

FIELD INSTALLED FANOUT KIT FOR 144- & 288-FIBER ROLLABLE RIBBON CABLE

Contents

1.	Introduction	1
1.	Tools and Material Required	1
2.	Important General Notes	1
2.	Fanout Kit Components	2
3.	Armor Kit Components	3
4.	Procedure	4
4.1	Preparing Armored Cable	4
4.2	Preparing the Cable	6
4.3	Installing the Fanout	8
4.4	Applying Shrink Tubing to Fanout	12
5.	Trademarks	16
6.	Contact Information	16

1. Introduction

This document describes how to install a CommScope Field Fanout Kit for a 144- or 288-fiber rollable ribbon cable. Contents include tables listing kit components, a list of required tools and material, general guidelines, and a four-part procedure with photos showing the kit being installed.

Note: Armor kits are sold separately.

1. Tools and Material Required

Obtain these tools and material and have them on hand before beginning the procedure:

- Cable armor cutting tool (for armored cables)
- Tape measure
- Cable sheath ring cutting tool, sheath knife or utility knife
- Needle nose pliers
- Scissors or electrician's snips
- ¾" (19 mm) vinyl tape (electrician's tape)
- Rags or paper towels
- Heat gun

2. Important General Notes

1. *If the cable assembly requires additional handling to route into place at the rack or cabinet, it is strongly recommended to handle the cable assembly ONLY by the cable sheath or armor. Avoid applying pull tension or excessive twisting motion to the fanout assembly and/or furcation tubes!*
2. *Refer to the instruction sheet included in the armor kit for the proper installation steps for securing the cable armor fitting to a rack or cabinet and grounding the cable armor.*

2. Fanout Kit Components

The photo below shows the fanout kit components for a 144-fiber cable. The kit components for a 288-fiber cable are analogous. [Table 1](#) lists the fanout kit components for a 144-fiber cable. [Table 2](#) lists fanout kit components for a 288-fiber cable.



Table 1: 144-Fiber Cable Fanout Kit Components

Item	Qty	UOM	Description
1	100	FT	Furcation Tubing
2	1	EA	Adhesive Foil Wrap, 4"X12" (10.2 cm X 30.5 cm)
3	1	EA	Installation Instructions
4	1	EA	Furcation Tube Labels 1-12
5	2	EA	Heat Shrink Tubing, Adhesive lined, 2.5" (6.4 cm) length, 1" (2.5 cm) diameter
6	1	EA	Heat Shrink Tubing, Adhesive lined, 6" (15.2 cm) length, 1.25" (3.2 cm) diameter
7	4	EA	Alcohol Wipes
8	1	EA	Loctite
9	1	EA	Retainer, Mesh Gland
10	1	EA	Cap, Mesh Gland
11	1	EA	Base
12	1	EA	Cover
13	1	EA	Fiber Retainer Clip
14	6	FT	Mesh Sleeving
15	1	EA	Spacer

Table 2: 288-Fiber Cable Fanout Kit Components

Item	Qty	UOM	Description
1	200	FT	Furcation Tubing
2	1	EA	Adhesive Foil Wrap, 4"X12" (10.2 cm X 30.5 cm)
3	1	EA	Installation Instructions
4	1	EA	Furcation Tube Labels 1-24
5	2	EA	Heat Shrink Tubing, Adhesive lined, 2.5" (6.4 cm) length, 1" (2.5 cm) diameter
6	1	EA	Heat Shrink Tubing, Adhesive lined, 6" (15.2 cm) length, 1.25" (3.2 cm) diameter
7	8	EA	Alcohol Wipes
8	1	EA	Loctite
9	1	EA	Retainer, Mesh Gland
10	1	EA	Cap, Mesh Gland
11	1	EA	Base
12	1	EA	Cover
13	1	EA	Fiber Retainer Clip
14	6	FT	Mesh Sleeving

3. Armor Kit Components

The photo below shows the armor kit components. [Table 3](#) lists armor kit components. The kits for a 144-fiber cable and 288-fiber cable are analogous.

**Table 3: 144/288-Fiber Cable Armor Kit Components**

Item	Qty	UOM	Description
1	1	EA	Installation Instructions (not shown)
2	1	EA	Mounting Bracket Kit
3	1	EA	Heat Shrink Tubing, Adhesive lined, 4" (10.2 cm) length, 1.5" (3.8 cm) diameter
4	1	EA	Ground Cable, #6, Lugged 10" (25.4 cm)
5	1	EA	Armor Fitting

4. Procedure

Use the following procedure to install a field breakout kit.

