



A Furukawa Company

Optical Fiber

FTTX Solutions

Fiber Optic Cable

Fitel Optical Components

Connectivity Products



A Furukawa Company

OFS is a world-leading designer, manufacturer and supplier of optical fiber, optical fiber cable, connectivity, FTTX, optical components, and specialty photonics products and solutions for a wide variety of applications and industries. Our manufacturing and research divisions work together to provide the fiber optic solutions you need in virtually any industry, any environment . . .

Exceptional products and solutions from OFS are the foundation of optical networks that traverse many different applications as they link people and machines worldwide. Between continents, between cities, around neighborhoods, and into the homes and businesses of digital consumers, optical signals need the right optical fiber,

optical cable, and connectivity components for efficient and cost-effective transmission.

For excellence in all parts of your optical network, use OFS products: optimum transmission, lower losses, reliability in the harshest environments, and superior efficiency.

The Science Behind the Products

OFS Laboratories has a long track record of turning science into practical, real world solutions, many of which have become ubiquitous in the industry today.

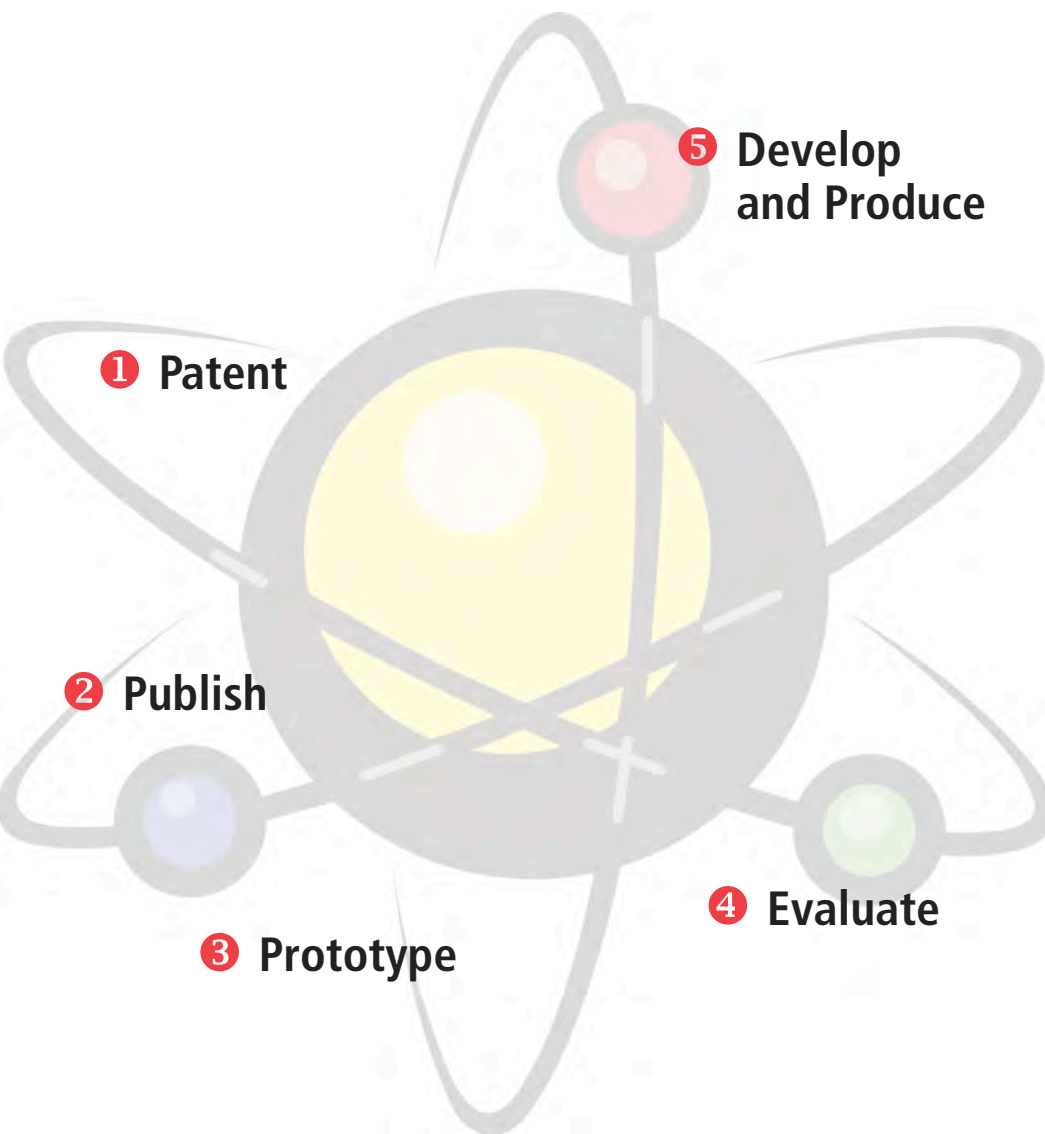
OFS Laboratories is where visionaries make voice-data-image transmission faster, clearer, more reliable and cost-effective. With one of the brightest teams in the industry, OFS Laboratories is a world-class reservoir of knowledge in the physical sciences. Through research—in optical and waveguide physics, materials processing, periodic structures, photonics and non-linear fiber physics—our scientists advance technology and create practical solutions in geophysics, industrial processing, medicine, aviation, transportation, and many other applications.

