

DATE : Apr. 15. 2022

SPEC. No. : WS22-H002A

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SPECIFICATION

FOR

e-Ribbon<sup>®</sup> Cable

T12V-SMEB-□□□-WB-NM-DJSA-OSP

(□□□ : 144, 288, 432, 864)

SWCC SHOWA CABLE SYSTEMS CO., LTD

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Accepted by

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SWCC SHOWA CABLE SYSTEMS CO., LTD.

**SPECIFICATION**  
**FOR**  
**e-Ribbon® Cable**

1. GENERAL

This specification covers the requirements for e-Ribbon® (Rollable Ribbon) Single-armored Cable as follows.

e-Ribbon® Single-armored Cable is an outside plant cable designed specifically for fiber-to-the-x (FTTx) or access network. The optical fiber is compliant with standard, Telcordia GR-20-CORE Issue 4, July 2014 and ANSI/ICEA S-87-640-2016.

No.	Description	Fiber Count
1	T12V-SMEB-144-WB-NM-DJSA-OSP	144
2	T12V-SMEB-288-WB-NM-DJSA-OSP	288
3	T12V-SMEB-432-WB-NM-DJSA-OSP	432
4	T12V-SMEB-864-WB-NM-DJSA-OSP	864

## 2. CONSTRUCTION

### 2.1 Optical Fiber

Table 1 Geometrical Parameters of Optical Fiber

Item		Specification
Type		Single Mode Fiber (Comply with ITU-T G.657.A1)
Core	Material	Ge Doped Silica Glass
	Mode Field Diameter $\lambda = 1310 \text{ nm}$	Nominal Value                      8.6 $\mu\text{m}$
		Tolerance $\pm 0.4 \mu\text{m}$
Cladding	Material	Silica Glass
	Diameter	$125 \pm 0.7 \mu\text{m}$
Cable Cut-off Wavelength		$\leq 1260 \text{ nm}$
Mode Field Concentricity Error		$\leq 0.5 \mu\text{m}$
Cladding Non-circularity		$\leq 1 \%$
Macro bending Loss	$\lambda = 1550 \text{ nm}$	R15 mm-10 turns : $\leq 0.25 \text{ dB}$
Color Coating	Material	UV Curable Acrylate (Color : See Table 3)
	Diameter	$250 \pm 15 \mu\text{m}$

2.2 12F e-Ribbon®

Table 2 Geometrical Parameters of 12F e-Ribbon®

Item		Specification
Optical Fiber	Number	12
Coating	Material	UV Curable Acrylate
	Construction	12 single optical fibers are aligned and two single optical fibers are bonded continuously as a flat ribbon also two adjacent flat ribbons are bonded together periodically in the longitudinal direction.
Dimension	Width	3.15 <sup>+0.12</sup> <sub>-0.15</sub> mm
	Thickness	0.28 <sup>+0.08</sup> <sub>-0.03</sub> mm
Ribbon Mass		Approx. 1.0 kg / km

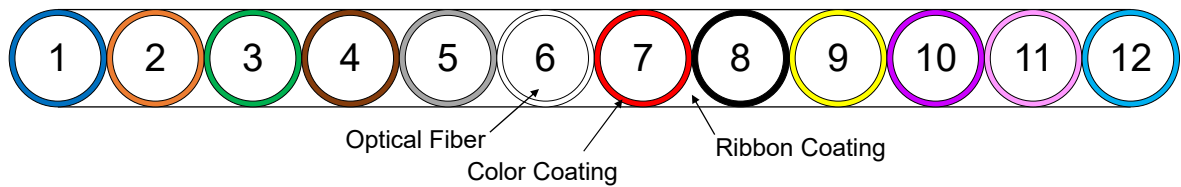


Fig. 1 Cross Section Schematic Drawing of 12F e-Ribbon®

Note : Figure assigned to optical fiber denote optical number.

