tyco Electronics

Energy Division
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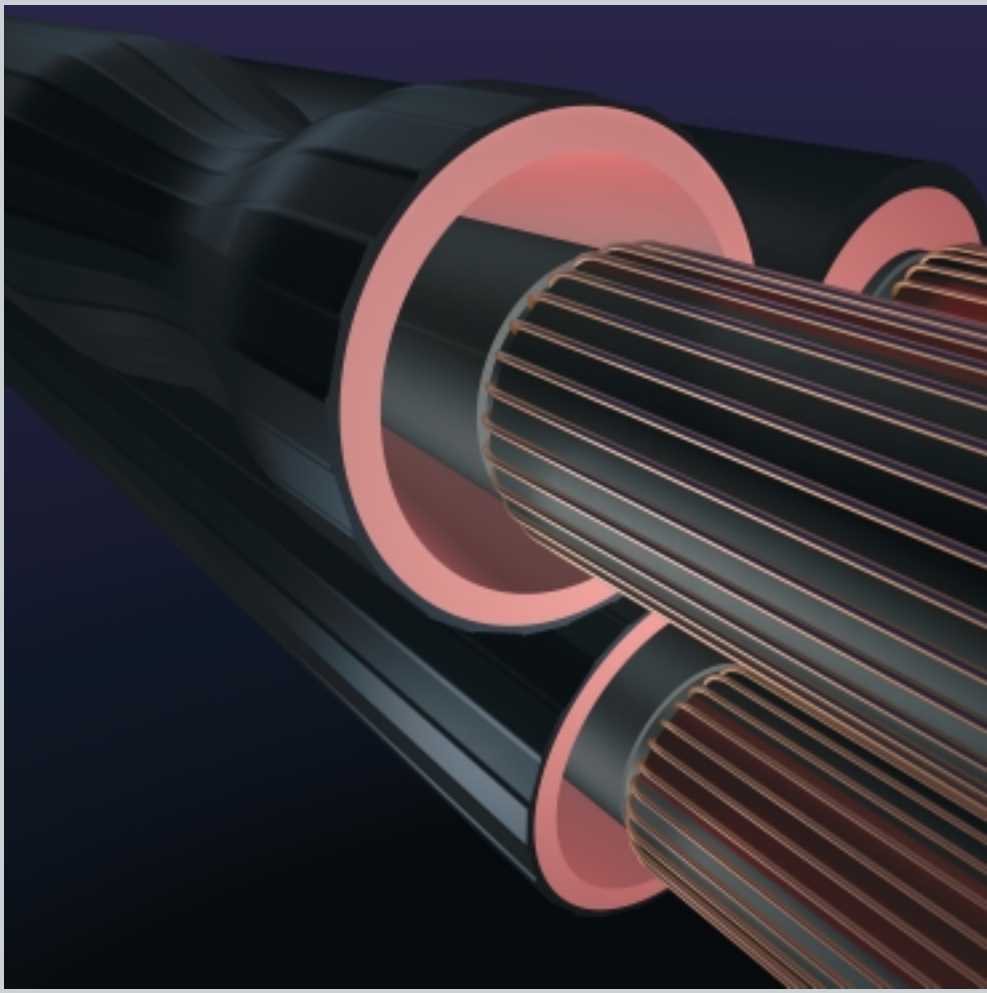
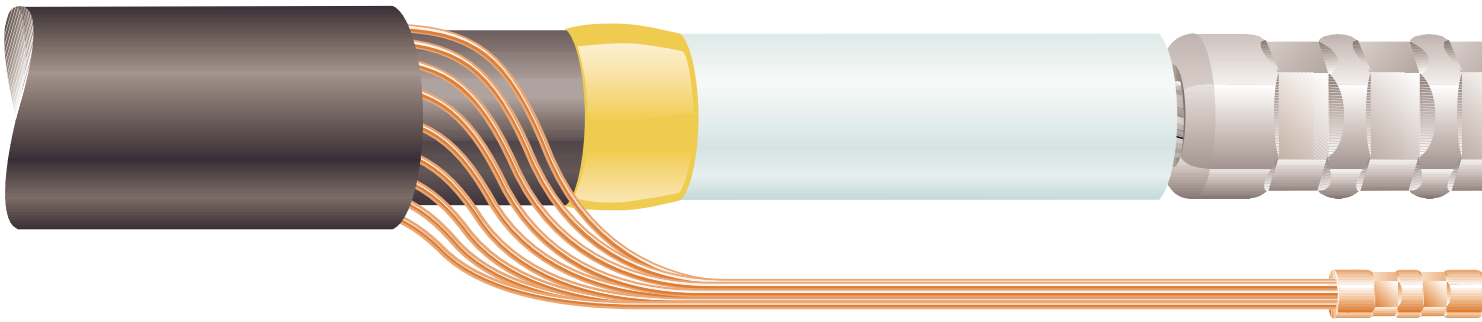
Heat-shrinkable elastomeric joints for single and 3-core polymeric cables up to 36 kV



