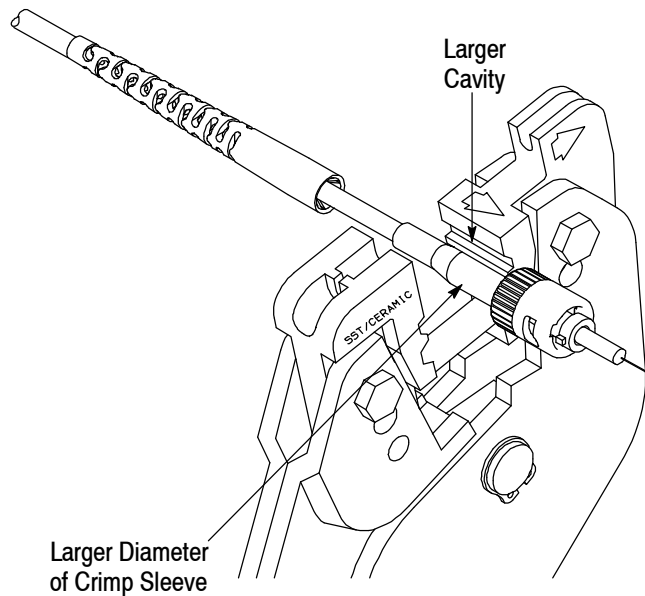


Figure 11

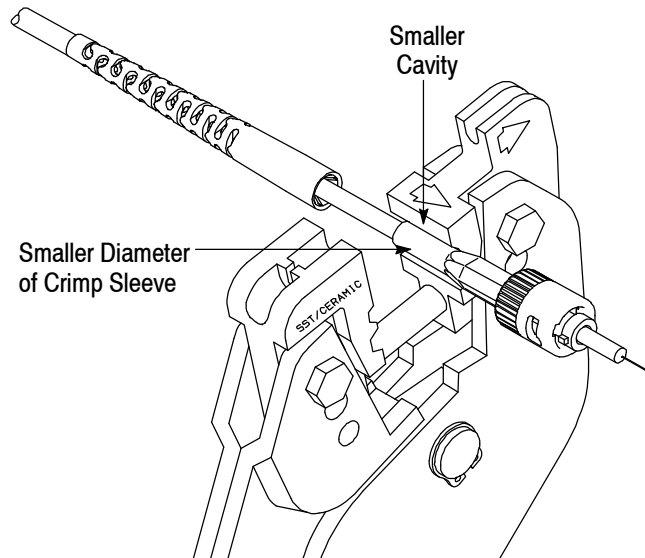


Figure 12

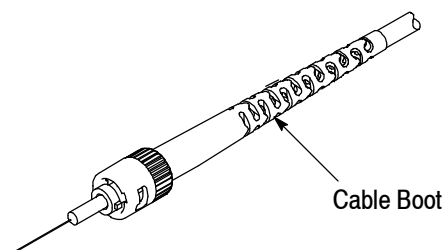


Figure 13

4. Gently depress the actuator button to cleave the fiber.

**CAUTION**

*All screws are factory preset on the cleave tool. DO NOT ADJUST THE SCREWS; otherwise, poor cleaves will result.*

5. If not polishing the connector immediately, place the dust cover on the connector.

**5.3. Polish the Fiber**

1. Cut a small piece (50 × 50 mm [2 × 2 in.]) of the 5-μm polishing film.
2. While holding the polishing film in the air, form a concave shape and air polish the connector tip by gently rubbing the tip of the connector in small circles or figure-8 patterns until the protruding stub of the cleaved fiber is flush with the ferrule surface. Refer to Figure 16.

**NOTE**

*An alternate method of air polishing is to hold one end of the polishing film between the index and middle fingers and hold the other end of the film between the thumb and the ring finger with the abrasive surface of the film up. Pull the film taut, and air polish the connector tip as described in Step 2 until no traces are visible on the film. See Figure 17.*

For stainless steel ferrule connectors, brush the cleaved fiber stub lightly in a circular motion on a hand-held piece of 5-μm polishing film to take off any sharp edges.

3. Clean the polishing plate with water or an appropriate window cleaning solution. Dry the polishing plate thoroughly.
4. For polymer ferrule connectors, remove the adhesive backing from the white woven resilient polishing pad, then place the pad on the polishing plate. See Figure 18.
- For the stainless steel and ceramic ferrule connectors, remove the adhesive backing from the black polishing pad, then place the pad on the polishing plate. See Figure 18.
5. Place a piece of the .3-μm polishing film on the polishing pad.
6. For polymer ferrule connectors, place the end of the metal or beige plastic polishing bushing onto the polishing film.

For the stainless steel and ceramic ferrule connectors, place the end of the metal or black plastic polishing bushing onto the polishing film.

