Sumitomo Cable Specification

SE-*DG**
FTTH Indoor/Outdoor Ribbon Drop Cable with Dielectric Sheath

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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 Indoor/Outdoor Ribbon Drop cable contains a 12-fiber ribbon and is 100% dielectric to eliminate bonding and grounding requirements resulting in low cost installation. The cable is UL-listed with an OFNR rating and is also OFN-FT4 rated. The ribbon is surrounded by water blocking yarns 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 drop cable technology through improved cable handling and reduced cable preparation time, and is suitable for use in both outside and indoor (riser) environments.

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.

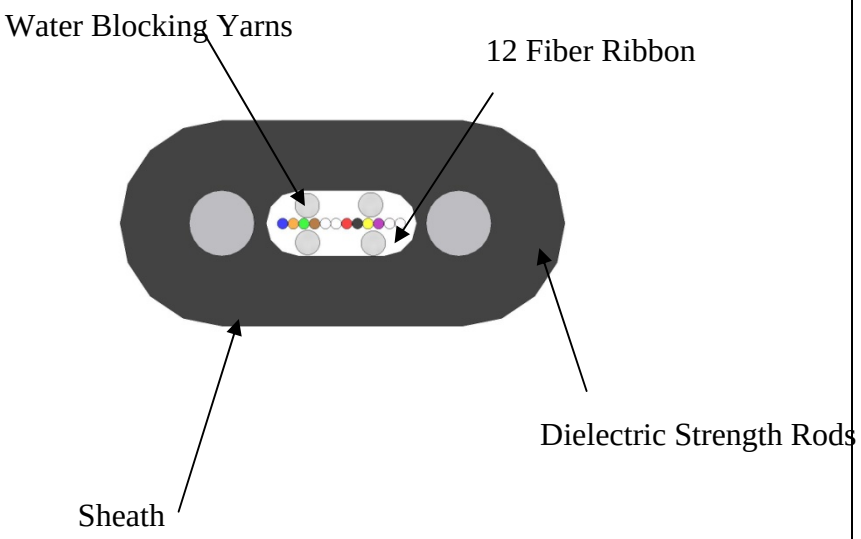
Sumitomo supports industry standards organizations such as Telcorida Technologies, Telecommunications Industry Association (TIA), Insulated Cable Engineers Association (ICEA), International Telecommunications Union (ITU), International Electrotechnical Commission (IEC), American Society for Testing and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

2. Cable Design

2.1 General

The ribbon drop cable has a single Flame-Retardent 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 and allows the cable to be rated for Indoor as well as Outdoor use.

OPTICAL DROP CABLES



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.

APPLICABLE FIBER TYPES

FIBER TYPE	TIA CLASS	SUMITOMO SPEC. #
PureBand™ Single Mode	Type Iva	SE-5**
PureAccess™ Single Mode	Type IVa	SE-8**

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.

FIBER COLOR CODE	
FIBER #	COLOR
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 Ribbon Matrix

Twelve (12) colored fibers are held together in the form of a flat ribbon by a UV cured acrylate matrix. Fibers within the ribbon are arranged in the order as shown in the table above. The optical fiber ribbons are fully compatible with Sumitomo's mass fusion splicing equipment and other commercially available splicing techniques. The matrix and coatings are easily stripped with thermal strippers and can also be easily and cleanly pulled away from the individual 250 μm colored fibers if single fiber access is needed from the ribbon end or at midspan using Sumitomo's ribbon midspan access kit.

2.5 Strength Elements

Tensile strength and antibuckling are provided by two longitudinal dielectric strength elements on opposite sides of the 12 fiber ribbon.

2.6 Cable Water Blocking

Water blocking yarns are applied around the ribbon to prevent water ingress.

2.7 Cable Sheath

A black Flame Retardent jacket is extruded over the ribbon and strength elements as the sheath.

2.8 Cable Dimensions

DROP CABLE DIMENSIONS		
FIBER COUNT	NOMINAL DIAMETER (W X H)	NOMINAL WEIGHT
12	10.9 mm(0.43 in) x 5.0 mm(0.20 in)	64 Kg/km (43 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

MECHANICAL PERFORMANCE				
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	EIA/TIA-455-37		10 cm (3.9 in)
	During Service			7.5 cm (3.0 in)
Maximum Span Length		Sag	1%	3%
		NESC Heavy	150 ft*	180 ft*
* Note for informational proposes only. Typical values		NESC Medium	255 ft*	315 ft*
		NESC Light	435 ft*	570 ft*

3.2 Environmental Performance

ENVIRONMENTAL PERFORMANCE			
PROPERTY		TEST PROCEDURE	SPECIFICATION
Temperature:	Operation Installation Storage / Shipping	EIA/TIA-455-3	-40 to +70 °C (-40 to +158 °F) -30 to +60 °C (-22 to +140 °F) -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.

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

6. 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. Please contact Sumitomo's Customer Service department for more information.

7. 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
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