



PPR-1675

Certificate
For protection and/or insulation
of cables and wires
Heat Shrinkable Tubing: MWTM & WCSM
Max. 1kV

Tested by: **DET NORSKE VERITAS AS, Norway**

Date: Issued **2014-12-23, valid until 2018-12-31**

Pages: 4

Appendix: —

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Termination and Joint for Cable

with type designation(s)

Heat shrinkable tubing: MWTM & WCSM

Issued to

**Tyco Electronics Raychem GmbH
OTTOBRUNN, Germany**

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

Application :

For protection and or insulation of cables and wires. Voltage: Max 1000 V.

This Certificate is valid until **2018-12-31**.

Issued at **Høvik** on **2014-12-23**

DNV GL local station: **Essen**

Approval Engineer: **Ivar Bull**

for **DNV GL**

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Marit Laumann
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Certificate No: **E-13883**
 File No: **828.20**
 Job Id: **262.1-009445-2**

Product description

| Component | | Colour | Property | Material / Product specification |
|-----------|----------|--------|------------------------------------|----------------------------------|
| Tubing | Coating | | | |
| MWTM Mono | | Black | Insulating low voltage application | PPS 3010/19 |
| Coex S | Adhesive | Opaque | Sealant against moisture | PPS 3012/76 |
| WCSM Mono | | Black | Insulating low voltage application | PPS 3010/10 |
| Coex S | Adhesive | Opaque | Sealant against moisture | PPS 3012/76 |

List of sizes:

| Type MWTM tubing | Inside diameter | | Wall thickness |
|----------------------------|-----------------------------|-------------------------------------|-------------------------------------|
| | As supplied Minimum (mm) | After free recovery Maximum (mm) | After free recovery Minimum (mm) |
| Size | | | |
| 10/3 | 10 | 3 | 1 |
| 12/3(coex) | 12 | 3 | 2 |
| 16/5 | 16 | 5 | 1.4 |
| 25/8 | 25 | 8 | 2 |
| 30/8 | 30 | 8 | 2 |
| 35/12(coex) | 35 | 12 | 2 |
| 35/12(mono) | 35 | 10 | 2 |
| 50/16 | 50 | 16 | 2 |
| 63/19 | 63 | 19 | 2.4 |
| 70/26(coex) | 70 | 26 | 2.0 |
| 70/26(mono) | 73 | 26 | 2.0 |
| 75/22 | 75 | 22 | 2.7 |
| 85/25 | 85 | 25 | 2.8 |
| 90/36(coex) | 90 | 36 | 1.9 |
| 90/36(mono) | 94 | 36 | 1.9 |
| 95/29 | 95 | 29 | 3.1 |
| 105/34 | 105 | 34 | 3.1 |
| 115/34 | 115 | 34 | 3.1 |
| 120/54(coex) | 120 | 54 | 2.0 |
| 120/54(mono) | 124 | 54 | 2.0 |
| 140/42 | 140 | 42 | 3.1 |
| 160/50 | 160 | 50 | 3.2 |
| 164/80(coex) | 164 | 80 | 1.9 |
| 164/80(mono) | 164 | 80 | 1.9 |
| 180/60 | 180 | 60 | 3.2 |
| 195/102 | 195 | 102 | 1.9 |
| 245/80(mono) | 245 | 80 | 2.4 |

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| Type WCSM tubing | Inside diameter | | Wall thickness |
|----------------------------|-----------------------------|-------------------------------------|-------------------------------------|
| | As supplied Minimum (mm) | After free recovery Maximum (mm) | After free recovery Minimum (mm) |
| Size | | | |
| 9/3 | 9 | 3 | 2 |
| 13/4 | 13 | 4 | 2.4 |
| 20/6 | 20 | 6 | 2.5 |
| 33/8 | 33 | 8 | 3.2 |
| 43/12 | 43 | 12 | 4.3 |
| 51/16 | 51 | 16 | 4.5 |
| 70/21 | 70 | 21 | 4.4 |
| 85/25 | 85 | 25 | 4.3 |
| 90/30* | 90 | 30 | 4.3 |
| 105/30** | 105 | 30 | 4.3 |
| 130/36 | 130 | 36 | 4.3 |
| 160/50 | 160 | 50 | 4.3 |
| 180/50 | 180 | 50 | 4.3 |
| 200/50 (coex) | 200 | 50 | 4,3 |
| 250/65 (coex) | 250 | 65 | 4,3 |
| 285/95 | 285 | 95 | 4,3 |
| 320/95 | 320 | 95 | 4,3 |

* Mono only
 ** Coex only

Application/Limitation

For protection and or insulation of the core joints and repair of the outer sheath of cables.

Voltage: Max 1000 V.

Temperature class: -40 °C to +90 °C

Dielectric Strength: 100 kV/cm Min. – 200 kV/cm Min. dependent upon material type and wall thickness.

MWTM and WCSM are not considered flame retardant.

This will normally not hinder its use due to the limited amount of material used.

Type Approval documentation

Data sheets:

Raychem master specification for extruded products, PPS 3010 dated December 1999,
 Raychem master specification for adhesives, sealants and related products, PPS 3012 dated December 1999

Raychem material/product specification for extrusions PPS 3010/10 dated September 1996,
 Material/product specification for adhesives, sealants and related products PPS 3012/76.

Product data sheets for MWTM tubing PPS 0103 dated 01-11-2007 and WCSM PPS 0106 tubing dated 01-06-2009.

Installation instructions:

EPP- 0001 INT 4/10.

Test reports:

PPR 1501 dated 2001-02-01

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PPR 1271 dated 1997-09-11

Tests carried out

Heat cycling, Submerged test, Insulation Resistance (WSCM part of repair joint).

Marking of product

Raychem – Product type – size – batch no.

Periodical assessment

The scope of the Periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Check results from Production Sample Tests (PST) and Routine tests (RT). If test reports are not available, tests according to PST and RT shall be carried out
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE