



*Leading Optical Innovations*

**EPOXY INSTALLATION PROCEDURES FOR ST<sup>®</sup> II  
FIBER OPTIC CONNECTORS  
(MULTIMODE AND SINGLEMODE)**

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# EPOXY INSTALLATION PROCEDURES FOR ST<sup>®</sup> II FIBER OPTIC CONNECTORS (MULTIMODE AND SINGLEMODE)

## 1. General

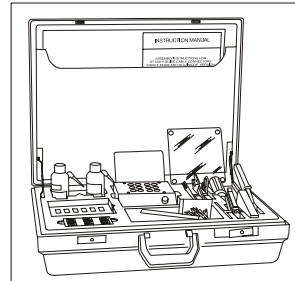
The 1032B5 (standard version) and the 1032B6 (international version) Tool Kits contain tools to assemble ST<sup>®</sup> II, ST<sup>®</sup> II+, and SC Connectors onto building and optical-fiber cables. Required consumables are sold separately.

The D-182739 Consumables Kit (for domed singlemode connectors) and the D-182738 Consumables Kit (for flat and domed multimode connectors) each contain polishing paper, epoxy, and other materials required to assemble approximately 100 connectors. See the table below for proper applications.

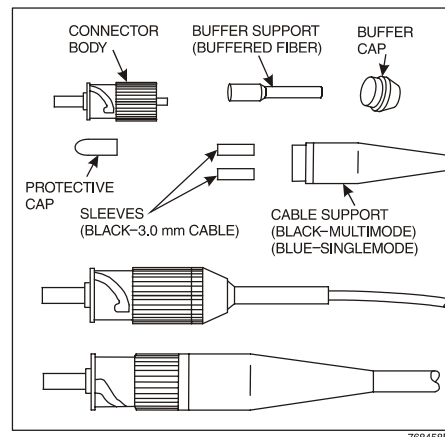
Ordering Information for these kits is provided in **Section 9**.

The 1032B5 Kit is identical to the 1032B6 Kit except the 200A1 Curing Oven replaces the 200A Curing Oven in the 1032B6 international version.

**Ordering Information** for this connector assembly is provided in **Section 9**.



**Figure 1. 1032 Tool Kit for ST II, ST II+, and SC**



**Figure 2. ST<sup>®</sup> II Fiber Optic Connector**

**TABLE 1. Connector Product Description**

| Applicable Connectors | Type Mode | End Face Geometry | Buffer or Jacket Size (mm) | Consumable Kit Required (Note) | 1032( ) Tool Kit Required |
|-----------------------|-----------|-------------------|----------------------------|--------------------------------|---------------------------|
| <b>P2020C-C</b>       | MM        | Flat              | 0.9, 2.4, 3.0              | D-182738                       | B, B1, B5, or B6          |
| <b>P2020C-Z</b>       | MM        | Domed             | 0.9, 2.4, 3.0              | D-182738                       | B, B1, B5, or B6          |
| <b>P2021C-Z</b>       | MM        | Domed             | 0.9                        | D-182738                       | B, B1, B5, or B6          |
| <b>P2024A-Z</b>       | MM        | Domed             | 3.0                        | D-182738                       | B, B1, B5, or B6          |
| <b>P3020A-Z</b>       | SM        | Domed             | 0.9, 2.4, 3.0              | D-182739                       | B, B1, B5, or B6          |
| <b>P3021A-Z</b>       | SM        | Domed             | 0.9                        | D-182739                       | B, B1, B5, or B6          |

**Note:** When using 250- $\mu$ m coated fiber, also use D-181755 Consumable Kit (see Section 3.1). The D-182969 Consumable Kit is required for 1.6-mm MiniCord<sup>™</sup> Cable.

## 2. Precautions

- Safety glasses should be worn at all times while performing the installation procedures.
- Avoid skin contact with epoxy.
- When the heater is in operation, place it away from combustibles.

- Disconnected optical connectors may emit radiation if the far end is coupled with a working laser or Light-Emitting Diode (LED). Do not view the fiber end of a cable or plug with an optical instrument until absolute verification is established that the fiber is disconnected from any laser or LED source.
- For cleaning of these fiber optic products, always use Isopropyl Alcohol (>91% 2-Propanol + water).
- It is recommended that you use the E-Series Ultrajet\* from Chemtronics\*, Inc. when canned air is required.

### 3. Cable and Fiber Preparation

#### 3.1 Coated Fiber

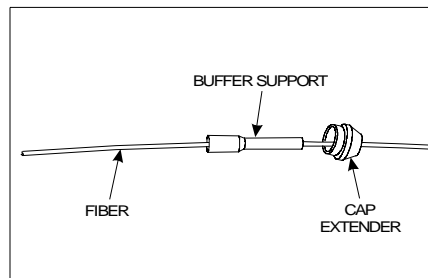
**Note 1:** Use the appropriate procedures for preparing outside plant (OSP) cable. See 636-299-110 for more information on grounding, blocking, and buffering Fiber Optic Cable.

**Note 2:** Before starting cable and fiber preparation, the curing oven may be set up to save warm-up time later. See **Section 6 - Curing Epoxy** section for detailed instructions.

**Important:** Do not attempt to remove the fiber coating until a buffer tube has been placed over the coated fiber. This will prevent cutting the fiber by mistake.

1. **EXPOSE AN APPROPRIATE LENGTH OF COATED FIBER** (as specified in the D-181755 Kit) to allow for connector installation and termination.
2. **PLACE AN APPROPRIATE LENGTH OF BUFFERED TUBING** from the D-181755 Kit over the fiber to be stripped.
3. **PLACE BUFFER CAP AND SUPPORT ONTO FIBER** Slip the buffer cap and

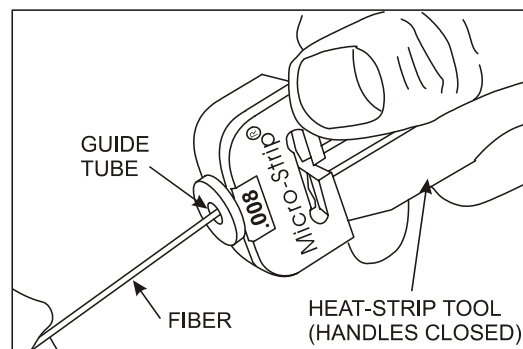
the buffer support onto the buffer tube covering the fiber (Figure 3).



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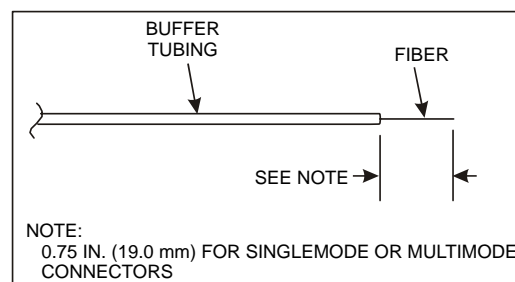
**Figure 3. Install Buffer Cap and Buffer Support on Buffer Tubing**

4. **REMOVE FIBER COATING** With the stripper handles open and the buffered tube aligned with the end of the fiber, insert both fiber and buffer tubing through the guide tube opening enough to allow about 0.75 inch (19.0 mm) of buffer and fiber coating to be removed (Figure 4).
5. Close the handles and pull the buffer away from the tool with a smooth motion.
6. Wipe the stripped fiber with a wipe dampened with isopropyl alcohol to remove any residual coating.



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**Figure 4. Heat-Strip Tool - Removing Coating from Coated Fiber**



NOTE:  
0.75 IN. (19.0 mm) FOR SINGLEMODE OR MULTIMODE CONNECTORS

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\* Chemtronics and Ultrajet are registered trademarks of Chemtronics, Inc.

**Figure 5. Recommended Strip Dimensions**

7. **INSTALL CONNECTOR ON FIBER**  
Use the procedures outlined in **Connector Installation, Section 5.1**, in this manual to complete installation of the connector, cure the epoxy, polish and inspect the fiber end.

