ezRIBBON™ | Loose Tube Ribbon Cable
Preparation & Handling Procedure

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1.0 Scope

This document provides instruction for the preparation and handling of Draka ezRIBBON | Loose Tube fiber optic cable. The instructions in this document explain how to prepare end openings and midspan openings of Loose Tube Ribbon fiber optic cable. When this cable is used in conjunction with splice closures, cabinets, pedestals, hardware, etc, the user must obtain installation procedures from the appropriate component manufacturers. Failure to adhere to preparation & handling procedures may void the cable warranty.

Questions? Call 1-800-879-9862.

2.0 Safety

2.1 Draka Comteq recommends the use of approved personal protective equipment in this procedure.

2.2 Wear safety glasses and gloves, and use solvents in well-ventilated areas.

2.3 Never look directly into the end of a fiber that may be carrying laser light. Laser light may be invisible and can damage your eyes. Viewing it directly does not cause pain. The iris of the eye will not close involuntarily as when viewing a bright light. Consequently, serious damage to the retina of the eye is possible. Should accidental eye exposure to laser light be suspected, arrange for an eye examination immediately.

2.4 DO NOT use magnifiers in the presence of laser radiation. Diffused laser light can cause eye damage if focused with optical instruments. Should accidental eye exposure be suspected, arrange for an eye exam immediately.

2.5 A Material Safety Data Sheet (MSDS) for Fiber Optic Cable is also available. Call **1-800-879-9862**.

3.0 Key Points

3.1 Do not allow blades or sharp edges to contact the ribbons or fibers.

3.2 Do not route Loose Tube Ribbon buffer tubes inside of splice closures, cabinets and pedestals. Remove the buffer tube and route the ribbons inside of splice closures, cabinets and pedestals.

3.3 Central strength member MUST be secured to prevent expansion/contraction and potential attenuation increase.

3.4 Jacket sheath MUST be secured insidethe closure, pedestal, cabinet, etc to prevent expansion/contraction and potential attenuation increase.

3.5 Do not exceed the minimum bend radius.

3.6 Do not exceed the maximum pull tension.

3.7 When removing buffer tubes keep ribbons pulled tight and straight when removing tubes to prevent fiber breaks. Pull the buffer tube off of the fibers rather than pushing. Do not attempt to remove more than 4 feet of buffer tube at a time.

3.8 Do not bend buffer Tubes at sharp angles while removing the jacket, armor, yarns, or strength members.

3.9 Some closure, cabinet, pedestal manufactures recommend the use of B-sealants, RTV sealants, to seal off the end of the buffer tube to contain future leakage of gel filling compound. This is an acceptable practice.

3.10 A Draka Unishaver™ Central tube Access Tool is highly recommended for Midspan access fibers in buffer tubes to prevent fiber damage. **Call 1-800-879-9862 to order.**

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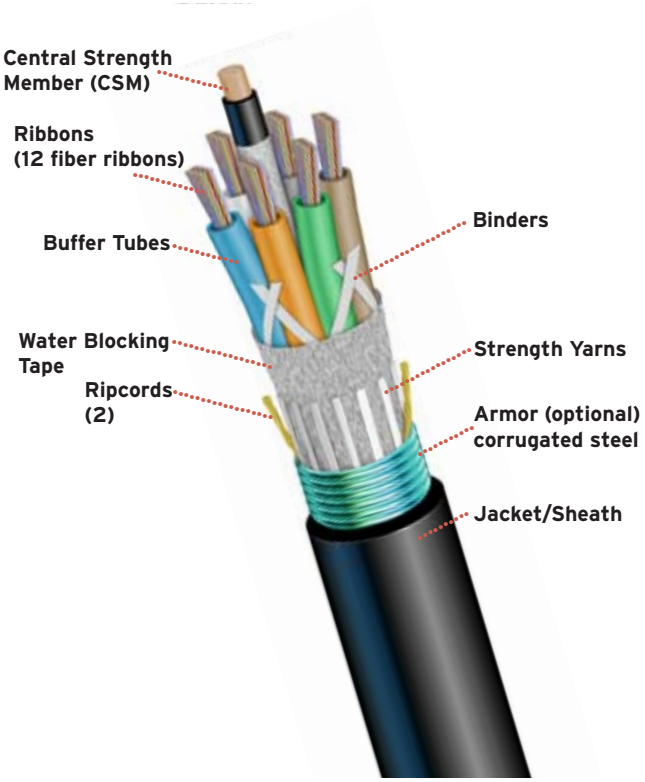
Issue Date: 3.7.2008 - V5 / PR03

