



## SUMITOMO PRODUCT SPECIFICATION

**FutureFLEX®**

### TCxxTLW LAP TUBE CABLE SERIES



**SUMITOMO ELECTRIC LIGHTWAVE CORP.**

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SEL is a Member of the Sumitomo Electric Industries, Ltd. Group

*Sumitomo Electric Lightwave reserves the right to improve or modify these specifications without notice.*

## CONTENTS

<b>1.0</b>	<b>GENERAL</b>	<b>3</b>
1.1	Tube Cable Description	3
1.2	Grounding and Bonding	3
1.3	Quality	3
1.4	Reliability	3
<b>2.0</b>	<b>Tube Cable Design</b>	<b>4</b>
2.1	General	4
2.2	Construction	4,5
<b>3.0</b>	<b>Tube Cable Characteristics</b>	<b>6</b>
3.1	Performance	6
3.2	Tube Markings	6
3.3	Reel Markings	6
3.4	Tube Cable Ends	6
3.5	Standard Reel Lengths	6
3.6	Maximum Reel lengths	7
<b>4.0</b>	<b>Blowing Performance / Testing</b>	<b>7</b>
<b>5.0</b>	<b>Installation / Handling Practices</b>	<b>7</b>
<b>6.0</b>	<b>Ordering Information</b>	<b>7</b>

## 1.0 GENERAL

This specification covers the design requirements and performance standards for FutureFLEX<sup>®</sup> Air-Blown Fiber<sup>®</sup> (ABF) LAP (Laminated Aluminum Polyethylene) outside plant tube cables. These tube cables are designed for outdoor tube cable infrastructures. The features described in this document are intended to provide information on the performance of Sumitomo Electric's FutureFLEX<sup>®</sup> tubes and aid in handling and use.

### 1.1 Tube Cable Description

Sumitomo's FutureFLEX<sup>®</sup> TLW LAP sheath series tube cables are designed for use as an optical fiber cabling infrastructure in ABF applications that require a high degree of water protection. The LAP sheath tube cables are ideal for duct installations or any flooded environments. The tubes are made of a black polyethylene and have a 6mm inside diameter and 8mm outside diameter. The tubes are wrapped with a non-conductive water-blocking tape. The outer jackets are made of a black polyethylene with a layer of aluminum bonded to the inside of the jacket. A ripcord is provided to aid in the removal of the LAP sheath jacket. These tube cables are pulled or placed in routes for the purpose of individual tube connections to establish pathways for FutureFLEX<sup>®</sup> fiber bundle installation.

### 1.2 Grounding and Bonding

The TLW LAP sheath series tube cables require Grounding and Bonding and protection devices in accordance with TIA and NEC codes.

### 1.3 Quality

Sumitomo ensures a continuing high level of quality through ISO / TL9000 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.

### 1.4 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 tube cables' performance and durability in a field environment.

Sumitomo supports industry standards organizations such as Bell Communications Research (Bellcore), 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).

