
Sumitomo Cable Specification

SE-LE***
****144-xx****

FTTH 600 lb. Armored Drop Cable

Central tube cable with 1 - 12 fibers

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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 armored drop cable contain up to 12 optical fibers. The color-coded fibers are housed in a plastic buffer tube with dielectric strength members. The armored drop cable provides the cable with more protection from rodents yet is also lightweight for easy installation. 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

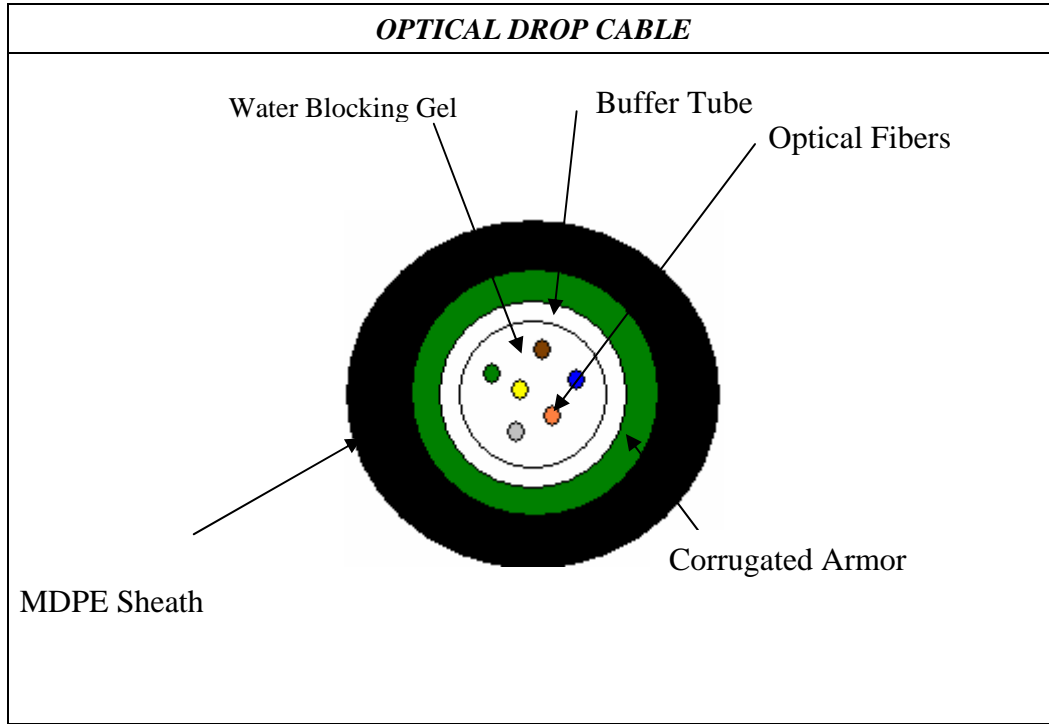
Sumitomo ensures product reliability through rigorous qualification testing of each product family to meet or exceed industry standards. Both initial and periodic qualification testing are performed to assure the cable's performance and durability in the field environment.

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 armored drop cable has a single medium density polyethelene (MDPE) outer jacket. There is no preferential bend in the cable due to the absence of strength rods. The two ripcords allow for easy entry.



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-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.

| <i>FIBER COLOR CODE</i> | |
|-------------------------|--------|
| 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 Buffer Tubes

Fibers are housed inside a standard 4.0 mm (0.16 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 aramid strength elements on all sides of the buffer tube.

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 medium density polyethylene [MDPE] jacket is extruded over the buffer tube and strength elements as the sheath.

2.8 Cable Dimensions

| <i>DROP CABLE DIMENSIONS</i> | | |
|-------------------------------------|------------------|------------------------|
| FIBER COUNT | NOMINAL DIAMETER | NOMINAL WEIGHT |
| 2, 4, 6, 8, 12 | 9.1 mm (0.36 in) | 92 Kg/km (62 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 indented 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

| <i>MECHANICAL PERFORMANCE</i> | | | |
|--------------------------------------|---------------------------------------|-----------------|--------------------------------------|
| 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: | | | 600 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 | 180mm(7.0 in) 90mm(3.5 in) |

3.2 Environmental Performance

| ENVIRONMENTAL PERFORMANCE | | |
|----------------------------------|-----------------|--------------------------------|
| 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.

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
Research Triangle Park, NC 27709
Attn: Customer Service Department*

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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.