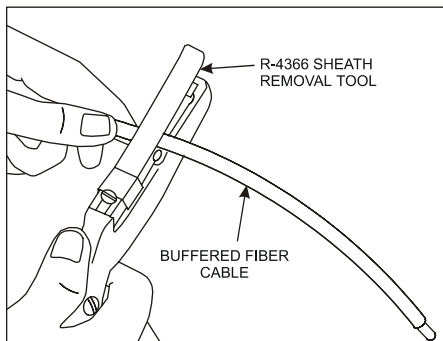
**3.2 Buffered Fiber Cable (Premises/Building)**

1. **REMOVE OUTER JACKET** Ring-cut the outer sheath the required distance from the cable end with the R-4366 sheath removal tool and remove outer jacket. **IMPORTANT: Do not cut into the fibers.** Typical length is approximately 24 to 36 inches (0.61 to 0.91 meters).

**Note 1:** The exposed buffered fiber should be long enough to:

- Allow for placement into the equipment cabinet
- Allow access to the curing oven, polishing plate, etc.
- Prevent stress on the fiber during the application of the connector.

**Note 2:** See Table 1, page 1, to verify correct connector choice for cable type.

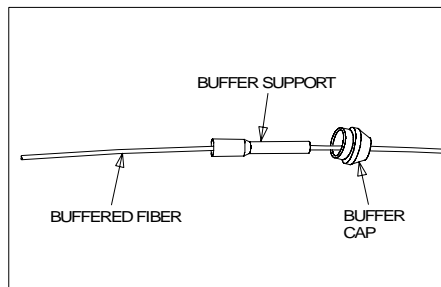


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**Figure 6. R-4366 Sheath Removal Tool - Ring-Cut Cable Jacket**

2. **PLACE BUFFER CAP AND SUPPORT ONTO CABLE** Slip the buffer cap and

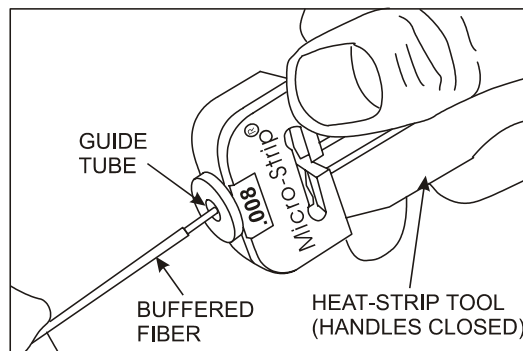
the buffer support onto the buffered fiber.



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**Figure 7. Install Buffer Cap and Buffer Support on Buffered Fiber**

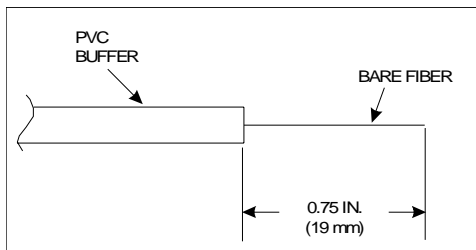
3. **MEASURE AND MARK THE BUFFERED FIBER** 0.75 inch (19.0 mm) from the end.
4. **REMOVE BUFFER AND FIBER COATING**
  - Refer to 1026A Heat-Strip Tool Operating Instructions for setup. Make sure heater unit is fully inserted.
  - Insert buffered fiber through the guide tube to allow 0.75 inch (19 mm) of the buffer and coating to be removed.
  - Close the handles and wait 6 to 10 seconds for softening of the buffer to occur. Pull the fiber from the tool with one smooth motion.
  - Wipe the stripped fiber once with a wipe dampened with isopropyl alcohol to remove any residual coating.



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**Figure 8. Heat-Strip Tool - Removing Fiber Coating from Buffered Fiber**

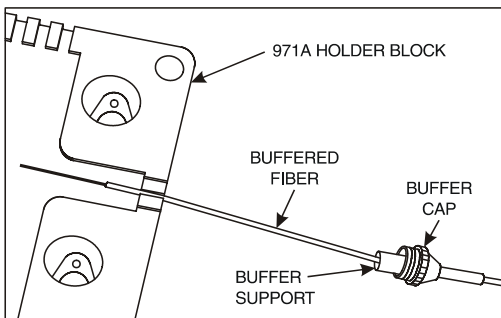


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**Figure 9. Buffered Fiber Stripping Dimensions**

**5. SET ASIDE THE PREPARED FIBERS**

Place the prepared fiber into the grooves of the 971A holder block (provided with the tool kits).



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**Figure 10. 971A Holder Block with Buffered Fiber**

**6. INSTALL CONNECTOR ON FIBER**

Use the procedures outlined in Connector Installation, Section 5.1, to complete the installation of the connectors, cure the epoxy, polish and inspect the fiber end.

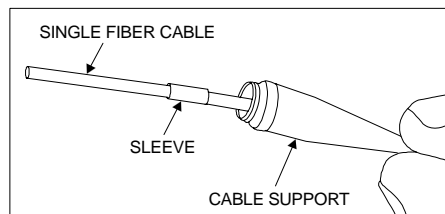
**3.3 Jacketed Fiber Cable (1.6, 2.4, and 3.0 mm)**

**1. PLACE CABLE SUPPORT AND SLEEVE ONTO CABLE** Slip cable support and crimp sleeve onto cable.

**Note:** For a 1.6-mm MiniCord™ cable, slip the cable support, 3.0-mm (black) crimp sleeve, and the 2-inch long polyvinyl chloride (PVC) tube (from the D-182969 Kit) onto the cable.

**Depending on connector application, the appropriate color crimp sleeve**

**and cable support must be selected. See Figure 2 for color selection.**

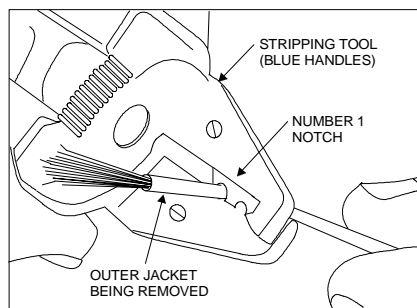


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**Figure 11. Cable Support and Sleeve on Jacketed Fiber Cable**

**2. MEASURE AND MARK CABLE** Using either a scale or template, measure and mark the cable 1.25 inches (31.8 mm) from the end of the cable.

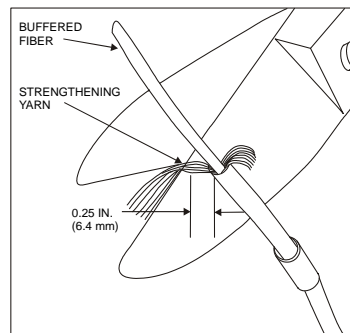
**3. REMOVE OUTER JACKET** Using the Number 1 notch on the blue-handled 700A stripping tool, remove the outer jacket back to the mark.



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**Figure 12. Stripping Outer Jacket of Single Fiber Cable**

**4. CUT STRENGTHENING YARN** With the strengthening yarn separated into two equal size bundles, use scissors to trim the strands 0.25 inch (6.4 mm) from the edge of the outer jacket. Flair the strengthening yarn evenly all around the cable.



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**Figure 13. Cutting Strengthening Yarn - Jacketed Fiber Cable**

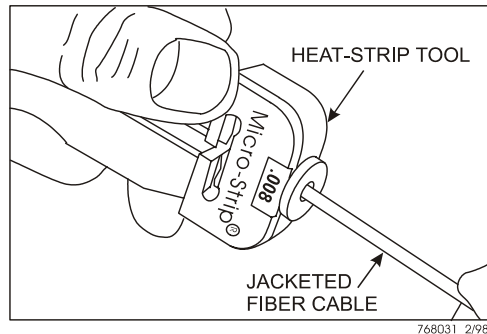
- 5. POSITION AND SECURE PVC TUBE** (1.6-mm MiniCord™ cable only) Apply a small drop of Loctite® 414 adhesive to the MiniCord™ jacket, about 0.25 inch (6.4 mm) from the end. Slide PVC tube forward until it is even with the end of the MiniCord™ jacket. Hold tube in place for 10 seconds until the adhesive sets.

