SUMITOMO ELECTRIC LIGHTWAVE

SUMITOMO RECOMMENDED PROCEDURE

SRP SP-F04-040

FutureFLEX® AIR-BLOWN FIBER® SOLUTIONS

FB48xxx 900 µm Buffer Tube Fiber Breakout and Termination into FOX Cassettes

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1.General

1.1 This procedure describes the standard techniques for installing Future FLEX 48 fiber Air-Blown Fiber (ABF) bundles into a breakout kits with color coded 900 µm buffer tubes and further into Fiber Optic exchange (FOX) cassettes.

1.2 Breakout Kits are used at locations where fiber bundles containing individual or FreeForm ribbon fibers are to be organized, terminated, and connectorized at FOX Cassettes or to splice on connectors. If you are not terminating in a FOX cassette, disregard mention in this sheet as well as skip section 4.3-5.4.

1.3 Before beginning make sure you have the right connector type, count, and mode designation on your FOX cassette for your application. If not using a FOX cassette, make sure your splice on connectors are correct. Also verify the breakout kit matches your fiber count number. NOTE: Both single and multimode fibers follow the same procedure.

2.Safety Precautions

Wear safety glasses when working with bare optical fibers / fiber ribbons.

3.Reference Documents

Sumitomo Recommended Procedure,
3.1 FutureFLEX Fiber Bundle Stripping Procedure SRP SP-F04-006

4. Equipment / Tools Required

4.1 The following equipment, tools, and materials are required to complete this procedure:

1. 48 Fiber ABF bundle

2. Two 24-capacity FOX cassette with tight buffer designation (xx24TBFxxx) or four 12-capactity (xx12TBFxxx). If not using Cassette, 48 LYNX-2 Splice on Connectors.

3. Fusion Splicer and related accessories (cleaver, strippers, cleaners, etc.)

4. Clean Work Surface / Table

5. FTFBK48 900 µm for 48 fiber breakouts

6. Adhesive tape

7. Cutting tool (scissors)

8. Wire strippers (with 10–20AWG positions)

4.2 Breakout kit Components

FB48FBK Field Termination Kits consists of a Base Unit, Cover Unit, and four Breakout Unit Assembly blocks. A 3.7 mm bushing is also provided specifically for the 48 fiber bundle diameter.

The Base Unit cavity holds four (4) stackable Breakout Unit Assemblies which hold 12 fibers each. See **Figure 1.**

NOTE: If you are not terminating into a FOX Cassette, skip to section 6.0 and ignore 7.0.

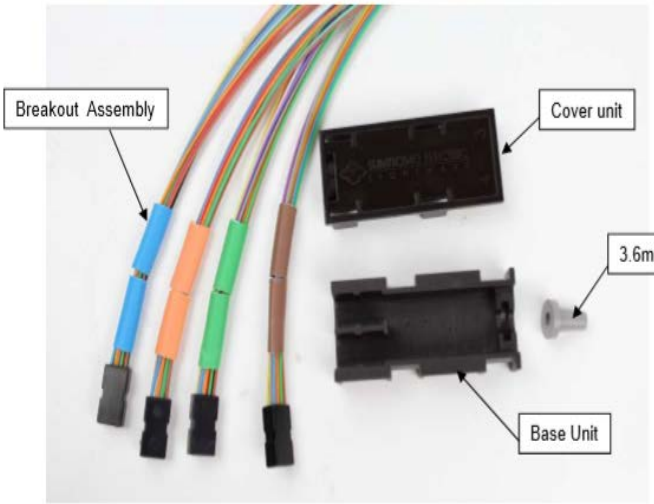


Figure 1
48 fiber bundle 900 µm termination kit components

4.3 Fox cassette components

Figure 2 displays a 24 capacity FOX cassette with two ribbon terminations. This instruction sheet addresses 900 µm breakout and terminations but has the same components.

A. Cassette -The main housing that contains the interconnect panel and the fiber breakout.

B. Cover/Lid – The cover requires no tools to remove.

C. Splice Tray Shuttle – Inside the cassette. Can be removed by sliding up white pipes attached to the case to accommodate splicing outside the cassette.

