# AFL Overview
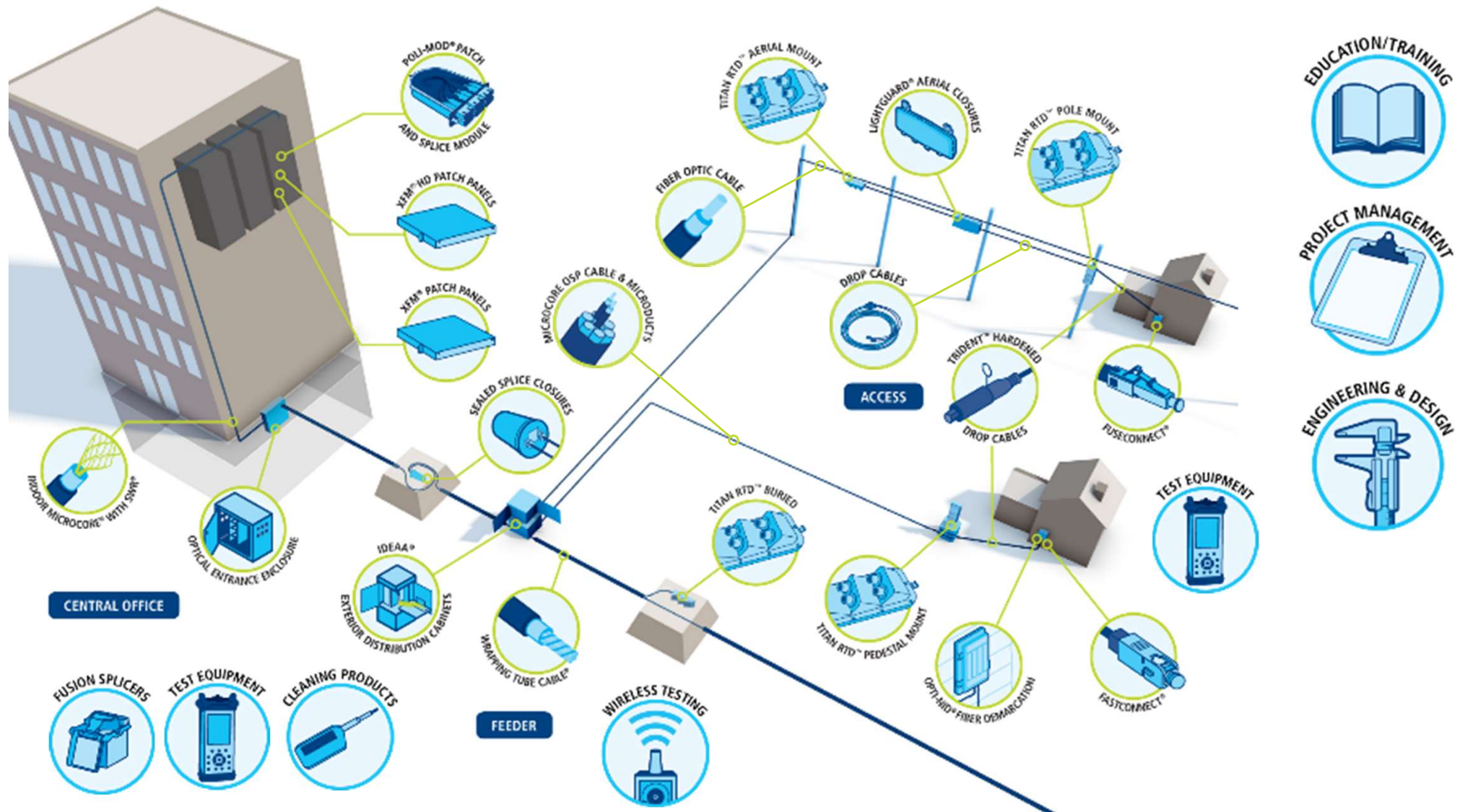
# Fujikura Parent Company

- Annual sales exceeding U.S. $7 Billion

- 35% of Fujikura's sales from telecommunications and optics

- Pioneer in fiber technology

- Leading manufacturer of optical fiber and cables

- Leader in optical connectivity technology

- Global manufacturing footprint

- AFL: 100% wholly owned by Fujikura

# AFL FTTx/ PON/ MDU
## Complete Integrated Solutions

# Highlights

- Increased density – especially with SWR
- Individual sealing ports
- Apex dome O ring retained but field replaceable
- Ease of Installation  - Can Wrench
- Reduced components
    - ONLY 1 "Universal" tray per closure    Single , mass, PLC,OADM (hybrid in 1 tray)
- Next Generation Splice Tray  - modules, cover, storage
- No longer issues with whose single sleeve will fit in a splice tray manifold
- Grounds are factory installed only
- Large basket with multiple tie down locations
- Optional  Inner Basket  on X-2 only
- Tested to GR 771 & PASSES  20' waterhead
- Significant number of field replaceable parts

# Sizes

| Apex Model* | Dimensions (Length x Diameter) | Weight | Number of Splice Trays | Splice Capacity | | |
| | | | | Single Fusion | Mass Fusion | |
| | | | | | Standard Ribbon | SpiderWeb Ribbon® (or rollable fiber) |
| X-2 | 25 in. x 12 in. | 25 lbs. | 6 | 432 | 864 | 3,456 (200 μm) 1,728 (250 μm) |
| X-2S | 20 in. x 12 in. | 22 lbs. | 6 | 216 | 432 | 1,728 (200 μm) 864 (250 μm) |

