



3M Science.
Applied to Life.™

Reliable Electrical Solutions

Cable Accessories and Solutions for
Maintenance, Repairs and Operations

You're in a demanding industry. To be successful, you need a wide range of reliable products designed to effectively manage your daily processes. You need a supplier with a solid understanding of your industry and the technology that drives it. Quite simply, you need 3M. Our Electrical Markets Division designs and manufactures a comprehensive line of products that can address your diverse applications. Widely recognized for our innovation, reliability and global corporate strength, 3M has the products and services you need and the name you trust.

In your business; power, technology and reliability are essential. 3M delivers that and more. We have the power of a diversified, global manufacturer with more than 70,000 products in our line; a reputation for technical excellence and innovation; and employees committed to delivering quality products and service to you, our valued customer. Our commitment and capability doesn't stop with electrical products, it starts there.

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3M Products for Energy

For power plants, data centers and factories, being online and running is critical. Industrial facilities depend on a reliable electrical network supported by terminations, splices and tapes – field-proven and designed for harsh environments. Understanding your field challenges helps 3M design cable accessories to accommodate tight spaces, locating tools that use GPS, fire barriers and safety equipment.

Helping you get better at your job makes us better at ours. That's why you'll see our representatives roll up their sleeves at job sites to provide onsite training. Helping you stay on time and budget is our priority.

Power Generation

3M offers various reliable solutions for generating power from different sources. Low voltage to high voltage cable portfolio is essential in harnessing the energy to be tied up to the grid.

Electrical Construction & Maintenance

3M provides innovative electrical construction and maintenance solutions you can rely on, including wire & cable management, motor lead connecting, insulating & sealing, locating & marking, splicing/connecting/grounding, cable repair, fire retarding and arc proofing.



Cold Shrink (Pre Moulded / Extruded) Solutions

Discover 3M Cold Shrink Solutions

- 3M makes the products you need for that peace of mind.
- Over 50 years ago, 3M pioneered cold shrink technology
- Withstand extreme environmental conditions
- Lower installed cost
- Permanent, durable environmental seal and insulation

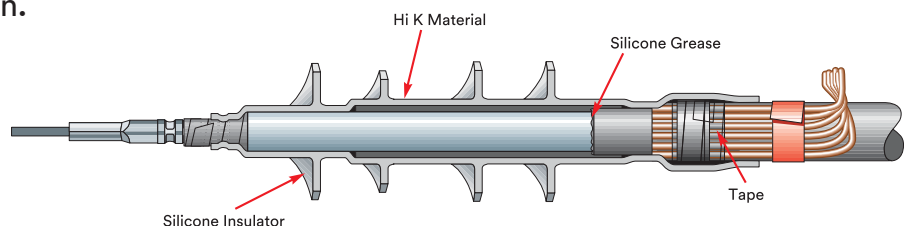
11/22/33 kV - Medium Voltage (MV) Termination



- 3M terminations are based on specially formulated, track-resistant, silicone rubber insulators with “built-in” Hi-K stress relief
- 3M “built-in” Hi-K provides a dielectric constant of approximately 25, distributing the electric field well beyond the shield cutoff. This greatly reduces the stress gradient at the end of the shield, thus helping to ensure long-lasting performance in medium-voltage applications
- Resistant to severe weathering, temperature extremes, heavy moisture and prolonged industrial contamination.

3M termination kits offer you:

- Fast, easy installation
- Reliable, long-lasting materials
- Solutions to fit your specs

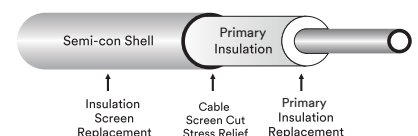


11/22/33 kV - Medium Voltage (MV) Splice

3M splice solutions can help you reduce the time, labor and cost involved in both above and below splice applications. What's more, every 3M splice has been 100% factory tested on power cable, so you can be assured of dependable performance, stability and long life with every splice you make.

Description:

- One-piece multilayer silicone splice body
- Integrated stress control mechanism, insulation and outer semi-conductive layer
- Permanent radial pressure guarantees a reliable function over the entire lifetime
- The outer semi-conductive layer re-establishes the insulation screen
- The insulation of the splice body rebuilds the cable insulation across the entire splice
- The integrated refractive stress control provides the proper electric field distribution
- 3M Scotch® Tape 13 is applied over the connector and forms the inner conductive electrode



66kV Cold Shrink Termination

Cold Shrink Termination Kit is designed for Cables up to 72.5kV (U_{max}) Voltage class, single core polymeric power cable systems.

Features:

- Accommodates crimp or mechanical lugs
- Solderless earth connection
- Thick walled, silicone rubber
- Physical protection
- Moisture sealing
- Silicone outer rain sheds ideal for contaminated, industrial or coastal environments

Applications:

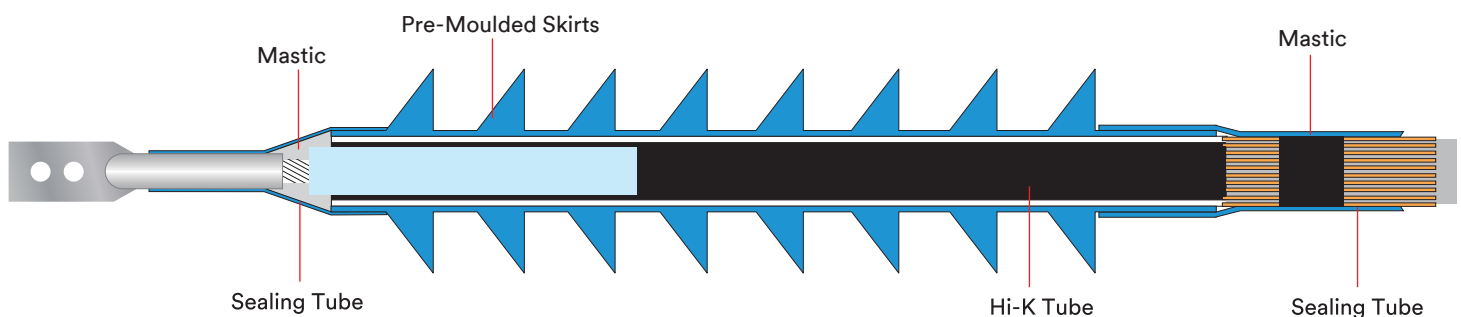
- Designed to terminate 72.5kV (IEC) power cables
- Covers conductor ranges up to 1200 mm²
- Designed for polymeric insulated cables

Certifications:

The 3M QTEN termination meets AND exceeds the requirements of IEC Standard 60840.

Advantages:

- Lightweight
- Proven Cold Shrink reliability
- Installs without heat, reducing worker safety risk
- Class I Termination



66kV Cold Shrink Joint

Cold Shrink Joint Kit is designed for cables upto 72.5kV Umax voltage class. The cold shrink joint body is a one-piece molded design made of specially formulated silicone rubbers.

Features:

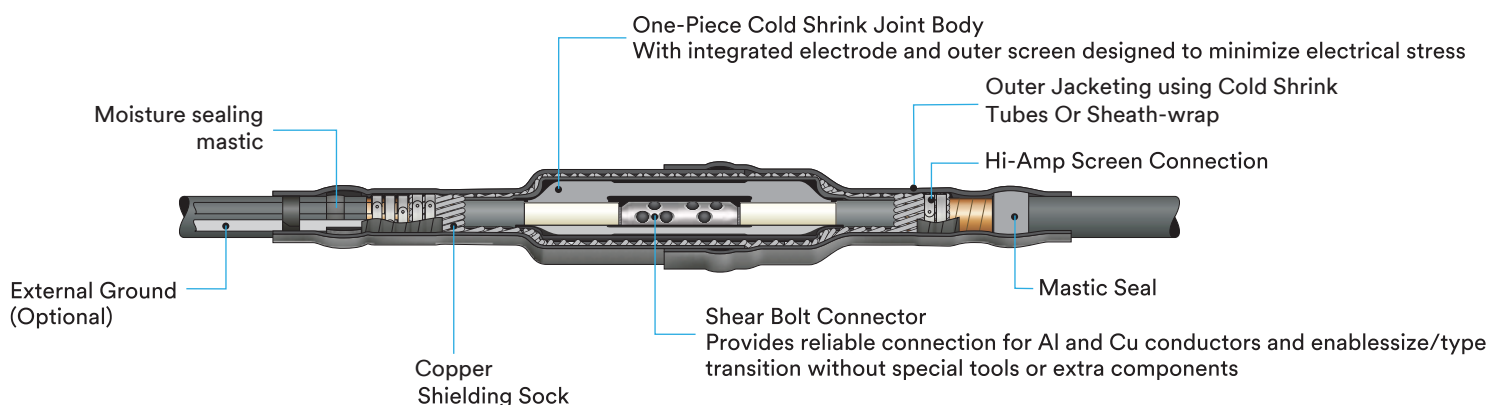
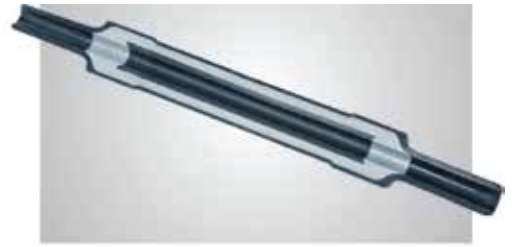
- One-piece cold shrink joint body
- Each joint body is 100% factory tested, for greater reliability and longer service life
- No special tools or flame required for installation
- Kit covers wide range of cable sizes and types

Applications:

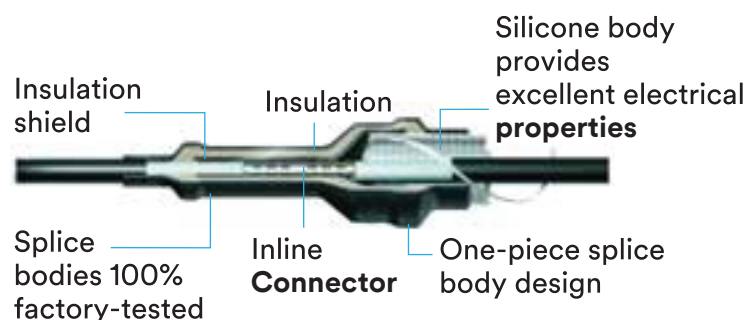
- Designed for polymeric insulated cables
- Covers inline and crossbond splicing applications
- Suitable for cable size and type transitions
- Covers conductor ranges up to 1200 mm²

Certifications:

The Quick Splice joint meets or exceeds the requirements of IEC 60840 for 72.5kV.



Easy, consistent installations by eliminating the pushing, pulling or heating required by traditional splices.



