

**Installation Instruction  
ESD-5999-AU-5/12**

**Joints for Screened  
1-Core to 3-Core  
Polymeric Insulated  
Cables with Wire Shield.**

**33 kV**

**150 - 300mm<sup>2</sup>**

**This joint is designed for cables without  
a fibre optic element.**

**The joint is designed for single core  
cables with composite sheath and 3 core  
cables with composite sheath.**

ENDORSED BY	SIGNATURE	DATE
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## **Before Starting**

**Check to ensure that the kit you are going to use fits the cable.**

**Refer to the kit label and the title of the installation instruction.**

**Components or working steps may have been improved since you last installed this product.**

**Carefully read and follow the steps in the installation instruction. Read all the text describing the picture before you start to carry out that step.**

## **General Instructions**

**Use a propane (preferred) or butane gas torch.**

**Ensure the torch is always used in a well-ventilated environment.**

**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 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 tubing at the position recommended in the instruction.**

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

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

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. Raychem is a trade mark.

# MXSU-RCP19

Qty: 1

## Kit Contents

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6	x	S1085-1-600	Sealant Mastic 600x20mm Red <b>Cut 6 x 200mm long</b>
1	x	S1085-3-400	Sealant Mastic 400x50mm Red
3	x	MWTM-63/19-A/U-4(S15)	Inner Rejacketing Sleeve <b>Cut 3 x 400mm long</b>
3	x	WCSM-85/25-A/U-C(50)	Outer Rejacketing Sleeve <b>Cut 3 x 400mm long</b>
1	x	402W439/S(S5)	Breakout 3 Finger Coated Black
6	x	EPPA-004	Cleaning Tissue

**The above items to be packed into on bag, labelled - "Trifurcation Kit"**

12	x	S1085-1-600	Sealant Mastic 600x20mm Red <b>Cut 12 x 200mm long</b>
12	x	S1085-3-400	Sealant Mastic 400x50mm Red <b>Cut 12 x 200mm long</b>
6	x	MWTM-85/25-1200/S(S5)	Composite Sheath Seal <b>Cut 6 x 150mm long</b>
3	x	WCSM-110/30-1000/S(S5)	Thick Wall Tube 1000mm Coated
6	x	S1189-3-600(A2)-(C360)	Yellow Filling Tape
6	x	HEL-4892	Mechanical Connector
6	x	S1189-1-150(A2)-(C1000)	Yellow Filling Tape
3	x	EPPA-048-CLAY-PACK	Clay Pack, Grey
3	x	JSCR-60/24-430-35/U	Stress Control Tube Black
6	x	EPPA-009-5000	Copper Mesh
3	x	BSMB-120/300	Junction Bolted Sleeve
3	x	ERIH-65/26-430/U	Insulating Tube Red/Black
1	x	ESD-5999-AU-5/12	Installation Instruction

### Application range of the MXSU kits

The kit is based on polymeric insulated cables for stranded circular conductors and wire shielding. Application range for copper or aluminium conductors are mentioned in Table A below.

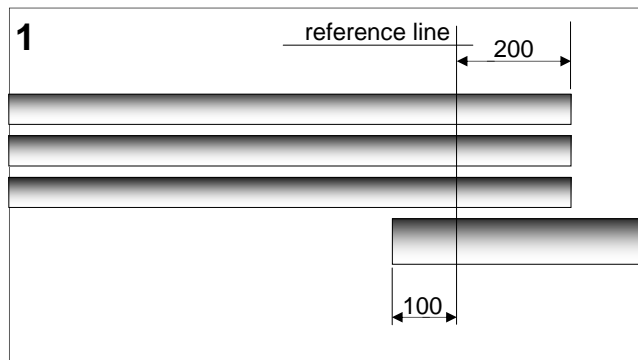
Table A

Kit number	Range stranded / round	Conductor Ø		Core Insulation Ø		Outer Cable Ø (3 Core)	
		min (mm)	max (mm)	min (mm)	max (mm)	min (mm)	max (mm)
MXSU-RCP19	150 - 300mm <sup>2</sup>	13.9	21.6	31.1	39.6	83	105

