

## Pulling Attachment Procedures for Single-Fiber Cables

### 1. General

**1.1** This document describes procedures for attaching either 200 lb or 50 lb pre-installed micro-duct pull lines to a 2.9 mm single fiber cable with a Corning Cable Systems TKT-DROP-GRIP kit (Figure 1). In addition, this document describes how to attach up to three cables to a single 50 lb pull line for pulling multiple cables together into a micro-duct.

**1.2** This procedure is recommended for placing cable in micro-ducts such as those produced by Dura-Line Corporation.

**1.3** For placement of one single-fiber cable, a minimum outer/inner diameter of 8.5/6.0 mm should be used. For placement of three single-fiber cables, a minimum outer/inner diameter of 12.7/10.0 mm should be used.

**1.4** Ensure that there is zero back tension when feeding cable into a micro-duct to lessen tension. This is typically accomplished by hand feeding the cable into the micro-duct.

**1.5** It is recommended that installations be limited to a maximum of 250 feet (76 m) of micro-duct, a maximum of nine 90-degree sweeps/bends, and no more than one vertical rise/fall combination to avoid excessive pulling tensions and possible cable damage. Actual field conditions vary and may impose additional limitations. For placement in other types and/or sizes of duct, contact Corning Cable Systems at 1-800-743-2671.

**1.6** This issue includes a corrected part number in step 3.1.

### 2. Precautions

#### 2.1 Safety Precautions

**WARNING:** Use extreme care when using sharp-bladed tools. Failure to do so may result in personal injury or damage to the single fiber cable.

#### 2.2 Grip Precautions

**CAUTION:** This type of pulling grip is suitable for hand placement only. Use of a cable puller may cause the grip to fail or damage the cable.

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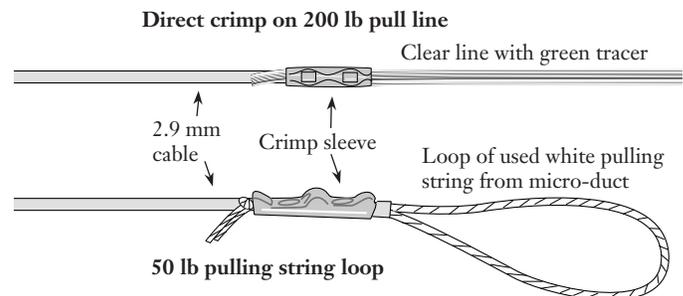


Figure 1

### 3. Kit Contents

**3.1** The single-fiber pulling kit (TKT-DROP-GRIP) contains the following items:

- Crimp tool - pulling grip
- Pulling grip crimp sleeves (qty 100)  
(may be ordered separately as p/n TKT-DROP-001)

### 4. Tools and Materials

**4.1** In addition to the single cable(s) and the pulling grip kit, the following tools and materials to complete this procedure:

- Scissors (p/n 100294-01)
- Tape measure (p/n 100305-01) or 12-inch ruler
- 12 in. (30 cm) of salvaged pulling string from a previous micro-duct installation (50 lb string application only)
- Clean rags or paper towels

### 5. 50 lb Pulling String Procedure

*This section assumes that you have already placed the micro-duct according its manufacturers instructions.*

**5.1** To prepare a white 50 lb pulling grip string:

- Using the tape measure and scissors, measure and cut a 12 inch (30.5 cm) piece of used or excess pulling string from a micro-duct (Figure 2).

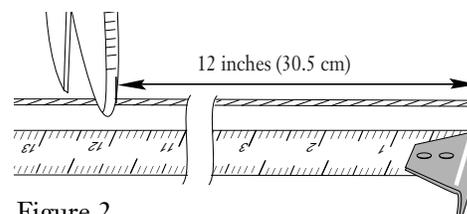


Figure 2

- b) Wipe any lubricant from the string with a paper towel or clean rag.
- c) Fold the string in half, gathering the two ends together. Tie a knot in the line, joining the two ends to make a loop (Figure 3).

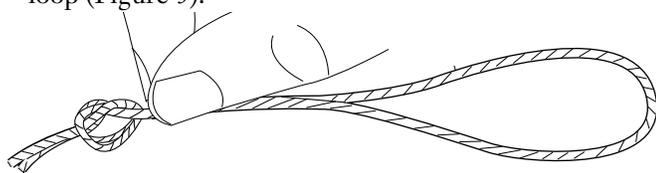


Figure 3

- c) Trim the loose ends to within a 1/4 inch (0.63 cm) of the knot (Figure 4).

