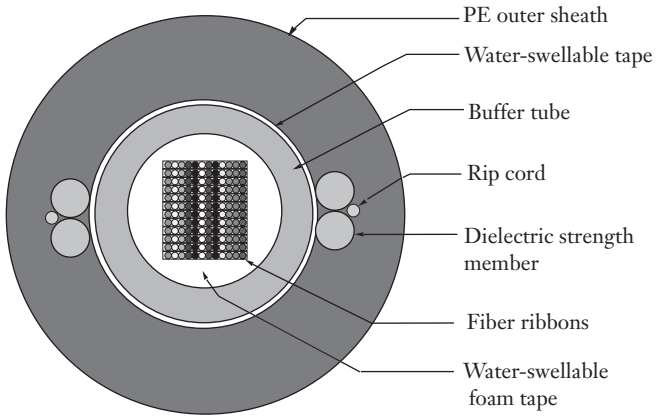
Sheath Removal and Mid-Span Access of Dielectric SST-Ribbon™ Gel-Free Cable

1. General

1.1 This procedure describes installation and handling practices for dielectric versions of Corning Cable Systems SST-Ribbon™ Gel-Free cable. Both sheath removal and mid-span access procedures are outlined in this document.

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

1.3 This issue reflects the current cable design and product name.



SST-Ribbon™ Gel-Free Cable- Dielectric Version

Figure 1

2. Precautions

2.1 General Precautions

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.*

*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.*

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 Buffer Tube Handling Precautions

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

2.4 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:

- Utility knife with hook-blade *
- Scissors *
- Vinyl tape *
- Cable tie tool and cable ties *
- Pliers
- Side cutters*
- Paper towels or cloth
- Tape measure *
- Permanent marking pen *
- Ideal® model 45-164 (1/4 to 9/16 in O.D.) coaxial cable stripper
- Small slotted screwdriver *
- Number markers *
- Cable sheath knife
- Needle nose plier
- Corning Cable Systems Universal Access Tool III (UAT III) and SRP-004-074
- Ribbon Splitting Tool (RST-000) and SRP-004-098

* Items available in the M67-003 Fusion Splicer 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).

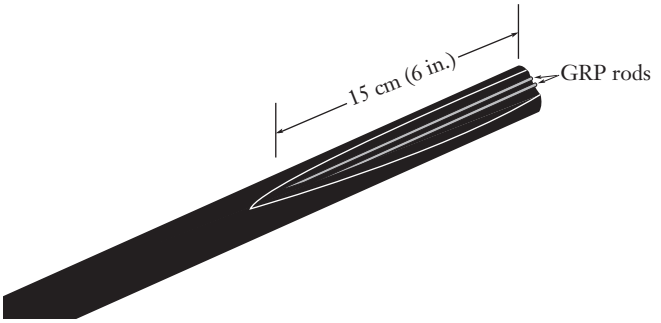


Figure 3

4.3 Separate the end 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).

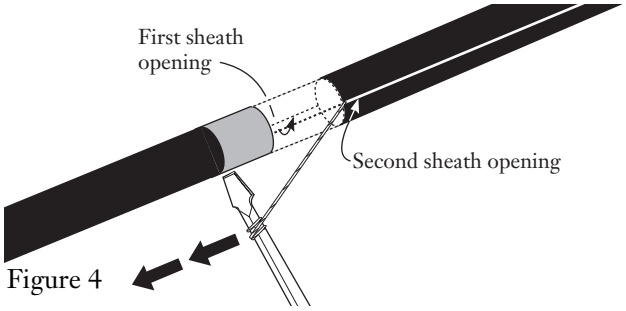


Figure 4

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).

