

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

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1. General

1.1 This procedure describes installation and handling practices for Corning Cable Systems dielectric SST-UltraRibbon™ Gel-Free 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 If this document is reissued, a summary of changes will appear in this paragraph.

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.

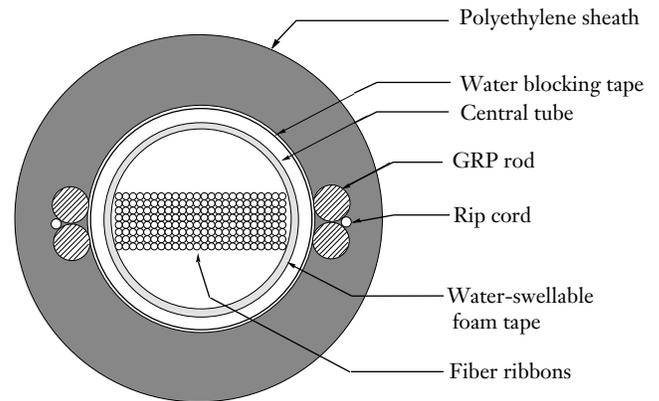


Figure 1

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 EVO-650 for the SST-UltraRibbon Gel-Free 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.*

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 *
- Vinyl tape *
- 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 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).

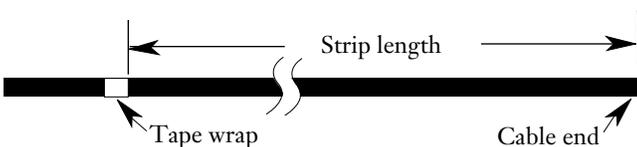


Figure 2

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).

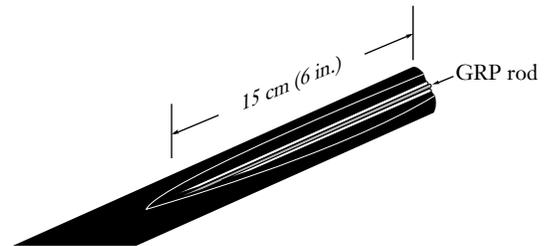


Figure 3

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).

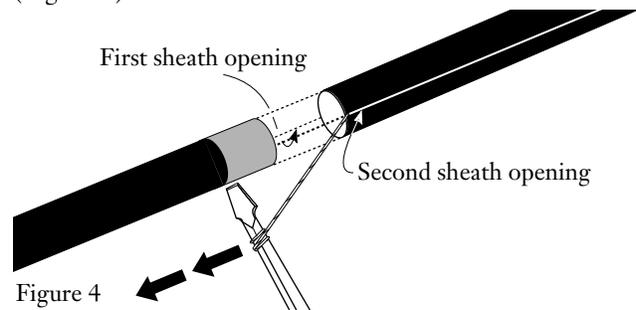


Figure 4

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).

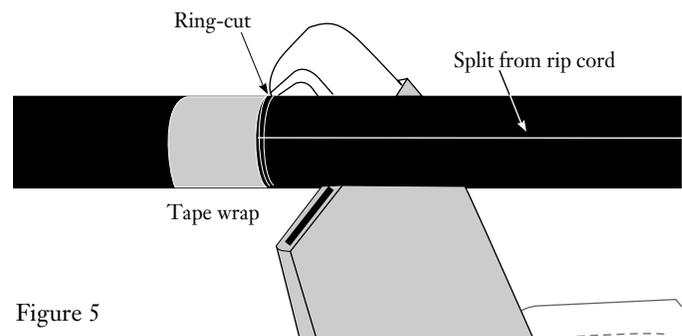


Figure 5

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).

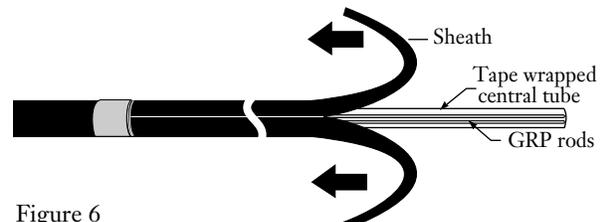


Figure 6

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).