66kV 3 Core Splice and Termination

66 kV 3C Cable are introduced first time in the industry. To meet the industry demand 3M made 66 kV 3C Joint & Termination which are hybrid solution being offered to customer. It is combination of Heat Shrink & Cold Shrink Technology. It is also suitable for the cable having integrated Fiber Optics based monitoring system.

Applications:

Suitable for 66 kV 3C, 300 sqmm Cable

Features:

- Pre-moulded Silicon Rubber single piece joint body
- No special tool required
- Flexibility to accommodate cable with different metallic sheath
- Very less installation time
- Type tested as per IEC 60840 at CPRI

Options:

Suitable for crimping/mechanical connector



Reliability and less installation time requirement

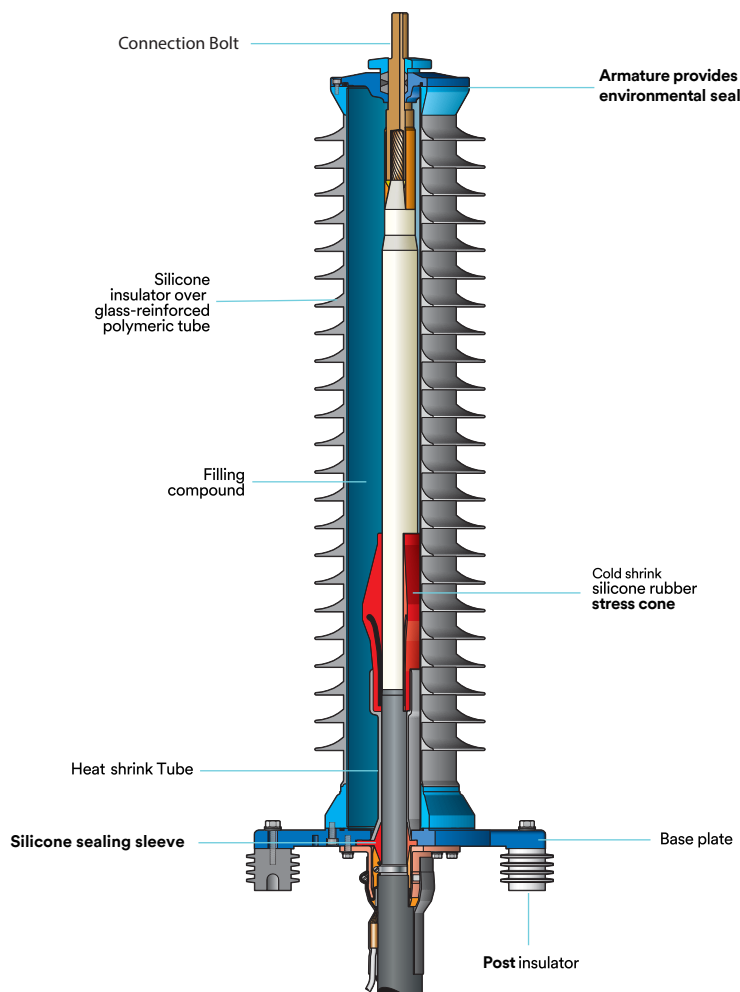
110-145 kV Oil Filled Outdoor Terminations

Description:

- Wet Silicone Termination TS-II Family with Cold Shrink Stress Cone for up to 145kV Applications
- Self-supporting, outdoor termination with composite insulator
- Conductor size up to 1200 sqmm
- Can accommodate a variety of pollution classes

Features:

- One-piece pre-molded cold shrink silicone stress cone
- Light-weight construction, approximately 1/3 the weight of most porcelain terminations
- Easier handling, transportation and installation than porcelain insulator
- Hydrophobic silicone materials provide excellent environmental performance
- Smooth surface enables self-cleaning properties
- Internal shear bolt connection option eliminates need for crimp-type connections
- No special tools required
- One kit covers a wide range of cable sizes
- Alternating sheds (skirts)
- Cold pour insulating compound



110-145 kV Straight / Insulated Joint

Description:

- Cold Shrink Joint SC-II & SS-II Family for up to 145kV Applications
- One-piece, cold shrink silicone rubber joint for in-line and cross bond applications

Applications:

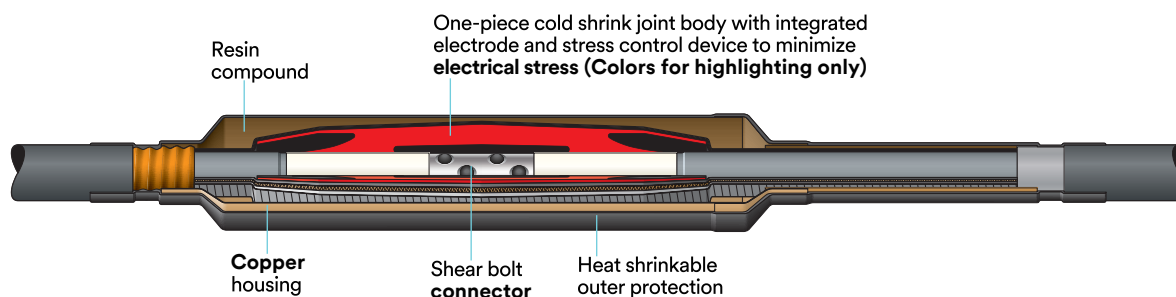
- Conductor size up to 1200 sqmm
- In-line and cross bond design available

Features:

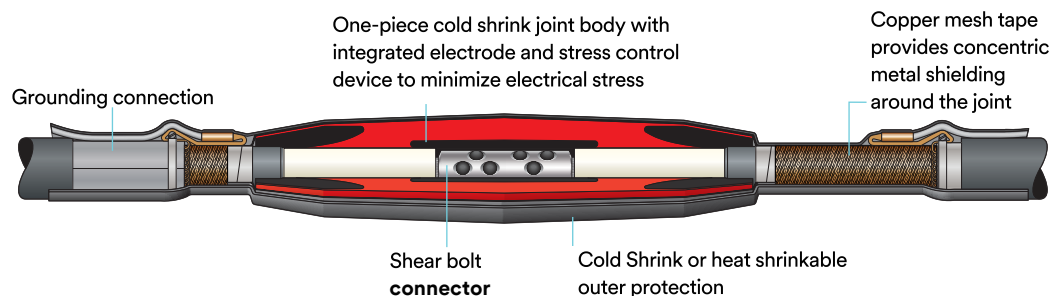
- One piece silicone rubber cold shrink joint body
- Shear bolt connector included (optional crimp connector)
- Connectors for round compacted or round segmented cable available
- Flexible design accommodates different shielding and cable re-jacketing systems
- No special tools required
- Short installation length
- No parking positioning required
- Kit covers a wide range of cable sizes

Optional:

- Re-jacketing with heat shrink or resin-filled enclosure
- Metal housing (optional)
- Link boxes for a variety of grounding systems



Cold Shrink Joint SC-II with a cross bond configuration and cold shrink or heat shrink re-jacketing



110-170kV Outdoor Cable Termination - Porcelain Insulator

Features:

- Reliable sealing construction – to prevent water immersion or water leakage
- Meets the requirements of IEC 60840
- Pollution class: IV

Voltage (kV) U	110	132	150
Rated Voltage (kV) U₀	64	76	87
Maximum Operating Voltage (kV)	123	145	170
Maximum Cross Conductor Section (mm²)	1600	1600	1200



110-170kV Outdoor Cable Termination - Composite Insulator

Features:

- Epoxy bushing is made of liquid silicone rubber
- Pollution and UV resistant product – suitable for outdoor, coastal or high pollution area
- Meets the requirement of IEC 60840

Voltage (kV) U	110	132	150
Rated Voltage (kV) U₀	64	76	87
Maximum Operating Voltage (kV)	123	145	170
Maximum Cross Conductor Section (mm²)	1600	1600	1200



110kV Dry Pre-Fabricated Cable Termination

Features:

- Prefabricated by liquid silicone rubber
- Oil free product
- Organic insulated, explosion proof, maintenance free, suitable for populous area in urban center
- Simple construction - suitable for harsh weather conditions and high pollution areas
- Meets the requirement of IEC 60840

Voltage (kV) U	110
Rated Voltage (kV) U₀	64
Maximum Operating Voltage (kV)	123
Maximum Cross Conductor Section (mm²)	1600



110-170kV Cable Joint - Push on Technology

Straight Joint/ Insulation Joint

- Pre-moulded stress relief cone, with long time operating experience.
- The protection casing is made of metal which is anticorrosive and has good mechanical property.
- Suitable for different cable cross section with long-term operating experience.
- Meets the requirement of IEC 60840

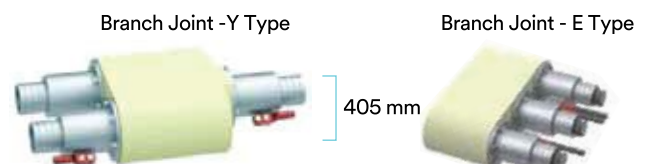


Voltage (kV) U	Rated Voltage (kV)	Maximum Operating Voltage (kV)	Maximum Cross Conductor Section (mm ²)
110	64	123	1600
132	76	145	1600
150	87	170	1200

110-170kV Cable Joint

Features:

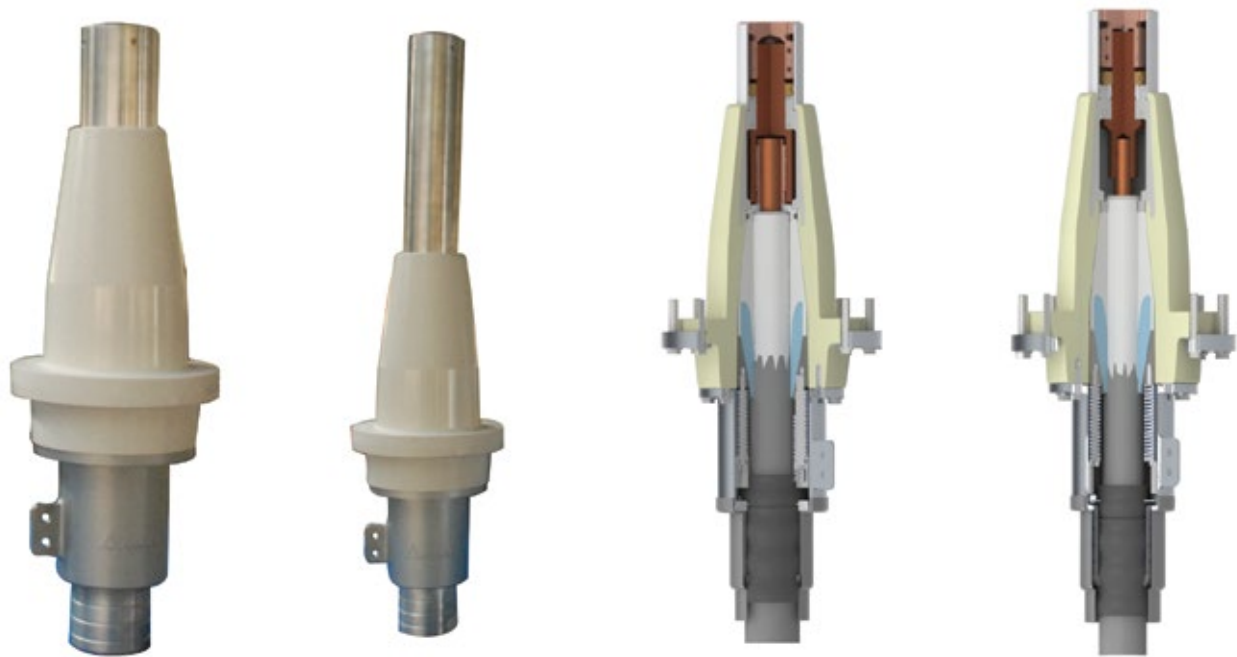
- Product made of epoxy resin
- Dry type, covers small area and is maintenance free
- Suitable to be installed in cable tunnel and cable well, saving investment and space
- Providing alternative lines for cables of different sections
- Meets the requirements of IEC 60840
- Can withstand a maximum operating voltage of 123kV
- Conductor size upto 1600 mm²