Superseded by EL 00125 v1.0

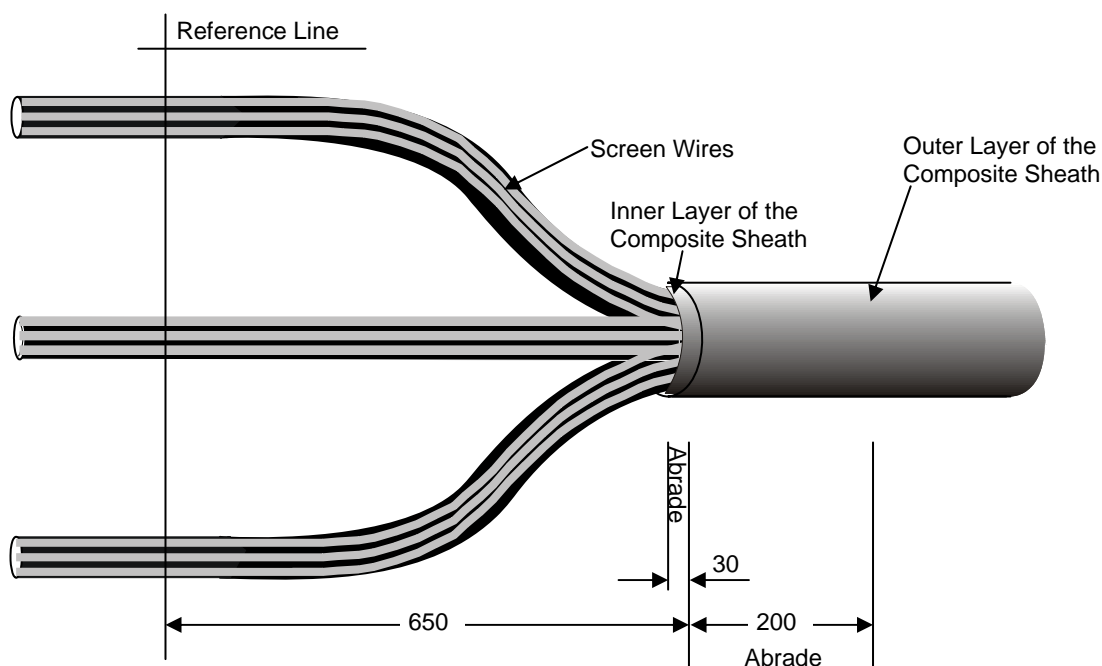
### Cable Overlap

1. Overlap the cables to be joined by 300 mm as shown.
2. Mark the reference line.
3. Clean the composite sheath of the three core cable for a distance of 2 m.
4. Clean the cable sheath of the single core cables for a distance of 1 m.



### Three Core Cable Preparation:

5. Remove the outer layer of the composite sheath on the three core cable to the dimension shown from the reference line.
6. Remove the inner layer of the composite sheath to the dimension shown.
7. Remove the fillers level with the inner layer of the composite sheath.



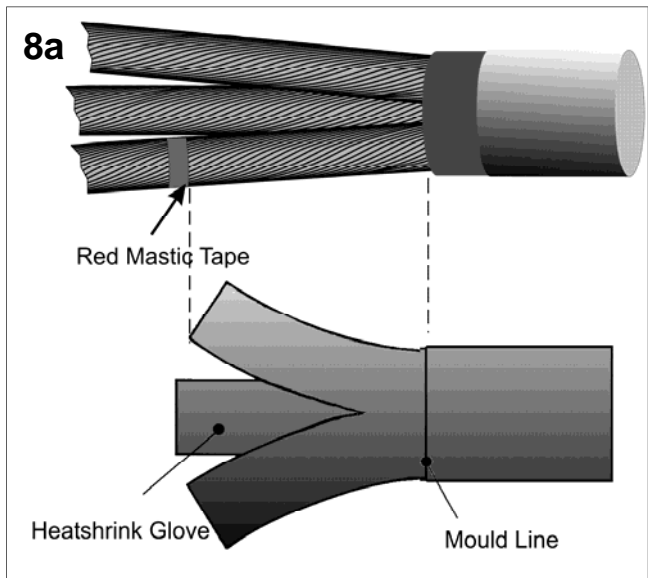
### Trifurcating the Three Core Cable

#### For Cables with Water Swellable Tapes under the Screen Wires Only:

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 20mm wide red mastic tape (S1085) over the screen wires of each core, level with the end of the glove fingers as shown.

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

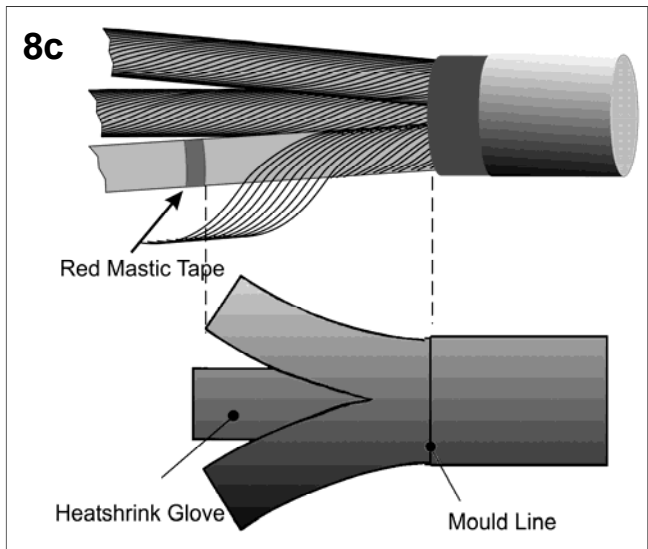
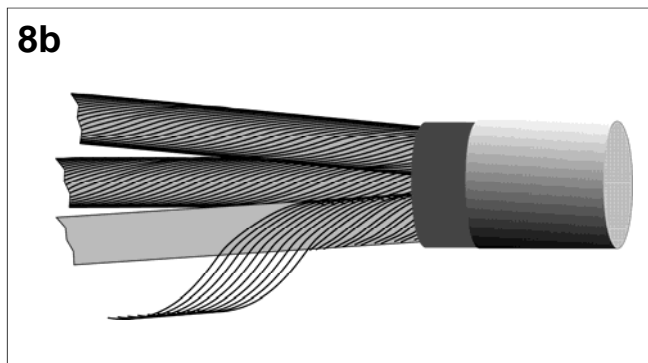


#### For Cables without Water Swellable Tapes under the Screen Wires Only:

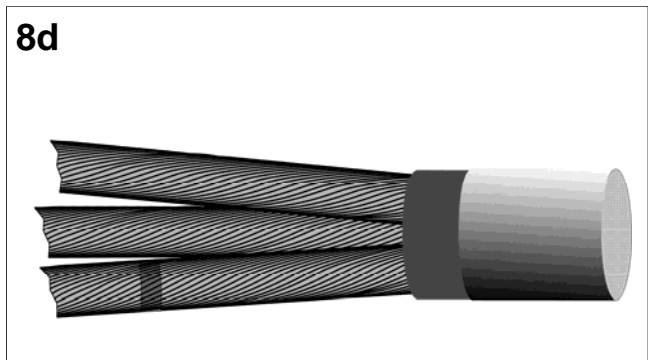
Starting with one core at a time, unwind the screen wires from the core. Do not bend them into position at this stage.

