

Installation of Cable End Kits on Loose Tube Fiber Optic Cable

1. General

1.1 This procedure describes how to install a Corning Cable Systems Cable End Kit on loose tube cable designs. Cable end kits provide the materials to mold an epoxy plug which both seals the end of a loose tube cable and provides secure anchoring for the cable's buffer tubes (Figure 1).

1.2 Corning Cable Systems Cable End Kits, when combined with Buffer Tube Fan-out kits (ordered separately) branch the fibers contained in a loose tube fiber optic cable into individual fibers protected by 900 μm OD protective tubes (Figure 2). The fibers can then be connectorized per hardware interface requirements.

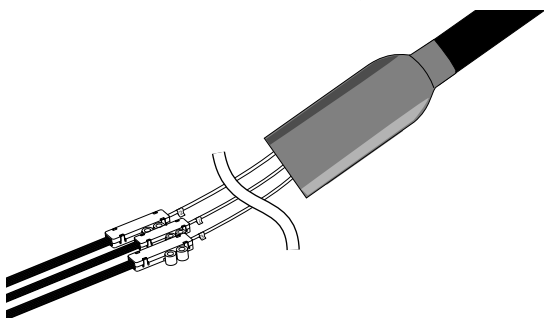


Figure 2

1.3 One Cable End Kit (LTC-END-XX) is required for each cable end to be connectorized. Cable end kit selection is determined by the size of the cable. There are three kits available based on cable outside diameter (OD). The OD of the cable must be known to properly fit the kit to a given cable.

When specifying a cable end kit, LTC-END-XX, the "XX" suffix must be one of the following numbers:

- 01 (cables up to 0.52 in. OD)**
- 02 (0.53 to 0.78-in. OD)**
- 03 (0.79 to 1.0-in. OD)**

1.4 A Buffer Tube Fan-out Kit is required for each buffer tube in the cable that will be connectorized. Thus a 216-fiber, 18-buffer tube cable will require one LTC-END kit and eighteen Buffer Tube Fan-out kits.



Figure 1

1.5 With the exception of the fiber and fan-out tubing lengths, the assembly of all indoor- application BTFs is identical. Standard BTF kits are available in both 6 and 12-fiber tube sizes, with lengths of 25, 36, 47, 64, 72, and 79 inches. Outdoor application BTF kits are available in 25 and 36-inch lengths for 6 -fiber tube sizes and in a 25-inch length for 12-fiber buffer tubes.


1.6 Cable end kits are designed for installation on all-dielectric cables. The assembly can also be installed on the inner sheath of armored cables. There are no provisions to ground steel central members or armor with the cable end kit.


1.7 Before attempting a cable end kit installation, please completely read and understand this procedure, and SRP-000-084, Indoor Applications Kit- 6 or 12-Fiber Buffer Tube Fan-Out (BTF) Assembly.

1.8 This issue reflects an updated format and current corporate information.

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 cable components. Use extreme care when cutting central members.*

 **WARNING:** *The wearing of safety gloves to protect your hands from accidental injury when using sharp-bladed tools is strongly recommended. Dispose of used blades properly.*

2.2 Cable Handling Precautions



CAUTION: *Fiber optic cable is sensitive to excessive pulling, bending and crushing forces. Consult the cable specification sheet for the cable you are installing. 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 – the cable may have to be replaced.*

2.3 Chemical Precautions



Cleaning Wipes

WARNING: *Contains petroleum distillates. Harmful or fatal if swallowed. DO NOT INDUCE VOMITING. Call a physician immediately.*



Potting Epoxy Precautions

WARNING: *Contains Diphenylmethane Diisocyanate. Harmful if inhaled. Do not breath vapor. Causes eye and skin irritation. Do not get in eyes or on skin. Wear eye protection and gloves. Can cause irritation of the respiratory tract. May cause skin sensitization or other allergic responses. Chemical reaction of mixed material may result in high temperature, wear gloves.*

FIRST AID INSTRUCTIONS: IN CASE OF CONTACT, WASH SKIN IMMEDIATELY WITH SOAP AND WATER.

Store in a cool dry place. Read MSDS before use. Use only in a well ventilated area. KEEP OUT OF THE REACH OF CHILDREN.