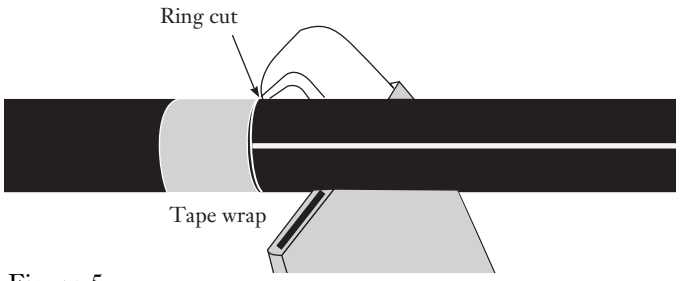


Figure 5

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

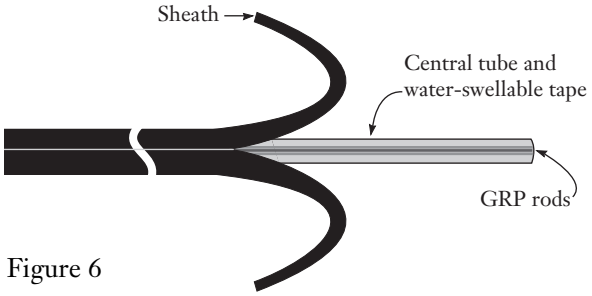


Figure 6

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

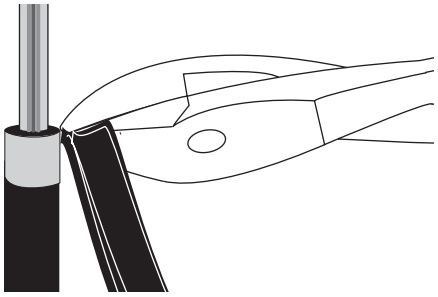


Figure 7

4.9 Pull the GRP rods out and away from the central tube.

4.10 Using side cutters, cut the four (4) GRP rods approximately 15 cm (6 in.) from the tape wrap (Figure 8). ALWAYS WEAR SAFETY GLASSES WHEN CUTTING THE GRP RODS.

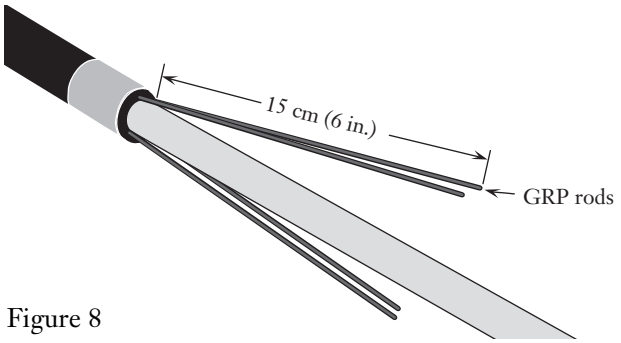


Figure 8

4.11 Using scissors, cut the water-swellable tape flush with the end of the sheath and the tape wrap (Figure 9).

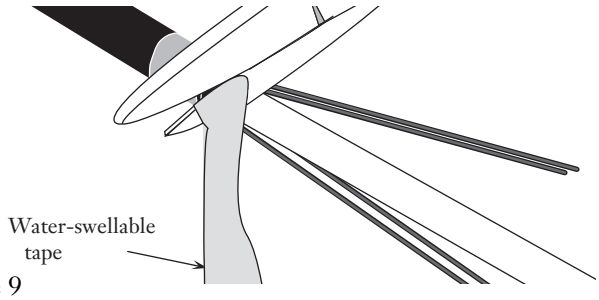


Figure 9

4.12 Remove the tape from the cable sheath.

5. Accessing the Fibers

5.1 Use an Ideal model 45-164 coaxial cable stripper to 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 central tube cutter so that it seats against the lower jaw but does not force the jaw open (Figure 10).

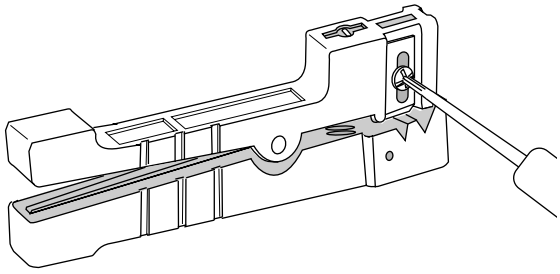


Figure 10

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.

5.2 Use the last 5 to 7.5 cm (2 to 3 in.) at the end of the cable 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 a central tube:

a) Open the tool by squeezing its handles together and place the stripper's blade on the central 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.

