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The practices contained herein are designed as a guide for use by persons having technical skill at their own discretion and risk. The recommended practices are based on average conditions. Panduit does not guarantee any favorable results or assume any liability in connection with this document.

In addition, the materials and hardware referenced herein appear as examples, but in no way reflect the only tools and materials available to perform these installations.

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1.0 General Information

The purpose of this best practices document is to provide a set of step by step instructions describing the installation of wire mesh pulling grips on non-armored and single armored cable. The methods and procedures contained herein are designed as a guide. Since there are numerous methods which may be utilized, these methods described herein have been determined are the most effective and efficient. The recommended procedures are based on average conditions.

In addition, the materials and hardware referenced herein appear as the recommended items, but in no way reflect the only tools and materials available to perform these evaluations.

2.0 Preparation Notes - Tools & Materials

1. Gloves
2. Safety Glasses
3. Diagonal Cutter
4. Wire Mesh Pulling Grip
5. Pliers
6. Sheath Knife
7. Friction Tape & Vinyl Tape
8. Scissors
9. Heat Gun (optional)

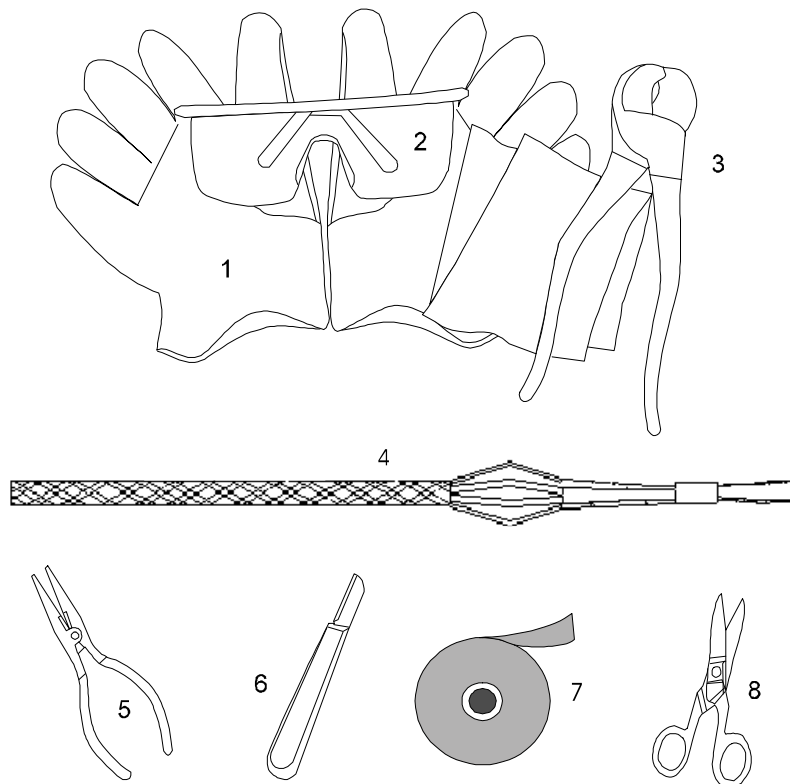


Figure 1

3.0 Installation Procedure for Dielectric and Armored Outside Plant Stranded and Indoor/Outdoor Central Loose Tube Cable

- 3.1 Select the proper size grip for the cable on which the grips are to be installed. Measure the outside diameter (OD) of the cable and select the appropriate grip size for that diameter as specified by the pulling grip manufacturer.
- 3.2 Strip approximately 3 feet of cable to expose the cable core and outer strength members (OSM) where used. **NOTE:** For 2 to 12 fiber indoor/outdoor central loose tube cable, remove only 1 foot of outer sheath, leaving the ripcords intact, and proceed to step 3.5b - Indoor/outdoor central loose tube cable only. Reference appropriate Panduit Sheath Removal Procedure Best Practices for detailed instructions. Be especially careful not to cut all the way through the jacket and damage the OSM yarns.
- 3.3 If the cable is armored, remove an additional 7 to 10 inches of the outer jacket down to the armor by shaving the outer jacket away from the steel armor with a sheath knife. **NOTE:** The use of a heat gun to soften the section of outer jacket to be removed may facilitate this process. Do not overheat the cable. Do not damage the armor.
- 3.4 Starting at the end of the jacket (or armor, when cable is armored), wrap one layer of friction tape around the cable OSM (when present) and core for a distance of approximately 5 inches. Cut the tape and secure the end tightly.
- 3.5a **Outside plant stranded loose tube cable only:** Slide the pulling grip over the exposed core and OSM (where present) so that approximately 1/3 (7 to 10 inches) of the mesh grips the jacket end and 2/3 grips the exposed core. If the cable is armored, slide the grip back over the exposed armor so that the grip butts against, but not over, the outer jacket. Tighten the grip over the cable by grasping the eye of the grip and smoothing the mesh to draw it tight. Proceed to step 3.6.
- 3.5b **Indoor/outdoor central loose tube cable only:** Slide the pulling grip over the exposed core so that about 3/4 of the mesh grips the jacket end and 1/4 grips the exposed core. Tighten the grip over the cable by grasping the eye of the grip and smoothing the mesh to draw it tight.
- 3.6 Starting with the cable jacket at least 1 inch beyond the wire mesh, tightly wrap over the assembly with vinyl tape to the other end of the mesh.

