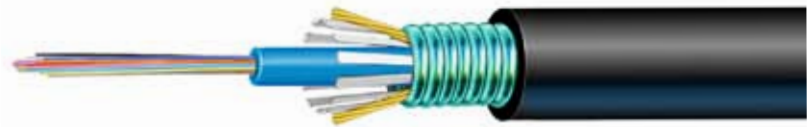


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3.0 Key Points

- 3.1** In aerial applications, coupling loops are required next to the splice points.
- 3.2** Do not leave more than the rated length of exposed (bare) buffer tube in closures, cabinets, pedestals, etc. Exposing buffer tube beyond the rated length may lead to attenuation increase. If longer buffer tube storage length is needed, remove the buffer tube and place the fiber in splice trays or inside spiral wrap.
- 3.3** Do not allow blades or sharp edges to contact the fibers.
- 3.4** Do not exceed the minimum bend radius.
- 3.5** Do not exceed the maximum pull tension.
- 3.6** When removing buffer tubes, keep fibers pulled tight and straight 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.
- 3.7** Do not bend buffer tubes at sharp angles while removing the jacket, armor, yarns, or strength members.
- 3.8** A Draka ezTools™ | Buffer Tube Access Tool is highly recommended for midspan access of fibers in the buffer tubes to prevent fiber damage.

1.0 Product Applications

The instructions in this document explain how to prepare end and mid-span openings of the Draka Central Loose Tube fiber optic cable for termination. The document outlines the procedure for installing a wire mesh pulling grip for installation via pulling in ducts. Instructions for the application of other fiber optic products, such as splice closures, distribution cabinets, etc., are included in the installation instructions for the device in question.

2.0 Cautions and Warnings

- 2.1** Draka strongly recommends the use of approved personal protective equipment in the performance of this procedure. Wear safety glasses and gloves, and use solvents in well-ventilated areas.
- 2.2** 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.
- 2.3** 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 examination immediately.
- 2.4** A Material Safety Data Sheet (MSDS) is included in this document.

4.0 Recommended Tools and Materials

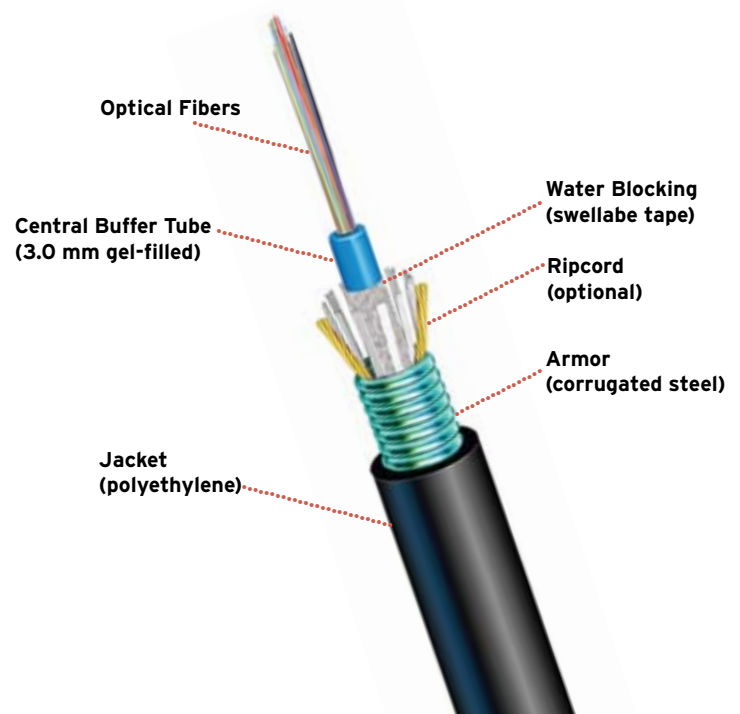


1. Cable ring-cutter
2. Sheath knife or utility knife
3. Needle nose pliers
4. Snips or scissors
5. Side cutters
6. Buffer tube stripper

Not pictured:

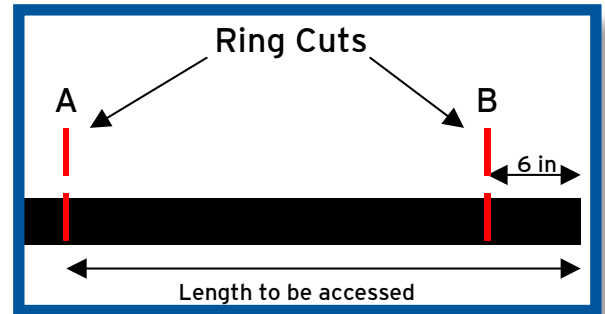
- Buffer Tube Mid-span Access Tool
- Protective gloves
- Safety glasses
- Vinyl Tape
- Lint-free wipes
- Isopropyl alcohol

5.0 Reference Drawing



6.0 Loose Tube | Central 600 & 300 (with ripcords) End Access Procedure

6.1 Determine the length of cable to be accessed. Using the cable ring-cutter, make one ring-cut at the end of the access window (A) and a second ring cut (B) approximately 6 inches from the end of the cable. The ring-cut should be deep enough to cut through the jacket and score the armor. It is important to score the armor and not cut through. Flex the cable at each ring-cut make sure the jacket is cut and to break the armor.



6.2 Remove the 6-inch section of jacket and armor by pulling the jacket off the end of the core

NOTE:

If the armor is sufficiently scored or cut, it should be very easy to slide the jacket and armor off the end of the core. It may be helpful to bend the cable back and forth at the ring cut to ensure the armor is sufficiently cut and is separated.



6.3 Locate the ripcords and separate them from the strength yarns. Tie a knot in each ripcord.



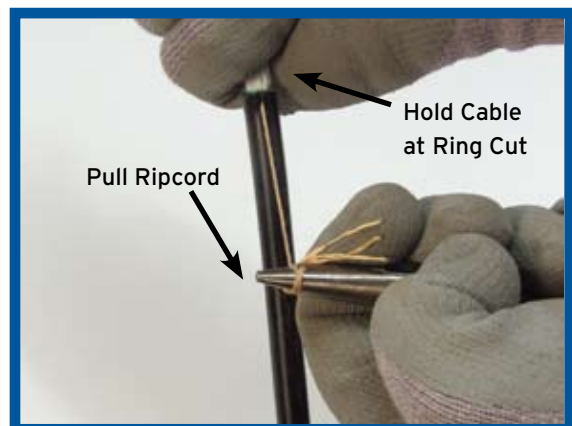
6.4 Using the side cutters, make a notch in the jacket and armor just adjacent to each ripcord. This initiates the cut through which the ripcord will be pulled.



6.5 Wrap one ripcord through and around the needle nose pliers. With one hand holding the cable right at the ring cut (B), use the other hand pull the ripcord with the pliers. Start the pull in the notch and pull all the way to the end of the access window just beyond ring cut (A). Repeat this step for the second ripcord.

NOTE:

It is important to use one hand to hold the cable right near the ring cut (B) to hold the cable and core in place. When pulling the second ripcord, make sure that the core does not slide through the first ripcord opening. This will prevent kinking of the buffer tube.



6.6 Peel away the two halves of jacket & armor from the cable core.



6.7 Cut the strength yarns to desired length as specified by local practices or the closure manufacturer.

NOTE:

The strength yarns need to be secured in the closure. Because this cable design does not have any rigid strength members, the strength yarns must be tied to the support mechanism as recommended by the closure manufacturer.



6.8 Determine the length of fibers to be accessed and score the buffer tubes using a rotary buffer stripper (similar to a coaxial cable stripper). Remove 12 to 15 inch (30 to 40 cm) increments until the desired length of fiber is exposed. Snap the buffer tube at the score location and slide it off the fibers. Clean fibers using lint-free wipes and alcohol in preparation for splicing.

CAUTION: Set the blade depth of the buffer tube stripper such that it does not cut through the tube, but only scores the tube. If the blade depth is too deep, it is possible to nick the fibers and cause damage.

