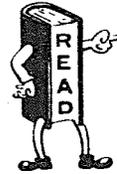


## SIGMAFORM SHRINKAROUND\* SLEEVE

### DESCRIPTION AND USE

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2.02 *Safety goggles and protective leather gloves must be worn when using the open flame torch and cleaning the cable sheath.*

2.03 *Extreme caution* should be used in handling the open flame propane torch. Loose fitting clothing *must* be secured. The flame should be directed *away* from the worker at all times.

2.04 Lead sheath must be prepared as per B.S.P. Addendum 644-200-005.

2.05 If necessary, protect telephone plant and foreign company attachments from the open flame by covering with a fire-proof material.

2.06 Avoid directing the flame on the supporting strand or guy wires as heat can weaken the strand or guys.

2.07 Preheat cable sheath until it is hot before applying Shrinkaround sleeve.

2.08 During the shrinking process, keep the torch moving constantly. The torch should be kept approximately 12 inches from the sleeve at all times.

2.09 Do not place a Shrinkaround sleeve over a wet cable sheath. Water should not be allowed to collect inside the sleeve because the steam generated when heat is applied will result in blow-outs or in tunnels in the adhesive under the sleeve.

2.10 Gas pressure on the torch should be maintained at approximately 6 psi. Higher pressures may result in long and uncontrollable flame lengths. Lower pressures may not provide adequate coverage or the required temperatures for shrinking the sleeve properly.

#### 1. GENERAL

1.01 This section describes the Sigmaform Shrinkaround Sleeve used for sealing existing minor sheath leaks on both lead and polyethylene sheath cables. This sleeve is also known as heat shrinkable tubing.

1.02 (Reserved for future use)

1.03 The Shrinkaround sleeve may be used on pressurized and nonpressurized lead and polyethylene sheath cables.

#### 2. PRECAUTIONS

2.01 *Pressurized cables must be vented and bled to zero pressure before and during application of the repair sleeve.* The adhesive during its heated liquid state would allow escaping air from the cable sheath to form holes and tunnels under the sleeve. The cable can be repressurized 15 minutes after the application of the Shrinkaround sleeve is completed. This will provide sufficient time for the adhesive to solidify.

*\*Trademark of Sigmaform*

#### NOTICE

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**SECTION 633-505-901PT**

2.11 *When using the climbers on the pole, avoid entanglement with the low pressure hose from the propane tank.*

**3. TOOLS AND MATERIALS**

3.01 The following tools and materials are required for the application or removal of a Shrinkaround sleeve.

*Tools:*

- Torch, Propane, FH 2603
- Hose, Pressure, E-30 foot section
- Regulator, For D — Propane Furnace
- Cylinder, Propane LP (B, C, D, or E)
- Wrench, Regulator, C
- Knife, Skinning, R-2761
- Hook, Shave, B

*Materials:*

- Shrinkaround sleeve (See Table A for Sizes)

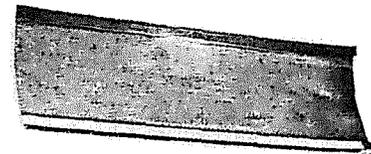
**TABLE A  
SHRINKAROUND SLEEVE**

CABLE DIA. (INCHES)	SLEEVE DESIGNATION	NOZZLE* REQUIRED
1.80 – 0.80	TR180-80	P/N 996149*
3.30 – 1.20	TR330-120	P/N 996149*
4.00 – 1.60	TR400-160	P/N 996136

\*In cold or windy weather it may be necessary to use the larger P/N 996136 nozzle to obtain satisfactory results.

**4. DESCRIPTION**

4.01 The Shrinkaround sleeve (Fig. 1) is a heat-shrinkable polyolefin sleeve. The exterior of the sleeve is spattered with a blue thermochromic heat-sensitive paint which changes to black when the appropriate application temperature has been reached.



**Before Bonding**



**After Seam Bonding**

**Shrinkaround Sleeve  
Fig. 1**

4.02 The interior of the sleeve is coated with a factory applied sealant.

4.03 The Shrinkaround sleeve is bonded together by removing the release paper from the inside of the overlapping flaps. The flaps' surfaces are then pressed together so that the contact adhesive on each flap bonds together.

4.04 Heating the Shrinkaround sleeve with an open flame propane torch causes the sleeve to shrink tightly around the cable sheath and softens the thermoplastic adhesive to a liquid state. The squeezing action of the shrinking sleeve forces the liquefied adhesive to penetrate and seal any cracks or cuts in the cable sheath.

