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Cable Accessories Selection Guide

Networks, MRO, Overhead Transmission and Distribution

Cable Accessories Selection Guide

Who We Are

Tyco Electronics is a global provider of engineered electronic components for thousands of consumer and industrial products; network solutions and systems for telecommunications and energy markets; and wireless systems for critical communications, radar and defense applications. Our company was founded by combining many well-known, trusted brands – Raychem, AMP, ALR, Buchanan, DEK and many others.

About This Cable Accessories Selection Guide

This Cable Accessories Selection Guide is intended for applications in the Networks, MRO, Overhead Transmission and Distribution. We have provided several features in the design of this catalog to assist you in choosing the right products for your needs.

Product Organization

- The products and the order of this catalog were selected with the user in mind
- Sub-headings are available for quick references

Point-of-Purchase (POP) Notations

- Each ordering chart indicates packaging choices for bulk or point-of-purchase
- Part numbers have been highlighted with color and/or in bold where POP packaging is available

Our Goal

We are committed to providing our customers:

- A single point of contact
- 24-hour emergency response
- Flexible ordering solutions
- Minimal order requirements with free freight
- Highly knowledgeable regional representation
- Free on-site training
- Global product offering with local awareness

Terminology

CLX - continuous corrugated metallic sheath

JCN - jacketed concentric neutral

LC SHIELD - longitudinally corrugated shield

PILC - paper-insulated, lead-covered

URD - underground residential distribution

VCLC - varnished cambric-insulated, lead-covered

Associations and Organizations References:

AEIC - Association of Edison Illuminating Companies

ANSI - American National Standards Institute

CSA - Canadian Standards Association

FAA- Federal Aviation Administration

ICEA - Insulated Cable Engineers Association, Inc.

IEEE - Institute of Electrical and Electronics Engineers

MSHA - Mine Safety and Health Administration

RUS - Rural Utilities Service

UL - Underwriters' Laboratories, Inc.

Material Safety Data Sheets

To obtain material safety data sheets (MSDS) go to <http://www.tycoelectronics.com> and enter MSDS in the Keyword search. Choose MSDS Search and Retrieval from the resulting list.

TABLE OF CONTENTS



Contents

Low Voltage Splices, Taps, Terminations & Network Protection	3
Medium/High Voltage Splices, Taps & Terminations	21
Cable Repair & Rejacketing	55
Low Voltage Tubing & Molded Parts.....	63
Tapes & Sealants	73
Wire Management	79
Identification Solutions.....	91
Connectors & Terminals.....	105
Accessories & Tools.....	113
Applications and Technical Specification.....	127
Index	153

LOW VOLTAGE SPLICES, TAPS & NETWORK PROTECTION



Low Voltage In-Line Splices (1000 V)

Cold-Applied

GelWrap Splice Closures	5
GILS In-Line Splices	6
RVS Splices	7

Heat-Shrink

WCSM Tubing	8
FCSM Tubing	10
CRSM Sleeves	11
CRSM CT Cable Tap Splices	12

Low Voltage Network Protection

Cable Protection

Smart Limiter	13
---------------------	----

Low Voltage Stub Splices & Motor Connection Kits (1000 V)

GelCap Splice Covers	14
RVC Splice Cover Kits	15
MCK Motor Connection Kits	16

Low Voltage Taps

GTAP Splices	17
GelCap SL Splice Covers	18
GHFC H-Frame Closures	19
GelPort Connectors	20



Low Voltage In-Line Splices



GelWrap Splice Closures Water Resistant Wraparound Splice Closures (1000 V)

Tyco Electronics' GelWrap splice closures quickly and conveniently insulate and seal buried electrical connections rated up to 1000 volts. The robust, yet compact, design is engineered to handle the harsh environments of direct burial and manhole applications. GelWrap splice closures are equally well suited for insulation and jacket repair. GelWrap UF splices include the UF connector.

Fast and easy installation

Installers will appreciate the simple wraparound design and dependable gel sealing performance. Simply wrap and snap the closure on any cable in the use range. The gel in the closure seals on contact. Installation is literally a snap. The GelWrap splice closure can be applied on all common compression connectors and low-voltage cables. Many in-line mechanical connectors can be covered as well.

Dependable performance

The factory cured PowerGel silicone sealant in the GelWrap closure encapsulates the connection. Since the gel is easily stretched and very sticky, it basically forms around the cable and connector sticking to everything including itself. Moisture cannot enter the splice.



Selection Information: dimensions in inches (millimeters)

Catalog Number	Sleeve Length	Conductor Size	Connector Opening	Maximum General Use Diameter Range	Std. Pack
GelWrap-18/4-100	4.0 (100)	#12 - 4/0 (4 - 95)	1.0 (25)	0.15 - 0.70 (4 - 18)	6
GelWrap-18/4-150	6.0 (150)	#12 - 4/0 (4 - 95)	3.0 (75)	0.15 - 0.70 (4 - 18)	6
GelWrap-18/4-200	8.0 (200)	#12 - 4/0 (4 - 95)	5.0 (125)	0.15 - 0.70 (4 - 18)	6
CPGI-GelWrap-18/4-200	8.0 (200)	#12 - 4/0 (4 - 95)	5.0 (125)	0.15 - 0.70 (4 - 18)	5
CPGI-GelWrap-18/4-200UL	8.0 (200)	#12 - 4/0 (4 - 95)	4.0 (100)	0.15 - 0.70 (4 - 18)	5
GelWrap-18/4-250	10.0 (250)	#12 - 4/0 (4 - 95)	7.0 (175)	0.15 - 0.70 (4 - 18)	6
CPGI-GelWrap-18/4-250UL	10 (250)	#2 - 4/0 (4 - 95)	6.0 (150)	0.40 - 1.30 (10 - 33)	5
GelWrap-18/4-300	12.0 (300)	#12 - 4/0 (4 - 95)	9.0 (225)	0.15 - 0.70 (4 - 18)	6
GelWrap-33/10-150	6.0 (150)	#2 - 500 (35 - 240)	2.0 (50)	0.40 - 1.30 (10 - 33)	6
CPGI-GelWrap-33/10-50	1.0 (50)	#2 - 500 (35 - 240)	6.0 (150)	0.40 - 1.30 (10 - 33)	5
GelWrap-33/10-200	8.0 (200)	#2 - 500 (35 - 240)	4.0 (100)	0.40 - 1.30 (10 - 33)	6
GelWrap-33/10-250	10.0 (250)	#2 - 500 (35 - 240)	6.0 (150)	0.40 - 1.30 (10 - 33)	6
GelWrap-33/10-250-I350M4*	10.0 (250)	#6 - 350 (16 - 180)	5 (125)	0.40 - 1.30 (10 - 33)	12
GelWrap-33/10-300	12.0 (300)	#2 - 500 (35 - 240)	8.0 (200)	0.40 - 1.30 (10 - 33)	12
GelWrap-33/10-350	14.0 (350)	#2 - 500 (35 - 240)	10.0 (250)	0.40 - 1.30 (10 - 33)	10
GelWrap-50/20-200	8.0 (200)	250 - 750	2.0 (50)	0.80 - 1.50 (20 - 38)	12
GelWrap-50/20-250	10.0 (250)	250 - 750	4.0 (100)	0.80 - 1.50 (20 - 38)	12
GelWrap-50/20-300	12.0 (300)	250 - 750	6.0 (150)	0.80 - 1.50 (20 - 38)	12
GelWrap-50/20-350	14.0 (350)	250 - 750	8.0 (200)	0.80 - 1.50 (20 - 38)	12
GelWrap-50/20-400	16.0 (400)	250 - 750	10.0 (250)	0.80 - 1.50 (20 - 38)	12
CPGI-GelWrap-UF-200	8.0 (200)	14/2 - 8/3 w/ground included connectors			5
CPGI-GelWrap-UF-250UL	10 (250)	14/2 - 8/3 w/ground included connectors			5

Notes: UL denotes UL & CSA for submersible applications

For other sizes or applications, a minimum seal length is required on each side of connector opening or jacket damage:

GelWrap closure 18/4 series 1.5" (38mm)

GelWrap closure 33/10 series 2.0" (51mm)

GelWrap closure 50/20 series 3.0" (75mm)

*Includes mechanical connector

Product Performance

Testing	Test Conditions
ANSI C119.1 - 1986	600 V insulated underground
Chemical Resistance	Fluid immersion, 168 hours @ 23°C, 75% elongation retention minimum
	- 10W-40 motor oil
	- 10% hydrochloric acid
	- 15% sodium chloride
	- 20% sodium hydroxide
	- ETX 60280 antifreeze (1000 hours)
Accelerated Aging	1000 hours @ 135°C
	- 93% retention tensile strength
	- 82% retention elongation at break

Ordering Information

- Selection is based on typical dimensions for low-voltage insulated cables.
- Related test reports:
EDR-5343 - 18/4;
EDR-5356 - 33/10,
EDR-5367 for 50/20,
EDR-5356 for GelWrap-33/10-250-I350M4
(A four screw connector is included).

For connector information refer to the Connectors and Terminals section of this catalog.

Low Voltage In-Line Splices



GILS In-Line Splices Water Resistant Splice Kit for Power Cable (1000 V)

The Tyco Electronics' GILS gel in-line splice kit offers a state-of-the-art sealed splice for underground, buried, and overhead applications. GILS closures offer a fast and simple method for splicing, insulating, and environmentally sealing low-voltage cable splices.

The GILS closure, with its revolutionary PowerGel sealant, covers and seals the splice quickly and easily, saving both time and effort.

Simply install the connector, place on the closure, and snap closed. It's that easy—no tapes, mastic, tools or mixing are required. The splice is ready to bury—no waiting to cure.

- Connector accommodates copper and/or aluminum cables
- Qualified to ANSI C119.1-1986 for underground splicing
- UV resistant
- Qualified for temperatures from -40°C to 90°C
- Connector included
- RUS accepted connector blocks and splices for secondary. Water-tight for use in all locations

Selection Information

Catalog Number	Conductor Size (AWG/kcmil)	Std. Pack
GILS-4/0	#2 - 4/0	18 or 72 each
CPGI-GILS-4/0	#2 - 4/0	5
GILS-350	1/0 - 350	18

Ordering Information

1. Based of typical dimensions for low-voltage insulated cables.
2. Related test reports: EDR-5298, EDR-5394

Low Voltage In-Line Splices



RVS Splices

“Roll-on” Splices for 1/C Power Cable (1000 V)

RVS splice cover kits are the easy “roll-on” way to insulate and seal cable connections up to 1000 volts. The gripping force of the specially formulated EPDM elastomer combines with the high-performance sealant to form a water-resistant, insulating sleeve that is UL listed and CSA certified for direct burial application over in-line compression connectors.

RVS splice cover sleeves feature a dual-wall design with an entrapped lubricant, making installation fast and simple. The elastomeric sleeve rolls onto the cable with minimal effort, even at temperatures below -13°F (-25°C). The cable can be energized immediately. It is ideal for use where gas or electric heating devices are not approved.

Qualified to ANSI C119.1-1986. CSA certified to C22.2 No. 198.2. UL listed per 96J4 (file E91151). RUS accepted for use as a secondary tap or splice cover. For use on standard poly- or elastomeric-insulated cables. Use to insulate and seal in-line compression connectors or to seal terminal lugs.



Selection Information: dimensions in inches (millimeters)

Catalog Number	Conductor Size (AWG/kcmil)	Cable O.D. (Min. - Max.)	Sleeve Length	Maximum Connector Length
RVS-11	#8 - 2/0	.22 - .68 (6 - 17)	8.0 (205)	5.00 (127)
CPGI-RVS-11	#8 - 2/0	.22 - .68 (6 - 17)	8.0 (205)	5.00 (127)
RVS-12	1/0 - 250	0.50 - 0.90 (13 - 23)	9.5 (241)	4.50 (114)
CPGI-RVS-12	1/0 - 250	0.50 - 0.90 (13 - 23)	9.5 (241)	4.50 (114)
RVS-13	250 - 600	0.70 - 1.20 (18 - 30)	12.0 (305)	7.00 (178)
CPGI-RVS-13	250 - 600	0.70 - 1.20 (18 - 30)	12.0 (305)	7.00 (178)
RVS-14	600 - 1000	0.95 - 1.50 (24 - 38)	14.0 (356)	9.00 (229)

Ordering Information

1. Select the appropriate catalog number. Selections are based on typical dimensions of low-voltage insulated cable. Confirm selection with dimensions to assure proper sizing.
2. Kits do not contain connectors. The RVS splice cover selection information mentioned above covers copper and aluminum in-line compression connections.
3. Each kit contains one Rayvolve RVS splice cover sleeve and sealant strips.
4. Standard package: 5 kits/box or 50 kits/box.
5. Related test report: EDR-5167

For connector information refer to the Connectors and Terminals section of this catalog.

Low Voltage In-Line Splices



WSCM Tubing

Heavy-Wall Sealant Coated or Uncoated Tubing (1000 V)

- For use on standard poly- or elastomeric insulated/jacketed cables or lead-jacketed cables, which may include aluminum or steel armoring
- Use sealant-coated tubing (-S) as a sealed in-line splice or terminal lug seal for non-flame retardant applications. Use uncoated tubing (-A/U and /U) for cable re-jacketing and mechanical protection only.
- Sealant-coated WSCM tubing, sizes -9/3 through -70/21 (-S designation) is UL listed per 486D (file E91151), certified to CSA C22.2, qualified to ANSI C119.1-1986, and rated to Western Underground Guide 2.5. Also RUS accepted for use as a secondary tap or splice cover, and for use as jacket restoration materials on JCN cable. WSCM tubing may be used for jacket repair on cables to 35 kV.
- Connectors over 6 inches: Recommended cut length = connector length + 5 inches
Connectors up to 6 inches: Recommended cut length = connector length + 4 inches
- WSCM tubing has a 3:1 shrink ratio and an unlimited shelf life when stored under normal conditions
- Note: UL listing applies to sealant-coated (-S) WSCM-9/3 through -70/21 only.
WSCM-105/30 and -130/36 are not UL listed.



Certified C22.2
No. 198.2



LISTED 96J4
Direct burial insulation
covered for listed
pressure connectors
SUBMERSIBLE

Selection Information: dimensions in inches (millimeters)

Catalog Number ¹	1000-V General Conductor Size (AWG/kcmil)	Use Range (Min. – Max.)	Cut-Piece Length ²	Std. Pack		
				(Ft/Roll)	(Pcs/Box)	(Pcs/Pack)
Sealant-Coated Cut-Length Tubing						
WSCM-9/3-150-S	#14 – #8	0.15 – 0.30 (4 – 8)	6 (150)	50		
CPGI-WSCM-9/3-150-S	#14 – #8	0.15 – 0.30 (4 – 8)	6 (150)			3
WSCM-9/3-300-S	#14 – #8	0.15 – 0.30 (4 – 8)	12 (300)	50		
WSCM-9/3-1200-S	#14 – #8	0.15 – 0.30 (4 – 8)	48 (1200)	25		
WSCM-13/4-150-S	#12 – #6	0.20 – 0.45 (5 – 11)	6 (150)	50		
CPGI-WSCM-13/4-150-S	#12 – #6	0.20 – 0.45 (5 – 11)	6 (150)			2
WSCM-13/4-1200-S	#12 – #6	0.20 – 0.45 (5 – 11)	48 (120)	25		
WSCM-20/6-150-S	#8 – #2	0.25 – 0.70 (6 – 18)	6 (150)	50		
CPGI-WSCM-20/6-150-S	#8 – #2	0.25 – 0.70 (6 – 18)	6 (150)			2
WSCM-20/6-225-S	#8 – #2	0.25 – 0.70 (6 – 18)	9 (225)	50		
WSCM-20/6-300-S	#8 – #2	0.25 – 0.70 (6 – 18)	12 (300)	50		
WSCM-20/6-1200-S	#8 – #2	0.25 – 0.70 (6 – 18)	48 (1200)	25		
WSCM-33/8-150-S	#4 – 4/0	0.35 – 1.20 (9 – 30)	6 (150)	50		
CPGI-WSCM-33/8-150-S	#4 – 4/0	0.35 – 1.20 (9 – 30)	6 (150)			2
WSCM-33/8-225-S	#4 – 4/0	0.35 – 1.20 (9 – 30)	9 (225)	50		
WSCM-33/8-300-S	#4 – 4/0	0.35 – 1.20 (9 – 30)	12 (300)	50		
WSCM-33/8-1200-S	#4 – 4/0	0.35 – 1.20 (9 – 30)	48 (1200)	25		
WSCM-43/12-150-S	1/0 – 400	0.50 – 1.55 (13 – 39)	6 (150)	40		
WSCM-43/12-225-S	1/0 – 400	0.50 – 1.55 (13 – 39)	9 (225)	40		
CPGI-WSCM-43/12-225-S	1/0 – 400	0.50 – 1.55 (13 – 39)	9 (225)			1
WSCM-43/12-300-S	1/0 – 400	0.50 – 1.55 (13 – 39)	12 (300)	40		
WSCM-43/12-1200-S	1/0 – 400	0.50 – 1.55 (13 – 39)	48 (1200)	10		
WSCM-51/16-100-S	250 – 500	0.70 – 1.75 (18 – 44)	4 (100)	100		
WSCM-51/16-225-S	250 – 500	0.70 – 1.75 (18 – 44)	9 (225)	30		
CPGI-WSCM-51/16-225-S	250 – 500	0.70 – 1.75 (18 – 44)	9 (225)			1
WSCM-51/16-300-S	250 – 500	0.70 – 1.75 (18 – 44)	12 (300)	30		
WSCM-51/16-1200-S	250 – 500	0.70 – 1.75 (18 – 44)	48 (1200)	10		
WSCM-70/21-300-S	400 – 1000	0.90 – 2.45 (23 – 62)	12 (300)	15		
WSCM-70/21-450-S	400 – 1000	0.90 – 2.45 (23 – 62)	18 (450)	15		
WSCM-70/21-600-S	400 – 1000	0.90 – 2.45 (23 – 62)	24 (600)	10 or 100		
WSCM-70/21-1200-S	400 – 1000	0.90 – 2.45 (23 – 62)	48 (1200)	10		
WSCM-105/30-300-S	800 – 1250	1.30 – 3.70 (33 – 94)	12 (300)	15		
WSCM-105/30-1200-S	800 – 1250	1.30 – 3.70 (33 – 94)	48 (1200)	5		
WSCM-130/36-300-S	1500 – 2500	1.60 – 4.20 (41 – 107)	12 (300)	10		
WSCM-130/36-450-S	1500 – 2500	1.60 – 4.20 (41 – 107)	18 (450)	20		
WSCM-130/36-1200-S	1500 – 2500	1.60 – 4.20 (41 – 107)	48 (1200)	5		

¹ Catalog numbers with -S designation are suitable for sealed electrical insulation to 1000 V. Catalog numbers with A/U and /U designations are for cable re-jacketing only.

² Length tolerance to 32 percent. Can be used for multi-conductor LV splices using different tubings.

Low Voltage In-Line Splices

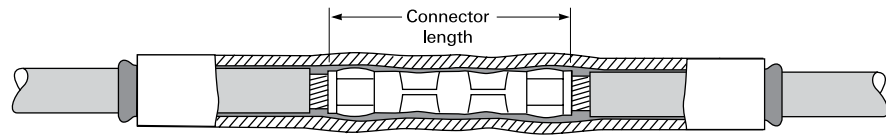
Selection Information: dimensions in inches (millimeters)

Catalog Number ¹	1000-V General Conductor Size (AWG/kcmil)	Use Range (Min. – Max.)	Cut-Piece Length ²	Std. Pack	
				(Ft/Roll)	(Pcs/Box) (Pcs/Pack)
Uncoated Tubing					
WCSM-9/3-A/U	#14 – #8	0.15 – 0.30 (4 – 8)		100	
WCSM-13/4-A/U	#12 – #6	0.20 – 0.45 (5 – 11)		100	
WCSM-20/6-A/U	#8 – #2	0.25 – 0.70 (6 – 18)		100	
WCSM-33/8-A/U	#4 – 4/0	0.35 – 1.20 (9 – 30)		65	
WCSM-43/12-A/U	1/0 – 400	0.50 – 1.55 (13 – 39)		50	
WCSM-51/16-A/U	250 – 500	0.70 – 1.75 (18 – 44)		40	
WCSM-70/21-A/U	400 – 1000	0.90 – 2.45 (23 – 62)		40	
WCSM-90/30-1500/U	800 – 1200	1.30 – 3.10 (33 – 79)	60 (1500)		5
WCSM-130/36-1500/U	1500 – 2500	1.60 – 4.20 (41 – 107)	60 (1500)		5

¹ Catalog numbers with -S designation are suitable for sealed electrical insulation to 1000 V. Catalog numbers with A/U and /U designations are for cable re-jacketing only.

² Length tolerance to 32 percent. Can be used for multi-conductor LV splices using different tubings.

Note: UL listing applies to sealant-coated (-S) WCSM-9/3 through -70/21 only. WCSM-105/30 and -130/36 are not UL listed.



Ordering Information

1. Select the appropriate catalog number based on typical dimensions for low-voltage insulated cable. Confirm selection with dimensions to assure proper sizing.
2. UL listing applies to sealant-coated (-S) WCSM-9/3 through -70/21 only. WCSM-105/30 and -130/36 are not UL listed.
3. Package does not contain connectors or lugs. Installed connector or lug diameter must be within use range.
4. If sealing is needed with WCSM-A/U uncoated tubing, order S-1052 sealant separately.
5. WCSM tubing may be field-cut for shorter requirements.
6. Bulk packaging is available for cut lengths. Consult your Tyco Electronics representative for information.
7. For testing information refer to the Technical Data section of this catalog.
8. Related test report: EDR-5139
9. UV resistant test report: EDR-5361.

For connector information refer to the Connectors and Terminals section of this catalog.

Low Voltage In-Line Splices



MSHA approved
(No. P-137-MSHA)

FCSM Tubing Heavy-Wall Flame Retardant Tubing (2000 V)

FCSM tubing's tough, crosslinked polyolefin construction provides mechanical strength and cut-through resistance equal to, or surpassing, the properties of low-voltage cable jackets.

- 3:1 shrink ratio and an unlimited shelf life when stored under normal conditions
- Use sealant-coated tubing (-S) as a sealed in-line splice or terminal lug seal. It provides a water-tight seal for direct-buried applications and wet environments.
- Use uncoated tubing (-/U) for cable rejacketing only
- Sealant-coated or uncoated tubing may be used for jacket repair on cable to 35 kV. Qualified to ANSI C119.1-1986; also rated to IEEE 383 (Vertical Tray Flame Test) and ICEA S-19-81.
- FCSM is also MSHA approved (No. P-137-MSHA).

For use on standard poly- or elastomeric- insulated/jacketed cables or lead-jacketed cables, which may include aluminum or steel armoring.

Connectors up to 6 inches: Recommended cut length = connector length + 4 inches.
Connectors over 6 inches: Recommended cut length = connector length + 5 inches.

Selection Information: dimensions in inches (millimeters)

Catalog Number	1000-V Insulated Conductor Size (AWG/kcmil)	General Use Range (Min.-Max.)	Tube Length*	Std. Ft.(m)/Roll	Pack Pcs/Box	Bulk Option Ft.(m)/Roll
In-Line Splice Or Terminal Lug Seal (With Sealant)						
FCSM-9/3-1200-S	#14 - #8	0.15 - 0.30 (4 - 8)	48 (1200)	25		
FCSM-19/6-150-S	#6 - #2	0.25 - 0.65 (6 - 17)	6 (150)	50		
FCSM-19/6-1200-S	#6 - #2	0.25 - 0.65 (6 - 17)	48 (1200)	25		
FCSM-28/9-225-S	#2 - 4/0	0.40 - 0.95 (10 - 24)	9 (225)	50		
FCSM-28/9-1200-S	#2 - 4/0	0.40 - 0.95 (10 - 24)	48 (1200)	25		
FCSM-38/12-300-S	1/0 - 350	0.50 - 1.30 (13 - 33)	12 (300)	40		
FCSM-38/12-1200-S	1/0 - 350	0.50 - 1.30 (13 - 33)	48 (1200)	10		
FCSM-51/16-300-S	250 - 500	0.70 - 1.75 (18 - 44)	12 (300)	30		
FCSM-51/16-1200-S	250 - 500	0.70 - 1.75 (18 - 44)	48 (1200)	10		
FCSM-68/22-1200-S	600 - 1000	0.95 - 2.30 (25 - 58)	48 (1200)	10		
FCSM-90/30-1200-S	800 - 1200	1.30 - 3.10 (33 - 79)	48 (1200)	5		
FCSM-120/40-1200-S	1500 - 2500	1.75 - 4.10 (44 - 104)	48 (1200)	5		
FCSM-177/63-600-S		2.75 - 6.05 (70 - 154)	24 (600)	6		
FCSM-177/63-1200-S		2.75 - 6.05 (70 - 154)	48 (1200)	5		

Cable Rejacketing (Without Sealant)

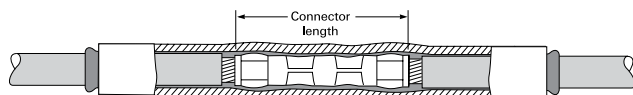
FCSM-9/3-A/U	#14 - #8	0.15 - 0.30 (4 - 8)		100 (30)		
FCSM-19/6-A/U	#6 - #2	0.25 - 0.65 (6 - 17)		100 (30)		825 (250)
FCSM-28/9-A/U	#2 - 4/0	0.40 - 0.95 (10 - 24)		65 (20)		495 (150)
FCSM-38/12-A/U	1/0 - 350	0.50 - 1.30 (13 - 33)		50 (15)		395 (120)
FCSM-51/16-A/U	250 - 500	0.70 - 1.75 (18 - 44)		40 (12)		330 (100)
FCSM-68/22-A/U	600 - 1000	0.95 - 2.30 (25 - 58)		80 (24)		
FCSM-90/30-1500/U	800 - 1200	1.30 - 3.10 (33 - 79)	60 (1500)		5	
FCSM-120/40-1500/U	1500 - 2500	1.75 - 4.10 (44 - 104)	60 (1500)		5	
FCSM-177/63-1500/U		2.75 - 6.05 (70 - 154)	60 (1500)		5	

*Length tolerance to 32 percent.

Ordering Information

1. Select the appropriate catalog number based on typical dimensions for low-voltage insulated cable. Confirm selection with cable dimensions to assure proper sizing.
2. Connectors or lugs not included.
3. If sealing is needed with uncoated FCSM tubing (-/U), order S-1052 separately.
4. Tubing may be field-cut for shorter requirements.
5. Bulk packaging is available for cut-lengths. Contact your Tyco Electronics representative for additional information.
6. For testing information refer to the Technical Data section of this catalog.
7. Related test reports: EDR-5133, EDR-5134, EDR-5141

For connector information refer to the Connectors and Terminals section of this catalog.



Low Voltage In-Line Splices



CRSM Sleeves Heat-Shrink Wraparound Sleeve (1000 V)

CRSM sleeves close easily with a permanent locking system that consists of a raised rail profile and a stainless steel channel. These sleeves are made from crosslinked polyolefin, which equals or exceeds the material properties of the original cable jacket. CRSM sleeves fit a wide range of cable sizes and have unlimited shelf life, when stored under normal conditions.

- Qualified to ANSI C119.1-1986, rated to ICEA electrical withstand test for 1000 volts.
- RUS accepted for use as jacket restoration materials on JCN cable.
- For use on standard poly- or elastomeric insulated/jacketed cables or lead-jacketed cables, which may include aluminum or steel armoring.
- Use as insulation for 1/C low-voltage power cable up to 1000 volts and for jacket repair up to 35 kV or for general sealing applications. All CRSM sleeves are sealant-coated.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Sleeve Length	Primary Electrical Repair (1000 V) Cable and Jacket Repair Conductor Size Use Range (AWG/kcmil)		General Sealing Use Range (0-35 kV)	Std. Pack
			(Min.-Max.)	(Min.-Max.)	
CRSM 34/10-200	08 (200)	#8 - 2/0	0.25 - 0.60 (6 - 15)	0.25 - 1.20 (6 - 30)	3
CRSM 34/10-1200	48 (1219)	#8 - 2/0	0.25 - 0.60 (6 - 15)	0.25 - 1.20 (6 - 30)	5
CRSM 53/13-200	08 (200)	3/0 - 400	0.60 - 0.95 (15 - 24)	0.60 - 1.80 (15 - 46)	10
CRSM 53/13-1200	48 (1219)	3/0 - 400	0.60 - 0.95 (15 - 24)	0.60 - 1.80 (15 - 46)	5
CRSM 84/20-750	30 (750)	500 - 1000	0.95 - 1.40 (24 - 36)	0.95 - 2.70 (24 - 69)	10
CRSM 84/20-1200	48 (1219)	500 - 1000	0.95 - 1.40 (24 - 36)	0.95 - 2.70 (24 - 69)	5
CRSM 107/29-1000	40 (1000)	1000 - 2000	1.30 - 2.00 (33 - 51)	1.30 - 3.60 (33 - 91)	10
CRSM 107/29-1200	48 (1219)	1000 - 2000	1.30 - 2.00 (33 - 51)	1.30 - 3.60 (33 - 91)	5
CRSM 143/36-1200	48 (1219)			1.65 - 4.95 (42 - 126)	5
CRSM 198/55-1200	48 (1219)			2.50 - 6.50 (64 - 165)	5

Ordering Information

1. Select the appropriate catalog number for either primary electrical repair (1000 volts max.) or general sealing applications. Electrical repair selections are based on typical dimensions for low-voltage insulated cable. Confirm selection with cable dimensions to assure proper sizing.
2. Use the "Primary Electrical Repair" columns for electrical repair applications (when CRSM is in direct contact with the conductor).
3. Use the "General Sealing and Jacket Repair Use Range" column for general re-jacketing or sealing applications (when CRSM is not in direct contact with the conductor).
4. Package does not contain connectors.
5. Kits include a wraparound sleeve and stainless steel channel closure. Both can be field-cut for shorter requirements (see "Reference dimensions" below).
6. Related test report: EDR-5124, EDR-5192
7. UV resistant test report: EDR-5361
8. CRSM 34/20 are available in shorter standard lengths by ordering the corresponding CRSM-CT kits. (The use ranges in the Selection Information table still apply).

For connector information refer to the Connectors and Terminals section of this catalog.



Cut sleeve length = Damage length + total seal length

Damage	Total Seal Length
<3 (<76)	3 (76)
3 - 12 (76-305)	4 (102)
12 - 24 (305-610)	6 (152)
>24 (>610)	8 (203)

Low Voltage In-Line Splices

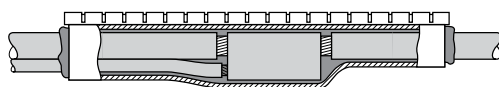


CRSM CT Cable Tap Splices Heat-Shrink Wraparound Cable Tap Splices (1000 V)

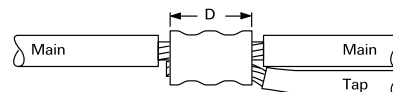
- Use as a wraparound, sealed cable tap splice
- Qualified to ANSI C119.1-1986, rated to ICEA electrical withstand test for 1000 volts
- RUS accepted for use with compression and split-bolt connectors
- Sealant-coated
- For use on standard poly- or elastomeric insulated conductors

Selection Information: dimensions in inches (millimeters)

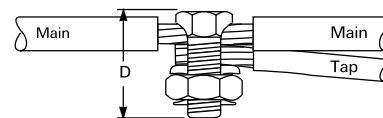
Catalog Number	Sleeve Length	Conductor size (1000 V Max.)		Connector Dimension (Max. D)	Std. Pack
		Main (AWG/kcmil)	Tap (AWG/kcmil)		
Compression connector					
CRSM-CT-34/10-150	6 (152)	#8 - #2	#10 - #2	2 (51)	10
CPGI-CRSM-CT-34/10-150	6 (152)	#8 - #2	#10 - #2	2 (51)	5
CRSM-CT-53/13-200	8 (203)	#2 - 4/0	#10 - 4/0	4 (102)	10
CRSM-CT-84/20-250	10 (254)	4/0 - 500	#2 - 500	6 (152)	10
Standard split-bolt connector					
CRSM-CT-53/13-200	8 (203)	#8 - #2	#14 - #2	1 1/2 (38)	10



Compression connector



Split-bolt connector

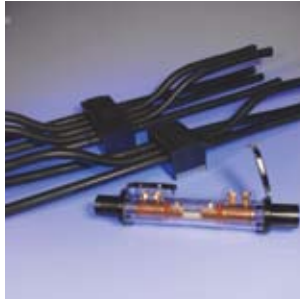


Ordering Information

1. Select the appropriate catalog number based on the main and tap conductor sizes and connector type for electrical repair (1000 volts max.). Selections are based on typical dimensions for low-voltage insulated cable. Confirm selection with cable dimensions to assure proper sizing.
2. Kits are capable of insulating and sealing wye (3-wire) or H (4-wire) configurations up to 1000 volts.
3. Kits do not contain connectors.
4. Kits include insulating sleeve, sealant strip, and stainless steel channel closure.
5. Standard package: 10 kits/box.
6. Related test report: EDR-5192.
7. UV resistant test report: EDR-5361.

For connector information refer to the Connectors and Terminals section of this catalog.

Low Voltage Network Protection



Smart Limiter Cable Protector

Tyco Electronics introduces a quick and easy way to protect secondary network cables—the Smart Limiter cable protector. To many utilities, a network system is the most attractive option for customers seeking steadfast reliability. The Smart Limiter cable protector will assist companies in restoring their network system to its most reliable state and when limiters operate, they will be easily identified and replaced.



- Increases reliability by protecting cable insulation from damage due to fault current
- Quick visual identification of blown limiters reduces the time needed to find faulted limiters
- Fast installation in compact spaces through the use of the ShearBolt connector. No special tools are required for installation, only 11/16" socket for installation and 1/2" for removal. Connection is repeatable to the same standard with every installation. No changing of die or using crimping tools that require calibration. Easily repeatable installation regardless of installer experience
- Sealing and mechanical protection are built in, eliminating the need for additional components
- The limiter will only blow on secondary faults and effortlessly coordinate with network protector fuses.
- Minimal exposure to energized parts. Only the conductor being inserted into the limiter needs to be exposed making it very safe
- Fuse blowing activity is entirely contained in a ballistic enclosure
- 100% submersible
- GelPort cable entries will quench any arc when "live" connections are made; making picking up load safer
- Hinged bolt caps allow entry to enable voltage measurements as required as these caps are re-enterable
- Available, 100% submersible copper buses (crab joints) make installing limiters in one compact place convenient and trouble-free. Available in 3 Way, 5 Way and 7 Way configurations
- Modular design allows circuits to be added or subtracted without cutting cables
- No parts to move, slide or park when installing or removing the limiter
- Tyco Electronics Smart Limiter cable protectors have tested fault duty of 25kA per limiter
- Designed specifically for 208Y/120V systems

Ordering Information

Smart Limiter Cable Protector



Part Number	Description	Per Box
SL-750-120V-F-FT(B1)	Fused limiter for 750 kcmil cable	1
SL-750-120V-NF-FT(B1)	Non-Fused splice for 750 kcmil cable	1
SL-500-120V-F-FT(B1)	Fused limiter for 500 kcmil cable	1
SL-500-120V-NF-FT(B1)	Non-Fused splice for 500 kcmil cable	1
SL-350-120V-F-FT(B1)	Fused limiter for 350 kcmil cable	1
SL-350-120V-NF-FT(B1)	Non-Fused splice for 350 kcmil cable	1
SL-250-120V-F-FT(B1)	Fused limiter for 250 kcmil cable	1
SL-250-120V-NF-FT(B1)	Non-Fused splice for 250 kcmil cable	1
SL-4/0-120V-F-FT(B1)	Fused limiter for 4/0 cable	1
SL-4/0-120V-NF-FT(B1)	Non-Fused splice for 4/0 cable	1

Crab Joint



Part Number	Description	Per Box
CJ-4/0-3W3W-CU-FT-B1	3 way/3 way copper crab joint with 4/0 conductors	1
CJ-4/0-5W5W-CU-FT-B1	5 way/5 way copper crab joint with 4/0 conductors	1
CJ-4/0-7W7W-CU-FT-B1	7 way/7 way copper crab joint with 4/0 conductors	1
CJ-250-3W3W-CU-FT-B1	3 way/3 way copper crab joint with 250 kcmil conductors	1
CJ-250-5W5W-CU-FT-B1	5 way/5 way copper crab joint with 250 kcmil conductors	1
CJ-250-7W7W-CU-FT-B1	7 way/7 way copper crab joint with 250 kcmil conductors	1
CJ-350-3W3W-CU-FT-B1	3 way/3 way copper crab joint with 350 kcmil conductors	1
CJ-350-5W5W-CU-FT-B1	5 way/5 way copper crab joint with 350 kcmil conductors	1
CJ-350-7W7W-CU-FT-B1	7 way/7 way copper crab joint with 350 kcmil conductors	1
CJ-500-3W3W-CU-FT-B1	3 way/3 way copper crab joint with 500 kcmil conductors	1
CJ-500-5W5W-CU-FT-B1	5 way/5 way copper crab joint with 500 kcmil conductors	1
CJ-500-7W7W-CU-FT-B1	7 way/7 way copper crab joint with 500 kcmil conductors	1
CJ-750-3W3W-CU-FT-B1	3 way/3 way copper crab joint with 750 kcmil conductors	1
CJ-750-5W5W-CU-FT-B1	5 way/5 way copper crab joint with 750 kcmil conductors	1
CJ-750-7W7W-CU-FT-B1	7 way/7 way copper crab joint with 750 kcmil conductors	1

Related test reports: EDR-5445, EDR-5446, EDR-5450, EDR-5452, 502-47332, 502-47339

Low Voltage Stub Splices & Motor Connection Kits



GelCap Splice Covers Water Resistant Stub Splice Cover Kit (1000 V)

GelCap splice cover kits quickly and conveniently insulate, seal, and protect stub splice connections up to 1000 volts. The robust, yet compact, design was engineered to handle the harsh environments of motor connections. GelCap splice cover kits are equally well suited for many other connection applications including street light connections. The specially formulated material provides excellent abrasion resistance and insulation value.

Each cap size is designed to fit a wide range of cable sizes. The expandable design keeps the cap as small as possible and allows it to expand only as much as needed to fit on large cable.

GelCap splice cover kits provide the fastest installation. Simply push the cover down over the connection and snap the clamp closed. No extra materials or greases are required. The PowerGel sealant is already in the cap. Removal is just as quick and easy as installation.

Common uses for GelCap splice cover kits:

- Street lights
- Over wire nuts for sealing
- Irrigation systems
- HVAC
- Outdoor lighting

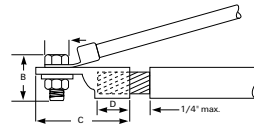
Selection Information: dimensions in inches (millimeters)

Catalog Number	Feeder Conductor Size (mm²)	Max. Bolt Dimensions Width (A)	Length (B)	Max. Lug Dimensions Total Length (C)	Barrel Length (D)	Cap length (Nominal)	Std. Pack
GelCap 1**	#16 - #10 AWG (1.5 - 5)	.375 (10)	.500 (13)	1.00 (25)	0.5 (13)	2.8 (71)	5
CPGI-GelCap-1**	#16 - #10 AWG (1.5 - 5)	.375 (10)	.500 (13)	1.00 (25)	0.5 (13)	2.8 (71)	5
GelCap 2	#8 - #2 AWG (8 - 35)	.625 (16)	1.00 (25)	2.00 (51)	1.0 (25)	3.5 (89)	5
CPGI-GelCap-2	#8 - #2 AWG (8 - 35)	.625 (16)	1.00 (25)	2.00 (51)	1.0 (25)	3.5 (89)	5
CPGI-GelCap-2-SGL*	#8 - #2 AWG (8 - 35)	.625 (16)	1.00 (25)	2.00 (51)	1.0 (25)	3.5 (89)	5
GelCap 3	#2 - #4/0 AWG (35 - 105)	.850 (22)	1.30 (33)	3.00 (76)	1.5 (38)	6.0 (152)	5
GelCap 4	250 - 500 kcmil (125 - 250)	1.100 (28)	1.85 (47)	5.00 (127)	2.0 (51)	8.0 (203)	5

* CPGI-GelCap-2-SGL kit contains one GelCap cover only.

** For wire sizes #16 - #10, the unique design of the GelCap 1 splice kit saves space by allowing all three phase connections to be installed in one cover.

• For GelCap splice kits sizes 2-4, one cap per phase is provided.



Product Performance

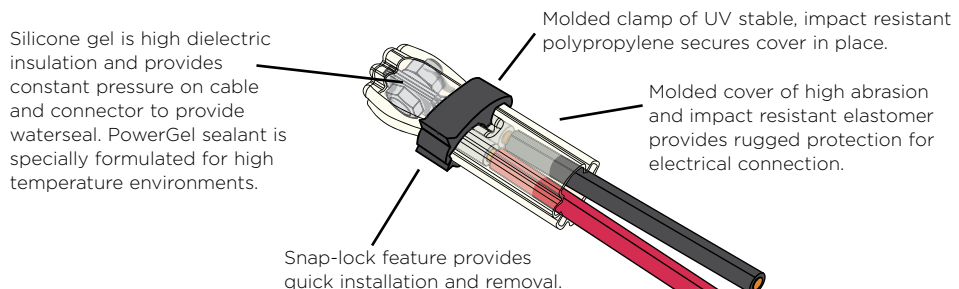
Testing	Test Conditions
Chemical Resistance	ASTM D543, Sulfuric acid, Sodium hydroxide and motor oil
Ozone Resistance	ASTM D1149, 168 hours @40°C, 50pphm
Accelerated Aging	ASTM D2671
Abrasion Resistance	2040 gm wt., 4000 cycles, 2% max thickness loss

Related Product Information: EDR-5435 Test Report

Ordering Information

1. Selection based on typical dimensions of low-voltage insulated cables.
2. Kits do not contain connectors.

For connector information refer to the Connectors and Terminals section of this catalog.



600V/105°C

Low Voltage Stub Splices & Motor Connection Kits



RVC Splice Cover Kits “Roll-on” Stub Connection Insulation Kits (1000 V)

RVC splice cover kits offer the quick and easy “roll-on” way to insulate and seal stub connections in motors and street lights up to 1000 volts. The elastomeric RVC cap splice cover provides the required insulation thickness, withstands abrasion, and forms a water-resistant seal. The tool-free RVC cap is ideal for installation in cramped motor boxes. It slides on easily and will not leak, unravel, or slip off.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Feeder Size (AWG/kcmil)	Bolt dimensions Size (Max.)	Length (Max.)	Lug Length (Max.)	Cap Length (Nominal)	Std. Pack
Motor connections or two-wire stub splices						
RVC-1V	#14 - #4	.375 (8)	.625 (15)	1.75 (45)	3.00 (75)	5
RVC-2V	#8 - 2/0	.375 (8)	.750 (20)	2.75 (70)	4.00 (100)	5
RVC-3V	#2 - 4/0	.500 (12)	1.00 (25)	3.00 (75)	5.25 (130)	5
RVC-4V	250 - 500	.625 (16)	1.50 (35)	5.00 (125)	7.50 (190)	5

Catalog Number	Conductor Size (AWG/kcmil)	Insulation Cut-Back (Max.)
Three-wire stub splices		
RVC-1V	#14 - #8	1.75 (44)
RVC-2V	#6 - #2	2.75 (70)

Information

1. Select the appropriate catalog number. Selections are based on typical dimensions of low-voltage insulated cable. Confirm selection with dimensions to assure proper sizing.
2. Kits do not contain connectors. The RVS splice cover selection information above covers copper and aluminum in-line compression connections.
3. Each kit contains one Rayvolve RVS splice cover sleeve and sealant strips.
4. Standard package: 5 kits/box.
5. Related test report: EDR-5167

For connector information refer to the Connectors and Terminals section of this catalog.



LISTED 96J4
Direct burial insulation
covered for listed
pressure connectors



Certified C22.2
No. 198.2

Qualified to ANSI C119.1-1986. CSA
certified to C22.2 No. 198.2. UL listed per 96J4
(file E91151).

Low Voltage Stub Splices & Motor Connection Kits



MCK Motor Connection Kits Heat-Shrink Motor Connection Kits for 1/C (2000 V)

- Qualified to ANSI-C119.1-1986 and rated to ICEA electrical withstand test for 1000 V
- For use as an in-line or stub splice between 1/C poly feeder cable and motor leads
- Excellent insulation sealing—and resistance to abrasion—in motor connections

Type V

The stub “Type V” kit is designed to splice the stub or butt configuration that is commonly used where there is insufficient room to make in-line connections.

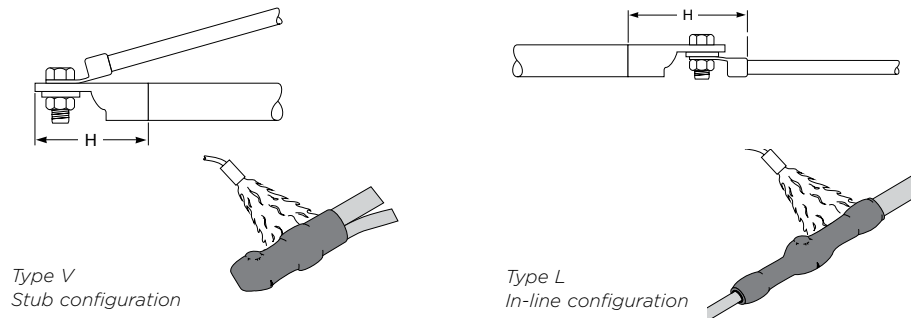
Type L

The In-Line “Type L” kit is used, where space permits, to splice in-line connections.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Motor feeder size (AWG/kcmil)	Bolt Length (Max.)	Connection Length (Max.) H	Length (Nominal)	Std. Pack
Stub Type V				<i>Cap</i>	
MCK-1V	#14 – #10	5/8	2.0 (51)	2.5 (64)	5
CPGI-MCK-1V	#14 – #10	5/8	2.0 (51)	2.5 (64)	5
MCK-2V	#12 – #4	3/4	2.5 (64)	3.4 (86)	5
CPGI-MCK-2V	#12 – #4	3/4	2.5 (64)	3.4 (86)	5
MCK-3V	#2 – 4/0	1	3.5 (89)	4.5 (114)	5
MCK-4V	250 – 500	1 1/2	5.5 (140)	6.5 (165)	5
In-Line Type L				<i>Sleeve</i>	
MCK-1L	#8 – 4/0	1 1/4	5.0 (127)	9.0 (229)	
MCK-2L	250 – 1000	1 1/2	8.0 (203)	12.0 (305)	

Notes: MCK motor connection kits are designed for single-hole connectors and include caps and sealant strips for three connections. Kits do not contain connectors.



Ordering information

1. Select appropriate catalog number based on the motor feeder cable. Motor pigtail leads of the same size or smaller are suitable. MCK selections are based on the typical dimensions of low-voltage insulated cable. MCK selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with the data contained in AEIC CS5-1987 and AEIC CS6-1987, as well as the dimensions of commonly used connectors. Nominal insulation thickness (100%): 90 mils. For cables manufactured to other specifications, confirm selection with cable and connector dimensions.
2. Shielded cable must be terminated before installing MCK.
3. MCK kits are designed for single-hole connectors and include caps and sealant strips for three connections. Kits do not contain connectors.
4. Related test reports: MCK: EDR-5110

For connector information refer to the Connectors and Terminals section of this catalog.

Low Voltage Taps



GTAP Splices Water Resistant Splice (1000 V)

The GTAP gel tap splice kit provides a fast and simple method for connecting, insulating, and environmentally sealing low-voltage splices. The GTAP splice kit is designed for underground as well as overhead environments. It is especially useful for street lighting applications.

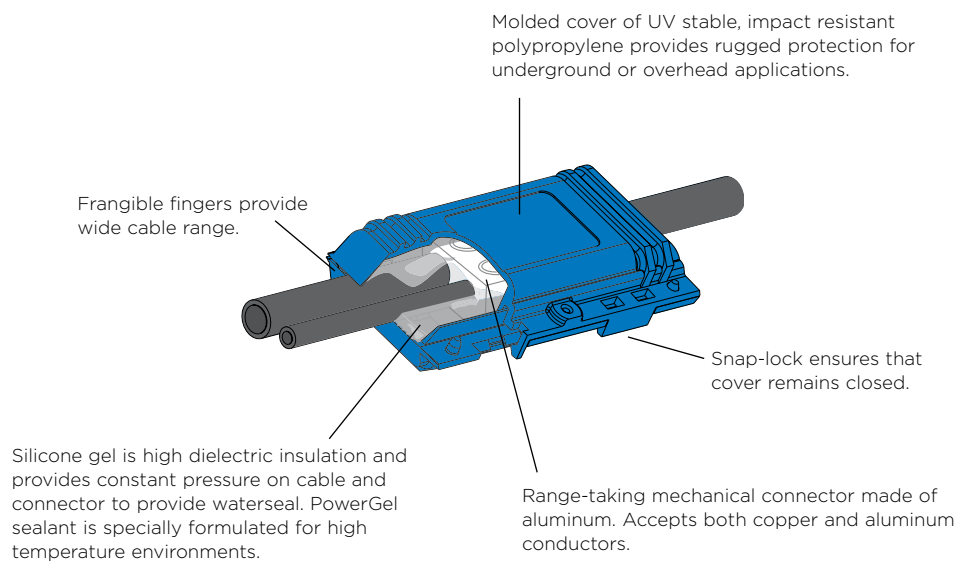
- Range-taking mechanical connectors splice a wide range of cables, including copper and aluminum
- Connector's four port design allows maximum inventory flexibility
- Hinged closure allows for one-step installation
- Can be installed over the connector in seconds by simply snapping the cover shut
- Utilizes Tyco Electronics' innovative PowerGel sealant to protect the connection from moisture ingress, corrosion, and pollution
- PowerGel sealant provides additional insulation

Selection Information

Catalog Number	Conductor Size (All Outlets) AWG (mm ²)	Std. Pack
GTAP-1	#14 - #2 (2-35)	18 or 72
CPGI-GTAP-1	#14 - #2 (2-35)	5
GTAP-2	#14 - 2/0 (2-70)	18 or 72
CPGI-GTAP-2	#14 - 2/0 (2-70)	5

Selections are based on typical dimensions for low voltage, insulated cable.

Catalog Number	Length	Width	Height
GTAP-1	2-3/4 (70)	1-5/8 (41)	1-1/16 (27)
GTAP-2	4-1/4 (108)	2 (51)	1-3/16 (30)



Ordering Information

1. Selection based on typical dimensions of low-voltage insulated cables.

Low Voltage Taps



GelCap SL Splice Covers Water Resistant Cover Kit with Connector (1000 V)

Tyco Electronics' GelCap SL splice cover kits provide quick installation, dependable performance, and easy reentry for street lighting connections, but they have many other uses.

GelCap SL splice cover kits quickly and conveniently insulate, seal, and protect stub splice connections up to 1000 volts.

PowerGel Sealant Technology

The GelCap SL splice cover kits feature revolutionary PowerGel sealant which provides an excellent moisture seal over a wide temperature range (-40°C to 105°C).

Innovative Cap Design and Material

The specially formulated material provides excellent abrasion resistance and insulation.

Range Taking Connector

The special three wire connector is perfect for street light connections. There are two ports that accept wires from #14-2/O AWG. Use these for the feeder cable. There is a single port that accepts #14-6 AWG. Use this port to power the light.

Fast and Easy Installation

GelCap SL splice cover kits provide fast installation. Simply push the cover down over the connection and snap the clamp closed. No extra materials or greases are required. The PowerGel sealant is already in the cap.

Easy to Reenter

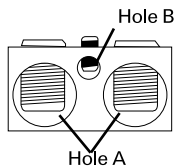
The GelCap SL splice cover is easy to re-enter because the PowerGel sealant pulls away leaving a clean connection. Re-entry is also safer than other methods because no sharp objects or cutting tools are required for removal of the cap.

Other Common Uses for GelCap Splice Cover Kits

- Irrigation systems
- HVAC
- Outdoor lighting
- Motor connections

Selection Information

Catalog Number	Hole A		Hole B		Std. Pack
	Wire Range	Recommended Torque Values	Wire Range	Recommended Torque Values	
GelCap-SL-2/O-3 Hole	#14-2/O AWG	120-180 in-lbs	#14-6 AWG	120-150 in-lbs	10
CPGI-GelCap-SL-2/O-3 Hole	#14-2/O AWG	120-180 in-lbs	#14-6 AWG	120-150 in-lbs	5



Testing

Testing	Test Conditions
Chemical Resistance	ASTM D543, Sulfuric acid, Sodium Hydroxide and motor oil
Ozone Resistance	ASTM D1149, 168 hours @ 40°C, 50 pphm
Accelerated Aging	ASTM D2671
Abrasion Resistance	2040 gm wt., 4000 cycles, 2% max thickness loss



600V/105°C

Ordering Information

1. Selections are based on typical dimensions of low-voltage insulated cables.
2. Kits include UL Listed connectors for use with copper and/or aluminum conductors.
3. Each kit contains a gel filled cap, cap clamp, and connector.

Low Voltage Taps



GHFC H-Frame Closures Water Resistant Closure for Power Cable (1000 V)

Tyco Electronics' low-voltage H-frame closures provide a fast and simple method for insulating and environmentally sealing low-voltage cable-taps and splices made with H-frame compression connectors.

