3M™ Cold Shrink QS-III Silicone Rubber Splice Kit 5488A-Shielded-XB

For Tape-Shielded and Longitudinally Corrugated (LC) Shielded Cable

For 250–2000 kcmil cable with 650-mil primary insulation thickness

Instructions

IEEE Std. No. 404
69kV Class 350 kV BIL
IEC 60840
72kV Class 325kV BIL

CAUTION

Working around energized systems may cause serious injury or death. Installation should be performed by personnel familiar with good safety practice in handling electrical equipment. De-energize and ground all electrical systems before installing product.

Kit Selection Table

<table>
<thead>
<tr>
<th>Kit Number</th>
<th>Primary Insulation O.D. Range</th>
<th>Conductor Size Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>5488A-Shielded-XB</td>
<td>1.94–3.08&quot; (49.3–75.4 mm)</td>
<td>250–2000 kcmil (125–1000 mm²)</td>
</tr>
</tbody>
</table>

Table 1
1.0 Kit Contents

1. Silicone Rubber Splice Body
2. Silicone Rubber Tube Assembly
3. Jacketing Tubes
4. Shielding Sleeve, 5' length
5. Pre-formed Ground Braid Assemblies
6. Constant Force Springs
7. 3M™ Red Compound P55/R Tubes (non-silicone grease)
8. 3M™ Scotch Seal™ Mastic Tape 2229, 1" x 10'
9. Rolls Scotch® Rubber Mastic Tape 2228, 2" x 36"
10. Rolls Scotch® Electrical Shielding Tape 24, 2" x 10'
11. Pad Scotch® Electrical Semi-conducting Tape 13, 18" x 35"
12. 4 Rolls Scotch® Vinyl Electrical Tape Super 88, 1½" x 44'
13. 4 Rolls Scotch® Linerless Rubber Splicing Tape 130C, 1½" x 30'
14. 4 3M™ Cable Cleaning Pads CC-3
15. 4 3M™ EMI Copper Foil Shielding Tape Strips 1811, 15" long
16. 4 Rolls Scotch® Linerless Rubber Splicing Tape 130C, 1½" x 30'
17. 4 Rolls Scotch® Armorcast Structural Material 4560, 3" x 15'
18. 1 Connector
19. 1 Connector, Foil Pad
20. 1 Connector, Instruction Sheet
21. 2 Instruction Booklets

Note: Utility Cloth (Aluminum Oxide) abrasive materials are required for cable preparation, but are NOT INCLUDED IN KIT. Required grits are P180, P240 and P320. Available 3M™ Utility Cloth (Aluminum Oxide) Rolls UPC Codes are:

P180: 51115-19788
P240: 51115-19786
P320: 51115-19784

Note: Do not use knives to open plastic bags.

2.0 Prepare Cable

2.1 Check to be sure the cable fits within the kit ranges as shown in Table 1.

2.2 Prepare cables according to standard procedures. Refer to Figure 1 for proper dimensions. Copper foil tape strips are included to secure and cover the ends of the tape/LC shield.
2.3 Remove cable insulation for [B]. Insulation removal length shall not exceed 4 ¼" (114 mm) from conductor end. Do not install connector now.

<table>
<thead>
<tr>
<th>Conductor Size Kcmil (mm²)</th>
<th>Primary Insulation O.D.* Inches (mm)</th>
<th>Semi-con Cutback [A] Inches (cm)</th>
<th>Insulation Cutback [B] Inches (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 – 600 (125 – 325)</td>
<td>1.94 – 2.24 (49.3 - 56.9)</td>
<td>13 ½ (34.3)</td>
<td>4 (102)</td>
</tr>
<tr>
<td>700 – 1000 (400 – 500)</td>
<td>2.25 – 2.60 (57.0 – 66.0)</td>
<td>13 ¼ (33.7)</td>
<td></td>
</tr>
<tr>
<td>1100 – 1500 (600 – 800)</td>
<td>2.61 – 2.85 (66.1 – 72.4)</td>
<td>13 (33.0)</td>
<td></td>
</tr>
<tr>
<td>1600 – 2000 (850 – 1000)</td>
<td>2.86 – 3.08 (72.5 – 75.4)</td>
<td>12 ¾ (32.4)</td>
<td></td>
</tr>
</tbody>
</table>

* Insulation OD is the final determining factor

2.4 Clean or cover the cable jackets if necessary, 36" (915 mm) from the cable jacket cutback.

2.5 Clean cables using standard practice:
   a. Do not allow solvent or abrasive to contact the cable semi-conductive insulation shield.
   b. Do not reduce cable insulation diameter below 1.94" (49.3 mm) specified for the splice.
   c. The insulation surface must be round, smooth and free of cuts/voids. Sanding may be necessary, finish sanding should be done with a 300 grit or higher electrical grade abrasive.
   d. Make certain the cable insulation is smooth, clean and dry before continuing.
2.6 Using two tubes of 3M™ Red Compound P55/R, fill the semi-con step. Spread the remainder of the red compound along the cable insulation (Figure 2).

