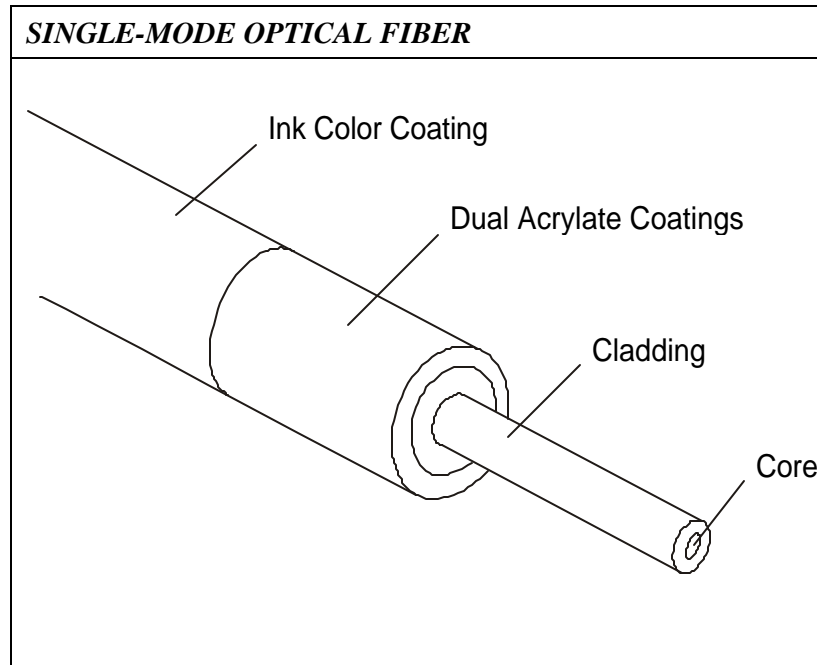


## 2. Fiber Design

### 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

<i>SINGLE-MODE OPTICAL FIBER</i>			
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**

<i>SINGLE- MODE OPTICAL FIBER</i>			
PROPERTY		TEST PROCEDURE	SPECIFICATION
Maximum Individual Fiber Attenuation (Uncabled)	At 1310 nm At 1383 nm At 1550 nm	EIA/TIA-455-61	≤0.33 dB/km ≤0.31 dB/km ≤0.19 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	≤ 0.31 dB/km
Attenuation Change vs. Bending	100 wraps / 50 mm dia. 1 wrap / 32 mm dia.	EIA/TIA-455-62	≤ 0.10 dB ≤ 0.50 dB
Chromatic Dispersion at 1550 nm		EIA/TIA-455-168	≤ 18.0 ps/nm·km
Zero Dispersion Wavelength		EIA/TIA-455-168	1300 - 1324 nm
Zero Dispersion Slope		EIA/TIA-455-168	≤ 0.090 ps/nm <sup>2</sup> ·km
Nominal Mode Field Diameter	1310 nm	EIA/TIA-455-167	9.20 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			< 0.2 ps/√km

#### **3.2 Mechanical Characteristics**

<i>SINGLE-MODE OPTICAL FIBER</i>			
PROPERTY		TEST PROCEDURE	SPECIFICATION
Proof Test Stress		EIA/TIA-455-31	120 kpsi (0.86 GPa)
Fiber Curl Radius		Internal	≥ 4 meters
Maximum Bend Radius:	During Installation During Service		16.0 mm 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:

<i>Sumitomo Electric Lightwave Corp.</i>	<i>Phone:</i>	800-358-7378
<i>78 Alexander Drive</i>		919-541-8100
<i>Research Triangle Park, NC 27709</i>	<i>Fax:</i>	919-541-8265
<i>Attn: Customer Service Department</i>	<i>E-mail:</i>	<a href="mailto:info@sumitomoelectric.com">info@sumitomoelectric.com</a>

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. 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.

## 2.2 Construction

Fiber Region		Property	Test Procedure	Specification
Glass Fiber	Core	Diameter Non-Circularity Core/Cladding Offset	EIA/TIA-455-58 EIA/TIA-455-45 EIA/TIA-455-45	$50 \pm 2.5 \mu\text{m}$ $\leq 5\%$ $\leq 1.5 \mu\text{m}$
	Cladding	Diameter Non-Circularity	EIA/TIA-455-45 EIA/TIA-455-45	$125 \pm 1.0 \mu\text{m}$ $< 1.0 \%$
Coating	Buffer	Material Inked Diameter	EIA/TIA-455-55	UV-Acrylate $250 \pm 15 \mu\text{m}$

## 2.3 Optical Characteristics

Property		Test Procedure	Specification		
Maximum Attenuation at 850 / 1300 nm		EIA/TIA-455-61	3.5 / 1.5 dB/km		
Point Discontinuities (850 and 1300 nm)		EIA/TIA-455-59	$\leq 0.1 \text{ dB}$		
Attenuation Change vs. Wavelength	800 to 900 nm 1250 to 1350 nm	EIA/TIA-455-46	$\leq 1 \text{ dB/km}$ $\leq 0.2 \text{ dB/km}$		
Attenuation Change vs. Bending	100 wraps / 75 mm	EIA/TIA-455-62	$\leq 0.5 \text{ dB}$		
Min. Overfilled Launch Bandwidth (MHz*km)	850 nm 1300 nm	EIA/TIA-455-204	Std. Grade	Ext'd Grade	Max Grade
			500	1500	3000
			500	500	500
Min. Gigabit Ethernet Distance	850 nm 1310 nm	EIA/TIA-455-204	Std. Grade	Ext'd Grade	Max Grade
			550 m	1 km	1 km
			550 m	600 m	600 m
Min. 10-Gigabit Ethernet Distance	850 nm 1310 nm	EIA/TIA-455-204	Std. Grade	Ext'd Grade	Max Grade
			N/A	300 m	500 m
			N/A	300 m	300 m
Numerical Aperture		EIA/TIA-455-177	$0.200 \pm 0.015$		
Group Index of Refraction	850 nm	EIA/TIA-455-44	1.483		
	1300 nm		1.479		