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## Sumitomo Fiber Specification

### **SE-7\*\***

## **Non-Zero Dispersion Shifted Single-Mode Fiber**

*PureMetro SM Optical Fiber, TIA Type Ivd, ITU-T G.655*

Issued: November 2003



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## CONTENTS

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<b>1. GENERAL</b> .....	<b>2</b>
1.1 FIBER DESCRIPTION.....	2
1.2 QUALITY.....	2
1.3 RELIABILITY.....	2
<b>2. FIBER DESIGN</b> .....	<b>3</b>
2.1 GENERAL.....	3
2.2 CONSTRUCTION.....	3
<b>3. FIBER CHARACTERISTICS</b> .....	<b>4</b>
3.1 OPTICAL CHARACTERISTICS.....	4
3.2 MECHANICAL CHARACTERISTICS.....	4
<b>4. TESTING AND INSPECTION</b> .....	<b>5</b>
<b>5. INSTALLATION / HANDLING PRACTICES</b> .....	<b>5</b>
<b>6. ORDERING INFORMATION</b> .....	<b>5</b>

## **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 PureMetro single-mode optical fiber is a low water-peak, step index, non-zero dispersion shifted fiber with a glass core, glass cladding and dual acrylate protective coatings. This Type IVd TIA specified fiber is optimized for operation in the 1550 nm transmission window. It is fully compatible with commercially available splicing and connector products and can be spliced to other commercially available single-mode fibers.

Low water-peak single-mode fiber is ideal for long haul, telephone, video or data networks. The PureMetro single-mode fiber used in Sumitomo's cables meets Telcordia requirements.

### **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**

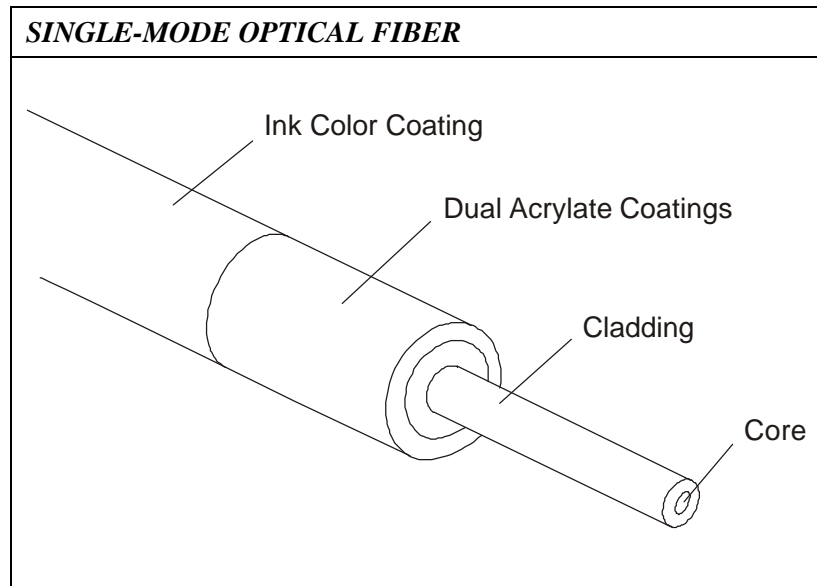
Sumitomo ensures product reliability through rigorous qualification testing of each product family to meet or exceed industry standards. Both initial and periodic qualification testing are performed to assure the fiber's performance and durability in the field environment.

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, low 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><i>SINGLE-MODE OPTICAL FIBER</i></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	$125 \pm 1.0 \mu\text{m}$
	Non-Circularity	EIA/TIA-455-176	$< 1.0 \%$
Coating	Material		UV-Acrylate
	Inked Diameter	EIA/TIA-455-173	$250 \pm 5 \mu\text{m}$
	Coating/Cladding Offset	EIA/TIA-455-173	$\leq 12.0 \mu\text{m}$

### **3. Fiber Characteristics**

#### **3.1 Optical Characteristics**

<i>SINGLE-MODE OPTICAL FIBER</i>			
PROPERTY		TEST PROCEDURE	SPECIFICATION
Maximum Individual Fiber Attenuation	At 1310 nm	EIA/TIA-455-61	0.40 dB/km
	At 1380 nm		0.37 dB/km
	At 1550 nm		0.22 dB/km
	At 1625 nm		0.25 dB/km
Point Discontinuity at 1550 nm		EIA/TIA-455-59	≤ 0.10 dB
Water Peak Attenuation at 1380 nm		EIA/TIA-455-78	≤ 0.37 dB/km
Attenuation Change vs. Bending	100 wraps / 75 mm dia.	EIA/TIA-455-62	≤ 0.05 dB
	1 wrap / 30 mm dia.		≤ 0.50 dB
Chromatic Dispersion in 1530 - 1565 nm		EIA/TIA-455-168	2.0 – 6.0 ps/nm·km
in 1565 – 1625 nm			4.0 – 9.8 ps/nm·km
Dispersion Slope at 1550 nm		EIA/TIA-455-168	≤ 0.061 ps/nm <sup>2</sup> ·km
Nominal Mode Field Diameter	1550 nm	EIA/TIA-455-167	8.3 μm
Mode Field Diameter Tolerance		EIA/TIA-455-167	± 0.5 μm
Cabled Fiber Cutoff Wavelength ( $\lambda_{cc}$ )		EIA/TIA-455-170	≤ 1300 nm
Polarization Mode Dispersion			≤ 0.2 ps/ $\sqrt{\text{km}}$

#### **3.2 Mechanical Characteristics**

<i>SINGLE-MODE OPTICAL FIBER</i>			
PROPERTY		TEST PROCEDURE	SPECIFICATION
Proof Test Stress		EIA/TIA-455-31	125 kpsi (0.86 GPa)
Fiber Curl Radius		Internal	≥ 4 meters
Maximum Bend Radius:	During Installation		16.0 mm
	During Service		30.0 mm

## **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 all 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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