Our mission is more than words and more than science—it's an ingrained culture for nurturing scientific concepts, patenting our unique ideas, and vigorously defending our extensive patent portfolio, which was born of our roots in Bell Labs and continues to grow each year. No traditional think-tank, OFS Laboratories takes scientific discovery one important step further: into commercial success. In fact, many OFS products have been the result of our ultimate goal to expand scientific knowledge and use that knowledge and our customers' feedback to create products with the features they need. Our tremendously successful system for accomplishing this involves following a rigorous 5-step model:

For more information on how you can have these steps customized to benefit your potential application, please call us. We frequently look for partners with a novel application early in the process to help guide the development of our ideas into commercially viable products.



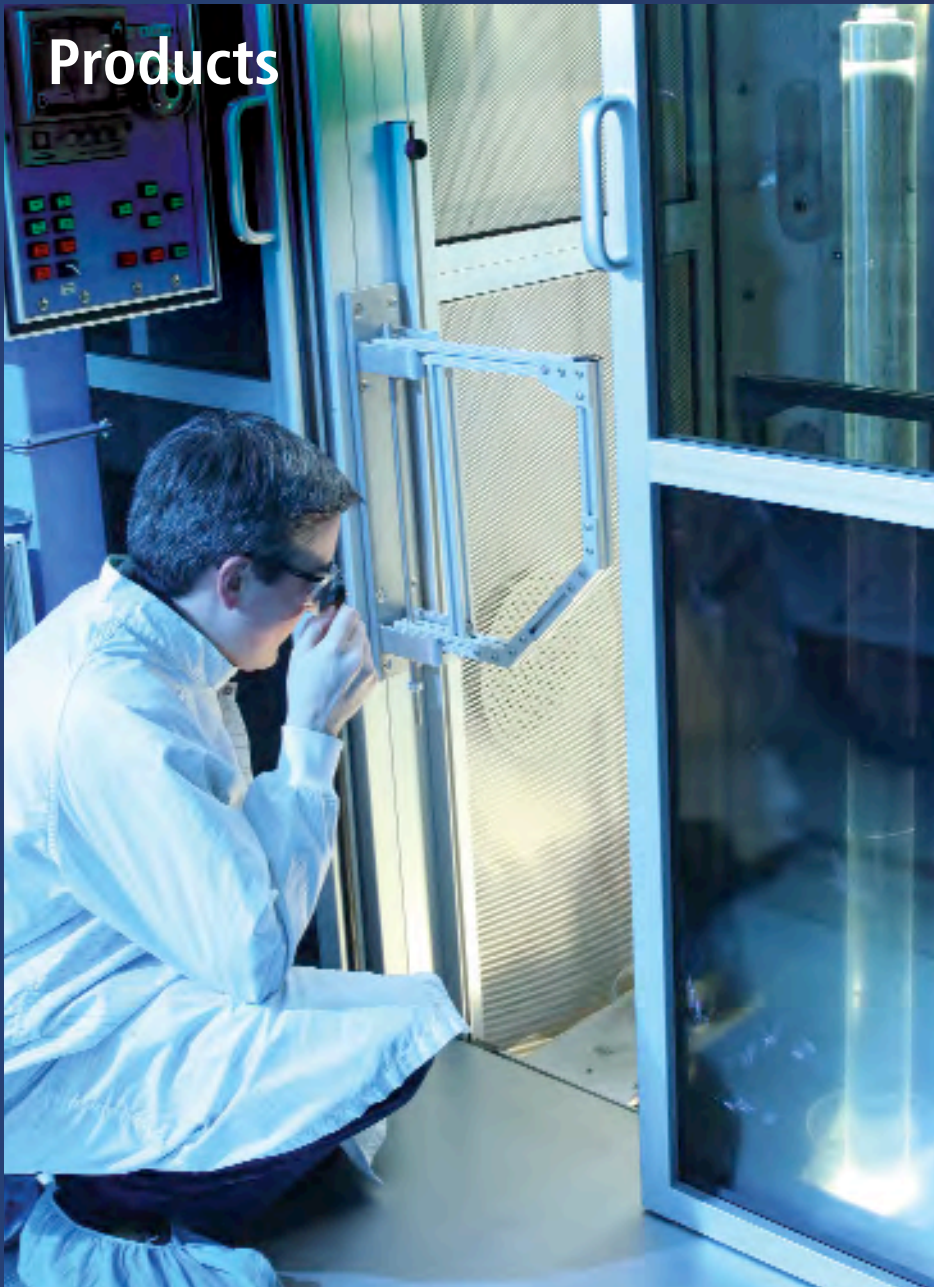
Bringing Ideas to Market



5-Step Model

No traditional think-tank,
OFS Laboratories takes
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Products



Fiber

OFS designs and manufactures high-performance fibers offering superior performance and reliability. Working with our global cable partners, OFS helps end-users to reach increased capacity for video, voice and data transmission. For applications with unique requirements beyond long distance and high speed, OFS Specialty Photonics Division provides added-value optical fiber solutions for specialty applications.

Single-Mode Fibers