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 20mm wide red mastic tape (S1085) over the insulation screen, level with the end of the glove fingers.



Wind the screen wires back over the insulation screen. Avoid crossing the individual screen wires.



Apply one layer of 20mm wide red mastic tape (S1085) over the screen wires at the same location the mastic was applied in Step 8d (i.e. over the mastic applied in Step 8c).

Repeat steps 8b - 8e for the other cores.

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

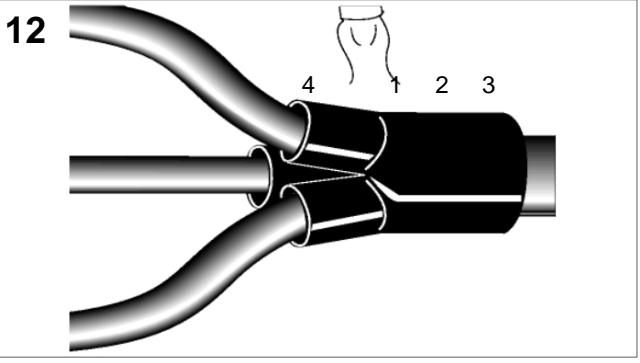
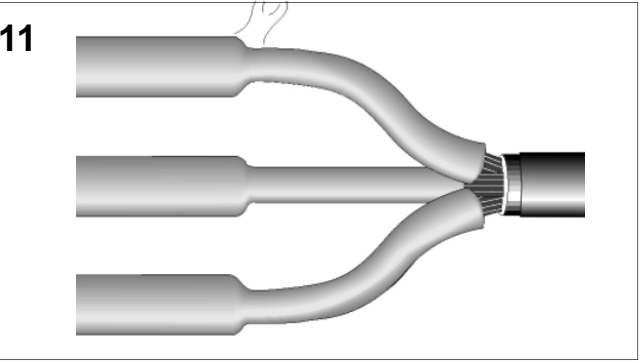
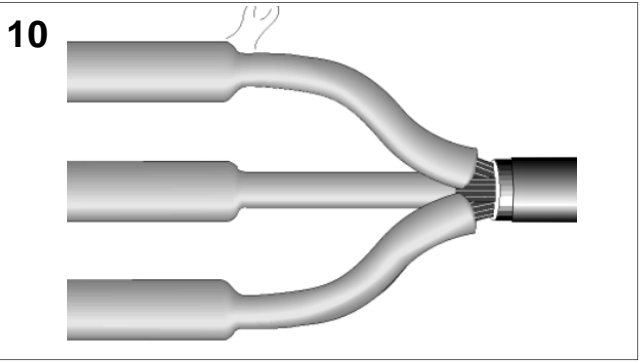
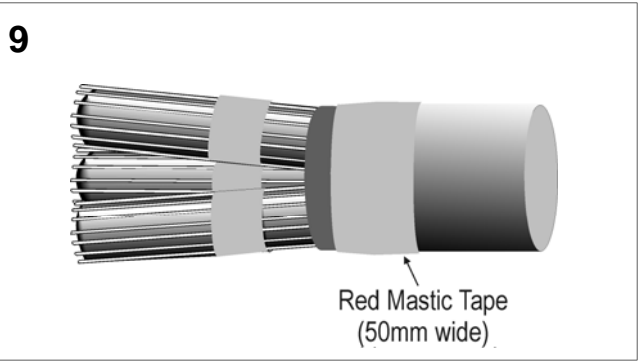
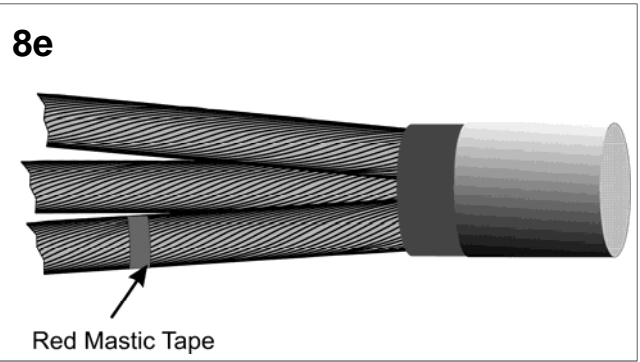
Apply one layer of the 50mm wide red mastic tape (S1085) to equally overlap the inner and outer layers of the composite sheath.

Position the first re-jacketing sleeve (MWTM) over each core. Push down into crutch of the cable. Starting at the overshath cut shrink the re-jacketing tube over the three cores. Ensure that the heat is applied evenly around all of the three cores. This is necessary to ensure the tubing recovers, maintaining an even wall thickness.

Position the second re-jacketing sleeve (WCSM) over each core. Push down into crutch of the cable. Starting at the overshath cut shrink the re-jacketing tube over the three cores. Ensure that the heat is applied evenly around all of the three cores. This is necessary to ensure the tubing recovers, maintaining an even wall thickness.

Slide the glove as far down the crutch as possible. Shrink the glove into place starting at the centre. Work first towards the lower end and then shrink the fingers onto the cores.