D. Removable Ears- Can be easily removed and replaced for installation and rework convenience.

E. Faceplate- Adapter location that can be removed for easier connectorization and cable management.

F. Double Sided Foam Tape – Along with zip ties is used to secure the Central Tube into the cable entry.

G. Cable Grommet – Used as a securing point when fiber is inside a sock or ABF tube.

H. Zip Ties – Used to secure the cable and/or Cable Grommet into the entry points.

I. Hook and Loop Velcro Fastener – Maintains organization inside cassette.

J. Splice Protection Sleeve – Steel reinforced heat shrink sleeve.

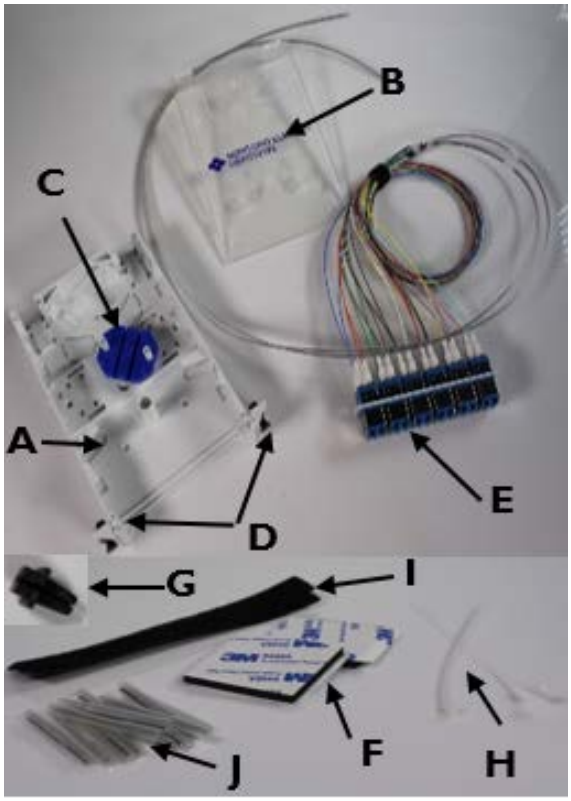


Figure 2
A standard Fox Cassette Kit.

5.0 FOX Cassette specific features

5.1 Every Fox Cassette lid is easily removed. **See Figure 3**.

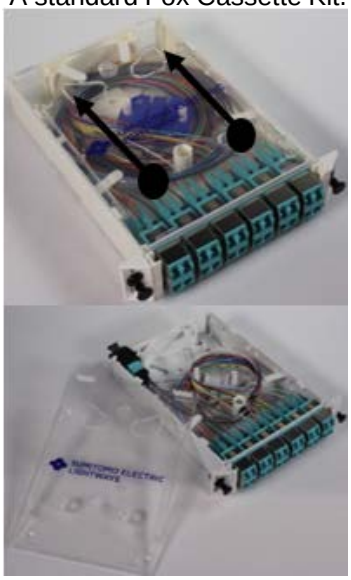


Figure 3
Firmly press thumbs down where black dots are on clear lid and slide lid towards back of cassette (away from faceplate).

5.2 Each Fox Cassette faceplate is easily removed in two steps. **See Figure 4.**

5.2.1 With lid removed, use thumbs to apply pressure on inside of cassette near faceplate and push towards the outside to expose faceplate extrusions.

5.2.2 Faceplate extrusions (circled below) will be exposed and can be lifted out of track.

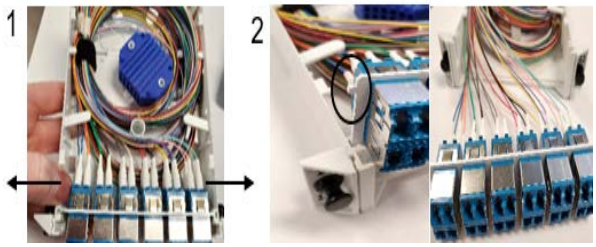


Figure 4
Faceplate removal procedure.

