SMF-28® Contour fiber

The shape of things to come.

The ideas that flow over the communication networks of today, drive the modern world and allow us to make human connections, even when separated by distance. The need for effective delivery of communication networks has never been greater, as bandwidth demands from users grow and the services connected to communication infrastructures increase in diversity. The principle drivers of efficiency in networks are; the reduction of errors in installation and operation and the efficient use of the existing infrastructure during upgrades. Optical fiber is a fundamental component of signal transport in the network and it must support delivery of these efficiencies.

Reducing errors in operation and installation and allowing the effective use of infrastructure means that fibers must have a combination of features that support these goals. There can be no compromise in any one feature, without compromise in network efficiency. Furthermore, the fiber must be standards compliant to provide assurance of interoperability across the network.

Corning's SMF-28® Contour fiber delivers on all the features needed to increase network efficiency and reduce network errors, without compromise.

Fiber requirements for efficient operation

Bend in the network will often occur during installation creating expensive remedial work in repair. Signal loss will occur when a fiber is bent to less than a specified minimum bend diameter. In standard ITU-T G.652.D fiber, this occurs for bends less than 30 mm in radius. The loss is higher at longer wavelengths of transmission. Many of the advanced network technologies being installed in networks today, and under consideration for the future, use these longer wavelengths. Furthermore, automatic network monitoring systems used to support operations, use the longest wavelengths of transmission between 1625 and 1650 nm. A bend resilient fiber can increase network efficiency by accommodating varying levels of field craft in installations and tolerance of human error.

Corning's SMF-28® Contour fiber is an ITU-T G.657.A2 fiber and has a minimum bend radius of 7.5 mm. The minimum bend radius of SMF-28® Contour fiber is reduced by 75%, compared with standard G.652.D fibers. Under bend, the loss incurred will be up to 10 times less than a standard fiber. Consequently, at long wavelengths, SMF-28® Contour fiber will protect up to twice the network reach of a link under bend, compared to a standard ITU-T G.652.D fiber.

Low-loss fibers will support extended reach and capture more of the potential customer base. This low loss must be across a wide spectrum of transmission, to support high bandwidth systems with many wavelengths at high bit rates in the communication channel. A bend resilient fiber will protect this optical performance and avoid link failures resulting from increased loss, in the presence of bend, within the network.

Corning's SMF-28® Contour fiber has an industry leading low loss across all the wavelengths of interest in communication systems, delivering 10% longer reach and 20% greater coverage for customer capture. Transmission within the fiber is bend protected by an ITU-T G.657.A2 bend resilience, low loss and wide spectrum of transmission, making it ideal for networks of today and tomorrow.

Fiber Requirements for Installation

Most of the legacy fiber installed in networks today has a 9.2 μm mode field diameter. The mode field diameter is the region in which the light is contained within the fiber. Significant splice and measurement error can occur if mode field diameters are mismatched. This issue becomes worse in the case where mass fusion splicing is used, where a fiber misalignment in conjunction with a mode field diameter mismatch will result in elevated splice losses and a wider distribution of splice loss results. Time and money are spent in remedial work to investigate ambiguous test results and high splice loss. This is avoided if the mode field diameters of fibers at either side of the splice are matched. The fiber must be compatible with existing fibers within the network for efficiencies in splice, connection and test in upgrades.

Corning's SMF-28® Contour fiber has a 9.2 μm mode field diameter, matched to most legacy fibers installed in networks. Consequently, it delivers up to 75% increase in splice yield on test and up to 50% of time saved in installation by the avoidance of remedial work.

Many ITU-T G.657.A2 fibers provide bend protection with a compromised, lower mode field diameter that is mismatched to legacy fibers, already installed in the network. SMF-28® Contour fiber does not compromise on either of these features and provides both bend and a compatible mode field diameter in the same product.

Fiber requirements for efficient use of infrastructure

As connections increase within networks, the space available for installation remains the same. Consequently, the ability to increase the fiber in cable density has value by allowing greater duct space utilization.

Low outer diameter fiber options must be available to provide even greater density of fiber in cable which allows more connections in a constrained space and the ability to use low-cost deployment techniques for even greater installation efficiency. Smaller cables are often lighter, and can take advantage of high-speed installation techniques, easier handling and lower freight costs.

Corning's SMF-28® Contour fiber has both 242 μm and 190 μm outer diameter options. The 190 μm outer diameter option provides a 40% cross sectional area reduction, compared to a 242 μm fiber. This provides opportunities for cable designs that deliver an increased fiber count for a given duct size, or a smaller cable for the same fiber count, allowing the use of smaller ducts.

In dense cable designs the fiber can experience microbend. Microbend results from small perturbations on the surface of the fiber and results in higher attenuation in the cabled fiber that is particularly apparent at low temperatures.