4.0 Tools and Materials Needed

- [+] Cable ring cutters (Kabifix® and Ideal® models are recommended)
- [+] Utility knife or sheath knife
- [+] Pliers – needle nose, diagonal, or linesman
- [+] Diagonal cutters
- [+] Scissors or snips
- [+] Flat-tip screwdriver
- [+] Cable cleaning solution / D'Gel
- [+] Lint free wipes
- [+] 99% propanol alcohol
- [+] Disposable rags
- [+] Tape measure

5.0 Reference Drawing



6.0 End of Cable Access Procedure

Quick Reference Checklist

1. Remove jacket and armoring (if applicable)

- [+] Measure access length and make ring cuts.
- [+] Slit the jacket & remove jacket. Remove the armor 6" inches from end of cable.
- [+] Notch armor/sheath and pull ripcords.
- [+] Remove jacket and armor.

2. Prepare the cable core.

- [+] Cut and remove yarns, binders, and unnecessary filler rods.
- [+] Separate buffer tubes from central strength member (CSM).
- [+] Cut CSM to proper length.

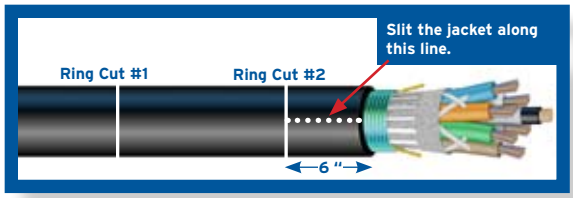
3. Prepare buffer tubes and fibers.

- [+] Score and remove buffer tubes in max. 4 foot sections.
- [+] Do not route ribbon buffer tubes inside of splice closures, cabinets and pedestals. Remove the buffer tube and route the ribbons inside of splice closures, cabinets and pedestals.
- [+] Clean fibers and prepare for splicing.

Step-by-Step: End of Cable Access

6.1 Measure and Ring Cut #1

Determine the length of cable needed to access by referring to the instructions of the closure, pedestal, cabinet, etc manufacturer. Make a Ring cut #1 at this distance from the end of the cable. Flex the cable at Ring Cut #1 to separate the jacket.



CAUTION:
Only a shallow cut is necessary to remove the jacket. Cutting too deeply through the jacket may result in damage to the ripcords, armor, buffer tubes, and ribbons.

6.2 Ring Cut #2

Make Ring Cut #2, 6 inches (15 cm) from the end of the cable, again being careful not to cut too deeply. Flex the cable at Ring Cut # 2 to separate the jacket.

6.3 Remove the Jacket

Using a slitter or utility knife, slit the jacket from Ring Cut #2 to the end of the cable.

6.4 Remove the Armor

Use a utility knife to score the Armor (Ring Cut). Use pliers to peel away the Armor.

6.5 Ripcord Notches

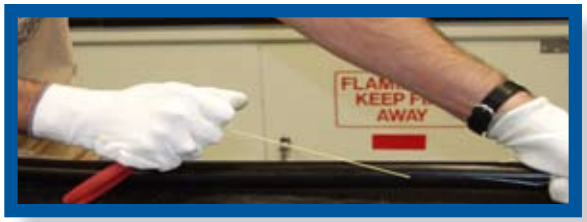
Use diagonal cutters to notch the jacket (and armor, if applicable) near the ripcords. This helps start the pull of the ripcords and prevents breaking ripcord.