5.3 For install and rework purposes the ears on the FOX cassette can be removed by a simple sliding technique. **See Figure 5.**

5.3.1 Firmly grasp cassette and use thumbs to push downwards from the top of ears to slide off.

5.3.2 Reverse the operation and slide the ears up t he side of the faceplate while lining up grooves on ears and case to return.

Figure 5:
Removal (top) and attachment (bottom) of ears

5.4 Predetermined knockouts can be popped out in the lid and bottom of cassette to route fibers into parallel cassettes and stack. **See Figure 6**

Figure 6
Lid (Left) and Bottom of cassette (Right) knock outs.

6.0 Fiber Bundle 900µm Breakout Kit Assembly

6.1 Refer to SRP SP-F04-006 for detailed 48 fiber bundle stripping procedures and techniques on how to remove the outer PEF jacket, access sub-unit ripcords, and remove inner nylon jackets.

6.2 Provide at least 6” – 10” of additional fiber sub unit strip-length beyond the actual fiber length required. SEL’s Field Termination Kits have an approximate 24” buffer tube length. Therefore, the four 12-fiber nylon sub units (**Figure 6**) in the 48 fiber bundles should be stripped back at least 30” – 34”.

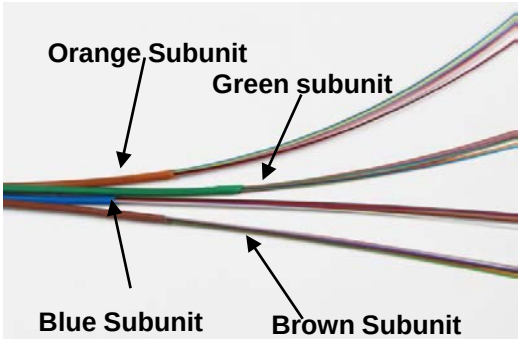


Figure 6
48 Fiber bundle **nylon** subunits after removing PEF jacket. Two subunits can be used for each XX24TBFXXX cassette.

6.3 Once the fiber bundle has been stripped, install the provided fiber bushing over the PEF jacket and secure it to work surface with adhesive tape. This will be installed in the base unit of the breakout kit.

6.4 Begin with the Blue nylon sub-unit. Insert each fiber into its colored-coded tube according to **Figure 10 (next page)**. Begin with the blue strand first, followed by the orange, and so on until all 12 fibers are started into the Breakout kit subunits. Work carefully, comb the fibers, and ensure strands are not crossed or twisted before placing into base unit. The completed breakout kit subunit should look like **Figure 7** below with fibers long enough to be past the end of the 900 µm tubes.

6.5 Separate and organize fiber bundle strands and assemblies. At the point where the strands exit the nylon sub-unit, carefully arrange them so they are not crossed and carefully separate them along their entire length.

6.6 Repeat the process with the Orange, Green, and Brown breakout kit sub-units. All four should now look like **Figure 8**.

6.7 Once all the strands of the four sub-units are inserted into the tubing, carefully grasp and push all fibers through each Breakout Unit Assembly tubing as a group. Starting with the blue subunit, place in the breakout kit holder in the labeled position 1 as shown in **Figure 9.**

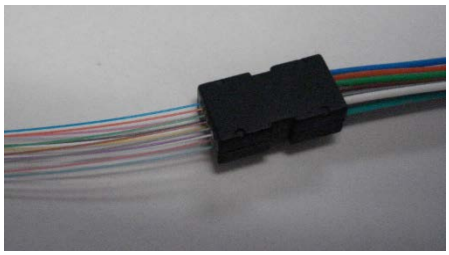


Figure 7
12 Fibers from a nylon subunit threaded through a breakout kit subunit.

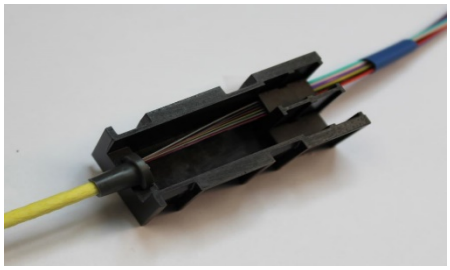


Figure 9
Blue subunit installed into base unit. Also acceptable for twelve fiber bundle terminations.

