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2.4 A Material Safety Data Sheet (MSDS) is included in this document.

3.0 Key Points

3.1 Please consult the product data sheet on the internet to assure that the cable bend radius, tension, maximum span distance, and maximum installation load are not violated.

3.2 Do not exceed the cable minimum bend radius. The minimum bend radius for the cable is specified at 6 inches for both no-load and under load applications.

3.3 Aerial applications: Coupling coils are required at both ends prior to entering the termination point.

3.4 Do not exceed the maximum pulling tension of 300 lbf. Note that the installation tension in aerial applications is below this value.

3.5 Separation of the messenger sub-unit and the fiber sub-unit should be limited to attachment, termination, and grounding and bonding locations. The length of separation between the messenger sub-unit and the fiber sub-unit shall not exceed 40 ft.

3.6 Never separate the messenger sub-unit and the fiber sub-unit by pulling apart by hand. Although this may seem okay, there is potential to kink the buffer tube and/or break fibers. Always use a tool to slit the web.

3.7 Do not bend the tube at sharp angles while removing the jacket to prevent kinking the buffer tube.

1.0 Scope

The instructions in this document explain how to prepare end openings of the Draka ezDROP Figure 8 Fiber Optic Cable for termination. The document also covers applications notes including the use of coupling coils and hardware recommendations for aerial installations. Instructions for the application of other Draka fiber optic products, such as splice closures, distribution cabinets, etc., are included in the Installation instructions for the device in question.

Questions? Call 1-800-879-9862.

2.0 Safety

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.

4.0 Tools and Materials Needed for Cable Access



- [+] Nine inch pliers
- [+] Wire strippers
- [+] Safety gloves
- [+] Buffer access tool
- [+] Utility knife
- [+] Snips
- [+] Needle nose pliers

Not pictured:

Vinyl tape, isopropyl alcohol, small black wire ties, lint free wipes

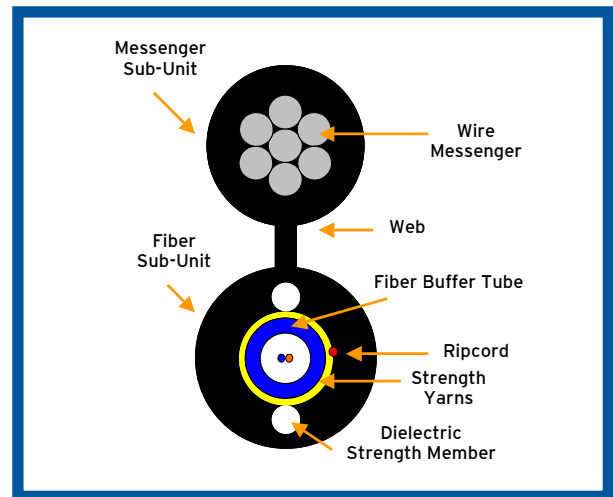
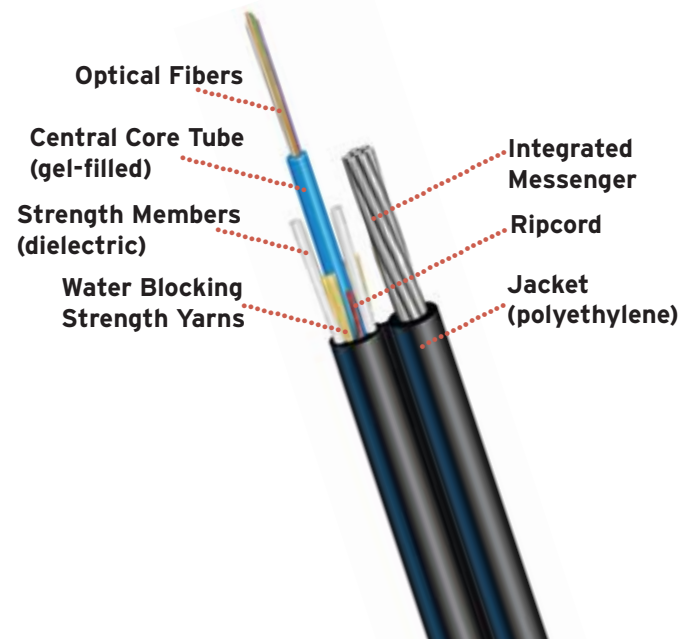
4.1 Alternative Web-Slitter for End Access

There are several web-slitting tools on the market that are designed to cut the web to separate the fiber sub-unit from the messenger sub-unit. Draka has tested and recommends using the Benner-Nawman UP-B36 Cable Slitter for slitting the web during end access. The largest opening should be used with the Draka ezDROP Figure 8 Fiber Optic Cable.