6.6 Knot the Ripcords

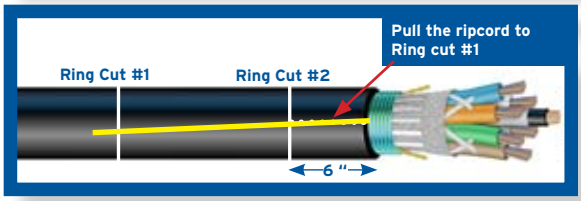
Tie a knot in the end of each ripcord. This will help hold the ripcord in the jaws of the pliers.

6.7 Pull Ripcords

Grasp one end of a ripcord in the jaws of needle nose pliers. Twist the pliers to wrap the ripcord around them, pull the ripcord through the jacket to Ring Cut #1. Cut the ripcords, leaving 1 inch exposed.



NOTE:
For armored cable, consult the closure, pedestal, cabinets, or hardware manufacturer procedure and make sure to leave enough armor in front of the ring-cut to be used for grounding. You may need to pull the ripcord several more inches to leave adequate armor for grounding.



6.8 Remove Jacket/Armor

Peel the jacket and armor (if applicable) away from the cable core and discard it. Start at the end of the cable and work toward Ring Cut #1.

6.9 Remove Strength Yarns & Water Swellable Tape.

Refer to the closure, pedestal, cabinet, and hardware manufacturer's procedures to determine how much strength yarn to leave exposed for anchoring. Use snips to cut and remove the excess length of yarns and tape from the cable core.

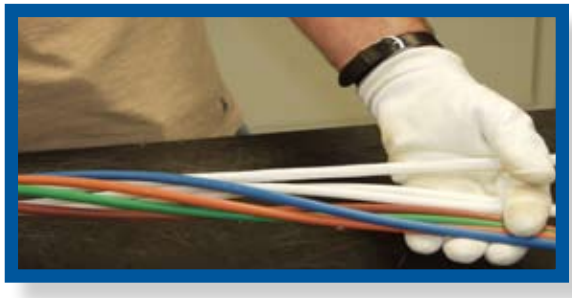
6.10 Remove Binders

Use scissors and/or diagonal cutters to cut and remove binders from cable core. Binders form a criss-cross pattern to hold the core together.

CAUTION:
Take care to avoid piercing or cutting the buffer tubes.

6.11 Separate Buffer Tubes

Separate the individual buffer tubes from the central strength member (CSM) and filler rods. Keep the buffer tubes straight as possible to prevent fiber breaks.



6.12 Central Strength Member (CSM)

Refer to the closure, pedestal, or cabinet manufacturer procedures to determine how much CSM to leave exposed for anchoring. When in doubt, leave 6 inches of CSM past the end of the jacket. Using lineman's pliers, cut the excess CSM and filler rods and remove them from the cable core.

CAUTION:
Securing the central strength member inside the closure, pedestal, or cabinet is a critical element to prevent expansion/contraction and potential attenuation increases.

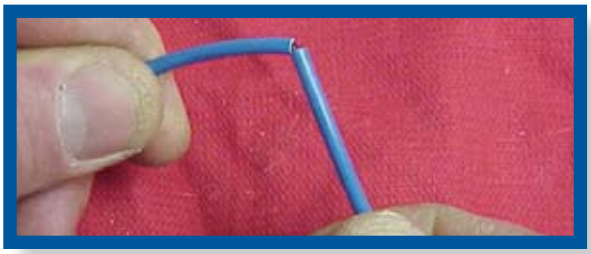
6.13 Buffer Tube Scoring

Starting from the end of the tube, measure 1 to 4 feet, then score each tube individually with rotations of the coaxial ring cutter. **(Ideal® models are recommended. Avoid using Miller® strippers.)**

CAUTION:
Care must be exercised in this step to prevent cutting or breaking ribbon fibers while removing the buffer tube.