The numbers in the drawing indicate the sequence.



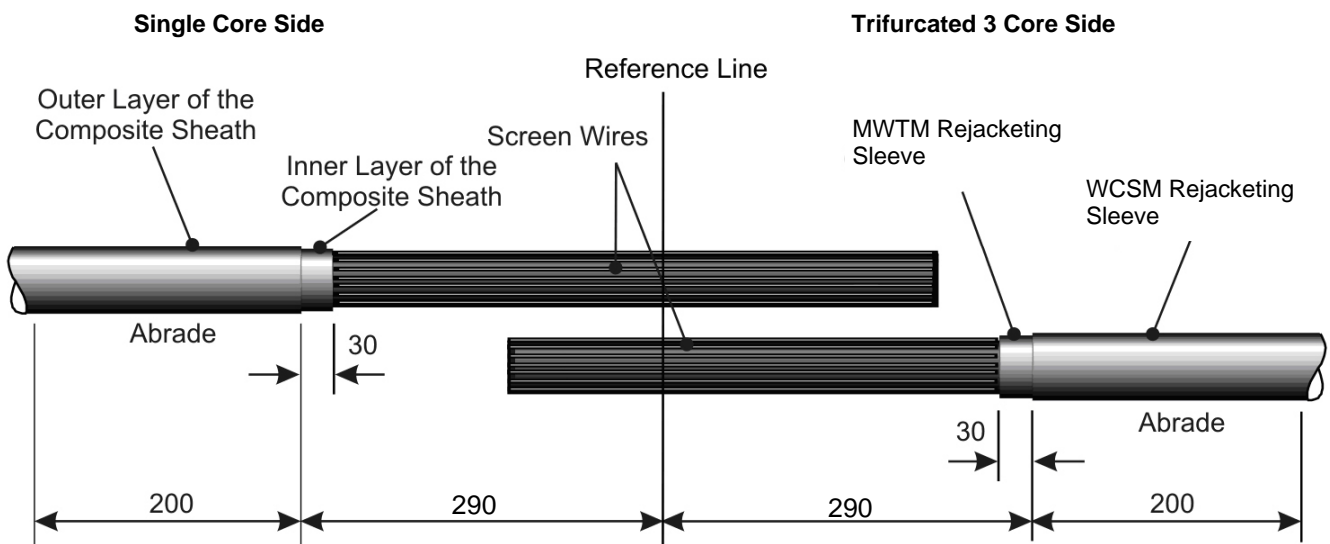
Superseded by EL 00125 v1.0

13) The 3 core cable has now been trifurcated to prepare for a conventional single core joint as follows.

The two re-jacketing tubings, applied earlier will be used as the conventional inner and outer sheaths.

#### Cable Preparation

- (i) Remove the outer layer of the composite sheath on the single core side and WCSM re-jacketing sleeve on the trifurcated 3 core side, for 290mm, from the reference line. Remove the inner layer of the composite sheath on the single core side and MWTM re-jacketing sleeve on the trifurcated 3 core side to the dimension shown.
- (ii) Remove the water swellable tapes (if any) level with the inner layer of composite sheath cut.
- (iii) Abrade the outer layer of the composite sheath and WCSM re-jacketing sleeve for a distance of 200 mm from the outer sheath cut. Abrade the inner layer of the composite sheath and MWTM re-jacketing sleeve.
- (iv) Clean and degrease all sheaths and re-jacketing sleeves using the cleaning tissue provided in the kit.
- (v) On the side of the joint where the outer sealing sleeve is intended to be parked, clean the outer layer of the composite sheath for a distance of 1 metre using the cleaning tissue provided in the kit.





### Core Preparation

Fold the screen wires back onto the cable sheath. Do not bend them into position at this stage.

**Do not cut the cables.**

Apply one layer of red mastic tape (20mm wide) over the insulation screen, 10 mm from the cable sheath cut.