*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 central tube and repeat a) through c) with **fewer** rotations in step c). If the blade cuts completely though the tube, damage to the fibers inside can result.*

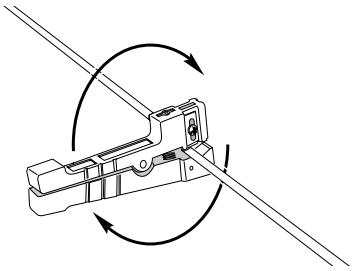


Figure 11

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

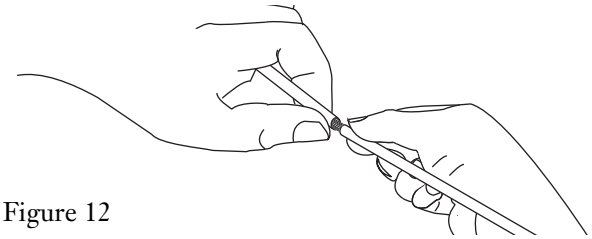


Figure 12

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 FIBERS.

f) Repeat these steps until the desired length of central tube is removed, leaving at least 2.5 cm (1 in.) of exposed central tube beyond the end of the sheath (see Figure 13). *The length of exposed central tube may vary depending on the hardware being used..*

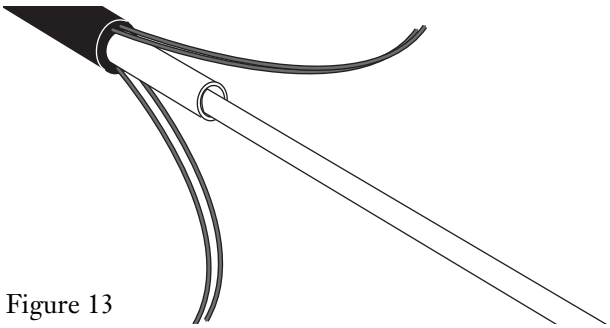


Figure 13

5.3 Carefully separate the water-swellable tape from the ribbons (Figure 14).

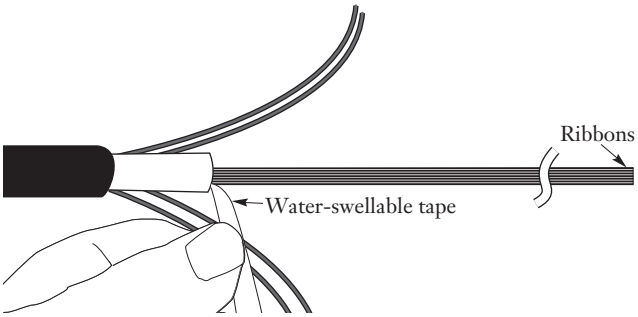


Figure 14

5.4 Use scissors to carefully cut the tape at the buffer tube, making sure not to cut any ribbons.

5.5 If necessary, wipe the ribbons with a dry, lint free cloth or tissue.

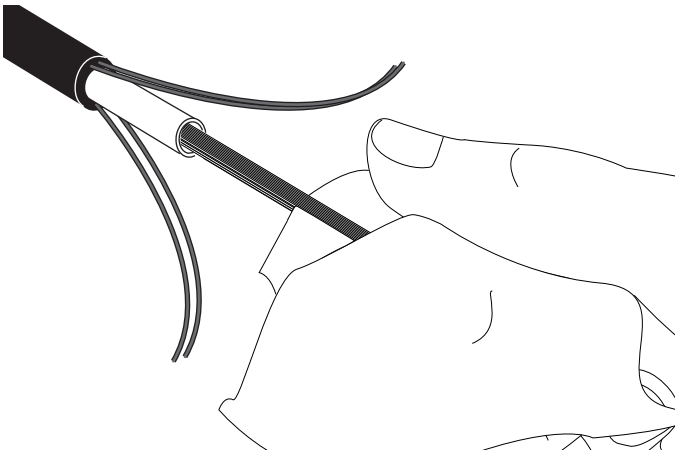


Figure 15

5.6 Route and secure the cable to the hardware being installed.

Accessing Ribbon Fibers

5.5 Secure the ribbons within the hardware in accordance with the hardware manufacturer's instructions.

5.6 If appropriate for your installation, divide the ribbon(s) using the RST-000 tool as described in SRP-004-098 (Figure 16).

