

HEAT SHRINKABLE TUBING (ZCSM)

LOW VOLTAGE INSULATION AND OUTER SEALING TUBINGS

KEY FEATURES

- Flame retardant according to IEC 60332-1
- High performance electrical and mechanical characteristics
- Approved for and used in applications in power plants, public accessible buildings and transportation network
- Approved for and used in applications with safety class cables, requiring insulation or circuit integrity
- Compliant to RoHS and REACH regulations
- Stabilized against UV Irradiation

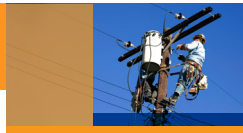
TE Connectivity's (TE) Raychem ZCSM heat-shrinkable heavy-wall flame retardant tubing is designed for insulation purposes on low voltage cable accessories and applications, including mechanical protection on medium voltage accessories.

ZCSM tubing is an uncoated, zero-halogen, thick wall type, low fire hazard tubing. They are used for splicing cables and also for general purpose protection tubing in low fire hazard environments such as the offshore, mining, construction industry. Other applications include transportation network and equipment and many others.

The optical smoke density produced by TE's Raychem ZCSM tubing in fire conditions has been measured in accordance with typical methods such as the 3 m³ Cube Test (IEC 60134), and has proven its applicability.

The range of thick-wall ZCSM tubing can be used as the jackets to MV and LV cable accessories, providing protection to the same fire standards as modern low smoke, low fire hazard cable specifications.

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



TESTING

Physical Characteristic	Test Method	Material Requirements
Tensile Strength	ISO 37	8 MPa min.
Ultimate Elongation	ISO 37	200 % min.
Density	ISO/R 1138 Method A	1,5 g/cm ³
Hardness	ISO 868	≥ 40 shore D
Accelerated ageing 168 hrs at 150 °C ± 2 °C Tensile Strength Ultimate Elongation	ISO 188 ISO 37 ISO 37	8 MPa min 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 ¹⁰ 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	
Low temperature flexibility	≥ - 40 °C	
Shrink ratio	≥ 2,5 : 1	
Longitudinal shrinkage free recovered	≤ - 15 %	

PRODUCT SELECTION INFORMATION

Description	Application Range (mm)		Diameter (mm)		Wall Thickness (mm)	
	from	to	expanded min	recovered max	expanded nom	recovered min
ZCSM 8/3	3,5	7	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

Ordering information

FCSM tubing - uncoated /U

ZCSM-8/3-1000/U
ZCSM-16/5-1000/U
ZCSM-24/8-1000/U
ZCSM-32/12-1000/U
ZCSM-45/16-1000/U
ZCSM-60/22-1000/U
ZCSM-70/25-1000/U
ZCSM-85/36-1000/U
ZCSM-120/50-1000/U
ZCSM-180/75-1000/U

* all sizes uncoated only

TE's Raychem ZCSM tubing is available uncoated and alternatively coated with an inner sealant wall.

Other lengths and delivery on spool available on request. Please contact your local TE sales representative.

Characteristics at a glance

- Cross-linked polyolefin, thick wall
- Available inline coated with hot melt adhesive
- Color black, shrinkage ratio 2,5 : 1
- 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 mining, power plants, railway and rolling stock applications
- Suitable for and approved for heat-shrink applications for safety cable networks, as in high-rise buildings, public buildings, subways, road or railway tunnels

Applications in

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

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