BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G50.681.1
Issue 2, February, 1958
AT&TCo Standard

INSULATING JOINTS
GENERAL

Contents **Page**

1. General 1
2. Location of Joint 1
3. Insulating Joint 2
4. Outer Wrapping for Aerial Cable 6
5. Outer Wrapping for Underground Cable 7
6. Insulating Joint Under Continuous Pressure..... 7
7. Insulating Joint at Alpeth Splice 8

1. GENERAL

1.01 This section describes the method of making gastight insulating joints in lead or polyethylene sheath cables.

1.02 This section has been reissued to include changes made in the method of making wrapped joints.

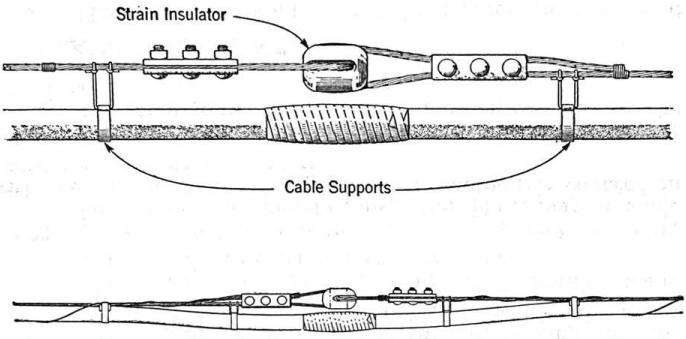
1.03 On polyethylene sheath cables up to and including 1.6-inch outside diameter, insulating joints may be made with the 13A or 14A Splice Cases. The method is covered in another section of the Practices.

1.04 The methods of installing bypass capacitors across insulating joints are covered in other sections of the Practices.

2. LOCATION OF JOINT

2.01 The insulating joint should be located in a straight portion of the cable where it will not be subjected to bending stress. In cable vaults make the joint as close to the second upright as practicable to allow as much straight cable as possible between the bend at the first vertical and the insulating joint.

2.02 An insulating joint in an aerial cable supported by rings, as well as one in a lashed cable, is illustrated by the following diagram. The joint should be located under the strain insulator.



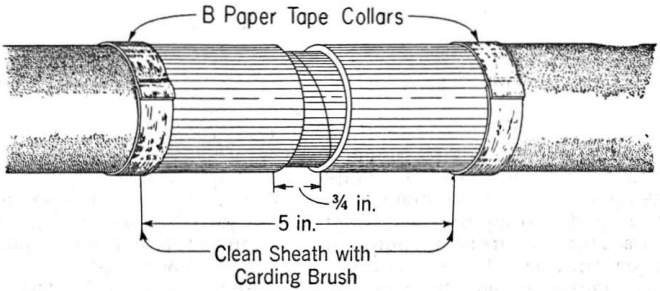
Cable should clear guy clamps and insulator by at least ½ inch.

3. INSULATING JOINT

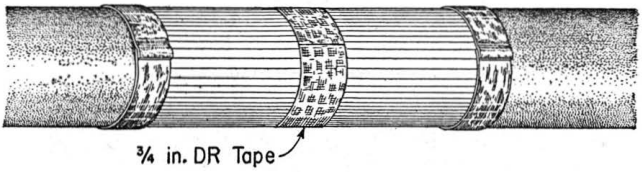
3.01 The method outlined below is used for straight insulating joints in lead, alpeth, stalpeth, PAP or PASP sheath cable. Several of the steps shown are used only on the polyethylene sheath cables and are marked **ON POLYETHYLENE ONLY.**

3.02 Remove any longitudinal scratches on the sheath at the proposed opening. The shave hook or splicer's file may be used to remove scratches on lead sheath while the splicer's file may be used to remove scratches on polyethylene sheath. Then clean 5 inches of the sheath at the proposed opening with the carding brush.

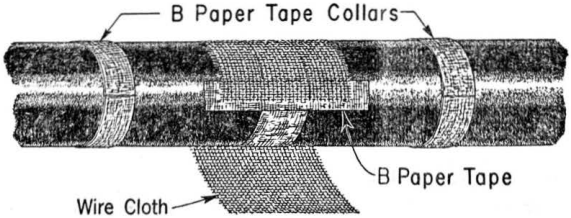
3.03 Place two rings of B Paper Tape as indicated below. Remove a 3/4-inch ring of sheath at the center of the cleaned area, and expose the core wrapping paper. On polyethylene, score and remove the polyethylene jacket; then peel off the aluminum or steel and aluminum to produce a smooth flared end. Remove any sharp points of metal which project toward the surface of the sheath.

