

**SUMITOMO RECOMMENDED PROCEDURE****SRP SP-F04-030****GROUNDING & BONDING ARMORED TUBE CABLE PROCEDURE**

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## 1.0 General

1.1 This procedure describes the standard techniques for Grounding and Bonding FutureFLEX outdoor metallic / armored tube cables.

1.2 Telecommunications network plants are often subject to electrical disturbances arising from lightning and commercial AC power line faults. To help safeguard personnel and property from the effects of these disturbances, primary telecommunications electrical protection is placed at the telecommunications entrance to a building or structure.

1.3 Grounding is defined as the intentional connection to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages that may result in undue hazard to connected equipment or to personnel.

1.3.1 Both ends of a FutureFLEX tube cable span containing a metallic element or elements must be grounded per the ANSI-J-STD-607-A Standard.

1.3.2 Typically, this work will be accomplished at a Tube Distribution Unit (TDU) located inside a building's Entrance Facility or in an outdoor enclosure located just before building entry (e.g.: in a manhole). In all cases, the grounding connection from the indoor TDU or outdoor enclosure shall be to earth ground.

1.4 Bonding is defined as the permanent joining of metallic parts to form an electrically conductive path that will assure electrical continuity and the capacity to safely conduct any current likely to be imposed.

1.4.1 The metallic elements of two (2) FutureFLEX tube cable segments coupled at an in-line splice point must be bonded together.

1.4.2 Typically, this work will be accomplished inside a properly rated outdoor enclosure such as a NEMA-4, -4X, -6, or -6P enclosure (box) or a Splice Case.

1.5 The following FutureFLEX outdoor Dielectric Core / Interlocked Galvanized Steel armored tube cable designs require Grounding and Bonding:

- TCxxTOX-2
- TC04TOD-2
- TCxxMSOS-2

## 2.0 Safety Precautions

**CAUTION:** *When working with the different metallic tube cables, always exercise extreme caution. Sharp edges will be present whenever the laminated aluminum, interlocked galvanized steel, and corrugated steel tape are exposed.*

2.1 The use of personnel safety equipment is strongly recommended while cutting and stripping tube cable ends and working around the metallic tube cable elements. This includes the use of cut-resistant Kevlar gloves and eye wear.

