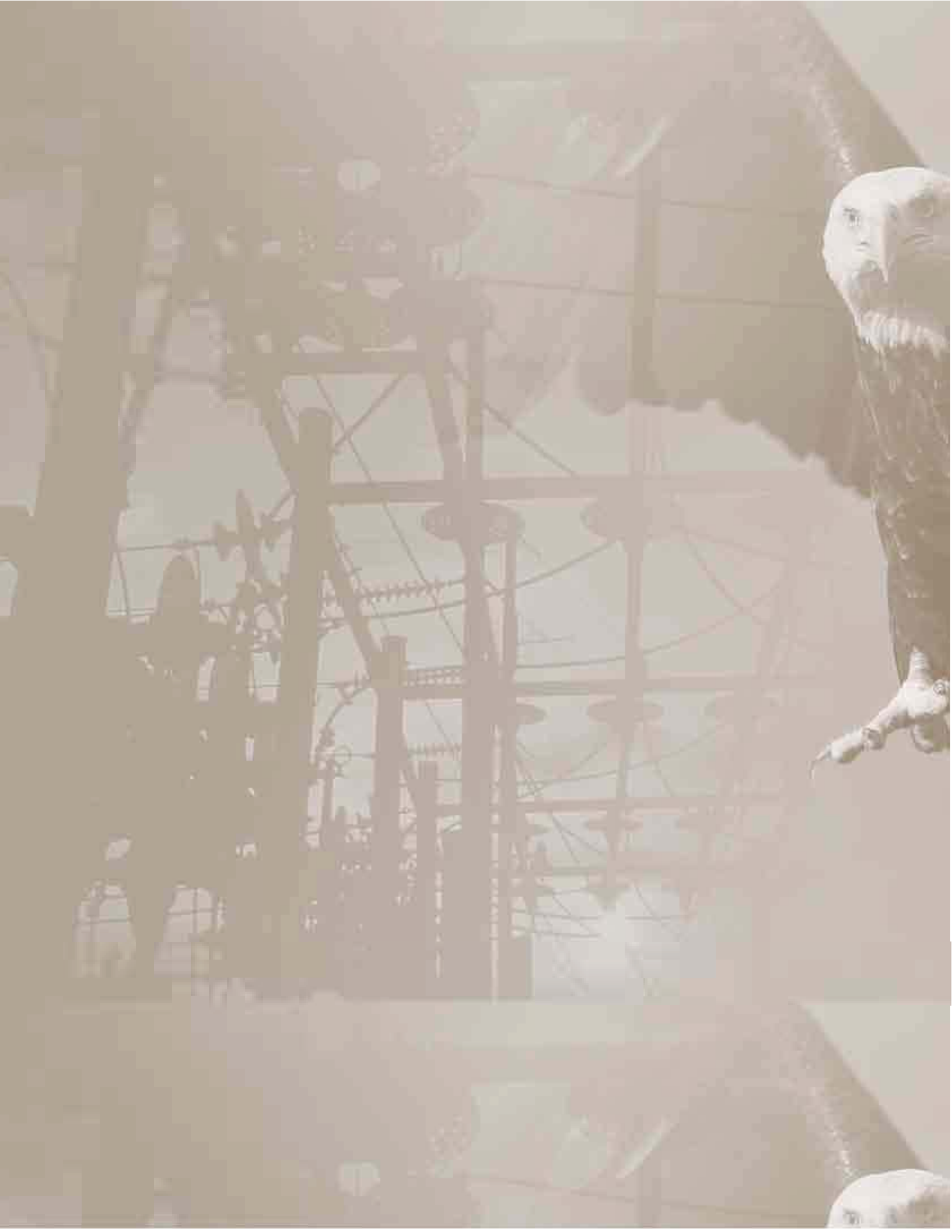
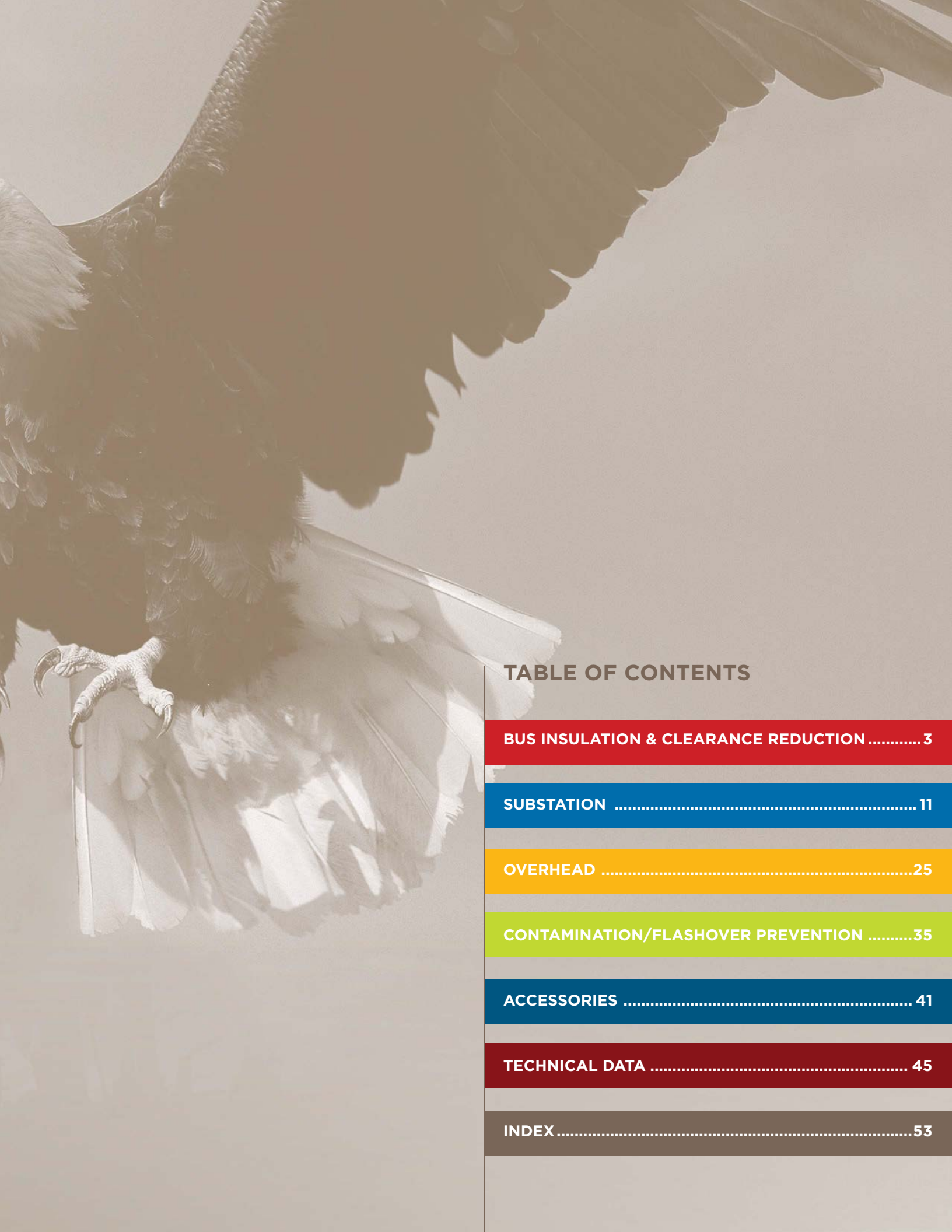




**Raysulate**  
Insulation, Asset & Wildlife Protection  
Selection Guide







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## HVBT

### High Voltage Busbar Insulating Tape (5-15 kV)\*




HVBT tape is an adhesive coated, high-voltage, heat-shrinkable, general-purpose tape for insulating straight and bent bars in retrofit applications where tubing cannot be used. In addition, HVBT easily insulates unusual connections and geometries in the factory or field.

HVBT tape is also ideal for protection against incidental/accidental bridging caused by birds and animals. HVBT may be suitable for higher voltage applications (see Ordering information #2 below). The HVBT adhesive layer fuses the tape layers but does not stick to bus or hardware, thus providing environmental sealing while allowing fast, easy removal.

HVBT tape may be used in applications up to 15 kV in accordance with ANSI/IEEE specifications and up to 36 kV in accordance with IEC specifications.

Rated to ANSI/IEEE C37.20-1987.

#### Selection Information: dimensions in inches/feet (millimeters/meters)

Bus Width	Recommended Product	Bus Length Insulated per Roll
 <b>Rectangular busbar</b>		
1 (25)	HVBT-1-R-01 (B8)	2.5 (0.7)
2 (50)	HVBT-2-R-01 (B4)	3.3 (1.0)
3 (75)	HVBT-2-R-01 (B4)	2.2 (0.6)
4 (100)	HVBT-2-R-01 (B4)	1.6 (0.5)
6 (150)	HVBT-2-R-01 (B4)	1.0 (0.3)
8 (200)	HVBT-4-R-01 (B2)	1.6 (0.5)
Maximum thickness: 5/8 inch (15 mm)		
 <b>Square busbar</b>		
1 x 1 (25)	HVBT-2-R-01 (B4)	4.0 (1.2)
2 x 2 (50)	HVBT-2-R-01 (B4)	2.0 (0.6)
3 x 3 (75)	HVBT-2-R-01 (B4)	1.3 (0.4)
4 x 4 (100)	HVBT-4-R-01 (B2)	2.0 (0.6)
6 x 6 (150)	HVBT-4-R-01 (B2)	1.3 (0.4)
 <b>Round busbar</b>		
0.5 (12)	HVBT-1-R-01 (B8)	5.0 (1.5)
1.0 (25)	HVBT-2-R-01 (B4)	5.0 (1.5)
2.0 (50)	HVBT-2-R-01 (B4)	2.5 (0.7)
3.0 (75)	HVBT-2-R-01 (B4)	1.5 (0.4)
4.0 (100)	HVBT-4-R-01 (B2)	2.5 (0.7)

#### Ordering/Application Information

- Select the appropriate catalog number for the application. Confirm selection with the following recommendations and HVBT tape dimensions:
  - HVBT-1-R is best for short lengths and small bus sizes.
  - HVBT-2-R is the most versatile width for general purpose use.
  - HVBT-4-R is useful for long lengths and larger bus sizes.
HVBT tape dimensions:

Catalog Number	Roll Width	Roll Length
HVBT-1-R-01 (B8)	1 inches	25 feet
HVBT-2-R-01 (B4)	2 inches	25 feet
HVBT-4-R-01 (B2)	4 inches	25 feet

- HVBT may be suitable for applications with higher voltage than those listed. Please contact your TE Connectivity representative for more information.
- To environmentally seal the bus, order S-1251-50-300-1 or S-1251-25-300-4 sealant strips separately.
- Recommended application is to wrap the tape around the busbar using a two-thirds overlap.
- Bolted connections require two layers of tape.
- Standard package:
  - HVBT-1-R: 8 rolls/box
  - HVBT-2-R: 4 rolls/box
  - HVBT-4-R: 2 rolls/box
- Continuous operating temperature: 90°C
- Related test reports: UVR-8023, EDR-5154



## BBIT/BPTM

### Busbar Insulating Tubing (5–35 kV)\*

#### BBIT (5–35 kV)

Heavy-wall tubing for use on straight or bent bars where maximum clearance reduction or 35 kV insulation is required.