Table 3 Optical Fiber Color Identification

Optical Fiber No.	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

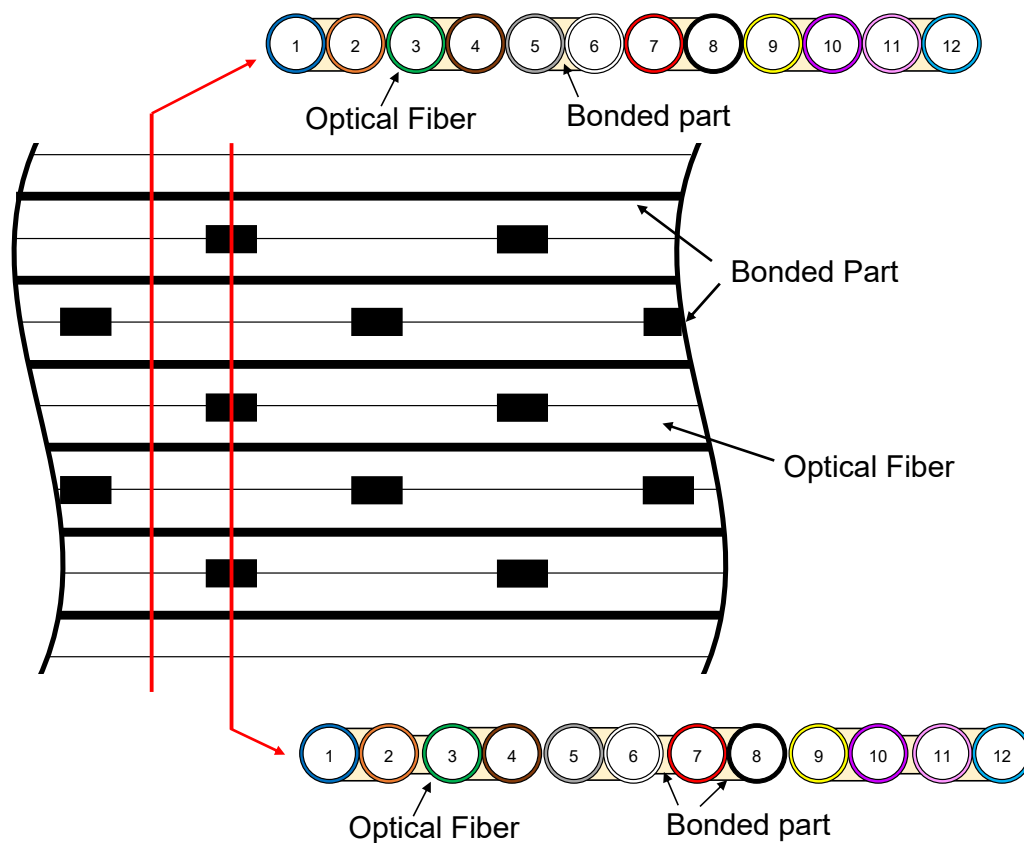


Fig. 2 Longitudinal Direction Schematic Drawing of 12F e-Ribbon®

Table 4 e-Ribbon® Code

Identification Code	
e-Ribbon® No.	Marking
#1	■
#2	■ ■
#3	■ ■ ■
#4	■ ■ ■ ■
#5	■■■■■■■■■■
#6	■■■■■■■■■■ ■
#7	■■■■■■■■■■ ■ ■
#8	■■■■■■■■■■ ■ ■ ■
#9	■■■■■■■■■■ ■ ■ ■ ■
#10	■■■■■■■■■■ ■■■■■■■■■
#11	■■■■■■■■■■ ■■■■■■■■■ ■
#12	■■■■■■■■■■ ■■■■■■■■■ ■ ■