**Caution:** Avoid getting adhesive on your fingers and the strengthening yarn.

- 6. MEASURE AND MARK BUFFERED FIBER** Measure and mark the buffered fiber 0.75 inch (19 mm) from the end of the buffered fiber. **Note:** For 2024A-Z connectors, measure and mark 0.69 inch (17.5 mm) from the end of the buffered fiber.

- 7. REMOVING BUFFER AND FIBER COATING**

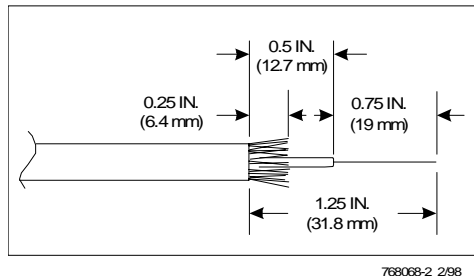
- Refer to 1026A Heat-Strip Tool Operating Instructions for setup. Make sure heater unit is fully inserted.
- Insert buffered fiber through the guide tube to allow 0.75 inch (19 mm) of the buffer and coating to be removed.
- Close the handles and wait 6 to 10 seconds for softening of the buffer to occur. Pull the fiber from the tool with one smooth motion. The delay is not necessary for 1800 and 2000 series cordage.
- Wipe the stripped fiber with a wipe dampened with isopropyl alcohol to remove any residual coating.



**Figure 14. Heat-Strip Tool - Jacketed Fiber Cable**

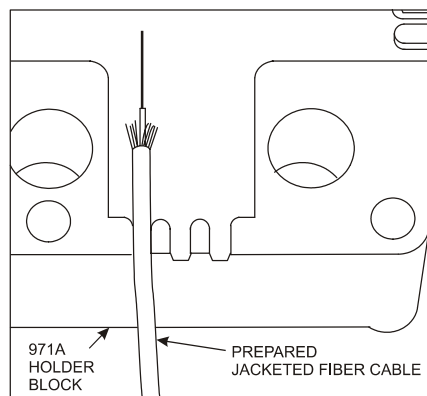
**RECOMMENDED DIMENSIONS FOR 1800, 2000, AND 9000 SERIES CORDAGE**

The recommended dimensions for the prepared cable and fiber are shown in Figure 15. **Note:** For the P2024A-Z connector, the buffered fiber and the bare fiber lengths should be 0.56 inch (14.2 mm) and 0.69 inch (17.5 mm), respectively.



**Figure 15. Recommended Dimensions for 1800, 2000, and 9000 Series Cordage**

- 8. SET ASIDE PREPARED CABLE** Place the prepared cable into the grooves of the 971A holder block provided with the tool kit.



\* Registered trademark of Loctite Corporation.

**Figure 16. 971A Holder Block with Jacketed Fiber Cable**

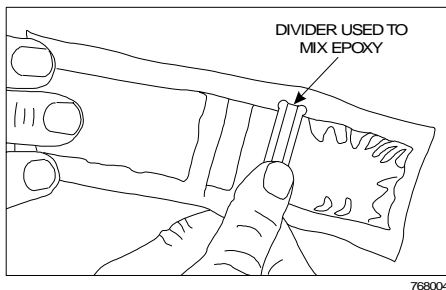
- 9. INSTALL CONNECTOR ON FIBER**  
Use the procedures outlined in Connector Installation, Section 5.2, to complete the installation of the connector, cure the epoxy, polish and inspect the fiber end.

## 4. Epoxy Preparation

The epoxy package is furnished with the consumable kit. See the ordering information in the back of this manual.

### 4.1 Preparation of Epoxy Furnished in Plastic Container

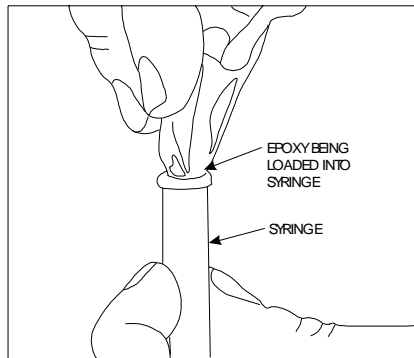
- 1. REMOVE EPOXY DIVIDER** This is a two-part epoxy separated with a divider. The divider must be removed to allow the epoxy to be mixed.
- 2. MIX THE EPOXY** Using the divider, thoroughly mix the epoxy until both parts are blended into a smooth, uniform color.



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**Figure 17. Mix the Epoxy**

- 3. INSTALL SYRINGE TIP** Place the syringe tip onto the syringe and twist to lock it in place. Then remove the plunger to allow the mixed epoxy to be loaded into the syringe.
- 4. PLACE EPOXY INTO SYRINGE** Fold the epoxy package in half, cut the corner of the package, and squeeze the mixed epoxy into the syringe. Replace the plunger in the syringe. A 3/4-inch length (19 mm) of epoxy will be enough for about 12 connectors.



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**Figure 18. Place Epoxy into Syringe**

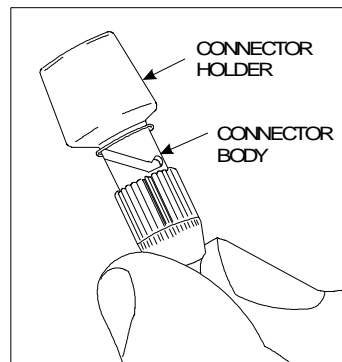
- 5. REMOVE AIR FROM SYRINGE**  
Remove air pockets from the syringe by holding the syringe tip upward and ejecting epoxy until the air pockets are removed.

## 5. Connector Installation

### 5.1 Connector – Buffered Fiber Assembly

- 1. PLACE CONNECTOR IN 600A OR 600B CONNECTOR HOLDER** Hold the connector toward a light and check to make sure the hole in the connector tip is clear of foreign matter. Use music wire (furnished) to clear the hole if necessary.

Place the connector into a 600A or 600B Connector Holder making sure that the bayonet pins of the holder are fully seated in the bayonet slots of the connector housing.

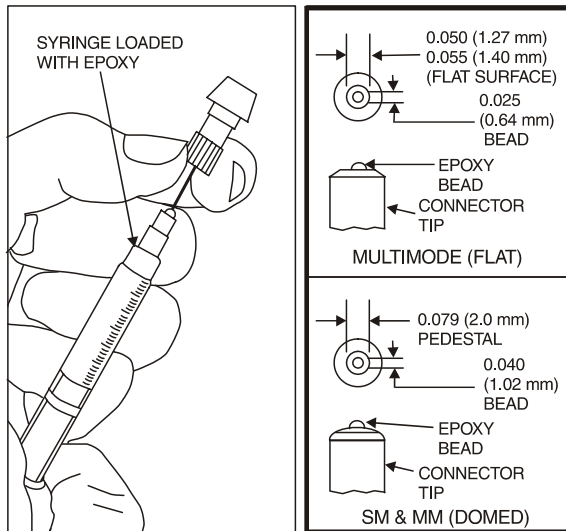


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**Figure 19. Install Connector Holder**

2. **INJECT EPOXY INTO THE CONNECTOR TIP**

- Insert the tip of the syringe into the back of the connector until it bottoms.
- Slowly inject epoxy into the connector until a small bead appears on the connector tip.  
**Important: The bead should cover at least one-half of the end face surface.**
- When the epoxy forms the correct size bead on the tip, maintain pressure on the plunger and slowly withdraw the syringe.