Raychem

Heat-shrinkable elastomeric joints for single and 3-core polymeric cables up to 36 kV



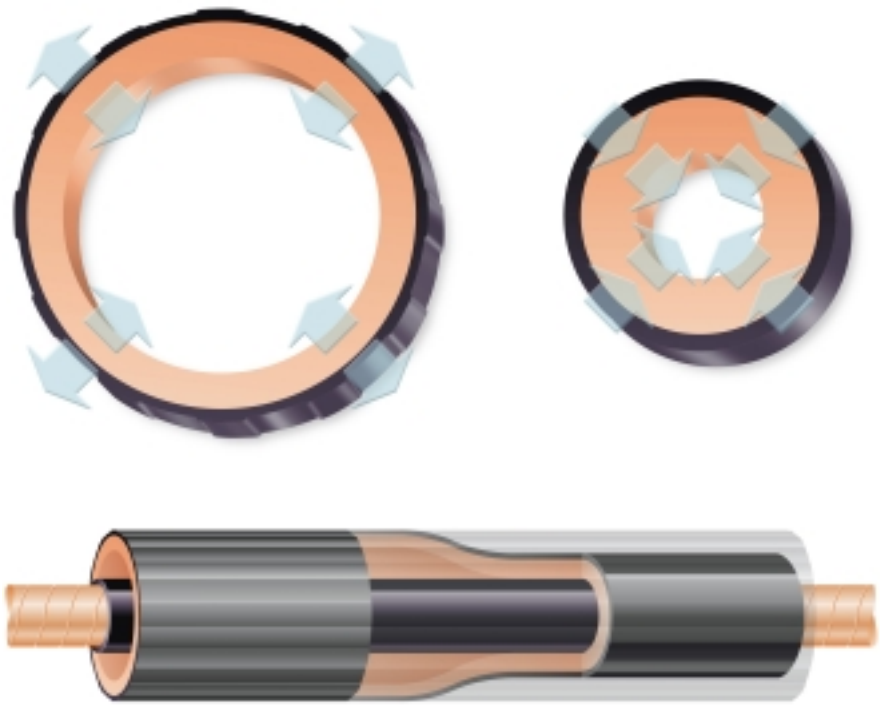
Jointing today...
Today, a modern jointing system must contain few, prefabricated components for easy, reliable installation, be applicable with different connection techniques and accommodate tolerances, different cross-sections and constructions. The tried and tested solution:

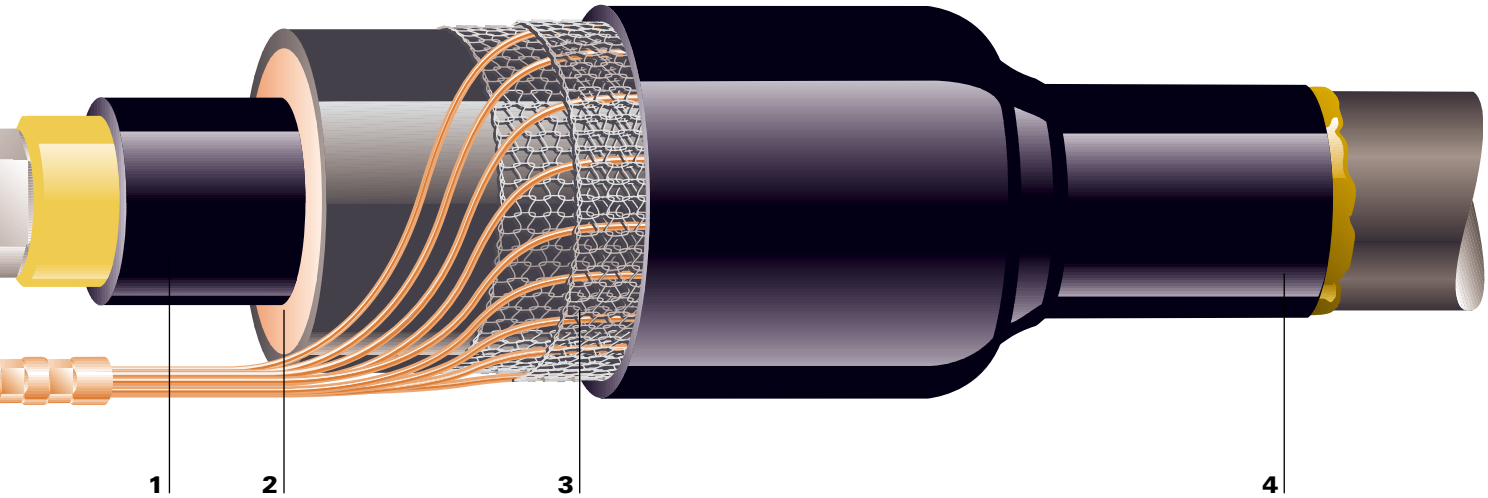
Raychem`s elastomeric technology...
The elastomeric heat-shrinkable joint has proven its suitability in installations all over the world, under even the most adverse conditions. Our technique combines an elastomeric thick-wall insulating material in one component with an outer layer of heat-shrinkable conductive polymer. The outer layer holds the thick insulating material at a large diameter, so that it can easily be placed over the cable. Using this construction, it is only necessary to heat the outer conductive layer to initiate the shrinking process. Other advantages to such an approach include:

- versatility: jointing of round and sector-shaped, single and 3-core cables, a range of sizes, cables of different cross-sections or oversheath thicknesses in one joint
- no extra cut-back of the oversheath to park the components
- effortless positioning of the components
- not limited to special connectors or conductor jointing methods
- suitable for various types of water-blocked cable.