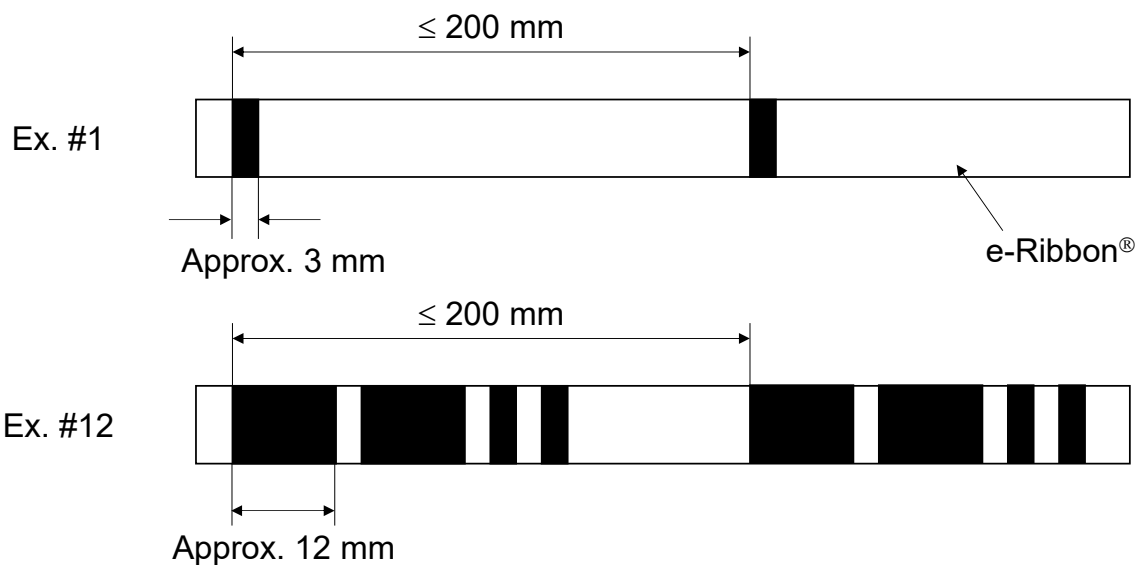


Fig. 3 Dimension of marking

## 2.3 Fiber Sub Unit

Table 5 Geometrical Parameters of 72F and 144F Sub Unit

Item		Specification
Optical Fiber Ribbon (e-Ribbon®)	Number	6 or 12
	Fiber Count	72 or 144 (As shown in Fig. 4 and 5)
Bundle Tape	Material	Colored Plastic Tape