*Small and Large sizes coming in 2021*



APEX X-2



APEX X-2S

- Same Base for X-2 and X-2S
- Common hardware and accessories between them
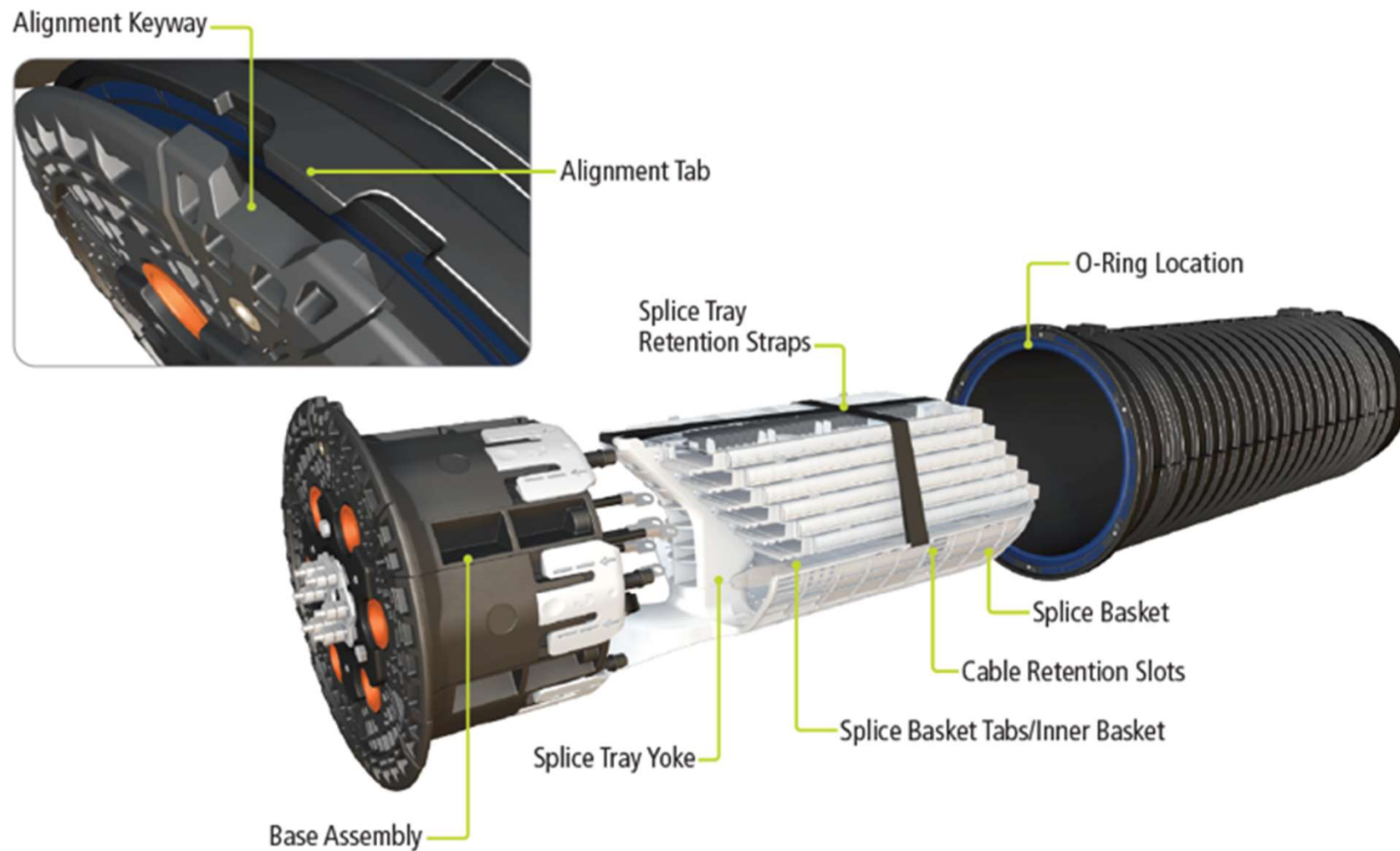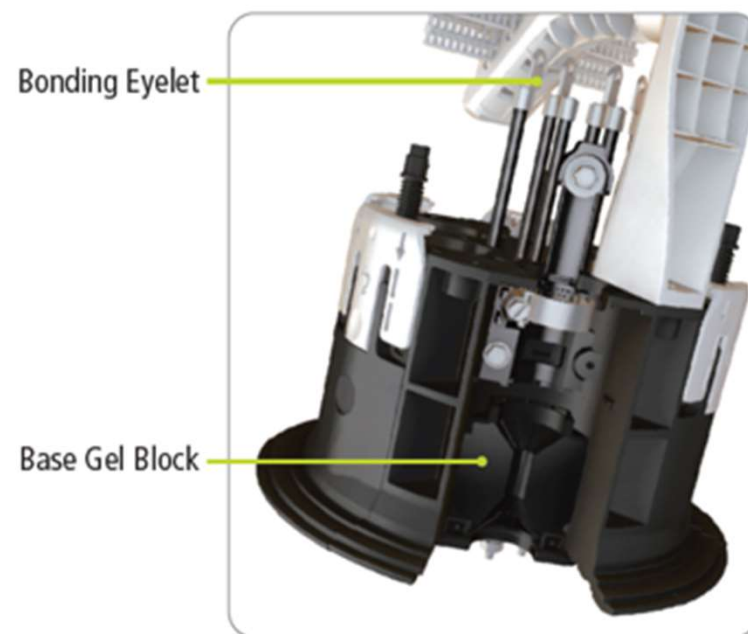- Single Universal Closure for most applications

# Defined



Pole Mount Retention Location
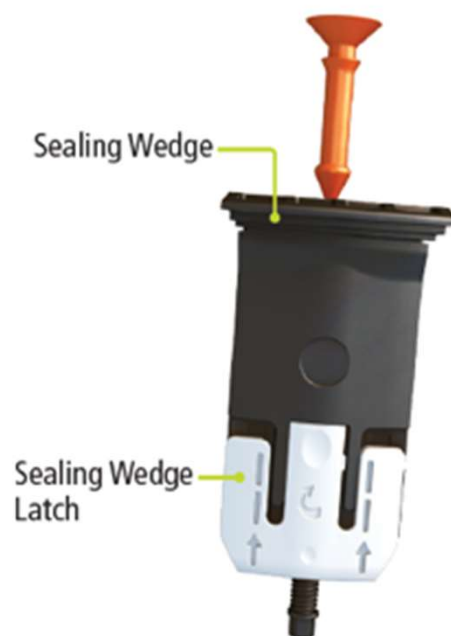
Flash Valve Location

