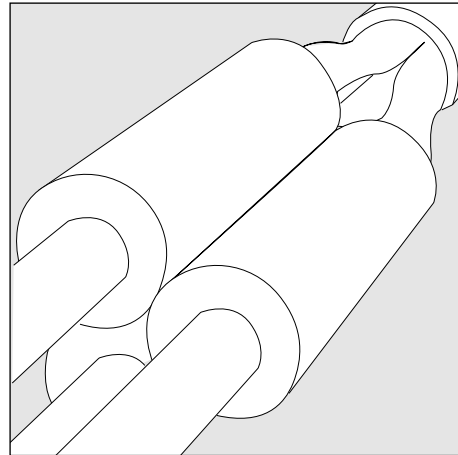


0 cm



TE's Raychem Cable Accessories



Installation Instructions EPP-1516-9/19

**Joint for Transitions from
Screened Single Core Plastic
Insulated Cables to Three
Core Belted or Screened
Paper Insulated Cable 12 kV
up to 24 kV**

**Type:
MXSU-12 /1XU-3SB
MXSU-24 /1XU-3SB**

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To view the TE Connectivity website:



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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 instructions.

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

Carefully read and follow the steps in the installation instructions.

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.

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, TE Connectivity 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.

TE Connectivity's only obligations are those in TE Connectivity's standard Conditions of Sale for this product and in no case will TE Connectivity be liable for any other incidental, indirect or consequential damages arising from the use or misuse of the products.

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Cable Overlap

Plastic cable with wire shield

Overlap the cables to be joined by the length $a + 100$ mm as shown in drawing A. The length a is given in Table 1.

Mark the reference line.

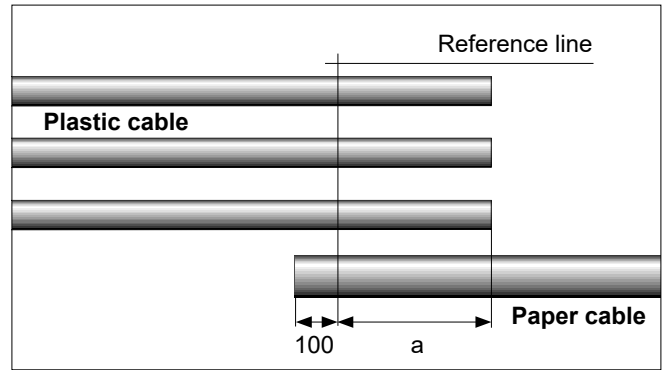


Table 1

Kit Size	Overlap a [mm]	Cross Section 12 kV Paper Cable [mm ²]	Cross Section 24 kV Paper Cable [mm ²]	b [mm]	c [mm]
MXSU-12A	650	25 - 70		600	110
MXSU-12B	650	70 - 120		600	120
MXSU-12C	650	95 - 185		600	140
MXSU-12D	700	150 - 240		650	150
MXSU-12E	750	240 - 300		700	170
MXSU-24A	650		25 - 70 (95 RS)	600	130
MXSU-24B	700		70 - 120 (150 RS)	650	140
MXSU-24C	700		95 - 185 (240 RS)	650	160
MXSU-24D	700		150 - 240	650	170
MXSU-24E	750		240 - 300	700	180

Paper Cable Preparation

Remove the overshooth according to the dimension b in Table 1.

Remove the armour and bedding according to the dimensions given in drawing A.

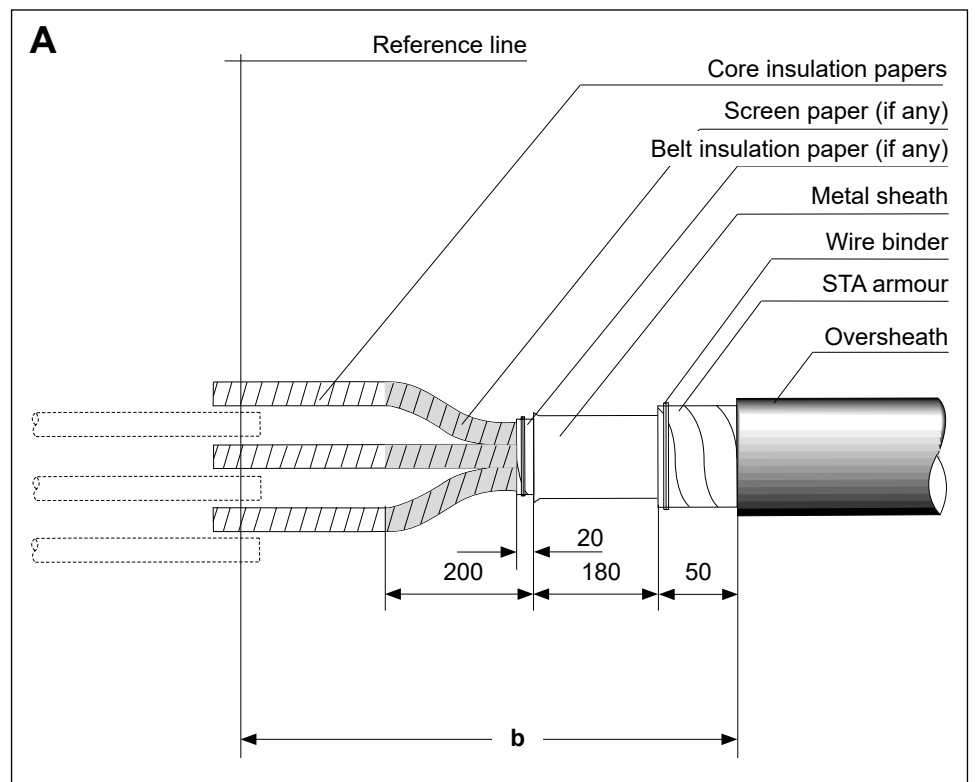
Clean, abraid and degrease the metal sheath and the armour.

