



Energy Division

Insulation, Asset & Wildlife Protection Selection Guide



BUS Insulation & Wildlife Protection

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Bus Insulation & Wildlife Protection



HVBT
Raysulate High Voltage Busbar Insulating Tape (5-15 kV)*

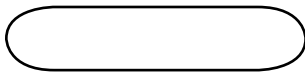
HVBT tape is an adhesive coated, high-voltage, heat-shrinkable general-purpose tape for insulating straight and bent bars in retrofit applications where tubing cannot be used. In addition, HVBT easily insulates unusual connections and geometries in the factory or field.

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.

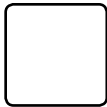
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Selection Information: dimensions in inches (millimeters)

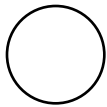


Bus Width	Recommended Product	Bus Length Insulated per Roll
Rectangular busbar		
1 (25)	HVBT-1-R	2.5 ft (0.7 m)
2 (50)	HVBT-2-R	3.3 ft (1.0 m)
3 (75)	HVBT-2-R	2.2 ft (0.6 m)
4 (100)	HVBT-2-R	1.6 ft (0.5 m)
6 (150)	HVBT-2-R	1.0 ft (0.3 m)
8 (200)	HVBT-4-R	1.6 ft (0.5 m)

Maximum thickness: 5/8 inch (15 mm)



Square busbar		
1 x 1 (25)	HVBT-2-R	4.0 ft (1.2 m)
2 x 2 (50)	HVBT-2-R	2.0 ft (0.6 m)
3 x 3 (75)	HVBT-2-R	1.3 ft (0.4 m)
4 x 4 (100)	HVBT-4-R	2.0 ft (0.6 m)
6 x 6 (150)	HVBT-4-R	1.3 ft (0.4 m)



Round busbar		
0.5 (12)	HVBT-1-R	5.0 ft (1.5 m)
1.0 (25)	HVBT-2-R	5.0 ft (1.5 m)
2.0 (50)	HVBT-2-R	2.5 ft (0.7 m)
3.0 (75)	HVBT-2-R	1.5 ft (0.4 m)
4.0 (100)	HVBT-4-R	2.5 ft (0.7 m)

Ordering 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 1	inch	25 feet
HVBT-2-R2	inches	25 feet
HVBT-4-R4	inches	25 feet

- HVBT may be suitable for applications with higher voltage than those listed. Please contact your Tyco Electronics 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 by wrapping 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: 70°C
- Related test reports: UVR-8023, EDR-5154

Bus Insulation & Wildlife Protection



BBIT/BPTM

Raysulate 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)

Catalog Number	Busbar dimensions		Square Bar		Round Bar		BBIT Tubing Diameter as Supplied and Fully Recovered
	Rectangular Bar** (bus width)		(each side)		(diameter min.–max.)		
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)
BPTM Tubing 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	0.25–0.5 (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 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 Tyco Electronics 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 235/130: 66'/box
 All other BPTM sizes: 50'/box
 BBIT and BPTM are also available in bulk spooled quantities. Contact your Tyco Electronics representative for more information.
- Related test reports:
 BBIT—UVR-8136, UVR-8137,
 BPTM—UVR-8019
- Minimum continuous length is 15 feet (4.5 meters).

Bus Insulation & Wildlife Protection



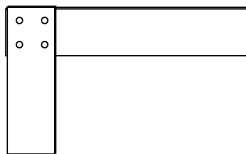
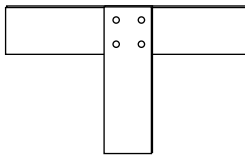
HVIS

Raysulate 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 (millimeters)

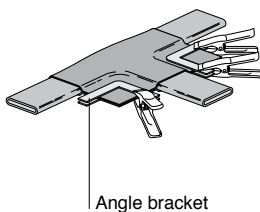
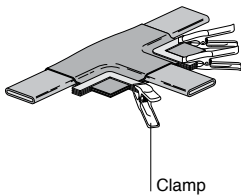
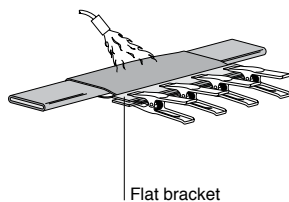


Catalog Number	Width	Length
HVIS-05 (sheet)	26 (660)	20 (508)
HVIS-10 (roll)	26 (660)	33 ft (10 m)

Bus Width	Cut Size Needed	No. of Installations Per Sheet/Roll	
		HVIS-05 Sheet	HVIS-10 Roll
T Connection			
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

Elbow Connection			
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. Package
Raysulate Sheet (HVIS) Accessories		
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 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.
- *5. HVIS may be rated for applications up to 35 kV. Please contact your Tyco Electronics representative for more information.
- Standard package:
HVIS-05: 3 sheets/box
HVIS-10: 1 roll/box
7. Related test report: EDR-5175.

Raysulate Splice Cover Sheet Accessories

Raysulate sheet (HVIS) accessories

These brackets and clamp are for use with HVIS high-voltage insulating sheet to hold the sheet in place while shrinking around various configurations.

