BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G73.157.4
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AT&TCo Standard

PRESSURE TESTING
RESIN PLUGS—SLEEVE INJECTION LEAD CABLES OVER 5/8-INCH DIAMETER

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1. GENERAL

1.01 This section describes the sleeve injection method of constructing cold resin plugs in lead sheath and lepeth sheath cables.

1.02 The methods described are used in plugging the larger diameter, lead sheath cables as well as all sizes of lepeth sheath cable, also cables that have a paper wrapper around an inside layer of pairs or quads.

1.03 **Plugging Cable Under Pressure:** Refer to general Section G73.157.1.

2. LOCATION OF PLUG

2.01 These sleeve-type plugs can be made in a horizontal or vertical section of cable.

2.02 In aerial cable, the plug can be made at any convenient point in the span. If near a pole, the plug should be at least 20 inches beyond the point where a splice may later be made. If a splice is present, the plug should preferably be made 20 inches or more from the nearest wiped joint to avoid the flow of compound into the sleeve.

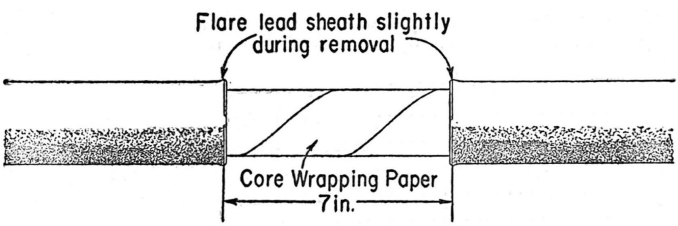
2.03 In main underground cable, the plug should be made as far as practicable from the lead sleeve. In subsidiary cable, the plug should be made at least 15 inches from the nearest wiped joint in the manhole, in the riser on the pole, or in the subscriber building.

2.04 In plugging branches from the main cable in manholes, the plug can be made in the stub cable if it can be located at least 15 inches from the main and stub splices. Otherwise, the individual branch or subsidiary cables can be plugged.

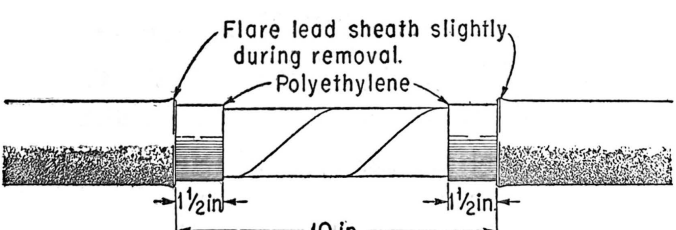
2.05 In cable vaults, if there is not enough room to make a sleeve injection plug in the main cable, sheath injection plugs can be made on the individual textile insulated cables.

3. PREPARATION

3.01 **Plain Lead Sheath:** The following shows the preparation of a cable having plain lead sheath.

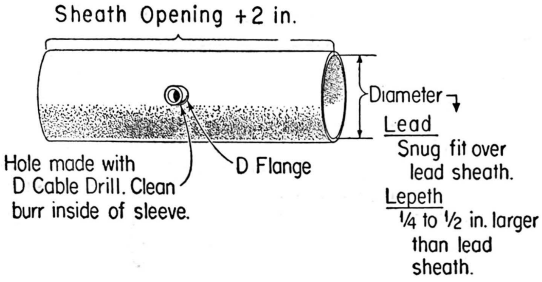


3.02 **Lepeth Sheath:** The following shows the preparation of a cable having lepeth sheath.



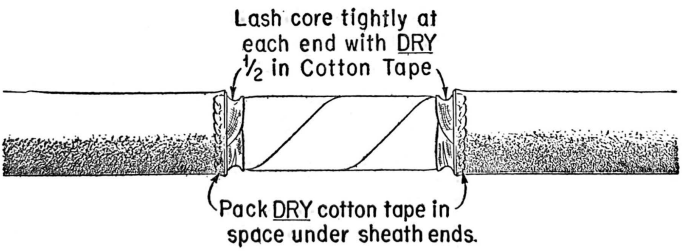
3.03 Any asphalt on the polyethylene sheath should be cleaned off with kerosene before the opening is made in the polyethylene sheath.

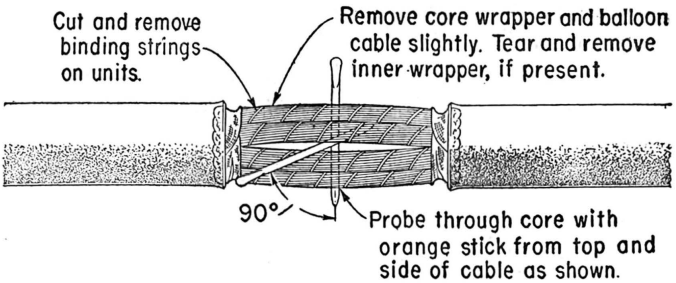
3.04 **Lead Sleeve:** The lead sleeve for covering the opening is prepared as illustrated below. A close fitting sleeve is used for lead sheath cable; a sleeve of 1/4 to 1/2-inch larger diameter than the sheath is used on lepeth cable, to preserve the high dielectric strength through the plug.