Remove the metal sheath according to the dimensions in the drawing, in such a way that a slight bell is formed.

Tear off the carbon papers at the end of the metal sheath. Tie the twine binder round the fabric tape or belt paper 20 mm from the end of the metal sheath.

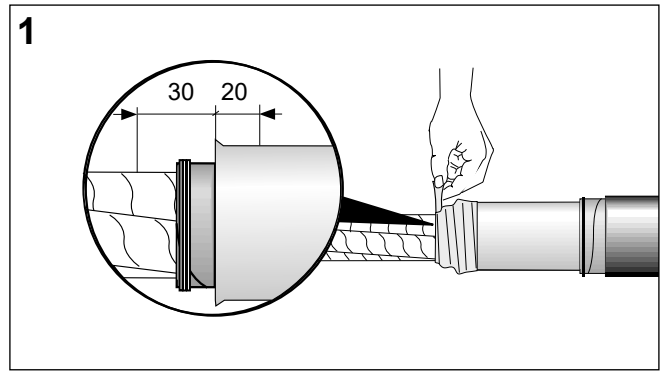
Cut off the fabric tape or carbon paper level with the twine binder.

Remove the fillers level with the twine binder. Take care not to damage the core insulation.



Protect the belt papers or fabric tape with nylon tape.

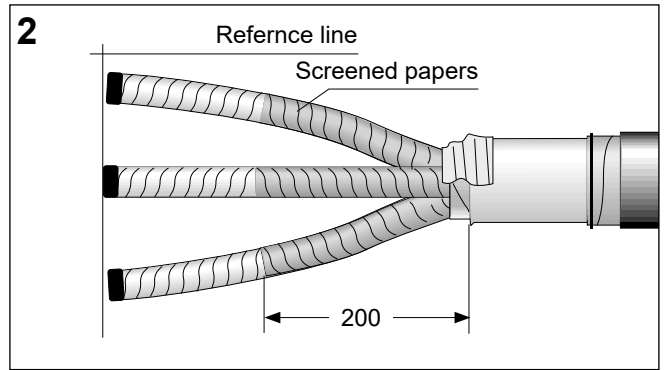
Start taping 20 mm onto the metal sheath and continue for 30 mm onto the cores applying the tape with tension.



Screened Cable only

Tie a temporary twine binder around the screen papers 200 mm from the end of the metal sheath. Remove and tear off the screen papers up against the twine binder. Remove two top layers of the paper insulation up to the screen cut.

Remove the twine binder from the screen papers.

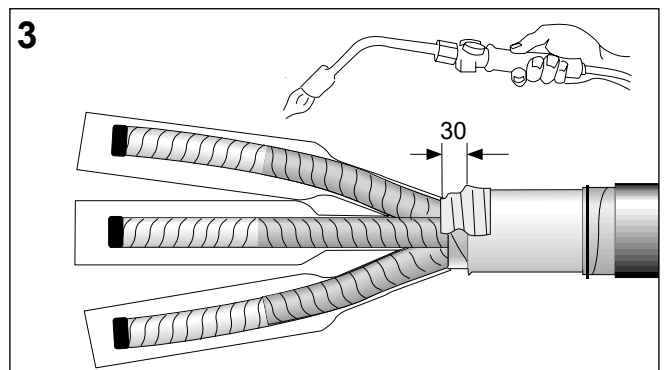


Belted and Screened Cables

Separate the cores carefully so as not to damage the belt or core insulation papers.

Slide the oil barrier tubings (transparent) over the cores and position it 30 mm from the end of the metal sheath.

Shrink down the oil barrier tubing starting at the crutch and working towards the cable end. Ensure that the tubing is shrunk down evenly and is free from air and grease pockets.



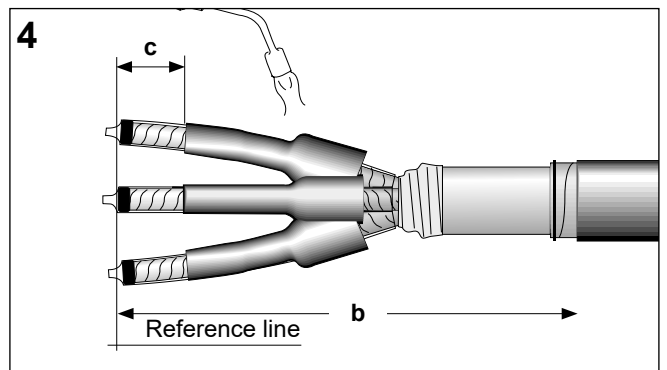
Bend out the cores carefully.

Cut the cores with a saw at the reference line, considering the dimension b given in Table 1.

Slide the conductive tubings (Pack (A)) over the cores and position it according to dimension c given in Table 1.

