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# Sumitomo Fiber Specification

## **SE-8\*\***

### **PureAccess™ Single-Mode Fiber**

*Zero Waterpeak (ZWP), Reduced Bend Radius, SM Optical Fiber, TIA Type IVa*

Issued: November 2003

Revised: October 2006



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## **1. General**

This specification covers the design requirements and performance standards for the optical fiber described below. This fiber is used in Sumitomo's optical cables. The features described in this document are intended to provide information on the performance of Sumitomo Electric's optical fiber and aid in handling and use. Refer to the appropriate *cable* specification for details regarding the finished cable's performance.

### **1.1 Fiber Description**

Sumitomo's PureAccess™ single-mode optical fiber is a zero water-peak, step index dispersion-unshifted fiber with a glass core, glass cladding and dual acrylate protective coatings. This fiber offers improved bending performance, which provides customers with relief from the 15mm minimum bend radius restrictions of conventional SMF. This fiber offers improved bending performance through a germanium doped silica core and a silica cladding. This Type IVa TIA specified fiber is optimized for operation in 5 operating windows between 1285 to 1650. It is fully compatible with commercially available splicing and connector products and can be spliced to other commercially available single-mode fibers.

PureAccess zero water-peak single-mode fiber is ideal for Access Networks including FTTP, and fiber to the desk due to its excellent bending performance while maintaining compatibility with conventional SMF.

### **1.2 Quality**

Sumitomo ensures a high level of quality through ISO / TL 9000 registered Quality Management Systems and our commitment to continuous improvement. Guaranteed, high quality products have been manufactured at Sumitomo's facility in Research Triangle Park, North Carolina since 1984.

### **1.3 Reliability**

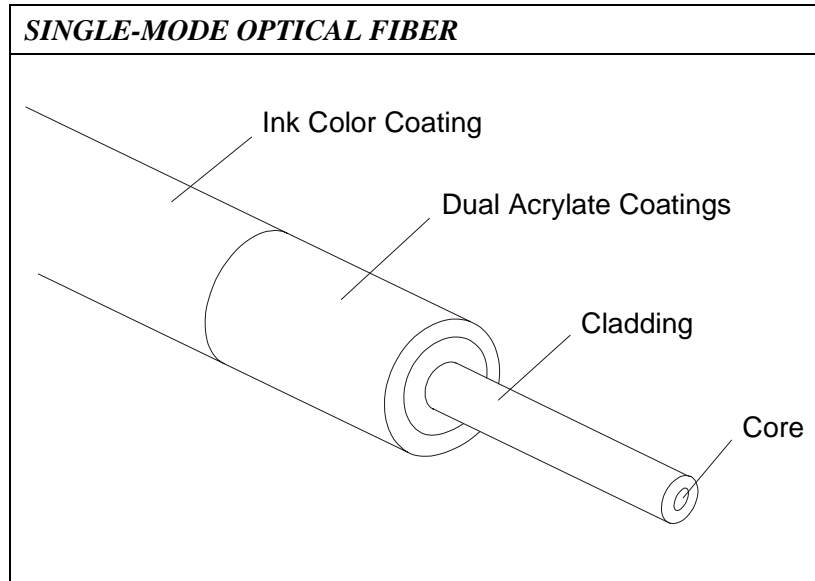
Sumitomo ensures product reliability through rigorous qualification testing of each product family to meet or exceed industry standards. Both initial and periodic qualification testing are performed to assure the fiber's performance and durability in the field environment.

Sumitomo supports industry standards organizations such as Bell Communications Research (Telcordia), Telecommunications Industry Association (TIA), International Telecommunications Union (ITU), International Electrotechnical Commission (IEC), American Society for Testing and Materials (ASTM), Rural Utilities Service (RUS), The Institute of Electrical and Electronics Engineers (IEEE), and Insulated Cable Engineers Association (ICEA).

## 2. Fiber Design

### 2.1 General

Sumitomo employs only the highest quality, zero water-peak, single-mode fibers in their cables. The step index glass fibers are coated with dual acrylate protective coatings to provide the necessary bending and tensile strength required for handling in the field and to ensure maximum fiber lifetime through increased reliability. Colored ink coatings are applied per the detailed cable specification.