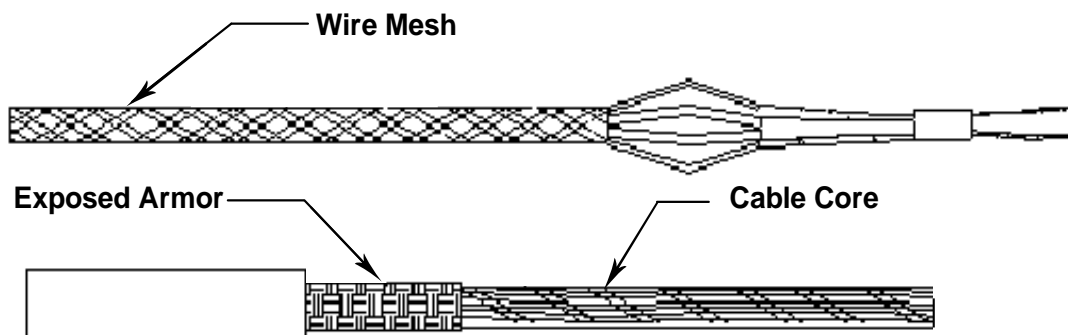


Figure 2

4.0 Installation Procedure for Dielectric and Armored Outside Plant Ribbon Central Loose Tube and Outside Plant Bundled Central Loose Tube Cable

- 4.1 Select the proper size grip for the cable on which the grips are to be installed. Measure the outside diameter (OD) of the cable and select the appropriate grip size for that diameter as specified by the pulling grip manufacturer.
- 4.2 Since outside plant ribbon central loose tube and outside plant bundled central loose tube cable do not have yarn strength members or a central strength member, there is no need to prepare the end of the cable. Simply cleaning the cable jacket to ensure the absence of slippery waxes or gels is the only preparation necessary.
- 4.3 Once the jacket is cleaned and the outside diameter is checked, place the entire length (24 inches minimum) of the proper size mesh grip over the jacket. Placing this length of grip over the jacket will completely couple the pulling load (600 lbs. max.) to the two strength member rods located beneath the jacket.



Figure 3: Completed setup on outside plant ribbon central loose tube or outside plant bundled central loose tube cable with grip applied over cable

5.0 Installation Procedure for Dielectric and Armored Outside Plant Ribbon Stranded Loose Tube Cable

- 5.1 Because outside plant ribbon stranded loose tube cable has a relatively large diameter, a grip sized to fit over the cable jacket will not likely fit into the subduct. Thus, the following procedure has been developed for fitting the grip over the central strength member (CSM).
- 5.2 Strip approximately 2 to 3 feet of cable jacket from the end of the cable to expose the cable core (dependent upon length of grip being used). Use care when ring cutting the sheath to avoid damaging or cutting the outside strength member yarns (OSM). Remove the jacket and unwind the OSM yarns.
- 5.3 Unwrap and discard any water swellable tapes. Cut the buffer tube binders, unwrap, and remove back to beginning of the sheath. Cut the buffer tubes approximately 1 inch from the beginning of the sheath and discard them.
- 5.4 Remove any water swellable tapes or yarns from the CSM. Starting at the end of the sheath, evenly spiral wrap the OSM yarns around the CSM. Again starting at the end of the sheath, evenly spiral wrap 1 layer of friction tape over the CSM/OSM to the end of the CSM. Ideally, the tape should form a smooth wrap and cone up to the jacket sheath to reduce the chance of the cable end snagging during installation.
- 5.5 Choose the appropriate sized grip. For 432 and 864 fiber count, use a 0.33-inch to 0.50-inch sized grip. For 1152 fiber count, use a 0.64-inch to 0.87-inch sized grip. There may be slight variation in sizes among grip manufacturers.
- 5.6 Slide the grip over the friction tape and down to the end of the jacket.

- 5.7 Tighten the grip over the cable by grasping the eye of the grip and smoothing the mesh to draw it tight. Once the grip is tight, a layer of vinyl or friction tape can be applied over the grip to reduce the chance of the grip snagging during the installation.



Figure 4: Completed grip setup on outside plant ribbon stranded loose tube cable using CSM and OSM only

- 5.8 The cable is now ready for installation. NOTE: A BREAKAWAY SWIVEL SHOULD ALWAYS BE USED DURING INSTALLATION AND THE CABLE TENSION MONITORED TO ENSURE THE RATED LOAD OF THE CABLE IS NOT EXCEEDED.