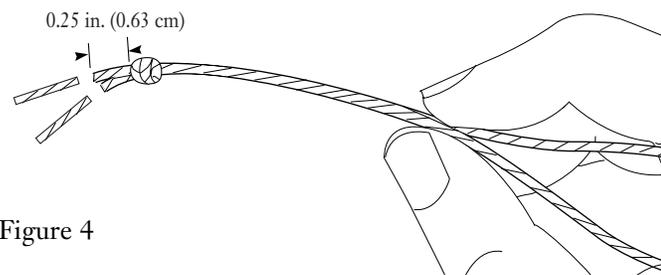


Figure 4

- 5.2 Feed the loop of pull line through the crimp sleeve (Figure 5).

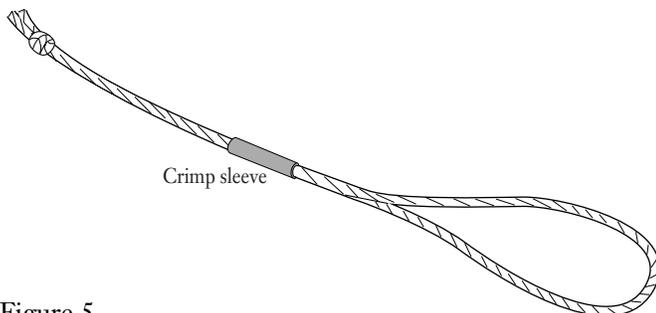


Figure 5

- 5.3 Use the scissors to trim the end of the cable, making sure that all components (sheath, yarns, and 900 µm fiber) are visible and flush with the end of the cable (Figure 6).

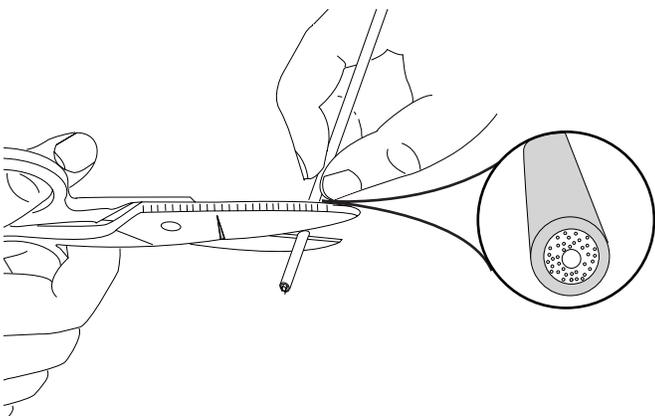


Figure 6

- 5.4 Feed the cable through the crimp sleeve so that at least 1/8 inch (3 mm) of cable is present beyond the crimp part. The loop of pull line should be beyond the crimp sleeve, while the knot rests on the cable sheath just behind the crimp sleeve (Figure 7).

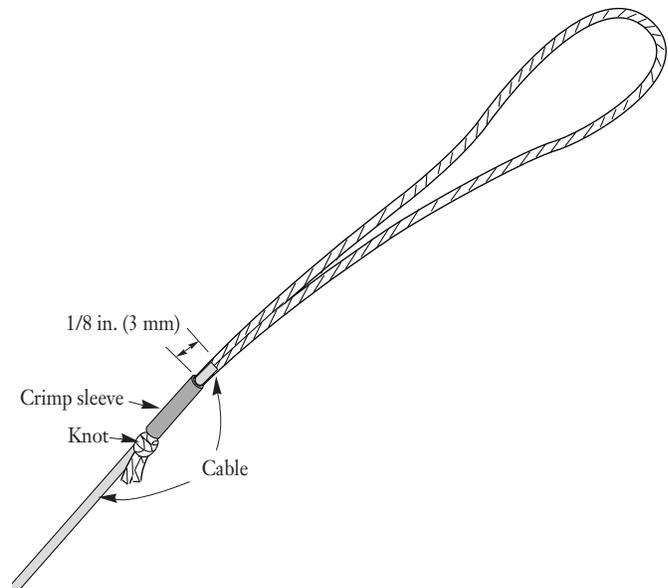


Figure 7

- 5.5 Making sure that the string is positioned under the tooth of the crimp tool jaw, use the tool to crimp the crimp sleeve, first in front of the knot, and again on the cable-end side of the sleeve (Figure 8).

