
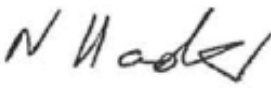



**Installation Instruction  
ESD-4873-AU-5/09**

**Straight Through Joint for  
11kV Three Core XLPE  
Insulated Cables with  
Screen Wires and with  
Composite Sheath**

**95-240mm<sup>2</sup>**

ENDORSED BY	SIGNATURE	DATE
<b>Wilfred Leung</b> Principal Engineer—Mains RailCorp		22.6.2009

APPROVED BY	SIGNATURE	DATE
<b>Neal Hook</b> Chief Engineer - Electrical Systems RailCorp		19/8/2009

APPROVED BY	SIGNATURE	DATE
<b>Andrew Thompson</b> Product Manager Tyco Electronics		20/8/09

Superseded by PTA EL200 2019, 01/10/2019

## **Before Starting**

Refer to the kit label and the title of the installation instruction to ensure that the kit you are going to use fits the cable.

Components or work steps may have improved since you last installed this product. Carefully read and follow the steps in the installation instruction.

## **General Instructions**

Use an LPG gas torch.

Ensure the torch is always used in a well ventilated area.

Adjust the torch to obtain a soft blue flame with a yellow tip.

Pencil-like blue flames should be avoided.

Keep the torch aimed in the shrink direction to preheat the material.

Keep the flame moving continuously to avoid scorching the material.

Clean and degrease all parts that will come into contact with the adhesive.

If a solvent is used follow the manufacturer's handling instructions.

Tubing should be cut smoothly with a sharp knife leaving no jagged edges.

Start shrinking the tube at the position recommended in the instruction.

Ensure that the tubing is shrunk smoothly all round before continuing along the cable.

Tubing should be smooth and wrinkle free with the inner components clearly defined.

## **Important**

The joint kit includes cable connectors. RailCorp will not accept substitutes for these connectors unless specific approval has been obtained.

### **DISCLAIMER**

The information contained in these installation instructions is for use only by installers trained to make electrical power installations and is intended to describe the correct method of installation for this product. However, Tyco Electronics has no control over the field conditions which influence product installation.

It is the user's responsibility to determine the suitability of the installation method in the user's field conditions. Tyco Electronics' only obligations are those in Tyco Electronics' standard Conditions of Sale for this product and in no case will Tyco Electronics be liable for any other incidental, indirect or consequential damages arising from the use or misuse of the products.

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# MXSU-RCP07

Qty: 1

## Kit Contents

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3	x	ERIT-45/17-320/U	Screened Insulation Sleeve - 320 Long
6	x	JSCR-42/16-100/U(S1)	Stress Control Tubing - 100 Long
6	x	S1189-1-120(A2)-(C1500)	Void Filling Mastic 20 x 120 Long
3	x	S1300-1-150/150(C1)	Stress Control Patch - 150 x 150
2	x	EPPA-009-6000	Tinned Copper Mesh 6000mm Long
3	x	BSM-95/240	Mechanical Shear Bolt Connector
3	x	EPPA-048-CLAY PACK	Clay Pack
3	x	HEL-4892	Mechanical Shear Bolt Connector ( Screen )
6	x	EPPA-004	Cleaning Tissue
12	x	S1085-1-150	Sealant Mastic Red - 25 x 150mm Long
2	x	S1085-3-300	Sealant Mastic Red - 50 x 300mm Long
1	x	EPPA-202-2	PVC Tape - 10 Metres x 25mm Wide
2	x	402W526/S	Low Voltage Breakout Coated
3	x	S1061-8-300	Sealant Mastic Black 60 x 300 Long
1	x	WCSM-105/30-700/S	Heavy Wall Tubing 700 Long Coated
1	x	WCSM-130/36-900/S	Heavy Wall Tubing 900 Long Coated
1	x	ESD-4873-AU-4/09	Installation Instruction