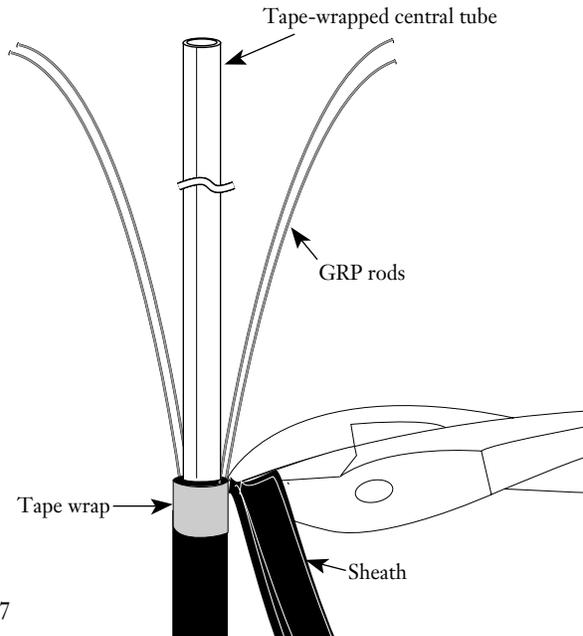


Figure 7

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.**

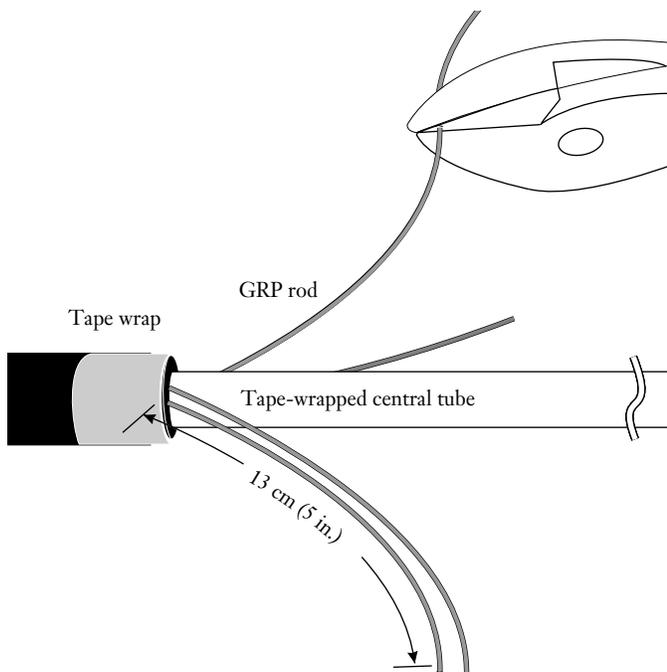


Figure 8

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.

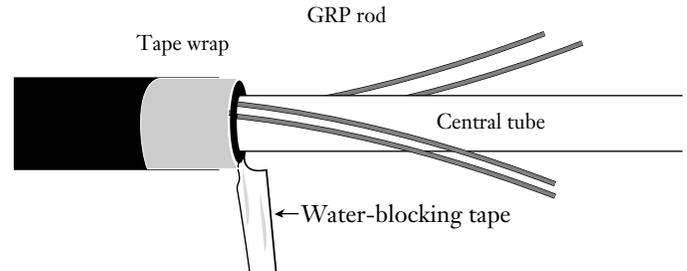


Figure 9

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.

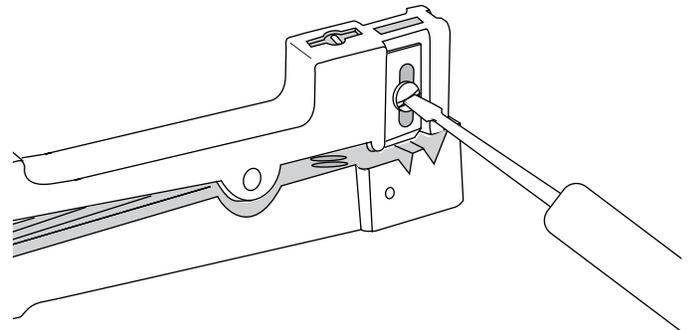


Figure 10

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.