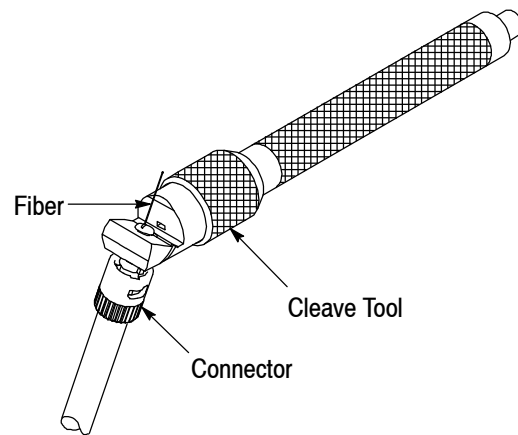


Figure 14

*After Scoring, Pull Fiber Straight Away*

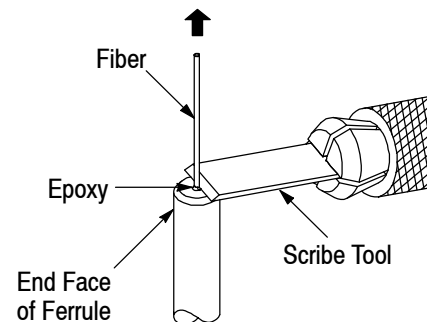


Figure 15

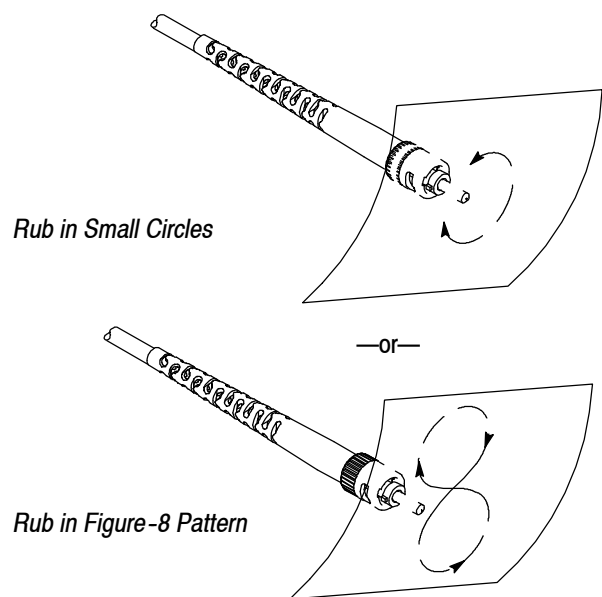


Figure 16

7. *Gently* insert the connector into the polishing bushing, and move the bushing in a figure-8 pattern, supporting the weight of the connector for the first three figure-8 patterns to prevent the fiber from breaking or scoring the film. See Figure 18.

**CAUTION**

*DO NOT wet the polishing film with water. These connectors require a dry polish. Using water or other liquid during polishing will cause debris build-up within the connector which may adversely effect the connector optical performance.*

**NOTE**

*Replace scored film to avoid fiber breakage.*

8. Continue polishing from 15 to 20 more figure-8 patterns allowing the full weight of the polishing bushing to rest on the polishing film.

**NOTE**

*A protruding fiber (PF) polish often provides superior connector performance. Therefore, it is recommended to leave the fiber protruding slightly from the ferrule surface.*

For stainless steel ferrule connectors, remove the circular machine marks on the ferrule tip (from the edge toward the center) until a circle between 0.5 and 0.7 mm [.020 and .028 in.] (still visible) of machine marks remains. This will leave the fiber protruding slightly from the ferrule face as recommended for optimum performance (refer to Figure 20). Other relevant criteria for inspecting the fiber described in Section 6 prevail.

**NOTE**

*Never remove the fiber hole chamfer. DO NOT over-polish.*

Another method of approximating the correct finished diameter is to see if the diameter of the machine marks is five times the diameter of the fiber; however, actually measuring the finished diameter is the preferred method. See Figure 19.

9. For stainless steel ferrule connectors, clean the ferrule face with a dry, lint-free tissue, and/or dab the ferrule face on a resilient piece of tape to remove any stubborn polishing grit.

10. Clean the connector tip and polishing tool face with a lint-free tissue to remove any residue.

11. Mate the connector with the receptacle or, if not mating the connector immediately, place the dust cover on the connector.

