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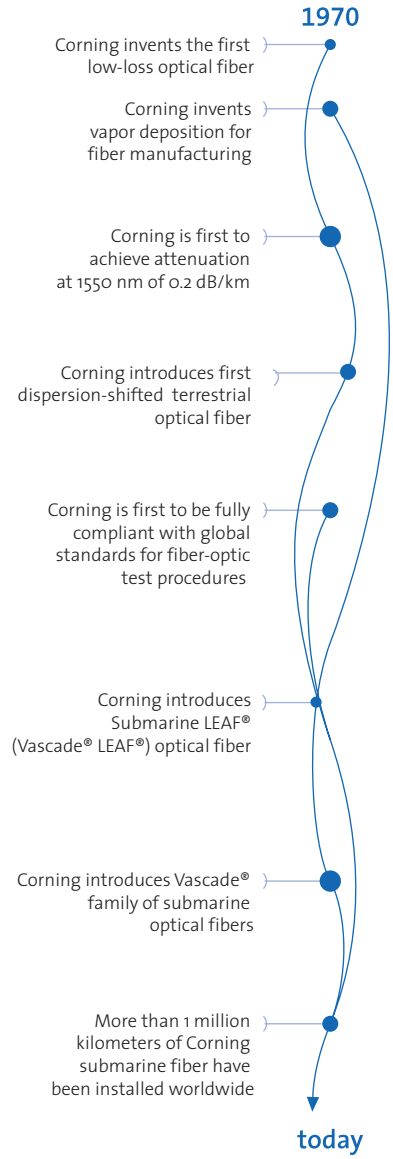
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Corning® Vascade® Optical Fiber Product Information





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 unrepeatered systems spanning a few hundred kilometers to repeatered networks spanning the world's oceans, demand the most advanced optical technologies. To address these special requirements, Corning developed the Vascade family of optical fibers. Each fiber in the Vascade portfolio has a unique optical profile to allow customized system solutions; however they all share the fundamental characteristics unique to Corning's submarine fibers: high mechanical reliability, high optical stability, matched and managed optical properties, complete characterization of every fiber, and splicing and coloring options.

In addition to offering individual Vascade fibers, Corning also offers customized Vascade fiber solutions, or spliced combinations of individual fibers.

High Mechanical Reliability

Submarine fiber-optic cables experience uniquely high tensions during deployment and recovery from the ocean floor. With this in mind, every Vascade fiber is subjected to 1.38 GN/m^2 (~200 kpsi) proof test, double that of the typical terrestrial fiber. In addition, dedicated manufacturing and processing lines are reserved 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 fibers' long-term reliability.

PI1445 | Issued: January 2005 | Supersedes: June 2003 | ISO 9001 Registered

Complete Characterization

Corning Vascade fibers come with an unparalleled wealth of measured data on the final product. All critical optical parameters are fully characterized and reported for the system's operating band. For example, Corning's state-of-the-art measurement systems allow us to provide a comprehensive fiber data package for every spool of fiber.

Coloring Options

To meet the unique requirements of each submarine network, all Vascade fibers can be supplied either uncolored, or in one of 16 colors.

Vascade Optical Fibers

Typical values at 1550 nm

	Vascade® L1000 Fiber	Vascade® LS+ Fiber	Vascade LEAF® Fiber	Vascade® S1000 Fiber
Description	A high positive dispersion fiber with large effective area and very low loss	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
Attenuation (dB/km)	0.187	0.20	0.21	0.24
Dispersion (ps/nm/km)	+18.5	-3	-4	-37
Dispersion slope ($ps/nm^2/km$)	+0.06	+0.05	+0.12	-0.12
Effective area (μm^2)	101	50	70	27
PMD ($ps/\sqrt{km}$)	≤0.06	≤0.06	≤0.06	≤0.06

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 enhanced, dual acrylate CPC® coatings provide excellent protection. Designed to be mechanically strippable, with an outside diameter of 250 µm, they are optimized for many single- and multi-fiber cable designs, including loose tube.

