3M™ Cold Shrink Silicone Rubber Splice Kit QS-III 5488A
For Jacketed Concentric Neutral (JCN) 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</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 | Jacketing Tubes |
| 1 | Shielding Sleeve, 7" |
| 1 | Pre-formed Ground Braid Assembly |
| 7 | Constant Force Springs |
| 6 | 3M™ Red Compound P55/R Tubes (non-silicone grease) |
| 2 | Roll 3M™ Scotch-Seal™ Mastic 2229, 1" x 3.5' |
| 4 | Rolls Scotch® Rubber Mastic Tape 2228, 2" x 36" |
| 1 | Roll Scotch® Electrical Shielding Tape 24, 1" x 15' |

| 1 | Pad Scotch® Electrical Semi-conducting Tape 13, 18" x 35" |
| 2 | Roll Scotch® Vinyl Electrical Tape Super 88, 1½" x 44' |
| 4 | 3M™ Cable Cleaning Pads CC-3 |
| 4 | 3M™ EMI Copper Foil Tape Strips 1811, 15" long |
| 4 | Rolls 3M™ Armorcast Structural Material 4560, 3" x 15' |
| 1 | Connector |
| 1 | Connector, Foil Pad |
| 1 | Connector, Instruction Sheet |
| 3 | Splice 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 the illustration below for proper dimensions. **Additional distance is required on one cable to provide extra neutral wire length, allow 36" (915 mm) minimum.**

![Diagram of cable preparation](image)

<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</td>
<td>1.94 – 2.24 (49.3 - 56.9)</td>
<td>13 1/2 (34.3)</td>
<td>4 (102)</td>
</tr>
<tr>
<td>700 – 1000</td>
<td>2.25 – 2.60 (57.0 – 66.0)</td>
<td>13 1/4 (33.7)</td>
<td>4 1/2 (114)</td>
</tr>
<tr>
<td>1100 – 1500</td>
<td>2.61 – 2.85 (66.1 – 72.4)</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>1600 – 2000</td>
<td>2.86 – 3.08 (72.5 – 75.4)</td>
<td>12 3/4 (32.4)</td>
<td></td>
</tr>
<tr>
<td>(850 – 1000)</td>
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<td></td>
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</tbody>
</table>

* Insulation OD is the final determining factor

Figure 1

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

2.4 Carefully bend the neutral wires back over the edge of the cable jackets. Keep wire profile low, do not fold wires square back but follow concentric turn in the cable and turn the wires in that direction. Press them against the cable jacket and secure/cover the end of the wires with vinyl tape.

![Diagram of neutral wires](image)

Figure 2
2.5 Insulation removal length shall not exceed 4½" (114 mm) from conductor end. **Do not install connector now.**

![Figure 3]

2.6 Slide the jacketing tubes onto one cable end (small tube inside larger tube with loose core ends opposite each other) (*Figure 4*). Slide splice body onto the opposite cable, loose core end first (*Figure 5*).

![Figure 4]

![Figure 5]
2.7 Slide expanded shield sleeve over the splice body onto the cable (*Figure 6*).

3.0 Install Connector

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

4.0 Install Splice

4.1 Apply tape marker to semi-con insulation shield 1¾" (45 mm) from the cut back edge of the cable semi-con on the cable which does not contain splice (*Figure 8*).
4.2 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. **Finish sanding must be done with a 300 grit or higher electrical grade abrasive.**

d. Make certain that the cable insulation is smooth, clean and dry before continuing.

4.3 Apply 3M™ Red Compound P55/R on cable insulations, making certain to fill in edge of cable semi-con. **Do not use silicone grease** (*Figure 9*).

![Figure 9](image)

4.4 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 10*).

![Figure 10](image)
5.0 Connect the Neutral Wires

5.1 Wrap the Scotch® Electrical Semi-conducting Tape 13, 18" x 36" pad over the splice body (36" length following the cable), between the folded neutral wires. The pad can be trimmed to fit between the neutrals. Secure with four bands of vinyl tape (Figure 11). **Do not cover the entire pad with vinyl tape.**

![Figure 11](image1)

5.2 Center the expanded shield sleeve over the semi-con pad (Figure 12).

![Figure 12](image2)

5.3 Hand tighten the sleeve outward while keeping it centered over the semi-con pad. Secure the centered shield sleeve on both sides using vinyl tape to the semi-con pad next to the folded neutral wires. Fold the remaining sleeve ends over the vinyl tape, toward the splice body, and cover them with tape (Figure 13).