Shrink down the conductive tubing starting at the cable side and working towards the cable crutch.

Remove the packaging of the small wedge (1) first (see detailed drawing) and insert it well into the crutch area by using the installation tool provided.



NOTE

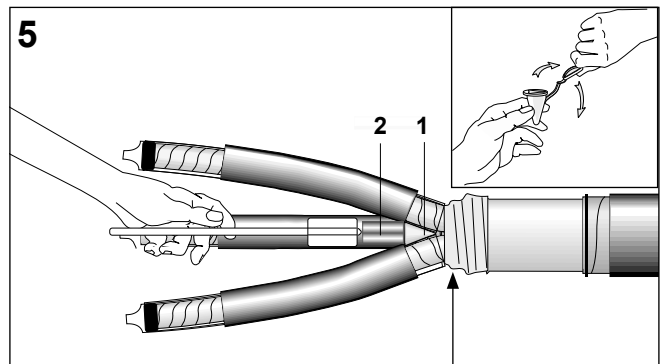
For **small size applications**, use **two small wedges** (included in the kit). For **large size applications**, use **one small wedge and one large wedge**.

Take the second wedge (2) out of the cartridge and insert it behind the previously installed small wedge.

Clean and degrease the cores.

NOTE

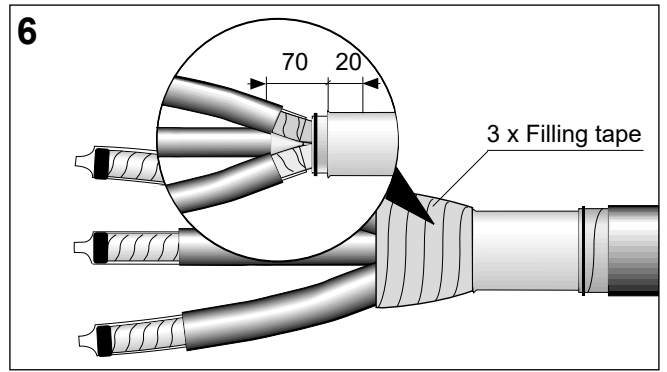
Remove the nylon tape after inserting the wedges. Clean and degrease the conductive tubing and the metal sheath.



Remove one paper from the long void filling tape (yellow) and roll up the tape.

Applying the void filling tape with a 50% overlap and stretching it to about half of its original width, tape up the outside of the crutch as shown.

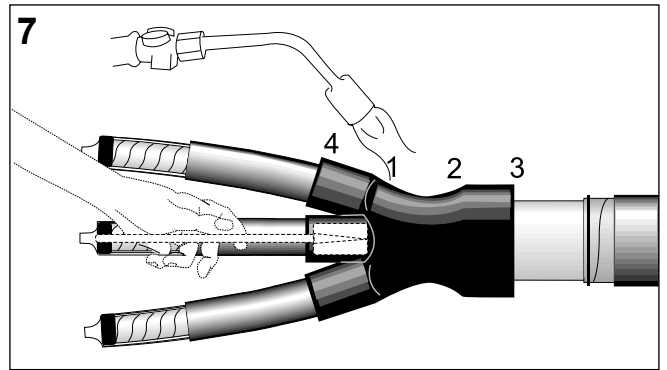
Cover 20 mm of the metal sheath and continue for 70 mm onto the belt insulation and the conductive tubes until a cone shape is formed.



Pass the conductive breakout (Pack **(B)**) over the cores and pull it well down into the crutch.

Shrink the conductive breakout into place starting at the centre. Work first towards the metal sheath, then shrink the turrets onto the cores.

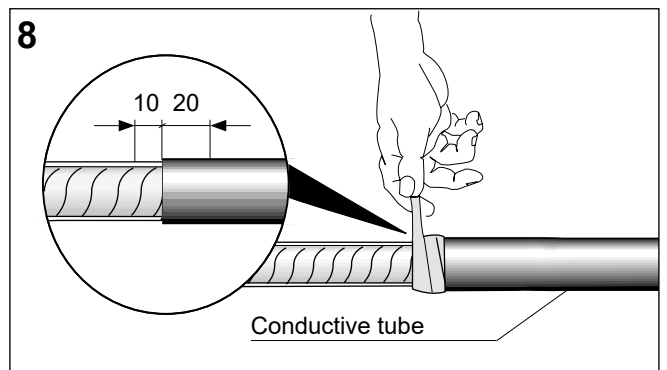
The numbers in the drawing indicate the shrink-sequence.



Remove the release papers from the short void filling strip with the pointed ends.

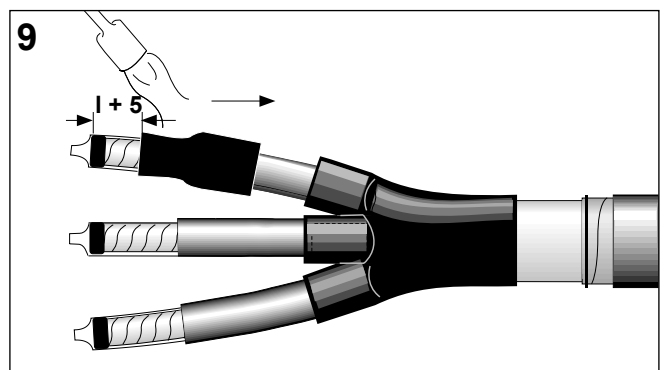
Wrap the void filler (yellow) for a length of 20 mm around the end of each conductive tubing (black) and continue for 10 mm onto the oil barrier tubings (transparent).

