



SUMITOMO SPECIFICATION

FutureFLEX®

ENG - ABFFB Standard Fiber Bundle



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1.0 FIBER BUNDLE DESIGN

This specification covers the design requirements and performance standards for FutureFLEX® Air-Blown Fiber (ABF) bundles. These fiber bundles are designed for installation into FutureFLEX ABF tube cable infrastructures. The features described in this document are intended to provide information on the performance of Sumitomo Electric's FutureFLEX fiber bundles and aid in handling and use.

1.1 Fiber Bundle Description

Sumitomo's standard FutureFLEX fiber bundles are designed for use in an optical fiber cabling infrastructure in ABF applications. They may be used in indoor and outdoor applications. The fiber bundles are UL listed for use in fire-rated ABF tube cables. UV inked fibers are individually colored coded per TIA Standards. The fibers are contained in either a clear or color coded nylon sub-unit/inner jacket. Polyester ripcords are provided for entry into the nylon sub-units. Aerodynamic foamed polyethylene outer jackets contain the sub-units and allow for long blowing distances. These fiber bundles are blown through an ABF tube cable infrastructure to establish a point-to-point fiber link in a FutureFLEX ABF 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).

2.1 GENERAL

Sumitomo's FutureFLEX ABF bundles provide a small diameter, lightweight, aerodynamically designed method for installing optical fiber in FutureFLEX ABF installations. FutureFLEX ABF fiber bundles are available in Single-Mode OS2, 62.5/125 micron Multimode OM1, and 50/125 micron Multimode Standard OM2, Laser Optimized 300 meter OM3, and Laser Optimized 550 meter OM4 grades with 2, 4, 6, 12, 18, 24 or 48 fiber strand counts. One fiber bundle can be field-installed in each ABF tube.

NOTE: The design requirements and performance standards for the various Single-Mode, 62.5/125 micron and 50/125 micron Multimode types of optical fibers used in Sumitomo's FutureFLEX ABF bundles are described in separate specification sheets.

2.2 Fiber Bundle Types

SEL Part Number	Fiber Type	Fiber Diameter	ABF Bundle Jacket Color
FBxxSX	Single-Mode (OS2)	250 μ m	Yellow
FBxxM6	62.5/125 μ m Multimode (Standard Grade) (OM1)	250 μ m	Blue
FBxxM5	50/125 μ m Multimode (Standard Grade) (OM2)	250 μ m	White/Natural
FBxxG53	50/125 μ m Multimode (Laser Optimized 300 meter Grade) (OM3)	250 μ m	Aqua
FBxxG55	50/125 μ m Multimode (Laser Optimized 550 meter Grade) (OM4)	250 μ m	Aqua

2.3 Fiber Bundle Construction

2-Fiber ABF Bundles			
SEL Part Number	Product Description	ABF Bundle Jacket Outside Diameter	ABF Bundle Jacket Weight (lb/kft)
FB02SX	Foamed polyethylene jacket, one (1) nylon sub-unit, two (2) Single-Mode optical fibers, and five (5) polyester ripcords	2mm	1.34
FB02M6	Foamed polyethylene jacket, one (1) nylon sub-unit, two (2) 62.5/125 μ m Multimode fibers, and five (5) polyester ripcords	2mm	1.34
FB02M5	Foamed polyethylene jacket, one (1) nylon sub-unit, two (2) 50/125 μ m Multimode fibers, and five (5) polyester ripcords	2mm	1.34

4-Fiber ABF Bundles			
SEL Part Number	Product Description	ABF Bundle Jacket Outside Diameter	ABF Bundle Jacket Weight (lb/kft)
FB04SX	Foamed polyethylene jacket, one (1) nylon sub-unit, four (4) Single-Mode optical fibers, and three (3) polyester ripcords	2mm	1.34
FB04M6	Foamed polyethylene jacket, one (1) nylon sub-unit, four (4) 62.5/125 μm Multimode optical fibers, and three (3) polyester ripcords	2mm	1.34
FB04M5	Foamed polyethylene jacket, one (1) nylon sub-unit, four (4) 50/125 μm Multimode optical fibers, and three (3) polyester ripcords	2mm	1.34

