



COMMUNICATOR

FIBER INSTRUMENT SALES, INC. | WWW.FIBERINSTRUMENTSALES.COM | 1-800-5000-FIS (347)

Titan Dark Fiber

Tips from the Field

Titan fiber was engineered by Corning to withstand harsh environments. Because of this toughness, it can be difficult to cleave and splice this older type of "dark fiber" without knowing a couple of tricks of the trade.

Cleaving and Splicing Titan Fiber

Technicians who have worked with Titan fiber suggest lowering the blade of the cleaver; this will score the fiber deeply enough to provide a good cleave with the proper endface geometry.

To splice Titan fiber, technicians report that the fusion splicer must be set at a "higher temperature" than that required for most other types of fibers. This may require adjusting the Fuse Arc Value and/or Fuse Arc Time settings of your fusion splicer.

Before you change any settings on your fusion splicer, here are a few things to try first:

- Review the "recipes" listed in your Splice Mode Menu. There is an outside chance that you already have a recipe for Titan fiber among the dozens of modes listed in your Splice Mode Menu. If not, contact the manufacturer of your fusion splicer to inquire whether a setting for Titan fiber is available for your machine.
- Another approach is to turn on your splicer's Auto Mode, which is usually the default setting when you switch on your machine. Your fusion splicer will evaluate the fiber you have installed and attempt to provide you with the proper settings.
- If all else fails, you can try editing one of the existing Splice Modes in your fusion splicer. Choose a Splice Mode that most closely resembles the specifications of Titan fiber, which are available from Corning.

Be aware that different fusion splicers typically have different recipes for a given fiber; there is no one "Titan fiber recipe" that fits all machines.

FUSION SPLICING 101

This issue of Communicator will help you choose a fusion splicer that best meets your needs. Key purchase considerations include the fiber types that various models can accommodate, as well as the alignment mechanism within each of these devices.

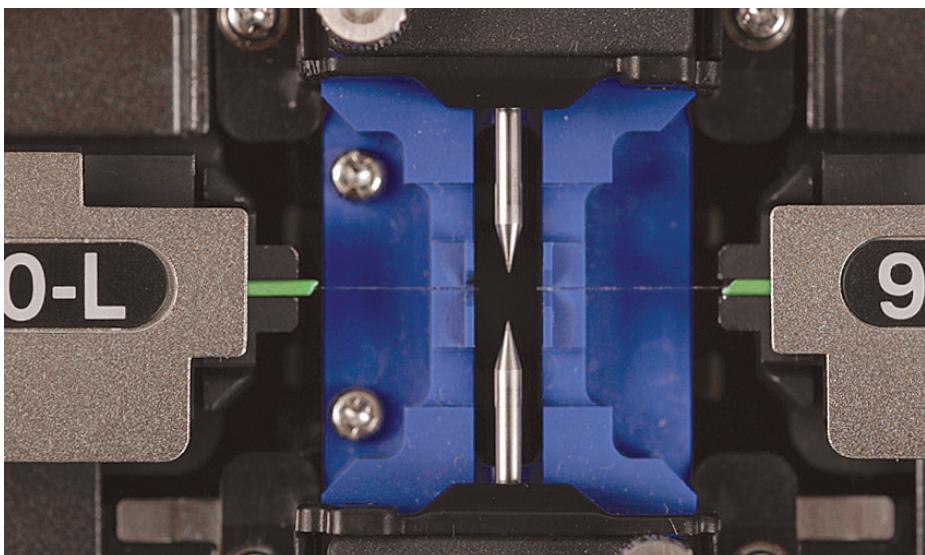
Fusion splicing is becoming the preferred method of terminating fiber thanks to the ease of use and affordability of today's fusion splice machines. These versatile devices are used for repairing broken fiber, attaching connectorized pigtails, fiber-to-fiber extensions for long hauls, and terminating fiber with Splice-On Connectors (SOC's).