#### BPTM (5–25 kV)

Medium-wall tubing for use on straight or bent bars where some clearance reduction or 25 kV insulation is required. These heat-shrinkable tubes for straight and bent busbars are extremely flexible, allowing them to be easily positioned on busbars and quickly installed using a gas torch or oven. They have a high expansion ratio, so each size of tubing fits a range of busbar sizes. Both BBIT and BPTM tubing are ideal for original equipment assembly, and for retrofit applications where access to one end is available.

BBIT and BPTM tubings are also ideal for protection against accidental bridging caused by birds and animals.

#### Selection Information: dimensions in inches (millimeters)

##### BBIT Tubing

	Busbar dimensions			
				
Catalog Number	Rectangular Bar** (bus width)	Square Bar (each side)	Round Bar (diameter min.-max.)	Diameter as Supplied and Fully Recovered
BBIT (5-35 kV)*				
BBIT-25/10-A/U	0.5 (12)		0.50-0.70 (12-18)	0.98-0.39 (25-10)
BBIT-40/16-A/U	1.0 (25)		0.70-1.10 (18-28)	1.57-0.63 (40-16)
BBIT-65/25-A/U	2.0 (50)	1.0 (25)	1.10-1.55 (28-40)	2.56-0.98 (65-25)
BBIT-100/40-A/U	3.0 (75)	2.0 (50)	1.75-2.45 (44-62)	3.94-1.57 (100-40)
BBIT-150/60-A/U	4.0 (100)	3.0 (75)	2.60-3.60 (66-91)	5.91-2.36 (150-60)
BBIT-175/80-A/U	5.0-6.0 (125-150)	4.0 (100)	3.45-4.75 (88-121)	6.89-3.15 (175-80)

	Rectangular Bar**		Square Bar		Round Bar		Diameter as Supplied and Fully Recovered
Catalog Number	5-15 kV	25 kV	5-15 kV	25 kV	5-15 kV	25 kV	
BPTM (5-25 kV)*							
BPTM-15/6-A/U	N/A	N/A	N/A	N/A	0.26-0.52 (7-13)	0.26-0.30 (7-8)	0.59-0.24 (15-6)
BPTM-30/12-A/U	.25-0.5 (12)		0.5 (12)	0.5 (12)	0.53-0.90 (14-23)	0.53-0.65 (14-16)	1.18-0.47 (30-12)
BPTM-50/20-A/U	1.0 (25)	1.0 (25)	1.0 (25)	N/A	0.90-1.35 (23-33)	0.90-1.10 (23-28)	1.97-0.79 (50-20)
BPTM-75/30-A/U	2.0 (50)	2.0 (50)	1.5 (38)	1.0 (25)	1.30-2.00 (33-51)	1.30-1.65 (33-42)	2.95-1.18 (75-30)
BPTM-100/40-A/U	3.0 (75)	3.0 (75)	2.0 (50)	1.5 (38)	1.75-2.75 (44-70)	1.75-2.30 (44-58)	3.94-1.57 (100-40)
BPTM-120/50-A/U	4.0-5.0 (100-127)	4.0 (100)	3.0 (75)	2.0 (50)	2.15-4.00 (55-102)	2.15-3.20 (55-81)	4.72-1.97 (120-50)
BPTM-175/70-A/U	6.0-7.0 (150-178)	5.0-6.0 (127-150)	4.0 (100)	3.0 (75)	3.20-5.50 (81-140)	3.20-4.40 (81-112)	6.88-2.75 (175-70)
BPTM-205/110-A/U	8.0 (200)	8.0 (200)	5.0 (127)	4.0 (100)	4.75-7.00 (120-178)	4.75-6.80 (120-174)	8.07-4.33 (205-110)
BPTM-235/130-A/U	12 (300)	10 (250)	6.0 (150)	6.0 (150)	5.70-8.45 (145-215)	5.70-8.07 (145-205)	9.25-5.12 (235-130)

#### Ordering/Application Information

- Select the appropriate catalog number. Confirm selection with bus dimensions.
- These products may be suitable for applications with higher voltages than those listed. Please contact your TE Connectivity representative for more information.
- Rectangular bus thickness range is 1/4 to 5/8 inch.
- Bolted connections require two layers of tubing or a fiber bolt pad.
- To environmentally seal the bus at each end of the BBIT tubing, order S-1251-50-300-1 or S-1251-25-300-4 sealant strip separately.
- Standard package:  
BBIT-25/10-A/U: 65'/box  
BBIT-40/16-A/U: 60'/box  
BBIT-65/25 A/U: 50'/box  
BBIT-100/40: 50'/box  
BBIT-150/60: 50'/box  
BBIT-175/80: 50'/box  
BPTM 235/132: 66'/box  
All other BPTM sizes: 50'/box  
*BBIT and BPTM are also available in bulk spooled quantities.*
- Related test reports:  
BBIT-UVR-8136  
UVR-8137  
BPTM-UVR-8019
- Minimum continuous length is 15 feet (4.5 meters).





## HVIS

### High Voltage Busbar Insulating Sheet (5-15 kV)\*

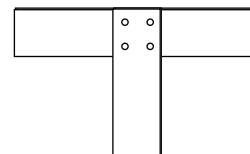
HVIS is an adhesive coated, heat-shrinkable sheet that shrinks in two directions to tightly conform to complex shapes. It is ideal for insulating busbar tees, elbows, and other connections where tubing or tape cannot be used. HVIS may also be used in conjunction with Raysulate electrical insulating tapes and tubings or alone to help protect against accidental bridging caused by birds and animals.

Rated to ANSI/IEEE C37.20-1987.

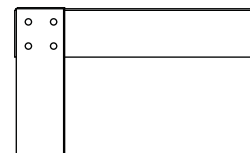
#### Selection Information: dimensions in inches/feet (millimeters/meters)

Catalog Number	Width	Length	Packaging
HVIS-05-(B3) NS	26 (660)	20 (508)	Sheet
HVIS-10-(B1) NS	26 (660)	33 ft (10m)	Roll

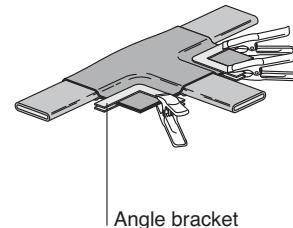
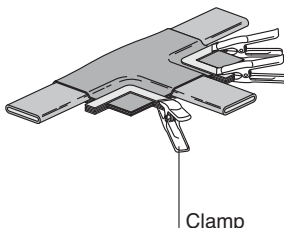
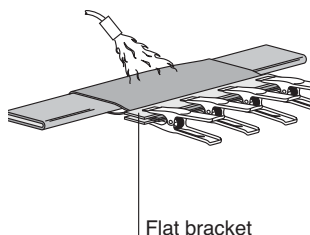
Bus Width	Cut Size Needed	Number of Installations HVIS-05 Sheet	Per Sheet/Roll HVIS-10 Roll
<b>T Connection</b>			
1 (25)	11 x 9 (275 x 225)	4	88
2 (50)	13 x 10 (325 x 250)	4	78
3 (75)	16 x 11 (400 x 275)	2	48
4 (100)	18 x 13 (450 x 325)	2	44
6 (150)	22 x 17 (550 x 425)	1	23



<b>Elbow Connection</b>			
1 (25)	11 x 7 (275 x 175)	4	112
2 (50)	13 x 9 (325 x 225)	4	88
3 (75)	15 x 10 (375 x 250)	2	52
4 (100)	18 x 11 (450 x 275)	2	44
6 (150)	22 x 13 (550 x 325)	1	36



Catalog Number	Description	Std. Pack
<b>Sheet (HVIS) Accessories</b>		
HVIS-Flat (B12)	36" flat bracket for clamping HVIS on straight runs	12 ea.
HVIS-Angle (B12)	Angle brackets for clamping HVIS at 90° angles	12 ea.
HVIS-Clamp (B25)	Spring clamps to hold brackets on HVIS.	25 ea.



#### Ordering/Application Information

- Select the appropriate catalog number. Confirm selection with dimensions.
- Busbars are assumed to be insulated to within 1 inch of the joint. Cut size should extend a minimum of 4 inches onto each leg of the joint before shrinking.
- The above table should be used as a guide only; experiment to confirm final cut size. Table is based on 5/8-inch bus thickness.
- To environmentally seal each leg of the bus, order S-1251-50-300-1 or S-1251-25-300-4 sealant strips separately.
- HVIS may be rated for applications up to 35 kV. Please contact your TE Connectivity representative for more information.
- Standard package:  
HVIS-05: 3 sheets/box  
HVIS-10: 1 roll/box
- Related test report: EDR-5175



## RRBB Interphase Insulating Barrier Board

RRBB board is a non-structural, interphase barrier for switchgear applications. The RRBB board is made from a homogeneous polymer and has excellent track resistance, especially following a power-arc. Easily fabricated into a shape, it produces less nuisance dust and less tooling wear than other boards.

### Applications

RRBB barriers protect switchgear cabinets against interphase flashovers that can be caused by contaminants, moisture and animals.

- Excellent tracking resistant properties provide longevity not found in typical polymers
- UV properties of the barrier boards are suitable for outdoor applications
- Extremely durable barrier boards resist damage from solvents, mechanical impact and general wear and tear
- Machining properties allow it to be cut and drilled for mounting without requiring special safety equipment
- Innovative cross-linking polymer withstands power-arcs without compromising its physical shape
- High temperature resistant material can be wiped clean after power-arc events resulting in no visible effects or surface damage

### Selection Information: dimensions in inches (millimeters)

Catalog Number	Width	Length	Thickness
RRBB-6-1.25Mx1.25M-(B3)	48 (1220)	48 (1220)	0.250 (6)
RRBB-2440/1220-6.2-BP	48 (1220)	96 (2440)	0.250 (6)

### Product Information

Related Test Report: EDR-5311



## HVBC High Voltage Cable-to-Bus Insulation (5–15 kV)

The HVBC kit contains heat-shrinkable insulating tubing and sealant strips for insulating and environmentally sealing high-voltage in-line cable-to-busbar connections. For multiple cable connections, the kit also contains a heat-shrinkable sealing boot. The kit greatly simplifies field installation and eliminates the labor and skill needed for tape-and-putty methods.

When HVBC kits are used with TE's high voltage terminations, the diameter build-up over the cable is minimal. This increases working space in cramped areas and allows up to four cable connections. HVBC may be used in applications up to 15 kV in accordance with ANSI/IEEE specifications, and up to 36 kV in accordance with IEC applications. Rated to ANSI/IEEE C37.20-1987.