Alcohol - Isopropyl

WARNING: *Flammable. Flashpoint 59°F Can cause irritation to eyes on contact. In case of eye contact, flush eyes with water for at least 15 minutes. May induce mild narcosis, use with adequate ventilation. In case of ingestion, consult a physician or a Poison Control Center.*

2.4 Heat Gun Precautions



WARNING: *To avoid burn and electrical shock hazards, read and follow all precautions provided by the manufacturer of the heat gun you are using.*

3. Tools and Materials

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

- Utility knife with hook blade
- Scissors
- Side cutters
- Isopropyl alcohol
- Tissues
- Slotted screwdriver
- Buffer tube stripper
- Table vise, C-clamp, or duct tape
- 3/4-inch electrical tape
- Needle nose pliers
- Heat gun and power source
- Single-edge razor blades
- Permanent marker
- Cable ties, 8-inch
- Masking tape

4. Kit Contents

4.1 Each LTC-END-XX cable end kit contains the following:

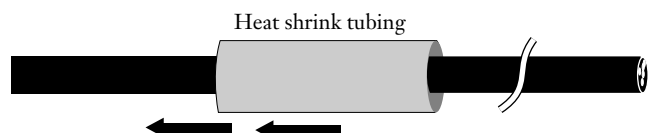
- 3.5-inch piece of vinyl tubing (1)
- 3.5-inch piece of heat shrink (1)
- Hose clamp, large (1)
- 45g bottle of plug epoxy (1)
- 3/4-inch wide roll of strapping tape (1)
- d'Gel ® cleaning wipes (4 packs)
- 60 grit sandpaper

5. Cable Preparation

5.1 Cable sheath removal lengths and buffer tube lengths required at the end of a cable are based upon the termination hardware being used. Refer to the instructions supplied with the hardware for the required strip lengths.

For stacked hardware configurations where the buffer tubes will be routed into multiple housings, determine the additional buffer tube length required to go from one housing to another.

5.2 Slide the 3.5-inch piece of adhesive-lined heat shrink down the cable and position it out of the way.(Figure 3).



5.3 Strip the cable according to the cable manufacturer's instructions.

5.4 Carefully remove the aramid yarn and central member as close as possible to the cable sheath end (Figure 4). The central member must not extend more than 1.25 cm (0.5 inches) from the cable sheath end.

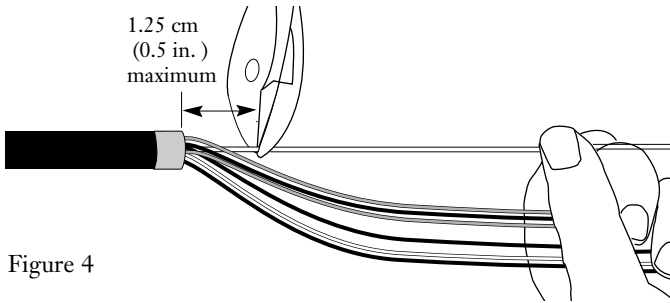


Figure 4

5.5 Trim off any filler rods or empty tubes at the cable sheath end.

5.6 Use one of the D-Gel wipes supplied with the Cable End Kit to clean the cable components (Figure 5). After cleaning, dry all the cable components with a clean tissue. Be sure to remove any cleaning solution that may have migrated down the outer cable sheath.

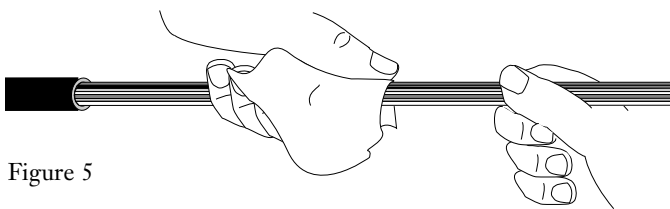


Figure 5

5.7 Using a piece of 60 grit sandpaper, rough a length of 5 cm (2 in.) back from the cable's end. Rotate the sandpaper around the cable, not up-and-down, to perform this step. Use a clean tissue to remove any loose shavings from this section of cable.