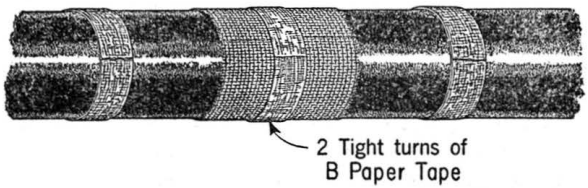


3.04 Wrap the opening with 3/4-inch DR Tape until it is flush with the sheath as shown below. For lead sheath proceed to Paragraph 3.06 for the next step.

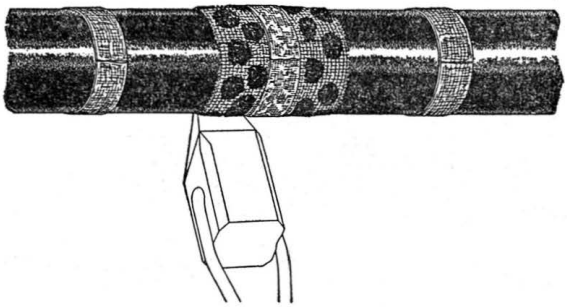


3.05 **On Polyethylene only.** Prepare a length of wire cloth to encircle the cable and provide an overlap of approximately one inch. Place B Paper Tape on the sheath. Then center the wire cloth over the opening with the starting edge on the paper tape and wrap tightly around the cable and fasten as shown below.

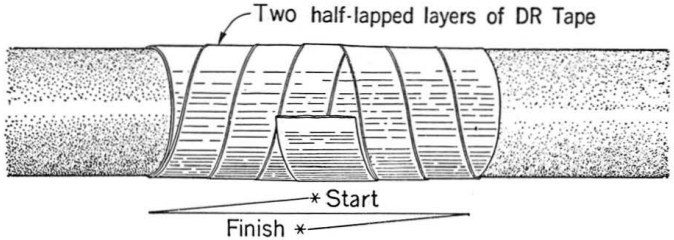




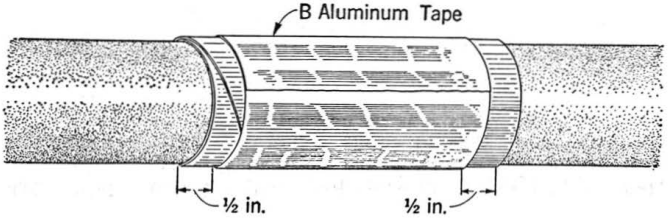
With a hot copper held against the wire cloth, heat the plastic at a number of points around the cable at each side of the tape. Black patches will show in the wire cloth when the plastic is soft enough. Do not overheat the polyethylene and do not use the point or an edge of the copper.



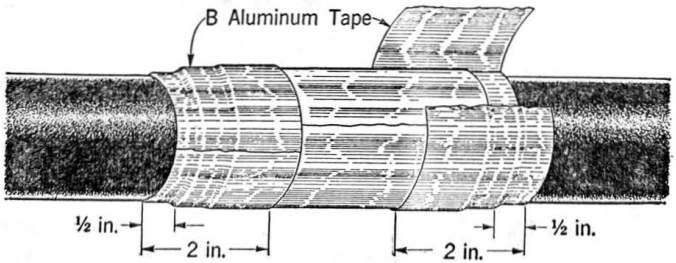
3.06 Coat the enclosed area between the B Paper Tape collars with C Cement. Remove the paper tape collars and allow 3 to 5 minutes drying time in warm weather and 5 to 10 minutes in cool weather. Apply two half-lapped layers of 2-inch DR Tape over the cemented area, as indicated below. In applying the tape it should be stretched to reduce its width to 1-1/2 inches. (This is a means of specifying the correct tension in the DR Tape.)



3.07 Apply a collar of three turns of B Aluminum Tape centered on the DR Tape, as indicated below. Iron smoothly in place with the handle of the dresser or carding brush. For lead sheath proceed to Part 4 or 5 for the next step, depending on whether the cable is aerial or underground.

