

## Sheath Removal and Mid-Span Access of Dielectric SST-UltraRibbon™ Cables

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### 1. General

**1.1** This procedure describes installation and handling practices for Corning Cable Systems dielectric SST-UltraRibbon™ fiber optic cables.

**1.2** The cable illustrated in this procedure is a non-armored cable manufactured with a single central tube. Four glass-reinforced plastic (GRP) rods located beneath the sheath provide tensile strength for the cable (Figure 1).

**1.3** This issue includes additional information about matrix removal.

### 2. Precautions

#### 2.1 General Precautions



**Safety Glasses**

**WARNING:** The wearing of safety glasses to protect the eyes from accidental injury is strongly recommended when handling chemicals and cutting GRP rods or fiber. Pieces of glass fiber are very sharp and can damage the cornea of the eye easily.



**Safety Gloves**

**WARNING:** The wearing of safety gloves to protect your hands from accidental injury when using sharp-bladed tools or working near exposed rods from the sheath is strongly recommended. Use extreme care when the tool is open and its blades are exposed. Dispose of used blades properly.

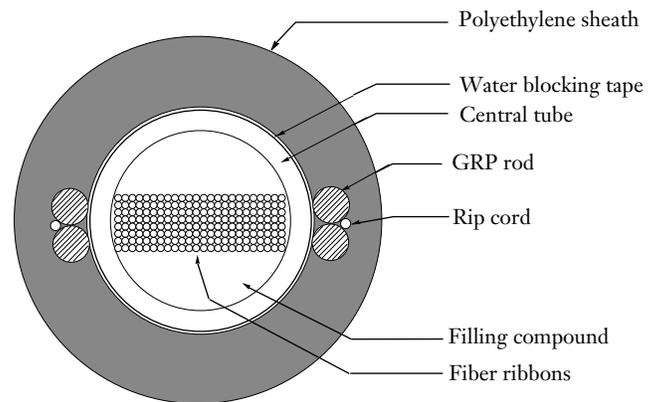


Figure 1

#### 2.2 Laser Precautions



**WARNING:** Laser light can damage your eyes.

Laser light is invisible. Viewing it directly does not cause pain. The iris of the eye will not close involuntarily as when viewing a bright light. Consequently, serious damage to the retina of the eye is possible. Never look into the end of a fiber which may have a laser coupled to it. Should accidental eye exposure to laser light be suspected, arrange for an eye examination immediately.

#### 2.3 Cable Handling Precautions



**CAUTION:** Fiber optic cable is sensitive to excessive pulling, bending and crushing forces. Refer to cable specification sheet CLT-78 for the SST-UltraRibbon cable bend radius. Do not bend cable more sharply than the minimum recommended bend radius. Do not apply more pulling force to the cable than specified. Do not crush the cable or allow it to kink. Doing so may cause damage that can alter the transmission characteristics of the cable.

#### 2.4 Central Tube Handling Precautions



**CAUTION:** The central tube is sensitive to excessive pulling, bending and crushing forces. Great care should be used when handling a central tube. Excessive bending will cause kinking which may damage the fibers inside.

## 2.5 Fiber Precautions



**WARNING:** Cleaved glass fibers are very sharp and can pierce the skin easily. Do not let cut pieces of fiber stick to your clothing or drop in the work area where they can cause injury later. Use tweezers to pick up cut or broken pieces of the glass fibers and place them on a loop of tape kept for that purpose alone. Good housekeeping is very important.

## 2.6 Filling Compound Remover



**WARNING:** Contains petroleum distillates. Harmful or fatal if swallowed. DO NOT INDUCE VOMITING. Call a physician immediately.

## 3. Tools and Materials

3.1 The following tools and materials are required for this procedure:

- Safety glasses
- Safety gloves
- Utility knife with hook-blade \*
- Permanent marking pen
- Scissors \*
- Filling compound remover \*
- Vinyl tape \*
- TKT-050 or TKT-060 Ribbon Mid-span Access Kit (if necessary)
- Paper towels or lint-free cloth
- Tape measure \*
- Ideal® model 45-164 ( 1/4 to 9/16 in O.D.) coaxial cable stripper
- Small slotted screwdriver \*
- Side cutters (diagonal cutting pliers)\*
- Cable sheath knife (or utility knife with straight-blade\*)
- Corning Cable Systems Universal Access Tool II (UAT II) and SRP-004-069 (for mid-span access only) or
- Corning Cable Systems Universal Access Tool III (UAT III) and SRP-004-074 (for mid-span access only)
- Ribbon Splitting Tool (RST-000) and SRP-004-098

\* Items available in the M67-003 Fusion Splicing Tool Kit

## 4. Cable-end Sheath Removal

4.1 Determine the proper sheath removal length for the hardware being used. Mark a point at this distance from the end of the cable with a wrap of tape (Figure 2).

