# 3M™ Mining Cable Splice Kit 3100
## Instructions

### Kit Contents:
1 Scotch® Heavy Duty Mining Tape 31, 2" x 8.5'
1 Scotch® Linerless Rubber Splicing Tape 130C, 1½" x 30'
1 3M™ Temflex™ Vinyl Electrical Tape 1700P, 1½" x 44'
1 3M™ Cable Cleaning Preparation Kit CC-2-Dry
1 Instruction Sheet

***Note: Scotch® Linerless Rubber Splicing Tape 130C is applied highly-stretched with tacky side DOWN.***

### Technical Information:
For use on 2, 3 or 4-Conductor Flat Type W, G or G-GC
3 or 4-Conductor Round Type W, G or G-GC
#6 AWG–1/0 AWG (14-50 $mm^2$)
600 V–2 kV

Cables up tp 500 kcmil (250 $mm^2$) will require the use of additional tapes.

### Mine Safety and Health Administration Acceptance:
P-07-KA080005/00-MSHA

**⚠DANGER**

Before attempting any cable repairs, make sure that the proper cable is disconnected, locked out and suitably tagged.

**⚠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.

*August 2009*
*78-8127-6830-3-C*

3M

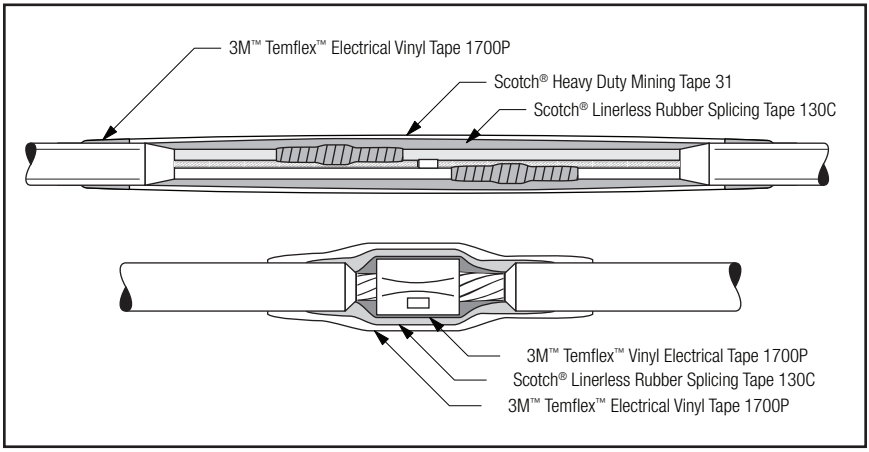


Figure 1

## 1.0 Cutting And Cable Preparation

1.1 Square cut cable ends to be spliced.

1.2 Split cable approximately 12" (305 mm) between phases.

1.3 If using cable types G or G-GC, pull grounds and ground check conductors out and tape to cable jacket behind split.

1.4 If using two-conductor cable, cut one lead approximately 6" (150 mm) from end of cable, leave other conductor approximately 12" (305 mm). Cut corresponding conductors to match.

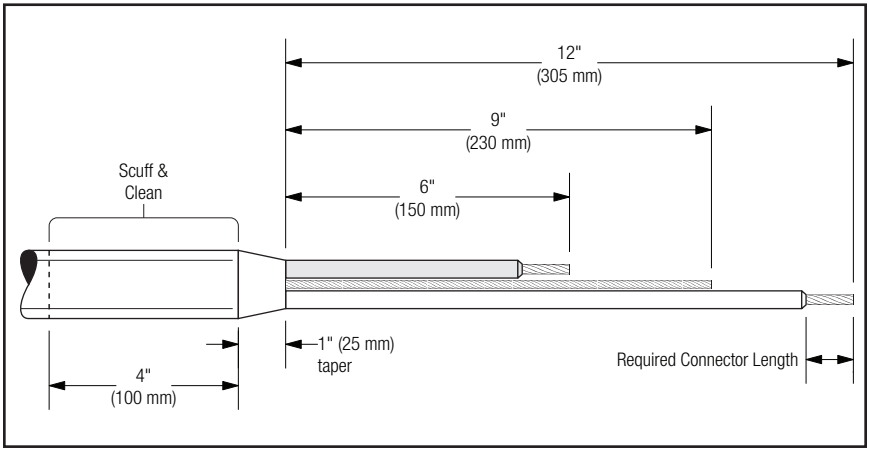


Figure 2

1.5 If using three-conductor cable, stagger leads approximately 6" (150 mm), 9" (230 mm), and 12" (305 mm) from end of split. Cut corresponding conductors to match.

