



Energy Division

Raychem heat-shrinkable busbar insulation tubing BPTM

Voltage class 25 kV, Application Ø 6.5-220 mm

Product description

Raychem medium wall, heat-shrinkable tubing BPTM provides insulation enhancement and protection against flashover and accidentally induced discharge. Particularly useful in confined spaces Raychem tubing BPTM can be used on both circular and rectangular copper or aluminium busbars.

On application of heat the tubing shrinks snugly over the busbar profile ensuring that the required minimum wall thickness is obtained. Raychem tubing BPTM can be installed easily during large scale production using an oven or in the field using a gas torch or hot air. Raychem tubing BPTM is manufactured from a non-halogen based polymer which has excellent performance in high voltage environments and greatly reduces the noxious and corrosive effects in fire situations.

Applications

The use of Raychem tubing BPTM allows equipment designers the freedom to reduce air spacing between busbars, such as in the manufacture of switchgear cabinets where space is at a premium. Raychem tubing BPTM provides flashover protection up to 25 kV.

Features/benefits

- Compatible with all other products in the Raychem MV insulation enhancement system
- Excellent flexibility, can be installed on a wide range of curved or bent busbars without cracking or creasing
- High shrink ratio reduces inventory and simplifies product selection
- Exceptional insulation and long term reliability even at high continuous operating temperatures

- Extremely durable, resists damage from solvents, ultraviolet light, weathering, mechanical impact and general wear and tear
- Suitable for indoor and outdoor use
- Excellent anti-tracking properties
- Good thermal emissivity and contact with busbars means no derating is required
- Flame retardant and non-halogen based material reduces flammability and the toxic and corrosive effects in fire situations
- Can be stored indefinitely at temperatures up to 50 °C without loss of performance
- Over 30 years of successful operating experience

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Clearance reduction

The tables indicate the clearance reductions which are possible using Raychem tubing BPTM. These are derived from BIL, AC withstand, DC withstand and discharge extinction tests. These clearances should not be adopted without testing by the user. Sharp electrodes and unusual geometries may require wider clearances.

Round busbars

Rated voltage (kV)	Phase-phase (mm)	Phase-ground (mm)	IEC 71-2 air clearance (mm)
12	55	65	120
17.5	70	85	160
24	95	125	220
36	150	205	320

Rectangular busbars

Rated voltage (kV)	Phase-phase (mm)	Phase-ground (mm)	IEC 71-2 air clearance (mm)
12	65	75	120
17.5	85	105	160
24	115	150	220
36	200	285	320

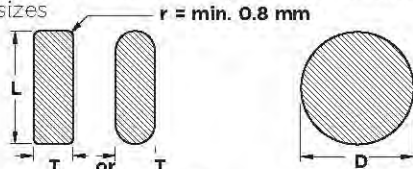
Key product specifications

Key product specifications	Test method	Requirement
Thermal endurance	IEC 216	105 °C min.
Accelerated ageing - Tensile strength - Ultimate elongation	ISO 188, ASTM D2671	168 hrs @ 120 °C 10 MPa min. 300% min.
Comparative tracking index	IEC 112, VDE 0303/1	KA 3c
Dielectric strength	ASTM D149, IEC 243	180 kV/cm min. @ 2 mm 150 kV/cm min. @ 2.5 mm 120 kV/cm min. @ 3 mm
Low temperature flexibility	ASTM D2671 Procedure C	No cracking after 4 hrs @ -40 °C
Smoke index	NES 711	Less than 120
Acid gas generation	Raychem PPS 3010 4.23	Less than 1% by weight

Note: For further product specification information see Raychem PPS 3010/04.

Product selection

Raychem tubing BPTM should normally be used on the following busbar sizes



Product size	Rectangular bars L + T (mm)		Round bars D (mm)	
	min.	max.	min.	max.
BPTM 15/6	12	18	6.5	12
BPTM 30/12	22	38	13.5	25
BPTM 50/20	36	65	22	43
BPTM 75/30	55	95	33	63
BPTM 100/40	70	130	44	86
BPTM 120/50	90	165	55	105
BPTM 175/70	125	235	80	150
BPTM 205/110	200	276	127	190
BPTM 235/130	235	315	150	220

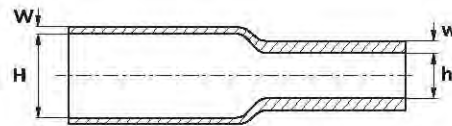
Technical reports

- UVR 8019 - (Rev 1) Qualification report of Raychem tubing BPTM
- UVR 8016 - Testing of Raychem tubing BPTM dust pick-up and comparison of Raychem tubing BPTM cleaning techniques
- UVR 8091 - Production-scale installation of Raychem tubing BBIT/BPTM
- UVR 8122 - Resistance of BBIT/BPTM to hydrofluoric acid
- UVR 8194 - Long term weathering and thermal ageing of Raychem BBIT and BPTM tubing

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Ordering information



Ordering description	Inside diameter (mm)		Wall thickness (mm)		UOM: roll of length (m)
	H min.	h max.	W nom.	w min.	
BPTM-15/6-A/U-4	15	6	1.1	1.90	30
BPTM-30/12-A/U-4	30	12	1.1	2.20	30
BPTM-50/20-A/U-4	50	20	1.1	2.35	30
BPTM-75/30-A/U-4	75	30	1.1	2.35	20
BPTM-100/40-A/U-4	100	40	1.1	2.35	25
BPTM-120/50-A/U-4	120	50	1.3	2.80	25
BPTM-175/70-A/U-4	175	70	1.3	2.80	15
BPTM-205/110-A/U-4	205	110	1.3	2.80	10
BPTM-235/130-A/U-4	235	130	1.5	3.10	20

Note: W, H = as supplied w, h = after free recovery. Maximum longitudinal change after free recovery: +5% -10%. Maximum eccentricity (as supplied): 40%, (after free recovery) 75/30 10% 100/40 15%. Fit the larger size of BPTM if two sizes fit the required application.

Installation instructions EPP 0618 5/96 and Material Safety Data Sheet available on request.