

**IDST****Heat-shrinkable indoor terminations for screened SL- type MI paper insulated cables for 12 kV to 24 kV**

Raychem heat-shrinkable materials have been widely used to insulate and seal paper insulated cables. Three decades of service experience demonstrated the reliability of this technique. We offer a range of indoor terminations for MI paper cables which includes SL-constructions up to 24 kV. In this termination system, oil and moisture sealing is achieved by the combined effect of special-purpose adhesives applied under the shrinking action of heat-shrinkable insulating materials. The skill-sensitive and time-consuming technique of soldering or plumbing to make oil seals is eliminated.

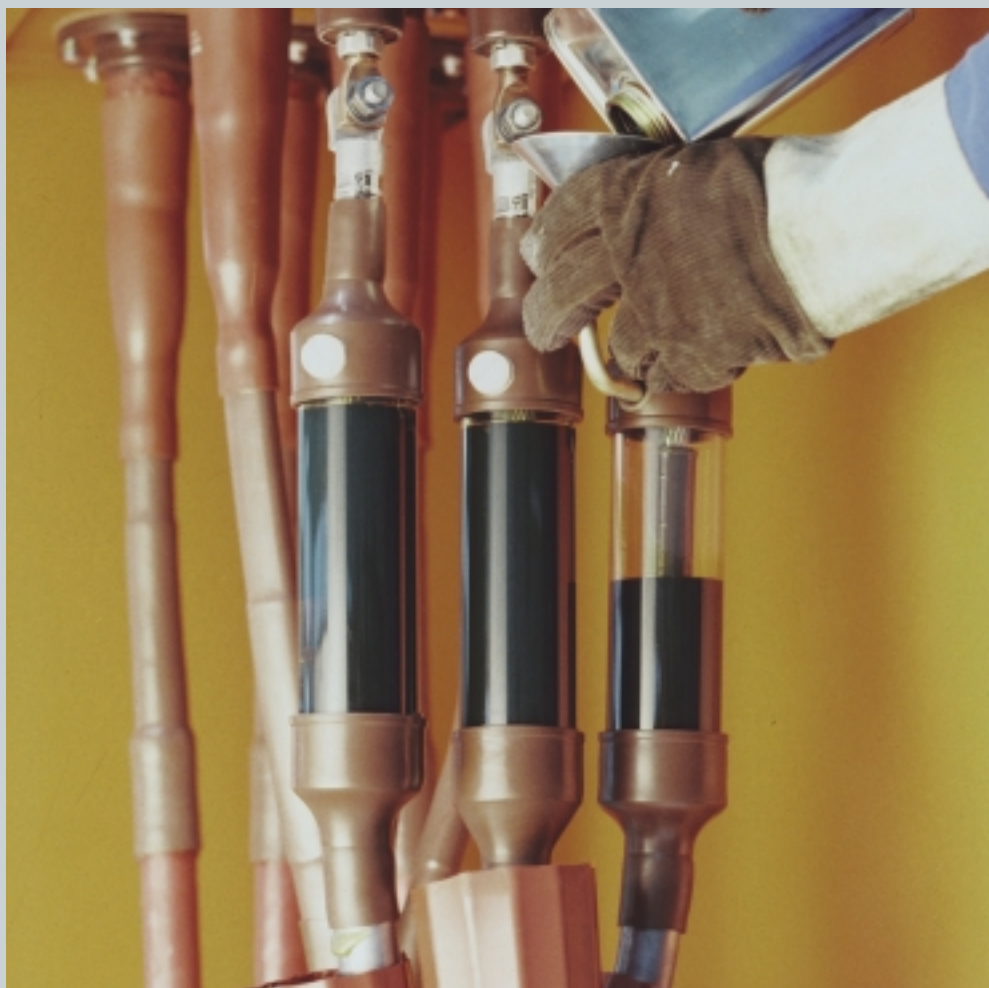
Industrial organisations and utilities worldwide are using this technique due to high level of ease of installation and reliability.

**Materials**

Materials for accessories on draining oil cables must resist oil, pressure and thermal cycling for long time periods. Condensation and dust in indoor conditions require that the termination surface withstand high humidity and surface contamination under electrical stress. For the heat-shrinkable components of the Raychem termination, a special material was developed to fulfil these requirements. Proven over more than three decades.