Installation Tools

Catalog number	Description	Standard package
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.

Bus Insulation & Wildlife Protection



BISG Bus Insulator Squirrel Guard

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

Reliable outage prevention

BISG discs have been successfully eliminating outages from squirrels, raccoons, opossums, cats, and other animals in substations for years. The BISG guard has been designed to provide the same great protection with added features.

High performance material

Superior high voltage outdoor materials are used in the new 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 guard allows easier hot-stick installation by incorporating a threaded area in the guard. The integrated threads eliminate the need to hold a nut while installing the bolt assembly with a hot-stick. The bolted design positively and tightly secures the device onto the insulator or bushing, eliminating loosening or drooping caused by wind, snow, ice, or animals.

Expanded size range

The BISG guard now fits insulator core diameters ranging from 1" (25mm) through 4.5" (115mm) from the factory. The new "grill" type design allows easy field modifications for even larger diameters (see your local Tyco Electronics 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.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Insulator Core Diameter Range	Application
BISG-60/115-02(B10)	1.0 - 4.5 (25 - 115)	Standard
BISG-60/115-03-HOT (B10)	1.0 - 4.5 (25 - 115)	Live installation



BISG-60/115-03-HOT

Ordering Information

1. Standard package: 10 BISG assemblies per box. (One BISG will install on one insulator.)
2. Each standard pack contains plastic bolts and installation instructions.
3. Related test report: EDR-5310.
4. Available in red or gray material.

Bus Insulation & Wildlife Protection



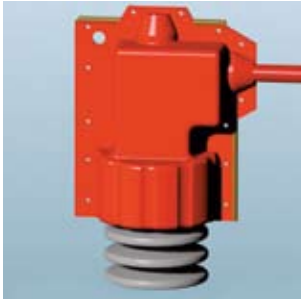
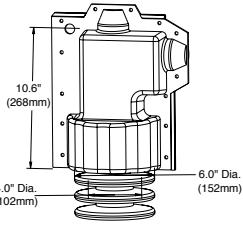
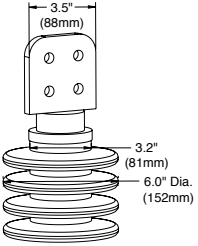

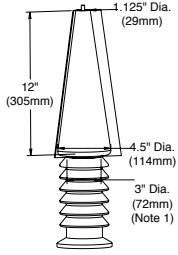
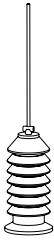

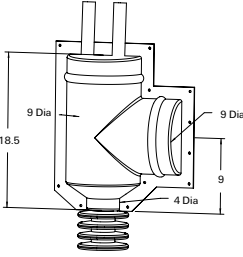
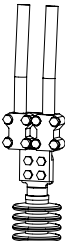
BCIC
Bus Connection Insulating Covers

BCIC covers are designed to protect energized conductors or busbar from flashovers due to contact from birds, squirrels and other wildlife. BCIC parts are made from a UV stable, track resistant, high performance Tyco Electronics 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
 <p><i>BCIC-4411</i></p>	 <p><i>Note: 4" (100mm) Bottom Port Opening</i></p>	 <p><i>Uses 13 BCIC Latches</i></p>
 <p><i>BCIC-SG-101-H2</i></p>	 <p><i>Note: Bottom and Top Opening</i></p>	 <p><i>Uses 5 BCIC Latches</i></p>
 <p><i>BCIC-9D/19-3</i></p>		 <p><i>Uses 11 BCIC Latches</i></p>

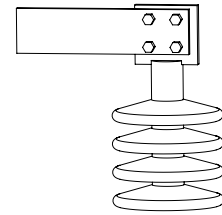
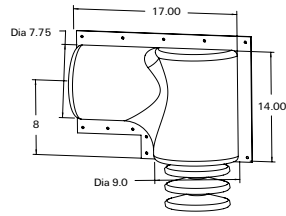
Bus Insulation & Wildlife Protection

Selection Information: dimensions in inches (millimeters)

Bushing covers

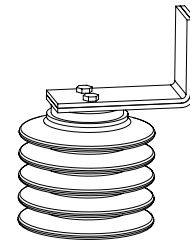
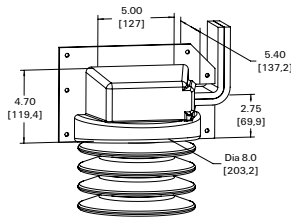
Installed product

Hardware configuration



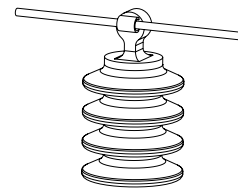
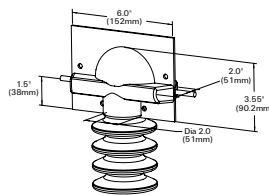
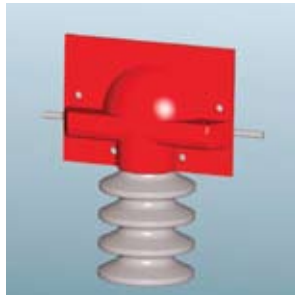
BCIC-10D/18-3