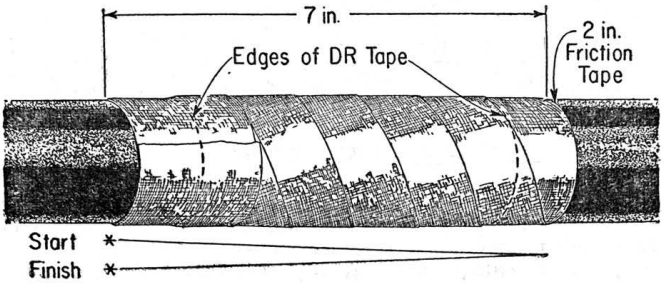


3.08 **On Polyethylene Sheath only.** Apply a 1-1/4 turn wrapping of 2-inch wide B Aluminum Tape at each end extending beyond the exposed DR Tape 1/2 inch, as indicated below. Then iron the 2-inch widths in place smoothly.

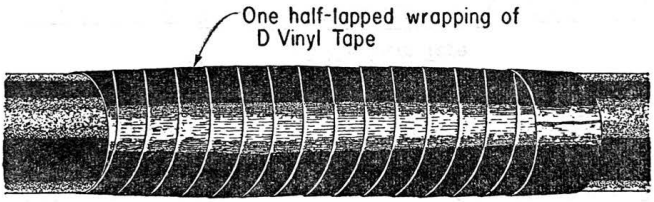


4. OUTER WRAPPING FOR AERIAL CABLE

4.01 Place two layers of half-lapped 2-inch friction tape.

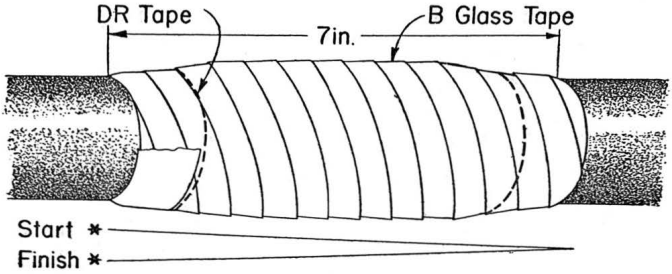


4.02 Finish with a half-lapped layer of D Vinyl Tape. This black vinyl plastic tape has good outdoor weathering characteristics. Apply it under slight tension. The last turn should be laid on with no tension so that the end of the tape will not start to ravel.



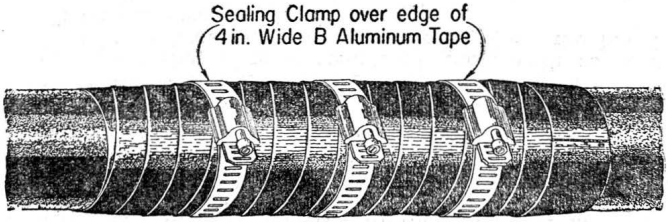
5. OUTER WRAPPING FOR UNDERGROUND CABLE

5.01 For insulating joints on underground cable place two layers of half-lapped B Glass Tape as indicated below. The full width of the tape is applied on the sheath beyond the DR Tape at each end of the splice.



6. INSULATING JOINT UNDER CONTINUOUS PRESSURE

6.01 If the cable is to be placed under continuous pressure, place Sealing Clamps over the outer tape wrapping, as indicated below:



7. INSULATING JOINT AT ALPETH SPLICE

7.01 To break the sheath continuity at a main or auxiliary sleeve alpeth splice, or a main sleeve stalpeth splice use the following method. Note that the method is not applicable to stalpeth cable with an auxiliary sleeve.

(1) Prepare the sheath butt of the cable to be isolated as outlined in Section G50.616.3. The **bonding ribbon** which is ordinarily soldered to the aluminum in Section G50.679.3 or to terne plate or aluminum in Section G50.679.5 **shall be omitted.** Around each sheath butt so prepared tie a linen tag on which is written, "Insulating Joint-Bonding Ribbon Omitted." This should remain in the splice.

(2) Prepare the sheath butts at the other end of the splice in the usual manner.

(3) When the splice is completed, the sheath continuity will be broken in any cable from which the bonding ribbon has been omitted.

7.02 In manholes, the lead sleeve at such an insulating joint should be bonded to the other cables in the usual manner, unless the detail plans specify that the bond be omitted.