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 L1000 Fiber

As a low-loss, high effective area fiber, Vascade L1000 fiber has applications in both repeatered and unrepeatered submarine systems. When used in unrepeatered systems, Vascade L1000 fiber's combination of high effective area and high dispersion maximizes the information-carrying capacity of the network by increasing the amount of optical power that can be launched into the fiber without incurring heavy non-linear penalties. This higher launch power, coupled with the fiber's low attenuation, means Vascade L1000 fiber offers longer reach and higher capacity.

In repeatered systems, Vascade L1000 can be used as a cost-effective fiber for the periodic in-line dispersion compensation that is typically required.

Vascade LS+ Fiber

Vascade LS+ fiber is an NZ-DSF with negative dispersion and low positive dispersion slope that is optimal for medium distance, wide bandwidth wavelength division multiplexed (WDM) systems. Its design ensures the non-linear impairments induced by zero dispersion are suppressed across the entire C-band. 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 to maximize system information-carrying capacity. The large effective area, 40 percent larger than typical NZ-DSFs, increases the amount of optical power the fiber can carry without susceptibility to 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.

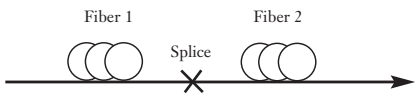
Vascade S1000 Fiber

Vascade S1000 fiber is Corning's first dispersion and dispersion slope compensation fiber designed for use in optical transmission cables. It has high negative dispersion and negative dispersion slope, and is sold with Vascade L1000 fiber as a dispersion-managed fiber solution.

Vascade Fiber Hybrid Designs

Performance and cost optimization within submarine systems requires careful balancing of fiber attenuation, bend performance, effective area, dispersion and dispersion slope. Unfortunately, these critical parameters often compete with one another during the design and manufacture of optical fiber. For each unique network, Corning's submarine team will work closely with system engineers to design the best configuration of Vascade fibers and fiber solutions for the network.

Enhanced performance and cost advantages can often be achieved by using more than one fiber type in the fiber span as shown:



Building optimized spans by splicing different fiber types together gives flexibility to the system designer and allows performance and overall cost optimization. Corning's ability to match individual fibers enables precise control of local dispersion, residual dispersion, dispersion slope, attenuation, effective area and length.

Vascade LEAF and Vascade LS+ fiber solution/hybrid	*Vascade® R1000 fiber*
A hybrid solution for moderate and longer distance repeatered systems	A dispersion-managed solution specifically designed for the longest and highest 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/nm^2/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/nm^2/km when the dispersion is compensated back to zero. This is an order of magnitude better than can be achieved using traditional NZ-DSF. These 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.

Corning offers a full line submarine products to meet the high-speed, high-capacity needs of undersea networks.

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
One Riverfront Plaza
Corning, NY 14831
U.S.A.

Ph: 800-525-2524 (U.S. and Canada)
607-786-8125 (International)

Fx: 800-539-3632 (U.S. and Canada)
607-786-8344 (International)

Email: cofic@corning.com

Europe

Ph: 00 800 6620 6621 (U.K., Ireland, Italy, France, Germany, The Netherlands, Spain and Sweden)
+1 607 786 8125 (All other countries)

Fx: +1 607 786 8344

Asia Pacific

Australia
Ph: 1-800-148-690
Fx: 1-800-148-568

Indonesia
Ph: 001-803-015-721-1261
Fx: 001-803-015-721-1262

Malaysia
Ph: 1-800-80-3156
Fx: 1-800-80-3155

Philippines
Ph: 1-800-1-116-0338
Fx: 1-800-1-116-0339

Singapore
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Fx: 001-800-1-3-721-1264

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Mexico
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Ph: 800-1-4418
Fx: 800-1-4419

Greater China

Email: GCCofic@corning.com

Beijing
Ph: (86) 10-6505-5066
Fx: (86) 10-6505-5077

Hong Kong
Ph: (852) 2807-2723
Fx: (852) 2807-2152

Shanghai
Ph: (86) 21-5467-4666
Fx: (86) 21-5407-5173

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