Table 6 72F and 144F Sub Unit Color Identification

Sub Unit No.	Bundle Tape Color
1	Blue
2	Orange
3	Green
4	Brown
5	Slate
6	White

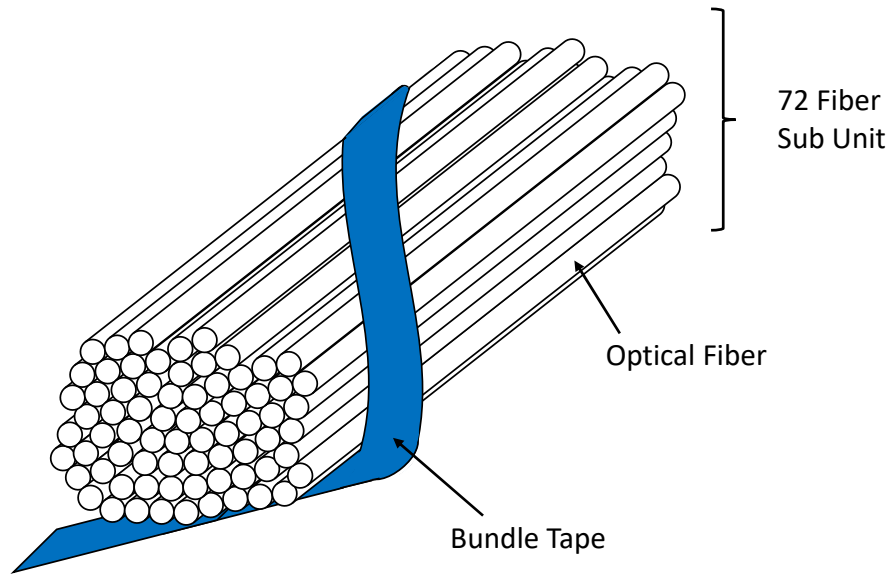


Fig. 4 Longitudinal Direction Schematic of 72F Sub Unit

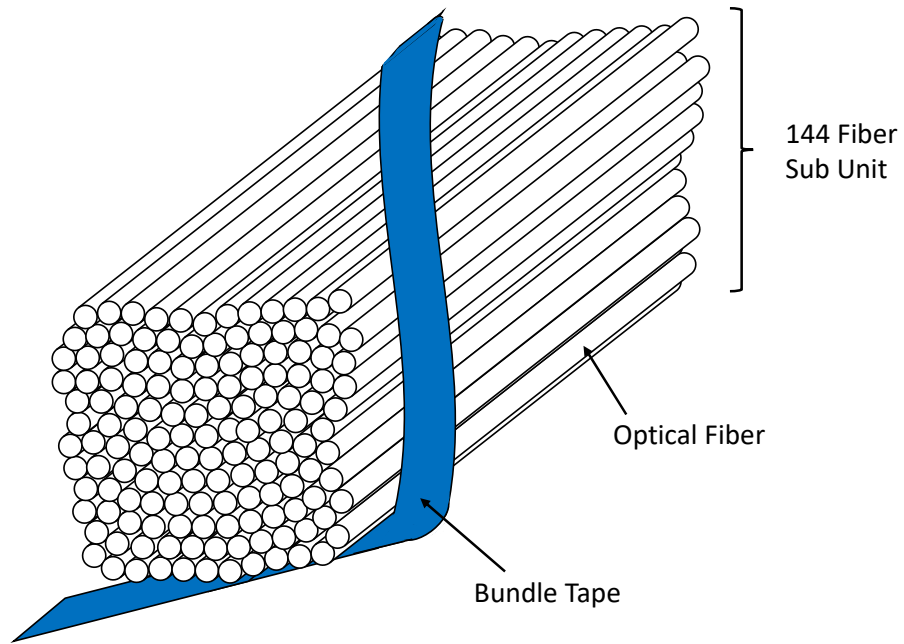


Fig. 5 Longitudinal Direction Schematic of 144F Sub Unit



## 2.4 Single-armored Cable

Table 7 Geometrical Parameters of Single-armored Cable (144 to 864F)

Item		Specification	
Stranding	Construction	Bundled 12F e-Ribbon <sup>®</sup> (72F or 144F Sub Unit) shall be stranded.	
Intervening Substance		Water Blocking Yarn	
Wrapping		Water Blocking Tape	
Strength Member	Material	G-FRP	
	Number	4	
	Diameter	1~2 mm	
Ripcord	Material	Plastic Yarn	
	Number	2	
Jacket	Material	Polyethylene	
	Thickness	Nom. 2 mm	
Armor	Material	Stainless Steel Tape with Copolymer	Steel Tape with Copolymer
	Thickness	Nom. 0.2 mm	Nom. 0.25 mm
Outer Sheath	Material	Polyethylene	
	Thickness	Nom. 2 mm	

Table 8 Structural Parameters of Single-armed Cable (144 to 864F)

Item		Specification			
Total Fiber Count	Fiber	144	288	432	864
12F e-Ribbon <sup>®</sup> Count	Ribbon	12	24	36	72
Sub Unit Count	Unit	Nothing	72F×4	72F×6	144F×6
Cable Out Diameter (Cable OD)	mm	16.5	18.5	20.0	24.0
Cable Mass	Kg / km	250	300	345	470
Standard Length	feet / Reel	19,000	15,000	13,000	9,000
	m / Reel	5,791	4,572	3,962	2,743