Mount Insert Location

Locking Ring

Port Plugs

Ground Studs with Bonding Linkage

Upper Hanger Retention Tabs

Mount Strap Retention Tabs

Locking Ring Handle

Lock Tag Hole

Locking Ring Latch

Alignment Keyway

Alignment Tab

O-Ring Location

Splice Tray Retention Straps

Splice Basket

Cable Retention Slots

Splice Basket Tabs/Inner Basket

Splice Tray Yoke

Base Assembly

## APEX DEFINED



- Port Plug
- Wedge Gel Block
- Gel Fingers
- Gel Compression Screw

- Sealing Wedge
- Sealing Wedge Latch

- Bonding Eyelet
- Base Gel Block
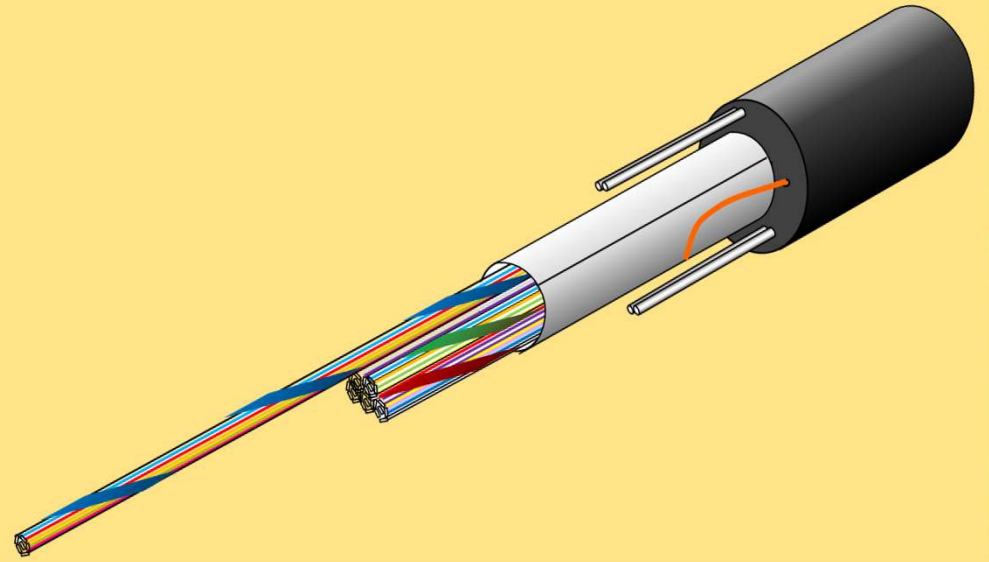
# SWR & OSP MicroCore

# What is the SWR & WTC?
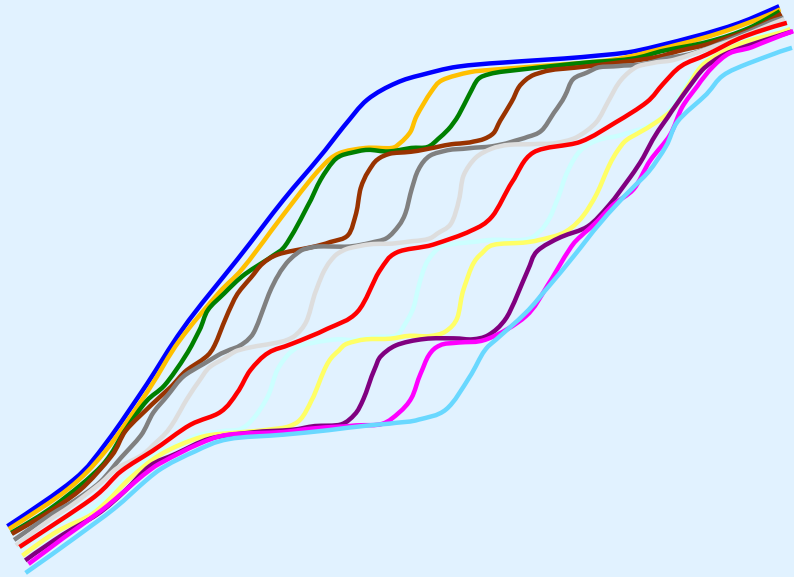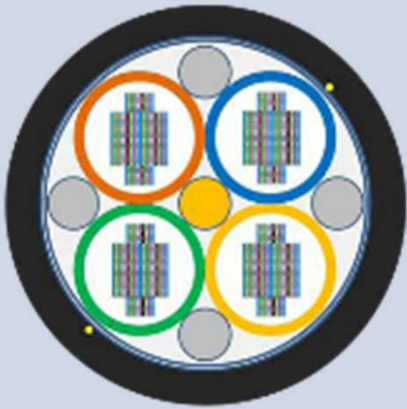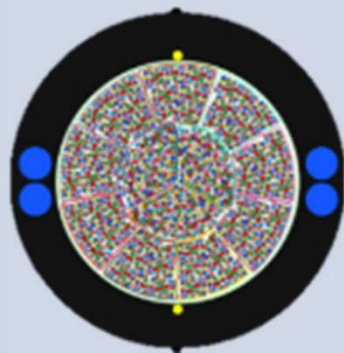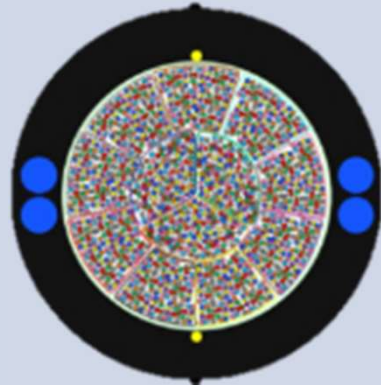


**S**pider **W**eb **R**ibbon (SWR)

**W**rapping **T**ube **C**able (WTC)

**AFL**

| | Company A | Company B | AFL | AFL |
|---|---|---|---|---|
| Fiber count | 1728 fiber | 1728 fiber | 1728 fiber | 3456 fiber (New) |
| Cable | Ribbon loose tube | Ribbon loose tube | WTC/SWR | WTC/SWR |
| Ribbon | 12f ribbon & 24f ribbon | 12f ribbon & 24f ribbon | 12f SWR | 12f SWR |
| Structure |  |  |  |  |
| Diameter | 1.34" (34.0mm) | 1.25" (31.5mm) | 0.870" (20.5mm) | **0.1.18" (30.0mm)** |

# OSP and I/O MicroCore Product Family

| Series Name | MicroCore Selection | Fiber Range | Conductors | Fiber Types | Applications | Target Pathway Environments |
|---|---|---|---|---|---|---|
| LM-Series | OSP MicroCore All-dielectric | 12-432 | N/A | SM, OM2, OM2, OM4 | FTTX, Campus, Local-loop and Long-haul | Underground Micro-ducts |
| LM-Series EZ-TONE | OSP MicroCore with locate/tone wire | 12-432 | 1x 20AWG (Solid) | SM, OM2, OM2, OM4 | FTTX, Campus, Local-loop and Long-haul | Underground Micro-ducts |
| LM-Series HD | LM-Series Heavy Duty for Aerial Lashing | 12 | N/A | SM, OM2, OM2, OM4 | Micro-duct to lashed aerial | Underground Micro-ducts and aerial lashed |
| LM200-Series | LM-Series using 200µm optical fiber | 24-432 | N/A | SM Only | FTTX, Campus, Local-loop and Long-haul | Underground Micro-ducts |
| LMZ-Series | NFPA 130 and NEC OFNG/LS | 12-144 | N/A | SM, OM2, OM2, OM4 | ONFG-LS, Indoor/Outdoor | Rail, Airport, Industrial |
| LM-Series Composite | OSP MicroCore with Power Conductors | 12-144 | 2, 3 and 4 - 16 AWG TFFN | SM Only | FTTX with remote power requirements | CCTV, DAS, WAP |