110-170kV Cable Termination for Transformers and GIS

Features:

- Pre molded stress cone and epoxy bushing
- Plug-in type GIS Termination with advantage of testing female-GIS part separately
- Simple installation, reliable earthing and maintenance free
- Meets the requirement of IEC 60840 & IEC 62271:209



Voltage (kV) U	Rated Voltage (kV)	Maximum Operating Voltage (kV)	Maximum Cross Conductor Section (mm2)
110	64	123	1600
132	76	145	1600
150	87	170	1200

Medium Voltage/ GIS/ RMU solutions

Cable Termination for GIS Equipment

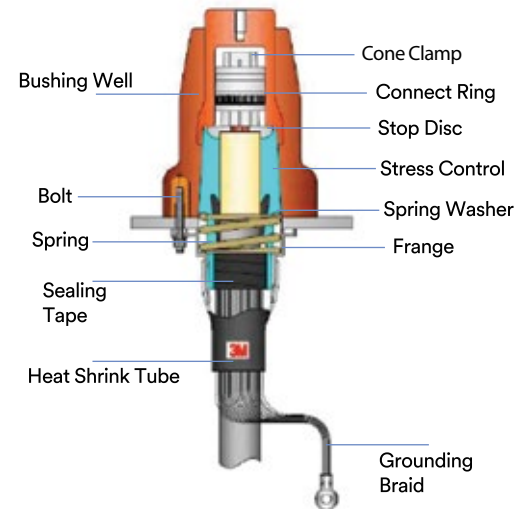
TG45 GIS cable termination, is used for cable connection to GIS switchgear, transformer, motor and generator at 33kV earthed or unearthed or 26/45kV level. High quality silicone is applied for stress cone, and plug-in technology for connection with the bushing. The termination is not limited by environment and free for daily maintenance.

Features:

- Integrated structure, easy for installation, and fit for the cable section from upto 630 sqmm
- Compact design with high quality insulation material
- Ampere capability reach to 1600A

Applications:

- TG45 GIS termination with plug-in technology connect the cable to the electrical equipment with sealing insulation system, and can match the bushing following DIN EN 50180 or DIN EN 50181 with No.3 interface type.
- Can be installed on 33kV earthed or 33kV unearthed or 26/45kV cable with the rated temperature at 90°C, and emergency temperature at 250°C
- Be used for the cable with solid insulation, such as Polyethylene, XLPE, and EPR
- Application for both indoor and outdoor environment



Screened Tee Separable Connectors

3M Range of Dead Break Screened Separable Connectors are designed for compact SF6 insulated Ring Main Units with Outer Cone bushing Type 'C' & bolted interface according to CENELEC 50180 & 50181.

Features:

- Compact in design with inbuilt cable termination.
- Made from Superior Silicone Rubber
- Screened outer surface – No influence of surrounding environment
- Tee Connectors available for multiple cable application
- No heating or taping required
- Maintenance free, simple disconnection & reconnection
- Safe in case of accidental touch
- Watertight Design - Resistant to moisture ingress even under submerged condition
- Provision for cable testing
- Meets IEC 60502-4



Terminal Protector

The Terminal Protector is an insulating barrier system, which can be used in conjunction with any indoor termination. The Terminal Protector is a unique insulating system for providing Phase to Phase and Phase to Earth insulation to power cable terminals where these terminations need to be installed in very compact areas like motor terminal boxes, ring main units, distribution transformers etc. The Terminal Protector comprises of an insulating bellow and grommets. All these components are injection moulded from EPDM / Si rubber.

Features:

- Accommodates a large cable cross section - 25 to 300 sq mm
- Also fits sector shaped cables
- Facilitates direct voltage testing
- Easy to fit, Re-openable, Re-usable
- Can be installed on any termination i.e. Premoulded Heat Shrink etc.
- Can be installed on XLPE, PVC or PILC cable



Electrical Conductive Compound – 3M 1328

3M 1328 Electrical Conductive Compound (ECC) is the recommended solution to provide efficient and trouble-free service on aluminum-to-aluminum and aluminum-to-copper connections. It can ensure better connection and lower electrical resistance on flat surfaces. Also it can be used for indoor and outdoor electrical connections

Features

- **Lowest Electrical Resistance**
Contains extremely hard metallic particles with sharp and irregular shapes of carefully controlled grain size. This forms many metal to metal contact points for low resistance connections.
- **Weather Resistant**
The compound adheres to pad surfaces, protecting the connection against the harmful effects of the environment.
- **Wide Temperature Tolerance**
3M 1328 compound has a wide temperature tolerance. It is workable at low temperatures, -18 °C (0 °F), and does not drip at high temperatures. It has a melting point above 288 °C (550 °F).



