

Corning® Vascade® Optical Fibers

Product Information

CORNING
Discovering Beyond Imagination

Optical
Fiber

1970

Corning invents the first low-loss optical fiber

Corning invents vapor deposition for fiber manufacturing

Corning is first to achieve attenuation at 1550 nm of 0.2 dB/km

Corning introduces first dispersion-shifted terrestrial optical fiber

Corning is first to be fully compliant with global standards for fiber-optic test procedures

Corning introduces Submarine LEAF® (Vascade® LEAF®) optical fiber

Corning introduces Vascade® family of submarine optical fibers

More than 1 million kilometers of Corning submarine fiber have been installed worldwide

Corning introduces Vascade® EX1000 optical fiber

today

Customized Solutions for Maximum Performance and Reliability

Corning's Vascade® family of submarine optical fibers provide high-speed, high-capacity solutions for transoceanic and short-haul submarine networks, guaranteeing the performance and reliability necessary in the harsh undersea environment.

Submarine systems, from unrepeated systems spanning a few hundred kilometers to repeated networks spanning the world's oceans, demand the most advanced optical technologies. Each Vascade fiber has a unique optical profile to allow customized system solutions, however, they all share the fundamental characteristics inherent to Corning's submarine fibers: high mechanical reliability, high optical stability, and matched and managed optical properties.

In addition to individual Vascade fibers, Corning also offers customized Vascade fiber solutions with coloring and splicing options.

High Mechanical Reliability

Submarine fiber-optic cables experience high tension during deployment and recovery from the ocean floor. With this in mind, every Vascade fiber is subjected to 1.38 GN/m² (~200 kpsi) proof test, double that of the typical terrestrial fiber. In addition, Corning has dedicated manufacturing and processing lines reserved especially for Vascade fibers. Corning's patented manufacturing process ensures high-quality fibers that offer maximum performance and economic advantage for your network. Vascade fibers are colored and spliced in a clean room environment and receive additional strength testing to ensure the fiber's long-term reliability.

Comprehensive Fiber Data

Corning Vascade fibers come with an unparalleled wealth of measured data. Corning's state-of-the-art measurement systems allow us to provide a comprehensive fiber data package for every spliced and unspliced spool of fiber.

Coloring Options

To meet the unique requirements of each submarine network, all Vascade fibers can be supplied in different colors.

Individual Vascade® Optical Fibers

Vascade® L1000 Fiber

A large effective area fiber, Vascade L1000 has applications in both repeatered and unrepeatered submarine systems. In unrepeatered systems, Vascade L1000 fiber's large effective area design allows for launching higher optical power in the fiber without significant non-linear penalties, as a result Vascade L1000 fiber can offer longer reach and higher capacity.

Vascade® LS+ Fiber

Vascade LS+ fiber is a non-zero dispersion shifted fiber (NZ-DSF) with negative dispersion and low positive dispersion slope that is optimal for medium distances and wide band wavelength division multiplexed (WDM) systems. Optimal dispersion across the entire C-band enables effective dispersion compensation and suppresses non-linear impairments. With low attenuation, dispersion slope, and bend loss, Vascade LS+ fiber delivers high-quality performance.

Vascade® LEAF® Fiber

Vascade LEAF fiber, an NZ-DSF with negative dispersion and positive dispersion slope, offers the advantages of a large effective area; 40 percent larger than typical NZ-DSFs; which increases the amount of optical power the fiber can carry without significant non-linear effects. Like Vascade LS+ fiber, Vascade LEAF fiber is designed to ensure that it can operate over the entire C-band while suppressing non-linear effects.

Corning® Optical Fiber – The Measure of Trust

Corning's Service Advantage

Corning Optical Fiber delivers the world's most comprehensive package of innovative products and services, including:

- * Worldwide sales support and door-to-door customer service
- * Full range of fibers and special order capabilities
- * Specialized support from technical experts
- * Extensive fiber delivery capabilities with proven success rates
- * Real-time, Web-based customer information
- * Dedicated account support for our long-term supply customers
- * Fiber support services and technical information for end-customers

At Corning Optical Fiber, we strive to provide the best possible customer service and technical support – before, during and after the sale. As a customer, you'll benefit from our established and extensive support infrastructure that's ready to meet your specific needs.

Corning's Product Advantage

Our state-of-the-art, dual acrylate CPC® coatings provide excellent mechanical protection and handleability. Designed to be mechanically strippable, CPC coatings are optimized for many different cable designs.

Corning is committed to product excellence and meeting the evolving needs of our customers. As updates to fiber characteristics or performance specifications become available, they will be posted on the Corning Optical Fiber website at www.corning.com/opticalfiber.