![Figure 2](image1)

2.7 Slide the gray cold shrink silicone rubber tube assembly onto cable with the loose core end going on first (extending toward the cable jacket) (Figure 3).

![Figure 3](image2)

2.8 Position the end of the silicone rubber tube assembly (not the core) near the end of the cable insulation and slowly start to remove the support core by pulling while unwinding the loose core ribbon in a counter-clockwise direction. Locate the end of the adapter tube ½" (13 mm) from the end of the cable insulation. Continue to unwind the core to complete the installation. Install silicone rubber tube assembly on one side only (Figure 4).

![Figure 4](image3)
3.0 Park Splice Components

3.1 Slide the jacketing tubes onto one cable end (small tube inside larger tube with loose core ends opposite each other) (*Figure 5*). Slide splice body onto the opposite cable, loose core end first (*Figure 6*).
3.2 Slide expanded shield sleeve over the splice body onto the cable (Figure 7).

4.0 Install Connector

4.1 Install the connector according to the connector instructions included with the connector.

5.0 Install Splice

5.1 Apply tape marker to cold shrink insulation adapter 1¾" (45 mm) from the cut back edge of the cable semi-con on the cable which does not contain splice (Figure 9).
5.2 Clean cables using standard practice:

a. Do not allow solvent or abrasive to contact the cable semi-conductive insulation shield.

b. Make certain the cable insulation and connector surface are smooth, clean and dry before continuing.

5.3 Apply 3M™ Red Compound P55/R on cold shrink insulation adapter and cable insulation between the cut back edges of the cable semi-con. Do not use silicone grease (Figure 10).

5.4 Position the splice body over connector area, aligning end of the splice body (not the core) at the center of the tape marker. Slowly start to remove the splice core by pulling and unwinding the loose core end counterclockwise, allowing only ¼" (6 mm) of the splice to shrink onto the tape marker. Carefully slide the splice body off the tape marker by pulling and twisting until the entire tape marker is exposed. Continue removing the core to complete the splice body installation (Figure 11).
6.0 Install Shield Break

6.1 Trim the 36” length of the Pad Scotch® Electrical Semi-conducting Tape 13, 18" x 36" Pad as shown and wrap over the splice body (cut length following the cable). Secure with three bands of vinyl tape (Figure 12). Do not cover the entire pad with vinyl tape.

![Figure 12](image)

6.2 (LC Shielded cable only.) Fill the valleys on the longitudinally corrugated shield with several wraps of Scotch® Electrical Shielding Tape 24. Half-hitch to tie off. Repeat for second cable. (Figure 13)

![Figure 13](image)
6.3 Center the expanded shield sleeve over the splice (Figure 14).

6.4 Hand tighten the sleeve outward while keeping it centered over the splice body. Secure the centered shield sleeve to the first 1½" (38 mm) of tape shield or longitudinally corrugated shield and Scotch® Electrical Shielding Tape 24. Using a constant force spring, wrap two turns over sleeve and metallic shield. Fold sleeve back over spring and finish wrapping spring (Figure 15).

6.5 Secure the shield sleeve with vinyl tape ½" (13 mm) from the splice body shoulder edge (Figure 15).

6.6 Fold remaining shield sleeve back over vinyl tape and secure with vinyl tape (Figure 16).
6.7 Cover constant force spring with vinyl tape (*Figure 17*).

![Figure 17](image)

6.8 Wrap four half-lapped layers of stretched Scotch® Linerless Rubber Splicing Tape 130C from the end of the silicone rubber tube assembly covering 5" (126 mm) of the shield sleeve (*Figure 18*).

![Figure 18](image)

6.9 Wrap four half-lapped layers of Scotch® Electrical Shielding Tape 24 starting and ending over the tape shield or longitudinally corrugated shield. Cover the previously applied rubber tape, leaving 2" (50 mm) exposed beyond the shielding tape. Secure the shielding tape using a constant force spring (*Figure 19*).

![Figure 19](image)
6.10 Cover the shielding tape, constant force spring and exposed rubber tape with two half-lapped layers of Scotch® Vinyl Electrical Tape Super 88 (Figure 20).