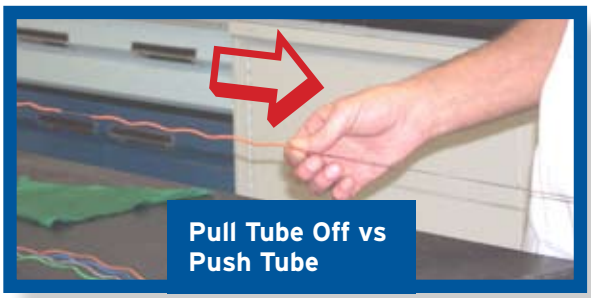
6.14 Removing the Buffer Tube and Exposing Fibers

Grasp the tube on each side of the score mark. Flex the tube in all directions to separate the tube at the scored mark.



CAUTION:
Hold the buffer tube tight and straight while pulling the tube off the ribbons. Apply back-tension to the ribbons while pulling the tube off.

Repeat the removal of tubes in 1 to 4 foot sections as described in steps 13 and 14 until the desired length of fiber is exposed.



6.15 Fiber Cleaning

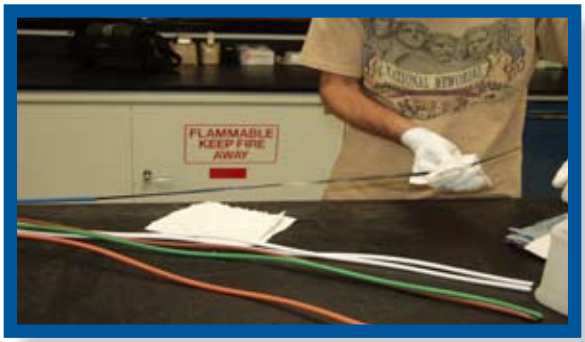
Clean the ribbons with 99% propanol alcohol and lint free wipes.

6.16 Gel Blocking

The use of sealants (B-sealants, RTV sealants, etc.) or other commericially available gel blocking kits is recommended as additional protection to provide a seal around the ribbons and the end of the buffer tube to prevent leakage of the gel filling compound.

6.17 Routing Ribbon Tubes.

Do not route ribbon buffer tubes inside of splice closures, cabinets and pedestals. Remove the buffer tube and route the ribbons inside the splice closures, cabinets or pedestals.

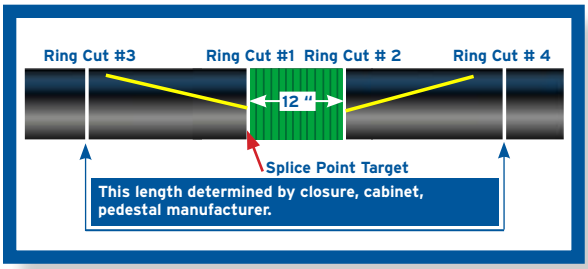


END OF PROCEDURE

7.0 Midspan Access Procedure

Tools and Materials Needed

- [+] **Cable ring cutter, sheath knife, or utility knife (alternatively, an ezACCESS cable jacket slitter)**
- [+] **Needle nose pliers**
- [+] **Diagonal cutters**
- [+] **Scissors or snips**
- [+] **Flat-tip screwdriver**
- [+] **Pliers**
- [+] **Procedure for closure, cabinet, pedestal hardware**
- [+] **Draka ezACCESS Midspan Access Tool**
- [+] **Cable cleaning solution or D'Gel**
- [+] **Cleaning rags**
- [+] **Lint free wipes**
- [+] **99% propanol alcohol**
- [+] **Tape measure**



NOTE:
The switchback point on a Loose Tube Ribbon cable is approximately 18-24 inches apart.