Vascade® S1000 Fiber

Vascade S1000 fiber is Corning's first dispersion and dispersion slope compensation fiber designed for use in optical transmission cables. It has dispersion designed specifically to match and compensate the dispersion characteristics of Vascade L1000 fiber. Together these fibers are offered as a dispersion managed solution, Vascade® R1000.

Vascade® EX1000 Fiber

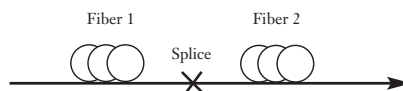
Vascade EX1000, an ITU-T G.654-compliant fiber, is the latest addition to Corning's Vascade family. The key attribute to Vascade EX1000 fiber is its ultra low attenuation designed to increase reach and reduce network complexity. Vascade EX1000 is the best solution for long (up to 400 km) and ultra-long (> 400 km) unrepeated submarine systems that need low attenuation characteristics compared to single-mode fiber. In repeated systems, the low attenuation of Vascade EX1000 fiber allows network designers to consider extended lengths of positive dispersion compensation spans and/or low-loss dispersion management solutions.

Typical values at 1550 nm

	Vascade® L1000 Fiber	Vascade® LS+ Fiber	Vascade® LEAF® Fiber	Vascade® S1000 Fiber	Vascade® EX1000 Fiber
Description	A high positive dispersion fiber with large effective area	A negative dispersion, non-zero dispersion shifted fiber (NZ-DSF) with low, positive dispersion slope	A negative dispersion, NZ-DSF with large effective area and positive dispersion slope	A high negative dispersion fiber with negative slope, paired with Vascade L1000 fiber to create a dispersion-managed fiber solution	An ultra low loss fiber
Attenuation (dB/km)	0.187	0.20	0.21	0.24	≤0.174
Dispersion (ps/nm*km)	+18.5	-3.0	-4.0	-37.0	+18.5
Dispersion slope (ps/nm²*km)	+0.06	+0.05	+0.12	-0.12	+0.06
Effective area (µm²)	101	50	70	27	76
PMDq (ps/√km)	≤0.05	≤0.05	≤0.05	≤0.06	≤0.06

Vascade® Fiber Hybrid Designs

Performance and cost optimization within submarine systems requires careful balancing of fiber attributes. Corning developed the Vascade® fiber portfolio to meet the diverse capacity/reach needs of submarine networks. By combining individual constituent fibers with unique optical and mechanical properties, Corning can meet a wide range of technical system performance specifications. Enhanced performance and cost advantages are achieved by using more than one fiber type in the fiber span as shown:



Corning's ability to match individual fibers enables precise control of local dispersion, residual dispersion, dispersion slope, attenuation, effective area and length.

<i>Vascade LEAF and Vascade LS+ fiber solution/hybrid</i>	<i>Vascade® R1000</i>
A hybrid solution for moderate and longer distance repeated systems	Dispersion-managed solution designed for long and high capacity systems, utilizing Vascade L1000 and Vascade S1000 fibers

Vascade LEAF and Vascade LS+ Fiber

Solution/Hybrid

The wider system bandwidth required to accommodate the larger number of channels on repeatered submarine systems has increased the importance of minimizing the dispersion slope to ensure good edge channel performance. Vascade LEAF fiber is used near the transmitter, where its large effective area is advantaged by the power levels. The remainder of the span uses Vascade LS+ fiber to obtain an overall span with a reduced dispersion slope (typically < 0.085 ps/nm²/km).

Vascade R1000 Fiber Solution

Corning's Vascade R1000 dispersion-managed fiber (DMF) solution combines Vascade L1000 and Vascade S1000 fibers in a single span, offering higher capacity and closer channel spacing than is possible with any other solution.

By adjusting the ratio of the constituent fibers, spans of Vascade R1000 fiber solution are manufactured to meet individual customer dispersion requirements. By careful fiber selection, Corning maintains an average dispersion slope that is typically < 0.005 ps/nm²/km when the dispersion is compensated back to zero. This is an order of magnitude better that can be achieved using traditional NZ-DSF. The same attributes that maximize system performance also significantly reduce the complexity and cost of terminal dispersion compensation and provide an ideal platform for upgrades to next generation technologies.

How to Order

Contact your sales representative, or call the Optical Fiber Customer Service Department:
Ph: 607-248-2000 (U.S. and Canada)
+44-1244-287-437 (Europe)
Email: opticalfibcs@corning.com
Please specify the fiber type, attenuation and quantity when ordering.

Corning Incorporated www.corning.com/opticalfiber

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