Stretch the void filling strip to half its original width to achieve a fine thin edge onto the oil barrier tubing.



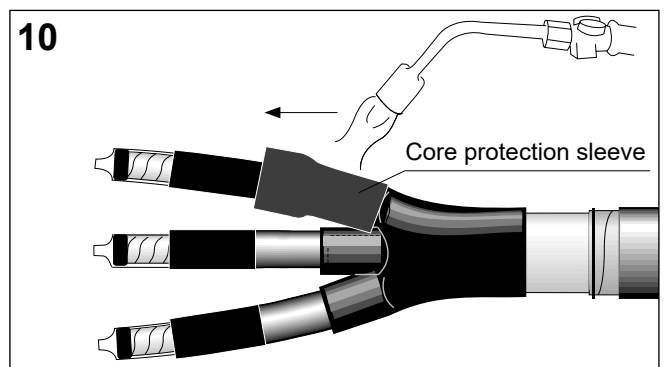
Slide one short stress control tubing (Pack **(C)**-paper cable) over each of the paper cable cores and position it according to dimension **I** (see table 2) + 5 mm, measured from the reference line at the end of the cores.

Shrink down starting from the insulation cut back, working towards the end of the conductive tubes as shown in the drawing.



Position the core protection sleeves (Pack **(D)**) as shown in the drawing over the breakout turrets and the conductive tubes.

Start shrinking at the breakout working towards the conductive tubing.

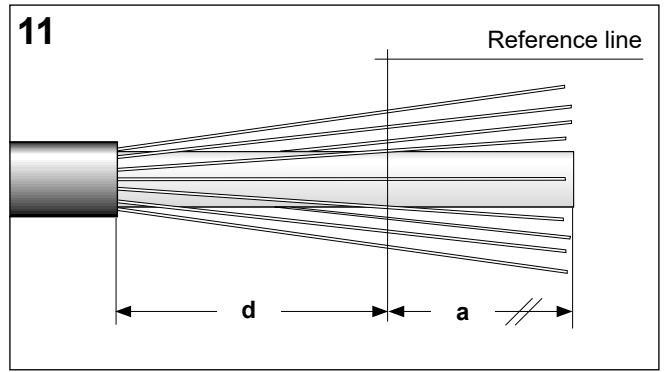


Plastic Cable Preparation

Clean and degrease the overshooth for a length of 1 m.

Remove the overshooth according to dimension **d + a** as given in Table 2.

Bend back the shield wires and secure the ends to the overshooth with PVC tape.



Cut the cores with a saw at the reference line, considering the dimension d given in Table 2.

Thoroughly remove the core screen to within 40 mm from the overshooth cut so that the insulation surface is free from all traces of conductive material.

Clean and degrease the insulation.

NOTE

Do not nick the insulation!

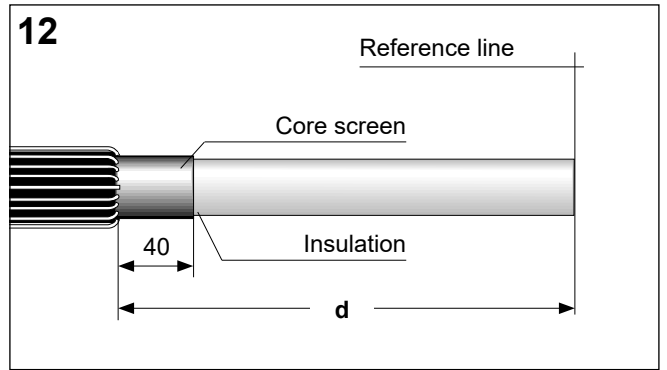


Table 2

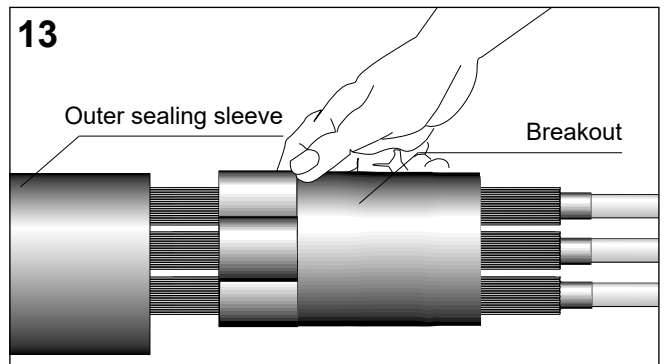
Kit Size	Application range		Cut back dimensions d [mm]	Overlap a [mm]	l [mm]
	Poly Cable [mm ²]	Paper Cable [mm ²]			
MXSU-12A	25 - 95	25 - 70	140	650	30
MXSU-12B	70 - 150	70 - 120	140	650	35
MXSU-12C	95 - 240	95 - 185	170	650	60
MXSU-12D	150 - 300	150 - 240	170	700	65
MXSU-12E	240 - 400	240 - 300	190	750	80
MXSU-24A	25 - 95	25 - 70 (95 RS)	160	650	30
MXSU-24B	50 - 150	70 - 120 (150 RS)	160	700	35
MXSU-24C	95 - 240	95 - 185 (240 RS)	190	700	60
MXSU-24D	150 - 300	150 - 240	190	700	65
MXSU-24E	240 - 400	240 - 300	210	750	80

Slide the outer sealing sleeve over the three single-core plastic cables.