### Selection Information: dimensions in inches (millimeters)

Catalog Number	Bus Width: 2–4 inches	Bus Width: 5–6 inches	Number of Cables	Cable Size Range (Min.–Max.)
HVBC-41		HVBC-61	1	#4–1000 kcmil
HVBC-42		HVBC-62	2	#4–1000 kcmil
HVBC-43		HVBC-63	3	#4–1000 kcmil
HVBC-44		HVBC-64	4	#4–1000 kcmil

Accessory	Description
BP-46	Bolt Pad

### Ordering/Application Information

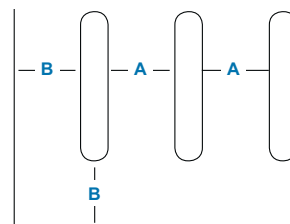
1. Select the appropriate catalog number. Confirm selection with dimensions. One HVBC kit insulates one phase of an in-line cable-to-bus connection.
  - Maximum bolt length: 2 inches
  - Maximum busbar thickness: 5/8 inch
  - Maximum bare bus length: 9 inches
2. BBIT tubing, BPTM tubing, or HVBT tape, can be used to insulate the exposed busbar before installing the HVBC products.
3. Shielded cable must be terminated before installing the HVBC products; use TE's HVT terminations.
4. Standard package: 3 kits/box
5. Related test report: EDR-5103

## Busbar Insulation Technical Data

This table indicates clearance differences for rectangular busbars without and with various Raysulate electrical insulation products. These spacings are derived from BIL, AC-withstand, DC-withstand, and discharge-extinction tests on a limited number of busbar configurations insulated with Raysulate electrical insulation products.

Due to the wide range of possible busbar geometries, these spacings should not be adopted without actual testing by the user. Sharp electrodes and unusual geometries will require wider spacings.

*Note: Phase-to-phase distances are reduced more than phase-to-ground distances because it is assumed that each phase is insulated.*



### Selection Information: dimensions in inches (millimeters)

System Voltage kV	BIL kV	Uninsulated Clearance (Indoor)		BBIT Clearance (Indoor)		BPTM, HVBT, and HVIS Clearance (Indoor)	
		A*	B**	A*	B**	A*	B**
15	95	7.5 (190)	5.0 (125)	2.2 (55)	2.6 (65)	3.4 (85)	4.2 (105)
25	125	10.5 (265)	7.5 (190)	2.8 (70)	4.0 (100)	4.5 (115)	6.0 (150)
35	150	12.5 (320)	9.5 (240)	5.6 (140)	7.5 (190)	6.5 (165)	8.0 (200)

\* Phase-to-phase

\*\* Phase-to-ground

### Recommended Guide Specification

Please Feel Free To Use The Following in Your Design Specification:

Insulation for energized bus components and connections shall consist of tubing, tape, and sheets that are factory-engineered to meet applicable switchgear performance requirements.

All insulation components shall be fabricated from flexible, crosslinked, heat-shrinkable polymeric materials formulated to provide high dielectric strength, adequate thermal endurance at bus operating temperatures, and tracking and erosion resistance.

The insulation materials shall contain no halogen compounds and be compatible with other commercial, factory-installed bus insulation materials.

Materials shall be installable at temperatures as low as -40°F. Adhesive coatings on tape and sheet products shall not adhere to metal surfaces, thus permitting easy re-entry to the connections.

The insulation supplier shall furnish technical data to document design and performance to these requirements and functional testing of the complete insulation system in accordance with ANSI/IEEE C37.20.



**BISG | BISG-24**

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**BISG-60/115-02**  
installed on switch

## BISG

### Bus Isolation Squirrel Guard

This isolation guard prevents animal-caused outages in electrical sub-station equipment.

#### Reliable outage prevention

BISG discs have been successfully eliminating outages caused by squirrels, raccoons, opossums, cats, and other animals in substations for years. The guards are designed to allow for excellent visibility of switch blades and other components through the guard while providing mechanical resistance to power arcs and high winds.

#### High performance material

Superior high voltage outdoor materials are used in the BISG guard design. The rugged, track resistant, UV-stable polymer ensures long-term performance even in the most extreme environmental conditions. Available in red or gray material.

#### Faster, easier installation

The BISG-24 guard can be installed on energized equipment by one person. The new design incorporates a wedge device which makes hot-stick installations on vertical and horizontal mounted insulators quick and easy.

#### Expanded size range

The BISG guard family fits insulator core diameters ranging from 1" (25 mm) through 5.0" (125 mm) from the factory. The "grill" type design allows easy field modifications for even larger diameters (see your local TE representative for details).

The BISG guard can also have its outside diameter reduced by trimming along the grill ribs. This will allow the guard to fit in tight phase-to-phase insulator applications.



**BISG-24** energized install



**BISG-60/115-02** installed on bus support insulator

#### Selection Information: dimensions in inches (millimeters)

<b>BISG</b>	<b>Insulator Core Diameter Range</b>	<b>Overall Product Diameter</b>	<b>Color</b>	<b>Installation</b>
<b>Catalog Number</b>				
BISG-60/115-02 (B10)	1.0-4.5 (25-115)	24	Red	De-energized
BISG-60/115-03-HOT (B10)	1.0-4.5 (25-115)	24	Red	Two stick (energized)
BISG-G-60/115-02 (B10)	1.0-4.5 (25-115)	24	Gray	De-energized
BISG-G-60/115-03-HOT (B10)	1.0-4.5 (25-115)	24	Gray	Two stick (energized)

<b>BISG-24</b>	<b>Insulator Core Diameter Range</b>	<b>Overall Product Diameter*</b>	<b>Color</b>	<b>Installation</b>
<b>Catalog Number</b>				
BISG-24-01 (B10)	2.5-5.0 (62-125)	24	Red	One stick (energized)
BISG-G-24-01 (B10)	2.5-5.0 (62-125)	24	Gray	One stick (energized)

\*Overall product diameter can be trimmed down to 16" diameter

#### Ordering/Application Information

- Standard package: 10 BISG-60/115-02 | 10 BISG-24-01 assemblies per box.  
(One BISG will install on one insulator).
- Related test report: EDR-5310, EDR-5517-Bus Insulator Squirrel Guard (BISG-24-01).



## BCAC Bushing Connection Animal Cover

These insulating covers are designed to prevent animal caused outages on bushings ranging from 15 to 35 kV. They fit a wide range of bushing sizes and are suitable for substation and distribution applications.

### Reliable Outage Protection

TE's insulating covers have been successfully eliminating outages from all types of animals for years. These covers have been designed to provide the same great protection with enhanced features.

### Fast and Versatile Installation

These BCACs are fast and easy to install. No trimming is required and they fit a wide range of bushing skirt diameters (see chart below). If needed, they can be installed on energized equipment as well. The feathered edges of these covers allow for conductor exits in both vertical and horizontal directions. These same edges act as thermal scan sites for true temperature evaluation of the covered hardware.

### High Performance Material

Superior high-voltage outdoor materials are used in the BCAC cover design. The rugged, non-tracking, UV-resistant polymer ensures long-term performance even in the most extreme environmental conditions.

BCAC-5D/8

### Selection Information: dimensions in inches (millimeters)

Catalog Number	Max. Shed Diameter	Cover Height	Color
BCAC-5D/8 (B12)	4.8 (122)	8.0 (203)	Red
BCAC-7D/10 (B6)	6.8 (172)	10.5 (266)	Red
BCAC-8D/14 (B6)	8.0 (203)	14.0 (355)	Red
BCAC-G-5D/8 (B12)	4.8 (122)	8.0 (203)	Gray
BCAC-G-7D/10 (B6)	6.8 (172)	10.5 (266)	Gray
BCAC-G-8D/14 (B6)	8.0 (203)	14.0 (355)	Gray

### Ordering/Application Information

- Standard package: 12 or 6 units per box, depending on size of cover. (One BCAC will install on one insulator.)
- Related test reports: EDR-5339, UVR-8209



BCAC-8D/14

### Selection Information: dimensions in inches (millimeters)

Catalog Number	Max. Shed Diameter	Cover Height	Color
BCAC-BYPASS-01 (B6)	6.8 (172)	10.6 (266)	Red
BCAC-BYPASS-02 (B6)	8.0 (203)	14.0 (355)	Red

The BCAC covers are also kitted for voltage regulator applications. The kit includes two bushing covers and a center arrester cover.



BCAC-BYPASS



## BCAC-IC Bushing Connection Inspection Substation Cover

This insulating cover is designed to prevent animal caused outages on breaker and transformer bushings ranging from 15 to 35 kV.

### Fast and Versatile Installation

The cover is easily installed around bushings and connections by wrapping the double hinged design around the insulator's top skirt and snapping it in place with a robust latching mechanism. The cover allows conductors to exit from both the top and side interfaces without the need to trim the cover. The design allows for visible inspections of oil fill levels on transformer bushings as well.

### High Performance Material

Superior high voltage outdoor materials are used in the BCAC cover design. The rugged, non-tracking, UV resistant, high temperature polymer ensures long-term performance even in the most extreme environmental conditions.

#### BCAC-IC-8D/18

#### Selection Information: dimensions in inches (millimeters)

Catalog Number	Std. Pack	Color	Insulator Core Range	Insulator Shed Range	Cover Size
BCAC-IC-7D/12 (B6)	6	Red	3.0-4.87 (76-124)	3.75-7.00 (95-178)	7.00 (178) dia, 12 (305) ht
BCAC-IC-8D/18 (B6)	6	Red	3.5-6.25 (90-160)	4.00-8.00 (100-200)	8.00 (200) dia, 18 (455) ht
BCAC-G-IC-7D/12 (B6)	6	Gray	3.0-4.87 (76-124)	3.75-7.00 (95-178)	7.00 (178) dia, 12 (305) ht
BCAC-G-IC-8D/18 (B6)	6	Gray	3.5-6.25 (90-160)	4.00-8.00 (100-200)	8.00 (200) dia, 18 (455) ht

#### Ordering/Application Information

1. Related test reports: EDR-5514, UVR-8209



BCAC-IC Installed on Bushings

The BCAC-IC covers are also kitted for voltage regulator applications. The kit includes two bushing covers and a center arrester cover.

#### Selection Information: dimensions in inches (millimeters)

Catalog Number	Max. Shed Diameter	Cover Height	Color
BCAC-IC-BYPASS-01 (B1)	7.0 (178)	12.00 (305)	Red



## BCIC Bus Connection Insulating Covers

BCIC covers are designed to protect energized conductors or busbars from flashovers due to contact from birds, squirrels and other wildlife. BCIC parts are made from a UV stable, track resistant, high performance TE Connectivity material to ensure years of reliable service.

A variety of different shapes and sizes are available to cover circuit breaker bushings, bus standoff insulators, capacitors, transformer bushings, voltage regulators, potential transformers and more.

Installation can be made quickly in the field by trimming the entry and exit holes to the required dimensions. The BCIC covers can be re-entered for other maintenance needs and then reused, thus lowering overall lifetime costs.


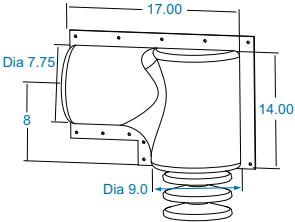
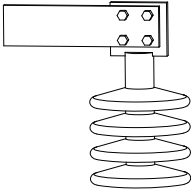

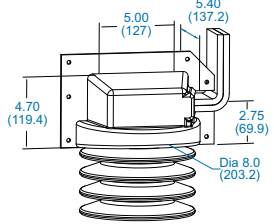
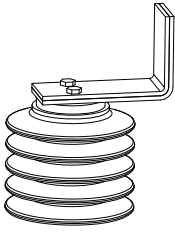
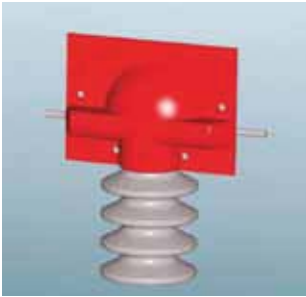
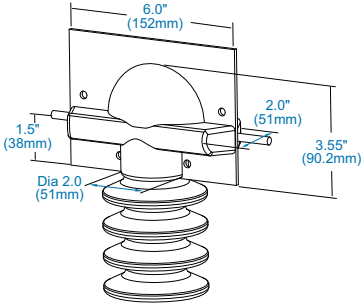
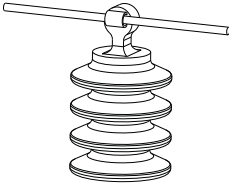

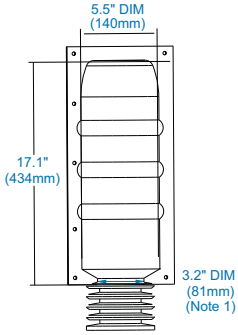
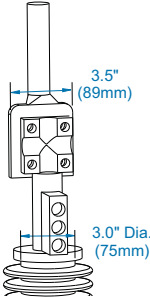
### Selection Information: dimensions in inches (millimeters)

Bushing Covers	Installed Product	Hardware Configuration
<b>BCIC-4411 (B3)</b>	Note: 4" (100mm) Bottom Port Opening	Uses 13 BCIC Latches
<b>BCIC-SG-101-H2 (B3)</b>	Note: Bottom and Top Opening	Uses 5 BCIC Latches
<b>BCIC-9D/19-3 (B3)</b>		Uses 11 BCIC Latches




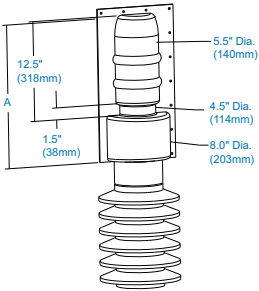
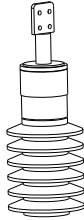

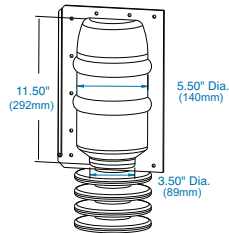
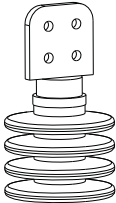

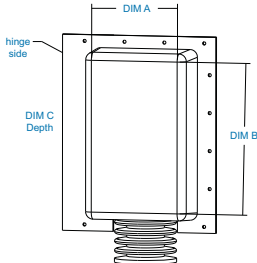
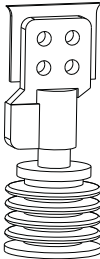
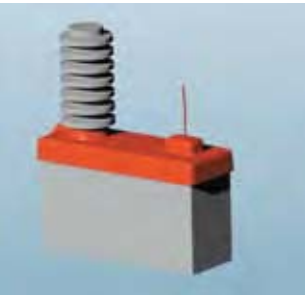
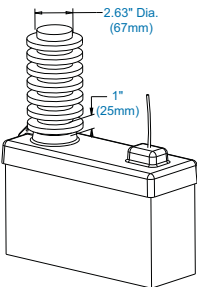
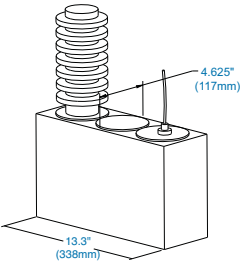
BCIC Bushing Covers continues

Selection Information: dimensions in inches (millimeters)

Bushing Covers	Installed Product	Hardware Configuration
		
<b>BCIC-10D/18-3 (B3)</b>		Uses 11 BCIC Latches
		
<b>BCIC-8D/6-3 (B3)</b>		Uses 6 BCIC Latches
		
<b>BCIC-3D/6-3 (B3)</b>		Uses 4 BCIC Latches
		
<b>BCIC-5.5D/16-HO (B3)</b>		Uses 7 BCIC Latches

BCIC Bushing Covers continues


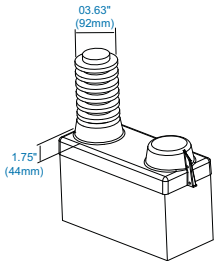

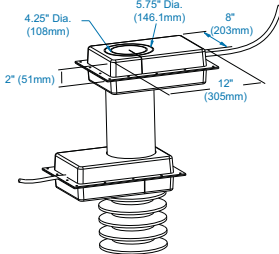

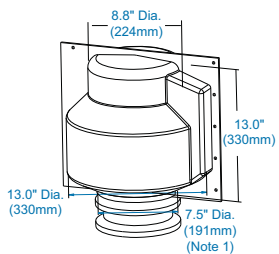

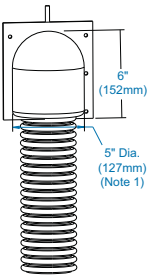
Selection Information: dimensions in inches (millimeters)

Bushing Covers	Installed Product	Hardware Configuration
		
<b>BCIC-8D/15H0 (B3)</b> <b>BCIC-8D/18-H0 (B3)</b>	Dim. A = 16.2 (411) Dim. A = 19.2 (488)	Uses 10 BCIC Latches
		
<b>BCIC-5.5D/11 (B3)</b>	Bushing Range Dia. 2-3.5 Note: No Opening	Uses 9 BCIC Latches
		
	<b>Dim A</b> <b>Dim B</b> <b>Dim C</b>	
BCIC-12/12/5-H (B3)	12 (305)    12 (305)    5 (127)	Uses 12 BCIC Latches
BCIC-14/19/6-U (B3)	14 (356)    19 (483)    6 (152)	Uses 16 BCIC Latches
BCIC-24/11/12-U (B3)	11 (279)    24 (610)    12 (304)	Uses 16 BCIC Latches
BCIC-4/12/4-H (B3)	4 (102)    12 (305)    4 (102)	Uses 12 BCIC Latches
BCIC-7/12/7-H (B3)	7 (178)    12 (305)    7 (178)	Uses 12 BCIC Latches
BCIC-4/16/4-H (B3)	4 (102)    16 (406)    4 (102)	Uses 12 BCIC Latches
Note: Must be field cut.		
		
<b>BCIC-0270-SCE (B3)</b>	Note: Single Bushing Capacitor Cover	Uses 2 BCIC Latches



BCIC Bushing Covers continues

**Selection Information: dimensions in inches (millimeters)**

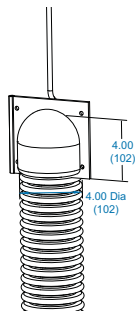
Bushing Covers	Installed Product	Hardware Configuration
		
<b>BCIC-0370-SCE (B3)</b>	Note: Single Bushing Capacitor Cover	Uses 2 BCIC Latches
		
<b>BCIC-8/12/2 (B3)</b>	Note: Field trimmed part	
		
<b>BCIC-13D/13-H0 (B3)</b>	Note: No Opening Must Be Field Cut	Uses 10 BCIC Latches
		
<b>BCIC-5D/6 (B3)</b>	Note: No Opening Must Be Field Cut	Uses 5 BCIC Latches

Selection Information: dimensions in inches (millimeters)

Bushing Covers

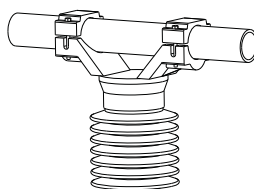
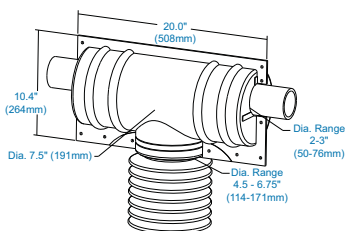
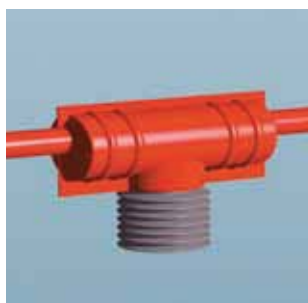
Installed Product

Hardware Configuration



BCIC-4D/4 (B3)

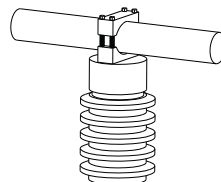
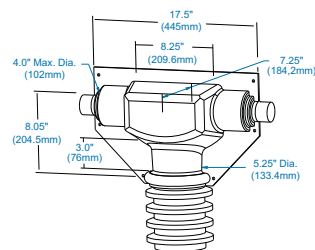
Uses 5 BCIC Latches



BCIC-7.5D/18-3 (B3)

Bus Bar Dia. 2-3 (50-75)  
Angle Bus Double 3 (75)

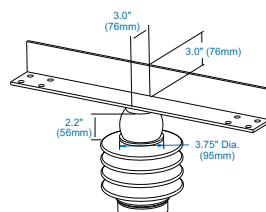
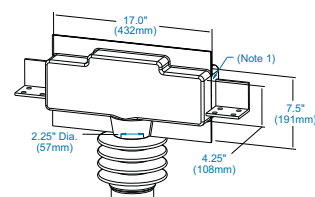
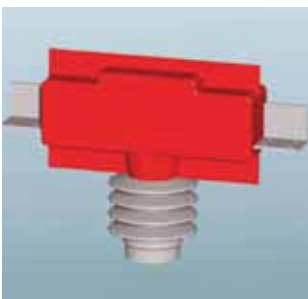
Uses 8 BCIC Latches



BCIC-SG-201 (B3)

Max. Bus Bar Dia. 4 (100)

Uses 10 BCIC Latches



BCIC-TR205-L (B3)

Note: No Opening  
Must Be Field Cut

Uses 10 BCIC Latches

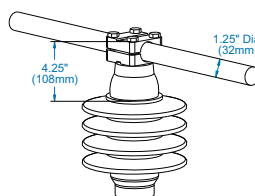
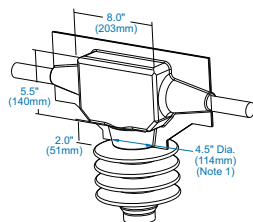
BCIC Bushing Covers continues