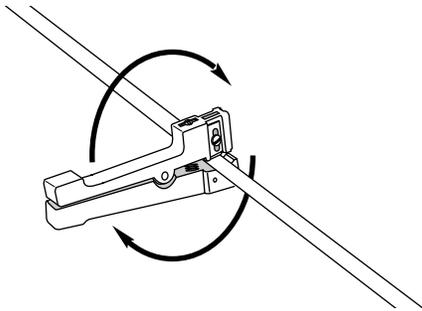


Figure 11

*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).

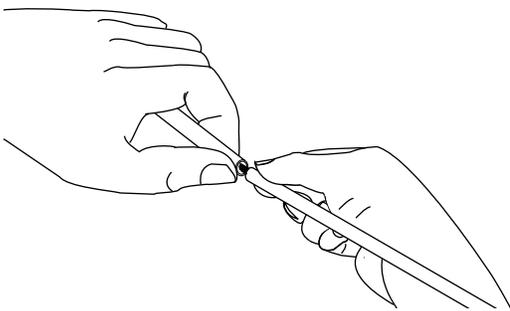


Figure 12

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 Carefully separate the water-swappable tape from the ribbons (Figure 13).

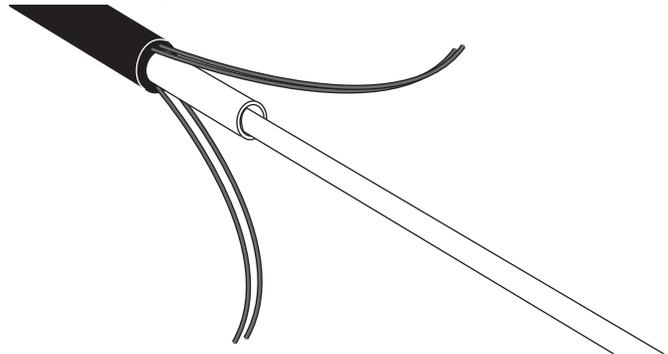


Figure 13

- 5.4 Use scissors to carefully cut the tape at the buffer tube, making sure not to cut any ribbons (Figure 14).

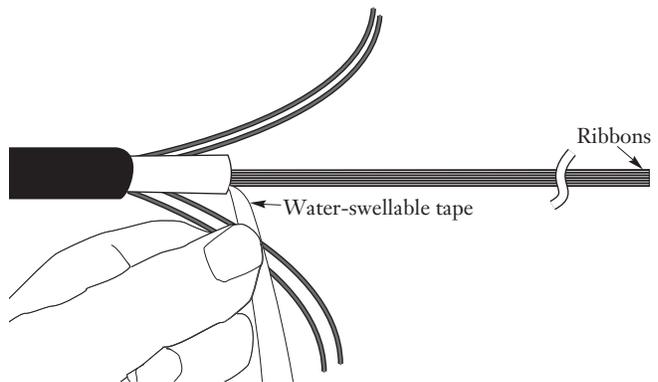


Figure 14

- 5.5 If necessary, wipe the ribbons with a dry, lint free cloth or tissue (Figure 15).