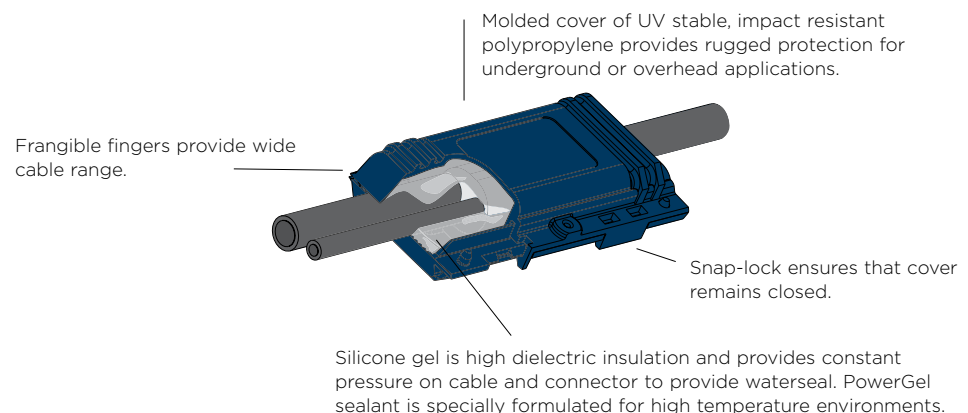
- Utilizes Tyco Electronics' PowerGel sealant material to seal and protect the connection from moisture ingress, corrosion, and pollution
- Ideal for both underground and overhead applications and is especially useful for street lighting applications
- Qualified to ANSI C119.1-1986 for underground splicing
- UV resistant
- Qualified for temperatures from -40°C to 90°C

Simply place the connection on the closure and press the closure together. It's that easy—no tapes, mastics, tools, or mixing are required. The closure can be easily installed with one hand.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Conductor Size (AWG/kcmil)		Die	Std. Pack
	Main	Tap		
GHFC-1-90	#6 - #2	#14 - #8	"BG"	10 or 100
CPGI-GHFC-1-90	#6 - #2	#14 - #8	"BG"	5
GHFC-2-90	#2 - 2/0	#14 - #6	"O"	10 or 100
CPGI-GHFC-2-90	#2 - 2/0	#14 - #6	"O"	5
GHFC-2.5-90	1/0 - 4/0	#6 - 3/0	"D"	30 each
GHFC-3-90	350	4/0	"N"	6 or 18

Catalog Number	Length	Width	Height
GHFC-1-90	2-3/4 (70)	1-5/8 (41)	1-1/16 (27)
GHFC-2-90	4-1/4 (108)	2 (51)	1-3/16 (30)
GHFC-2.5-90	7-1/8 (181)	2-3/4 (70)	1-4/7 (40)
GHFC-3-90	6-1/4 (159)	3-1/3 (84)	1-15/16 (49)



Ordering Information

1. Select the appropriate catalog number. Selections are based on typical dimensions for low-voltage, insulated cables and connectors.
2. Approved connectors (supplied by others) include, but are not limited to:

Product	Approved connectors
GHFC-1-90	Homac UB214; T&B 63105; Blackburn WR9; Burndy YPC2A8U
GHFC-2-90	Homac OB22, OB44, OB102, OB103; Burndy YHO-1, YHO-2, YHO100, YHO125, YHO150; Blackburn WR139, WR159, WR179, WR199; ILSCO AH1; T&B 63110; UTILCO HT1, HT2

3. Standard packs of 100 ea. are also available. Substitute a (B100) in place of the (B10) in the catalog number.
4. Related test report: GHFC-1-90 and GHFC-2-90 - EDR-5264, GHFC-3-90 - EDR-5326

Low Voltage Taps



GelPort Connectors

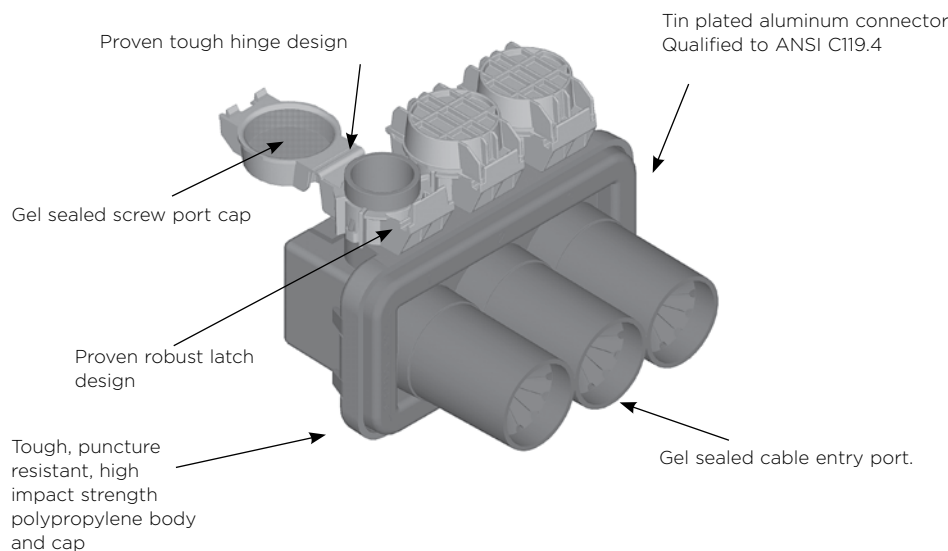
Submersible Connectors for URD Distribution (1000 V)

- Corrosion resistance
- No loose parts due to one piece housing
- Gel-filled cable entry ports provide a reliable cable seal
- PowerGel sealing gel seals out harsh environments
- Rugged, impact-resistant housing stands up to rough installations
- Clear view back allows for easy positive visual indication of wire position in connector

Selection Information: dimensions in inches (millimeters)

Catalog Number	Clear View	Number of Wire Ports	Conductor Use Range (mm ²)	Length Inches (mm)	Width Inches (mm)	Height Inches (mm)
GPRT-350-3P	-C	3	14 - 350 (2 - 150)	4.60 (117)	3.825 (97)	3.50 (89)
GPRT-350-4P	-C	4	14 - 350 (2 - 150)	5.85 (149)	3.825 (97)	3.50 (89)
GPRT-350-5P	-C	5	14 - 350 (2 - 150)	7.10 (180)	3.825 (97)	3.50 (89)
GPRT-350-6P	-C	6	14 - 350 (2 - 150)	8.35 (212)	3.825 (97)	3.50 (89)
GPRT-350-8P	-C	8	14 - 350 (2 - 150)	10.85 (276)	3.825 (97)	3.50 (89)
GPRT-350/4P-500/1P	-C	5 Hybrid		7.10 (180)	3.825 (97)	3.50 (89)
		4	14 - 350 (2 - 150)			
GPRT-350/6P-500/2P	-C	1	6 - 500 (16 - 250)			
		8 Hybrid		10.85 (276)	3.825 (97)	3.50 (89)
		6	14 - 350 (2 - 150)			
		2	6 - 500 (16 - 250)			

Note: For clear view back, add "-C" to catalog number



Ordering Information

1. Selection based on typical dimensions of low voltage cables.
2. Standard package is 6/box

Product Performance

Testing	Test Condition
Complete unit	ANSI C119.1, 2002, Report: EDR-5379, EDR-5409, EDR-5427
Connector	ANSI C119.4, 2003, Report: 502-47264, 502-47302, 502-47308
Chemical Resistance	ASTM D543 to the following liquids: Sulfuric Acid, Sodium Sulfate, Sodium Chloride, Sodium Hydroxide, Ethylene Glycol
UV Resistance	ASTM G-53-95, ASTM-D-638-95

MEDIUM/HIGH VOLTAGE SPLICES, TAPS & TERMINATIONS



Medium/High Voltage In-Line Splice (5-69 kV)

Cold-Applied

CSJA In-Line Splices (15-35 kV)	23
CSJG In-Line Joint (15-35 kV)	25

Heat-Shrink

HVS In-Line Splice (15-35 kV)	27
HVS-C-1520S In-Line Splice (15 kV)	28
HVS-1550S In-Line Splice w/ AL ShearBolt Connector (15 kV)	29
EHVS (46 and 69 kV)	30
HVS-LC (15-35 kV)	31
HVS/HVSR In-Line or Transition Splice (15-35 kV)	32
HVS-T/HVSR-T Trifurcating Transition Splice (15-35 kV)	33
HVS-T-1590S Trifurcating Splice Kits (15 kV)	34
HVS/HVSA-3-1580S In-Line Splice (15 kV) 3/C Transition	35
HVS-3-1590S/HVS-3-2590S In-Line Splice (15-25 kV) 3/C	36
HVSY In-Line Splice/Tap (15 kV) Wye	37
HVSH-MOD Kit (15 kV)	39
HVES Seals (15-25 kV) Live End Seals	39
HVE-1590 PILC Elbow Adapters (15 kV)	41
HV-MSK In-Line Mining Cable Splice (5-8 kV)	42

Link Boxes

Link Boxes	43
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Medium Voltage Terminations (5-69 kV)

Cold-Applied

TFT-E Terminations (15, 25, and 35 kV)	44
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Heat-Shrink

HVT-G/SG 1/C Termination (15-35 kV)	46
HVT-Z Termination with Built-In Stress Control (15-35 kV)	47
HVT-LC/SLC Termination (15-35 kV) LC Shield	49
HVT-J/SJ Termination (15-35 kV)	50
HVT/HVT-3 Termination (15 kV) PILC/VCLC	51
EHVT/GHVT Termination (46 and 69 kV)	52

Medium Voltage Stub Splices & Motor Connection Kits (5-8kV)

GelCap 8 Motor connection Kit (5-8 kV)	53
MCK-5 Stub Splice (5-8.7 kV)	54

Medium Voltage In-Line Splice



CSJA

In-line Cold Shrinkable Joints for 1/C Shielded Power Cables (15-35 kV)

Tyco Electronics introduces the "All-in-One" CSJA cold shrinkable joint for 15kV through 35kV. It is designed to splice tape shield, wire shield, LC shield, UniShield, and flat strap shielded cables.

- Cable joint has a pre-expanded EPDM re-jacketing sleeve and an integrated neutral sock
- "All-in-One" design is easy to install with minimal steps and short installation time
- Pre-expanded, single-piece silicone rubber joint body with high mechanical expansion capability allows a wide application range
- Ergonomically designed spiral holdout gives a smooth installation with low release forces
- Total length of the splice body on the holdout is 14 to 19 inches providing a compact design
- Silicone rubber body provides high dielectric strength, high tear strength, low tension set, and excellent low temperature recovery
- Excellent electrical stress control by factory molded stress cones and Faraday cage
- Void filling stress relief mastics are not necessary
- Proven shield continuity concept
- Joint accepts both mechanical and compression connectors
- Meets IEEE-404 requirements for 15 kV through 35 kV

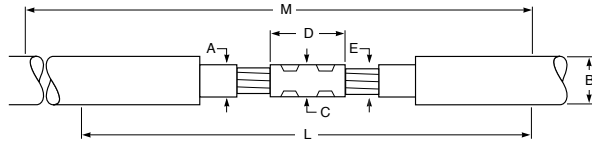
Each joint is factory tested to include AC withstand and partial discharge to ensure integrity of the installation in accordance to IEEE-404.

Ordering Information

1. Selections are based on the typical dimensions of 100% insulated cables, manufactured in accordance with AEIC standard. Nominal insulation thickness (100%): 15kV: 175mils, 25kV: 260mils, 35kV: 345mils.
2. Select the appropriate catalog number. Use the insulation OD, and jacket OD range as the final ordering criteria.
3. For mechanical ShearBolt connector included in the kit confirm the correct connector selection according to the Min/Max diameter over the cable conductor from the tables.
4. If external grounding is required, order the CSJ-EG kit.
5. For other applications or if you have any questions, contact your Tyco Electronics representative.
6. Standard package: 1 kit/box.
7. Related test report: EDR-5430, EDR-5455

MEDIUM/HIGH VOLTAGE SPLICES, TAPS & TERMINATIONS

Medium Voltage In-Line Splice



Selection Information: dimensions in inches (millimeters)

Voltage Class	Catalog Number Range	Nominal Cable Range	Min/Max Insulation OD	Max Jacket OD	Neutral Sock Length (AWG)	Connector Dimensions		Kit Installed Space	Required Installation Space
						Max, OD	Length		
						C	D		
CSJA Joint Without Connector									
15kV	CSJA-1521	#2 - 350	0.69 - 1.20 (17.5 - 30.5)	1.50 (38.1)	1/0	1.30 (33.0)	5.50 (140.0)	29 (737)	39 (990)
15kV	CSJA-1522	4/0 - 750	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	1/0	1.50 (38.0)	5.50 (140.0)	29 (737)	39 (990)
15kV	CSJA-1523	350 - 1000	1.03 - 1.58 (26.2 - 40.0)	2.05 (52.1)	2/0	1.65 (42.0)	6.69 (170.0)	33 (838)	43 (1090)
15kV	CSJA-1524	750 - 1250	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	2/0	1.85 (47.0)	7.90 (200.0)	37 (939)	49 (1244)
25/28kV	CSJA-2822	#1 - 500	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	1/0	1.50 (38.0)	5.50 (140.0)	29 (737)	39 (990)
25/28kV	CSJA-2823	4/0 - 750	1.03 - 1.58 (26.20 - 40.0)	2.05 (52.1)	2/0	1.65 (42.0)	6.69 (170.0)	33 (838)	43 (1090)
25/28kV	CSJA-2824	500 - 1250	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	2/0	1.85 (47.0)	7.90 (200.0)	37 (939)	49 (1244)
35kV	CSJA-3523	1/0 - 350	1.03 - 1.49 (26.20 - 37.8)	2.05 (52.1)	2/0	1.40 (35.6)	5.50 (140.0)	33 (838)	43 (1090)
35kV	CSJA-3524	350 - 1000	1.36 - 2.05 (34.54 - 52.0)	2.60 (66.0)	2/0	1.96 (50.0)	7.90 (200.0)	37 (939)	49 (1244)

Voltage Class	Catalog Number	Nominal Cable Range	Min/Max Insulation OD	Max Jacket OD	Neutral Sock (AWG)	Min/Max Diameter Over Cable Conductor*	Kit Installed Length	Required Installation Space
		A			B	E	L	M
		CSJA Joint With Copper Mechanical ShearBolt Connector						
15kV	CSJA-1521M1	2/0 - 350	0.69 - 1.20 (17.5 - 30.5)	1.50 (38.1)	1/0	0.376 - 0.736 (9.50 - 18.7)	29 (737)	39 (990)
15kV	CSJA-1522M1	4/0 - 500	0.87 - 1.40 (22 - 35.6)	1.80 (46.0)	1/0	0.376 - 0.736 (9.50 - 18.7)	29 (737)	39 (990)
15kV	CSJA-1522M2	350 - 750	0.87 - 1.40 (221 - 35.6)	1.80 (46.0)	1/0	0.570 - 0.945 (14.5 - 24.0)	29 (737)	39 (990)
15kV	CSJA-1523M2	350 - 750	1.03 - 1.58 (26.2 - 40.0)	2.05 (52.1)	2/0	0.570 - 0.945 (14.5 - 24.0)	33 (838)	43 (1090)
25/28kV	CSJA-2822M1	2/0 - 500	0.87 - 1.40 (221 - 35.6)	1.80 (46.0)	1/0	0.376 - 0.736 (9.50 - 18.7)	29 (737)	39 (990)
25/28kV	CSJA-2823M2	350 - 750	1.03 - 1.58 (26.2 - 40.0)	2.05 (52.1)	2/0	0.570 - 0.945 (14.5 - 24.0)	33 (838)	43 (1090)
25/28kV	CSJA-2824M2	500 - 750	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	2/0	0.570 - 0.945 (14.5 - 24.0)	37 (939)	49 (1244)
35kV	CSJA-3523M1	2/0 - 350	1.03 - 1.49 (26.20 - 37.8)	2.05 (52.1)	2/0	0.376 - 0.736 (9.50 - 18.7)	33 (838)	43 (1090)
35kV	CSJA-3524M2	350 - 750	1.36 - 2.05 (34.54 - 52.0)	2.60 (66.0)	2/0	0.570 - 0.945 (14.5 - 24.0)	37 (939)	49 (1244)

* Min/max diameter over cable conductor accepted by the copper mechanical connector.

Voltage Class	Catalog Number	Nominal			Neutral			Kit	Required
		Cable	Min/Max		Sock	Min/Max Diameter	Installed	Installation	
		Range	Insulation OD	Max Jacket OD	(AWG)	Over Cable Conductor *	Length	Space	
			A	B		E	L	M	
CSJA Joint With Aluminum Mechanical ShearBolt Connector									
15kV	CSJA-1521M4	#2 - 3/0	0.69 - 1.20 (17.5 - 30.5)	1.50 (38.1)	1/0	0.268 - 0.470 (6.80 - 11.9)	29 (737)	39 (990)	
15kV	CSJA-1521M5	#2 - 350	0.69 - 1.20 (17.5 - 30.5)	1.50 (38.1)	1/0	0.268 - 0.681 (6.80 - 17.3)	29 (737)	39 (990)	
15kV	CSJA-1522M6	4/0 - 500	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	1/0	0.423 - 0.813 (10.7 - 20.6)	29 (737)	39 (990)	
15kV	CSJA-1522M7	500 - 750	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	1/0	0.736 - 0.998 (18.7 - 25.3)	29 (737)	39 (990)	
15kV	CSJA-1523M8	350 - 750	1.03 - 1.58 (26.20 - 40.0)	2.05 (52.1)	2/0	0.616 - 0.998 (15.7 - 25.3)	33 (838)	43 (1090)	
15kV	CSJA-1524M9	750 - 1000	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	2/0	0.813 - 1.152 (20.6 - 29.2)	37 (939)	49 (1244)	
25/28kV	CSJA-2822M5	#1 - 350	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	1/0	0.268 - 0.681 (6.80 - 17.3)	29 (737)	39 (990)	
25/28kV	CSJA-2822M6	4/0 - 500	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	1/0	0.423 - 0.813 (10.7 - 20.6)	29 (737)	39 (990)	
25/28kV	CSJA-2823M8	350 - 750	1.03 - 1.58 (26.20 - 40.0)	2.05 (52.1)	2/0	0.616 - 0.998 (15.7 - 25.3)	33 (838)	43 (1090)	
25/28kV	CSJA-2824M9	500 - 750	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	2/0	0.616 - 0.998 (15.7 - 25.3)	37 (939)	49 (1244)	
25/28kV	CSJA-2824M9	750 - 1000	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	2/0	0.813 - 1.152 (20.60 - 29.2)	37 (939)	49 (1244)	
35kV	CSJA-3523M5	1/0 - 350	1.03 - 1.49 (26.20 - 37.8)	2.05 (52.1)	2/0	0.268 - 0.681 (6.8 - 17.3)	33 (838)	43 (1090)	
35kV	CSJA-3524M8	350 - 750	1.36 - 2.05 (34.54 - 52.0)	2.60 (66.0)	2/0	0.616 - 0.998 (15.7 - 25.3)	37 (939)	49 (1244)	
35kV	CSJA-3524M9	750 - 1000	1.36 - 2.05 (34.54 - 52.0)	2.60 (66.0)	2/0	0.813 - 1.152 (20.60 - 29.2)	37 (939)	49 (1244)	

* Min/max diameter over cable conductor accepted by the aluminum mechanical connector.

Catalog Number	Length of Moisture Blocked Braid	Braid (AWG)
Cold-applied External Grounding Kit		
CSJ-EG-1	24 (610)	#8
CSJ-EG-2	24 (610)	#6
CSJ-EG-3	24 (610)	#4

Medium Voltage In-Line Splice

**CSJG****In-line Cold Shrinkable Joint for 1/C Jacketed Concentric Neutral Cables (15-35 kV)**

Tyco Electronics introduces the CSJG cold shrinkable joint for 15kV through 35kV. It is designed to splice jacketed concentric neutral (JCN) cables.

- Splice consists of a pre-expanded silicone body on a unique holdout design and separate rejacketing system. This design is easy to install with minimal steps and short installation time
- Pre-expanded, single piece silicone rubber body with high mechanical expansion capability allows a wide application range
- Ergonomically designed spiral holdout gives a smooth installation with low release forces
- Silicone rubber body provides high dielectric strength, high tear strength, low tension set, and excellent low temperature recovery
- Total length of the silicone body on the holdout ranges from 14 to 19 inches providing a compact design
- Excellent electrical stress control by factory molded stress cones and Faraday cage
- Void filling stress relief mastics are not necessary
- Rejacketing system is a cold-applied wraparound sleeve designed to seal the entire splice and provide mechanical and environmental protection for direct buried installation
- Joint accepts both mechanical and compression connectors
- Meets IEEE-404 requirements

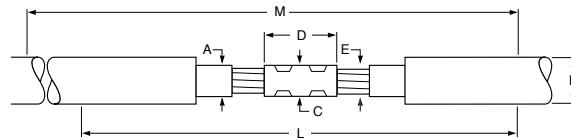
Each silicone body is factory tested to include AC withstand and partial discharge to ensure integrity of the installation in accordance to IEEE-404.

Ordering Information

1. Selections are based on the typical dimensions of 100% insulated cables, manufactured in accordance with AEIC standard. Nominal insulation thickness (100%): 15kV: 175mils, 25kV: 260mils, 35kV: 345mils.
2. Select the appropriate catalog number. Use the insulation OD and jacket OD range as the final ordering criteria.
3. For mechanical ShearBolt connector included in the kit confirm the correct connector selection according to the Min/Max diameter over the cable conductor from the tables.
4. If external grounding is required, order the CSJG-EG kit.
5. For other applications or if you have any questions, contact your Tyco Electronics representative.
6. Standard package: 1 kit/box.
7. Related test report: EDR-5430, EDR-5455. Gelwrap rejacketing sleeve is qualified per IEEE 404-2006

MEDIUM/HIGH VOLTAGE SPLICES, TAPS & TERMINATIONS

Medium Voltage In-Line Splice



Selection Information: dimensions in inches (millimeters)

Voltage Class	Catalog Number	Nominal Cable Range	Min/Max Insulation OD	Max Jacket OD	Connector Max. OD	Dimensions Length	Kit Installed Length	Require Installation Space
			A	B	C	D	L	M
CSJG Joint Without Connector								
15kV	CSJG-1511	#2 - 350	0.69 - 1.20 (17.5 - 30.5)	1.50 (38.1)	1.30 (33.0)	5.50 (140.0)	33 (850)	42 (1060)
15kV	CSJG-1512	4/0 - 750	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	1.50 (38.0)	5.50 (140.0)	33 (850)	42 (1060)
15kV	CSJG-1513	350 - 1000	1.03 - 1.58 (26.2 - 40.0)	2.05 (52.1)	1.65 (42.0)	6.69 (170.0)	41 (1050)	50 (1270)
15kV	CSJG-1514	750 - 1250	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	1.85 (47.0)	7.90 (200.0)	41 (1050)	55 (1390)
25/28kV	CSJG-2812	#1 - 500	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	1.50 (38.0)	5.50 (140.0)	33 (850)	42 (1060)
25/28kV	CSJG-2813	4/0 - 750	1.03 - 1.58 (26.20 - 40.0)	2.05 (52.1)	1.65 (42.0)	6.69 (170.0)	41 (1050)	50 (1270)
25/28kV	CSJG-2814	500 - 1250	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	1.85 (47.0)	7.90 (200.0)	41 (1050)	55 (1390)
35kV	CSJG-3513	1/0 - 350	1.03 - 1.49 (26.20 - 37.8)	2.05 (52.1)	1.40 (35.6)	5.50 (140.0)	41 (1050)	50 (1270)
35kV	CSJG-3514	350 - 1000	1.36 - 2.05 (34.54 - 52.0)	2.60 (66.0)	1.96 (50.0)	7.90 (200.0)	41 (1050)	55 (1390)
35kV	CSJG-3515	750 - 1250	1.63 - 2.36 (41.40 - 60.0)	2.60 (66.0)	2.36 (60.0)	7.90 (200.0)	41 (1050)	55 (1390)

Voltage Class	Catalog Number	Nominal Cable Range	Min/Max Insulation OD	Min/Max Jacket OD	Min/Max Diameter Over Cable Conductor*	Kit Installed Length	Required Installation Space
			A	B	E	L	M
CSJG Joint With Copper Mechanical ShearBolt Connector							
15kV	CSJG-1511M1	2/0 - 350	0.69 - 1.20 (17.5 - 30.5)	1.50 (38.1)	0.376 - 0.736 (9.50 - 18.7)	33 (850)	42 (1060)
15kV	CSJG-1512M1	4/0 - 500	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	0.376 - 0.736 (9.50 - 18.7)	33 (850)	42 (1060)
15kV	CSJG-1512M2	350 - 750	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	0.570 - 0.945 (14.5 - 24.0)	33 (850)	42 (1060)
15kV	CSJG-1513M2	350 - 750	1.03 - 1.58 (26.2 - 40.0)	2.05 (52.1)	0.570 - 0.945 (14.5 - 24.0)	41 (1050)	50 (1270)
25/28kV	CSJG-2812M1	2/0 - 500	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	0.376 - 0.736 (9.50 - 18.7)	33 (850)	42 (1060)
25/28kV	CSJG-2813M2	350 - 750	1.03 - 1.58 (26.2 - 40.0)	2.05 (52.1)	0.570 - 0.945 (14.5 - 24.0)	41 (1050)	50 (1270)
25/28kV	CSJG-2814M2	500 - 750	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	0.570 - 0.945 (14.5 - 24.0)	41 (1050)	55 (1390)
35kV	CSJG-3513M1	2/0 - 350	1.03 - 1.49 (26.20 - 37.8)	2.05 (52.1)	0.376 - 0.736 (9.50 - 18.7)	41 (1050)	50 (1270)
35kV	CSJG-3514M2	350 - 750	1.36 - 2.05 (34.54 - 52.0)	2.6 (66.0)	0.570 - 0.945 (14.5 - 24.0)	41 (1050)	55 (1390)

* Min/max diameter over cable conductor accepted by the copper mechanical connector.

Voltage Class	Catalog Number	Nominal Cable Range	Min/Max Insulation OD	Max Jacket OD	Min/Max Diameter Over Cable Conductor*	Kit Installed Length	Required Installation Space
			A	B	E	L	M
CSJG Joint With Aluminum Mechanical ShearBolt Connector							
15kV	CSJG-1511M4	#2 - 3/0	0.69 - 1.20 (17.5 - 30.5)	1.50 (38.1)	0.268 - 0.470 (6.80 - 11.9)	33 (850)	42 (1060)
15kV	CSJG-1511M5	#2 - 350	0.69 - 1.20 (17.5 - 30.5)	1.50 (38.1)	0.268 - 0.681 (6.80 - 17.3)	33 (850)	42 (1060)
15kV	CSJG-1512M6	4/0 - 500	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	0.423 - 0.813 (10.7 - 20.6)	33 (850)	42 (1060)
15kV	CSJG-1512M7	500 - 750	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	0.736 - 0.998 (18.7 - 25.3)	33 (850)	42 (1060)
15kV	CSJG-1513M8	350 - 750	1.03 - 1.58 (26.20 - 40.0)	2.05 (52.1)	0.616 - 0.998 (15.7 - 25.3)	41 (1050)	50 (1270)
15kV	CSJG-1514M9	750 - 1000	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	0.813 - 1.152 (20.6 - 29.2)	41 (1050)	55 (1390)
25/28kV	CSJG-2812M5	#1 - 350	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	0.268 - 0.681 (6.80 - 17.3)	33 (850)	42 (1060)
25/28kV	CSJG-2812M6	4/0 - 500	0.87 - 1.40 (22.1 - 35.6)	1.80 (46.0)	0.423 - 0.813 (10.7 - 20.6)	33 (850)	42 (1060)
25/28kV	CSJG-2813M8	350 - 750	1.03 - 1.58 (26.20 - 40.0)	2.05 (52.1)	0.616 - 0.998 (15.7 - 25.3)	41 (1050)	50 (1270)
25/28kV	CSJG-2814M8	500 - 750	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	0.616 - 0.998 (15.7 - 25.3)	41 (1050)	55 (1390)
25/28kV	CSJG-2814M9	750 - 1000	1.28 - 2.05 (32.50 - 52.0)	2.60 (66.0)	0.813 - 1.152 (20.60 - 29.2)	41 (1050)	55 (1390)
35kV	CSJG-3513M5	1/0 - 350	1.03 - 1.49 (26.20 - 37.8)	2.05 (52.1)	0.268 - 0.681 (6.8 - 17.3)	41 (1050)	50 (1270)
35kV	CSJG-3514M8	350 - 750	1.36 - 2.05 (34.54 - 52.0)	2.60 (66.0)	0.616 - 0.998 (15.7 - 25.3)	41 (1050)	55 (1390)
35kV	CSJG-3514M9	750 - 1000	1.36 - 2.05 (34.54 - 52.0)	2.60 (66.0)	0.813 - 1.152 (20.60 - 29.2)	41 (1050)	55 (1390)
35kV	CSJG-3515M9	750 - 1000	1.63 - 2.36 (41.40 - 60.0)	2.60 (66.0)	0.813 - 1.152 (20.60 - 29.2)	41 (1050)	55 (1390)

* Min/max diameter over cable conductor accepted by the aluminum mechanical connector.

Catalog Number	Length of Moisture Blocked Braid	Braid (AWG)
Cold-Applied External Grounding Kit		
CSJG-EG-1	24 (610)	#8
CSJG-EG-2	24 (610)	#6
CSJG-EG-3	24 (610)	#4

Medium Voltage In-Line Splice



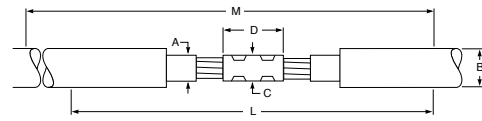
HVS

In-Line Splices for 1/C Shielded Cable (15-35 kV)

Tyco Electronics' Raychem brand heat-shrinkable shielded power cable splices are pre-engineered to offer a compact, low-profile installation with a minimum diameter buildup.

- Kits contain a solderless grounding kit, consisting of a ground clamp, a ground braid, and a shielding mesh
- Heat-shrink feature allows the kits to accommodate out-of-round, out-of-spec cable.

Rated to IEEE 404. For use on copper tape, wire shield, lead sheath, and UniShield cables.



Selection information: dimensions in inches (millimeters)

Catalog Number	Conductor Size (AWG/kcmil)	Insulation Diameter	Jacket O.D.	Connector Dimensions		Kit Installed	Required
		(Min.-Max.)	(Max.)	Max. O.D.	Max. Length	Length	Installation Space
		A	B	C	D	L	M
HVS-1520S (15 kV - Tube)							
HVS-1521S	#2-4/0	0.65-1.05 (17-27)	1.25 (32)	0.90 (23)	4.25 (108)	27 (686)	54 (1372)
HVS-1522S	250-350	0.90-1.30 (23-33)	1.50 (38)	1.20 (30)	5.5 (140)	28 (711)	56 (1422)
HVS-1523S	500-750	1.10-1.60 (28-41)	1.85 (47)	1.60 (41)	8.0 (203)	30 (762)	59 (1499)
HVS-1524S	750-1000	1.25-1.80 (32-46)	2.10 (53)	1.85 (47)	8.0 (203)	34 (864)	67 (1702)
HVS-1525S	1250-2000	1.60-2.50 (41-64)	2.80 (71)	2.40 (61)	8.0 (203)	40 (1016)	74 (1880)
HVS-1520S-W (15 kV with Wraparound Rejacketing Sleeve)							
HVS-1521S-W	#2-4/0	0.65-1.05 (17-27)	1.25 (32)	0.90 (23)	4.25 (108)	28 (711)	39 (990)
HVS-1522S-W	250-350	0.90-1.30 (23-33)	1.50 (38)	1.20 (30)	5.50 (140)	28 (711)	40 (1016)
HVS-1523S-W	500-750	1.10-1.60 (28-41)	1.85 (47)	1.60 (41)	8.00 (203)	30 (762)	45 (1143)
HVS-1524S-W	750-1000	1.25-1.80 (32-46)	2.10 (53)	1.85 (47)	8.00 (203)	34 (864)	49 (1244)
HVS-1525S-W	1250-2000	1.60-2.50 (41-64)	2.80 (71)	2.40 (61)	11.00 (279)	40 (1016)	54 (1371)
HVS-2520S (25 kV with Wraparound Rejacketing Sleeve)							
HVS-2521S	#1-250	0.90-1.20 (23-31)	1.50 (38)	1.10 (28)	4.0 (102)	40 (1016)	56 (1422)
HVS-2522S	350-500	1.20-1.50 (31-38)	1.95 (50)	1.35 (34)	6.0 (152)	40 (1016)	60 (1524)
HVS-2523S	750-1000	1.50-1.80 (38-46)	2.40 (61)	1.85 (47)	8.0 (203)	40 (1016)	62 (1575)
HVS-3520S (35 kV with Wraparound Rejacketing Sleeve)							
HVS-3521S	1/0-3/0	0.95-1.35 (24-34)	1.55 (39)	1.20 (30)	4.0 (102)	40 (1016)	53 (1346)
HVS-3522S	4/0-600	1.20-1.70 (31-43)	2.10 (53)	1.50 (38)	6.0 (152)	44 (1118)	62 (1575)
HVS-3523S	600-1000	1.55-2.15 (39-55)	2.80 (71)	1.85 (47)	10.0 (254)	44 (1118)	67 (1702)

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100% insulated cables (manufactured in accordance with the data contained in AEIC CS5-1987 and AEIC CS6-1987), commonly used connectors. Nominal insulation thickness (100%): 15 kV: 175 mils., 25 kV: 260 mils., 35 kV: 345 mils. Nominal insulation thickness (133%): 15 kV: 220 mils. Check the jacket O.D. on the 15 kV, 133%-insulated 4/0 and 750-kcmil cables to ensure they fall within the use range specified. If you have any questions, contact your Tyco Electronics sales engineer or representative.
2. For cables manufactured to other specifications, confirm selection with cable and connector dimensions.
3. HVS-SHM kits are available if the diameter of one of your cables is not within the standard range.
4. Kits do not contain connectors; order compression or solder connectors separately.
5. Standard package: 1 kit/box.
6. Related test reports: EDR-5181, HVS15 kV: EDR-5114; HVS 25 kV: EDR-5150; HVS 25-35 kV: EDR-5197; HVS-1520S-W: EDR-5225.

Medium Voltage In-Line Splice



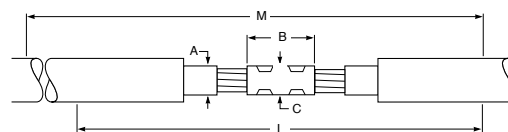
HVS-C-1520S

In-Line Splice for 1/C Shielded Cable 15 kV

Tyco Electronics heat-shrink shielded power cable splice, features a triple extrusion tube. The triple extrusion tube provides increased recovery forces, reduced shrinking time and improved profile conformity

Provides:

- Reduced shrink time
- Improved heat transfer
- Significantly increased recovery forces
- Reduced overall diameters and length



Catalog Number	Conductor Size (AWG/kcmil)	Insulation Diameter (Min-Max)	Jacket O.D. (Max)	Maximum Connector Length	Maximum Connector O.D.	Required Installed Length	Installation Space
			A	B	C	L	M
HVS-C-1520S Splice for Compression Connector (Not Included)							
HVS-C-1521S	#2 - 2/0	0.65 - 0.95 (17 - 24)	1.20 (30)	4.00 (100)	0.80 (20)	28.00 (700)	28.00 (700)
HVS-C-1522S	3/0 - 400	0.85 - 1.30 (23 - 33)	1.65 (42)	5.00 (125)	1.20 (30)	28.00 (700)	28.00 (700)
HVS-C-1523S	500 - 750	1.10 - 1.55 (28 - 47)	1.90 (48)	6.00 (150)	1.45 (44)	35.00 (870)	35.00 (870)
HVS-C-1524S	750 - 1000	1.30 - 1.90 (33 - 48)	2.30 (58)	8.00 (200)	1.85 (47)	35.00 (870)	35.00 (870)

Catalog Number	Conductor Size (AWG/kcmil)	Insulation Diameter (Min-Max)	Jacket O.D. (Max)	Supplied Connector Length	Connector Dimension	Required Installed Length	Installation Space
			A	B	C	L	M
HVS-C-1520S with Copper ShearBolt (Connector Included)							
HVS-C-1522S-M1	3/0 - 400	0.85 - 1.30 (23 - 33)	1.20 (30)	4.0 (100)	1.20 (30)	28.00 (700)	28.00 (700)
HVS-C-1523S-M2	500 - 750	1.10 - 1.55 (28 - 47)	1.45 (37)	5.0 (125)	1.45 (37)	35.00 (870)	35.00 (870)

Note: Only the above two kits are available with connectors.

M1 = CSBS-20C-500C-505

M2 = CSBS-300C-750C-505

Ordering Information

1. Select the appropriate catalog number. All selections are based on the typical dimensions for both 100% and 133% insulated cables, nominal insulation thickness 0.175-0.220".
2. Kits can be installed with either aluminum or copper compression connectors (connectors not included with kit).
3. If external grounding, order an HVS-EG kit.
4. Standard package: 1 kit/box
5. Related Test Report: EDR-5440, IEEE 404-2008 and IEEE 48 draft 2006 for 105°C of Splice and Terminations.

Medium Voltage In-Line Splice



HVS-1550S

In-Line Splice for 1/C Shielded Cables 15 kV with Tin Plated Aluminum ShearBolt Connector

Tyco Electronics heat-shrink shielded power cable splice features a triple extrusion tube. The triple extrusion tube provides increased recovery forces, reduced shrinking time and improved profile conformity.

Provides:

- Reduced shrink time
- Improved heat transfer
- Significantly increased recovery forces
- Reduced overall diameters and length
- Tin plated aluminum ShearBolt Connector (CU/AL)



Catalog Number	Conductor Size (AWG/kcmil)	Insulation Diameter (Min-Max)	Jacket O.D. (Max)	Connector Dimensions		Required Installed Length	Installation Space	Connector Included in Kit
				Length	O.D.			
HVS-1551S	#2 - 2/0	0.65 - 0.95 (17 - 24)	1.20 (30)	2.50 (65)	.095 (24)	28.00 (700)	28.00 (700)	M4
HVS-1552S	2/0 - 350	0.79 - 1.19 (20 - 30)	1.65 (42)	4.00 (100)	1.25 (30)	28.00 (700)	28.00 (700)	M5
HVS-1553S	350 - 500	1.04 - 1.33 (26 - 34)	1.80 (45)	5.00 (125)	1.30 (34)	35.00 (870)	35.00 (870)	M6
HVS-1554S	500 - 750	1.16 - 1.55 (29 - 39)	1.90 (48)	6.00 (150)	1.55 (40)	35.00 (870)	35.00 (870)	M8
HVS-1555S	750 - 1000	1.35 - 1.70 (34 - 43)	2.30 (58)	8.00 (200)	1.75 (43)	35.00 (870)	35.00 (870)	M9

M4= ASBS-2-3/0

M5= ASBS-2-350

M6= ASBS-3/0-500

M8= ASBS-500-750

M9= ASBS-600-1000

Ordering Information

1. Select the appropriate catalog number. All selections are based on the typical dimensions for both 100% and 133% insulated cables, nominal insulation thickness 0.175-0.220".
2. Kits are supplied with tin plated aluminum ShearBolt connectors which have been tested with the HVS-1550S kit for 105°C operation.
3. If external grounding, order an HVS-EG kit or special splice kit with longer solder blocked braid.
4. Standard package: 1 kit/box
5. Related Test Report: EDR-5444, IEEE 404-2006 and IEEE 48 draft 2006 for 105°C of Splice and Terminations.

High Voltage In-Line Splice



EHVS

In-Line Splices for 1/C Shielded Cable (46 and 69 kV)

A complete line of splice kits for conductor sizes ranging from 4/0-2500 kcmil.

Tyco Electronics sizes the EHVS splice to your application. You simply fill out an EHVS information sheet (available from your Tyco Electronics representative). Based on the information you provide (conductor, insulation, and jacket diameters), we will machine a connector to fit your cable and supply you with a kit containing both the connector and the EHVS splice for your cable.

- 69 kV splice incorporates a connector that allows large cross sections to be joined without special tools, heat treatment, or filing off after installation, thus reducing outage time.
- For use on wire shield, wire metallic tape shield, and metallic sheathed power cables
- Minimum installation space required is 84.0"

Selection Information: dimensions in inches (millimeters)

Catalog Number	69 kV Nominal Cable Range	46 kV Nominal Cable Range	Maximum Jacket Diameter	Insulation Diameter Range
EHVS-6920-W-CXXX	1/0 - 3.0 AWG	250 - 500kcmil	2.00 (61)	1.35 - 1.75 (34 - 44)
EHVS-6921-W-CXXX	2/0 - 500kcmil	600 - 1000kcmil	2.85 (72)	1.70 - 2.35 (43 - 60)
EVHS-6922-W-CXXX	600 - 1000kcmil	1250 - 2000kcmil	3.00 (76)	2.05 - 2.55 (52 - 55)
EVHS-6923-W-CXXX	1250 - 2500kcmil	2500kcmil	3.85 (98)	2.50 - 3.05 (63 - 77)

Ordering Information

1. Contact your local Tyco Electronics representative for the appropriate part number to order. To help us supply the correct product; the following information is required: conductor, insulation, and jacket diameters.
2. Each splice comes supplied with a ShearBolt connector manufactured to your cable dimensions.
3. Standard package: 1 kit/box.
4. Related test report: 46/69 kV: PPR 1010 EDR-5228



Stripper Tool for extruded and bonded cable screens and Primary Insulations for diameters as follows: HVIA-STRIPPER-35/90 mm and HVIA-STRIPPER-75/150 mm.

Tyco Electronics now offers a complete line of EHVS splices for system voltages up through 170 kV.

Medium Voltage In-Line Splice

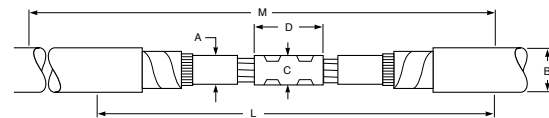
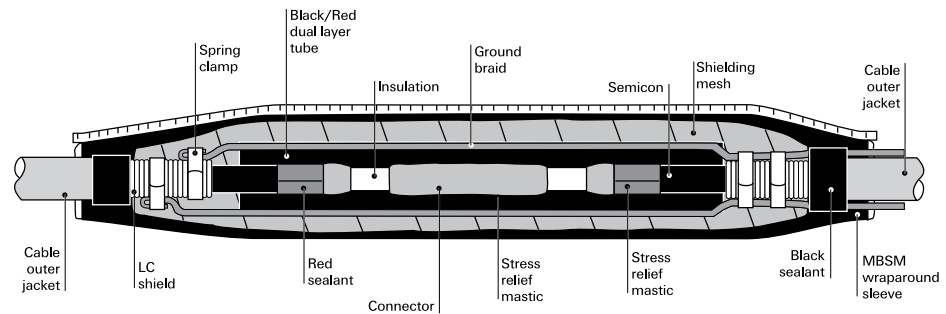
HVS-LC

Splices Kits for 1/C In-Line LC Shielded Cable (15-35 kV)

HVS-LC kits feature a metal laminated wraparound re-jacketing sleeve that reduces moisture-vapor transmission. This tough sleeve also protects the splice from coincidental abrasion, back fill, and handling damage.

Ground connections are made using stainless steel clamps and tinned copper braid. The ground connections have been tested to multiple reclosed faults in excess of 13-kA rms without damage.

- Designed to withstand fault current duty of 10-kA rms for 100 cycles
- Rated to IEEE 404
- For use on LC shield cable



Selection Information: dimensions in inches (millimeters)

Catalog Number	Conductor Size (AWG/kcmil)	Insulation Diameter (Min.-Max.)	Jacket O.D. (Max.)	Connector Dimensions		Kit Installed Length	Required Installation Space
				Max. O.D.	Max. Length		
HVS-1520-LC	(15 kV)						
HVS-1531-LC	#2 - 4/0	0.65 - 0.95 (16 - 24)	1.30 (33)	0.75 (29)	4.0 (102)	30 (762)	35 (889)
HVS-1532-LC	4/0 - 400	0.85 - 1.30 (22 - 33)	1.65 (42)	1.25 (29)	5.5 (140)	34 (864)	38 (965)
HVS-1533-LC	500 - 600	1.10 - 1.50 (28 - 38)	1.90 (48)	1.45 (37)	6.0 (152)	34 (864)	40 (1016)
HVS-1534-LC	750 - 1000	1.30 - 1.90 (33 - 48)	2.30 (58)	1.85 (47)	8.0 (203)	40 (1016)	45 (1143)
HVS-2530-LC	(25 kV)						
HVS-2531-LC	#1 - 250	0.90 - 1.20 (16 - 24)	1.55 (39)	1.10 (28)	4.00 (102)	36 (914)	48 (1219)
HVS-2532-LC	350 - 500	1.20 - 1.50 (30 - 38)	1.95 (50)	1.35 (34)	6.00 (152)	37 (940)	50 (1270)
HVS-2533-LC	750 - 1000	1.50 - 1.80 (38 - 46)	2.40 (61)	1.85 (47)	8.00 (203)	39 (991)	54 (1372)
HVS-3530-LC	(35 kV)						
HVS-3531-LC	1/0 - 3/0	0.95 - 1.35 (29 - 34)	1.55 (39)	1.00 (25)	4.00 (102)	40 (1016)	52 (1321)
HVS-3532-LC	4/0 - 500	1.30 - 1.70 (33 - 43)	2.10 (53)	1.60 (41)	5.50 (140)	40 (1016)	58 (1473)
HVS-3533-LC	750 - 1000	1.65 - 2.15 (42 - 55)	2.80 (71)	1.85 (47)	8.00 (203)	48 (1219)	64 (1626)

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100%- and 133%-insulated cables (manufactured in accordance with the data contained in AEIC CS5-1987 and AEIC CS6-1987) and commonly used connectors. Nominal insulation thickness (100%): 15 kV: 175 mils. 25 kV: 260 mils. 35 kV: 345 mils. Nominal insulation thickness (133%): 15 kV: 220 mils.
2. For cables manufactured to other specifications, confirm selection with cable and connector dimensions.
3. Kits do not contain connectors; order compression or solder connectors separately.
4. HVS-LC kits are supplied with two pieces of braid to provide fault current carrying capacity over the splice. User should verify compatibility of supplied braids to application on LC shield cable.
5. Standard package: 1 kit/box.
6. Related test reports:
15 kV: EDR-5174
25 kV: EDR-5150
35 kV: EDR-5157

Medium Voltage In-Line Splice

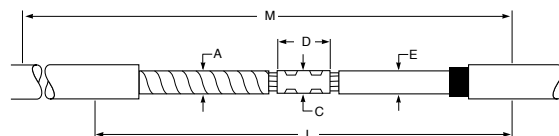
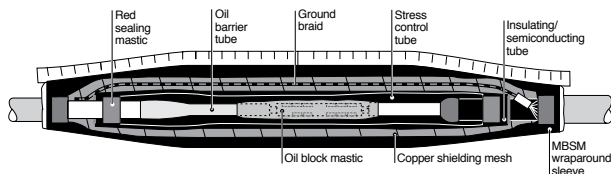
HVS/HVSR

1/C In-Line or Transition and Transition “Reducer” Kits (15-35 kV)

- Use as an in-line splice for paper-insulated, lead-covered (PILC) cable or varnished cambric-insulated, lead-covered (VCLC) cable
- Can also be used as a transition splice—PILC/VCLC to poly (copper tape, lead sheath, wire shield, UniShield, or jacketed/unjacketed concentric neutral) cable.

PILC splices utilize a highly effective oil-stop system. The system helps to reduce installation and outage time by eliminating insulation stepping, hand taping, lead wiping, and compound filling. Tested to the electrical and load cycling requirements of IEEE 404.

HVSR “reducer” kits are used as a transition splice when the PILC/VCLC conductor size is much smaller than that of the poly cable.



Selection Information: dimensions in inches (millimeters)

Catalog Number	PILC/Poly Conductor Size (AWG/kcmil)	PILC Insulation Diameter (Min.-Max.)	Poly Insulation Diameter (Min.-Max.)	Connector Dimension			Kit Installed Length	Required Installation Space
				Both Cables (Max. O.D.)	PILC/PILC (Max. Length)	PILC/Poly (Max. Length)		
				A	E	C		
HVS-1580D (15 kV)								
HVS-1581D	#4-4/0	0.60-0.90 (15-23)	0.65-1.05 (17-27)	0.90 (23)	3.5 (89)	4.5 (114)	31 (787)	48 (1219)
HVS-1582D	250-350	0.85-1.10 (22-28)	0.90-1.30 (23-33)	1.15 (29)	3.5 (89)	5.5 (140)	35 (889)	50 (1270)
HVS-1583D	500-750	1.05-1.30 (27-33)	1.10-1.60 (28-41)	1.60 (41)	5.0 (127)	7.0 (178)	37 (940)	50 (1270)
HVS-1584D	750-1000	1.15-1.50 (29-38)	1.25-1.80 (32-46)	1.85 (47)	6.0 (152)	8.0 (203)	40 (1016)	54 (1392)
HVS-2580E (25 kV)								
HVS-2582E	#1-250	0.85-1.20 (22-30)	0.90-1.25 (23-32)	1.10 (28)	3.5 (89)	5.5 (140)	40 (1016)	57 (1448)
HVS-2583E	350-500	1.15-1.45 (29-37)	1.15-1.50 (29-38)	1.35 (34)	5.0 (127)	7.0 (178)	40 (1016)	58 (1473)
HVS-2584E	750-1000	1.50-1.70 (38-43)	1.60-1.90 (41-48)	1.85 (47)	6.0 (152)	8.0 (203)	40 (1016)	61 (1549)
HVS-2880E (28 kV)								
HVS-2882E	#1-250	0.85-1.25 (21-32)	0.90-1.33 (22-34)	1.10 (28)	3.5 (90)	5.5 (140)	40 (1016)	57 (1448)
HVS-2883E	350-500	1.15-1.45 (29-37)	1.15-1.56(29-40)	1.35 (34)	5.0 (127)	7.0 (178)	40 (1016)	58 (1473)
HVS-2884E	750-1000	1.50-1.70 (38-43)	1.60-1.90 (41-48)	1.85 (47)	6.0 (152)	8.0 (203)	40 (1016)	61 (1549)
HVS-3580D (35 kV)								
HVS-3582D	1/0-250	1.05-1.40 (27-36)	1.05-1.40 (27-36)	1.20 (30)	3.5 (89)	5.5 (140)	40 (1016)	62 (1575)
HVS-3583D	300-750	1.20-1.70 (30-43)	1.30-1.75 (33-44)	1.60 (41)	6.0 (152)	9.0 (229)	48 (1219)	67 (1702)
HVS-3584D	750-1000	1.60-2.00 (41-51)	1.65-2.00 (41-51)	1.85 (47)	7.0 (178)	10.0 (254)	48 (1219)	67 (1702)
HVSR-1580 Transition Reducer (15 kV)								
HVSR-1582	#4-4/0/4/0-350	0.60-0.90 (15-23)	0.90-1.30 (23-33)	1.15 (29)		5.5 (140)	33 (838)	78 (1981)
HVSR-1583	4/0-350/500-750	0.80-1.10 (20-28)	1.10-1.60 (28-41)	1.60 (41)		7.0 (178)	37 (940)	87 (2210)
HVSR-1584	4/0-500/750-1000	0.80-1.20 (20-30)	1.25-1.80 (32-46)	1.85 (47)		8.0 (203)	40 (1016)	92 (2337)
HVSR-2580E Transition Reducer (25 kV)								
HVSR-2583E	#1-350/350-500	0.80-1.20 (20-30)	1.15-1.50 (29-38)	1.35 (34)		7.0 (178)	40 (1016)	58 (1473)
HVSR-2584E	500-750/750-1000	1.25-2.50 (32-38)	1.55-1.90 (39-48)	1.85 (47)		8.0 (203)	40 (1016)	61 (1549)

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100% and 133% insulated cables (manufactured in accordance with the data contained in AEIC-1-1968, AEIC CS5-1987, and AEIC CS6-1987) and commonly used connectors. Nominal insulation thickness (100%): 15 kV: 165 mils (PILC/VCLC), 175 mils (poly). 25 kV: 255 mils (PILC/VCLC), 260 mils (poly). 28 kV: 255 mils (PILC/VCLC), 280 mils (poly). 35 kV: 330 mils (PILC/VCLC), 345 mils (poly) Nominal insulation thickness (133%): 15 kV: 220 mils (poly).
2. For cables manufactured to other specifications, confirm selection with cable and connector dimensions.
3. Kits do not contain ShearBolt connectors; order oil block (sweated or compression) connectors separately.
4. Cable paper cutters are available. EXRM-1004
5. For lead sheath repair, order an HVS-LR kit.
6. Standard package: 1 kit/box.
7. Related test reports: 15 kV: EDR-5080, 25 kV: EDR-5083, 28 kV: EDR- 5318, 35 kV: EDR-5184

Medium Voltage In-Line Splice

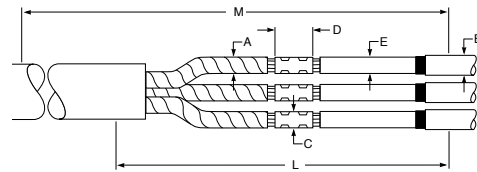


HVS-T/HVSR-T

3/C PILC/VCLC to 1/C Poly Trifurcating Transition and Transition “Reducer” Kits (15–35 kV)

These trifurcating transition splices greatly reduce the complexity of splicing one 3/C PILC cable to three 1/C polymeric cables. By converting the PILC cable to a polymeric equivalent, the splices eliminate compound filling and difficult lead wiping which lets you get on and off the job site quickly. Heat-shrink components help to eliminate lead sleeve failures by replacing lead sleeves and wipes that can crack due to corrosion or cable flexing.

HVS-T/HVSR-T series splices provide solderless ground braid connection for PILC cable. Tested to the electrical and load cycling requirements of IEEE 404. One 3/C (VCLC) cable to three 1/C poly cable. The HVSR kits are for use when the PILC/VCLC cable has a much smaller conductor size than the poly cable.



Selection Information: dimensions in inches (millimeters)

Catalog Number	PILC/Poly Conductor Size (AWG/kcmil)	PILC Insulation Dia. (Min.–Max.)	Poly Insulation Dia. (Min.–Max.)	1/C Poly Jacket (Max. O.D.)	Connector Dimensions Kit			Required Installation Space
		A	E	B	Max. O.D. C	Max. Length D	Installed Length L	
HVS-T-1580S (15 kV)								
HVS-T-1581S	#4–4/0*	0.60–1.00 (15–25)	0.65–1.05 (17–27)	1.35 (34)	0.90 (23)	4.5 (114)	40 (1016)	60 (1525)
HVS-T-1582S	250–350*	0.85–1.10 (22–28)	0.90–1.30 (23–33)	1.50 (38)	1.15 (29)	5.5 (140)	40 (1016)	62 (1575)
HVS-T-1583S	500–750*	1.05–1.50 (27–38)	1.10–1.60 (28–41)	1.90 (48)	1.60 (41)	7.0 (178)	48 (1219)	68 (1727)
HVS-T-1584S	750–1000	1.30–1.75 (33–44)	1.25–1.80 (32–46)	2.15 (55)	1.85 (47)	8.0 (203)	48 (1219)	69 (1753)
HVS-T-1580E-S (15 kV) Short Splice								
HVS-T-1581E-S	1/0–4/0*	0.65–1.00 (17–25)	0.70–1.05 (18–27)	1.40 (36)	0.90 (23)	2.50 (63)	40 (1016)	61 (1550)
HVS-T-1582E-S	250–500*	0.85–1.20 (22–30)	0.90–1.20 (23–30)	1.50 (38)	1.35 (34)	4.50 (114)	40 (1016)	65 (1650)
HVS-T-1583E-S	500–1000	1.10–1.50 (28–38)	1.15–1.75 (29–44)	2.20 (56)	1.85 (47)	5.00 (127)	40 (1219)	69 (1753)
HVS-T-2580E (25 kV)								
HVS-T-2582E	#1–250	0.85–1.20 (22–30)	0.90–1.25 (23–32)	1.55 (39)	1.10 (28)	5.5 (140)	48 (1219)	65 (1650)
HVS-T-2583E	350–500	1.15–1.40 (29–36)	1.15–1.50 (29–38)	2.00 (51)	1.35 (34)	7.0 (178)	48 (1219)	75 (1900)
HVS-T-2584E	750–1000	1.50–1.70 (38–43)	1.50–1.90 (38–48)	2.15 (55)	1.85 (47)	8.0 (203)	48 (1219)	77 (1955)
HVS-T-3580S (35 kV)								
HVS-T-3582S	1/0–350	1.05–1.40 (27–36)	1.05–1.50 (27–38)	1.90 (48)	1.20 (30)	6.5 (165)	55 (1397)	81 (2057)
HVS-T-3583S	250–750	1.20–1.70 (30–43)	1.30–1.75 (30–44)	2.10 (53)	1.80 (46)	8.0 (203)	55 (1397)	85 (2159)
HVSR-T-1580 Transition Reducer (15 kV)								
HVSR-T-1582	#4–4/0/4/0–350*	0.60–1.00 (15–25)	0.90–1.30 (23–33)	1.50 (38)	1.15 (29)	5.5 (140)	40 (1016)	62 (1575)
HVSR-T-1583	4/0–350/500–750 *	0.80–1.20 (20–30)	1.10–1.60 (28–41)	1.90 (48)	1.60 (41)	7.0 (178)	48 (1219)	68 (1727)
HVSR-T-1584	250–500/750–1000	0.85–1.30 (22–33)	1.25–1.80 (32–46)	2.15 (55)	1.85 (47)	8.0 (203)	48 (1219)	69 (1753)
HVSR-T-2580E Transition Reducer (25 kV)								
HVSR-T-2582E	#1–400/350–500	0.80–1.20 (20–30)	1.15–1.50 (29–38)	2.00 (51)	1.35 (34)	7.0 (178)	48 (1219)	75 (1900)
HVSR-T-2583E	500–600/750–1000	1.25–1.40 (32–36)	1.55–1.90 (39–48)	2.15 (55)	1.85 (47)	8.0 (203)	48 (1219)	77 (1955)

Ordering Information

- Select the appropriate catalog number. Selections are based on the typical dimensions of 100% and 133% insulated poly cables (manufactured in accordance with the data contained in AEIC 1-1968, AEIC CS5-1987, AEIC CS6-1987) and commonly used connectors. Nominal insulation thickness (100%): 15 kV: 165 mils (PILC/VCLC). 175 mils (poly). 25 kV: 225 mils (PILC/VCLC). 260 mils (poly). 35 kV: 330 mils (PILC/VCLC). 345 mils (poly). Nominal insulation thickness (133%): 15 kV: 220 mils (poly).
- Check the jacket O.D. on the 133% insulated, single-conductor 15-kV 4/0, 350-kcmil, and 750-kcmil cables to ensure they fall within the use range specified. If you have any questions, contact your Tyco Electronics field sales engineer or representative.
- For cables manufactured to other specifications, confirm selection with cable and connector dimensions.
- Kits do not contain connectors; order oil block (sweated or compression) connectors separately.
- Standard package: 1 kit/box.
- Related test reports: 15 kV: EDR-5137, 25 kV: EDR-5142, 35 kV: EDR-5184, 15 kV HVS-T-1580E-S: EDR-5227
- Cable paper cutters are available EXRM-1004.

