Draka's Enhanced Single-Mode Fiber (ESMF) provides improved performance across the entire 1260 nm to 1625 nm wavelength spectrum. It has a low dispersion in the 1310 nm window and low attenuation in the 1383 nm water-peak region to allow use of the extended band (1360 nm to 1460 nm). With its wide operating spectrum, ESMF expands the future growth capability of the fiber and allows flexible configuration of voice, data, and video services within the fiber. It can be used in all cable constructions, including loose tube, tight buffered, ribbon, and central tube designs.

The tighter geometrical, attenuation and PMD specifications of ESMF enable superior performance in long-haul, metropolitan, access and premises applications in telecommunications, CATV and utility networks. ESMF is completely interchangeable with standard single-mode fiber.

Draka's Advanced Plasma and Vapor Deposition (APVD™) manufacturing process ensures the highest quality and purity of fibers. Proprietary ColorLock™ coating process further enhances the performance, durability and reliability of the fiber, even in the harshest environments.


### Features and Advantages

<table>
<thead>
<tr>
<th>Features</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low 1383 nm (water-peak) attenuation</td>
<td>Provides expanded fiber capacity and cost savings through use of cheaper lasers in the entire 1260 to 1625 nm range, multiplexing filters and higher number of channels</td>
</tr>
<tr>
<td>Low hydrogen sensitivity</td>
<td>Low attenuation in the 1383 nm region even as fiber ages, for improved performance and long life</td>
</tr>
<tr>
<td>Lower PMD of 0.06 ps/√km link design value</td>
<td>Extends the PMD distance performance, reducing regeneration costs</td>
</tr>
</tbody>
</table>
| Low 1460 nm attenuation (< 0.25 dB/km) | • Easy design of low cost laser and filter based systems over a wide wavelength range  
                           | • Ensure efficient Raman pumping for C-band amplification |
| Proprietary APVD™ manufacturing process | Superior geometry, uniformity and purity |
| Revolutionary ColorLock-XS 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 easy-of-use and flexibility |

### Key Industry Leading Milestones

<table>
<thead>
<tr>
<th>Year</th>
<th>Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>ColorLock™, world only life time guaranteed colored fibers</td>
</tr>
<tr>
<td>2001</td>
<td>Enhanced SMF more than 2 years in advance on international standards</td>
</tr>
<tr>
<td>2008</td>
<td>ColorLock-XS: extreme protection against micro-bendings</td>
</tr>
</tbody>
</table>
Enhanced Single-Mode Optical Fiber (ESMF)

Improved performance across the entire 1260 nm to 1625 nm wavelength spectrum

**Optical Specifications**

**Attenuation**

<table>
<thead>
<tr>
<th>Wavelength range (nm)</th>
<th>Reference λ (nm)</th>
<th>Induced Attenuation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1285 - 1330</td>
<td>1310</td>
<td>≤ 0.03</td>
</tr>
<tr>
<td>1525 - 1575</td>
<td>1550</td>
<td>≤ 0.02</td>
</tr>
<tr>
<td>1460 - 1625</td>
<td>1550</td>
<td>≤ 0.04</td>
</tr>
</tbody>
</table>

**Maximum attenuation change over the window from reference**

**Mode Field Diameter**

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>MFD (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310</td>
<td>9.0 ± 0.4</td>
</tr>
<tr>
<td>1550</td>
<td>10.1 ± 0.5</td>
</tr>
</tbody>
</table>

**Chromatic Dispersion**

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>Chromatic Dispersion (ps/[nm.km])</th>
</tr>
</thead>
<tbody>
<tr>
<td>1285 - 1330</td>
<td>≤ 3 [3]</td>
</tr>
<tr>
<td>1550</td>
<td>≤ 18.0</td>
</tr>
<tr>
<td>1625</td>
<td>≤ 22.0</td>
</tr>
</tbody>
</table>

**Zero Dispersion Wavelength (λ0):**

1300 - 1322 nm

**Slope (S) at λ0:**

≤ 0.090 ps/(nm².km)

**Polarization Mode Dispersion (PMD)**

**PMD Link Design Value** (ps/km)

≤ 0.06

Max. Individual Fiber (ps/km)

≤ 0.1

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

**Geometrical Specifications**

**Glass Geometry**

- Cladding Diameter: 125.0 ± 0.7 µm
- Core/Cladding Concentricity Error: ≤ 0.5 µm
- Cladding Non-Circularity: ≤ 0.7 %
- Fiber Curl (Radius): ≥ 4 m

**Coating Geometry**

- Coating Diameter: 242 ± 7 µm
- Coating/Cladding Concentricity Error: ≤ 12 µm
- Coating Non-Circularity: ≤ 5 %

**Length**

Standard lengths up to 50.4 km

**Typical Values**

**Miscellaneous**

Nominal Zero Dispersion Slope

0.085 ps/(nm².km)

Effective group index @ 1310 nm

1.467

Effective group index @ 1550 nm

1.468

Effective group index @ 1625 nm

1.468

Rayleigh Backscatter Coefficient for 1 ns pulse width:

- @ 1310 nm: - 79.4 dB
- @ 1550 nm: - 81.7 dB
- @ 1625 nm: - 82.5 dB

Median Dynamic Tensile Strength

5.3 GPa (750 kpsi)

(Aged at 85°C, 85% RH, 30 days; 0.5 m gauge length)

**Environmental Specifications**

**Attenuation**

<table>
<thead>
<tr>
<th>Test Conditions</th>
<th>Induced Attenuation at 1310, 1550 nm (dB/km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature cycling</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Temperature-Humidity cycling</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Water Immersion</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Dry Heat</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Damp Heat</td>
<td>≤ 0.05</td>
</tr>
</tbody>
</table>

**Typical Values**

**Other values available on request**

- Including H2-agaging according to IEC 60793-2-50, type B.1.3
- Other values available on request

**Mechanical Specifications**

**Proof Test**

The entire length is subjected to a tensile proof stress ≥ 0.7 GPa (100 kpsi); 1% strain equivalent

**Tensile Strength**

Dynamic tensile strength (0.5 meter gauge length):

Aged*** and unaged: median > 3.8 GPa (550 kpsi)

*** Aging at 85°C, 85% RH, 30 days

**Dynamic and Static Fatigue**

Dynamic fatigue, unaged and aged***

n ≥ 20

Static fatigue, aged***

n ≥ 23

**Coating Performance**

Coating strip force unaged and aged****:

- Average strip force: 1 N to 3 N
- Peak strip force: 1.2 N to 8.9 N

**** Aging:

- 0°C and 45°C
- 30 days at 85°C and 85% RH
- 14 days water immersion at 23°C
- Wasp spray exposure (Telcordia)

The Draka Communications policy of continuous improvement may cause in changed specifications without prior notice