Banner-Nawman, Inc.
UP-B36 Cable Slitter
<http://www.benner-nawman.com/>
1-800-992-3833



5.0 Reference Drawing

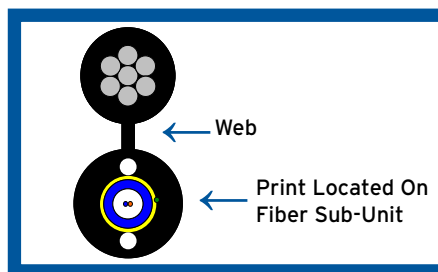
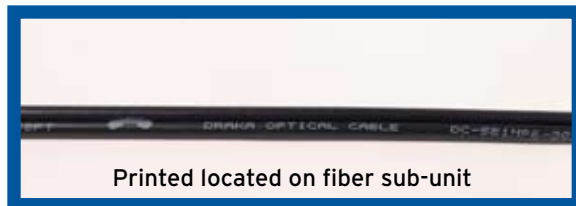


6.0 End Access Procedure

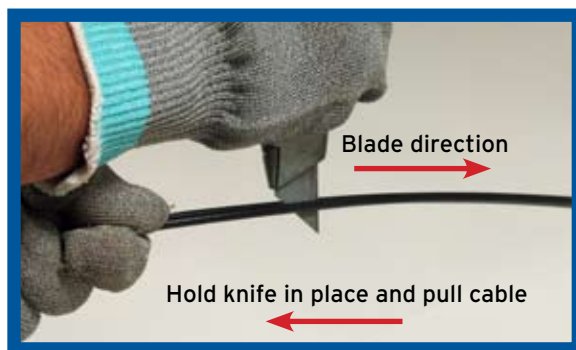
1. Determine the length of fiber and tube needed for splicing as recommended by the manufacturer of the splice closure or termination box. Leave enough sub-unit length to route from the messenger attachment point to the closure. Mark the cable or place some tape to identify the end of the length to be accessed.



2. Identify the fiber sub-unit and the messenger sub-unit. The fiber sub-unit will always be the half with print.



3. At 12 inches from the end of the cable, cut a small hole through the web using a utility knife such that the knife blade will fit through the web. Place the knife blade through the web such that the sharp end is facing toward the end of the cable and away from your body. Rotate the knife such that it is pointing slightly towards the messenger and away from the fiber sub-unit. The tilting of the knife will prevent inadvertent cutting into the fiber sub-unit.



4. Hold the knife in place at the slight angle and pull the cable towards your body, slitting web is with the utility knife.

NOTE:

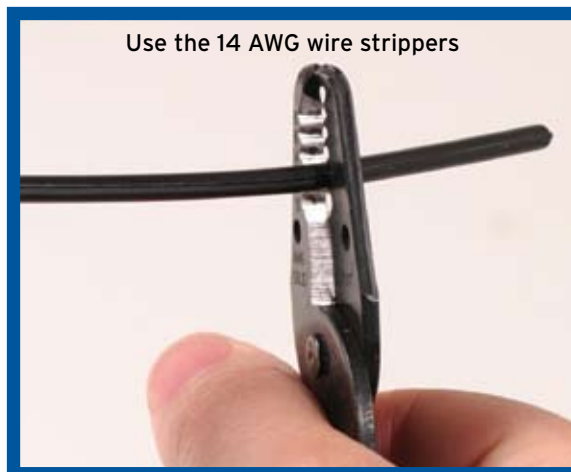
By holding the knife in place at the slight angle and pulling the cable through the blade, the web is cut smoothly and consistently, minimizing risk of cutting into the fiber sub-unit.

5. At 2 inches from the end, score the fiber sub-unit, using 14 AWG wire strippers.

6. Grab a section of intact cable with one hand (downstream from the separated 12 inches) and use the wire strippers in the other hand to pull the 2-inch section of the sheath off of the fiber sub-unit. The ripcord, buffer tube, and strength elements will now be exposed.

NOTE:

Grab a section of the cable with the messenger still attached for leverage when stripping the 2-inch jacket section.



