

revision history |




Issue	Date	Reason for Change
2	September 2009	Correction of typographical error in Figure 4
1	May 2009	Initial Release

Related literature |

SRP-004-136 Accessing All-Dielectric DX Armored Fiber Optic Cables

Admonishments |

The precautionary terms used by Corning Cable Systems in its standard recommended procedures conform to the guidelines expressed in the American National Standards Institute document (ANSI Z 535) for hazard alert messages. Alerts are included in this instruction based on the following:

-  **DANGER:** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
-  **WARNING:** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
-  **CAUTION:** indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

1. General

This procedure provides instructions for installing a wire mesh pulling grip on Corning Cable Systems DX Armored Riser and Plenum Rated Fiber Optic Cables. The DX Armored Cable contains a multi-fiber tight buffered fiber optic cable which is not connectorized.

Refer to the appropriate cable specification sheet or catalog for the maximum tensile load rating of the cable to be installed.

This issue includes grip installation on cables with the All-Dielectric armor referred to as “DX” armor.

2. Precautions

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 fiber. Pieces of glass fiber are very sharp and can easily damage the cornea of the eye.



Safety Gloves

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

Cable and Fiber Handling Precautions



CAUTION: Fiber optic cables are sensitive to excessive pulling, bending and crushing forces. Excessive bending will cause kinking which may damage the fibers inside — the cable may have to be replaced.

3. Tools and Materials

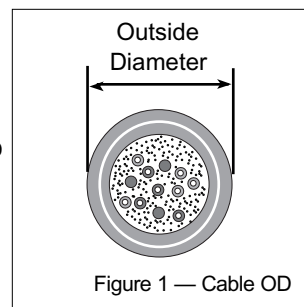
The following tools and materials are required to complete this procedure:

- Kellems® pulling grip
- Side cutters (diagonal cutting pliers) *
- Tape measure *
- Permanent marking pen *
- Utility knife with hook blade * or cable knife
- Vinyl tape, 3/4 in (19.1 mm) *
- Friction tape, 3/4 in (19.1 mm)
- Coaxial Cable Cutter (large blue Ideal® tool)
- Gloves
- Scissors *
- Swivel, ball-bearing type
- Hex wrench or screwdriver (to fit swivel)*

* Items included in the M67-003 Fusion Splicer Tool Kit

4. Pulling Grip Selection and Installation on Cables with DX Armor

Step 1: Prior to installation, the proper size grip must be chosen for the cable to be pulled. Grip selection is based on the outside diameter of the cable (Figure 1).



Step 2: Generally speaking, use the smallest grip which will fit over the cable without excessive difficulty. Measure the outer diameter and determine the proper grip by locating the diameter in Table 1:

Cable Diameter and Grip Size		
If cable diameter is in the range of...	Grip is Corning part number	Kellems part number
2.5 - 5.6 mm (0.10 to 0.22 in.)	GRP-010	033-29-1182
5.3 - 9.0 mm (0.21 to 0.35 in.)	GRP-011	033-29-1182
9.1 - 12.2 mm (0.36 to 0.48 in.)	GRP-012	033-29-1184
12.3 - 15.5 mm (0.49 to 0.61 in.)	GRP-013	033-29-1185
15.6 - 18.5 mm (0.62 to 0.73 in.)	GRP-014	033-29-1186
18.6- 22.1 mm (0.74 to 0.87 in.)	GRP-015	033-29-1187
22.2 - 25.4 mm (0.88 to 1.0 in.)	GRP-016	033-29-1188

Table 1

Step 3: Once the proper grip is obtained, inspect it for damaged or broken wires, bulges due to stress, rust, etc. Grasp the pulling eye in one hand (gloves are recommended) and smooth out the mesh with the other, tightening the wires. Figure 2 illustrates the technique, which is critical when reusing grips.