OFS' metropolitan and access fiber solutions, including AllWave® *FLEX* fiber, the industry's first Zero Water Peak bend-optimized fibers, 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, we offer nonzero dispersion fibers to support continued bandwidth growth. If the need is for a cost-effective long haul network, Raman-optimized TrueWave® Low Water Peak fibers can efficiently carry a network from hundreds to thousands of kilometers. And we offer a range of ocean fibers for continent-to-continent as well as medium and shorter distance submarine connections.

Multimode Fibers

OFS offers graded-index multimode fibers in a variety of core diameters and bandwidth options to support a wide range of short-reach LAN, Central Office, and Data Center applications. Our LaserWave® laser-optimized fibers, including the first OM3 fiber in the industry, cost-effectively support enterprise networks up to 10 Gb/s. DMD-controlled to provide optimum performance with laser sources, they are designed and manufactured to a carefully controlled refractive index profile to achieve low attenuation, high bandwidth and longer link distances. The superior geometry of OFS multimode fiber results in easier cabling and better connector and transceiver coupling performance.

Specialty Fibers

OFS Specialty Photonics Division offers a broad range of standard and custom specialty optical fibers. Specialty multi-mode fibers include products using our hermetic carbon coating expertise, as well as HCS® and PYROCOAT® brand technologies. Specialty single mode fibers include polarization maintaining fibers, erbium-doped fibers, and cladding pumped and Large Mode Area fibers doped with various rare earth elements, such as Erbium, Ytterbium, and Erbium/Ytterbium. OFS Specialty Photonics is the industry leader in fiber design or modification for highly customized applications.