**Selection Information: dimensions in inches (millimeters)**

**Bushing Covers**

**Installed Product**

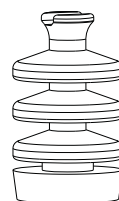
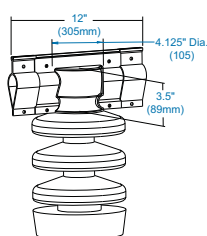
**Hardware Configuration**



**BCIC-TR205-R (B3)**

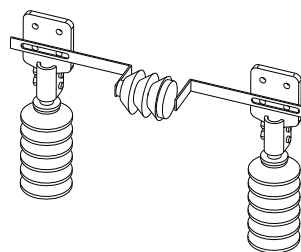
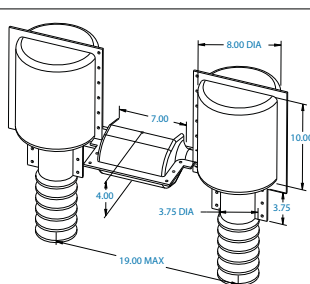
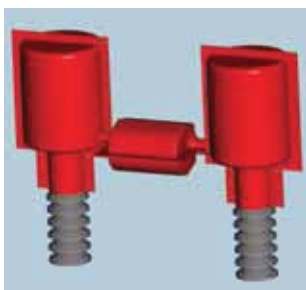
Note: 4.5 (114) Dia.  
Bottom Port Opening

Uses 10 BCIC Latches



**BCIC-3212-01 (B3)**

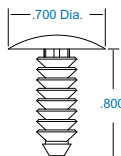
Note: Bottom Port Has Opening      Uses 8 BCIC Latches



**BCIC-BYPASS (B1)**

Note: 3.75 (95) Dia.  
Bottom Port Opening

Uses 60-8" Long Tywraps



**BCIC-LATCH (B250)**

Std. Pack = 250 Latches or 1000 Latches



**MVFT**  
**Medium Voltage Fusion Tape**

Medium Voltage Fusion Tape (MVFT) is a self amalgamating tape that provides insulation enhancement and protection against accidentally induced discharge. MVFT tape is designed to combine the integrity of a silicone polymer with the versatility of a wraparound product.

**Fast and Versatile Installation**

MVFT tape is quick and easy to install. Upon application the tape amalgamates the over-lapped layers together, producing a complete seal. A single layer of MVFT tape, two-thirds overlapped, will provide AC voltage withstand (flashover protection) to at least 15 kV increasing to 35 kV if a second layer is applied. Although MVFT tape will stick to itself and other insulating materials, it will not adhere to metal or porcelain allowing easy removal for maintenance.

**Features**

MVFT tape is compatible with all other products in the Raysulate MV Insulation enhancement system. This fusion tape is suitable for both Indoor and outdoor use. MVFT tape exhibits non-tracking properties and possesses a continuous operating temperature up to 90°C.

**Applications**

MVFT 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.

**Selection Information: dimensions in inches (millimeters)**

Catalog Number	Color	Width UOM: Inches (mm)	Supplied Length UOM: Yards (M)	Std. Pack
MVFT-G-2-12(B4)	Gray	2 (50)	12 (11)	4 Rolls

**Product Information**

EDR-5465 Medium Voltage Fusion Tape Qualification Report



## MVCC

### Medium Voltage Conductor Covers for Outage Prevention

Medium Voltage Conductor Covers (MVCC) provide high quality electrical insulation for substation leads and jumpers. These covers are made from a non-tracking silicone material that is suitable for harsh medium voltage outdoor environments. MVCC covers are split for easy installation. The MVCC's flexibility allows installation on tight bends which makes it ideal for substation applications. These covers are designed to protect energized conductors from flashovers due to contact from birds and animals. The Medium Voltage Conductor Cover is suitable for applications up to 25 kV phase to ground. They are currently available in four sizes that will fit conductors with diameters ranging up to 1.75 inch.

#### Selection Information: dimensions in inches/feet (millimeters/meters)

Catalog Number	Conductor Diameter Use Range UOM: inches (mm)	Color	Supplied Length UOM: feet (M)
MVCC-10/.40 (B100)	up to .450 (11)	Red	2 pieces @ 50 (15.24)
MVCC-G-10/.40 (B100)	up to .450 (11)	Gray	2 pieces @ 50 (15.24)
MVCC-19/0.750 (B50)	.50-.75 (12-19)	Red	2 pieces @ 25 (7.6)
MVCC-G-19/0.750 (B50)	.50-.75 (12-19)	Gray	1 piece @ 25 (7.6)
MVCC-25/1.0 (B25)	.75-1.125 (19-28)	Red	1 piece @ 25 (7.6)
MVCC-G-25/1.0 (B25)	.75-1.125 (19-28)	Gray	6 pieces @ 4 (1.2)
MVCC-45/1.75 x 4 (B24)	1.125-1.75 (28-44)	Red	6 pieces @ 4 (1.2)
MVCC-G-45/1.75 x4 (B24)	1.125-1.75 (28-44)	Gray	6 pieces @ 4 (1.2)

#### Product Information

Related Test Report: EDR-5461 Medium Voltage Conductor Cover Electrical Testing







### BCIC

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BCIC-G-HZ-795-01

## BCIC Raptor Protection Cover

These hot-stickable insulating covers are designed to prevent raptor caused outages on medium voltage distribution lines. This family of products fits a variety of polymeric and porcelain insulator configurations— including pin type insulators, horizontal post insulators and dead end insulators.

### Reliable Outage Protection

TE's insulating covers have been successfully eliminating outages from all types of animals for years. These covers have been designed to provide the same great protection with enhanced features.

### Fast and Versatile Installation

These BCIC Raptor protection covers use a patented bimaterial design to allow for hot-stick installations. The main covers and extension arms are built with rigid clips to provide a reliable mechanical hold. Up to 10 feet of coverage on conductor sizes ranging from #2 to 795 can be achieved when one cover and two arms are installed together. The arms are designed to nest over vibration dampers. The flexible covers allow conductors to exit at up to 30 degree angles from any axis.

### High Performance Material

Superior high voltage outdoor materials are used in the BCAC cover design. The rugged, track resistant, UV resistant polymer ensures long-term performance even in the most extreme environmental conditions.

#### Selection Information: dimensions in inches

Catalog Number	Application	Conductor Range	Cover Length	Insulator Type/ ANSI	Std. Pack
BCIC-G-PIN-556-01 (B6)	Porcelain PIN	#6-556	42	55-2, 55-3, 55-4, 55-5	6
BCIC-G-SMPIN-795-01 (B6)	Porcelain PIN	#6-795	42	55-2, 55-3, 55-4, 55-5	6
BCIC-G-PIN-795-01 (B6)	Porcelain PIN	#6-795	32	55-5, 55-6, 55-7, 56-1, 56-2, 56-3	6
BCIC-G-DPIN-795-01 (B6)	Double Porcelain PIN	#6-795	41	55-5, 55-6, 55-7, 56-1, 56-2, 56-3	6
BCIC-G-DPIN-556-01 (B6)	Double Porcelain PIN	#6-556	42	55-2, 55-3, 55-4, 55-5	6
BCIC-G-DSMPIN-795-01 (B6)	Double Porcelain PIN	#6-795	42	55-5, 55-6, 55-7, 56-1, 56-2, 56-3	6
BCIC-G-HZ-795-01 (B6)	Horizontal Post	#6-795	29	Polymeric	6
BCIC-G-HZPOR/3.5D-795-01 (B6)	Horizontal Post	#6-795	29	Porcelain >35kV	6
BCIC-G-HZPOR/4.5D-795-01 (B6)	Horizontal Post	#6-795	29	Porcelain 25 to 35kV	6
BCIC-G-PIN-556/55-01 (B6)	Line Post	#6-556	55	Polymeric	6
BCIC-G-POR-228-795-01 (B6)	Line Post	#6-795	55	Porcelain 7-9 inch diameter	6
BCIC-G-DE/CL-01(B6)	Dead End	#6-795	27	Conductor	6
BCIC-G-ARM-48-01 (B12)	Extension ARM	#6-795	48	Conductor	12
BCIC-G-ARM-24-01 (B12)	Extension ARM	#6-795	24	Conductor	12

#### Product Information

Related Test Report: EDR-5369 Raptor Protection Cover (BCIC-795) Mechanical/Electrical Evaluation  
 EDR-5311 Rigid Red Barrier Board Qualification  
 EDR-5314 EMMAQUA Testing of BCIS



BCIC-G-PIN-795-01



**BCAC-G-5D/8-01**  
**BCAC-G-AR-5D-2**



**BCAC-G-4D/13-2**

## BCAC | BCIC

### Distribution Covers for Animal Protection

These insulating covers are designed to prevent raptor caused outages on distribution equipment ranging from 15 to 35 kV. Covers are available for terminations, reclosures, lightning arresters, and fuse cutouts.

#### Transformer Bushing

The BCAC-4D/13-2 covers a wide variety of termination sizes. The cover is easily installed on top of the first termination skirt. No trimming is required and the cover fits terminations ranging in size from #1 to 750 kcmil. Extensive testing has ensured that the cover will not damage or deteriorate the terminations.

#### Fast and Versatile Installation

These BCACs are fast and easy to install. No trimming is required and they fit a wide range of bushing skirt diameters. If needed, they can be installed on energized equipment as well. The feathered edges of these covers allow for conductor exits in both vertical and horizontal directions. These same edges act as thermal scan sites for true temperature evaluation of the covered hardware.

#### Lightning Arresters

Distribution surge arrester caps protect against unwanted animal and bird outages. The unique design covers the first skirt which improves the level of protection. The cap is easily installed and attaches to both the stud and the conductor so that it will stay secure even in high winds. Three different covers are available.

#### Fuse Cutouts

The BCAC-G-CUTOUT hot-stickable insulating cover is designed to protect fused cutout switch applications up to 25 kV. The unique omega shaped attachment area easily clips onto the cutout insulator between the first and second skirt. The insulated conductor is captured securely as well to ensure retention even in high winds. Two different covers are available for 100 and 200 amp applications.

#### High Performance Material

Superior high voltage outdoor materials are used in all of these BCAC cover designs. The rugged, track resistant, UV resistant polymer ensures long-term performance even in the most extreme environmental conditions.



**BCAC-G-CUTOUT-100-01**

#### Selection Information: dimensions in inches (millimeters)

Catalog Number	Hardware
BCAC-G-4D/13-2 (B18)	Terminations
BCAC-G-5D/8-01 (B12)	Transformer Bushing
BCAC-G-AR-5D-2 (B24)	Ohio Brass Arrester
BCAC-G-AR-4D-2 (B24)	TE Arrester
BCAC-G-AR-3.75D-2 (B24)	Cooper Arrester
BCAC-G-CUTOUT-100-01 (B12)	Fuse Cutout Switch (100 AMP) Porcelain Style
BCAC-G-CUTOUT-200 (B3)	Fuse Cutout Switch (200 AMP) Porcelain Style

All products available in red



## BCIC Recloser Covers

Insulating covers are designed to prevent animal electrocution and related outages on reclosers operating from 15 kV to 35 kV. There are numerous cover designs available to fit a wide variety of reclosers. TE also offers tubing and line hose to insulate leads as well as BCAC covers to protect lightning arresters on recloser units.