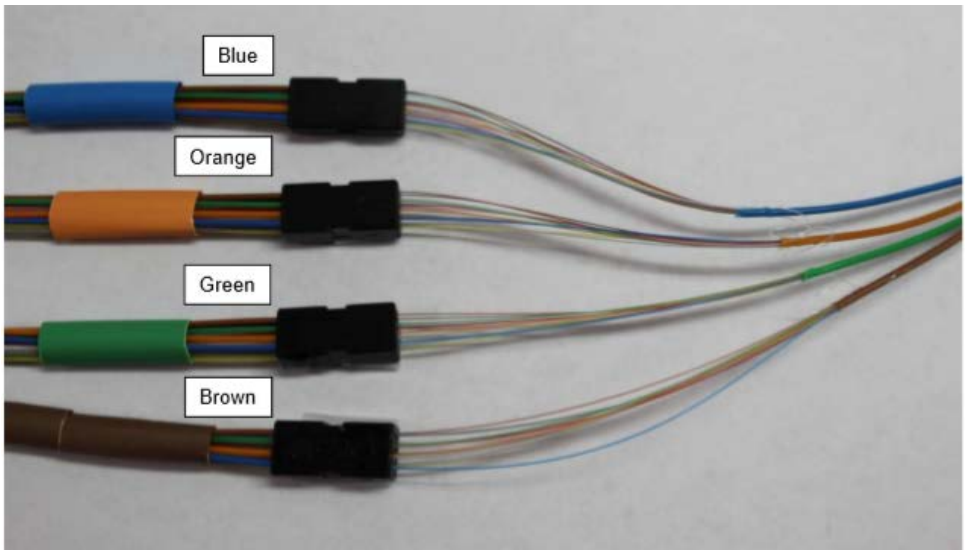
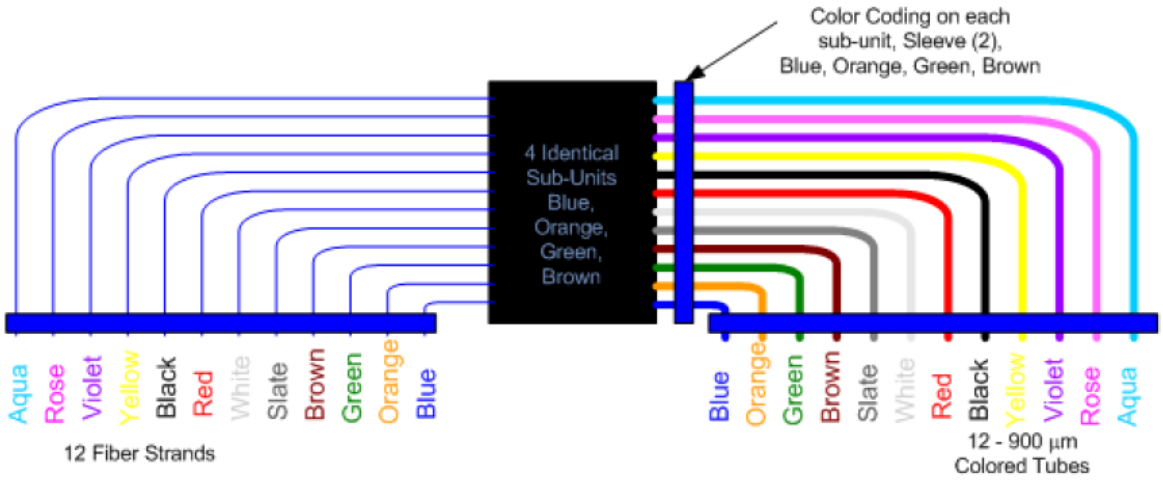


Figure 8
Subunits broken out into 12 900-µm termination units.