### 2.2 Construction

<b>SINGLE-MODE OPTICAL FIBER</b>			
FIBER REGION	PROPERTY	TEST PROCEDURE	SPECIFICATION
Core (Glass)	Core/Cladding Offset	EIA/TIA-455-176	$\leq 0.4 \mu\text{m}$
Cladding (Glass)	Diameter	EIA/TIA-455-176	$125 \pm 0.5 \mu\text{m}$
	Non-Circularity	EIA/TIA-455-176	$\leq 0.5 \%$
Coating	Material		UV-Acrylate
	Inked Diameter	EIA/TIA-455-173	$250 \pm 15 \mu\text{m}$

### **3. Fiber Characteristics**

#### **3.1 Optical Characteristics**

<b><i>SINGLE-MODE OPTICAL FIBER</i></b>			
<b>PROPERTY</b>		<b>TEST PROCEDURE</b>	<b>SPECIFICATION</b>
Maximum Individual Fiber Attenuation (Uncabled)	At 1310 nm At 1383nm At 1550 nm	EIA/TIA-455-61	≤0.35 dB/km ≤0.33 dB/km ≤0.21 dB/km
Point Discontinuities at 1310 / 1550 nm		EIA/TIA-455-59	≤ 0.1 dB
Water Peak Stability at 1383 nm		EIA/TIA-455-78 IEC 60793-2-50	≤ 0.34 dB/km
Attenuation Change vs. Bending	100 wraps / 60 mm dia. 10 wraps / 30mm dia. 1 wrap / 32 mm dia.	EIA/TIA-455-62	≤ 0.03 dB ≤ 0.25 dB ≤ 0.03 dB
Chromatic Dispersion at 1550 nm		EIA/TIA-455-168	≤ 18.0 ps/nm·km
Zero Dispersion Wavelength		EIA/TIA-455-168	1302 - 1322 nm
Zero Dispersion Slope		EIA/TIA-455-168	≤ 0.092 ps/nm <sup>2</sup> ·km
Nominal Mode Field Diameter	1310 nm	EIA/TIA-455-167	8.6 μm
Mode Field Diameter Tolerance		EIA/TIA-455-167	± 0.40 μm
Cabled Fiber Cutoff Wavelength ( $\lambda_{cc}$ )		EIA/TIA-455-170	≤ 1260 nm
Group Index of Refraction	1310 nm 1550 nm	EIA/TIA-455-44	1.466 1.467
Polarization Mode Dispersion			< 0.20 ps/ $\sqrt{\text{km}}$

#### **3.2 Mechanical Characteristics**

<b><i>SINGLE-MODE OPTICAL FIBER</i></b>			
<b>PROPERTY</b>		<b>TEST PROCEDURE</b>	<b>SPECIFICATION</b>
Proof Test Stress		EIA/TIA-455-31	156 kpsi (1.07 GPa) 1.5%
Fiber Curl Radius		Internal	≥ 4 meters
Minimum Bend Radius During Service			15mm

## **4. Testing and Inspection**

The optical properties of all fibers are measured prior to cable manufacturing and remain traceable throughout the manufacturing process and the lifetime of the cable.

After cabling, we use statistical process control techniques along with periodic verification to insure 100% compliance to attenuation requirements in each length of cable with bi-directional OTDR at the operating wavelengths. Cable dimensional measurements are also made at final inspection and recorded.

## **5. Installation / Handling Practices**

Sumitomo has incorporated a wide range of technical support and training services for our fiber optic cable products into our Technical Support Services (TSS) program. TSS offers training in the areas of cable installation sheath entry, splicing, testing, and system troubleshooting. The services are available in a variety of media formats and can be customized to better accommodate individual training needs. The TSS program consists of an extensive series of recommended procedure documents, training courses with classroom and hands-on instruction, as well as demonstration video tapes. Please contact Sumitomo's Customer Service department for more information.

## **6. Ordering Information**

To learn more about Sumitomo's cables or to place an order, call, fax, e-mail, or write us at:

*Sumitomo Electric Lightwave Corp.  
78 Alexander Drive  
Research Triangle Park, NC 27709  
Attn: Customer Service Department*

*Phone: 800-358-7378  
919-541-8100  
Fax: 919-541-8265  
E-mail: [info@sumitomoelectric.com](mailto:info@sumitomoelectric.com)*

Sumitomo Electric Lightwave Corp. reserves the right to improve, enhance, or modify the cable's features and specifications. For special requirements different than those shown above, please contact our Inside Sales Department. Each Sumitomo Electric Lightwave Corp. optic cable and/or its manufacture may be covered by one or more of the following US Patents: 4,715,677 4,729,629 4,763,983 4,770,489 4,828,349 4,953,945 5,043,037 5,082,347 5,165,003 D331,567 5,247,599 5,410,901 5,471,555 5,642,452.  
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