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Sumitomo Cable Specification

**SE-\*LW\***

**FTTH All Purpose Optical Drop Cable  
with Dielectric Sheath**

*Central tube cable with 1 - 12 fibers*

Issued: June 2008



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## **1. General**

This specification covers the design requirements and performance standards for the supply of optical fiber cables as described below. The features described in this document are intended to provide information on the performance of Sumitomo Electric Lightwave's optical cable and aid in handling and installation. Please refer to the separate fiber specification for details regarding the optical fiber.

### **1.1 Cable Description**

Sumitomo's all purpose service drop cables contain up to 12 optical fibers and are 100% dielectric to eliminate bonding and grounding requirements resulting in low cost installation. The color-coded fibers are housed in a plastic buffer tube with dielectric strength members. The service drop cable is designed to meet NESC requirements for cable attachment to residential homes. The cable design represents an advancement in loose tube cable technology through improved cable handling and reduced cable preparation time.

### **1.2 Quality**

Sumitomo ensures a continuing level of quality in our cable products through multiple programs including TL 9000, and our own Kaizen system of continuous improvement. Quality product is guaranteed and is evident in the optical fiber cable products manufactured at Sumitomo's facility in Research Triangle Park, North Carolina for over two decades.

### **1.3 Reliability**

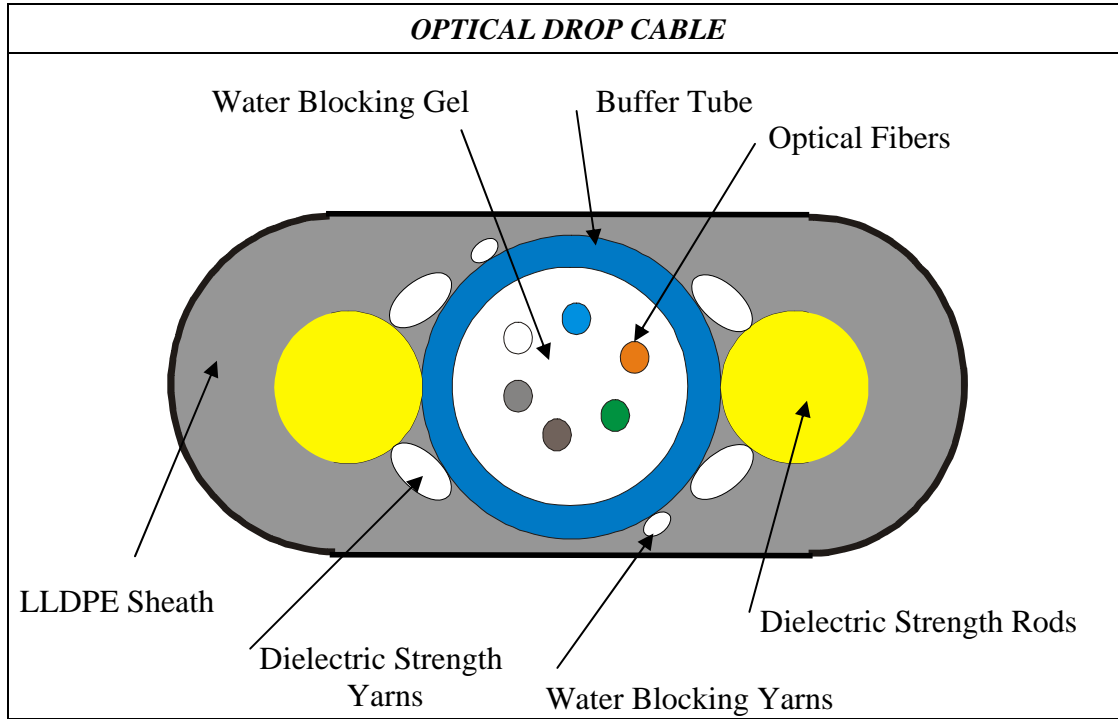
Sumitomo ensures product reliability through rigorous qualification testing of each product family to meet or exceed industry standards. Both initial and periodic qualification testing are performed to assure the cable's performance and durability in the field environment.

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

## 2. Cable Design

### 2.1 General

The all-dielectric drop cable has a single linear low-density polyethylene [LLDPE] outer jacket. The non-metallic design makes this cable ideal for buried, duct, lashed aerial, aerial self-support applications. The design of the jacket allows for easy cable entry by shaving along the strength elements.



### 2.2 Fiber Types

The following fiber types are available in this cable design. Please refer to the appropriate fiber specification document for details on fiber design and performance.

<i>APPLICABLE FIBER TYPES</i>		
FIBER TYPE	TIA CLASS	SUMITOMO SPEC. #
PureBand™ Single Mode	Type IVa	SE-5**
PureAccess™ Single Mode	Type IVa	SE-9**

## 2.3 Optical Fiber Color Code

The UV acrylate coated fibers are color coded with highly distinguishable, vibrant colors according to the following table. All colors meet Munsell standards as specified in TIA-359 and TIA-598.