4.05 Shrinkaround sleeves are furnished in 36 inch lengths. Three sizes will accommodate diameters from .8 inch to 4 inches (See Table A.)

**5. METHOD OF APPLICATION**

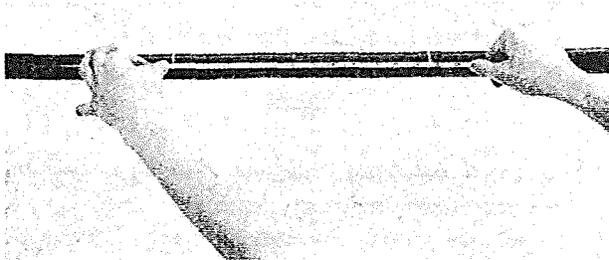
5.01 After the cable has been bled and vented to zero pressure (2.01) or if it is nonpressurized, the application of the Shrinkaround sleeve may proceed as follows:

1. Remove cable supports.
  - a. *Ringed Cable:* Remove cable rings or cable supports for a distance of 3 feet on either side of the pole or a 6-foot area if the sleeve application is to be in midspan.
  - b. *Lashed Cable:* Temporarily secure the lashing wire to the strand with a C Lashing Wire Grip approximately 4 feet from

each side of the pole. Terminate the lashing wire with D Cable Lashing Clamps. Place lashed cable supports 2 inches from the lashing clamps and remove the C Lashing Wire Grips. This should provide sufficient clearance below the strand on either side of the pole.

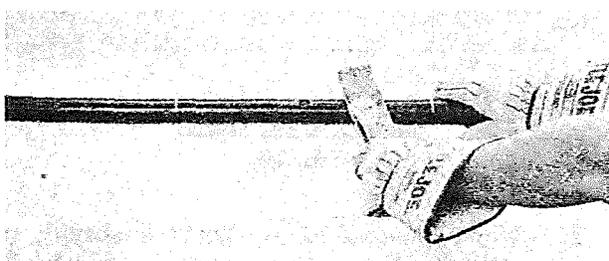
c. Lead cable must be prepared as per Addendum 644-200-005.

2. In the area to be covered, remove any foreign matter from the cable sheath with a cleaner or carding brush. Brush perpendicular to the axis of the cable.
3. Select the proper size Shrinkaround sleeve indicated in Table A. *Allowing 6 inches per end* overlap beyond the damaged area, cut the required length of Shrinkaround sleeve with a sharp knife (Fig. 2).



Determine the Length of Shrinkaround Sleeve Required  
Fig. 2

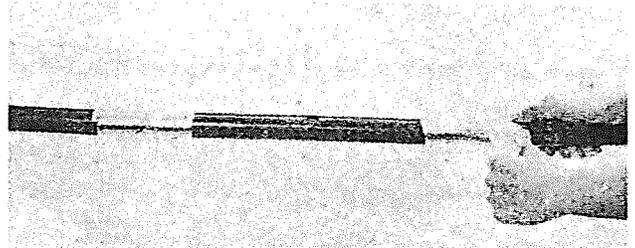
4. Preheat cable sheath until it is hot. This forms a good bond with the Shrinkaround sleeve.
5. Scrape the polyethylene cable jacket to be covered circumferentially, with either a carding brush or emery strip (Fig. 3).



Scrape the Cable Jacket Circumferentially  
Fig. 3

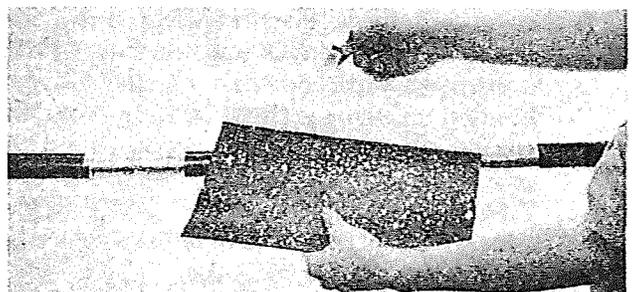
6. When applying over a polyethylene (PIC) cable, wrap B aluminum tape starting approximately 1 inch inside each end of the sleeve for a distance of 4 to 6 inches (Fig. 4).

*Note:* This procedure is not required on lead cables.