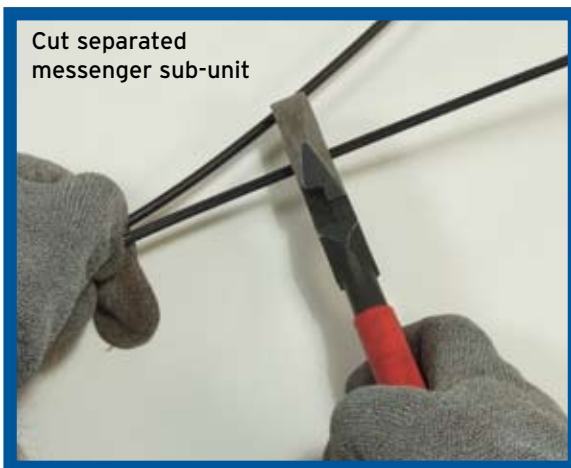
7. From the end of the access window (location marked in Step 1), use the utility knife to separate the remaining length of cable. Again, make sure to slightly tilt the knife blade away from the fiber sub-unit (printed side) and towards the messenger sub-unit. Hold the knife in place and pull the cable towards your body. Pull in multiple steps, 2-3 ft at a time.



8. Cut the separated messenger sub-unit at the desired location. Make sure to leave some length for hardware attachment within the closure or termination unit and/or pole.

NOTE:

If the steel messenger needs to be exposed for grounding / bonding, use 14 AWG strippers to strip off the sheath from the messenger.



9. Make a second score of the fiber sub-unit at the end of the desired access window. The ripcord will be used to remove the sheath from the end of the cable up to this location.



10. Locate the red ripcord and wrap it through and around the needle nose pliers. With one hand holding the buffer tube and strength elements, pull the ripcord in the opposite direction. Holding the tube and strength elements will counteract the force of pulling the ripcord in the opposite direction.

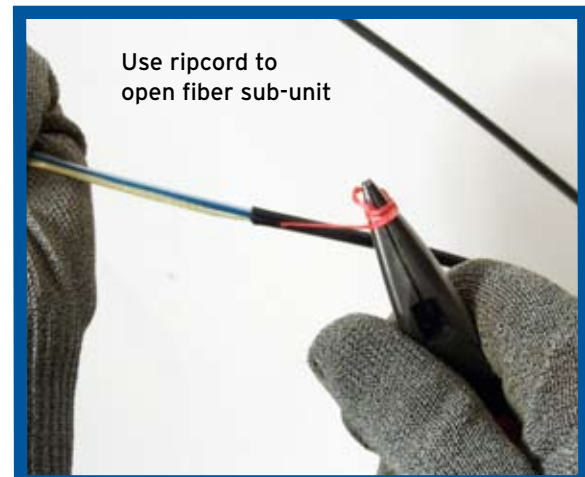
NOTE:

Hold the fiber sub-unit at one end while pulling the ripcord in the opposite direction. This will prevent kinking of the buffer tube.



11. Pull the ripcord in 2-3 ft increments and re-grip the fiber sub-unit with the opposite hand. Pull the ripcord to the second score location.

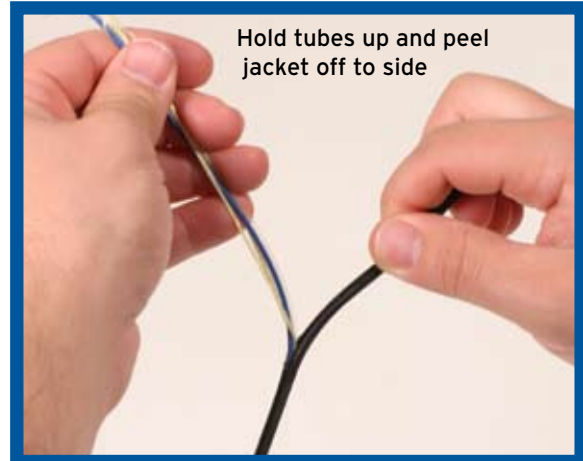
DO NOT wrap the buffer tube around the palm of your hand for leverage while pulling on the ripcord. This may kink the tube and break fibers. Keep the fiber buffer tube as straight as possible while pulling on the ripcord.



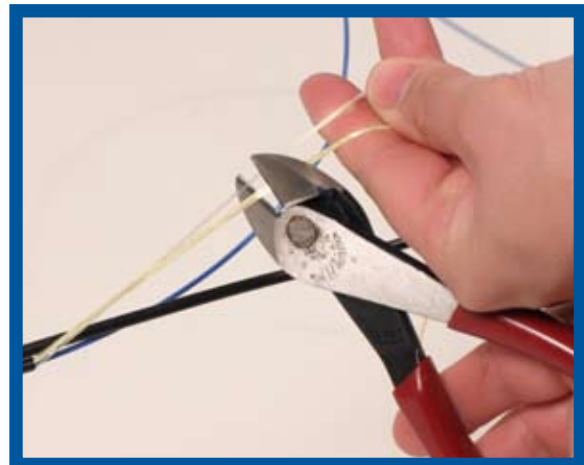
12. While holding the buffer tube and strength elements in one hand, peel away the sheath. In order to prevent the tube from kinking, re-grip every 1-2 ft.