![Figure 13](image3)
5.4 Take the temporary tape off neutral wires. Do not twist wires in to a single bundle.

5.5 Route the longer neutral wires straight across the previously installed shield sleeve. Secure to sleeve, over the semi-con pad, with a band of vinyl tape (*Figure 14*).

![Figure 14](image)

_Note: If this splice is to be grounded, jump to Section 6.0 Grounding (Optional) at this point._

5.6 Connect the longer neutral wires to the shorter wires using multiple connectors (3 or more). This is done to avoid damage to the splice body shoulders and end seals caused by large diameter wire/connectors being pressed in to them (*Figure 15*).

![Figure 15](image)

5.7 Cover the connectors with two half-lapped layers of vinyl tape (*Figure 16*).

![Figure 16](image)

5.8 Continue with _Section 7.0 Install Jacket._
6.0 Grounding (Optional)

Note: Use these instructions if circuit grounding is required at this location.

6.1 Grounding can be done using the provided ground strap or by using ground wires.

If using the provided ground strap, cut the center of the U-shaped strap (opposite the lug) creating two sets of three braid ends (Figure 17).

![Figure 17](image17.png)

6.2 Position each ground braid solder block over the cable jacket on opposite sides of the cable. The solder block should be within ¼" (6 mm) of the cable jacket cutback. Temporarily secure both solder blocks to the cable jacket using two wraps of vinyl tape in the middle of the solder blocks (Figure 18).

![Figure 18](image18.png)

6.3 Divide the longer neutral wires evenly into 3 or 6 groups. If using 3 groups of neutral wires, connect two braid ends to each group of neutral wires. If using 6 groups of neutral wires, connect each braid end to each group of neutral wires (Figure 19). This can be accomplished using the appropriate C, H or barrel connectors. Do not connect over large diameter of splice body.

![Figure 19](image19.png)
6.4 Press ground connectors down to pad. Secure and cover the ground connectors with two half-lapped layers of vinyl tape (Figure 20).

![Figure 20](image)

6.5 Remove temporary tape from over the solder blocks. Select the roll of 1" (25 mm) wide 3M™ Scotch-Seal™ Mastic 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 ground braid solder blocks (Figure 21).

![Figure 21](image)

6.6 Secure the two tails of the ground braid assembly to the cable jacket approximately 6 inches (152 mm) from the cable jacket edge with several wraps of vinyl tape. (Figure 21)

6.7 Cut four 1" (25 mm) lengths of 1" (25 mm) wide 3M™ Scotch-Seal™ Mastic 2229. Remove the release liner and roll each mastic strip into a small roll. Press the mastic rolls into place on either side of the ground braid solder blocks (Figure 22).

![Figure 22](image)
6.8 Select the roll of 1" (25 mm) wide 3M™ Scotch-Seal™ Mastic 2229 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. (Figure 23)

![Figure 23](image)

7.0 Install Jacket

*Note: Jacketing is not optional.*

7.1 Wrap a roll of slightly stretched Scotch® Rubber Mastic Tape 2228, 2" x 36" around cable jacket ends (tacky side toward cable) (Figure 24). Stretch and tear off last 1–2" (25–50 mm) of mastic (Figure 25). If grounding was applied, apply tape centered over 3M™ Scotch-Seal™ Mastic 2229.

![Figure 24](image)

![Figure 25](image)
7.2 Install the smaller cold shrink tube by covering the rubber mastic, 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 26).

![Figure 26](image)

7.3 Wrap a single wrap of 3M™ Scotch-Seal™ Mastic 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 27).

![Figure 27](image)

7.4 Install the larger cold shrink tube over the rubber mastic on the other cable in the same manner (Figure 28).

![Figure 28](image)
7.5 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 29).

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.

<table>
<thead>
<tr>
<th>4 rolls 3M™ Armorcast Structural Material</th>
</tr>
</thead>
</table>

Figure 29

7.6 Connect optional grounding.
Important Notice

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