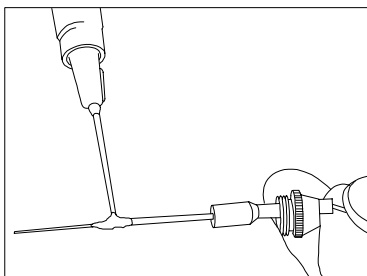


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Figure 20. Inject Epoxy into Connector Tip

3. **APPLY EPOXY TO FIBER AND BUFFER**

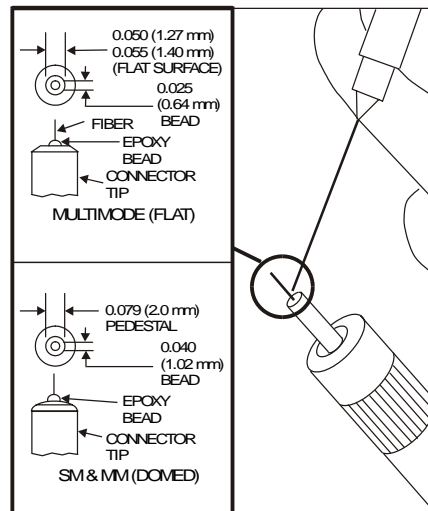
Using the syringe, apply a **thin** coating of epoxy to the fiber and 0.1 inch (2.5 mm) of the buffer.



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Figure 21. Apply Epoxy to Fiber and Buffer

4. **INSERT FIBER INTO CONNECTOR**  
Insert the fiber through the connector, carefully feeling for the opening in the tip. When the fiber is seated, pull it back slightly and watch for movement at the tip to make sure the fiber has not been broken. Reseat the fiber into the connector making sure the buffer is completely seated against the ceramic.
5. **CHECK FIBER/CONNECTOR TIP INTERFACE**  
Inspect the tip of the connector. If the epoxy is wicked away on the fiber as it is inserted, the bead must be reestablished. A proper bead will cover **one-half of the end face surface**.



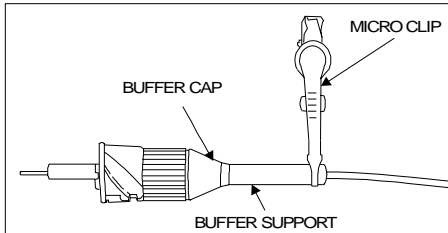
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Figure 22. Check Fiber/Connection Interface

6. **INSTALL BUFFER SUPPORT**  
Apply a drop of epoxy onto the barrel of the connector. Slip the buffer support onto the connector barrel.
7. **INSTALL BUFFER CAP**  
Apply a drop of epoxy onto the threads of the buffer cap. Slip the buffer cap over the buffer support and screw the buffer cap into the connector body. Make sure the fiber is fully inserted into the connector.

**Important: Use only the connector or buffer support when handling the connector assembly. Make sure that**

the buffered fiber is fully inserted into the connector. Place a micro clip on the buffer support as shown. This inhibits the buffered fiber from being accidentally pulled out of the connector.



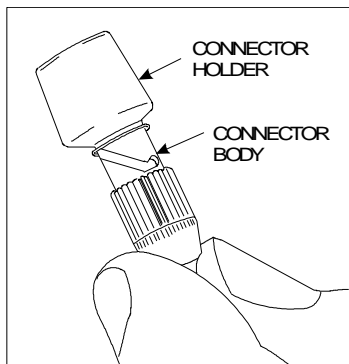
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**Figure 23. Install Buffer Cap and Micro Clip**

**5.2 Connector – Jacketed Fiber Cable Assembly (1.6, 2.4, and 3.0 mm)**

- 1. PLACE CONNECTOR IN 600A OR 600B CONNECTOR HOLDER** Hold the connector toward a light and check to make sure the hole in the connector tip is clear of foreign matter. Use music wire (furnished) to clear the hole if necessary.

Place the connector into a 600A or 600B Connector Holder making sure that the bayonet pins of the holder are fully seated in the bayonet slots of the connector housing.



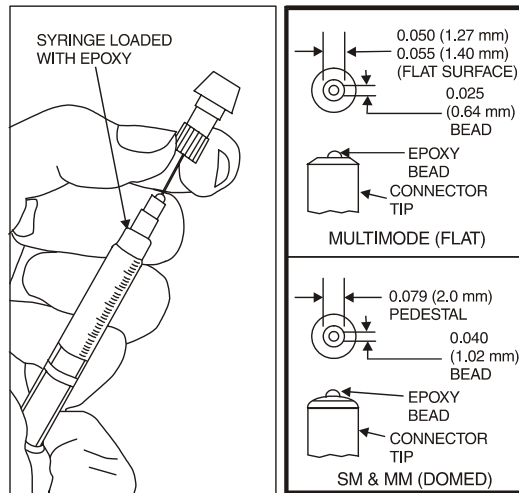
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**Figure 24. Install Connector Holder**

- 2. INJECT EPOXY INTO THE CONNECTOR TIP**

- Insert the tip of the syringe into the back of the connector until it bottoms.

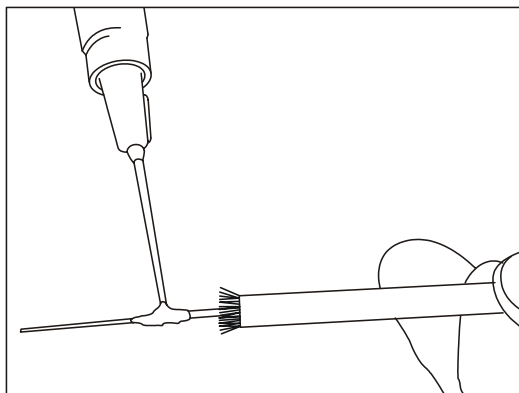
- Slowly inject epoxy into the connector until a small bead appears on the connector tip. **Important: The bead should cover at least one-half of the end face surface.**
- When the epoxy forms the correct size bead on the tip, maintain pressure on the plunger and slowly withdraw the syringe.



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**Figure 25. Inject Epoxy into Connector Tip**

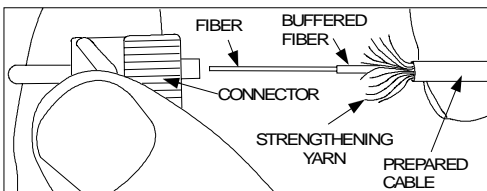
- 3. APPLY EPOXY TO FIBER AND BUFFER** Using the syringe, apply a thin coating of epoxy to the fiber and 0.1 inch (2.5 mm) of the buffer.



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**Figure 26. Apply Epoxy to Fiber and Buffer**

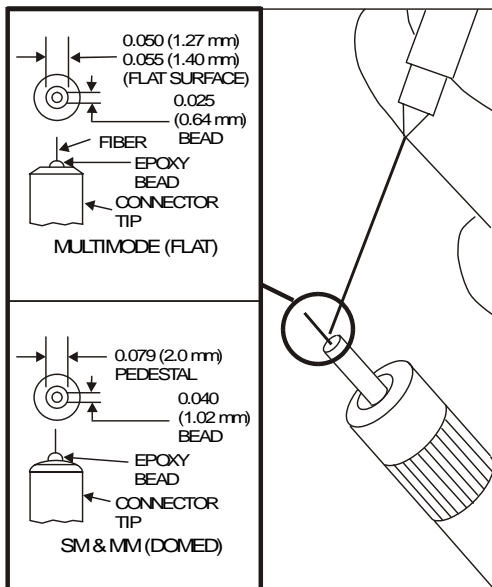
4. **INSERT FIBER INTO CONNECTOR**  
 Insert the fiber into the connector.  
 Rotate the connector carefully feeling for the opening in the tip. When the fiber is seated, pull it back slightly and watch for movement at the tip to make sure the fiber has not been broken. **Reseat the fiber into the connector so the outer jacket butts against the connector barrel.**



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**Figure 27. Insert Fiber into Connector (Single-Fiber Cable)**

5. **CHECK FIBER/CONNECTOR TIP INTERFACE** Inspect the tip of the connector. If the epoxy is wicked away on the fiber as it is inserted, the bead must be reestablished. A proper bead will cover **one-half of the end face surface.**

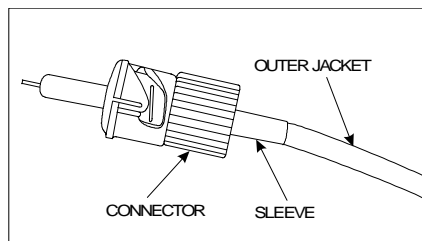


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**Figure 28. Check Fiber/Connection Interface**

6. **INSTALL CABLE SLEEVE** Slip the cable (crimp) sleeve over the outer

jacket and the connector barrel to capture the strengthening yarn between the barrel and sleeve.