NOTE:

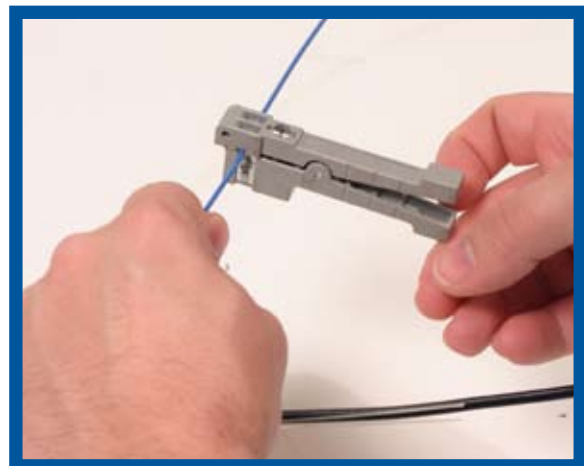
Pull a couple of the yarns through the beginning of the tear to initiate the opening. This will help guide the tube out of the jacket.



13. Cut the strength yarns, ripcord and rigid strength elements.



14. Determine the length of fibers to be accessed, score and snap the buffer tube and remove the tube in 12-15 inch (30-40 cm) increments until the desired length of fiber is exposed. Note that the small buffer tube can be routed in most splice trays eliminating the need for transportation tubing. Clean fibers and prepare for splicing.



7.0 Preparing the Messenger Sub-Unit for Hardware Attachment (AERIAL INSTALLATION ONLY)

1. Determine the location on the cable at which the messenger will be attached to hardware. Mark that location and separate the messenger 8 inches on either side of that mark using a utility knife. Make sure to slightly tilt the knife blade away from the fiber sub-unit (printed side) and towards the messenger sub-unit. The tilting of the knife will prevent inadvertent cutting into the fiber sub-unit.

Be sure to leave enough fiber sub-unit length for the coupling coil and routing of the buffer tube and fiber in the closure.



2. Cut the messenger sub-unit at the marked location.



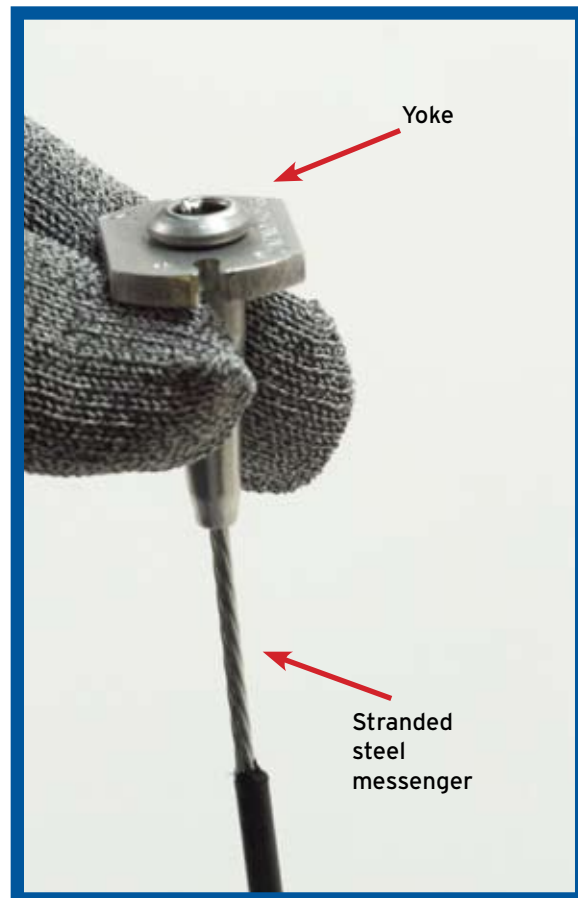
3. At 2-3 inches from the end of the cable, score the messenger sub-unit, using 14 AWG wire strippers by repeatedly twisting. Use the wire strippers to pull the 2-3 inch section of sheath from the messenger. This will expose the stranded steel messenger and allow it to be attached to the clamps.