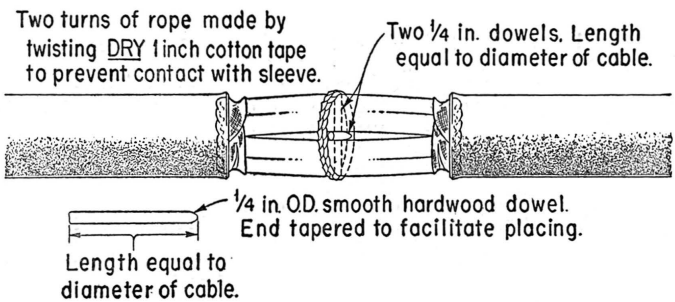


3.05 **Core Preparation:** The following sketches show the preparation of the core on plain lead and lepeth sheaths. The cotton tape binder is applied over the core wrapper adjacent to the polyethylene or lead, depending on the type of sheath. In multiple unit cable, the binding strings should be cut and removed to loosen the units. If there is an inner paper wrapper in the core, it must be torn and removed to ensure proper impregnation.

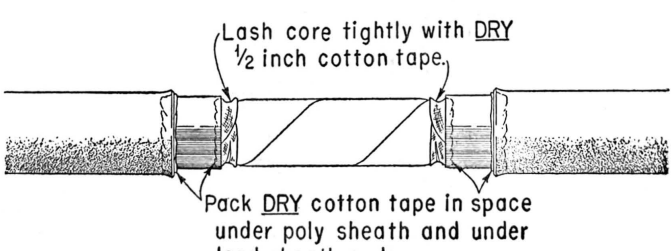
(a) **Plain Lead Sheath**



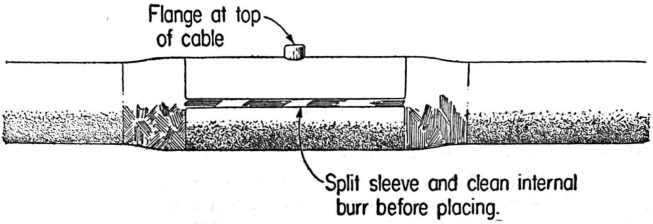




(b) **Lepeth Sheath:** The preparation of lepeth sheath is similar except in the following details.



3.06 **Placing and Wiping Sleeve:** Only one flange is used in the sleeve injection method. Since a split lead sleeve is generally used, it is important to clean the saw burr inside the sleeve to avoid damaging the conductor insulation. The sleeve should be arranged as illustrated below:



4. QUANTITY OF RESIN AND ACTIVATOR

4.01 The quantity of resin and activator required in this method of plugging cables of various diameter is shown below:

Outside Diam. of Cable (Inches)	Number of SMALL CHARGES*		Number of LARGE CHARGE** Injections		Number of Injections Using 3 SMALL CHARGES each	
	Lead	Lepeth	Lead	Lepeth	Lead	Lepeth
.65 to .73 inclusive	2	2	—	—	—	—
.74 to .83 "	3	4	—	—	—	—
.84 to .90 "	4	5	—	—	—	—
.91 to .99 "	4	6	—	—	—	—
1.00 to 1.16 "	5	—	—	2	—	3
1.17 to 1.35 "	—	—	2	3	3	4
1.36 to 1.62 "	—	—	3	4	4	5
1.63 to 1.86 "	—	—	4	5	5	6
1.87 to 2.02 "	—	—	4	6	5	7
2.03 to 2.15 "	—	—	5	7	6	8
2.16 to 2.25 "	—	—	6	8	7	9
2.26 to 2.33 "	—	—	6	9	7	10
2.34 to 2.47 "	—	—	7	10	8	11
2.48 to 2.61 "	—	—	8	11	9	12

*SMALL CHARGE	**LARGE CHARGE
1 — 50 Gram Tube, C Resin and 1 — 19 Gram Tube, C Activator	1 — 168 Gram Can, C Resin and 1 — 50 Gram Tube, C Activator

5. MIXING AND INJECTING RESIN

5.01 The loose fitting lead sleeve on this type of plug permits the use of a single injection point. Aside from this, the method of mixing and injecting the resin is the same as that covered in Section G75.157.3.

5.02 In large diameter, tight core cables, such as the 22-, 24-, and 26-gauge exchange types, considerable back pressure may develop while injecting the resin. To prevent damage to the sleeve and seam, place 4 Sealing Clamps on the sleeve snug tight, before injecting the resin.

6. CORRECTING FAULTY PLUGS

6.01 When it is necessary to repair a faulty sleeve injection plug, proceed as follows:

(1) If the sleeve is not already reinforced, place 4 Sealing Clamps, snug tight. Also, relieve the cable pressure adjacent to the plug.

(2) Remove the screw plug from the flange. Depending on the amount of void found in the sleeve, prepare a small or large charge of resin and activator and inject enough to fill the sleeve.

(3) It will then be found that the resin in the cable offers considerable resistance to the entrance of the new material. Inject resin until back pressure develops, but do not overstress as the sleeve or seam may be damaged.

(4) Maintain this pressure for a minute or two; the cable may now start to take resin. If it can be done without undue stress, slowly feed the equivalent of one Small Charge (see Paragraph 4.01) into the cable.

(5) If it is evident that the gun pressure is not being relieved, stop the injection. Wait two or three minutes, remove the gun and replace the plug flange.

(6) Then allow the resin to solidify; do not apply pressure to the cable for at least 24 hours after injection.