



## HEAT-SHRINKABLE TUBING (WCSM)

### HEAVY LOW VOLTAGE INSULATION AND OUTER SEALING TUBINGS

#### KEY FEATURES

- Excellent electrical characteristics and mechanical strength for low voltage applications
- Material formulation ensures top end performance
- Material hardness increased
- Halogen-free material content, non-corrosive, non-toxic
- Silicon-free material content, no disturbance of coating equipment
- Compliant to RoHS and REACH regulations
- Stabilized against UV

TE Connectivity's (TE) Raychem WCSM heat-shrinkable heavy-wall tubing is designed for insulation on Low voltage cable accessories and applications, as well as for sealing and protection on low, medium and high voltage cables and accessories. In this tubing type, the electrical and physical properties of cable oversheath and core insulation of low voltage cables are combined with ruggedness and easy installation.

On heating, TE's Raychem WCSM tubing recovers to the original smaller diameter, fitting tightly over a wide range of cable sizes and accessories because of its high shrink ratio. At the same time the tubing's inner sealant wall gives a reliable moisture seal over the most irregular shapes.

TE's Raychem WCSM tubing mechanical strength enables immediate back-filling of cable trenches after jointing. Widely used to insulate, protect and seal power cable joints, accessories and electrical connections, it is one result of our extensive capability in materials technology.

Shelf-life restrictions usually associated with tapes or resins or cold-applied products do not apply and the completed installation may be taken into service at once. TE's Raychem WCSM tubing is fast and easily installed and has proven its long term reliability in harsh climatic conditions and polluted environments.

**Customers can count on consistent, high quality products, driven by TE's proven innovation and backed by our extraordinary customer support.**

## Heat-Shrinkable Tubing WCSM



### TESTING

Physical Characteristic	Test Method	Material Requirements
Tensile Strength	ISO 37	12 MPa min
Ultimate Elongation	ISO 37	350% min
Density	ISO 1183 Method A	0.8-1.0 g/cm <sup>3</sup>
Hardness	ISO 868	≥ 45 shore D
Accelerated ageing 7 days at 150°C ± 2°C Tensile Strength Ultimate Elongation	ISO 37 ISO 37	12 MPa min 350% min
Low Temperature Flexibility	ASTM D2671 Procedure C	No cracking at 4 hours at -40°C ± 3°C
Dielectric Strength	IEC 60243 part 1 and 2	≥ 10 kV/mm min.
Volume Resistivity	IEC 60093	1 x 10 <sup>10</sup> Ω cm min
Dielectric Constant	IEC 60250	5.0 max
Water Absorption	ISO 62 method 1	≤ 0.25% max after 14 days at 23°C ± 2°C
Weathering	The material from which WCSM is manufactured contains carbon black (≥ 2.5 %) to protect it from ultra-violet light	
Application Characteristics		
Operating temperature range	- 40°C up to + 100°C (coated)	
Installation/ shrinking temp	> 120°C	
Low temperatures flexibility	down to - 40°C	
Shrink ratio	> 3 : 1	
Longitudinal shrinkage free recovered	≤ - 10 %	

### Characteristics at a glance

- Cross-linked polyolefin, Thick wall
- Available inline coated with Hot melt adhesive
- Color black, shrinkage ratio 3 : 1
- Resistant to chemical agents
- Stabilized against UV rays
- Halogen-free, non-corrosive, free of lead and aluminium
- High tensile strength and mechanical robustness
- Suitable for heat-shrink applications, approved for marine, offshore and shipbuilding applications

### Applications in

- Low voltage insulation
- Protection against moisture and pressure
- Mechanical protection
- Corrosion protection  
(with approved sealing materials only)

### WCSM tubing - coated with hot melt adhesive /S

WCSM-12/3-1000/S(S20)
WCSM-16/4-1000/S(S20)
WCSM-24/6-1000/S(S20)
WCSM-34/8-1000/S(S10)
WCSM-48/12-1000/S(S10)
WCSM-56/16-1000/S(S10)
WCSM-70/20-1000/S(S5)
WCSM-90/25-1000/S(S5)
WCSM-110/30-1000/S(S5)
WCSM-130/35-1000/S(S5)
WCSM-160/50-1000/S(S5)
WCSM-180/50-1000/S(S5)
WCSM-200/50-1000/S(C20)
WCSM-250/65-1000/S(S5)
WCSM-320/95-1000/S(C50)
WCSM-385/110-1000/S(S50)

For other available lengths please contact your local TE sales rep.

Delivery on spool up to size 110/30 on request. Sizes 320/95 and 385/110 in uncoated version on request.

### PRODUCT SELECTION INFORMATION

Description	Application Range (mm)		Diameter (mm)		Wall Thickness (mm)	
	from	to	Expanded min	Recovered max	Expanded nom	Recovered min
WCSM- 12/3	3,5	10	12	3	0,7	2
WCSM- 16/4	4,5	14	16	4	0,8	2,4
WCSM- 24/6	6,5	22	24	6	0,8	2,7
WCSM- 34/8	9	31	33	8	1,2	4
WCSM- 48/12	13	44	48	12	1,3	4,5
WCSM- 56/16	17,5	50	56	16	1	4,4
WCSM- 70/20	22	63	70	20	1	4,4
WCSM- 90/25	27	81	90	25	1	4,3
WCSM- 110/30	33	100	110	30	1	4,3
WCSM- 130/35	38	118	130	35	1	4,3
WCSM- 160/50	55	144	160	50	1	4,3
WCSM- 180/50	55	162	180	50	1	4,3
WCSM- 200/50	55	180	200	50	1	4,3
WCSM- 250/65	70	225	250	65	1	4,3
WCSM- 320/95 *	105	295	320	95	1,1	4,3
WCSM- 385/110 *	125	350	385	110	1,1	4,3

\* Available coated and uncoated; all other sizes available coated only

Standard Lengths: All sizes are available in the standard lengths 1000 mm. On request, other lengths and on spools.

All lengths subject to standard cutting tolerances. TE's Raychem WCSM tubing is available coated with an inner sealant wall.

The sealant exhibits excellent bonding and sealing characteristics to all materials commonly used in the various cable insulation and sheath constructions, such as plastic, rubber, lead, and aluminium.

[te.com/energy](http://te.com/energy)

©2014 TE Connectivity Ltd. family of companies. All Rights Reserved. EPP-1836-10/14

Raychem, TE Connectivity and TE connectivity (logo) are trademarks. Other logos, product and/or company names might be trademarks of their respective owners. While TE has made every reasonable effort to ensure the accuracy of the information in this brochure, TE does not guarantee that it is error-free, nor does TE make any other representation, warranty or guarantee that the information is accurate, correct, reliable or current. TE reserves the right to make any adjustments to the information contained herein at any time without notice. TE expressly disclaims all implied warranties regarding the information contained herein, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose. The dimensions in this catalog are for reference purposes only and are subject to change without notice. Specifications are subject to change without notice. Consult TE for the latest dimensions and design specifications.

### FOR MORE INFORMATION: TE Technical Support Centers

USA:	+ 1 800 327 6996
France:	+ 33 380 583 200
UK:	+ 44 0870 870 7500
Germany:	+ 49 896 089 903
Spain:	+ 34 916 630 400
Benelux:	+ 32 16 351 731
Canada:	+ 1 (905) 475-6222
Mexico:	+ 52 (0) 55-1106-0800
Latin/S. America:	+ 54 (0) 11-4733-2200
China:	+ 86 (0) 400-820-6015