Uses 11 BCIC Latches



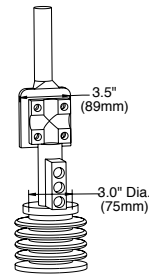
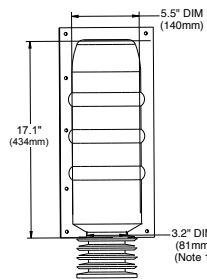
BCIC-8D/6-3

Uses 6 BCIC Latches



BCIC-3D/6-3

Uses 4 BCIC Latches


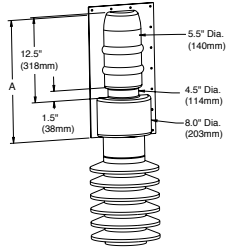
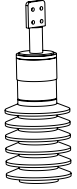

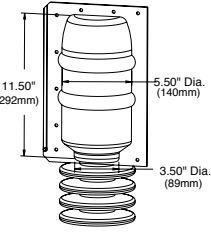
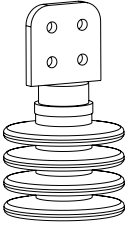

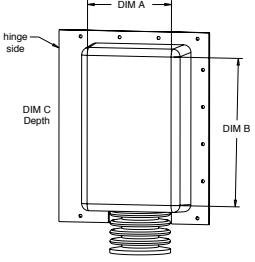
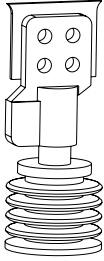


BCIC-5.5D/16

Uses 7 BCIC Latches

Bus Insulation & Wildlife Protection

Selection Information: dimensions in inches (millimeters)

Bushing covers	Installed product	Hardware configuration
 <p>BCIC-8D/15H0 BCIC-8D/18-H0</p>	 <p>Dia. A = 16.2" (411) Dia. A = 19.2" (488)</p>	 <p>Uses 10 BCIC Latches</p>
 <p>BCIC-5.5D/11</p>	 <p>Bushing Range Dia. 2-3.5 in. Note: No Opening</p>	 <p>Uses 9 BCIC Latches</p>
		

	Dim A	Dim B	Dim C	
BCIC-12/12/5-H	12 (305)	12 (305)	5 (127)	Uses 12 BCIC Latches
BCIC-14/19/6-U	14 (356)	19 (483)	6 (152)	Uses 16 BCIC Latches
BCIC-24/11/12-U	11 (279)	24 (610)	12 (304)	Uses 16 BCIC Latches
BCIC-4/12/4-H	4 (102)	12 (305)	4 (102)	Uses 12 BCIC Latches
BCIC-7/12/7-H	7 (178)	12 (305)	7 (178)	Uses 12 BCIC Latches
BCIC-4/16/4-H	4 (102)	16 (406)	4 (102)	Uses 12 BCIC Latches

Note: Must be field cut.

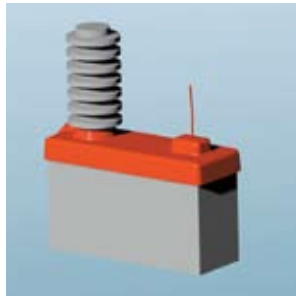
Bus Insulation & Wildlife Protection

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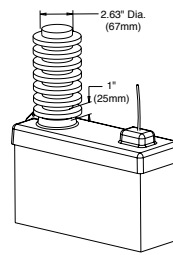
Bushing covers

Installed product

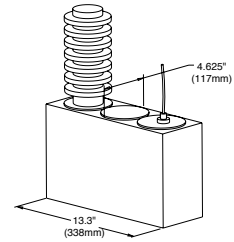
Hardware configuration



BCIC-0270



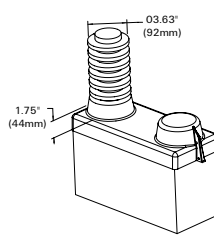
Note: Single Bushing Capacitor Cover



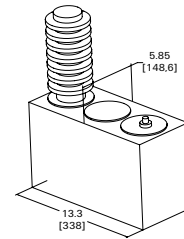
Uses 2 BCIC Latches



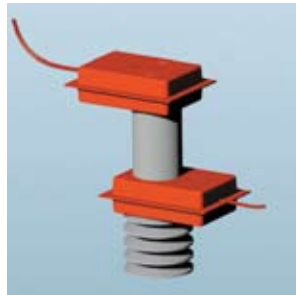
BCIC-0370



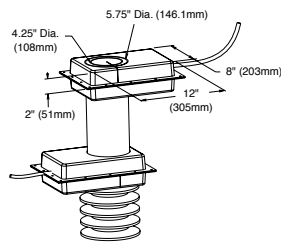
Note: Single Bushing Capacitor Cover



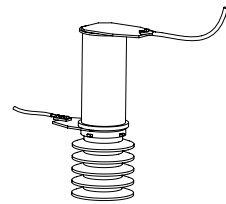
Uses 2 BCIC Latches



BCIC-8/12/2



Note: Field trimmed part



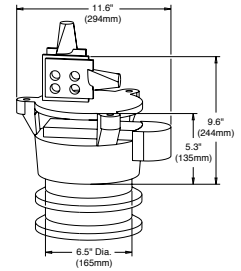
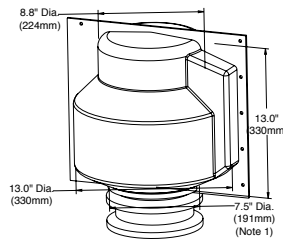
Bus Insulation & Wildlife Protection