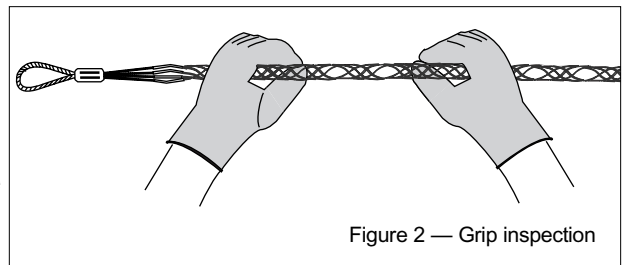


Figure 2 — Grip inspection

Step 4: To ease installation, trim the end of the cable with side cutters to remove any protruding armor, buffered fibers or yarn (Figure 3).

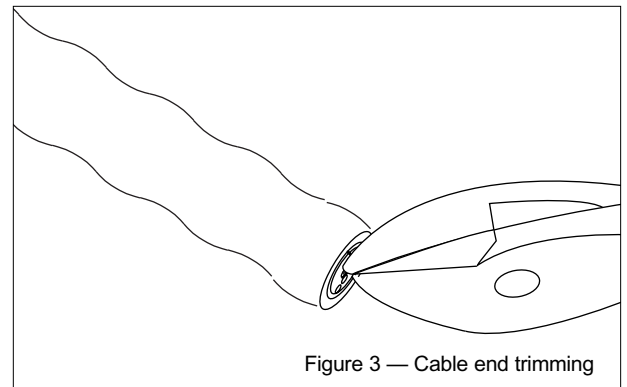


Figure 3 — Cable end trimming

Step 6: Table 2 and Figure 4 indicate the outer jacket strip length (A), exposed armor length (B), and exposed cable core length (C) required for each grip installation.

Mesh Length	A	B	C
45 cm (18 in.)	50 cm (20 in.)	15 cm (6 in.)	35 cm (14 in.)
53 cm (21 in.)	48 cm (23 in.)	18 cm (7 in.)	40 cm (16 in.)
60 cm (24 in.)	65 cm (26 in.)	20 cm (8 in.)	45 cm (18 in.)
68 cm (27 in.)	75 cm (30 in.)	25 cm (10 in.)	50 cm (20 in.)
75 cm (30 in.)	83 cm (33 in.)	30 cm (12 in.)	53 cm (21 in.)

Table 2

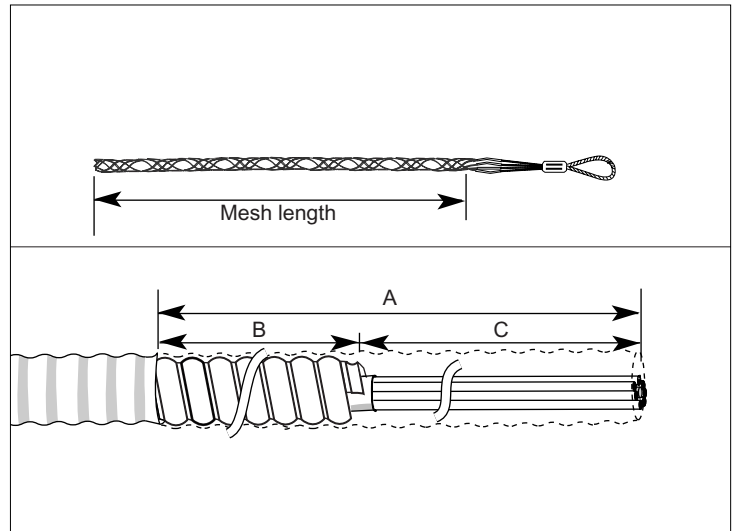


Figure 4 — Outer jacket marking lengths

Measure and mark lengths C from the end of the cable on its outer jacket (Figure 5).

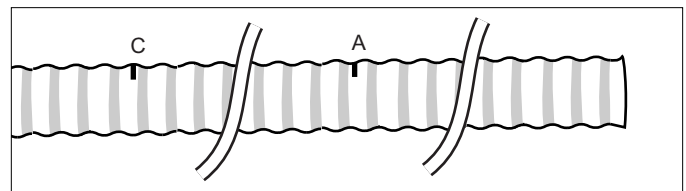


Figure 5 — Strip length markings

Step 7: Use a pumping action to walk the grip over the cable by bringing your hands together and then relaxing them until the end of the grip is past the A mark on the cable (Figure 6)