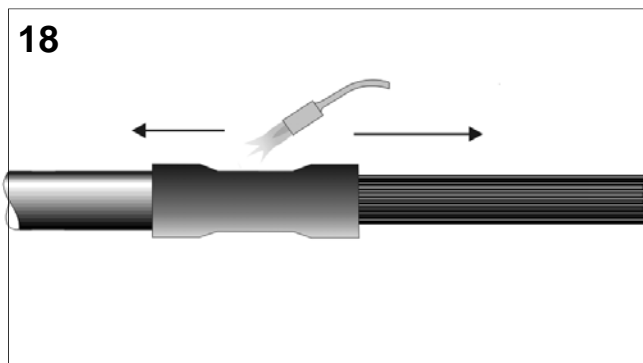
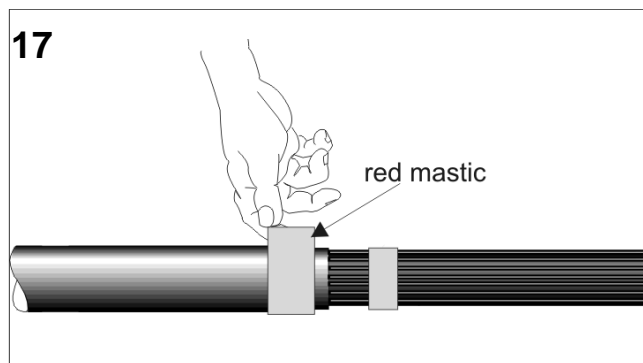
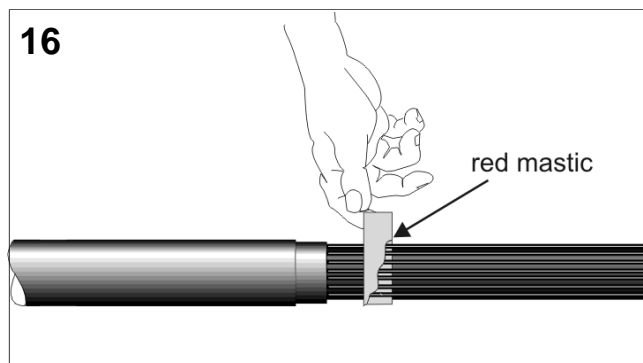
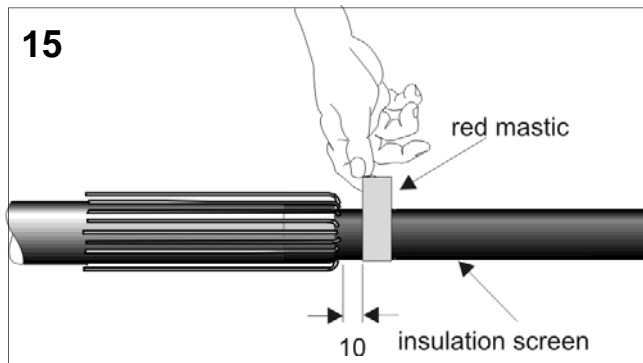
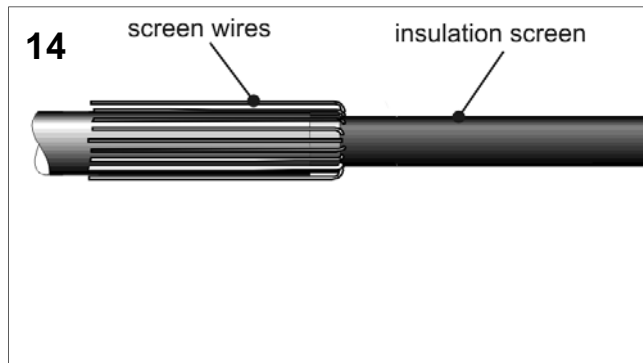
Fold the screen wires back over the insulation screen.

Apply one layer of red mastic tape (20mm wide) over the screen wires, 10 mm from the cable sheath cut (i.e. over the mastic applied in step 15).

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

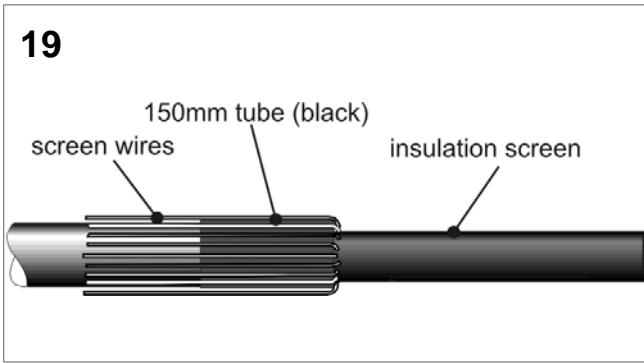
Slide the 150 mm long tube (black) over the cable, centered over the outer sheath cutback.

Shrink tube into position, applying additional heat over the area where the red mastic tape was applied.



Bend the screen wires back over the tube and onto the cable sheath.

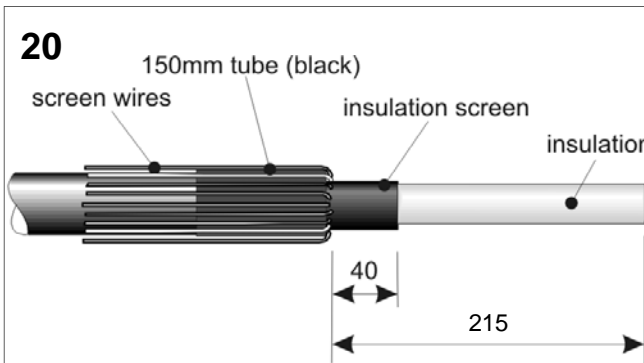
Secure the screen wires to the cable using PVC tape.



Cut the cables at 215mm as shown using a hacksaw or a suitable power driven saw to prevent deformation of the conductor strands.

Thoroughly remove the insulation screen to the dimension shown, so that the insulation surface is free from all traces of conductive material.

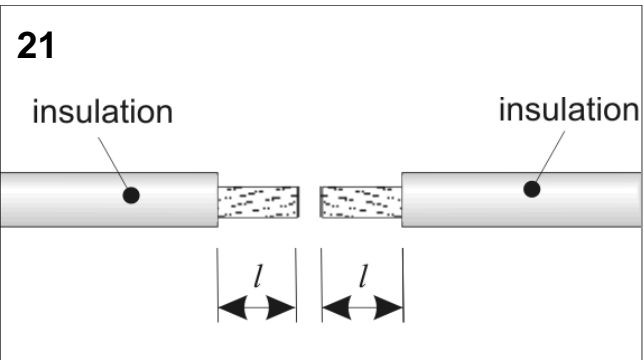
**Note:** Do not nick the insulation.



Remove the insulation from the cables to for a length of 65mm (l)

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.