5.8 With the cable sheath end facing up, place the cable end in a table vise approximately 10 to 15 cm (4 to 6 in.) from the cable sheath end (Figure 6). **DO NOT OVERTIGHTEN THE VISE — CABLE DAMAGE AND DEFORMATION WILL OCCUR.**

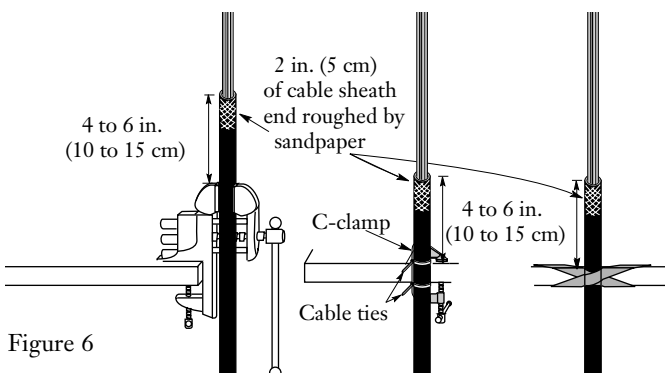


Figure 6

Note: As a substitute for a table vise, secure the cable with a C-clamp and cable ties or tape the cable to a table edge using duct tape.

5.9 With a hook blade knife, start at the edge of the cable sheath and make a downward slice in the sheath 1.25 cm (0.5 in.) long (Figure 7). Use extreme care to avoid damaging the buffer tubes.

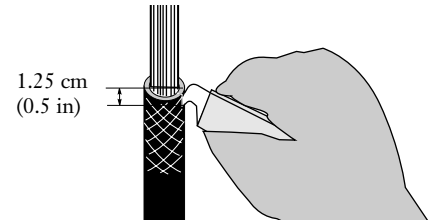


Figure 7

5.10 Move 6.35 mm (0.25 in.) to one side of the initial slice and make another slice in the cable sheath.

5.11 Make the same slice pattern on the opposite side of the cable sheath (Figure 8).

Slice patterns on cable sheath

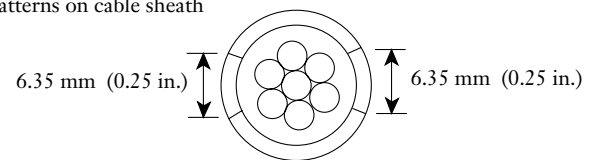


Figure 8

5.12 With the needle nose pliers, grab one 6.35 mm (0.25-in.) section of cable sheath and pull it out and down until it is perpendicular to the cable (see Figure 9).

5.13 Use scissors to remove this section of cable sheath (Figure 9) and any aramid yarn which is present in the newly formed notch.

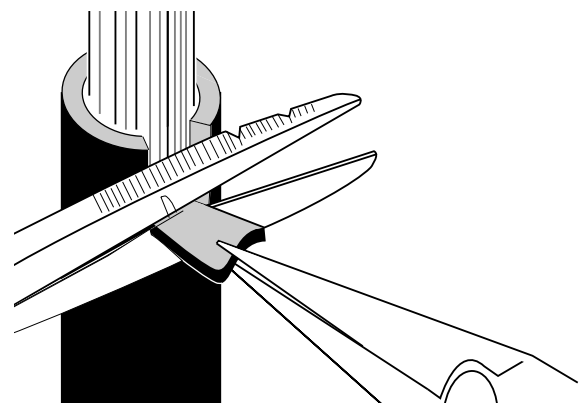


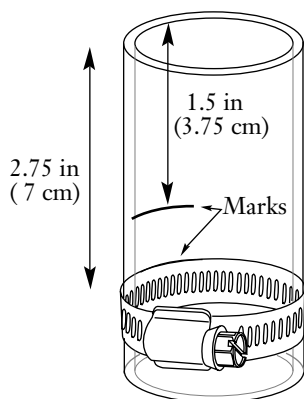
Figure 9

5.14 Repeat steps 5.12 and 5.13 for the remaining 6.35 mm (0.25-in.) section of cable sheath.

6. Installing the Cable End Kit

6.1 Mark the 3.5 inch vinyl tube 1.5 inches (3.75 cm) and 2.75 inches (7 cm) from one end with a permanent marker (see Figure 10).

6.2 Position the hose clamp at the 2.75 inch mark on the vinyl tube. Tighten the hose clamp just enough so that it will not slide from this position, but do not tighten it to the point it compresses the vinyl tube (Figure 10).



6.3 Position the vinyl tube on the cable. Line up the 1.5 inch mark made on the tube in step 6.2 with the cable sheath end. Tighten the hose clamp to compress the vinyl tube down on the cable sheath (Figure 11).