Selection Information: dimensions in inches (millimeters)

Bushing covers

Installed product

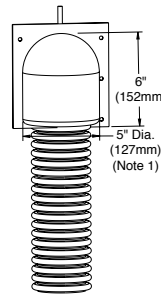
Hardware configuration



BCIC-13D/13-H0

Note: No Opening
Must Be Field Cut

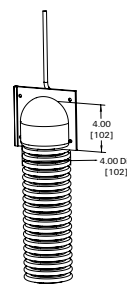
Uses 10 BCIC Latches



BCIC-5D/6

Note: No Opening
Must Be Field Cut

Uses 5 BCIC Latches



BCIC-4D/4

Uses 5 BCIC Latches

Bus Insulation & Wildlife Protection

Selection Information: dimensions in inches (millimeters)

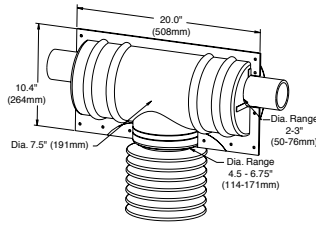
Bushing covers

Installed product

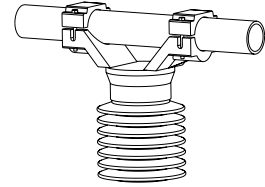
Hardware configuration



BCIC-7.5D/18-3



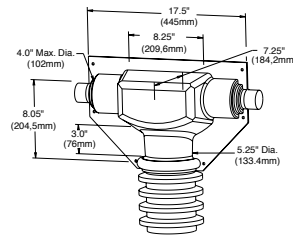
Bus Bar Dia. 2-3" (50-75mm)
Angle Bus Double 3" (75mm)



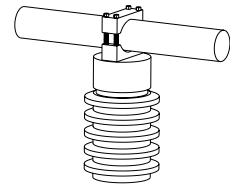
Uses 8 BCIC Latches



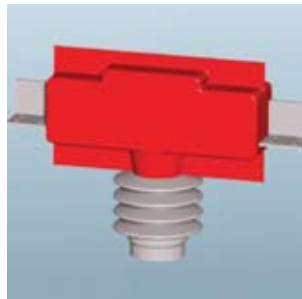
BCIC-SG-201



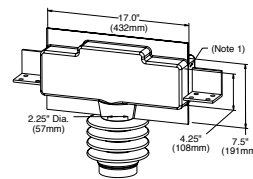
Max. Bus Bar Dia. 4" (100mm)



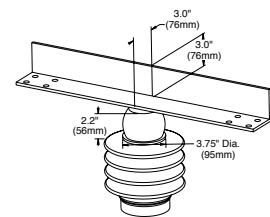
Uses 10 BCIC Latches



BCIC-TR205-L



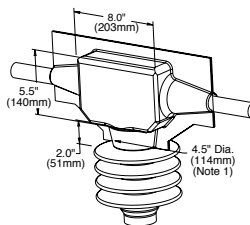
Note: No Opening
Must Be Field Cut



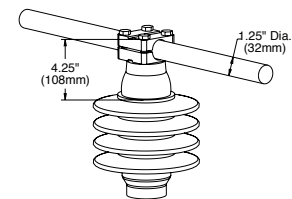
Uses 10 BCIC Latches



BCIC-TR205-R



Note: 4.5 (114) Dia.
Bottom Port Opening



Uses 10 BCIC Latches

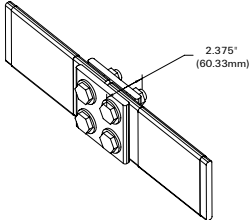
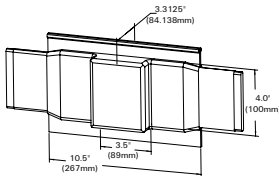
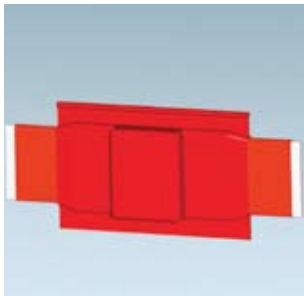
Bus Insulation & Wildlife Protection

Selection Information: dimensions in inches (millimeters)