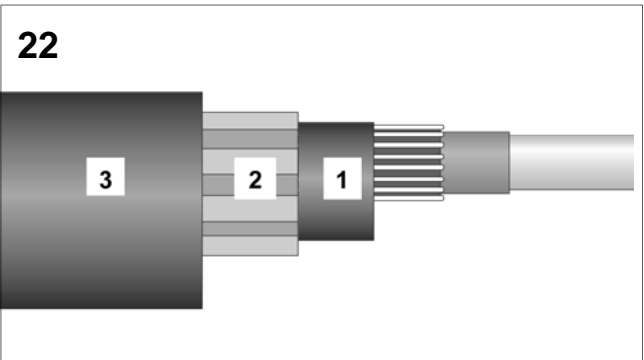
**Note:** Do not use a cleaning tissue that has previously been in contact with the insulation screen.



### Completion of Joint

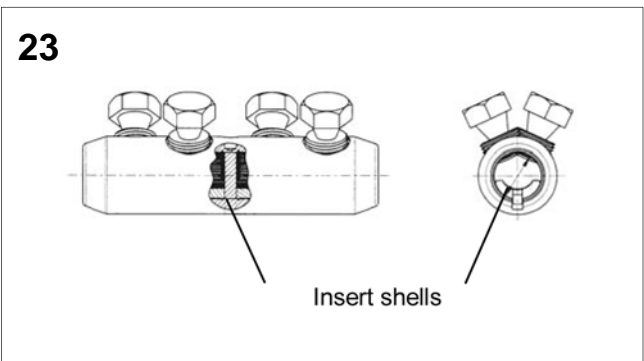
Slide a combined tubing set and the outer sleeve over one cable end. The plastic bag of the tubing set shall be used as additional protection by placing it under the tubing set.

1. Stress control tubing (black)
2. Screened insulation sleeve (black and red)
3. Outer sleeve (black)



### Installation of the mechanical connector

The connector is supplied with insert half shells which have to be used on small cross sections. Check before installation if the conductor can be inserted into the connector with the half shells installed. In case the conductor can not be inserted, remove the inserts from the connector bore.



Clean and abrade the surface of the exposed conductors. Insert the conductors so that the insulation butts up with the end of the connector. Hand tighten the shear bolt each side. Tighten the bolts alternately and shear them off starting with the outer bolts. (see also sequence shown in drawing).

Notes:

- When a cordless impact wrench is in use the tightening intervals should be in the range of 2 seconds.
- Avoid core bending on smaller cross-sections by using a support tool such as IT-1000-019 or similar

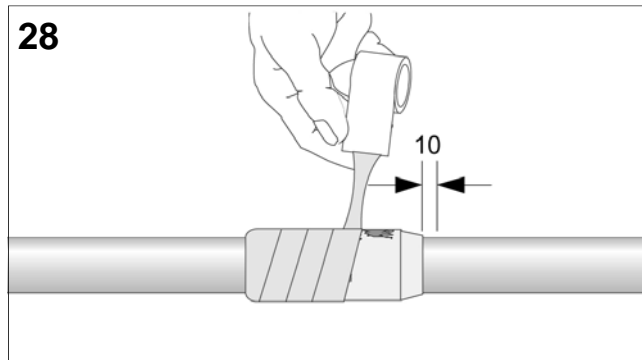
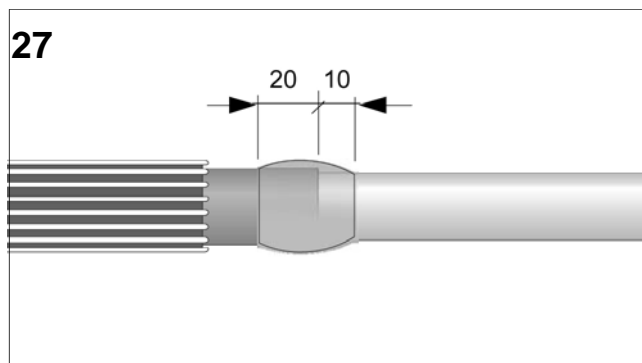
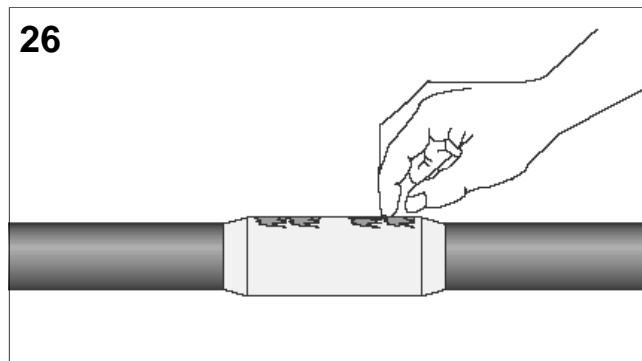
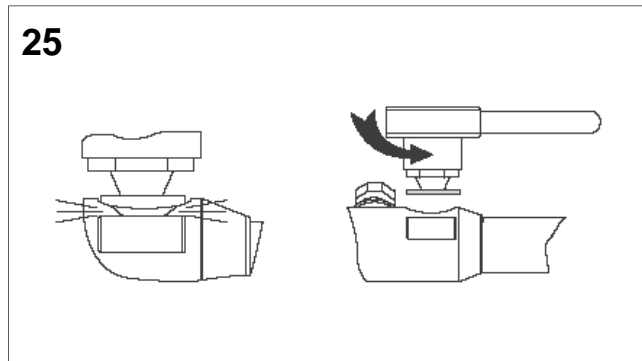
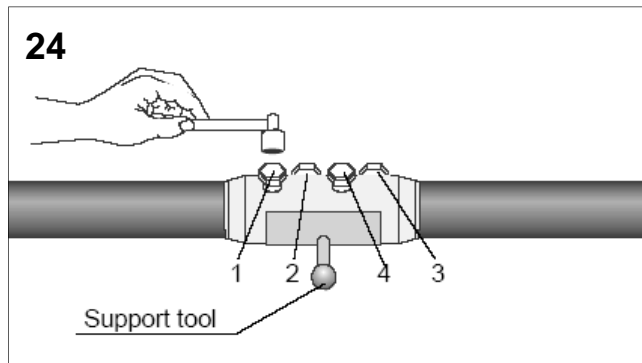
Smooth out any sharp edges of protruding bolts where appropriate. Clean and degrease the connector area and insulation with a cleaning wipe.