Medium Voltage In-Line Splice

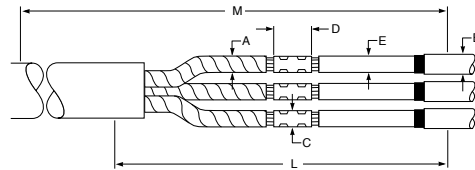
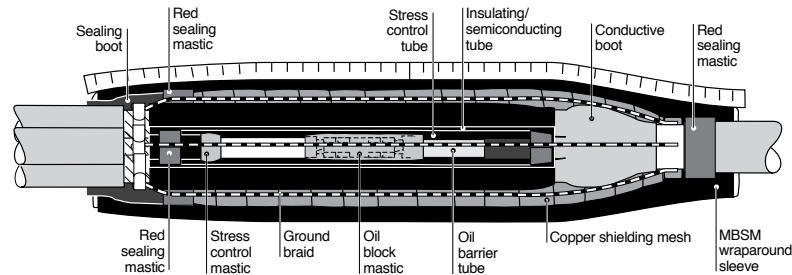


HVST-1590S

3/C PILC/VCLC to PILC/VCLC Trifurcating Kits (15 kV)

These trifurcating splices greatly reduce the complexity of splicing one 3/C PILC cable to three 1/C PILC cables. By converting the PILC cable to a polymeric equivalent, these splices eliminate compound filling and difficult lead wiping which lets you get on and off the job site quickly.

Heat-shrink components help to eliminate lead sleeve failures by replacing lead sleeves and wipes that can crack due to corrosion or cable flexing. Tested to the electrical and load cycling requirements of IEEE 404. One 3/C (PILC/VCLC) cable to three 1/C (PILC/VCLC) cables. For use on paper-insulated, lead-covered (PILC) cable, or varnished cambric-insulated, lead-covered (VCLC) cable.



Selection Information: dimensions in inches (millimeters)

Catalog Number	PILC Conductor Size (AWG/kcmil)	PILC Insulation Dia. (Min.–Max.)	1/C PILC Jacket (Max. O.D.)	Connector Dimensions		Kit Installed Length L	Required Installation Space M
				Max. O.D. C	Max. Length D		
				HVS-T-1590S (15 kV)			
HVS-T-1591S	#4-4/0	0.60-1.05 (15-27)	1.30 (33)	0.90 (23)	3.5 (89)	40 (1016)	60 (1524)
HVS-T-1592S	4/0-400	0.85-1.30 (22-33)	1.50 (38)	1.15 (29)	4.5 (114)	40 (1016)	60 (1524)
HVS-T-1593S	500-750	1.05-1.60 (27-40)	1.90 (48)	1.60 (41)	6.0 (152)	48 (1219)	64 (1626)

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with the data contained in AEIC-1-1968 as well as the dimensions of commonly used connectors. Nominal insulation thickness (100%): 165 mils.
2. Kits do not contain connectors; order oil block (sweated or compression) connectors separately.
3. Standard package: 1 kit/box
4. Related test reports: EDR-5143
5. Cable paper cutters are available EXRM-1004.

Medium Voltage In-Line Splice

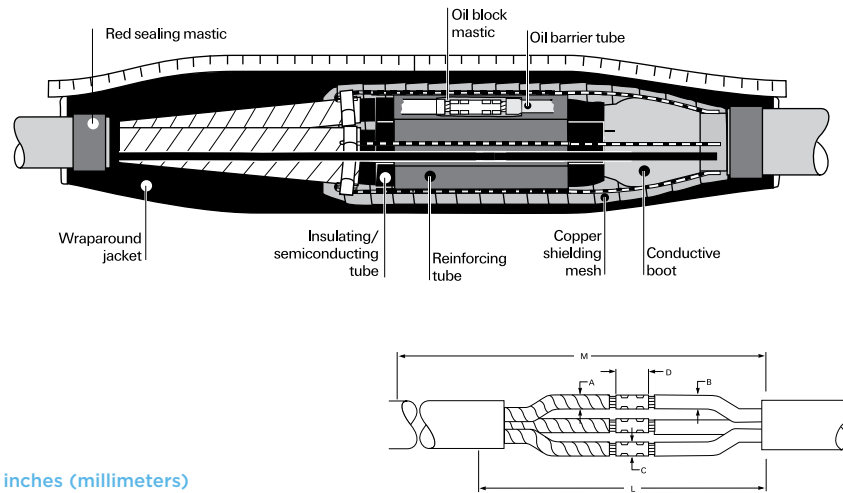


HVS/HVSA-3-1580S

3/C PILC/VCLC to 3/C POLY (Unarmored and Armored) Kits (15 kV)

These transition splices provide a reliable means for splicing 3/C 15 kV PILC/VCLC cables to 3/C 15 kV armored or unarmored polymeric cables. They eliminate the need for compound filling, lead wiping and hot oil. Installation is quick, easy, and repeatable.

Tyco Electronics utilizes high temperature oil barrier tubing, oil-block mastic, and a high-density conductive boot to seal the oil within the PILC cable. This oil sealing technology has been successful in over 18 years of installations. Heat-shrink accessories fit out-of-round and sectoried cables. Conductor size transitions are easily handled. Tyco Electronics utilizes its rugged MBSM re-jacketing sleeve to seal against moisture ingress. The splice also incorporates a thermoplastic internal moisture sealant as a secondary barrier to moisture. Tested to the electrical and load cycling requirements of IEEE 404. One 3/C (PILC/VCLC) cable to one 3/C poly cable. Load cycle tested to perform at a conductor temperature of 110°C with an internal oil pressure of 15 psi.



Selection Information: dimensions in inches (millimeters)

Catalog Number	PILC/Poly Conductor Size (AWG/kcmil)	PILC Insulation Dia. (Min.-Max.)	Poly Insulation Dia. (Min.-Max.)	Connector Dimensions		Kit Installed Length	Required Installation Space
				Max.	Max.		
				O.D.	Length		
		A	B	C	D	L	M
HVS-3-1580S Unarmored Cable (15 kV)							
HVS-3-1581S	#4-4/0	0.60-1.00 (15-25)	0.60-1.05 (17-27)	1.15 (29)	5.5 (140)	60 (1524)	68 (1727)
HVS-3-1582S	250-350	0.85-1.10 (22-28)	0.90-1.30 (23-33)	1.15 (29)	5.5 (140)	60 (1524)	68 (1727)
HVS-3-1583S	500-750	1.05-1.50 (27-38)	1.10-1.60 (28-41)	1.60 (41)	7.0 (178)	72 (1829)	80 (2032)
HVS-3-1584S	750-1000	1.15-1.75 (29-44)	1.25-1.80 (32-46)	1.85 (47)	8.0 (203)	72 (1829)	80 (2032)
HVSA-3-1580S Armored Cable (15 kV)							
HVSA-3-1581S	#4-4/0	0.65-1.00 (17-25)	0.60-1.05 (17-27)	0.90 (23)	4.50 (114)	63 (1600)	70 (1778)
HVSA-3-1582S	250-350	0.85-1.10 (22-28)	0.90-1.30 (23-33)	1.15 (29)	5.5 (140)	72 (1829)	80 (2032)
HVSA-3-1583S	500-750	1.05-1.50 (27-38)	1.10-1.60 (28-41)	1.60 (41)	7.0 (178)	72 (1829)	80 (2032)
HVSA-3-1584S	750-1000	1.15-1.75 (29-44)	1.25-1.85 (32-46)	1.85 (47)	8.0 (203)	72 (1829)	80 (2032)

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with the data contained in AEIC 1-1968 as well as the dimensions of commonly used connectors. Nominal insulation thickness (100%): 165 mils
2. Armored kits include an interlocking steel armoring wraparound with bendable fingers to provide a smooth transition to the armor.
3. Kits do not contain connectors; order oil block (sweated or compression) connectors separately.
4. Note: These kits do not allow cross-phasing.
5. Standard package: 1 kit/box
6. Related test reports: EDR-5137
7. Cable paper cutters are available EXRM-1004.

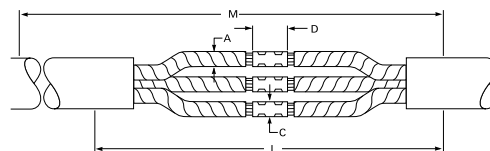
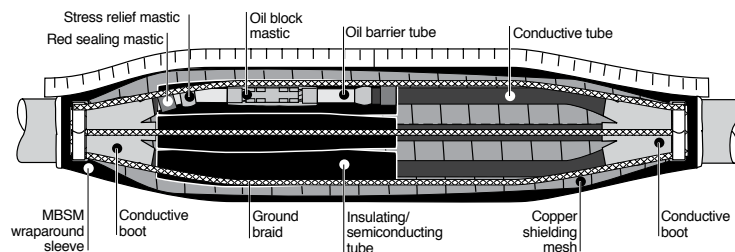
Medium Voltage In-Line Splice



HVS-3-1590S/HVS-3-2590S 3/C In-Line Splices for PILC Cable (15-25 kV)

Tyco Electronics' Raychem 3/C in-line PILC splices provide a highly effective and easily installed oil stop system, using standard heat-shrinkable components. The adhesive-lined conductive breakout provides an oil- and pressure-resistant seal and grounds the conductive tubing to the lead sheath.

Oil barrier tubing locks the oil in the PILC cables, converting each conductor into the polymeric equivalent. Tested to the electrical and load cycling requirements of IEEE 404. For use on paper-insulated, lead-covered (PILC) cable, or varnished cambric-insulated, lead covered (VCLC) cable.



Selection Information: dimensions in inches (millimeters)

Catalog Number	PILC Conductor Size (AWG/kcmil)	PILC	Connector Dimensions		Kit Installed Length	Required Installation Space
		Insulation Dia.	Max. O.D.	Max. Length		
		(Min.-Max.)				
A						
C						
D						
L						
M						
HVS-3-1590 (15 kV)						
HVS-3-1591	#4-4/0	0.60-1.00 (15-25)	0.90 (23)	3.5 (89)	63(1600)	67 (1702)
HVS-3-1592	250-350	0.85-1.10 (22-28)	1.15 (29)	3.5 (89)	63 (1600)	67 (1702)
HVS-3-1593	500-750	1.05-1.50 (27-38)	1.60 (41)	5.0 (127)	67 (1702)	71 (1803)
HVS-3-1594	750-1000	1.15-1.75 (29-44)	1.85 (47)	6.0 (152)	67 (1702)	71 (1803)
HVS-3-1590S "Shorty" (15 kV)*						
HVS-3-1591S	#2-350	0.65-1.00 (17-25)	0.85 (22)	3.0 (76)	55 (1397)	55 (1397)
HVS-3-1592S	4/0-600	0.85-1.25 (22-32)	1.20 (30)	4.0 (102)	59 (1499)	59 (1499)
HVS-3-1593S	500-1000	1.00-1.50 (25-38)	1.50 (38)	5.0 (127)	59 (1499)	59 (1499)
HVS-3-2590E (25 kV)						
HVS-3-2591E	#1-350	0.85-1.15 (22-29)	1.15 (29)	4.0 (102)	67 (1702)	71 (1803)
HVS-3-2592E	350-750	1.10-1.50 (28-32)	1.40 (36)	5.0 (25)	67 (1702)	71 (1803)

Ordering Information

- Select the appropriate catalog number. Selections are based on the typical dimensions of 100% insulated cables (manufactured in accordance with the data contained in AIEC 1-1968 and commonly used connectors). Nominal insulation thickness (100%): 15 kV: 165 mils., 25 kV: 255 mils.
- For cables manufactured to other specifications, confirm selection with cable and connector dimensions.
- Kits do not contain connectors; order oil block (sweated or compression) connectors separately.
- Standard package: One 3/C kit/box.
- Related test reports:
HVS-3-1590/2590: EDR-5143
HVS-3-1590S: EDR-5250
HVS-3-2590E: EDR-5223
- * HVS-3-1590S "Shorty" splice kit does not allow cross phasing.
- Cable paper cutters are available EXRM-1004.

Medium Voltage In-Line Splice (Tap)



HVSY

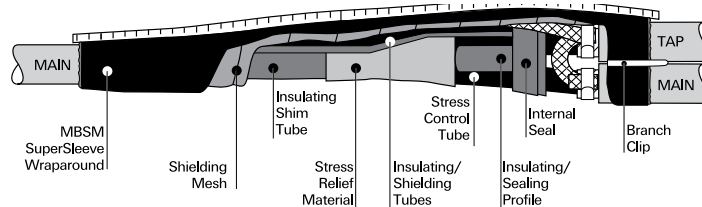
Wye (Tap) Splices for 1/C Poly-Poly, PILC-PILC, and PILC-Poly Cable (15 kV)

The Wye (tap) splice kits may be used for submersible or direct burial applications and have been tested to meet the performance requirements of IEEE-404. They include a positive heat-activated sealant system that eliminates taping between main and tap cables.

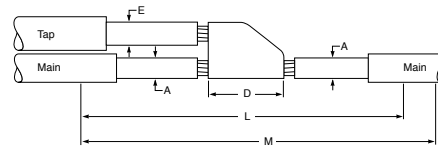
- Designed to seal against moisture ingress by including a branch clip and the heavy-duty MBSM wraparound sleeve
- Internal moisture seals provide a redundant seal against water intrusion
- Splices accept a wide range of main and tap cable sizes
- Compact shape simplifies cable training
- Rated to IEEE 404

HVSY-1520S is for use on copper tape, wire shield, lead sheath, and UniShield cables.

HVSY-1580D is for use as a wye splice where the main and/or tap cables may be paper-insulated, lead-covered (PILC) cable; varnished cambric-insulated, lead-covered (VCLC) cable.



Selection Information: dimensions in inches (millimeters)



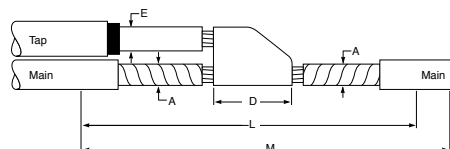
For Use with Soldered Connectors:

Catalog Number	Poly Conductor Size (AWG/kcmil)		Insulation Diameter		Connector Length (Max.)	Kit Installed Length	Required Installation Space
	Main	Tap	Main (Min.-Max.)	Tap (Min.-Max.)			
			A	E	D	L	M
HVSY-1520S (15 kV Polymeric Wye)							
HVSY-1522S	#2-4/0	#2-4/0	0.65-1.05 (17-27)	0.65-1.05 (17-27)	3.0 (75)	30 (750)	45 (1125)
HVSY-1523S	250-750	#2-750	0.95-1.45 (24-37)	0.65-1.45 (17-37)	3.5 (90)	30 (750)	45 (1125)

For use with Burndy YSH Crimp Connectors for Copper Conductors Only:

Catalog Number	Poly Conductor Size (AWG/kcmil)		Insulation Diameter		Connector Length (Max.)	Kit Installed Length	Required Installation Space	Burndy Connector
	Main	Tap	Main (Min.-Max.)	Tap (Min.-Max.)				
			A	E	D	L	M	
HVSY-1520S (15 kV Polymeric Wye)								
HVSY-1522S	#2-4/0	#2-4/0	0.65-1.05 (17-27)	0.65-1.05 (17-27)	3.0 (75)	30 (750)	45 (1125)	YSH-2929
HVSY-1523S	250-500	4/0-500	0.85-1.25 (22-32)	0.85-1.25 (22-32)	3.5 (90)	30 (750)	45 (1125)	YSH-3434
HVSY-1523S	500-750	350-750	1.10-1.45 (28-37)	1.00-1.45 (25-37)	3.5 (90)	30 (750)	45 (1125)	YSH-3939

Medium Voltage In-Line Splice



Selection Information: dimensions in inches (millimeters)

Catalog Number	PILC/Poly Conductor Size (AWG/kcmil)		PILC/Poly Insulation Diameter		Lead Sheath (O.D. Max.)	Connector Length (Max.)	Kit Installed Length	Required Installation Space
	Main	Tap	Main (Min.–Max.)	Tap (Min.–Max.)				
	A	E						
HVSY-1580D (15 kV PILC and PILC-Poly Wye)								
HVSY-1582D	#2-4/0	#2-4/0	0.65-1.05 (17-27)	0.65-1.05 (17-27)	1.20 (30)	3.0 (75)	30 (750)	45 (1125)
HVSY-1583D	250-750	#2-750	0.95-1.45 (24-37)	0.65-1.45 (17-37)	1.50 (38)	3.5 (90)	30 (750)	45 (1125)

Ordering Information

- Select the appropriate catalog number. Selections are based on the typical dimensions of 100%- and 133%-insulated cables manufactured in accordance with the data contained in AEIC CS5-1987 AEIC CS6-1987 and dimensions of commonly used connectors. Nominal insulation thickness (100%): 165 mils (PILC/VCLC) 175 mils (poly) Nominal insulation thickness (133%): 220 mils (poly)
- For cables manufactured to other specifications, confirm selection with cable and connector dimensions.
- Kits do not contain connectors. For all HVSY-1580D kits and for HVSY-1520S kits, use soldered, split-ferrule (half-duplex) connectors, available from: Richards Manufacturing Company, 517 Lyons Avenue, Irvington, NJ 07111 (973) 371-1771. A special flux is needed to sweat aluminum conductors. Contact your local Tyco Electronics sales representative for information. For HVSY-1520S kits with copper conductors only, H-tap compressed connectors, available from Burndy (800-346-4175), may be used in place of the half-duplex connector.
- Check poly cable insulation diameter to help ensure a proper fit.
- For 15 kV H-configuration connections on 1/C shielded power cable, order the HVSH-1520 mod kit for use in conjunction with appropriate HVSY-1520S kit.
- Standard package: 1 kit/box.
- Related test reports: HVSY-1520S: EDR-5236, EDR-5256, HVSY-1580D: EDR-5235
- Burndy Connector, Tool and Die Guide as recommended by Burndy. Please check appropriate tools and dies. YSH-2929 and YSH-3434 connectors may be installed using the Y750 or Y46 tool.
- Aluminum ShearBolt connectors available for many size combinations of CU/AL connectors.
Dies that fit the Y750 tool are narrow and will require multiple compressions. P654, P1104 and PYFR dies for the Y46 tool only.
- Require one compression on either side of the connector. The Y46 tool requires a hydraulic pump to operate.

Connector	Option 1		Option 2	
	Tool	Die	Tool	Die
YSH-2929	Y46	P654	Y750	U654
YSH-3434	Y46	P1104	Y750	U1104
YSH-3939	Y46	PYFR	N/A	

Medium Voltage In-Line Splice

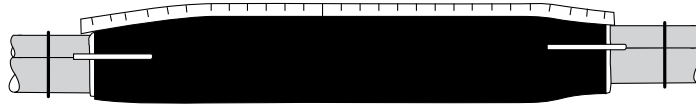


HVSH-MOD

H Configuration Kits for 1/C Shielded Power Cable (15 kV)

The HVSH-1520D-MOD and HVSH-1580D-MOD series modification kits are used in conjunction with HVSY-1520S and HVSY-1580D-MOD series wye splice kits. This combination provides a heat-shrinkable 15kV system that accommodates "H-configuration" connections for single-conductor power cables. This kit will accommodate both crimped connectors (copper conductor only) and soldered connectors.

These splices can be used for submersible or direct burial applications and have been tested to meet the performance requirements of IEEE 404.



Selection Information: dimensions in inches (millimeters)

Catalog Number*	Conductor Size**		Insulation Diameter		Connector Length Max.	Kit Installed Length	Required Installation Space
	AWG/kcmil		Main	Tap			
HVSH-1520-MOD							
HVSY-1522S	#2-4/0	#2-4/0	0.65-1.05 (17-27)	0.65-1.05 (17-27)	3.0 (75)	30 (750)	45 (1125)
HVSH-1522-MOD							
HVSY-1523S	250-750	#2-750	0.95-1.45 (24-37)	0.65-1.45 (17-37)	3.5 (90)	30 (750)	45 (1125)
HVSH-1523 -MOD							
HVSH-1580-MOD							
HVSY-1582D	#2-4/0	#2-4/0	0.65-1.05 (17-27)	0.65-1.05 (17-27)	3.0 (75)	30 (750)	45 (1125)
HVSH-1582D-MOD							
HVSY-1583D	250-750	#2-750*	0.85-1.45 (22-37)	0.65-1.45 (17-37)	3.5 (90)	30 (750)	45 (1125)
HVSH-1583D-MOD							

*Check cable insulation diameter to ensure proper fit.

Ordering Information

1. To make an "H-configuration", order both the standard HVSY kit and the HVSH-MOD kit.
- *2. Poly cable selections are based on the typical dimensions of 100% insulated cables made in accordance with the data contained in AEIC CS5-1987. Final kit selection should be verified by actual cable dimensions. PILC/VCLC cable selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with AEIC-1-1968.
- **3. Kits do not contain connectors. The splice may be installed using either a Burndy YSH H-tap compression connector or a split-ferrule (half-duplex) connector. The soldered connector is available from: Richards Manufacturing Co. 517 Lyons Ave., Irvington, NJ 07111, (973) 371-1771 contact your local Burndy dealer for information on the H-tap connector.
4. A special flux is needed to sweat aluminum conductors; contact your local Tyco Electronics representative for more information.
5. Standard package: 1 kit/box.
6. Related test reports HVSH-1520-MOD: EDR-5236. HVSH-1580D-MOD: EDR-5235.

Burndy Connector, Tool and Die Guide as recommended by Burndy. Please check appropriate tools and dies. YSH-2929 and YSH-3434 connectors may be installed using the Y750 or Y46 tool.

Dies that fit the Y750 tool are narrow and will require multiple compressions. P654, P1104 and PYFR dies for the Y46 tool only, require one compression on either side of the connector. The Y46 tool requires a hydraulic pump to operate.

Connector	Option 1		Option 2	
	Tool	Die	Tool	Die
YSH-2929	Y46	P654	Y750	U654
YSH-3434	Y46	P1104	Y750	U1104
YSH-3939	Y46	PYFR	N/A	

Medium Voltage In-Line Splice



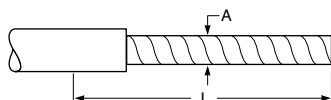
HVES

Seals for 1/C PILC and Poly or 3/C PILC Cable (15-25 kV)

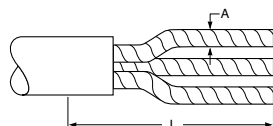
HVES heat-shrinkable live end seals insulate and seal the ends of polymeric and PILC cables. These kits consist of heat-shrinkable tubings and a high-dielectric strength, polymeric plug which overlap the conductor to provide excellent insulation. The outer adhesive-lined re-jacketing sleeve is designed to provide a positive environmental seal.

Once the HVES kit is installed, the cable can be re-energized. Typical applications include the live ending of spare cables for future use, isolating a failed cable length, and sectionalizing a cable circuit during system maintenance and repair, expansion, or testing.

Selection Information: dimensions in inches (millimeters)



Catalog Number	PILC/Poly Conductor Size (AWG/kcmil)	PILC Insulation Dia. (Min.-Max.) A	Poly Insulation Dia. (Min.-Max.) A	Kit Installed Length L
HVES-1520D (1/C PILC/VCLC and 1/C Poly) 15 kV				
HVES-1521D	#4-4/0	0.60-0.90 (15-23)	0.65-1.05 (17-27)	12 (305)
HVES-1522D	250-350	0.85-1.10 (22-28)	0.90-1.30 (23-33)	12 (305)
HVES-1523D	500-750	1.05-1.30 (27-33)	1.10-1.60 (28-41)	12 (305)
HVES-1524D	750-1000	1.20-1.50 (30-38)	1.25-1.80 (32-46)	12 (305)
HVES-2520D (1/C PILC/VCLC and 1/C Poly) 25 kV				
HVES-2521D	#1-250	0.85-1.25 (22-32)	0.85-1.25 (22-32)	21 (533)
HVES-2522D	350-500	1.15-1.50 (29-38)	1.15-1.50 (29-38)	23 (584)
HVES-2523D	750-1000	1.50-1.90 (38-48)	1.50-1.90 (38-48)	25 (635)



Catalog Number	PILC Conductor Size (Min.-Max.)	PILC Insulation Dia. (Min.-Max.) A	Kit Installed Length L
HVES-3-1590 (3/C PILC/VCLC) 15 kV			
HVES-3-1591	#4-4/0	0.60-1.00 (15-25)	27 (686)
HVES-3-1592	250-350	0.85-1.10 (22-28)	27 (686)
HVES-3-1593	500-750	1.05-1.50 (27-38)	27 (686)
HVES-3-1594	750-1000	1.15-1.75 (29-44)	27 (686)
HVES-3-2590E (3/C PILC/VCLC) 25 kV			
HVES-3-2591E	#1-250	0.85-1.20 (22-30)	28 (711)
HVES-3-2592E	350-500	1.15-1.40 (28-36)	31 (787)
HVES-3-2593E	750-1000	1.50-1.70 (38-43)	32 (813)

Ordering Information

- Select the appropriate catalog number. Selections are based on the typical dimensions of 100% and 133% insulated poly cables manufactured in accordance with data contained in AEIC 1-1968, AEIC CS5-1987, and AEIC CS6-1987. Nominal insulation thickness (100%): 15 kV: 165 mils (PILC/VCLC). 175 mils (poly). 25 kV: 225 mils (PILC/VCLC). 260 mils (poly). Nominal insulation thickness (133%): 15 kV: 220 mils (poly).
- For cables manufactured to other specifications, confirm selection with cable dimensions.
- Standard package:
HVES-1520D,-2520D: One kit/box.
HVES-3-1590,-2590E: One 3/C kit/box.
- Related test reports: 15 kV: EDR-5146. 25 kV: EDR-5273.

Medium Voltage In-Line Splice

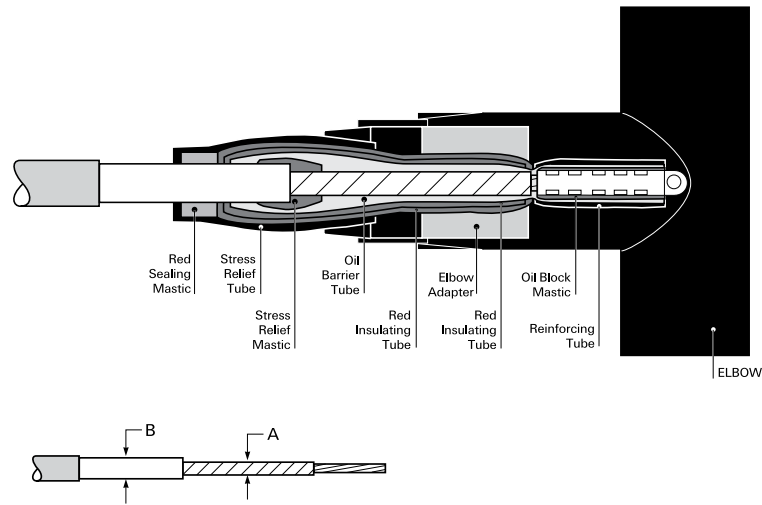


HVE-1590

Adapts 1/C PILC Cable for Installation of Elbow (15 kV)

HVE-1590 elbow adapters provide a highly effective and easily installed oil stop system, using standard heat-shrinkable components. The system provides an oil-and pressure-resistant seal.

- Oil barrier tubing locks the oil in the PILC cables, converting each conductor into the polymeric equivalent
- Pressure rated to 15 psi at 90°C.
- Rated to the applicable requirements of ANSI-386-1985.
- Converts PILC cable to allow installation of dead-break elbows. 600 Amp.
- For use on 1/C PILC/VCLC cable.



Selection Information: dimensions in inches (millimeters)

Catalog Number	1/C 15 kV* PILC Conductor Size (Nominal)	Min. Insulation O.D. A	Max. Insulation O.D. A	Max Lead Sheath O.D. B	Adapter Type Elastimold
HVE-1591	#2 AWG-2/0	0.65 (16)	0.75 (19)	0.95 (24)	655CA-L
HVE-1592	3/0-250 kcmil	0.75 (19)	0.95 (24)	1.10 (28)	655CA-L
HVE-1593	300-500 kcmil	0.95 (24)	1.15 (29)	1.35 (34)	655CA-M
HVE-1594	600-750** kcmil	1.20 (30)	1.35 (34)	1.50 (38)	655CA-P

*5 kV cables may be used provided the cable dimensions fall within the dimension ranges given above.

**Compact strand only

Please Note: The Tyco Electronics kit does not include the compression connector, cable adapter or elbow.

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100%-insulated cables manufactured in accordance with data contained in AEIC 1-1968.
Nominal insulation thickness (100%): 15 kV: 165 mils (PILC/VCLC).
2. For cables manufactured to other specifications, confirm selection with cable dimensions.
3. Standard package: One kit/box.
4. Related test reports: 15 kV: EDR-5269.

Medium Voltage In-Line Splice



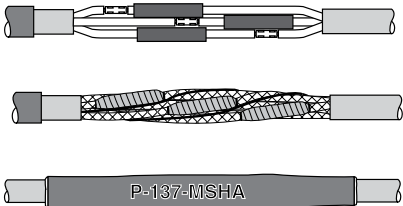
HV-MSK
SplICES for In-Line and Multiconductor or Medium-Voltage
Multi-Conductor Mining Cable (5-8 kV)

- Flame-retardant, multiconductor splice kits for use on standard flexible cables and mining cables (MP-GC and SHD-GC) up to 8 kV
- MSHA approved for P-137-MSHA

Selection Information: dimensions in inches (millimeters)

Catalog Number	Power Conductor Size (AWG/kcmil)				Sleeve Length
	5 kV 3/C MP-GC	5 kV 3/C SHD-GC	8 kV 3/C MP-GC	8 kV 3/C SHD-GC	
HV-MSK for 3/C Flexible Cable (5-8 kV)					
HV-MSK-3/C-581	#6-#1	#6-#4	#6-#4		22
HV-MSK-3/C-582	1/0-350	#2-3/0	#2-4/0	#4-2/0	22
HV-MSK-3/C-584	400-750	4/0-350	250-750	3/0-350	29

Typical HV-MSK Installation



Ordering Information

1. Select appropriate catalog number based on conductor size for your cable type. Confirm selection with cable diameter range.
2. Kits do not contain connectors; please order separately.
3. For cable types not listed in this catalog, contact your local Tyco Electronics representative.
4. Standard package: One 3/C kit per box.

Link Boxes

**Link Boxes****Cross Bonding and Sectionalization for High-Voltage Cable Systems****Link Boxes and Sheath Voltage Limiters**

Link boxes are used with cable joints and terminations to provide easy access to shield breaks for test purposes and to limit voltage build-up on the sheath. Lightning, fault currents and switching operations can cause overvoltages on the cable sheath. The link box optimizes loss management in the cable shield on cables grounding both sides.

Application

- Can be installed in pits or vaults and on structures or poles
- Use with single core or concentric bonding lead
- Cross section up to 250 kcmil
- Direct grounding
- Single point bonding
- Cross bonding
- Cross bonding and transposition
- Sheath voltage limiters (SVL)

Type Tests

- Tested to ANSI/IEEE Std 575-1988
IEEE—Guide for the application of sheath-bonding methods for single conductor cables and the calculation of induced voltages and currents in cable sheaths.
- CIGRE/ELECTRA recommendations for cross bonding (Larger cable cross sections on request)

Selection Information: dimensions in millimeters

Catalog Number		Number of Phases	Sheath Voltage Limiter	Dimensions		
				L (mm)	W (mm)	H (mm)
EPPA-055-0/1	Direct grounding	1	---	300	190	165
EPPA-055-3/1	Cross bonding	1	3 kV	300	190	165
EPPA-055-6/1	Cross bonding	1	6 kV	300	190	165
EPPA-055-0/3	Direct grounding	3	---	310	310	255
EPPA-055-3/3	Cross bonding	3	3 kV	310	310	255
EPPA-055-6/3	Cross bonding	3	6 kV	310	310	255

Test Reports: PPR 1168 Type Test of Link Box LBOX3-ZnO-3

PPR 1449 Type Test of Link Box EPPA-055-6/3

Medium Voltage Termination



TFT-E

Elastomeric Medium Voltage Terminations for 15 kV, 25 kV and 35 kV Single Core Polymeric Cables

TFT-E, TFT-E-G/SG, and TFT-E-SLC tool-free termination kits have been developed to provide a quick and easy, cold-applied method of terminating 5-35 kV, single-core polymeric cables. Both the TFT-E and TFT-E-SG are designed for indoor and outdoor conditions. TFT-E-G kits do not have skirts and should be used for 15 kV indoor applications.

TFT-E, TFT-E-G/SG, and TFT-E-SLC kits offer the following features and benefits:

- Advanced Metal Oxide Matrix stress control.
- Positive placement of stress control patch.
- Provided on a crush-resistant core.
- Easy installation—allows for repositioning.
- Rated to IEEE-48-1996, class 1 terminations.

TFT-E accommodates Jacketed and Unjacketed Concentric Neutral Cable. For outdoor or indoor use. TFT-E-G and TFT-E-SG kits are for use on Copper Tape, Wireshield, Lead Sheath, and Unshield cables. TFT-E-SLC is for use on LC shield cables. All offer advanced Metal Oxide Matrix stress control.

Selection Information Lugs and Terminals:

Catalog Number	Conductor Range		Type
	Solid	Termination Stranded	
TFT-151E	#2AWG - 250kcmil	#2AWG - 4/0AWG	Pin
TFT-152E	4/0 / 250kcmil	-	Pin
TFT-153E	-	350 / 500kcmil	NEMA Lug
TFT-154E	-	500 / 750kcmil	NEMA Lug
TFT-154E	-	1000/1250kcmil	NEMA Lug
TFT-251E	#1AWG - 3/0AWG	#1AWG - 3/0AWG	Pin
TFT-252E	#1AWG / 250kcmil	#1AWG - 4/0AWG	Pin
TFT-253E	-	350 - 500kcmil	NEMA Lug
TFT-253E	250kcmil	-	Pin
TFT-254E	-	350 - 750kcmil	NEMA Lug
TFT-254E	-	750 - 1250kcmil	NEMA Lug
TFT-352E	1/0AWG - 250kcmil	1/0AWG - 4/0AWG	Pin
TFT-353E	4/0 / 250kcmil	-	Pin
TFT-354E	-	350 - 500kcmil	NEMA Lug
TFT-354E	-	500 - 1250kcmil	NEMA Lug

Related Product Information:

15kv Test Report: EDR-5302/EDR-5306

25kv Test Report: EDR-5303

35kv Test Report: EDR-5299

Packaging: Standard packaging is three terminations per box.

Available accessories: The BRKT series of stainless steel cable mounting brackets are available.

Four sizes of bracket accommodate cable diameters from 0.80-2.40"

3 conductor modification kits

The MOD-3-TFT series of three conductor modification kits are available.

Kits provide re-jacketing of phase conductors and break out seals.

Lugs and pin terminals also available.

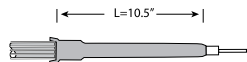
Medium Voltage Termination

Selection Information: dimensions in inches (millimeters)

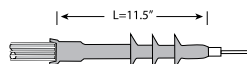
Catalog Number	Cable Range (AWG/kcmil)	Insulation Diameter (Min./Max.)	Number of Skirts	Standard Pkg (kits/box)	Hold Out I.D.
CN and JCN Cable - Indoor/Outdoor (15 kV)					
TFT-151E	#2-250	0.64-1.09 (16-28)	3	1 ea.	1.5 (38)
TFT-152E	4/0-500	0.85-1.45 (22-37)	3	1 ea.	1.77 (45)
TFT-153E	500-750	1.06-1.70 (27-43)	3	1 ea.	2.09 (53)
TFT-154E	1000-1250	1.49-2.20 (38-56)	3	1 ea.	2.56 (65)
CN and JCN Cable - Indoor/Outdoor (25 kV)					
TFT-251E	#1-3/0	0.64-1.09 (16-28)	5	1 ea.	1.5 (38)
TFT-252E	#1-500	0.85-1.45 (22-37)	5	1 ea.	1.77 (45)
TFT-253E	250-750	1.06-1.70 (27-43)	5	1 ea.	2.09 (53)
TFT-254E	750-1250	1.49-2.20 (38-56)	5	1 ea.	2.56 (65)
CN and JCN Cable - Indoor/Outdoor (35 kV)					
TFT-352E	1/0-250	0.85-1.45 (22-37)	8	1 ea.	1.77 (45)
TFT-353E	4/0-500	1.06-1.70 (27-43)	8	1 ea.	2.09 (53)
TFT-354E	500-1250	1.49-2.20 (38-56)	8	1 ea.	2.56 (65)
Shielded Cable - Indoor/Outdoor (5 kV No Sheds)					
TFT-151E-G	2/0-250	0.64-1.09 (16-28)	0	3 ea.	1.5 (38)
TFT-152E-G	350-500	0.85-1.45 (22-37)	0	3 ea.	1.77 (45)
TFT-153E-G	500-750	1.06-1.70 (27-43)	0	3 ea.	2.09 (53)
Shielded Cable - Indoor/Outdoor (8 kV No Sheds)					
TFT-151E-G	1/0-250	0.64-1.09 (16-28)	0	3 ea.	1.5 (38)
TFT-152E-G	250-500	0.85-1.45 (22-37)	0	3 ea.	1.77 (45)
TFT-153E-G	500-750	1.06-1.70 (27-43)	0	3 ea.	2.09 (53)
Shielded Cable - Indoor Only (15 kV No Sheds)					
TFT-151E-G	#2-250	0.64-1.09 (16-28)	0	3 ea.	1.5 (38)
TFT-152E-G	4/0-500	0.85-1.45 (22-37)	0	3 ea.	1.77 (45)
TFT-153E-G	500-750	1.06-1.70 (27-43)	0	3 ea.	2.09 (53)
Shielded Cable - Indoor/Outdoor (15 kV)					
TFT-151E-SG	#2-250	0.64-1.09 (16-28)	3	3 ea.	1.5 (38)
TFT-152E-SG	4/0-500	0.85-1.45 (22-37)	3	3 ea.	1.77 (45)
TFT-153E-SG	500-750	1.06-1.70 (27-43)	3	3 ea.	2.09 (53)
TFT-154E-SG	1000-1250	1.49-2.20 (38-56)	3	3 ea.	2.56 (65)
Shielded Cable - Indoor/Outdoor (25 kV)					
TFT-251E-SG	#1-3/0	0.64-1.09 (16-28)	5	3 ea.	1.5 (38)
TFT-252E-SG	#1-500	0.85-1.45 (22-37)	5	3 ea.	1.77 (45)
TFT-253E-SG	250-750	1.06-1.70 (27-43)	5	3 ea.	2.09 (53)
TFT-254E-SG	750-1250	1.49-2.20 (38-56)	5	3 ea.	2.56 (65)
Shielded Cable - Indoor/Outdoor (35 kV)					
TFT-352E-SG	1/0-250	0.85-1.45 (22-37)	8	3 ea.	1.77 (45)
TFT-353E-SG	4/0-500	1.06-1.70 (27-43)	8	3 ea.	2.09 (53)
TFT-354E-SG	500-1250	1.49-2.20 (38-56)	8	3 ea.	2.56 (65)
LC Shielded Cable - Indoor/Outdoor (15 kV)					
TFT-151E-SLC	#2-250	0.64-1.09 (16-28)	3	3 ea.	1.5 (38)
TFT-152E-SLC	4/0-500	0.85-1.45 (22-37)	3	3 ea.	1.77 (45)
TFT-153E-SLC	500-750	1.06-1.70 (27-43)	3	3 ea.	2.09 (53)
TFT-154E-SLC	1000-1250	1.49-2.20 (38-56)	3	3 ea.	2.56 (65)
LC Shielded Cable - Indoor/Outdoor (25 kV)					
TFT-251E-SLC	#1-3/0	0.64-1.09 (16-28)	5	3 ea.	1.5 (38)
TFT-252E-SLC	#1-500	0.85-1.45 (22-37)	5	3 ea.	1.77 (45)
TFT-253E-SLC	250-750	1.06-1.70 (27-43)	5	3 ea.	2.09 (53)
TFT-254E-SLC	750-1250	1.49-2.20 (38-56)	5	3 ea.	2.56 (65)
LC Shielded Cable - Indoor/Outdoor (35 kV)					
TFT-352E-SLC	1/0-250	0.85-1.45 (22-37)	8	3 ea.	1.77 (45)
TFT-353E-SLC	4/0-500	1.06-1.70 (27-43)	8	3 ea.	2.09 (53)
TFT-354E-SLC	500-1250	1.49-2.20 (38-56)	8	3 ea.	2.56 (65)

I.D. - Inside Dimension

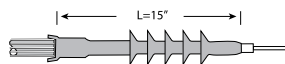
Installed Length
5/8/15kV (without sheds)



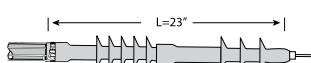
15kV (with sheds)



23kV (with sheds)



35kV (with sheds)



Ordering information:

- The -SG and -SLC kits contain a solder-blocked ground braid and a solderless ground clamp.
- Select the appropriate catalog number. Selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with the data contained in AEIC CS5-198, and CS6-1987 as well as the dimensions of commonly used connectors.
Nominal insulation thickness (100%): 15 kV: 175 mils, 25 kV: 260 mils, 35 kV: 345 mils
- For cables manufactured to other specifications, confirm selection with cable dimensions.
- Kits do not contain connectors; order compression or solder connectors separately.
- Cable mounting brackets are available to accommodate cable diameters from 0.80-2.40.

Medium Voltage Termination



HVT-G/SG 1/C Shielded Power Cable (15-35 kV)

Superior High-Contamination Withstand and Non-Tracking

The unique high-voltage insulating sleeve is a field-proven, nontracking, and erosion-resistant material that does not require periodic cleaning. The material properties have been formulated to be thermally stable and highly resistant to UV degradation, weathering and environmental pollution.

Positive Environmental Seal

The cable, along with external ground, is sealed from moisture ingress using Tyco Electronics' proven high-voltage, heat-activated sealing system. No field engineering or additional accessory kits are required.

Rated to IEEE-48, class 1. Indoor (in enclosures) or outdoor (weather-exposed) use. For use on copper tape, wire shield, lead sheath, and UniShield cables.

Selection Information: dimensions in inches (millimeters)

Catalog Number		Conductor Size	Insulation	Jacket
Indoor	Outdoor	(AWG/kcmil)	Diameter	O.D.
			(Min.-Max.)	(Max.)
15 kV				
HVT-151-G	HVT-151-SG	#4 - 1/0	0.60 - 0.95 (15 - 24)	1.20 (30)
HVT-152-G	HVT-152-SG	2/0 - 350	0.80 - 1.25 (20 - 32)	1.50 (38)
HVT-153-G	HVT-153-SG	400 - 1000	1.10 - 1.65 (28 - 42)	2.10 (53)
HVT-154-G	HVT-154-SG	1250 - 2500	1.60 - 2.45 (41 - 62)	2.75 (70)
<i>Installed Length: 15 (381) - 2 Skirts</i>				

25 kV				
HVT-252-G	HVT-252-SG	#2 - 250	0.80 - 1.25 (20 - 32)	1.50 (38)
HVT-253-G	HVT-253-SG	300 - 750	1.10 - 1.70 (28 - 43)	2.10 (53)
HVT-254-G	HVT-254-SG	1000 - 1750	1.60 - 2.45 (41 - 62)	2.75 (70)
HVT-255-G	HVT-255-SG	2000 - 2500	2.05 - 3.00 (52 - 76)	3.45 (88)
<i>Installed Length: 28 (711) - 3 Skirts</i>				

35 kV				
HVT-352-G	HVT-352-SG	#1 - 1/0	0.80 - 1.25 (20 - 32)	1.50 (38)
HVT-353-G	HVT-353-SG	2/0 - 500	1.10 - 1.85 (28 - 47)	2.10 (53)
HVT-354-G	HVT-354-SG	750 - 1750	1.60 - 2.45 (41 - 62)	2.75 (70)
HVT-355-G	HVT-355-SG	2000 - 2500	2.05 - 3.00 (52 - 76)	3.45 (88)
<i>Installed Length: 33 (838) - 4 Skirts</i>				

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with data contained in AEIC CS5-1987 and AEIC CS6-1987, as well as the dimensions of commonly used connectors. Nominal insulation thickness 15 kV: 175 mils; 25 kV: 260 mils; 35 kV: 345 mils. Nominal insulation thickness (133%): 15 kV: 220 mils..
2. Kits do not contain connectors; order compression or solder connectors separately.
3. All kits include a solderless ground connection. Outdoor (-SG) kits include skirts for outdoor use.
4. Standard package: Three single-conductor kits/box.
5. Related test reports: 5-8 kV: EDR 5217, 15 kV: EDR 5218, 25 kV: EDR 5219, 35 kV: EDR 5222
6. See next page for 3/C modification kits.
7. Cable mounting brackets are available to accommodate cable diameter.

Medium Voltage Terminations



HVT-Z

Heat-Shrinkable Terminations with Built-In Stress Control

The HVT-Z high voltage termination system features a co-extruded one-piece termination. Unlike the HVT product line, which includes a non-tracking tube and a separate stress control tube, the HVT-Z termination consists of the same proven non-tracking tube together with a co-extruded, built-in stress control grading layer. This stress control layer is based on ceramic semi-conductor technology (ZnO) and provides superior discharge and impulse performance. When the tubing is shrunk down, the coating softens and sticks to irregular surfaces, providing moisture seals as well as electrical stress control. The termination design provides a superior product with a shorter overall length and fewer rain sheds than the HVT product line.

Selection Information: dimensions in inches (millimeters)

Catalog Number Indoor/Outdoor		Conductor Size Min./Max.		Insulation Diameter Min./Max. (5 kV 133%)	Jacket Diameter Maximum
Indoor	Outdoor				
15 kV					
HVT-Z-151-G	HVT-Z-151-SG	#4 - 1/0 AWG		0.60 - 0.95 (15 - 24)	1.20 (30)
HVT-Z-152-G	HVT-Z-152-SG	2/0 - 350 kcmil		0.80 - 1.25 (20 - 32)	1.50 (38)
HVT-Z-153-G	HVT-Z-153-SG	400 - 1000 kcmil		1.10 - 1.65 (28 - 42)	2.10 (53)
HVT-Z-154-G	HVT-Z-154-SG	1250 - 2500 kcmil		1.60 - 2.45 (41 - 62)	2.75 (70)
Installed Length 11.8 (300)				1 Skirt for Outdoor Operation	
25kV/35 kV		25 kV (0.260)	35 kV (0.345)		
HVT-Z-252/352-G	HVT-Z-/252/352-SG	#2AWG - 250 kcmil	#1 - 1/0 AWG	0.80 - 1.25 (20 - 32)	1.50 (38)
HVT-Z-253/353-G	HVT-Z-253/353-SG	300 - 750 kcmil	2 AWG - 500 kcmil	1.10 - 1.75 (28 - 44)	2.10 (53)
HVT-Z-254/354-G	HVT-Z-254/354-SG	1000 - 2000 kcmil	750 - 1750 kcmil	1.60 - 2.45 (41 - 62)	2.75 (70)
Installed length: 19.7 (500)				4 Skirts for Outdoor Operation	

Product Performance

Testing Chart

Product and voltage class 1

Test Description	HVT-Z-80 Series (5-8 kV)	HVT-Z-150 Series (15 kV)	HVT-Z-250/350 Series (25-35 kV)
AC withstand, 1 minute, (kV)	35	60	90
DC withstand, 15 minutes, (kV)	65	75	40
Partial discharge (min. kV) for 5 pC or less	9	13	30
Impulse withstand 1.2 x 50 Qs, crest kV	95	110	200

Continuous Current Rating

Equal to Cable Ampacity

Wet withstand, 10 seconds, kV rms	30	45	80
Dry withstand, 6 hours, kV rms	25	35	75

1. HVT-Z-250 meets requirements of 25/28 kV systems.

2. Outdoor kits (-SG designation) were tested with skirts (rain sheds). Indoor kits (-G designation) do not contain skirts.

Test Reports

	Indoor	Outdoor
5/8/15 kV	EDR-5322	EDR-5323
25/28/35 kV	EDR-5337	EDR-5338

Note: HVT-Z termination kits can be supplied with 2 hole NEMA copper terminal lugs for all sizes of conductors from #4 AWG through 1000 kcmil by adding the suffix "conductor size C" to the end of the catalog number. Ex. 500 kcmil conductor supplied with an indoor 15kV HVT-Z kit is catalog number HVT-Z-153-G-500C.

HVT-Z-J/SJ

1/C Unjacketed and Jacketed URD Cable (15-35 kV)

Indoor Kit	Outdoor Kit	Conductor Size		Min/Max Insulation	Max. Jacket
		0.175" Insulation 100%	0.220" Insulation 133%		
15 kV					
HVT-Z-151-J	HVT-Z-151-SJ	#2 - #1 AWG		0.06 - 0.95	1.05
HVT-Z-152-J	HVT-Z-152-SJ	#2/0 - 250 kcmil	#2 - #4 AWG	0.80 - 1.05	1.45
HVT-Z-153-J	HVT-Z-153-SJ	350 - 500 kcmil	250 - 500kcmil	1.05 - 1.40	1.90
HVT-Z-154-J	HVT-Z-154-SJ	750 - 1000 kcmil	750 - 1000kcmil	1.25 - 2.00	2.50
Installed length: 11.5' (300)					
25/35 kV					
HVT-Z-252/352-J	HVT-Z-252/352-SJ	#2 - #1 AWG		0.80 - 1.05	1.45
HVT-Z-253/353-J	HVT-Z-253/353-SJ	#4/0 - 500 kcmil	#1 - #4AWG	0.06 - 0.95	1.05
HVT-Z-254/354-J	HVT-Z-254/354-SJ	750 - 1000 kcmil	250 - 1000 kcmil	1.25 - 2.00	2.50
Installed length 20" (500)					

Medium Voltage Termination

3/C Cable Terminating

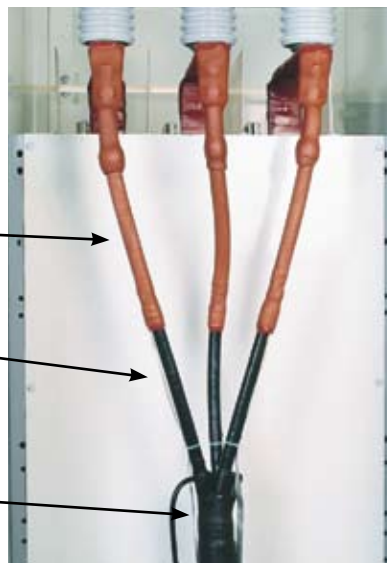
MOD-3X-HVT and MOD-3Y-HVT are for jacketing of phases and ground conductors. MOD-3A-HVT and MOD-3B-HVT provide jacketing, plus an environmental crotch sealing boot. Tubing provided does not have sealant coating on the inner wall. This makes it easy to remove, like any cable jacket. Each kit includes three 4-foot long sleeves for the phases and three 4-foot long smaller sleeves for any ground conductors. (Tubing can be field-cut to appropriate length.) A unique six-legged cable breakout boot, provided in -3A and -3B kits, has an internal coating of a special adhesive to provide total environmental sealing of the cable crotch (breakout) area. It has three large legs for the phases and three smaller legs for ground conductors. Plugs are included for insertion into any unused ground legs to maintain the environmental seal integrity.

3/C Mod Kit for Converting One 3/C Cable to Three 1/C Cables

1/C "HVT"/ "HVT-Z" series termination.

Heat-shrink jacketing tubes for protection of the phases and any ground conductors.

Heat-shrink cable breakout boot for crotch seal.



MOD-3-HVT Kit Components and Bulk Ordering Information

Catalog Number	Kit Components	Component Catalog Number	Bulk Ordering Catalog Number
MOD-3X-HVT	Uncoated tubing to rejack each phase	3 each MWTM-35/12-1200/U	MWTM-35/12-A/U
	Uncoated tubing to rejack each ground	3 each MWTM-16/5-1500/U	MWTM-16/5-A/U
	Sealant strip	1 each S1085-3-380	S1085-3-380
MOD-3Y-HVT	Uncoated tubing to rejack each phase	3 each MWTM-85/25-1500/U	LVIT-75/25-A/U
	Uncoated tubing to rejack each ground	3 each MWTM-16/5-1200/U	MWTM-16/5-A/U
	Sealant strip	1 each S1085-3-380	S1085-3-380
MOD-3A-HVT	Uncoated tubing to rejack each phase	3 each MWTM-35/12-1200/U	MWTM-35/12-A/U
	Uncoated tubing to rejack each ground	3 each MWTM-16/5-1200/U	MWTM-16/5-A/U
	Sealant strip	1 each S1085-3-380	S1085-3-380
	Cable breakout boot	1 each CBR-6-1-A	CBR-6-1-A
	Cable breakout plugs	3 each CBR-PLUG	CBR-PLUG
MOD-3B-HVT	Sealant-coated shim tubing	1 each WCSM-70/21-150-S	WCSM-70/21-1200S
	Uncoated tubing to rejack each phase	3 each MWTM-85/25-1500/U	LVIT-75/25-A/U
	Uncoated tubing to rejack each ground	3 each MWTM-16/5-1200/U	MWTM-16/5-A/U
	Sealant strip	1 each S1085-3-380	S1085-3-380
	Cable breakout boot	1 each CBR-6-2-A	CBR-6-2-A
	Cable breakout plugs	3 each CBR-PLUG	CBR-PLUG
	Ground wire shim tubing	3 each WCSM-20/6-150S	WCSM-20/6-150S (B50)

Note: MOD-3-HVT kits should be installed prior to installing Tyco Electronics HVT kits.

Ordering Information

- Standard package: 1 kit/box.
- Kit contents: Unsealed (-3X and -3Y) kits contain rejacketing tubes for phase and ground conductors, and sealant for indoor terminations that don't require environmental sealing. Sealed (-3A and -3B) kits contain rejacketing tubes, sealant, a cable breakout, and plugs for both outdoor and indoor terminations.
- Kit components can be purchased in bulk quantities (see table above).

Medium Voltage Terminations



HVT-LC/SLC 1/C LC Shield Cable (15-35 kV)

- Rated to IEEE-48-1990, class 1. Indoor (in enclosures) or outdoor (weather-exposed)
- Use on LC shield cables

Selection Information: dimensions in inches (millimeters)

Catalog Number		Conductor Size	Insulation Diameter	Jacket O.D.
Indoor	Outdoor	(AWG/kcmil)	(Min.-Max.)	(Max.)
15 kV				
HVT-151-LC	HVT-151-SLC	#2 - 3/0	0.65 - 1.00 (17 - 25)	1.45 (37)
HVT-152-LC	HVT-152-SLC	4/0 - 350	0.85 - 1.40 (22 - 36)	1.85 (47)
HVT-153-LC	HVT-153-SLC	500 - 1000	1.15 - 1.70 (29 - 43)	2.20 (56)
HVT-154-LC	HVT-154-SLC	1250 - 2000	1.60 - 2.15 (41 - 55)	2.70 (69)
<i>Installed Length: 15 (381)</i>				
25 kV				
HVT-252-LC	HVT-252-SLC	#2 - 400	0.85 - 1.40 (22 - 36)	1.80 (46)
HVT-253-LC	HVT-253-SLC	400 - 1000	1.25 - 1.80 (32 - 46)	2.50 (64)
HVT-254-LC	HVT-254-SLC	1000 - 1500	1.60 - 2.10 (41 - 55)	2.70 (69)
<i>Installed Length: 26 (660)</i>				
35 kV				
HVT-352-LC	HVT-352-SLC	#1 - 250	1.05 - 1.40 (27 - 36)	1.90 (48)
HVT-353-LC	HVT-353-SLC	250 - 1250	1.25 - 2.10 (32 - 55)	2.60 (66)
<i>Installed Length: 33 (838)</i>				

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100%-insulated and 133%- insulated cables manufactured in accordance with the data contained in AEIC CS5-1987 and AEIC CS6-1987, as well as the dimensions of commonly used connectors. Nominal insulation thickness: (100%) 15 kV: 175 mils 25 kV: 260 mils 35 kV: 345 mils Nominal insulation thickness: (133%) 15 kV: 220 mils
2. For cables manufactured to other specifications, confirm selection with cable dimensions.
3. HVT-LC/SLC kits are supplied with two pieces of #4 AWG braid to provide fault-current carrying capacity. Users should verify the compatibility of the braids with their LC shield cable.
4. Kits do not contain connectors; order compression or solder connectors separately.
5. HVT-LC and HVT-SLC kits contain solderless ground connection clamp.
6. Standard package: 1 kit/box.
7. Related test reports:
 - 15 kV: EDR-5218
 - 25 kV: EDR-5219
 - 35 kV: EDR-5222
8. Cable mounting brackets are available to accommodate cable diameters from 0.80-2.40 (20-46).

Medium Voltage Terminations



HVT-J/SJ

1/C unjacketed and jacketed URD cable (15–35 kV)

HVT-J/SJ terminations are lightweight. They can be mounted directly to fuse cutouts, eliminating the need for extra support brackets. As with all HVT kits, these URD terminations offer superior UV stability and a nontracking outer surface.

RUS accepted for indoor and outdoor terminations—Indoor (in enclosure) or outdoor (weather-exposed) use. For use on concentric neutral and jacketed concentric neutral cables.