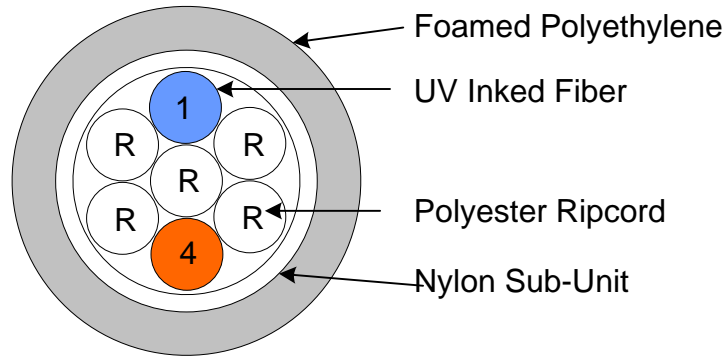
6-Fiber ABF Bundles			
SEL Part Number	Product Description	ABF Bundle Jacket Outside Diameter	ABF Bundle Jacket Weight (lb/kft)
FB06SX	Foamed polyethylene jacket, one (1) nylon sub-unit, six (6) Single-Mode optical fibers, and one (1) polyester ripcord	2mm	1.34
FB06M6	Foamed polyethylene jacket, one (1) nylon sub-unit, six (6) 62.5/125 μm Multimode optical fibers, and one (1) polyester ripcord	2mm	1.34
FB06M5 FB06G53 FB06G55	Foamed polyethylene jacket, one (1) nylon sub-unit, six (6) 50/125 μm Multimode optical fibers, and one (1) polyester ripcord	2mm	1.34

12-Fiber ABF Bundles			
SEL Part Number	Product Description	ABF Bundle Jacket Outside Diameter	ABF Bundle Jacket Weight (lb/kft)
FB12SX	Foamed polyethylene jacket, three (3) nylon sub-units, four (4) Single-Mode optical fibers per sub-unit, three (3) polyester ripcords per sub-unit	3mm	3.35
FB12M6	Foamed polyethylene jacket, three (3) nylon sub-units, four (4) 62.5/125 μm Multimode optical fibers per sub-unit, and three (3) polyester ripcords per sub-unit	3mm	3.35
FB12M5 FB12G53 FB12G55	Foamed polyethylene jacket, three (3) nylon sub-units, four (4) 50/125 μm Multimode optical fibers per sub-unit, and three (3) polyester ripcords per sub-unit	3mm	3.35

18-Fiber ABF Bundles			
SEL Part Numbers	Product Description	ABF Bundle Jacket Outside Diameter	ABF Bundle Jacket Weight (lb/kft)
FB18SX	Foamed polyethylene jacket, three (3) nylon sub-units, six (6) Single-Mode optical fibers per sub-unit, and one (1) polyester ripcord per sub-unit	3mm	3.35
FB18M6	Foamed polyethylene jacket, three (3) nylon sub-units, six (6) 62.5/125 μm Multimode optical fibers per sub-unit, and one (1) polyester ripcord per sub-unit	3mm	3.35
FB18M5 FB18G53 FB18G55	Foamed polyethylene jacket, three (3) nylon sub-units, six (6) 50/125 μm Multimode optical fibers per sub-unit, and one (1) polyester ripcord per sub-unit	3mm	3.35

24-Fiber ABF Bundles			
SEL Part Number	Product Description	ABF Bundle Jacket Outside Diameter	ABF Bundle Jacket Weight (lb/kft)
FB24SX	Foamed polyethylene jacket, four (4) nylon sub-units, six (6) Single-Mode optical fibers per sub-unit, one (1) polyester ripcord per sub-unit, and one (1) Central Member	3mm	3.77
FB24M6	Foamed polyethylene jacket, four (4) nylon sub-units, six (6) 62.5/125 μm Multimode optical fibers per sub-unit, one (1) polyester ripcord per sub-unit, and one (1) Central Member	3mm	3.77
FB24M5 FB24G53 FB24G55	Foamed polyethylene jacket, four (4) nylon sub-units, six (6) 50/125 μm Multimode optical fibers per sub-unit, one (1) polyester ripcord per sub-unit, and one (1) Central Member	3mm	3.77

