An OSP Installation Story
Part Three

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Water-blocking tape and polymer-coated yarn use technology similar to that in baby diapers.

For years, many fiber optic cabling competitors fought against using tight-buffer cables for OSP applications. A few still stand their ground today and insist that loose-tube technology is the only sure method to properly provide protection against water migration and the resulting stress that temperature swings can have on the fiber strands.

Further, any 900 um tight-buffer cable has very limited use.

Key concern for the cabling designer or consultant is the warranty—or rather a liability factor—along with budgetary concerns of the overall project costs. Most campus OSP backbone cables are rapidly becoming mission-critical for a variety of applications. Our introductory story describes a real-life-like scenario. Having the cable break down due to environmental conditions is unacceptable, results can be devastating, and the long-term legal challenges can easily bankrupt an installer.

FIBER SUPPLIER SOLUTIONS

In the past few years, many fiber cable manufacturers have relented and are offering their own tight-buffer cable "solutions." Some have stricter installation guidelines for warranty purposes—like having the cables installed in (dry?) conduits and below the freeze or frost line.

Another alternative to gel-filled or flooded OSP cables would be using dry water-blocking tape or a super-absorbent polymer coated yarn that swells upon exposure to water. This is similar technology as used in baby diapers.

When exposed to water, the tape/yarn

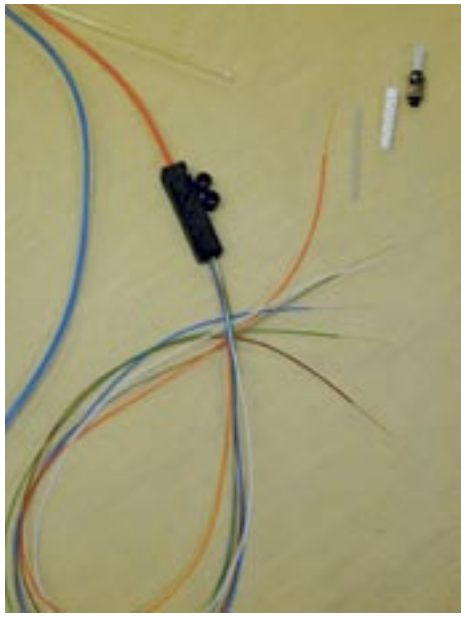


FIGURE ONE Breakout kit installed requiring 3 mm tubing for connector.

Editor's note: ***You'll want to read Part One and Part Two of this series before continuing to the article that follows. Here's where to find them on the Web:***

1: www.rexelusa.com/power_outlet/PO_V6_N2/v6n2_PDFs/v6n2_AskBo.pdf

2: www.rexelusa.com/power_outlet/PO_V6_N1/v6n1_PDFs/v6n1_094_AskBo_w1.pdf

FIGURE TWO Fusion Splicing 900 um pigtail onto 250 um OSP cable eliminating need for breakout kit.

becomes absorbent and turns into a gel to protect against water migration… like wax on a car. Users derive the benefits of proven loose-tube cabling, but without the cleaning preparation process. While the breakout kit is still required, it simplifies the process quite a bit.

STANDARDS YOU NEED TO KNOW

It is also strongly advisable to ensure that the cable you are purchasing conforms to ANSI Telcordia, ANSI/ICEA, and ANSI/TIA/EIA industry standards that define OSP cabling parameters and applications.

Applicable standards include:

GR-20-CORE (issued July 1998)—this document is a module of Fiber Optic Cables and Connectors FR-FIBER-1. It provides the Telcordia view of generic requirements and objectives for single-mode (SM) and multi-mode (MM) optical fiber cables used in OSP outside plant applications.

Replaces: TR-TSY-000020, TR-TSY-000944, and TR-626-23343-84-2

GR-409-CORE (issued June 1994)—provides the Telcordia view of generic requirements and characteristics of optical fiber and cables used in premises optical systems. Inclusive of SM fibers (both dispersion unshifted and shifted) and 62.5 µm and 50.0 µm/125 µm MM fibers.

Included: Proposed functional design criteria; generic mechanical and optical requirements; desired features; and test methods for comparison against stated requirements—reflecting operational conditions for optical fiber and cable analysis.

Replaces: TR-NWT-000409. Refer to GR-20, GR-955, and UL 910,1581 & 1666 (fire ratings). Other referrals include TIA/EIA 359A and 598, 455 FOTPs plus TR-TSY-000843, TR-NWT-001121, AND TR-NWT-001322

GR-2961-CORE (issued January 1998)—this document is a module of Fiber Optic Cables and Connectors, FR-FIBER-1, the GR sets for the Telcordia view of proposed generic technical requirements and characteristics required of optical cables. These premises OSP products are intended for use in LEC, interoffice, loop feeder, and Fiber-In-The-Loop applications.