4. Slide the yoke of the Wirewise clamp onto the steel messenger.

NOTE:

The yoke will only slide on in one direction. It cannot be removed from the cable once initially installed. Careful measurements must be made to ensure the clamp is at the correct location on the cable.



5. Once the yoke is secured, attach the bail to the yoke. The bail will be attached to hooks on the poles or house. In order to prevent additional separation of the fiber and messenger sub-units, vinyl tape should be applied around the cable adjacent to the wirewise clamp. A black wire tie should be applied over the vinyl tape for additional protection. Additionally, depending on recommended local practices, multiple twists should be applied for each aerial span.

NOTE:

Apply vinyl tape and a black wire tie to the cable to prevent undesired separation.



8.0 Recommended Hardware for the Aerial Installation of Draka ezDrop | Figure 8 Fiber Optic Cable

Draka's ezDROP Figure 8 Fiber Optic Cable is designed for use with standard wirewise service drop wire clamps in aerial applications. Wirelink splices can be used to splice together the messenger at mid-point locations for continuity purposes.

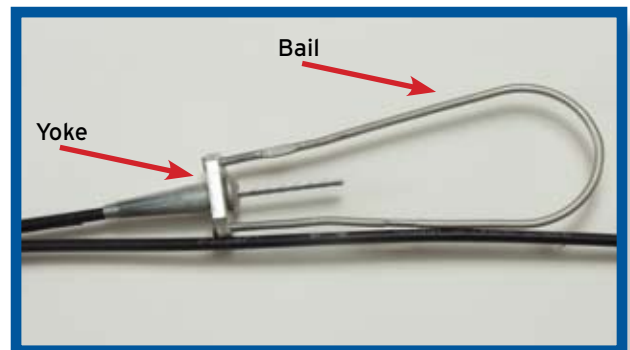
These parts are specifically designed for interface with the 3/23" stranded galvanized steel messenger in the ezDROP Figure 8 Fiber Optic Cable.

MacLean Power Systems
Clamp: Wirewise Part # 5056
Splice: Wirelink Part #5057 or 5057N
<http://www.maclepower.com>

These parts are available through various distribution outlets.

WARNING:

The Wirewise clamps are the only approved clamps with the Draka ezDROP Figure 8 Fiber Optic Cable. Other clamps such as twisted wire dead end, universal clamps or drop wire wedge clamps are not compatible with the ezDROP Figure 8 Fiber Optic Cable. Use of unapproved clamps may lead to damage to the cable and/or fibers. Please consult Draka Customer Service if there are any questions, 1-800-879-9862.



9.0 Bonding and Grounding

When installed aerially in the vicinity of power lines, Figure 8 Drop cables (and all cables with metallic elements) are susceptible to an induced voltage. Draka strongly recommends the proper bonding and grounding of the metallic components according to National Electric Code (NEC) and the National Electrical Safety Code (NESC).

Article 770 of NESC states that all non-current carrying metallic elements of an optical fiber cable must be bonded and grounded at the point of entrance into a building or residence.

There may also be local and state regulations that supersede the NEC and NESC recommendations. Draka strongly recommends installation according to the proper local and state regulations.

National Electrical Code, ANSI/NFPA 770, 1999 Edition
National Electrical Safety Code, ANSI C2-1997

10.0 Vibration (Aerial Installation Only)

When installed aerially, ezDROP Figure 8 Fiber Optic Cables may be subjected to wind, which can cause the cable to vibrate. Low frequency, high amplitude vibration, often called galloping or dancing, may result under certain circumstances.

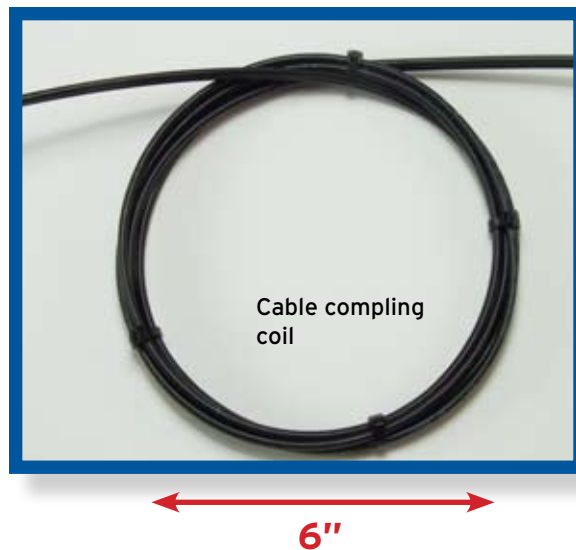
In order to minimize galloping, Draka recommends applying one complete twist for every 20 to 40 ft of ezDROP Figure 8 Fiber Optic Cable.