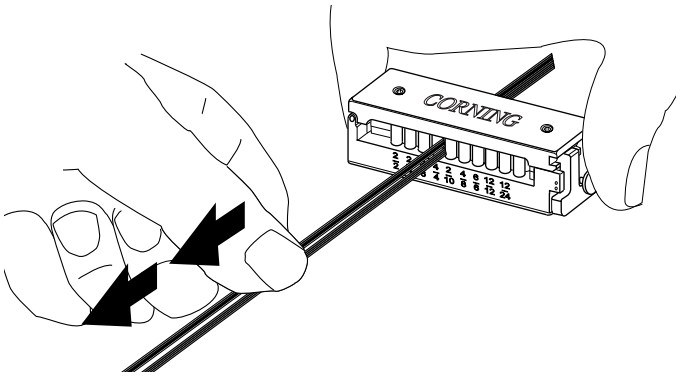


Figure 16

5.7 To access to individual fibers in a ribbon, refer to Section 8 in SRP-004-098, *Corning Cable Systems Ribbon Splitting Tool (RST-000) Instructions.*

5.8 Splice the fibers according to the system design plan.

5.9 Follow the closure or hardware manufacturer's instructions for central tube mounting and routing. Complete the hardware or closure assembly according to its manufacturer's instructions.

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 = 60 cm X cable diameter + 105 cm (42 in.):

  for example, for a 1.25 cm (0.5 in.) OD cable,

  60 X 1.25 =75 cm + 105 cm = 180 cm (72 in.) of slack
- Add additional slack as necessary 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 17).

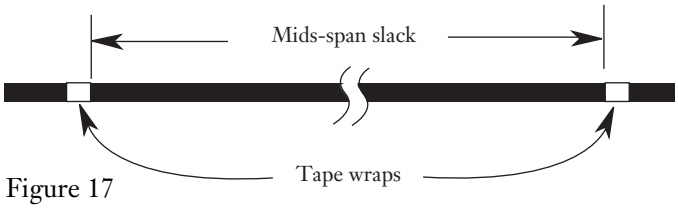


Figure 17

6.4 Starting at either inside tape mark, locate and expose the rods and rip cords as follows:

a) Using the cable sheath knife, 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. Repeat until the rods have been located.

b) Shave 25 cm (10 in.) of the outer sheath directly over the GRP rods (Figure 18).

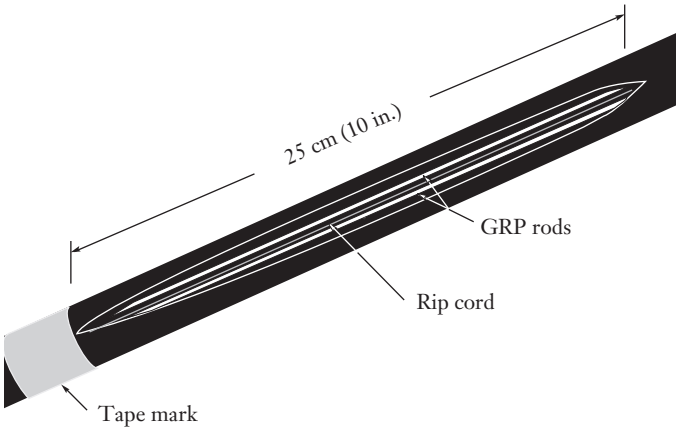


Figure 18

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

6.5 Locate the rip cords. Cut the rip cords near the tape mark with scissors (Figure 19).

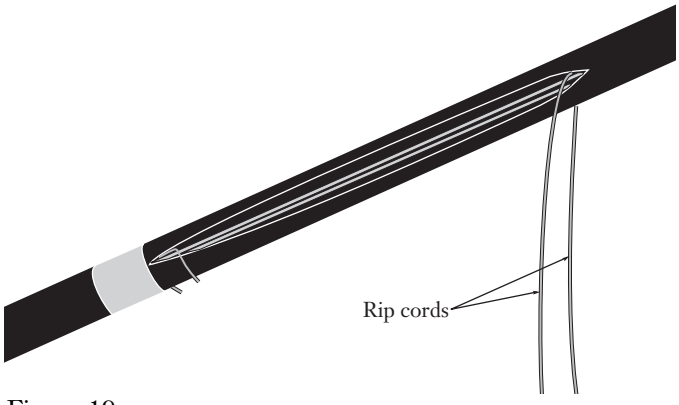


Figure 19

6.6 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 20).

