



Energy Division

# HVBT

## High Voltage Busbar Insulation Tape

Tyco Electronics' HVBT is a heat-shrinkable, adhesive-coated tape which provides insulation enhancement and protection against accidentally induced flashover. HVBT tape is designed to combine the integrity of a heat-shrinkable tubing with the versatility of a wraparound product.

HVBT tape is quick and easy to install. Upon application of heat the tape shrinks and the adhesive lining melts amalgamating the overlapping layers, to produce a complete lap to lap seal. A single layer of HVBT tape, two-thirds overlapped, will provide AC voltage withstand (flashover protection) to at least 17.5 kV increasing to 36 kV if a second layer is applied.

Although HVBT tape will adhere to itself and other insulating materials, it will not adhere to metal or porcelain, allowing easy removal for maintenance.

### Applications

HVBT tape offers a simple and effective solution to the problems of retrofit insulation of busbars, particularly where existing equipment cannot be dismantled. It can be used for indoor and outdoor applications and is easily installed over a wide variety of shapes, including complex connections.

### Clearance Reduction

The table below indicates the clearance reductions which are possible using HVBT tape. 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.

Rated Voltage (kV)	Phase-Phase (mm)	Phase-Ground (mm)	IEC 71-2 Air Clearance (mm)
<b>Round Busbars</b>			
12	55	65	120
17.5	70	85	160
24	95	125	220
36	150	205	320
<b>Rectangular Busbars</b>			
12	65	75	120
17.5	85	104	160
24	115	150	220
36	200	285	320

### Features and Benefits

- Compatible with all other products in the Raychem MV insulation enhancement system
- Easy to apply using readily available equipment
- Suitable for both indoor and outdoor use
- Excellent anti-tracking properties
- Continuous operating temperature up to 90°C
- Extremely versatile and flexible at temperatures as low as -40°C, the 30% shrink ratio enables coverage of almost any shape
- Good thermal emissivity and contact with busbars means no derating is required
- Manufactured from non-halogen based materials, reducing the toxic and corrosive effects in the event of fire
- Can be stored indefinitely at temperatures up to 50°C without loss of performance

# HVBT

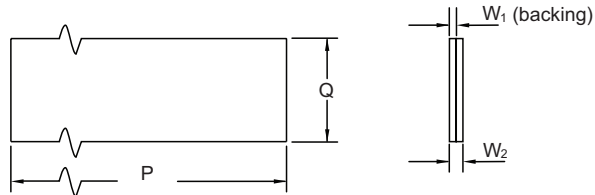
# High Voltage Busbar Insulation Tape

Key Product Specifications	Test Method	Requirement
Dielectric strength	ASTM D149, IEC 243	130 kV/cm min.
Accelerated aging	ISO 188, ASTM D2671	168 hrs@ 120°C
-Tensile strength		10 MPa min.
-Ultimate elongation		300% min.
Low Temperature Flexibility	ASTM D2671 Procedure C	No cracking after 4 hrs @ -40°C
Volume resistivity	ASTM D257, IEC 93	1 x 10 <sup>13</sup> Ohm cm min.
Smoke Index	NES 711	Less than 50
Acid gas generation	Raychem PPS 3010 4.23	Less than 3% by weight
Resistance to transformer oil	VDE 0370	168 hrs @ 23°C
-Tensile strength		10 MPa min.
-Ultimate elongation		300% min.

**Note:** For further product specification information see Raychem PPS 3010/33. The above information refers to backing material only.

## Product Selection: dimensions in inches (millimeters)

Rectangular Busbars Width	IEC Application Recommended Product	IEEE Applications	HVBT Length Needed/meter of Busbar	IEC Round Busbars Diameter	Application Recommended Product	IEEE Applications	HVBT Length Needed/meter of Busbar
1.0 (25)	HVBT-12-A	HVBT-1-R-01	33 (10.0)	.5 (12)	HVBT-12-A	HVBT-1-R-01	16.5 (5.0)
2.0 (50)	HVBT-14-A	HVBT-2-R-01	25 (7.6)	1.0 (25)	HVBT-14-A	HVBT-2-R-01	16.5 (5.0)
3.0 (75)	HVBT-14-A	HVBT-2-R-01	38 (11.4)	2.0 (50)	HVBT-14-A	HVBT-2-R-01	33 (10.0)
4.0 (100)	HVBT-14-A	HVBT-2-R-01	52 (15.6)	3.0 (75)	HVBT-14-A	HVBT-2-R-01	55 (16.7)
6.0 (150)	HVBT-14-A	HVBT-2-R-01	82 (25.0)	4.0 (100)	HVBT-16-A	HVBT-4-R-01	33 (10.0)
8.0 (200)	HVBT-16-A	HVBT-4-R-01	52 (15.6)				



## IEC Applications: dimensions millimeters

Ordering Description	Dimensions Q a min.	W <sub>1</sub> a min.	W <sub>1</sub> b min.	W <sub>2</sub> b min.	UOM : Roll of length, P (meters)
HVBT-12-A	25	0.38	0.56	0.86	10
HVBT-14-A	50	0.38	0.56	0.86	10
HVBT-15-A	75	0.38	0.56	0.86	10
HVBT-16-A	100	0.38	0.56	0.86	10

**NOTE:** a = as supplied | b = after free recovery

## IEEE Applications: dimensions inches

Ordering Description	Dimensions Q a min.	W <sub>1</sub> a min.	W <sub>1</sub> b min.	W <sub>2</sub> b min.	UOM : Roll of length, P (feet)
HVBT-1-R-01 (8)	1	0.14	.022	0.034	25
HVBT-2-R-01 (4)	2	0.14	.022	0.034	25
HVBT-4-R-01 (2)	4	0.14	.022	0.034	25

**NOTE:** a = as supplied | b = after free recovery

## Technical Report

EDR-5466—Qualification report for HVBT

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