Heat Shrink Technology

Heat Shrink Technology offers complete range of cable jointing & termination kits for XLPE, PILC, PVC & EPR Cables from 1.1kV to 36kV voltage grades. The kits consist of heat shrinkable tubes, mastics, moulded parts, mastics & other accessories for making a complete termination / splice:

Stress Control Tube

3M Heat Shrink high K Stress Control tubes have been designed for providing electrical stress grading & relief on screen interruptions, which avoids localized stress accumulation leading to failures. 3M SCT tubes are made from specially formulated Polyolefin and provide good balance between electrical and mechanical properties.



Features:

- Good chemical resistance & thermal aging properties
- Split resistant
- Higher shrink ratios ensure versatility/ low inventories

Stress Control Mastic

3M Stress Control Mastics are integral part of Stress grading system used in 3M Heat Shrink cable splicing and termination kits along with 3M heat shrink Stress Control Tubes for providing stress relief on screen interruptions. The self amalgamating, high K & low permittivity mastics provide excellent void filling and stress control.

Features:

- Suitable for both XLPE and PILC cables
- High resistance to humidity and moisture ingress

Dual Wall Tube

3M Heat Shrink Dual Wall Tubes are two layered, co extruded with inner insulating and outer semi-conducting layers. These tubes provide excellent insulation, outer screen continuity and exhibit excellent mechanical and electrical properties.



Features:

- Co-extruded to avoid any air pockets between insulation and screen
- Reduces no. of tubes for heat shrinking in a splice
- Split resistant

Anti-Tracking Tube

3M Heat Shrink Anti-Tracking Tubes have been specially designed to meet the outdoor conditions & performance requirements of medium voltage power cable end terminations. The material resists to splitting and has excellent arc resistance.



Features:

- Suitable for outdoor and indoor applications
- Flexible, conforms to shapes/ core bends
- Halogen free, Self extinguishing Insulating Tube

3M Heat Shrink Insulating tubes have been designed for providing electrical insulation, protection from mechanical impact and provide atmospheric sealing. These are made from specially formulated Polyolefin and offer outstanding physical, electrical & chemical resistant properties.



Features:

- Excellent thermal aging properties & Best-in-class weather/ chemical resistance

Heat Shrink Solutions (1.1kV to 66kV)

Heat Shrink Splice / Cable Jointing Kit

Description:

3M Heat Shrink medium voltage joints are available for tape/wire shielded, armoured/unarmoured medium voltage single core and three core polymeric cables. 3M Heat Shrinkable joint utilizes a unique high dielectric constant (High K) stress control tube and mastic for effective grading of electrical stresses. The stress control tube together with the insulating and dual walled (inside insulating & outside semiconducting) tubes forms the splice body. All the heat shrinkable components are supplied in an expanded state and would shrink effectively on application of heat. All the grounding connections are solder-less.



Features:

- Available for 1-Core and 3-Core polymeric cables.
- Provides excellent environmental protection and moisture sealing.
- Wide conductor size ranges upto 1000 mm²



Heat Shrink Termination Kit

Description:

3M Heat Shrink medium voltage terminations are available for tape/wire shielded, armoured/unarmoured medium voltage single core and three core polymeric cables. 3M Heat Shrinkable terminations utilize a unique high dielectric constant (High K) stress control tube and mastic for effective grading of electrical stresses. The non tracking heat shrinkable insulating outer tube is optimally designed for reliable environmental protection. The modular heat shrinkable skirts allow installation of the termination in inverted condition if required. For three core cable terminations, a heat shrinkable breakout is provided for environment sealing of the trifurcating crotch area. All the heat shrinkable components are supplied in an expanded state and would shrink effectively on application of heat. All the grounding connections are solder-less.



The modular heat shrinkable skirts allow installation of the termination in inverted condition if required. For three core cable terminations, a heat shrinkable breakout is provided for environment sealing of the trifurcating crotch area.

All the heat shrinkable components are supplied in an expanded state and would shrink effectively on application of heat. All the grounding connections are solder-less.

Features:

- Available for 1-core and 3-core polymeric cables.
- Provides excellent environmental protection and moisture sealing.
- Wide conductor size ranges upto 1000 mm²



66KV Heat Shrink Termination & Splice

Features:

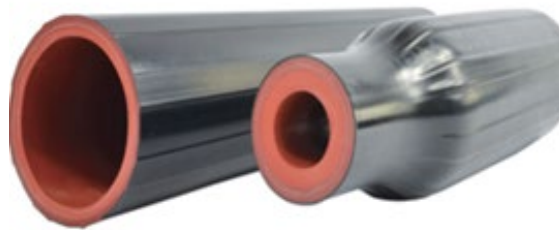
- Application range upto 1200 sq.mm. cables
- Suitable for crimped & shear bolt connectors
- BIL of 350 KVp
- Installation support and training

Advantages:

- Complete portfolio from 1.1 kV to 66 kV
- Application flexibility – Can accommodate wide range of cables sizes & constructions
- Covers inline and crossbond splicing applications
- Strong technical support

Certifications:

Type tested according to IEC 60840



This has special construction inner layer as Elastomeric material, middle layer is HS insulating and outer layer is semi conducting layer.