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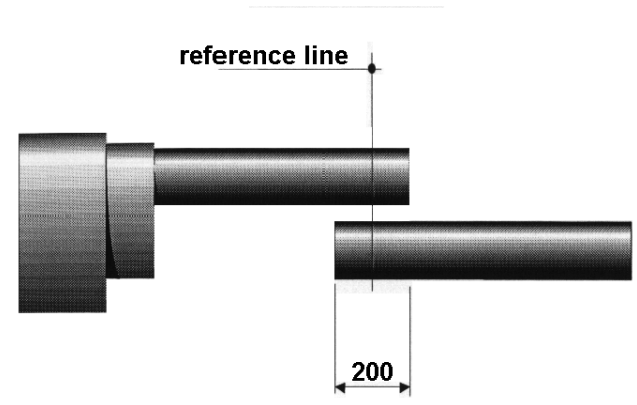
**Energy Division**



Superseded by PTA EL200 2019, 01/10/2019

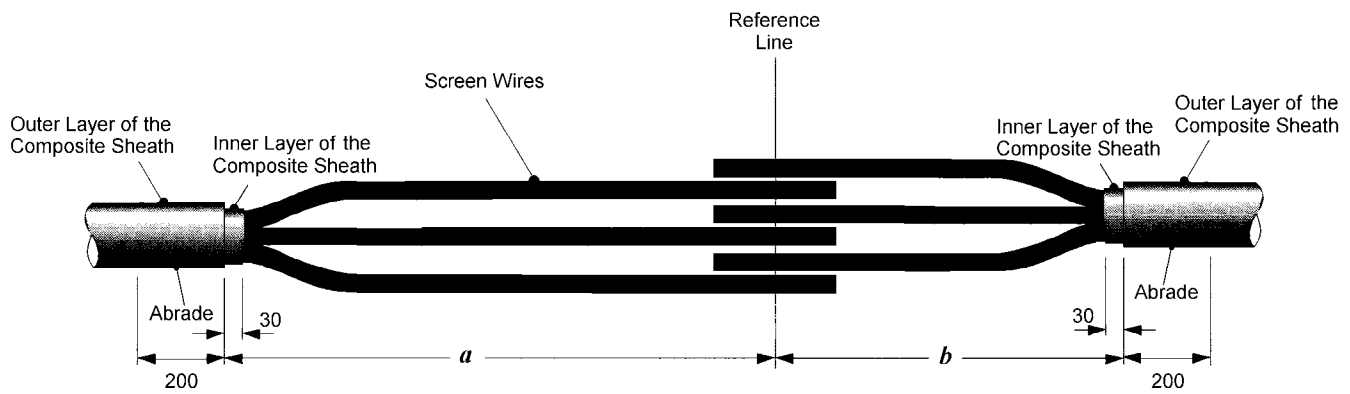
**Cable Overlap**

1. Overlap the cables to be jointed by 200 mm.
2. Mark the reference line (the middle of the overlap).
3. Clean one cable end over a distance of 2 m using the cleaning tissues provided in the kit. Completely cover the composite sheath with plastic where the sealing sleeves are intended to be parked, to ensure the joint components do not get contaminated.
4. Slide the small sealing sleeve over it. Fold and tape it down temporarily.
5. Position the remaining sealing sleeve over the first one.



**Cable Preparation**

6. Remove the outer layer of the composite sheath to dimensions **a** and **b** given in Table 3, from the reference line.
7. Remove the inner layer of the composite sheath to the dimensions shown, from the reference line.
8. Remove the fillers level with the inner layer of the composite sheath.
9. Abrade, clean and degrease the outer layer of the composite sheath for a distance of 200 mm from the outer layer sheath cut using the cleaning tissues provided in this kit. Use a wiping action away from the exposed cores.
10. Abrade, clean and degrease the inner layer of the composite sheath using the cleaning tissues provided in this kit.