Slide the remaining breakout as shown in the drawing over the 3 single-core plastic cables.

NOTE

Take care that the turrets (small fingers of the breakout) points towards the plastic cable overshooth.



Slide one screened insulation sleeve (black and red) over each plastic cable core:

NOTE

The plastic bag of the tubing set has to be used as a protection by placing it onto the cable oversheath underneath the tubing set.

Completion of the Joint

Polymeric Cable

Remove the core insulation on the polymeric cable side according to dimension I as given in table 2.

Remove the release papers from the short void filling strip with the pointed ends.

Wrap the void filler (yellow) around the core screen starting 20 mm from the end of the screen and continuing onto the insulation for 10 mm.

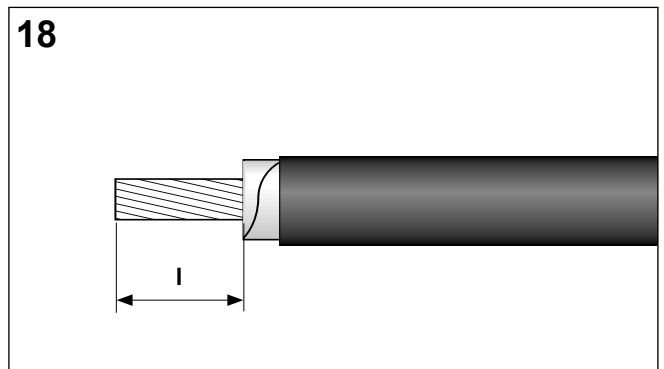
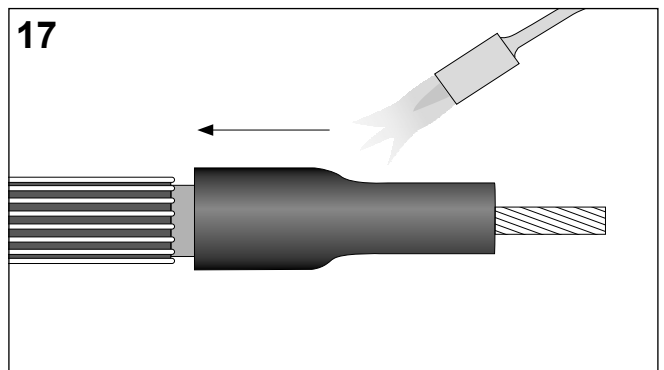
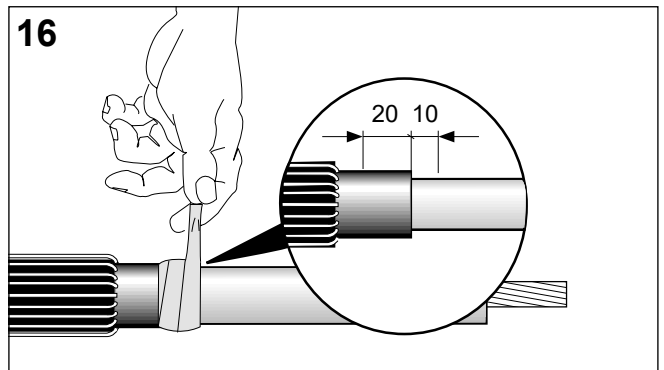
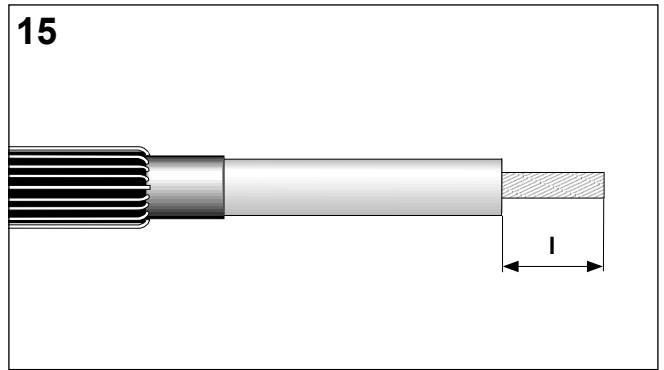
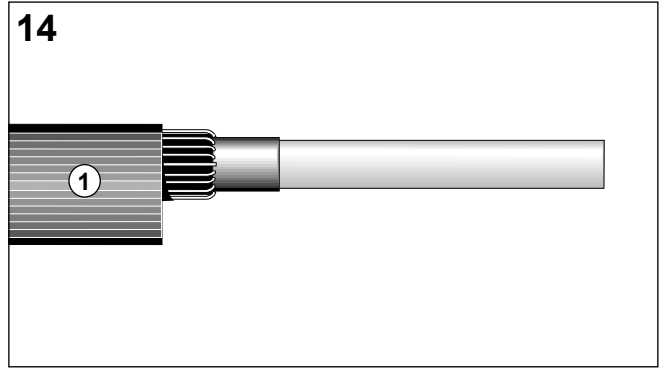
Stretch the strip to half of its original width to achieve a fine thin edge.

Slide one short stress control tubing (Pack (E)-polymeric cable) over each of the plastic cable cores and position it level with the end of the insulation cut back.