FTTX

*What's the **X** in your FTTX?*

From the Head End/Central Office to the home, business or Multiple Dwelling Unit, OFS can fiber-connect your community. Our FOX™ (Fiber-to-the-X) Solution helps service providers achieve maximum performance and reliability for deployments in a broad range of environments. We can also optimize network designs, facilitate MDU projects, and provide ground-breaking fiber management systems to worldwide customers eager to meet their customers' most demanding needs.

FOX Solution™

A comprehensive, end-to-end solution that helps achieve maximum return on investment (ROI) for Fiber-To-The-Subscriber (FTTX) deployments and supports HDTV, video on demand, online gaming, and many other revenue-generating services.

V-Linx™ Spool & Play Solution

Designed to address the varying conditions in MDU deployments, the V-Linx Solution is the right choice for dense, multi-floor units and provides components that can be flexibly configured to address diverse cabling conditions.

EZ Bend™ Optical Technology

An OFS breakthrough that allows cables to be bent to a 5 mm radius and stapled, with negligible signal loss and no degradation in video picture quality.

Slim Line™ FTTX Cable Solution

A design philosophy looking with a view toward quick and easy installation in field. All passive OSP and ISP elements are included in one solution, where individual elements are designed and optimized to fit together and handle any type of network layout.

OptiCost™ FTTX Modeling Services

The OptiCost Models included in this service analyze a series of factors or dynamics that are unique to each provider to help find the most cost-effective design.

Some of OFS' Flagship Brands

AllWave® FLEX
Zero Water Peak Fiber

EZ Bend™ Optical Technology

FITEL® Fusion Splicers

FOX Solution™

HCS® 200 µm Fiber

LaserWave® Laser-Optimized
Multimode Fiber

Slim Line™
FTTX Solution

TruePhase®
Polarization Maintaining
Fiber

TrueWave® REACH
Nonzero Dispersion Fiber
(NZDF)

Orbital™
Fiber Management System

NEW!
HCXtreme™
Optical Fiber for High Power
in Tight Bends

Products

Cable

Our innovative optical fiber cables are the result of exceptional optical fibers protected to help ensure superior performance and durability. The OFS portfolio includes a wide variety of central tube and loose tube cables. Tight buffer, armored, miniaturized, multi-fiber, and ruggedized cables are just some of the additional options available through our Specialty Photonics Division.

Totally Dry Cable

Eliminate messy gels and filling compounds and streamline the handling and installation process for outside plant (OSP) cables for higher efficiencies. These cables are available in loose tube or ribbon structures with dielectric or metallic sheath options.

Loose Tube Cable

Innovative designs increase fiber density and make deployment easy for duct, aerial (lashed and self-supporting), direct buried, and outdoor/indoor installations.

Ribbon Cable

Ribbon cables deliver the highest fiber density in the most compact cable package possible. Streamlining fiber termination can save time and money with easy mass-fusion splicing.

Drop Cable

Compact, durable, and self-supporting drop cables come in a completely dry construction. Reliable and cost-effective for the last link in the optical network, they are the ideal solution for self-supporting aerial, direct buried, and duct FTTX drop installations.

Central Tube Cable

OFS was the first optical cable manufacturer to introduce the central tube cable design, offering easy fiber access and maximum fiber density. The central tubes provide excellent optical, mechanical and environmental performance, making them suitable for a wide variety of deployments, including underground conduit and rugged direct burial.

Outdoor/Indoor Cable

Combine the flame resistance and safety features of indoor riser or plenum cable with the durability critical for OSP use. The result is a unique, dual-purpose cable that can save time and money by allowing OSP applications to flow seamlessly indoors, using a single cable and no splices.

Microcables and Blown Fiber Units

For fiber to home, business, and multiple dwelling unit deployments.

Optical Ribbon

OFS has led the industry in optical fiber ribbon technology by being the first to introduce fiber ribbons, as well as the first to introduce UV-curable acrylate material ribbons. Today's AccuRibbon® Optical Ribbons hold up to 24 colored optical fibers in a planar array, providing a high fiber density unit for use in fiber optic cabling or routing inside electronic equipment.