**Stripping Dimensions**

**Table 3**

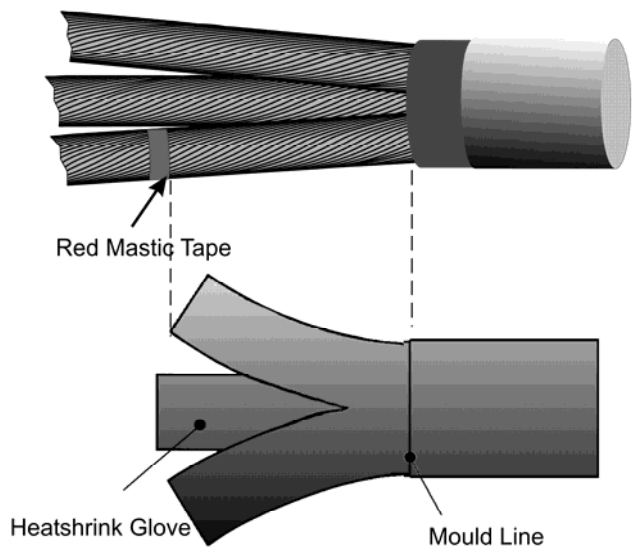
Cable Range	Stripping Dimensions (mm)	
	<i>a</i>	<i>b</i>
95-240mm <sup>2</sup>	630	330

### Installing the Glove on each Three Core Cable

#### 11.(a) For Cables with Water Swellable Tapes under the Screen Wires Only:

- (i) Position the glove along side the cable so that the mould line of the glove is level with the end of the inner layer of the composite sheath.

Apply one layer of red mastic tape (20mm wide) over the screen wires of each core, level with the end of the glove fingers as shown.



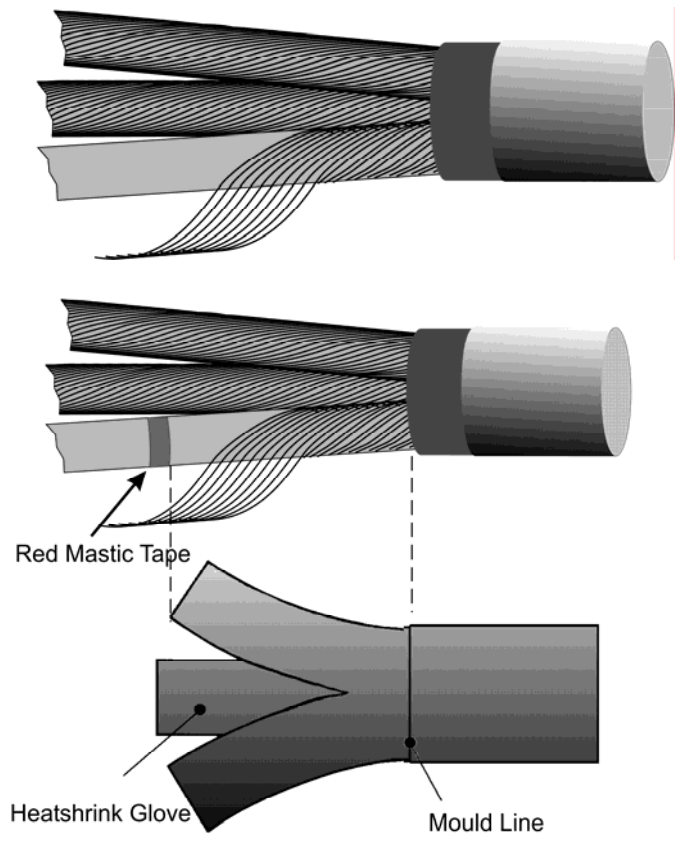
- (ii) Apply 2 full turns of PVC tape over the screen wires at the end of the core to facilitate easy installation of the glove.