11.0 Coupling Coils (AERIAL INSTALLATION ONLY)

11.1 Coupling Coil Overview

Coupling coils are necessary to prevent an undesirable phenomenon commonly referred to as “fiber retraction” at splice closures or other termination points. When installed aerially, a cable may be subjected to weather loading as a result of wind and ice. This weather loading can cause a significant elongation of the cable. In typical stranded loose tube cables, the fibers, buffer tube, and cable are coupled together by design, and will elongate or strain in equal amounts. However, in central-tube-type cables, there is insufficient coupling between the fibers and the buffer tube. Because of this lack of coupling, as the cable elongates due to weather loading, the fibers will retract at both ends of the cable. This fiber retraction at closures can lead to high optical loss at the termination points, or in a worst-case scenario, break the splice.

The use of coupling coils is a necessary applications solution to prevent fiber retraction in the ezDROP Figure 8 Fiber Optic Cable. Coupling coils are a means to couple the fibers to the buffer tube and the cable, such that they all behave together, similar to a stranded loose tube cable.



Draka has conducted extensive testing and has found coupling coils to be the best solution to prevent fiber retraction. A coupling coil consists of four 6-inch loops of cable at each end of the cable. Details of preparing a coupling coil are included in Section 9.2.

NOTE:

A coupling coil must be placed at both ends of the cable to be effective. Failure to place a coupling coil at each end of the cable can lead to fiber retraction from the closure or termination box.

12.0 Cable Coupling Coil Procedure

12.1 Determine suitable location to place the cable coupling coil that is non-intrusive and does not cross into other rights-of-way.

NOTE:

Coupling coils should be placed at both ends of the cable between the clamp and the splice closure or termination box.

12.2 Make a coil with at least 4 loops of cable, with a loop diameter of at least 6 inches. The coil should be no smaller than 6 inches, but may be larger.

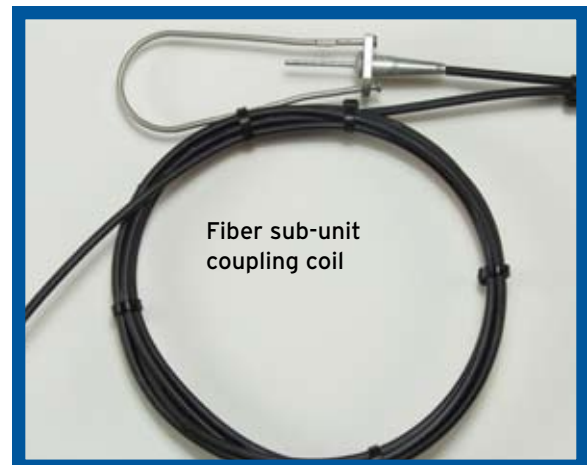
12.3 Secure the coil together by applying cable ties at 4 locations of the coupling coil, 90 degrees apart. Using less than 4 cable ties may result in the coil unraveling.

13.0 Alternative: Fiber Sub-Unit Coupling Coil Procedure

13.1 Determine a suitable location to place the fiber sub-unit coupling coil. A common practice is to attach the coil directly to the bail of the Wirevise clamps. Coils should be placed at both ends of the cable, between the clamp and the termination point.

13.1 Make a coil with at least 4 loops of the fiber sub-unit, with a loop diameter of at least 4 inches. The coil should be no smaller than 4 inches, but may be larger.

13.1 Secure the coil together by applying cable ties at 4 locations of the coupling coil, 90 degrees apart. Using less than 4 cable ties may result in the coil unraveling.



14.0 Material Safety Data Sheet

I. Company/Product Identification

PRODUCT: Fiber Optic Telecommunications Cable
MANUFACTURER: Draka Communications USA, Inc.
 Optical Cable Plant
 2512 Penny Road
 Claremont, North Carolina USA 28610-0039

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

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 09002-88-4	N/A N/A	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/m3	3.5 mg/m3
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.

Notes:



Value Innovation is a way of looking at the world. How can we help our customers do more, make more, save more, achieve more? Draka is a global leader in delivering advanced cable and network solutions. Focusing on the passive elements of the network, our goal is to deliver superior network, connectivity and cable solutions that meet your current and future network requirements, based on more bandwidth, longer life and absolute reliability.



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