Premises Cable

OFS cables meet the needs of premises distribution systems in the central office, frame cabling environment, or FTTX. From a manhole splice to the Central Office (CO) frame, or from frame to frame between buildings. All OFS premises cable designs are fully qualified to industrially accepted specifications, offer outstanding performance, and easy connectivity.

Specialty Cable

These cables combine specialty optical fiber with cabling constructions that make installation or deployment easier and/or protect the fibers for long-term use in unusual or harsh environments. Simplex, zipcord, multiple fiber, armored, and other constructions are available. Various material combinations and layers of ETFE, PVC, Polyurethane, and Polyethylene are used to create cables that meet the demands of the desired application.

Connectivity

Ultimately, cables need a way to plug into your system. OFS connectivity solutions offer a wide array of products for connecting and housing fibers in an optical network. Our heritage of innovation allows us to craft products that can lower your overall network cost, enable flexibility, and enhance performance.

- **Jumpers:** *pre-connectorized cables in a wide range of cable types, including LSZH, Plenum or Riser Rated, 2-72 fiber counts.*
- **Connectors and Adapters:** *shielded or non-shielded in various connector types.*
- **Cabinets and Shelves:** *LGX frames and a full line of shelves accessorized for your fiber management system.*
- **Attenuators:** *space-saving solutions offering ease-of-cleaning options, as well as build-on varieties.*
- **Fiber Management Systems**

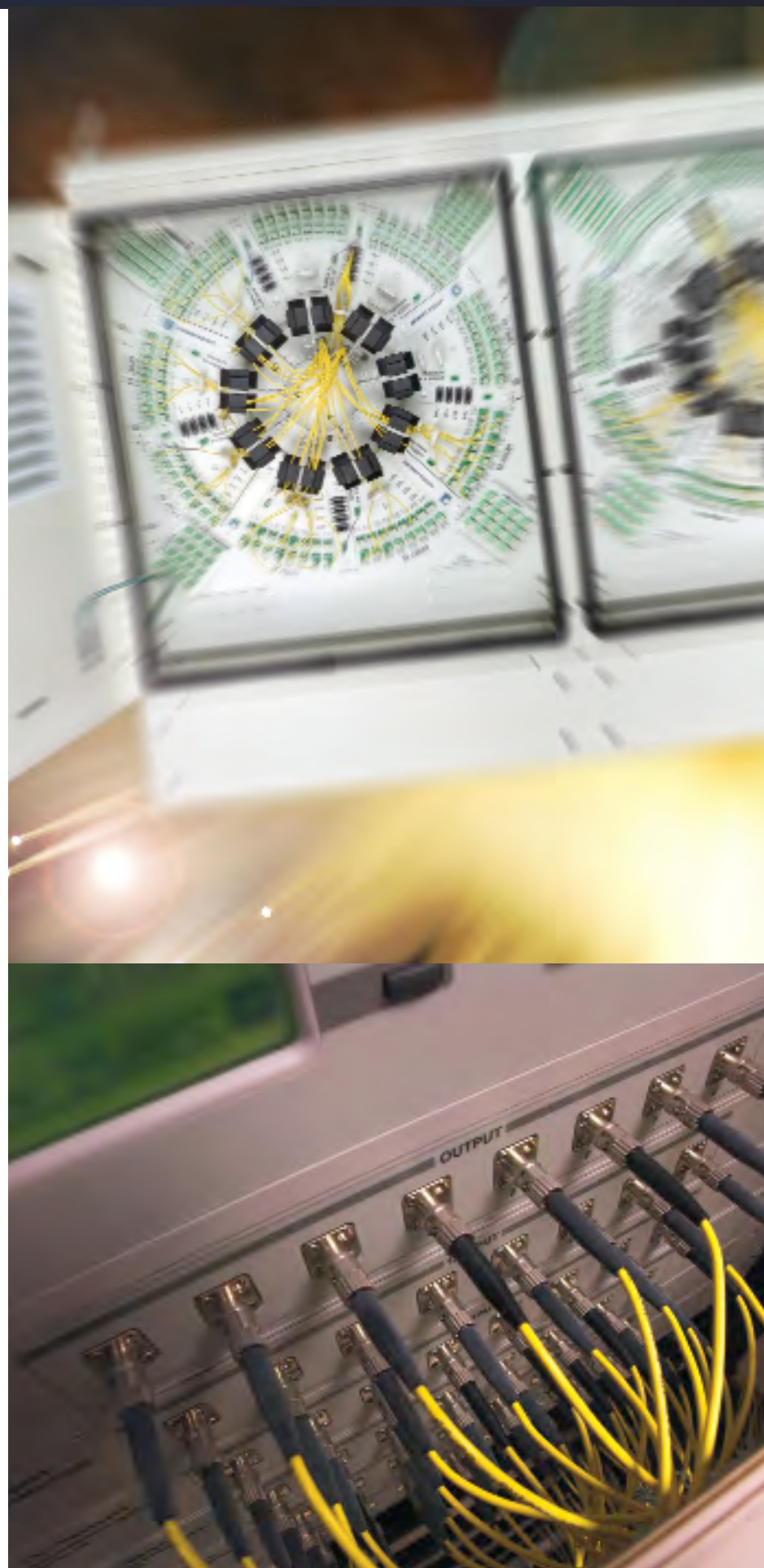
These products, coupled with our design service, enable OFS to collaborate with systems vendors and customers to develop unique connectivity and system component solutions.