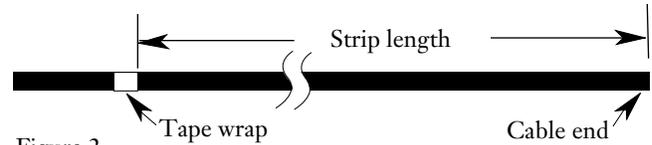


Figure 2

4.2 Starting at the end of the cable, use the cable sheath knife to shave off 15 cm (6 in.) of the outer sheath directly over the rods. Shave the sheath until the GRP rods and the rip cord on each side of the cable are visible (Figure 3).

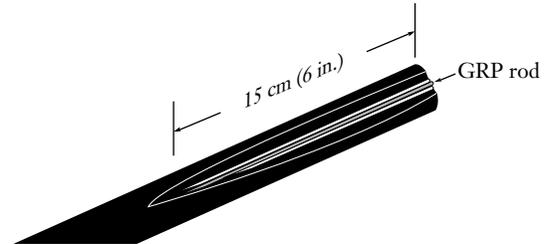


Figure 3

4.3 Separate the ends of the rip cords from the cable.

4.4 Using the shaft of a screwdriver as a handle, pull one rip cord at a time through the sheath to the wrap of tape (Figure 4).

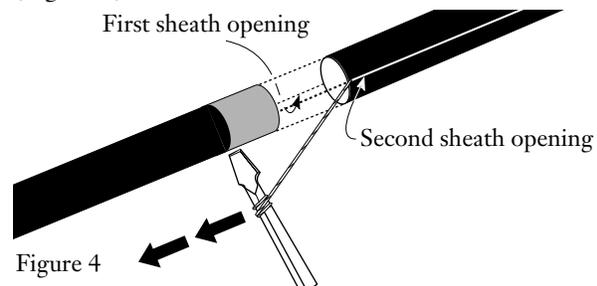


Figure 4

4.5 Cut the rip cords flush at the tape wrap with scissors.

4.6 Taking care not to cut through the GRP rods, use the hook blade knife to make a *shallow* ring cut through the black outer sheath at the tape mark (Figure 5).

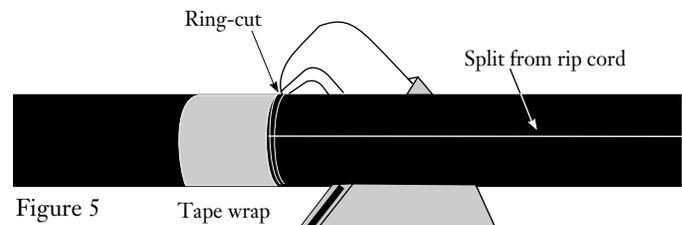


Figure 5

4.7 Starting at the end of the cable, peel back both sections of split sheath to expose the water blocking tape-wrapped central tube and GRP rods (Figure 6).

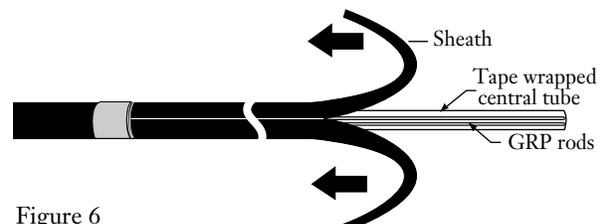


Figure 6

4.8 At the ring cut, carefully flex the sections of sheath and remove them. Side cutters may be helpful in their removal (Figure 7).

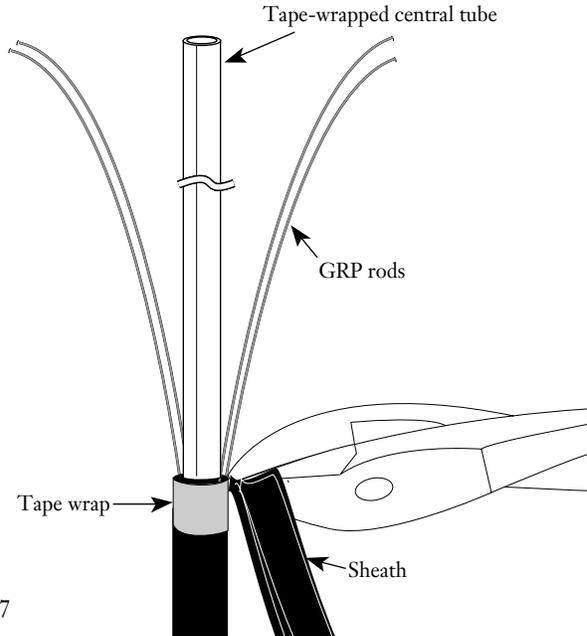


Figure 7

4.9 Use side cutters to cut the GRP rods about 13 cm (5 in.) from the tape wrap (Figure 8). **ALWAYS WEAR SAFETY GLASSES WHEN CUTTING THE GRP RODS.**

