

## Heat-shrinkable joints for transitions from MI/MIND paper insulated cables to plastic and rubber insulated cables up to 1 kV

The problem of connecting plastic insulated power cables to existing paper insulated ones has led to the requirement for an insulating and sealing system with proven service records of reliability for jointing each of the two cable types.

### Universal applicability

Raychem transition joints for 1 kV meet this requirement because they rely on a technique designed and used from the outset for both paper and plastic insulated cables. This is the technology of Raychem heat-shrinkable materials. Following extensive application over the last decades, our system is now widely acknowledged as an unusually dependable and easy-to-install jointing method for traditional and modern cable types alike.

### Fast and efficient

Mixing, pouring, lopping-up and curing delays are all eliminated since Raychem joints require no jointing compound or resin. This feature also enables the joint to be buried immediately. As the components are of heat-shrinkable material, they can be held in stock in varying climatic conditions without risk of long-term deterioration.

### Ease of installation

The heat-shrinkable design of the joint enables a dependable seal to be made easily at the end of the paper insulated cable. To keep water out and oil in, the cores are protected with heat-shrinkable tubing and the cable crutch sealed with a heat-shrinkable breakout. Adhesive precoated on the inside of the breakout melts and flows during the shrinking action to form a lasting barrier on the tubing covered cores and the cable's metal sheath.



The conductors can be jointed with either mechanical, compression or soldered connectors, which are then insulated by shrinking adhesive-lined thick-walled tubing over them, at the same time finally sealing the cores of both cables.

### Outer sealing and mechanical strength

For unarmoured and concentric neutral cables, the mechanical and sealing functions of the oversheath are restored by heat shrinking a thick-walled insulating tubing over the joint area. A durable and repeatable seal is ensured here, too, by hot-melt adhesives already pre-installed on the inside of this component.

For armoured cables, earth continuity and impact protection are provided by a hot tin plated steel joint case.

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<b>Performance</b>	Raychem joints are designed and fully tested to meet Raychem specification PPS 3013, which encompasses the requirements of the major national standards and the IEC norms. Each joint covers a range of cable sizes and is supplied complete with full installation instructions.	As one of the leaders in heat-shrinkable materials, and one of the largest cable accessory makers, we support our products with customer training, service and technical assistance to meet the demands of the growing world of energy.
<b>Test sequence</b>		<b>Result</b>
<b>Insulation Resistance</b>	between conductor and grounded water bath	≥ 1000 MΩ
<b>Impact</b>	4 kg wedge dropped 6 times from 2 m	no functional damage
<b>A.C. Voltage Withstand</b>	4 kV for 15 min	no breakdown and no flashover
<b>Impulse Voltage Withstand</b>	10 positive and 10 negative, 1.2/50 μs, 8 kV peak, between conductor and grounded water bath	no breakdown and no flashover
<b>Insulation Resistance</b>	repeat	≥ 1000 MΩ
<b>Load Cycling</b>	63 cycles 5 h heating, 3 h cooling Conductor temperature: Paper cables: 85 °C PVC cables: 75 °C XLPE cables: 95 °C	pass
<b>Thermal Short Circuit</b>	1 s symmetrical fault with conductor temperature as for cable specification  1 s earth fault with armour temperature as for cable specification	no visible signs of damage
<b>Load Cycling</b>	as above, with cable in 1 m water, oversheath removed	pass
<b>Insulation Resistance</b>	repeat	≥ 1000 MΩ
<b>Impulse Voltage Withstand</b>	repeat	no breakdown and no flashover
<b>D.C. Voltage Withstand</b>	15 kV for 5 min	no breakdown and no flashover
<b>Notes:</b>	1. All voltages are phase to ground. 2. Further details are given in Raychem specification PPS 3013.	

**Ordering Information:**

Raychem joints are available for transitions from paper to plastic insulated cables with or without armour for up to 1 kV, with 4 cores and with conductor cross-sections up to 300 mm<sup>2</sup>. A full selection table is available on request.



Tyco Electronics Raychem GmbH  
Finsinger Feld 1, 85521 Ottobrunn/Munich, Germany  
Phone: +49-89-6089-0, Fax: +49-89-6096345  
<http://energy.tycoelectronics.com>

All of the above information, including drawings, illustrations and graphic designs, reflects our present understanding and is to the best of our knowledge and belief correct and reliable. Users, however, should independently evaluate the suitability of each product for the desired application. Under no circumstances does this constitute an assurance of any particular quality or performance. Such an assurance is only provided in the context of our product specifications or explicit contractual arrangements. Our liability for these products is set forth in our standard terms and conditions of sale. RAYCHEM is a trademark.

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**Energy Division – economical solutions for the electrical power industry: cable accessories, connectors & fittings, electrical equipment, instruments, lighting controls, insulators & insulation enhancement and surge arresters.**