Fitel® Optical Components

OFS and its Fitel brand supply off-the-shelf and custom components with industry-leading product quality and world wide resources. Whether it's a telecom, data, or CATV communications network, the strength of your overall system is only as good as its components and installation. High-quality pump lasers, optical components, connectors, and amplifiers are essential for system integrity.

Fusion Splicers

OFS provides a complete line of FITEL fusion splicers that produce highly accurate, reliable splices with minimal loss. FITEL fusion splicers are designed using state-of-the-art technology from Furukawa, decades of manufacturing experience, and feedback from countless customer installations. You'll find that FITEL splicers are simple yet precise and reliable tools that can support your full range of fiber manufacturing, R&D, installation, and maintenance applications.



Products



Dispersion Slope Compensating Modules (DSCMs)

Telecommunications use of specialty optical fibers and trends toward longer distances, higher bandwidths, and higher data rates have also necessitated the use of Dispersion Slope Compensating Modules. DSCMs compensate for various types of chromatic dispersion accumulated throughout long-distance systems operating over the C- and L-Band wavelengths. OFS offers a full line of fixed broadband, reconfigurable, and tunable colorless modules, including FemtoComp modules for ultra-short pulse lasers to address difficult-to-match third- and fourth-order dispersions.

See the full range of possibilities at:

www.SpecialtyPhotonics.com



Specialty Photonics

OFS' in-house custom shop, the Specialty Photonics Division, is the industry leader in optical fiber design and manufacturing for highly customized applications. It develops focused fiber solutions — the right fibers, cables, and other specialty products — to meet unique needs for fiber optics.

Advanced optical fibers can include multimode (MM) and single-mode (SM) fibers with a variety of core and cladding sizes, operating wavelengths, numerical apertures (NA), and coatings. These features optimize fiber performance in a specific application and are often designed in response to a customer request. Some examples include: coating a SM fiber to increase its strength and temperature range for missile payout; designing a large-core MM fiber to withstand the tight bends in medical laser delivery; or fabricating a polarization maintaining (PM) fiber with a reduced diameter and high NA to perform well in interferometric sensing coils.

Growth in the telecommunications industry created a large demand for specialties such as erbium-doped fibers, coupler fibers, 980 nm PM fibers for pump laser pigtails and 1550 nm PM fibers for lithium niobate modulators and switches. We make these for telecom use and also apply the technology in new markets. From work in rare earth doped fibers for telecom amplifiers came double-clad fibers which are now used in medical devices, material processing, micromachining, and high-power military applications.