48-Fiber ABF Bundles			
SEL Part Number	Product Description	ABF Bundle Jacket Outside Diameter	ABF Bundle Jacket Weight (lb/kft)
FB48SX	Foamed polyethylene jacket, four (4) color coded nylon sub-units, twelve (12) Single-Mode optical fibers per sub-unit, one (1) polyester ripcord per sub-unit, and one (1) center member	3.7mm	5.63
FB48M5 FB48G53 FB48G55	Foamed polyethylene jacket, four (4) color coded nylon sub-units, twelve (12) 50/125 μm Multimode optical fibers per sub-unit, one (1) polyester ripcord per sub-unit, and one (1) center member	3.7mm	5.63

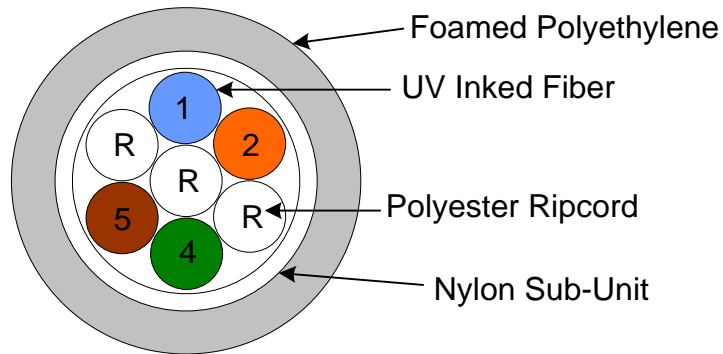


Standard
2-Fiber Bundle

Drawing not to scale

Fiber Color Code (“OR Pos” = Outer Ring and “Ctr Pos” = Center Position)

Pos. #1	Pos. #2	Pos. #3	Pos. #4	Pos. #5	Pos. #6	Pos. #7
Blue	Ripcord	Ripcord	Orange	Ripcord	Ripcord	Ripcord

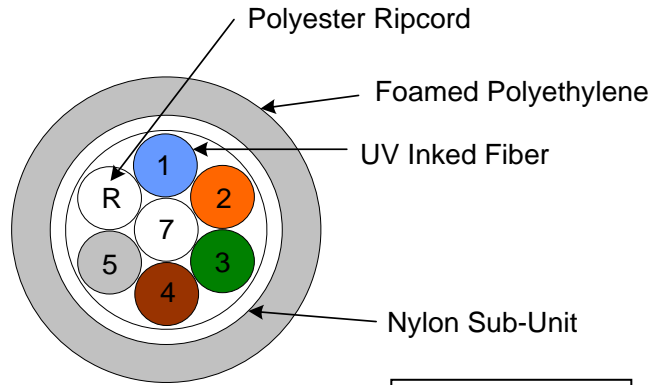


Standard
4-Fiber Bundle

Drawing not to scale

Fiber Color Code (“OR Pos” = Outer Ring and “Ctr Pos” = Center Position)

OR Pos. #1	OR Pos. #2	OR Pos. #3	OR Pos. #4	OR Pos. #5	OR Pos. #6	Ctr Pos. #7
Blue	Orange	Ripcord	Green	Brown	Ripcord	Ripcord

