



## HEAT SHRINK TUBING ZCSM

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

#### 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 and IEEE 1202. Approved for applications with safety class cables
- Halogen-free, non-corrosive, free of lead and aluminium
- Color black, 2.5:1 shrink ratio
- Unlimited shelf-life

TE Connectivity's (TE) Raychem ZCSM heat shrink 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, halogen-free, thick-wall type and low fire hazard tubing. It is used for jointing and protection of low fire hazard cables commonly used in offshore, marine, mining, shipbuilding, construction industry and transportation network and equipment.

The ZCSM tubing 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 the 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 provides protection to the same fire standards as modern low smoke, low fire hazard cable specifications.

The material content of the ZCSM tubing is halogen-free and stabilized against UV irradiation. The 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 Shrink Tubing ZCSM



Compliant to RoHS and REACH regulations.

Approved for offshore applications.

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

PRODUCT SELECTION INFORMATION - DIMENSIONS IN INCHES (MM)						
Description	Application Range		Diameter		Wall Thickness	
	from	to	expanded min	recovered max	expanded nom	recovered min
ZCSM 8/3	0.14 (3.5)	0.27 (7)	0.31 (8)	0.12 (3)	0.023 (0.6)	0.079 (2.0)
ZCSM 16/5	0.22 (5.5)	0.57 (14.5)	0.62 (16)	0.19 (5)	0.027 (0.7)	0.094 (2.4)
ZCSM 24/8	0.35 (9)	0.84 (21.5)	0.94 (24)	0.31 (8)	0.035 (0.9)	0.11 (2.9)
ZCSM 32/12	0.51 (13)	1.14 (29)	1.25 (32)	0.47 (12)	0.040 (1.0)	0.16 (4.0)
ZCSM 45/16	0.69 (17.5)	1.60 (40.5)	1.77 (45)	0.63 (16)	0.040 (1.0)	0.16 (4.0)
ZCSM 60/22	0.94 (24)	2.12 (54)	2.36 (60)	0.86 (22)	0.040 (1.0)	0.16 (4.0)
ZCSM 70/25	1.08 (27.5)	2.48 (63)	2.75 (70)	0.98 (25)	0.040 (1.0)	0.16 (4.0)
ZCSM 85/36	1.55 (39.5)	3.01 (76.5)	3.34 (85)	1.42 (36)	0.040 (1.0)	0.16 (4.0)
ZCSM 120/50	2.16 (55)	4.25 (108)	4.72 (120)	2.00 (50)	0.040 (1.0)	0.165 (4.2)
ZCSM 180/75	3.25 (82.5)	6.38 (162)	7.08 (180)	2.95 (75)	0.040 (1.0)	0.165 (4.2)

\* all sizes uncoated only

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