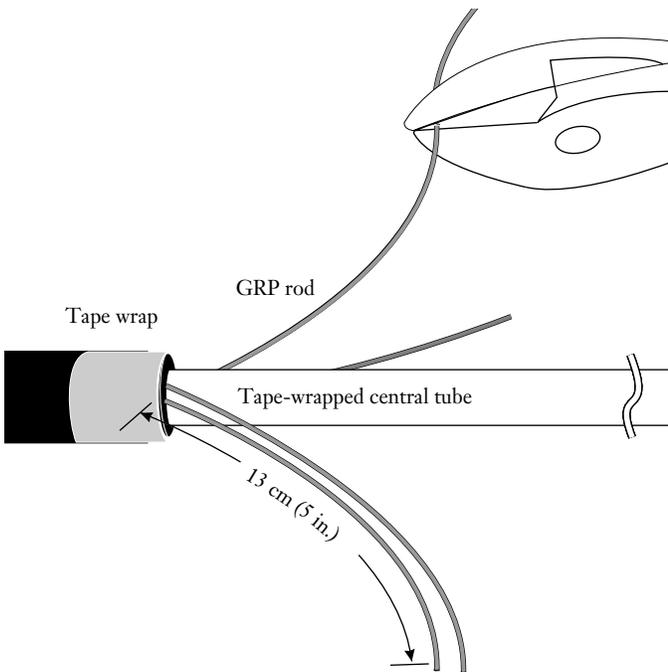


Figure 8

4.10 Separate the water blocking tape from the cable core (Figure 9). Use scissors to cut the water-blocking tape flush with the end of the cable sheath.

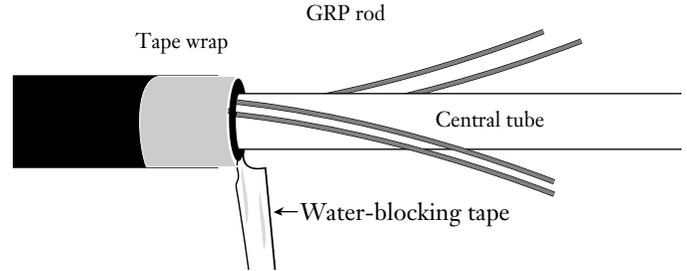


Figure 9

### 5. Accessing a Cable-end Central Tube

5.1 Determine the proper central tube removal length for the hardware being used. Use an Ideal® model 45-164 coaxial cable stripper to score the tube and then remove the needed strip length of central tube in 60 cm (24 in.) increments. Scoring the circumference of the tube will enable you to make a clean break in the tube with minimal risk to the fibers inside.

Before using the stripper, make sure that it is properly adjusted. Use a small slotted screwdriver to adjust *one* of the blades on the side of the stripper so that it seats against the lower jaw but does not force the jaw open (Figure 10).

*Leave the blades on the front and other side of the tool fully retracted so that they do not extend into the grooves of the lower jaw.*

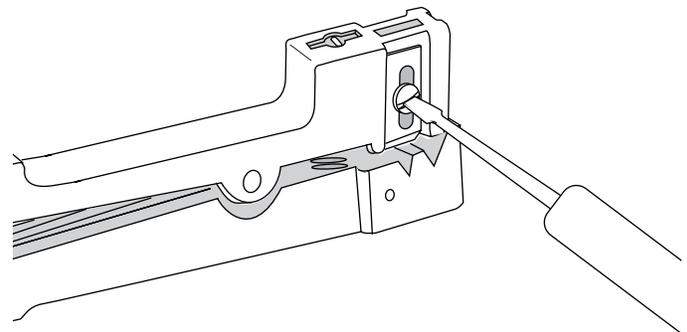


Figure 10

5.2 Use the last 5 to 7.5 cm (2 to 3 in.) at the end of the cable end to determine the sharpness of the stripper's blade and how many turns of the tool will be required to score the tube. *To minimize damage to the fibers inside the tube, always use the tool to score the tube, **not** ring cut it.*

To score the central tube:

- a) Open the tool by squeezing its handles together and place the stripper's blade on the tube at the desired scoring point.
- b) Hold the central tube steady with one hand to prevent it from twisting.
- c) Use your other hand to rotate the tool around the tube two to three complete turns to score it (Figure 11). Remove the tool from the central tube.

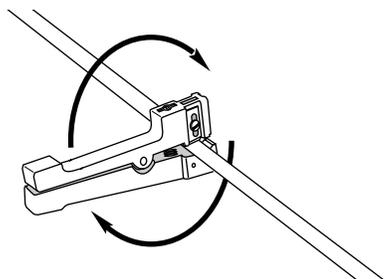


Figure 11

*If the stripper completely cuts through the tube during this trial step, move the tool to a new trial area at the end of the buffer tube and repeat a) through c) with **fewer** rotations in step c). If the blade cuts completely through the tube, damage to the fibers inside can result.*

- d) Carefully flex the tube to break it at the score point. The break should be clean and free of rough edges (Figure 12).