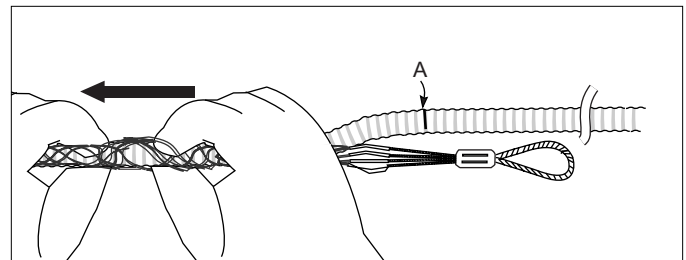


Figure 6 — Walking the grip

Step 8: Using the coaxial cable cutter, make a ring cut through the outer jacket *and score the armor* at the C strip-length mark (Figure 7). It may take several rotations (5-7 or more) depending on blade sharpness. Do not cut into inner cable jacket. It is safer to make several rotations, flex and try to snap the armor and repeat the process rather than to cut through outer and inner jackets at once.

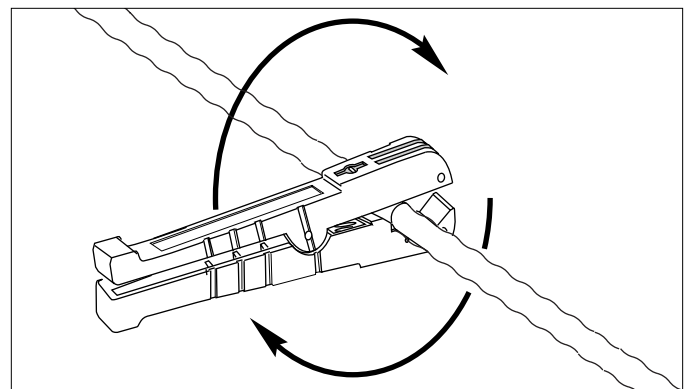


Figure 7 — Ring cutting the jacket

Step 9: Gently flex the cable until the DX armor snaps and remove the armor and outer jacket to expose the inner cable (Figure 8).

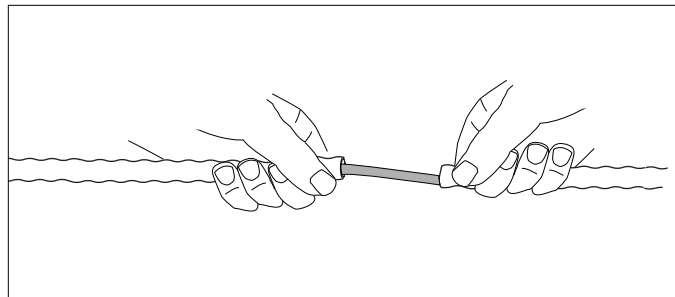


Figure 8 — Exposed cable

Step 10: Ring cut the inner jacket at the end of the exposed armor and 15 cm (6 in.) from the end of the cable (Figure 9). Use care to avoid damaging the aramid yarn strength elements under the jacket.

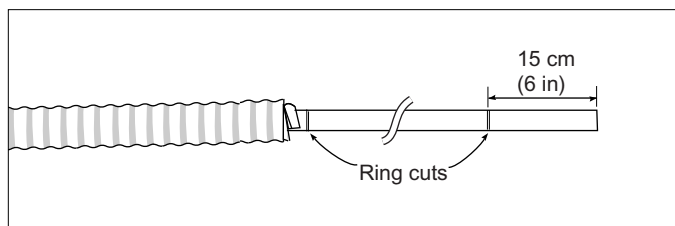


Figure 9 — Ring cutting the inner jacket

Step 11: Position the blade of the hook blade knife at the 15 cm (6 in) ring cut so that it can travel down the cable between the jacket and the cable core towards the cable end.

Hold the knife at a 45° angle to the cable to prevent the blade from slipping out of the jacket

Slit the 15 cm (6 in.) section of inner jacket by holding the arm which has the knife out straight and pulling the cable through the hook blade with your other hand (Figure 10).