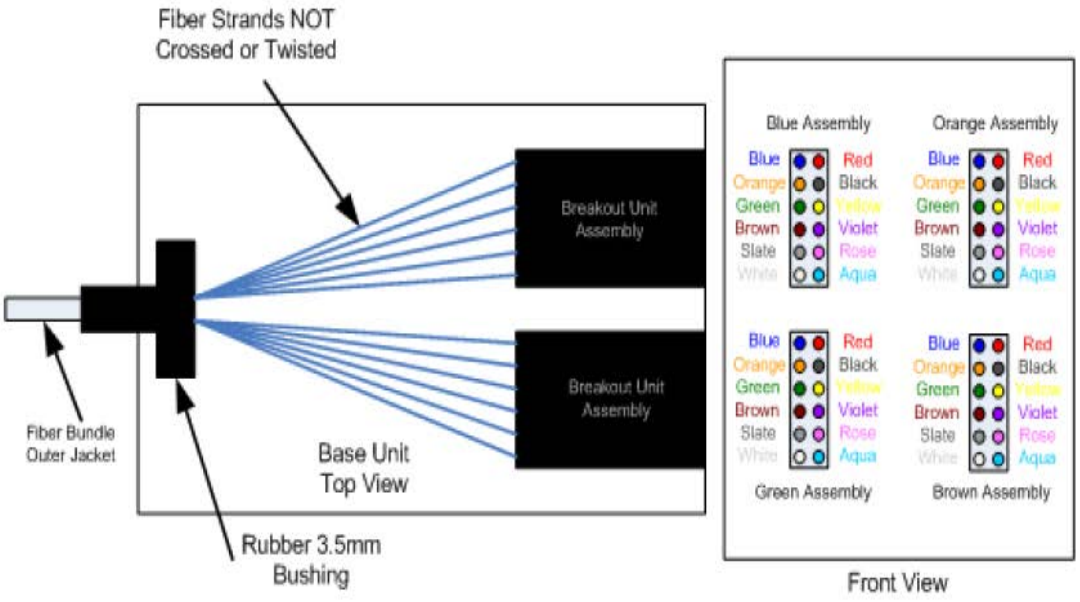


Figure 10
Fiber Strands in Color-Order Ready to be Inserted into Breakout Unit Block.
48-fiber bundles contain four (4) colored nylon sub-units of 12 fibers each in the following color-order sequence:
Blue, Orange, Green, Brown, Slate, White, Red, Black, Yellow, Violet, Rose and Aqua.