### Alternate Method of Holding Polishing Film

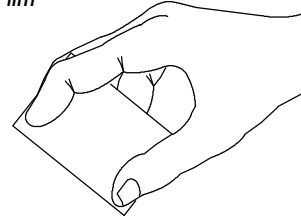


Figure 17

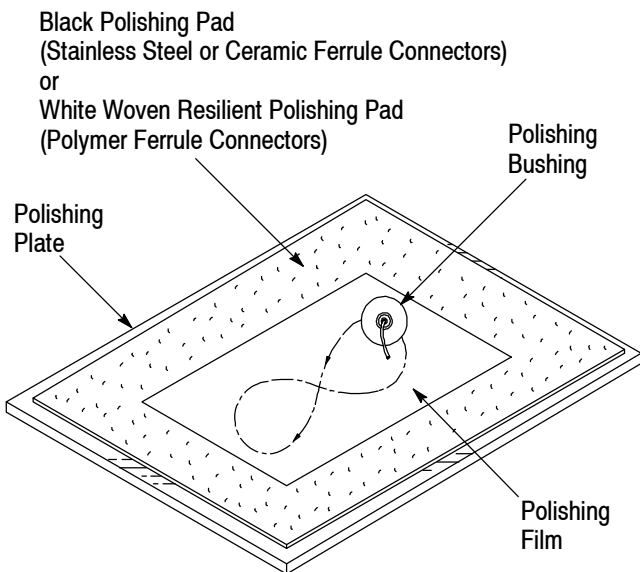


Figure 18

### For Stainless Steel Ferrule Connectors

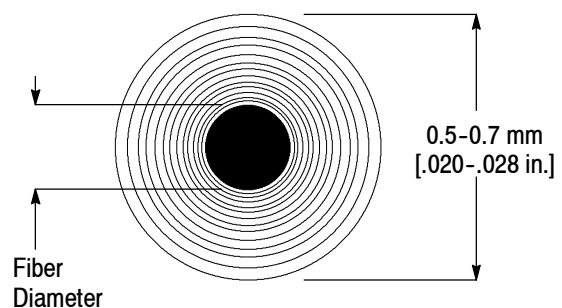


Figure 19

**6. INSPECTING THE FIBER** (See Figure 20)

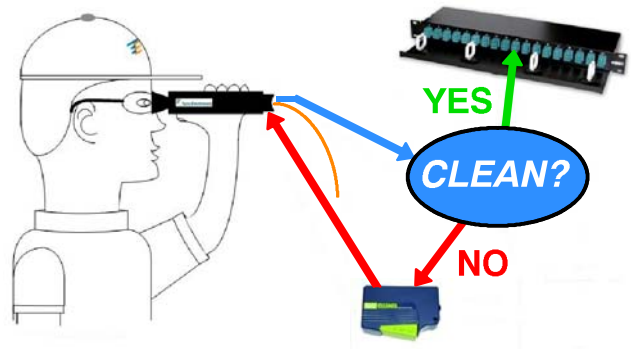
*DISCONNECT the cable from the source before inspecting. The infrared light used, although it cannot be seen, can cause injury to the eye.*

1. Remove the connector from the polishing bushing, and clean the ferrule face with a lint-free tissue. The ferrule face may also be cleaned by dabbing the ferrule face on a resilient piece of tape to remove stubborn polishing grit.

2. Inspect the connector with the microscope. If possible, place the far end of the fiber near a bright light. Compare the fiber end to Figure 20, and take any recommended action.

3. Verify that the fiber is flush (or is protruding only a few microns) with the ferrule surface by moving the microscope focus control. If the fiber and ferrule surface come into focus together, the fiber is flush. If the fiber comes into focus before the ferrule surface (when moving toward the endface), then the fiber is protruding, and additional polishing may be required.

**STOP!**  
Don't Connect Unless You Inspect!



**DANGER: Never View Active Fiber Signals**

**7. REVISION SUMMARY**

Revisions to this instruction sheet include:

- Added box-note to Figure 1

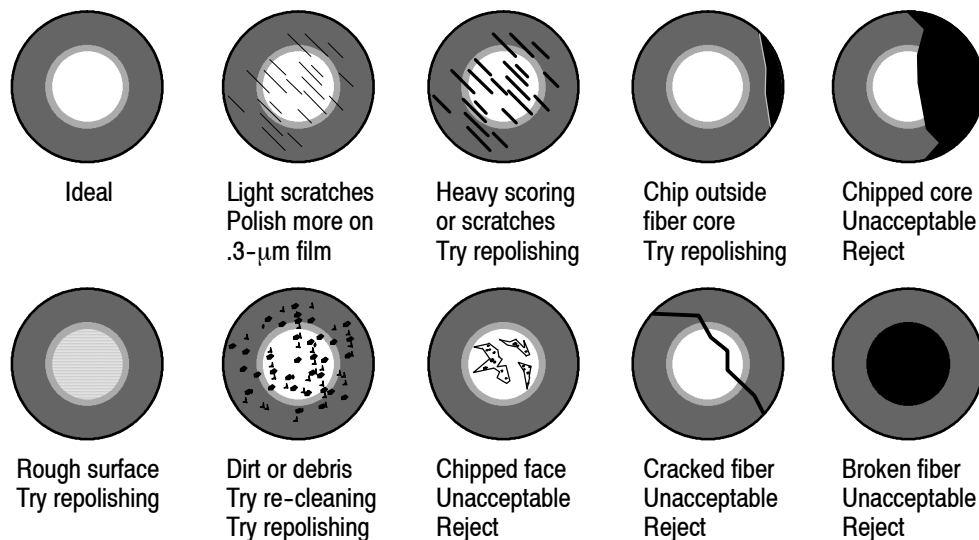


Figure 20