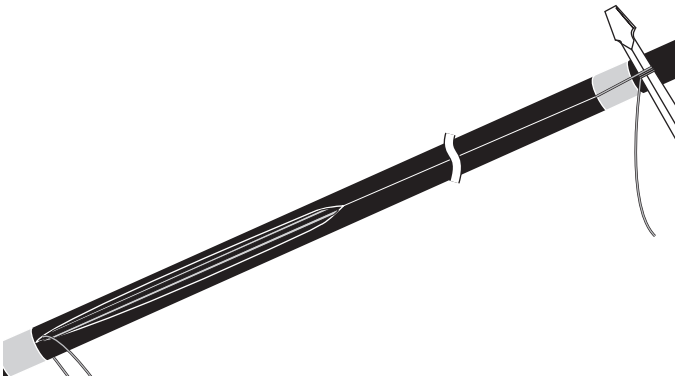


Figure 20

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

6.8 At a point approximately 15 cm (6 in.) from the tape wrap, use the hook blade knife to score a ring cut around the black outer sheath. Do not cut completely through the sheath (Figure 21).

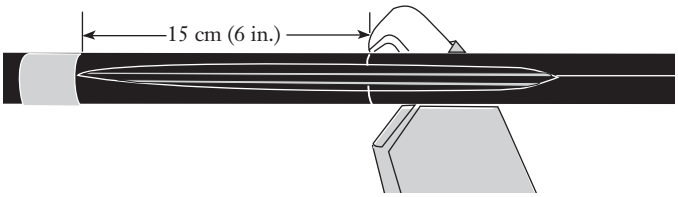


Figure 21

6.9 Using needle nose pliers, peel off both sections of the split sheath to the tape mark to expose a 15 cm (6 in.) section of central tube. Use side cutters to remove the sheath sections flush with the tape wrap (Figure 22).

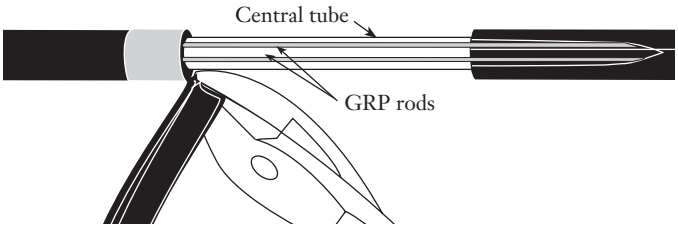


Figure 22

6.10 Use side cutters to cut the GRP rods 15cm (6 in.) from the tape wrap. (Figure 23).

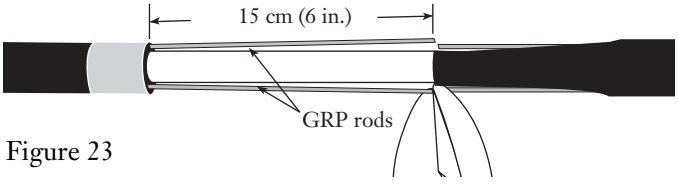


Figure 23

6.11 Using needle nose pliers, peel off both sections of split sheath to the opposite tape wrap. Use side cutters to remove the sheath sections flush with the tape wrap.

6.12 Use the side cutters to cut the GRP rods 15 cm (6 in.) from the other tape wrap (Figure 24).

Figure 24

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

Use the UAT-3 to remove the buffer tube in accordance with the the manual provided with the tool, SRP-004-074, *Universal Access Tool III Operating Instructions.*

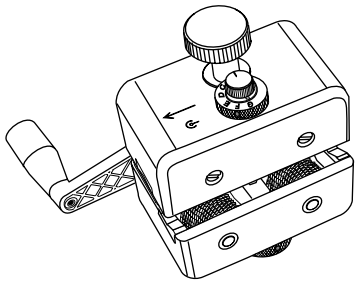


Figure 25

6.14 Place a mark 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 mark locations will vary depending on the hardware being utilized.*

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

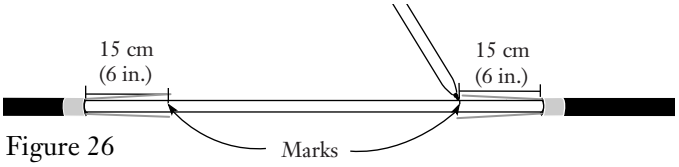


Figure 26

6.15 Follow the UAT instructions to access the ribbons. After using a UAT III, the final result will look like Figure 27.

