LIGHT BRIGADE®
TRAINING & EDUCATION
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In This Issue

Instructor Corner

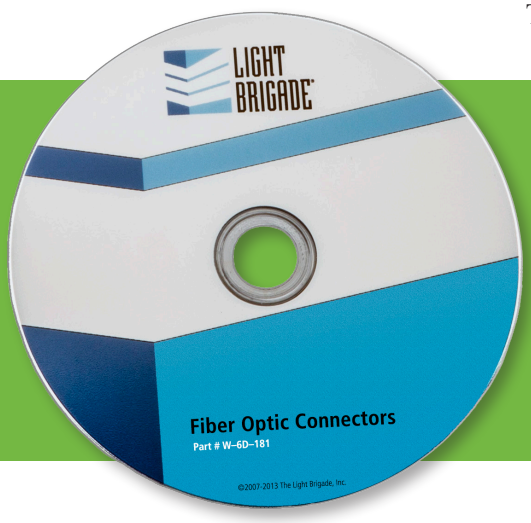
Field Termination Methods

As our technology continues to advance in the field of fiber optics, different termination options for the field technician have emerged and proven themselves with reliability, repeatability and durability. Our old standby of direction termination by either anaerobic, thermal or UV adhesive has now become only one of many proven technologies.

The epoxy-less splice on connector has demonstrated itself for many years as being an economically viable option. These connectors can be terminated onto both single-mode and multimode cable with little tooling and come in most connector styles and polishes commonly used in today's marketplace. Tooling can be as little as a pair of strippers, cleaver, cleaning wipes and solvents and a good visual fault locator or visible laser.

Fuse-on connectors have also come into play as more and more companies invest in fusion splicers. These splice on connectors come pre-cleaved and polished from the factory and require little to no additional tools. These splice on connectors eliminate the need for additional splice trays as they can be terminated directly onto 250 µm, 900 µm or up to 3 mm jacketed cable thus freeing up valuable space inside the cross-connect or patch panels.

Direct termination is still a skill that every technician should know, whether for quick repairs or lengthy installations of multimode networks. The skills required to terminate still apply and can be used for a variety of other tasks inside the fiber optic network. Standard connectors are still the lowest material cost option for termination but require significant experience and precision. Visual inspection and optical loss testing of these connectors is required after polishing to verify the loss and endface quality prior to connecting to the rest of the fiber optic network. ■



Did You Know...

Three Keys for Lowering Employee Turnover and Boosting Satisfaction

From constantly changing technology to the pressure of meeting daily productivity metrics, frontline employees face constant challenges that impact their proficiency and productivity on the job. When they lack confidence on the job, they may consider leaving. The cost of replacing an employee is substantial – ranging from one and a half to two times that staffer's salary to recruit, hire and train a replacement.

Research conducted by Jones/NCTI provides insight gained directly from technicians via an online survey and interviews with training leaders. This research indicated three keys for broadband companies to lower turnover and boost employee satisfaction.

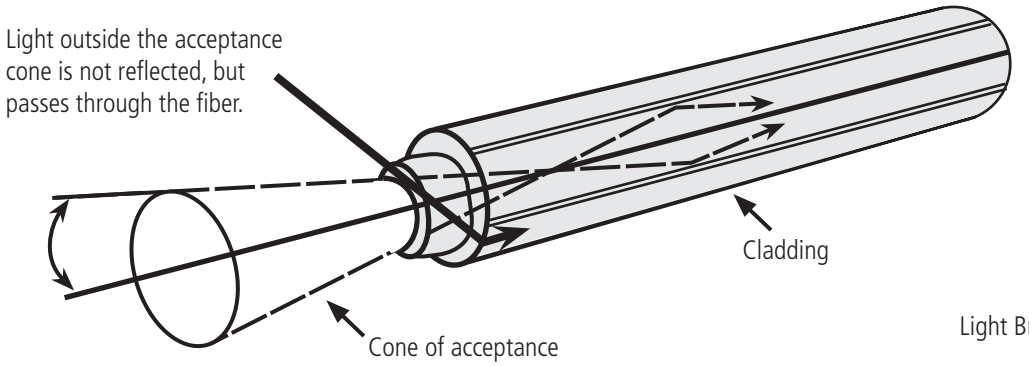
- Eight out of ten frontline employees say **a clearly defined career path** supports their desire to stay with their current company.
- Almost 90% of technicians say **feeling proficient and productive on the job builds loyalty to their company**, yet almost half say they are not getting enough training.
- Seven out of ten technicians report that **bonuses and pay increases tied to achievement of professional certifications is an important consideration to stay with their current employer**; however, fewer than half receive increases tied to certifications. ■

Training Tidbits

Numerical Aperture

The numerical aperture (NA) of a fiber is the maximum angle at which light will be accepted and propagated within the core of the fiber. This angle can vary depending upon the index of refraction values of the core and cladding materials.