Bushing covers

Installed product

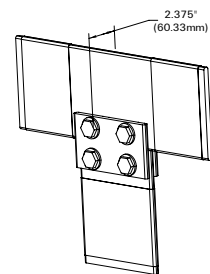
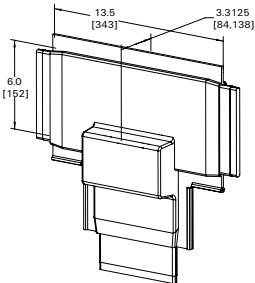
Hardware configuration



BCIC-100/4-1-ST

BUS Bar Size 4" x .50"

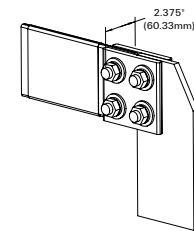
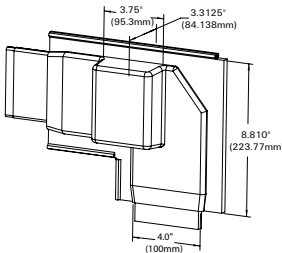
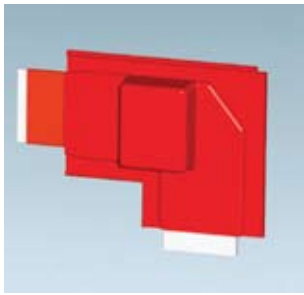
Uses BCIC Closure In Kit



BCIC-150/6-1-ST

BUS Bar Size 6" x .50"

Uses BCIC Closure In Kit



BCIC-100/4-L

BUS Bar Size 4" x .50"

Uses BCIC Closure In Kit

Bus Insulation & Wildlife Protection

Selection Information: dimensions in inches (millimeters)

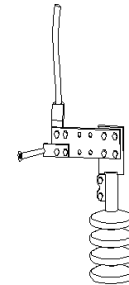
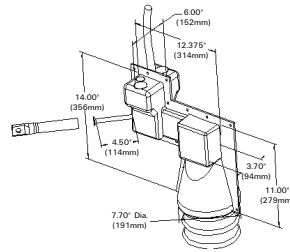
Bushing covers

Installed product

Hardware configuration



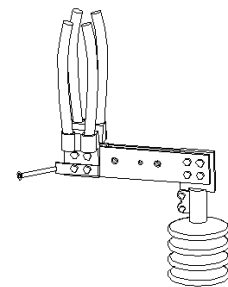
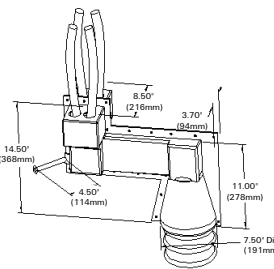
BCIC-7.5D/11-DB



Uses 15 BCIC Latches



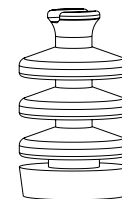
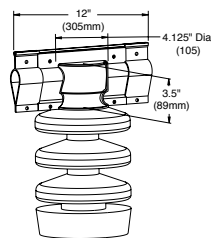
BCIC-7.5D/17-DB



Uses 19 BCIC Latches



BCIC-3212-01

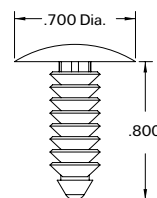


Note: Bottom Port Has Opening

Uses 8 BCIC Latches



BCIC-LATCH



Std. Pack = 250 Latches or 1000 Latches

Bus Insulation & Wildlife Protection



BCAC
Bushing Connection Animal Cover

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

Reliable Outage Protection

Tyco Electronics' 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.

Selection Information: dimensions in inches (millimeters)

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

Ordering Information

1. Standard package: 12 or 6 units per box, depending on size of cover. (One BCAC will install on one insulator.)
2. Related test reports: EDR-5339, UVR-8209
3. Also available in gray material, BCAC-G-5D/8.



BCAC-7D/10



BCAC-8D/14

Bus Insulation & Wildlife Protection



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

Tyco Electronics' 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 (millimeters)

Description	Pin Insulator Diameter Range	Application	Conductor Range	Cover Length
BCIC-G-PIN-795-01	7-9 (170-230)	Porcelain Pin	#2-795	32
BCIC-G-PIN-556-01	4.75-7 (100-170)	Porcelain Pin	#6 -556	42
BCIC-G POR-228-795	9.0 (228)	Porcelain Pin	#2 -556	55
BCIC-G-PIN-556/55	4.75-7 (100-170)	Polymeric Pin	#6 -556	55
BCIC-G-DPIN	7-9 (170-230)	Porcelain Pins (up to 14" apart)	#2 -795	41
BCIC-G-HZ-795-01		Horizontal Post	#2-795	29
BCIC-G-RT-795-01		Vertical Deadend	#2 -795	29
BCIC-G-RTP-795-01		Vertical Deadend	#2 -795	29
BCIC-G-RTH-795-01		Horiz. Deadend	#2 -795	29
BCIC-ARM-01		Pin/Horiz. Post	#2 -795	48
BCIC-ARM-24		Pin/Horiz Post	#2 -795	24



Bus Insulation & Wildlife Protection



**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, reclosers, lightning arresters, and fuse cutouts.

Terminations

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.