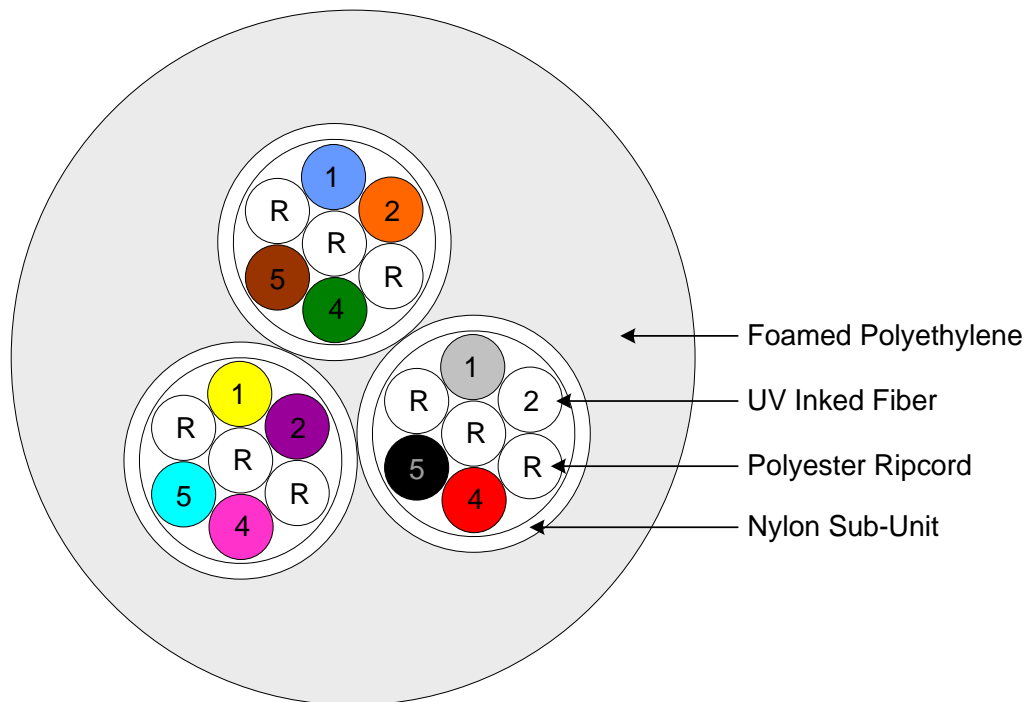


Drawing not to scale

Standard
6-Fiber Bundle

Fiber Color Code (“OR Pos” = Outer Ring and “Ctr Pos” = Center Position)

OR Pos. #1	OR Pos. #2	OR Pos. #3	OR Pos. #4	OR Pos. #5	OR Pos. #6	Ctr Pos. #7
Blue	Orange	Green	Brown	Slate	Ripcord	White

