



## HEAT-SHRINKABLE TUBING ZCSM

### THICK-WALL LOW VOLTAGE FLAME-RETARDANT HALOGEN-FREE INSULATION AND OUTER SEALING TUBINGS

#### KEY FEATURES

- High electrical characteristics and mechanical strength for low voltage applications
- Thick-wall, Cross-linked polyolefin. UV stabilised against irradiation and weathering
- Flame retardant in accordance with IEC 60332-1. Approved for applications with safety class cables
- Halogen-free, non-corrosive, free of lead and aluminium
- Compliant to RoHS and REACH regulations. Approved for offshore applications
- Color black, 2,5:1 shrink ratio
- Unlimited shelf-life

TE Connectivity's (TE) Raychem ZCSM heat-shrinkable thick-wall flame retardant tubing is designed for insulation purposes on low voltage cable accessories and applications as well as providing mechanical protection on medium voltage accessories.

TE's Raychem ZCSM tubing is an uncoated, zero-halogen, thick wall type and low fire hazard tubing. They are used for jointing and protection of low fire hazard cables commonly used in offshore, marine, mining, shipbuilding, construction industry, transportation network and equipment.

ZCSM is approved for core insulating and as re-jacketing of safety class cables, in high-rise buildings, public buildings, subways, road or railway tunnels requiring insulation or circuit integrity even under fire condition.

The optical smoke density produced by ZCSM tubing in fire conditions has been measured in accordance with methods as defined in standard IEC 61034. The range of thick-wall ZCSM tubing providing protection to the same fire standards as modern low smoke, low fire hazard cable specifications.

The material content of the ZCSM tubings is halogen-free and stabilized against UV irradiation. ZCSM tubing is fast and easily installed and has proven its long-term reliability in harsh climatic conditions and polluted environments. It also has an unlimited shelf-life when stored under normal conditions.

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

## Heat Shrinkable Tubing ZCSM



TESTING		
Physical Characteristic	Test Method	Material Requirements
Tensile Strength	ISO 37	8 MPa min.
Ultimate Elongation	ISO 37	200 % min.
Hardness	ISO 868	≥ 40 shore D
Accelerated ageing 168 hrs at 150 °C ± 2 °C	ISO 188	
Tensile Strength	ISO 37	8 MPa min
Ultimate Elongation	ISO 37	100% min
Low Temperature Flexibility	ASTM D 2671	No cracking at 4 hours at -40 °C ± 3 °C
Dielectric Strength	IEC 60243	10 kV/mm min.
Volume Resistivity	IEC 60093	1x10 <sup>10</sup> Ω cm min.
Water Absorption	ISO 62 proc. A	max. 0.3% after 24 h at 23 °C max. 0.7% after 14 days at 23 °C
Flame-retardant Characteristics, Fire Safety		
Flammability	IEC 60332-1	pass
Flame propagation	IEC 60332-1	pass
Limited oxygen index	ISO 4589	29 min.
Temperature index	NES 715, type B	250°C min
Smoke density	IEC 60134	on request
Smoke index	NES 711	20 max.
Acid gas generation	BR TDE 76-P-16	1,5% max.
Toxicity index	NES 713	3 max.
Corrosion	ASTM D 2671 Proc. A	No corrosion after 16 h at 150 °C
Application Characteristics		
Operating temperature range	- 40 °C up to + 120 °C	
Installation/ shrinking temperature	> 125 °C	

PRODUCT SELECTION INFORMATION - DIMENSIONS IN mm						
Description	Application Range		Diameter		Wall Thickness	
	from	to	expanded min	recovered max	expanded nom	recovered min
ZCSM 8/3	3.5		8	3	0.6	2
ZCSM 16/5	5.5	14.5	16	5	0.7	2.4
ZCSM 24/8	9	21.5	24	8	0.9	2.9
ZCSM 32/12	13	29	32	12	1	4
ZCSM 45/16	17.5	40.5	45	16	1	4
ZCSM 60/22	24	54	60	22	1	4
ZCSM 70/25	27.5	63	70	25	1	4
ZCSM 85/36	39.5	76.5	85	36	1	4
ZCSM 120/50	55	108	120	50	1	4.2
ZCSM 180/75	82.5	162	180	75	1	4.2

\* all sizes uncoated only

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