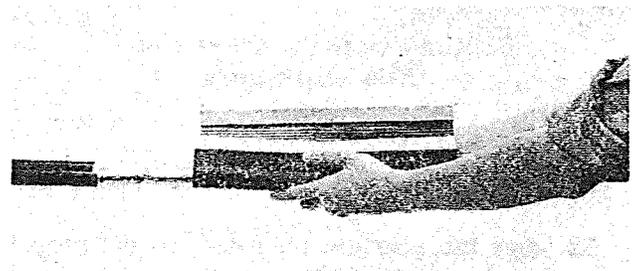
Wrap B Aluminum Tape Over Cable Jacket  
Fig. 4

7. Remove the protective release paper from *both flaps* of the Shrinkaround sleeve by pulling the black tabs. This will expose the surfaces of the contact adhesive (Fig. 5).



Remove the Release Paper from the Contact Adhesive  
Fig. 5

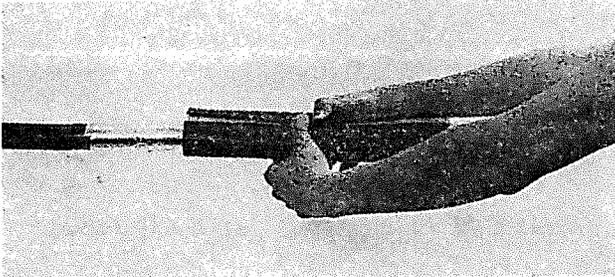
8. Place the Shrinkaround sleeve around and on the cable so that the sealant side of the sleeve is next to the cable and the white contact adhesive of the lower flap is facing up (Fig. 6).



Place the Sleeve Around the Cable  
Fig. 6

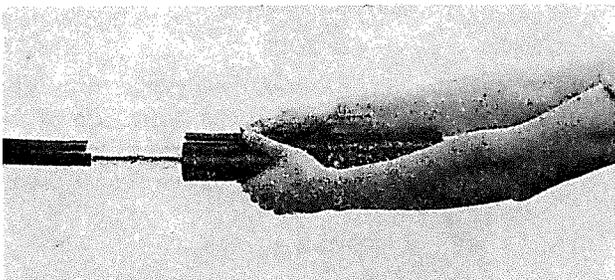
SECTION 633-505-901PT

- Align center of top flap over center of lower flap, also align edge of top flap with white line ridge of lower flap. *Press down firmly* on center of flaps to mate adhesive surfaces. **ONCE THE SURFACES CONTACT EACH OTHER, DO NOT TRY TO PULL APART OR REALIGN** (Fig. 7).



Align the Center of the Flaps and Press Down Firmly  
Fig. 7

- Working from the center to one end, align flaps and press them together using firm pressure. Work slowly and continue in such a manner until one-half of the sleeve is bonded together. Then, starting from the center, use the same method to bond the other half of the sleeve. **DO NOT TRY TO TAKE THE FLAPS APART ONCE THEY ARE BONDED.** The bonded sleeve is now ready to be shrunk (Fig. 8).



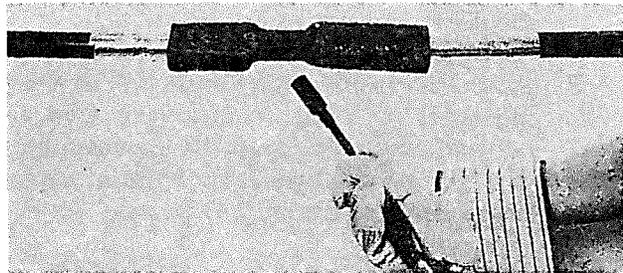
Continue Until the Entire Flap is Bonded Together  
Fig. 8

- Cover pole attachments described in 2.04.
- Set the pressure regulator on the propane tank at about 6 psi. The nozzle of the torch must be directed away from yourself or other craftspersons at ignition. Adjust

the needle valve on the torch until a flame of 12 to 18 inches in length is produced.

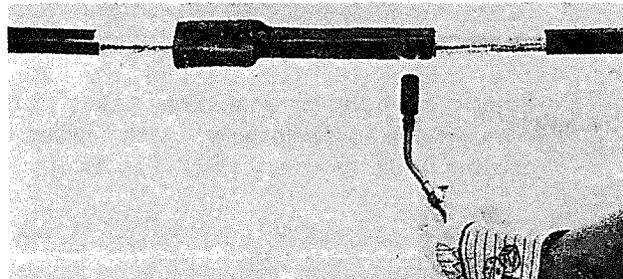
*Caution: Increase gas pressure to ensure flame does not blow back on windy days.*

- Center sleeve over damaged area, placing flap on top of cable. Heat the flap lightly along its full length, then heat the center area until it shrinks over the cable and the blue spots turn to black (Fig. 9).