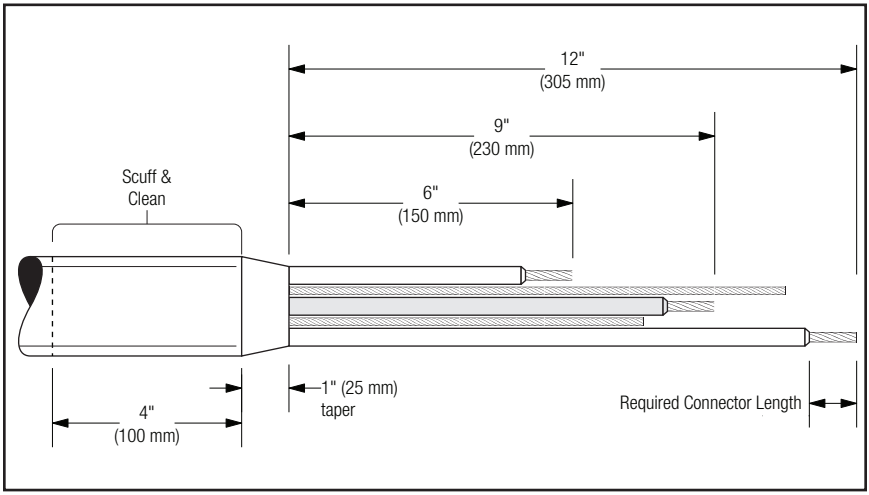


Figure 3

1.6 Remove jacket and phase insulation for one-half butt connector length or two parallel connector lengths from each phase end.

1.7 Taper jacket approximately 1" (25 mm). Taper or bevel ends of insulation to conductor.

1.8 Scuff and clean 4" (100 mm) of cable jacket beyond each taper or split end.

1.9 Cut ground and ground check conductor to lie in between connections of phases.

## 2.0 Install Connectors

2.1 Join conductors one at a time using proper connectors (butt, parallel or modified crow's foot) and crimping tool.

***Note: Insulate each conductor in sequence before connecting the next conductor, ground, or ground check.***

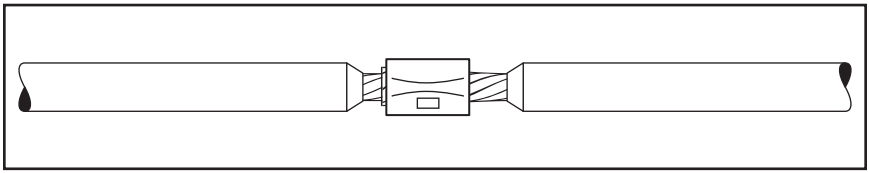

Figure 4

## 3.0 Replace Insulation

3.1 Apply one half-wrapped layer of 3M™ Temflex™ Vinyl Electrical Tape 1700P from edge of taper to edge of taper.

***Note: Scotch® Glass Cloth Tape 27 or Scotch® Glass Cloth Tape 69, while not included, may be added and used at this time.***

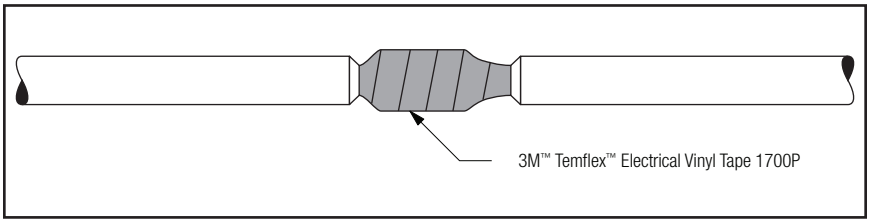


Figure 5

3.2 Apply highly-stretched half-lapped layers of Scotch® Linerless Rubber Splicing Tape 130C (**tacky side DOWN**) over 1700P tape and up onto tapers. Build up half-lapped layers of tape gradually going out on existing insulation ½" (13 mm) past top of tapers. Tape should be wrapped to a thickness equal to or greater than the original insulation.

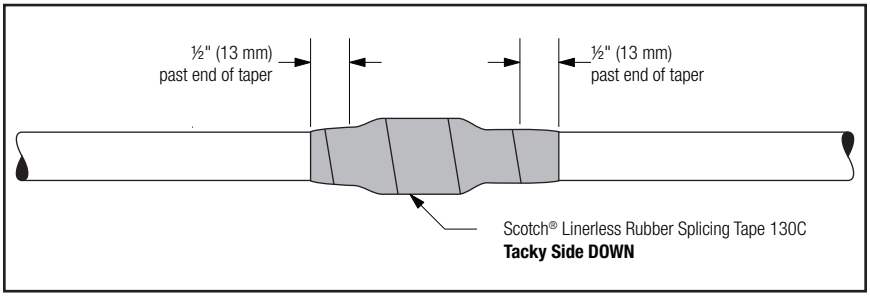


Figure 6

3.3 Starting ½" (13 mm) past end of 130C tape apply one half-lapped layer of 1700P tape over the 130C tape, extending ½" (13 mm) past the other end of the 130C tape.

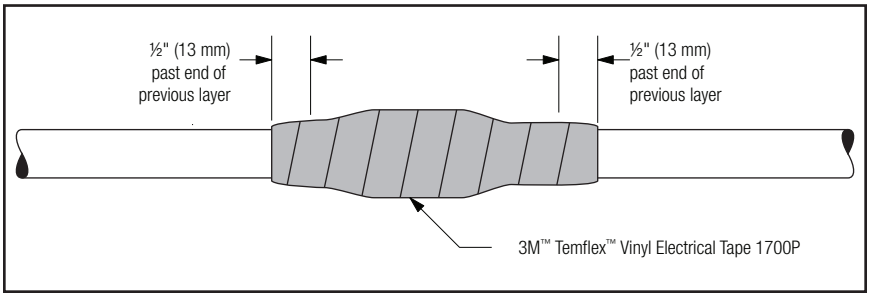


Figure 7

3.4 If cable includes a ground check, the ground check connector should be wrapped with one half-lapped layer of 3M™ Temflex™ Electrical Vinyl Tape 1700P extending ¼" (6 mm) onto existing insulation, followed by a half-lapped layer (**tacky side DOWN**) of Scotch® Linerless Rubber Splicing Tape 130C extending ¼" (6 mm) past the 1700P tape, then using the same ¼" (6 mm) overlap, add a final layer of half-lapped 1700P tape.