## 3.0 Reference Documents

3.1 Sumitomo Recommended Procedure, *FutureFLEX Indoor, Wall-Mount TDU Installation Procedures*, SRP SP-F04-005.

3.2 Sumitomo Recommended Procedure, *FutureFLEX Tube Cable Splicing Procedures*, SRP SP-F04-031.

3.3 ANSI-J-STD-607-A (latest revision) Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

3.4 ANSI / NFPA-70 (latest revision) National Electrical Code (NEC)

3.5 Local Codes as mandated

## 4.0 Equipment / Tools Required

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

4.1 Grounding and Bonding hardware (DE09SBK or DE12SPK) . **See Fig. 1.**

4.2 Felt Tip Pen / Marker

4.6 Utility Knife with Hook Blade

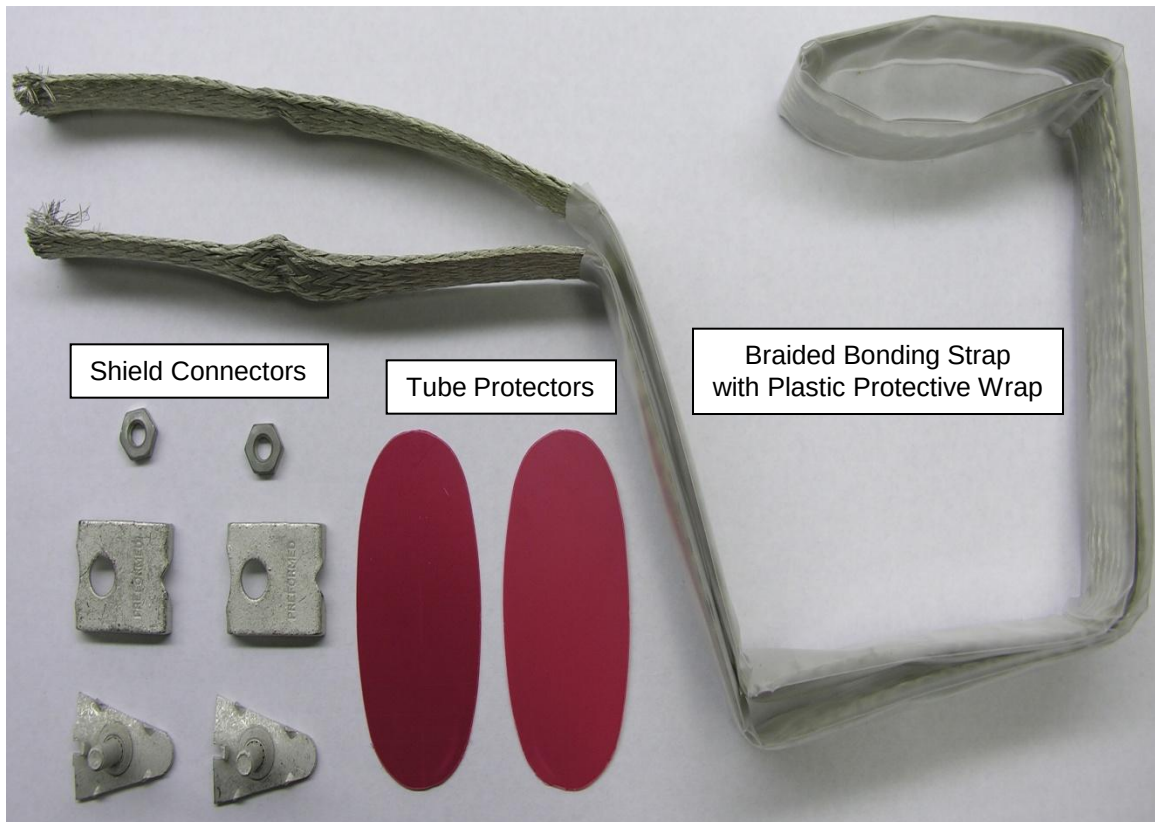
4.3 Tape Measure

4.7 Scissors

4.4 Tube Cable Cutter (BETL03)

4.8 Vinyl Electricians Tape

4.5 Hacksaw or equal



**Figure 1**  
Typical Shield Connector Assembly  
(DE09SBK Bonding Kit shown)

*Shield Connector* describes the hardware that attaches to or under a tube cable's metallic element. A typical Shield Connector Assembly consists of a bottom plate with a threaded stud, a top plate, and a nut. Other examples include clamps, lugs, and so forth.

*Bonding Strap* describes the hardware that connects a Shield Connector to either a grounding point or to another Shield Connector in a bonding application. Examples include bare or insulated wires, harnesses, braided straps with or without eyelets, and so forth.

*Tube Protector* describes the hardware (plastic piece) used as a protective barrier between the bottom plate of a Shield Connector and the exposed tubes.

**Note:** DE09SBK and DE12SBK Bonding Kits include insulated Bonding Braid (short and long length difference), Shield Connectors (top & bottom halves) with nuts, and Plastic Tube Protectors.

## 5.0 Dielectric Core / Interlocked Galvanized Steel Tube Cables

5.1 Route tube cable end into Tube Distribution Unit (TDU) and mark where outer jacket and excess tube cable length are to be cut. **See Fig. 2.**

5.2 Provide a minimum 1"-2" of outer jacket length inside TDU entry. Mark jacket.

5.3 Provide a minimum 1"-2" of Interlocked Galvanized Steel wrap for grounding and bonding hardware attachment. Mark jacket.

5.4 Provide a minimum 1"-2" of dielectric core inner jacket length. Mark jacket.

5.5 Remove tube cable from TDU and remove outer jacket to expose Interlocked Galvanized Steel wrap.

5.6 Unravel the spiral Interlock Galvanized Steel wrap back to where the outer jacket was removed. Bend the steel wrap back and forth until it breaks and remove it from around the core cable.

5.7 Use Hook Blade Knife to lightly score inner jacket at mark. Pull ripcord and strip jacket away to expose individual tubes.