Quick Reference Checklist

1. Remove jacket and armoring

- [+] Determine access point and make 2 ring cuts 12" inches apart.
- [+] Slit jacket between ring cuts & remove.
- [+] Cut and pry away the armor.
- [+] Notch jacket and pull ripcords in equal and opposite direction.
- [+] Locate the switchback point and center in the opening.
- [+] Remove jacket and armor.

2. Prepare the cable core.

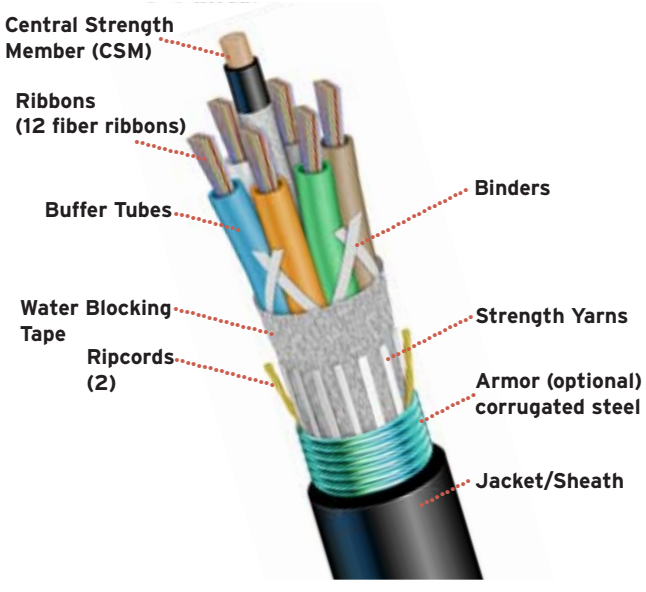
- [+] Cut and remove yarns and binders.
- [+] Separate buffer tubes from central strength member (CSM).
- [+] Cut CSM and remove filler rods (if present).

3. Prepare buffer tubes and fibers.

- [+] Clean buffer tubes (as needed).
- [+] Refer to "Procedure for Midspan Access in Buffer Tubes". Draka recommends the Unishaver™ Central Tube Access Tool. **Call 1-800-879-9862 to order.**

4. Ensure appropriate buffer tube length.

- [+] Do not route ribbon buffer tubes inside of splice closures, cabinets and pedestals. Remove the buffer tube and route the ribbons inside of splice closures, cabinets and pedestals.

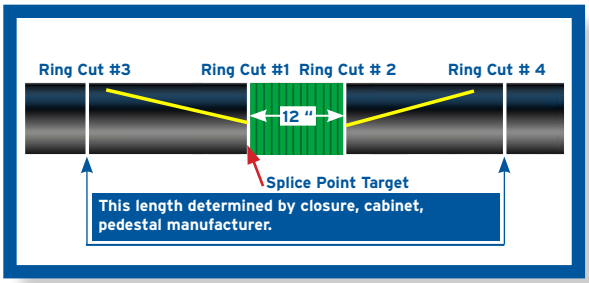


Step-by-Step: Midspan Access

7.1 Ring Cut #1:

Determine the desired access/splice point location and make a ring cut at this location. (Ring cut #1)

CAUTION:
Only a shallow cut is necessary to remove the jacket. Cutting too deeply through the jacket can result in unintentional damage to the ripcords, armor or buffer tubes.



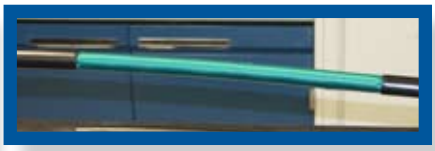
7.2 Ring Cut #2:

Make a second ring cut 12 inches (30 cm) from Ring Cut #1. Flex the cable at Ring Cut #1 & #2 to break the jacket sheath.

NOTE:
The switchback point on a Loose Tube Ribbon cable is approximately 18-24 inches apart.

7.3 Slit & Remove the Jacket:

Use a cable slitter or utility knife to slit the outer jacket between Ring Cut #1 and Ring Cut #2. Make several shallow cut passes. Remove the jacket in a single piece.



