3M Science. Applied to Life.™

3M™ High Voltage Cable Accessories for 72.5 kV Applications

Enhance grid reliability in an evolving landscape.

Efficient, reliable 3M Cold Shrink Terminations and Joints for renewable energy.

As the world transitions towards clean energy to help reduce the reliance on fossil fuels, there is an increased demand for electricity.
The shift toward higher voltage classes, an increasing need for reliable power transit solutions and a willingness to bury grids in response to climate change all require faster and easier installation of cable joints and terminations. With a long-standing history of providing reliable solutions, 3M Cold Shrink Technology can help utilities meet these challenges.

The benefits of 3M™ Cold Shrink Products go beyond long-lasting and reliable performance:

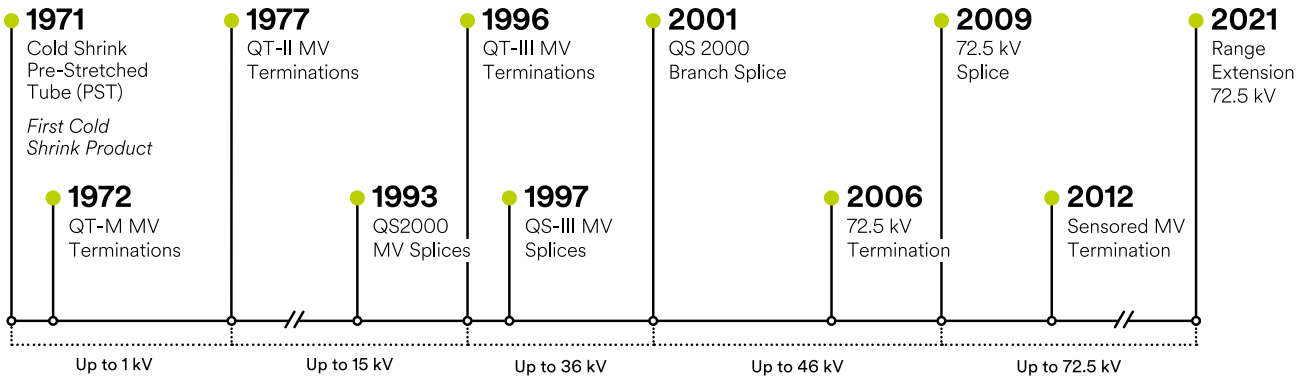
- Faster and easier process — no heat or special tools required
- Ideal for installation in the field, even in harsh weather conditions
- Provides excellent electrical insulation
- Protects against environmental factors such as moisture

50+ years of cold shrink technology expertise.

Since inventing the first cold shrink pre-stretched tube (PST) in the early 1970s, 3M has developed power cable accessories for:

- Various voltage classes
- Different applications, including joints, branch joints, transition joints, terminations and sensored terminations
- Different market segments, including electric power utilities, railways or renewables

3M Cold shrink technology offers great benefits for high voltage cable accessories and more innovations to cover many cable sizes and voltage classes.



3M™ Cold Shrink Terminations

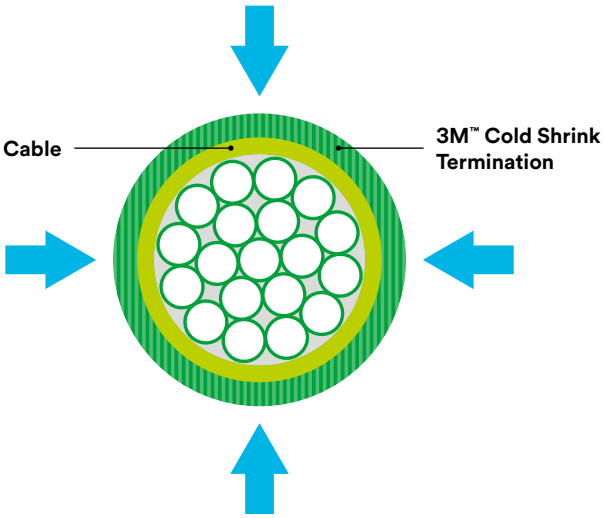
There are various technologies available for terminations, including self-supportive terminations filled with a dielectric fluid and non-self-supportive terminations made from technologies such as slip-on or push-on, heat shrink and cold shrink.

3M Cold Shrink Tubing: A great match for high voltage.

The 72.5 kV voltage class can be seen as an extension of medium voltage applications where 3M cold shrink technology serves as an excellent solution due to its ease of application and reliability. 3M Cold shrink terminations and mechanical lugs require no special tools to install, making the technology a good choice for terminating power cables in the energy industry.

3M™ Cold Shrink Termination maintains an active seal through thermal cycles without losing pressure.

- Provides constant, inward pressure
- Allows for expansion and contraction after installation
- Provides a pressure seal, no adhesives needed
- May result in more reliable long term electrical performance due to higher interfacial pressure



The benefits of 3M Cold Shrink Technology:

Reliability

- Easy installation process; no push-on force required
- No specific tools required for accessory installation
- Easier to use
- No use of flame

Larger Range Taking

- Cold shrink technology allows for larger coverage with one accessory
- Use of screw-type cable lugs with larger range taking

Reduced Time

- Quicker installation may lead to potentially reduced labour costs

Robust Design

- Constant inward pressure creates a “living seal”

Manufacturing Quality

- Pre-moulded bodies
- Pre-moulded termination bodies are 100% factory tested with alternating current (AC) test/partial discharge (PD)

3M™ Cold Shrink QTEN Termination Kits: Engineered for fast, economical installation.

