Overview

BendBright™ A1 fiber encompasses all the features of ESMF™ Optical Fiber (Enhanced Single-Mode Fiber) and provides high resistance to additional losses due to macro-bending, particularly in the 1600 nm wavelength region.

This fiber can be used in all cable constructions, including loose tube, tight buffered, ribbon, and central tube designs. It supports long-haul, metropolitan and in particular access and premises (FTTH) applications in telecommunications, CATV, utility and intelligent traffic networks.

Opening the transmission window up to the highest wavelength region in the L-band has challenged traditional fiber macro-bending performance. BendBright™ meets and exceeds the challenge.

The fibers are further enhanced with the proprietary ColorLock™ coating. This coating enables optimum fiber performance, reliability and durability, even in harsh environments.


Features and Benefits

Low bending losses
- Up to 1/10th the bending loss of standard single mode fiber provides improved system performance.
- Low bending loss at 15 mm bend radius; 10 turn loss ≤ 0.25 dB at 1550 nm
- Specified down to a 10 mm bend radius; 1 turn loss ≤ 0.75 dB at 1550 nm
- Allows a smaller bend radius with small diameter cables such as patch cords and distribution cables.
- Improperly installed small diameter bends result in lower attenuation impacts on systems.
- Allow the use of smaller splice trays or closures.
- Provides lower bending losses at higher wavelengths such as 1625 nm which future proofs the network.
- Improves temperature cycling and mid-span express tube routing loss performance providing long-term attenuation stability.

Lower PMD of 0.06 ps/√km Link Design Value
- Extends the PMD distance performance, reducing regeneration costs.

Improved Geometrical Parameters
- Low splice loss and high splice yield.

Proprietary APVD™ Manufacturing Process
- Superior geometry, uniformity and purity.

Revolutionary ColorLock™ Coating Process
- Increased reliability, durability, and superior aging performance, resulting in lower maintenance and replacement costs. Makes color a component of the coating, thus enhancing fiber identification and colored fiber reliability. Consistent, vibrant color for ease-of-use and flexibility.
**BendBright™ A1 Single-Mode Optical Fiber - North America**

### Performance Specifications (Uncabled Fiber)

#### Maximum Attenuation (dB/km)*

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>Attenuation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>@ 1310</td>
<td>0.34</td>
</tr>
<tr>
<td>@ 1383 **</td>
<td>0.31 – 0.34</td>
</tr>
<tr>
<td>@ 1490</td>
<td>0.24</td>
</tr>
<tr>
<td>@ 1550</td>
<td>0.20</td>
</tr>
<tr>
<td>@ 1625</td>
<td>0.23</td>
</tr>
</tbody>
</table>

* Other values on request.

** Including H2-aging according to IEC 60793-2-50, type B.1.3.

#### Attenuation vs. Wavelength

- 1285 nm to 1330 nm: $\alpha_{1330} \leq 0.03$ dB/km
- 1525 nm to 1575 nm: $\alpha_{1575} \leq 0.02$ dB/km

#### Point Discontinuities

No point discontinuity greater than 0.05 dB at 1310 nm and 1550 nm

#### Attenuation with Bending

<table>
<thead>
<tr>
<th>Mandrel Radius (mm)</th>
<th>Number of Turns</th>
<th>Wavelength (nm)</th>
<th>Attenuation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1</td>
<td>1550</td>
<td>0.75</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>1625</td>
<td>1.5</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>1550</td>
<td>0.25</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>1625</td>
<td>1.0</td>
</tr>
</tbody>
</table>

#### Cutoff Wavelength

- Cable Cutoff Wavelength ($\lambda_{ccf}$) ≤ 1260 nm

#### Mode Field Diameter

- 1310 nm: 9.2 ± 0.4 μm
- 1550 nm: 10.4 ± 0.5 μm

#### Chromatic Dispersion

- 1285-1330 nm: ≤ |B| ps/(nm*km)
- 1550 nm: ≤ 18.0 ps/(nm*km)
- 1625 nm: ≤ 22.0 ps/(nm*km)
- Zero Dispersion Wavelength ($\lambda_o$): 1304-1324 nm
- Slope (So) at $\lambda_o$: ≤ 0.092 ps/(nm²*km)

#### Polarization Mode Dispersion (PMD)

- PMD Link Design Value**: ≤ 0.06 ps/V/km
- Max. Individual Fiber: ≤ 0.1 ps/V/km

** ** According to IEC 60794-3, Ed 3 (Q=0.01%)

### Geometrical Specifications

#### Glass Geometry

- Core/Cladding Concentricity Error: ≤ 0.5 μm
- Cladding Diameter: 125.0 ± 0.7 μm
- Cladding Non-Circularity: ≤ 0.7%
- Fiber Curl: ≥ 4.0 m radius

#### Coating Geometry

- Coating/Cladding Concentricity Error: ≤ 12 μm
- Coating Diameter: 242 ± 7 μm
- Coating Non-Circularity: ≤ 6%
- Lengths: Up to 50.4 km

### Mechanical Performance

- Minimum Proof Test: 100 Kpsi (0.7 GPa); 1% strain equivalent
- Tensile Strength: Median > 3.8 GPa (550 kpsi)
- Dynamic Fatigue: Dynamic: Unaged & Aged*** $\eta_{p}>20$
- Coating Performance Unaged & Aged***: Average Strip Force: 1N to 3N
  Peak Strip Force: 1.2 N to 8.9 N

*** Aging: 0°C and 45°C, 30 days at 85°C and 85% RH, 30 days water immersion at 23°C, Wasp spray exposure (Telcordia)

#### Environmental Performance

<table>
<thead>
<tr>
<th>Environmental Test</th>
<th>Induced Attenuation at 1310, 1550 nm (dB/km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Cycling (-60°C to +85°C)</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Temperature Humidity Cycling (-10°C to +85°C, up to 98% RH)</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Water Immersion (23°C ± 2°C)</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Dry Heat (30 days, 85°C ± 2°C)</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Damp Heat (30 days, 85°C, 85% RH)</td>
<td>≤ 0.05</td>
</tr>
</tbody>
</table>

### Environmental Test

<table>
<thead>
<tr>
<th>Effective Group Index</th>
<th>@ 1310 nm 1.467</th>
</tr>
</thead>
<tbody>
<tr>
<td>@ 1550 nm 1.468</td>
<td>@ 1625 nm 1.488</td>
</tr>
<tr>
<td>Rayleigh Backscatter (Coefficient 3 ps = pulse width)</td>
<td>@ 1310 nm: -79.4 dB</td>
</tr>
<tr>
<td>@ 1550 nm: -81.7 dB</td>
<td>@ 1625 nm: -82.5 dB</td>
</tr>
</tbody>
</table>

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