



PPR-1675

Certificate
for protection and/or insulation
of cables and wires

Heat Shrinkable Tubing:
MWTM & WCSM

max. 1kV

Tested by: Det Norske Veritas

Date: 13.12.2002

Pages: 4

Appendix: —



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-6431
This Certificate consists of 4 pages

This is to certify that the
Heat Shrink Cable Protection
with type designation(s)
Heat shrinkable tubing: MWTM & WCSM

Manufactured by
Tyco Electronics Raychem GmbH
Ottobrunn, Germany

is found to comply with
Det Norske Veritas' Rules for Classification of Ships and Mobile Offshore Units

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

Place and date
Høvik, 2002-12-13
for DET NORSKE VERITAS AS

Per Ivar Halleland
Head of Section



Local Office
DNV Essen

This Certificate is valid until
2006-12-31

Erik Hoffmann
Surveyor

Notice: 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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



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File No.: 828.20

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



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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

* 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

Raychem master specification for extruded products, PPS 3010 dated December 1999, master specification for adhesives, sealants and related products, PPS 3012 dated December 1999, material/product specification for extrusions PPS 3010/10, /19 dated September 1996, material/product specification for adhesives, sealants and related products PPS 3012/76 dated June 2001.

Product data sheets for MWTM tubing dated 01-01-29 and WCSM tubing dated 01-01-15.



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Installation instructions EPP 0001 INT 9/96. Test Report PPR1271.
Internal test report: PPR 1501 dated 2001-02-01.

Tests carried out

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

Marking of product

Product to be marked: Raychem – Product type – size – batch no.

Certificate retention survey

The scope of the retention/renewal survey 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)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and RT to 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 renewal only.

END OF CERTIFICATE