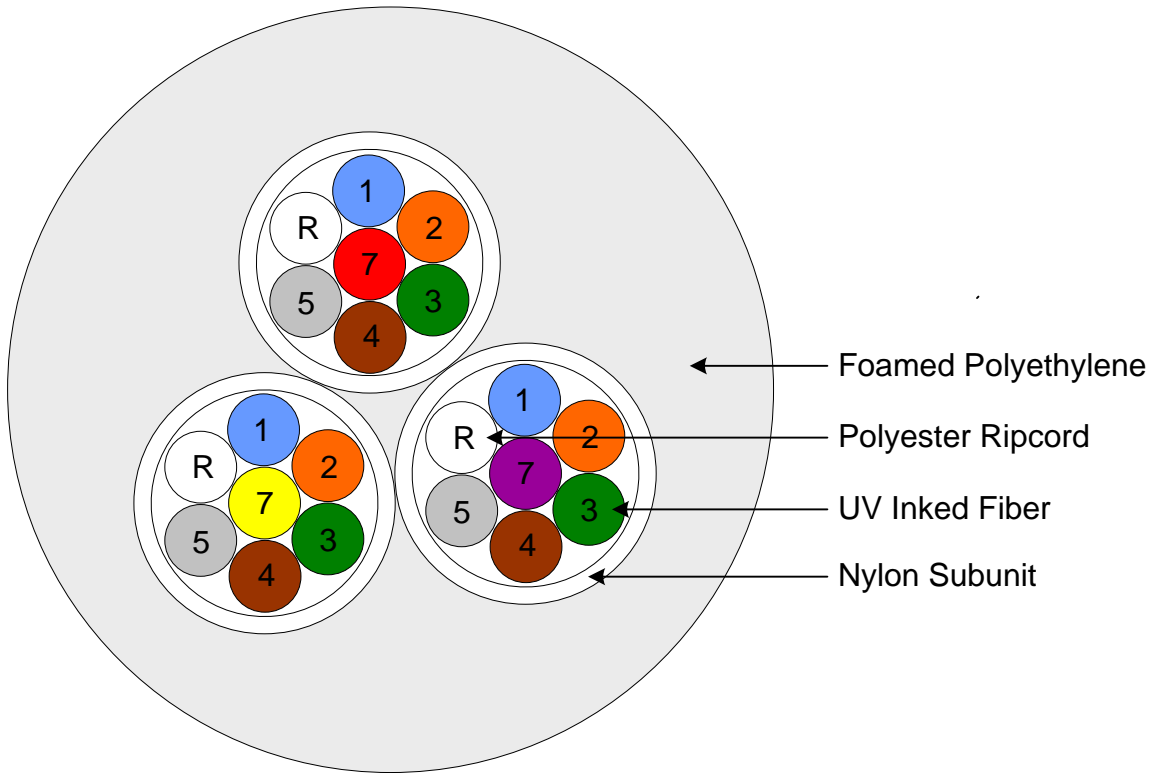


Drawing not to scale

Standard
12-Fiber Bundle

Fiber Color Code (“OR Pos” = Outer Ring and “Ctr Pos” = Center Position)

OR Pos. #1	OR Pos. #2	OR Pos. #3	OR Pos. #4	OR Pos. #5	OR Pos. #6	Ctr Pos. #7
Blue	Orange	Ripcord	Green	Brown	Ripcord	Ripcord
Slate	White	Ripcord	Red	Black	Ripcord	Ripcord
Yellow	Violet	Ripcord	Rose	Aqua	Ripcord	Ripcord