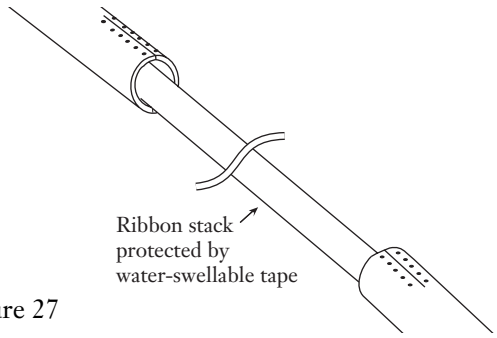


Figure 27

6.16 To remove the water-swellable tape from the ribbons:

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

b) Carefully separate the water-swellable 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 29).

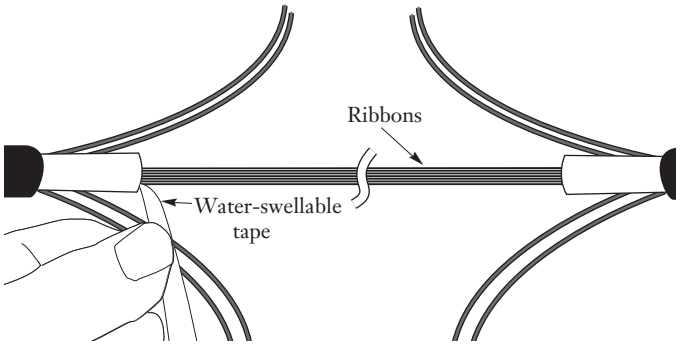


Figure 28

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

Accessing Ribbon Fibers

6.17 If appropriate for your installation, divide the ribbon(s) using the Ribbon Splitting Tool (RST-000) (Figure 29).

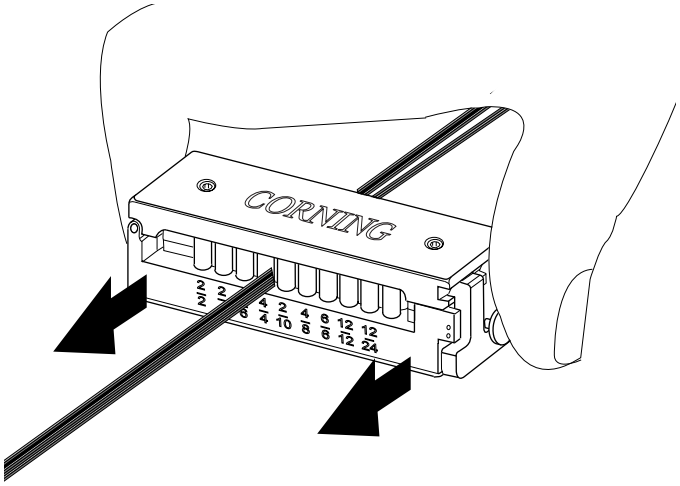


Figure 29

6.18 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.

6.19 Determine the end of the accessed fiber(s) 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.

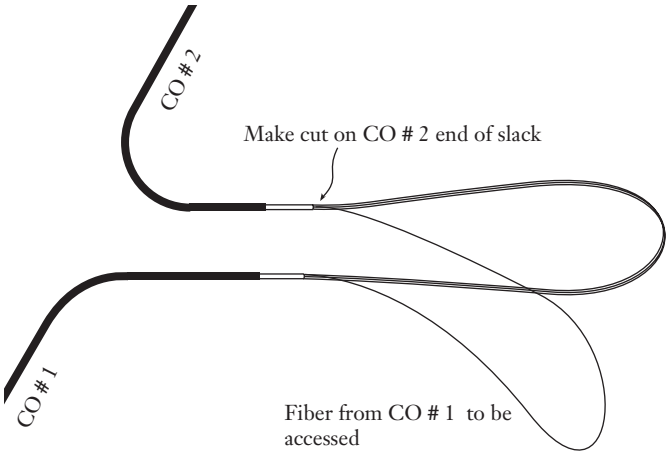


Figure 30

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

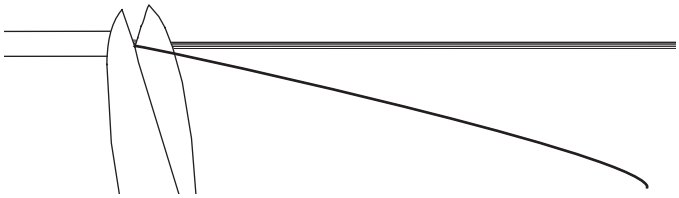


Figure 31

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

6.22 Splice the fibers according to the system design plan.

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

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