Reclosers

These insulating covers are designed for reclosers operating from 15 to 35 kV. The one piece, hinged parts are easily and quickly installed around both the vertical and horizontal bushing skirts and secured using supplied push pin latches. Two different covers are available to fit both the ABB (BCIC-RECLOSER-100) and Cooper type (BCIC-RECLOSER-COVER) reclosers.



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. Two different covers are available. The BCAC-G-AR-5D-2 fits the Ohio Brass Arrester. The BCAC-G-AR-3.75D-2 fits the Cooper Arrester.

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 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.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Hardware
BCAC-4D/13-2(B18)	Terminations
BCIC-RECLOSER-100(B6)	ABB Recloser
BCIC-RECLOSER-COVER(B6)	Cooper Recloser
BCAC-G-AR-5D-2(B24)	Ohio Brass Arrester
BCAC-G-AR-3.75D-2(B24)	Cooper Arrester
BCAC-G-CUTOUT-100	Fuse Cutout Switch (100 AMP)
BCAC-G-CUTOUT-200	Fuse Cutout Switch (200 AMP)

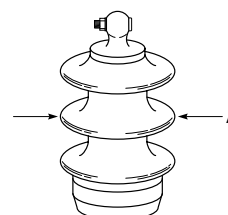
* Also available in gray

Bus Insulation & Wildlife Protection



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

Ordering Information

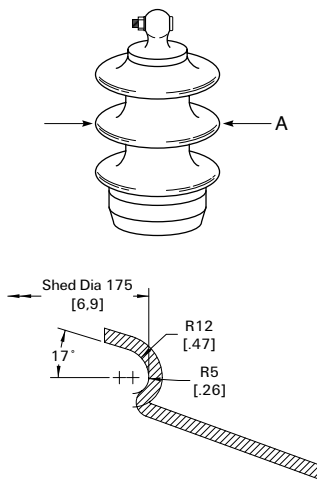
1. Select the appropriate catalog number. Confirm selection with insulator skirt outer diameter (A).
2. Each HVCE extender adds a nominal 4 inches to the creepage length. As a general recommendation, Tyco Electronics advises a 20 percent increase in existing creepage distance. Use this formula to calculate 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 Tyco Electronics representative.
4. HVCE does not upgrade the voltage class of the insulator.
5. Related test reports:
 UVR-8138
 UVR-8144
 UVR-8037
 EDR-5350

Bus Insulation & Wildlife Protection



HVCE-WA
Raysulate Electrical Insulator Wraparound Creepage Extenders

Raysulate electrical insulator 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 below 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 (pcs/box)
HVCE-WA-109-01-FT(B6)	4.29 (109)	6
HVCE-WA-175-01-FT(B6)	6.90 (175)	6
HVCE-WA-179-01-FT(B6)	7.05 (179)	6
HVCE-WA-206-01(B6)	8.11 (206)	6
HVCE-WA-214-01(B6)	8.43 (214)	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-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-278-01-FT(B6)	10.94 (278)	6
HVCE-WA-280-01-FT(B6)	11.02 (280)	6
HVCE-WA-287-01(B6)	11.30 (287)	6
HVCE-WA-292-01(B6)	11.50 (292)	6
HVCE-WA-295-01(B6)	11.61 (295)	6
HVCE-WA-303-01(B6)	11.93 (303)	6
HVCE-WA-319-01(B6)	12.56 (319)	6
HVCE-WA-320-01(B6)	12.60 (320)	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 (340)	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-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)	15.43 (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 (420)	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)	17.80 (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)	18.98 (482)	3
HVCE-WA-501-01(B6)	19.72 (501)	6
HVCE-WA-528-01(B6)	20.79 (528)	3
HVCE-WA-611-01(B6)	24.05 (611)	6

Ordering Information

- Each HVCE-WA Extender adds nominal 6 inches to the creepage length. As a general recommendation, Tyco Electronics 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 x 0.2 ÷ 6 = Minimum number of HVCE creepage extenders recommended. (i.e., 60" x .2 ÷ 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 Tyco Electronics 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

Bus Insulation & Wildlife Protection



MVLC

Raysulate Electrical Insulator Medium Voltage Line Over (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
Covers for overhead conductors			
MVLC-14-A/U	#6-3/0kcmil	0.5 (12.7)	15kV
MVLC-14-A/241	#6-3/0kcmil	0.5 (12.7)	25kV
MVLC-18-A/U	#2-397kcmil	.75 (18)	15kV
MVLC-18-A/241	#2-397kcmil	.75 (18)	25kV (sealing mastic in receptacle)
MVLC-38-A/U	477-1590kcmil	1.5 (38)	15kV
MVLC-38-A/241	477-1590kcmil	1.5 (38)	25kV (sealing mastic in receptacle)