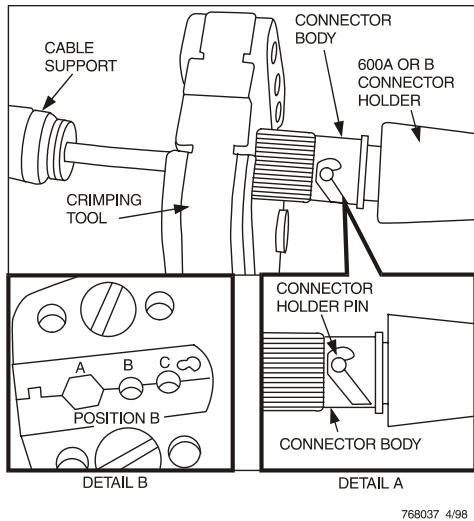
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**Figure 29. Install Cable Sleeve (Single-Fiber Cable)**

7. **CRIMP CABLE SLEEVE** Position the 600A or 600B connector holder pins onto the connector body as shown in Detail A (Figure 30) for the crimping and curing operation. This will allow the sleeve to be fully exposed for crimping.

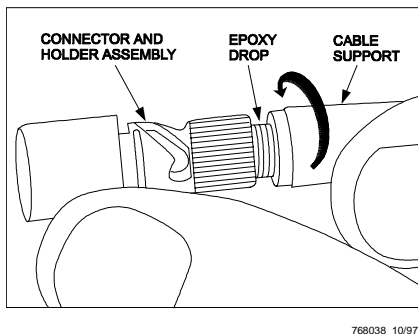
**Before crimping, make sure the sleeve is butted against the connector.** Place position B of the 102A Crimping Tool [shown in Detail B (Figure 30) and used for the silver 2.4-mm sleeve] over the sleeve so when crimped the first two indentations on the sleeve appear over the connector barrel and the third appears over the cable jacket. This will ensure a good crimp and prevent cable rotation. Squeeze the crimping tool handles until they release. Rotate the connector 90° and crimp again.

For black 3.0-mm sleeves, follow the same procedures described above except use position C on the 102A Crimping Tool, or the position marked "ST" on the 1510B Crimping Tool. **DO NOT use the 1510B Crimping Tool to crimp silver 2.4-mm sleeves.**



**Figure 30. Crimp Cable Sleeve (Single-Fiber Cable)**

8. **INSTALL CABLE SUPPORT** Apply a drop of epoxy onto the threads of the cable support, slip the support over the crimped sleeve, and screw the support into the connector body. (**Note:** For the P2024A-Z Connector, apply a small drop of epoxy onto the rear edge of the crimp sleeve. Slip the cable support over the crimp sleeve until it seats. Rotate the cable support to evenly distribute the epoxy.) The assembly is now ready to be placed into the curing oven.

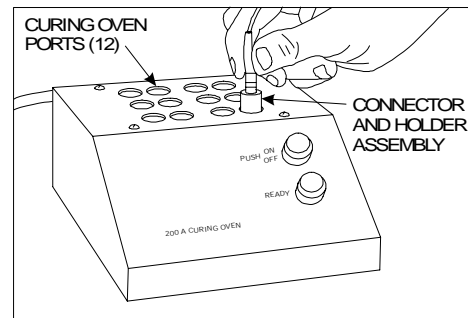


**Figure 31. Install Cable Support (Single-Fiber Cable)**

## 6. Curing Epoxy, Cleaving and Polishing

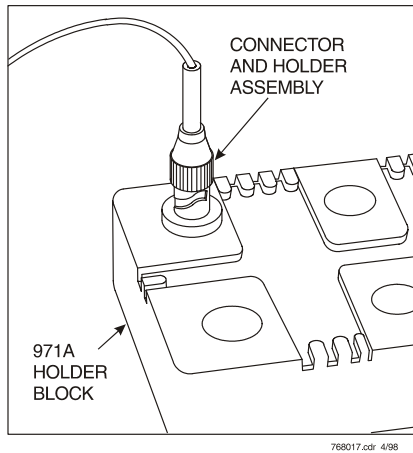
### 6.1 Curing Epoxy

1. **SET UP THE CURING OVEN** Place the oven away from combustibles, and connect the power cord to a power source (**120 V 60 Hz AC for the 200A oven and 220 V 50 Hz AC for the 200A1 international oven**). To apply power, push the ON/OFF switch to the ON position. The switch will illuminate, indicating that the power is on. In about 5 minutes, an illuminated READY lamp indicates that the oven is ready for use.
2. **PLACE CONNECTOR INTO OVEN** Place the connector and holder assembly into one of the oven ports. Cure for 10 minutes.



**Figure 32. Place Connector into Oven**

3. **PLACE CONNECTOR INTO 971A HOLDER BLOCK** After 10 minutes of curing time, remove the assembly from the oven and place it into one of the ports in the 971A holder block to cool. Remove micro clip from buffer support after connector has cooled.



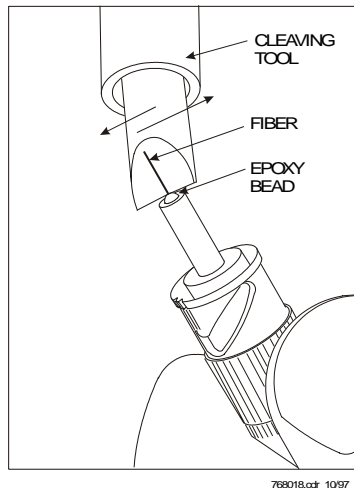
**Figure 33. Place Connector into 971A Holder Block**

### 6.2 Cleaving the Fiber

**SCORE THE FIBER** Remove the 600A or 600B holder from the connector. Using one or two strokes with the cleaving tool, score the fiber close to the crest of the epoxy bead. Scissors may be used as an optional method of removing the excess fiber.

**Note:** A clean, short score significantly improves the success rate. **Do not break the fiber.**

Using a **gentle straight pull**, remove the exposed fiber. If the fiber does not pull off with a gentle pull, rescore and try again.



**Figure 34. Scoring the Fiber**

### 6.3 Polishing Connector Ends

**PREPARE POLISHING MATERIAL** Before positioning the polishing material, clean the bare polishing plate and the back of the non-foam-backed polishing paper with a wipe dampened with isopropyl alcohol. Blow the plate and paper dry with canned air.

If domed connectors are to be polished, also clean the rubber pad. Blow the pad dry with canned air.

**Important: Foreign material can cause scratches on the end face of the ferrule if the polishing plate or paper is not properly cleaned.**

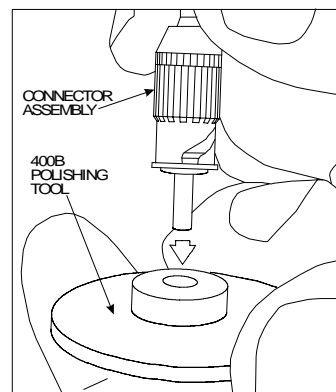
**PREPARE POLISHING TOOL** Clean the surface of the 400B or 1510A polishing tool and the connector tip with a wipe dampened with alcohol.