#### 11.(b) For Cables without Water Swellable Tapes Only:

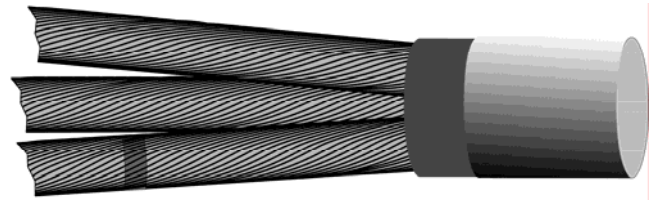
- (i) Starting with one core at a time, unwind the screen wires from the core. Do not bend them into position at this stage.

- (ii) Position the glove along side the cable so that the mould line of the glove is level with the end of the inner layer of the composite sheath.

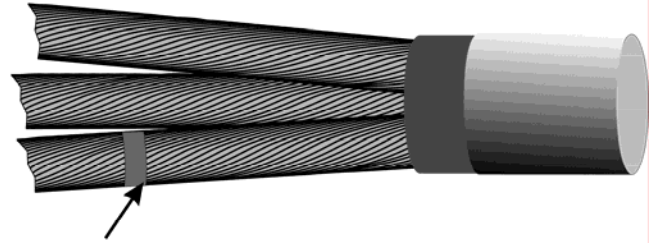
Apply one layer of red mastic tape (20mm wide) over the insulation screen, level with the end of the glove fingers.



(iii) Wind the screen wires back over the insulation screen. Avoid crossing the individual screen wires.



(iv) Apply one layer of red mastic tape (20mm wide) over the screen wires at the same location the mastic was applied in Step (ii), (i.e. over the mastic applied in Step (ii)).



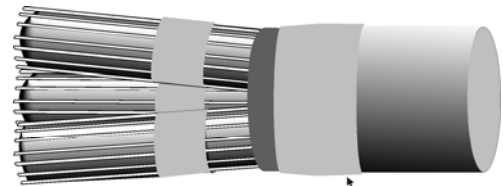
Red Mastic Tape

(v) Repeat Steps (i)-(iv) for the other cores.

(vi) Apply 2 full turns of PVC tape over the screen wires at the end of the core to facilitate easy installation of the glove.

**Steps 12 to 17 below apply to three core polymeric cables with and without Water Swellable Tapes:**

12. Apply wide red mastic tape (50mm wide) to equally overlap the inner and outer layers of the composite sheath.



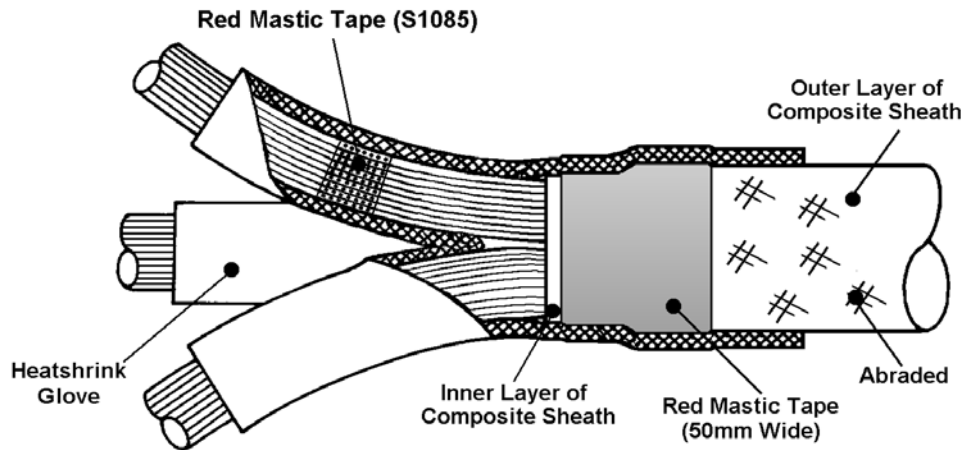
Red Mastic Tape  
(50mm wide)

13. Fit the 3-way glove over the three cores on one side of the joint and push it into the cable crotch as far as possible.