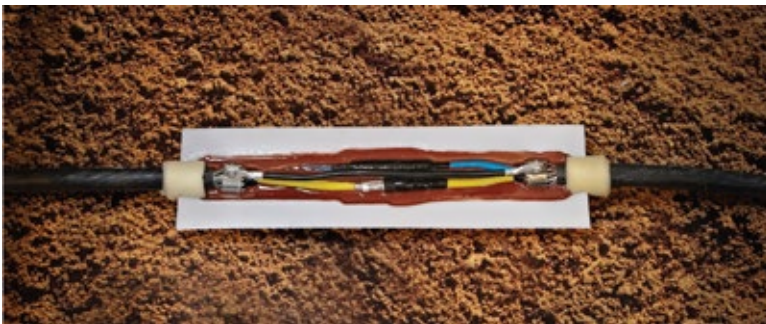
Resin and Tapex Solutions

Resin-based joints - Scotchcast 450

Kastex now Scotchcast 450 Cable Accessories for Low Voltage PVC / PILC / XLPE Cables have been designed for simplicity in installation and a prolonged service life. Kastex joints and terminations for LV Cables are based on a cast resin system. The casting resin is polyurethane based which has complete compatibility with the cable components.

Features:

- Simple & easy to install
- Provides good mechanical/moisture ingress protection
- Option of crimping ferrules or mechanical connectors
- Tee Joints also available



KASTEX IS NOW
3M
Scotchcast™450

Taped Joints

Tapex/Taped System of cable jointing follows the time tested technique of rebuilding the cable construction. The system is simple and is based on three components:

- Self Amalgamating Insulating Tapes
- Self Amalgamating Semi-Conducting Tapes
- Non Linear Stress Grading Pads

Features:

- Few Components and no mastics
- Easy to install as it requires no heating
- No tapering of XLPE Insulation
- Cold Flow property
- Thermally compatible with XLPE Insulation
- Provides complete mechanical & moisture protection



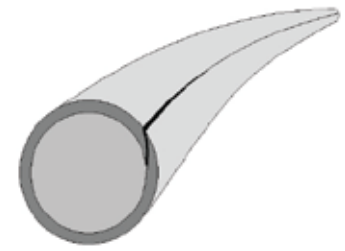
Insulation Enhancement Products

CCI (Conductor Cover Insulation) - Animal Protection Product

CCI Series Animal Protection Products are extruded silicone rubber products that are designed for field installation over bare conductors. These covers provide a layer of electrical insulation for phase-to-phase and phase-to-ground protection from bird and animal contact.

The silicone rubber material provides electrical Insulation, UV resistance and tracking resistance. The covers are made with a full-length longitudinal bias cut to provide an increased creepage distance between the conductor and the outer surface of the cover and to allow for easy slip-on installation.

CCI is able to cover a wide range of voltage classes overhead bare conductors and is available in different internal diameters from 9mm to 50mm with varied insulation thickness as per the requirement.



CCI Series
Conductor Covers



Heat shrink Tubing for Busbars (upto 52KV)

Indoor and outdoor bus bar application up to 52 kV for Round & Rectangular Bus bars. Prevents from Bird, Animal, flashovers in reduced clearance situations.

Features

- Easy to install
- Good Anti-tracking properties
- Prevent Bird & Animal faults
- Prevent flashovers in reduced clearance

Applications

- Indoor and outdoor bus bar application
- Round & Rectangular Bus bars
- Bus bar & cable connection insulations
- Bus bar in switch gear cabinets



3M Electrical Maintenance Solutions

Electrician's reputation precedes them. Keeping Electrical network Power ON is their main job. They may be working in a cable tunnel one day & on a high tower the next day. Keeping their toolkit stocked with reliable Scotch Electrical tapes and Electrical supplies lets them make reliable and safe connections which can withstand extreme conditions in harsh environments.

3M brings you an array of Electrical maintenance products & solutions which you can rely on.

- Vinyl Electrical Tapes
- Rubber, Mastic & Heavy-Duty Tapes
- Corrosion Protection Tapes
- Specialty Tapes
- Wire Connectors & Terminals
- Wire Pulling Lubricants
- Aerosols (Sprays) & Coatings
- Cable Jacket Repair Products
- Splice kits - for Cables used in Mining
- Contact resistance & General Repair Kits
- Comfort Grip and Cut resistant Gloves
- Animal Guard and Conductor cover Insulation
- Cable Ties



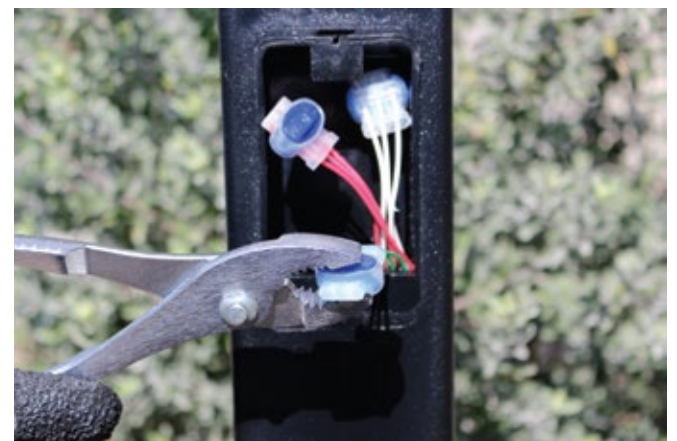
Vinyl Electrical Tape



Insulating and Sealing Tape



Aerosol (Spray)



Wire Connector

Cable Route Locators & Electronic Route Markers

3M™ Locators and Markers provide a complete system for locating, marking and mapping vital underground assets. From markers that give an exact path and estimated depth of underground utilities, to markers that store information, to utility locators that interface with GPS/GIS field mapping instruments, 3M offers the precision tools needed to manage your assets. Together, they provide a complete solution with the performance and reliability you trust from 3M.