Fiber alignment is a key consideration when choosing a fusion splicer. Precision fiber alignment must be achieved in order to obtain a quality splice. Precision alignment is especially important when splicing singlemode fiber, which has a small core diameter. A quality fusion splicer will align and fuse fibers so precisely that the splice will not significantly impede data throughput.

Continued
on page 2



Continued from page 1



Splicer Evolution

In the earliest fusion splicers, fiber alignment was done along the Z axis only and it was a manual process. Today, more accurate alignment is achieved by aligning fibers along multiple axes, and some fusion splicers align along all three (X Y and Z axes).

For the most part, alignment has become fully automated through the use of internal cameras, motors and microprocessors that work in unison to align the fibers. These features are the result of years of development by Corning, AFL, Sumitomo, Fitel and other leading manufacturers.

Fiber alignment methods vary, depending on the fusion splicer. Fusion splicers are often characterized by the type of alignment method they employ:

Core Alignment Splicers (three-axis alignment)

This type of splicer is ideal for fusing singlemode fiber because it provides very precise fiber alignment which is necessary for small-core fibers. Typical splice loss is only 0.02dB. Core alignment splicers are essential if you are splicing new fiber to older legacy fiber, which tends to have inconsistent core geometry. This type of splicer can also be used to enhance the performance of multimode fiber.

Clad Alignment Splicers (fixed-groove, single-axis alignment)

Commonly used for ribbon splicing, this splicer aligns fiber along a single axis. Internal cameras and a fixed-groove aid

Splicing Tips

Keep It Clean – Keeping your fusion splicer clean and otherwise well maintained is vital to achieving a good splice. Electrodes, camera lenses and mirrors deserve special attention. Refer to your owner's manual for cleaning and maintenance instructions specific to your machine.

Buy a 'Precision' Cleaver! – Fusion splicing requires the use of a precision cleaver, as opposed to a less expensive "field cleaver" (beaver cleaver) that is sometimes used to prepare fiber for mechanical splicing. Some recommendations can be seen in our latest product catalog.

A good precision cleaver will produce a 90 degree cleave that is perpendicular to the fiber endface. To further ensure accurate cleaves, you may want to replace or rotate your cleaver blades ahead of the manufacturer's recommended schedule.

in the alignment of the fibers. This type of splicer has a typical splice loss of 0.05dB SM and is suited for multimode or singlemode applications.

Active V-Groove Splicers (movable V-groove)

Some newer types of clad alignment splicers have an "active" (movable) V-groove. This mechanism provides more precise fiber alignment than a "fixed" v-groove clad alignment splicer. The accuracy of this new type of splicer makes it well suited for singlemode fiber splicing, including splicing done in the manufacture of optical components.

Other Considerations

Heat Shrink Speed – The speed at which different fusion splicers fuse fibers together doesn't vary by very much. What tends to slow down splicing work is the time required for heat-shrinking the splice protection sleeve. If you do a lot of fusion splices, you'll probably want a splicer that offers a dual heat shrink oven, or fast single heat oven. You may even consider a stand alone heat sleeve oven to increase efficiency.

Information Display – A good fusion splicer will provide you with important splicer information such as system status, splice loss values, diagnostics, maintenance information, arc test results, help menus and more. Choose a fusion splicer that has a display screen that is easy to read under various lighting conditions.

Upgrade Potential – New fibers sometimes come along that require you to change the settings on your fusion splicer to accommodate them. Some fusion splicers offer software upgrades that will do this for you.

Benchtop Vs. Hand Held

Benchtop models are typically larger than hand held models and have a flat bottom that provides a stable platform for fusion splicing, especially for production environments. Benchtop models can be powered through AC current, and DC battery models are also available. Benchtop fusion splicers may incorporate more features than hand held devices, although this is not necessarily the case.

Hand held models are very compact and portable, and they are usually powered by a rechargeable battery. They are ideal for aerial applications, working in confined spaces, or anywhere AC power is not available. Hand held splicers are popular for FTTx, LAN, backbone and long haul installations. Some hand held units have a wide flat base, enabling them to be used as benchtop units as well. Performance of a good hand held fusion splicer can be on a par with benchtop models.