4.1 Preparing Armored Cable

If the fanout kit is being installed on an armored cable, complete the following section; otherwise proceed to [Section 4.2](#).

Note: [Section 4.1](#) is done for armored cable only.

1. Determine the desired length between the end of the cable armor and the fanout assembly. On the factory-terminated end of the cable assembly, this length will be approximately 15 inches (38 cm), but it could be longer on the field terminated end if desired depending on where the armor will be attached to the rack or cabinet and where the fanout will be located. Add 96 inches (244 cm) to this measurement to allow for the length of the ribbon furcation tubes.
2. Measure, mark, and cut the cable armor at this location. Use caution while cutting the armor to prevent accidentally cutting into the cable sheath.



3. Slide the cable armor off of the cable.



4. Slide the heat shrink tubing included in the armor kit over the end of the cable.



5. Slide the heat shrink tubing up past the cable armor and out of the way.
6. Slide on the armor fitting.



7. Trim back the armor jacket about 1 inch (2.5 cm) to prepare a place for the armor fitting to be threaded onto the interlocking steel armor.



8. Thread the armor fitting onto the interlock steel armor; tighten until snug.



9. Slide the heat shrink tubing over the rear of the armor fitting until it reaches the flange at the end of the armor.



10. Using the most effective distance and lowest effective heat setting on the heat gun, shrink the heat shrink tube until it is fully compressed.



Caution! Do not allow adhesive to come in contact with skin or clothing until fully cooled.



Note: The heat shrink is adhesive lined so it is normal to see a small amount of adhesive leaking out at the edges of the tubing.

11. Below is an example of a completed armor kit.



4.2 Preparing the Cable

To prepare the cable, proceed as follows.

1. Slide the 6-inch (15.2 cm) heat shrink tubing over the cable stub end.



2. Slide the 6-inch (15.2 cm) heat shrink tubing up the cable and out of the way.



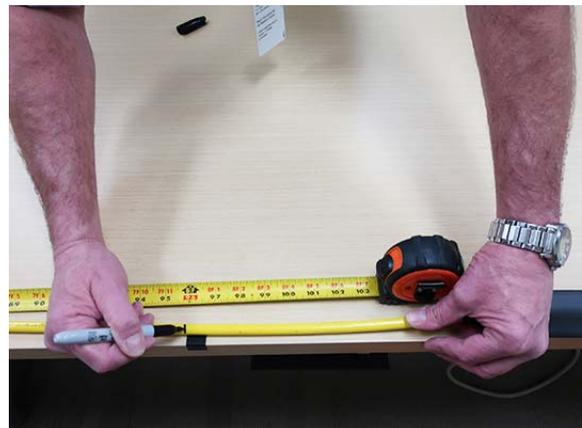
3. Slide one of the two pieces of 2.5-inch (6.4 cm) heat shrink tubing over the cable stub end.



4. Slide the 2.5-inch (6.4 cm) heat shrink tubing up the cable and out of the way.



5. Measure and mark the cable sheath at 96 inches (244 cm) from the stub end of the cable.



6. Make a ring cut around the cable sheath at the 96-inch (244 cm) mark.



7. Make a ring cut approximately 3 inches (7.6 cm) from the end of the cable.



8. Remove the sheath exposing the ripcord(s) at the stub end of the cable.



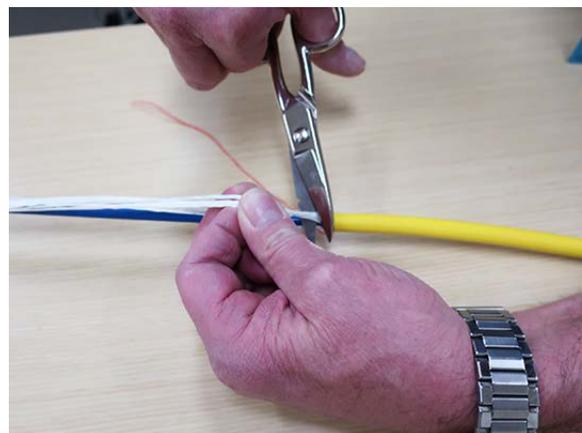
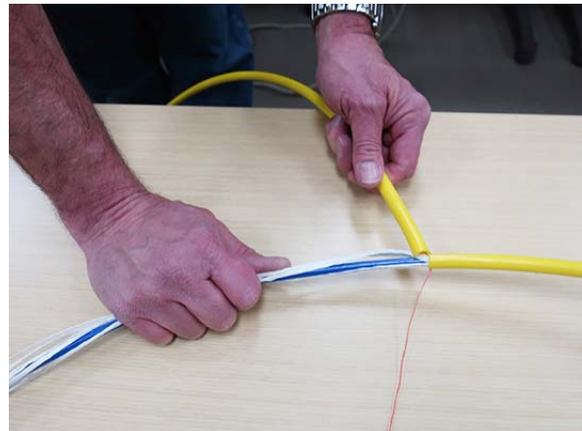
9. Pull the ripcord(s) to split the cable sheath back to the ring cut at the 96-inch (244 cm) mark. Needle nose pliers can be helpful to grasp and pull the ripcord(s).