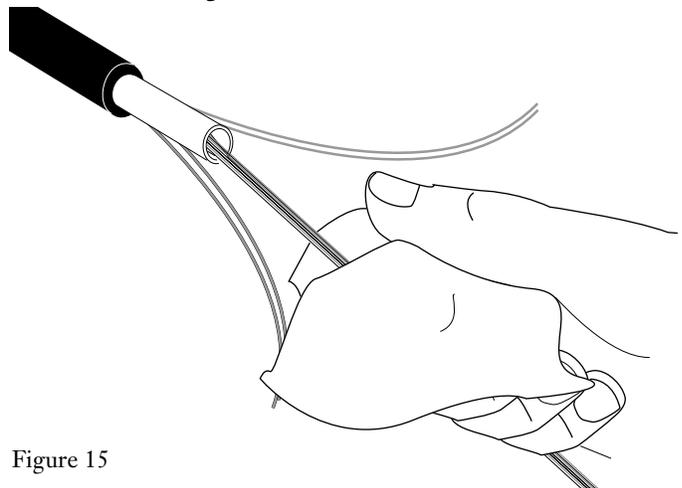


Figure 15

- 5.6 Route and secure the SST-UltraRibbon Gel-Free 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 Gel-Free 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 cm = 180 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 16).

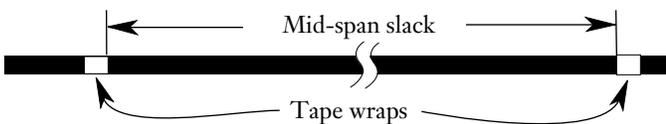


Figure 16

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 17).

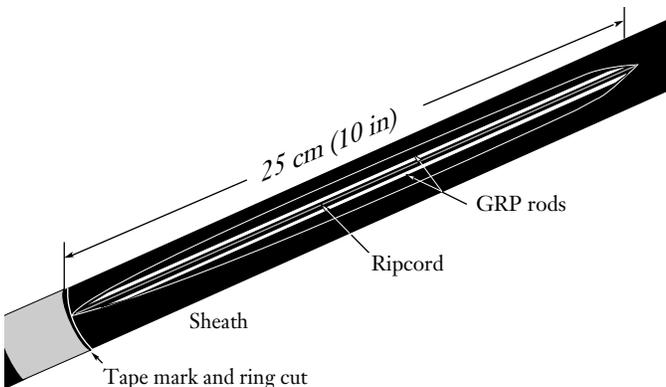


Figure 17

- 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 18).

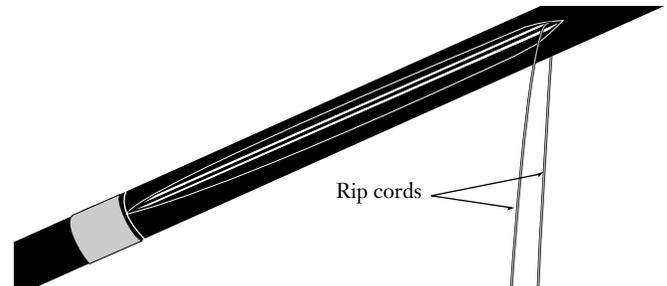


Figure 18

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 19).

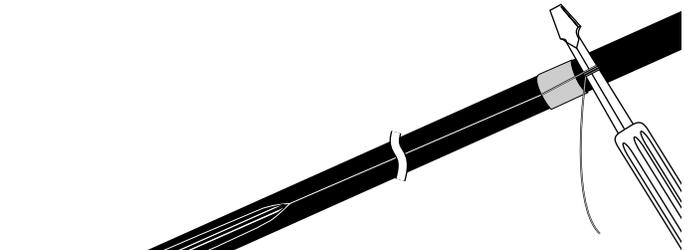


Figure 19

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 20).

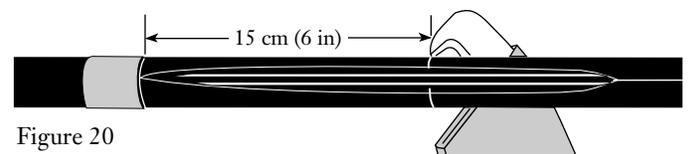


Figure 20

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 21).

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

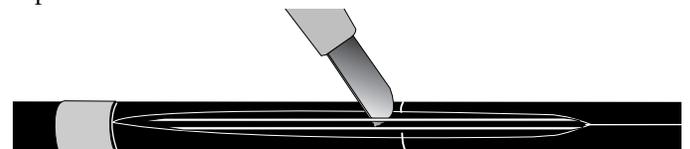


Figure 21

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 22).