14. Protect the cable cores near the glove fingers from heat using fibreglass tape.

15. Shrink the glove down. Shrink the body of the glove first, starting at the base of the fingers and working towards the composite sheath. Then shrink the fingers starting at the base of the fingers and working towards the centre of the joint. Apply additional heat to the fingers to melt the applied sealant strip.

***While shrinking the glove, ensure that the torch flame is not directed at the insulation screen.***



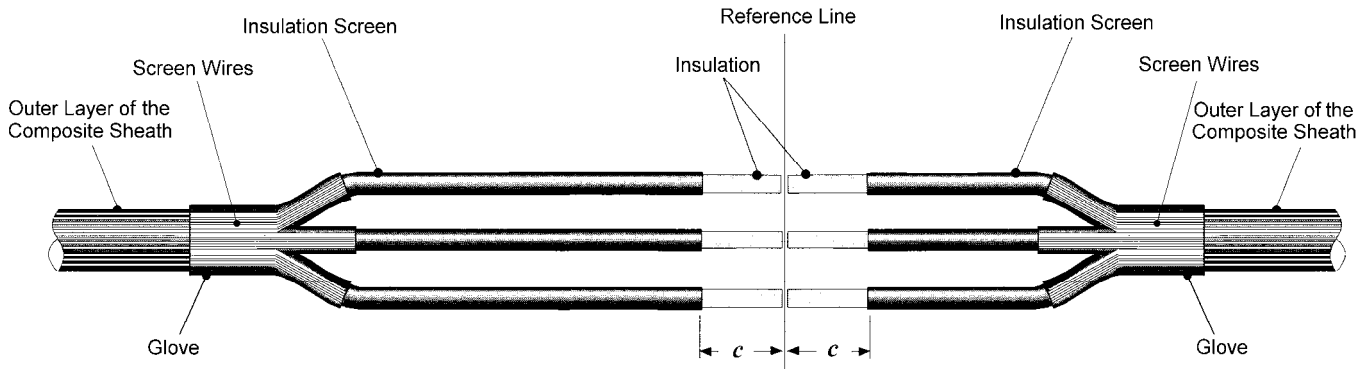
16. Fold the screen wires from each core back onto the outer layer of the composite sheath creating 3 separate bunches of screen wires, one from each core. Secure the screen wires to the outer layer of the composite sheath using PVC tape.
17. Repeat Steps 11-16 for the other three core cable.
18. **For Cables with Water Swellable Tapes under the Screen Wires Only:**  
Remove the water swellable tapes level with the end of the glove fingers.



## Core Preparation

19. Shape and position the cores as shown in the drawing below. Cut the cores at the reference line using a hacksaw. Thoroughly remove the insulation screen to dimension  $c$  given in Table 4. Ensure that the insulation surface is free from all traces of conductive material.

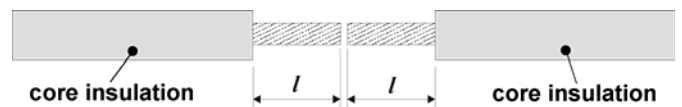
**Note:** Do not nick the insulation.



**Table 4**

Cable Range	Stripping Dimension (mm)	
	$c$	$l$
95-240	130	60

20. Remove the insulation from the cores to dimension  $l$  given in Table 4.

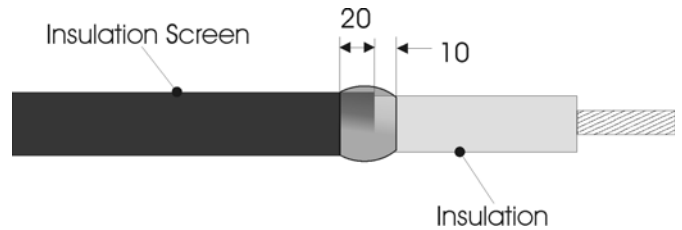


21. Clean and degrease the insulation using the cleaning tissues provided in the kit. Use a wiping action from the exposed conductor towards the insulation screen.