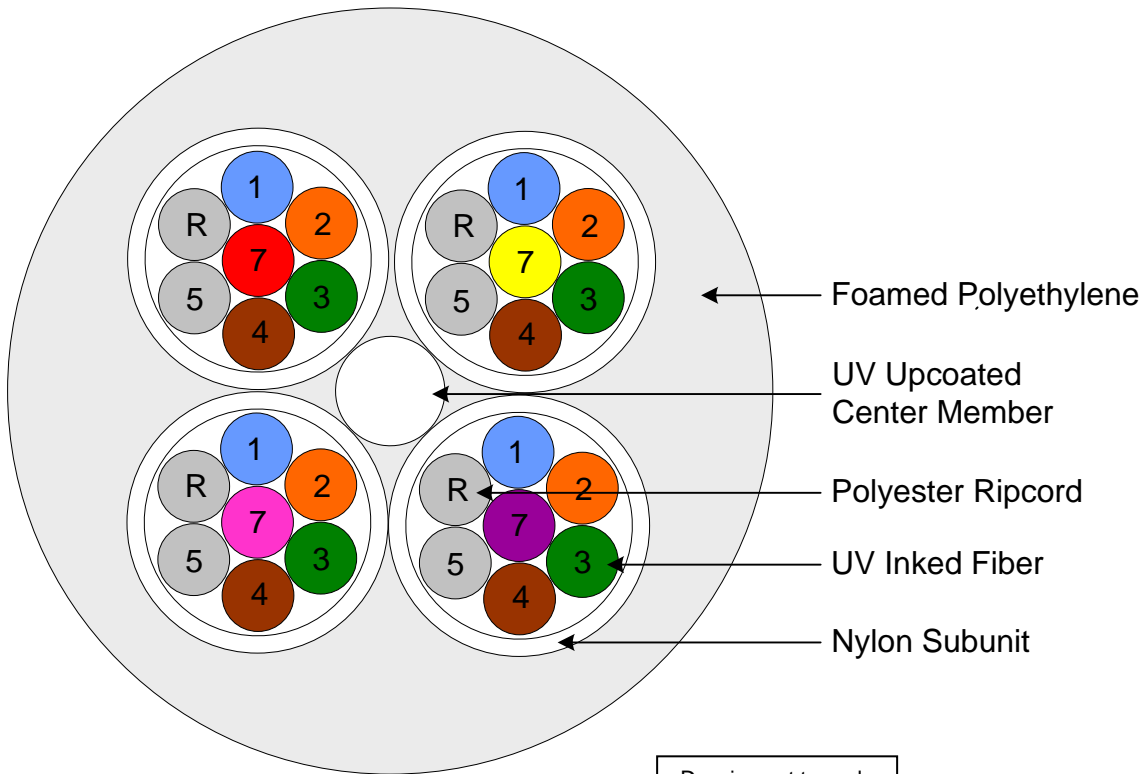


Standard
18-Fiber Bundle

Drawing not to scale

Fiber Color Code (“OR Pos” = Outer Ring and “Ctr Pos” = Center Position)

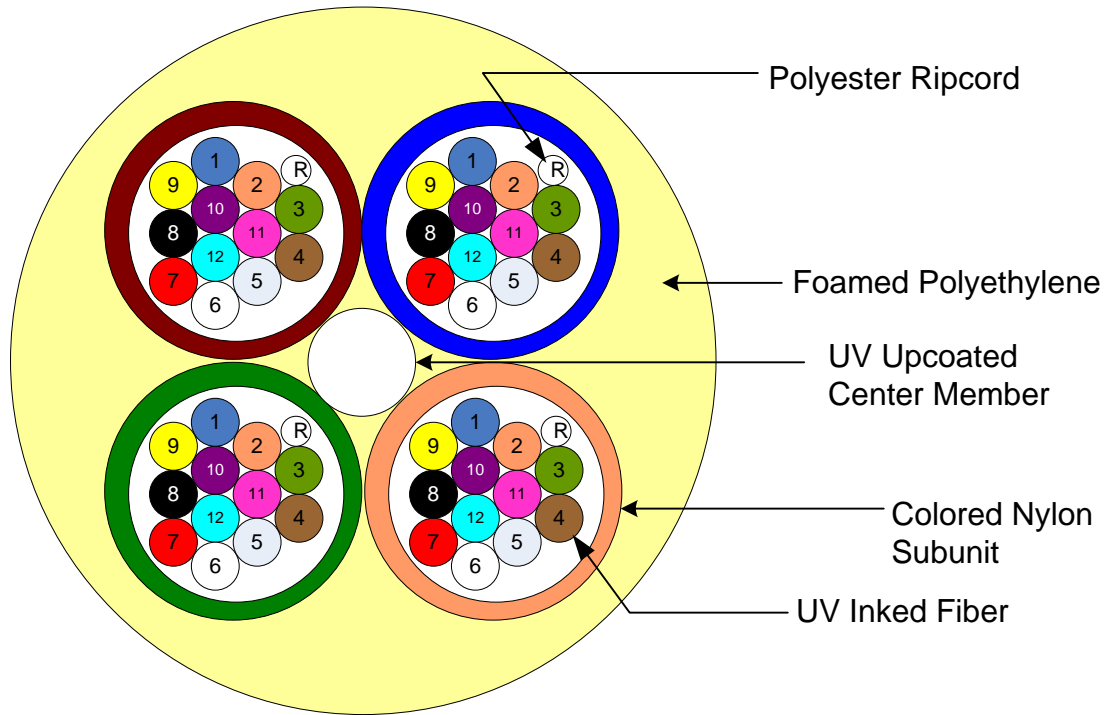
OR Pos. #1	OR Pos. #2	OR Pos. #3	OR Pos. #4	OR Pos. #5	OR Pos. #6	Ctr Pos. #7
Blue	Orange	Green	Brown	Slate	Ripcord	Red
Blue	Orange	Green	Brown	Slate	Ripcord	Yellow
Blue	Orange	Green	Brown	Slate	Ripcord	Violet



Standard
24-Fiber Bundle

Fiber Color Code (“OR Pos” = Outer Ring and “Ctr Pos” = Center Position)

OR Pos. #1	OR Pos. #2	OR Pos. #3	OR Pos. #4	OR Pos. #5	OR Pos. #6	Ctr Pos. #7
Blue	Orange	Green	Brown	Slate	Ripcord	Red
Blue	Orange	Green	Brown	Slate	Ripcord	Yellow
Blue	Orange	Green	Brown	Slate	Ripcord	Violet
Blue	Orange	Green	Brown	Slate	Ripcord	Rose