If a light ray enters the fiber at an angle that is greater than the NA, the light will not be reflected back into the core but rather will pass into the cladding. The cladding properties then cause the light to exit the fiber entirely. Fibers with a large NA allow light to propagate at greater angles. These rays of light are referred to as higher order modes. Because these rays travel an elongated path that takes longer to reach the receiver, they decrease the bandwidth (information carrying capacity) of that fiber. Therefore, fibers with lower NA values will have higher bandwidth specifications. ■



Source:
Light Brigade's Fiber Optic 1-2-3 Training Course Manual
Chapter 2, page 3

LIGHT BRIGADE®

Upcoming Classes

Click on Location to Register

Fiber Optics 1-2-3

Indianapolis, IN	October 6-9
Fresno, CA	October 13-16
Honolulu, HI	October 20-23
Columbus, OH	October 20-23
Anchorage, AK	October 27-30
Topeka, KS	November 3-6
New Orleans, LA	November 3-6
Reno, NV	November 10-13
Alameda, CA	November 10-13
Birmingham, AL	November 17-20
Austin, TX	November 17-20
Ontario, CA	December 1-4
Jacksonville, FL	December 1-4
El Paso, TX	December 1-4
Salt Lake City, UT	December 8-11
Portland, OR	December 8-11
Omaha, NE	December 8-11
Spartanburg, SC	December 14-17
Seattle, WA	December 14-17
Dallas, TX	December 14-17

Advanced Hands-on Training

Denver, CO	October 13-16
San Juan, PR	October 13-16
Atlanta, GA	December 8-11

FTTx for Installers and Technicians

San Antonio, TX	October 20-23
San Juan, PR	October 20-23
Anchorage, AK	November 17-20
Denver, CO	December 1-4

FTTx OSP Design

Denver, CO	October 27-29

Fiber Optics for ITS, Traffic, Fire Alarm, and Communication Systems

Technician Level I

Las Vegas, NV	October 26-27
Vancouver, BC	December 7-8

Field Technician Level II

Las Vegas, NV	October 28-29
Vancouver, BC	December 9-10

Design Technician Level II

Vancouver, BC	December 11

Fiber Optics for Utilities

Level 1 Technician

Portland, OR	November 3-5

Level 2 Designer

Portland, OR	November 6

Fiber Characterization

San Jose, CA	November 23-25

Fiber Optics for Oil/Gas

Houston, TX	October 20-23

Fiber Optics for Pro A/V and Broadcast

Anaheim, CA	November 17-20

Complete 2015 Schedule

2015 Training Catalog

Take a look at the catalog featuring a complete schedule of 2015 training dates and locations throughout the United States and Canada for each of Light Brigade's 18 training courses.

Download a Copy

Custom Fiber Optic Training

Light Brigade can develop and deliver a custom onsite course specific to your needs and application.

Learn More

Standards Review

The Importance of Encircled Flux

The IEC 61280-4-1 Ed. 2 and the TIA-568-14-C standards added encircled flux (EF) requirements for loss testing multimode fiber as a means of minimizing the measurement variability sometimes seen when using different test equipment. EF controls the spot size and angle of light launched into the fiber core. If all loss test sets have an EF compliant launch, measurements will be more repeatable and accurate.

This is important in high speed networks and "engineered links" with tight loss budgets. When a link has a tight loss specification (perhaps as low as 1.5 dB) and two or more connector pairs, test accuracy is imperative. Test equipment must properly represent the use conditions for the link and neither overstate nor understate the end-to-end loss. Passing a link that should fail will cause problems when the network is turned up. Failing a link that should pass will add unnecessary troubleshooting and replacement costs.

EF-compliant light sources or mode controlling launch cords are the best way to test and certify a high speed multimode fiber optic network. The traditional mandrel wrap technique can be fraught with inconsistencies. Is the mandrel the right size? How many turns? How tightly is the cable wound? Does the launch cord have bend-insensitive fiber, which doesn't work with a mandrel? And, most of all, what if there is no mandrel? Do you wind it around a pen or a finger?

If you are testing high-speed multimode links, invest in an EF compliant solution and get the right results. ■

Upcoming Events

Click on Any Event for More Information

Trade Shows	Dates	Location	Booth Number
Fiber for the New Economy Conference	September 15-17	Lexington, KY	27
• Short Course: FTTH 101, September 16, 11:15am - 12:05pm			
• Training Course: Certified Fiber to the Home Professional, September 17-18, 8:00am - 5:00pm			
BICSI Fall Conference & Exhibition	September 20-24	Las Vegas, NV	AFL Booth 143
Optical Networking USA	October 6-7	Dallas, TX	
• Workshop: Understanding Emerging Technologies in 100G Fiber Optic Systems, October 5			
Cable-Tec Expo	October 13-15	New Orleans, LA	AFL Booth 1027

Free Training Webinars	Date	Host
Technician Disciplines for the Future	September 16, 1:30pm EST	Lightwave
Passive and Active Devices in FTTx Networks	October 20, 2:00pm EST	FTTH Council
Isolate, Test, and Troubleshoot FTTx Drops in the Last Mile	November 18, 1:30pm EST	Lightwave