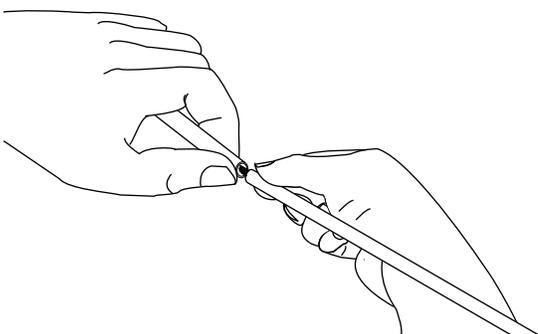


Figure 12

*If the break is not clean, repeat the trial at a new location at the end of the tube with an additional rotation or two.*

- e) Slide the severed tube off the fibers. **USE CARE TO AVOID DAMAGING THE RIBBONS.**
- f) Repeat these steps until the desired length of central tube is removed, leaving at least 2.5 cm (1 in.) of exposed tube beyond the end of the sheath (see Figure 13). *The length of exposed buffer tube may vary depending on the hardware being used.*

**5.3** Use a lint free tissue or cloth to wipe the filling compound from each ribbon (Figure 13). If cleaner ribbons are desired, filling compound remover may be used as follows.

- a) Wipe off the majority of the filling compound with lint-free tissues or cloths using moderate pressure.
- b) Use a lint-free tissue or cloth soaked in filling compound remover to wipe each ribbon with moderate pressure one or two times.
- c) Wipe off any remaining filling compound with lint-free tissue or cloths using moderate pressure.



**CAUTION:** *If filling compound remover or other solvents are used to clean the ribbons, wipe away excess solvent with a clean, dry tissue or cloth. NEVER ALLOW OPTICAL FIBERS TO SOAK IN SOLVENTS FOR EXTENDED PERIODS OF TIME – DAMAGE TO THE FIBER COATING CAN OCCUR.*



**CAUTION:** *Do not violate the ribbons' minimum bend radius during cleaning, i.e., do not wrap any ribbons round a finger during cleaning.*

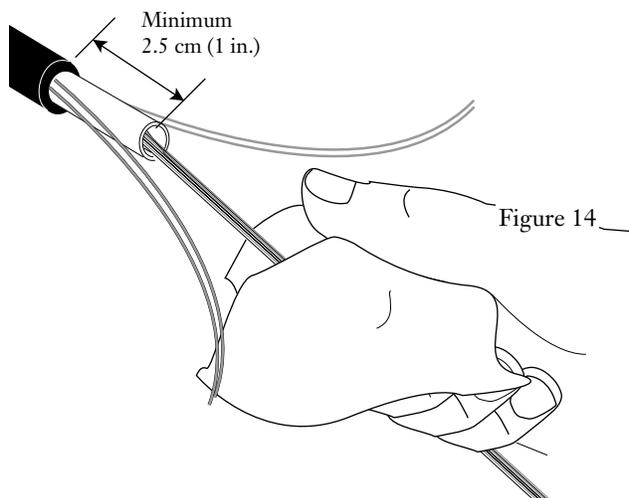


Figure 13

**5.4** Route and secure the SST-UltraRibbon cable to the hardware being installed. Secure the ribbons within the hardware in accordance with the hardware manufacturer's instructions.

*Skip to Section 7, Ribbon Splitting and Accessing Fibers in SST-UltraRibbon Cables*

## 6. Mid-span Access of the Cable

6.1 This mid-span access procedure is dependent upon sufficient slack cable for access. The minimum amount of cable slack is determined as follows:

- Slack needed =  $60 \times \text{cable diameter} + 105 \text{ cm (42 in.)}$ :  
for example, for a 1.25 cm (0.5 in.) OD cable,  
 $60 \times 1.25 \text{ cm} = 75 \text{ cm}$  plus  $105 \text{ cm} = 180 \text{ cm (72 in.)}$   
of slack
- Add any necessary additional slack needed to reach the splicing workstation from a pole or manhole.

**IMPORTANT:** Please read and understand this procedure before attempting to access a central tube.

6.2 Prepare the tie-in (drop) cable according to its manufacturer’s instructions. Set the cable aside in a secure place.

6.3 Determine the amount of slack needed. Place a wrap of tape at each end of the cable sheath that is to be removed (Figure 14).

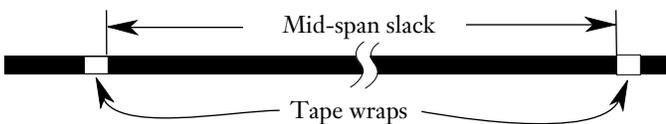


Figure 14

6.4 Use a hook blade knife to score a shallow ring cut around the sheath at the two tape marks. Do not cut completely through the sheath or damage the GRP rods.