Check out our wide range of fusion splicers and precision cleavers available for sale or rent.

Go to, www.fiberinstrumentsales.com



FIS HAS FUSION SPLICERS FOR EVERY NEED!

Prior to purchasing or renting a fusion splicer, place a check mark next to the features you require. Based on this information, your FIS Sales Representative will suggest the splicer that best meets your needs.

1 Fiber Construction Enter number of fibers _____

Ribbon Fiber: Not Required Desirable Essential
Single Fiber: Not Required Desirable Essential

2 Singlemode vs. Multimode Fiber

Singlemode: Not Required Desirable Essential
Multimode: Not Required Desirable Essential

3 Splice Loss Specification

Tight (<0.05 dB) Moderate (0.10 dB to 0.20 dB)

4 Fiber Alignment Mechanism

Core Alignment Fixed V-Groove Active V-Groove

5 Fiber Holding Mechanism

Fixed Clamp Removable Holder

6 Compatible with Splice-On Connector (SOC)

Not Required Desirable Essential

7 Able to Save (Store) Test Results

Not Required Desirable Essential

8 Provides Splice Loss Estimate

Desirable Essential

9 Amount Budgeted for a Fusion Splicer Enter amount \$ _____

10 Portability Desired

Hand-Held Benchtop

11 Powered By

AC Power Battery Power Both

12 Additional Desired Options/Accessories

Hard Case Extra Battery Spare Electrodes
 Cleaning Kit Precision Clever Splice Protection Sleeves
 External Heat-Shrink Tube Heater

FIS Fusion Splicers

'Making Ends Meet'

If you are looking for a top-quality fusion splicer that won't break your budget, FIS fills the bill. Our CA3 Splicer is ideal for making permanent, low-loss splices. This splicer can also be used to quickly terminate fiber with splice-on connectors, as well as connectors that have factory-installed pigtails.

FIS CA3 Core Alignment Splicer

Part # FI-CA3 | \$7,995.00

The CA3 offers fast splice and heating times, excellent environmental performance, and a standard kit package with precision cleaver and two extended life batteries.

Users have the option of operating the unit with integrated hard keys, or a new ultra-sensitive 4.3" LCD (tempered glass) touch screen. Fast, low-loss splice performance and compatibility with FIS Cheetah Splice-On Connectors make this fusion splicer perfect for premise and long haul OSP applications.



Features

- Fast Splice Time - SM 7s Quick Mode / 18s Heat Time
- Rugged 4.3" Tempered Glass LCD Touch Screen
- Typical 130 Cycles (Splice and Heat) / Single Battery (Two Batteries Standard with Kit)
- Perfect for use with Splice-On Connectors with Metal SOC Holder



▲ Standard kit package with precision cleaver and two extended life batteries.

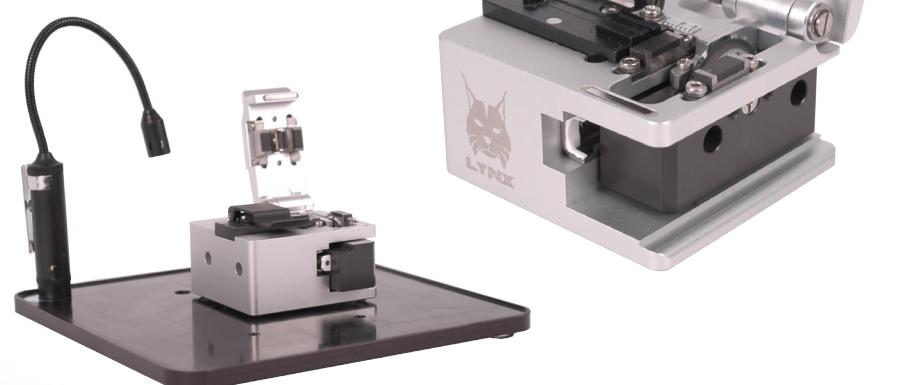
FIS Precision Cleavers

Strong, low-loss fusion splices begin with a good cleave. FIS Precision Cleavers provide the precise endface geometry required to prepare fiber for fusion splicing. These top-quality cleavers are reasonably priced and provide maximum value for your money.