<b><i>FIBER COLOR CODE</i></b>	
<b>FIBER #</b>	<b>COLOR</b>
1	Blue
2	Orange
3	Green
4	Brown
5	Slate
6	White
7	Red
8	Black
9	Yellow
10	Violet
11	Rose
12	Aqua

## 2.4 Buffer Tubes

Fibers are housed inside a standard 2.5 mm (0.10 in) gel-filled buffer tube manufactured with industry standard polybutelene terephthalate (PBT). Water blocking gel fills the tube to prevent migration of water through the tube. Industry standard tools and practices can be used to enter the buffer tube.

## 2.5 Strength Elements

Tensile strength and antibuckling are provided by two longitudinal dielectric strength elements on opposite sides of the buffer tube. In addition, two dielectric yarns are placed along side of each strength element to minimize fiber strain.

## 2.6 Cable Water Blocking

Water blocking yarns are applied around the outside of the buffer tube to prevent water ingress.

## 2.7 Cable Sheath

A black linear low-density polyethylene [LLDPE] jacket is extruded over the buffer tube and strength elements as the sheath.

## 2.8 Cable Dimensions

<b><i>DROP CABLE DIMENSIONS</i></b>		
FIBER COUNT	NOMINAL DIAMETER (W X H)	NOMINAL WEIGHT
1 - 12	8.2 mm(0.32 in) x 4.9 mm(0.19 in)	39 Kg/km (26 lbs./kft)

## 2.9 Sheath Marking

The entire length of each cable is marked with the following items:

- "SUMITOMO OPTICAL CABLE"
- Month and Year of Manufacture
- Number of Optical Fibers
- Fiber Type
- SOC Code
- NESC Handset
- Sequential Length Markings in feet

All length markings are placed at two-foot intervals. The actual cable length will be within +1%, -0% of the marked length. All markings will be ink-jet permanent white characters.

## 3. Cable Performance

The finished cables can be subjected to the following mechanical and environmental conditions without a permanent increase in attenuation or damage to the cable.

### 3.1 Mechanical Performance

<b><i>MECHANICAL PERFORMANCE</i></b>			
PROPERTY		TEST PROCEDURE	SPECIFICATION
Low and High Temperature Cable Bend		EIA/TIA-455-37	150 mm Bend Dia. @ -30°C and 60°C
Impact Resistance		EIA/TIA-455-25	2.9Nm
Compressive Strength:		EIA/TIA-455-41	220 N/cm
Tensile Strength:			300 lbs.
Cable Twist		EIA/TIA-455-85	2m length +/- 180°
Cable Cyclic Flexing		EIA/TIA-455-104	20 x cable O.D. 25 cycles
Minimum Bend Radius:	During Installation During Service	EIA/TIA-455-37	10 cm (3.9 in) 7.5 cm (3.0 in)
Maximum Span Length		<u>Sag</u>	<u>1%</u> <u>3%</u>
		NESC Heavy	150 ft*      180 ft*
		NESC Medium	255 ft*      315 ft*
		NESC Light	435 ft*      570 ft*
* Note for informational proposes only. Typical values			

## 3.2 Environmental Performance

<b>ENVIRONMENTAL PERFORMANCE</b>		
PROPERTY	TEST PROCEDURE	SPECIFICATION
Temperature: Operation	EIA/TIA-455-3	-40 to +70 °C (-40 to +158 °F)
Installation		-30 to +60 °C (-22 to +140 °F)
Storage / Shipping		-40 to +70 °C (-40 to +158 °F)
Cable Aging	EIA/TIA-455-3	168 hours @ 85°C
Cable Freezing	EIA/TIA-455-98	No Fiber Discontinuity
Water Penetration	EIA/TIA-455-82	1 meter for 24 hours
Compound Drip Temperature	EIA/TIA-455-81	70 °C (158 °F)
Wasp Spray Exposure	Telcordia GR-20	No Deterioration
Color Coding Permanence	Telcordia GR-20	Colors are Stable after Aging

## 4. Cable 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, fibers in each length of cable are measured with bi-directional OTDR. The attenuation for each fiber is recorded. Cable dimensional measurements are also made at final inspection and recorded.

## 5. Packaging and Shipping

Cable is supplied in bulk lengths, which are specified at the time of purchase. Each length will be shipped on a separate non-returnable wooden reel. The minimum barrel diameter of the reel will not be less than 30 times the cable diameter. Cable reels will be suitably packaged to protect product from damage.

Each reel is marked with the manufacturer's name and address, cable type, fiber count, attenuation specs, and cable length. A final inspection test report with attenuation performance data for each fiber is attached to the reel flange along with shipping labels. A final inspection test report with attenuation performance data for each fiber is provided with each cable. The cable ends will be easily accessible for testing.

REEL TYPE	REEL CODE	FLANGE DIAMETER	REEL WIDTH	REEL WEIGHT	[ft]
Wood	L-3	850 mm (34 in)	580 mm (23 in)	32 Kg (70 lbs)	15,000
	L-8	1050 mm (41 in)	760 mm (30 in)	61 Kg (134 lbs)	37,000

NOTE: Actual reel size used will depend on production capacity, net weight, and reel availability. Check with your sales representative for more details.

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.