6.5 Starting at one tape mark, locate and expose the rods and rip cords as follows:

- Use the cable sheath knife to shave off a small section of cable sheath to locate the rods. *If the rods are not visible after a few passes of the knife, stop immediately. Shave another section of cable about 1 cm on either side of the initial pass. Do this until the rods have been located.*
- Shave 25 cm (10 in.) of the outer sheath directly over the GRP rods (Figure 15).

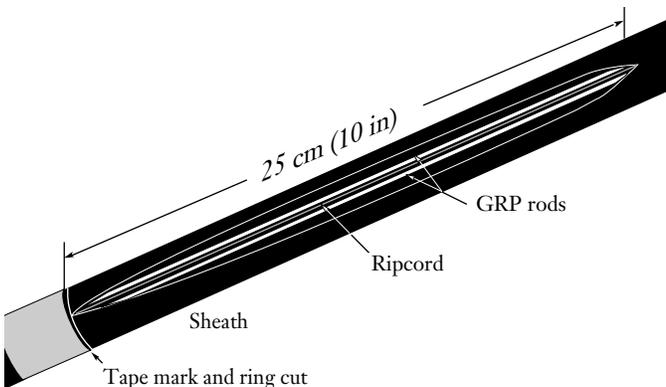


Figure 15

- Repeat steps a) and b) to expose the other rods and rip cord on the opposite side (180°) of the cable.

6.6 Locate the rip cords. Cut the rip cords near the tape mark with scissors (Figure 16).

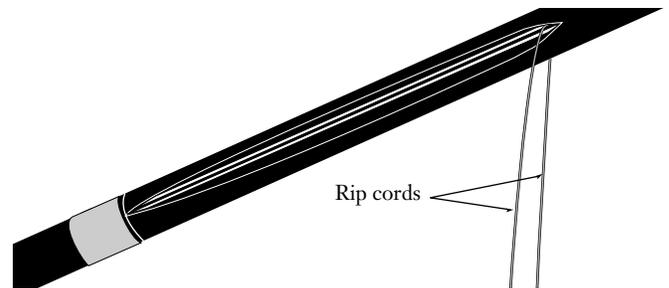


Figure 16

6.7 Using the shaft of a screwdriver as a handle, pull one rip cord at a time through the sheath to the opposite wrap of tape (Figure 17).

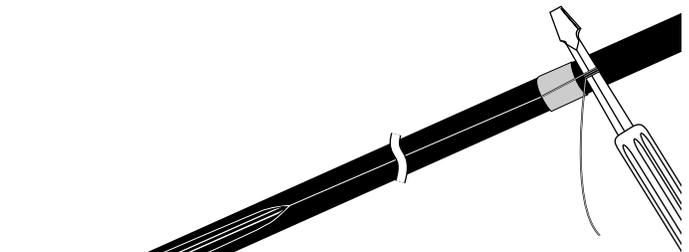


Figure 17

6.8 Cut the rip cords flush at the tape wraps with scissors.

6.9 At a point approximately 15 cm (6 in.) from the tape wrap, use the hook blade knife to score a ring cut around the sheath. Do not cut completely through the sheath or damage the GRP rods (Figure 18).

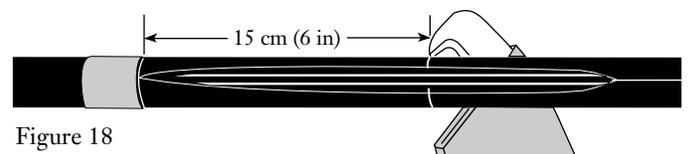


Figure 18

6.10 Using the cable knife, separate the two GRP rods from the jacket at the 15 cm ring cut. Use caution when inserting the cable knife under the GRP rods to avoid damaging the central tube (Figure 19).

Repeat this step on the opposite side (180°) of the cable to separate the other rods.

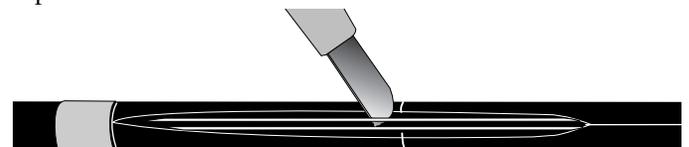


Figure 19

**6.11** Peel off both sections of the split sheath from the ring cut to the tape mark to expose a 15 cm (6 in.) section of the central tube.

Use side cutters to remove the sheath sections flush with the tape wrap (Figure 20).

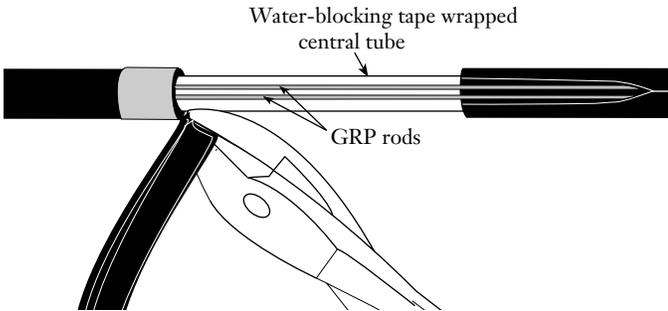


Figure 20

**6.12** Peel off the remaining sections of split sheath to the opposite tape wrap. Use side cutters to remove the sheath sections flush with the tape wrap.