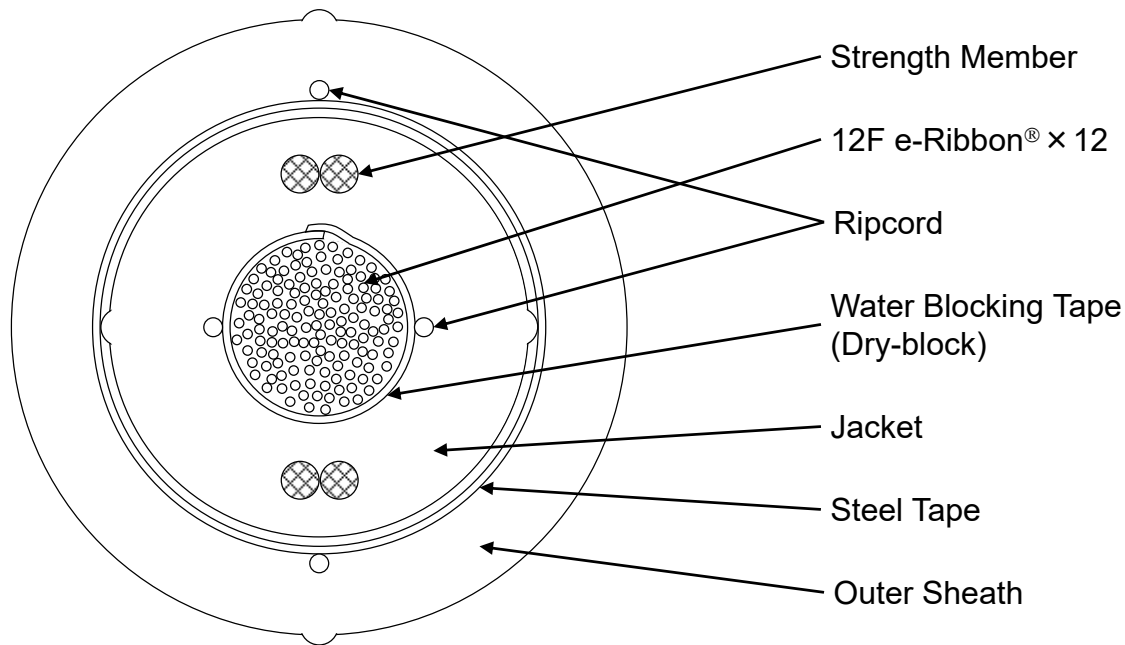


Fig. 6 Cross Section of 144F e-Ribbon® Single-armored Cable

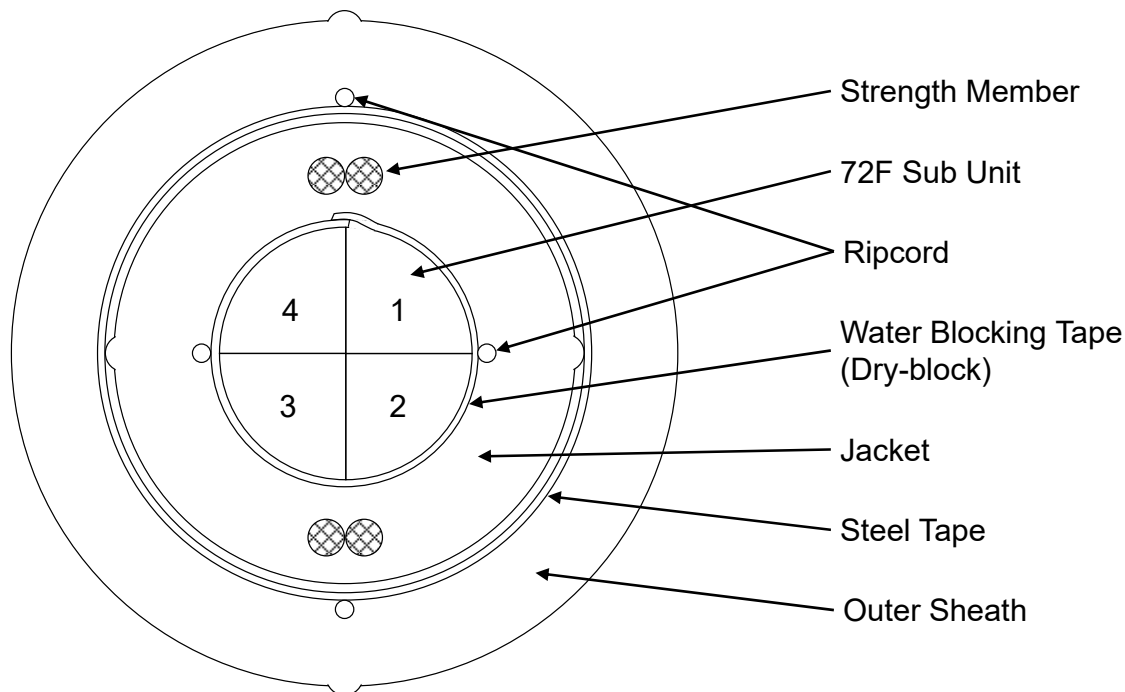


Fig. 7 Cross Section of 288F e-Ribbon® Single-armored Cable  
Note : Numbers assigned to Unit denote 72F Sub Unit number.