**Figure 20**

7.0 Install Braid Assemblies

7.1 Select the pre-formed braid assembly from the kit. Position the ground braid assembly around the tape shield or longitudinally corrugated shield and Scotch® Electrical Shielding Tape 24 tape as shown. (Figure 21)

**Figure 21**
7.2 Select the 3 constant force springs from the kit. Starting at the loop of the braid assembly nearest the cable jacket edge, install the 3 constant force springs, one around each braid loop. Cinch (tighten) the springs after wrapping the final turn. Extend the braid tails down the cable jacket. (*Figure 22*)

7.3 Select the roll of 1" (25 mm) wide 3M™ Scotch-Seal™ Mastic Tape 2229 from the kit. Cut a length of the tape long enough to wrap around the cable jacket. Remove the release liner from the mastic and, using light tension, apply a single wrap of mastic around the cable jacket, positioned under the braid solder blocks. (*Figure 23*)

7.4 Secure the tails of the braid assembly to the cable jacket approximately 6 inches (150 mm) from the cable jacket edge with several wraps of vinyl tape. (*Figure 23*)
7.5 Cut four 1" (25 mm) lengths of 1" (25 mm) wide 3M™ Scotch-Seal™ Mastic Tape 2229. Remove the release liner and roll each mastic strip into a small roll. (*Figure 24*) Press the mastic rolls into place on either side of the ground braid solder blocks. (*Figure 25*)

![Figure 24](image1)

![Figure 25](image2)

7.6 Select the roll of 1" (25 mm) wide 2229 mastic from the kit and cut a length of the mastic. Using light tension, apply a single wrap of mastic around the cable jacket over the ground braid solder blocks and the previously applied mastic. Cover mastic with a wrap of vinyl tape. (*Figure 26*)

![Figure 26](image3)
Wrap a roll of slightly stretched Scotch® Rubber Mastic Tape 2228, 2" x 36" centered over mastic seal, tacky side toward cable. Cover constant force springs with two half-lapped layers of Scotch® Vinyl Electrical Tape Super 88 (Figure 27). Stretch and tear off last 1–2" (25–50 mm) of mastic (Figure 28).

7.8 Repeat steps 7.1–7.7 for the opposite cable end.

8.0 Connect Braid Assemblies

8.1 Connect a wire to the braid assembly tails in the area shown in Figure 29. Keep the connector profile as low as possible. For C-Tap or H-Tap connectors, position flat against the cable. Inline compression connectors may also be used.
8.2 Cut 3M™ Scotch-Seal™ Mastic Tape 2229 mastic into five 3” pieces. Place one piece on the cable jacket centered under the ground wire near the connector. Roll the four remaining mastic strips into small rolls and place around the ground wire. Press the mastic around the ground wire and to the cable jacket (Figure 30).

8.3 Wrap one layer of 2229 mastic over the previously applied mastic and ground wire (Figure 31). Overwrap the mastic and connector with vinyl tape (Figure 32).

**Note:** Additional rolls of 3M™ Scotch-Seal™ Mastic Tape 2229 and Scotch® Rubber Mastic Tape 2228 are provided in the kit. Use as required to ensure a good environmental seal.
9.0 Install Jacket

*Note: Jacketing is not optional.*

9.1 Install the smaller cold shrink tube by covering the mastic seal, overlapping the cable jacket approximately 1/4–1/2" (6–12 mm), and unwinding toward the splice body, slowly pulling and unwinding the core counterclockwise (*Figure 33*).

![Figure 33](image.png)

9.2 Wrap a single wrap of 3M™ Scotch-Seal™ Mastic Tape 2229, 1" x 10' around the smaller cold shrink tube ¼" from the end (over the splice body). Completely cover the sealing mastic with a wrap of vinyl tape (*Figure 34*).

![Figure 34](image.png)
9.3 Install the larger cold shrink tube over the sealing mastic on the other cable in the same manner (Figure 35).

![Figure 35](image)

9.4 Using the four rolls of 3M™ Armorcast Structural Material provided, wrap half-lapped layers over the entire splice extending 3" (76 mm) onto the cable jacket. Bind the final wrap in place with vinyl tape (Figure 36).

Tear open the top end of the foil armorcast material container and fill foil container half full with water. Squeeze the container four or five times allowing the water to penetrate the roll. Pour out water, remove roll from foil container and immediately apply to splice area.

*Note: Wear rubber gloves provided when handling armorcast material. The resin contains a black dye that will stain human skin.*

Armorcast can be applied first and then sprayed with water to activate the curing system. It will also cure from moisture in the air in humid conditions.

![Figure 36](image)

9.5 Mark wires and connect as required.
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