10. Manually separate the central tube (blue in the photo below) from the cable sheath, strength members, tape liner(s), and ripcord(s).



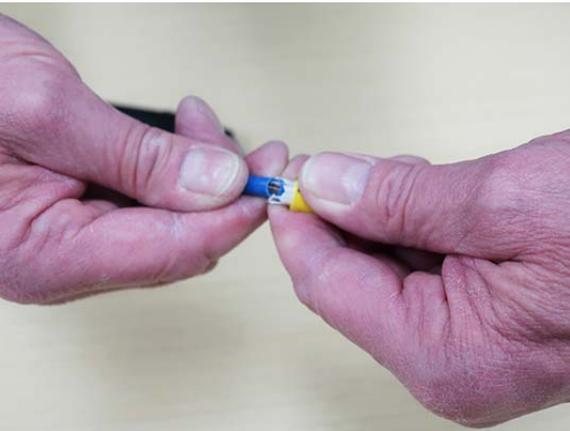
11. Remove the cable sheath, strength members, tape liner(s), and ripcord(s) at the ring cut, leaving just the central tube.



- Carefully score the central tube near the point where it exits the cable sheath.



- Snap off the central tube at the score line just made.



- Remove the central tube exposing the fiber ribbons.



4.3 Installing the Fanout

To install the fanout, proceed as follows.

- Feed the ribbons through the rear of the base.



- Slide the base up and over the cable sheath, and take note of the internal stop centered within the cylindrical base opening. For 144-fiber cable, slide the cable sheath beyond the internal stop until snug and firm. For the 288-fiber cable, slide the cable sheath up to the internal stop.



Note: The base should fit very snugly around the cable sheath. If necessary, make one or two wraps of electrical tape around the cable sheath to ensure a snug fit.

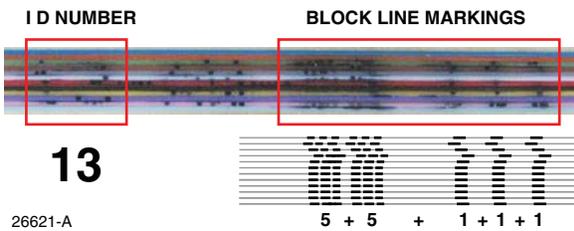
- Cut the 3mm furcation tubing into 12 pieces (for 144-fiber cable) or 24 pieces (for 288-fiber cable) at the desired length (see **Note** below).



Note: The furcation tubing length will be determined by the final fanout kit location within the rack or cabinet and the desired length of service loop between the fanout and the cable entry point into the fiber shelf PLUS 33 inches (84 cm) of length within the fiber shelf. The typical minimum furcation tubing length is 72 inches (183 cm), typical maximum length is 93 (236 cm) inches.

4. Apply one numerical ID label to each furcation tube 12 inches (30.5 cm) from the end of the furcation tube.

Note: Individual ribbons are identified with printed ID numbers and block/line markings. If the ID number to the left is unclear, obtain the value by adding block/line markings on the right. Each rectangular block has a value of 5 and each line has a value of 1.



5. At the end opposite of the label, cut the ends of the tubes at a 45-degree angle. This allows easier insertion of the ribbons into the tubes.



6. If ribbon fibers are grouped by binder yarn, undo one group at a time as ribbon fibers are inserted into the furcation tubes. If present, trim binder yarn to expose 1/2 inch (13 mm) or less.