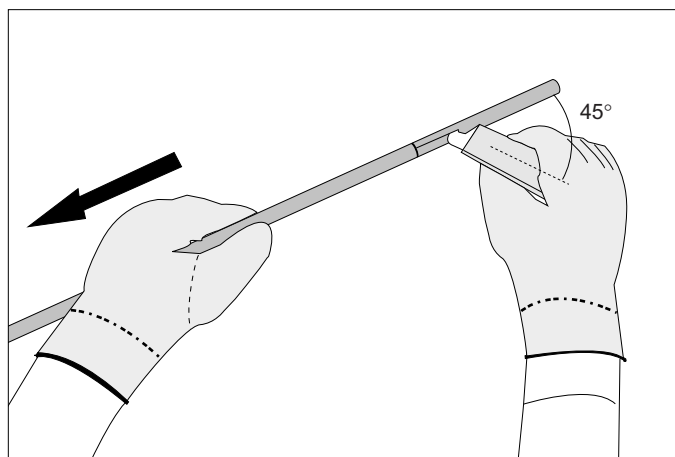


Figure 10 — Slitting the inner jacket

Step 12: Remove the 15 cm (6 in) section of jacket to expose the rip cord.

Step 13: Carefully separate the rip cord from the aramid yarn and other components of the cable core. Place a wrap of tape around the cable core to hold these components in place (Figure 11).

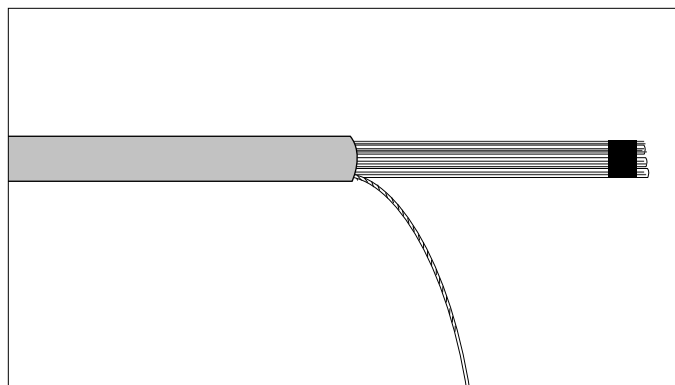


Figure 11 — Exposing the rip cord

Step 14: To remove the remaining exposed inner jacket:

- a) Carefully cut a starting notch in the inner jacket with a hook blade.
- b) Wrap a rip cord around the shaft of a screw-driver, short section of scrap cable, or other object which can serve as a handle.
- c) Pull the rip cord through the jacket to the ring cut (Figure 12).
- d) Cut the rip cord flush at the ring cut.

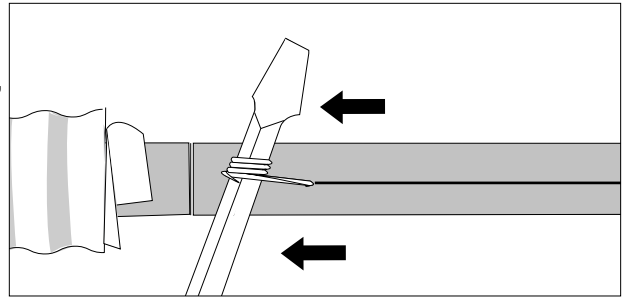


Figure 12 — Pulling the rip cord

Step 15: Remove the jacket from the DX armor back to the A mark (Figure 13).

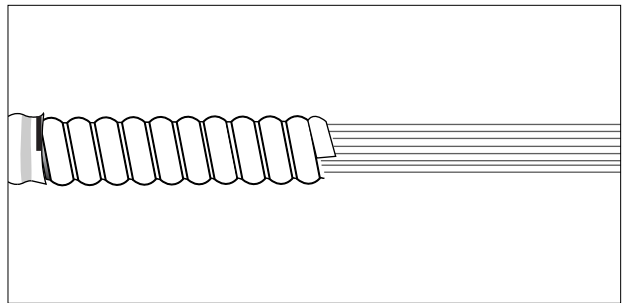


Figure 13 — Exposed cable core

Step 16: Place a wrap of friction tape over the exposed DX armor and over the entire length of the exposed cable core (Figure 14).

Note: Do not apply any friction tape over the outer jacket- the grip will not slide over the cable.