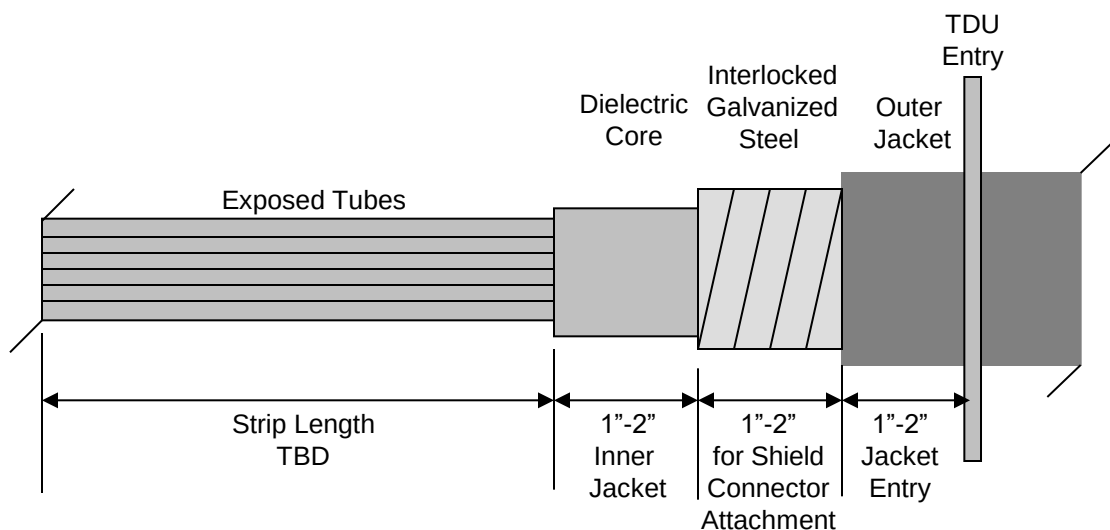
5.8 Reinstall tube cable into TDU.

5.9 Slide the bottom plate of Shield Connector between inner tube cable jacket and under Interlocked Galvanized Steel. Push in until threaded stud contacts exposed the steel to ensure a good metal-to-metal contact.

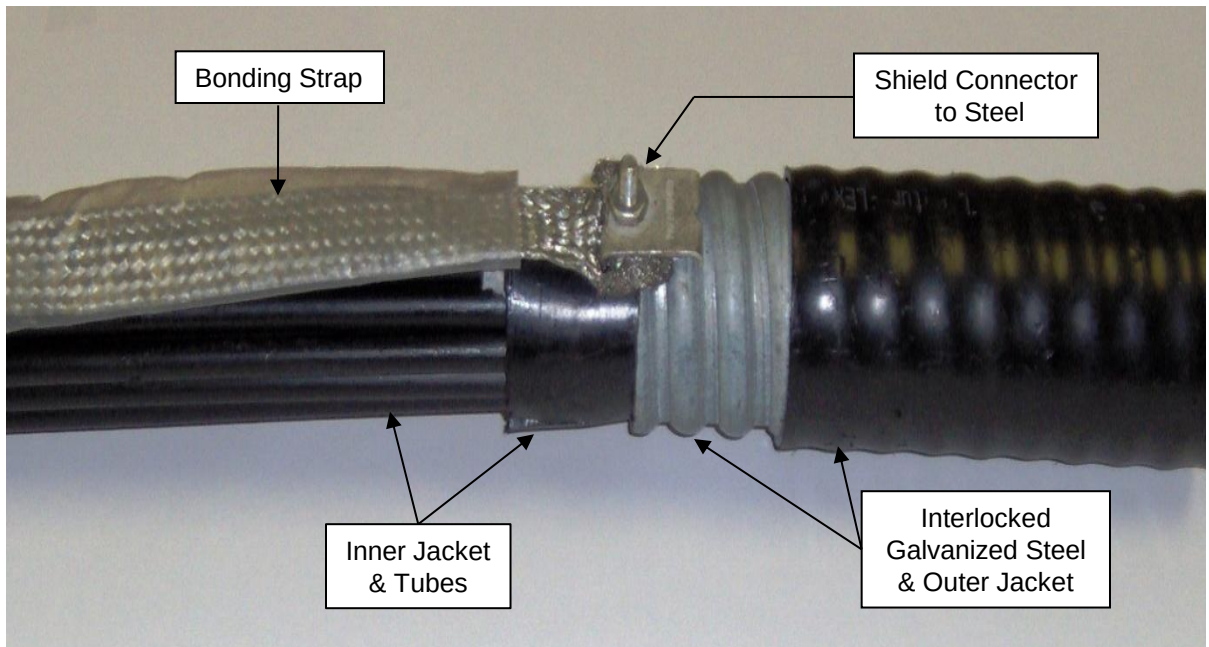
5.10 Install Bonding Strap on threaded stud and secure top plate of Shield Connector with nut provided. **See Fig. 3.**

8.11 Wrap all exposed metal with Vinyl Electricians Tape.

8.12 Fasten other end of Bonding Strap to ground connection or Shield Connector installed on mating tube cable.



**Figure 2**  
Grounding & Bonding  
Dielectric Core / Interlocked Galvanized Steel Tube Cable



**Figure 3**

Dielectric Core / Interlocked Galvanized Steel Tube Cable  
with Shield Connector Assembly & Grounding / Bonding Strap Installed