

**BELL SYSTEM PRACTICES**  
**Outside Plant Construction**  
**and Maintenance**

**SECTION G50.677.1**  
**Issue 2, March, 1949**  
**AT&T Co Standard**

## **CABLE SPLICING—GENERAL**

### **WIPED JOINTS—GENERAL INSTRUCTIONS**

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#### **1. GENERAL**

1.01 This section contains general instructions for wiping joints on cables and sleeves. It is being reissued to delete the reference to 50-50 solder which is no longer available and also to eliminate the use of a splicer's file or shave hook in preparing a cable for wiping.

1.02 It is essential that all tools used in wiping operations be clean and dry and that they are rested on a dry surface when not in use. Care should also be taken that any solder or lead that is added to a pot of melted solder is thoroughly dry.

1.03 When wiping or unwiping, use a pan or trough to prevent the drippings from falling and causing damage to persons or property. When working near a wall or fence, or in a building, protect the property from the drippings. Pedestrians should be warned not to pass beneath a splice when it is being wiped or unwiped.

1.04 While the solder is hardening immediately following the wiping operation, it is essential to avoid moving or jarring the cable as this may crack the joint or cause it to become porous.

## 2. COMPOSITION OF WIPING SOLDER

2.01 Wiping solder is an alloy of tin and lead with a small quantity of other metals. The tin content of the standard wiping solder is about 35 per cent. Excess lead will produce a coarse, porous solder while excess tin will not allow sufficient time to form a satisfactory joint before the solder solidifies.

2.02 The following rules may be used as a general guide to determine whether the solder has the proper percentages of tin and lead:

- (a) Coarse solder, having excess lead, has a dull white chalky appearance when cold.
- (b) Good solder, when poured on a dry concrete or stone surface to form a button or small disc, should show several bright spots on the top surface after cooling.

2.03 The wiping and unwiping of joints on lead surfaces, such as cable sheath and sleeves, removes a small amount of lead from the surfaces. The addition of this lead to the solder tends to decrease the tin content and it may, therefore, be necessary occasionally to replace solder which has become coarse, to avoid porous joints.

2.04 Care should be taken not to introduce any zinc (from galvanized articles) into the solder because even a very small quantity will produce an unsatisfactory solder.

## 3. HEATING

3.01 Wiping solder should be heated to about 800° F. The surface color of molten solder gives an approximate indication of its temperature, changing from yellow to blue and then to gray with rising temperature. When the surface has a uniform gray color, the solder is at approximately the right temperature. A better test can be made by dipping a piece of dry newspaper into the molten solder. If the paper chars to a dark brown color in about half a second, the solder is at the correct temperature. If the paper ignites, the solder is too hot and should be allowed to cool before using.

3.02 When solder is heated, a small quantity of dross collects on the surface. Before starting a wiping operation, the dross should be skimmed off with a solder ladle and the solder should then be thoroughly stirred.

3.03 It is not generally advisable to wipe two large joints in succession without reheating the solder. The solder in the pot may cool to such an extent while wiping the first joint that the temperature at the start of the second joint will be too low to permit wiping a satisfactory joint.

#### 4. TINNING

4.01 In wiping a joint it is necessary to form an alloy between the sheath and sleeve surfaces and the wiping solder, so that the finished joint will be an integral part of the sheath and the sleeve. The formation of this alloy is "tinning" the surface.

4.02 In order to tin a lead surface it must be bright and clean. The cable should be cleaned with a carding brush as the use of any other tool may remove too much of the sheath.

4.03 A clean lead surface will quickly become dull if exposed to the air and, therefore, it should be given a coating of stearine immediately after cleaning. The stearine will also serve as a flux and make tinning of the lead surface easier.

#### 5. PREPARATION FOR WIPING

5.01 Before starting to wipe a joint make sure that the sheath and sleeve surfaces are clean and coated with stearine. The sleeve should be in proper position over the sheath opening, and its ends should be beaten in tightly around the sheath, in the general shape of the finished joint.

5.02 Pastes should be placed around the cable and the sleeve to limit the width of the joint. A pan or trough should be tied or supported securely below the joint, and to facilitate removal of the solder drippings it is advisable to place a dry newspaper in the pan or trough.

5.03 A piece of stearine and the necessary wiping cloths should be placed conveniently close to the joint. If the cloths are stiff, warm them gently to make them flexible. At a "Y" joint a piece of textile insulated wire or a crotch cloth should be placed between the cables, for use in cutting or shaping the solder in the crotch.

#### 6. WIPING AND UNWIPING JOINTS IN CABLES UNDER GAS PRESSURE

6.01 Before wiping or unwiping joints in a cable under pressure a small hole should be drilled in the lead sleeve or, if there is a valve in the sleeve, remove the core. If this is not done the gas is likely to escape through the molten solder and not only interfere with wiping but also blow particles of hot solder from the joint and possibly cause injury. After the solder work has been completed the hole should be sealed in accordance with the instructions given in the pressure testing practices.

## 7. INSPECTING, REMOVING PASTERS AND MARKING JOINTS

7.01 Finished joints should be smooth, with clean edges and of uniform shape. They should be inspected carefully for any defects, using a mirror if necessary for the bottom and back.

7.02 After the joint has cooled the pasters should be removed carefully so as not to score the sheath or sleeve.