## 2.0 TUBE CABLE DESIGN

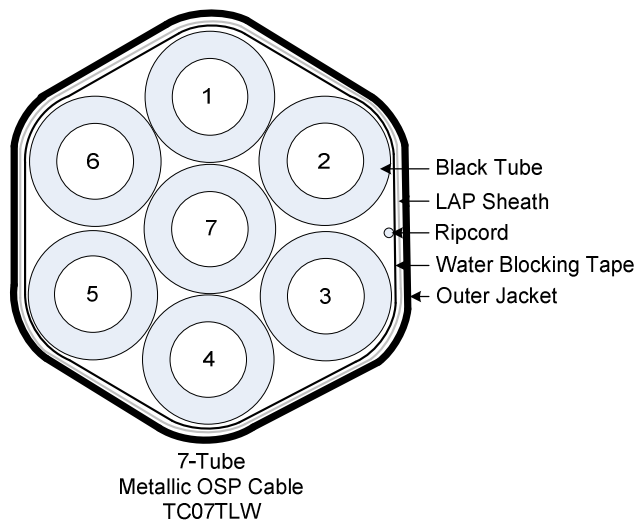
### 2.1 General

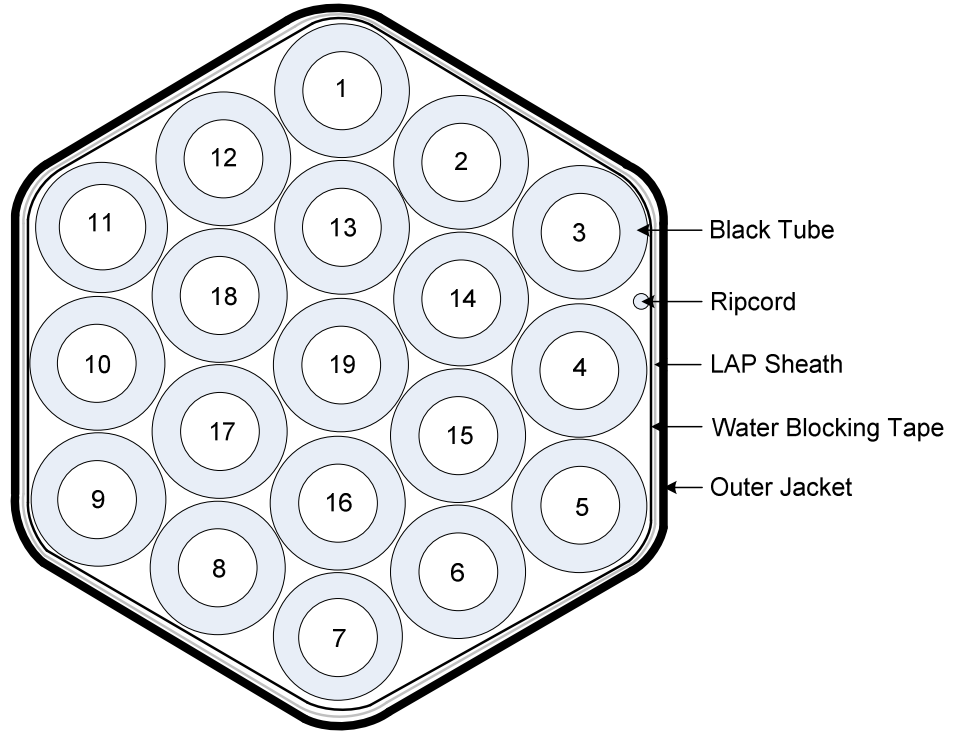
Sumitomo's LAP FutureFLEX® tube cables provide a small diameter, lightweight, indoor pathway for FutureFLEX® fiber bundle installations. FutureFLEX® ABF fiber bundles are available in Single Mode, 50 micron and 62.5 micron Multimode versions with 2, 4, 6, 12, 18 or 24 fiber strand counts. One fiber bundle can be field-installed in each tube.

### 2.2 Construction

SEL Part Number	Product Description	Outside Diameter (in.)	Max. Weight (lbs./kft.)	Max. Tensile Load (lbs.)
TC07TLW	7-tubes, black, wrapped with water-blocking tape, ripcord, and black outer polyethylene jacket with aluminum layer bonded to inside of jacket	1.1	223	400
TC19TLW	19-tubes, black, wrapped with water-blocking tape, ripcord, and black outer polyethylene jacket with aluminum layer bonded to inside of jacket	1.8	463	500

Drawings are not to scale





19-Tube  
Metallic OSP Cable  
TC19TLW

### 3.0 TUBE CABLE CHARACTERISTICS

#### 3.1 Performance

Property	Specification
Operation Temperature Range	-65° to +158°F
Minimum Bend Radius (During / After Installation)	20 / 10 x tube cable outside diameter

#### 3.2 Tube Markings

The outside surface of each jacketed cable is marked every two (2) feet with the following information:

**(Phone Receiver) SEL FutureFLEX® (SEL Part No.) (#)-Tube LAP OSP Optical Fiber Cable, A-(Lot # -1, -2, -3, etc.) (Seq. Ftg.) 1-877-356-FLEX WWW.FUTUREFLEX.COM →**

The outside surface of each tube is marked every two (2) inches with the tube designation number. (1 through 19)

#### 3.3 Reel Markings

The outside of each flange is marked with the Sumitomo Electric Lightwave Corp. product part number, the tube cable manufactured length in feet, and the text "Do Not Lay Flat."

#### 3.4 Tube Cable Ends

Both ends of the tube cable are accessible on the reel. Each tube is sealed with a plastic cap or plug. Tube cable ends are sealed with a heat shrink end cap.

#### 3.5 Standard Reel Lengths

Sumitomo Part No.	Std Reel Length (ft)	Std Reel H x W (in)	Minimum Drum Diameter (in)	Std Reel Weight (lbs) Empty	Std Reel Weight (lbs) Full
TC07TLW	1000	54 x 36	40	137	360
TC19TLW	1000	60 x 49	40	420	883

#### Notes:

- Standard Reel Length tolerances are  $\pm 5\%$
- All Reel Widths shown are approximate values only and measured across outside-of-flanges
- If tube cable is re-spoiled, the Minimum Drum Diameter of the new reel shall be as shown to avoid damaging tube cable product
- All Empty and Full Reel Weights shown are approximate values only

### 3.6 Maximum Reel Lengths

Sumitomo Part No.	Max Reel Length (ft)	Max Reel H x W (in)	Minimum Drum Diameter (in)	Std Reel Weight (lbs) Empty	Std Reel Weight (lbs) Full
TC07TLW	3000	60 x 49	40	420	1089
TC19TLW	2000	72 x 49	40	523	1449
TC19TLW	3000	72 x 52	36	543	1932

#### Notes:

- Maximum Reel Length tolerances are  $\pm 5\%$
- All Reel Widths shown are approximate values only and measured across outside-of-flanges
- If tube cable is re-spoiled, the Minimum Drum Diameter of the new reel shall be as shown to avoid damaging tube cable product
- All Empty and Full Reel Weights shown are approximate values only

### 4.0 Blowing Performance / Testing

Each finished tube cable on its reel is required to pass a 5mm diameter steel ball from end to end using 70 psi (+/-10 psi) gas pressure.

### 5.0 Installation / Handling Practices

Sumitomo has incorporated a wide range of technical support and training services for our tube 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.

### 6.0 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

Sumitomo Electric Lightwave 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.