### Fast and Versatile Installation

The one piece hinged design is easily and quickly installed around the top skirts and secured using the supplied push pins to ensure years of reliable service. The cover can be re-entered for maintenance needs and then reused, thus lowering overall lifetime costs.

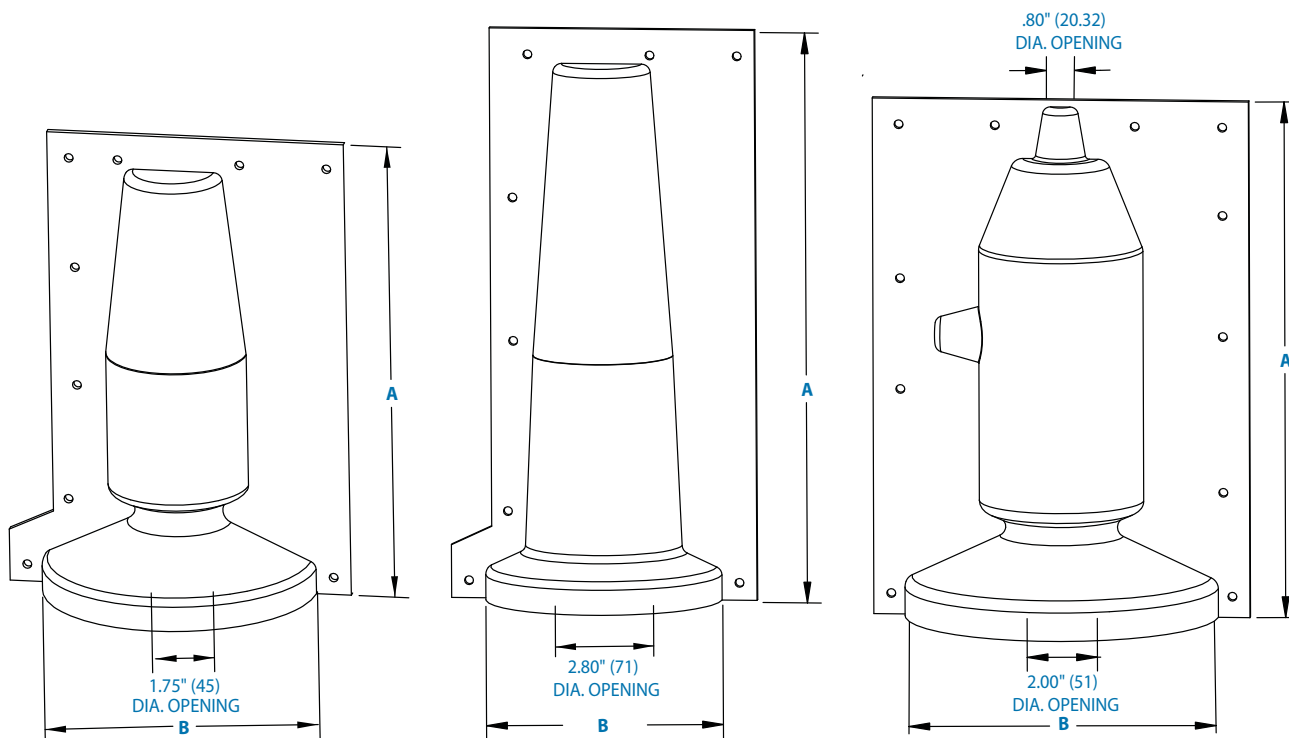
### Selection Information: dimensions in inches (millimeters)

Catalog Number	Height (A)	Max. Skirt (B)	Fits Recloser Type
BCIC-G-Reclosercover (B6)	12.4 (315)	7.8 (198)	Cooper
BCIC-G-Recloser-100 (B6)	15.4 (390)	6.75 (171)	ABB
BCIC-G-Recloser-200 (B6)	14.5 (368)	8.5 (216)	Siemens

Note: Specialty kits are also available that include BPTM and MVCC.  
Available in red or gray.

### Product Information

Related Test Report: EDR-5369 Raptor Protection Cover (BCIC-795) Mechanical/Electrical Evaluation  
EDR-5311 Rigid Red Qualification  
EDR-5314 EMMAQUA Testing of BCIS



BCIC-RecloserCover (B6)  
BCIC-G-RecloserCover (B6)

BCIC-Recloser-100 (B6)  
BCIC-G-Recloser-100 (B6)

BCIC-G-Recloser-200 (B6)





## MVLC

### Medium Voltage Line Cover (5-25 kV)

The MVLC cover is a cold-applied wrap-around cover that provides retrofit insulation for overhead conductors to help prevent electrical outages caused by incidental contact from tree branches or wildlife. The MVLC cover may be applied selectively on problem spans to avoid costly conductor replacement. Installation is possible on energized lines utilizing the MVLC tool which attaches directly to the overhead conductor and remains stationary in a single location. The tool may be manually or automatically operated, using a gasoline powered drill. The tool forms, closes, and feeds the MVLC cover along the conductor with speed and consistency. The MVLC hand tool allows for quick installation on short lengths of conductors, especially in substations.

#### Selection Information: dimensions in inches (millimeters)

Product Size	Conductor Size	Max. Conductor Dia.	Voltage Class
<b>Covers for overhead conductors</b>			
MVLC-14-A/U-C-100	#6-3/0kcmil	0.5 (12.7)	15 kV
MVLC-14-A/241-C-100	#6-3/0kcmil	0.5 (12.7)	25 kV
MVLC-18-A/U-C-75	#2-397kcmil	.75 (18)	15 kV
MVLC-18-A/241-C-75	#2-397kcmil	.75 (18)	25 kV (sealing mastic in receptacle)
MVLC-38-A/U-C-50	477-1590kcmil	1.5 (38)	15 kV
MVLC-38-A/241-C-50	477-1590kcmil	1.5 (38)	25 kV (sealing mastic in receptacle)

#### Installation Tools for overhead conductors

MVLC-14-TOOL-100	for use with MVLC-14	15-25 kV
MVLC-18-TOOL-03-2006	for use with MVLC-18	15-25 kV
MVLC-38-TOOL-03-2006	for use with MVLC-38	15-25 kV
MVLC-Hydraul-Drill	non-impact hydraulic drill	

#### Covers & Installation Tools for substation use

MVLC-14-1830/U (B18)	package of 18 six foot lengths for 15 kV use
MVLC-14-1830/241 (B18)	package of 18 six foot lengths for 25 kV use
MVLC-18-1830/U (B18)	package of 18 six foot lengths for 15 kV use
MVLC-18-A/241-1830 (B18)	package of 18 six foot lengths for 25 kV use
MVLC-38-A/U-1830 (B18)	package of 18 six foot lengths for 15 kV use
MVLC 38-A/241-1830 (B18)	package of 18 six foot lengths for 25 kV use
MVLC-HAND-TOOL-14	hand tool for installing MVLC-14
MVLC-HAND-TOOL-02	hand tool for installing MVLC-18 and 38

#### Ordering/Application Information

- OLIC-C, MVLC-38-SPLICE-COVER, and S-1251 mastic can be used to cover splices.
- Overhead Conductors: standard package for MVLC-14 is 330 feet (100m) continuous on a spool. Standard package for MVLC-18 is 247 feet (75 m) continuous on a spool. Standard package for MVLC-38 is 165 feet (50 m) continuous on a spool.
- Please contact TE Connectivity for use on 35 kV and other sizes.
- Related Test Reports: EDR-5308, EDR-5309, EDR-5316
- MVLC TOOL contains the MVLC installation tool, MVLC cutters, drainage hole punch, hand crank, and a drive nut socket packaged in a protective bag.
- MVLC can be installed at temperatures above 0°C (32°F).



## Product Performance

Test	MVLC-A/U / MVLC-A/241 (Sealed)
AC withstand (dry)-1 minute	15 kV min. / 25 kV min.
AC withstand (wet)-1 minute	15 kV min. / 25 kV min.
AC long term withstand (dry)-4 hours	8.6 kV min. / 14.4 kV min.
30 day thermal loading (8 hr @ 130°C; 16 hr off)	No MVLC deformation
Conductor ampacity	82-89% of bare conductor ampacity

Material Properties Per pps 3010/42		Test Method	Requirement
Physical	Tensile Strength	ASTM D638	8 MPa min. 1150 psi min.
	Ultimate Elongation	ASTM D638	200% min.
	Abrasion Resistance	1000 cycles, 2068g	20% max. thickness loss
	Low Temperature Impact	ASTM D746	No cracking at -20°C
Electrical	Dielectric Strength	ASTM D149	217 kV/cm @ 1.27 mm 550 V/mil min @ 0.050"
	Tracking and Erosion	ASTM D2303	No tracking or erosion
	Resistance	Step Voltage Method (Initiate @ 2.5 kV)	to top surface or flame failure after: 200 minutes



Installation Tool for  
Overhead Conductors



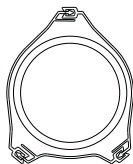
MVLC-HAND-TOOL-14



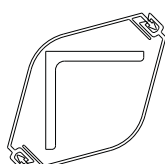
MVLC-HAND-TOOL-02

## For Busbar Applications:

2"	use 1-MVLC-38 and 1-MVLC-18
2.5" L	use 2-MVLC-38
3"	use 2-MVLC-38
4"	use 2-MVLC-38 and 1-MVLC-18



4" busbar with 2-MVLC-38  
1-MVLC-18

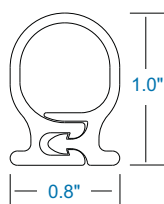


2.5" L busbar with 2-MVLC-38

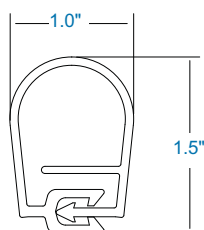


2 Pieces: MVLC-38 on busbar  
with BCIC

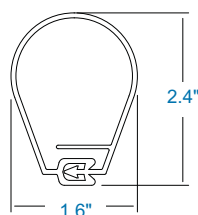
## Nominal Dimensions



MVLC-14



MVLC-18



MVLC-38



**BCIC-115-PH**  
**Transmission Flashover Protection Cover**

The BCIC-115-PH insulating cover provides protection from raptor induced flashovers on 115 kV transmission lines. Cover is made out of the same thick BCIS material and can be used on both porcelain disc and polymeric insulator designs. The seven foot long body and bolt locking system can be used on energized or de-energized installations. Unique design allows the cover to rest on the lowest insulator for porcelain I string designs. In polymeric designs, the cover rests on a bolted collar on top of the lowest portion of the insulator string. The collar is made from robust BCIS material. The superior high-voltage material is made from a rugged, non-tracking, UV-resistant, high temperature polymer ensuring long-term performance even in the most extreme environmental conditions.