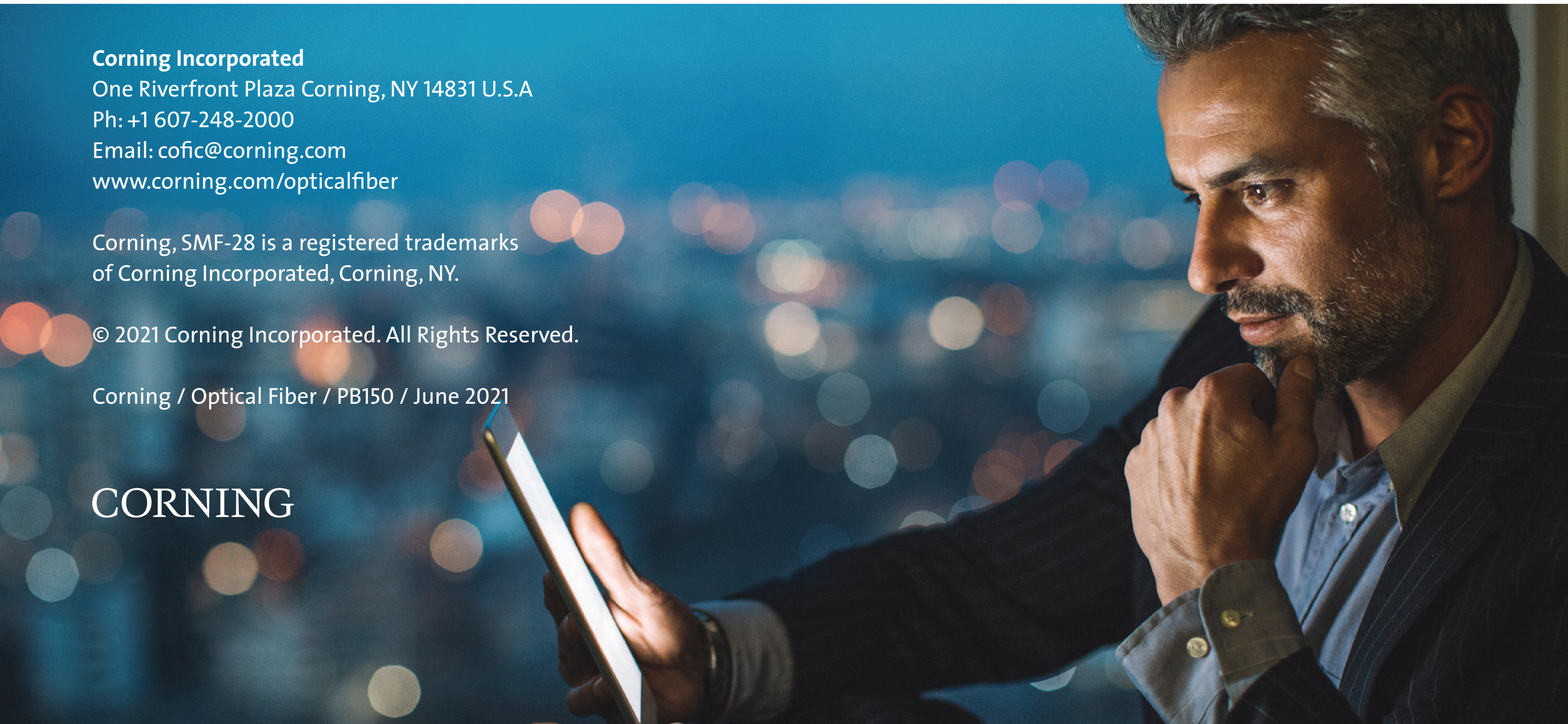
Corning's SMF-28® Contour fiber has greater bend resilience conforming to the ITU-T G.657.A2 specification. In a 190 μm outer diameter option, it has been shown to deliver a 75% reduction in microbend induced attenuation in dense cable designs, compared to our SMF-28® Ultra 200 fiber. The increase in bend resilience and reduction in fiber outer diameter make SMF-28® Contour fiber, with a 190 μm outer diameter option, an ideal candidate fiber for the highest density cable applications.

Conclusion

Networks are quickly evolving to support our rapidly changing world. Corning introduced the first low-loss fiber in 1970, continuing our history of innovations in optical communications, Corning introduces SMF-28® Contour optical fiber. With a first-of-its-kind combination of ITU-T G.657.A2 bend resilience, 9.2-micron mode field diameter, and industry-leading low loss, this optical fiber brings more bend, and more reach, in more places. Thanks to SMF-28® Contour fiber, the future of communication, connection, and progress will be led by Corning and SMF-28® Contour fiber will shape it.

Key Specifications

Attribute	SMF-28® Contour fiber	ITU-T G.652.D	ITU-T G.657.A2
Attenuation @ 1310 nm	≤ 0.32 dB/km	0.40 dB/km	0.40 dB/km
Attenuation @ 1383 ± 3 nm	≤ 0.32 dB/km	0.40 dB/km	0.40 dB/km
Attenuation @ 1550 nm	≤ 0.18 dB/km	0.30 dB/km	0.30 dB/km
Attenuation @ 1625 nm	≤ 0.20 dB/km	0.40 dB/km	0.40 dB/km
Macrobend Loss, 1 turn x 7.5 mm radius @ 1550 nm	≤ 0.5 dB	Not specified	≤ 0.5 dB
Macrobend Loss, 1 turn x 7.5 mm radius @ 1625 nm	≤ 1.0 dB	Not specified	≤ 1.0 dB
Macrobend Loss, 1 turn x 10 mm radius @ 1550 nm	≤ 0.1 dB	Not specified	≤ 0.1 dB
Macrobend Loss, 1 turn x 10 mm radius @ 1625 nm	≤ 0.2 dB	Not specified	≤ 0.2 dB
Macrobend Loss, 10 turns x 15 mm radius @ 1550 nm	≤ 0.03 dB	Not specified	≤ 0.03 dB
Macrobend Loss, 10 turns x 15 mm radius @ 1625 nm	≤ 0.1 dB	Not specified	≤ 0.1 dB
Mode Field Diameter @ 1310 nm	9.2 ± 0.4 μm	8.6-9.2 ± 0.4 μm	8.6-9.2 ± 0.4 μm



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