**Ease of installation**

The expanded components of the termination are internally coated with adhesive. This allows them to be easily placed over the cable. When heated, they shrink in diameter to fit and seal the cable end. The shrinking action and the flow of adhesive provide the cable fitter with a visual check of the installation. Inspection and maintenance of the oil level is simplified by the tough, transparent reservoir.

**Seals without plumbing or soldering**

The combination of heat-shrinkable materials and pre-coated hot-melt adhesives provides a lasting seal of the termination body to the cable sheath and lug. No plumbing or soldering is required.

**Lightweight and compact**

From lug to cable sheath, the whole of the Raychem termination is of insulating materials. A proper creepage path is obtained for a short overall termination length, of slim design. The robust oil reservoir and lightweight polymeric materials make

the termination easy to handle and install, each kit consisting of a few components including illustrated installation instructions.

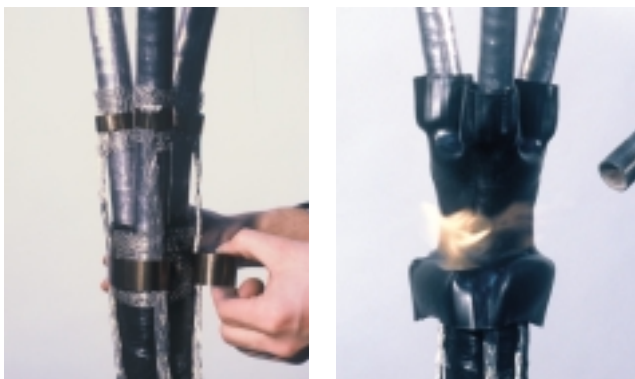
**Performance**

Extensive laboratory test programmes and field trials were followed by installation of large numbers of these termination by utilities, where long-term service has confirmed the performance of the system. Raychem terminations for MI paper insulated cables meet Raychem specification PPS 3013, which encompasses the requirements of the major national standards and international norms.

## Solderless earth connection and sealing for three-core cables

The Raychem termination system does not only eliminate plumbing and soldering for sealing the termination body to the lead sheath. We can also provide a solderless earth connections system now widely in use. The entire installation can now be carried out without the need for plumbing or soldering skills.

Corrosion protection and sealing for three-core cables is provided by installing a heat-shrinkable, adhesive-lined breakout in the cable crutch.



### IDST Minimum performance for Raychem indoor terminations for screened SL-type MI paper insulated cables 12 kV to 24 kV

Test Sequence		Test Voltage			Result
		Highest Voltage for Cable $U_m$ [kV]			
		12	17.5	24	
<b>A.C. Voltage Withstand</b>	1min	35	45	55	no breakdown and no flashover
<b>Impulse Voltage Withstand</b>	10 positive and 10 negative, 1.2/50 $\mu$ s, between each conductor and the grounded sheath	75	95	125	no breakdown and no flashover
<b>Load Cycling</b>	63 cycles 5h heating, 3h cooling Conductor temperature: 70°C	15	22	30	no breakdown and no flashover
<b>Thermal Short Circuit</b>	1 s symmetrical fault with conductor temperature as for cable specification  1 s earth fault with sheath temperature as for cable specification				no damage
<b>Load Cycling</b>	repeat	15	22	30	no breakdown and no flashover
<b>A.C. Voltage Withstand</b>	4h	24	36	48	no breakdown and no flashover
<b>Impulse Voltage Withstand</b>	repeat	75	95	125	no breakdown and no flashover
<b>D.C. Voltage Withstand</b>	30 min	48	72	96	no breakdown and no flashover
<b>Humidity</b>	1000h conductivity 800 $\mu$ S/cm spray rate: 0.4 l/m <sup>3</sup> /h	7.5	10.9	15	no breakdown and no flashover no tracking and no erosion
<b>Dynamic Short Circuit 3-core cables</b>	63 kA				no damage

- Notes:**
- $U_m$  is the highest phase to phase voltage. All other voltages are stated as phase to ground values.
  - Further details are given in Raychem specification PPS 3013.

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