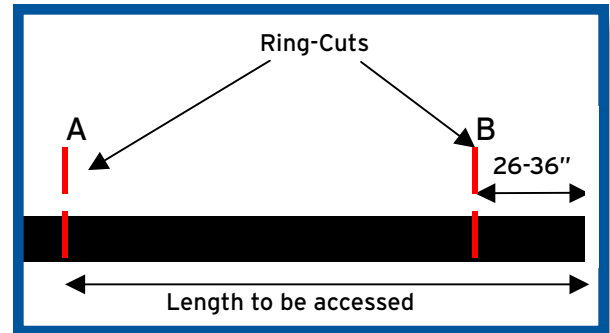


BONDING & GROUNDING:

If it is necessary to bond & ground this cable, a length of armor must be exposed. This can be accomplished by making a ring-cut at the desired length and two longitudinal cuts from the ring cut to the end of the jacket. The two jacket halves of jacket can be peeled away and the armor will be exposed. Refer to local practices for appropriate bonding and grounding procedures.

7.0 Loose Tube | Central 300 (no ripcords) End Access Procedure

7.1 Determine the length of cable to be accessed and marked this as point A.



7.2 Using the cable ring-cutter, make one ring-cut approximately 24 to 36" from the cable end. The ring-cut should be deep enough to cut through the jacket and score the armor. It is important to score the armor and not cut through. Flex the cable at each ring-cut make sure the jacket is cut and to break the armor.



7.3 Pull off the jacket from the cable core.



7.4 Cut of cable strength yarns



7.5 Repeat steps 2 through 4 until point A is reached. This should provide the desired length of tube/fiber to be accessed. Leave enough strength yarn to secure to the closure termination points.

NOTE:

The strength yarns need to be secured in the closure. Because this cable design does not have any rigid strength members, the strength yarns must be tied to the support mechanism as recommended by the closure manufacturer.

7.6 Determine the length of fibers to be accessed and score the buffer tubes using a rotary buffer stripper (similar to a coaxial cable stripper). Remove 12 to 15 inch (30 to 40 cm) increments until the desired length of fiber is exposed. Snap the buffer tube at the score location and slide it off the fibers. Clean fibers using lint-free wipes and alcohol in preparation for splicing.

CAUTION: Set the blade depth of the buffer tube stripper such that it does not cut through the tube, but only scores the tube. If the blade depth is too deep, it is possible to nick the fibers and cause damage.

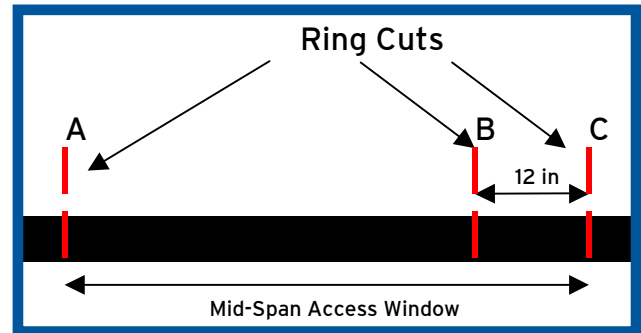
BONDING & GROUNDING:

If it is necessary to bond & ground this cable, a length of armor must be exposed. This can be accomplished by making a ring-cut at the desired length and two longitudinal cuts from the ring cut to the end of the jacket. The two jacket halves of jacket can be peeled away and the armor will be exposed. Refer to local practices for appropriate bonding and grounding procedures.



8.0 Mid-Span Access Procedure 600lbs & 300lbs designs with ripcords

8.1 Determine the length of cable to be accessed. Make a ring-cut at each end of the access window (A) and (C) and make a third ring cut (B) approximately 12 inches from ring cut C.



8.2 Make two longitudinal cuts through the jacket on the 12-inch section (B to C), 180 degrees apart. The cuts should be through the jacket, but not through the armor.



8.3 Use side cutters or needle-nose pliers to peel the two halves of the jacket off the 12-inch section.

NOTE:

Although not required, it may be helpful to use a heat gun to heat the jacket over this section. This softens the jacket and makes it easy to peel off.



8.4 Peel open and remove the armor over the 12 inch section using a sheath knife, exposing the core and ripcords.

CAUTION: Be careful not to cut or kink the buffer tube when removing the armor and during handling.



8.5 Cut each ripcord near end C, on the opposite side of the remaining cable to be accessed. Tie a knot in each ripcord.



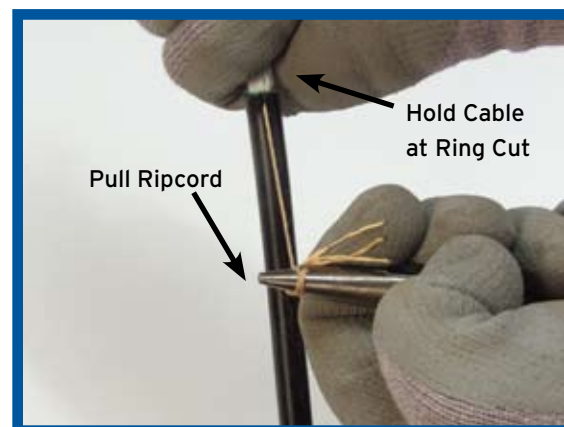
8.6 Using the side cutters, make a notch in the jacket and armor just adjacent to each ripcord. This initiates the cut through which the ripcord will be pulled.



8.7 Wrap one ripcord through and around the needle nose pliers. With one hand holding the cable right at the ring cut (B), use the other hand pull the ripcord with the pliers. Pull the ripcord all the way to the end of the access window just beyond ring cut (A). Repeat this step for the second ripcord.

NOTE:

It is important to use one hand to hold the cable right near the ring cut (B) to hold the cable and core in place. When pulling the second ripcord, make sure that the core does not slide through the first ripcord opening. This will prevent kinking of the buffer tube.



8.8 Peel away the two halves of jacket & armor from the cable core.

8.9 Cut the strength yarns to desired length as specified by local practices or the closure manufacturer.

NOTE:

The strength yarns need to be secured in the closure. Because this cable design does not have any rigid strength members, the strength yarns must be tied to the support mechanism as recommended by the closure manufacturer.

8.10 Access the buffer tube using an appropriate mid-span access tool. If using Draka Comteq 6652 Buffer Tube Access Tool, refer to the procedures included with that tool.

BONDING & GROUNDING: If it is necessary to bond & ground this cable, a length of armor must be exposed. This can be accomplished by making a ring-cut at the desired length and two longitudinal cuts from the ring cut to the end of the jacket. The two jacket halves of jacket can be peeled away and the armor will be exposed. Refer to local practices for appropriate bonding and grounding procedures.



9.0 Pulling Grip Attachment

Scope

The following procedure outlines the method to install a wire-mesh design pulling grip onto the Draka Armored Central Loose Tube fiber optic cable.

Procedure

9.1 Measure the cable outer diameter and select a wire-mesh pulling grip designed for this diameter fiber optic cable.



9.2 Push the cable all the way through the grip and out the pulling end. 18 to 24 inches should be pushed through the grip. A pumping motion will assist the cable through the grip.

NOTE:

If the grip design does not provide sufficient separation in the wire mesh to push the cable through, steps 3-5 must be completed prior to the cable being inserted into the grip.



9.3 Ring cut the jacket and armor at a distance of $\frac{2}{3}$ the grip length from the end of the cable. If the grip has a double weave section followed by a single weave section, make sure that enough jacket is cut back to ensure that the double weave section will not be in contact with the outer jacket.



9.4 Remove the section of jacket and armor off the cable core by sliding the jacket off the end. If the armor is sufficiently scored or cut, it should be very easy to remove the jacket and armor. It is helpful to bend the section back and forth after the initial ring cut is made to ensure the armor is sufficiently cut.



9.5 Tape the exposed yarns together with the ripcords and buffer tube for a few wraps at the end of the core. It is important to keep the yarns taut when the cable is being installed.



9.6 Slide the end of the cable back into the grip such that the end of the cable is at the end of the grip.

NOTE:
Special care must be taken not to disturb the yarns during this step.

9.7 Starting 3 inches beyond the end of the grip, tightly wrap vinyl tape around the grip for the entire grip length. It is especially important to wrap the tape tightly around the yarns as they will support the tension during installation.

9.8 Connect the pulling grip to an approved swivel. It is highly recommended to use a break-away swivel in order to ensure that the maximum rated tension of the cable is never exceeded.

NOTE:
Cut off and discard the length of cable that was used in grip.