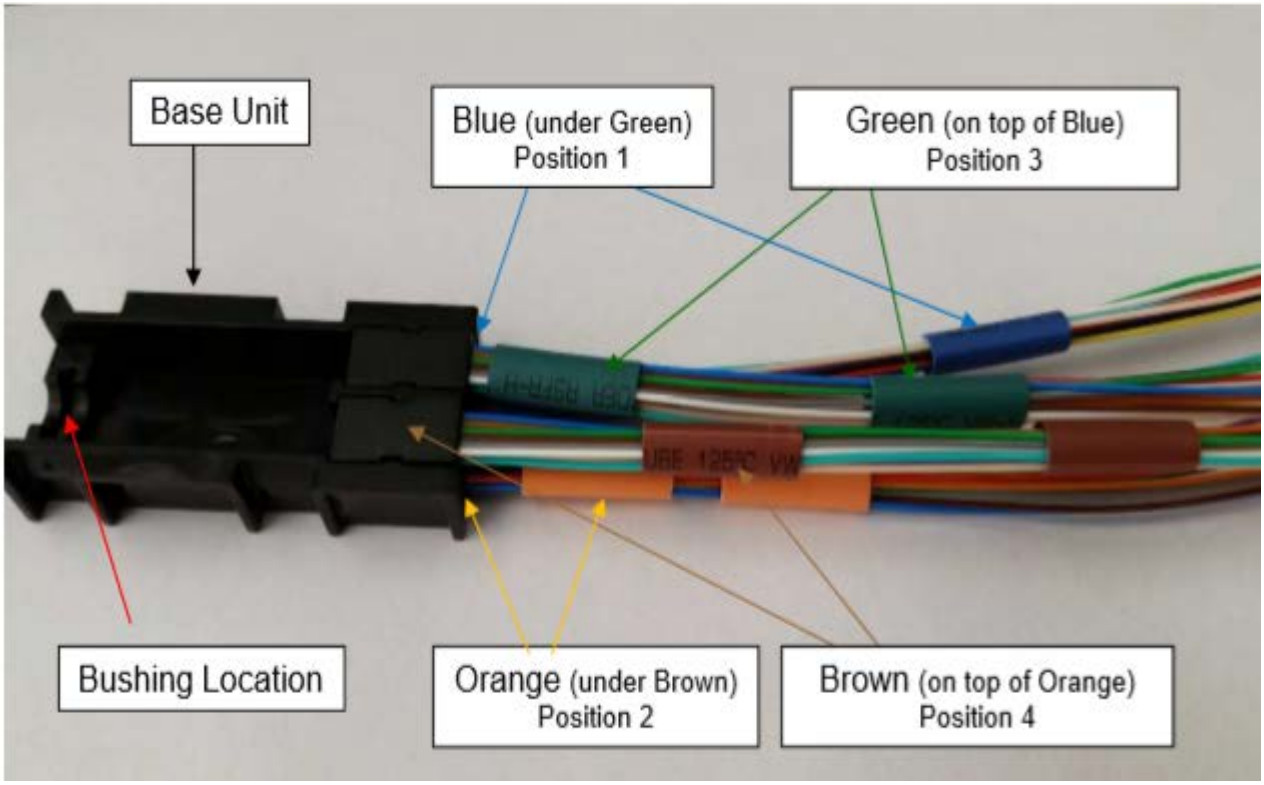


Figure 11
48 fiber breakout kit organization in Base Unit.

6.8 Install the Orange subunit into position 2 of the base unit. Looking from the bushing location, the Blue assembly goes in the bottom left cavity and Orange assembly goes into the bottom right cavity. (see **Figure 11**)

6.9 Install the Green subunit into position 3, directly on top of the Blue subunit, and the Brown into position 4 of the base unit directly on top of the Orange subunit. The Green subunit goes in the top left cavity and the Brown assembly goes in the top right cavity (the actual placement of the assemblies is not critical). It is important to be able to distinguish each sub unit. We have provided 8 colored (BL, OR, GR & BRN.) shrink tubes, two of each color, to insert over the corresponding colored sub unit's at each end of the 900µm tubes for easy identification.)

6.10 Once all fibers are inserted into Breakout Unit Assemblies re-confirm that fiber strands are not crossed or twisted over each other between the end of the nylon jackets and the Breakout Unit Assembly block. Crossed fibers may cause additional optical attenuation due to macro-bending. (Our new units are longer than our previous units to allow more length between the PEF jacket and the assembly blocks which makes it less likely to cause attenuation issues.) If fibers are crossed, they should be carefully removed from the Breakout Unit Assembly tubes, straightened out, and reinstalled.

6.11 Carefully push all the fibers as a group into Breakout Unit Assemblies until ends of the PEF jacket and inner nylon jackets are even with or just past the inside of the 3.6mm bushing.

6.12 Slide the 8 colored heat Shrink Tubing pieces into position over the corresponding sub Units at each end.

6.13 Complete the Field Termination Kit assembly by snapping Cover Unit onto the Base Unit of the breakout kit. Using the provided color tape is optional but is used for easier identification of subunits. You should now have all 48 fibers enclosed in individual 900 µm buffer tubes for termination. These fibers can now be spliced to LYNX2 splice on connectors or Tight Buffer FOX cassettes

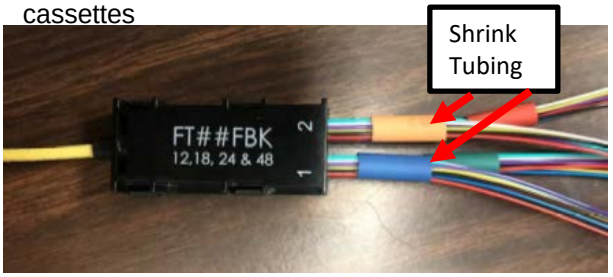


Figure 12
Finished 48 fiber breakout kit.