Note: Tighten the hose clamp down as much as possible to prevent leakage of the epoxy out of the bottom of the tube when the epoxy is poured.

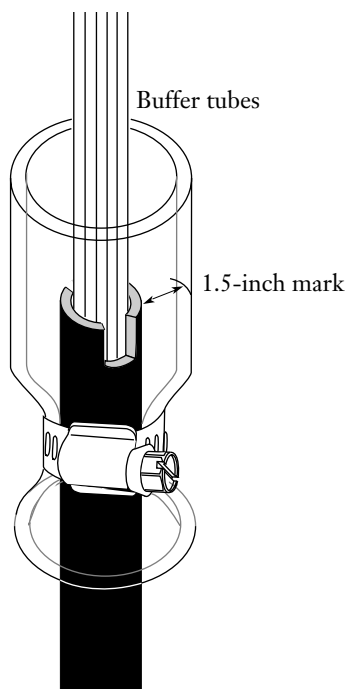


Figure 11

6.4 After all of the buffer tubes are positioned inside the large vinyl tube, group and tape the buffer tubes together with masking tape approximately 2-4 inches (5-10 cm) above the top of the vinyl tube (Figure 12). To assure easy routing into hardware later on, keep the tubes in the same configuration (order) in the vinyl tube that they had in the cable.

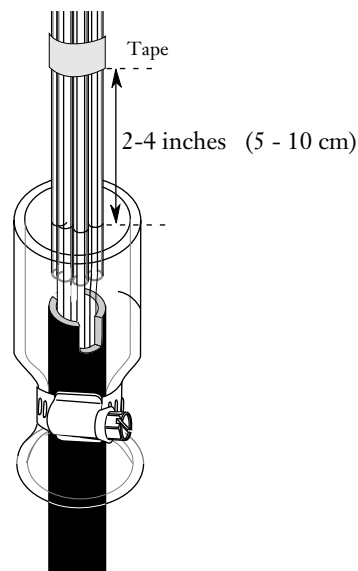


Figure 12

IMPORTANT: The epoxy you will be mixing and pouring in the next few steps sets up quickly. Become familiar with Steps 6.6 - 6.11 and ensure all materials are at hand before “flipping” the barrier of the epoxy tube.

6.5 Hold the epoxy tube horizontally. Holding the tube's internal barrier between your forefinger and thumb, “flip” the barrier to allow the tube's two components to mix (Figure 13). The mixed contents will cause the tube to become hot to the touch — this is normal.

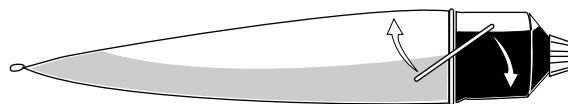


Figure 13

6.6 Shake the tube vigorously for 1 minute.

Note: If the temperature is below 65° F (18° C), increase the shaking time to 2 minutes.

6.7 Uncap the epoxy tube and pour the mixture into the vinyl tube. Fill to the top of the vinyl tube (Figure 14).

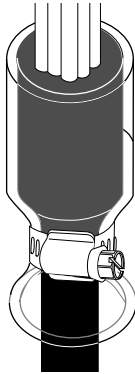


Figure 14

6.8 Gently flex the vinyl tube above the hose clamp with your thumb and forefinger to ensure the epoxy fills sufficiently between the inner vinyl wall and the outer cable sheath to include the notches. Add more epoxy to top-off the vinyl tube if needed.

Important: For proper sealing, make sure that there are no air voids on or near the surface of the vinyl tube. If any air bubbles are present, continue to gently flex the vinyl tube to work the air out the top of the tube.

6.9 Position the grouped protective tubes in the center of the vinyl tube and hold in place until the epoxy initially sets (typically 2 to 3 minutes at room temperature).

6.10 Allow the epoxy to harden (wait at least 10- 15 minutes). After 10-15 minutes, remove the hose clamp from the vinyl tube.

Note: During the next step, you will slice into the epoxy "plug" now formed inside the vinyl tube. Try to minimize the cut depth into epoxy to prevent major damage to the plug integrity. Avoid cutting the vinyl toward the protective tube if at all possible.

6.11 Slice completely through and down one side of the vinyl tube with a razor blade. Do not cut the cable sheath (Figure 15).