**AIR POLISH THE CLEAVED FIBER** Hold the Type A polishing paper (brown side down, white side up) over the connector. Point the connector ferrule upward and, using light circular or figure-8 strokes, polish the cleaved fiber down flush with the epoxy bead.

**Note:** This will reduce the risk of breaking the fiber during the first polishing.

**INSERT CONNECTOR INTO POLISHING TOOL** Insert the connector tip into the 400B or 1510A polishing tool.

*Refer to the Polishing Guide Table and the detailed instructions in the following sections.*



**Figure 35. Prepare Polishing Tool**



## ST® II Connector Polishing Guide (Epoxy Installation)

|  | 1 <sup>st</sup> Polish            |                                   |                                   | 2 <sup>nd</sup> Polish |                               |                           | 3 <sup>rd</sup> Polish | Repairs  |
|--|-----------------------------------|-----------------------------------|-----------------------------------|------------------------|-------------------------------|---------------------------|------------------------|--|
| <b>Product Code</b>                        | P2020CC                           | P2020CZ<br>P2021CZ<br>P2024AZ     | P3020AZ                           | P2020CC                | P2020CZ<br>P2021CZ<br>P2024AZ | P3020AZ                   | P3020AZ                | P2020CZ<br>P2021CZ<br>P2024AZ  |
| <b>Ferrule Type</b>                        | MM<br>Alumina                     | MM<br>Zirconia                    | SM<br>Zirconia                    | MM<br>Alumina          | MM<br>Zirconia                | SM<br>Zirconia            | SM<br>Zirconia         | MM<br>Zirconia<br><br>SM<br>Zirconia   |
| <b>End Face Geometry</b>                   | Flat                              | Domed                             | Domed                             | Flat                   | Domed                         | Domed                     | Domed                  | Domed  |
| <b>Pad Type</b>                            | None                              | Rubber                            | Rubber                            | None                   | Rubber & type A paper         | Rubber & type A paper     | Rubber & type A paper  | Rubber & type A paper  |
| <b>Paper Type</b>                          | A, over glass                     | A, over pad                       | A, over pad                       | C or D over glass      | C or D, over type A & pad     | C or D, over type A & pad | E, over type A & pad   | F, over type A & pad   |
| <b>Polishing Solution</b>                  | None                              | None                              | None                              | None                   | None                          | None                      | Distilled water        | Distilled water  |
| <b>Polishing Time or Number of Strokes</b> | Until thin layer of epoxy remains | Until thin layer of epoxy remains | Until thin layer of epoxy remains | Remove remaining epoxy | Remove remaining epoxy        | Remove remaining epoxy    | 10 to 15 strokes       | Until flaw is removed (40 strokes max), then E over type A & pad, 10 to 15 strokes |

### 6.3.1 Polishing Flat-Tipped Connector Ends (P2020C-C)

#### 1st Polish – Multimode Connector

Position a sheet of the Type A (brown foam-backed) polishing paper onto the polishing plate, foam side down. The foam backing cushions the fiber during the initial polishing operation. Start with a very light pressure using figure-8 motions. A shiny halo can be observed around the thin layer of epoxy remaining on the tip at the end of the first polishing procedure. The polishing time may vary with the size of the epoxy bead. Use the eye loupe or magnifier to verify that a thin layer still remains.

**Whenever the polishing tool is lifted from the polishing paper, use canned air to remove grit from the tool and paper. For the first and second polish, make sure that the paper is aligned with the glass plate. This will prevent damage to the connector end face by preventing it from hitting the edge of the polishing plate during polishing.**

Remove the connector from the polishing tool and clean both the connector and the tool with a wipe dampened with isopropyl alcohol. Then, use canned air to dry the connector and the tool. Once cleaned, replace the connector into the tool.

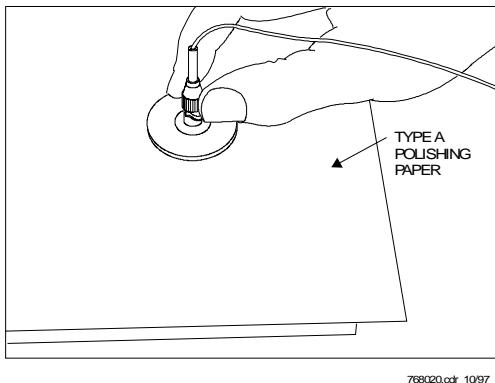


Figure 36. 1<sup>st</sup> Polish - Multimode (Flat-Tipped Connectors)

#### 2nd Polish – Multimode Connector

Position the mylar-backed Type C (gray) or D (light green) polishing paper over the polishing plate (glossy side down). **Do not**

**use water or the polishing pad.** Using figure-8 motions, polish the connector tip until all the epoxy is removed. Check periodically with the eye loupe or magnifier. When all the epoxy has been removed, the entire end face will appear shiny.

Remove the connector from the polishing tool and clean both the connector and the tool with a wipe dampened with isopropyl alcohol. Then, use canned air to dry the connector tip.

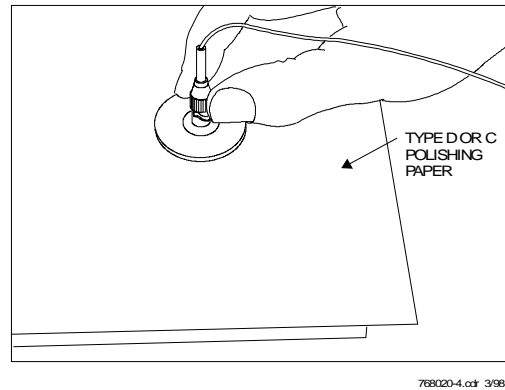


Figure 37. 2<sup>nd</sup> Polish - Multimode (Flat-Tipped Connectors)

### 6.3.2 Polishing Domed-Tipped Connector Ends (P2020C-Z, P2021C-Z, P2024A-Z, P3020A-Z, and P3021A-Z)

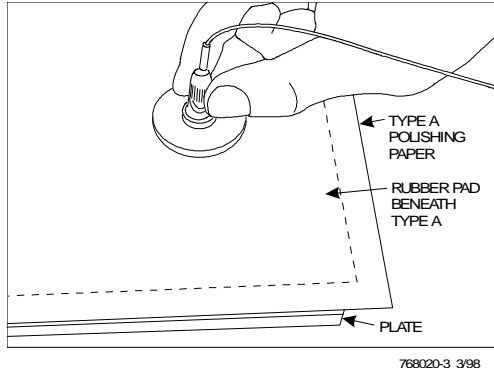
#### 1st Polish – Singlemode and Multimode Connector

1. Place the rubber pad on the polishing plate.
2. Place a sheet of Type A Polishing Paper (brown foam-backed) over the pad (foam-side down).
3. Carefully place the connector ferrule into the polishing tool. Starting with **extremely light pressure**, polish the connector on the Type A paper using figure-8 strokes. Check periodically with the eye loupe or magnifier until a shiny halo can be observed around a thin layer of epoxy remaining on the tip.

**Note:** **EXTREMELY** light pressure should be used during the first few polishing strokes to avoid breaking the fiber off below the connector tip surface.

