



## SUMITOMO PRODUCT SPECIFICATION

**FutureFLEX®**

**TCxxMTX-1 INDOOR/OUTDOOR ARMORED TUBE CABLE SERIES  
FOR USE IN MASS TRANSIT APPLICATIONS, NUCLEAR PLANTS,  
CLASS 1 DIV. 1 & 2 APPLICATIONS**



**SUMITOMO ELECTRIC LIGHTWAVE CORP.**

201 South Rogers Lane, Suite 100, Raleigh, NC 27610

(919) 541-8100 or 1-800-358-7378

[www.sumitomoelectric.com.com](http://www.sumitomoelectric.com.com)

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	Quality	3
1.3	Reliability	3
<b>2.0</b>	<b>Tube Cable Design</b>	<b>4</b>
2.1	General	4
2.2	Construction	4-6
<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	Tube Cable Reel Data	7
3.6	Maximum Reel Lengths	7
<b>4.0</b>	<b>Testing</b>	<b>7</b>
<b>5.0</b>	<b>Installation / handling Practices</b>	<b>8</b>
<b>6.0</b>	<b>Ordering Information</b>	<b>8</b>

## **1.0 GENERAL**

This specification covers the design requirements and performance standards for FutureFLEX® Air-Blown Fiber® (ABF) indoor/outdoor Low Smoke Zero Halogen armored tube cables. The features described in this document are intended to provide information on the performance of Sumitomo Electric's FutureFLEX® tube cables and aid in handling and use.

### **1.1 Tube Cable Description**

Sumitomo's FutureFLEX® TCxxMTX-1 (Low Smoke Zero Halogen) armored series tube cables for Mass Transit, Nuclear Plants, Class 1 Division 1 & 2 applications are designed for use as an optical fiber cabling infrastructure in ABF applications which meet UL 1581, UL 1685 LS, NFPA 130 (Standard for Fixed Guideway Transit and Passenger Rail Systems) cabling requirements ICEA 640 and OFN-LS. These requirements include FT4 / IEEE1202 exposure requirements for char height, total smoke released, and peak smoke released rate of ANSI/UL 1685. Mass Transit Tube Cables may also be used in indoor applications where: 1) lesser fire ratings, such as Optical Fiber Nonconductive – General Purpose (OFN) apply or 2) no fire ratings apply. The individual tubes have a 6mm inside diameter and 8mm outside diameter. A non-conductive, water blocking tape wrap surrounds the tube bundle and provides the necessary protection for use in outdoor applications. The jacket is made of non-halogen fire retardant thermoplastic and is cable tray rated. Ripcords are provided to aid in jacket removal. There is an interlocked steel armor over the inner jacket with no outer jacket. These tube cables are pulled or placed in routes for the purpose of individual tube connections to establish pathways for FutureFLEX® fiber bundle installation.

### **1.2 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.

### **1.3 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 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).

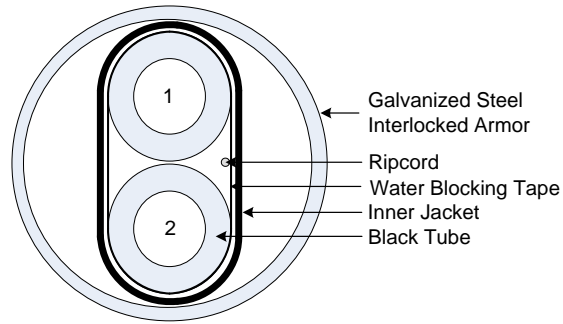
## 2.0 TUBE CABLE DESIGN

### 2.1 General

Sumitomo's FutureFLEX® TCxxMTX-1 Mass Transit indoor/outdoor rated armored tube cables series for NFPA130, UL 1581, UL 1685-LS applications provide a small diameter pathway for FutureFLEX® fiber bundle installations. FutureFLEX® ABF fiber bundles are available in Single-mode OS1, 62.5 micron Multimode OM1, 1-Gigabit 50 micron Multimode OM2, Laser Optimized 10-Gigabit 50 micron Multimode OM3, and Laser Optimized 10-Gigabit 50 micron Multimode OM4 versions with 2, 4, 6, 12, 18, or 24 fiber strand counts. One fiber bundle can be field-installed in each tube.