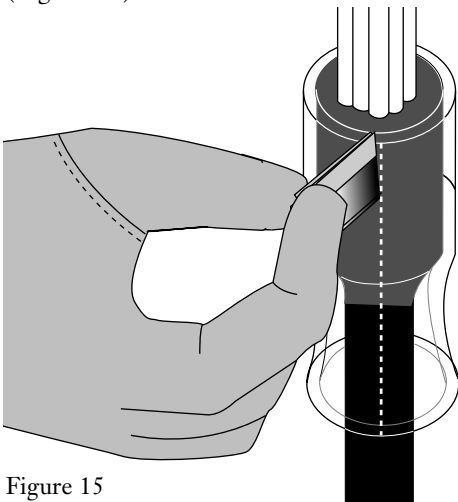


Figure 15

6.12 Grab the slices at the bottom of the vinyl tube and pull out and up to separate the tube from the plug. (Figure 16).

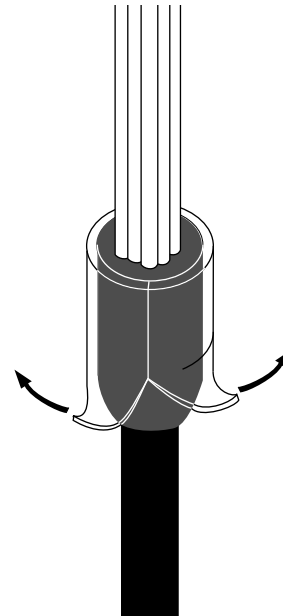


Figure 16

6.13 Clean the outer edge of the epoxy plug as necessary with a razor blade or scissors.

6.14 Remove the cable from the vise or tape which secured it to the work surface.

6.15 Slide the 3.5 inch piece of adhesive-lined heat shrink down the cable so that it hangs over the edge of the tube end of the epoxy plug about 1/16 of an inch (2 mm) (Figure 17).

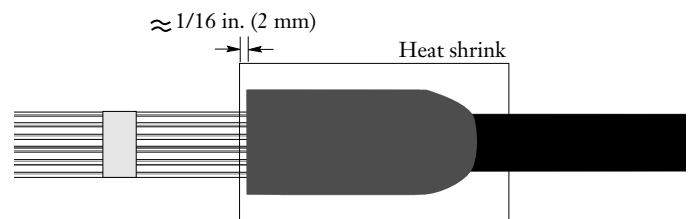


Figure 17

6.16 Use a heat gun to shrink the heat shrink into place (Figure 18) . Do not overheat or burn the plug assembly. Allow time for the assembly to cool before handling it.

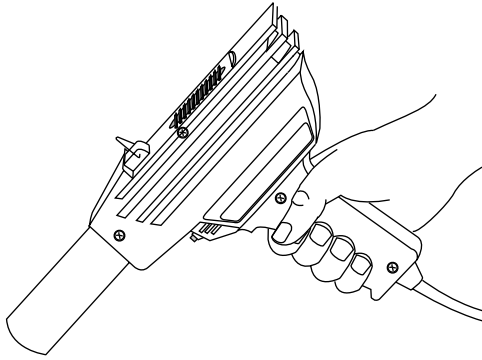


Figure 18

6.17 Remove the wrap of masking tape which grouped the protective tubes together.

7. Installing The BTF Kits

7.1 If applicable, complete the assembly by installing the Buffer Tube Fan-Out Kits as described in SRP-000-084, Indoor Applications Kit - 6 or 12-Fiber Buffer Tube Fan-Out (BTF) Assembly.

*Special Note:
Fiber Optic
Training
Programs*



Corning Cable Systems offers comprehensive, integrated training programs. Courses are structured for: Telephony, CATV, LAN, Intelligent Transportation Systems and Power Utilities.

For information on Engineering Services Training call: 800-743-2671.

Corning Cable Systems reserves the right to improve, enhance, and modify the features and specifications of Corning Cable Systems' products without prior notification.

All trademarks are the property of their respective holders

Corning Cable Systems is ISO 9001 certified.
© 2003 Corning Cable Systems LLC. All rights reserved.

Printed in U.S.A.

Corning Cable Systems LLC
PO Box 489
Hickory, NC 28603-0489 USA
For US and Canada 1-800-743-2673
International 828-901-5000
FAX: 828-901-5973
<http://www.corning.com/cablesystems>