Selection Information: (dimensions in inches/millimeters)

Catalog Number		Conductor Size	Insulation Diameter	Jacket O.D.
Indoor	Outdoor	(AWG/kcmil)	(Min.–Max.)	(Max.)
15 kV				
HVT-151-J	HVT-151-SJ	#2 – 3/0	0.65 – 1.00 (17 – 25)	1.45 (37)
HVT-152-J	HVT-152-SJ	4/0 – 350	0.85 – 1.40 (22 – 36)	1.85 (47)
HVT-153-J	HVT-153-SJ	500 – 1000	1.15 – 1.70 (29 – 43)	2.20 (56)
HVT-154-J	HVT-154-SJ	1250 – 2000	1.60 – 2.15 (41 – 55)	2.70 (69)
<i>Installed length: 15 (381)</i>				
25 kV				
HVT-252-J	HVT-252-SJ	#2 – 400	0.85–1.40 (22 – 36)	1.80 (46)
HVT-253-J	HVT-253-SJ	400 – 1000	1.25–1.80 (32 – 46)	2.50 (64)
HVT-254-J	HVT-254-SJ	1000 – 1500	1.60–2.10 (41 – 53)	2.70 (69)
<i>Installed length: 26 (660)</i>				
35 kV				
HVT-352-J	HVT-352-SJ	#1 – 250	1.05 – 1.40 (27 – 36)	1.90 (48)
HVT-353-J	HVT-353-SJ	250 – 1250	1.25 – 2.10 (32 – 53)	2.60 (66)
HVT-354-J	HVT-354-SJ	1500 – 2000	2.00 – 2.70 (51 – 69)	3.30 (84)
<i>Installed length: 33 (838)</i>				

Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100% and 133% insulated cables manufactured in accordance with the data contained in AEIC CS5-1987 and AEIC CS6-1987, as well as the dimensions of commonly used connectors. Nominal insulation thickness 100%: 15 kV: 175 mils, 25 kV: 260 mils, 35 kV: 345 mils
Nominal insulation thickness 133%: 15 kV: 220 mils
2. For cables manufactured to other specifications, confirm selection with cable dimensions.
3. Kits do not contain connectors; order compression or solder connectors separately.
4. Indoor (-J) kits are suitable for unjacketed and jacketed URD cable.
5. Outdoor (-SJ) kits include skirts for outdoor use and are suitable for unjacketed and jacketed URD cable.
6. Standard package: 1 kit/box.
7. Related test reports: 15 kV: EDR-5218, 25 kV: EDR-5219, 35 kV: EDR-5222
8. Cable mounting brackets are available to accommodate cable diameters from 0.80-2.40 (20-46).

Medium Voltage Terminations



HVT/HVT-3 15 kV Terminations, (1/C, 3/C) PILC/VCLC

HVT-1590-G/SG and HVT-3-1590-G/SG series heat-shrinkable high voltage terminations combine proven oil-sealing capabilities with stress-control and nontracking technologies to terminate 15 kV 1/C and 3/C PILC/VCLC cables.

The HVT-1590-G/SG and HVT-3-1590-G/SG heat-shrinkable terminations install quickly and easily, with no need for special adapters, compound filling, leadwiping, or hot oils. The HVT-1590-G/SG and HVT-3-1590-G terminations are fully qualified to applicable sections of IEEE-48 to provide a long, trouble-free product life. In addition, these terminations have been pressure tested to perform at 110°C and 15 psi under load-cycling conditions.

- Rated to IEEE-48, class 1 termination
- Accommodates belted or shielded paper-insulated, lead-covered (PILC) or varnished cambric-insulated (VCLC) cable

Selection Information: dimensions in inches (millimeters)

Catalog Number		Conductor Size	Insulation Diameter	Installed Length		Outdoor	
Indoor	Outdoor	(AWG/kcmil)	(Min.)	Indoor (Min.)	(Max.)	(Min.)	(Max.)
HVT-3-1590-G/SG 3/C PILC/VCLC Cable							
HVT-3-1591-G	HVT-3-1591-SG	#4 – 4/0	0.60 (15)	31.5 (800)	35 (888)	28 (711)	40 (1015)
HVT-3-1592-G	HVT-3-1592-SG	4/0 – 400	0.85 (22)	31.5 (800)	35 (888)	28 (711)	40 (1015)
HVT-3-1593-G	HVT-3-1593-SG	500 – 800	1.00 (25)	31.5 (800)	35 (888)	28 (711)	40 (1015)

Catalog Number	Indoor	Outdoor	Conductor	Insulation	Max Lead	Min	Min	Installed	Outdoor
			Size (AWG/kcmil)	Diameter (Min.)	Sheath OD	Lug OD	Lug barrel Length	Length Indoor	
HVT-1590-G/SG 1/C PILC/VCLC Cable									
HVT-1591-G	HVT-1591-SG		#4 - 2/0	0.60 (15)	0.95 (24)	1.50 (13)	1.50 (38)	22.4 (570)	22.4 (570)
HVT-1592-G	HVT-1592-SG		3/0 - 400	0.85 (22)	1.25 (32)	0.65 (16)	1.50 (38)	22.4 (570)	22.4 (570)
HVT-1593-G	HVT-1593-SG		400 - 1000	1.00 (25)	1.65 (42)	0.95 (24)	1.50 (38)	23.6 (600)	23.6 (600)
HVT-1594-G	HVT-1594SG		1250 - 2000	1.75 (44)	2.20 (56)	1.25 (32)	1.50 (38)	23.6 (600)	23.6 (600)

Technical Data

The Tyco Electronics HVT-1590-G/SG and HVT-3-1590-G PILC/VCLC terminations have been tested to and meet the following IEEE-48-1990 requirements:

Test	Requirement
AC withstand, 1 minute	50 kV
AC dry withstand, 6 hours	35 kV
Impulse (BIL) 1.2 x 50 Qs	95 kV
DC withstand, 15 minutes	75 kV
Cyclic aging, 30 cycles at 110°C conductor temp. with 17-kV and 15-psi internal pressure (one cycle = 8 hours on/16 hours off)	Passed
Post load cycling impulse (BIL) 1.2 x 50 Qs	95 kV
Pressure test, 30-psi internal pressure for 1 hour	Passed

The Tyco Electronics HVT-3-1590-SG PILC/VCLC terminations have been tested to:

Impulse (BIL) 1.2 x 50 Qs	110 kV
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Ordering Information

1. Select the appropriate catalog number. Selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with the data contained in AEIC 1-1968. Nominal insulation thickness (100%): 165 mils
2. Lugs are not supplied in the kits and should be ordered separately. Use oil block lugs only.
3. Standard package quantity:
1 kit (Each 3/C kit contains all components required to terminate one 3/C PILC cable) per box.
4. Related test report: EDR-5245.
5. To order cable prep kit.
6. Cable mounting brackets are available to accommodate cable diameters from 0.80-4.50 (20-115).

High Voltage Terminations



EHVT/GHVT 1/C Shielded Power Cable (46 and 69 kV)

Tyco Electronics' Raychem EHVT series high-voltage terminations utilize a stress control system that has been field-proven for more than 20 years.

Reduced Installation Costs

Because the 46 and 69 kV HVT kits use standard heat-shrink components, guide tubes are not needed for alignment, elastomer compression, computed venting, or field compound filling. Only standard cable support systems are needed, reducing steel structure or pole top support requirements.

Available in Gray Color

For applications where gray appearance is preferred, GHVT 69 kV terminations are now available. These terminations meet the same criteria as Tyco Electronics' EHVT kits. GHVT kits have gray outer tubes and skirts.

Superior High-Contamination Withstand and Non-Tracking

The unique high-voltage insulating sleeve is a field-proven, nontracking, and erosion-resistant material that does not require periodic cleaning. The material properties have been formulated to be thermally stable and highly resistant to UV degradation, weathering, and environmental pollution.

Positive Environmental Seal

The cable, along with external ground, is sealed from moisture ingress using Tyco Electronics' proven high-voltage, heat-activated scaling system. No field engineering or additional accessory kits are required.

Rated to IEEE-48, class 1, for outdoor (weather-exposed) use. For use on wire shield, wire/metallic-tape shield, lead sheath, and jacketed concentric neutral cables. Both kits contain a limited number of lightweight components with unlimited shelf life under normal storage conditions.

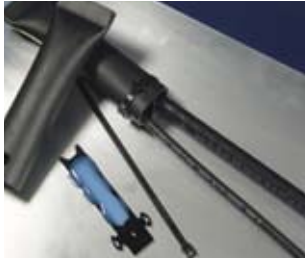
Selection Information: dimensions in inches (millimeters)

Catalog Number			Conductor Size (AWG/kcmil)	Insulation Diameter (Min - Max.)	Jacket O.D. (Max.)
Indoor	Outdoor				
46 kV 32"	40"				
EHVT-462-G	EHVT-462-SG		#2 - 4/0	1.18-1.77 (30 - 45)	2.36 (60)
EHVT-463-G	EHVT-463-SG		250 - 750	1.47-2.05 (38 - 52)	2.75 (70)
EHVT-464-G	EHVT-464-SG		1000 - 1500	1.97-2.56 (50 - 65)	3.35 (85)
EHVT-465-G	EHVT-465-SG		1750 - 2500	2.48-3.03 (63 - 77)	3.94 (100)
69 kV 42"	52"				
EHVT-691-G	EHVT-691-SG		1/0 - 350	1.50-2.05 (38 - 52)	2.65 (67)
EHVT-692-G	EHVT-692-SG		350 - 1000	1.95-2.55 (50 - 65)	3.25 (83)
EHVT-693-G	EHVT-693-SG		1000 - 2000	2.50-3.05 (64 - 77)	3.95 (100)
GHVT-69 kV (Gray) 40"	52"	SSG 36"			
GHVT-691-G	GHVT-691-SG	GHVT-691-SSG	1/0 - 350	1.50 - 2.05 (38 - 52)	2.65 (67)
GHVT-692-G	GHVT-692-SG	GHVT-692-SSG	350 - 1000	1.95 - 2.55 (50 - 65)	3.25 (83)
GHVT-693-G	GHVT-693-SG	GHVT-693-SSG	1000 - 2000	2.50 - 3.05 (64 - 77)	3.95 (100)

Ordering Information

- Select the appropriate catalog number. Selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with the data contained in AEIC CS6-1982 and AEIC CS7-1987, as well as the dimensions of commonly used connectors. Nominal insulation thickness (100%): 46 kV: 420 mils, 69 kV: 650 mils
- For cables manufactured to other specifications, confirm selection with cable dimensions
- Kits do not contain connectors; order compression or solder connectors separately
- Standard package: 1 kit/box
- Installed length: 46 kV:
Indoor (-G): 32 (813)
Outdoor (-SG): 40 (1016)
Installed Length 69 kV:
Indoor (-G): 42 (1067)
Outdoor (-SG): 52 (1321)
Outdoor (-SSG): 36 (915)
- Related test report: 46 kV: PPR-1085 69 kV: EDR-5241
- EHVT-BRKT available to accommodate cable diameters from 2.5-4.5 (65-115 mm).
- EHVT-BP base plates for mounting the EHVT-BRKTs are also available.

Medium Voltage Stub Splices & Motor Connection Kits (5-8 kV)



GelCap 8

Motor Connection Kits 5-8 kV Shielded and Unshielded Cable

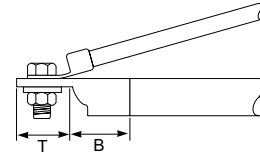
Tyco Electronics' GelCap 8 stub connection kits provide quick installation, dependable performance, and easy reentry.

GelCap 8 stub connection kits insulate, seal, and protect stub splice connections up to 8kV. The design was engineered to provide quick, secure installation and protection of the electrical connection from both physical and chemical attacks common in the harsh environment of motor connections.

GelCap 8 stub connection kits feature revolutionary PowerGel sealing gel which provides an excellent moisture seal over a wide temperature range (-40°C to 105°C). PowerGel sealing gel has excellent insulating properties and the added benefit of acting as a vibration damper.

The specially formulated material provides excellent abrasion resistance, insulation value, and UV resistance. The cap is designed to fit a wide range of cable sizes.

GelCap 8 stub connection kits provide the fastest installation. Simply place the gel filled insert between the cables and push the cover down over the connection. Secure with cable tie. No extra materials or grease are required. No trimming. The PowerGel sealing gel is already in the cap.



Selection Information: dimensions in inches (millimeters)

Catalog Number	Cap Length	Feeder Cable O.D.	Nominal Size	Lead Cable O.D.	Max. Length Tang (T)	Barrel (B)	Bolt
GelCap-8-NS Non-Shielded Cable							
GELCAP-8-NS-IV	8.5 (216)	0.47 - 0.84 (12-21)	4 - 250 kcmil	0.43 - 0.67 (11-17)	1.33 (34)	1.0 (25)	0.75 (19)
GELCAP-8-NS-IVEX	11.5 (292)	0.47 - 0.84 (12-21)	4 - 250 kcmil	0.43 - 0.67 (11-17)	3.53 (90)	1.0 (25)	0.75 (19)
GELCAP-8-NS-2V	12.5 (318)	0.84 - 1.10 (21-28)	250 - 500 kcmil	0.67 - 0.84 (17-21)	3.92 (100)	2.25 (57)	1.0 (25)

Catalog Number	Cap Length	Feeder Cable O.D.	Nominal Size	Lead Cable O.D.	Max. Length Tang (T)	Barrel (B)	Bolt
GelCap-8-S Shielded Cable							
GELCAP-8-S-IV	8.5 (216)	0.67 - 1.00 (17 - 25)	4 - 2/0 AWG	0.40 - 0.62 (10 - 16)	1.33 (34)	1.0 (25)	0.75 (19)
GELCAP-8-S-IVEX	11.5 (292)	0.67 - 1.00 (17 - 25)	4 - 2/0 AWG	0.40 - 0.62 (10 - 16)	3.64 (92)	1.0 (25)	0.75 (19)
GELCAP-8-S-2V	12.5 (318)	1.00 - 1.35 (25 - 34)	4/0 - 500 kcmil	0.62 - 0.96 (16 - 24)	3.79 (96)	2.00 (51)	1.00 (25)

Catalog Number	Minimum Shield Diameter	Maximum Jacket Diameter
Ground Kit Selection (Select Based on Shielded Cable Shield Diameter and Jacket Diameter Per Below)		
GELCAP-8-GRD-1	.47 (12)	.70 (18)
GELCAP-8-GRD-2	.67 (17)	1.35 (34)

Kit contents - Each GELCAP-8-GRD kit contains the following: three each solder blocked ground braid, GelWrap sealing cover, roll spring, gel sealant strip, and six each copper tape strips and one installation instruction. If grounding is required at the motor box for shielded cable, a separate grounding kit may be purchased.

Product Performance

AC Voltage withstand: 18kV, 1 minute

DC Voltage withstand: 35kV, 15 minutes

Impulse Withstand (BIL): minimum performance 75kV, 10+, 10-

Ordering Information

1. Select appropriate catalog number based on the motor feeder cable and motor lead guidelines above. Selections are based on typical cable dimensions. Confirm selection with cable and connector dimensions.
2. Packaging: Standard packaging is one kit per box. Each GelCap 8 kit contains components for a 3 phase motor connection which consists of three each of the following: elastomeric, gel filled cap; a gel filled cable insert; and cable tie. The type S kits for shielded cable also contain three each stress control pads.
3. Kits do not contain connectors.
4. Related tests reports: EDR-5408

Medium Voltage Stub Splices & Motor Connection Kits (5-8.7 kV)



MCK-5 MCK-5 to 8.7 kV, Flame Retardant

Type V

The Type V kit is designed to splice the stub or butt configuration that is commonly used where there is insufficient room to make in-line connections.

Type L

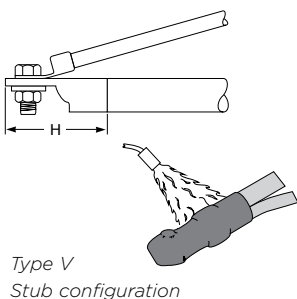
The Type L kit is used, where space permits, to splice in-line connections. MCK is qualified to NSI-C119.1-1986 and rated to ICEA electrical withstand test for 1000 V.

- MCK-5 is rated to the general electrical requirements of the IEEE-48 withstand tests
- For use as an in-line or stub splice between 1/C poly feeder cable and motor leads
- Motor connection kit provides excellent insulation sealing—and resistance to abrasion—in motor connections



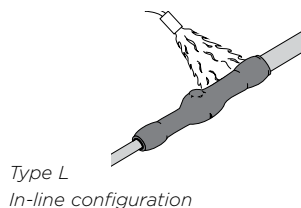
Selection Information: dimensions in inches (millimeters)

Catalog Number	Motor Feeder Size (AWG/kcmil)	Bolt Length (Max.)	Connection Length (Max.) H	Length (Nominal)
*MCK (5/8.7 kV)				
Type V (Stub)				Cap
MCK-5-1V	#8-#2	1	5.0 (127)	7.5 (191)
MCK-5-2V	#1-250	1 1/2	6.0 (152)	8.5 (216)
MCK-5-3V	300-750	1 1/2	7.0 (178)	9.5 (241)
*Type L (In-Line)				Sleeve
MCK-5-1L	#8-250	1	6.0 (152)	12.0 (305)
MCK-5-2L	300-1000	1 1/2	7.0 (178)	14.0 (356)



Ordering Information

1. Select appropriate catalog number based on the motor feeder cable. MCK-5 selections are based on the typical dimensions of medium-voltage insulated cable. MCK-5 selections are based on the typical dimensions of 100% insulated cables manufactured in accordance with the data contained in AEIC CS5-1987 and AEIC CS6-1987, as well as the dimensions of commonly used connectors. Nominal insulation thickness (100%):90 mils. For cables manufactured to other specifications, confirm selection with cable and connector dimensions.
2. Shielded cable must be terminated before installing MCK-5 (use Tyco Electronics HVT-80x-G or HVT-Z-8x-G/SG. G only for HVT).
3. MCK-5 kits are designed for single-hole connectors and include caps and sealant strips for three connections. Kits do not contain connectors.
- *4. Standard package: MCK-5: 1 kit/box.
5. Related test reports: MCK-5: EDR-5010



CABLE REPAIR & REJACKETING



Repair & Rejacketing

GWRS Gel Wraparound Rejacketing Sleeve	57
GelWrap ES Gel Wraparound Elbow Sealing Adapter	58
RVS-SK Rayvolve Elbow Sealing Adapter	59
MBSM Wraparound Jacket Repair	60
ESA Heat-Shrinkable Wraparound Sleeves	61
CRSM Sleeves	61

Repair & Rejacketing

**GWRS****Gel Wraparound Rejacketing Sleeves (to 35 kV)**

Cold-applied Gel Wraparound Rejacketing Sleeves quickly and conveniently seal and protect medium voltage cable splices up to 35 kV. GWRS rejacketing closure sleeves can also be used to repair cables with jacket damage. GWRS closure sleeves are designed for manhole, direct buried, or weather exposed applications.

The GWRS closure sleeves can be used over all types and brands of push-on and cold-applied splices when a water-tight cover is required.

The wraparound design reduces installation space because it is not required to position a tube to the side while installing the splice. The result is easier installation in cramped manholes and less digging for direct buried applications.

Selection Information: dimensions in inches (millimeters)

Kit Description	Cable Diameter Use Range	Joint Body Diameter Use Range	Length	Max Jacket Opening
GWRS-75/25-750	1.0 - 2.1 (25 - 55)	1.0 - 3.0 (25-75)	29.5 (750)	20.0 (510)
GWRS-75/25-850	1.0 - 2.1 (25 - 55)	1.0 - 3.0 (25-75)	33.5 (850)	24.0 (610)
GWRS-75/25-1050	1.0 - 2.1 (25 - 55)	1.0 - 3.0 (25-75)	41.3 (1050)	32.0 (810)
GWRS-100/40-1050	1.6 - 2.8 (40 - 70)	1.6 - 3.9 (40-100)	41.3 (1050)	32.0 (810)

Note: Add X at the end of the catalog number (e.g. GWRS-100/40-1050x) for external grounding, this kit includes gel strips for sealing neutrals or ground wire exits.

Ordering Information

1. Select the appropriate catalog number based on the cable diameter and the jacket opening. Cable and splice body must be within specified use range.
2. Order kits with "X" designation if neutrals or ground wires will be exiting the sleeve.
3. Standard package: 1 kits/box
4. Meet IEEE 404-2006
5. Related test reports:
 - EDR-5380
 - EDR-5423
 - EDR-5371
 - EDR-5358
 - EDR-5359
 - EDR-5360
 - EDR-5454

Repair & Rejacketing



GelWrap ES

Wrap Around Cold-Applied Elbow Sealing Adapter for 1/C Jacketed Cables

Use this kit to seal the jacket of a power cable used with a premolded elbow.

GelWrap ES elbow sealing closure kits are easily installed due to the wrap around design. Simply install the elbow as you normally would. Then use the components of the GelWrap ES elbow sealing closure kit to provide an environmental seal. Pre-positioning of the sleeve is not required so retrofit installations are easily accomplished. One kit provides a very wide use range to minimize inventory requirements.

The sleeve is factory coated with PowerGel sealant to provide a positive moisture seal. PowerGel sealant strips are included in the kit to ensure proper sealing of any neutrals or grounds exiting the sleeve.

Ordering Information

1. Select the appropriate catalog number based on the cable conductor size and voltage class. Selections are based on the typical dimensions of 100%- or 133%-insulated cables manufactured in accordance with the data contained in AEIC CS5-1987. For cables manufactured to other specifications, selection should be confirmed with cable dimensions.
2. Kits used on metallic-tape-shielded cables may require external grounding components. See items HVS-GC and HV-BRAID on pages 115 and 116.
3. Standard package: 6 or 24 kits/box

Selection Information (dimensions in inches/millimeters)

Catalog Number	Outside Diameter		Voltage Class (kV)	100% Insulated Conductor Size	133% Insulated Conductor Size
	Minimum Insulation Shield	Maximum Cable Jacket or Covered Arm of Elbow			
GelWrap-ES-65/25-150	1.00 (25)	2.40 (61)	5	500 - 1000	500 - 1000
			15	4/0 - 1000	2/0 - 1000
			25	#1 - 1000	#1 - 1000
			35	1/0 - 1000	1/0 - 750

Repair & Rejacketing

**RVS-SK****Rayvolve “Roll-On” Elbow Sealing Adapters for Concentric Neutral Jackets for 1/C Jacketed URD Cable**

Rayvolve RVS-SK splice cover kits are the easy, “roll-on” way to seal JCN cable jackets when they are terminated to premolded elbows. RVS-SK splice cover kits provide an environmental seal that is maintained throughout exposure to conditions typical of elbow installations: temperature extremes (–36°F to 162°F/–20°C to 90°C), temperature cycling (41°F to 162°F/23°C to 90°C), and twisting and flexing motions as seen during switching.

- Qualified to ANSI C119.1-1986
- For use on standard poly- or elastomeric-insulated cables
- Use to seal JCN cable jackets when terminated to pre-molded elbows

Selection Information: dimensions in inches (millimeters)

Catalog Number	Outside Diameter		Voltage Class (kV)	Conductor Size	
	Insulation Shield (Min.)	Cable Jacket (Max.)		100% Insulation (AWG/kcmil)	133% Insulation (AWG/kcmil)
RVS-13-SK	0.55 (14)	1.25 (32)	5	#2 – 250	#2 – 250
			15	#2 – 3/0	#2 – 1/0
			25	#1	
RVS-14-SK	0.70 (18)	1.60 (41)	5	3/0 – 600	3/0 – 600
			15	#2 – 400	#2 – 350
			25	#1 – 250	#1 – 3/0
			35	1/0 – 2/0	
RVS-15-SK*	1.15 (29)	2.00 (51)	5	600 – 1000	600 – 1000
			15	350 – 750	250 – 750
			25	4/0 – 600	1/0 – 500
			35	1/0 – 400	1/0 – 250

Ordering Information

1. Select the appropriate catalog number. Selections are based on typical dimensions of low voltage insulated cable. Confirm selection with dimensions to assure proper sizing.
2. Kits do not contain connectors. The RVS-SK selection information covers all conductor types from solid to stranded.
3. Kits contain all materials necessary to seal from the cable jacket to either the cable semi-con or 200-A elbow.
- * 4. For warm weather installations (above 32°F), use range may be extended to a 2.25-inch-maximum jacket diameter. This covers 133%-insulated 1000-kcmil 15-kV and 25-kV cable, and 133%-insulated 750-kcmil 35-kV cable.
5. Kits used on metallic-tape-shielded cables may require an external grounding kit.
6. Each kit contains one Rayvolve RVS-SK sleeve and sealant strips.
7. Standard package: 6 kits/box.
8. Related test report: EDR-5196

Repair & Rejacketing



MBSM Wraparound Jacket Repair Sleeve

MBSM repair sleeves protect cables in mechanically abusive environments; re-jacket premolded splices; repair and re-jacket LC-shielded and moisture-impervious cables; and provide strain relief.

Available in five diameters with 5:1 shrink ratios.

For use on standard poly- or elastomeric-insulated/jacketed cables, which may include aluminum or steel armoring. Provides a moisture-vapor-transmission (MVT) barrier for repairing and re-jacketing LC-shield and moisture impervious cables. *MBSM sleeves do not provide electrical insulation.*

Selection Information: dimensions in inches (millimeters)

Catalog Number	Cable Use Range (Min.-Max.)	Sleeve Length*	Standard Pkg (Kits/Box)
MBSM-43/8-1200	0.35 - 1.50 (9 - 38)	48 (1219)	6
MBSM-75/15-1200	0.65 - 2.65 (17 - 67)	48 (1219)	6
MBSM-125/30-1200	1.30 - 4.30 (33 - 109)	48 (1219)	6
MBSM-160/42-1200	1.80 - 5.70 (46 - 145)	48 (1219)	6
MBSM-200/50-1200	2.15 - 7.10 (55 - 180)	48 (1219)	6

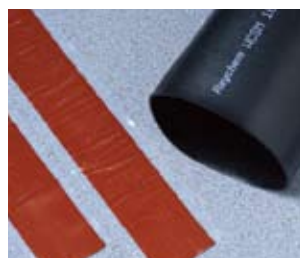
Damage	Total Seal Length
<3 (<76)	3 (76)
3 - 12 (76-305)	4 (102)
12 - 24 (305-610)	6 (152)
>24 (>610)	8 (203)



Cut Sleeve Length = Damage Length + Total Seal Length

Ordering Information

1. Select appropriate catalog number based on the cable use range.
2. Kits contain a wraparound sleeve, stainless steel channel closure, and redundant sealant strips.
- * 3. Sleeve may be field-cut for shorter requirements.
4. Length tolerance is $\pm 2\%$.
5. Related test report: EDR-5225



ESA Heat-Shrinkable Elbow Sealing Adapters for 1/C Jacketed URD and Shielded Power Cable

ESA elbow sealing adapters shrink down tightly to form an environmental re-jacketing seal.

- For use on jacketed concentric neutral, drain-wire-shielded, or copper-tape-shielded power cable
- Qualified to ANSI C119.1-1986
- RUS accepted for termination/elbow sealing

Use this heat-shrinkable kit to seal the jacket of a power cable used with a premolded elbow.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Conductor Size (AWG/kcmil)			
	5 kV	15 kV	25 kV	35 kV
ESA-1	#2 - 500	#2 - 250	#1 - 3/0	
ESA-2	600 - 1000	350 - 1000	4/0 - 1000	1/0 - 1000

Ordering Information

1. Select the appropriate catalog number based on the cable conductor size and voltage class.
Selections are based on the typical dimensions of 100%- or 133%-insulated cables manufactured in accordance with the data contained in AEIC CS5-1987 and AEIC CS6-1987. For cables manufactured to other specifications, selection should be confirmed with cable dimensions.
2. Kits used on metallic-tape-shielded cables may require an external grounding kit.
3. Standard package: 3 kits/box
4. Related test report: EDR-5145

Repair & Rejacketing

**CRSM Sleeves****Heat-Shrink Wraparound Sleeve (1000 V)**

CRSM sleeves close easily with a permanent locking system that consists of a raised rail profile and a stainless steel channel. These sleeves are made from crosslinked polyolefin, which equals or exceeds the material properties of the original cable jacket. CRSM sleeves fit a wide range of cable sizes and have unlimited shelf life, when stored under normal conditions.

- Qualified to ANSI C119.1-1986, rated to ICEA electrical withstand test for 1000 volts.
- RUS accepted for use as jacket restoration materials on JCN cable.
- For use on standard poly- or elastomeric insulated/jacketed cables or lead-jacketed cables, which may include aluminum or steel armoring.
- Use as insulation for I/C low-voltage power cable up to 1000 volts and for jacket repair up to 35 kV or for general sealing applications. All CRSM sleeves are sealant-coated.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Sleeve Length	Primary Electrical Repair (1000 V) Cable and Jacket Repair Conductor Size Use Range (AWG/kcmil)		General Sealing Use Range (0-35 kV) (Min.-Max.)	Std. Pack
		(Min.-Max.)	(Min.-Max.)		
CRSM 34/10-200	08 (200)	#8 - 2/0	0.25 - 0.60 (6 - 15)	0.25 - 1.20 (6 - 30)	3
CRSM 34/10-1200	48 (1219)	#8 - 2/0	0.25 - 0.60 (6 - 15)	0.25 - 1.20 (6 - 30)	5
CRSM 53/13-200	08 (200)	3/0 - 400	0.60 - 0.95 (15 - 24)	0.60 - 1.80 (15 - 46)	10
CRSM 53/13-1200	48 (1219)	3/0 - 400	0.60 - 0.95 (15 - 24)	0.60 - 1.80 (15 - 46)	5
CRSM 84/20-750	30 (750)	500 - 1000	0.95 - 1.40 (24 - 36)	0.95 - 2.70 (24 - 69)	10
CRSM 84/20-1200	48 (1219)	500 - 1000	0.95 - 1.40 (24 - 36)	0.95 - 2.70 (24 - 69)	5
CRSM 107/29-1000	40 (1000)	1000 - 2000	1.30 - 2.00 (33 - 51)	1.30 - 3.60 (33 - 91)	10
CRSM 107/29-1200	48 (1219)	1000 - 2000	1.30 - 2.00 (33 - 51)	1.30 - 3.60 (33 - 91)	5
CRSM 143/36-1200	48 (1219)			1.65 - 4.95 (42 - 126)	5
CRSM 198/55-1200	48 (1219)			2.50 - 6.50 (64 - 165)	5

Ordering Information

1. Select the appropriate catalog number for either primary electrical repair (1000 volts max.) or general sealing applications. Electrical repair selections are based on typical dimensions for low-voltage insulated cable. Confirm selection with cable dimensions to assure proper sizing.
2. Use the "Primary electrical repair" columns for electrical repair applications (when CRSM is in direct contact with the conductor).
3. Use the "General sealing and jacket repair use range" column for general rejacketing or sealing applications (when CRSM is not in direct contact with the conductor).
4. Package does not contain connectors.
5. Kits include a wraparound sleeve and stainless steel channel closure. Both can be field-cut for shorter requirements (see "Reference dimensions" below).
6. Related test report: EDR-5124, EDR-5192
7. UV resistant test report: EDR-5361
8. CRSM 34/20 are available in shorter standard lengths by ordering the corresponding CRSM-CT kits. (The use ranges in the selection information table still apply).



Cut sleeve length = Damage length + total seal length

Damage	Total Seal Length
<3 (<76)	3 (76)
3 - 12 (76-305)	4 (102)
12 - 24 (305-610)	6 (152)
>24 (>610)	8 (203)

TUBINGS & MOLDED PARTS



Heat-Shrink Tubing

MWTM Tubing	.65
WCSM Tubing	.66
FCSM Tubing	.68
LVIT Tubing	.69

Molded Parts

ESC Sealing Caps	.69
CFTS Seals	.70
CBR Breakout Boot	.70
CBR-NPB Sealing Adapters	.71

Heat-Shrink Tubing

**MWMTM Tubing****Medium-Wall Sealant Coated or Uncoated Tubing (600 V)**

- Sealant coated MWMTM tubing (-S designation) is for use as insulation/jacket repair up to 600 V or for general sealing and re-jacketing of polymeric- or elastomeric insulated cables up to 35kV
- RUS accepted as jacket restoration of JCN cable
- Uncoated MWMTM tubing (-U or -A/U) is for cable re-jacketing only
- 3:1 shrink ratio and an unlimited shelf life when stored under normal conditions

Selection Information: dimensions in inches (millimeters)**Sealant-Coated, Cut-Length Tubing**

Catalog Number	Use Range	Min. - Max.	Cut-Piece Length	Standard Pkg /Box
MWMTM-10/3-1200-S	0.13 - 0.35	(3 - 9)	48 (1200)	25
MWMTM-16/5-1200-S	0.25 - 0.55	(6 - 14)	48 (1200)	25
MWMTM-25/8-1200-S	0.35 - 0.85	(9 - 22)	48 (1200)	25
MWMTM-35/12-1200-S	0.50 - 1.25	(13 - 32)	48 (1200)	25
MWMTM-50/16-1200-S	0.65 - 1.70	(17 - 43)	48 (1200)	15
MWMTM-85/25-1200-S	1.00 - 2.90	(25 - 74)	48 (1200)	5
MWMTM-115/34-1200-S	1.40 - 3.90	(36 - 99)	48 (1200)	5
MWMTM-140/42-1200-S	1.80 - 4.70	(46 - 119)	48 (1200)	5

Uncoated, Spooled Tubing

Catalog Number	Use Range	Min. - Max.	Standard Min. Cont. Length	Bulk Option Pkg/Spool /Spool
MWMTM-10/3-A/U	0.13 - 0.35	(3 - 9)	25 (7.6)	100 (30)
MWMTM-16/5-A/U	0.25 - 0.55	(6 - 14)	25 (7.6)	100 (30) 1155 (350)
MWMTM-25/8-A/U	0.35 - 0.85	(9 - 22)	25 (7.6)	100 (30) 660 (200)
MWMTM-35/12-A/U	0.50 - 1.25	(13 - 32)	25 (7.6)	100 (30) 495 (150)
MWMTM-50/16-A/U	0.65 - 1.70	(17 - 43)	15 (4.6)	75 (23) 330 (100)

Uncoated, Cut-Piece Tubing

Catalog Number	Use Range	Min. - Max.	Cut-Piece Length	Standard Pkg/Box
MWMTM-85/25-1500/U	1.00 - 2.90	(25 - 74)	60 (1500)	5
MWMTM-115/34-1500/U	1.40 - 3.90	(36 - 99)	60 (1500)	5
MWMTM-140/42-1500/U	1.80 - 4.70	(46 - 119)	60 (1500)	5

Ordering Information

1. Select the appropriate catalog number. Confirm selection with application dimensions to assure proper sizing.
2. MWMTM is a general purpose tubing; for sealing applications use MWMTM with sealant (-S) or use uncoated MWMTM (-U or -A/U) in combination with S-1052 sealant. Order sealants separately.
3. UV resistant test report: EDR-5361.

Heat-Shrink Tubing

**WCSM Tubing****Heavy-Wall Sealant-Coated or Uncoated Tubing (1000 V)**

- For use on standard poly- or elastomeric -insulated/jacketed cables or lead-jacketed cables, which may include aluminum or steel armoring
- Use sealant-coated tubing (-S) as a sealed in-line splice or terminal lug seal for non-flame-retardant applications. Use uncoated tubing (-A/U and /U) for cable re-jacketing and mechanical protection only.
- Sealant-coated WCSM tubing, sizes -9/3 through -70/21 (-S designation) is UL listed per 486D (file E91151), certified to CSA C22.2, qualified to ANSI C119.1-1986, and rated to Western Underground Guide 2.5. Also RUS accepted for use as a secondary tap or splice cover, and for use as jacket restoration materials on JCN cable. WCSM tubing may be used for jacket repair on cables to 35 kV.
- Connectors over 6 inches: Recommended cut length = connector length + 5 inches
Connectors up to 6 inches: Recommended cut length = connector length + 4 inches
- WCSM tubing has a 3:1 shrink ratio and an unlimited shelf life when stored under normal conditions

Selection Information: dimensions in inches (millimeters)

Catalog Number ¹	1000-V General Conductor Size (AWG/kcmil)	Use Range (Min. - Max.)	Cut-Piece Length ²	Std. Pack (Ft/Roll)	(Pcs/Box)	(Pcs/Pack)
Sealant-Coated Cut-Length Tubing						
WCSM-9/3-150-S	#14 - #8	0.15 - 0.30 (4 - 8)	6 (150)		50	
CPGI-WCSM-9/3-150-S	#14 - #8	0.15 - 0.30 (4 - 8)	6 (150)			3
WCSM-9/3-300-S	#14 - #8	0.15 - 0.30 (4 - 8)	12 (300)		50	
WCSM-9/3-1200-S	#14 - #8	0.15 - 0.30 (4 - 8)	48 (1200)		25	
WCSM-13/4-150-S	#12 - #6	0.20 - 0.45 (5 - 11)	6 (150)		50	
CPGI-WCSM-13/4-150-S	#12 - #6	0.20 - 0.45 (5 - 11)	6 (150)			2
WCSM-13/4-1200-S	#12 - #6	0.20 - 0.45 (5 - 11)	48 (120)		25	
WCSM-20/6-150-S	#8 - #2	0.25 - 0.70 (6 - 18)	6 (150)		50	
CPGI-WCSM-20/6-150-S	#8 - #2	0.25 - 0.70 (6 - 18)	6 (150)			2
WCSM-20/6-225-S	#8 - #2	0.25 - 0.70 (6 - 18)	9 (225)		50	
WCSM-20/6-300-S	#8 - #2	0.25 - 0.70 (6 - 18)	12 (300)		50	
WCSM-20/6-1200-S	#8 - #2	0.25 - 0.70 (6 - 18)	48 (1200)		25	
WCSM-33/8-150-S	#4 - 4/0	0.35 - 1.20 (9 - 30)	6 (150)		50	
CPGI-WCSM-33/8-150-S	#4 - 4/0	0.35 - 1.20 (9 - 30)	6 (150)			2
WCSM-33/8-225-S	#4 - 4/0	0.35 - 1.20 (9 - 30)	9 (225)		50	
WCSM-33/8-300-S	#4 - 4/0	0.35 - 1.20 (9 - 30)	12 (300)		50	
WCSM-33/8-1200-S	#4 - 4/0	0.35 - 1.20 (9 - 30)	48 (1200)		25	
WCSM-43/12-150-S	1/0 - 400	0.50 - 1.55 (13 - 39)	6 (150)		40	
WCSM-43/12-225-S	1/0 - 400	0.50 - 1.55 (13 - 39)	9 (225)		40	
CPGI-WCSM-43/12-225-S	1/0 - 400	0.50 - 1.55 (13 - 39)	9 (225)			1
WCSM-43/12-300-S	1/0 - 400	0.50 - 1.55 (13 - 39)	12 (300)		40	
WCSM-43/12-1200-S	1/0 - 400	0.50 - 1.55 (13 - 39)	48 (1200)		10	
WCSM-51/16-100-S	250 - 500	0.70 - 1.75 (18 - 44)	4 (100)		100	
WCSM-51/16-225-S	250 - 500	0.70 - 1.75 (18 - 44)	9 (225)		30	
CPGI-WCSM-51/16-225-S	250 - 500	0.70 - 1.75 (18 - 44)	9 (225)			1
WCSM-51/16-300-S	250 - 500	0.70 - 1.75 (18 - 44)	12 (300)		30	
WCSM-51/16-1200-S	250 - 500	0.70 - 1.75 (18 - 44)	48 (1200)		10	
WCSM-70/21-300-S	400 - 1000	0.90 - 2.45 (23 - 62)	12 (300)		15	
WCSM-70/21-450-S	400 - 1000	0.90 - 2.45 (23 - 62)	18 (450)		15	
WCSM-70/21-600-S	400 - 1000	0.90 - 2.45 (23 - 62)	24 (600)		10 or 100	
WCSM-70/21-1200-S	400 - 1000	0.90 - 2.45 (23 - 62)	48 (1200)		10	
WCSM-105/30-300-S	800 - 1250	1.30 - 3.70 (33 - 94)	12 (300)		15	
WCSM-105/30-1200-S	800 - 1250	1.30 - 3.70 (33 - 94)	48 (1200)		5	
WCSM-130/36-300-S	1500 - 2500	1.60 - 4.20 (41 - 107)	12 (300)		10	
WCSM-130/36-450-S	1500 - 2500	1.60 - 4.20 (41 - 107)	18 (450)		20	
WCSM-130/36-1200-S	1500 - 2500	1.60 - 4.20 (41 - 107)	48 (1200)		5	
Uncoated Tubing						
WCSM-9/3-A/U	#14 - #8	0.15 - 0.30 (4 - 8)		100		
WCSM-13/4-A/U	#12 - #6	0.20 - 0.45 (5 - 11)		100		
WCSM-20/6-A/U	#8 - #2	0.25 - 0.70 (6 - 18)		100		
WCSM-33/8-A/U	#4 - 4/0	0.35 - 1.20 (9 - 30)		65		
WCSM-43/12-A/U	1/0 - 400	0.50 - 1.55 (13 - 39)		50		
WCSM-51/16-A/U	250 - 500	0.70 - 1.75 (18 - 44)		40		
WCSM-70/21-A/U	400 - 1000	0.90 - 2.45 (23 - 62)		40		
WCSM-90/30-1500/U	800 - 1200	1.30 - 3.10 (33 - 79)	60		5	
WCSM-130/36-1500/U	1500 - 2500	1.60 - 4.20 (41 - 107)	60		5	

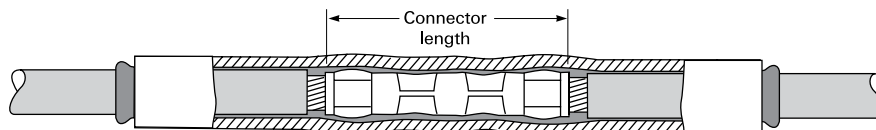
¹ Catalog numbers with -S designation are suitable for sealed electrical insulation to 1000 V. Catalog numbers with A/U and /U designations are for cable re-jacketing only.

² Length tolerance to 32 percent. Can be used for multi-conductor LV splices using different tubings.

Note: UL listing applies to sealant-coated (-S) WCSM-9/3 through -70/21 only. WCSM-105/30 and -130/36 are not UL listed.

Heat-Shrink Tubing

WCSM Tubing



Ordering Information

1. Select the appropriate catalog number based on typical dimensions for low-voltage insulated cable. Confirm selection with dimensions to assure proper sizing.
2. UL listing applies to sealant-coated (-S) WCSM-9/3 through -70/21 only. WCSM-105/30 and -130/36 are not UL listed.
3. Package does not contain connectors or lugs. Installed connector or lug diameter must be within use range.
4. If sealing is needed with WCSM-A/U uncoated tubing, order S-1052 sealant separately.
5. WCSM tubing may be field-cut for shorter requirements.
6. Bulk packaging is available for cut lengths. Consult your Tyco Electronics representative for information.
7. UV resistant test report: EDR-5361.



Certified C22.2
No. 198.2



LISTED 96J4
Direct burial insulation
covered for listed
pressure connectors
SUBMERSIBLE

Heat-Shrink Tubing



**MSHA approved
(No. P-137-MSHA)**

FCSM Tubing Heavy-Wall Flame Retardant Tubing (2000 V)

FCSM tubing's tough, crosslinked polyolefin construction provides mechanical strength and cut-through resistance equal to, or surpassing, the properties of low-voltage cable jackets.

- 3:1 shrink ratio and an unlimited shelf life when stored under normal conditions
- Uses sealant-coated tubing (-S) as a sealed in-line splice or terminal lug seal. It provides a watertight seal for direct-buried applications and wet environments.
- Use uncoated tubing (-/U) for cable rejacketing only
- Sealant-coated or uncoated tubing may be used for jacket repair on cable to 35 kV. Qualified to ANSI C119.1-1986; also rated to IEEE 383 (Vertical Tray Flame Test) and ICEA S-19-81. FCSM is also MSHA approved (No. P-137-MSHA).

For use on standard poly- or elastomeric- insulated/jacketed cables or lead-jacketed cables, which may include aluminum or steel armoring.

Connectors up to 6 inches: Recommended cut length = connector length + 4 inches.

Connectors over 6 inches: Recommended cut length = connector length + 5 inches.

Selection Information (dimensions in inches/millimeters)

Catalog Number	1000-V Insulated Conductor Size (AWG/kcmil)	General Use Range (Min.-Max.)	Tube Length*	Standard ft. (m)/Roll	Package Pcs/Box	Bulk Option ft (m)/Roll
In-line Splice or Terminal Lug Seal						
FCSM-9/3-1200-S	#14 - #8	0.15 - 0.30 (4 - 8)	48	(1200)	25	
FCSM-19/6-150-S	#6 - #2	0.25 - 0.65 (6 - 17)	6	(150)	50	
FCSM-19/6-1200-S	#6 - #2	0.25 - 0.65 (6 - 17)	48	(1200)	25	
FCSM-28/9-225-S	#2 - 4/0	0.40 - 0.95 (10 - 24)	9	(225)	50	
FCSM-28/9-1200-S	#2 - 4/0	0.40 - 0.95 (10 - 24)	48	(1200)	25	
FCSM-38/12-300-S	1/0 - 350	0.50 - 1.30 (13 - 33)	12	(300)	40	
FCSM-38/12-1200-S	1/0 - 350	0.50 - 1.30 (13 - 33)	48	(1200)	10	
FCSM-51/16-300-S	250 - 500	0.70 - 1.75 (18 - 44)	12	(300)	30	
FCSM-51/16-1200-S	250 - 500	0.70 - 1.75 (18 - 44)	48	(1200)	10	
FCSM-68/22-1200-S	600 - 1000	0.95 - 2.30 (25 - 58)	48	(1200)	10	
FCSM-90/30-1200-S	800 - 1200	1.30 - 3.10 (33 - 79)	48	(1200)	5	
FCSM-120/40-1200-S	1500 - 2500	1.75 - 4.10 (44 - 104)	48	(1200)	5	
FCSM-177/63-600-S		2.75 - 6.05 (70 - 154)	24	(600)	6	
FCSM-177/63-1200-S		2.75 - 6.05 (70 - 154)	48	(1200)	5	

Cable Rejacketing

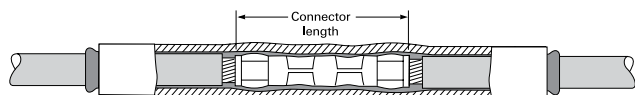
FCSM-9/3-A/U	#14 - #8	0.15 - 0.30 (4 - 8)			100 (30)	
FCSM-19/6-A/U	#6 - #2	0.25 - 0.65 (6 - 17)			100 (30)	825 (250)
FCSM-28/9-A/U	#2 - 4/0	0.40 - 0.95 (10 - 24)			65 (20)	495 (150)
FCSM-38/12-A/U	1/0 - 350	0.50 - 1.30 (13 - 33)			50 (15)	395 (120)
FCSM-51/16-A/U	250 - 500	0.70 - 1.75 (18 - 44)			40 (12)	330 (100)
FCSM-68/22-A/U	600 - 1000	0.95 - 2.30 (25 - 58)			80 (24)	
FCSM-90/30-1500/U	800 - 1200	1.30 - 3.10 (33 - 79)	60	(1500)		5
FCSM-120/40-1500/U	1500 - 2500	1.75 - 4.10 (44 - 104)	60	(1500)		5
FCSM-177/63-1500/U		2.75 - 6.05 (70 - 154)	60	(1500)		5

*Length tolerance to 32 percent.

Ordering Information

1. Select the appropriate catalog number based on typical dimensions for low-voltage insulated cable. Confirm selection with cable dimensions to assure proper sizing.
2. Connectors or lugs not included.
3. If sealing is needed with uncoated FCSM tubing (-/U), order S-1052 separately.
4. Tubing may be field-cut for shorter requirements.
5. Bulk packaging is available for cut-lengths. Contact your Tyco Electronics representative for additional information.
6. Related test reports: EDR-5133, EDR-5134, EDR-5141

For connector information refer to the Connectors and Terminals section of this catalog.



Heat-Shrink Tubing



LVIT Tubing

Busbar Insulating Tubing (1000 V)

LVIT is a heat-shrinkable medium-wall, flame-retardant, low voltage tubing for insulating straight and bent busbars during original equipment assembly or in retrofit applications where access to one end of the busbar is available.

When used according to the selection guidelines, LVIT may be used in applications up to 1 kV in accordance with ANSI/IEEE C37.20 specification. LVIT tubing may be used in applications up to 3.6 kV in accordance with IEC specifications.

Rated to ANSI/IEEE C37.20.1-1987. UL recognized to Standard 224 (file E137416), 600 V-125°C-VW.1.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Busbar Dimensions			LVIT Tubing Dia. as Supplied & Fully Recovered (Min.-Max.)	Std. Pack
	Rectangular Bar* (Bus Width)	Square Bar (Each Side)	Round Bar (Dia. Min.-Max.)		
LVIT-30/10-A/U	0.50 - 1.0 (12 - 25)		0.40 - 1.0 (11 - 25)	1.18 - 0.39 (30 - 10)	200 ft.
LVIT-75/25-A/U	2.0 - 3.0 (50 - 75)	1 (25)	1.0 - 2.0 (25 - 50)	2.95 - 0.98 (75 - 25)	100 ft.
LVIT-150/50-A/U	4.0 - 6.0 (100 - 150)	2 - 3 (50 - 75)	2.0 - 4.0 (50 - 100)	5.91 - 1.97 (150 - 50)	100 ft.

*Rectangular bus thickness range is 1/4 to 5/8 inch.

Molded Parts



ESC Sealing Caps

End Sealing Caps for 1/C Power Cable (1000 V)

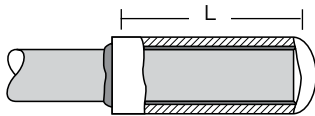
- Shrink and compress a hot-melt adhesive on the cable jacket, forming a secure environmental seal
- Fits easily over the cable end and shrinks in seconds, leaving a compact, rugged end seal
- Qualified to ANSI C119.1-1986 and rated to ICEA electrical withstand test for 1000 volts
- For use on standard poly- or elastomeric insulated/ jacketed cables or lead-jacketed cables, which may include aluminum or steel armoring

Use as a live end seal to 1000 volts. Use as an end seal for storage and pulling of de-energized cable.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Primary Insulation Conductor Size (AWG/kcmil)	(1000 V) Use Range (Min.-Max.)	General Use Range (Min.-Max.)	Length as Supplied	Std. Pack (Pcs/Box)
ESC-1/A	#12 - #8	0.17 - 0.35 (4 - 9)	0.15 - 0.30 (4 - 8)	1.0	50
CPGI-ESC-1/A	#12 - #8	0.17 - 0.35 (4 - 9)	0.15 - 0.30 (4 - 8)	1.0	25
ESC-2/A	#6 - 3/0	0.31 - 0.71 (8 - 18)	0.30 - 0.70 (8 - 18)	2.0	50
CPGI-ESC-2/A	#6 - 3/0	0.31 - 0.71 (8 - 18)	0.30 - 0.70 (8 - 18)	2.0	25
ESC-3/A	4/0 - 750	0.65 - 1.25 (17 - 32)	0.65 - 1.25 (17 - 32)	3.5	40
ESC-4/A	750 - 1500	1.08 - 1.94 (27 - 49)	1.05 - 1.95 (27 - 50)	5.3	20
ESC-5/A	1500 - 2000	1.38 - 2.58 (35 - 66)	1.30 - 2.65 (33 - 67)	6.7	10
ESC-6/A		1.94 - 3.54 (49 - 90)	1.85 - 3.70 (47 - 94)	5.6	10
ESC-7/A		3.02 - 4.25 (77 - 108)	2.95 - 4.50 (75 - 114)	5.4	10

*5 packs, each with 5 pcs. per Point of Purchase Package.



Each energized conductor requires a separate ESC sealing cap.

Ordering information

1. Select the appropriate catalog number based on the conductor size or use range. Confirm selection with dimensions to assure proper sizing.
2. Each energized conductor requires a separate ESC sealing cap.
3. Bulk options also available. Consult your Tyco Electronics representative for information.
4. Caps are coated with an adhesive.
5. Related test report: EDR-5161

Heat-Shrink Tubing



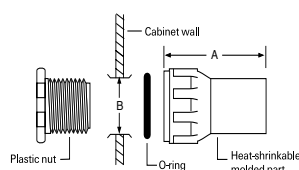
CFTS Seals

Heat-Shrink Cabinet Feed-Through Seals

CFTS seals are heat-shrinkable molded parts for moisture-sealing applications where cable enters enclosures, such as cabinets or connection boxes.

- Suitable for environments that have existing periodic pressure difference and/or temperature differential
- Precoated with a thermoplastic adhesive that seals around the entering cable. The O-ring creates the water/air seal at the cabinet entry.
- Utilizes a rigid plastic that, when inserted through the cabinet wall, protects the entering cable from abrasion or cut-through

Selection Information: dimensions in inches (millimeters)



Catalog Number	Cable Diameter (Min. - Max.)	A Length of Molded Part	B Clearance (Knockout) Hole Size	Std. Pack
CFTS-1	0.20 - 0.40 (5 - 10)	2.75 (70)	1 (25)	5
CFTS-2	0.25 - 0.65 (6 - 17)	2.75 (70)	1 (25)	5
CFTS-3	0.55 - 1.00 (14 - 25)	3.75 (95)	1 3/8 (35)	5
CFTS-4	0.80 - 1.45 (20 - 37)	4.50 (114)	2 (51)	5
CFTS-5	1.45 - 2.40 (37 - 61)	7.00 (178)	3 1/2 (89)	5



CBR Breakout Boot

Heat-Shrink Cable Breakout Boots

CBR products seal breakouts in multiconductor cables and conduit.

These seals are made of tough, crosslinked polyolefin to provide mechanical protection and strain relief. CBR seals have an adhesive-coating on the body and the legs to form a durable watertight seal, and conform tightly to conduits and cable jackets.

For use on standard poly- or elastomeric- insulated/jacketed multiconductor cables or cables in metal or plastic conduits.

Selection Information: dimensions in inches (millimeters)

Cross Section	Catalog Number	Body Use Range (Min. - Max.)	Legs Use Range (Min. - Max.)	Std. Pack
	CBR-2-1-A	0.35 - 1.00 (9 - 25)	0.15 - 0.55 (4 - 14)	3
	CBR-2-2-A*	1.25 - 1.70 (32 - 43)	0.30 - 0.75 (8 - 19)	3
	CBR-2-3-A	1.65 - 3.00 (42 - 76)	0.65 - 1.40 (17 - 36)	3
	CBR-3-1-A	0.50 - 1.35 (13 - 34)	0.20 - 0.55 (5 - 14)	3
	CBR-3-2-A*	0.85 - 2.20 (22 - 56)	0.35 - 0.90 (9 - 23)	3
	CBR-3-3-A*	1.10 - 2.90 (28 - 74)	0.50 - 1.25 (13 - 32)	3
	CBR-3-4-A	2.35 - 5.65 (60 - 144)	1.20 - 2.10 (30 - 53)	3
	CBR-4-1-A	0.70 - 1.25 (18 - 32)	0.15 - 0.45 (4 - 11)	3
	CBR-4-2-A*	1.00 - 2.10 (25 - 53)	0.35 - 0.90 (9 - 23)	3
	CBR-4-3-A*	1.20 - 3.50 (30 - 89)	0.55 - 1.40 (14 - 36)	3
	CBR-4-4-A	2.35 - 6.05 (60 - 154)	0.90 - 1.50 (23 - 38)	3
	CBR-6-1-A*	1.45 - 3.85 (37 - 98)	0.60 - 1.50 (15 - 38) phase	3
			0.30 - 0.75* (8 - 19) ground	3
	CBR-6-2-A*	2.65 - 5.30 (67 - 135)	0.90 - 2.20 (23 - 56) phase	3
			0.40 - 0.95* (10 - 24) ground	6

CBR-Plugs are for blocking and sealing unused legs of breakouts. The plug will fit those items asterisked () above.

Molded Parts



CBR-NPB Sealing Adapters

Network protector breakout boots

The CBR-NPRB network protector boot is a heat-shrinkable boot designed to provide electrical and environmental protection of the secondary cable terminations for underground network protector systems.

Available in 4 and 8 leg breakouts, Tyco Electronics' network protector boots will work well with existing (rebuilt) network protector (GE and Westinghouse) systems and are designed specifically for new Cutler-Hammer CMD, CM22 & CMR network protectors.

These boots can be used on almost all existing bushings, on different type "A" protectors and also new protector bushings.

Provided as a kit, Tyco Electronics' network protector boots are adaptable to field or shop installations. Kits include heat-shrink boot, plugs for unused legs, accessories, and instructions.