Installation Tools for overhead conductors

MVLC-14-TOOL-100	for use with MVLC-14	15-25kV
MVLC-18-TOOL-03	for use with MVLC-18	15-25kV
MVLC-38-TOOL-03-2006	for use with MVLC-38	15-25kV
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 15kV use
MVLC-14-1830/241 (B18)	package of 18 six foot lengths for 25kV use
MVLC-18-1830/U(B18)	package of 18 six foot lengths for 15kV use
MVLC-18-A/241-1830(B18)	package of 18 six foot lengths for 25kV use
MVLC-38-A/U-1830(B18)	package of 18 six foot lengths for 15kV use
MVLC 38-A/241-1830(B18)	package of 18 six foot lengths for 25kV use
MVLC-HAND-TOOL-14	hand tool for installing MVLC-14
MVLC-HAND-TOOL-02	hand tool for installing MVLC-18 +38



MVLC-HAND-TOOL



MVLC-18-TOOL

Ordering Information

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

Bus Insulation & Wildlife Protection

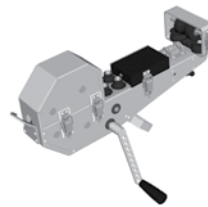
Product Performance

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 Resistance	ASTM D2303 Step Voltage Method (Initiate @ 2.5 kV)	No tracking or erosion to top surface or flame failure after: 200 minutes



MVLC-38 Tool



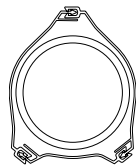
MVLC-14 Tool



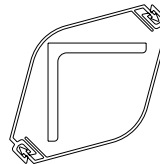
MVLC-14 Hand Tool

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



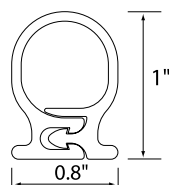
4" busbar with 2-MVLC-38
1-MVLC-18



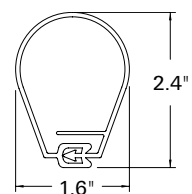
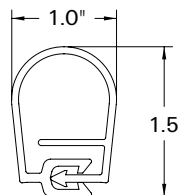
2.5" L busbar with 2-MVLC-38



2 Pieces: MVLC-38 on busbar
with BCIC



Nominal Dimensions



Bus Insulation & Wildlife Protection



RRBB **Interphase Insulating Barrier Board**

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

Selection Information: dimensions in inches (millimeters)

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

Ordering Information

Related Test Report: EDR-5311

Accessories

Torches

These clean-burning, efficient, heat-shrinking torches are recommended for shrinking high voltage products through 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-3061-13-PS-REGULATOR**

- Works with torch handle FH-3366-97-PS-HANDLE above
- Adjustable from 14-57psi
- Fitting POL, UNF 9/16" 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

Accessories

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

Technical Data



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.

Technical Data



HVBC Bus Connection Kit

For Protection, Repair, and Maintenance

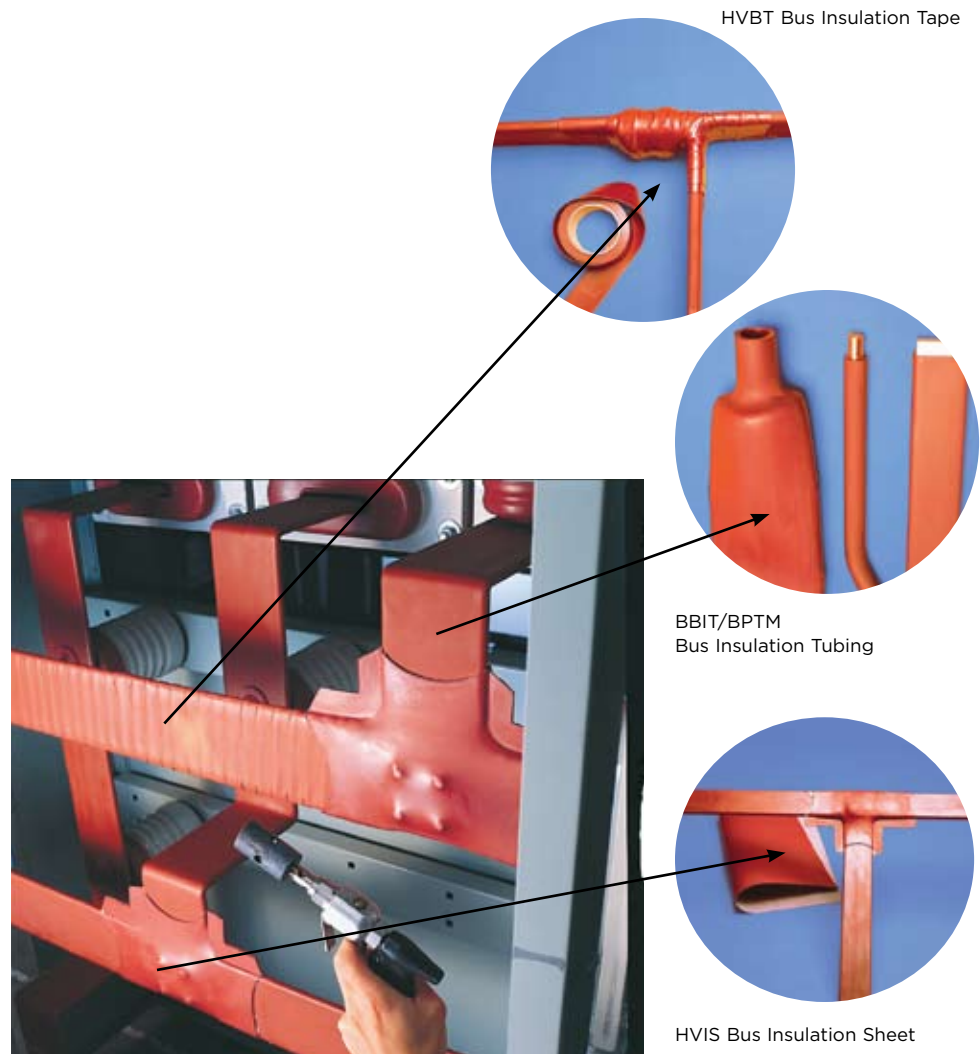
Raysulate heat-shrinkable electrical insulating tubes, tapes, and sheets provide a complete system for electrical repair and maintenance of enclosed or exposed buswork and for connections in switchgear and electrical equipment. They offer:

- 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
- Tyco Electronics' assistance and support for testing and applications



HVBT Bus Insulation Tape

BBIT/BPTM
Bus Insulation Tubing

HVIS Bus Insulation Sheet

Technical Data

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



MVLC-18-A/U Overhead Line Cover



BCIC-4411, MVLC-38



BCAC-8D/14 Bushing Cover



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



HVCE

Technical Data

Medium-Voltage Products*

Test and Performance Data

Material Properties	Test method	Requirements	BBIT BPTM	BCIC HVIS	CITM	BCAC, HVCE-WA, HVBT, OLIT			BISG RRBB
						HVCE	MVLC		
Electrical									
Volume resistivity	ASTM D-257, IEC 93	ohm-cm min.	1.0x10 ¹³	1.0x10 ¹³	1.0x10 ¹³	1.0x10 ¹³	1.0x10 ¹³	1x10 ¹³	1x10 ¹³
Dielectric constant	ASTM D-150, IEC 250	max.	5.0	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.						550	
		V/mil at 1.5mm min.	500						
		V/mil at 2mm min.	450	330		330	250		
		V/mil at 2.5mm min.	400						380
		V/mil at 3mm min.	350		350				

Thermal

Thermal endurance	IEEE 1-1969, IEC 216	min.	105°C	105°C	110°C	105°C**	110°C	105°C	
Accelerated aging for 168 hours	ISO 188	Tensile strength	1450 psi	1450 psi	2160 psi	1450 psi.	1100 psi	1450 psi	2450 psi
		Ultimate elongation	300%	300%	300%	300%	300%	100%	25%
		Aging Temp.	120°C	120°C	120°C	120°C	120°C	150°C	120°C

Chemical

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	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 -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	

Physical

Tensile strength	ASTM D-638, ISO 37	psi. (min.)	1450 <4 mm, 1150 >4 mm	1450	2160	1450	1150	1450	2450
Ultimate elongation	ASTM D-638, ISO 37	% min.	300	300	400	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 70°C maximum continuous operating temperature limit.

Low-Voltage Products

Test and Performance Data

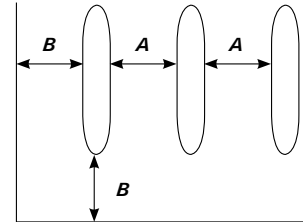
Material properties	Test method	LVIT, LVBT, LVBC
Electrical		
Volume resistivity	ASTM D-257, IEC 93	1x10 ¹³ ohm-cm minimum
Dielectric constant	ASTM D-150, IEC 250	6.0 maximum
Dielectric strength	ASTM D-149, IEC 243	330 V/mil at 2.5 mm
Thermal		
Thermal endurance	IEEE 1-1969, IEC 216	105°C minimum
Accelerated aging	ISO 188	168 hr at 150°C
	Tensile strength	1600 psi minimum
	Ultimate elongation	200% minimum
Chemical		
Flammability	ICEA-S-19-81	Pass
Water absorption	ISO/R 62, procedure A	0.5% maximum after 14 days @ 23°C
Low-temperature flexibility	ASTM D-2671, procedure C	No cracking after 4 hr at -40°C
Physical		
Tensile strength	ASTM D-638, ISO 37	1750 psi minimum
Ultimate elongation	ASTM D-638, ISO 37	350% minimum

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 C37.20-1987.





All of the above information, including drawings, illustrations and graphic designs, reflects our present understanding and is to the best of our knowledge and belief correct and reliable. Users, however, should independently evaluate the suitability of each product for the desired application. Under no circumstances does this constitute an assurance of any particular quality or performance. Such an assurance is only provided in the context of our product specifications or explicit contractual arrangements. Our liability for these products is set forth in our standard terms and conditions of sale. RaySulate, ShearBolt, TE logo and Tyco Electronics are trademarks.

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