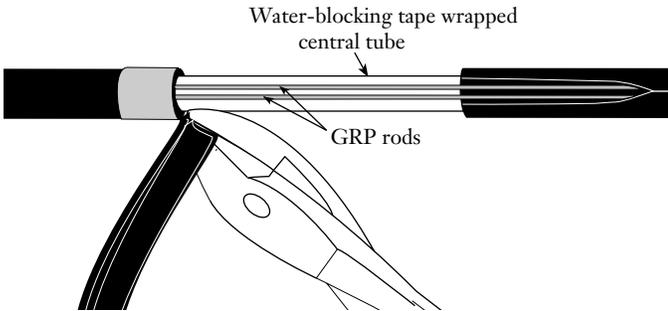


Figure 22

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 15 cm (6 in.) from the tape wraps (Figure 23).

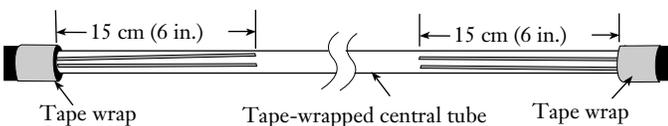
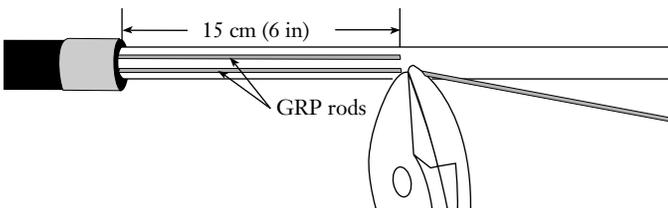


Figure 23

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 24).

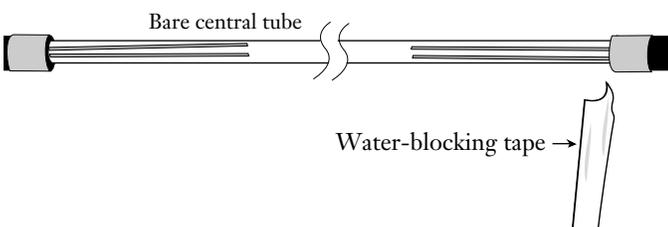


Figure 24

6.15 The Corning Cable Systems Universal Access Tool III is designed to access the fibers of single-tube cables in a mid-span location where slack is present (Figure 25).

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

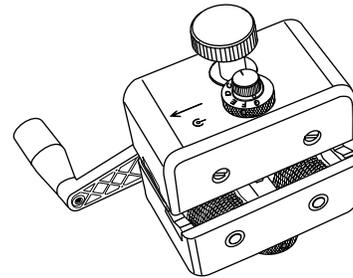


Figure 25

6.16 Place marks 15 cm (6 in.) from the end of each side of the exposed section of central tube with a permanent marking pen (Figure 26). *These access starting and ending mark locations will vary depending on the hardware being utilized.*

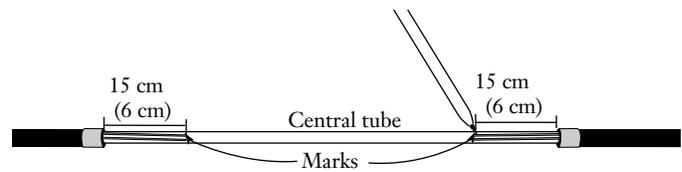


Figure 26

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 III instructions to access the ribbons. After using the UAT III and Ideal tool on the central tube, the end result will look like Figure 27.

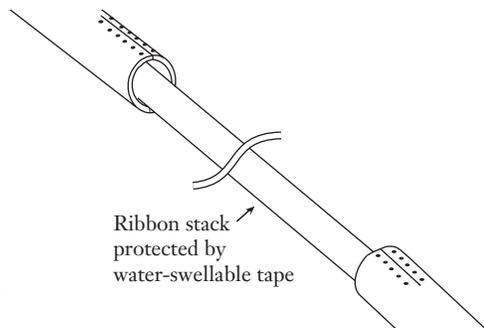


Figure 27

6.18 To remove the water-swellaable tape from the ribbons:

- a) Find the overlap opening for the water-swellaable tape.