FIS LYNX™ Precision Cleaver

Part # FI-LYNX | \$595.00

The LYNX provides clean, accurate cleaves required for fusion splicing. LYNX is also ideal for preparing fiber for quick-term style connectors such as Bobtails, UNICAMs and other pre-polished connectors. LYNX features a cleave angle of 90 degrees +/- 0.5 degrees. Its 16-position blade provides approximately 48,000 cleaves. LYNX cleaves single fibers (250-900µm).



▲ The LYNX Precision Cleaver can be used alone or mounted to an optional Work Tray that includes a gooseneck LED (Part # FI-LYNXWKS shown above)

For more information, contact your FIS Sales Representative 1-800-5000-FIS (347)

Also see our online Product Catalog at www.fiberinstrumentsales.com

ASK BRUNO

John Bruno, V.P. of Technical Services



- Q.** What are the advantages and disadvantages of splice-on connectors vs. mechanical connectors? Which of these connectors is more feasible for terminating drop cables?



- A.** First, I'd like to state my opinion that a factory pre-terminated cable with a pre-polished connector (and attached pulling eye for installation) is superior and generally preferred over manually polishing and installing a connector in the field.

There are only three different ways to install a fiber optic connector and all of them have their pros and cons:

- Connectors can be field installed using the epoxy and polish method, the quick-term mechanical connector method, or by using a pre-polished connector that has a factory installed pigtail or fiber stub (Splice-On Connector) to fusion splice onto the field fiber.
- Traditional connector installation using the epoxy and polish method may have the advantage of low initial tooling costs but that is about where the advantages end. This method tends to be labor intensive with high connector scrap rates, the use of numerous consumables and requires a higher skill level than other options.
- The mechanical connector option, while quick and efficient, also presents challenges. The initial kit cost for this type of connector can be as high as \$1,800 and the connectors themselves are expensive. The appeal of these connectors is the speed at which they can be installed with a lower skill level. When using a mechanical connector you are sacrificing quality, specifically in higher attenuation and ORL (Optical Return Loss).

Considering your specific situation (drop cables and singlemode) the disadvantages of the mechanical connector should rule out its use.

fis UNIVERSITY

PREMIER FIBER OPTIC EDUCATION

Upcoming Training Dates

Fiber Optics I and II - Two Days

April 19-20 | Baltimore, MD

May 9-10 | Louisville, KY

May 11-12 | Columbus, OH

May 24-25 | Pittsburgh, PA

June 7-8 | Detroit, MI

June 20-22 | Brightside Training Center, Raquette Lake, NY

June 27-29 | Brightside Training Center, Raquette Lake, NY

Fiber To The x - One Day

April 20 | Nashville, TN

May 18 | Denver, CO

June 15 | Tampa, FL

DAS/Small Cell Interactive Online Training

April 19 – 9-11am PST

April 26 – 9-11am PST

View full curriculum and register online at www.fisuniversity.com



Further questions? Contact Grace Edel at 1-800-5000-FIS (347) ext. 2169, or email gedel@fissales.com

NEW! FIS University's Alumni Advantage Program

Take advantage of your preferred benefits today!

- 10% off online training registration for returning students
- "Bruno's Picks" special product pricing
- Free subscription to Wavelengths Magazine and FIS Communicator publications
- Free WaveLengths Magazine "Connections" business listing—Print and digital
- Preferred advertising pricing/placement in WaveLengths Magazine
- And, more!

When shopping on the FIS website, look for this symbol on select products!



To receive your free Alumni card,
visit www.fisuniversity.com
and click on **Alumni Advantage**



LEARN MORE ABOUT FISU'S TRAINING PROGRAMS

www.fisuniversity.com | 1-800-5000-FIS (347) | training@fissales.com