7.0 900 µm Tight Buffer For Cassette Termination

7.1 Remove lid of the 24 capacity FOX cassette and cut zip ties holding top panel position adapters (Unit 1) and bottom panel position adapters (Unit 2) for cassette terminations (see **Figure 13**). A 12 capacity FOX cassette will only have 1 subunit of 12 fibers.

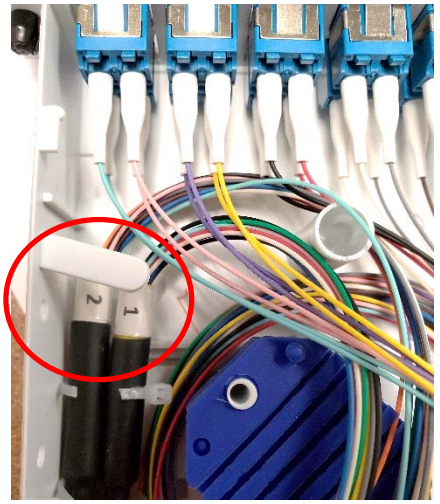


Figure 13
Cassette termination units 1 and 2 (underlined in rest of text) to left of splice tray modules in cassette.

7.2 Follow the table in **Figure 14** for organizing colored breakout kit bundle block patterns. 48 fibers require 2 24-capacity cassettes. Blue and green subunits from the termination kit will connect to positions 1-12 in the FOX cassettes which is unit 1(Figure 13). Orange and Brown will be in positions 13-24 which connect to unit 2 in the cassette(Figure 13). Connector positions are also labeled on Cassette ears

Nylon Bundle Color	24 Fiber Fox Cassette
Blue	Cassette One
Orange	
Green	Cassette Two
Brown	

Figure 14
Breakout subunit color termination in 24 capacity cassettes. **If using 12 fiber capacity, each nylon subunit has it's own 12 fiber cassette.**

7.3 First separate the blue termination unit from the cassette's unit 1- 900 µm fibers. Also, separate the blue fiber from the blue nylon subunit from the termination kit that has bare fiber exposed beyond the breakout kit buffer tube. These fiber ends will be spliced together. Make sure to tape together other loose fibers in subunit groups to keep track of them as you go. See **Figure 15.**

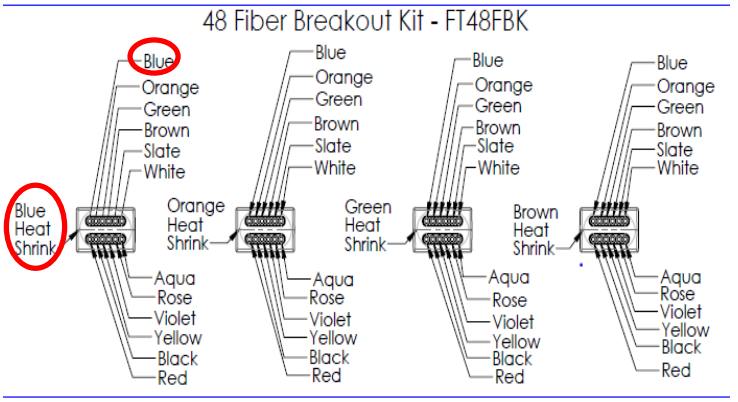


Figure 15
48 Fiber 900 µm subunit organization. Circled is blue fiber of blue subunit which will be spliced to the Blue Termination Unit 1 (Figure 13) of FOX cassette.