AFL

# Product Overview – LM-Series OSP MicroCore®

**12-f to 144-f designed for 10 mm ID Micro-ducts**
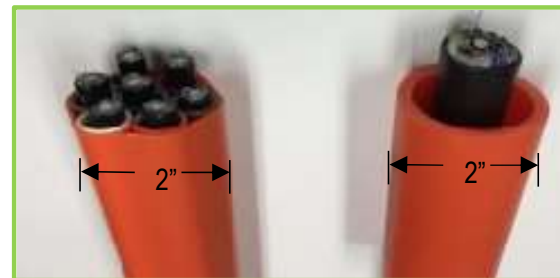
LM 144 in 7-way Micro-duct.
*Total of 1,008 fibers*

Conventional 144-f LT

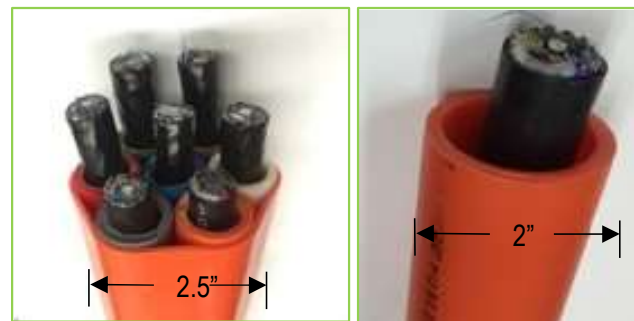**288-f designed for 10 mm ID Micro-ducts**

LM 288 in 7-Way Micro-duct.
*Total of 2,016 fibers*

2"    2"

Conventional 432-F OSP Loose
Tube in 2" Inner-duct

**432-f designed for 16 mm ID Micro-ducts**

LM 432 in 7-Way Micro-duct.
*Total of 3,024 fibers*

2.5"    2"

Conventional 432-F OSP Loose
Tube in 2" Inner-duct

# LM-Series Heavy Duty

- Features

  - Thick-walled LM-Series

  - GR-20 compliant

  - Can be jetted <u>AND</u> aerially lashed

  - Thicker jacket wall allows cable to be lashed using convention cable lashing equipment and methods

  - Micro-duct size typically increase by 2mm compared to LM-Series of the same fiber-count



Polyethylene Jacket
Core Binders
Ripcords/WB Binders
Color Coded Buffer Tubes
Optical Fiber
WB Binders
Central Strength Member
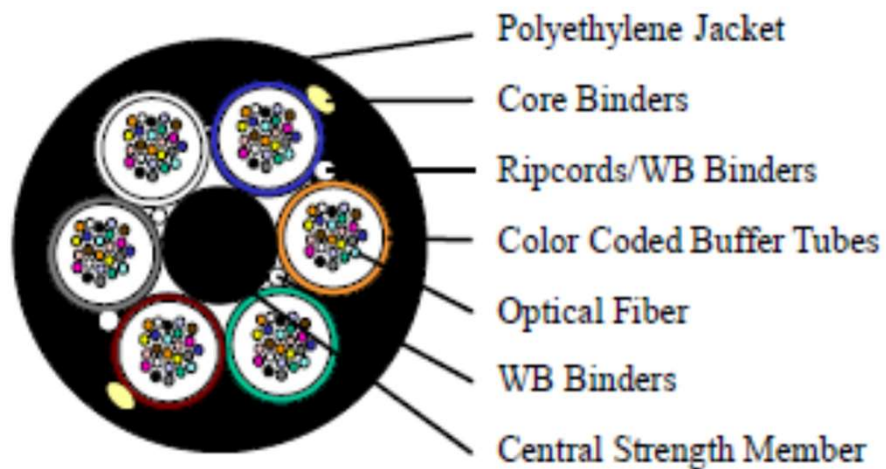
# Switchblade FCV

# Overview - Switchblade

- ## Features & Benefits
  - Folding design
    - Reduces:
      - Shipping costs
      - Storage footprint
    - Increases:
      - Productivity
      - Speed to market
  - Lowest weight in the category (Size & Classification)
    - Base - 66 lbs.
    - Lid - 48 lbs.
    - Extension - 26 lbs.
  - Flared wall design
    - Optimizes internal volume
    - Compresses coiled cable
    - Minimizes frost heave
  - Non-conductive/Non-corrosive Glass Filled Polyethylene
  - Tier 15 rated
    - 22,500 lb tested
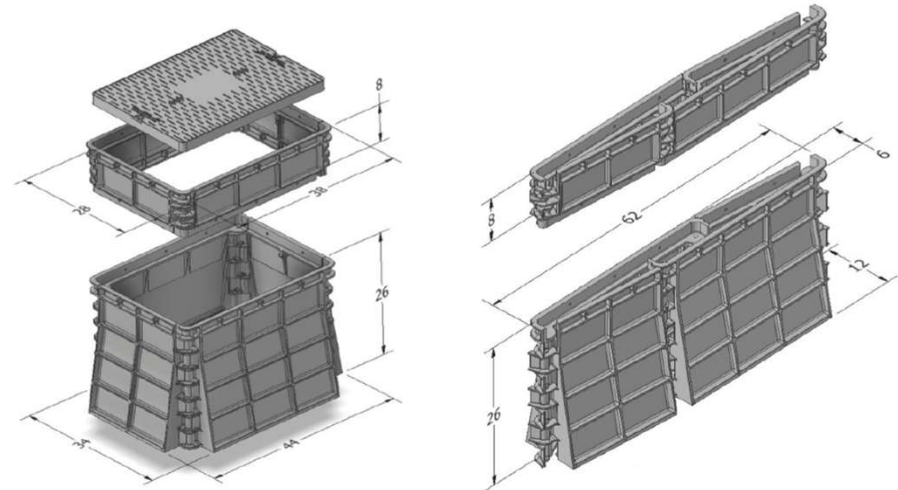
# FUSEConnect® Fusion Spliced Field-Terminated Connectors