3.5 Connect remaining ground wires.

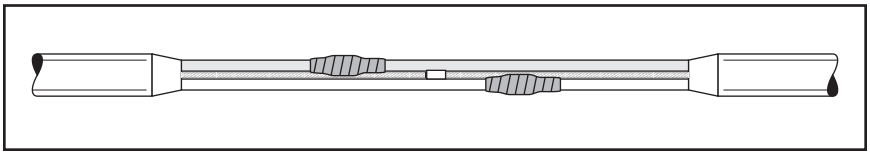

Figure 8

## 4.0 Replace Jacket

4.1 Start 1" (25 mm) above split or top of taper and apply half-lapped layers of 130C tape (**tacky side DOWN**) across splice and 1" (25 mm) past end of opposite split or top of taper. Apply half-lapped layers, filling all voids until splice area is returned to greater than or equal to original cable profile.

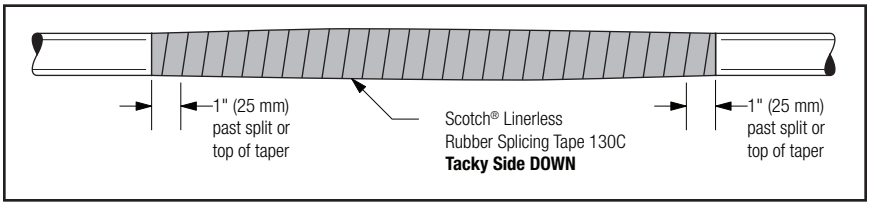


Figure 9

4.2 Start 2" (50 mm) from 130C tape and apply one half-lapped layer of Scotch® Heavy Duty Mining Tape 31 with mastic side toward the cable across the splice and continue 2" (50 mm) past the end of the Scotch® Linerless Rubber Splicing Tape 130C. Always wrap the 31 tape toward the machine end of the cable.

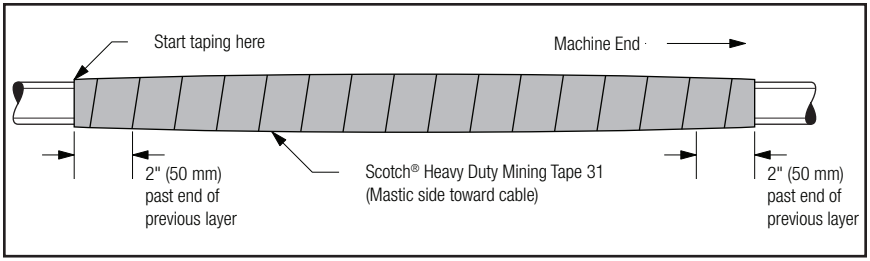


Figure 10

4.3 Starting 1" (25 mm) past the Scotch® Heavy Duty Mining Tape 31, apply 3 half-lapped layers of 3M™ Temflex™ Vinyl Electrical Tape 1700P to each end to temporarily secure the ends of the 31 tape acket until the jacket reaches full bond.

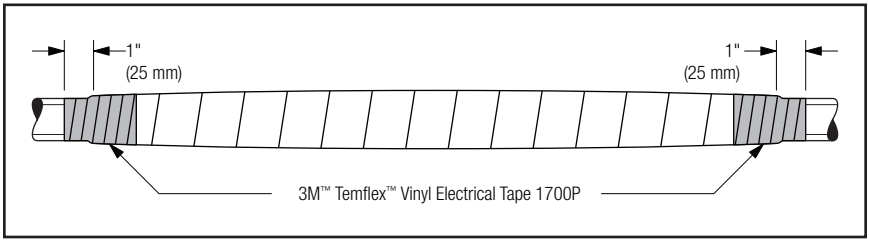


Figure 11

## 5.0 Repairing Damaged Cable Jacket

***Note: For jacket repair option, additional tape may be needed for longer repairs.***

5.1 Remove damaged cable jacket and taper jacket approximately 1" (25 mm).

5.2 Scuff and clean 3" (75 mm) of cable jacket beyond each split end.

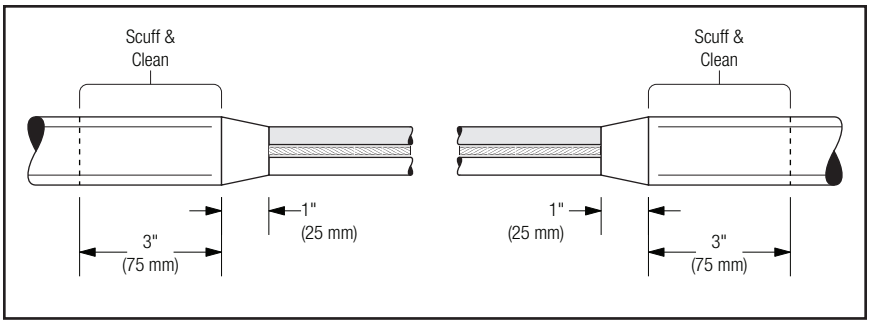


Figure 12

5.3 Start 1" (25 mm) above split or top of taper and apply half-lapped layers of Scotch® Linerless Rubber Splicing Tape 130C (**tacky side DOWN**) to 1" (25 mm) past end of opposite split or top of taper. Apply half-lapped layers, filling all voids until the area is returned to greater than or equal to original cable profile.