- b) Carefully separate the water-swollable tape from the ribbons (see Figure 28).
- c) Use scissors to carefully cut the tape at the buffer tube ends, making sure not to cut any ribbons (Figure 26).

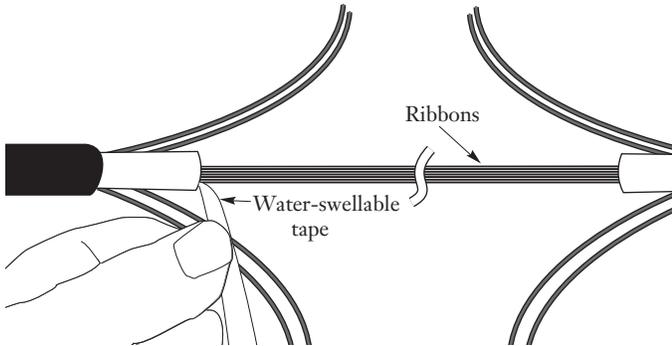


Figure 28

- d) If necessary, wipe the ribbons with a dry, lint free cloth or tissue.

6.19 Route and secure the SST-UltraRibbon Gel-Free 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-Fiber Ribbon



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.*

7.1 24-fiber ribbons can be manually split into two 12-fiber sections at their ends.

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

- a) Snap the end of each 24-fiber ribbon, bending the ribbon flat against itself to get a clean break (Figure 29).

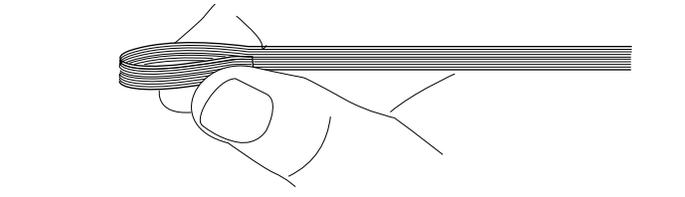


Figure 29

- b) Grasp the end of the ribbon with the thumb and forefinger of each hand. Make sure the thumb of each hand completely covers a 12-f section.
- c) Pull the two sections apart in opposite directions (Figure 30).

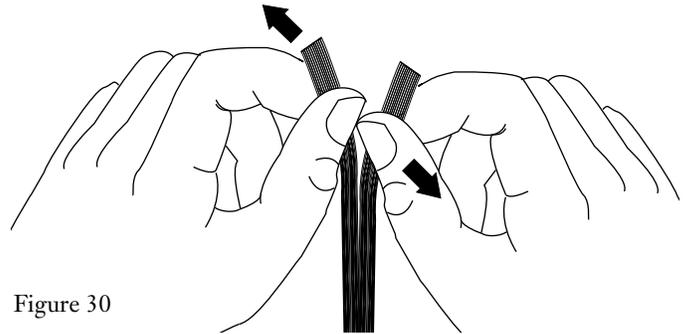


Figure 30

7.2 There may be some overhanging ribbon matrix material along the edge of the 12-fiber ribbon after the larger 24-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 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 31.

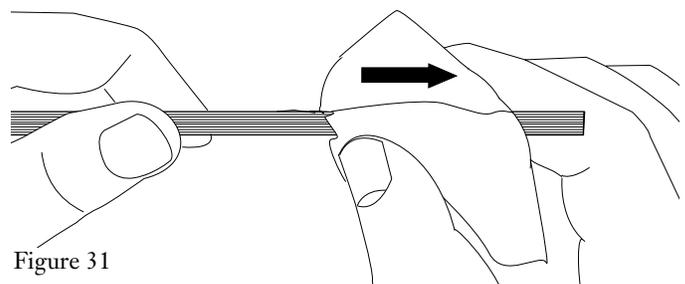


Figure 31

Mid-span Access of Ribbons

7.4 If appropriate for your installation, divide the 12-fiber ribbon(s) using the RST-000 tool and the instructions in Section 6 of SRP-004-098 (Figure 32).