Shrink down starting from the insulation cut back towards the oversheath as shown in the drawing.

Paper Cable

Remove the core insulation on the paper cable side according to dimension I as given in table 2.



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 conductors so that the insulation butts up with the end of the connector. Hand tighten the shear bolts so that the connector stays in place.

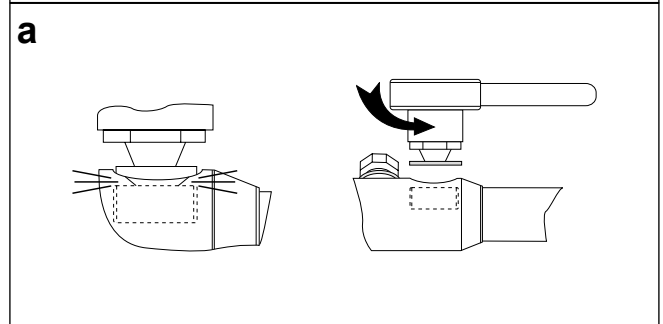
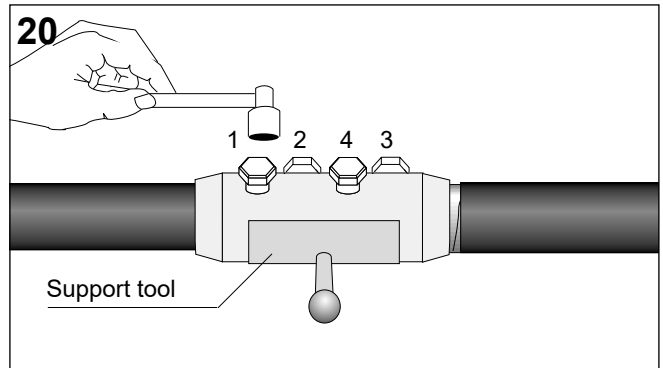
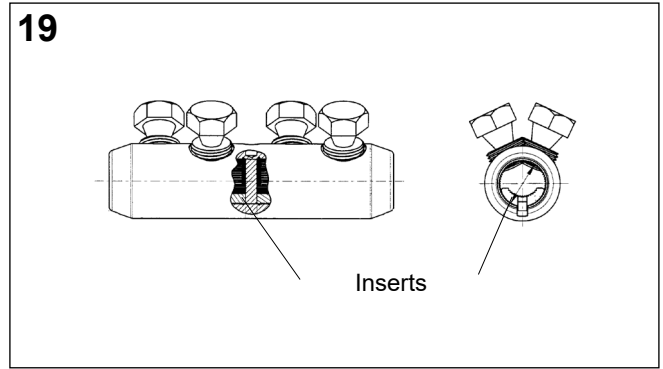
For connectors using more than one shear bolt per side, tighten the bolts alternately and shear them off starting with the outer bolts (see also sequence shown in the drawing).

NOTE

- 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 available such as IT-1000-019 or similar.

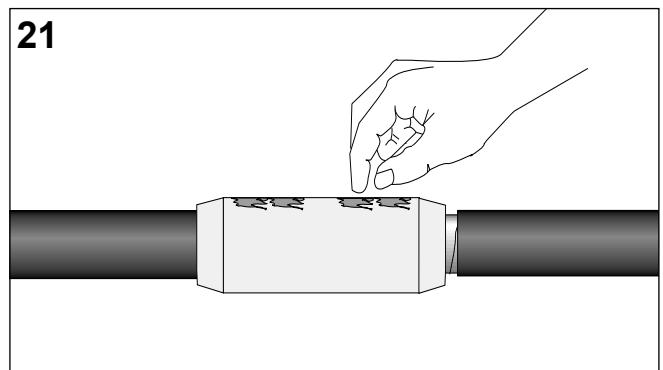
Smooth out any sharp edges of protruding bolts where appropriate. Clean and degrease the connector area and the insulation with a cleaning wipe.

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 EPPA-048 over the sheared off bolts to obtain a smooth finish.



Open the large aluminium foil bag. Take out the long yellow void filling strips. Remove one release paper from the void filling tape (yellow) and roll it up.

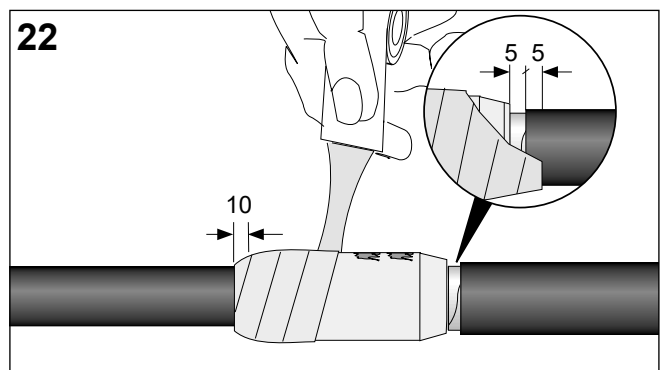
Wrap it around the connector with a 50 % overlap. Stretching it to about half of its original width.

Fill up the connector area continuing onto the insulation for not more than 10 mm.