**6.13** Use the side cutters to cut the GRP rods 12.7 cm (5 in.) from the tape wraps (Figure 21).

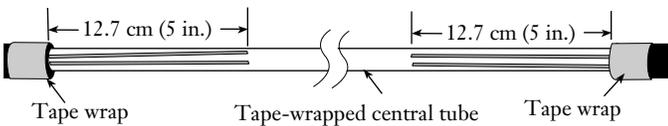
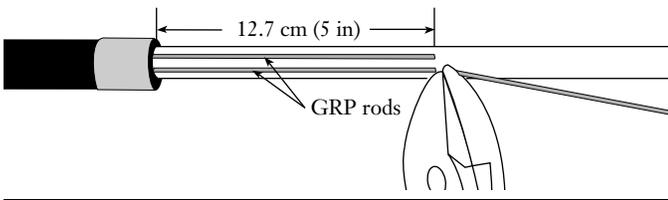


Figure 21

**6.14** Locate the longitudinal seam of the water-blocking tape which covers the central tube. Separate the tape from the tube. Use scissors to cut the tape flush at both exposed ends of the cable sheath (Figure 22).

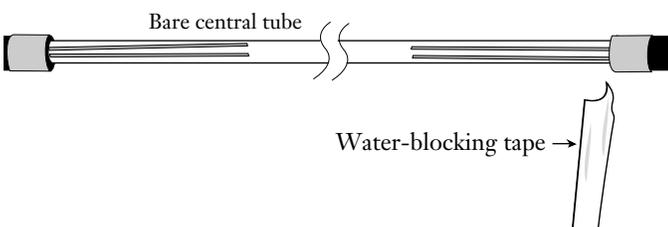


Figure 22

**6.15** Corning Cable Systems Universal Access Tool II and III are designed to access the fibers of single-tube cables in a mid-span location where slack is present (Figure 23).

For further information about these tools, refer to the manual provided with the tool, SRP-004-069, *Universal Access Tool II Operating Instructions* or SRP-004-074, *Universal Access Tool III Operating Instructions*.

**Note:** *The UAT II is capable of accessing the fibers in high fiber count (>432-f) SST-UltraRibbon cables; however, it is not optimized for use on the polyethylene buffer tubes associated with these cables.*

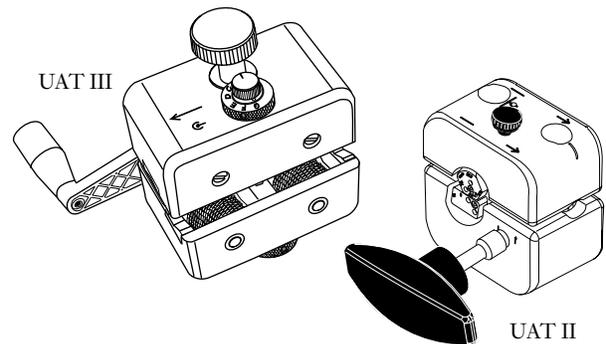


Figure 23

**6.16** Place marks 12.7 cm (5 in.) from the end of each side of the exposed section of central tube with a permanent marking pen (Figure 24). *These access starting and ending mark locations will vary depending on the hardware being utilized.*

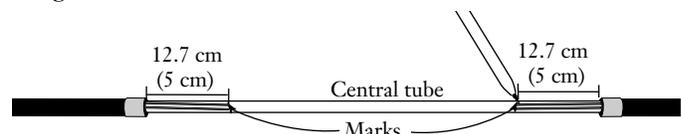


Figure 24

**Note:** *Depending upon the type of closure being used, assembly may be easier if you install cable mounting hardware and sealants at this time.*

**6.17** Follow the UAT II or III instructions to access the ribbons. After using the UAT and Ideal tool on the central tube, the end result will look like Figure 25.

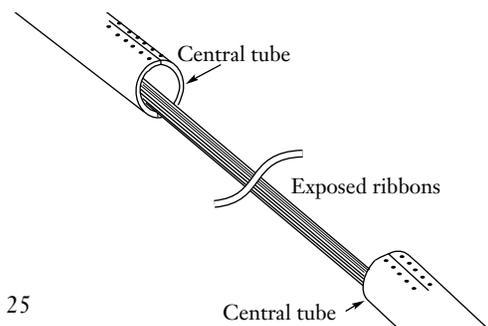


Figure 25

6.18 Use a lint free tissue or cloth to wipe the filling compound from each ribbon. If cleaner ribbons are desired, filling compound remover may be used as follows.