**Note:** Do not use a cleaning tissue that has previously been in contact with the insulation screen.



- 22. Remove the yellow void filling tape from the aluminium foil packet.
- 23. Remove the release papers from the yellow void filling tape with the pointed ends.
- 24. Wrap the void filler around the insulation screen starting 20 mm from the end of the insulation screen and continuing onto the insulation for 10 mm. Stretch the tape to half of its original width to achieve a fine, thin edge around the insulation.

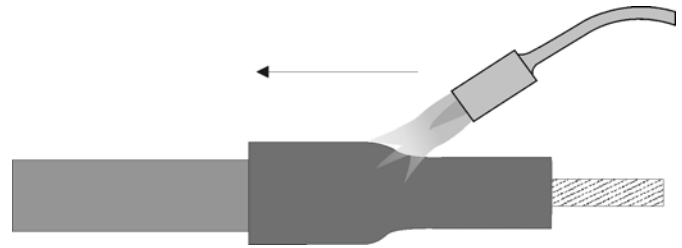


Finish on the insulation screen.

- 25. Slide the stress control tubing (black) over the cable core level with the end of the insulation cut.

Start shrinking from the insulation cut towards the cable sheath as shown.

Apply additional heat over the area where the void filling tape was applied.



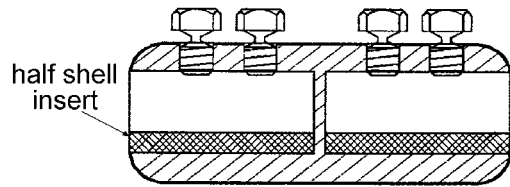
- 26. Repeat Steps 22 through to 25 for the remaining two cores, and for the cores on the other cable.

### Completion of the Joint

27. Slide a screened insulation sleeve (black and red) over each cable core on the long side of the joint.

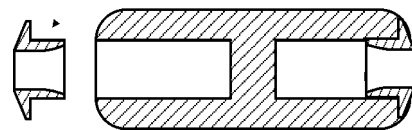


28. The connector is supplied with either half shell inserts or centralising inserts for use on smaller conductor cross sections. Check if each of the conductors will fit with the respective half shell or centralising insert installed. If the conductor fits, leave the half shell or centralising insert fitted. The centralising insert is a tight fit in the connector and requires complete insertion.



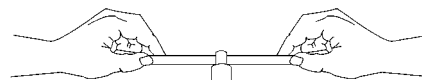
half shell insert

If the conductor does not fit with the half shell insert or centralising insert installed, remove and discard the half shell or centralising insert from that side of the connector.

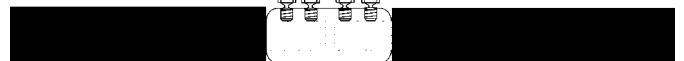


29. Fit the conductor into the connector. There should be no gap left between the connector and the insulation.

Take up the tension equally on all shear bolts with a tee bar spanner (do not shear the heads at this stage).



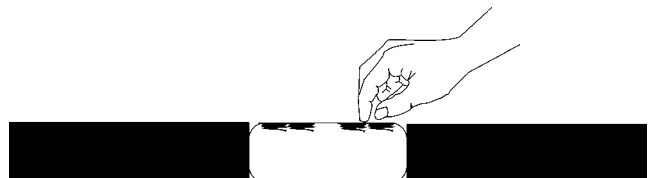
Starting at the connector ends and working towards the middle (following the number sequence indicated), tighten the bolts until the heads shear off. If a proud edge remains after removal of the bolt heads, this edge should be filed to obtain a smooth finish.



The numbers indicate the bolt tightening sequence.

**Note:** The use of a support tool (such as Tyco Electronics IT-1000-019) is strongly recommended in order to pick up the torque and avoid conductor bending.