**Selection Information: dimensions in inches (millimeters)**

Catalog Number	Part Number	Length	Height	Insulator Range	Applications
BCIC-115-PH (B1)	111371-000	74 (1879.6)	15 (381)	9-12 (229-305)	Main Cover
BCIC-Collar-50/280-5-BP	471716-000	—	—	—	Adapter collar for polymeric installations

**Porcelain Applications**









<b>HVCE</b>	
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<b>RRGS</b>	
Guano Shield .....	40





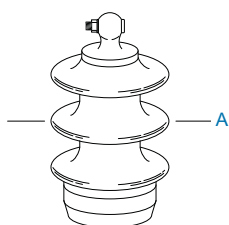


## HVCE

### High Voltage Creepage Extenders

Heat-shrinkable creepage extenders help to increase the flashover performance of insulators by reducing the surface electrical stress and leakage current and increasing the electric strength of the insulators. The extenders are designed to be resistant to conventional spray washing techniques and will withstand most normal handling, abuse, and extreme weather conditions.

#### Selection Information: dimensions in inches (millimeters)



Catalog Number	Skirt Diameter of Insulator (Min.-Max.) A	Minimum Internal Diameter of HVCE (as supplied)	Nominal Creepage Extension Per Extender (in.)	Std. Pack (pcs/box)
HVCE 100/80-01 (B6)	3.20-3.90 (81-99)	4.50 (114)	4	6
HVCE 120/100-01 (B6)	3.90-4.70 (99-119)	5.30 (135)	4	6
HVCE 140/120-01 (B6)	4.70-5.50 (119-140)	6.10 (155)	4	6
HVCE 160/140-01 (B6)	5.50-6.30 (140-160)	7.00 (178)	4	6
HVCE 183/161-01 (B6)	6.30-7.20 (160-183)	8.00 (203)	4	6
HVCE 205/184-01 (B6)	7.20-8.10 (183-206)	9.00 (229)	4	6
HVCE 226/206-11 (B6)	8.10-8.90 (206-226)	9.40 (239)	4	3
HVCE 247/227-11 (B6)	8.90-9.70 (226-246)	10.30 (262)	4	3
HVCE 268/248-11 (B6)	9.70-10.50 (246-267)	11.10 (282)	4	3
HVCE 289/269-11 (B6)	10.50-11.40 (267-290)	11.90 (302)	4	3
HVCE 310/290-11 (B6)	11.40-12.20 (290-310)	12.70 (323)	4	3
HVCE 331/311-11 (B6)	12.20-13.00 (310-330)	13.60 (345)	4	3
HVCE 352/332-11 (B6)	13.00-13.90 (330-353)	14.40 (366)	4	3
HVCE 373/353-11 (B6)	13.90-14.70 (353-373)	15.20 (386)	4	3
HVCE 394/374-11 (B6)	14.70-15.50 (373-393)	16.10 (409)	4	3

#### Ordering/Application Information

1. Select the appropriate catalog number. Confirm selection with insulator skirt outer diameter (A).
2. Each HVCE extender adds a nominal 4 inches to the creepage length. As a general recommendation, TE advises a 20 percent increase in existing creepage distance. Use this formula to calculate the number of creepage extenders needed: Existing creepage distance in inches  $\times 0.2 \div 4$  = Minimum number of HVCE creepage extenders recommended (i.e., 40 inches creepage  $\times 0.2 \div 4$  = 2 HVCEs needed). Always round up to a whole number (i.e., 1.33 to 2 HVCE's).
3. For applications that do not fall within the ranges above, contact your local TE representative.
4. HVCE does not upgrade the voltage class of the insulator.
5. Related test reports:  
 UVR-8138  
 UVR-8144  
 UVR-8037  
 EDR-5350

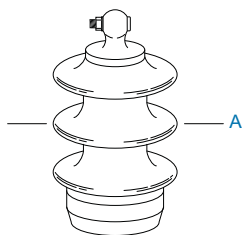
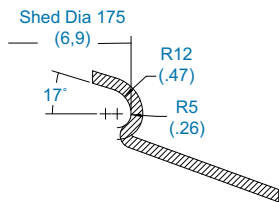


Diagram B



#### Ordering/Application Information

- Each HVCE-WA Extender adds nominal 6 inches to the creepage length. As a general recommendation, TE advises a 20 percent increase in existing creepage distance. Use this formula to calculate the number of creepage extenders needed: Existing creepage distance in inches  $\times 0.2 \div 6$  = Minimum number of HVCE creepage extenders recommended. (i.e.,  $60" \times .2 \div 6 = 2$  HVCE-WAs needed). Always round up to a whole number (i.e.,  $1.33 = 2$  HVCE's needed).
- For applications that do not fall within the ranges above, contact your TE representative.
- HVCE does not upgrade the voltage class of the insulator.
- Related test reports: UVR-8152, EDR-5350  
Related Installation Instructions: HVCE-WA
- Installation Tool: HVCE-WA-TOOL

## HVCE-WA High Voltage Wraparound Creepage Extenders

High Voltage Wraparound Creepage Extenders (HVCE-WA) are designed for use in highly contaminated environments. In order to select the appropriate size of HVCE, an insulator or section of an insulator must be obtained. Then measure accurately the dimensions of the shed diameter and outside profile of the shed at its farthest point. This can be done by breaking a piece of porcelain off of the insulator or by using a profile gauge. The vital measurements needed to select a creepage extender are shown below. The illustration (Diagram B) shows an example of a typical cross section of an HVCE with the dimensions representing that of the insulator profile.

#### Selection Information: dimensions in inches (millimeters)

Catalog Number	Shed Diameter of Insulator A	Std Pk
HVCE-WA-175-02-FT (B6)	6.90 (175)	6
HVCE-WA-206-01 (B6)	8.11 (206)	6
HVCE-WA-216-01 (B6)	8.50 (216)	6
HVCE-WA-221-01 (B6)	8.70 (221)	6
HVCE-WA-226-01 (B6)	8.90 (226)	6
HVCE-WA-227-01 (B6)	8.94 (227)	6
HVCE-WA-234-01 (B6)	9.21 (234)	6
HVCE-WA-244-01-FT (B6)	9.61 (244)	6
HVCE-WA-248-01 (B6)	9.76 (248)	6
HVCE-WA-251-01 (B6)	9.88 (251)	6
HVCE-WA-255-01 (B6)	10.04 (255)	6
HVCE-WA-267-01 (B6)	10.51 (267)	6
HVCE-WA-271-01 (B6)	10.67 (271)	6
HVCE-WA-280-01 (B6)	11.02 (280)	6
HVCE-WA-281-01 (B6)	11.06 (281)	6
HVCE-WA-287-01 (B6)	11.30 (287)	6
HVCE-WA-292-01 (B6)	11.50 (292)	6
HVCE-WA-303-01 (B6)	11.93 (303)	6
HVCE-WA-323-01 (B6)	12.72 (323)	6
HVCE-WA-326-01 (B6)	12.83 (326)	6
HVCE-WA-330-01 (B6)	13.00 (330)	3
HVCE-WA-336-01 (B6)	13.23 (336)	6
HVCE-WA-341-01 (B6)	13.39 (341)	6
HVCE-WA-348-01 (B6)	13.70 (348)	6
HVCE-WA-349-01 (B6)	13.74 (349)	6
HVCE-WA-356-01 (B6)	14.02 (356)	6
HVCE-WA-359-01 (B6)	14.13 (359)	3
HVCE-WA-364-01 (B6)	14.33 (364)	6
HVCE-WA-367-01 (B6)	14.45 (367)	6
HVCE-WA-372-01 (B6)	14.65 (372)	6
HVCE-WA-373-01 (B6)	14.68 (373)	6
HVCE-WA-377-01 (B6)	14.84 (377)	6
HVCE-WA-381-01 (B6)	15.00 (381)	6
HVCE-WA-392-01 (B6)	14.53 (392)	6
HVCE-WA-393-01 (B6)	15.47 (393)	6
HVCE-WA-406-01 (B6)	15.98 (406)	6
HVCE-WA-407-01 (B6)	15.98 (407)	6
HVCE-WA-413-01 (B6)	16.26 (413)	6
HVCE-WA-421-01 (B6)	16.54 (421)	6
HVCE-WA-426-01 (B6)	16.77 (426)	6
HVCE-WA-429-01 (B6)	16.89 (429)	6
HVCE-WA-440-01 (B6)	17.32 (440)	6
HVCE-WA-442-01 (B6)	17.40 (442)	6
HVCE-WA-452-01 (B6)	17.60 (452)	6
HVCE-WA-457-01 (B6)	18.00 (457)	6
HVCE-WA-463-01 (B6)	18.23 (463)	6
HVCE-WA-482-01 (B6)	16.98 (482)	3
HVCE-WA-488-01 (B6)	19.21 (488)	6
HVCE-WA-490-01 (B6)	19.29 (490)	6
HVCE-WA-501-01 (B6)	19.72 (501)	6
HVCE-WA-528-01 (B6)	20.79 (528)	3
HVCE-WA-551-01 (B6)	21.69 (551)	3
HVCE-WA-584-01 (B6)	22.99 (584)	3
HVCE-WA-611-01 (B6)	24.05 (611)	6



## HVBS

### High Voltage Booster Shed

The Booster Shed is a loose fitting collar made from Raysulate anti-tracking polymer which is spaced from the porcelain skirt by short pegs and from the insulator core by spacers. Booster sheds prevent "heavy wetting" flashover by breaking up the water cascades from skirt to skirt. Booster sheds have also been proven to prevent ice-cascade-induced flashovers.

#### Feature and Benefits

- Wraparound installation speeds installation time since the connections don't need to be disconnected
- Superior UV resistance
- Anti-tracking material

#### Applications

- Circuit breaker bushings
- Bus support insulators
- Surge arresters
- Transformer bushings

#### Selection Information: dimensions in inches (millimeters)

Catalog Number	Suitable Insulator Core	Medium Outside Insulator Skirt	Booster Shed Diameter Fully Installed
HVBS-770/310-01-M-BP	8.9 - 10.1 (227 - 257)	12.0 (304)	28.1 (713)
HVBS-740/280-01-M-BP	7.8 - 9.0 (199 - 229)	10.9 (276)	27.0 (685)
HVBS-710/250-01-M-BP	6.9 - 7.9 (175 - 201)	9.8 (249)	25.9 (657)
HVBS-685/225-01-M-BP	6.2 - 7.0 (158 - 178)	9.3 (235)	25.0 (634)
HVBS-665/205-01-M-BP	5.5 - 6.3 (140 - 160)	8.5 (216)	24.3 (616)
HVBS-615/155-01-M-BP	3.7 - 4.5 (94 - 114)	6.3 (161)	22.4 (569)

#### Product Information

Related Test Report: UVR-8107 Qualification report for Booster Sheds



**RRGS**  
**Polymeric and Porcelain Rigid Red Guano Shield**

The rigid red guano shield protects against bird streamer caused outages. There are designs to fit both porcelain bells and polymeric insulators. This two piece shield attaches easily with plastic bolts and nuts around the top of the insulator and provides protection from fecal contaminates coming from above the insulator string. For porcelain applications there are 18 inch and 24 inch diameter shield designs. For polymeric applications the shield has an 18 inch diameter.