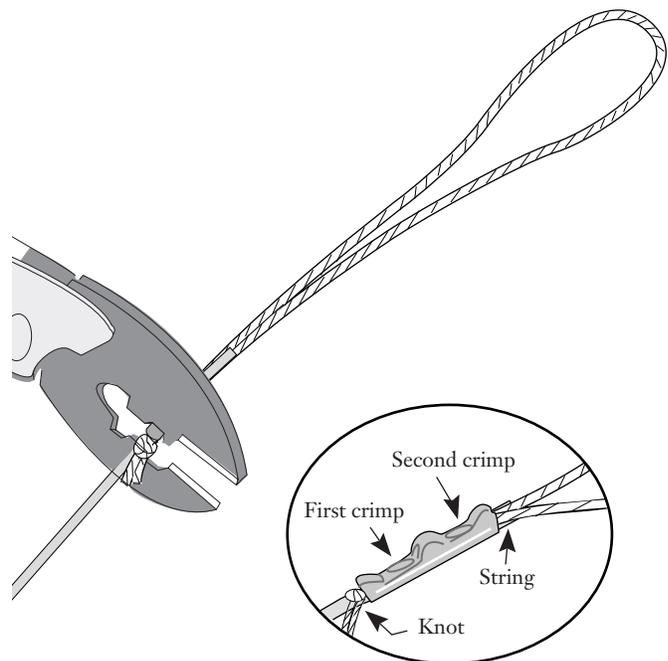


Figure 8

5.6 If necessary, trim the end of the cable to within 1/8 inch (3 mm) of the crimp part to avoid snagging on the micro-duct wall. Use care not to damage the pull line (Figure 9).

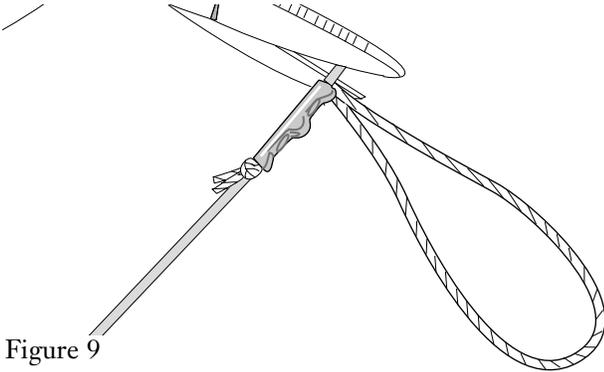


Figure 9

5.7 The completed pull line loop should resemble Figure 10.

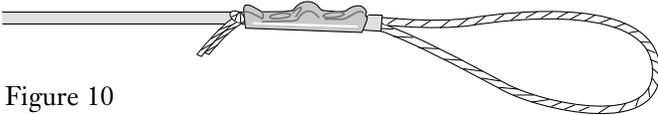


Figure 10

Skip to Section 7

## 6. 200 lb Pulling Line Attachment Procedure

*This section assumes that you have already placed the micro-duct according its manufacturers instructions.*

6.1 This section describes single-fiber grip attachment on 200 lb micro-duct pulling line (a clear line with green or blue tracers). To attach the line:

- Use scissors to trim the ends of both the pull line and the 2.9 mm cable at a 45° angle (see Figure 11).
- Slide the ends of the cable and pulling line through opposite ends of a crimp sleeve as shown in Figure 11:

*The ends of the line and cable should extend 0.25 in. (6.35 mm) from the crimp sleeve- if necessary, trim the pulling line and cable ends to this length.*

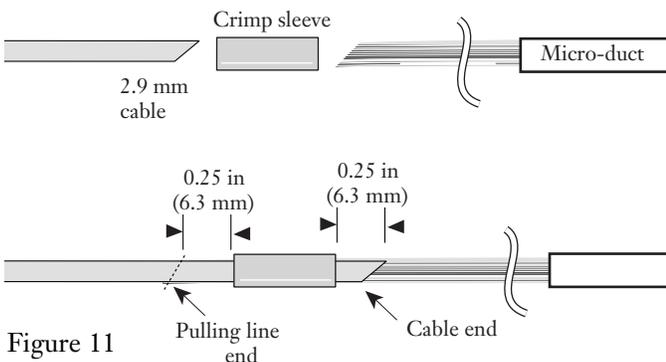


Figure 11

- Use the crimp tool to make two two crimps on the crimp sleeve (Figure 12).