7.4 Armor Removal: (If Applicable)

Once the jacket is removed, pry open the armor and use diagonal cutters/snips to remove armor between the ring cuts. Locate the ripcords.

7.5 Ripcord:

Cut the ripcords in the center of the opening. Use diagonal cutters to notch the jacket (and armor, if applicable) near the ripcords. This helps start the pull of the ripcords.

7.6 Knot in the Ripcords:

Tie a knot in the end of each ripcord.

7.7 Pull Ripcords and locate the Switchback Point:

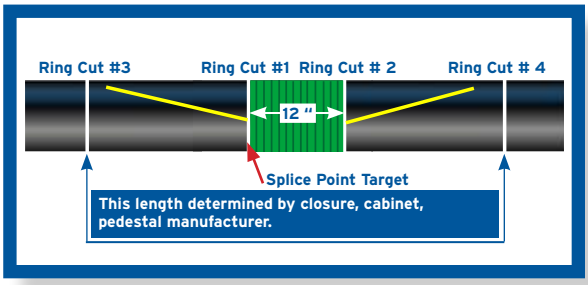
Grasp one end of a ripcord in the jaws of needle nose pliers. Turn the pliers to wrap the ripcord around them, then pull the ripcords through the jacket to the nearest switchback point (stranding reversal point). Switchbacks will occur every 18-24 inches. Pull each ripcord seperately.

NOTE:
For armored cable, consult the closure, pedestal, cabinet, or hardware manufacturer's procedure and make sure to leave enough armor in front of the ring cut to be used for grounding.

7.8 Make Ring Cuts #3 & #4 on Equal Sides of the Switchback.

Refer to the closure, pedestal, cabinet, and hardware manufacturer's procedure to determine the required midspan length. Mark equal distance on both sides of the switchback, then make Ring cuts #3 & #4.

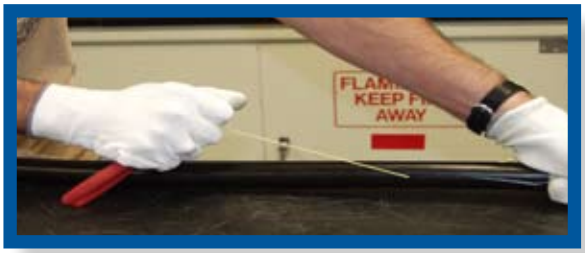
CAUTION:
Only a shallow cut is necessary to remove the jacket. Cutting too deeply through the jacket can result in unintentional damage to the ripcords, armor or ffer tubes.



NOTE:
The switchback point on a Loose Tube Ribbon cable is approximately 18-24 inches apart.

7.9 Pull Ripcords to Ring Cut #3 & Ring Cut #4.

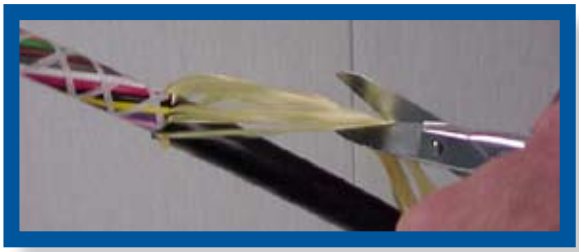
Pull the ripcords through the jacket and open the jacket to ring cuts #3 & #4. Cut ripcords, leaving 1 inch of ripcord exposed.



NOTE:
For armored cable, consult the closure, pedestal, cabinet, or hardware manufacturer's procedure and make sure to leave enough armor in front of the ring cut to be used for grounding.

7.10 Remove Strength Yarn & Water Blocking Tape.

Refer to the closure, pedestal, cabinet, or hardware manufacturer's procedure to determine how much strength yarn to leave exposed for anchoring. Use snips to cut and remove the excess length of yarns and tape from the cable core.