Elastomeric technology
The elastomeric joint component is supplied in an expanded form, in which the heat-shrinkable outer wall holds the insulating layer at a wide diameter. Application of heat causes the outer wall to shrink, allowing the insulating layer to contract at the same time, and closely fit the joint. The rubber-like characteristics of the material enable the joint to follow the thermally-induced dimensional changes of the cable insulation.

1 Electrical field control
The stress control tubing has a precisely defined impedance characteristic which smoothes the electrical field over the connector and cable screen ends. During installation of the tubing, its shrinking action compresses the special void filler (yellow) into position round the screen ends and the connector. Pencilling of the insulation at the connector is not necessary.





2 Insulation and screen
The elastomeric sleeve provides the correct thickness of insulation (red) in one step. The insulation screen is provided by the outer wall of the sleeve, which is of heatshrinkable conductive polymer (black). This technique saves installation time and ensures a flawless bond between joint insulation and screen.

3 Metallic shielding
Copper mesh continues the correct shield cross section across the connection area and makes electrical contact with the outer screen of the joint.

4 Outer sealing
The heat used to shrink the outer sleeve causes the pre-coated adhesive to melt and flow, resulting in a lasting barrier against moisture and corrosion on the cable oversheath.

Installation procedure
A pre-packed set of components is slid over the prepared cable end, together with an outer sealing sleeve. After jointing the conductors, the connector and screen ends are electrically smoothed with a void filling compound. The stress control tubing and then the elastomeric component are each positioned in turn over the connector and shrunk into place. The cable shield is replaced with copper mesh and the oversheath by an adhesive-coated sealing sleeve. All kits are supplied with illustrated step-by-step instructions.

Tyco Electronics Energy Division total commitment to quality assurance
Even the best technology must be backed up by a thorough and consistent quality assurance program. We subject every product to an extensive quality control regimen which includes the following procedures:

- At every production stage, beginning with the raw materials and continuing through to the packaged product, the QC lab tests all physical and electrical characteristics which can influence quality.
- By means of lot numbers, the Quality Assurance Program ensures traceability backwards all the way to the details of the compound batch test reports.

ISO 9000 series certification for almost all locations underline our continuing commitment to quality.

Minimum performance for Raychem joints for screened polymeric cables up to 36 kV

Test Sequence		Test Voltage Highest Voltage for Cable U_m (kV) 12	17.5	24	36	Result
Impact	4 kg wedge dropped 6 times for 2 m (armoured cables only)					no functional damage
A.C. Voltage Withstand	1 min	35	45	55	75	no breakdown
Partial Discharge		7.5 12	10.9 17.5	15 24	22.5 36	≤ 3 pC ≤ 20 pC
Impulse Voltage Withstand	10 positive and 10 negative, 1.2/50 µs, between conductor and grounded screen	95	110	150	200	no breakdown
Load Cycling	63 cycles 5 h heating, 3 h cooling Conductor temperature: PE, PVC cables: 75 °C XPE cables: 95 °C	15	22	30	45	no breakdown
Partial Discharge		7.5 12	10.9 17.5	15 24	22.5 36	≤ 3 pC ≤ 20 pC
Thermal Short Circuit	1 s symmetrical fault with conductor Temperature as for cable specification 1 s earth fault with armour Temperature as for cable specification					no functional damage
Load Cycling	as above with cable in 1 m water (oversheath removed)	15	22	30	45	no breakdown
Partial Discharge		7.5 12	10.9 17.5	15 24	22.5 36	≤ 3 pC ≤ 20 pC
A.C. Voltage Withstand	4 h	24	36	48	72	no breakdown
Impulse Voltage Withstand	repeat	95	110	150	200	no breakdown
D.C. Voltage Withstand	30 min	48	72	96	144	no breakdown
Dynamic Short Circuit	as for cable specification (3-core cables only)					no functional damage
Notes:	1. U_m is the highest phase to phase voltage. All other voltages are stπated as phase to ground values. 2. Further details given in Raychem specification PPS 3013.					

Energy Division – a pioneer in the development of economical solutions for the electrical power industry. Our product range includes: cable accessories, connectors & fittings, electrical equipment, instruments, lighting controls, insulators & insulation enhancement and surge arresters.

For more information and your country contact person, please visit us at:
http://energy.tycoelectronics.com

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