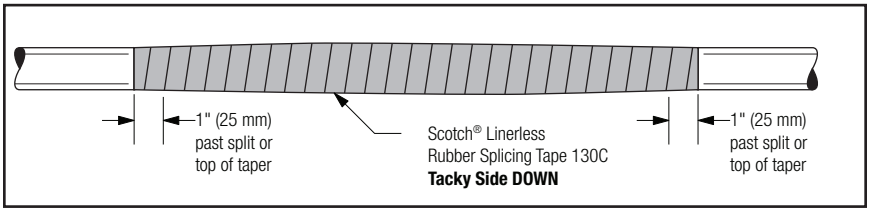


Figure 13

5.4 Start 2" (50 mm) from Scotch® Linerless Rubber Splicing Tape 130C and apply one half-lapped layer of Scotch® Heavy Duty Mining Tape 31 with mastic side toward the cable continuing 2" (50 mm) past the end of the 130C tape. Always wrap the 31 tape toward the machine end of the cable.

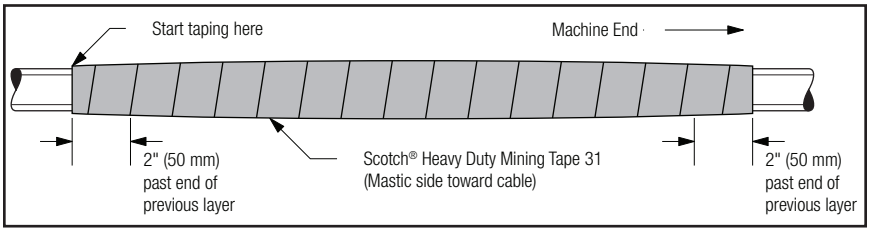


Figure 14

5.5 Starting 1" (25 mm) past the 31 tape, apply 3 half-lapped layers of 3M™ Temflex™ Vinyl Electrical Tape 1700P to each end to temporarily secure the ends of the 31 tape until the tape reaches full bond.