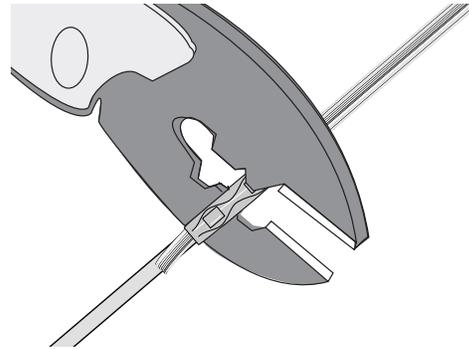


Figure 12

- The completed pull line should resemble Figure 13.



Figure 13

## 7 Pulling Single-fiber Cables (50 and 200 lb Line Applications)

7.1 Ensure that the duct size, cable size, number of bends, and length of duct are an acceptable combination. See Steps 1.3 through 1.5 for minimum recommended duct sizes and maximum installation conditions.

7.2 To prepare for the cable installation:

- Position the new cable near the point of entry (such as a wall outlet or media center) where the cable will enter the micro-duct.
- Ensure a clear path for the cable to enter the micro-duct and take precautions to prevent kinking of the cable as it enters. Avoid or remove conditions that could drag dirt into the micro-duct as this will increase pulling tensions
- Make certain that minimum bend radius requirements are observed for the cable being installed.

**The cable should be paid-off into the micro-duct by hand, with zero back tension, to minimize overall pulling tension. Do not exceed a pulling tension of 48 lb. - typically, tensions will be much less.**

7.3 For 50 lb string applications only, tie the pull line in the micro-duct to the pulling loop on the cable.

7.4 Pull the cable into the micro-duct, using care to guide the crimp sleeve into the micro-duct. Once the crimp sleeve is inside the micro-duct, pull the cable in, using a steady, hand-over-hand technique. **To avoid possible damage to the cable, never pull the cable by grabbing the sheath.**

7.5 Pull enough cable through the far end to reach the termination location, plus normal cable slack, plus three feet. Cut the cable three feet (91 cm) behind the crimp sleeve (Figure 13).

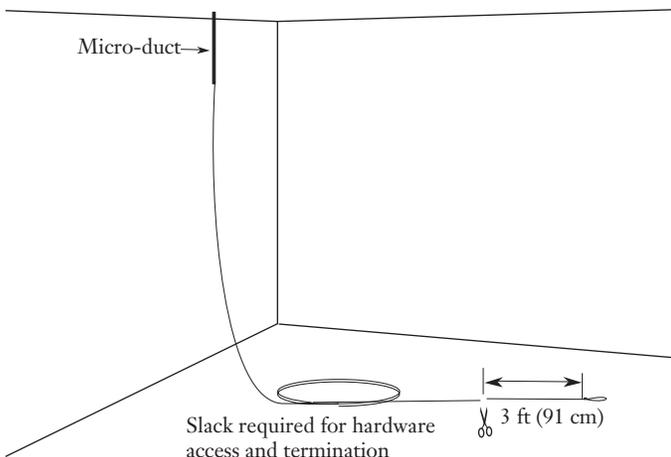


Figure 13

7.6 Proceed with the termination or splicing of the cable.

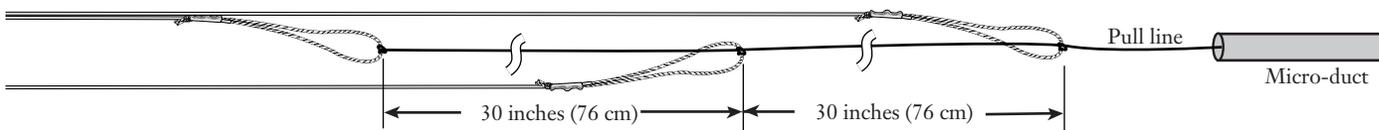


Figure 14

## 8. Procedure for Pulling Multiple Cables in One Micro-duct

8.1 Up to three cables can be attached to a single 50 lb pull line for pulling multiple cables together into a micro-duct.

8.2 Ensure that the micro-duct inside diameter, cable outside diameter, number of cables, number of bends and length of pull are an acceptable combination. See Steps 1.3 through 1.4 for minimum recommended duct sizes and maximum installation conditions.

8.3 Follow the steps in Section 5 to attach the pull loops to the individual single-fiber cables.

8.4 Tie up to three single-fiber cables to the same pull line. Stagger the tie-points by spacing them at least 30 inches (76 cm) apart to allow for easy transition of the attachment point around bends and sweeps (Figure 14).

8.5 Follow Steps 7.1 through 7.5 for guiding the cables into the micro-duct and for cutting back three feet behind each crimp sleeve once the pull is completed.

8.6 Proceed with the termination or splicing of the cables.

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