Included: Proposed functional

FIGURE THREE Preparation of OSP cable—splitting the jacketing.

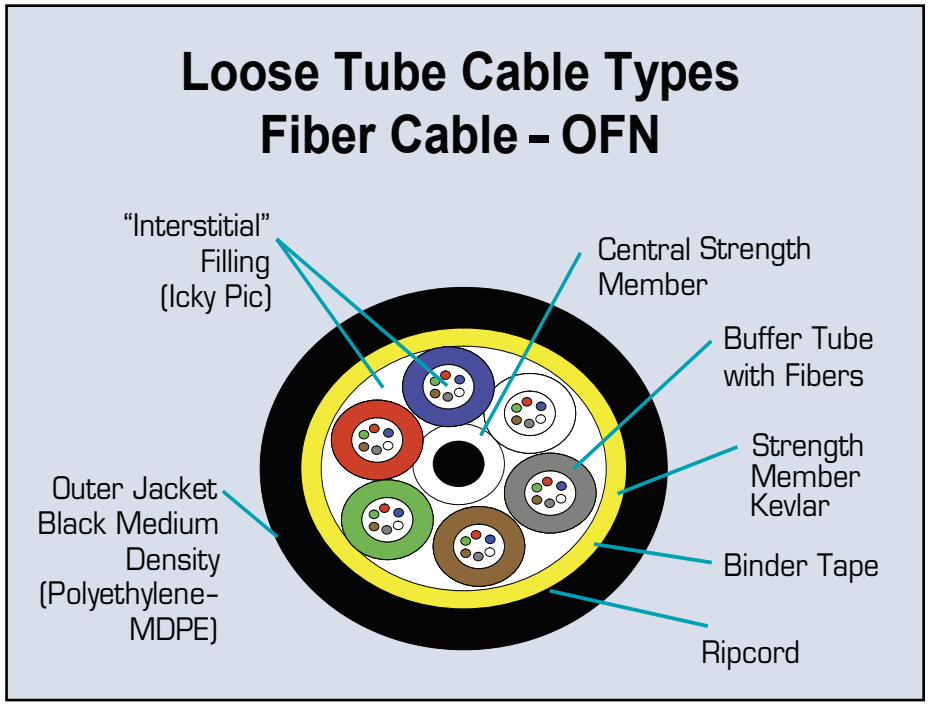
design criteria; generic mechanical and optical requirements; desired features, and test methods for comparison against stated requirements—reflecting operational conditions for optical fiber and cable analysis.

Refer to GR-20 and SR-2014, GR-454, GR-839, 909, and GR-955. Also ASTM E29, G53, and D4565; UL 1666: TIA/EIA FOTP 178, 559, and 598, and 359A.

TIA-758-A Customer-owned OSP Telecommunications Infrastructure Standard—specifies the cabling, pathways, and spaces to support the cabling that are intended to have a useful life of 40 years.

ANSI/ ICEA S-83-596 (issued 2001)—Fiber Optic Premises Distribution Cable.

ANSI/ICEA S-89-648 (issued 1999)—Fiber Optic OSP Outside Plant Communications Cables



YOUR CHOICE

So—which OSP fiber optic cable design should YOU use? Your choices include:

(1) Flooded gel-filled cable with gel-filled tubes;

(2) Dry water blocking tape around the cable and gel-filled tubes;

(3) Complete gel-free design for the cable and tubes (using dry water-blocking tape and yarn);

(4) Tight-buffered/distribution/non-breakout style cables with dry water-blocking design; or

(5) Tight-buffer/breakout style cables with dry water-blocking design.

I decided to perform a comprehensive study and contacted the product managers, engineers, and customer service departments of 18 major fiber optic cable manufacturers. Fortunately, 17 of them responded.

See **TABLE ONE** for info provided on each manufacturer's product line.

Look for more information from the survey, plus some closing pointers, in the fourth and last part of this series.

TABLE ONE

Product Line information		
Part number series	Lowest operating temp	Mil-spec approved
Application	UV resistance	REA approved
OFC or OFN	Jacket color	Install below freeze line
Aerial Lashed "8"	Buffer size	Tensile strength
All-dielectric	Ribbon style	Crush resistance
Extra protection jacketing	Furcation kit required	Impact resistance
Direct Burial	Fire-rating	Cable diameter
Duct	Telcordia compliance	Spool length
Gel Flooded/Gel Tubes	ICEA compliance	Glass source

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