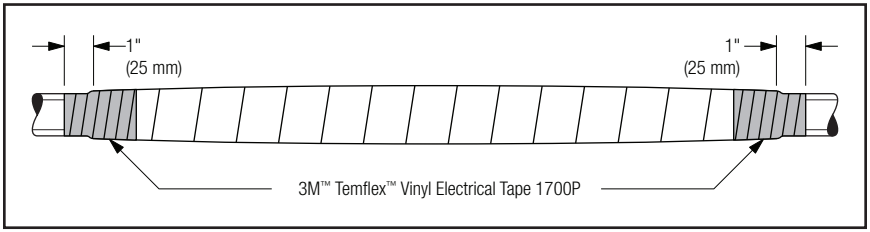


Figure 15

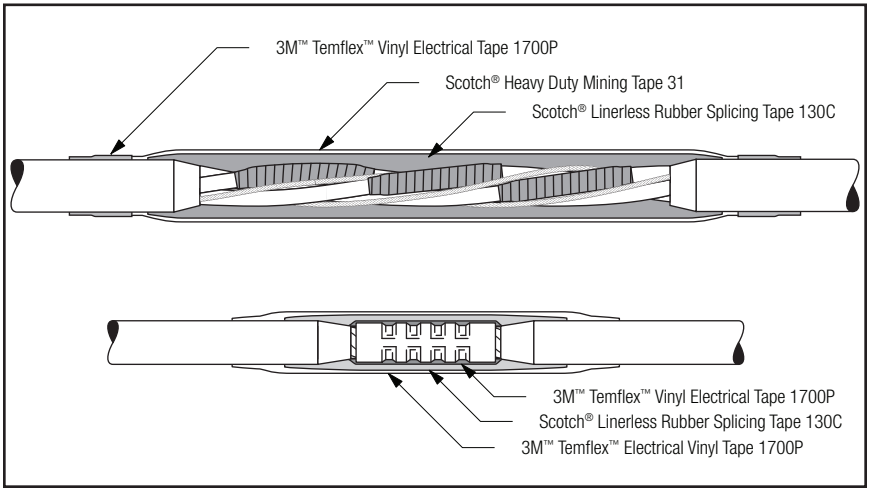


Figure 16

## 6.0 Prepare Cable

6.1 Position cable ends so that conductor color rotation matches.

6.2 Circle-cut cable jacket approximately 12" (305 mm) from each end. Be sure not to damage cable conductors.

6.3 Measure approximately 14" (355 mm) from cable end and fully taper cable jacket down to circle cut.

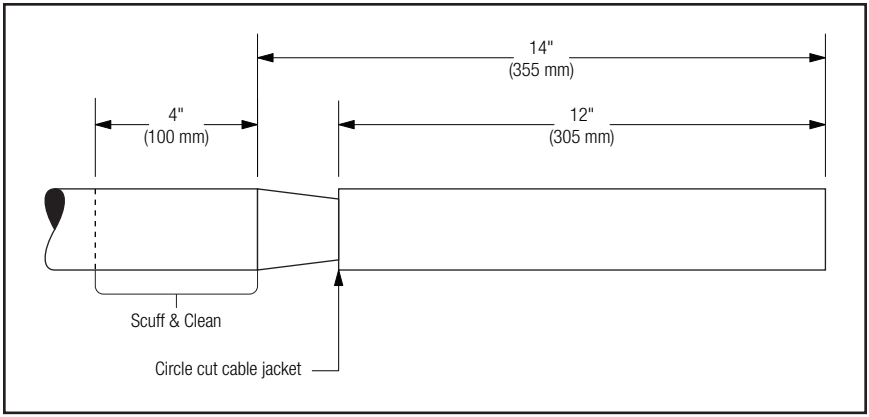


Figure 17

6.4 Remove approximately 12" (305 mm) of cable jacket.

6.5 Scuff and clean 4" (100 mm) of cable jacket beyond each split end.

6.6 Remove cable fillers.

6.7 If present, fold back grounds and ground check conductors and temporarily tape to cable jacket with vinyl tape.

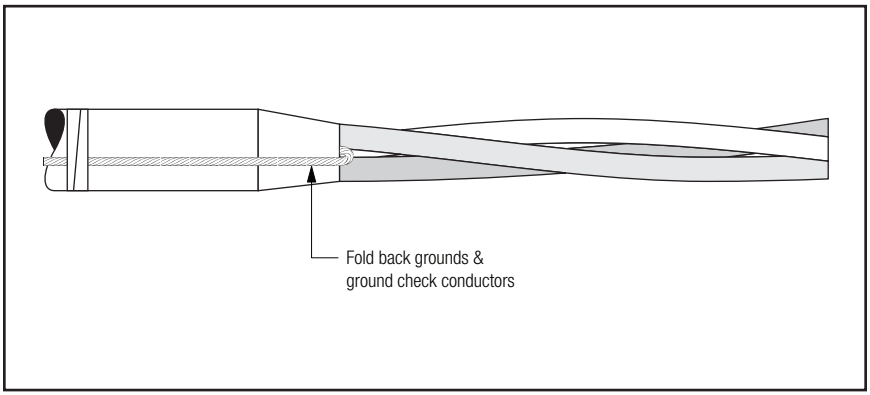


Figure 18

6.8 Select one conductor and cut conductor approximately 9" (230 mm). Match this conductor with same color conductor on opposite end.

6.9 Rotate cable so conductor twist will match original cable lay as much as possible.

6.10 Take next conductor in rotation and cut approximately 6" (150 mm) from end.

6.11 If present, remove color code and/or separator tape for length of phase.

6.12 Remove insulation from ends of conductors for one-half connector length if using butt splices, or two connector lengths if using parallel splices.

6.13 Pencil insulation for approximately ½" (13 mm), sand smooth and clean with solvent wipe.

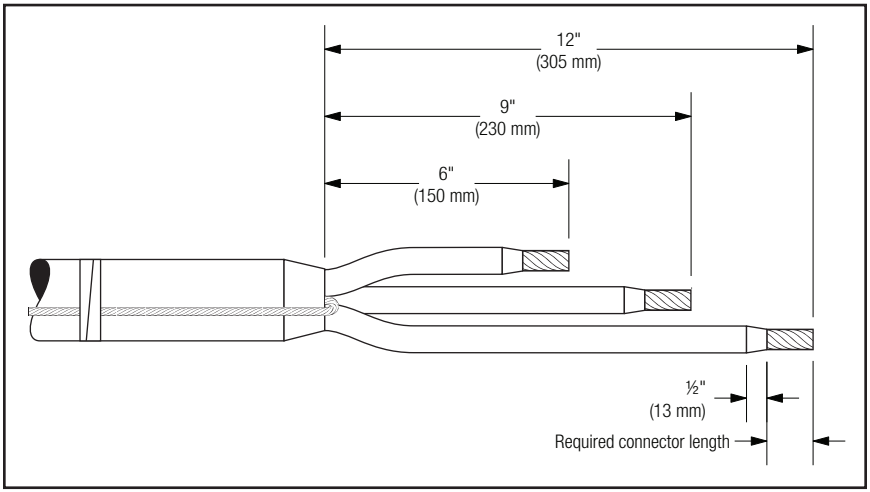


Figure 19

## 7.0 Connect Phase Conductors

7.1 Join power conductors with proper connectors and appropriate crimping tool. Make certain conductors butt center indents of connector.