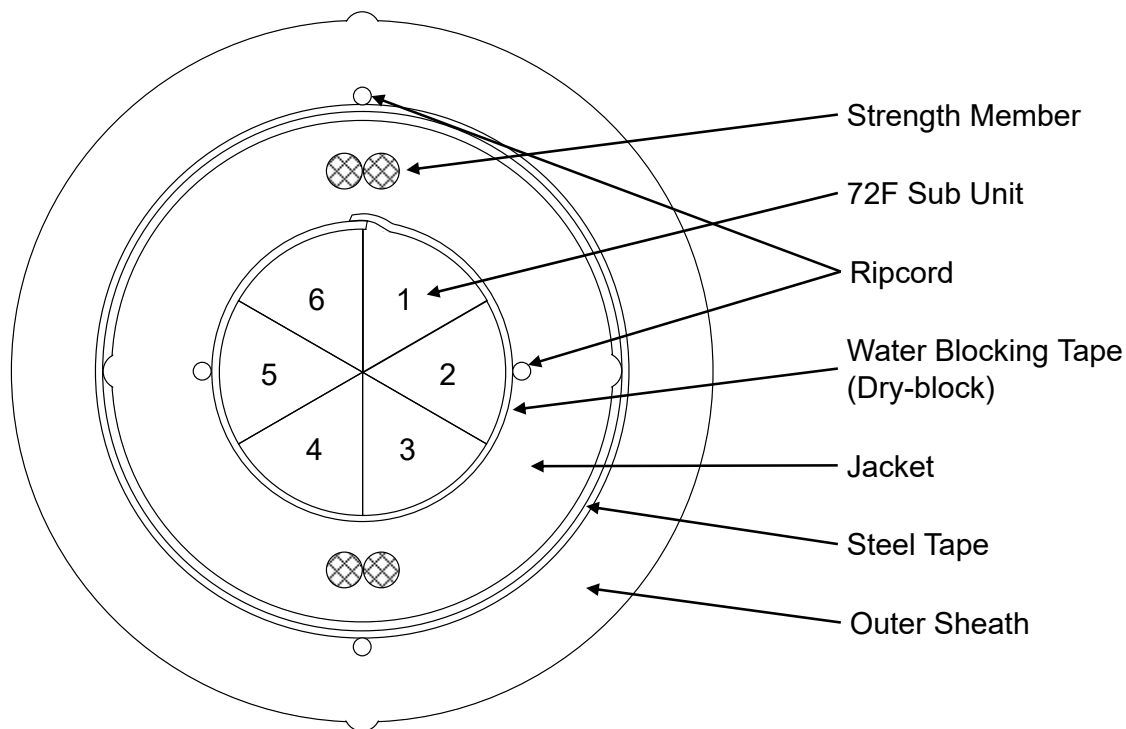


Fig. 8 Cross Section of 432F e-Ribbon® Single-armed Cable  
Note : Numbers assigned to Unit denote 72F Sub Unit number.