7. Identify a numbered fiber ribbon and feed the ribbon into the associated furcation tube at the 45 degree cut. The ribbon may be cleaned with an alcohol wipe prior to insertion into the tubes if desired to aid in the insertion process, although this step may be unnecessary.

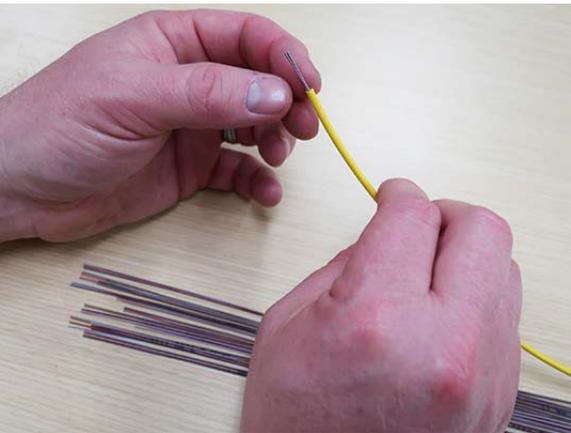


Caution! If the ribbons are cleaned with alcohol, be aware that this may smear or remove the identification marks on the ribbons.

Note: Laying out the furcation tube as flat and straight as possible will aid in feeding the ribbon into the tube.



8. Once the ribbon appears at the opposite end of the tube, the ribbon can be held steady and the furcation tubing can be pushed toward the base.

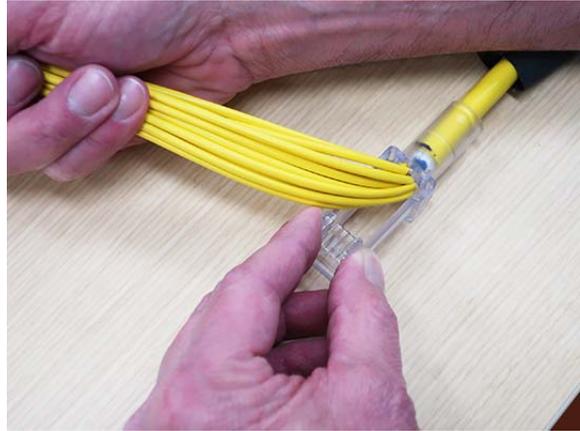


9. Slide the furcation tube all the way into the base until it meets the end of the cable.



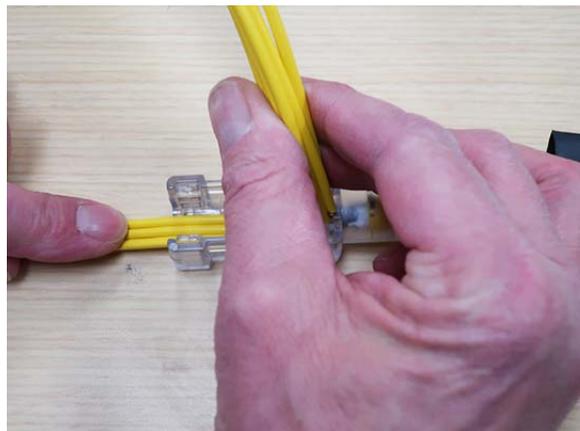
10. Repeat this process for the remaining ribbons.

11. Lift the furcation tubes out of the base and rest them aside. Insert the 3mm fiber retainer clip into the base.



12. Note the natural order of the furcation tubes as the ribbons exit the cable sheath. It is important to try to maintain this order as the tubes are loaded back into the fiber retainer clip in the fanout base to ensure that the ribbons do not become twisted or cross over one another.
13. Locate the four furcation tubes that are best oriented to make up the bottom row in the fiber retainer clip and lay the ribbons into place.

Note: If binder yarns are present, trim to expose 1/2 inch (13 mm) or less of yarn.



14. Once in place, slowly pull each furcation tube away from the cable sheath to expose approximately 1 inch (2.5 cm) of bare ribbon within the base.



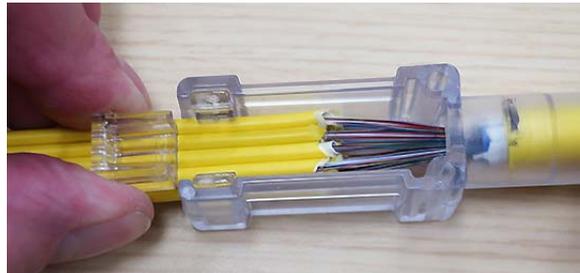
15. At a point about 1/8 inch-1/4 inch (3 mm - 6 mm) outside the fanout base, apply the adhesive generously to the first horizontal row of furcation tubes. Ensure that the application of the adhesive occurs between all the tubes. Do not allow adhesive to dry before starting Step 16.