National security initiatives have also advanced specialty fiber development. The military is increasingly using high-speed communication systems on its aircraft, meaning optical fibers must be telecom quality — but tougher. They must pass vibration, shock, wide-temperature requirements

and a host of other test criteria. For port security, fiber optic acoustic sensors are towed behind submarines, mounted on a ship's hull, or laid on the ocean floor. Sensing fibers may employ fiber gratings or specialty coatings that allow them to react to the presence of chemical and biological warfare agents. These types of sensors have further applications in medicine, such as for blood gas sensing. In geophysical environments, carbon- and polyimide-coated fibers provide hermetic protection and high-temp performance for distributed temperature and strain sensors deployed down-hole.



Applications



Talk with our scientists at OFS Laboratories.

Your application could be the next unique thing.

It is no longer possible to put a limit on the industries or individual applications in which fiber optics can be used to optimize a system. Everyone knows **Telecommunications**, and even within that industry, new applications are being developed all the time, such as Tunable Dispersion Compensation to maximize distance, 40+ Gb/s systems to maximize bandwidth, and the growing **FTTX** applications segment.

Medicine uses fiber optic solutions for high-power laser delivery, sensing, illumination, surgery, and more.

The **Geophysical** industry has found fiber optics to be indispensable in its oil well development technologies.

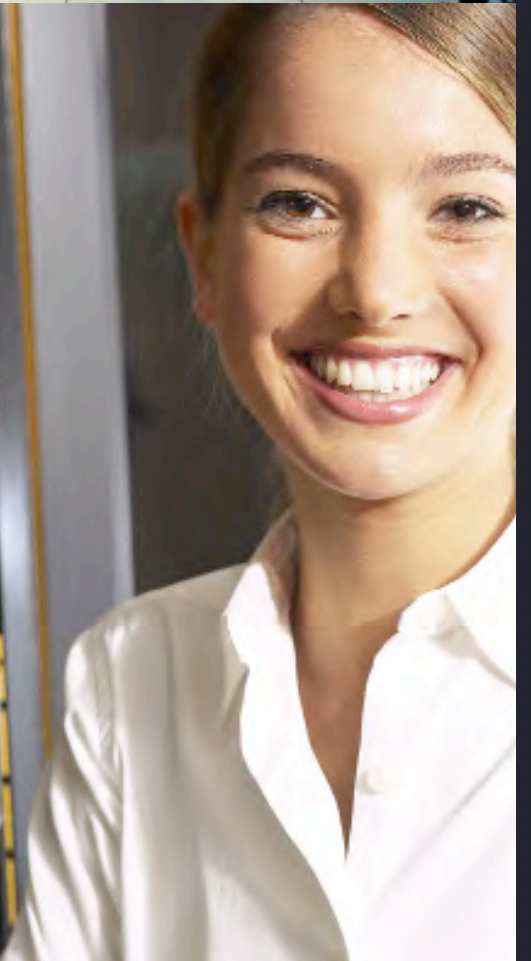
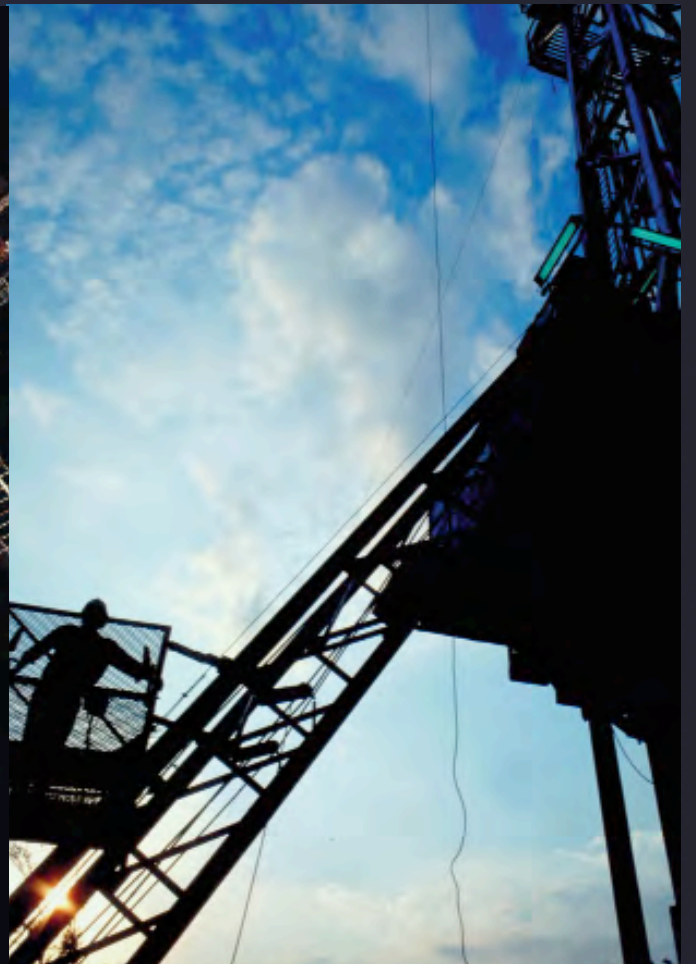
Heavy Industry uses optical fibers to control its robots, transmit its data, weld its materials.

The **Military** uses specialty optical fibers to help guide its planes, deflect missiles, detect threats, communicate during the noise of war.

In **Transportation**, high-speed trains are able to communicate with base stations through extreme levels of radio frequency and electromagnetic interference simply by using fiber optics inherently immune to EMI/RFI. Shipboard controls enter the communication age with fiber optic cables installed on board. Airplanes and spacecraft navigate safely with fiber optic gyroscopes.

Environmental applications employ fiber optics to control windmills, and measure temperature and various gases.

These are just some of the places you'll already find OFS optical fibers. Talk with us.



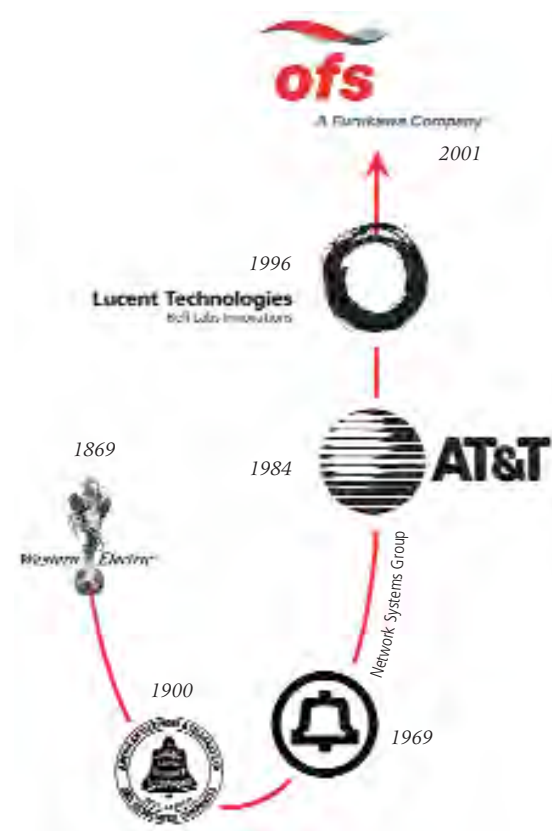
Active in the Industry



Stability, Reliability, Resources

When customers can find exactly the fiber optic products they need from one vertically integrated company and be confident they have a reliable supplier who will meet their needs now and in the future, we call that an ideal situation. OFS, together with its parent company, the Furukawa Electric Company, Ltd., has the history, the worldwide presence, and the financial and scientific resources to offer that confidence. We do everything possible to understand our customers' needs and then meet and exceed their expectations every time.

OFS Corporate Heritage



Corporate lineage dating back to 1869

Global Reach



OFS Facilities Worldwide

Leadership

OFS takes seriously its leadership role as a steward for industry change, viability, and innovation. Our professional memberships show the breadth of this commitment:

- ITU
- IEC
- TIA
- IEEE
- FTTH Council
- SAE
Fiber Optics Subcommittee
Wire and Cable Subcommittee
- POFTO
(Plastic Optical Fiber Trade
Organization)
- OSA
(Optical Society of America)
- SPIE

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