7.4 Strip, cleave, splice, and heat shrink the blue fiber in unit 1 of the cassette and the blue fiber in the blue subunit of the breakout kit according to splicer manual. Place heat shrinked (correctly sized shrinks provided with FOX cassette) splice in designated splice tray modules as shown in **Figure 16.**

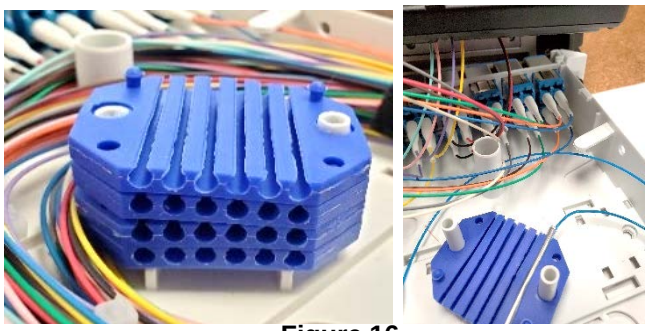


Figure 16
4 individual splice holder modules that hold 6 individual heat shrinked fibers. Organize with termination 1-6 on the bottom splice tray module and work upwards..

7.5 Repeat this process of joining 900 µm fibers from the cassette to the appropriate breakout kit subunit fibers. Use velcro and zip ties for cable management inside cassette. After completing the blue subunit from the breakout kit, the orange nylon breakout subunit blue fiber will then be spliced to the blue 900 µm fiber of the cassette unit 2. (See **Figure 17) Your first protected splice from the orange subunit will be in the 3rd stacked splice module.**

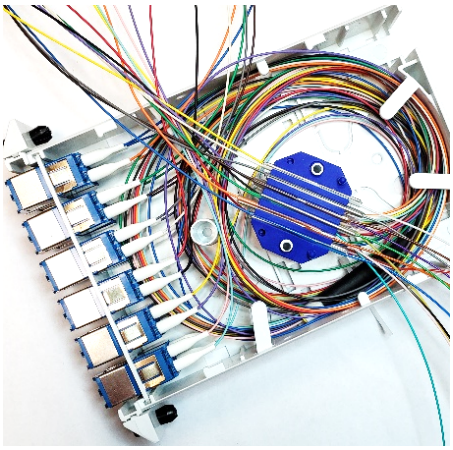


Figure 17
All 24 splices from blue and orange fiber bundle nylon subunits placed in splice module. Fibers still need to be organized with cable ties and velcro.

7.6 When all splices are complete use Velcro and tie wraps to organize fibers neatly into cassette. Use the grommet in the fox cassette kit to hold the breakout kit fibers together and in place in the back of the cassette where cable entry occurs. The grommets fit in the removable cable entry punch-outs on the cassette lids and have a groove that holds them in place in the cassette case. One grommet on each side can also be used, but all 24 fibers fit in 1. (See **Figure 18**)

Figure 18
Snap off rear lid pop out, place terminated 900 µm fibers into grommet, and finally fit grommet into rear fitting of cassette case to secure cable entry.

7.7 Close the lid of the cassette. There should be no exposed bare fibers. 24- 900 µm buffered fibers should be protected between the 48 fiber breakout kit and the back of the fox cassette coming out of the grommet.

7.8 The 1st 24 fiber fox cassette should now be terminated on the blue and orange nylon subunits from the fiber bundle as shown in **Figure 19**.

7.9 Repeat the same process for the green (similar to blue nylon subunits) and brown (similar to the orange nylon subunit) ABF bundle subunits to terminate the remaining 24 fibers of the bundle in the second cassette. All 48 fibers should now be terminated in two separate tight buffer cassettes.

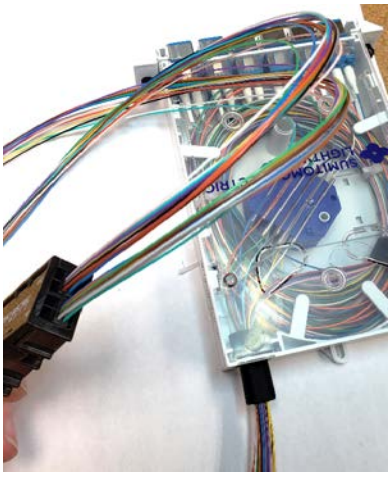


Figure 19
24 fiber fox cassette terminated on the blue and orange nylon breakout kit 900µm subunits.