NOTE

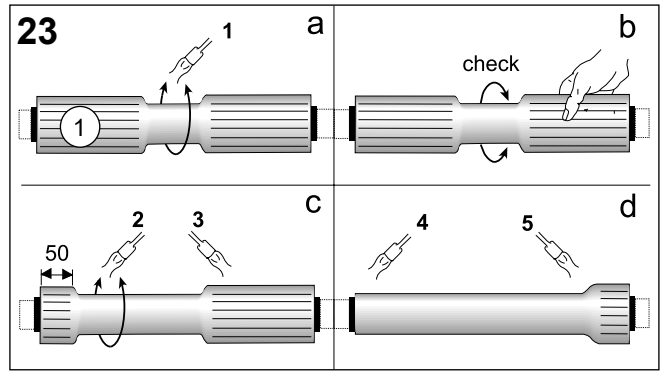
Do not use too much void filling tape.

The final diameter should be only slightly greater than the core or connector diameter, whichever is larger.



Position **all three** screened insulating sleeves (black and red) centrally over the previously installed connectors.

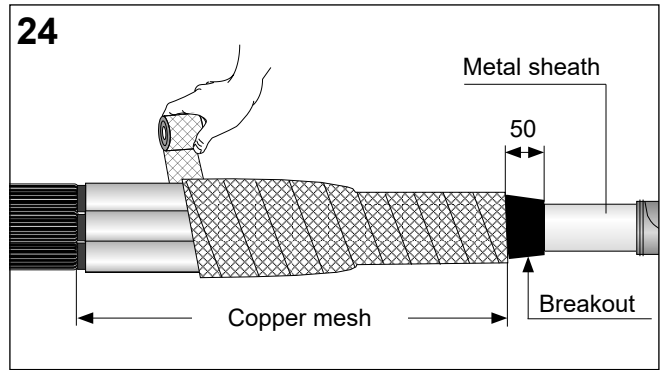
- Start shrinking the sleeves in the centre (1).
- Check if fully shrunk by twisting the end. The **sleeve should not** move from its position.
- Continue shrinking by working towards one side (2), stopping 50 mm from the end. Shrink the other half in the same way (3).
- Shrink down the first end (4) and finally the second (5). The sleeves should be fully shrunk without leaving ridges.



Relay the cores as far as possible.

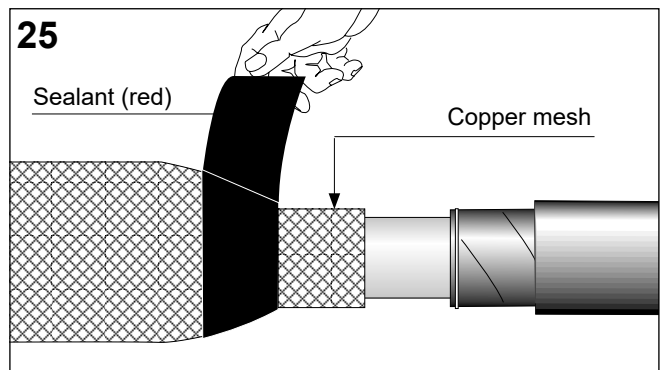
Wrap one layer of copper mesh (wide size) round the cores with an 20% overlap.

Start the installation 50 mm from the end of the breakout on the paper cable side and continue across the joint towards the plastic cable.



Wrap one layer of the red sealant tape around the breakout body in the area between the end of the copper mesh and the end of the breakout.

Wrap 1 roll of the slim copper mesh level with the end of the breakout around the metal sheath.

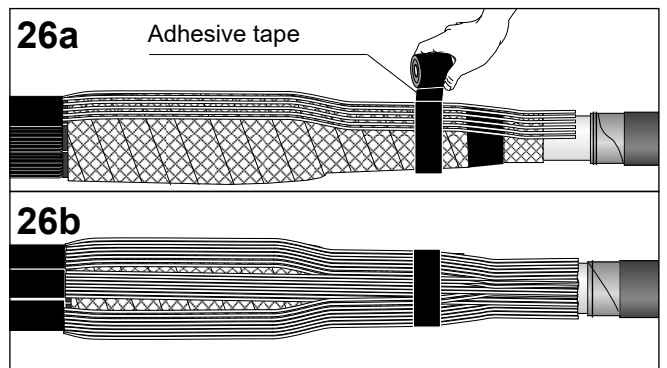


Bend the shielding wires back towards the paper cable onto the wrapped copper mesh. Spread the wires around all cores and distribute them equally around the breakout body by pressing them into the layer of sealant tape.

NOTE

Fix the wires temporarily in place using an adhesive tape.

Avoid crossing the shield wires in the sealing area.



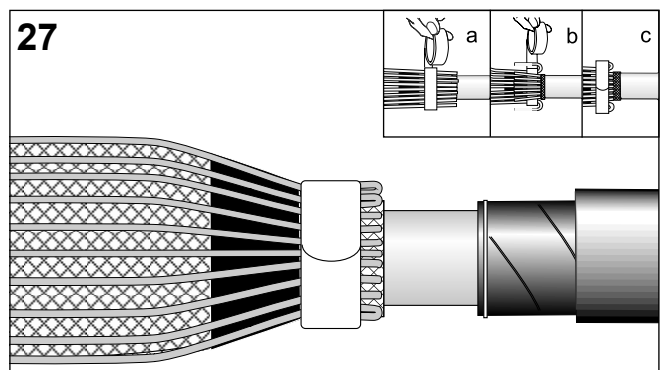
Embed the shield wires onto the copper mesh right at the end of the breakout body.