- Uniquely designed and feature just four components

- Factory pre-polished ferrule and innovative field-termination process eliminates polishing, adhesives and crimping in the field minimizing the potential for operator error and expensive connector scrap

- Use a fusion splicer to terminate the connector in the field, addressing return loss concerns present in analog optical networks

- Advanced process yields true APC performance of >65 dB return loss in an SC/APC configuration

- SC single-mode connector compliant to GR-326-CORE

- Designed to work with industry standard splicers utilizing fiber holders
  - Compatible with Fujikura fusion splicers and most other fiber holder-based fusion splicing platforms
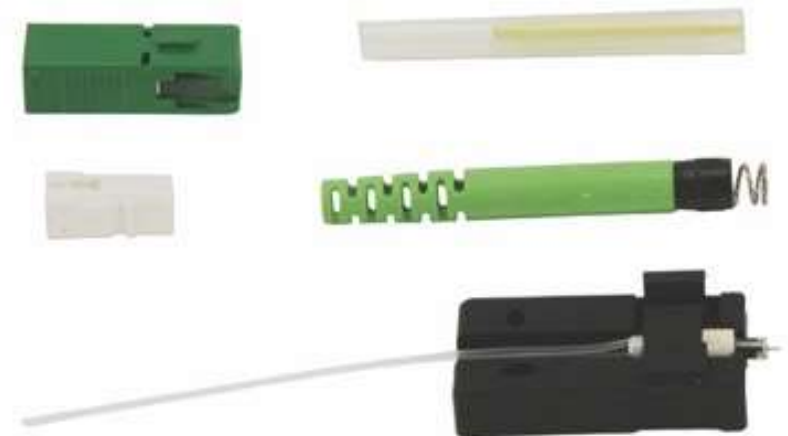
# FASTConnect® Field-Installable Connectors

- Factory pre-polished, field-installable connectors that completely eliminate the need for hand polishing in the field

- Proven mechanical splice technology ensures precision fiber alignment

- Factory pre-cleaved fiber stub and a proprietary index-matching gel combine to offer an immediate low loss termination to either single-mode or multimode optical fibers

- Compatible with 250 µm and 900 µm optical fibers as well as 900 µm, 2 mm and 3 mm cordage

- Supports all primary fiber types

- Color-coded connectors (per industry standard requirements) aide in identification during and after installation

- Remove and discard factory-installed wedge clip (included with each connector) upon completion of the termination

- Innovative, translucent wedge (incorporated into this device) enables use of a common Visual Fault Identifier (VFI) to provide a "pass/fail" signal on physical contact
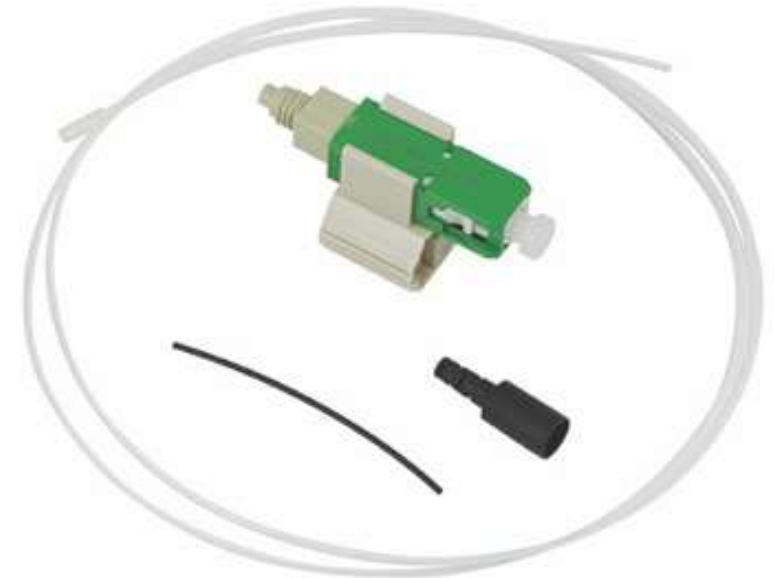
# Optical Connectivity: TITAN

## AFL TITAN RTD™ Multiport Terminal

- TRIDENT™ Hardened Connector ports for speedy customer connections

- Available with flat drop cable stubs – toneable and dielectric (pushable microdrop coming soon)

- Factory sealed for deployment in up to 10 feet of water head, but **re-enterable** for connector repair

- Fully Telcordia GR-771 Compliant

- Installation Accessories

  ▪ Strand Mount Bracket

  ▪ Pole Mount = features integrated into Terminal Base

  ▪ Pedestal Mount = mounting holes integrated into Terminal Base

# Optical Connectivity: TRIDENT

## AFL TRIDENT™ Hardened Fiber Connectors

- GR-3120 Compliant Design

- Dielectric design (eliminates grounding/bonding and corrosion concerns)

- Improved ergonomics with positive mechanical indication connector is engaged in adapter

- Quarter-turn BNC-style locking/sealing design

- Similar form-factor as Corning Optitap

- Utilize GR-326 Tested SCAPC design know-how

# OPN Duo

- Up top 4 SC simplex or LC duplex adapters

- Integrated, molded-in splice tray holds up to 18 single or 6 mass fusion splices using AFL's new splice module.  Can also hold PLCs or mechanical splices

- Optional splice/security cover protects fibers in splice tray and/or provider-side connectors

- Two cable entry options in base – U-shaped grommets or half-inch holes for grommets, conduit fittings, or compression glands

- Can be kitted based off customer needs – see spec sheet for configuration options

# OPN-500

- Designed for use in either indoor or outdoor environments

- Suited for FTTH demarcation applications

- Versatile enough to suit Cat5 or coax connections

- Capable of housing up to six bulk-head adapters in one LGX® 118 compatible adapter plate

- Equipped with an integrated splice tray, which holds up to six single fusion splices

# Test and Inspection Products

- Optical Time Domain Reflectometers
- Optical Certification Test Sets
- Power Meter and Light Source Kits
- Optical Fiber Identifiers and Visual Light Sources
- Connector Inspection Scopes and Probes
- Optical Test Accessories
- Optical Attenuators
- Optical Talk Sets
- Fiber and Connector Cleaning Systems
- TRM Records and Reporting Software
- Repair and Calibration Services

# FLEXSCAN® Overview

- Handheld **OTDR / Fault Locator** family
  - **PON** and **Point-to-Point** testing available at 1310/1550 nm
  - **Live fiber** testing at 1650 nm (filtered detector)