Caution! Do not allow Loctite adhesive to come into contact with skin or clothing until fully cured. Carefully read safety label warning adhered to Loctite tube.

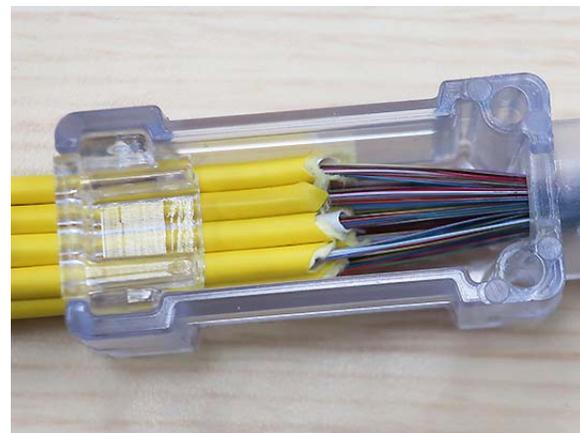


Note: The goal of this step is to securely glue all the tubes together and it is a **CRITICAL STEP** in the installation process, so don't skimp on the application of the adhesive horizontally and vertically.

16. Repeat steps 13-15 one row at a time until all the furcation tubes are adhered together.
17. Wipe up any excess adhesive from the work area and allow the adhesive a few minutes of drying time before continuing.
18. **(FOR 144-FIBER CABLE ONLY)** Slide the spacer into place at the top of the fiber retainer clip to secure and retain the furcation tubes.



19. Visually inspect the orientation of the ribbons in the base. The ribbons should exit the cable sheath and enter the furcation tubes without twisting or crossing over one another and there should be no bending of the fibers.
20. Install the fanout cover to the fanout base.



21. Cut the mesh sleeve material to the appropriate length. This length will vary, but it will typically be the length of the furcation tubes MINUS 30" (91 cm).



22. Tape the ends of the fiber ribbons together securely to protect them from fraying or breaking while being inserted into the mesh tubing.



23. Wrap the tape around the ends of the fibers as shown.

Note: This a CRITICAL STEP to avoid damage to the fiber ribbons!



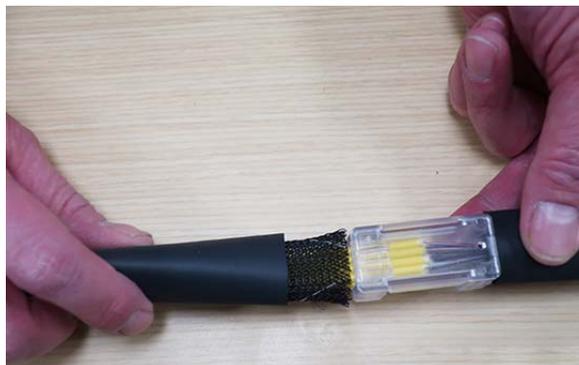
24. Slide the mesh sleeve over the fiber ribbons/furcation tubes until the end of the mesh reaches the fanout assembly, as shown in the second photo.



4.4 Applying Shrink Tubing to Fanout

To apply heat shrink tubing to the fanout, proceed as follows.

1. Slide the remaining piece of 2.5-inch (6.4 cm) heat shrink tubing over the ribbons/tubes and mesh sleeve until it touches the plastic fanout assembly.



2. Cut a 4x4-inch (10x10 cm) square from the provided adhesive foil -- remaining piece will not be used.
3. Mark the outer edge of heat shrink with tape.



4. Slide the heat shrink a minimum of 8 inches away from the plastic fanout assembly.
5. Apply a second piece of tape towards the fanout assembly, leaving a 1/8-1/4-inch (3-6 mm) gap.



6. Remove the first piece of tape.



7. Peel the backing off the 4x4-inch (10x10 cm) adhesive foil tape and place the foil tape edge against the tape edge furthest from the plastic fanout assembly.



8. Wrap the foil tape around the mesh sleeve, making a minimum of 1-1/4 revolutions.
9. Remove the second piece of tape.



10. Slide the first 2.5-inch (6.4 cm) heat shrink (from Step 3. on Page 3) over the foil adhesive until it touches the plastic fanout assembly.