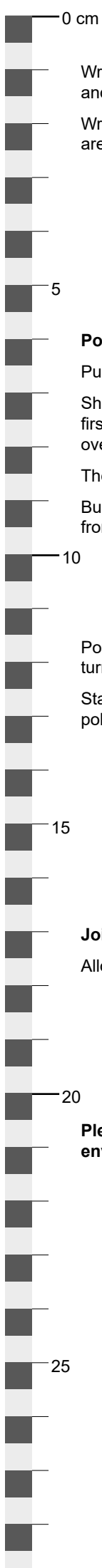
Wrap the roll spring twice over the copper shield wires and the copper mesh (see detail a). Fold the end of the shield wires back over the roll spring (see detail b).

Wrap the rest of the roll spring over the wires and tighten it with a twisting action. Fix it into place with two layers of adhesive tape (see detail c).

Cut the overlapping short shield wires in the centre over the red sealant tape.

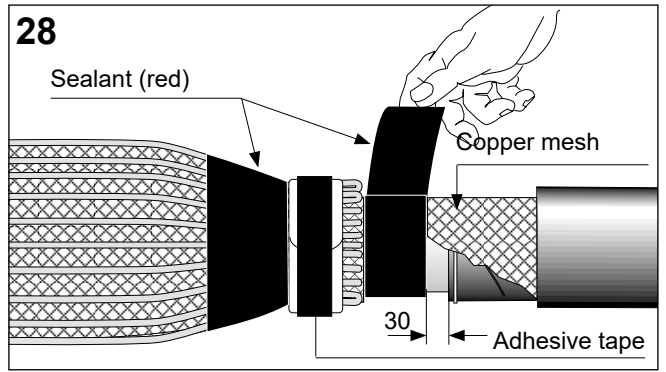
Seal the shielding wires over the breakout body with a second layer of red sealant mastic on top of the first one.





Wrap one roll of copper mesh (slim size) around the armour and continue 30 mm onto the metal sheath.

Wrap one layer of the red sealant tape around the remaining area of the exposed lead sheath.



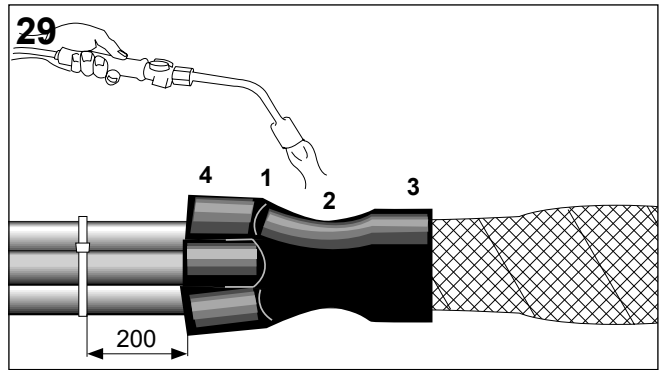
Polymeric Cable

Pull the breakout well towards the joint sleeves.

Shrink the breakout into place starting at the centre. Work first towards the joint side, then shrink the turrets onto the overshield of the plastic cable.

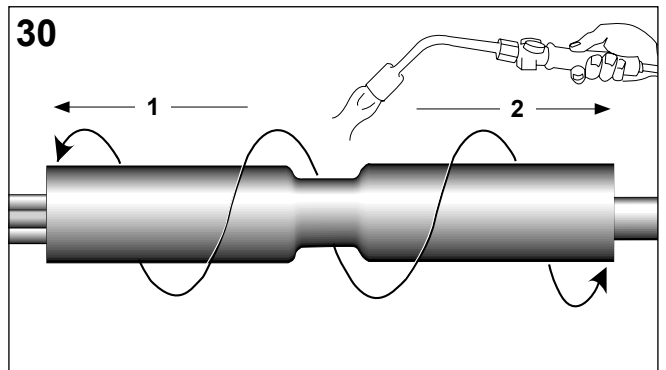
The numbers in the drawing indicate the shrink-sequence.

Bundle the three single-core cables with a cable tie 200 mm from the end of the breakout.



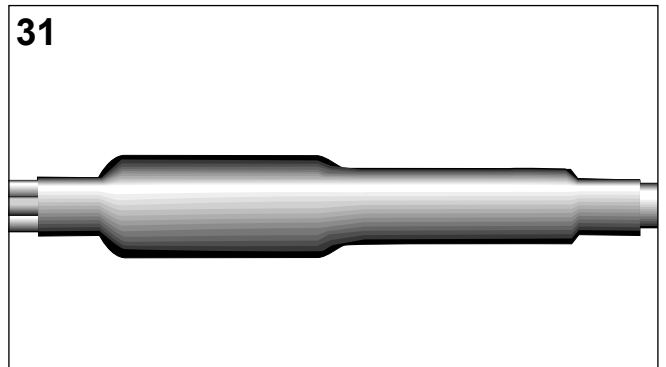
Position the outer sealing sleeve so that it is level with the turrets of the breakout on the plastic cable side.

Start shrinking in the joint centre, working first towards the polymeric cable (1) then towards the paper cable side (2).



Joint completed.

Allow the joint to cool before applying any mechanical strain.



Please dispose of all waste according to environmental regulations.