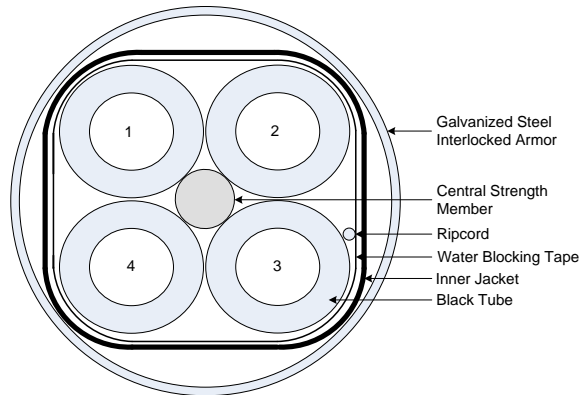
### 2.2 Construction

SEL Part Number	Product Description	Outside Diameter (in.)	Max. Weight (lbs./kft.)	Max. Tensile Load (lbs.)
TC02MTX-1	2-tubes, water blocking tape wrap, ripcord and black non-halogen fire retardant thermoplastic outer jacket, with an interlocked galvanized steel armoring.	1.078	544	200
TC04MTX-1	4-tubes, black fire retardant polyethylene center member, water blocking tape wrap, ripcord, and black non-halogen fire retardant thermoplastic outer jacket, with an interlocked galvanized steel armoring.	1.204	779	300
TC07MTX-1	7-tubes, water blocking tape wrap, ripcord, and black non-halogen fire retardant thermoplastic outer jacket, with an interlocked galvanized steel armoring.	1.401	1007	400
TC19MTX-1	19-tubes, water blocking tape wrap, ripcord, and black non-halogen fire retardant thermoplastic outer jacket , with an interlocked galvanized steel armoring.	2.011	1881	500