- 30. Re-align the cables if necessary.
- 31. Clean and degrease the cable cores and connectors using the cleaning tissues provided in the kit.
- 32. Using the clay pack supplied in the kit, fill the hollows over the sheared off bolts in the connector to obtain a smooth finish.



33. Remove the release paper from the stress grading patch (black).

34. Position the patch centrally over the connector area. The start of the patch should just cover the shear bolts to ensure two layers of stress grading will be applied over the shear bolt area.

**Note:** Apply the long side of the patch across the connector.

35. Wrap the patch over the connector.

**Note:** Do not stretch the patch.

36. Position the screened insulating sleeve (black and red) centrally over the connector area.

a) Start shrinking the sleeves in the centre (1).

b) Continue shrinking by working towards one side (2), stopping 50 mm from the end.

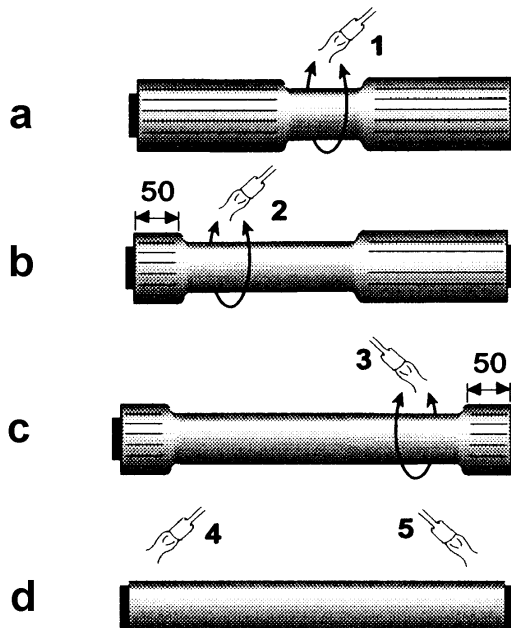
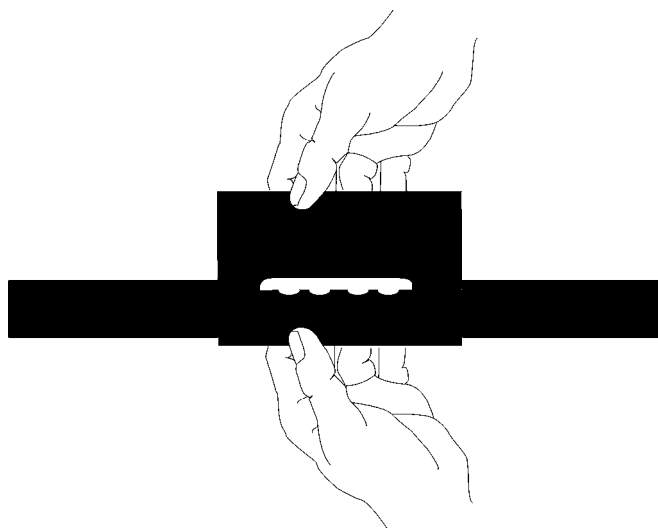
c) Shrink the other half in the same way (3).

d) Shrink down the first end (4) and finally the second (5).

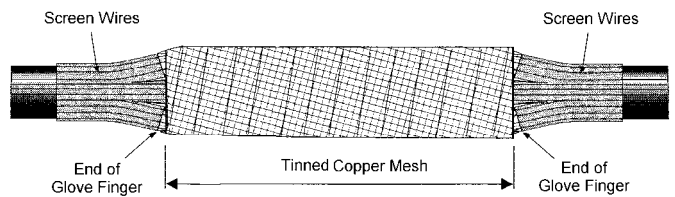
**Note:** The sleeves should be fully shrunk without leaving ridges.

e) Repeat steps (a) – (d) for the remaining cores.

37. Lay the three cores together.



38. Wrap one half-lapped layer of tinned copper mesh around the cores and across the full length of the joint, as shown.



39. Bend the screen wires back over the joint area close to the tinned copper mesh. Form an earth lead for each core with the screen wires. Cut the screen wires centrally above the joint centre.