**CAUTION:** *If filling compound remover or other solvents are used to clean the ribbons, wipe away excess solvent with a clean, dry tissue or cloth. NEVER ALLOW OPTICAL FIBERS TO SOAK IN SOLVENTS FOR EXTENDED PERIODS OF TIME— DAMAGE TO THE FIBER COATING CAN OCCUR.*

- Wipe off the majority of the filling compound with lint-free tissues or cloths using moderate pressure.
- Use a lint-free tissue or cloth soaked in filling compound remover to wipe each ribbon with moderate pressure one or two times.
- Wipe off any remaining filling compound with lint-free tissue or cloths using moderate pressure.

6.19 Route and secure the SST-UltraRibbon cable to the hardware being installed. Secure the ribbons within the hardware in accordance with the hardware manufacturer's instructions.

## 7. Ribbon Splitting and Fiber Accessing

### Splitting the End of a 24- or 36-Fiber Ribbon

7.1 24- and 36- fiber ribbons can be manually split into two and three 12-fiber sections at their ends, respectively.



**CAUTION:** *Wear safety glasses and be sure to point the breaking section away from your eyes since glass particles may fly out during the break.*

**For best results, do not use scissors or cable cutters to cut the ribbon prior to hand splitting.**

- Snap the end of the ribbon, bending the ribbon flat against itself to get a clean break (Figure 26).

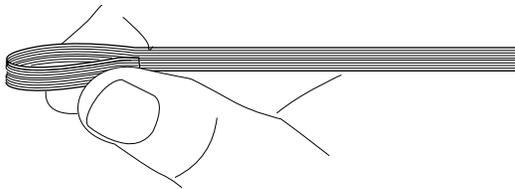


Figure 26

- Grasp the end of the ribbon with the thumb and forefinger of each hand.

*For 24-f ribbons:* make sure the thumb of each hand completely covers a 12-f section.

*For 36-f ribbons:* make sure the thumb of one hand completely covers a 24-f section, the other a 12-f section. Separate the resulting 24-fiber section as described above.

- Pull the two sections apart in opposite directions (Figure 27).

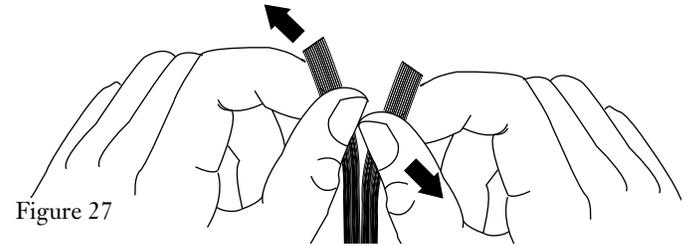


Figure 27

7.2 Corning Cable Systems recommends the use of its Ribbon Splitting Tool (p/n RST-000) for both mid-span and end-of-ribbon applications.

The RST-000 has nine positions which accommodate ribbons from 4 to 36 fibers, as indicated by the sum of the stacked numbers on the tool (e.g., 2/2 = 4-f, 12/12= 24-f, 12/24=36-f – see Figure 28).

Refer to SRP-004-098 for complete instructions for the tool.

7.3 There may be some overhanging ribbon matrix material along the edge of the 12-fiber ribbon after the larger 24-fiber or 36-fiber ribbon is separated into 12-fiber ribbon sub-units. This overhanging ribbon matrix material or “overhang” generally measures less than one fiber width and does not typically pose a problem with thermal stripping, cleaving or mass-fusion splicing of the ribbon.

*If desired, this overhang can be removed or minimized for the length of ribbon that will be placed into the handler for the mass-fusion splicer. Remove the overhang by using a lint-free tissue or cloth soaked with filling compound remover or isopropyl alcohol to rub the edge of the ribbon with the overhang; Rub in one direction toward the ribbon's free end along the ribbon's long axis as shown in Figure 28.*

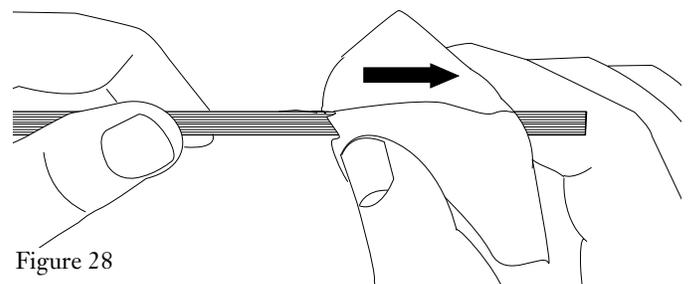


Figure 28

## Mid-span Access of Ribbons

7.4 If appropriate for your installation, divide the ribbon(s) using the RST-000 tool and the instructions in Section 6 of SRP-004-098 (Figure 29).