**WARNING: To avoid pitting the fiber end face, DO NOT remove all of the epoxy during this step.**

4. Start with a fresh area of the polishing paper for each connector to be polished.



**Figure 38. Polishing Domed-Tipped Connectors (Type A Paper/Rubber Pad)**

### **2nd Polish – Singlemode and Multimode Connector**

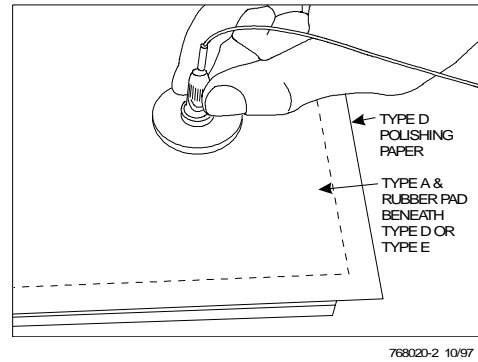
Place the Type C (gray) or Type D (light green) polishing paper (glossy side down) over the Type A paper. Using figure-8 strokes, polish the connector until all of the remaining epoxy is removed. Check periodically with the eye loupe or magnifier. When all the epoxy has been removed, the entire end face will appear shiny. **No further polishing is required for multimode connectors.** Start with a fresh area of paper for each connector.

### **3rd Polish – Singlemode Connector**

To achieve optimum return loss, replace the Type C or D paper with a sheet of Type E (white) polishing paper (glossy side down). Remove the connector from the tool and clean with a wipe dampened with isopropyl alcohol. Add a small amount of water to the portion of the paper that will be the working area. Using the polishing tool, work the water into the polishing paper. Place the connector ferrule into the polishing tool and polish the connector ferrule for 10 to 15 strokes; each stroke should be

approximately 2 inches in height.

**WARNING: DO NOT exceed 15 strokes.**



**Figure 39. Polishing Domed-Tipped Connectors (Type D or E/Type A Paper/Rubber Pad)**

## **7. Inspection**

### **7.1 Using Microscope to Inspect Fiber**

1. **ATTACH CONNECTOR TO MICROSCOPE** See **Precautions** on **page 2**. Insert the connector tip into the bottom of the microscope. Open the microscope barrels to illuminate the connector tip, and use the side wheel to focus. A high-intensity light may be used at the other end of the fiber to illuminate the core area.

**Caution:** Do not use a laser or LED to illuminate the core area for viewing.

The core may not necessarily illuminate if an epoxy film or bead still exists on the connector end face.

2. **INSPECT FIBER END** An acceptable fiber end is free of cracks. Voids or scratches must be avoided in the core area. If the fiber is unacceptable, this fiber end must be repaired or reterminated.
3. If the connector is not to be used immediately, cover the end with the protective cap.

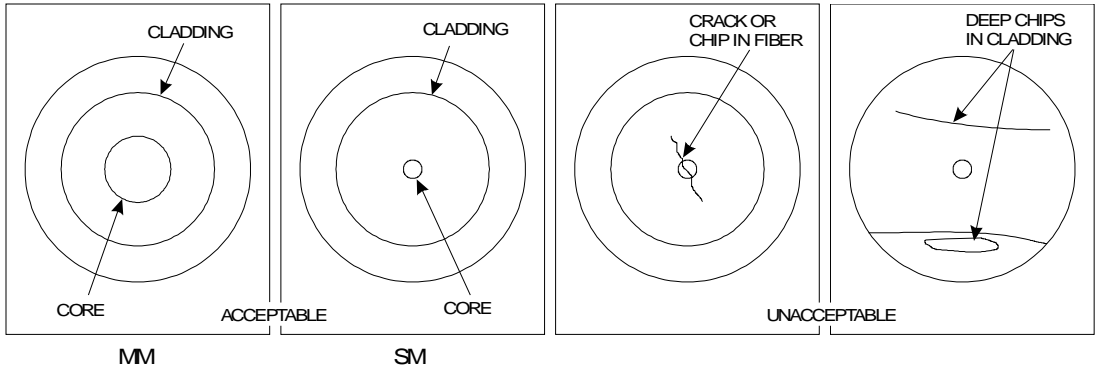


Figure 40. Fiber End Views (Microscope)

### 7.2 Repairs (Domed Connectors Only)

In some instances when the fiber is cracked or scratched in or near the core, the plug may be repaired. Using Type F (yellow) polishing paper with water, placed over the Type A paper and rubber pad, polish the connector for 20 to 40 strokes or until the flaw has been removed. No further polishing is required for multimode. **For singlemode, once the flaw is removed, repeat the 3<sup>rd</sup> Polish - Singlemode Connector in Section 6.3.2.**

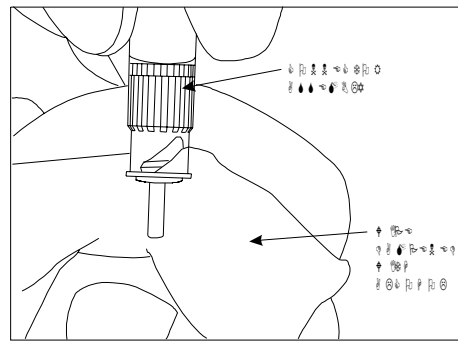


Figure 41. Cleaning Connector Tip

## 8. Interconnecting with ST<sup>®</sup> II Fiber Optic Connectors

Several interconnecting couplings are available for joining the ST<sup>®</sup> II Fiber Optic Connectors. See Ordering Information in this manual.

### 8.1 Cleaning Connector and Coupling

#### 1. CLEAN END OF CONNECTOR TIP

Clean the end and sides of the connector ferrule with a wipe dampened with isopropyl alcohol.

**Important: If the connector tip is not thoroughly cleaned, the signal performance will be affected.**

#### 2. CLEAN INTERIOR OF COUPLING

Use pipe cleaners saturated with isopropyl alcohol to remove debris from the interior of the coupling. This should be done only if necessary.

Using canned air, remove any dust particles from the interior of the coupling.

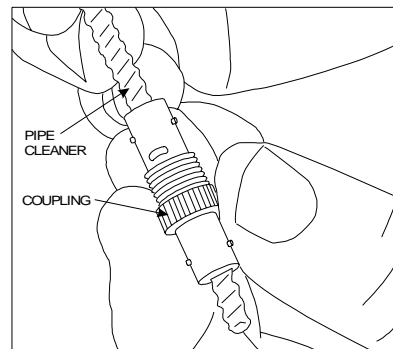
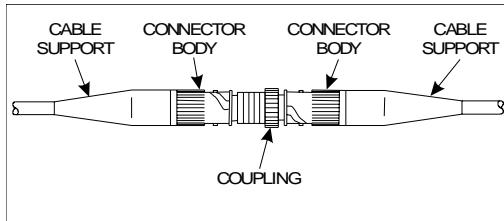


Figure 42. Cleaning Coupling

## 8.2 Installing Coupling on Standard Version ST<sup>®</sup> II Connectors

1. **INSTALL COUPLING** Install the ST<sup>®</sup> II connectors onto the coupling by aligning the notch on the rim of the connector body with the slot in the coupling. Complete the connection by pushing the connectors onto the coupling with a clockwise twist-locking motion.



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Figure 43. ST<sup>®</sup> II Connectors Coupled

2. If a high-loss condition exists, use canned air to reclean the interior of the coupling, and reinstall the coupling as just described.
3. When doing rearrangements or reinsertions of an ST<sup>®</sup> II connector, blow any dust from the coupling using canned air. Clean the connector tip with a wipe dampened with isopropyl alcohol and push the connector onto the coupling with a clockwise twist-locking motion.