7.11 Remove Binders

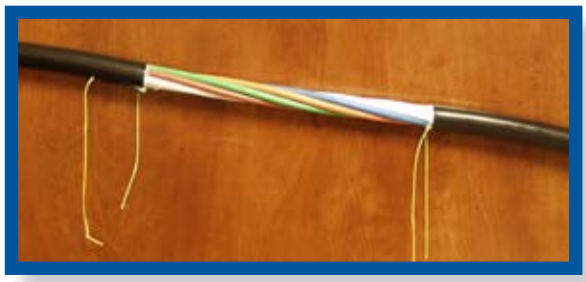
Use a Scissors and/or diagonal cutters to cut and remove binders from around the cable core. Binders form a criss-cross pattern to hold the core together.

CAUTION:
Take care to avoid piercing or cutting the buffer tubes.

7.12 Central Strength Member (CSM)

Refer to the closure, pedestal, cabinet, or hardware manufacturer's procedure to determine how much CSM to leave exposed for anchoring. Using lineman's pliers, cut the excess CSM and filler rods and remove them from the cable core.

CAUTION:
Securing the central strength member inside the closure, pedestal, or cabinet is a critical element to prevent expansion/contraction and potential attenuation increases.



7.13 Gel Blocking

The use of sealants (B-sealants, RTV sealants, etc.) or other commericially available gel blocking kits is recommended as additional protection to provide a seal around the ribbons and the end of the buffer tube to prevent leakage of the gel filling compound.

7.14 Routing RIbbon Tubes

Do not route ribbon buffer tubes inside of splice closures, cabinets and pedestals. Remove the buffer tube and route the ribbons inside of splice closures, cabinets and pedestals.

END OF PROCEDURE

8.0 Prepare to Open The Buffer Tube

8.1 Prepare to Open The Buffer Tube

Select the proper Draka UniShaver™ tool size needed to access the tube. Open the tool to verify the engraved number matches the proper size of the tube being opened.

8.2 Ensure the blade is correctly positioned in the tool, with the curved side of the blade facing "downhill" in the blade slot. Do not tighten blade at this point.

8.3 Calibrate the blade setting in UniShaver™. Each UniShaver™ insert is color coded to indicate size. Use the calibration standard of the same color to perform these steps.

A. Insert the calibration standard into the center groove from either side of the tool. The flat edge of the standard should be facing up.

B. Set the blade to rest on the calibration standard and tighten blade's security screw.

C. Remove the calibration standard.

CAUTION:
Calbrate or test the depth of your coaxial ring cutter before performing step 16. Failure to do so could result in cuttling of fibers. Draka recommends a shallow cut requiring mulitple rotations.

8.4 Two inches (5cm) from the cable jacket ring cut #1 and #2, use a coaxial ring cutter to carefully score the tube.

CAUTION:
Do not route the tube inside the closure. Bending the tube inside the closure may kink the tube causing fiber damage.

8.5 Open the UniShaver™ and position the tube in the center channel. Start the Unishaver near the black jacket. Ensure the shaved area passes over the ring cut.

8.6 Open the Buffer Tube

Grasp the UniShaver™ firmly and pull from Ring Cut #1 to RIng Cut # 2.

8.7 Use snips to carefully cut off the stripped buffer tube

8.8 Remove the UniShaver™ from the tube by backing it off 2 inches, then opening it up.

8.9 Flex the tube at the scored points at ring cut #1 and #2 to snap the opened tube from the intact core tube. Separate the opened shaved tube from the ribbons and removed it.

8.10 Final Preparation

Using lint-free wipes and isopropyl alcohol, clean the ribbons.

8.11 Remove gel filling compound at the central tube using a Q-tip or similar swabbing tool. Remove gel 1 inch inside the central tube.

8.12 Apply B-sealants, RTV sealants, etc. to seal off the end of the buffer tube to contain future leakage of gel filling compound.

8.13 The cable is now ready for ribbon breakout and/or anchoring. Refer to that procedure.

END OF PROCEDURE