Standard
48 - Fiber Bundle

Drawing not to scale

48-FIBER BUNDLES (4 NYLON SUB-UNITS)

Nylon sub-Unit Color							
Blue	1st Pos	2nd Pos	3rd Pos	4th Pos	5th Pos	6th Pos	7th Pos
	Blue	Orange	Green	Brown	Slate	White	Red
	8th Pos	9th Pos	10th Pos	11th Pos	12th Pos	R Pos	
	Black	Yellow	Violet	Rose	Aqua	Ripcord	
Orange	1st Pos	2nd Pos	3rd Pos	4th Pos	5th Pos	6th Pos	7th Pos
	Blue	Orange	Green	Brown	Slate	White	Red
	8th Pos	9th Pos	10th Pos	11th Pos	12th Pos	R Pos	
	Black	Yellow	Violet	Rose	Aqua	Ripcord	
Green	1st Pos	2nd Pos	3rd Pos	4th Pos	5th Pos	6th Pos	7th Pos
	Blue	Orange	Green	Brown	Slate	White	Red
	8th Pos	9th Pos	10th Pos	11th Pos	12th Pos	R Pos	
	Black	Yellow	Violet	Rose	Aqua	Ripcord	
Brown	1st Pos	2nd Pos	3rd Pos	4th Pos	5th Pos	6th Pos	7th Pos
	Blue	Orange	Green	Brown	Slate	White	Red
	8th Pos	9th Pos	10th Pos	11th Pos	12th Pos	R Pos	
	Black	Yellow	Violet	Rose	Aqua	Ripcord	

3. FIBER BUNDLE CHARACTERISTICS

3.1 Performance

Property	Specification
Operation Temperature Range	-40° to +158° F
Minimum Bend Radius of Fiber Bundle	1.5"

3.2 Fiber Bundle Markings

The outside surface of the fiber bundle jacket is marked every two (2) feet with the following information:

(FB Part No.) (Lot #) (Seq. Ftg.)

3.3 Reel Markings

A sticker with the Sumitomo fiber bundle part number is attached to the outside of the reel flange.

3.4 Fiber Bundle Ends

Both ends of the fiber bundle are accessible on the reel. Each reel has a reusable plastic cover (clamshell) installed to protect the fiber bundle from damage and contamination during storage and handling.

SEL Part Number	Fiber Bundle OD (mm)	Standard Reel Length (ft.)	Reel Weight (lbs.) (Empty)	Reel Weight (lbs.) (Full)	Reel H x W (in)
FB02xx	2	14000	13.2	36	19.5 x 11.8
FB04xx	2	14000	13.2	36	19.5 x 11.8
FB06xx	2	14000	13.2	36	19.5 x 11.8
FB12xx	3	7000	13.2	41	19.5 x 11.8
FB18xx	3	7000	13.2	41	19.5 x 11.8
FB24xx	3	7000	13.2	41	19.5 x 11.8
FB48xx	3.7	7000	13.2	50	19.5 x 11.8

Notes:

- Fiber Bundle Reel Length tolerances are +2% / -0%.
- All Empty and Full Reel Weights shown are approximate values only
- All 2 mm fiber bundles (2, 4 & 6) can have a maximum length of 16,000 feet
- All 3 mm fiber bundles (12, 18 & 24) can have a maximum length of 9,000 feet
- The 48 fiber bundles can have a maximum length of 8,500 feet

4. BLOWING PERFORMANCE / TESTING

The Sumitomo Blowing Head Kit is used to propel the compact FutureFLEX ABF fiber bundles through an ABF tube cable on a stream of compressed gas (Nitrogen or "Dry Grade" compressed air) at speeds up to 150 feet per minute.

5. INSTALLATION / HANDLING PRACTICES

Sumitomo has incorporated a wide range of technical support and training services for our tube cable and fiber bundle 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. 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 CORPORATION
201 South Rogers Lane
Suite 100 Raleigh, NC 27610
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