Buried Asset Locating

Know where to dig! The 3M™ Electronic Marker System (EMS) helps save electrical end users' time and money by enabling field crews to quickly pinpoint the location of underground electric facilities, including cable runs, splices, vaults, conduits and road crossings. 3M also offers wide product support and service for increased safety, performance and reliability. EMS markers used for underground electric cable location are color-coded to APWA standards for visual reference and power utilities have their own frequency, helping reduce the risk of accidentally locating and excavating other underground electric facilities. For power utilities, all underground electric cable markers are red in color

3M EMS Power series can be used to locate:

- Service drops
- Buried transformers and splices
- Street lighting
- Distribution loops
- Conduit stubs
- Service laterals
- Manhole covers
- Utility and road crossings

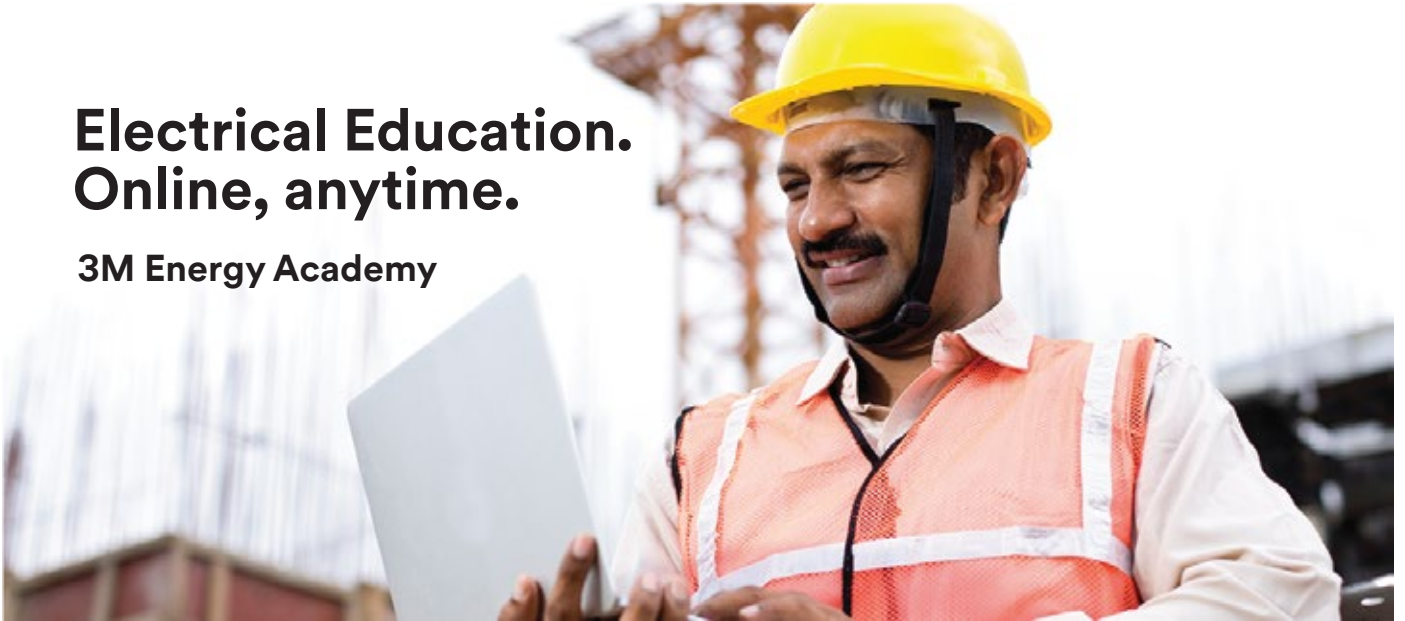


3M Energy Academy

3M brings you Free Online Electrical Training courses which you can access anytime, anywhere 24×7. Register Now.

Electrical Education. Online, anytime.

3M Energy Academy



3M Energy Academy offers a flexible 24×7 online learning experience, covering an array of electrical topics like:

- Basics of Electrical Network
- Protecting Electrical Equipment
- Best Installation Practices for Cable Accessories
- Medium Voltage Splices
- Electrical Maintenance, Repair, and Operations Application Solutions
- Locating and marking

And many more....

Why Register with 3M Energy Academy?

- Courses on Energy Academy are updated from time -to-time.
- Relevant courses are added onto the portal.
- Simple and attractive illustrations to aid better understanding.
- Quiz/Knowledge check at the end of every course.
- Certification for each completed course is valid for 2 years.

So, register with 3M Energy Academy and stay top-notch and supercharge your electrical skills. Why wait? **Register on the link below:**

https://www.3mindia.in/3M/en_IN/energy-in/3m-energy-academy/registration/
and be a champion at what you do!



To explore the many ways we can serve you or to arrange for sales assistance

Contact:

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