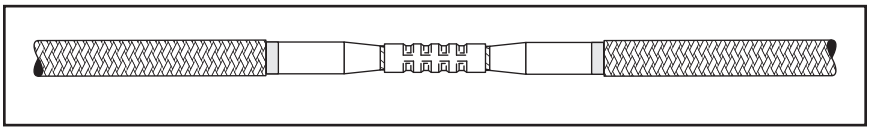

Figure 20

## 8.0 Apply Primary Insulation

8.1 Apply one half-lapped layer of 3M™ Temflex™ Vinyl Electrical Tape 1700P from edge of taper to edge of taper.

***NOTE: Scotch® Glass Cloth Tape 27, while not included, may be used at this time.***

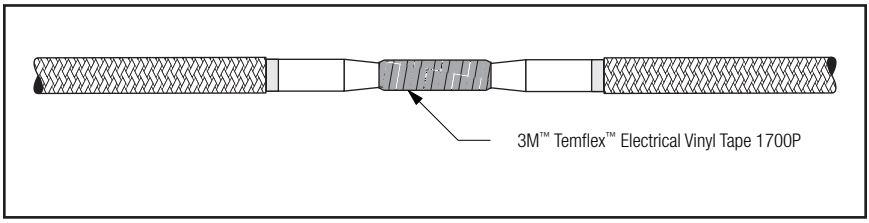


Figure 21

8.2 Apply half-lapped layers of two-thirds-stretched Scotch Linerless® Rubber Splicing Tape 130C (**tacky side DOWN**) over 1700P tape and up onto tapers. Build up half-lapped layers of 130C tape until equal to or greater than original and extending ½" (13 mm) onto existing insulation.

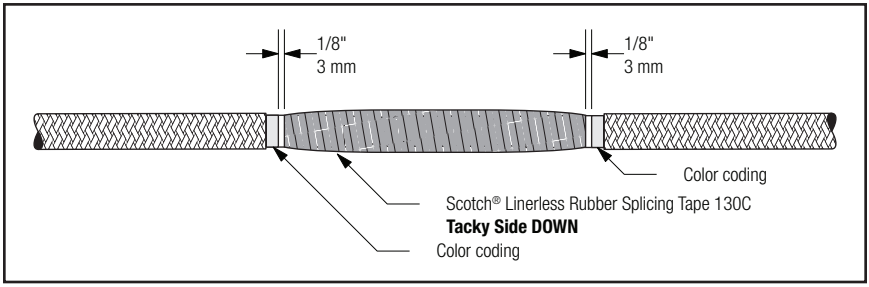


Figure 22

8.3 Starting ½" (13 mm) past end of Scotch® Linerless Rubber Splicing Tape 130C apply one half-lapped layer of 3M™ Temflex™ Vinyl Electrical Tape 1700P over the 130C tape, extending ½" (12 mm) past the other end of the 130C tape.

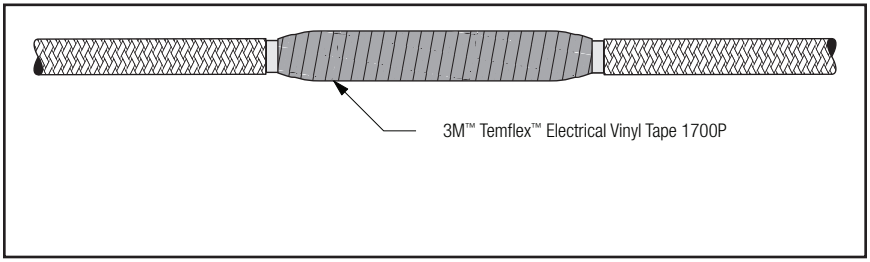


Figure 23

## 9.0 Connect Ground Connectors

9.1 Before cutting ground wires, reposition the spliced power conductors so that the conductors are returned to the natural helix of the cable.

9.2 Lay the ground wires in their natural position in the valley between two power conductors. Cut ground to lengths staggered to avoid connection over power conductor connections.

9.3 Join conductors with proper connectors and appropriate crimping tool.

9.4 If present, connect the ground check conductor after trimming to proper length and removing one connector length of insulation from each lead. Use proper connector and crimping tool.

9.5 For ground check, clean the insulation 1" (25 mm) on both sides of the connection and apply one half-lapped layer of 1700P tape, one half-lapped layer 130C tape (**tacky side DOWN**), and one half-lapped layer of 1700P tape over the connector and the cleaned insulation.

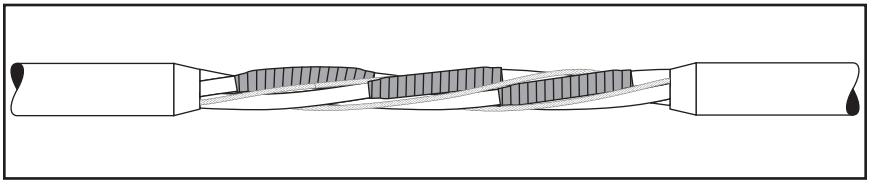

Figure 24

9.6 Connect remaining ground wires.

## 10.0 Jacketing the Splice

10.1 Bundle cable assembly and bind with 3M™ Temflex™ Vinyl Electrical Tape 1700P. Starting half way up the tapers, wrap half-lapped layers of Scotch® Linerless Rubber Splicing Tape 130C (**tacky side DOWN**), building up and across the splice until 130C tape is equal to or greater than original jacket thickness and extends 1" (25 mm) past the top of jacket tapers.