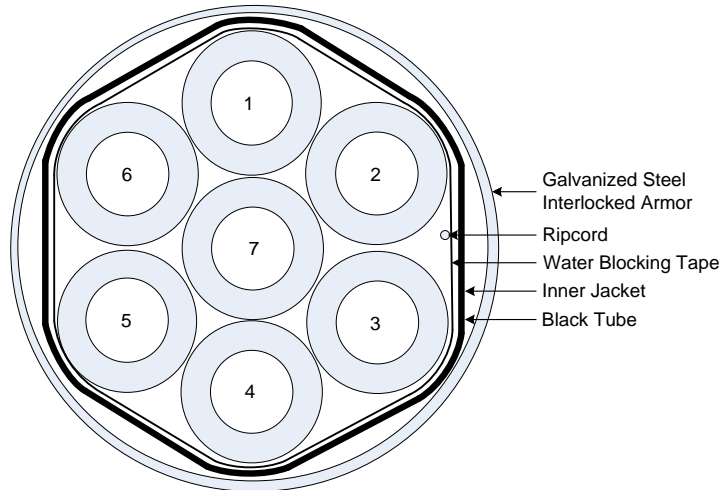


2-Tube  
Interlocked Armor /  
Dielectric MTX Cable  
TC02MTX-1

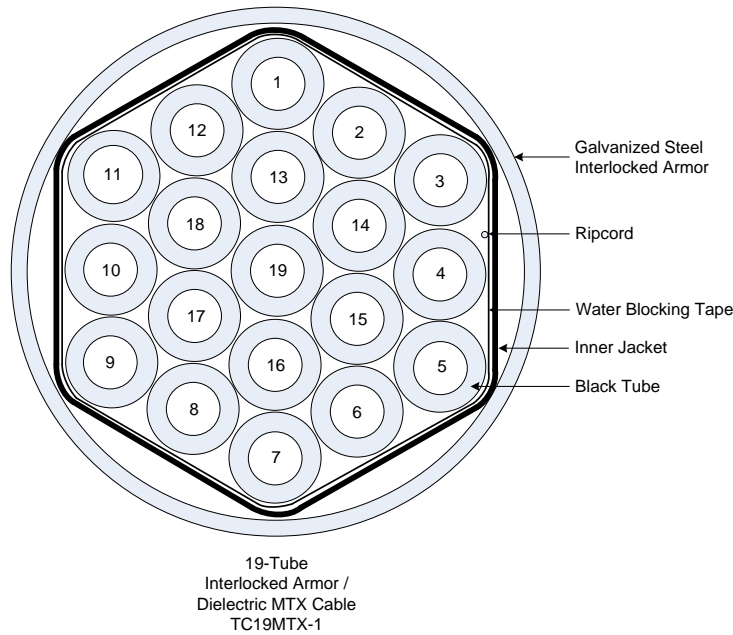
Drawings Not To Scale



4-Tube  
Interlocked Armor /  
Dielectric MTX Cable  
TC04MTX-1



7-Tube  
Interlocked Armor /  
Dielectric MTX Cable  
TC07MTX-1



### 3.0 TUBE CABLE CHARACTERISTICS

#### 3.1 Performance

Property	Specification
Operation Temperature Range	-40° to +70° C
Minimum Bend Radius (During / After Installation)	20 / 10 x tube cable outside diameter

#### 3.2 Tube Markings

The outside surface of each tube in multi-tube configurations is marked every two (2) inches with a tube number designation number (1 through 19).

In accordance with UL requirements, the outside surface of each cable jacket, under the armoring, is marked every two (2) feet with the following product identification information:

**'Phone receiver symbol' SEL FutureFLEX® (SEL Part No.) Type OFNG-LS / FT4 ETL Listed c(ETL)us Field Assembled Optical Fiber Cable (Manufacturing Lot #) (Seq. Ftg.) 1-877-356-FLEX WWW.FUTUREFLEX.COM ←**

#### 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 Tube Cable Reel Data

Sumitomo Part No.	Reel Length (ft)	Reel F x W (in)	Minimum Drum Diameter (in)	Reel Weight (lbs) Empty	Reel Weight (lbs) Full
TC02MTX-1	1000	54 x 16	40	116	660
TC04MTX-1	1000	54 x 16	40	116	895
TC07MTX-1	1000	54 x 16	40	116	1123
TC19MTX-1	1000	60 x 42	40	420	2301

#### **Notes:**

- Standard Reel Lengths are 1,000-feet and Maximum Reel Lengths are 3,000-feet unless otherwise noted. All Reel Length tolerances are  $\pm 5\%$ . Cut Lengths are available. Contact FutureFLEX® Distributor for additional information.
- If tube cable is re-spooled, the minimum Drum Diameter of the new reel SHALL be no less than that specified herein to avoid damaging tube cable product.
- All Reel Widths shown are approximate values only and measured from outside-of-flange to outside-of-flange plus an allowance for fastener hardware protrusions.
- 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)	Max Reel Weight (lbs) Empty	Max Reel Weight (lbs) Full
TC02MTX-1	3000	60 x 42	40	420	2052
TC04MTX-1	3000	60 x 42	40	420	2757
TC07MTX-1	3000	60 x 42	40	420	3441
TC19MTX-1	2000	72 x 42	40	523	4285
TC19MTX-1	3000	84 x 61	42	930	6573

#### **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-spooled, 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 TESTING

Each finished tube cable 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  
201 South Rogers Lane  
Suite 100, Raleigh, NC 27610  
Attn: Customer Service Department  
Phone: 800-358-7378  
919-541-8100  
Fax: 919-541-8265  
E-mail: [info@sumitomoelectric.com](mailto: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.