Note: There will now be heat shrink tubing on both ends of the fanout assembly.



11. Using the most effective distance and lowest effective heat setting on the heat gun, begin heating one heat shrink tube at a time (any order). Apply uniform heat around and across the heat shrink, using special care to prevent extreme differences in diameter. Uneven heating will cause trapped air pockets and/or backwards curling at the ends. The heat shrink is adhesive lined so it is normal to see a small amount of adhesive leaking out at the edge of the tubing.



Caution! Do not allow adhesive to come in contact with skin or clothing until fully cooled.

12. After the 2.5-inch (6.4 cm) heat shrink tubing has cooled, slide the 6-inch (15.2 cm) heat shrink tubing over the fanout assembly.



13. Center the 6-inch (15.2 cm) heat shrink tubing between the fused edges of the cable and mesh sleeve.



14. Shrink the large tubing using the lowest effective heat setting on the heat gun. Apply uniform heat around and across the heat shrink, using special care to prevent extreme differences in diameter. Uneven heating will cause trapped air pockets and/or backwards curling at the ends. The heat shrink is adhesive lined so it is normal to see a small amount of adhesive leaking out at the edges of the tubing.



15. When the assembly has fully cooled, remove the foil tape from the mesh sleeve.

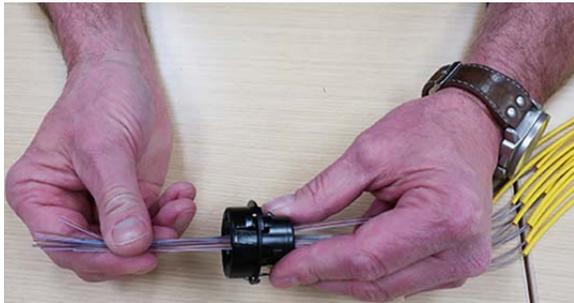
Caution! Do not allow adhesive to come in contact with skin or clothing until fully cooled.



16. Slide the mesh gland retainer over the ribbons/furcation tubes.



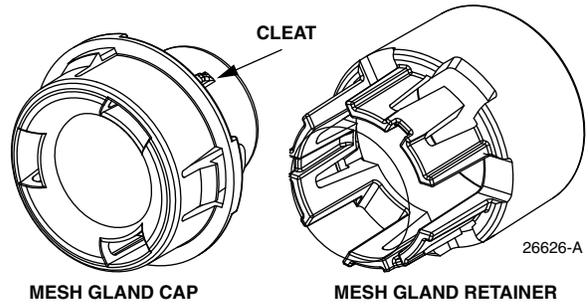
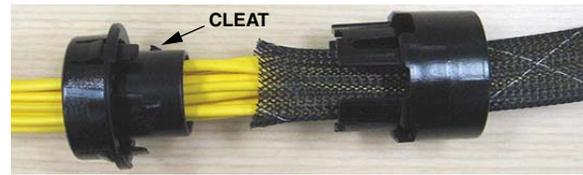
17. Slide the mesh gland cap over the ribbons/furcation tubes.



18. Slide the mesh gland cap further to the gland retainer.



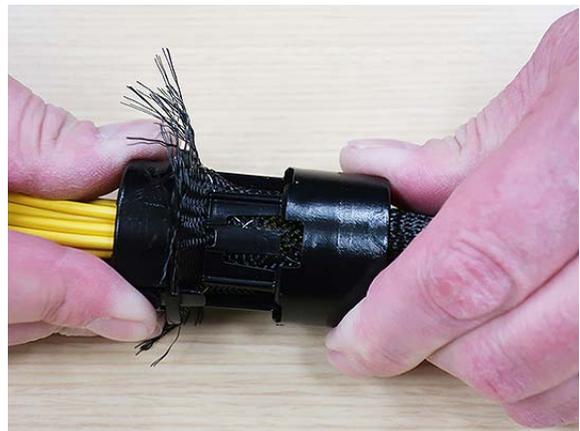
19. Slide the end of the mesh sleeve into the gland cap.



20. Anchor the mesh sleeve on the cleats on the gland cap.



21. Slide the gland retainer toward gland cap and align the slots in the retainer with the cleats in the cap.



22. Snap the cap and the retainer together to capture the mesh sleeve.



23. Trim any excess mesh from the assembly.



24. The cable assembly is now ready for splicing or connectorization.



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