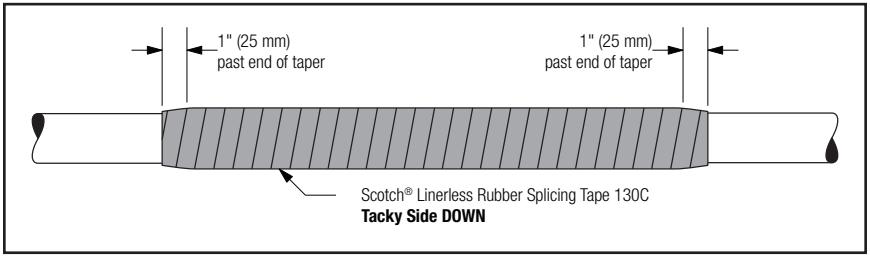


Figure 25

10.2 Start 2" (50 mm) beyond 130C tape, wrap one half-lapped layer of Scotch® Heavy Duty Mining Tape 31 with mastic side toward the cable extending 2" (50 mm) beyond the 130C tape on the opposite end. Always wrap the 31 tape toward the machine end of the cable.

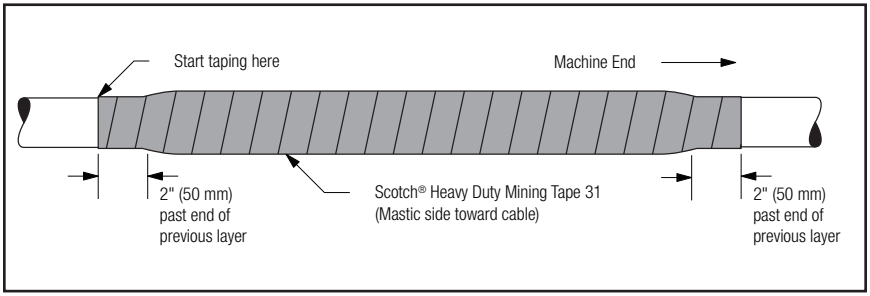


Figure 26

10.3 Starting 1" (25 mm) past the 31 tape, apply 3 half-lapped layers of 1700P tape to each end to temporarily secure the ends of the 31 tape until the tape reaches full bond.

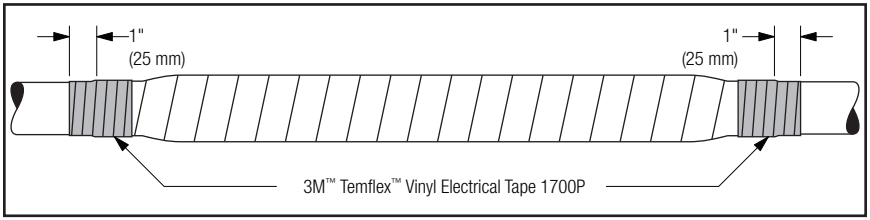


Figure 27

## 11.0 Repairing Damaged Cable Jacket

***Note: For jacket repair option, additional tape may be needed for longer repairs.***

11.1 Remove damaged cable jacket and taper jacket approximately 1" (25 mm).

11.2 Scuff and clean 4" (100 mm) of cable jacket beyond each split end.

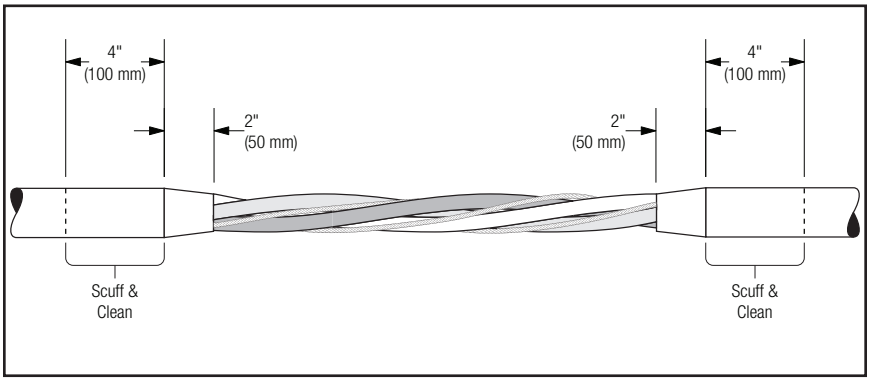


Figure 28

11.3 Starting half way up the tapers, wrap half-lapped layers of Scotch® Linerless Rubber Splicing Tape 130C (**tacky side DOWN**), building up and across the splice until 130C tape is equal to or greater than original jacket thickness and extends 1" (25 mm) past the top of jacket tapers.