- **LinkMap® View** – Network Configuration at a glance

- **SmartAuto®** – Auto scan using network-optimized multiple pulses settings

- **Pass/Fail Analysis**
  - Overall network health
  - Fault Detection:  Location and reason

- Integrated **Source**, **Power Meter**, **VFL**

- **Pair with FOCIS Flex** Inspection Probe

- **Touch-screen** – Easy navigation

- **Bluetooth & USB** file transfers

# LinkMap® Interprets OTDR Trace

- Easy to understand **LinkMap** results
  - Icon-based representation of tested network
  - Color-coded event pass/fail reporting
  - Suggests corrective action for faulty events
  - Touchscreen event navigation

- LinkMap End-to-end **Link Summary**
  - Link Length, Loss, ORL, Attenuation (dB/km)

- LinkMap **Event Details**
  - Location, Type, Loss, Reflectance, Cum Loss
  - PON split ratio for detected splitters

- LinkMap **Fiber Section Details**
  - Section Length, Loss, Attenuation (dB/km)

- **Trace** available at touch of a button
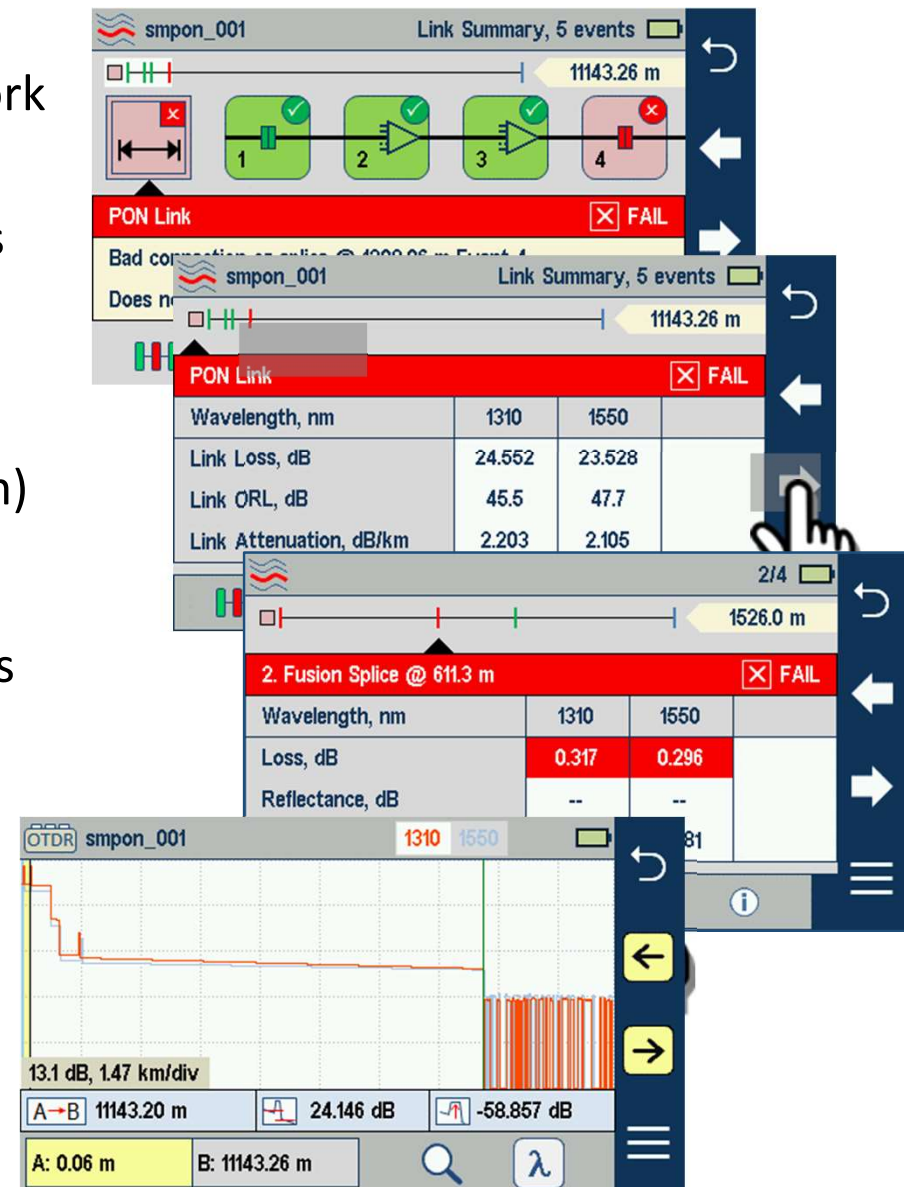
# Configurations & Availability

- **FLEXSCAN Models:**
  - **FS200-304**: 1310/1550/1650 PON & Pt-to-Pt Verification & Troubleshooting
  - **FS200-300**: 1310/1550 PON & Pt-to-Pt Verification & Troubleshooting
  - **FS200-100**: 1310/1550 nm Pt-to-Pt Verification / Troubleshooting
  - **FS200-60**: 1650 nm Live PON Troubleshooting OTDR / Fault Locator
  - **FS200-50**: 1550 nm Pt-to-Pt Troubleshooting OTDR / Fault Locator

- **Model Options:**
  - Source and Power Meter (-P1) plus Bluetooth/WiFi (-W1)

- **Basic Kits:**
  - Selected FLEXSCAN, USB cable, TRM 2.0 Basic, soft carry case

- **Plus & PRO Kits**: Save $300 - $500 (vs. ordering separately)
  - PLUS Kits: Basic Kit **+** Fiber Ring, One-click & TRM 2.0 Advanced
  - PRO Kits: PLUS Kit **+** FOCIS Flex & 2 Adapter Tips

- **Complete Kits:** Save $800 (vs. ordering items separately)
  - Complete BI Kit: PRO Kit **+** OFI-BI Optical Fiber Identifier
  - Complete BIPM Kit: PRO Kit **+** OFI-BIPM Fiber Identifier with Power Meter

**FLEXSCAN PRO Kit**

# What is FOCIS Flex?

**Simple!
Fast!
Convenient!**

## FOCIS Flex Connector Inspection

- **Single button operation**
    - Auto-focuses, centers, captures, analyzes & sends
- **Auto-focus and Auto-centering** – What could be easier?
- **Pass/Fail Analysis** – IEC, AT&T, IPC and User-set criteria
- **Use independently** or **pair with FlexTester** or **FLEXSCAN**
- **Bluetooth and USB** image and results transfer
    - Auto-sends captured image and pass/fail results to FlexTester
    - Received image instantly displayed on FlexTester
    - Pass/Fail results available for display on FlexTester
    - Inspection results may be saved with FlexTester OTDR traces
- Internal **Storage** for images and results
- **Interchangeable adapter tips** for most connectors
- 8 hours typical battery operation with power save enabled