**Selection Information: dimensions in inches**

Catalog Number	Insulator Type	Shield Diameter
RRGS-35/470-FT (B12)	Polymeric	18
RRGS-35/600-FT (B12)	Polymeric	24
RRGS-35/470-M (B12)	Porcelain	18
RRGS-35/600-M(B12)	Porcelain	24

*Also available in gray.*



**Polymeric RRGs Shield**



**Porcelain RRGs Shield**





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## Torches

*These clean-burning, efficient, heat-shrinking torches are recommended for shrinking high and low voltage products.*

### Selection information

#### Primus-Sievert Siever-Matic Torch Materials



##### FH-3366-97-PS-HANDLE

- Siever-Matic S auto ignite, auto shut-off torch handle
- Ergonomic design ensures comfortable operation
- Adjustable output
- Piezo ignition



##### FH-AD-3061-23-PS-REGULATOR

- Works with torch handle FH-3366-97-PS-HANDLE above
- Adjustable from 14-57psi
- Fitting POL, UNF 9/16 inch LH
- Requires torch hose AD-1432 or AD-1434



##### FH-AD-3347-91-PS-BURN-1

- Works with torch handle FH-3366-97-PS-HANDLE above
- Recommended especially for low voltage and general purpose products
- Tip diameter 1.0 inch 20,000BTU/hour



##### FH-AD-3341-91-PS-BURN1.5

- Works with torch handle FH-3366-97-PS-HANDLE above
- Recommended especially for low voltage products and high voltage terminations and splices
- Tip diameter 1.5 inch 40,000BTU/hour



##### FH-AD-3348-91-PS-BURN-2

- Works with torch handle FH-3366-97-PS-HANDLE above
- Recommended especially for Raysulate products
- Tip diameter 2.0 inch 90,000BTU/hour



#### Bullfinch Torch Materials

##### FH-2629-TORCH ASSY

- Built-in ignitor recommended for all products
- General purpose, heavy-duty propane torch with comfortable grip
- Provides a clean burning flame for shrinking high voltage products or thick-wall low voltage products.
- Output: Approximately 30,000 BTU/Hour

##### FH-2629-ELECTRODE

- Replacement ignitor for FH-2629 torch

## Torch Accessories

### AD-1358-LPG-REGW/GAGE

- Propane tank regulator with gauge (0–30 psi)
- Can also be used with Primus-Sievert or BullFinch products

### AD-1432-ACD10FT-LPG-HOSE

- 10-foot LPG hose

### AD-1434-ACD30FT-LPG-HOSE

- 30-foot LPG hose

### AD-1460-ACD-HEAT-SHLDGPA

- 12 x 40 pad woven of heat-resistant fabric with corner grommets
- Protects adjacent components from torch heat during installation of heat-shrinkable products in confined areas

### AD-1563-ADAPTER

- Valve to standard hose
- For use with FH-2618A-1 propane torch if disposable cylinders are not used

### AD-3015-04

- Adapts Siever-Matic S FH-2649-PS-KIT or FH2629 for use with disposable 14.1 oz propane cylinders
- Includes 4-foot hose and regulator preset at 28 psi

## Torch Kits

### FH-2618A-1

- Light, portable propane torch for installing low voltage products and smaller, conductor-sized, high-voltage (up to 15 kV) accessories
- Includes hose, handle assembly, and regulator for disposable propane cylinder
- Operates from disposable 14.1 oz. propane cylinders
- Output: Approximately 20,000 BTU/hour
- Handle and torch head not available separately
- Regulator and hose assembly is product AD-3015-04

### FH-2629-Kit

- Includes (AD-1432) 10 foot hose, (AD-1358) adjustable regulator, and (FH-2629-TORCH-ASSY) torch handle and tip

### FH-2640-PS-KIT

- Primus-Sievert torch kit for use with disposable propane bottles
- Includes (FH-3366-97-PS-HANDLE, FH-AD-3341-91-PS-BURN1.5, & AD-3015-04)

### FH-2649-PS-KIT

- Seiver-Matic S auto ignite, auto shut-off torch system
- Recommended especially for Raysulate products and can be used with all products
- Includes ergonomic handle, 30 foot hose, adjustable regulator, and large burner (3348-91); all in a canvas carrying bag
- Output: Approximately 90,000 BTU/hour
- Smaller burner and adapter for disposable bottles available. Includes: FH-3366-97-PS-HANDLE, FH-AD-3348-91-PS-BURN-2, FH-AD-3061-13-PS-REGULAT, AD-1434-ACD30FT-LPG-HOSE, and a carrying bag



## BUSBAR & WILDLIFE PROTECTION

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The Raysulate electrical insulation family of products offers easy-to-install busbar insulation systems for both the field engineer and the manufacturer. Raysulate electrical insulation products provide flashover protection against the accidental bridging of conductors commonly caused by birds and animals.

The system is ideal for both enclosed and exposed bus work and for connections in switchgear lineups, substations, and other electrical apparatus. It also permits clearance reduction in many applications.

#### **Excellent Electrical and Thermal Performance**

Raysulate electrical insulation products are manufactured from high dielectric strength, radiation-crosslinked, heat-shrinkable materials. The high-voltage materials are specially formulated to provide high resistance to arcing and tracking. All high-voltage and low-voltage materials provide high-thermal endurance throughout the range of switchgear operating temperatures. They offer field-proven reliability and long service life in harsh environments. In addition, these heat-shrink tubing, tape, and sheet products can be preformed and preshrunk in the customer's shop, allowing easy, quick installation in the field.

#### **Compatibility with Other Insulating Materials**

All Raysulate heat-shrinkable electrical insulation products are compatible with other solid switchgear insulating materials. Raysulate electrical insulating materials are not subject to stress crazing or embrittlement and are not adversely affected by common plasticizers used in conventional switchgear insulating materials.

#### **Flame-retardant Materials**

Most Raysulate heat-shrinkable electrical insulating materials pass the ANSI C37.20 switchgear insulation flammability tests.

#### **Reduced Corrosive and Toxic Fumes**

Raysulate electrical insulation materials contain no chlorine compounds. This minimizes noxious and corrosive effects in case of equipment fault or fire.



HVBC Bus Connection Kit

#### For Protection, Repair, and Maintenance

Raysulate heat-shrinkable electrical insulating tubes, tapes, and sheets provide a complete system for electrical repair and maintenance of enclosed or exposed buswork and for connections in switch-gear and electrical equipment. They offer:

- Fast, easy installation and removal
- A flexible system to cover most conductor shapes and sizes
- Consistent, reliable installation
- Consistent electrical and thermal performance
- Proven corrosion protection
- Compatibility with conventional solid insulating materials
- Protection against flashovers

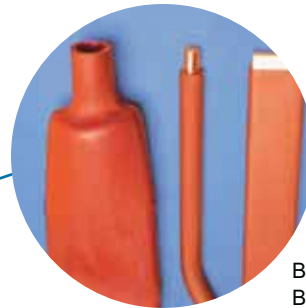
#### For the Electrical Equipment Manufacturers

The Raysulate system of insulation-enhancement components addresses the needs of electrical equipment manufacturers. The superior material properties and versatility of these components enhance the quality and reliability of the final product. Raysulate electrical insulating materials feature:

- Low-hazard formulation
- Flexibility
- Track resistance
- Rugged, easy installation
- Excellent electrical and thermal performance
- Unlimited shelf life
- Corrosion protection of conductor
- TE Connectivity assistance and support for testing and applications



HVIS Bus Insulation Sheet



BBIT/BPTM  
Bus Insulation Tubing



HVBT Bus Insulation Tape







MVLC-18-A/U Overhead  
Line Cover

#### For Outdoor Equipment

Raysulate electrical insulation products provide a complete system of insulation enhancement for high-voltage busbars and related equipment in outdoor substations and overhead lines. The system offers:

- Easy installation in the field
- Insulation for many different shapes, including busbars, joints, tees, insulators/bushing connections
- Flashover protection against accidental bridging
- Protection of wildlife and from wildlife-induced outages
- Excellent UV and weathering resistance
- Protection against corrosion
- Protection against incidental tree branch contact



MVCC



HVCE



BCAC-IC-8D/18 Bushing Cover



BCAC-G-AR-5D/2  
Lighting Arrester Cover



BISG-24

Medium-Voltage Products\*

Test and Performance Data

Material Properties	Test Method	Requirements	BBIT BPTM	BCIC HVIS	BCAC, HVCE-WA, HVBt, OLIT	HVCE	MVLC	BISG RRBB
<b>Electrical</b>								
Volume resistivity	ASTM D-257, IEC 93	ohm-cm min.	1.0x10 <sup>13</sup>	1.0x10 <sup>13</sup>	1.0x10 <sup>13</sup>	1.0x10 <sup>13</sup>	1x10 <sup>13</sup>	1x10 <sup>13</sup>
Dielectric constant	ASTM D-150, IEC 250	maximum	5.0	5.0	5.0	5.0	5.0	5.0
Dielectric strength	ASTM D-149, IEC 243	V/mil at 1.3mm min. V/mil at 1.5mm min. V/mil at 2mm min. V/mil at 2.5mm min. V/mil at 3mm min.	500 450 400 350	330	330	250	550	380
<b>Thermal</b>								
Thermal endurance	IEEE 1-1969, IEC 216	minimum	105°C	105°C	105°C**	110°C	105°C	
Accelerated aging for 168 hours	ISO 188	Tensile strength Ultimate elongation Aging Temp.	1450 psi 300% 120°C	1450 psi 300% 120°C	1450 psi. 300% 120°C	1100 psi 300% 120°C	1450 psi 100% 150°C	2450 psi 25% 120°C
<b>Chemical</b>								
Flammability	ANSI C37.20	Pass	Pass	Pass	Pass			
Water absorption	ISO/R 62, procedure A	1% max. after 14 days at 23°C	Pass	Pass	Pass	Pass	Pass	Pass
Low-temperature flexibility	ASTM D-2671, procedure C	No cracking after 4 hr	Pass -40°C	Pass -40°C	Pass -40°C	Pass -40°C	Pass -20°C	Pass -40°C
Corrosion	Copper Mirror, ASTM D-2671, procedure B	Passed visual inspection after 16 hr		Pass 150°C	Pass 150°C		Pass 135°C	
<b>Physical</b>								
Tensile strength	ASTM D-638, ISO 37	psi. (min.)	1450<4 mm, 1150>4 mm	1450	1450	1150	1450	2450
Ultimate elongation	ASTM D-638, ISO 37	% minimum	300	300	300	300	200	25

Note: Blank spaces indicate that property was not measured during product qualification.

\*Each product's voltage rating will be displayed with its selection information.

\*\*Properties measured on backing material only. HVBt and OLIT have a 90°C maximum continuous operating temperature limit.















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