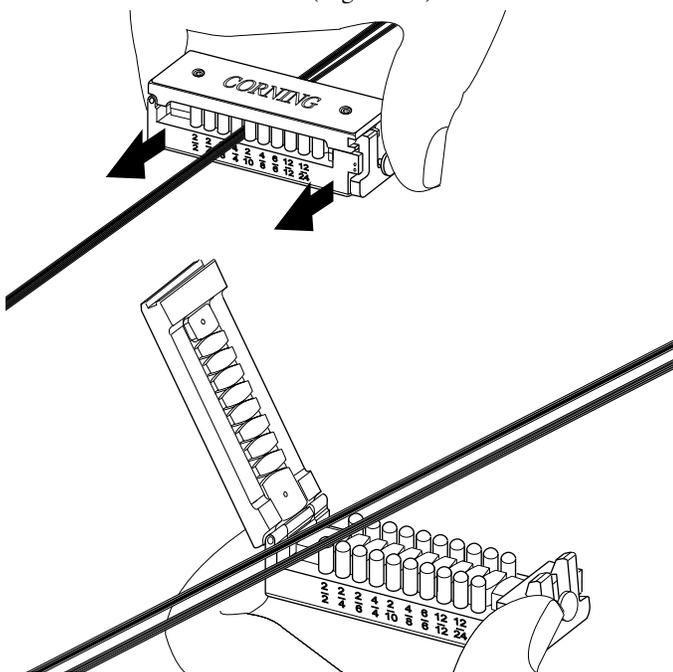


Figure 32

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 33, 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 at the mid-span point, refer to Section 7 in SRP-004-098, *Corning Cable Systems Ribbon Splitting Tool (RST-000) Instructions*. If individual fibers are to be accessed at the mid-span-point, follow Section 8 of the same procedure, SRP-004-098.

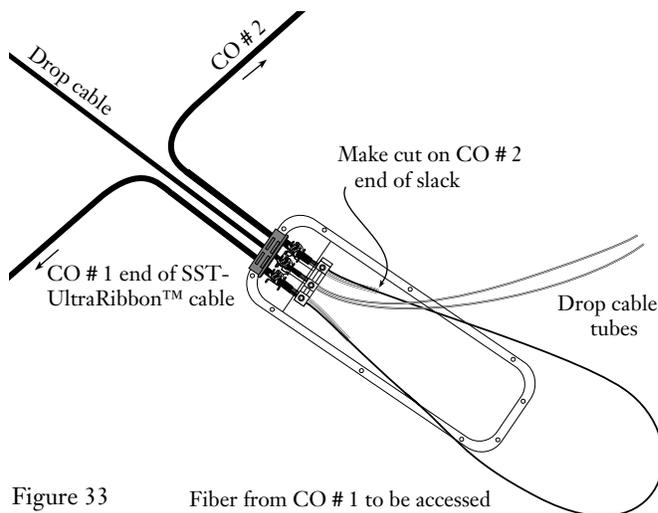


Figure 33 Fiber from CO # 1 to be accessed

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 34) USE EXTREME CARE TO CUT ONLY THE FIBER(S) TO BE ACCESSED.

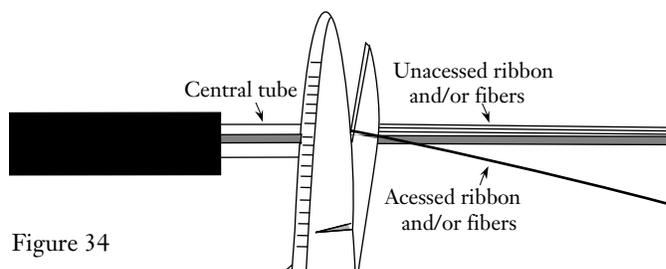


Figure 34

7.7 Follow the closure or hardware manufacturer's instructions for central tube mounting and routing.

7.9 Splice the fibers or ribbons according to the system design plan.

7.10 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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