# Why OFI-BI and OFI-BIPM?

- **Superior Performance:**
  - Best OFI Signal Detection Sensitivity on the market today
  - Ensures traffic will not be interrupted and fibers will not be damaged

- **Simple Operation Using Universal Fiber Clamp:**
  - No need to change multiple clamp heads – saving time

- **Easily Identifies both Live and Trace Fibers**
  - Traffic (CW), Tone (270 Hz, 1K or 2K)

- **Positive Stop Plunger:**
  - Mechanism provides the right amount pressure ensuring proper detection without excess bending loss

# Fusion Splicing Products

- Core and Active Cladding Alignment Splicing Systems

- V-groove Alignment and Mass Splicing

- Splicing Accessory Systems

- Precision Fiber Cleaving

- Factory Precision Splicing Systems

- Fiber Recoating Solutions

- Automated Fiber Preparation Systems

- Technical Support

- 24-hour Repair Services

# Introducing the Fujikura 41S



- Bluetooth technology for management of Bluetooth enabled fiber preparation accessories

- Highest accuracy cladding alignment loss estimation with Warm Splice Imaging (WSI)

- Automatic Arc Calibration functionality

- Dual camera, active v-groove alignment technology

- Extended electrode life – (5,000 – 6,000 arcs)

- Excellent visibility in direct sunlight with 5.0" TFT color LCD touch-screen display

- IP52 Ruggedized for shock, dust and moisture resistance

- Tool-less electrode replacement

# Fujikura 41S – Specifications

- **Applicable fibers**
  - Single-mode
  - Multimode
  - DSF
  - NZDS

- **Loss Estimation with WSI Core Sensing**

- **Number of fibers: single fiber**

- **Bluetooth 4.1 LE**

- **100 splice modes**

- **30 heating modes**

- **Stores up to 2,000 splice results**

- **Electrode life: 5,000 – 6,000 splices**

- **Dimensions**
  - 120 W x 189 D x 71 H (mm)
  - 4.72 W x 7.44D x 2.8 H (in.)

- **Operating conditions**
  - Altitude: 0 to 5,000 m above sea level
  - Wind: 15 m/sec
  - Temperature: -10° to 50°C
  - Humidity: 0 to 95% RH
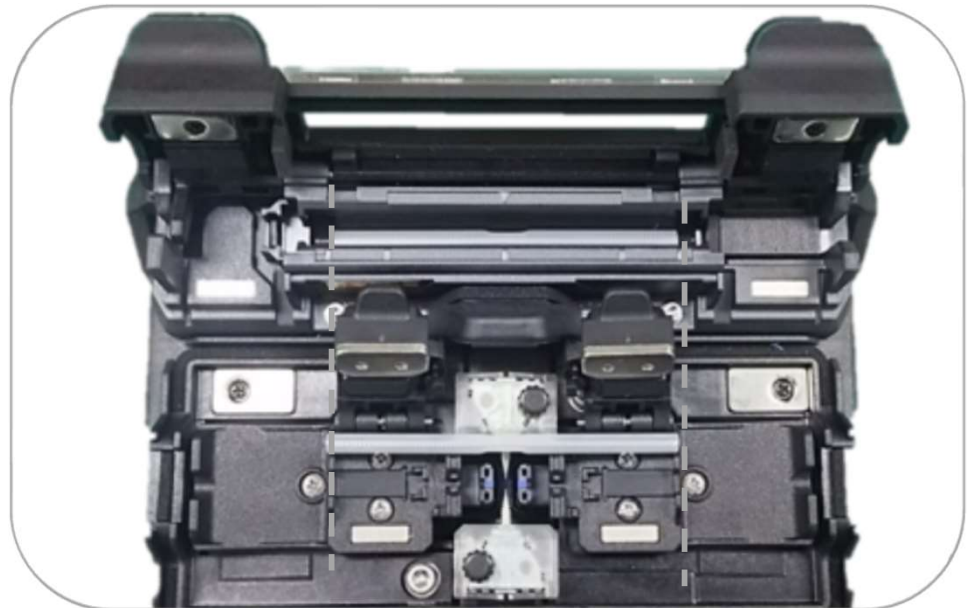
# 90R Splicer

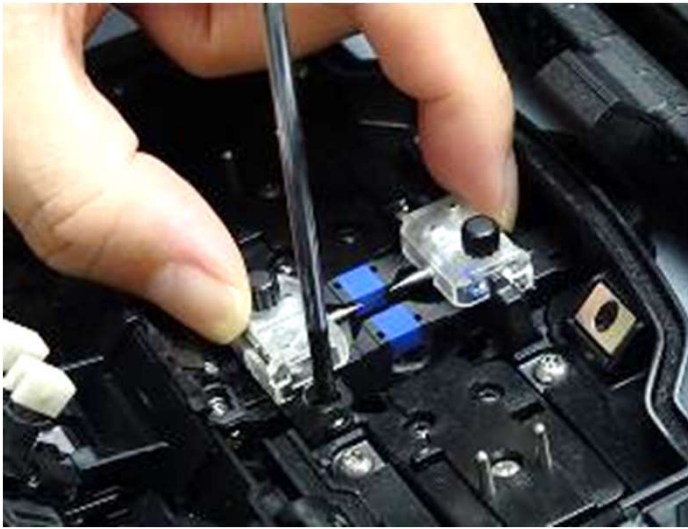

- Field replaceable V-grooves

- Automated cleaver tracking and blade rotations via Bluetooth

- Customized functionality to meet your style

- Ruggedized for drops in 6 orientations & moisture and dust resistance

- 200µm ribbonized splicing compatibility with optimized accessories

- Versatile work tray & case with increased storage capacity

- Graphical User Interface with 5.0" Touchscreen

# Replaceable V-grooves





- Glass & debris buildup eventually make V-grooves uncleanable

- No longer required to send splicer in for service when this occurs

- Replace V-grooves in the field in minutes

- Only tool needed is a hex wrench

- Easier to clean V-grooves outside of splicer

- Spare set with stabilized electrodes included in 90R kit

# Bluetooth Accessory Management



- Maximize Cleaver Blade Life

- Splicer Rework Reduction

- Increased Operator Efficiency and Confidence

- Reduced Cost of Ownership

- More time splicing and less time managing fiber prep accessories

# 90S Splicer



- Fastest and most ergonomic core alignment splicer
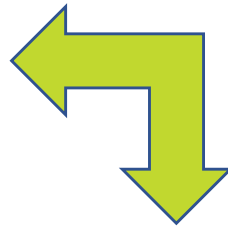
- Automated cleaver tracking and blade rotations via Bluetooth