Heat the Center Portion of the Shrinkaround Sleeve  
Fig. 9

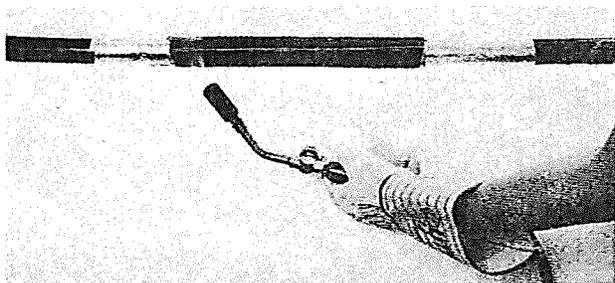
- Start working towards one end, applying the heat uniformly and smoothly so that all the blue spots turn to black. Then apply more heat to the flap area so that the "Sigmaform" letters become shallow and flatten out. Check sealant to ensure it is flowing around the end (Fig. 10).



Continue to Shrink Half of the Shrinkaround Sleeve  
Fig. 10

- When one-half of the sleeve is shrunk, repeat the same procedure on the unshrunk half. Recheck to see that all the blue spots have turned black; if not, apply more

heat to the blue areas. Also, check the entire flap length to ensure that the "Sigma-form" letters have flattened out (Fig. 11).



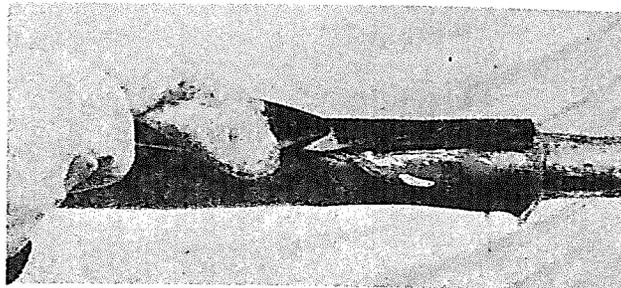
Shrink the Remaining Half of the Shrinkaround Sleeve  
Fig. 11

5.02 The liquefied thermoplastic adhesive will solidify in approximately 15 minutes after the heat is removed. The cable can then be resupersized. However, the cable may be resupported on the strand immediately, *using care to prevent burns from the heated plastic sleeve*. Cable guards or scrap polyethylene sheath should be placed between the rings or cable supports and the sleeve to prevent cutting through the heat-softened sleeve.

## 6. REMOVAL

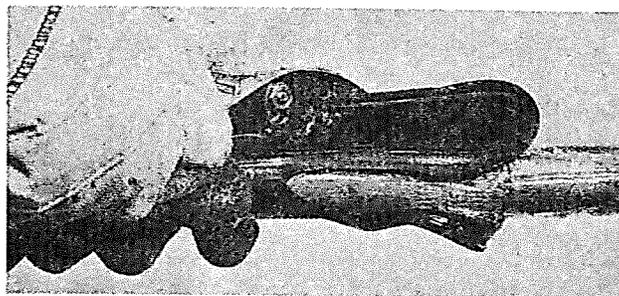
6.01 If it is necessary to remove an installed Shrinkaround sleeve, proceed as follows:

1. Bleed pressurized cables as indicated in 2.01.
2. Remove the cable supports as described in 5.01, Steps 1 and 2.
3. With a propane torch, heat the entire length of the installed sleeve.
4. Draw the point of the skinning knife next to the overlap or flap area of the sleeve along the entire length of the sleeve. Only a light cutting pressure is required since the sleeve is softened by the heat. (Fig. 12).



Start Cut at End of Heated Sleeve Next to Overlap Area  
Fig. 12

5. The sleeve will continue to shrink under heat and will split along the length of the cut. Grasp an edge of the sleeve with pliers and peel the sleeve off the cable (Fig. 13).



Grasp Edge of Cut Sleeve with Pliers and Off the Cable  
Fig. 13

6. Apply additional heat to the sleeve where it resists removal. Remove the sleeve and discard it.
7. The adhesive remaining on the cable sheath does not have to be removed unless access to the sheath is required. A shave hook can be used for removing the solidified adhesive.

6.02 A new Shrinkaround sleeve can be applied over the cable sheath originally repaired. Place the new sleeve over the solidified adhesive and complete the application as described in Part 5. The solidified adhesive on the cable sheath will liquefy and blend into the adhesive of the new sleeve as heat is applied.