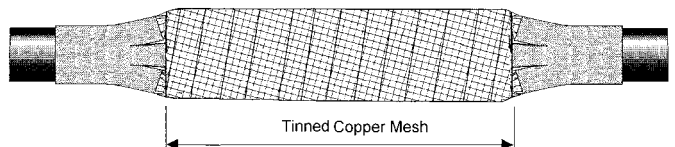


40. Insert the screen wires into the shear head connector supplied.

41. Tighten the shear head until the head shears off.

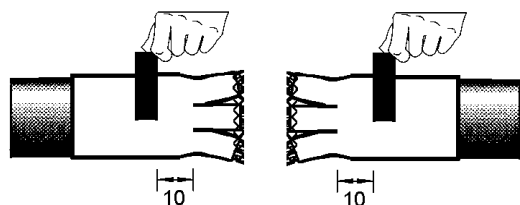
42. Push the screen wire connectors into the gaps between the cores.

43. Wrap a second layer of tinned copper mesh around the joint with a 50% overlap. Cover the complete joint area including the mechanical screen wire connectors.



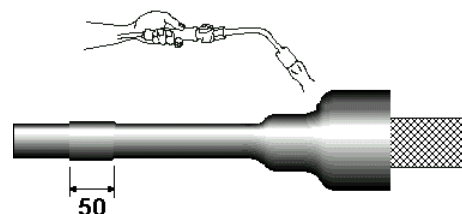
44. Clean and degrease the gloves using the cleaning tissues provided in the kit.

Apply one layer of black sealant mastic tape onto the body of the gloves 10 mm from the base of the glove fingers.

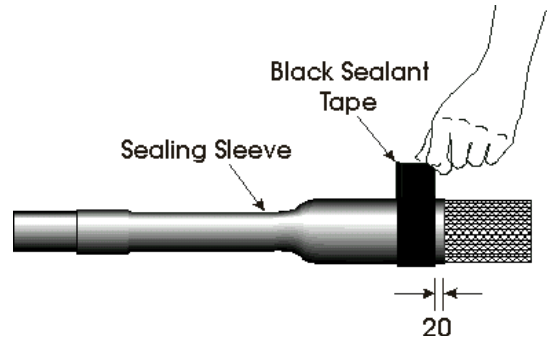


45. Position the short sealing sleeve over the long side of the joint so that it overlaps onto the outer layer of the composite sheath by approximately 50 mm.

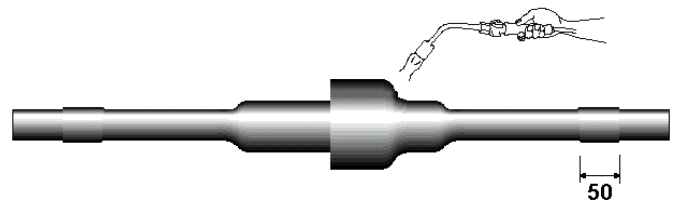
Shrink the sleeve down - starting at the composite sheath end and work towards the centre of the joint.



46. Starting 20 mm from the inner end of the outer sealing sleeve, wrap one layer of black sealant tape around the sleeve.

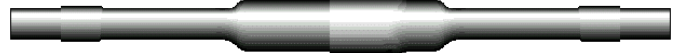


47. Position the long sealing sleeve so that it overlaps onto the outer layer of the composite sheath by approximately 50 mm. Shrink the sleeve down - starting at the composite sheath end and work towards the centre of the joint.



48. The joint is completed.

Allow the joint to cool before applying any mechanical strain.



**IMPORTANT NOTE:**

**YOU MUST ENSURE THAT A BURIED JOINT IS SURROUNDED WITH SOFT BEDDING MATERIAL UP TO A DEPTH OF 100MM ABOVE THE JOINT.**

**DISCARD THIS INSTRUCTION ONCE THE JOINT IS COMPLETE**