Network protector boots:

- Eliminate extensive taping and wrapping
- Prevents Tracking
- Provides electrical insulation and protects termination pad environmentally, even when totally submerged
- Can be easily installed and easily removed
- Meets MIL spec. mil I 81765/1A
- Heavy wall, rugged construction

Specification Values

Property/Units	Test Method	Value
Physical		
Ultimate Tensile	ASTM D412	1700
Ultimate elongation	ASTM D412	350
Hardness - Shore "D"	ASTM D2240	52
Water Absorption, % Max	ASTM D570	0.1
Specific Gravity	ASTM D792, Method 6.1	1.36
Stiffness in Flexure, psi	ASTM D747	18500

Electrical

Dielectric Strength, 75 mils (v/mil)	ASTM D149	400 min.
Volume Resistivity, ohm-cm, min	ASTM D257	10 ¹⁵

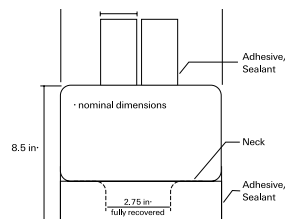
Thermal Properties

Heat Aging	MIL-1-81765	5 days, 186 hr@175°C
Tensile Strength, psi, min.	ASTM D412	1200
Elongation, %min.	ASTM D412	200
Heat Shock	MIL-1-81765	4hr@225°C
Low Temperature	MIL-1-23053D	-55°C

Flammability

Non-Burning	ASTM D635	Yes
Oxygen Index	ASTM D2863	28

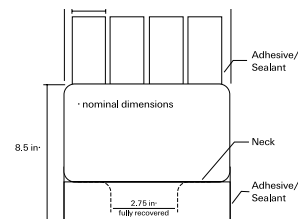
Specification value cover the physical, electrical, thermal and chemical properties of the materials for the network protector boots. The values used are typical and should not be used in the preparation of specifications.



CBR-NPB-4L

Kit consists of:

1 Boot, 1 End Cap, Abrasion Strip, Cable Wipe, and Installation instructions.



CBR-NPB-8L

Kit consists of:

1 Boot, 2 End Caps, Abrasion Strip, Cable Wipe, and Installation instructions.



TAPES & SEALANTS



Tapes

FSTW Splicing Tape	75
LVBT Busbar Tape.....	76

Sealants

Hot-Melt and Cold-Applied Sealants	77
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Tapes



FSTW Splicing Tape Fast Splicing Tape Wrap

Tyco Electronics' FSTW is a thermoplastic rubber tape combined with a butyl rubber sealant specially formulated for underground applications. FSTW is ideal for repairing cable jackets, sealing low-voltage splices, and re-jacketing MV cable splices.

This tape provides a complete re-jacketing solution in one pass as opposed to the multi-layer construction required when using traditional tape products. It's quick to install. There is no need for separate sealing mastic and tape as it combines sealant and rubber tape in one convenient product.

FSTW rubber tape is made 50 mils thick, which offers strong puncture resistance from underground material and debris. FSTW is rated for use on 90°C rated cables, in underground use, in acid or caustic soils, and saltwater environments. It is UV resistant and rated for aerial exposure.

Mastic is in contact with cable surface only at ends which allows for easy removal.

Splices made with FSTW quality to ANSI C119.1

Selection Information: dimensions in inches (millimeters)

Catalog Number	Roll Width	Roll Length	Std Pk.
FSTW-2-1-6	2 (50)	6' (1.8)	12

Approximate Coverage Length

Catalog Diameter	FTSW-2-1-4	FTSW-2-1-6
0.50 (13)	28 (710)	42 (1000)
0.75 (19)	18 (460)	27 (680)
1.00 (25)	14 (355)	21 (530)
1.25 (32)	11 (280)	17 (430)
1.50 (38)	9 (230)	14 (355)
1.75 (44)	7 (180)	10 (280)
2.00 (51)	6 (150)	9 (230)
2.50 (63)		7 (180)
3.00 (76)		6 (150)

Ordering Information

1. See the approximate coverage length per roll based on cable diameter.
2. For repairing cable jackets, install the FSTW tape beginning 2" before the damage and continuing 1" after the damage.
3. FSTW is 2"(50) wide
4. Related test reports: EDR-5431, EDR-5360

Tapes

**LVBT Busbar Tape****Low-Voltage Busbar Insulating Heat-Shrink Tape (1000 V)**

LVBT is an adhesive-coated, low-voltage heat-shrinkable tape. One wrap insulates straight and bent bars in retrofit applications where tubing cannot be used. In addition, LVBT easily insulates unusual connections and geometries in the factory or field.

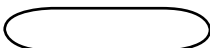
- Adhesive layer fuses the tape layers but does not stick to bus or hardware, providing tough insulation up to 1 kV in accordance with ANSI C37.20-1987 and up to 3.6 kV in accordance with IEC specifications
- Rated to ANSI/IEEE C37.20-1987
- UL-recognized to Standard 224 (file E137417), 600 V-125°C-VW.1

LVBT Tape Dimensions

Catalog Number	Roll Width	Roll Length
LVBT-1-R	1 (25)	25 ft (7.5 m)
LVBT-2-R	2 (50)	25 ft (7.5 m)
LVBT-4-R	4 (100)	25 ft (7.5 m)

Selection Information: dimensions in inches (millimeters)

Bus Width	Catalog Number	Bus Length Insulated per Roll	Rolls/Std. Pack
-----------	----------------	-------------------------------	-----------------

**Rectangular Busbar***

1 (25)	LVBT-1-R	3.8 ft (1.2 m)	8
2 (50)	LVBT-2-R	4.8 ft (1.5 m)	4
3 (75)	LVBT-2-R	3.5 ft (1.1 m)	4
4 (100)	LVBT-2-R	2.7 ft (0.8 m)	4
6 (150)	LVBT-2-R	1.9 ft (0.6 m)	4
8 (200)	LVBT-4-R	2.9 ft (0.9 m)	4

*Maximum thickness: 5/8 (15)

**Square Busbar**

1 (25)	LVBT-2-R	6.25 ft (2.0 m)	4
2 (50)	LVBT-2-R	3.1 ft (1.0 m)	4
3 (75)	LVBT-2-R	2.0 ft (0.6 m)	4
4 (100)	LVBT-4-R	3.1 ft (1.0 m)	2
6 (150)	LVBT-4-R	2.0 ft (0.6 m)	2

**Round Busbar**

0.5 in (12 mm)	LVBT-1-R	8.0 ft (2.6 m)	8
1.0 in (25 mm)	LVBT-2-R	8.0 ft (2.6 m)	4
2.0 in (50 mm)	LVBT-2-R	4.0 ft (1.3 m)	4
3.0 in (75 mm)	LVBT-2-R	2.6 ft (0.9 m)	4
4.0 in (100 mm)	LVBT-4-R	4.0 ft (1.3 m)	2

Ordering Information

1. LVBT-1-R is best for shorter lengths. LVBT-2-R is the most versatile width for general purpose use. LVBT-4-R is useful for long lengths and larger bus sizes.
2. If sealing is needed, order the S-1052-6-150 sealant strips.

Sealants



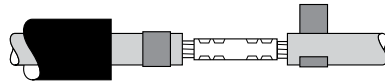
Hot-Melt and Cold-Applied Sealants

These adhesives are to be used for sealing the ends of uncoated tubing or for low-voltage applications requiring void-filling. The hot-melt sealants flow when heated and set when cooled to provide a superior watertight seal. The cold-applied sealants bond to surfaces when placed under pressure to create a water-tight seal.

Use sealants with uncoated tubing and molded parts for sealing applications or as an adhesion enhancement for specific applications.

Selection Information

Sealant Type	Description	Use with These Products:
S-1052	General purpose low-voltage sealant	WCSM-A/U (uncoated), MWTM-A/U (uncoated), FCSM-A/U (uncoated), LVBT, LVIT
S-1085	General purpose high-voltage sealant	HVS (high-voltage splices), HVT (high-voltage terminations), MCK-5
S-1174	High-temperature, low-voltage sealant	MCK
S-1251	High-voltage Raysulate electrical insulator sealant	BBIT, BPTM, HVBC, HVBT, HVIS
S-1171	Low-voltage mining sealant	LV-MSK, HV-MSK
S-1278	Low-voltage sealant	RDSS
GelWrap Pad	Low-voltage PowerGel sealing gel	GelWrap, GelWrap-RS closure



Catalog Number	Color	Dimensions (W x L x T)	Std. Pack
S-1052-3-3000	Black	Roll: 1.5 x 120 x .12	5 rolls/box
S-1171-4-300	Black	Strip: 2 x 12 x .10	100 strips/box
S-1174-2-300	Black	Strip: .5 x 12 x .09	25 strips/box
S-1174-4-460	Black	Strip: 1 x 18 x .19	15 strips/box
S-1251-25-300-4	Red	Strip: 1 x 12 x .150	25 strips/box
S-1251-50-300-1	Red	Strip: 2 x 12 x .045	25 strips/box
S-1278-3 x 61 x 7620	Gray	Roll: 2.4 x 300 x .12	1 roll/box
GelWrap Pad 2x8	Gray	Strip: 2 x 8 x .18	6 strips/box

Ordering Information

1. Select the appropriate catalog number based on the application information in columns two and three of the above table.
2. Use the information in the table directly above for ordering.
3. Sealants are supplied in bulk form with protective release paper.



WIRE MANAGEMENT

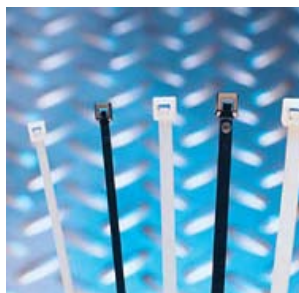


Cable Ties & Accessories
AMP Cable Ties 81
Mounting Head Ties - Natural and UV Black83
In-Line Ties - Natural and UV Black83
Plenum Rated - Halar Ties.....84
Releasable Ties - Natural and UV Black.....84
Identification & Flag Cable Ties.....85
Mounting Pads.....85
Low Profile Screw Mounts.....85
Wall Mounts86
Screw Mounts.....86
Wing Push Mounts & Button Mounts.....86
Identification Plates87
Cable Clamps87

Duct Sealing System
RDSS Sealing System.....88



Cable Ties & Accessories



AMP Cable Ties

- Available in three grades of Nylon 6/6
- General purpose cable ties (NATURAL) are suitable for use in most practical applications at continuous temperatures up to 150°F.
- UV Stabilized cable ties (BLACK) ties are used in continuous or extended exposure to outdoor use. This nylon cable tie is a weather-resistant grade, enduring additional ultraviolet (UV) light.
- Heat Stabilized cable ties (BLACK) are used in continuous or extended exposure to high temperatures (up to 250 degrees Fahrenheit). These cable ties contain specially formulated heat stabilizers which provide additional thermal endurance. Heat stabilized nylons are engineered for continuous exposure to temperatures above 185°F.

The entire AMP cable tie line provides the following features and benefits:

- Faster—low insertion and pull through force
- Stronger—high tensile strength is achieved from one piece, advanced pawl, and teeth design
- Purer—manufactured from filtered nylon reducing particle contamination
- Easier—angled tail provides quicker initial insertion alignment and tail finger grips allow easier handling and tightening
- Safer—rounded edges provide added safety and eliminates insulation damage
- Consistent—formulated molding processes

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Width	Thickness	Max Bundle	Tensile Strength	Mil-spec Reference	Qty/ Bag	Packs/ Carton
Miniature (18 lb.) Natural & UV Black									
CPGI-CTY-04-18-NAT-C	Natural Nylon	4.12 (104.77)	.095 (2.413)	.042 (1.06)	7/8 (22.22)	18 lbs.	MS3367-4	100	10
CPGI-CTY-04-18-NAT-M	Natural Nylon	4.12 (104.77)	.095 (2.413)	.042 (1.06)	7/8 (22.22)	18 lbs.	MS3367-4	1000	5
CPGI-CTY-04-18-BLK-C	UV Black Nylon	4.12 (104.77)	.095 (2.413)	.042 (1.06)	7/8 (22.22)	18 lbs.	MS3367-4	100	10
CPGI-CTY-04-18-BLK-M	UV Black Nylon	4.12 (104.77)	.095 (2.413)	.042 (1.06)	7/8 (22.22)	18 lbs.	MS3367-4	1000	5
CPGI-CTY-06-18-NAT-C	Natural Nylon	6.18 (157.14)	.095 (2.413)	.042 (1.06)	1.5 (38.10)	18 lbs.	MS3367-4	100	10
CPGI-CTY-06-18-BLK-C	UV Black Nylon	6.18 (157.14)	.095 (2.413)	.042 (1.06)	1-1/2 (38.10)	18 lbs.	MS3367-4	100	10
CPGI-CTY-08-18-NAT-C	Natural Nylon	8.1 (206)	.094 (2.39)	.042 (1.06)	2-3/16 (55.56)	18 lbs.	MS3367-4	100	10
CPGI-CTY-08-18-NAT-M	Natural Nylon	8.1 (206)	.094 (2.39)	.042 (1.06)	2-3/16 (55.56)	18 lbs.	MS3367-4	1000	5
CPGI-CTY-08-18-BLK-C	UV Black Nylon	8.1 (206)	.094 (2.39)	.042 (1.06)	2-3/16 (55.56)	18 lbs.	MS3367-4	100	10
CPGI-CTY-08-18-BLK-M	UV Black Nylon	8.1 (206)	.094 (2.39)	.042 (1.06)	2-3/16 (55.56)	18 lbs.	MS3367-4	1000	5

Cable Ties & Accessories

AMP Cable Ties (continued)

Catalog Number	Description	Length	Width	Thickness	Max Bundle	Tensile Strength	Mil-spec Reference	Qty/ Bag	Packs/ Carton
Intermediate (40 lb.) Natural & UV Black									
CPGI-CTY-05-40-NAT-C	Natural Nylon	5.84 (148.33)	.140 (3.56)	.049 (1.24)	1-7/16 (36.51)	40 lbs.	MS3367-5	100	10
CPGI-CTY-05-40-NAT-M	Natural Nylon	5.84 (148.33)	.140 (3.56)	.049 (1.24)	1-7/16 (36.51)	40 lbs.	MS3367-5	1000	5
CPGI-CTY-05-40-BLK-C	UV Black Nylon	5.84 (148.33)	.140 (3.56)	.049 (1.24)	1-7/16 (36.51)	40 lbs.	MS3367-5	100	10
CPGI-CTY-05-40-BLK-M	UV Black Nylon	5.84 (148.33)	.140 (3.56)	.049 (1.24)	1-7/16 (36.51)	40 lbs.	MS3367-5	1000	5
CPGI-CTY-08-40-NAT-C	Natural Nylon	8.88 (225.42)	.140 (3.56)	.049 (1.24)	2-3/8 (60.33)	40 lbs.	MS3367-5	100	10
CPGI-CTY-08-40-NAT-M	Natural Nylon	8.88 (225.42)	.140 (3.56)	.049 (1.24)	2-3/8 (60.33)	40 lbs.	MS3367-5	1000	5
CPGI-CTY-08-40-BLK-C	UV Black Nylon	8.88 (225.42)	.140 (3.56)	.049 (1.24)	2-3/8 (60.33)	40 lbs.	MS3367-5	100	10
CPGI-CTY-08-40-BLK-M	UV Black Nylon	8.88 (225.42)	.140 (3.56)	.049 (1.24)	2-3/8 (60.33)	40 lbs.	MS3367-5	1000	5
CPGI-CTY-11-40-NAT-C	Natural Nylon	11.5 (292)	.140 (3.56)	.058 (1.473)	3-3/8 (85.72)	40 lbs.		100	10
CPGI-CTY-11-40-BLK-C	UV Black Nylon	11.5 (292)	.140 (3.56)	.058 (1.473)	3-3/8 (85.72)	40 lbs.		100	10
CPGI-CTY-14-40-NAT-C	Natural Nylon	14.5 (368.30)	.140 (3.56)	.058 (1.473)	4 (101.60)	40 lbs.		100	10
CPGI-CTY-14-40-BLK-C	UV Black Nylon	14.5 (368.30)	.140 (3.56)	.058 (1.473)	4 (101.60)	40 lbs.		100	10
Standard (50 lb.) Natural, UV Black & Heat Stabilized Black									
CPGI-CTY-07-50-NAT-C	Natural Nylon	7.56 (192.07)	.180 (4.572)	.052 (1.32)	1-7/8 (47.63)	50 lbs.	MS3367-1	100	10
CPGI-CTY-07-50-NAT-M	Natural Nylon	7.56 (192.07)	.180 (4.572)	.052 (1.32)	1-7/8 (47.63)	50 lbs.	MS3367-1	1000	5
CPGI-CTY-07-50-BLK-C	UV Black Nylon	7.56 (192.07)	.180 (4.572)	.052 (1.32)	1-7/8 (47.63)	50 lbs.	MS3367-1	100	10
CPGI-CTY-07-50-BLK-M	UV Black Nylon	7.56 (192.07)	.180 (4.572)	.052 (1.32)	1-7/8 (47.63)	50 lbs.	MS3367-1	1000	5
CPGI-CTY-07-50-HS-BLK-C	Heat Stabilized Black Nylon	7.56 (192.07)	.180 (4.572)	.052 (1.32)	1-7/8 (47.63)	50 lbs.		100	10
CPGI-CTY-11-50-NAT-C	Natural Nylon	11.25 (285.75)	.180 (4.572)	.052 (1.32)	3-1/16 (77.79)	50 lbs.	MS3367-7-9	100	10
CPGI-CTY-11-50-NAT-D	Natural Nylon	11.25 (285.75)	.180 (4.572)	.052 (1.32)	3-1/16 (77.79)	50 lbs.	MS3367-7-9	500	5
CPGI-CTY-11-50-BLK-C	UV Black Nylon	11.25 (285.75)	.180 (4.572)	.052 (1.32)	3-1/16 (77.79)	50 lbs.	MS3367-7-9	100	10
CPGI-CTY-11-50-BLK-D	UV Black Nylon	11.25 (285.75)	.180 (4.572)	.052 (1.32)	3-1/16 (77.79)	50 lbs.	MS3367-7-9	500	5
CPGI-CTY-11-50-HS-BLK-C	Heat Stabilized Black Nylon	11.25 (285.75)	.180 (4.572)	.052 (1.32)	3-1/16 (77.79)	50 lbs.		100	10
CPGI-CTY-14-50-NAT-C	Natural Nylon	14.56 (369.87)	.180 (4.572)	.052 (1.32)	4-1/8 (104.78)	50 lbs.	MS3367-2-9	100	10
CPGI-CTY-14-50-NAT-D	Natural Nylon	14.56 (369.87)	.180 (4.572)	.052 (1.32)	4-1/8 (104.78)	50 lbs.	MS3367-2-9	500	5
CPGI-CTY-14-50-BLK-C	UV Black Nylon	14.56 (369.87)	.180 (4.572)	.052 (1.32)	4-1/8 (104.78)	50 lbs.	MS3367-2-0	100	10
CPGI-CTY-14-50-BLK-D	UV Black Nylon	14.56 (369.87)	.180 (4.572)	.052 (1.32)	4-1/8 (104.78)	50 lbs.	MS3367-2-0	500	5
CPGI-CTY-14-50-HS-BLK-C	Heat Stabilized Black Nylon	14.56 (369.87)	.180 (4.572)	.052 (1.32)	4-1/8 (104.78)	50 lbs.		100	10
CPGI-CTY-17-50-NAT-C	Natural Nylon	17.09 (434.16)	.187 (4.749)	.060 (1.52)	4-3/4 (120.65)	50 lbs.		100	10
CPGI-CTY-17-50-BLK-C	UV Black Nylon	17.09 (434.16)	.187 (4.749)	.060 (1.52)	4-3/4 (120.65)	50 lbs.		100	10
Light Heavy-Duty, Heavy-Duty & Extra Heavy-Duty Natural, UV Black									
CPGI-CTY-15-120-NAT-L	Natural Nylon	15.09 (383.36)	.300 (7.62)	.076 (1.930)	4-1/16 (103.18)	120 lbs.	MS3367-3	50	10
CPGI-CTY-15-120-BLK-L	UV Black Nylon	15.09 (383.36)	.300 (7.62)	.076 (1.930)	4-1/16 (103.18)	120 lbs.	MS3367-3	50	10
CPGI-CTY-18-120-NAT-L	Natural Nylon	17.70 (449.58)	.305 (7.74)	.080 (2.032)	5-1/4 (133.35)	120 lbs.		50	10
CPGI-CTY-18-120-BLK-L	UV Black Nylon	17.70 (449.58)	.305 (7.74)	.080 (2.032)	5-1/4 (133.35)	120 lbs.		50	10
CPGI-CTY-24-120-NAT-L	Natural Nylon	24.18 (630.22)	.305 (7.74)	.080 (2.032)	7 (177.80)	120 lbs.		50	5
CPGI-CTY-24-120-BLK-L	UV Black Nylon	24.18 (630.22)	.305 (7.74)	.080 (2.032)	7 (177.80)	120 lbs.		50	5
CPGI-CTY-28-120-NAT-L	Natural Nylon	28.50 (723.9)	.305 (7.74)	.080 (2.032)	8 (203.20)	120 lbs.		50	5
CPGI-CTY-28-120-BLK-L	UV Black Nylon	28.50 (723.9)	.305 (7.74)	.080 (2.032)	8 (203.20)	120 lbs.		50	5
CPGI-CTY-25-175-NAT-L	Natural Nylon	25.25 (641.35)	.340 (8.64)	.090 (2.29)	7-1/8 (182.56)	175 lbs.	MS3367-10	50	5
CPGI-CTY-25-175-BLK-L	UV Black Nylon	25.25 (641.35)	.340 (8.64)	.090 (2.29)	7-1/8 (182.56)	175 lbs.	MS3367-10	50	5
CPGI-CTY-37-175-NAT-L	Natural Nylon	37.25 (946.15)	.340 (8.64)	.090 (2.29)	11 (279.40)	175 lbs.	MS3367-13	50	5
CPGI-CTY-37-175-BLK-L	UV Black Nylon	37.25 (946.15)	.340 (8.64)	.090 (2.29)	11 (279.40)	175 lbs.	MS3367-13	50	5
CPGI-CTY-48-175-NAT-L	Natural Nylon	48.50 (1231.9)	.340 (8.64)	.090 (2.29)	14-1/2 (368.30)	175 lbs.	MS3367-16	50	5
CPGI-CTY-48-175-GRY-L	Gray Nylon	48.50 (1231.9)	.340 (8.64)	.090 (2.29)	14-1/2 (368.30)	175 lbs.	MS3367-16	50	5
CPGI-CTY-48-175-BLK-L	UV Black Nylon	48.50 (1231.9)	.340 (8.64)	.090 (2.29)	14-1/2 (368.30)	175 lbs.	MS3367-16	50	5
CPGI-CTY-22-250-NAT-C	Natural Nylon	21.93 (557.19)	.494 (12.54)	.086 (2.18)	6 (152.40)	250 lbs.		100	5
CPGI-CTY-22-250-BLK-C	UV Black Nylon	21.93 (557.19)	.494 (12.54)	.086 (2.18)	6 (152.40)	250 lbs.		100	5

Cable Ties & Accessories



Mounting Head Ties - Natural and UV Black

- One piece design allows for quicker mechanical mounting and reduced cost
- Secures and positions wire bundles, cables, hoses, etc. to panels or other surfaces with one mechanical fastener

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Width	Thickness	Max Bundle	Tensile Strength	Screw Size	Qty/ Bag	Packs/ Carton
CPGI-CTY-05-30-MH-NAT-C	Natural Nylon	5.8 (149.2)	.138 (3.505)	.045 (1.143)	1-1/4 (31.75)	30 lbs.	No. 8	100	10
CPGI-CTY-05-30-MH-BLK-C	UV Black Nylon	5.8 (149.2)	.138 (3.505)	.045 (1.143)	1-1/4 (31.75)	30 lbs.	No. 8	100	10
CPGI-CTY-07-50-MH-NAT-C	Natural Nylon	8 (203.2)	.177 (4.495)	.052 (1.32)	1-3/4 (44.45)	50 lbs.	No. 10	100	5
CPGI-CTY-07-50-MH-BLK-C	UV Black Nylon	8 (203.2)	.177 (4.495)	.052 (1.32)	1-3/4 (44.45)	50 lbs.	No. 10	100	5
CPGI-CTY-11-50-MH-NAT-C	Natural Nylon	11.7 (298.4)	.191 (4.851)	.061 (1.5459)	3 (76.20)	50 lbs.	No. 10	100	5
CPGI-CTY-11-50-MH-BLK-C	UV Black Nylon	11.7 (298.4)	.191 (4.851)	.061 (1.5459)	3 (76.20)	50 lbs.	No. 10	100	5
CPGI-CTY-14-50-MH-NAT-C	Natural Nylon	14.5 (368.3)	.186 (4.724)	.060 (1.52)	4 (101.60)	50 lbs.	No. 10	100	5
CPGI-CTY-14-50-MH-BLK-C	UV Black Nylon	14.5 (368.3)	.186 (4.724)	.060 (1.52)	4 (101.60)	50 lbs.	No. 10	100	5
CPGI-CTY-16-120-MH-NAT-C	Natural Nylon	15.7 (398)	.298 (7.569)	.075 (1.90)	4-1/16 (103.12)	120 lbs.	1/4	100	5
CPGI-CTY-16-120-MH-BLK-C	UV Black Nylon	15.7 (398)	.298 (7.569)	.075 (1.90)	4-1/16 (103.12)	120 lbs.	1/4	100	5



In-Line Ties - Natural and UV Black

- Reduced head height compared to standard head designs
- Increased safety, eliminates snags, cuts and abrasions to cables, hoses, products, and users
- No sharp tail cutoffs—remaining tail slips back into head of tie leaving no exposed sharp edges
- Quick and safe removal—simply cut and pry top crossbar to release cable tie, eliminating damage to wires, tubing, etc.
- Flexible head design allows the head to easily flex around the total circumference of tubing or bundled wires
- Tamper proof pawl located under the tie's head makes it inaccessible when bundled
- Easy handling finger grips on the tail provide a no slip grip during insertion and tensioning
- Ideal applications: wire harnesses, confined spaces, control panels, marine, hoses, playgrounds, construction, appliances, and safety equipment

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Width	Thickness	Max Bundle	Tensile Strength	Mil-Spec Reference	Qty/ Bag	Packs/ Carton
CPGI-CTY-07-50-LP-NAT-C	Natural Nylon	7.5 (191)	.177 (4.495)	.053 (1.35)	1-3/4 (44.45)	50 lbs.	MS3367-23	100	10
CPGI-CTY-07-50-LP-BLK-C	UV Black Nylon	7.5 (191)	.177 (4.495)	.053 (1.35)	1-3/4 (44.45)	50 lbs.	MS3367-23	100	10
CPGI-CTY-16-120-LP-NAT-C	Natural Nylon	16 (406.4)	.300 (7.62)	.075 (1.90)	41/6 (103.18)	120 lbs.		100	5
CPGI-CTY-16-120-LP-BLK-C	UV Black Nylon	16 (406.4)	.300 (7.62)	.075 (1.90)	41/6 (103.18)	120 lbs.		100	5

Cable Ties & Accessories



Plenum Rated - Halar Ties

- Halar ties feature low smoke density and high flame-resistance and are ideal for plenum areas where smoke generation is a concern

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Width	Thickness	Max Bundle	Tensile Strength	Qty/ Bag	Packs/ Carton
CPGI-CTY-04-18-HL-C	Maroon Halar	4.0 (102)	.094 (2.4)	.042 (1.07)	1/16 - 7/8	18 lbs	100	5
CPGI-CTY-08-50-HL-C	Maroon Halar	8.0 (203)	.178 (4.5)	.053 (1.35)	1/16 -	50 lbs	100	5



Releasable Ties - Natural and UV Black

- Temporary or Permanent Bundling allows for quick addition or removal of wires or items
- Strap finger release latch allows easy access but reduces snags compared to top latch styles

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Width	Thickness	Max Bundle	Tensile Strength	Qty/ Bag	Packs/ Carton
CPGI-CTY-05-50-RL-NAT-C	Natural Nylon	5.905 (150.00)	.299 (7.60)	.050 (1.27)	1-3/8 (35.00)	50 lbs.	100	10
CPGI-CTY-05-50-RL-BLK-C	UV Black Nylon	5.905 (150.00)	.299 (7.60)	.050 (1.27)	1-3/8 (35.00)	50 lbs.	100	10
CPGI-CTY-08-50-RL-NAT-C	Natural Nylon	7.87 (200)	.299 (7.60)	.053 (1.35)	2 (50.00)	50 lbs.	100	10
CPGI-CTY-08-50-RL-BLK-C	UV Black Nylon	7.87 (200)	.299 (7.60)	.053 (1.35)	2 (50.00)	50 lbs.	100	10
CPGI-CTY-12-50-RL-NAT-C	Natural Nylon	11.81 (300)	.299 (7.60)	.053 (1.35)	3 (76.20)	50 lbs.	100	10
CPGI-CTY-12-50-RL-BLK-C	UV Black Nylon	11.81 (300.00)	.299 (7.60)	.053 (1.35)	3 (76.20)	50 lbs.	100	10

Cable Ties & Accessories



Identification & Flag Cable Ties

- One easy step to identify and bundle items
- Flat ties extend from bundle to be easily seen when identification is critical
- Identification ties reduce snags while providing support to the bundle

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Width	Thickness	Max Bundle	Tensile Strength	Pad Size	Qty/ Bag	Packs/ Carton
CPGI-CTY-04-18-ID-NAT-C	Natural Nylon	4.0 (102)	.100 (2.54)	.044 (1.12)	7/8 (22.22)	18 lbs.	5/16 x 1	100	5
CPGI-CTY-07-50-ID-NAT-C	Natural Nylon	7.8 (200)	.181 (4.59)	.055 (1.40)	1-7/8 (47.63)	50 lbs.	1/2 x 1 1/8	100	5
CPGI-CTY-14-50-ID-NAT-C	Natural Nylon	14.1 (358.10)	.187 (4.749)	.055 (1.40)	4 (101.60)	50 lbs.	1/2 x 1 1/8	100	5



Mounting Pads

- Saves cable tie clinching time: stay-n-place tab keeps cable tie head from sliding down behind bundle during applications and maintenance placement during horizontal applications
- Easy insertion of cable ties: lead-n-feature funnels cable ties into position and countersunk screw hole allows cable ties to easily pass over screw head
- Saves positioning time with the 4 sided entry and center screw hole

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Height	Adhesive	Height	Width	Qty/ Bag	Packs/ Carton
CPGI-CTY-MP-750-NAT-C	Natural Nylon	.74 (18.7)	.19 (4.8)	Rubber	.05 (1.2)	.20 (5.0)	100	5
CPGI-CTY-MP-750-BLK-C	Black Nylon	.74 (18.7)	.19 (4.8)	Rubber	.05 (1.2)	.20 (5.0)	100	5
CPGI-CTY-MP-1000-NAT-C	Natural Nylon	.99 (25.1)	.20 (5.0)	Rubber	.06 (1.5)	.20 (5.0)	100	5
CPGI-CTY-MP-1000-BLK-C	Black Nylon	.99 (25.1)	.20 (5.0)	Rubber	.06 (1.5)	.20 (5.0)	100	5



Low Profile Screw Mounts

- Reduces snags allowing bundles closer proximity to mounting material
- Confined spaces and control panels or other areas where space is limited
- Achieve extreme low height when combined with ACT's Cobra-low profile cable tie

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Slot Height	Slot Width	Height	Width	Qty/ Bag	Packs/ Carton
CPGI-CTY-LPM1-NAT-C	Natural Nylon	.75 (19.05)	.12 (3.04)	.50 (12.70)	.062 (1.587)	.18 (4.57)	100	5

Cable Ties & Accessories



Wall Mounts

- Saves cable tie cinching time - the stay-in-place tab keeps cable tie head from sliding down during vertical applications and maintains placement during horizontal applications
- Quickly secures and positions wire bundles, cables, hoses, etc. to walls
- One piece design allows for quicker mounting with no mechanical fastener, reducing time and cost

Selection Information: dimensions in inches (millimeters)

Catalog Number	Shaft Description	Head Height	Shaft Height	Head Diameter	Slot Width	Head Width	Depth	Qty/ Bag	Packs/ Carton
CPGI-CTY-WM-BLK-C	Black Nylon	1.45 (37.0)	.248 (6.3)	.393 (10.0)	.50 (12.7)	.381 (9.7)	.492 (12.5)	100	5



Screw Mounts

- Secure support deep cradle design provides maximum support for large bundles and tubing
- Easy insertion of cable ties: deep recessed screw hole allows cable ties to pass over screw head

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Height	Width	Slot Height	Slot Width	Qty/ Bag	Packs/ Carton
CPGI-CTY-SM1-NAT-C	Natural Nylon	.59 (14.98)	.27 (6.85)	.37 9.39	.062 (1.587)	.19 (4.82)	100	5
CPGI-CTY-SM1-BLK-C	Black Nylon	.59 (14.98)	.27 (6.85)	.37 9.39	.062 (1.587)	.19 (4.82)	100	5
CPGI-CTY-SM2-NAT-C	Natural Nylon	.87 (22.09)	.38 (9.65)	.64 16.25	.125 (3.175)	.30 (7.62)	100	5
CPGI-CTY-SM2-BLK-C	Black Nylon	.87 (22.09)	.38 (9.65)	.64 16.25	.125 (3.175)	.30 (7.62)	100	5



Wing Push Mounts & Button Mounts

- One piece design allows for quicker mounting with no mechanical fastener, reducing time and cost
- Quickly secures and positions wire bundles, cables, hoses, etc. to panels
- Easy insertion of cable ties through wide entry slot
- Extra stability is created from the push mount tensioning wings
- Saves cable tie cinching time. The button mount's stay-in-place tab keeps cable ties from sliding during application

Selection Information: dimensions in inches (millimeters)

Wing Push Mounts

Catalog Number	Description	Height	Depth	Wing Width	Head Width	Slot Width	Mount Width	Qty/ Bag	Packs/ Carton
CPGI-CTY-PMW-NAT-C	Natural Nylon	.732 (18.6)	.375 (9.5)	.79 (20.1)	.422 (10.72)	.31 (8.1)	.244 (6.2)	100	5

Button Mounts

Catalog Number	Description	Height	Exposed	Shaft Length	Button Diameter	Slot Width	Shaft Diameter	Qty/ Bag	Packs/ Carton
CPGI-CTY-BM-BLK-C	Black Nylon	.535 (13.6)	.248 (6.3)	.287 (7.3)	.634 (16.12)	.196 (5.0)	.299 (7.6)	100	5

Cable Ties & Accessories



Identification Plates

- Allows larger print when information and visibility is critical
- Increased surface area provides twice the area as conventional identification cable ties
- Orientation variety: apply to bundle vertically or horizontally
- For use with 18 lb., 40 lb., and 50 lb. cable ties

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Length	Width	Slot Thickness	Slot Height	Width	Qty/ Bag	Packs/ Carton
CPGI-CTY-IDP-1-NAT-C	Natural Nylon	1.57 (40.0)	.787 (20.0)	.039 (1.0)	.08 (2.03)	.18 (4.57)	100	5
CPGI-CTY-IDP-2-NAT-C	Natural Nylon	2.36 (60.0)	.984 (25.0)	.039 (1.0)	.08 (2.03)	.18 (4.57)	100	5



Cable Clamps

- Designed to secure the routing of cables, harnesses, and hoses
- Radius edges protect against insulation, abrasion, and cutting hoses
- Quick alignment is achieved with bottom oval screw hole
- Accurate selection is made easy with clearly identified diameter sizes

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Screw Hole	Diameter	Width	Center to Center	Thickness	Qty/ Bag	Packs/ Carton
CPGI-CTY-CCL-125-NAT-C	Natural Nylon	.181 (4.6)	.126 (3.2)	.378 (9.6)	.374 (9.5)	.055 (1.4)	100	5
CPGI-CTY-CCL-125-BLK-C	Black Nylon	.181 (4.6)	.126 (3.2)	.378 (9.6)	.374 (9.5)	.055 (1.4)	100	5
CPGI-CTY-CCL-250-NAT-C	Natural Nylon	.181 (4.6)	.250 (6.3)	.394 (10.0)	.394 (10.0)	.055 (1.4)	100	5
CPGI-CTY-CCL-250-BLK-C	Black Nylon	.181 (4.6)	.250 (6.3)	.394 (10.0)	.394 (10.0)	.055 (1.4)	100	5
CPGI-CTY-CCL2-375-NAT-C	Natural Nylon	.181 (4.6)	.374 (9.5)	.472 (12.0)	.492 (12.5)	.059 (1.5)	100	5
CPGI-CTY-CCL2-375-BLK-C	Black Nylon	.181 (4.6)	.374 (9.5)	.472 (12.0)	.492 (12.5)	.059 (1.5)	100	5
CPGI-CTY-CCL2-500-NAT-C	Natural Nylon	.181 (4.6)	.500 (12.7)	.472 (12.0)	.598 (15.2)	.059 (1.5)	100	5
CPGI-CTY-CCL2-500-BLK-C	Black Nylon	.181 (4.6)	.500 (12.7)	.472 (12.0)	.598 (15.2)	.059 (1.5)	100	5
CPGI-CTY-CCL2-750-NAT-C	Natural Nylon	.181 (4.6)	.764 (19.4)	.472 (12.0)	.717 (18.2)	.059 (1.5)	100	5
CPGI-CTY-CCL2-750-BLK-C	Black Nylon	.181 (4.6)	.764 (19.4)	.472 (12.0)	.717 (18.2)	.059 (1.5)	100	5
CPGI-CTY-CCL2-1000-NAT-C	Natural Nylon	.181 (4.6)	1.00 (25.4)	.472 (12.0)	.866 (22.0)	.071 (1.8)	100	5
CPGI-CTY-CCL2-1000-BLK-C	Black Nylon	.181 (4.6)	1.00 (25.4)	.472 (12.0)	.866 (22.0)	.071 (1.8)	100	5

Duct Sealing System



RDSS Sealing System Duct Sealing System

RDSS duct sealing system has been designed for use in conjunction with plastic, concrete, or steel ducts to provide a watertight duct seal. The RDSS duct sealing system seals cable ducts and helps to prevent flooding in cable vaults, access manholes, substation basements, and customer feeds. It can be installed while the water is flowing - see photograph.

Provides Watertight Seal

The RDSS sealing system consists of an inflatable, sealed bladder of flexible, metallic laminate material, which has pre-installed, high-temperature sealant strips on both sides. The bladder is first inflated to 45 psi (three-bar) internal pressure, and then presses the sealant against the duct wall and onto the substrate. The bag uses a self-sealing gel material to seal the filling hole when the filling tube is removed.

Seals Multiple Cable Ducts

For applications with three or more cables, an RDSS-CLIP is inserted between the cables. The RDSS-CLIP is a high-temperature mastic mounted on an installation stick. It seals the area between the cables when used in conjunction with the RDSS inflatable bladder. Acceptable to use on medium voltage cables including unjacketed concentric neutral.

Selection Information: dimensions in inches (millimeters)

Duct Inner Diameter	Number of Cables in Duct / Maximum Cable Bundle Diameter					
	0, 1, or 2 Cables		3 or 4 Cables		5, 6, or 7 Cables	
1.25 (32)	RDSS-45	0.5 (13)	RDSS-45, 1 RDSS-CLIP-45	0.3 (8)	RDSS-45, 2 RDSS-CLIP-45	0.1 (3)
1.50 (38)	RDSS-45	1.0 (25)	RDSS-45, 1 RDSS-CLIP-45	0.8 (20)	RDSS-45, 2 RDSS-CLIP-45	0.6 (15)
1.75 (45)	RDSS-45	1.3 (32)	RDSS-45, 1 RDSS-CLIP-45	1.05 (27)	RDSS-45, 2 RDSS-CLIP-45	0.9 (22)
2.00 (50)	RDSS-60	1.2 (30)	RDSS-60, 1 RDSS-CLIP-75	1.0 (25)	RDSS-60, 2 RDSS-CLIP-75	0.8 (20)
2.25 (57)	RDSS-60	1.6 (41)	RDSS-75, 1 RDSS-CLIP-75	1.4 (36)	RDSS-75, 2 RDSS-CLIP-75	1.2 (31)
2.50 (64)	RDSS-75	1.5 (38)	RDSS-75, 1 RDSS-CLIP-75	1.3 (33)	RDSS-75, 2 RDSS-CLIP-75	1.1 (28)
2.75 (70)	RDSS-75	1.8 (46)	RDSS-75, 1 RDSS-CLIP-75	1.6 (41)	RDSS-75, 2 RDSS-CLIP-75	1.4 (36)
3.00 (75)	RDSS-75	2.2 (56)	RDSS-75, 1 RDSS-CLIP-75	2.0 (50)	RDSS-75, 2 RDSS-CLIP-75	1.8 (46)
3.25 (83)	RDSS-100	2.2 (56)	RDSS-100, 1 RDSS-CLIP-100	2.0 (50)	RDSS-100, 2 RDSS-CLIP-100	1.8 (46)
3.50 (89)	RDSS-100	2.6 (66)	RDSS-100, 1 RDSS-CLIP-100	2.4 (61)	RDSS-100, 2 RDSS-CLIP-100	2.2 (56)
3.75 (95)	RDSS-100	2.9 (74)	RDSS-100, 1 RDSS-CLIP-100	2.7 (69)	RDSS-100, 2 RDSS-CLIP-100	2.5 (64)
4.00 (100)	RDSS-100	3.2 (80)	RDSS-100, 1 RDSS-CLIP-100	3.0 (75)	RDSS-100, 2 RDSS-CLIP-100	2.8 (70)
4.25 (108)	RDSS-100	3.5 (89)	RDSS-100, 1 RDSS-CLIP-100	3.3 (85)	RDSS-100, 2 RDSS-CLIP-100	3.1 (79)
4.50 (114)	RDSS-100	3.5 (89)	RDSS-100, 1 RDSS-CLIP-100	3.3 (85)	RDSS-100, 2 RDSS-CLIP-100	3.1 (79)
4.75 (121)	RDSS-125	3.8 (97)	RDSS-125, 1 RDSS-CLIP-125	3.6 (92)	RDSS-125, 2 RDSS-CLIP-125	3.4 (87)
5.00 (125)	RDSS-125	4.1 (104)	RDSS-125, 1 RDSS-CLIP-125	3.9 (98)	RDSS-125, 2 RDSS-CLIP-125	3.7 (93)
5.25 (133)	RDSS-150*	4.3 (109)	RDSS-150*, 1 RDSS-CLIP-150	4.1 (104)	RDSS-150*, 2 RDSS-CLIP-150	3.9 (98)
5.50 (140)	RDSS-150*	4.7 (120)	RDSS-150*, 1 RDSS-CLIP-150	4.5 (114)	RDSS-150*, 2 RDSS-CLIP-150	4.3 (109)
5.75 (146)	RDSS-150*	4.9 (124)	RDSS-150*, 1 RDSS-CLIP-150	4.7 (119)	RDSS-150*, 2 RDSS-CLIP-150	4.5 (114)
6.00 (150)	RDSS-150*	5.1 (129)	RDSS-150*, 1 RDSS-CLIP-150	4.9 (124)	RDSS-150*, 2 RDSS-CLIP-150	4.7 (120)
6.25 (159)	RDSS-150*	5.4 (138)	RDSS-150*, 1 RDSS-CLIP-150	5.2 (133)	RDSS-150*, 2 RDSS-CLIP-150	5.0 (125)
6.50 - 8.00 (165 - 210mm) Ducts in this range require the use of RDSS-AD-210 adapter. Contact Tyco Electronics for application information.						

*See Ordering information.

RDSS sealing system continues next page

Duct Sealing System

RDSS Sealing System continued

Ordering Information

1. In ducts where the cable/cable bundle is less than 2.4" (60mm) in diameter, an RDSS-AT/AP-150 device must be used in conjunction with the RDSS-150.
2. Standard package: RDSS = 10 kits/box or 3 kits/box RDSS-CLIP = 5 clips/box
RDSS-TOOLS = 1 each/box, CO2 cartridges = 10 each/box,
RDSS-AT/AP-150 = 1 each/box
3. Related test report: EDR-5253
4. S-1278 sealant, used in RDSS-CLIPS, is available separately.

RDSS Sealing Clip

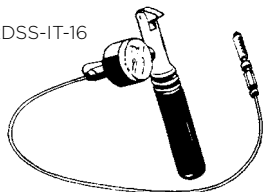
RDSS duct sealing clips are to be used if the duct is occupied by more than two cables. The maximum number of cables sealed with one RDSS-CLIP is four. If more cables are to be sealed, one extra clip is needed for every three additional cables. Check with your Tyco Electronics representative for applications with more than seven cables.

Catalog Number	Kit Used With
RDSS-CLIP-45	RDSS-45
RDSS-CLIP-75	RDSS-75 and RDSS-60
RDSS-CLIP-100	RDSS-100
RDSS-CLIP-125	RDSS-125
RDSS-CLIP-150	RDSS-150

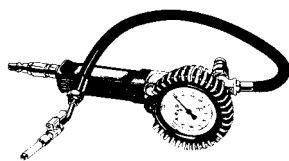
RDSS Installation Tools

RDSS duct seals can be installed with a variety of inflation tools having the capability of inflating RDSS to 4533 psi (3 bar) of pressure. The tools Tyco Electronics offers are summarized in the table below. The tool will only accept 16-gr CO2 gas cylinders (listed below).

RDSS-IT-16

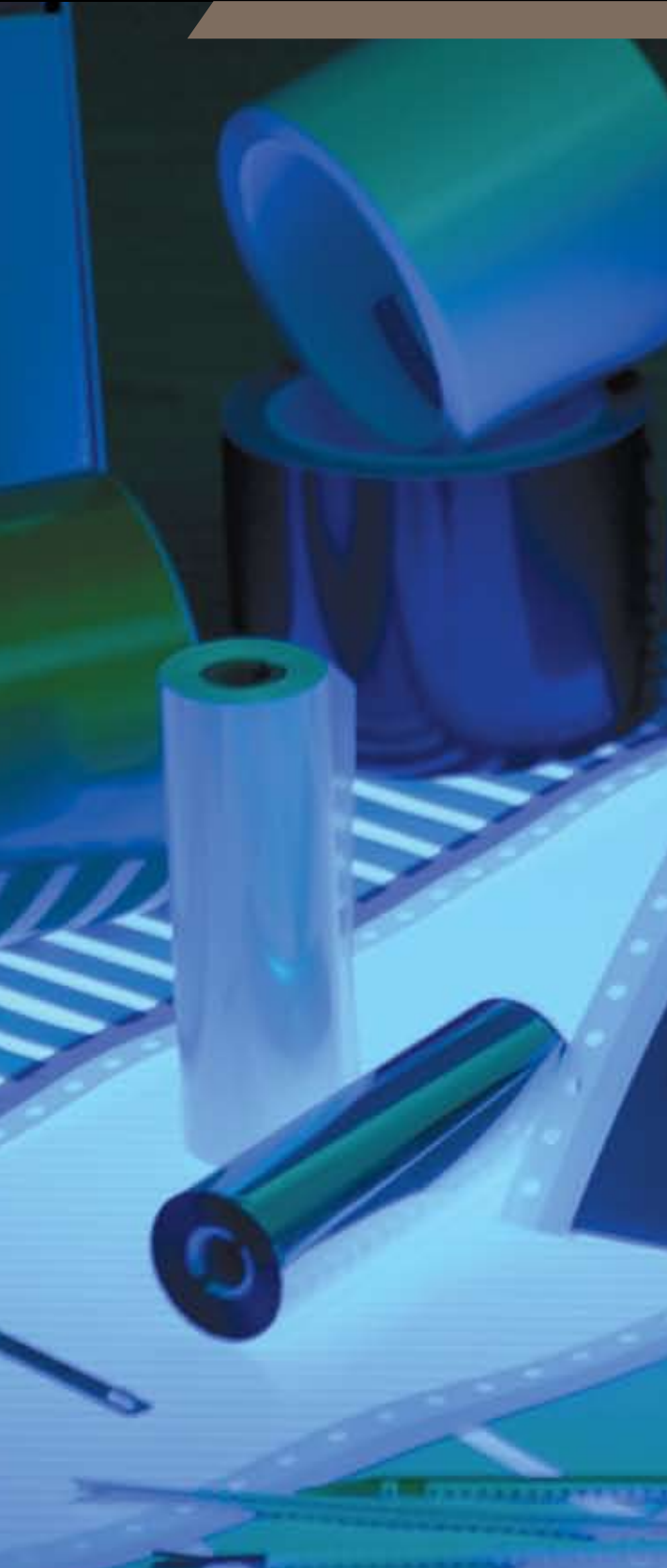


RDSS-IG-SR-AS



Catalog Number	Description	Std. Pack
RDSS-IT-16	Inflation tool designed with an ON/OFF switch and an automatic pressure-monitoring system. The required CO2 gas cylinders (E7512-0160) must be ordered separately.	1 tool/box
E7512-0160	16-gr CO2 gas cylinders for the RDSS-IT-16 tool. Each gas cylinder inflates approximately four RDSS-100 duct seals.	10 cylinders/box
RDSS-IG-SR-AS	Inflation tool designed for use with customer's own source of nitrogen or compressed air. Features a pressure gauge, automatic shutoff, VGF valve connection, and two alternate connections for plastic or rubber hoses.	1 tool/box
E7512-0220	Tube snap assembly.	1 each/box
E7512-0240	Spare part for RDSS-IT-16 inflation tool.	1 each/box
E7512-0260	Spare pressure gauge assembly for RDSS-IT-16 inflation tool.	1 each/box
E7512-0260	Spare delivery pipe for RDSS-IT-16 inflation tool.	1 each box
S-1278-3 x 61 x 7620	RDSS sealant roll.	1 25-ft roll/box
RDSS-AT/AP-150	For use with the RDSS-150 in duct 5.25" or larger with cable/cable bundles less than 2.4" (60mm) in diameter.	1 each/box
RDSS-AD-210	Adapter for ducts 6.5 - 8.0" (165 - 210mm) diameter	4 each/box
E4540-1250	RDSS-LUBE for installation of RDSS.	25 each/box

IDENTIFICATION SOLUTIONS



Heat-Shrink Markers

ShrinkMark Heat-Shrinkable Sleeves	93
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Cable Markers

CM-SCE Cable Markers	94
HL Cable Markers	94
HLX-NEL Cable Markers	95
Permark Pre-Printed 316 Stainless Steel Markers	96
Snap-On Markers	96

Labels

Self-Laminating Labels	97
Pressure Sensitive Polyester Labels	98
ProjectMark Continuous Labels	99

Insta-Mark Wire Markers

Pre-Printed Books	100
Pre-Printed Dispensers	100
Write-On Books and Dispensers	100

Portable Marker Kit

LM2020 Plus Marking Kit	101
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Printers, Software & Accessories

Printers	102
Software	102
Ribbons	103
Accessories	103

Heat-Shrink Markers



ShrinkMark Heat-Shrinkable Sleeves

ShrinkMark sleeves are suitable for a wide variety of applications. Heat-shrinkable sleeves provide legible identification for all types of cables used by electrical contractors and instrumentation control manufacturers.

Because ShrinkMark sleeves are extruded from Tyco Electronics tubing, they have a low installed profile with no edges to snag. The crosslinked polyolefin construction makes ShrinkMark sleeves resistant to abrasion, aggressive cleaning solvents, and industrial fluids.

ShrinkMark sleeves are ideal for tough industrial environments, including switch gear, motor control centers, and terminal boxes. They shrink faster than conventional thermoplastic tags.

- Shrink ratio of 3:1
- Expanded sleeve diameters from .125" (3.125mm) to 1.50" (38mm)
- Sleeves come in 2.00" (50mm) lengths
- Flame retardant. Sleeves meet UL 224
- Print performance to military requirements
- ShrinkMark sleeves can be supplied pre-scored for a more economical use of material
- Several packaging options to choose from: 250, 1,000 or 2,500 pieces per box
- Standard colors are white and yellow
- Elliptical shape leaves un-shrunk sleeves in place
- Temperature Range: -30°C to 105°C

Selection Information: dimensions in inches (millimeters)

Product Order Code Replace - 9 with - 4 if Yellow is needed	Wire Size	Nominal Diameter	Recovered Diameter
ShrinkMark-18-2-9	#22 - #18	0.125 (3)	0.042 (1)
ShrinkMark-18-2-S1-9	#22 - #18	0.125 (3)	0.042 (1)
ShrinkMark-12-2-9	#18 - #12	0.187 (5)	0.062 (2)
ShrinkMark-12-2-S1-9	#18 - #12	0.187 (5)	0.062 (2)
ShrinkMark-10-2-9	#16 - #10	0.250 (6)	0.083 (2)
ShrinkMark-10-2-S1-9	#16 - #10	0.250 (6)	0.083 (2)
ShrinkMark-2-2-9	#10 - #2	0.500 (13)	0.167 (4)
ShrinkMark-2-2-S1-9	#10 - #2	0.500 (13)	0.167 (4)
ShrinkMark-250-2-9	#1 - 250	1.00 (25)	0.333 (9)
ShrinkMark-250-2-S1-9	#1 - 250	1.00 (25)	0.333 (9)
ShrinkMark-1000-2-9	350 - 1000	1.40 (36)	0.740 (19)
ShrinkMark-1000-2-S1-9	350 - 1000	1.40 (36)	0.740 (19)

ShrinkMark 10 - 2 - S2 - 9 (1K)

Product name

Largest nominal conductor size in range

Sleeve length in inches

Number of scores

Blank = No scores yields 1 each - 2" marker
 S1 = One score yields 2 each - 1" markers per sleeve
 S2 = Two scores yield 3 each - 5/8" markers per sleeve
 S3 = Three scores yield 4 each - 1/2" markers per sleeve

Standard package

Blank = 250 sleeves per box
 (1K) = 1,000 sleeves per box
 (2.5K) = 2,500 sleeves per box

Color

4 = Yellow
 9 = White



Certified
C22.2
No. 198.1

Recommended

Printers

IDP-T208M-PRINTER
 IDP-T312M-PRINTER
 IDP-AM6310-110V-PRINTER

Ribbons

IDP-T208M-RIBBON
 IDP-TMS-RJS-RIBN-4RPSCE
 IDP-1892BK04-RIBBON

Cable Markers



CM-SCE Cable Markers

CM-SCE cable markers provide a reliable method of identification of larger cables and bundles. They can be installed using standard nylon tie wraps.

- Cable markers are a standard 2"(55mm) length that come in a .25"(6.25mm) or .50"(2.5mm) width
- Flame retardant
- Cable Markers meet UL 224
- Print performance to military requirements
- Standard color is white
- Temperature Range: -55°C to 135°C

Selection Information

Catalog Number	Description	Std. Pack
IDP-CM-SCE-25-4H-9	1/4" Cable Marker, 4 hole	250
IDP-CM-SCE-50-4H-9	1/2" Cable Marker, 4 hole	250
IDP-CM-SCE-50-6H-9	1/2" Cable Marker, 6 hole	250

Recommended

Printers

IDP-AM6310-110V-PRINTER

Ribbons

IDP-1892BK04-RIBBON



HL Cable Markers

HL cable markers are a cost effective way to identify cables already terminated. Like CM-SCE cable markers, cable ties are used to secure the label to cables or bundles.