10.0 Aerial Applications Coupling Procedure

- 10.1** The coupling coil must be placed next to any cable termination point if the cable is installed in an aerial application. This prevents any fiber retraction that can take place from aerial wind or ice loading on the cable/messenger.
- 10.2** Determine a suitable location to place the coupling coil that is non-intrusive and does not cross into other rights-of-way.
- 10.3** Make a cable coil with at least 4 loops of cable. The coil diameter must be greater than 20 times the cable diameter, which is 16 inches for a single jacket single armor construction.
- 10.4** Secure the coil together by applying cable ties equally spaced around the coupling coil. It is recommended that tie wraps be placed at the entrance and exit point of the coil as well as a minimum of 3 places evenly spaced around the coil. Using less than 4 cable ties may result in the coil unraveling.
-



11.0 Material Safety Data Sheet

I. Company/Product Identification

DATE: January 4, 2006
PRODUCT: Fiber Optic Telecommunications Cable
MANUFACTURER: Draka Communications - Americas
Optical Cable Plant
2512 Penny Road
Claremont, North Carolina USA 28610

NAME OF PREPARER: Rick Miller, Cable Safety Coordinator
INFORMATION PHONE: (800)-729-3737 within United States; Outside U.S.A. (828)-459-9821
REVISION DATE: January 4, 2006

II. Composition/Information on Ingredients

COMPONENT	CAS#	OSHA PEL	ACGIH/OSHA TLV
UV Acrylate	N/A	N/A	N/A
Amorphous polyolefin	009010-79-1	N/A	N/A
	09002-88-4	N/A	N/A
Polybutene	9003-29-6	N/A	N/A
Buffer tube gel	N/A	N/A	N/A
Thermoplastic PVC	N/A	N/A	N/A
Epoxy/fiberglass rod	N/A	N/A	N/A
Optical fiber	N/A	N/A	N/A
Thermoplastic polyethylene	25087-34-7	3.5 mg/m ³	3.5 mg/m ³
Steel tape	N/A	N/A	N/A

III. Hazards Identification

By nature of the product, no known immediate or chronic health hazards are expected. All industrial products containing chemicals should be handled with caution to avoid unnecessary exposure.

IV. First Aid Measures

- [+] Eye contact with glass fiber or filling gel/flooding compound: Immediately flush eye(s) with water and seek medical attention.
- [+] Skin penetration with glass fiber: Remove fiber by mechanical means or seek medical attention.
- [+] Skin contact with filling gel/flooding compound: Wash thoroughly with soap and water.

V. Fire Fighting Measures

This material will burn if exposed to flame. Fire fighters should protect themselves from combustion products that may include carbon dioxide, carbon monoxide, or other toxic gases. Wear self-contained breathing apparatus and complete personal protective equipment. Fire extinguishing media include water, carbon dioxide, foam or dry chemical.

VI. Accidental Release Measures

By nature of the product, release is not to be expected.

VII. Handling and Storage

No special precautions required.

VIII. Exposure Controls/Personal Protection

Use leather gloves when handling reels to prevent splinters, cuts and abrasions. Filling gel or flooding compound may cause skin irritation, use latex or nitrile gloves. Filling gel or flooding compound may cause eye irritation; always wear approved safety glasses, flush with plenty of water and seek medical attention if irritation persists. Cables contain glass fibers, always wear approved safety glasses. Seek medical attention if glass fiber enters eye. Cables may contain steel armor tape and steel wire which could cut or puncture skin, wear leather or other cut resistant gloves.

IX. Physical and Chemical Properties

Boiling Point: N/A	Evaporation Rate: N/A
Melting Point: N/A	Specific Gravity: N/A
Vapor Pressure: N/A	Water Solubility: N/A
Vapor Density: N/A	pH: N/A

X. Stability and Reactivity

Chemical Incompatibilities:	Unknown
Chemical Instabilities:	Unknown
Hazardous Polymerization:	Will not occur

XI. Toxicological Information

No known toxicity.

XII. Ecological Information

No known adverse ecological effects.

XIII. Disposal Considerations

Dispose in compliance with Federal, State and local laws and regulations.

XIV. Transport Information

Non-hazardous.

XV. Regulatory Information

None.

XVI. Disclaimer

The information contained herein is believed to be accurate but is not warranted to be so. Draka makes no warranty of any kind, expressed or implied, concerning the safe use of this material in your process or end use. User has the sole responsibility to determine the suitability for any use. User must meet all applicable safety and health standards.