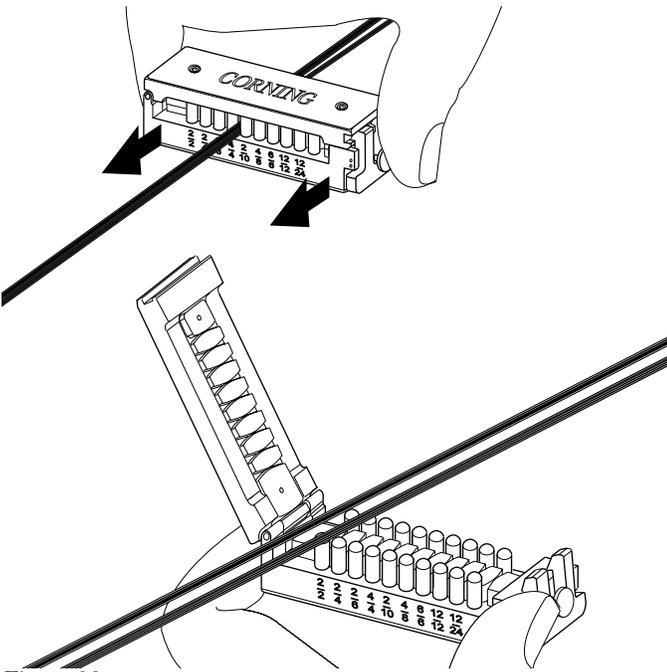


Figure 29

7.5 Determine the end of the accessed fiber(s) or ribbon to be cut by checking the system design splice plan and the feet/ meter marks printed on the cable sheath before cutting any fibers.

As shown in Figure 30, typically you will cut the fiber ribbon at the end opposite the desired point of origin. If an entire ribbon or section of divided ribbon can be cut, access the individual fibers by following Section 4 of SRP-004-048, *Accessing Individual Fibers in Corning Cable Systems Ribbon Fiber Optic Cables with the TKT-050 Kit*.

If individual fibers are to be accessed, follow either the **mechanical** process described in SRP-004-076, *Accessing Individual Fibers in Corning Cable Systems Optical Fiber Ribbons Using the TKT-060 Kit*, or the **chemical** process described in SRP-004-048.

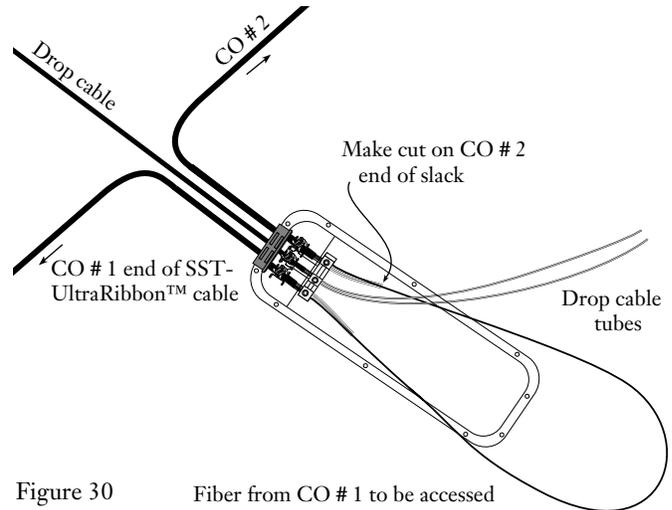


Figure 30 Fiber from CO # 1 to be accessed

7.6 Using scissors, cut the fiber(s) (or ribbon) to be accessed as close as possible to the end of the central tube (Figure 31) **USE EXTREME CARE TO CUT ONLY THE FIBER(S) TO BE ACCESSED.**

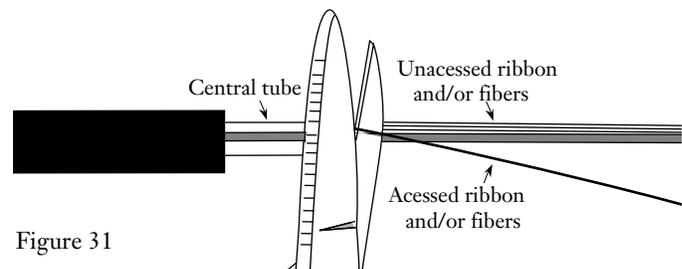


Figure 31

7.7 There may be some overhanging ribbon matrix material along the edge of the 12-fiber ribbon after the larger 24-fiber or 36-fiber ribbon is separated into 12-fiber ribbon sub-units. This overhang can be removed or minimized by following the procedure in step 7.3.

7.8 Follow the closure or hardware manufacturer's instructions for central tube mounting and routing. Splice the fibers or ribbons according to the system design plan.

7.9 Complete the hardware or closure assembly according to its manufacturer's instructions.

Special Note:  
Fiber Optic  
Training  
Program



Corning Cable Systems offers comprehensive, integrated training programs. Courses are structured for: Telephony, CATV, LAN, Intelligent Transportation Systems and Power Utilities.

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Corning Cable Systems LLC  
PO Box 489  
Hickory, NC 28603-0489 USA  
For US and Canada 1-800-743-2673  
International 828-901-5000  
FAX: 828-901-5973  
<http://www.corning.com/cablesystems>