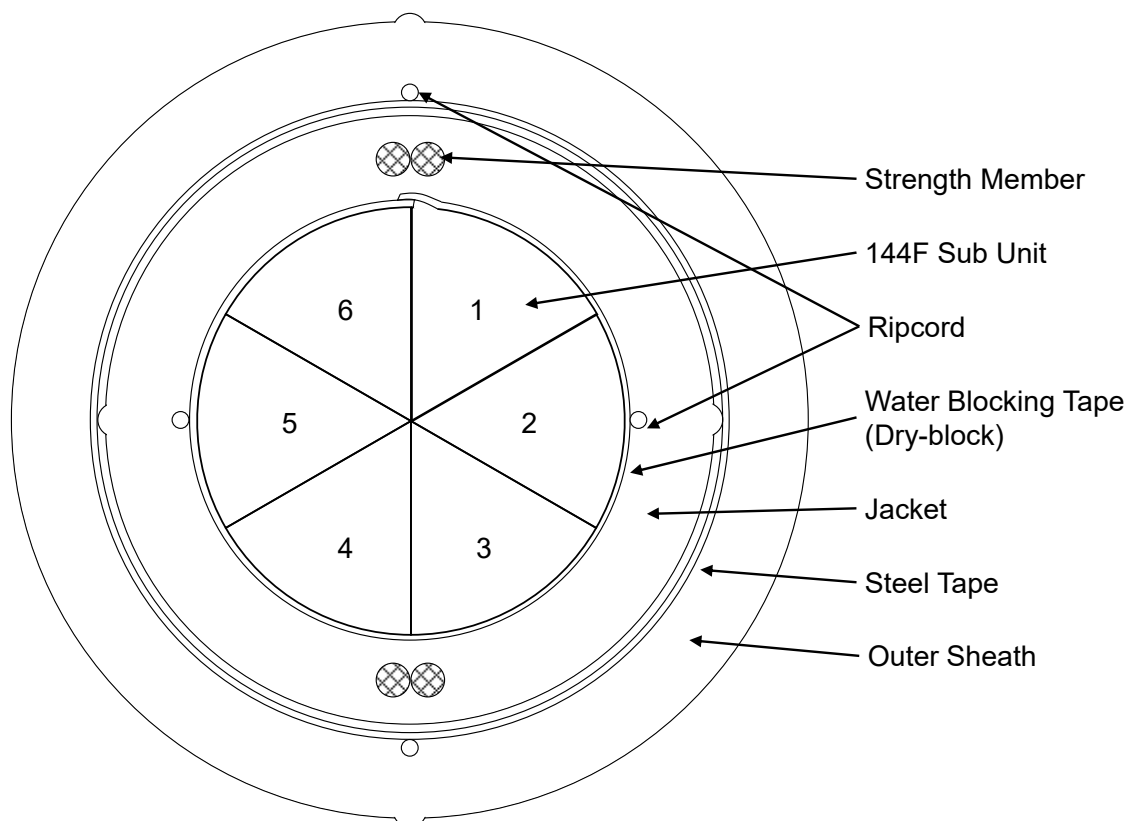


Fig. 9 Cross Section of 864F e-Ribbon® Single-armed Cable  
Note : Numbers assigned to Unit denote 144F Sub Unit number.

### 3. CHARACTERISTICS

#### 3.1 Optical Characteristics

Table 9 Optical Characteristics of Cable

Item		Specification
Attenuation	$\lambda = 1310 \text{ nm}$	$\leq 0.4 \text{ dB / km (*1)}$
	$\lambda = 1383 \text{ nm}$	$\leq 0.4 \text{ dB / km (*1)}$
	$\lambda = 1550 \text{ nm}$	$\leq 0.3 \text{ dB / km (*2)}$

(\*1) In case of cable length (L) < 1 km, the specification is as follows.

$$0.2 \leq L < 1 \quad : \quad 0.25 \times L + 0.15 \text{ (dB)}$$

$$L < 0.2 \quad : \quad \leq 0.2 \text{ (dB)}$$

(\*2) In case of cable length (L) < 1 km, the specification is as follows.

$$0.2 \leq L < 1 \quad : \quad 0.125 \times L + 0.175 \text{ (dB)}$$

$$L < 0.2 \quad : \quad \leq 0.2 \text{ (dB)}$$

#### 3.2 Physical Characteristics

Table 10 Physical Characteristics of Cable

Item		Specification
Minimum Bending Radius		$15 \times \text{Cable OD mm}$
Maximum Pulling Tension	Short Term	2700 N
	Long Term	810 N

## 3.3 Mechanical and Environmental Characteristics

Table 11 Mechanical and Environmental Characteristics of Cable

Item	Method	Specification
Low and High Temperature Cable Bend	FOTP-37	Bending Radius : 20D or 30D Temperature Range : -30 °C to +60 °C Number of Turn : 4 Turns Number of Cycle : 3 Cycles
Impact	FOTP-25	Impact Energy : 4.4 N·m
Compressive	FOTP-41	Load : 2200 N / 100 mm Retention Time : 1 min
Tensile	FOTP-33 FOTP-38	Load : 2700 N
Twist	FOTP-85	Rotation : ±90° Number of Cycle : 10 Cycles
Cycling Flexing	FOTP-104	Bending Radius : 10D Number of Cycle : 25 Cycles
Temperature Cycling	FOTP-3	Temperature Range : -40 °C to +70 °C Number of Cycle : 2 Cycles
Water Penetration <sup>1)</sup>	FOTP-82	Specimen length : 3 m Height of Water : 1 m Retention Time : 24 hr.
Note : 1) The test conduct only inner core. The Outer Sheath and Armor shall be removed from cable specimen. And the cable is tested using pre-soak accordance to the FOTP-82.		

#### 4. IDENTIFICATION

The following details shall be printed in indelibly and continuously at interval of 2 feet on the outer sheath.

- Manufacturer's Name and/or Abbreviation
- Year and Month of Manufacture
- Length Marking\*

\* The length mark number of the coiled start of reel is not limited as "00000 ft", and the length mark number dose the count up or down toward the cable end of products at intervals of 2 feet.

#### 5. PACKING

After completion of tests, both ends of the cable shall be sealed with suitable end cap in order to prevent the ingress of moisture.

Each length of cable shall be coiled on suitable reel, the ends being securely fixed in order to prevent the coil from getting loose during transportation and storage.

The reel shall be lagged with stout closely fitting battens in order to protect cable from damage during transportation and storage.

The following information shall be attached on the package.

- Description and/or Abbreviation
- Length
- Manufacturer's Name and/or Abbreviation
- Year and Month of Manufacture etc.

#### 6. LIMITATION OF LIABILITY

Maximum amount of compensation caused by our products due to this specification is the total sum of the contract.

———— End of Specification ————