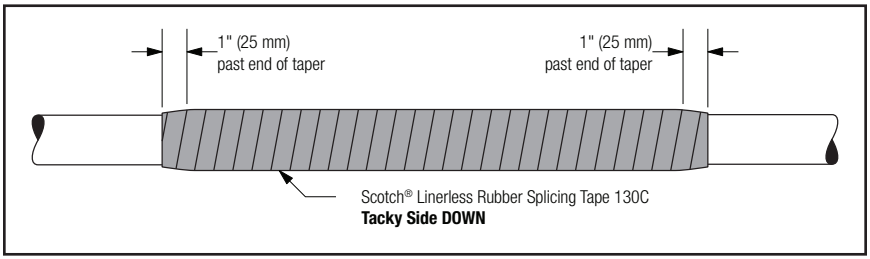


Figure 29

11.4 Start 2" (50 mm) beyond Scotch® Linerless Rubber Splicing Tape 130C, wrap one half-lapped layer of Scotch® Heavy Duty Mining Tape 31 with mastic side toward the cable extending 2" (50 mm) beyond the 130C tape on the opposite end. Always wrap the 31 tape toward the machine end of the cable.

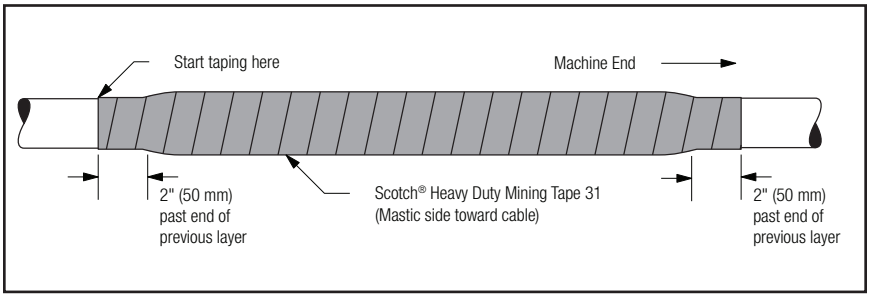


Figure 26

11.5 Starting 1" (25 mm) past the 31 tape, apply 3 half-lapped layers of 3M™ Temflex™ Electrical Vinyl Tape 1700P to each end to temporarily secure the ends of the 31 tape until the tape reaches full bond.

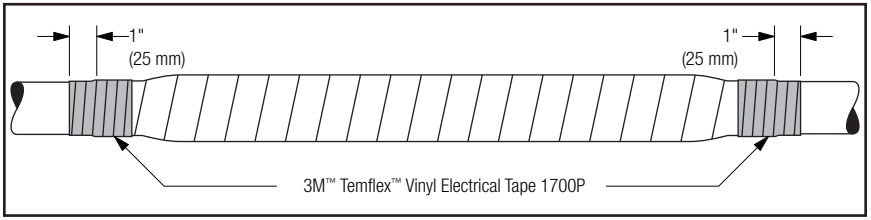


Figure 27

## 12.0 For Conduit Repair and Splicing

12.1 If splicing, cut conduit at 30–45° angle.

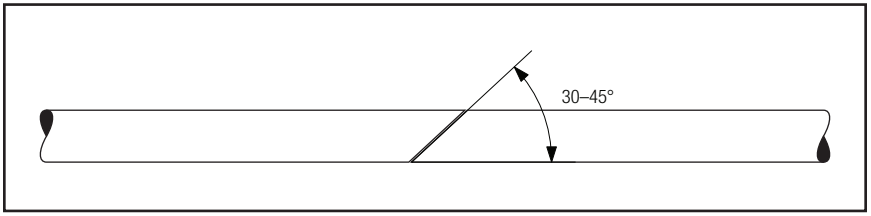


Figure 28

12.2 Clean and abrade conduit surface.

12.3 Fill voids using 130C tape.

12.4 Apply one half-lapped layer of Scotch® Heavy Duty Mining Tape 31 beginning and ending a minimum of 4" (102 mm) from each side of the conduit cut or repair location.

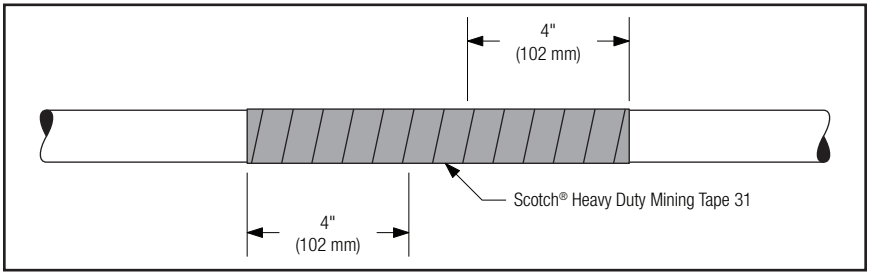


Figure 29

12.5 Starting 1" (25 mm) past the 31 tape, apply 3 half-lapped layers of 3M™ Temflex™ Vinyl Electrical Tape 1700P to each end to temporarily secure the ends of the 31 tape until the tape reaches full bond.

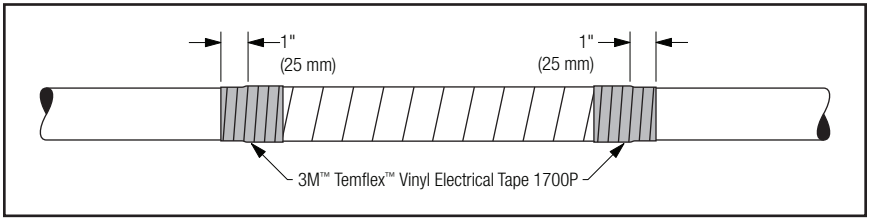


Figure 30

**Important Notice**

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