Proven Fiber Optic Solutions for Every Application:

Telecommunications

Amplification
Dispersion Management
Optical Transport
Optical Networking
Metro Edge / Access

www.ofsoptics.com

OFS | Your Optical Fiber Solutions Partner™
**Proven Fiber Solutions for Every Application**

**Dispersion Management**
- Fixed Broadband Dispersion Slope Compensating Modules
- Reconfigurable Dispersion Slope Compensating Modules
- Dispersion Compensating Raman Fiber

**Specialty Fibers**
- Erbium-Doped Fiber (C- or L-Band)
- Ytterbium Doped Fibers
- Thulium Doped Fibers
- ClearLite® 980 1380 nm Coupler Fibers
- TruePhase® 980, 1310, 14xx, and 1550 nm Polarization-Maintaining Fibers

**Optical Transmission Products**

**OPTICAL TRANSPORT:**
- TrueWave® RS, REACH, XL, and SRS Fibers
- UltraWave® Fiber

**METRO EDGE/ACCESS:**
- TrueWave RS LWP Fiber
- AllWave® FLEX ZWP Fiber
- LaserWave® 10G Fibers
- Laser-Optimized 1G Fibers
- EZ-Bend™ Cables and Cable Assemblies

**Optical Networking**
- ITLA (Integrated Tunable Laser Assembly)
- Athermal-AWG Module
- PLC Splitter
- Coherent Mixer
- Narrow Linewidth Full-Band Tunable Laser
- 980, 1480, and 14xx Pump Lasers
- Small EDFA and Raman EDFA
- Fast AGC Amplifier
- Fixed-Wavelength DFB Laser
- Triple Play WDM Filter Array

OFS and its parent, Furukawa Electric Company of Japan using the Fitel brand, offer a wide selection of specialty fiber and fiber-based products, components, and modules that are widely used in optical communications systems. Our products enable 10 Gbs, 40Gbs and 100Gbs high-speed, long-distance, and high-bandwidth optical networks with the reliability standards required for terrestrial or submarine network deployments.
Dispersion Management

Over long-distance and long-haul applications where chromatic dispersion becomes a factor, OFS provides several dispersion compensation options in either fixed broadband or remotely reconfigurable. Dispersion Slope Compensating Modules (DSCMs) provide an ideal solution for overcoming the effects of dispersion in single-mode fiber, and thereby, enable wideband DWDM operation in the C- or L-Bands at high bit rates.

All OFS DSCMs feature low Insertion Loss (IL), superior Polarization Mode Dispersion (PMD) and excellent slope matching. They are plug-and-play products, easily integrated into any optical path. DSCMs are passive units and have no electrical power requirements.

The modules—though customized for each application—are based entirely on mature, reliable single-mode optical fiber technology. OFS can deliver DSCMs for compensation of any transmission fiber.
Custom Configuration of Fixed Broadband DSCMs

OFS routinely manufacture custom products based on specifications that include customer-defined dispersion value at a specified operating wavelength, mechanical configuration, connector choice, certification data, labels, and packaging. Other options include an eeprom for remote detecting and identification of modules in a system, or standardization of the same insertion loss across a range of modules.

OFS also offers a generic specification for SMF, TWRS and LEAF compensation. The generic specification includes all aspects of the modules and order codes.

OFS offers full solutions of mechanical demands. Modules can be delivered on a spool, where the fiber is protected by a silicone layer, which can be mounted directly on a linecard. The size of the spool can vary to fit each customer’s demand. Modules can also be delivered in a customized box, or a standard box, which fits into a rack. Some DSCMs are available in a Small Form Factor, which is reduced size, but maintaining the excellent performance.

Requirements for low loss can be balanced with a desire for achieving a low residual dispersion over a wide wavelength range. And in situations where low loss takes precedence over residual dispersion, we offer a high figure of merit product that is suitable for single wavelength or narrow band applications.

Mini In-Line DSCMs

- For any transmission fiber
- Extremely compact size to fit tight linecard spaces

This group of leading-edge DSCMs offers the same excellent optical performance as former generations in a more compact size. With this new packaging, the system integrator enjoys a more flexible solution for all major transmission fibers and those with high slope transmission. These modules are suitable for excellent dispersion control in any system deployment at any wavelength. They offer a reduced footprint, are easy to integrate, and reduce the cost of ownership.
Reconfigurable DSCMs

- Broadband dispersion control
- Remotely adjustable

The compact, reconfigurable module is capable of compensating up to 100 km of standard single-mode fiber. The units provide dispersion and dispersion-slope compensation for up to 16 different lengths, which allows for part number reduction by using the same module for all span lengths. Features include easy operation through USB with easy-to-use software, an included full set of measurement data with each unit, and low loss with high repeatability for all settings. The many available customized features include: target dispersion and step size, physical dimensions, dispersion range, connectors, and pigtails.

Reconfigurable Dispersion Test Unit (RDTU)

- Compensate for broadband dispersion
- Constant output power for reliable measurements
- Universal lab testing tool

This compact, easy-to-use laboratory dispersion tester allows reconfiguration between up to 256 different dispersion levels. Customers may specify dispersion values up to +1700 ps/nm for positive dispersion or down to -3000 ps/nm for negative dispersion over 100 km of standard single-mode fiber. This is an excellent tool for characterizing the dispersion tolerance of optical components, optimizing pre- or post-compensation in transmission experiments, determining optimum module size, or conducting pass/fail tests on transponders.
Specialty Fibers

Specialized communications fibers are offered in the various standard transmission wavelengths, such as 980, 1310, and 1550 nm. Two of the fibers in our ClearLite line of photonic fibers—ClearLite 980-16 and ClearLite 980-20—guide light at both 980 and 1550 nm wavelengths, which allows Wavelength Division Multiplexing (WDM) pump/signal couplers to combine the pump power at 980 nm and the transmission signal at 1550 nm into one fiber. Other designs and customizations include reduced outer diameter for smaller form-factor applications and other applications where size is critical. High numerical aperture is designed to provide bend insensitivity, especially for coupler applications. And higher proof test levels help ensure extended lifetime in high-stress and submarine applications.