- Easy to use fan-fold format for easy kitting and marker selection
- Cable markers are available in 1.75"(44mm) – 3.50" (87.5mm) lengths and .375" (9.4mm) – 1.0" (25mm) widths
- Standard color is white
- Temperature Range: -55°C to 135°C

Selection Information: dimensions in inches (millimeters)

Catalog Number	Dimensions	Printable Area	Pcs/ Pack	Std. Pack
	W x H	W x H		
IDP-HL104WEITS025B	1.800 x 0.400 (45.00 x 10.40)	1.000 x 0.400 (25.00 x 10.40)	1000	1
IDP-HL104WEITS033B	2.100 x 0.400 (52.00 x 10.40)	1.300 x 0.400 (33.00 x 10.40)	1000	1
IDP-HL104WEITS038B	2.300 x 0.400 (58.00 x 10.40)	1.500 x 0.400 (38.00 x 10.40)	1000	1
IDP-HL104WEITS050B	2.750 x 0.400 (70.00 x 10.40)	2.000 x 0.400 (50.00 x 10.40)	1000	1
IDP-HL104WEITS070B	3.500 x 0.400 (90.00 x 10.40)	2.750 x 0.400 (70.00 x 10.40)	1000	1
IDP-HL203WEITS025B	1.800 x 0.800 (45.00 x 20.30)	1.000 x 0.800 (25.00 x 20.30)	500	1
IDP-HL203WEITS033B	2.100 x 0.800 (52.00 x 20.30)	1.300 x 0.800 (33.00 x 20.30)	500	1
IDP-HL203WEITS038B	2.300 x 0.800 (58.00 x 20.30)	1.500 x 0.800 (38.00 x 20.30)	500	1
IDP-HL203WEITS050B	2.750 x 0.800 (70.00 x 20.30)	2.000 x 0.800 (50.00 x 20.30)	500	1
IDP-HL203WEITS070B	3.500 x 0.800 (90.00 x 20.30)	2.750 x 0.800 (70.00 x 20.30)	500	1
IDP-HL253WEITS025B	1.800 x 1.000 (45.00 x 25.30)	1.000 x 1.000 (25.00 x 25.30)	250	1
IDP-HL253WEITS033B	2.100 x 1.000 (52.00 x 25.30)	1.300 x 1.000 (33.00 x 25.30)	250	1
IDP-HL253WEITS038B	2.300 x 1.000 (58.00 x 25.30)	1.500 x 1.000 (38.00 x 25.30)	250	1
IDP-HL253WEITS050B	2.750 x 1.000 (70.00 x 25.30)	2.000 x 1.000 (50.00 x 25.30)	250	1
IDP-HL253WEITS070B	3.500 x 1.000 (90.00 x 25.30)	2.750 x 1.000 (70.00 x 25.30)	250	1

Recommended

Printers

IDP-T312M-PRINTER

Ribbons

IDP-TMS-RJS-RIBN-4RPSCE

Cable Markers

**HLX-NEL Cable Markers**

Tyco Electronics HLX markers are assembled in Narrow Edge Leading (NEL) format for use in the T208M printer. Markers are manufactured from low fire hazard polyolefin material making them ideal in applications where low smoke, low toxicity and zero halogen are critical.

- Ideal for pre- or post- termination assembly
- Attach using standard cable ties
- Available in white and yellow
- Temperature Range: -40°C to 105°C

Selection Information: dimensions in inches (millimeters)

Catalog Number	Marker Dimensions	Number of Printable Area	Markers Across	Std. Pack
IDP-HLX125WE4NEL60S	3.15 x 0.49 (80 x 12.5)	2.35 x 0.4 (60 x 10.50)	4	200
IDP-HLX125WE2NEL60S	3.15 x 0.49 (80 x 12.5)	2.35 x 0.4 (60 x 10.50)	2	200
IDP-HLX125YW4NEL60S	3.15 x 0.49 (80 x 12.5)	2.35 x 0.4 (60 x 10.50)	4	200
IDP-HLX125YW2NEL60S	3.15 x 0.49 (80 x 12.5)	2.35 x 0.4 (60 x 10.50)	2	200

Recommended**Printers**

IDP-T208M-PRINTER

Ribbons

IDP-T200-RIBBON-1966

Cable Markers



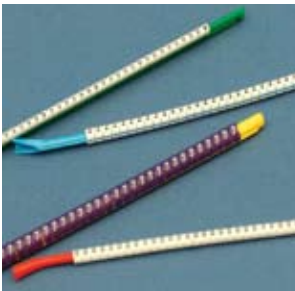
Permark Pre-Printed 316 Stainless Steel Markers

Permark stainless steel markers and identification plates are designed to withstand the most hostile environments. Using state-of-the-art technology and no inks, the marking process produces a permanent, deep surface mark. Permark markers are produced for individual customer requirements on a fast turn-around basis.

- Pre-marked to customer requirements
- Transfer of data files electronically
- Excellent chemical, abrasion, corrosion, and weather resistance
- One-piece, 316 stainless steel construction
- Stainless steel cable ties are also available
- Temperature Range: -80°C to 500°C

Selection Information: dimensions in inches (millimeters)

Catalog Number	Description	Std. Pack
IDP-PM09512	Stainless Steel 4mm, 3.74 x 0.47 (95 x 12) marker - Pre-Printed (max 25 characters)	1
IDP-PM09512-BLANK	Stainless Steel 4mm, 3.74 x 0.47 (95 x 12) marker - Blank	1
IDP-PM07507	Stainless Steel 4mm, 2.95 x 0.28 (75 x 7) marker - Pre-Printed (max 20 characters)	1
IDP-PM07507-BLANK	Stainless Steel 4mm, (75 x 70) marker - Blank	1
IDP-SST141-316	SS cable tie 0.18 x 14.3 (4.6 x 360), Ties/ Pack 100	100
IDP-SST71-316	SS cable tie 0.18 x 7.9 (4.6 x 200), Ties/ Pack 100	100



Snap-On Markers

Snap-on markers represent the best snap-on wire marking system available. Convenient and easy to use, these markers are supplied on a "wand" applicator that simplifies and reduces installation time and saves on the cost of marking.

- Perfect way to permanently and rapidly mark cables and wires after installation
- Resistant against oils, cleaning agents, and fuels
- Markers come in white with black print. Color-coding options available for markers 0-9
- Temperature Range: -40°C to 106°C

Selection Information: dimensions in inches

Catalog Number	Description	Wand Color	Pcs. / Pack
STD03W-x	Cable diameters 0.076 - 0.104 - 30 markers/wand, 10 wands/pack	Green	300
STD06W-x	Cable diameters 0.104 - 0.140 - 30 markers/wand, 10 wands/pack	Red	300
STD09W-x	Cable diameters 0.140 - 0.180 - 30 markers/wand, 10 wands/pack	Blue	300
STD12W-x	Cable diameters 0.180 - 0.240 - 30 markers/wand, 10 wands/pack	Yellow	300
STD15W-x	Cable diameters 0.232 - 0.340 - markers in loose packs, wand separate		50
STD17W-x	Cable diameters 0.340 - 0.460 - markers in loose packs, wand separate		50
STD21W-x	Cable diameters 0.433 - 0.610 - markers in loose packs, wand separate		50
STD24W-x	Cable diameters 0.590 - 0.750 - markers in loose packs, wand separate		50
STD15MO	Wand for marker size 15	Orange	1
STD17MO	Wand for marker size 17	Orange	1
STD21MO	Wand for marker size 21	Gray	1
STD24MO	Wand for marker size 24	Gray	1

*Replace "x" in Catalog Number with the number or letter required on the markers.

Labels



Self-Laminating Labels

Self-Laminating labels offer a fast and inexpensive way to identify wire and cable. Because these labels wrap over themselves, creating a seal, the printed surface is protected from solvents, oil, water, and abrasion. Self-laminating labels are able to run through various thermal transfer printers.

- Self-laminating labels offer a white area for printed or handwritten information and a clear wrap that winds around and protects the information
- Protects printed information from chemicals and frequent handling
- Designed to withstand exposure to oil, solvents, and water
- Vinyl material with acrylic adhesive
- UL recognized for indoor use
- Temperature Range: -40°C to 80°C

Selection Information: dimensions in inches (millimeters)

Catalog Number	Maximum Cable OD	Print Area Height	Label Width	Height	Labels/Roll
IDP-SB050100WE10	.20 (5.1)	.33 (8.5)	.50 (12.7)	1.0 (25.4)	10,000
IDP-SB050143WE10	.30 (7.6)	.50 (12.7)	.50 (12.7)	1.437 (36.5)	10,000
IDP-SB100143WE5	.30 (7.6)	.50 (12.7)	1.0 (25.4)	1.437 (36.5)	5,000
IDP-SB200143WE2.5	.30 (7.6)	.50 (12.7)	2.0 (50.8)	1.437 (36.5)	2,500
IDP-SB080150WE10	.30 (7.6)	.50 (12.7)	.80 (20.3)	1.50 (38.1)	10,000
IDP-SB100225WE5	.48 (12.2)	.75 (19)	1.0 (25.4)	2.25 (57.2)	5,000
IDP-SB200225WE2.5	.48 (12.2)	.75 (19)	2.0 (50.8)	2.25 (57.2)	2,500
IDP-SB100375WE2.5	.88 (22.4)	1.0 (25.4)	1.0 (25.4)	3.75 (95.3)	2,500
IDP-SB200375WE2.5	.88 (22.4)	1.0 (25.4)	2.0 (50.8)	3.75 (95.3)	2,500
IDP-SB100594WE1	1.40 (35.5)	1.50 (38.1)	1.0 (25.4)	5.94 (151)	1,000
IDP-SB190594WE1	1.40 (35.5)	1.50 (38.1)	1.90 (48.3)	5.94 (151)	1,000
IDP-SB200743WE1	1.90 (48.3)	1.50 (38.1)	2.0 (50.8)	7.437 (189)	1,000

These standard labels fit inside the T312M Printer or they can feed into a T208M Printer using the IDP-T200-SPINDLE

T208M Size Rolls

IDP-SB050100WE5-T200	.20 (5.1)	.33 (8.5)	.50 (12.7)	1.0 (25.4)	5,000
IDP-SB050143WE5-T200	.30 (7.6)	.50 (12.7)	.50 (12.7)	1.437 (36.5)	5,000
IDP-SB100143WE2.5-T200	.30 (7.6)	.50 (12.7)	1.0 (25.4)	1.437 (36.5)	2,500
IDP-SB080150WE5-T200	.30 (7.6)	.50 (12.7)	.80 (20.3)	1.50 (38.1)	5,000
IDP-SB100225WE1-T200	.48 (12.2)	.75 (19)	1.0 (25.4)	2.25 (57.2)	2,500
IDP-SB200225WE1-T200	.48 (12.2)	.75 (19)	2.0 (50.8)	2.25 (57.2)	1,000
IDP-SB100375WE1-T200	.88 (22.4)	1.0 (25.4)	1.0 (25.4)	3.75 (95.3)	1,000
IDP-SB200375WE1-T200	.88 (22.4)	1.0 (25.4)	2.0 (50.8)	3.75 (95.3)	1,000
IDP-SB100594WE0.5-T200	1.40 (35.5)	1.50 (38.1)	1.0 (25.4)	5.94 (151)	500
IDP-SB200743WE0.5-T200	1.90 (48.3)	1.50 (38.1)	2.0 (50.8)	7.734 (189)	500

These labels have a smaller core that allows them to fit inside of the T208M Printer. However, these are not recommended for the T312M Printer.

Recommended

Printers

IDP-T208M-PRINTER
IDP-T312M-PRINTER

Ribbons

IDP-T208M-RIBBON
IDP-TMS-RJS-RIBN-4RPSCE

Labels



Pressure Sensitive Polyester Labels

Tyco Electronics offers a wide range of label products for thermal transfer printing applications. Several material types and adhesives are available providing guaranteed results for your application. Tyco Electronics is a UL-recognized label supplier.

- Labels made of polyester provide the best material for your application
- Permanent acrylic adhesive provides excellent bond to many surfaces: tubing, wiring, cables or panels
- No heat curing process required
- Excellent for barcode applications
- Multiple die-cut sizes available
- MP – Metalized Polyester
- WP – White Polyester
- Temperature Range: -40°C to 150°C

Selection Information: dimensions in inches (millimeters)

Catalog Number	Width	Height	Material	T208M	Labels per Roll
IDP-MP-191064-10-8A	.75 (19)	.25 (6.4)	Metalized Polyester	No	10,000
IDP-MP-203127-10-8A	.80 (20.3)	.50 (12.7)	Metalized Polyester	No	10,000
IDP-MP-254127-10-8A	1.0 (25.4)	.50 (12.7)	Metalized Polyester	Yes	10,000
IDP-MP-254254-10-8A	1.0 (25.4)	1.0 (25.4)	Metalized Polyester	Yes	10,000
IDP-MP-381064-10-8A	1.50 (38.1)	.25 (6.4)	Metalized Polyester	Yes	10,000
IDP-MP-381191-5-8A	1.50 (38.1)	.75 (19)	Metalized Polyester	No	5,000
IDP-MP-508254-5-8A	2.0 (50.8)	1.0 (25.4)	Metalized Polyester	Yes	5,000
IDP-MP-508318-2.5-8A	2.0 (50.8)	1.25 (31.8)	Metalized Polyester	Yes	2,500
IDP-MP-699254-5-8A	2.75 (70)	1.0 (25.4)	Metalized Polyester	Yes	5,000
IDP-MP-762381-2.5-8A	3.0 (76.2)	1.50 (38.1)	Metalized Polyester	Yes	2,500
IDP-MP-762508-2.5-8A	3.0 (76.2)	2.0 (50.8)	Metalized Polyester	Yes	2,500
IDP-MP-101635-2.5-8A	4.0 (101.6)	2.50 (63.5)	Metalized Polyester	Yes	2,500
IDP-WP-040040-25-9	.157 (4)	.157 (4)	White Polyester	No	25,000
IDP-WP-064064-25-9	.25 (6.4)	.25 (6.4)	White Polyester	No	25,000
IDP-WP-080080-10-9	.315 (8)	.315 (8)	White Polyester	No	10,000
IDP-WP-950950-10-9	.375 (9.5)	.375 (9.5)	White Polyester	Yes	10,000
IDP-WP-114040-25-9	.45 (11.4)	.157 (4)	White Polyester	No	25,000
IDP-WP-127111-10-9	.50 (12.7)	.437 (11.1)	White Polyester	Yes	10,000
IDP-WP-165102-10-9	.65 (16.5)	.40 (10.2)	White Polyester	Yes	10,000
IDP-WP-165051-25-9	.65 (16.5)	.20 (5.1)	White Polyester	No	25,000
IDP-WP-178095-10-9	.70 (17.8)	.375 (9.5)	White Polyester	No	10,000
IDP-WP-191064-10-9	.75 (19)	.25 (6.4)	White Polyester	No	10,000
IDP-WP-203127-10-9	.80 (20.3)	.50 (12.7)	White Polyester	No	10,000
IDP-WP-229364-10-9	.90 (22.9)	.25 (6.4)	White Polyester	Yes	10,000
IDP-WP-254097-10-9	1.0 (25.4)	.38 (9.7)	White Polyester	Yes	10,000
IDP-WP-254127-10-9	1.0 (25.4)	.50 (12.7)	White Polyester	Yes	10,000
IDP-WP-254254-10-9	1.0 (25.4)	1.0 (25.4)	White Polyester	Yes	10,000
IDP-WP-318064-10-9	1.25 (31.8)	.25 (6.4)	White Polyester	Yes	10,000
IDP-WP-381020-10-9	1.50 (38.1)	.08 (2)	White Polyester	Yes	10,000
IDP-WP-381064-10-9	1.50 (38.1)	.25 (6.4)	White Polyester	Yes	10,000
IDP-WP-381190-5-9	1.50 (38.1)	.75 (19)	White Polyester	No	5,000
IDP-WP-508127-10-9	2.0 (50.8)	.5 (12.7)	White Polyester	Yes	10,000
IDP-WP-508254-5-9	2.0 (50.8)	1.0 (25.4)	White Polyester	Yes	5,000
IDP-WP-508318-2.5-9	2.0 (50.8)	1.25 (31.8)	White Polyester	Yes	2,500
IDP-WP-508064-10-9	2.0 (50.8)	.25 (6.4)	White Polyester	Yes	10,000
IDP-WP-523841-1.5-9	2.06 (52.3)	3.31 (84.1)	White Polyester	Yes	1,500
IDP-WP-700254-5-9	2.75 (70)	1.0 (25.4)	White Polyester	Yes	5,000
IDP-WP-762381-2.5-9	3.0 (76.2)	1.50 (38.1)	White Polyester	Yes	2,500
IDP-WP-762508-2.5-9	3.0 (76.2)	2.0 (50.8)	White Polyester	Yes	2,500
IDP-WP-101635-2.5-9	4.0 (101.6)	2.50 (63.5)	White Polyester	Yes	2,500
IDP-WP-101165-0.85-9	4.0 (101.6)	6.5 (165)	White Polyester	Yes	900

* All labels are compatible with T312M-Printer, but only those marked "Yes" in the T208M column are compatible with T208M Printer.

Recommended

Printers

IDP-T208M-PRINTER
IDP-T312M-PRINTER

Ribbons

IDP-1330-0607-T200
IDP-1330-0607-10

Labels



ProjectMark Continuous Labels

ProjectMark (TTPA) is a durable, high strength polyester material that can be used as warning and service labels, rating plates, and a way to identify cable trays—all of which can be produced on demand.

- High tack acrylic adhesive
- Resistant to moisture/humidity
- 4 printable continuous widths in several colors
- Material comes on a 100' reel and ranges from 1.0" (25mm) to 4.0" (100mm) wide
- Standard white ProjectMark labels have a 5–7 year outdoor life
- Apply a UV protection laminate (IDP-NPVF) to provide 15 year protection
- Temperature Range: -40°C to 150°C

Standard Colors are White (WE) and Metalized Polyester (MP)

Additional colors include the following: OE = Orange, GN = Green, BE = Blue, RD = Red, BK = Black, YW = Yellow, CL = Clear

Selection Information: dimensions in inches

Catalog Number	Description	Std. Pack
IDP-TTPA100WE-10*	Continuous Polyester 100 Ft Roll - 1" Wide, White	1
IDP-TTPA100YW-10*	Continuous Polyester 100 Ft Roll - 1" Wide, White	1
IDP-TTPA200MP-10	Continuous Polyester 100 Ft Roll - 2" Wide, Metalized Poly	1
IDP-TTPA200WE-10	Continuous Polyester 100 Ft Roll - 2" Wide, White	1
IDP-TTPA300MP-10	Continuous Polyester 100 Ft Roll - 3" Wide, Metalized Poly	1
IDP-TTPA300WE-10	Continuous Polyester 100 Ft Roll - 3" Wide, White	1
IDP-TTPA400MP-10	Continuous Polyester 100 Ft Roll - 4" Wide, Metalized Poly	1
IDP-TTPA400WE-10	Continuous Polyester 100 Ft Roll - 4" Wide, White	1

*1 inch wide rolls are only available in White and Yellow.

Recommended

Printers

IDP-T208M-PRINTER*
IDP-T312M-PRINTER

Ribbons

IDP-1330-0607-10
IDP-1330-0607-T200

* Software adjustments required to use the T208M with ProjectMark. Call 866-374-9655 for support.

Insta-Mark Wire Markers



Insta-Mark Wire Marker Books & Dispensers

Insta-Mark Wire Marker Books and Dispensers offer a portable and convenient pocket-sized solution of vinyl impregnated cloth tape wire markers and self-laminating labels. Each item is packaged for Point-of-Purchase merchandising and provides an array of letters, numbers, symbols, or colors to easily identify any type of wire and/or terminal block.

Pre-Printed Marker Books (PPMB) contain 10 pages of pre-cut markers 1-1/4" long, totaling 450 wire markers with 450 matching terminal markers sized 3/16" x 3/16".

Write-On Self-Laminating Marker Books (WOMB) contain 10 pages of pre-cut self laminating markers made of .004" thick clear vinyl film, using an acrylic adhesive and mounted on a silicone release liner. The service temperature is -40°C to 93°C.

Pre-Printed Marker Dispensers (PPMD) are a portable wire marker system. Each dispenser contains 10 rolls of marker tape. Each roll contains 76 individual markers with a pre-determined length of 1-1/4" and a width of 1/4". Legends available are 0-9, A-J or the NEMA colors.

Write-On Marker Dispensers (WOMD) are a portable and disposable dispenser containing a roll of pre-cut Self-Laminating Wire Markers. Each marker has a white area available for legend inscription using a pen or pencil. The adhesive is an aggressive acrylic that is impervious to oil and water with a service temperature range of -40°C to 121°C.

Selection Information: dimensions in inches

Catalog Number	Description	Std. Pack
CPGI-PPMB-01	Insta-Mark Pre-Printed Marker Book - 0-9	10
CPGI-PPMB-02	Insta-Mark Pre-Printed Marker Book - A-Z, 1-15, +, -, /	10
CPGI-PPMB-03	Insta-Mark Pre-Printed Marker Book - 1-45	10
CPGI-PPMB-04	Insta-Mark Pre-Printed Marker Book - 1, 2, 3	10
CPGI-PPMB-05	Insta-Mark Pre-Printed Marker Book - A, B, C	10
CPGI-PPMB-06	Insta-Mark Pre-Printed Marker Book - T1, T2, T3	10
CPGI-PPMB-07	Insta-Mark Pre-Printed Marker Book - L1, L2, L3	10
CPGI-PPMB-08	Insta-Mark Pre-Printed Marker Book - 46-90	10
CPGI-PPMB-09	Insta-Mark Pre-Printed Marker Book - 10 NEMA COLORS	10
CPGI-PPMB-10	Insta-Mark Pre-Printed Marker Book - AC, DC, POS, NEG, GND,	10
CPGI-PPMB-11	Insta-Mark Pre-Printed Marker Book - Burglar Alarm	10
CPGI-PPMB-12	Insta-Mark Pre-Printed Marker Book - 0-9, L1-L3, T1-T3	10
CPGI-PPMB-13	Insta-Mark Pre-Printed Marker Book - 1-30	10
CPGI-PPMB-14	Insta-Mark Pre-Printed Marker Book - 1-45, +/-, L1-L3, T1-T3,	10
CPGI-PPMB-15	Insta-Mark Pre-Printed Marker Book - 1, 2, 3, A, B, C, L1-L3, T1-T3	10
CPGI-PPMB-16	Insta-Mark Pre-Printed Marker Book - 1-45, 46-90, A-Z, +, -, /, 0	10
CPGI-PPMB-20	Insta-Mark Pre-Printed Marker Book - Circuit Breaker (3 SET)	10
CPGI-PPMB-21	Insta-Mark Pre-Printed Marker Book - Circuit Breaker (1 SET)	10
CPGI-PPMB-22	Insta-Mark Pre-Printed Marker Book - Fire Alarm	10
CPGI-WOMB-B30	Insta-Mark Write-on Marker Book - Label Size 1.0 x 5.0	10
CPGI-WOMB-B50	Insta-Mark Write-on Marker Book - Label Size 0.5 x 1.25	10
CPGI-WOMB-B60	Insta-Mark Write-on Marker Book - Label Size 1.0 x 2.5	10
CPGI-WOMB-B75	Insta-Mark Write-on Marker Book - Label Size .75 x 1.67	10
CPGI-PPMD-0-9	Insta-Mark Preprinted Marker Dispenser 0,1,2,3,4,5,6,7,8,9	5
CPGI-PPMD-A-J	Insta-Mark Preprinted Marker Dispenser A,B,C,D,E,F,G,H,I,J	5
CPGI-PPMD-NEMA	Preprinted Marker Dispenser NEMA COLORS (Wht, Yel, Org, Red, Blu, Grn, Vio, Brn, Gry, Blk)	5
CPGI-PPMDRF-0-9	Preprinted Marker Dispenser REFILL 0,1,2,3,4,5,6,7,8,9	5
CPGI-PPMDRF-A-J	Preprinted Marker Dispenser REFILL A,B,C,D,E,F,G,H,I,J	5
CPGI-PPMDRF-NEMA	Preprinted Marker Dispenser REFILL NEMA COLORS (Wht, Yel, Org, Red, Blu, Grn, Vio, Brn, Gry, Blk)	5
CPGI-WOMD-13	Insta-Mark Write-on Marker Dispensers - Label Size .75 x3.0	5
CPGI-WOMD-16	Insta-Mark Write-on Marker Dispensers - Label Size .75 x6.0	5
CPGI-WOMD-51	Insta-Mark Write-on Marker Dispensers - Label Size .75 x1.25	5
CPGI-WOMD-52	Insta-Mark Write-on Marker Dispensers - Label Size .75 x1.75	5

Portable Marker Kit

**LM2020 PLUS Portable Hand-Held Marking Kit**

The LM2020 Plus system is an advanced portable thermal label printer. It is designed for both labeling and bar coding. The LM2020 Plus system is quick and easy to use in the field, office, or shop. The LM2020 Plus marker material and ribbon are pre-loaded into a snap-in cartridge. This allows for repeatable, error free loading into the printer.

Features

- Minimum media width of 0.125" (3.2mm). Maximum media width of 1.0" (25mm)
- 67 point size ranging from 6 point to 72 point
- 10 resident bar codes
- Alphanumeric sequencing
- Battery-operated or AC power supply-operated
- Product and ribbon comes housed in easy-to-install cartridges

Materials available

- Shrink tube wire and cable markers (White & Yellow)
- Self-laminating wrap-around wire and cable markers
- Industrial labels for tray and pipe identification

Advantages over other portable systems

- No smearing—Ink dries immediately
- One-step loading process—No separate ribbon and markers to load
- 300 dpi thermal print quality—Superior print quality compared to 9-pin dot matrix printers
- Savings—Very affordable portable thermal printing system

Selection Information: dimensions in inches

Catalog Number	Description	Std. Pack
LM2020PLUS-PRINTER-KIT	Handheld printer, protective jacket, 6 ni-cad batteries	1
LM2020PLUS-2800MAH-NICAD	LM 2020 Rechargeable Batteries	1
LM-CASE	LM 2020 Hard Sided Carrying Case	1
LM-1/8-TUBE-WE	Shrinktube 1/8" x 100" Cartridge, White #16 - #22	1
LM-1/8-TUBE-YW	Shrinktube 1/8" x 100" Cartridge, Yellow #16 - #22	1
LM-3/16-TUBE-WE	Shrinktube 3/16" x 100" Cartridge, White #12 - #18	1
LM-3/16-TUBE-YW	Shrinktube 3/16" x 100" Cartridge, Yellow #12 - #18	1
LM-1/4-TUBE-WE	Shrinktube 1/4" x 100" Cartridge, White #10 - #16	1
LM-1/4-TUBE-YW	Shrinktube 1/4" x 100" Cartridge, Yellow #10 - #16	1
LM-1/2-TUBE-WE	Shrinktube 1/2" x 100" Cartridge, White #1 - #12	1
LM-1/2-TUBE-YW	Shrinktube 1/2" x 100" Cartridge, Yellow #1 - #12	1
LM-1/2-TAPE-BK	0.5" x 40' Industrial Tape- White on Black	1
LM-1/2-TAPE-CR	0.5" x 40' Industrial Tape- Black on Clear	1
LM-1/2-TAPE-WE	0.5" x 40' Industrial Tape- Black on White	1
LM-1/2-TAPE-YW	0.5" x 40' Industrial Tape- Black on Yellow	1
LM-1-TAPE-BK	1" x 40' Industrial Tape- White on Black	1
LM-1-TAPE-CR	1" x 40' Industrial Tape- Black on Clear	1
LM-1-TAPE-WE	1" x 40' Industrial Tape- Black on White	1
LM-1-TAPE-YW	1" x 40' Industrial Tape- Black on Yellow	1
LM-1/2-VINYL-CR	0.5" x 40' Vinyl Industrial Tape- Black on Clear	1
LM-1/2-VINYL-RD	0.5" x 40' Vinyl Industrial Tape- Black on Red	1
LM-1/2-VINYL-WE	0.5" x 40' Vinyl Industrial Tape- Black on White	1
LM-1/2-VINYL-YW	0.5" x 40' Vinyl Industrial Tape- Black on Yellow	1
LM-1-VINYL-CR	1" x 40' Vinyl Industrial Tape- Black on Clear	1
LM-1-VINYL-RD	1" x 40' Vinyl Industrial Tape-Black on Red	1
LM-1-VINYL-SR	1" x 40' Vinyl Industrial Tape-Black on Silver	1
LM-1-VINYL-WE	1" x 40' Vinyl Industrial Tape-Black on White	1
LM-1-VINYL-YW	1" x 40' Vinyl Industrial Tape-Black on Yellow	1
LM-1/2-SL	Self-Lam 1" x .50" Print Area 1" x .25" 230 each. Fits #16-#22	1
LM-3/4-SL	Self-Lam 1" x .75" Print Area 1" x .375" 250 each. Fits #10-#16	1
LM-1-SL	Self-Lam 1" x 1" Print Area 1" x .375" 200 each. Fits #10-#12	1
LM-1-1/4-SL	Self-Lam 1" x 1.25" Print Area 1" x .50" 170 each. Fits #8-#12	1
LM-2-1/2-SL	Self-Lam 1" x 2.50" Print Area 1" x .75" 108 each. Fits #6-#10	1
LM-4-SL	Self-Lam 1" x 4" Print Area 1" x 1" 81 each. Fits #4-#6	1

Accessories

System Printers, Software, & Accessories

These printers have been selected to suit a range of identification requirements and offer excellent legibility and mark permanence. An extensive range of ribbons has been designed for use with the Tyco Electronics' identification products. These ribbons ensure excellent mark permanence and legibility to applicable industry specifications.



Thermal Transfer Printers

T208M Printer

T208M Printer Kit (Contains T208M-Printer & T208M-Ribbon) medium volume, 200 dpi printer. Lightweight printer with a 4.1" printhead that can print sleeves and labels. Parallel and USB ports provided.

T208M-C-Printer comes with cutter for continuous labels, such as ProjectMark.

T312M Printer

T312M Printer is a high performance, yet cost effective thermal transfer printer with a 4.1" printhead. Robust, industrial computer-driven thermal transfer printer. This 300 dpi printer has been specially designed to print the full range of Tyco Electronics' cable identification and labeling products giving the optimum in flexibility, print quality and permanence. With dual 32 bit processors this printer is ideal for high volume users.

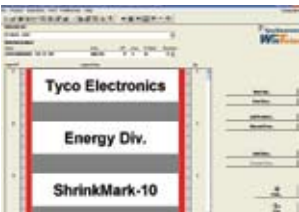
T312S-C-Printer comes with optional cutter, ideal for ProjectMark continuous labels, not recommended for ShrinkMark sleeves.



Dot-Matrix Printer

AM6310 Printer

Specifically designed by Tyco Electronics, the AM6310 is a heavy-duty, industrial dot matrix printer with a high impact 24-pin print head. Automatic media thickness detection and a high impact print head make the AM6310 the best industrial printer available for heavy gauge wire marker and tag materials, and the 24-pin print head produces high quality text printing with fast print speeds. Standard AM6310 printer models are designed to print on Tyco Electronics wire marker sleeves and dot matrix pressure sensitive label and tag products.



WinTotal Software

WinTotal software is a powerful Windows based package that makes identification marking quick and easy. The Windows environment gives access to a huge array of font options, including non-English fonts and also allows simple importing and manipulation of graphics and logos.

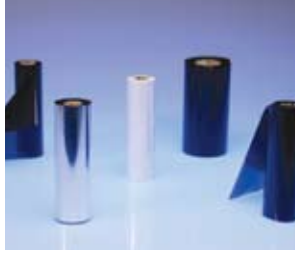
- Pre-loaded with all of Tyco Electronics identification products
- Powerful import and export functions: reads wire lists from spreadsheets, and text files
- Incremental alpha and numeric fields
- Double-sided marker printing
- Automatic or manual routing to multiple printers
- Network compatible

WinTotal USB Dongle option available - Allows software registration to be purchased once and shared among different computers simply by plugging the dongle into an available USB port.

Selection Information

Catalog Number	Description	Std. Pack
IDP-T208M-PRINTER	Medium Vol. Thermal Trans Printer Kit, 4" Print head,	1
IDP-T208M-C-PRINTER	Medium Vol. Thermal Trans Printer Kit, 4" Print head, with cutter	1
IDP-T312M-PRINTER	High Vol. Thermal Trans Printer Kit, 4" Print head, 3MB RAM	1
IDP-T312S-C-PRINTER	High Vol. Thermal Trans Printer Kit, 4" Print head, 3MB RAM, with cutter	1
IDP-AM6310-110V-PRINTER	AM-6310 Dot Matrix Printer Kit	1
IDP-WINTOTAL-SWARE	WinTotal Software	1
IDP-WINTOTAL-SWARE-DGLUS	WinTotal Software with USB Dongle	1

Accessories



Ribbons

Printer	Ribbon	Print Media
IDP-T208M-PRINTER	IDP-T208M-RIBBON	ShrinkMark sleeves & SB labels
	IDP-I330-0607-T200	TTPA & MP, WP, WV labels
	IDP-T200-RIBBON-1966	HLX-NEL cable markers
IDP-T312M-PRINTER	IDP-TMS-RJS-RIBN-4RPSCE	ShrinkMark sleeves, SB labels, HL cable markers
	IDP-I330-0607-10	TTPA & MP, WP, WV labels
IDP-AM6310-110V-PRINTER	IDP-I892BK04-RIBBON	ShrinkMark sleeves & CM-SCE cable markers

Selection Information

Catalog Number	Description	Std. Pack
IDP-T208M-RIBBON	Ribbon for T208M printer, use with heat-shrink sleeves & SB labels, 242' (74M)	1
IDP-I330-0607-T200	Ribbon for T200 printers, use with TTPA, MP, WP, WV labels, 242' (74M)	1
IDP-T200-RIBBON-1966	Ribbon for T200 printers, use with HLX-NEL cable markers, 242' (74M)	1
IDP-TMS-RJS-RIBN-4RPSCE	T300-T400 Series Ribbon for heat-shrink sleeves & SB labels, 4.33" wide, 984' (300M)	1
IDP-I330-0607-10	T300-T400 Series Ribbon for TTPA, MP, WP, WV labels, 4.33" wide, 984' (300M)	1
IDP-I892BK04-RIBBON	AM-6310-Ribbon designed for heat-shrink sleeves and CM-SCE cable markers	1



Accessories

Catalog Number	Description	Std. Pack
IDP-T200-SPINDLE	Feeds TTPA, MP, WP, SB (standard), and other labels into T208M	1
IDP-PAYOFF-CRADEL	Feeds SHRINKMARK-18/12/10 (2.5K box) and -2/250/1000 (1K box) into T208M	1
IDP-T200-CASE	Hard-sided gray case with foam interior, ideal for travel with T208M Printer	1
CPGI-GLOW-GUN	Flameless heat gun for shrinking ShrinkMark sleeves or thin wall tubing	6

CONNECTORS & TERMINALS



Compression Connectors

Copper Compression Terminals.....	107
Copper Compression Splices.....	109

ShearBolt Connectors

Aluminum ShearBolt Connectors.....	110
Copper ShearBolt Connectors.....	112

Compression Connectors



Copper Compression Terminals

- Uses industry-standard tooling for simple installation
- Industry-standard color coding system simplifies die selection
- Chamfered connector end allows cable to be inserted easily
- One-piece, seamless construction from electrolytic tough pitch (ETP) copper for superior electrical performance and mechanical operation
- Closed barrel transition design for protection from moisture and contaminants
- Tin-plated for corrosion resistance and durability, and tempered for easy crimping

Copper compression terminals are ideally suited for secondary power distribution in buildings, power plants, electrical equipment, and industrial applications. Connectors can be used on applications up to 35 kV, and meet the requirements of UL486A and CSA C22.2 No. 65-95 when applied with approved die sets. (See Instruction Sheet #408-8869 for approved listing of die sets.)

Copper compression terminals are available to accommodate a range of cable sizes from 6 AWG through 1,000 MCM and are designed for terminating concentric, compact, or standard stranded copper conductors. These terminals are offered in one-hole terminals from 6 AWG through 1,000 MCM with either a standard or long barrel. A two-hole NEMA terminal with a long barrel is also available for 4 AWG through 1,000 MCM.

Compression crimping forms the terminal barrel and conductor into a strong, almost homogeneous unit, producing excellent conductivity, low temperature rise, and outstanding resistance to oxidation and corrosion.

Physical and Electrical Properties

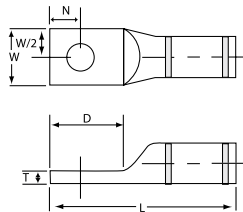
Material:	ETP copper alloy C11000
Plating:	Electro tin plate
Heat treating:	Soft tempered
Voltage Rating:	For applications up to 35 kV consult shielded cable manufacturers stress relief instructions.

Agency approvals (when crimped with the approved die sets): Listed by Underwriters Laboratories, Inc. File No. E13288, Compression terminal connectors comply with the requirements of UL486A and CSA C.22.2 NO. 65-93.

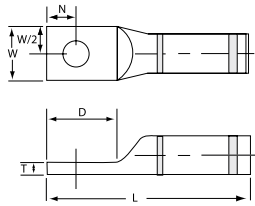
Compression Connectors

Copper Compression Terminals continued

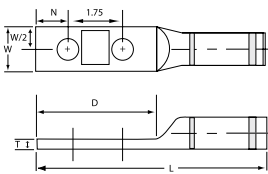
Selection Information: dimensions shown in inches (millimeters)



Catalog Number	Conductor	Stud Size	Dimensions					Color Code
			L	W	T	D	N	
One Hole, Short Barrel								
1099898-1	6 STR.	1/4	1.5	0.45	0.08	0.56	0.27	blue
1099898-2	4 STR.	1/4	1.5	0.50	0.09	0.56	0.27	gray
1099898-3	3 STR.	5/16	1.6	0.57	0.09	0.70	0.34	white
1099898-4	2 STR.	5/16	1.6	0.61	0.11	0.70	0.34	brown
1099898-5	1 STR.	1/4	1.6	0.68	0.10	0.56	0.27	green
1099898-6	1/0 STR.	5/16	1.7	0.74	0.12	0.70	0.34	pink
1099898-7	1/0 STR.	1/2	2.1	0.88	0.09	1.08	0.53	pink
1099898-8	2/0 STR.	3/8	1.9	0.83	0.12	0.83	0.41	black
1099898-9	3/0 STR.	1/2	2.2	0.91	0.13	1.08	0.53	orange
1-1099898-0	4/0 STR.	1/2	2.2	1.02	0.14	1.08	0.53	purple
1-1099898-1	250 MCM	1/2	2.4	1.11	0.16	1.08	0.53	yellow
1-1099898-2	350 MCM	1/2	2.5	1.27	0.18	1.08	0.53	red
1-1099898-3	500 MCM	1/2	3.2	1.54	0.23	1.30	0.65	brown
1-1099898-4	750 MCM	5/8	4.0	1.88	0.27	1.94	0.88	black
1-1099898-5	1000 MCM	5/8	4.9	2.16	0.32	2.12	0.94	white



One Hole, Long Barrel								
1099899-1	6 STR.	1/4	1.9	0.45	0.08	0.56	0.34	blue
1099899-2	4 STR.	1/4	1.9	0.50	0.09	0.56	0.38	gray
1099899-3	3 STR.	5/16	2.3	0.57	0.09	0.70	0.38	white
1099899-4	2 STR.	5/16	2.3	0.60	0.11	0.75	0.38	brown
1099899-5	1 STR.	5/16	2.4	0.68	0.10	0.75	0.27	green
1099899-6	1/0 STR.	5/16	2.4	0.74	0.12	0.75	0.27	pink
1099899-7	1/0 STR.	1/2	2.7	0.75	0.11	1.08	0.53	pink
1099899-8	2/0 STR.	3/8	2.7	0.82	0.12	0.88	0.44	black
1099899-9	3/0 STR.	1/2	2.9	0.91	0.13	1.08	0.53	orange
1-1099899-0	4/0 STR.	1/2	3.0	1.00	0.14	1.08	0.53	purple
1-1099899-1	250 MCM	1/2	3.2	1.09	0.16	1.12	0.56	yellow
1-1099899-2	300 MCM	1/2	3.6	1.19	0.16	1.12	0.56	white
1-1099899-3	350 MCM	1/2	3.7	1.28	0.18	1.12	0.56	red
1-1099899-4	400 MCM	5/8	4.2	1.38	0.19	1.50	0.75	blue
1-1099899-5	500 MCM	5/8	4.4	1.52	0.23	1.50	0.75	brown
1-1099899-6	500 MCM	1/2	4.2	1.54	0.23	1.30	0.65	brown
1-1099899-7	600 MCM	5/8	5.2	1.69	0.27	1.75	0.88	green
1-1099899-8	750 MCM	5/8	5.4	1.89	0.27	1.94	0.88	black
1-1099899-9	1000 MCM	5/8	6.0	2.17	0.32	2.12	0.94	white



Two-Hole NEMA, Long Barrel								
1099939-1	4 STR.	1/2	4.4	0.83	0.11	3.00	0.62	gray
1099939-2	3 STR.	1/2	4.4	0.83	0.11	3.00	0.62	white
1099939-3	2 STR.	1/2	4.5	0.82	0.11	3.00	0.62	brown
1099939-4	1 STR.	1/2	4.7	0.80	0.09	3.00	0.62	green
1099939-5	1/0 STR.	1/2	4.7	0.75	0.12	3.00	0.62	pink
1099939-6	2/0 STR.	1/2	4.8	0.82	0.12	3.00	0.62	black
1099939-7	3/0 STR.	1/2	4.8	0.90	0.12	3.00	0.62	orange
1099939-8	4/0 STR.	1/2	5.0	1.00	0.14	3.00	0.62	purple
1099939-9	250 MCM	1/2	5.0	1.09	0.16	3.00	0.62	yellow
1-1099939-0	300 MCM	1/2	5.4	1.18	0.16	3.00	0.62	white
1-1099939-1	350 MCM	1/2	5.4	1.27	0.18	3.00	0.62	red
1-1099939-2	500 MCM	1/2	5.7	1.53	0.23	3.00	0.62	brown
1-1099939-3	600 MCM	1/2	6.2	1.71	0.27	3.00	0.62	green
1-1099939-4	750 MCM	1/2	6.5	1.89	0.27	3.00	0.62	black
1-1099939-5	1000 MCM	1/2	6.8	2.16	0.33	3.00	0.62	white

Compression Connectors



Copper Compression Splices

- Uses industry-standard tooling for simple installation
- Industry-standard color coding system simplifies die selection
- Chamfered connector end allows cable to be inserted easily
- One-piece, seamless construction from electrolytic tough pitch (ETP) copper for superior electrical performance and mechanical operation
- Tin-plated for corrosion resistance and durability, and tempered for easy crimping

Copper compression splices are ideally suited for secondary power distribution in buildings, power plants, electrical equipment, and industrial applications. Connectors can be used on applications up to 35 kV, and meet the requirements of UL486A and CSA C22.2 No. 65-95 when applied with approved die sets. (See Instruction Sheet #408-8969 for approved listing of die sets.)

Copper compression splices are available to accommodate a range of cable sizes from 6 AWG through 1,000 MCM and are designed for splicing concentric, compact, or standard stranded copper conductors. These splices are offered from 6 AWG through 1,000 MCM with either a standard or long barrel.

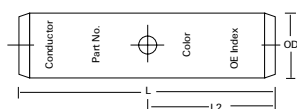
Compression crimping forms the splice and conductor into a strong, almost homogeneous unit, producing excellent conductivity, low temperature rise, and outstanding resistance to oxidation and corrosion.

Physical and Electrical Properties

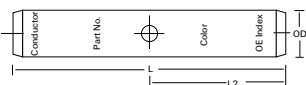
Material: ETP copper alloy C11000
 Plating: Electro tin plate
 Heat treating: Soft tempered
 Voltage rating: For applications up to 35 kV
 Consult shielded cable manufacturers stress relief instructions.

Agency approvals (when crimped with the approved die sets): Listed by Underwriters Laboratories, Inc. File No. E13288, Compression splice connectors comply with the requirements of UL486A and CSA C.22.2 NO. 65-93.

Selection Information: dimensions shown in inches (millimeters)



Catalog Number	Conductor	Length (L)	(L/2)	Outside Diameter(D)	Color Code
Standard Barrel Splice					
1443402-1	#6 STR	1.75	0.83	0.292	Blue
1443402-2	#4 STR	2.00	0.96	0.340	Gray
1443402-3	#3 STR	2.09	1.00	0.377	White
1443402-4	#2 STR	2.09	1.00	0.418	Brown
1443402-5	#1 STR	2.09	1.00	0.462	Green
1443402-6	1/0 STR	2.09	1.00	0.515	Pink
1443402-7	2/0 STR	2.18	1.05	0.583	Black
1443402-8	3/0 STR	2.32	1.11	0.618	Orange
1443402-9	4/0 STR	2.32	1.12	0.691	Purple
1-1443402-0	250 MCM	2.50	1.19	0.753	Yellow
1-1443402-1	300 MCM	2.50	1.19	0.815	White
1-1443402-2	350 MCM	2.62	1.25	0.844	Red
1-1443402-3	400 MCM	2.75	1.31	0.953	Blue
1-1443402-4	500 MCM	3.15	1.50	1.064	Brown
1-1443402-5	600 MCM	3.25	1.55	1.185	Green
1-1443402-6	750 MCM	3.75	1.80	1.302	Black
1-1443402-7	1000 MCM	4.26	2.06	1.504	White



Long Barrel Splice					
1443403-1	#6 STR	2.41	1.16	0.292	Blue
1443403-2	#4 STR	2.41	1.16	0.340	Gray
1443403-3	#3 STR	2.53	1.22	0.377	White
1443403-4	#2 STR	2.65	1.28	0.418	Brown
1443403-5	#1 STR	2.91	1.41	0.462	Green
1443403-6	1/0 STR	2.91	1.41	0.515	Pink
1443403-7	2/0 STR	3.15	1.53	0.583	Black
1443403-8	3/0 STR	3.15	1.53	0.618	Orange
1443403-9	4/0 STR	3.39	1.63	0.691	Purple
1-1443403-0	250 MCM	3.39	1.63	0.753	Yellow
1-1443403-1	300 MCM	4.13	2.00	0.815	White
1-1443403-2	350 MCM	4.13	2.00	0.844	Red
1-1443403-3	400 MCM	4.38	2.13	0.953	Blue
1-1443403-4	500 MCM	4.62	2.23	1.064	Brown
1-1443403-5	600 MCM	5.50	2.67	1.185	Green
1-1443403-6	750 MCM	5.88	2.86	1.302	Black
1-1443403-7	1000 MCM	6.12	2.96	1.504	White



ShearBolt Connectors



Aluminum ShearBolt Connectors

#2 AWG Compact to 1000 kcmil Standard

Tyco Electronics' new line of Aluminum ShearBolt connectors are range-taking mechanical connectors. Just six connectors will accommodate a wide range of aluminum and copper conductors from #2 AWG compact stranded to 1000 kcmil standard stranded class B. The primary application of Aluminum ShearBolt connectors is for underground splices up to 35kV.

ShearBolt connectors are ideally suited for aluminum to aluminum, aluminum to copper and copper to copper applications making them the universal connector solution. Please refer to test report matrix.

The only tool required to install the connector is a standard ratchet wrench with the appropriate sized hexagonal sockets. The connector design incorporates shear head bolts, which ensures that the correct torque is applied to each bolt and consequently the optimal contact force is generated to minimize connection resistance. A holding tool is recommended to avoid core bending of conductors and can be ordered from Tyco Electronics (#188072-000).

The Tyco Electronics cordless impact wrench (#CA7469-000) can also be used to install the connector. This convenient and quick tool has been tested and qualified to install ShearBolt connectors.

The solid center stop (available on certain sizes) inside the connector ensures proper conductor positioning and eliminates oil leakage when connecting oil impregnated conductors.

Two removable inserts in the connector body centralize smaller conductor sizes. For larger sizes, inserts are not required and are easily removed with a standard screwdriver.

ShearBolt connectors are only available from Tyco Electronics. They meet the electrical requirements (Class A) of ANSI C119.4-2004 and exceed the mechanical requirements of a class 3 connector by a large margin of safety.

ShearBolt connectors are designed to be compatible with Tyco Electronics' Raychem brand cable accessories and insulation products. For a complete list of cable accessories please visit our web site, <http://energy.tycoelectronics.com>. For other applications, please consult the manufacturer's installation instructions for compatibility.

Feature	Advantage	Benefit
Wide Application Range	Only six connectors needed to accommodate all cable sizes from #2 AWG compact strand to 1,000 kcmil standard stranded	Reduces inventory and prevents accidental use of the wrong connector
Patented hexagonal shear head bolts	Installs with simple ratchet-type socket wrench	Installs easily and quickly in confined areas
No crimp tooling or dies required	Installs easily using readily available tool	Ease of installation. Installation tool is no longer a source of failure. Reduces tool and die inventory, maintenance and cost
Compact, smooth body design	Compatible with Raychem brand heat-shrink and cold-applied products	An engineered system providing years of trouble-free performance
Torque-controlled shear head bolts	Sheared head gives positive indication of correct installation	Low contact resistance gives superior electrical performance
Heavy-duty design	Connector bodies are made of high strength, tin-plated aluminum alloy	Provides long service life under normal operation conditions with reserve capacity for emergency loading conditions
Centering inserts for small diameter conductors	Properly positions small conductors for proper connection	Minimizes voltage stresses at transition from connector body to cable insulation
Knurled inner bore	Unique profile breaks through oxides and grips conductor strands	Generates low contact resistance and increases conductor pullout rating
Solid center stop	Eliminates oil leakage and ensures proper conductor position	Accommodates transition applications from polymeric to oil impregnated conductors

ShearBolt Connectors

Selection Information: dimensions shown in inches (millimeters)

Catalog Number	Conductor Range	OD Range	Length	Connector OD	Stop
ASBS-2-3/0	2 AWG compact stranded to 3/0 AWG standard stranded	.268 - .470 (6.8 - 11.9mm)	2.5 (65mm)	.95 (24mm)	Disc
ASBS-2-350	2 AWG compact stranded to 350 kcmil standard stranded	.268 - .681 (6.8 - 17.3mm)	3.9 (100mm)	1.22 (31mm)	Solid
ASBS-3/0-500	3/0 AWG compact stranded to 500 kcmil standard stranded	.423 - .813 (10.7 - 20.6mm)	4.9 (125mm)	1.3 (34mm)	Disc
ASBS-500-750	500 kcmil compact stranded to 750 kcmil standard stranded	.736 - .998 (18.7 - 25.3mm)	6 (152mm)	1.52 (39mm)	Solid
ASBS-350-750	350 kcmil compact stranded to 750 kcmil standard stranded	.616 - .998 (15.6 - 25.3mm)	6.7 (170mm)	1.67 (42.5mm)	Solid
ASBS-600-1000	600 kcmil compact stranded to 1000 kcmil standard stranded	.813 - 1.152 (20.6 - 29.2 mm)	8 (203mm)	1.75 (44.4mm)	Solid

Please request Data Sheet # 1654972 for our line of Copper ShearBolt connectors.

Application Information

Catalog Number	Installation Instruction Number	Socket Size (inches)	Test Number	Conductor Combination
ASBS-2-3/0	408-8990	1/2	Note 1	Note 1
ASBS-2-350	408-8990	11/16	502-47292(I)	4/0 kcmil CU to 350 kcmil AAC
			502-47300(I)	350 kcmil AAC to 350 kcmil AAC
			502-47340(I)	350 kcmil CU to 350 kcmil CU
ASBS-3/0-500	408-8990	3/4	502-47331(I)	500 kcmil AAC to 500 kcmil AAC
			502-47331(I)	500 kcmil CU to 500 kcmil CU
ASBS-350-750	408-8990	7/8	502-47329(I)	750 kcmil AAC to 750 kcmil AAC
ASBS-500-750	408-8990	3/4	502-47288(I)	500 kcmil CU to 750 kcmil AAC
			502-47294(I)	750 kcmil AC to 750 kcmil AAC
ASBS-600-1000	408-8990	7/8	502-47289(I)	750 kcmil CU to 1000 kcmil AAC
			502-47344(I)	1000 kcmil CU to 1000 kcmil CU
			502-47305(I)	1000 kcmil AAC to 1000 kcmil AAC

Note 1: This part number was not tested, as ANSI C119.4 allows a smaller size connector of the same design to be added without additional testing.

Please contact your Tyco Electronics representative for conductor sizes or types not listed in this catalog.

ShearBolt Connectors



Copper ShearBolt Connectors 2/0 AWG Compact to 750 kcmil Compact

Tyco Electronics' line of Copper ShearBolt connectors are range-taking, mechanical connectors that will accommodate a wide range of copper cables from 2/0 AWG compact stranded to 750 kcmil compact stranded. The primary application is for underground splices up to 35 kV.

The tool required to install the connector is a standard ratchet wrench with hexagonal sockets. The connector design incorporates shear head bolts, which ensures that the correct torque is applied to each bolt and consequently to the end of each conductor. A holding tool is recommended to avoid core bending of conductors and can be ordered separately (#188072-000).

The Tyco Electronics cordless impact wrench (#CA7469-000) can also be used to install the connector. This tool offers convenience and speed and has been tested and qualified to install ShearBolt connectors. It eliminates the need for a holding tool. Please refer to accessory and tool section for ordering information.

The connector is supplied with two copper inserts assembled into the connector body to center small conductor sizes. For larger sizes, inserts are not required and must be removed with a standard screwdriver. Please see the installation table for details. An oxide-inhibiting joint compound is factory-applied in the barrel of the connector to provide low initial contact resistance, seal out air and moisture, prevent oxidation/corrosion, and maintain a reliable connection for the life of the installation.

The connectors have been electrically tested to the class A requirements of ANSI C119.4 and mechanically rated at a pull out force of 2300 lbs, for the 2/0 AWG to 500 kcmil version and 3000 lbs, for the 300 kcmil to 750 kcmil version. Engineering Test Reports are available upon request.

Copper ShearBolt connectors have an impermeable oil block for connecting paper-insulated cables.

Product Selection Guide

Selection Information: dimensions shown in inches (centimeters)

Catalog Number	Cable Range	Conductor OD Range	Length	OD	Connector Type
CSBS-20C-500C-SOS (solid oil stop)	2/0 AWG compact to 500 kcmil compact	.376 to .736 (0.95 cm to 1.87 cm)	4 (10.10 cm)	1.2 (3.05 cm)	Center cable block, impermeable to oil, recommended for oil impregnated cables
CSBS-300C-750C-SOS (solid oil stop)	300 kcmil compact to 750 kcmil compact	.570 to .945 (1.45 cm to 2.40 cm)	5.00 (12.70 cm)	1.45 (3.68 cm)	Center cable block, impermeable to oil, recommended for oil impregnated cables

Installation

Copper ShearBolt connectors use four brass shear head bolts, two on each side of the center stop. A torque wrench is not required. The only tool required is a standard ratchet wrench with a hexagonal socket.* Refer to the following installation table.

Catalog Number	Installation Sheet Number	Socket Size	Application Guide
CSBS-20C-500C-SOS	408 -8894	11/16	Remove inserts for cable sizes equal to or greater than 300 kcmil compact.
CSBS-300C-750C-SOS	408 -8863	3/4	Remove inserts for cable sizes equal to or greater than 500 kcmil compact.

Engineering Test Information

#502-47260 (300 kcmil compact) - CSBS-300C-750C

#502-47257 (750 kcmil compact) - CSBS-300C-750C

#502-47265 (500 kcmil compact) - CSBS-20C-500C

Available upon request

Please contact your Tyco Electronics representative for conductor sizes or types not listed in this catalog.

* Ask about the new cordless impact wrench (RPN# CA7469-000), specially designed for quick and easy installation.

ACCESSORIES & TOOLS



Accessories

Cable Preparation Kit	.115
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Splicing Accessories

HV-BRAID Ground Braid	.115
HVS-MESH Shielding Mesh	.116
HVS-GC Grounding Clamps	.116
HVS-SHIM Heat-Shrinkable Shim Kits (5-35 kV)	.117
HVS-EG External Grounding	.118
HVS-LR Lead Sheath Repair Kits	.118

Termination Accessories

BRKT-SS Cable Mounting Brackets	.119
EHVT-BRKT High Voltage Cable Mounting Brackets	.119
EHVT-BP Cable Mounting Base Plate	.120
EAKT-1520 Mounting Kits	.120
MOD-S Skirts	.121

Torches & Heat Guns

Heat Guns	.122
Torches	.123
Torch Accessories	.124
Torch Kits	.124

Tools

Impact Tools	.125
Wire Strippers	.125
Wire Cutters	.126
All-Purpose Tools	.126

Accessories



Cable Preparation Kit P63

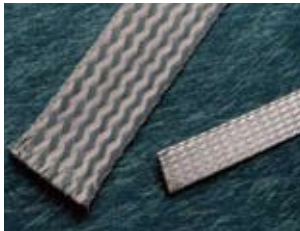
- P63 cable preparation kits can be used with all Tyco Electronics cable accessories
- Use P63 kits to clean and abrade cable insulation

Selection Information

Catalog Number	Std. Pack (kits/box)
P63	12

Ordering Information

1. One kit contains six solvent wipes, six dry wipes and three strips of abrasive paper.
2. For splices, the number of prep kits vary depending upon size of cable and type of splice. For terminations, one prep kit will clean three phases (one 3/C termination or three 1/C terminations).
3. Solvent wipes contain PT Technologies type PF cleaner.



HV-BRAID Ground Braid

HV-Braid is tinned copper braid, solder-blocked for use with Tyco Electronics HVS and HVT kits.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Braid Size (AWG)	Length of Moisture-Blocked Braid	Standard Pkg. (pcs/box)
HV-BRAID-8-1520	#8	60 (1524)	3
HV-BRAID-6-1520	#6	60 (1524)	3
HV-BRAID-4-1520	#4	60 (1524)	3

Ordering Information

Order shielding mesh based on braid size.