## 9. Ordering Information

### 9.1 Tool Kits

**1032B5 Tool Kit** (Comcode 106 705 213) – Contains the following tools and materials for assembly of ST<sup>®</sup> II, ST<sup>®</sup> II+, and SC Fiber Optic Connectors.

| Kit Quantity | Description                  | Replacement Comcode | Replacement Quantity |
|--------------|------------------------------|---------------------|----------------------|
| 1            | 1510B Crimping Tool          | 106 918 998         | 1 Tool               |
| 1            | 300B Microscope              | 104 412 077         | 1 Microscope         |
| 1            | 1510A Polishing Tool         | 106 918 980         | 1 Tool               |
| 12           | 600B Connector Holders       | 107 118 549         | 12 Holders           |
| 1            | 700A Stripping Tool          | 104 278 478         | 1 Tool               |
| 1            | 1026A Heat-Strip Tool        | 105 514 764         | 1 Tool               |
| 2            | 971A-1 Holder Block          | 104 229 398         | 1 Block              |
| 1            | 975A Cleaving Tool           | 103 808 770         | 1 Tool               |
| 1            | Scissors                     | 105 257 364         | 2 Scissors           |
| 1            | 6-inch Scale                 | 105 257 356         | 5 Scales             |
| 1            | Alcohol Bottle               | 105 257 463         | 2 Bottles            |
| 1            | Glass Plate                  | 105 075 618         | 2 Plates             |
| 1            | Sheath Removal Tool (R-4366) | 105 114 581         | 1 Tool               |
| 1            | Instruction Manual           | Contact OFS Rep.    | 1 Manual             |
| 15           | Micro Clips (1043A)          | 106 228 455         | 15 Micro Clips       |
| 1            | 200A Curing Oven             | 104 055 058         | 1 Oven               |
| 12           | 1510C SC Connector Holders   | 106 919 004         | 12 Fixtures          |
| 2            | Modified SM/MM SC Grips      | 107 480 022         | 10 Grips             |
| 1            | Rubber Polishing Pad         | 106 978 992         | 10 Pads              |
| 1            | 1039A Cut-Length Template    | 106 075 146         | 5 Templates          |
| 1            | 1039B Cut-Length Template    | 107 149 783         | 5 Templates          |
| 1            | 7X Eye Loupe                 | Obtain Locally      |                      |

**1032B6 Tool Kit** (Comcode 106 919 012) – The 1032B6 Tool Kit is the same as the 1032B5 Tool Kit except the 200A Curing Oven is replaced by the 200A1 Curing Oven for use internationally. The 200A1 oven operates on 220 V 50 Hz. Replacement comcode for the 200A1 oven is 105 537 690 and is replaced in quantities of one each.

**9.2 Consumables (D-Kits)**

**D-181755 Kit (Comcode 105 052 047)**

The D-181755 Kit contains the parts required to make a transition from ribbon or LIGHTPACK<sup>®</sup> bundle to individually buffered fibers.

**D-182739 Kit (Comcode 106 919 244)**

The D-182739 Kit contains consumables to install 100 (P3020A-Z or P3021A-Z) singlemode ST<sup>®</sup> II Fiber Optic Connectors with zirconia ferrules using heat-cured epoxy.

| Kit Quantity | Description            | Replacement Comcode | Replacement Quantity | Physical Descriptions  |
|--------------|------------------------|---------------------|----------------------|------------------------|
| 25 Sheets    | Type A Polishing Paper | 105 488 175         | 100 Sheets           | Brown<br>(Foam Backed) |
| 25 Sheets    | Type D Polishing Paper | 106 960 107         | 100 Sheets           | Light Green            |
| 20 Sheets    | Type E Polishing Paper | 106 960 115         | 100 Sheets           | White                  |
| 2 Sheets     | Type F Polishing Paper | 106 960 123         | 10 Sheets            | Yellow                 |
| 2 Pkgs.      | Wipes                  | 105 205 678         | 250 Sheets           |                        |
| 1 Vial       | Music Wire             | 105 071 013         | 4 Vials              |                        |
| 15 Syringes  | Syringes               | 105 257 422         | 10 Syringes          |                        |
| 25 Tips      | Dispensing Tips        | 105 157 879         | 125 Tips             |                        |
| 1 Pkg.       | Epoxy                  | 105 489 355         | 15 Packs             |                        |
| 10           | Pipe Cleaners          |                     | Obtain Locally       |                        |

**D-182738 Kit (Comcode 106 919 236)**

The D-182738 Kit contains consumables to install 100 (P2020C-C, P2020C-Z, P2021C-Z, or P2024A-Z) multimode ST<sup>®</sup> II Fiber Optic Connectors using heat-cured epoxy. The kit is the same as the D-182739 Kit except no Type E Polishing Paper is provided.

| Kit Quantity | Description            | Replacement Comcode | Replacement Quantity | Physical Description   |
|--------------|------------------------|---------------------|----------------------|------------------------|
| 25 Sheets    | Type A Polishing Paper | 105 488 175         | 100 Sheets           | Brown<br>(Foam Backed) |
| 25 Sheets    | Type D Polishing Paper | 106 960 107         | 100 Sheets           | Light Green            |
| 2 Sheets     | Type F Polishing Paper | 106 960 123         | 10 Sheets            | Yellow                 |
| 2 Pkgs.      | Wipes                  | 105 205 678         | 250 Sheets           |                        |
| 1 Vial       | Music Wire             | 105 071 013         | 4 Vials              |                        |
| 15 Syringes  | Syringes               | 105 257 422         | 10 Syringes          |                        |
| 25 Tips      | Dispensing Tips        | 105 157 879         | 125 Tips             |                        |
| 1 Pkg.       | Epoxy                  | 105 489 355         | 15 Packs             |                        |
| 10           | Pipe Cleaners          |                     | Obtain Locally       |                        |

**D-182969 Kit (Comcode 108 292 426)**

The D-182969 Kit contains consumables to terminate MiniCord™ cable with ST® II Fiber Optic Connectors.

| Kit Quantity | Description                       | Replacement Comcode | Replacement Quantity |
|--------------|-----------------------------------|---------------------|----------------------|
| 1            | Instruction Manual                | Contact Lucent Rep. | NA                   |
| 100          | 3.0-mm PVC Tube<br>(50.8 mm long) | NA                  | NA                   |
| 1            | Loctite 414 Super Bonder          | NA                  | NA                   |

### 9.3 ST® II Connectors

| Connector Code   | Comcode     | Fiber Mode | Ferrule Type   | Housing Description | Cable Size (mm) | Fiber OD (µm) | Packaging            |
|------------------|-------------|------------|----------------|---------------------|-----------------|---------------|----------------------|
| P2020C-C-125     | 105 143 911 | MM         | Flat Alumina   | Enh-Metal           | 0.9/2.4/3.0     | 125           | Individual           |
| P2020C-Z-125     | 106 812 274 | MM         | Domed Zirconia | Enh-Metal           | 0.9/2.4/3.0     | 125           | Individual           |
| P2020C-Z-125-100 | 106 952 500 | MM         | Domed Zirconia | Enh-Metal           | 0.9/2.4/3.0     | 125           | Bulk<br>(100 pieces) |
| P2021C-Z-125     | 108 056 078 | MM         | Domed Zirconia | Enh-Metal           | 0.9             | 125           | Individual           |
| P2024A-Z-125-100 | 108 170 432 | MM         | Domed Zirconia | Plastic             | 3.0             | 125           | Bulk<br>(100 pieces) |
| P3020A-Z-125     | 106 812 258 | SM         | Domed Zirconia | Enh-Metal           | 0.9/2.4/3.0     | 125           | Individual           |
| P3020A-Z-125-100 | 106 952 518 | SM         | Domed Zirconia | Enh-Metal           | 0.9/2.4/3.0     | 125           | Bulk<br>(100 pieces) |
| P3021A-Z-125-100 | 107 223 430 | SM         | Domed Zirconia | Enh-Metal           | 0.9             | 125           | Bulk<br>(100 pieces) |

### 9.4 Couplings (Standard)

| Coupling Code | Comcode     | Description                    |
|---------------|-------------|--------------------------------|
| C2000A-2      | 104 148 028 | Bayonet/Threaded Coupling (MM) |
| C3000A-2      | 105 271 142 | Bayonet/Threaded Coupling (SM) |

## 10. Assistance Information

- For technical assistance, contact:
  - Your local OFS Account Representative
  - Fiber Optic Technical Assistance Help Line: 1-888-FIBER HELP