It could be possible that the bolt shears but the top is retained in the connector body. In that case unscrew the head of the bolt until it is removed from the connector.

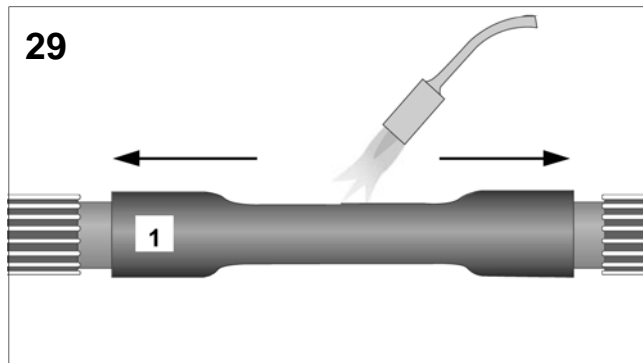
Clean and degrease the cable cores and the connector. Fill Raychem clay over the sheared off bolts to obtain a smooth finish.

Take the yellow void filling strip from the alu foil pocket. Remove the release papers from the strip with the pointed ends. Wrap the void filler around the core screen starting 20 mm from the end of the screen and continue onto the insulation for 10 mm. Stretch the strip to half of its original width to achieve a fine thin edge.

Take the yellow void filling strip from the alu foil pocket. Remove the printed release paper from the void filling tape (yellow). Apply the tape with a 50 % overlap stretching it to about half of its original width. Fill up the connector area continuing onto the insulation for not more than 10 mm. Use the filler to achieve a smooth transition from the connector onto the insulation.  
**Note:** Do not use too much void filler, max. 2 mm over the connector

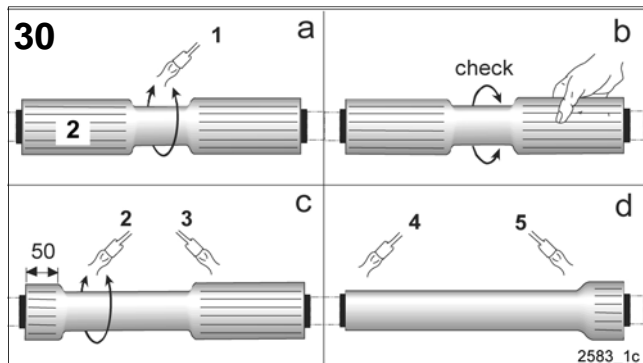


Pull the stress control tubing (black) from the inside of the tubing set and position it centrally over the connector. Start shrinking in the centre working towards the ends. The tubing should be fully shrunk and wrinkle free.

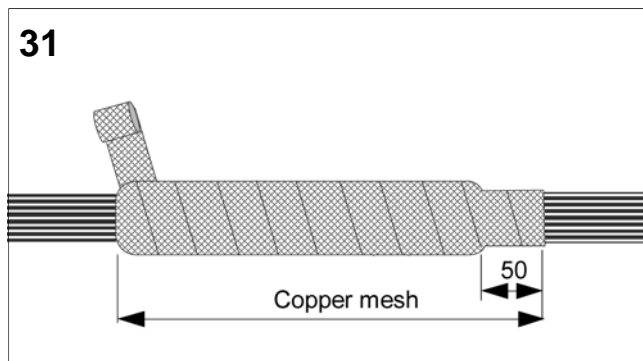


Position the screened insulating sleeve (black and red) centrally over the connector area.

- a. Start shrinking the sleeve in the centre (1).
- b. Check if fully shrunk by twisting the end.**
- c. Continue shrinking by working towards one side (2), stopping 50 mm from the end. Shrink the other half in the same way (3).
- d. Shrink down the first end (4) and finally the second (5). **The sleeve should be fully shrunk without leaving ridges.**

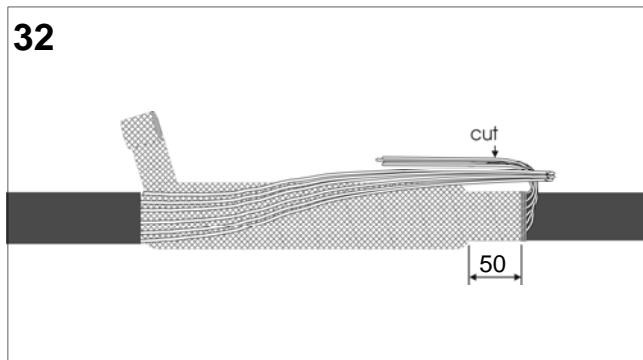


Starting with a 50 mm overlap onto the oversheath of the cable side with the short shield wires, wrap one layer of copper mesh round the joint with a 50 % overlap.