Accessories



HVS-MESH Shielding Mesh

HVS-MESH is used in conjunction with high-voltage ground braids to provide shield continuity when splicing shielded power cables.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Width	Length	Standard Pkg
HVS-MESH-2-5000	2 (51)	16 ft. (4.8)	4 rolls/box

Ordering Information

1. Order shielding mesh based on cable diameter and length of cable to be covered.
2. To apply shielding mesh, half-lap around cable.



HVS-GC Grounding Clamps

HVS-GC are used for securing ground braids when splicing or terminating power cables.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Use Range	Standard Pkg.
HVS-GC-0.5	0.5-1.0 (13-25)	100 pieces/box
HVS-GC-1.0	1.0-2.0 (25-51)	100 pieces/box
HVS-GC-1.5	1.5-3.0 (38-76)	50 pieces/box
EPPA-034-E	0.7-1.1 (17-29)	
EPPA-034-F	1.2-1.5 (30-39)	
EPPA-034-G	1.6-2.4 (40-60)	
EPPA-034-H	2.0-3.0 (50-75)	
EPPA-034-L	2.3-3.3 (57- 85)	

Ordering Information

1. Order ground clamps based on cable diameter.
2. Confirm size with use range.

Accessories



HVS-SHIM

Heat-Shrinkable Shim Kits (5-35 kV)

Use HVS shim kits to increase the insulation diameter of a polymeric cable, allowing it to fit in the use range of a standard splice kit. For use on copper tape, LC shield, wire shield, lead sheath, UniShield, and jacketed/unjacketed concentric neutral cables.

Follow these steps to select the appropriate shim kit

1. Verify that the insulation diameters of the two cables to be spliced do not fall within the insulation range of any standard splice kit.
2. Select the splice kit that fits the larger of the two cables within the kit's insulation-diameter use range. If the larger cable fits in more than one kit, choose the smaller kit.
3. Determine the minimum cable insulation diameter for the kit and find that value in the first column below. Example: An HVS-1523S kit has a cable insulation range of 1.10–1.60 inches. Therefore, the minimum cable insulation diameter for this kit is 1.10 inches.
4. In the second column, find the insulation diameter range in which the smaller cable falls. Note: If the smaller cable does not fit within any of the specified ranges in the second column, a standard shim cannot be used for your application. Contact your local Tyco Electronics representative for more information.
5. In the third column, find the correct HVS-SHIM kit to order.

Find the kit's minimum cable insulation diameter in this column:	Find the smaller cable's insulation diameter range in this column:	This is the HVS-SHIM kit to order:
0.80 (20)	0.60–0.80 (15–20)	HVS-SHIM-1
0.85 (22)	0.65–0.85 (17–22)	HVS-SHIM-1
0.90 (23)	0.70–0.90 (18–23)	HVS-SHIM-1
0.95 (24)	0.80–0.95 (20–24)	HVS-SHIM-1
1.00 (25)	0.85–1.00 (22–25)	HVS-SHIM-1
1.05 (27)	0.90–1.05 (23–27)	HVS-SHIM-1
	0.70–0.90 (18–23)	HVS-SHIM-2
1.10 (28)	0.90–1.10 (23–28)	HVS-SHIM-3
	0.70–0.90 (18–23)	HVS-SHIM-4
1.15 (29)	0.95–1.15 (24–29)	HVS-SHIM-3
	0.80–0.95 (20–24)	HVS-SHIM-4
1.20 (30)	1.00–1.20 (25–30)	HVS-SHIM-3
	0.85–1.00 (22–25)	HVS-SHIM-4
1.25 (32)	1.10–1.25 (28–32)	HVS-SHIM-3
	0.95–1.10 (24–28)	HVS-SHIM-4
1.30 (33)	1.15–1.30 (29–33)	HVS-SHIM-3
	1.00–1.15 (25–29)	HVS-SHIM-4
1.35 (34)	1.20–1.35 (30–34)	HVS-SHIM-3
	1.00–1.20 (25–30)	HVS-SHIM-5
1.40 (36)	1.25–1.40 (32–36)	HVS-SHIM-3
	1.05–1.25 (27–32)	HVS-SHIM-5
1.45 (37)	1.30–1.45 (33–37)	HVS-SHIM-3
	1.15–1.30 (29–33)	HVS-SHIM-5
1.50 (38)	1.35–1.50 (34–38)	HVS-SHIM-3
	1.20–1.35 (30–34)	HVS-SHIM-5
1.55 (39)	1.35–1.55 (34–39)	HVS-SHIM-6
1.60 (41)	1.40–1.60 (36–41)	HVS-SHIM-6
1.65 (42)	1.45–1.65 (37–42)	HVS-SHIM-6
1.70 (43)	1.50–1.70 (38–43)	HVS-SHIM-6
1.75 (44)	1.55–1.75 (39–44)	HVS-SHIM-6
1.80 (46)	1.60–1.80 (41–46)	HVS-SHIM-6

Ordering Information

1. Select the appropriate shim kit catalog number based on actual cable dimensions and Tyco Electronics splice kit use range.
2. Shim kits are supplied separately. Order Tyco Electronics splice kit and shim kit separately.
3. Shim kits do not contain connectors. Order a size-reducing connector separately.
4. Contact your local Tyco Electronics sales engineer or representative for cable sizes not listed in the selection table.
5. Standard package: 1 kit/box.

Accessories



HVS-EG

External Grounding

- Use HVS-EG to externally ground a Tyco Electronics splice.
- For use with splices when installing an external ground.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Insulation Diameter (Min.-Max.)	Length of Moisture-Blocked Braid	Braid Size (AWG)
1/C cables			
HVS-EG-1	0.30-1.25 (8-32)	24 (610)	#8
HVS-EG-2	1.00-2.15 (25-55)	24 (610)	#6
HVS-EG-3	1.55-3.40 (39-86)	24 (610)	#4
3/C cables			
HVS-EG-3-1	0.30-1.25 (8-32)	36 (914)	#8
HVS-EG-3-2	1.00-2.15 (25-55)	36 (914)	#6
HVS-EG-3-3	1.55-3.40 (39-86)	36 (914)	#4

Ordering Information

1. Select the appropriate catalog number based on the insulation diameter.
2. Kits include ground braid and sealant to make an external ground and/or shield interrupt with a Tyco Electronics splice kit.
3. Standard package: HVS-EG: 3 kits/box, HVS-EG-3: 1 kit/box.



HVS-LR

Lead Sheath Repair Kits for PILC Cable

The HVS-LR series kit offers a simple method of repairing lead sheath damage on paper-insulated, lead-covered (PILC) cables.

- Combines the strength and durability of Tyco Electronics' Raychem MBSM wraparound sleeve with an effective oil-resistant sealing mastic.
- Tested to and meet the following load-cycling and pressure test requirements:

Product Performance

Test	Result
Current cycling at 110°C conductor temperature for 90 cycles (5 hours on, 3 hours off)	Pass
Applied pressure	15 psi
Maximum continuous conductor temperature	110°C

Selection Information: dimensions in inches (millimeters)

Catalog Number	Nominal Sleeve Length	Application Use Range (Min.-Max.)
HVS-LR-75/15-600	24 (600)	0.65-2.65 (17-67)
HVS-LR-75/15-1200	48 (1200)	0.65-2.65 (17-67)
HVS-LR-160/42-600	24 (600)	1.80-5.70 (46-144)
HVS-LR-160/42-1200	48 (1200)	1.80-5.70 (46-144)
HVS-LR-200/50-600	24 (600)	2.15-7.10 (55-180)
HVS-LR-200/50-1200	48 (1200)	2.15-7.10 (55-180)

Ordering Information

1. Be sure to look at both the cable jacket diameter and the lead sheath diameter when selecting the HVS-LR kit.
2. Standard package: 3 kits/box.
3. Related test report: EDR-5243.

Accessories



BRKT-SS Cable Mounting Brackets

BRKT-SS cable mounting brackets are versatile and may be used outdoors. The brackets are constructed of stainless steel and include all hardware.

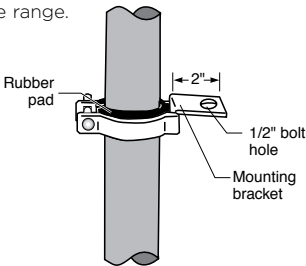
- Suitable for use on all types of cables
- For use with terminations or other applications where cable mounts are needed
- Includes a mounting bracket and rubber pad

Selection Information: dimensions in inches (millimeters)

Catalog Number	Cable Range O.D. Range
BRKT-1-SS	0.80-1.25 (20-32)
BRKT-2-SS	1.10-1.50 (28-38)
BRKT-3-SS	1.45-1.95 (37-50)
BRKT-4-SS	1.80-2.40 (46-61)

Ordering Information

1. Standard package: 1 bracket/box
2. Order brackets based on cable diameter, confirm size with use range.
3. Related test report: NCTR-99-065



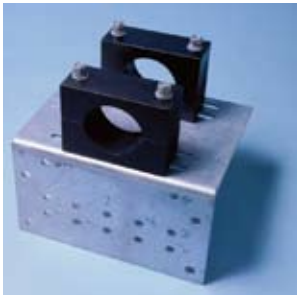
EHVT-BRKT High Voltage Cable Mounting Brackets

EHVT-BRKT high voltage cable mounting brackets are made from a high density UV resistant black polymer and are designed to support larger diameter cables. The brackets will be bolted to appropriate supporting steel work or cross-arms, using the galvanized steel fixing hardware, including two seven inch long bolts, with nuts and washers to suit. Supporting steelwork will need two holes drilled with centers five and one half inches apart to accept the "nuts, bolts and washers". Seven sizes accommodate cable diameters from 1.75" thru 4.25".

Selection Information: dimensions in inches (millimeters)

Catalog Number	Min. Cable O.D.
EHVT-BRKT-2.00IN	1.75-2.00 (44-51)
EHVT-BRKT-2.25IN	2.00-2.25 (51-57)
EHVT-BRKT-2.50IN	2.25-2.50 (57-63)
EHVT-BRKT-2.75IN	2.50 - 2.75 (63-70)
EHVT-BRKT-3.00IN	2.75 - 3.00 (70-76)
EHVT-BRKT-3.50IN	3.25-3.50 (83-89)
EHVT-BRKT-3.75IN	3.50-3.75 (89-95)
EHVT-BRKT-4.00IN	3.75-4.00 (95-102)
EHVT-BRKT-4.25IN	4.00-4.25 (102-108)

Accessories



EHVT-BP
High Voltage Cable Mounting Base Plate

The base plate is a galvanized steel plate intended for use with Tyco Electronics heat-shrink EHVT/ GHVT terminations together with EHVT-BRKT support brackets. The plate comes suitably drilled for attaching to supporting steelwork or cross arms that have been drilled to accept steelwork for various porcelain insulator type terminations. It is especially useful when retrofitting old porcelain termination with heat-shrink terminations. It has suitable spaced slots to accommodate two EHVT-BRKTs.

Selection Information: dimensions in inches (millimeters)

Catalog Number

EHVT-BP	1 base plate per box
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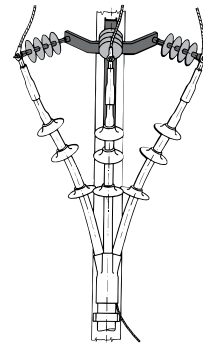
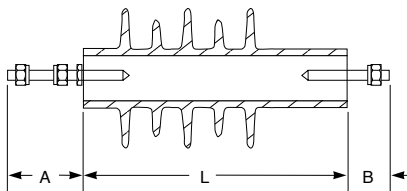
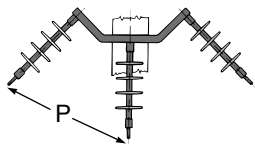


EAKT-1520
Mounting Kits

Tyco Electronics offers a mounting bracket and support insulators for poletop mounting of Tyco Electronics high voltage terminations. The EAKT-1520 series mounting kits provide a galvanized steel bracket, three insulators for mounting outdoor terminations, and installation instructions.

The bracket is dip galvanized to meet outdoor requirements (BS 729). The insulators are lightweight and shatterproof. They combine a strong and flexible polymeric core with Tyco Electronics' proven high-voltage, nontracking material.

- Used with Tyco Electronics' Raychem high-voltage outdoor termination kits (15–35 kV).
- Includes a galvanized steel T-bracket, three insulators for poletop mounting, and installation instructions.



Selection Information: dimensions in inches (millimeters)

Catalog Number	Voltage Class (kV)	Insulator Dimensions				No. of Skirts	Min. Creepage Length	Mechanical Capabilities	
		P	L	A	B			Cantilever	(ft. lb) Torque M12
EAKT 1521	15	12.5 (310)	7.6 (195)	2.6 (65)	1.4 (35)	5	15.4 (390)	184	37
EAKT 1523	25	17.0 (430)	12.0 (305)	2.6 (65)	1.4 (35)	9	26.0 (660)	184	37
EAKT 1524	35	22.0 (560)	15.0 (380)	2.6 (65)	1.4 (35)	11	43.3 (1100)	516	37

Ordering Information

1. Standard package: 1 kit/box.
2. Related test reports: UVR-8150
UVR-8166

Accessories



MOD-S Skirts

MOD-S Skirts are used with Tyco Electronics high voltage termination kits for outdoor applications.

Selection Information: dimensions in inches (millimeters)

Catalog Number	Cable Insulation Diameter (Min.-Max.)	Standard Package (Skirts/Box)
MOD-S1-314-Skirts	0.35-0.55 (9-14)	6
MOD-S2-325-Skirts	0.60-1.25 (15-32)	6
MOD-S3-336-Skirts	0.85-1.75 (22-44)	6
MOD-S4-346-Skirts	1.15-2.45 (29-62)	6
MOD-S5-357-Skirts	2.00-3.30 (50-84)	6

Ordering Information

1. Tyco Electronics outdoor termination kits (-S) include appropriate number of skirts for the particular voltage.
2. See the table below for the number of skirts needed at each voltage.

Voltage	HVT Number of Skirts	HVT-Z Number of Skirts
5 - 8 kV	1	0
15 kV	2	1
25 kV	3	4
35 kV	4	4

Accessories



Heat Guns

These hot-air heat guns are ideal for shrinking small low voltage products and identification marking sleeves. Heat guns are not recommended for shrinking high voltage products or thick-wall low voltage products.

FH-PS-2001

Primus-Sievert model with increased air flow allows faster shrinking. 120V, 1750 watt, 80°F – 1100°F, Variable air flow: 21 cfm max., double insulated LED read out. This heat gun can be used for shrinking thick-wall low voltage products.

HG-501A**115 Volts****(462047)**

500°F – 750°F hot-air gun ideal for shrinking ShrinkMark or TMS marking products, and thin-wall tubing. Includes stand. Reflector must be ordered separately.

HG-751A-C**120 Volts****(926935)**

750°F – 1000°F hot-air gun for shrinking low voltage and marking products. Includes stand. Reflector must be ordered separately.

Heat Gun Accessories

Catalog Number	Description
TG-12 Reflector	Use on tubing up to 3/4 inch in diameter.
TG-13 Reflector	Use on tubing up to 2 inches in diameter.
TG-23 Reflector	Use on tubing and cable breakouts up to 1 3/4 inches in diameter.
TG-24 Reflector	Use on tubing and cable breakouts up to 3 1/4 inches in diameter.

Ordering Information

Standard package: 1 each/box.



Glow Gun

- Portable and convenient with a powerful temperature rating
- Hand-held refillable heat gun with standard butane
- Automatic Piezo Electronics Ignition System
- Installs thin wall, dual wall and adhesive lined heat-shrink tubing and sleeves

Catalog Number	Description	Std. Pack
CPGI-GLOW-GUN	Flameless Heat Gun	6



Glow Torch

- Lightweight, portable, and ergonomic design
- Provides a wide-flame torch output for instant controlled heating
- Automatic Piezo Electronics Ignition System
- Attaches directly to 1 lb or 2 lb disposable propane bottles
- Installs thin wall, dual wall and adhesive lined heat-shrink tubing and sleeves

Catalog Number	Description	Std. Pack
CPGI-GLOW-TORCH	Wide-Flame Torch	10



C US Listed
Heat Gun 16C6

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

Tools



Impact Tools

Impact Tool

- Non-slip rubber grips on handle
- Blade storage in rear of tool
- Tool with 110 blade: 158608-1
- Replacement 110 Blade: 1583609-1

1583608-2



Premium Impact Tool

- Light system, pick, hook and spudger
- Non-slip rubber grips on handle
- Blade storage in rear of tool
- Adjustable Hi/Lo impact setting
- Accepts all Twist and Lock blades
- Tool with 110 Blade: 1583694-1

1583694-2



Non-Impact Tool

- Rubber palm grip
- Blade storage area in side of tool
- Accepts all Twist and Lock blades
- Replacement 110 Blade: 1583609-1
- Tool with 110 Blade: 1583694-1

1583236-2

Wire Strippers



Coax Stripper

- 3 blades designed to strip RG-6, 58, 59 cable in one step
- Replaceable blade cartridges

1490490-1



Cyclops Cable Stripper

- Outer sheath stripper
- Automatically adjusts to different cable thicknesses
- Works on cable diameters up to 11mm

1375317-1



Automatic Wire Stripper

- Strips PVC, THHN, and THHW
- Adjustable wire stop
- Built-in cutter

734185-1

Tools



Wire Cutters

350 MCM Cutter

- Steel handles
- Not for steel or ACSR cable

605744-1



500 MCM Cutter

- 21" overall length
- Fiberglass handles
- Not for steel or ACSR cable

605742-1

All-Purpose Tools



Cable Tie Gun

- For cable ties 3.3 - 4.8mm
- Thickness up to 1.6mm
- Automatic cut-off
- Adjustable tension setting

734587-1



Raceway Cutting Tool

- Cuts surface mount raceway to length
- Cuts PVC tubing up to 1.25" in diameter

1375479-1



SUPER CHAMP

- Economy Crimper
- Great for bolt cutting, wire stripping
- Convenient for tool boxes and repair kits

696201-1



Tel-Splice Pliers

- Works with all Tel-Splice part numbers
- Rounded nose won't snag on wires
- Wire cutter built into side
- Yellow handles
- Spring loaded handles

790162-1



Ratcheted Crimp Tool

- Tool with die: RBY Terminals
Coax Terminals
- Interchangeable with Ideal dies
- Ratchet release lever
- Easy clean plastic handles

1490496-2
1490496-3

APPLICATIONS AND TECHNICAL SPECIFICATIONS



Technical Data

Applications by Cable Type	129
Low Voltage Tubing	135
Splices	139
Terminations	146

Application by Cable Type

1/C Power Cable (Up to 1000V)



	Application(s)*	Product(s)	Heat-Shrink (HS)	Cold-Applied (CA)
 	- Sealed in-line splices - Terminal lug seals - Insulation - Jacket repair	WCSM	(HS)	
  	- Sealed in-line splices - Insulation - Jacket repair - Terminal lug seals - UF underground feeder cable splice	FCSM MWTM RNF-100 Gelwrap closure sleeve GILS closure RVS	(HS) (HS) (HS)	(CA) (CA)
	Submersible secondary BUS connectors	GelWrap UF closure sleeve GelPort connector		(CA) (CA)
  	- Sealed motor connections 2- or 3-wire stub splices	MCK GelCap splice cover GelCap SL splice cover RVC	(HS) (CA) (CA)	
	- Insulation and jacket repair - General wraparound sealing	CRSM MBSM GelWrap splice cover GWRS	(HS) (HS) (CA)	(CA)
 	- Wraparound, sealed cable - Tap splices	CRSM-CT GHFC MW GHFC GTAP	(HS)	(CA) (CA)
	- End seals for storage and pulling - Sealing of live ends (up to 1000V)	ESC RVC	(HS)	(CA)
 	- Wire and cable marking - Labels - Hardware and Software	Identification Solutions		
	Installation of heat-shrink products	Propane torches Heat guns		
	Sealing of uncoated tubing	Sealing mastics		
	Duct sealing	RDSS		
	Airport lighting kit	ALK	(HS)	
	- Cable breakout boots - Network protector sealing	CBR CBR-NPB	(HS) (HS)	
	Cabinet feed through seals	CFTS	(HS)	
	Cable prep kit	P-63		(CA)

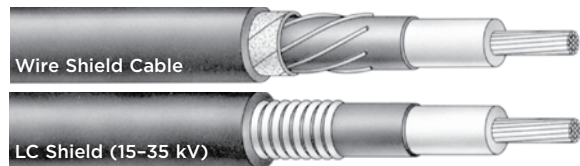
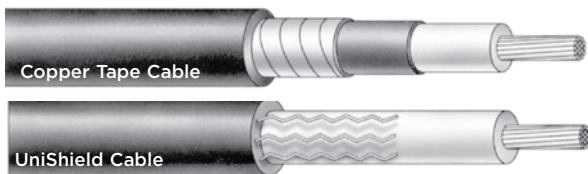
Application by Cable Type

1/C Nonshielded Power Cable (5 kV)



	Application(s)*	Product(s)	Heat-Shrink (HS)	Cold-Applied (CA)
	- Indoor terminations (in enclosures) - Outdoor (weather-exposed) terminations	HVT-50	(HS)	
	In-line splices	HVS-500	(HS)	
	- Sealed motor connections 2 wire pigtail splices	MCK-5 GelCap 8- motor connection	(HS)	(CA)

1/C Shielded Power Cable (5-69 kV)



	Application(s)*	Product(s)	Heat-Shrink (HS)	Cold-Applied (CA)
	Indoor heat-shrinkable terminations for copper tape, wire shield, and UniShield cable (in enclosures)	HVT-80-G (5/8 kV) HVT-150-G (15 kV) HVT-250-G (25 kV) HVT-350-G (35 kV) EHVT-460-G (46 kV) EHVT-690-G (69 kV) GHVT-690-G (69 kV)	(HS) (HS) (HS) (HS) (HS) (HS) (HS)	
	Indoor heat-shrink terminations with built in stress control	HVT-Z-80-G/SG (5/8 kV) HVT-Z-150-G (15 kV) HVT-Z-250/350-G (35 kV)	(HS) (HS) (HS)	
	Indoor cold-applied terminations (5-15 kV) for copper tape, wire shield and UniShield cable (in enclosures)	TFT-150R-G (5/8 kV) TFT-E-G (5-15 kV)		(CA) (CA)
	Indoor heat-shrinkable terminations LC-shield cable (in enclosures) (15-35 kV)	HVT-150-LC (15 kV) HVT-250-LC (25 kV) HVT-350-LC (35 kV)	(HS) (HS) (HS)	

Application by Cable Type

1/C Shielded Power Cable (5-69 kV)

	Application(s)*	Product(s)	Heat-Shrink Cold-Applied	
			(HS)	(CA)
	• Outdoor heat-shrinkable terminations for copper tape, wire shield, and UniShield cable (weather-exposed)	HVT-80-G/SG (5/8 kV)	(HS)	
		HVT-150-SG (15 kV)	(HS)	
		HVT-250-SG (25 kV)	(HS)	
		HVT-350-SG (35 kV)	(HS)	
	• Outdoor heat-shrink terminations with built-in stress control, for copper tape, wire shield, and UniShield cable (weather exposed)	HVT-Z-80-SG (5/8 kV)	(HS)	
		HVT-Z-150-SG (15 kV)	(HS)	
		HVT-Z-250/350-SG (25 kV)	(HS)	
		EHVT-460-SG (46 kV)	(HS)	
		EHVT-690-SG (69 kV)	(HS)	
		GHVT-690-SG (69 kV)	(HS)	
	• Outdoor heat-shrinkable terminations for LC-shield cable (weather exposed) 15-35 kV	GHVT-690-SSG	(HS)	
		HVT-150-SLC (15 kV)	(HS)	
		HVT-250-SLC (25 kV)	(HS)	
	• Outdoor cold-applied terminations, for copper tape, wire shield, and UniShield cable (weather exposed) (15-35 kV)	HVT-350-SLC (35 kV)	(HS)	
		TFT-150R-SG (15 kV)		(CA)
		TFT-250R-SG (25 kV)		(CA)
		TFT-350R-SG (35 kV)		(CA)
		TFT-150E-SG (15 kV)		(CA)
		TFT-250E-SG (15 kV)		(CA)
		TFT-350E-SG (15 kV)		(CA)
		TFT-150E-SLC (15 kV)		(CA)
 	• In-line splices for copper tape, wire shield, and UniShield cable	TFT-250E-SLC (15 kV)		(CA)
		TFT-350E-SLC (15 kV)		(CA)
		HVS-820S (5/8 kV)	(HS)	
		HVS-C-1520S (15 kV)	(HS)	
		HVS-1520S (15 kV)	(HS)	
		HVS-1550S (15 kV)	(HS)	
		HVS-2520S (25 kV)	(HS)	
	• In-line splices for LC shield cable (15-35 kV)	HVS-3520S (35 kV)	(HS)	
		EHVS-6920 (49/69 kV)	(HS)	
		HVS-1530-LC (15 kV)	(HS)	
 	• In-line splices for copper tape, wire shield, Unishield, flat strap and LC shielded cable (15-35kV)	HVS-2530-LC (25 kV)	(HS)	
		HVS-3530-LC (35 kV)	(HS)	
		CSJA-152X (15kV)		(CA)
	• Wye splice	CSJA-282X (25/28kV)		(CA)
		CSJA-352X (35kV)		(CA)
 	• H-tap splice	HVSY-1520S (15 kV only)	(HS)	
		HVSH-Mod (15 kV only)	(HS)	
 	• Sealing of live ends	HVES-1520D (15 kV)	(HS)	
		HVES-2520D (25 kV)	(HS)	
 	• Sealed motor connections	MCK-5 (5/8 kV)	(HS)	
		GelCap 8 motor connection		(CA)
 	• 2 wire pigtail splices			

Application by Cable Type

1/C Unjacketed & Jacketed URD Power Cable (15-35 kV)



		Application(s)*	Product(s)	Heat-Shrink (HS)	Cold-Applied (CA)
 		Indoor heat-shrinkable unjacketed or jacketed terminations (in enclosures)	HVT-150-J (15 kV)	(HS)	
			HVT-250-J (25 kV)	(HS)	
		Indoor cold-applied terminations (15-35 kV)	HVT-350-J (35 kV)	(HS)	
			TFT-150-E (15kV)		(CA)
			TFT-250-E (25kV)		(CA)
 		Outdoor heat-shrinkable unjacketed or jacketed terminations (weather-exposed)	HVT-150-SJ (15 kV)	(HS)	
			HVT-250-SJ (25 kV)	(HS)	
		Outdoor cold-applied terminations (15-35 kV)	HVT-350-SJ (35 kV)	(HS)	
			TFT-150-E (15 kV)		(CA)
			TFT-250-E (25 kV)		(CA)
 		Unjacketed in-line splices	TFT-350-E (35 kV)		(CA)
			HVS-1510S (15 kV)	(HS)	
			HVS-2510E (25 kV)	(HS)	
		Jacketed in-line splices	HVS-3510S (35 kV)	(HS)	
			HVS-1510S-J (15 kV)	(HS)	
			HVS-2510E-J (25 kV)	(HS)	
			HVS-3510S-J (35 kV)	(HS)	
			CSJG-151X (15kV)		(CA)
			CSJG-281X (25/28kV)		(CA)
			CSJG-351X (35kV)		(CA)
 		Unjacketed repair splices	HVS-1510E-R (15 kV)	(HS)	
			HVS-2510E-R (25 kV)	(HS)	
			HVS-3510S-R (35 kV)	(HS)	
		Jacketed repair splices	HVS-3510S-R (35 kV)	(HS)	
			HVS-3510S-RJ (35 kV)	(HS)	
			HVS-1510E-RJ (15 kV)	(HS)	
			HVS-2510E-RJ (25 kV)	(HS)	
		Sealing of live ends	HVES-1520D (15 kV)	(HS)	
			HVES-2520D (25 kV)	(HS)	
 		Jacket/elbow sealing	ESA	(HS)	
			RVS-SK		
			GelWrap ES Splice Closure		(CA)
		Jacketed cable grounding kits	JGK-MS (15-35 kV)	(HS)	

Application by Cable Type

1/C PILC/VCLC Power Cable (15-35 kV)

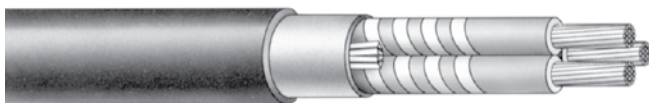


Paper-Insulated, Lead-Covered (PILC) Cable/
Varnished Cambric-Insulated, Lead-Covered (VCLC) Cable

	Application(s)*	Product(s)	Heat-Shrink (HS)	Cold-Applied (CA)
 	• 1/C PILC indoor/outdoor terminations	HVT-1590-G/SG (15 kV)	(HS)	
	• 1/C PILC-to-PILC splices • 1/C PILC-to-poly transition splices	HVS-1580D (15 kV) HVS-2580E (25 kV) HVS-3580D (35 kV)	(HS) (HS) (HS)	
	• 1/C PILC-to-poly transition "reducer" splices	HVSR-1580 (15 kV) HVSR-2580E (25 kV)	(HS) (HS)	
	• Wye splices (PILC-to-PILC splices or PILC-to-poly transition splices) • H-tap splices	HVSY-1580D (15 kV only) HVSH-1580 MOD (15 kV)	(HS) (HS)	
	• Sealing of live ends	HVES-1520D (15 kV) HVES-2520D (25 kV)	(HS) (HS)	
	• 1/C PILC elbow adapter	HVE-1590 (15 kV) Adapter for 1/C PILC elbows	(HS)	
	• Lead repair kit for PILC cables	HVS-LR	(HS)	

Application by Cable Type

3/C PILC/VCLC Power Cable (15-35 kV)



Paper-Insulated, Lead-Covered (PILC) Cable/
Varnished Cambric-Insulated Lead-Covered (VCLC) Cable

Application(s)*		Product(s)	Heat-Shrink (HS)	Cold-Applied (CA)
		3/C PILC indoor/outdoor terminations	HVT-3-1590-G/SG (15 kV)	(HS)
		3/C PILC to 3/C PILC splices	HVS-3-1590S (shorty-15 kV) HVS-3-1590 (15 kV) HVS-3-2590 (25 kV)	(HS) (HS) (HS)
		3/C PILC to three 1/C poly trifurcating transition splices 3/C PILC to 3/C poly 3/C PILC to 3/C poly armor	HVS-T-1580S (15 kV) HVS-T-2580D (25 kV) HVS-T-3580S (25 kV) HVS-3-1580S (15 kV) HVSA-3-1580S (15 kV)	(HS) (HS) (HS) (HS) (HS)
		3/C PILC to three 1/C poly trifurcating transition "reducer" splices	HVSR-T-1580 (15 kV) HVSR-T-2580E (25 kV)	(HS) (HS)
		3/C PILC to three 1/C PILC trifurcating splices	HVS-T-1590S (15 kV)	(HS)
		Sealing of live ends	HVES-3-1590 (15 kV) HVES-3-2590 (25 kV)	(HS) (HS)
		Lead repair kit	HVS-LR	(HS)

Low-Voltage Tubing And Wraparound Sleeves



General Purpose Cable Accessories (1000 V)

Tyco Electronics offers a complete line of Raychem brand general purpose heat-shrinkable and cold-applied power cable accessories that consistently provide outstanding mechanical protection, complete moisture sealing, and excellent electrical insulation for a broad range of low voltage applications.

Heat-Shrink Products

Raychem invented heat-shrinkable products in 1959 and the Raychem brand continues to be the world leader in heat-shrink technology and design. With Tyco Electronics, our heat-shrink products continue to be upgraded and improved to provide the best performance and value possible.

Rugged Mechanical Protection—Every Time

The tough, abrasion-resistant, cross-linked polyolefin construction of Tyco Electronics general-purpose products provides mechanical protection equal to the cable jacket. In addition, the one-piece solid protective layer cannot unravel or slip off.

Watertight Seals—Every Time

Most heat-shrinkable products are coated with a high-performance adhesive that melts and flows when heated, forming a durable bond that seals out water and dirt.

General purpose sealants are also available for use with uncoated tubings and other moisture-sealing applications.

Superior Electrical Insulation—Every Time

Heat-shrinkable products not only conform tightly to the connection, but they are also pre-engineered to shrink consistently to the required insulation thickness.



Cold-Applied Products

Cold-applied products offer superior sealing and electrical insulation. Our revolutionary PowerGel sealant provides the best and quickest cold-applied seal. By combining the properties of solids and liquids, PowerGel sealant conforms to intricate shapes to completely seal out water and contaminants.



Low-Voltage Tubing And Wraparound Sleeves

Material Properties

Physical	Test Method	WCSM Heavy Wall	FCSM Heavy Wall, Flame-Retardant	MWTM Medium Wall	RNF-100 Thin Wall	CRSM Wrap-Around
Tensile strength	ASTM D 412	1750 psi min.	1750 psi min.	2000 psi min.	1500 psi min.	2450 psi min.
Ultimate elongation	ASTM D 412	350% min.	350% min.	350% min.	200% min.	350% min.
Accelerated aging (168 hrs at 150°32°C)	ASTM D 2671					
Tensile strength	ASTM D 412	1750 psi min.	1600 psi min.	2000 psi min.		2000 psi min.
Ultimate elongation	ASTM D 412	350% min.	200% min.	300% min.		300% min.
Low-temperature flexibility (4 hrs. at temp. indicated)	ASTM D 2671	No cracking (-55°C)	No cracking (-40°C)	No cracking (-40°C)	No cracking (-55°C)	No cracking (-40°C)
Flammability	ASTM D 2671				Self-extinguishing (60 sec max.)	

Electrical

Dielectric strength	ASTM D 149	430 V/mil min. (at 0.04 inch)	330 V/mil min. (at 0.10 inch)	500 V/mil min. (at 0.04 inch)	500 V/mil min.	500 V/mil min. (at 0.04 inch)
Volume resistivity	ASTM D 257	1 x 10 ¹² ohm-cm min.	1 x 10 ¹³ ohm-cm min.	1 x 10 ¹² ohm-cm min.	1 x 10 ¹⁴ ohm-cm min.	1 x 10 ¹² ohm-cm min.

Chemical

Resistance to liquids	ASTM D 543	X	X	X		X
Tensile strength	ASTM D 412	1450 psi min.	1600 psi min.	2000 psi min.	1000 psi min.	2000 psi min.
Ultimate elongation	ASTM D 412	300% min.	300% min.	300% min.		300% min.
Corrosive effect (16 hours at 150°32°C)	ASTM D 2671	No corrosion			No corrosion at 175°C	
Fungus resistance	ASTM G 21	Pass rating 1	Pass rating 1	Pass rating 1	Pass rating 1	Pass rating 1

Technical Specifications

ANSI C119.1-1986		X	X			X
UL 486D-1986		X				
UL Standard 224					X	
CSA 22.2		X			X	
Western Underground Guide 2.5		X				
MIL-I-23053/15, Class 1 & 2					X	
Flame-retardant per IEEE 383, ICEA-S-19-81			X			

Note: Blank space indicates that property was not measured during product qualification.

Low-Voltage Tubing And Wraparound Sleeves

Material Properties

Physical	Test Method	MCK	ESC	CBR
Tensile strength	ASTM D 412	1450 psi min.	1750 psi min.	1500 psi min.
Ultimate elongation	ASTM D 412	300% min.	200% min.	300% min.
Accelerated aging (168 hours at temperature indicated)	ASTM D 2671			
Tensile strength	ASTM D 412	1000 psi min. (175°32°C)	1750 psi min. (150°32°C)	1250 psi min. (150°32°C)
Ultimate elongation	ASTM D 412	200% min. (175°32°C)	200% min. (150°32°C)	100% min. (150°32°C)
Low-temperature flexibility (4 hours at -40°33°C)	ASTM D 2671	No cracking	No cracking	No cracking
Flammability	ASTM D 635	Self-extinguishing (120 sec. max.)		

Electrical

Dielectric strength (at .075 inch)	ASTM D 149	250 V/mil min.	200 V/mil min.	250 V/mil min.
Volume resistivity	ASTM D 257	1×10^{12} ohm-cm min.	1×10^{12} ohm-cm min.	1×10^{12} ohm-cm min.

Chemical

Resistance to liquids, transformer oil to VDE 0370 (168 hours at 23°32°C)	ASTM D 543			
Tensile strength	ASTM D 412	1150 psi min.	1750 psi min.	1250 psi min.
Ultimate elongation	ASTM D 412	240% min.	200% min.	240% min.
Corrosive effect(16 hours at 175°32°C)	ASTM D 2671	No corrosion		
Resistance to fungi	ASTM G 21	Pass rating 1	Pass rating 1	Pass rating 1

Technical Specifications

ANSI C119.1-1986		X	X	
Flame-retardant per IEEE 383, ICEA-S-19-81		X		

Note: Blank space indicates that property was not measured during product qualification.

Low-Voltage Tubing And Wraparound Sleeves

Material Properties

Physical	Test Method	S1052	S1085	S1171	S1174	S1251
Softening point	ASTM E 28	70°C min.		140°C min.	140°C min.	
Adhesive peel strength:						
Polyethylene		1 lb/in min.	5.5 lb/in min.		5 lb/in min.	6 lb/in min.
Steel		2 lb/in min.			5 lb/in min.	
Aluminum			4.4 lb/in min.			
Copper			4.4 lb/in min.			
Low-temperature flexibility (4 hours at temperature indicated)	ASTM D 2671	No cracking (-40°C/33°C)	No cracking (-30°C/32°C)		No cracking (-40°C/33°C)	No cracking (-40°C/33°C)

Electrical

Dielectric strength min.	ASTM D 149 (0.04 inch)	300 V/mil min.	200 V/mil min.	200 V/mil min.	300 V/mil min.	300 V/mil
Volume resistivity	ASTM D 257	1×10^{12} ohm-cm min.	1×10^{12} ohm-cm min.	1×10^{12} ohm-cm min.	1×10^{12} ohm-cm min.	1×10^{12} ohm-cm min.
Tracking and erosion resistance	ASTM D 2303		No tracking or erosion to top surface or flame failure after: 1 hr at 2.00 kV 1 hr at 2.25 kV 1 hr at 2.50 kV			

Chemical

Corrosive effect (16 hours at 121°/32°C)	ASTM D 2671	No corrosion		No corrosion	No corrosion	
Fungus resistance	ASTM G 21	Pass rating 1			Pass rating 1	

Note: Blank space indicates that property was not measured during product specification.

PowerGel Testing	Test Methods	S.I. Units	Imperial Units
Dielectric strength (4 mm/016 inch wall thickness)		40 kV/cm min.	100 V/mil min.
Volume Resistivity		1×10^{12} Ohm cm min.	1×10^{12} Ohm cm min.
Resistance to Liquids Chemicals: 1 N na2SO4 0,1 N NaOH; 0, 1 N NaCl; 0, 1 NH2SO4; Distilled water; Ethylene Glycol	ASTM D543 modified: 10.0 cm x 1.0 cm x 0.4 cm, test bar supported on wire mesh, 24 hours immersion, IPA rinse after immersion, 24 hr. drying	No visible cracking, max. 2% weight change, 80% retention of elongation and tensile strength	No visible cracking, max. 2% weight change, 80% retention of elongation and tensile strength
Corrosive Effect	ASTM D2671	No corrosion	No corrosion
Resistance to Fungi 4.5 cm diameter x 0.4 cm thickness petridish	ISO 846	Pass rating 1 or less	Pass rating 1 or less
UV Resistance 10.0 cm x 1.0 cm x 0.4 cm test bar, UVB 313; 250 cycles (2000 hrs); 4 hours UV at 60°C then 4 hours at 50°C with condensation	ISO 4892/3	80% tensile strength retention, no visible cracking	80% tensile strength retention, no visible cracking

Splices



A sealant-coated, outer jacket on high-voltage splices provide a moisture resistant seal for direct buried.

Superior Long-Term Performance

Even in the harshest environments, Tyco Electronics' Raychem brand cable splices are ideal for the following direct-burial and manhole applications: copper tape, wire shield, UniShield, LC-shield, PILC, and jacketed/unjacketed URD cables. The splices not only match the requirements of cable test specifications but also meet or exceed the requirements of IEEE-404. Throughout the world, Tyco Electronics' splices are meeting the needs of industrial, utility, and mining customers with outstanding performance and reliability.

Positive Moisture Sealing and High Abrasion-Resistance

Internal moisture seals protect the cable from water that may enter the cable through a damaged jacket outside of the splice area. In addition, the adhesive-lined re-jacketing sleeve provides a moisture-resistant seal that is field-tested and superior to interference fits. Underwater cyclic aging tests per ANSI C119.1-1986 and IEEE 404 specifications confirm this. In addition, the outer jacket is superior to tape in abrasion resistance and cannot unravel or fray.

Fast, Consistent Installations

Simple heat-shrinking techniques reduce installation time and training. Pre-engineered kits help to ensure consistent performance while minimizing potential installation errors.

Unique Repair Splices

Specially designed to speed URD cable repair, Tyco Electronics' Raychem brand URD repair splices reduce cable preparation and required excavation space, thus minimizing total repair costs. With our superior heat-shrink adhesive system, our splices reliably seal fault-deformed cables. In addition, one splice repair kit may replace two conventional splices for most repairs.



Polymeric wye and H-tap splices produce dependable water tight seals between the main and tap cable(s) with no taping.

Heat-shrink, high-voltage splice kits install quickly and uniformly.



Splices



All cable splices must rebuild these critical cable functions:

- Electrical stress control
- Insulation and semiconductive layer
- Shielding and grounding
- Environmental and mechanical protection

The typical Tyco Electronics Raychem brand splice—based on heat-shrink technology, specialized materials, and pre-engineered designs—delivers reliable performance.

A close look at one of our polymeric cable splices shows how each component draws on Tyco Electronics' technical excellence and field experience to rebuild every function of the cable.

Grounding and Shielding*

- Ground braid provides continuity across the splice.
- Ground clamp provides secure grounding without soldering.
- Shielding mesh surrounds the splice for personnel protection.

*Grounding components not included with URD cable splices.

Electrical Stress Control

Stress relief material
Minimizes stress around the connector and at the shield cutback.

Heat-Shrinkable Stress Control Tubing

- Reduces electrical stress to safe operating levels.
- Delivers long-term, stable electrical performance.



Insulation and Semiconductive Layer

Heat-shrinkable dual-layer insulation/conductive tube
Delivers consistent insulation thickness without field measurements, in a factory-engineered system.

- Outer conductive layer reconstructs the cable's insulation shield.
- Inner insulating wall provides insulation thickness to meet or exceed that of the cable.
- Both layers are factory-bonded to help ensure a void-free interface between the insulation and shield.

Heat-Shrinkable Adhesive-Lined Wraparound Jacket

- Heat-activated adhesive promotes a positive moisture seal between the cable and splice.
- Tough, crosslinked polyolefin materials provide impact and abrasion-resistance.

Moisture Sealing and Mechanical Protection

Moisture sealant
Internal moisture seal inhibits migration of moisture even on cables with jacket damage.

Splices



Positive, Consistent Oil Stop

Unlike other oil stops, Tyco Electronics' unique system combines heat-shrinkable, high temperature oil barrier tubing and oil blocking stress relief material (SRM) to avoid splice failures due to oil leakage.

Long-Term Reliability

Both the component materials and the complete splices have undergone rigorous, long-term test programs, including pressurized load-cycling to maximum cable system overload temperatures.

Elimination of Lead Sleeve Failures

Moisture is the worst enemy of PILC cable systems. A major source of leakage problems is cracking of lead sleeves and wipes due to cable flexing or corrosion. Tyco Electronics' design replaces these components with heavy-duty, heat-shrinkable jacketing and adhesive seals, so moisture problems are minimized.

Field-Tested Performance

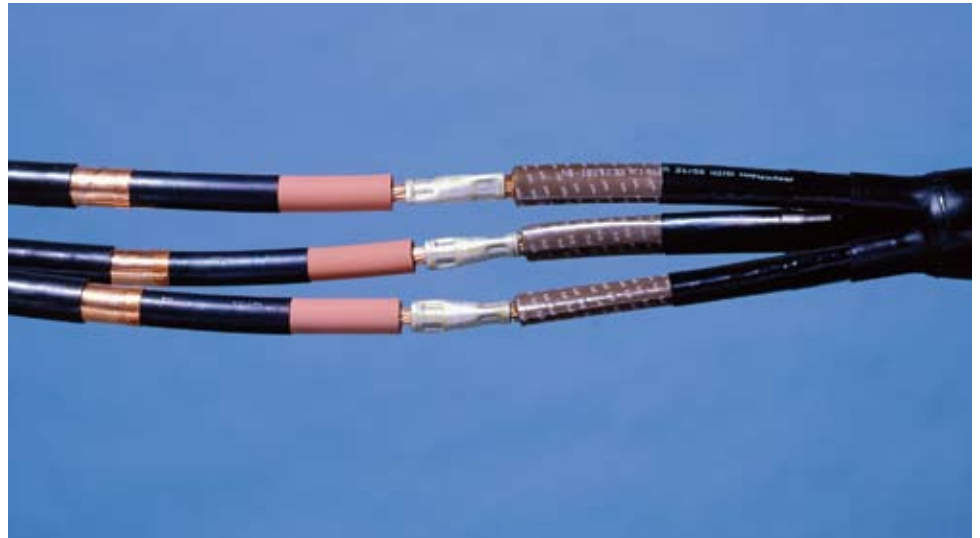
Since Tyco Electronics "converts" the PILC cable to a "polymeric equivalent," all Tyco Electronics designs can then use the effective components found in our plastic cable splices. For more than a decade, these products have compiled an excellent service history in more than a million installations worldwide.

Easy, Consistent Installations

By "converting" the PILC cable to a "polymeric equivalent," these Tyco Electronics Raychem brand kits eliminate compound-filling and difficult lead-wiping. Also, heat-shrinking means no time-consuming insulation, stepping or penciling, hand taping, and stress cone building.

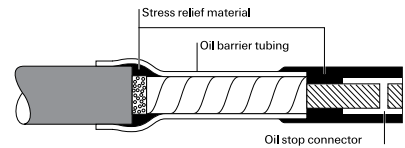
Reduced Installation and Training Time

You get on and off the job site quicker. There's no lead-wiping, no compound pouring, and no waiting for "cool downs" and "top-ups." Time and cost are drastically reduced, with users reporting installation cost savings of up to 75 percent.



Splices

To produce a simple, field-tested oil stop system, Tyco Electronics' Raychem brand splices utilize high-temperature oil barrier tubing and oil-blocking stress relief material.



Easy to Install Wye Splices

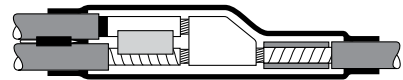
PILC wye splices produce water-tight seals between the main and tap cable with no tedious, complex taping. The simple construction does not require lead wiping, so installation is fast and easy. These splices are versatile, accommodating both PILC-to-PILC and PILC-to-polymeric constructions.

Breakout Seal

Heat-activated sealants combine with heat-shrinkable components to produce a field-tested moisture resistant system for the critical branch breakout area.

Intercable Insulation

A soft (pliant) preformed profile conforms tightly to the cable surfaces upon shrinking. This provides insulation in the area between the main and branch (or tap) cable.



Positive Oil Stop Systems for 3/C Cables

Tyco Electronics provides a highly effective and easily installed oil stop system, using standard heat-shrinkable components:

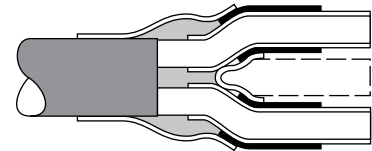
- Adhesive-lined, conductive breakout
- Converts the 3/C cable into three 1/C cables
- Provides an oil- and pressure-resistant seal
- Grounds the conductive tubing to the lead sheath

Oil Blocking Stress Relief Material

- During shrinking, the material softens and conforms around the individual conductors forming an oil-resistant seal
- Provides electrical stress relief between the insulated conductors on belted cable.
- Conductive tubing
- Reshields the individual insulated conductors

Oil Barrier Tubing

- Locks the oil in the PILC cables, converting each conductor to a polymeric equivalent



Elastomeric Technology

The elastomeric splice component is supplied in an expanded form. In this form, the heat-shrinkable outer wall holds the insulating layer at a wide diameter. Application of heat causes the outer wall to shrink, allowing the insulating layer to contract at the same time and closely fit the splice. The rubber-like characteristics of the material enable the splice to follow the thermally induced dimensional changes of the cable insulation.



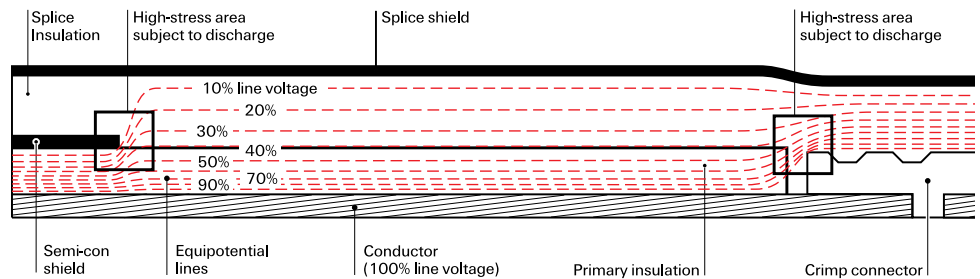
The elastic memory of the material helps to ensure that the correct insulation-wall thickness is obtained for the defined application range of the component.

Features and Benefits:
Elastomeric Technology

Splices

Cable Splice without Stress Control

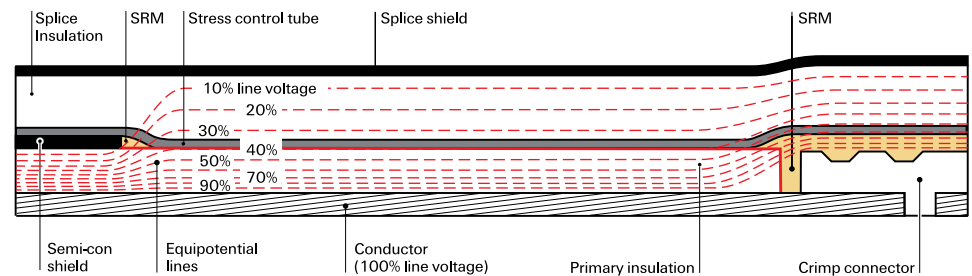
The figure below shows a computer-simulated plot of electrical stress in a splice without stress control. Areas of high stress exist near the edge of the semi-con and connector as shown by the concentrations of equipotential lines. These high stresses must be lowered to prevent premature insulation damage and splice failures.



Cable Splice with Stress Control System

Tyco Electronics' stress control system controls the distribution of the electrical field in the splice. The equipotential lines are distributed uniformly, reducing the stresses within the splice to levels required for longer service life. This is achieved by the unique resistive and capacitive properties of the heat-shrinkable tubing and stress relief material (SRM).

The stress control materials reduce stress through their electrical properties rather than the geometry of the splice or correct positioning of a Faraday cage. Stress cone buildup is diminished, resulting in a slim, compact splice and significantly decreasing splice installation time.



Splices

Test and Performance Data for Polymeric and URD Splices

To help provide long-term reliability and durability, Tyco Electronics' Raychem brand splices have been subjected to extensive testing in both the laboratory and actual field environments. Kits are factory-designed and tested to meet cable system requirements as summarized in the table below. Test levels are drawn from relevant sections of existing industry standards, including the following:

- IEEE 404-2006
- IEEE 593-1990
- ANSI C119.1-1986
- ANSI/IEEE 386-1985
- AEIC CS5-1987
- AEIC CS6-1987

Test Description	HVS-8XX (5-8 kV)	HVS-15XX (15 kV)	HVS-25XX* (25 kV)	HVS-35XX (35 kV)	EHVS-69XX (46/69 kV)
Partial discharge (min. kV) for 3 pC or less	7	13	22	30	60
AC withstand, 1 min (kV)	23	35	52	69	120 (15 min)
AC withstand, 5 min (kV)	21	39	65	90	N/A
AC withstand, 5 hr (kV)	16	31	50	71	100 (6 hr)
DC withstand, 15 min (kV)	45	75	105	140	240
Impulse withstand 1.2 x 50 Qs (crest kV)	95	110	150	200	350
Water sealing properties**	Pass	Pass	Pass	Pass	

*Also meets requirements of 25/28 kV systems.

**Refer to EDR-5101, "A Survey of the Water Sealing Properties of Raychem brand Heat-Shrinkable Splices" (9/7/83) for testing details. IEEE 404-2006 requires testing without jacket installed for load cycling under water. All Tyco Electronics heat-shrink splices pass this new requirement.

Recommended Guide Specification for Polymeric and URD Splices (5-35 kV)

Please feel free to use the following in your design specification:

Power cable splices for nonshielded or shielded solid dielectric cable and unjacketed or jacketed URD (concentric neutral) cable shall be factory-engineered kits that rebuild the primary cable insulation, shielding and grounding systems, and outer jacket equivalent to that of the original cable.

When assembled on cable, the splice shall be capable of passing the electrical test requirements of IEEE-404 and the water immersion tests of ANSI C119.1-1986.

Splices shall be of a uniform-cross-section, heat-shrinkable polymeric construction utilizing an impedance-layer stress control tube and high-dielectric-strength insulating layers.

The outer insulating layer shall be bonded to a conducting layer for shielding. The splice shall be re-jacketed with a heat-shrinkable adhesive-lined sleeve to provide a waterproof seal.

The splice shall accommodate a range of cable sizes and be completely independent of cable manufacturer's tolerances. Splices shall be capable of being properly installed on out-of-round cable per relevant ICEA and AEIC standards. Kits shall accommodate a range of commercially available connectors.

Splices for armored cables shall provide a means of reinstating the armor over the span of the installed splices.

Wye splices shall include a sealant profile to seal the area between the branch and the main cable.

The splice manufacturer shall provide a test report demonstrating compliance with the above requirements.

Splices shall be manufactured by Tyco Electronics Corporation or approved equivalent.

Splices

Test and Performance Data for PILC Splices

PILC splices are fully engineered to provide a long, trouble-free service life. They are factory-designed and tested to meet PILC cable system requirements, as summarized in the table below.

Test levels are drawn from relevant sections of existing industry standards, including those that follow:

- IEEE 404 (power cable splices)
- IEEE 48-1990 (terminations)
- AEIC-1-1968 (paper cable)
- AEIC-CS5-1982 (XLPE cable)
- AEIC-CS6-1982 (EPR cable)
- ANSI C119.1-1986 (sealed insulated underground connection system)

Test and Performance Data for PILC Splices

Electrical	Voltage Class		
	15 kV	25 kV	35 kV
AC withstand test, 6 hours	35 kV	58 kV	80 kV
DC withstand test, 15 minutes	55 kV	75 kV	100 kV
Impulse withstand (BIL) 1.2 x 50 Qs	110 kV	150 kV	200 kV

Load Cycle/Pressure			
Current load cycling; ¹ 2 cycles of 5 hours heating, 3 hours cooling to conductor temperature of 110°C with applied overvoltage and maximum continuous internal oil pressure; no breakdown, oil leakage			
Maximum continuous internal oil pressure	Pass	Pass	Pass
Maximum continuous conductor temperature ²	15 psig	15 psig	15 psig
Maximum overload conductor temperature ²	90°C	90°C	90°C
Maximum overload conductor temperature ²	110°C	110°C	110°C

Sealing			
Water immersion outer jacketing system	ANSI C119.1	ANSI C119.1	ANSI C119.1
Proof test on oil blocking system:			
Tyco Electronics test method—no oil diffusion ³	Pass	Pass	Pass

1. Not applicable to live end seals.

2. Maximum continuous/emergency conductor temperature for wye splices: 70°C.

3. Test methods discussed in IEEE paper 84 T&D 340-6, "The extension of heat-shrinkable components for use with 1/C transition and paper cable splices," by Mackevich, et al.

Recommended Guide Specification for PILC Splices (15-35 kV)

Please feel free to use the following in your design specification:

Splices shall be factory-manufactured kits to suit the specific type and size of the cables to be spliced.

The electric field distribution in the splice shall be controlled by a heat-shrinkable tubing having a complex impedance when energized with an AC voltage. A dual-wall tubing with a co-extruded outer conductive layer to form a void-free interface between the insulation and shield shall be used.

Kits shall be factory-engineered to contain all necessary materials, except connector, and provide an oil block and oil seal, electrical stress control, insulation, shielding, and environmental sealing. The kit shall allow for external grounding. Major kit components shall be heat-shrinkable.

The splice insulation shall not require a lead sleeve, lead wipe, or any kind of filling.

The splice manufacturer shall provide a test report, upon request, demonstrating that the splice performance is equivalent to the cables per relevant sections of IEEE-404, AEIC-1-1968. Splices shall be load cycled with 15 psig internal oil pressure at 2.5x rated line-to-ground voltage at 110°C emergency overload rating. Splices shall also be subjected to a voltage withstand test sequence per listed standards.