ClearLite TruePhase polarization-maintaining (PM) fibers are designed for integration into EDFA modules. The 980 nm version can be used to pigtail 980 nm pumps and to construct PM pump combiners or pump/signal WDM couplers.

Erbium-doped fiber is a critical component for the amplification of optical transmission signals. Most erbium-doped fibers optimized for either C- or L-Band communications are available in either standard or reduced cladding sizes and/or with standard or enhanced doping levels. Various combinations of fiber design features also allow for optimal performance in ASE source applications, Dense Wave Division Multiplexing (DWDM) systems or amplifiers, optical amplifiers, and other telecommunications applications. Together with our OASiX® Optical Amplifier Simulation Software, our experienced and knowledgeable customer support staff can help you determine which OFS erbium-doped fiber is best for your application. Furthermore we are able to supply Thulium-and Ytterbium doped fibers, S band Erbium doped fiber, as well as Raman fiber.

Optical Transmission Products

Working with our global cable partners, OFS helps end-users to reach increased capacity for video, voice and data transmission. The industry's benchmark full spectrum fiber, AllWave® Zero Water Peak (ZWP) Fiber, offers increased bandwidth and capacity and the lowest loss in metro/access applications to seamlessly extend the optical network into the end user’s premises. For use in transitioning from the long haul backbone through the longer metro express to the metro local, TrueWave® RS Low Water Peak (LWP) Fiber is an excellent option to support continued bandwidth growth. Laser-Optimized Multimode Fiber is designed for premises applications up to 10 Gbps for distances to 550 meters and beyond. For long-haul transmission over land and sea, OFS' line of Nonzero Dispersion Fiber (NZDF) Fibers, including Raman-optimized TrueWave® REACH, offers optimum dispersion characteristics for the most cost-effective high-capacity, longest reach systems that can efficiently carry a network from hundreds to thousands of kilometers. UltraWave™, TrueWave and AllWave Ocean Fibers are the choice for continent-to-continent as well as medium and shorter distance submarine connections.
Optical Networking Products
from Furukawa Electric Company

Fitel components play a critical role in rapidly growing network systems, such as WDM, CATV, and FTTx. We supply a full suite of components for these networks, including a tunable LD, amplifiers, and Athermal-AWG modules and subsystems. All these components are based on high-quality, reliable fiber manufacture in our own vertically integrated facilities.

Integrated Tunable Laser Assembly (ITLA)

- Full C- or L-Band coverage
- Built-in wavelength locker

Athermal-AWG Module

- DWDM and WDM-PON applications
- High performance for cascadability

This module is a key component for next-generation networks, mesh networks, optical cross-connects, and WDM-PON. It has electrical power-free performance and high reliability for outside use based on PLC techniques.

PLC Splitter and Coherent Mixer

- For high-speed coherent receivers in 100G or 40G systems
- Low insertion loss
- Compact size for installation
- High reliability for outside use
- Built-in polarization Mx/DMx
**Full-Band Tunable Laser**
- With narrow linewidth precision local oscillator sources
- Full C- or L-Band coverage
- Built-in wavelength rocker

The simple, thermal-tuning scheme is customer-friendly for designing into transponder cards. It employs a single monolithic chip, integrated with arrayed DFBs, a passive combiner, and a semiconductor amplifier.

**980 Pump Laser**
- Standard 14-pin butterfly form factor
- 980 nm fiber Bragg grating
- For high-power EDFA applications

**1480/14xx Pump Laser**
- Standard 14-pin butterfly form factor
- 14xx, fiber Bragg grating
- 1480 nm, built-in oscillator
- For high-power EDFA and Raman applications

Furukawa has shipped over 600,000 of these units over the past decade, and they are operating in the field with exceptional reliability. High power and raman erbium-doped fiber amplifiers rely on the benefits of efficient photon-to-photon conversion at the 14xx nm pump wavelength.

**Small EDFA**
- Ultra compact size
- High saturated output power (more than +15dBm)
- Low power-consumption (1.25W)
- Low noise figure (Max 6.5dB)
Raman EDFA

- Compensates for insertion loss due to optical components
- Improves optical signal to noise ratio (OSNR) in the ultra-high bit rate transmission range over 100 Gbps

This amplifier integrates a Raman amplifier with an Erbium-doped fiber amplifier. This unit combines the superior noise characteristics of the Raman amplifier with the high-power capabilities of the EDFA.

Fast Auto Gain Control (AGC) Amplifier

- Compact size for DWDM applications
- High performance

Fixed Wavelength DFB Laser

- Standard 14-pin butterfly form factor
- DWDM fixed wavelength for the C- and L-Bands
- 40mW-CW or 10mW-OC48

Triple Play WDM Filter Array

- 8 channel WDM for triple play
- High reliability with PLC
Product Availability and Distribution

OFS is a wholly owned United States subsidiary of Furukawa Electric Company of Japan.

Specialty Fiber, Dispersion Management, and Optical Transmission products offered in this brochure are all branded under the OFS name.

FITEL® brand optical components from Furukawa are distributed in the Americas by OFS’s New Jersey office. They are also available worldwide directly from Furukawa with regional offices in Japan, Europe, and Asia.