**Cable side with short screen wires:**

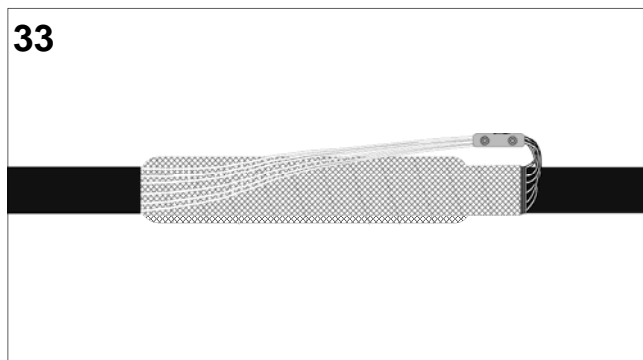
Bend the screen wires back over the joint area close to the tinned copper mesh. Gather the screen wires together and cut them as indicated, above the 50 mm tinned copper mesh overlap on the cable sheath.



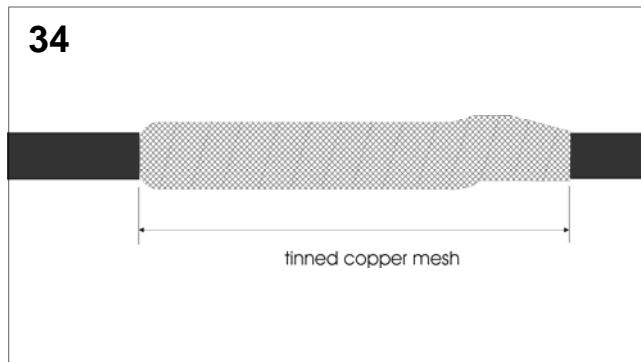
Insert the screen wires into the shear head connector supplied.

Tighten the shear heads until the heads shear off.

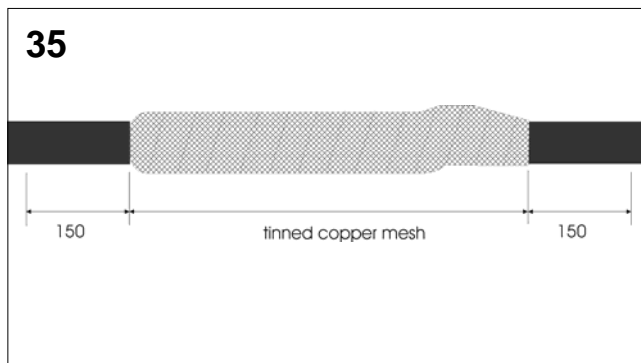
Rotate the screen wire connector so that the screws of the screen wire connector do not puncture the outer sealing sleeve or the screened insulating sleeve.



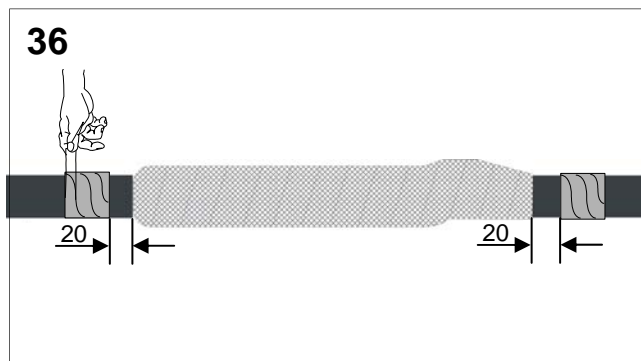
Wrap a second layer of tinned copper mesh around the joint with a 50% overlap. Cover the complete joint area including the mechanical screen wire connector.



Abrade, clean and degrease the cable sheath for a distance of 150mm either side of the tinned copper mesh.

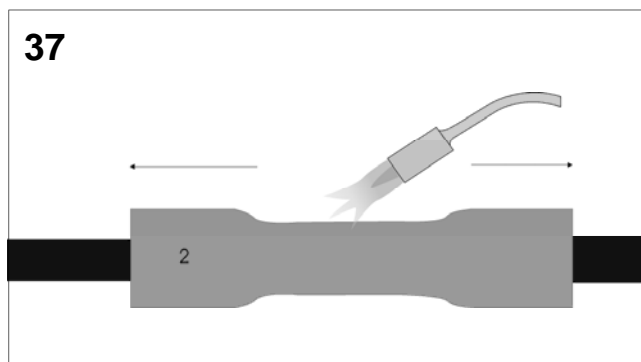


Wrap one layer of red sealant tape (50mm wide) around the composite sheath sealing sleeve starting at 20mm from the ends of the mesh on both sides of the joint.



Centre the outer sealing sleeve (black) over the copper mesh area.

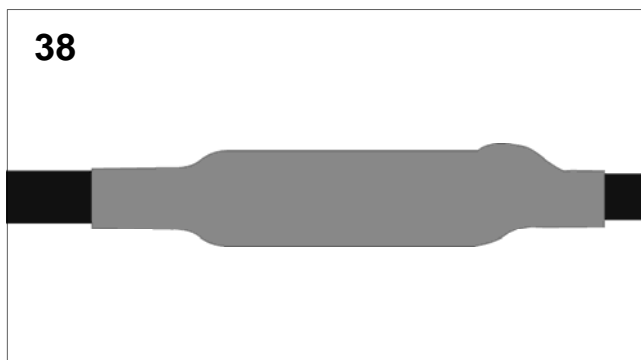
Start shrinking in the centre, working towards the ends.



Repeat steps 13 - 37 for the remaining two cores

**Joint completed.**

Allow the joint to cool before applying any mechanical strain.



Please dispose of all waste according to environmental regulations.



**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**

**Superseded by EL 00125 v1.0**