Wye splices on PILC cable shall be tested to the requirements of ANSI C119.1-1986. The test shall demonstrate the mechanical integrity, water sealing, and electrical properties of the outer jacket system.

Splices shall be manufactured by Tyco Electronics Corporation or approved equivalent.

Terminations



Tyco Electronics' proven oil-sealing technology has been used for more than 18 years in medium-voltage transition joints. This technology is now put to work in our PILC termination kits.

Reliable, Field-Proven Performance

Independent testing and field experience have repeatedly proven the long-term stability, durability, and reliability of the Tyco Electronics' Raychem HVT system, even in highly polluted environments. The nontracking, insulating outer jacket can withstand the rigors of long-term electrical stress and surface pollution without loss of performance. The nontracking material offers the additional benefit of being maintenance free, with no need for periodic cleaning. Extensive load cycle testing verifies the long-term thermomechanical compatibility between the termination system and the cable.

Ease of Installation

HVT kits can be installed on all cable types without special adapters or accessories. No special tooling or connectors are required since HVT kits accept all common compression or terminal lugs. The HVT installation method also provides generous cable cutback and component positioning tolerances, further reducing installation variability. Heat-shrinking allows the kits to be easily inspected, either visually or by simple touch, to help ensure proper installation.

Always Ready for the Job—Even in Emergencies

HVT kits have an unlimited shelf life. They remain ready to use on short notice, so you have no worries about scrapping aged inventory or being caught with useless products during an emergency or on a time-critical project.

Flexible and Versatile

An HVT system may be installed upright or inverted and can bend to the same bending radius as the cable. Slim and lightweight, the system can also be mounted directly to fuse cutouts or other devices, eliminating the cost of additional supporting brackets and cross arms.

46 and 69 kV

At voltages as high as 69 kV the need for proven stress control is even more important. The materials used in our 46 and 69 kV terminations (as with all lower voltages) are suitable for severely polluted areas—and for all installation conditions, including top feed installation.

The material is designed to be resistant to impact damage from transportation or vandalism, a typical problem for heavy, inflexible porcelain products. Tyco Electronics' Raychem brand 46/69 kV terminations also require no compound filling which can leak over time.

Cold-Applied Termination System

TFT terminations are designed for customers who want Tyco Electronics material technology in a cold-applied system. The cold-applied terminations also provide positive positioning of the stress control patch.

Tyco Electronics' Raychem brand HVT system features a nontracking, insulating surface that can withstand long-term electrical stress and surface pollution.



Terminations

HVT

Shielding and Solderless Grounding
(included in polymeric cable kits except URD)

Ground Braid

- Provides shield continuity

Ground Clamp

- Has a constant-force roll spring, which provides secure grounding without soldering

Moisture Sealing

- Nontracking, high-voltage sealant

Moisture Sealing

Nontracking, high-voltage sealant:

- Provides a watertight connector seal when combined with heat-shrinkable material
- Will not harden or crack

Additional Creepage for Outdoor Applications

Heat-shrinkable skirts:

- Increase surface creepage distance
- Easily adapt terminations for outdoor use
- May be inverted for terminations facing downward

Electrical Stress Control and Insulation (8 kV and up)

Heat-shrinkable stress control tubing:

- Reduces the electrical stress gradient at the end of the cable shield to safe operating levels
- Shrinks to fit out-of-spec cable
- Provides long-term electrical performance

Nontracking, Heat-Shrinkable Outer Insulation Tubing:

- Provides excellent UV stability
- Withstands polluted environments
- Is proven to withstand severe application

Stress Relief Material:

- Minimizes stress at the shield cutback
- Applies easily, smoothing the step at the cable semi-con edge and filling any voids
- Acts as a secondary moisture sea

TFT

Moisture Sealing

- Nontracking, high-voltage sealant:
- Provides a watertight connector seal
 - Will not harden or crack

Additional Creepage for Outdoor Applications

Molded skirts:

- Increase surface creepage distance

Electrical Stress Control

Metal Oxide Matrix stress control patch:

- Reduces the electrical stress gradient at the end of the cable shield to safe operating levels
- Conforms to fit out-of-spec cable
- Provides long-term electrical performance

Nontracking, Termination Body:

- Provides excellent UV stability
- Withstands polluted environments
- Is proven to withstand severe applications

Moisture Sealing

- Nontracking, high-voltage sealant

Spring clamp and solder-block ground braid available for metallic shielded cables

Terminations

HVT Testing Data

Tyco Electronics' Raychem brand high-voltage terminations are fully qualified per IEEE-48 as Class I terminations to provide a long, trouble-free service life. Independent testing and field experience have repeatedly proven the long-term durability, reliability, and stability of the HVT system, even in highly polluted environments. Tyco Electronics' proven nontracking, insulating jacket can withstand the rigors of long-term electrical stress and surface pollution without loss of performance. The nontracking material is maintenance free and does not require periodic cleaning. Extensive load-cycle testing verifies the thermomechanical compatibility between the termination system and cable.

Recommended Guide Specifications

Please feel free to use one or all of the following in your design specifications:

Medium-Voltage Terminations (through 69 kV)

Shielded power cable termination kits shall be factory engineered for the application. The kits shall consist of high-permittivity, high-resistivity, heat-shrinkable stress control tubing, and outer insulation tubing and skirts (outdoor applications) made from UV-stable, nontracking (per ASTM D 2303) materials. Heat-activated sealant materials to help prevent moisture ingress and contamination should also be included. Termination kits shall meet or exceed all rating requirements of IEEE-48 for Class I terminations and the test sequence prescribed by IEEE-404, including 130°C load cycling and 130°C impulse withstand.

Multi-Conductor Shielded Cable Terminations

In addition to the phase terminations, multi-conductor termination kits shall provide a heat-shrinkable breakout boot, factory-coated with sealant for strain-relief and sealing purposes. Each kit shall include lengths of heat-shrinkable tubing to help prevent corrosion and shifting of the shielding layers between the boot and the phase-termination installation point.

When grounding and/or ground check conductors are included, the kit includes lengths of heat-shrinkable tubing and sealant material to seal each conductor from the boot to its connection point.

Nonshielded Cable Terminations (2-5 kV)

Termination kits for nonshielded power cables installed in contaminated indoor or outdoor environments are factory engineered to provide UV-stable, nontracking (per ASTM D 2303 and the Ontario Hydro accelerated tracking wheel test) exterior surfaces and complete environmental sealing for the termination area. Termination kits shall consist of heat-shrinkable tubing, skirts (outdoor applications), and sealing boots (for 3/C only) supplied with heat-activated sealant materials to help prevent moisture ingress and contamination.

Product and Voltage Class 1

Test Description	HVT-80 (5-8 kV)	HVT-150 (15 kV)	HVT-250 (25 kV2)	HVT-350 (35 kV)	EHVT-460 (46 kV)	EHVT-690 (69 kV)
AC withstand, 1 minute, (kV)	35	50	65	90	120	175
DC withstand, 15 minutes, (kV)	65	75	105	140	170	245
Partial discharge (min. kV) for 5 pC or less	9	13	21.5	30	40	60
Impulse withstand 1.2 x 50 Qs, crest kV (outdoor) ³	95	110	150	200	250	350
Impulse withstand 1.2 x 50 Qs, crest kV (indoor) ³	80	95	125	150	250	350
Continuous current rating	Equal to cable ampacity					
Wet withstand, 10 seconds, kV rms	30	45	60	80	100	145
Dry withstand, 6 hours, kV rms	25	35	55	75	100	120

1. URD and LC kits are rated for 15-35 kV only; HVT-M kits for 5/8-25 kV only.

2. HVT-250 meets requirements of 25/28 kV systems.

3. Outdoor kits (-SJ, -SG, or -SLC designation) were tested with skirts (rain sheds). Indoor kits (-J, -G, -LC designation) do not contain skirts.

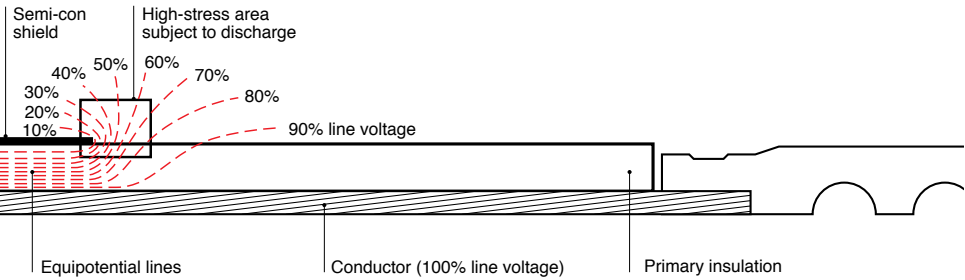
Terminations

Electrical Stress Control

Shielded power cables require electrical stress control when terminated. When the insulation shield is removed from a cable, the electrical field is concentrated at the cutback point, causing high electrical stress. If the stress is great enough, it can cause the air to break down, resulting in corona. High-stress areas also cause internal discharges. Corona or internal discharges will ultimately destroy the cable insulation, causing premature failure.

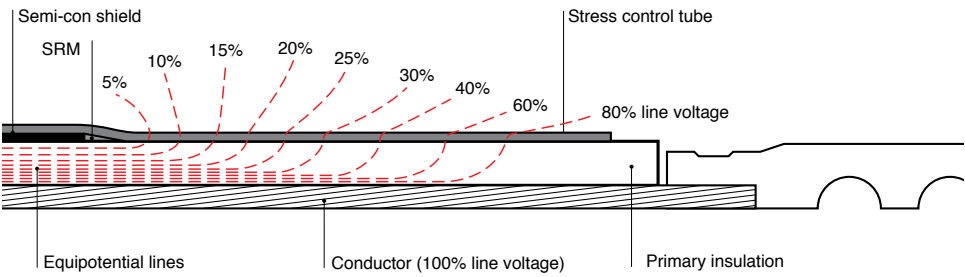
Cable Termination Without Stress Control

The diagram below shows an energized cable termination without stress control. The electric field intensity is greatest where the equipotential lines (line of constant voltage) are concentrated. Note the concentration near the edge of the semi-con shield. Stress control is required here to reduce the electrical stress below levels at which the air would break down or discharges would occur in the insulation.



Cable Termination with Tyco Electronics' Unique Stress Control System

With Tyco Electronics' stress control tube installed, the equipotential lines are spread out, distributing the electrical field and reducing the electrical stress to the cable insulation's operating level, as shown in the diagram below. This is achieved by the unique resistive and capacitive properties of the heat-shrinkable material. Note that no diameter buildup is required as in a conventional stress cone that utilizes its geometry to reduce stress.



Terminations

Recommended Air Clearance (Heat-Shrink and Cold-Applied Products)

Phase/Phase and Phase/Ground

The stress control system provides a linear voltage distribution from the lug at high voltage to the shield termination at ground potential. If the termination is installed too close to another phase termination or grounded metal, the electric stress in the air gap will rise to a level where discharge or flashover may occur. The table and diagrams below indicate the minimum clearances needed between various termination configurations. These clearances are based on IEEE Basic Impulse Levels (BIL).

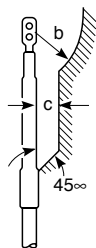


Figure 1.
Phase to ground

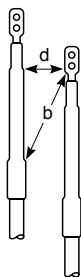


Figure 2.
Same phase



Figure 3.
Between phases

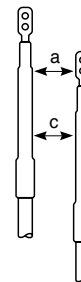


Figure 4.
Between phases

Minimum Clearance¹ (inches/millimeters)

BIL (kV)	a	b	c ²	d
95	6.5 (160)	3.5 (90)	1.2 (30)	0.8 (20)
110	7.0 (175)	4.0 (100)	1.4 (35)	0.9 (23)
125	9.0 (225)	6.0 (150)	1.6 (40)	1.0 (25)
150	9.0 (225)	6.0 (150)	1.6 (40)	1.0 (25)
200	13.0 (325)	9.0 (225)	2.0 (50)	1.4 (35)

¹ Values are based on normal operating conditions. Humid or poorly ventilated environments may require additional air clearance.

² For skirted, outdoor terminations, the value for "c" is equal to the distance from the edge of one skirt to another or from a skirt to ground.

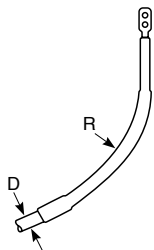


Figure 5.
Bending radius

Recommended cable bending radius Tyco Electronics' Raychem brand terminations are as flexible as the original cable. A cable end should not be bent to a radius less than that recommended by the manufacturer.

D = Cable jacket O.D.

R = 10 x D—Minimum bending radius (consult cable manufacturer's values and check them against Tyco Electronics'. Select the higher of the two values. Preheat cable to approximately 80°C before bending.)

Terminations

TFT Testing Data

These terminations are fully qualified per IEEE-48 as Class 1 terminations to provide a long, trouble-free service life. These terminations incorporate Tyco Electronics material technology in a cold-applied system. These terminations have an elastomeric tubing that is formulated for long-term performance in typical extreme termination environments. The non-tracking material is maintenance-free and does not require periodic cleaning.

This series of products features the latest in advanced stress control systems using Metal Oxide Matrix technology to provide superior electrical performance.

Tyco Electronics Products: Voltage Class

Test Description	TFT (5 – 8 kV)	TFT (15 kV)*	TFT (25 kV)	TFT (35 kV)
AC withstand, 1 minute, (kV)	35	50	65	90
DC withstand, 15 minutes, (kV)	65	75	105	140
Partial discharge (min. kV) for 5 pC or less	9	13	21.5	30
Impulse withstand 1.2 x 50 Qs, crest kV (outdoor)	95	110	150	200
Wet withstand, 10 seconds, kV rms	30	45	60	80
Dry withstand, 6 hours, kV rms	25	35	55	75

*With or without sheds

1		1375317-1	125	CBR-4-3-A	70
		1375479-1	126	CBR-4-4-A	70
1099898-1	108	1443402-1	109	CBR-6-1-A	70
1099898-2	108	1443402-2	109	CBR-6-2-A	70
1099898-3	108	1443402-3	109	CBR-NPB-4L	71
1099898-4	108	1443402-4	109	CBR-NPB-8L	71
1099898-5	108	1443402-5	109	CFTS-1	70
1099898-6	108	1443402-6	109	CFTS-2	70
1099898-7	108	1443402-7	109	CFTS-3	70
1099898-8	108	1443402-8	109	CFTS-4	70
1099898-9	108	1443402-9	109	CFTS-5	70
1099899-1	108	1443403-1	109	CJ-250-3W3W-CU-FT-B1	13
1099899-2	108	1443403-2	109	CJ-250-5W5W-CU-FT-B1	13
1099899-3	108	1443403-3	109	CJ-250-7W7W-CU-FT-B1	13
1099899-4	108	1443403-4	109	CJ-350-3W3W-CU-FT-B1	13
1099899-5	108	1443403-5	109	CJ-350-5W5W-CU-FT-B1	13
1099899-6	108	1443403-6	109	CJ-350-7W7W-CU-FT-B1	13
1099899-7	108	1443403-7	109	CJ-4/0-3W3W-CU-FT-B1	13
1099899-8	108	1443403-8	109	CJ-4/0-5W5W-CU-FT-B1	13
1099899-9	108	1443403-9	109	CJ-4/0-7W7W-CU-FT-B1	13
1099939-1	108	1490490-1	125	CJ-500-3W3W-CU-FT-B1	13
1099939-2	108	1490496-2	126	CJ-500-5W5W-CU-FT-B1	13
1099939-3	108	1490496-3	126	CJ-500-7W7W-CU-FT-B1	13
1099939-4	108	1583236-2	125	CJ-750-3W3W-CU-FT-B1	13
1099939-5	108	1583608-2	125	CJ-750-5W5W-CU-FT-B1	13
1099939-6	108	1583694-2	125	CJ-750-7W7W-CU-FT-B1	13
1099939-7	108	605742-1	126	CPGI-CRSM-CT-34/10-150	12
1099939-8	108	605744-1	126	CPGI-CTY-04-18-BLK-C	81
1099939-9	108	696201-1	126	CPGI-CTY-04-18-BLK-M	81
1-1099898-0	108	734185-1	125	CPGI-CTY-04-18-HL-C	84
1-1099898-1	108	734587-1	126	CPGI-CTY-04-18-ID-NAT-C	85
1-1099898-2	108	790162-1	126	CPGI-CTY-04-18-NAT-C	81
1-1099898-3	108			CPGI-CTY-04-18-NAT-M	81
1-1099898-4	108	A		CPGI-CTY-05-30-MH-BLK-C	83
1-1099898-5	108			CPGI-CTY-05-30-MH-NAT-C	83
1-1099899-0	108	AD-1358-LPG-REGW/GAGE	124	CPGI-CTY-05-40-BLK-C	82
1-1099899-1	108	AD-1432-ACD10FT-LPG-HOSE	124	CPGI-CTY-05-40-BLK-M	82
1-1099899-2	108	AD-1434-ACD30FT-LPG-HOSE	124	CPGI-CTY-05-40-NAT-C	82
1-1099899-3	108	AD-1460-ACD-HEAT-SHLDGPA	124	CPGI-CTY-05-40-NAT-M	82
1-1099899-4	108	AD-1563-ADAPTER	124	CPGI-CTY-05-50-RL-BLK-C	84
1-1099899-5	108	AD-3015-04	124	CPGI-CTY-05-50-RL-NAT-C	84
1-1099899-6	108	AM6310 Printer	102	CPGI-CTY-06-18-BLK-C	81
1-1099899-7	108	ASBS-2-3/0	111	CPGI-CTY-06-18-NAT-C	81
1-1099899-8	108	ASBS-2-350	111	CPGI-CTY-07-50-BLK-C	82
1-1099899-9	108	ASBS-3/0-500	111	CPGI-CTY-07-50-BLK-M	82
1-1099939-0	108	ASBS-350-750	111	CPGI-CTY-07-50-HS-BLK-C	82
1-1099939-1	108	ASBS-500-750	111	CPGI-CTY-07-50-ID-NAT-C	85
1-1099939-2	108	ASBS-600-1000	111	CPGI-CTY-07-50-LP-BLK-C	83
1-1099939-3	108			CPGI-CTY-07-50-LP-NAT-C	83
1-1099939-4	108	B		CPGI-CTY-07-50-MH-BLK-C	83
1-1099939-5	108			CPGI-CTY-07-50-MH-NAT-C	83
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1-1443402-1	109	BRKT-2-SS	119	CPGI-CTY-07-50-NAT-M	82
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1-1443402-3	109	BRKT-4-SS	119	CPGI-CTY-08-18-BLK-M	81
1-1443402-4	109			CPGI-CTY-08-18-NAT-C	81
1-1443402-5	109	C		CPGI-CTY-08-18-NAT-M	81
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1-1443402-7	109	CBR-2-1-A	70	CPGI-CTY-08-40-BLK-M	82
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1-1443403-2	109	CBR-3-1-A	70	CPGI-CTY-08-50-HL-C	84
1-1443403-3	109	CBR-3-2-A	70	CPGI-CTY-08-50-RL-BLK-C	84
1-1443403-4	109	CBR-3-3-A	70	CPGI-CTY-08-50-RL-NAT-C	84
1-1443403-5	109	CBR-3-4-A	70	CPGI-CTY-11-40-BLK-C	82
1-1443403-6	109	CBR-4-1-A	70	CPGI-CTY-11-40-NAT-C	82
1-1443403-7	109	CBR-4-2-A	70	CPGI-CTY-11-50-BLK-C	82

CPGI-CTY-11-50-BLK-D	82	CPGI-GelWrap-18/4-250UL	5	CRSM 53/13-1200	61
CPGI-CTY-11-50-HS-BLK-C	82	CPGI-GelWrap-33/10-50	5	CRSM 53/13-200	11
CPGI-CTY-11-50-MH-BLK-C	83	CPGI-GelWrap-UF-200	5	CRSM 53/13-200	61
CPGI-CTY-11-50-MH-NAT-C	83	CPGI-GelWrap-UF-250UL	5	CRSM 84/20-1200	11
CPGI-CTY-11-50-NAT-C	82	CPGI-GHFC-1-90	19	CRSM 84/20-1200	61
CPGI-CTY-11-50-NAT-D	82	CPGI-GHFC-2-90	19	CRSM 84/20-750	11
CPGI-CTY-12-50-RL-NAT-C	84	CPGI-GILS-4/0	6	CRSM 84/20-750	61
CPGI-CTY-12-50-RL-BLK-C	84	CPGI-GLOW-GUN	103	CRSM-CT-34/10-150	12
CPGI-CTY-14-40-BLK-C	82	CPGI-GLOW-GUN	122	CRSM-CT-53/13-200	12
CPGI-CTY-14-40-NAT-C	82	CPGI-GLOW-TORCH	122	CRSM-CT-84/20-250	12
CPGI-CTY-14-50-BLK-C	82	CPGI-GTAP-1	17	CSBS-20C-500C-SOS	112
CPGI-CTY-14-50-BLK-D	82	CPGI-GTAP-2	17	CSBS-300C-750C-SOS	112
CPGI-CTY-14-50-HS-BLK-C	82	CPGI-MCK-1V	16	CSJA-1521	24
CPGI-CTY-14-50-ID-NAT-C	83	CPGI-MCK-2V	16	CSJA-1521M1	24
CPGI-CTY-14-50-MH-BLK-C	83	CPGI-PPMB-01	100	CSJA-1521M4	24
CPGI-CTY-14-50-MH-NAT-C	82	CPGI-PPMB-02	100	CSJA-1521M5	24
CPGI-CTY-14-50-NAT-C	82	CPGI-PPMB-03	100	CSJA-1522	24
CPGI-CTY-14-50-NAT-D	82	CPGI-PPMB-04	100	CSJA-1522M1	24
CPGI-CTY-15-120-BLK-L	82	CPGI-PPMB-05	100	CSJA-1522M2	24
CPGI-CTY-15-120-NAT-L	82	CPGI-PPMB-06	100	CSJA-1522M6	24
CPGI-CTY-16-120-LP-NAT-C	83	CPGI-PPMB-07	100	CSJA-1522M7	24
CPGI-CTY-16-120-LP-BLK-C	83	CPGI-PPMB-08	100	CSJA-1523	24
CPGI-CTY-16-120-MH-BLK-C	83	CPGI-PPMB-09	100	CSJA-1523M2	24
CPGI-CTY-16-120-MH-NAT-C	83	CPGI-PPMB-10	100	CSJA-1523M8	24
CPGI-CTY-17-50-BLK-C	82	CPGI-PPMB-11	100	CSJA-1524	24
CPGI-CTY-17-50-NAT-C	82	CPGI-PPMB-12	100	CSJA-1524M9	24
CPGI-CTY-18-120-BLK-L	82	CPGI-PPMB-13	100	CSJA-2822	24
CPGI-CTY-18-120-NAT-L	82	CPGI-PPMB-14	100	CSJA-2822M1	24
CPGI-CTY-22-250-BLK-C	82	CPGI-PPMB-15	100	CSJA-2822M5	24
CPGI-CTY-22-250-NAT-C	82	CPGI-PPMB-16	100	CSJA-2822M6	24
CPGI-CTY-24-120-BLK-L	82	CPGI-PPMB-20	100	CSJA-2823	24
CPGI-CTY-24-120-NAT-L	82	CPGI-PPMB-21	100	CSJA-2823M2	24
CPGI-CTY-25-175-BLK-L	82	CPGI-PPMB-22	100	CSJA-2823M8	24
CPGI-CTY-25-175-NAT-L	82	CPGI-PPMD-0-9	100	CSJA-2824	24
CPGI-CTY-28-120-BLK-L	82	CPGI-PPMD-A-J	100	CSJA-2824M2	24
CPGI-CTY-28-120-NAT-L	82	CPGI-PPMD-NEMA	100	CSJA-2824M8	24
CPGI-CTY-37-175-BLK-L	82	CPGI-PPMDRF-0-9	100	CSJA-2824M9	24
CPGI-CTY-37-175-NAT-L	82	CPGI-PPMDRF-A-J	100	CSJA-3523	24
CPGI-CTY-48-175-BLK-L	82	CPGI-PPMDRF-NEMA	100	CSJA-3523M1	24
CPGI-CTY-48-175-GRY-L	82	CPGI-RVS-11	7	CSJA-3523M5	24
CPGI-CTY-48-175-NAT-L	82	CPGI-RVS-12	7	CSJA-3524	24
CPGI-CTY-BM-BLK-C	86	CPGI-RVS-13	7	CSJA-3524M2	24
CPGI-CTY-CCL-125-BLK-C	87	CPGI-WCSM-13/4-150-S	8	CSJA-3524M8	24
CPGI-CTY-CCL-125-NAT-C	87	CPGI-WCSM-13/4-150-S	66	CSJA-3524M9	24
CPGI-CTY-CCL2-1000-NAT-C	87	CPGI-WCSM-20/6-150-S	8	CSJ-EG-1	24
CPGI-CTY-CCL2-1000-BLK-C	87	CPGI-WCSM-20/6-150-S	66	CSJ-EG-2	24
CPGI-CTY-CCL2-375-BLK-C	87	CPGI-WCSM-33/8-150-S	8	CSJ-EG-3	24
CPGI-CTY-CCL2-375-NAT-C	87	CPGI-WCSM-33/8-150-S	66	CSJG-1511	26
CPGI-CTY-CCL2-500-BLK-C	87	CPGI-WCSM-43/12-225-S	8	CSJG-1511M1	26
CPGI-CTY-CCL2-500-NAT-C	87	CPGI-WCSM-43/12-225-S	66	CSJG-1511M4	26
CPGI-CTY-CCL-250-BLK-C	87	CPGI-WCSM-51/16-225-S	8	CSJG-1511M5	26
CPGI-CTY-CCL-250-NAT-C	87	CPGI-WCSM-51/16-225-S	66	CSJG-1512	26
CPGI-CTY-CCL2-750-BLK-C	87	CPGI-WCSM-9/3-150-S	8	CSJG-1512M1	26
CPGI-CTY-CCL2-750-NAT-C	87	CPGI-WCSM-9/3-150-S	66	CSJG-1512M2	26
CPGI-CTY-IDP-1-NAT-C	87	CPGI-WOMB-B30	100	CSJG-1512M6	26
CPGI-CTY-IDP-2-NAT-C	87	CPGI-WOMB-B50	100	CSJG-1512M7	26
CPGI-CTY-LPM1-NAT-C	85	CPGI-WOMB-B60	100	CSJG-1513	26
CPGI-CTY-MP-1000-BLK-C	85	CPGI-WOMB-B75	100	CSJG-1513M2	26
CPGI-CTY-MP-1000-NAT-C	85	CPGI-WOMD-13	100	CSJG-1513M8	26
CPGI-CTY-MP-750-BLK-C	85	CPGI-WOMD-16	100	CSJG-1514	26
CPGI-CTY-MP-750-NAT-C	85	CPGI-WOMD-51	100	CSJG-1514M9	26
CPGI-CTY-PMW-NAT-C	86	CPGI-WOMD-52	100	CSJG-2812	26
CPGI-CTY-SM1-BLK-C	86	CRSM 107/29-1000	11	CSJG-2812M1	26
CPGI-CTY-SM1-NAT-C	86	CRSM 107/29-1000	61	CSJG-2812M5	26
CPGI-CTY-SM2-BLK-C	86	CRSM 107/29-1200	11	CSJG-2812M6	26
CPGI-CTY-SM2-NAT-C	86	CRSM 107/29-1200	61	CSJG-2813	26
CPGI-CTY-WM-BLK-C	86	CRSM 143/36-1200	11	CSJG-2813M2	26
CPGI-ESC-1/A	69	CRSM 143/36-1200	61	CSJG-2813M8	26
CPGI-ESC-2/A	69	CRSM 198/55-1200	11	CSJG-2814	26
CPGI-GelCap-1	14	CRSM 198/55-1200	61	CSJG-2814M2	26
CPGI-GelCap-2	14	CRSM 34/10-1200	11	CSJG-2814M8	26
CPGI-GelCap-2-SGL	14	CRSM 34/10-1200	61	CSJG-2814M9	26
CPGI-GelCap-SL-2/0-3 Hole	18	CRSM 34/10-200	11	CSJG-3513	26
CPGI-GelWrap-18/4-200	5	CRSM 34/10-200	61	CSJG-3513M1	26
CPGI-GelWrap-18/4-200UL	5	CRSM 53/13-1200	11	CSJG-3513M5	26

CSJG-3514	26	FCSM-120/40-1200-S	10	GelWrap-18/4-150	5
CSJG-3514M2	26	FCSM-120/40-1200-S	68	GelWrap-18/4 -200	5
CSJG-3514M8	26	FCSM-120/40-1500/U	10	GelWrap-18/4-250	5
CSJG-3514M9	26	FCSM-120/40-1500/U	68	GelWrap-18/4-300	5
CSJG-3515	26	FCSM-177/63 600-S	10	GelWrap-33/10-150	5
CSJG-3515M9	26	FCSM-177/63 600-S	68	GelWrap-33/10-200	5
CSJG-EG-1	26	FCSM-177/63-1200-S	10	GelWrap-33/10-250	5
CSJG-EG-2	26	FCSM-177/63-1200-S	68	GelWrap-33/10-250-I350M4	5
CSJG-EG-3	26	FCSM-177/63-1500/U	10	GelWrap-33/10-300	5
		FCSM-19/6-1200-S	10	GelWrap-33/10-350	5
E		FCSM-19/6-1200-S	68	GelWrap-50/20-200	5
		FCSM-19/6-150-S	10	GelWrap-50/20-250	5
E4540-1250	89	FCSM-19/6-150-S	68	GelWrap-50/20-300	5
E7512-0160	89	FCSM-19/6-A/U	10	GelWrap-50/20-350	5
E7512-0220	89	FCSM-19/6-A/U	68	GelWrap-50/20-400	5
E7512-0240	89	FCSM-28/9-1200-S	10	GelWrap-ES-65/25-150	58
E7512-0260	89	FCSM-28/9-1200-S	68	GelWrap Pad 2 x 8	77
EAKT 1521	120	FCSM-28/9-225-S	10	GHFC-1-90	19
EAKT 1523	120	FCSM-28/9-225-S	68	GHFC-2-90	19
EAKT 1524	120	FCSM-28/9-A/U	10	GHFC-2.5-90	19
EHVS-6920-W-CXXX	30	FCSM-28/9-A/U	68	GHFC-3-90	19
EHVS-6921-W-CXXX	30	FCSM-38/12-1200-S	10	GHVT-691-G	52
EHVS-6922-W-CXXX	30	FCSM-38/12-1200-S	68	GHVT-691-SG	52
EHVS-6923-W-CXXX	30	FCSM-38/12-300-S	10	GHVT-691-SSG	52
EHVT-462-G	52	FCSM-38/12-300-S	68	GHVT-692-G	52
EHVT-462-SG	52	FCSM-38/12-A/U	10	GHVT-692-SG	52
EHVT-463-G	52	FCSM-38/12-A/U	68	GHVT-692-SSG	52
EHVT-463-SG	52	FCSM-51/16-1200-S	10	GHVT-693-G	52
EHVT-464-G	52	FCSM-51/16-1200-S	68	GHVT-693-SG	52
EHVT-464-SG	52	FCSM-51/16-300-S	10	GHVT-693-SSG	52
EHVT-465-G	52	FCSM-51/16-300-S	68	GILS-350	6
EHVT-465-SG	52	FCSM-51/16-A/U	10	GILS-4/O	6
EHVT-691-G	52	FCSM-51/16-A/U	68	GPRT-350/4P-500/1P	20
EHVT-691-SG	52	FCSM-68/22-1200-S	10	GPRT-350/6P-500/2P	20
EHVT-692-G	52	FCSM-68/22-1200-S	68	GPRT-350-3P	20
EHVT-692-SG	52	FCSM-68/22-A/U	10	GPRT-350-4P	20
EHVT-693-G	52	FCSM-68/22-A/U	68	GPRT-350-5P	20
EHVT-693-SG	52	FCSM-9/3-1200-S	10	GPRT-350-6P	20
EHVT-BP	120	FCSM-9/3-1200-S	68	GPRT-350-8P	20
EHVT-BRKT-2.00IN	119	FCSM-9/3-A/U	10	GTAP-1	17
EHVT-BRKT-2.25IN	119	FCSM-9/3-A/U	68	GTAP-2	17
EHVT-BRKT-2.50IN	119	FCSM-90/30-1200-S	10	GWRS-75/25-600	57
EHVT-BRKT-2.75IN	119	FCSM-90/30-1200-S	68	GWRS-75/25-850	57
EHVT-BRKT-3.00IN	119	FCSM-90/30-1500/U	10	GWRS-75/25-950	57
EHVT-BRKT-3.50IN	119	FCSM-90/30-1500/U	68	GWRS-75/25-1050	57
EHVT-BRKT-3.75IN	119	FH-2618A-1	124		
EHVT-BRKT-4.00IN	119	FH-2629-ELECTRODE	123	H	
EHVT-BRKT-4.25IN	119	FH-2629-Kit	124		
EPPA-034-E	116	FH-2629-TORCH ASSY	123	HG-501A	122
EPPA-034-F	116	FH-2640-PS-KIT	124	HG-751A-C	122
EPPA-034-G	116	FH-2649-PS-KIT	124	HV-BRAID-4-1520	115
EPPA-034-H	116	FH-3366-97-PS-HANDLE	123	HV-BRAID-6-1520	115
EPPA-034-L	116	FH-AD-3061-I3-PS-REGULATOR	123	HV-BRAID-8-1520	115
EPPA-055-0/1	43	FH-AD-3341-91-PS-BURN1.5	123	HVE-1591	41
EPPA-055-0/3	43	FH-AD-3347-91-PS-BURN-1	123	HVE-1592	41
EPPA-055-3/1	43	FH-AD-3348-91-PS-BURN-2	123	HVE-1593	41
EPPA-055-3/3	43	FH-PS-2001	122	HVE-1594	41
EPPA-055-6/1	43	FSTW-2-1-6	75	HVES-1521D	40
EPPA-055-6/3	43			HVES-1522D	40
ESA-1	61	G		HVES-1523D	40
ESA-2	61			HVES-1524D	40
ESC-1/A	69	GelCap 1	14	HVES-2521D	40
ESC-2/A	69	GelCap 2	14	HVES-2522D	40
ESC-3/A	69	GelCap 3	14	HVES-2523D	40
ESC-4/A	69	GelCap 4	14	HVES-3-1591	40
ESC-5/A	69	GELCAP-8-GRD-1	53	HVES-3-1592	40
ESC-6/A	69	GELCAP-8-GRD-2	53	HVES-3-1593	40
ESC-7/A	69	GELCAP-8-NS-1V	53	HVES-3-1594	40
EVHS-6920-W	30	GELCAP-8-NS-1VEX	53	HVES-3-2591E	40
EVHS-6921-W	30	GELCAP-8-NS-2V	53	HVES-3-2592E	40
EVHS-6922-W	30	GELCAP-8-S-1V	53	HVES-3-2593E	40
EVHS-6923-W	30	GELCAP-8-S-1VEX	53	HV-MSK-3/C-581	42
		GELCAP-8-S-2V	53	HV-MSK-3/C-582	42
F		GelCap-SL-2/O-3 Hole	18	HV-MSK-3/C-584	42
		GelWrap-18/4-100	5	HVS-MESH-2-5000	116

HVS-1521S	27	HVS-GC-1.5	116	HVT-1593-G	51
HVS-1522S	27	HVSH-1522-MOD	39	HVT-1593-SG	51
HVS-1523S	27	HVSH-1523-MOD	39	HVT-1594G	51
HVS-1524S	27	HVSH-1582D-MOD	39	HVT-1594SG	51
HVS-1525S	27	HVSH-1583D-MOD	39	HVT-252-G	46
HVS-1521S-W	27	HVS-LR-160/42-1200	118	HVT-252-J	50
HVS-1522S-W	27	HVS-LR-160/42-600	118	HVT-252-LC	49
HVS-1523S-W	27	HVS-LR-200/50-1200	118	HVT-252-SG	46
HVS-1524S-W	27	HVS-LR-200/50-600	118	HVT-252-SJ	50
HVS-1525S-W	27	HVS-LR-75/15-1200	118	HVT-253-G	46
HVS-2521S	27	HVS-LR-75/15-600	118	HVT-253-J	50
HVS-2522S	27	HVS-MESH-2-5000	116	HVT-253-LC	49
HVS-2523S	27	HVSR-1582	32	HVT-253-SG	46
HVS-3521S	27	HVSR-1583	32	HVT-253-SJ	50
HVS-3522S	27	HVSR-1584	32	HVT-254-G	46
HVS-3523S	27	HVSR-2583E	32	HVT-254-J	50
HVS-1531-LC	31	HVSR-2584E	32	HVT-254-LC	49
HVS-1532-LC	31	HVSR-T-1582	33	HVT-254-SG	46
HVS-1533-LC	31	HVSR-T-1583	33	HVT-254-SJ	50
HVS-1534-LC	31	HVSR-T-1584	33	HVT-255-G	46
HVS-1551S	29	HVSR-T-2582E	33	HVT-255-SG	46
HVS-1552S	29	HVSR-T-2583E	33	HVT-3-1591-G	51
HVS-1553S	29	HVS-SHIM-1	117	HVT-3-1591-SG	51
HVS-1554S	29	HVS-SHIM-2	117	HVT-3-1592-SG	51
HVS-1555S	29	HVS-SHIM-3	117	HVT-3-1592-G	51
HVS-1581D	32	HVS-SHIM-4	117	HVT-3-1593-G	51
HVS-1582D	32	HVS-SHIM-5	117	HVT-3-1593-SG	51
HVS-1583D	32	HVS-SHIM-6	117	HVT-352-G	46
HVS-1584D	32	HVS-T-1581E-S	33	HVT-352-J	50
HVS-2531-LC	31	HVS-T-1581S	33	HVT-352-LC	49
HVS-2532-LC	31	HVS-T-1582E-S	33	HVT-352-SG	46
HVS-2533-LC	31	HVS-T-1582S	33	HVT-352-SJ	50
HVS-2582E	32	HVS-T-1583E-S	33	HVT-353-G	46
HVS-2583E	32	HVS-T-1583S	33	HVT-353-J	50
HVS-2584E	32	HVS-T-1584S	33	HVT-353-LC	49
HVS-2882E	32	HVS-T-1591S	34	HVT-353-SG	46
HVS-2883E	32	HVS-T-1592S	34	HVT-353-SJ	50
HVS-2884E	32	HVS-T-1593S	34	HVT-354-G	46
HVS-3-1581S	35	HVS-T-2582E	33	HVT-354-J	50
HVS-3-1582S	35	HVS-T-2583E	33	HVT-354-SG	46
HVS-3-1583S	35	HVS-T-2584E	33	HVT-354-SJ	50
HVS-3-1584S	35	HVS-T-3582S	33	HVT-355-G	46
HVS-3-1591	36	HVS-T-3583S	33	HVT-355-SG	46
HVS-3-1591S	36	HVSY-1522S	37	HVT-Z-151-G	47
HVS-3-1592	36	HVSY-1522S	39	HVT-Z-151-J	47
HVS-3-1592S	36	HVSY-1523S	37	HVT-Z-151-SG	47
HVS-3-1593	36	HVSY-1523S	39	HVT-Z-151-SJ	47
HVS-3-1593S	36	HVSY-1582D	38	HVT-Z-152-G	47
HVS-3-1594	36	HVSY-1582D	39	HVT-Z-152-J	47
HVS-3-2591E	36	HVSY-1583D	38	HVT-Z-152-SG	47
HVS-3-2592E	36	HVSY-1583D	39	HVT-Z-152-SJ	47
HVS-3531-LC	31	HVT-151-G	46	HVT-Z-153-G	47
HVS-3532-LC	31	HVT-151-J	50	HVT-Z-153-J	47
HVS-3533-LC	31	HVT-151-LC	49	HVT-Z-153-SG	47
HVS-3582D	32	HVT-151-SG	46	HVT-Z-153-SJ	47
HVS-3583D	32	HVT-151-SJ	50	HVT-Z-154-G	47
HVS-3584D	32	HVT-152-G	46	HVT-Z-154-J	47
HVSA-3-1581S	35	HVT-152-J	50	HVT-Z-154-SG	47
HVSA-3-1582S	35	HVT-152-LC	49	HVT-Z-154-SJ	47
HVSA-3-1583S	35	HVT-152-SG	46	HVT-Z-252/352-G	47
HVSA-3-1584S	35	HVT-152-SJ	50	HVT-Z-252/352-J	47
HVS-C-1521S	28	HVT-153-G	46	HVT-Z-252/352-SG	47
HVS-C-1522S	28	HVT-153-J	50	HVT-Z-252/352-SJ	47
HVS-C-1522S-M1	28	HVT-153-LC	49	HVT-Z-253/353-G	47
HVS-C-1523S	28	HVT-153-SG	46	HVT-Z-253/353-J	47
HVS-C-1523S-M2	28	HVT-153-SJ	50	HVT-Z-253/353-SG	47
HVS-C-1524S	28	HVT-154-G	46	HVT-Z-253/353-SJ	47
HVS-EG-1	118	HVT-154-J	50	HVT-Z-254/354-G	47
HVS-EG-2	118	HVT-154-LC	49	HVT-Z-254/354-SG	47
HVS-EG-3	118	HVT-154-SG	46	HVT-Z-254/354-J	47
HVS-EG-3-1	118	HVT-154-SJ	50	HVT-Z-254/354-SJ	47
HVS-EG-3-2	118	HVT-1591-G	51		
HVS-EG-3-3	118	HVT-1591-SG	51		
HVS-GC-0.5	116	HVT-1592-G	51		
HVS-GC-1.0	116	HVT-1592-SG	51	IDP-1330-0607-10	103

IDP-1330-0607-T200	103	IDP-T208M-PRINTER	97	LM-1-TAPE-BK	101
IDP-1892BK04-RIBBON	94	IDP-T208M-PRINTER	98	LM-1-TAPE-CR	101
IDP-1892BK04-RIBBON	103	IDP-T208M-PRINTER	99	LM-1-TAPE-WE	101
IDP-AM6310-110V-PRINTER	94	IDP-T208M-PRINTER	102	LM-1-TAPE-YW	101
IDP-AM6310-110V-PRINTER	102	IDP-T208M-PRINTER	103	LM-1-VINYL-CR	101
IDP-AM6310-110V-PRINTER	103	IDP-T312M-PRINTER	93	LM-1-VINYL-RD	101
IDP-CM-SCE-25-4H-9	94	IDP-T312M-PRINTER	94	LM-1-VINYL-SR	101
IDP-CM-SCE-50-4H-9	94	IDP-T312M-PRINTER	95	LM-1-VINYL-WE	101
IDP-CM-SCE-50-6H-9	94	IDP-T312M-PRINTER	98	LM-1-VINYL-YW	101
IDP-HL104WE1TS025B	94	IDP-T312M-PRINTER	97	LM2020PLUS-2800MAH-NICAD	101
IDP-HL104WE1TS033B	94	IDP-T312M-PRINTER	99	LM2020PLUS-PRINTER-KIT	101
IDP-HL104WE1TS038B	94	IDP-T312M-PRINTER	102	LM-2-1/2-SL	101
IDP-HL104WE1TS050B	94	IDP-T312M-PRINTER	103	LM-3/16-TUBE-WE	101
IDP-HL104WE1TS070B	94	IDP-T312S-C-PRINTER	102	LM-3/16-TUBE-YW	101
IDP-HL203WE1TS025B	94	IDP-TMS-RJS-RIBN-4RPSCE	94	LM-3/4-SL	101
IDP-HL203WE1TS033B	94	IDP-TMS-RJS-RIBN-4RPSCE	103	LM-4-SL	101
IDP-HL203WE1TS038B	94	IDP-TTPA100WE-10	99	LM-CASE	101
IDP-HL203WE1TS050B	94	IDP-TTPA100YW-10	99	LVBT-1-R	76
IDP-HL203WE1TS070B	94	IDP-TTPA200MP-10	99	LVBT-2-R	76
IDP-HL253WE1TS025B	94	IDP-TTPA200WE-10	99	LVBT-4-R	76
IDP-HL253WE1TS033B	94	IDP-TTPA300MP-10	99	LVIT-150/50-A/U	69
IDP-HL253WE1TS038B	94	IDP-TTPA300WE-10	99	LVIT-30/10-A/U	69
IDP-HL253WE1TS050B	94	IDP-TTPA400MP-10	99	LVIT-75/25-A/U	69
IDP-HL253WE1TS070B	94	IDP-TTPA400WE-10	99		
IDP-HLX125WE2NEL60S	95	IDP-WINTOTAL-SWARE	102	M	
IDP-HLX125WE4NEL60S	95	IDP-WINTOTAL-SWARE-DGLUS	102		
IDP-HLX125YW2NEL60S	95	IDP-WP-040040-25-9	98	MBSM-43/8-1200	60
IDP-HLX125YW4NEL60S	95	IDP-WP-064064-25-9	98	MBSM-75/15-1200	60
IDP-MP-101635-2.5-8A	98	IDP-WP-080080-10-9	98	MBSM-125/30-1200	60
IDP-MP-191064-10-8A	98	IDP-WP-101165-0.85-9	98	MBSM-160/42-1200	60
IDP-MP-203127-10-8A	98	IDP-WP-101635-2.5-9	98	MBSM-200/50-1200	60
IDP-MP-254127-10-8A	98	IDP-WP-114040-25-9	98	MCK-1L	16
IDP-MP-254254-10-8A	98	IDP-WP-127111-10-9	98	MCK-1V	16
IDP-MP-381064-10-8A	98	IDP-WP-165051-25-9	98	MCK-2L	16
IDP-MP-381191-5-8A	98	IDP-WP-165102-10-9	98	MCK-2V	16
IDP-MP-508254-5-8A	98	IDP-WP-178095-10-9	98	MCK-3V	16
IDP-MP-508318-2.5-8A	98	IDP-WP-191064-10-9	98	MCK-4V	16
IDP-MP-699254-5-8A	98	IDP-WP-203127-10-9	98	MCK-5-1L	54
IDP-MP-762381-2.5-8A	98	IDP-WP-229364-10-9	98	MCK-5-1V	54
IDP-MP-762508-2.5-8A	98	IDP-WP-254097-10-9	98	MCK-5-2L	54
IDP-PAYOFF-CRADEL	103	IDP-WP-254127-10-9	98	MCK-5-2V	54
IDP-PM07507	96	IDP-WP-254254-10-9	98	MCK-5-3V	54
IDP-PM07507-BLANK	96	IDP-WP-318064-10-9	98	MOD-3A-HVT	48
IDP-PM09512	96	IDP-WP-381020-10-9	98	MOD-3B-HVT	48
IDP-PM09512-BLANK	96	IDP-WP-381064-10-9	98	MOD-3X-HVT	48
IDP-SB050100WE10	97	IDP-WP-381190-5-9	98	MOD-3Y-HVT	48
IDP-SB050143WE10	97	IDP-WP-508064-10-9	98	MOD-S1-314-Skirts	121
IDP-SB050100WE5-T200	97	IDP-WP-508127-10-9	98	MOD-S2-325-Skirts	121
IDP-SB050143WE5-T200	97	IDP-WP-508254-5-9	98	MOD-S3-336-Skirts	121
IDP-SB080150WE10	97	IDP-WP-508318-2.5-9	98	MOD-S4-346-Skirts	121
IDP-SB080150WE5-T200	97	IDP-WP-523841-1.5-9	98	MOD-S5-357-Skirts	121
IDP-SB100143WE2.5-T200	97	IDP-WP-700254-5-9	98	MWTM-10/3-1200-S	65
IDP-SB100143WE5	97	IDP-WP-762381-2.5-9	98	MWTM-10/3-A/U	65
IDP-SB100225WE2.5-T200	97	IDP-WP-762508-2.5-9	98	MWTM-115/34-1200-S	65
IDP-SB100225WE5	97	IDP-WP-950950-10-9	98	MWTM-115/34-1500/U	65
IDP-SB100375WE1-T200	97			MWTM-140/42-1200-S	65
IDP-SB100375WE2.5	97	L		MWTM-140/42-1500/U	65
IDP-SB100594WE0.5-T200	97			MWTM-16/5-1200-S	65
IDP-SB100594WE1	97	LM-1/2-SL	101	MWTM-16/5-A/U	65
IDP-SB190594WE1	97	LM-1/2-TAPE-BK	101	MWTM-25/8-1200-S	65
IDP-SB200143WE2.5	97	LM-1/2-TAPE-CR	101	MWTM-25/8-A/U	65
IDP-SB200225WE1-T200	97	LM-1/2-TAPE-WE	101	MWTM-35/12-1200-S	65
IDP-SB200225WE2.5	97	LM-1/2-TAPE-YW	101	MWTM-35/12-A/U	65
IDP-SB200375WE1-T200	97	LM-1/2-TUBE-WE	101	MWTM-50/16-1200-S	65
IDP-SB200375WE2.5	97	LM-1/2-TUBE-YW	101	MWTM-50/16-A/U	65
IDP-SB200743WE0.5-T200	97	LM-1/2-VINYL-CR	101	MWTM-85/25-1200-S	65
IDP-SB200743WE1	97	LM-1/2-VINYL-RD	101	MWTM-85/25-1500/U	65
IDP-SST141-316	96	LM-1/2-VINYL-WE	101		
IDP-SST71-316	96	LM-1/2-VINYL-YW	101	P	
IDP-T200-CASE	103	LM-1/4-TUBE-WE	101		
IDP-T200-RIBBON-1966	103	LM-1/4-TUBE-YW	101	P63	115
IDP-T200-SPINDLE	103	LM-1/8-TUBE-WE	101		
IDP-T208M-C-PRINTER	102	LM-1/8-TUBE-YW	101		
IDP-T208M-PRINTER	93	LM-1-1/4-SL	101	R	
IDP-T208M-PRINTER	95	LM-1-SL	101		

RDSS-AD-210	89	T312S-C-Printer	102	WCSM-20/6-150-S	8
RDSS-AT/AP-150	89	TFT-151E	44	WCSM-20/6-150-S	66
RDSS-45	88	TFT-151E	45	WCSM-20/6-225-S	8
RDSS-60	88	TFT-151E-G	45	WCSM-20/6-225-S	66
RDSS-75	88	TFT-151E-SG	45	WCSM-20/6-300-S	8
RDSS-100	88	TFT-151E-SLC	45	WCSM-20/6-300-S	66
RDSS-125	88	TFT-152E	44	WCSM-20/6-A/U	9
RDSS-150	88	TFT-152E	45	WCSM-20/6-A/U	66
RDSS-CLIP-100	89	TFT-152E-G	45	WCSM-33/8-1200-S	8
RDSS-CLIP-125	89	TFT-152E-SG	45	WCSM-33/8-1200-S	66
RDSS-CLIP-150	89	TFT-152E-SLC	45	WCSM-33/8-150-S	8
RDSS-CLIP-45	89	TFT-153E	44	WCSM-33/8-150-S	66
RDSS-CLIP-75	89	TFT-153E	45	WCSM-33/8-225-S	8
RDSS-IG-SR-AS	89	TFT-153E-G	45	WCSM-33/8-225-S	66
RDSS-IT-16	89	TFT-153E-SG	45	WCSM-33/8-300-S	8
RVC-1V	15	TFT-153E-SLC	45	WCSM-33/8-300-S	66
RVC-2V	15	TFT-154E	44	WCSM-33/8-A/U	9
RVC-3V	15	TFT-154E	45	WCSM-33/8-A/U	66
RVC-4V	15	TFT-154E-SG	45	WCSM-43/12-1200-S	8
RVS-11	7	TFT-154E-SLC	45	WCSM-43/12-1200-S	66
RVS-12	7	TFT-251E	44	WCSM-43/12-150-S	8
RVS-13	7	TFT-251E	45	WCSM-43/12-150-S	66
RVS-13-SK	59	TFT-251E-SG	45	WCSM-43/12-225-S	8
RVS-14	7	TFT-251E-SLC	45	WCSM-43/12-225-S	66
RVS-14-SK	59	TFT-252E	44	WCSM-43/12-300-S	8
RVS-15-SK	59	TFT-252E	45	WCSM-43/12-300-S	66
		TFT-252E-SG	45	WCSM-43/12-A/U	9
		TFT-252E-SLC	45	WCSM-43/12-A/U	66
		TFT-253E	44	WCSM-51/16-100-S	8
		TFT-253E	45	WCSM-51/16-100-S	66
S-1052-3-3000	77	TFT-253E-SG	45	WCSM-51/16-1200-S	8
S-1171-4-300	77	TFT-253E-SLC	45	WCSM-51/16-1200-S	66
S-1174-2-300	77	TFT-254E	44	WCSM-51/16-225-S	8
S-1174-4-460	77	TFT-254E	45	WCSM-51/16-225-S	66
S-1251-25-300-4	77	TFT-254E-SG	45	WCSM-51/16-300-S	8
S-1251-50-300-1	77	TFT-254E-SLC	45	WCSM-51/16-300-S	66
S-1278-3 x 61 x 7620	77	TFT-352E	44	WCSM-51/16-A/U	9
S-1278-3 x 61 x 7620	89	TFT-352E	45	WCSM-51/16-A/U	66
ShrinkMark-1000-2-9	93	TFT-352E-SG	45	WCSM-70/21-1200-S	8
ShrinkMark-1000-2-S1-9	93	TFT-352E-SLC	45	WCSM-70/21-1200-S	66
ShrinkMark-10-2-9	93	TFT-353E	44	WCSM-70/21-300-S	8
ShrinkMark-10-2-S1-9	93	TFT-353E	45	WCSM-70/21-300-S	66
ShrinkMark-12-2-9	93	TFT-353E-SG	45	WCSM-70/21-450-S	8
ShrinkMark-12-2-S1-9	93	TFT-353E-SLC	45	WCSM-70/21-450-S	66
ShrinkMark-18-2-9	93	TFT-354E	44	WCSM-70/21-600-S	8
ShrinkMark-18-2-S1-9	93	TFT-354E	45	WCSM-70/21-600-S	66
ShrinkMark-2-2-9	93	TFT-354E-SG	45	WCSM-70/21-A/U	9
ShrinkMark-2-2-S1-9	93	TFT-354E-SLC	45	WCSM-70/21-A/U	66
ShrinkMark-250-2-9	93	TG-12 Reflector	122	WCSM-9/3-1200-S	8
ShrinkMark-250-2-S1-9	93	TG-13 Reflector	122	WCSM-9/3-1200-S	66
SL-250-120V-F-FT(B1)	13	TG-23 Reflector	122	WCSM-9/3-150-S	8
SL-250-120V-NF-FT(B1)	13	TG-24 Reflector	122	WCSM-9/3-150-S	66
SL-350-120V-F-FT(B1)	13			WCSM-9/3-150-S	66
SL-350-120V-NF-FT(B1)	13			WCSM-9/3-300-S	8
SL-4/0-120V-F-FT(B1)	13			WCSM-9/3-300-S	66
SL-4/0-120V-NF-FT(B1)	13			WCSM-9/3-A/U	9
SL-500-120V-F-FT(B1)	13			WCSM-9/3-A/U	66
SL-500-120V-NF-FT(B1)	13	WCSM-105/30-1200-S	8	WCSM-90/30-1500/U	9
SL-750-120V-F-FT(B1)	13	WCSM-105/30-1200-S	66	WCSM-90/30-1500/U	66
SL-750-120V-NF-FT(B1)	13	WCSM-105/30-300-S	8		
STD03W-x	96	WCSM-105/30-300-S	66		
STD06W-x	96	WCSM-13/4-1200-S	8		
STD09W-x	96	WCSM-13/4-1200-S	66		
STD012W-x	96	WCSM-13/4-150-S	8		
STD015W-x	96	WCSM-13/4-150-S	66		
STD017W-x	96	WCSM-13/4-A/U	9		
STD021W-x	96	WCSM-13/4-A/U	66		
STD024W-x	96	WCSM-130/36-1200-S	8		
STD15MO	96	WCSM-130/36-1200-S	66		
STD17MO	96	WCSM-130/36-1500/U	9		
STD21MO	96	WCSM-130/36-1500/U	66		
STD24MO	96	WCSM-130/36-300-S	8		
		WCSM-130/36-300-S	66		
		WCSM-130/36-450-S	8		
		WCSM-130/36-450-S	66		
		WCSM-20/6-1200-S	8		
		WCSM-20/6-1200-S	66		
T208M Printer	102				

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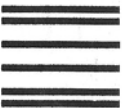
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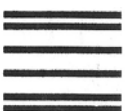
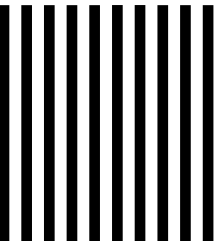
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