- Customized functionality to meet your style

- Loose & tight buffer splicing – same sheath clamps

- Ruggedized for drops in 6 orientations & moisture and dust resistance

- Versatile work tray & case with increased storage capacity

- Graphical User Interface with 5.0" Touchscreen

# Speed & Efficiency

- Fewest manual steps required to complete a splice



- Automated mechanics that lower your total splicing time

- Output capacity unmatched by any other single fiber splicer

# Some Specifications

- Applicable fibers
  - Single mode
  - Bend-Insensitive
  - Multi mode
  - DSF
  - NZDS
  - LEAF

- Automatic Arc Calibration function

- 80µm - 150µm cladding diameter

- Up to 3mm coating diameter

- 5 – 16mm cleave lengths

- 7s splice in SM Fast

- 13s heat with standard 60mm sleeve

- Battery life: 300 splice & heat cycles

- 5.0" TFT Touchscreen

- Dimensions
  - 170W x 173D x 150H (mm) – 2.8kg
  - 6.70W x 6.81D x 5.9H (in.) – 6.17lbs.

- Operating conditions
  - Altitude: 0 to 5,000m above sea level
  - Wind: 15 m/sec (34 mph)
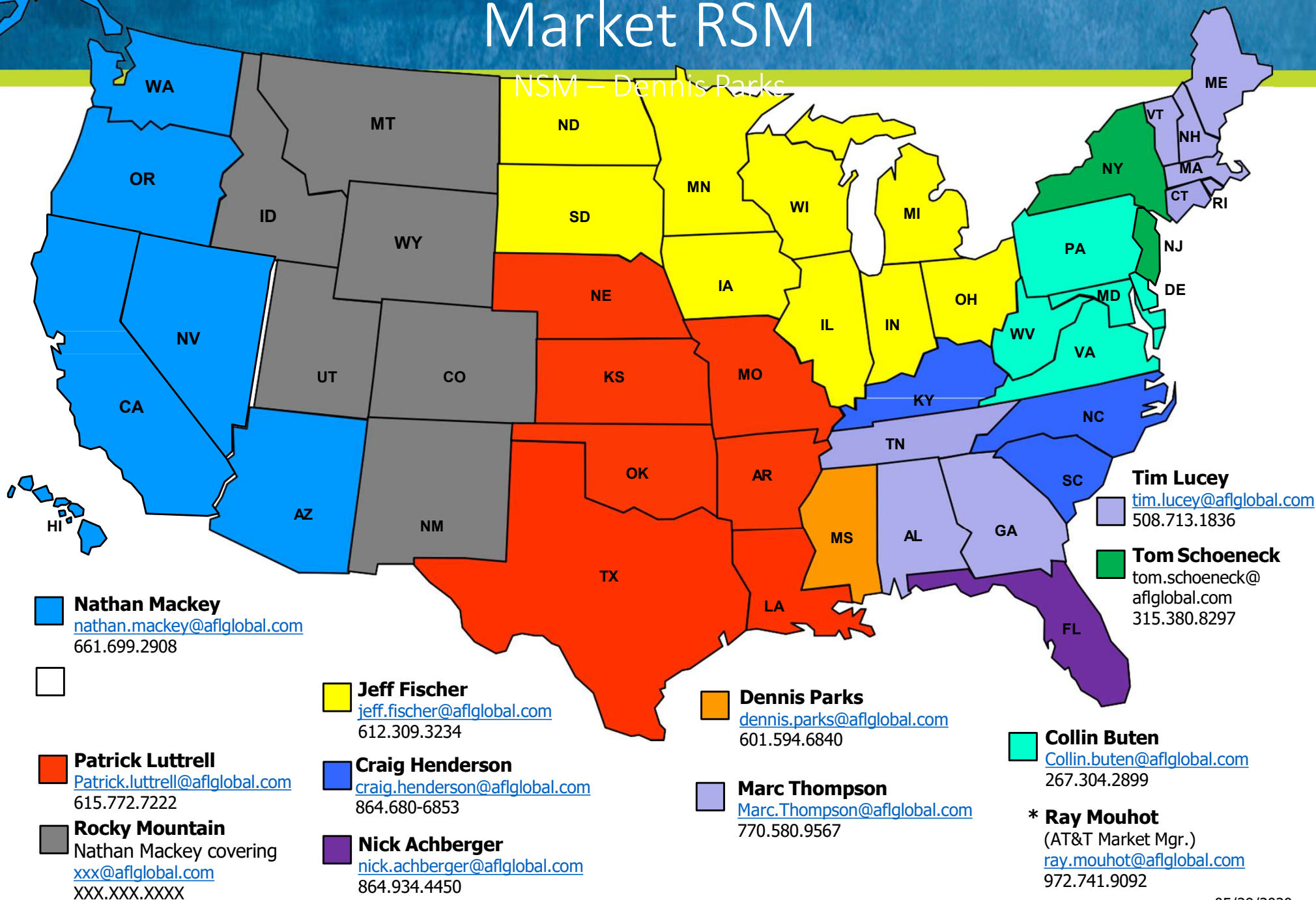  - Temperature: -10° to 50°C
  - Humidity: 0 to 95% RH

# Fusion Splicing Systems – Field Products

## Splicer Technical Support Line
## (800) 866-3602

- Available 24/7

- Support includes a staff of repair technicians and engineers

- Fluent Spanish speaking technical support available

- AFL stocks all necessary repair parts and consumables

- Same day turnaround available

# Service Provider Market RSM

NSM – Dennis Parks

**AK** **WA** **OR** **NV** **CA** **HI** **MT** **ID** **WY** **UT** **CO** **AZ** **NM** **ND** **SD** **NE** **KS** **OK** **TX** **MN** **IA** **WI** **IL** **MI** **IN** **MO** **AR** **LA** **MS** **AL** **GA** **FL** **OH** **KY** **TN** **NC** **SC** **PA** **WV** **VA** **MD** **NY** **NJ** **DE** **ME** **VT** **NH** **MA** **CT** **RI**

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05/29/2020

# Thank You!

www.AFLglobal.com