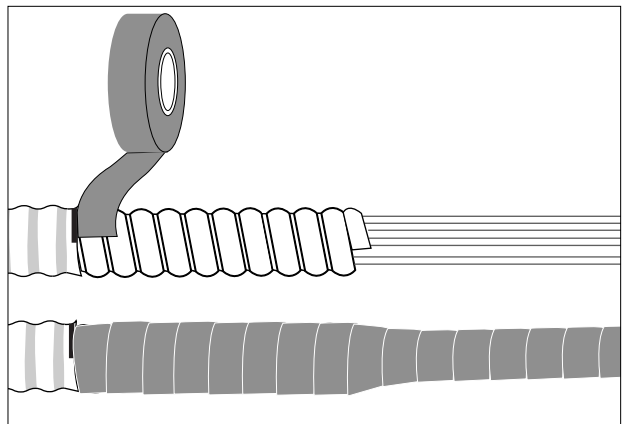


Figure 14 — Covering the cable core with Friction tape

Step 17: Walk the grip over the friction tape-covered cable core until the cable end is in the middle of the grip basket (Figure 15).

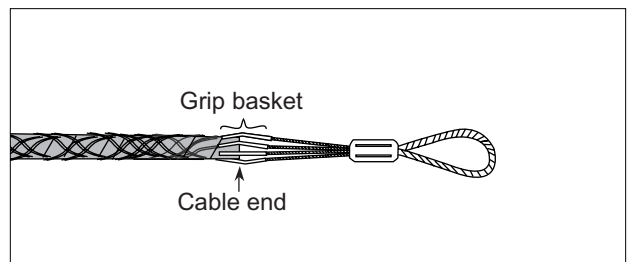


Figure 15 — Cable-end position in grip

Step 18: Smooth the mesh back over the cable core, moving from the pulling eye to the cable jacket. Tug on the grip to tighten it against the core (Figure 16).

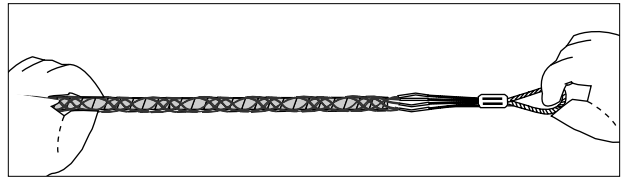


Figure 16 — Tightening the grip

Step 19: Starting at least 2.5 cm (1.0 in.) below the mesh on the cable jacket, wrap vinyl tape TIGHTLY to the top of the grip. The mesh's imprint should show clearly through the tape (Figure 17).

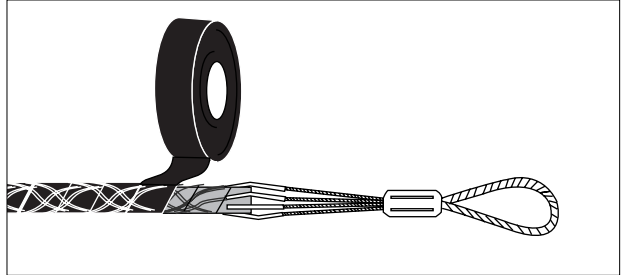


Figure 17 — Taping the grip

The tape must be tight because it helps compress the mesh against the cable core. Tug on the grip slightly to tighten it.

Note: When two or more vinyl tape layers are desired, always wrap the final, outside layer from the cable jacket to the pulling eye. This layers the tape like roofing shingles, so that it will not snag as it moves through a duct.

Step 20: Connect the pulling eye to the appropriate ball bearing swivel and pull tape or line (Figure 18). The grip installation is now ready for the cable placement.

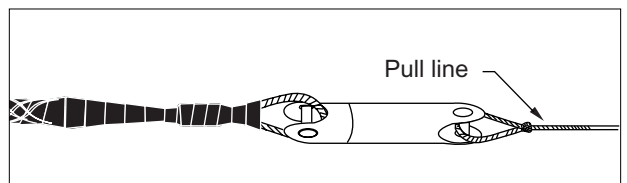


Figure 18 — Swivel and pull line

Grip Removal

After completion of the pull, cut the cable 91 cm (36 in.) behind the grip. Place a protective cap over the exposed cable end and tape in place to prevent water intrusion. Store the coiled splicing slack so that it is protected from damage.

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