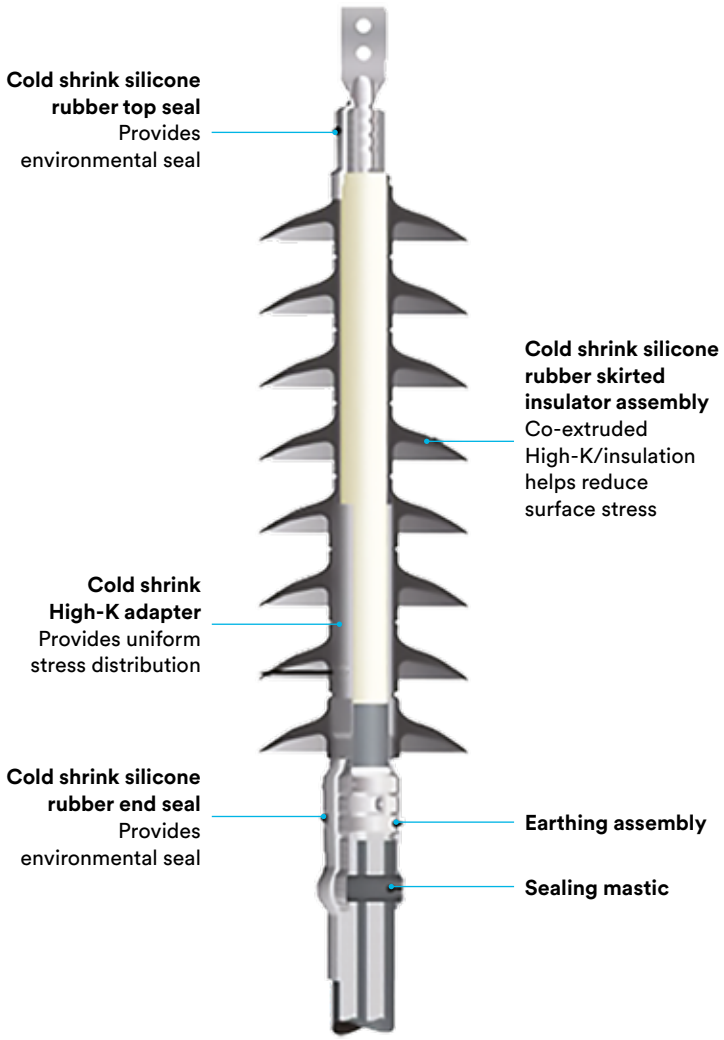
3M™ Cold Shrink QTEN Termination Kits are designed for termination of 72.5 kV voltage class single-core and polymeric insulated power cables according to IEC 60840. Customised Kits can be created to meet your specific requirements to include mounting, connecting and earthing hardware.

These terminations require no special tools or torch.

3M™ Cold Shrink QTEN Terminations for 72.5 kV meet the requirements of Institute of Electrical and Electronics Engineers (IEEE) Std. 48-2009, table 1A and International Electrotechnical Commission (IEC) 60840.

The 3M QTEN design offers a unique High-K adapter that reduces surface stress, allowing for a more compact termination. Cross sections up to 1600 mm^2 are covered.

3M™ Cold Shrink QTEN assembly



Product Features

- Versatile design of the silicone cold shrink termination body allows installation on a wide range of cable sizes and types, and a fast and easy installation at temperatures ranging from -20°C to +50°C (-4°F to +122°F)
- No heat, flame or special tools are needed during termination body installation
- Accommodates crimp or mechanical lugs up to 90 mm in diameter
- Wide application range covering several cable cross sectional areas from 120 mm^2–1600 mm^2
- Solderless earth connection by means of connection to copper screen wires or lead sheath
- Thick walled, silicone rubber cold shrink outer rain sheds and end seals provide physical protection and moisture sealing of the completed termination assembly

Learn more

3M™ Cold Shrink QTEN Termination Kit Portfolio

Kit Contents

The 3M QTEN Termination Kit includes a cold shrink body with integrated silicone elastomeric insulation and outer silicone rain sheds, with a separate cold shrink High-K adapter for refractive stress control. Also included are silicone cold shrink end seals for bottom and top lug sealing. The inner refractive stress control layer and the silicone insulation layer are co-extruded during the manufacturing process. The termination is designed to accommodate many available cable lug designs, including hexagonal or deep indent crimping technologies and a wide variety of mechanical shear-off connecting technologies.

Minimum Order Quantity = 1

Kit reference	Cross section (mm²)	Diameter over cable jacket (mm)	Diameter over primary insulation (mm)	Lug-max diameter (mm)	Lug included	Shielding type
QTEN 96-EP 720-2	120–1000	90	33.0–60.0	90	No	Copper Wire Screen
QTEN 96-EP 721-2	300-360 (800 solid)	90	33.0–60.0	70	Yes	Copper Wire Screen
QTEN 96-EP 722-2	120–1000	90	33.0–60.0	90	No	Lead Sheath
QTEN 96-EP 725-2*	120–1000	90	33.0–60.0	90	No	Copper Wire Screen
QTEN 96-EP 730-2	630–1600	110	51.1–87.0	110	No	Copper Wire Screen
QTEN 96-EP 732-2	630–1600	110	51.1–87.0	110	No	Lead Sheath

*This termination body contains 10 skirts for extended creepage distance.

3M™ Cold Shrink QS3000 Joint Kits: Engineered for dependable, trouble-free performance.

3M QS3000 Joint Kits are simple to install, feature a reliable design and offer a full size range from 150 mm² to 1600 mm². These Cold Shrink 3M QS3000 Joint Kits of cable cross sections contain a 72.5 kV class joint for connecting copper wire screen or lead sheathed cables.

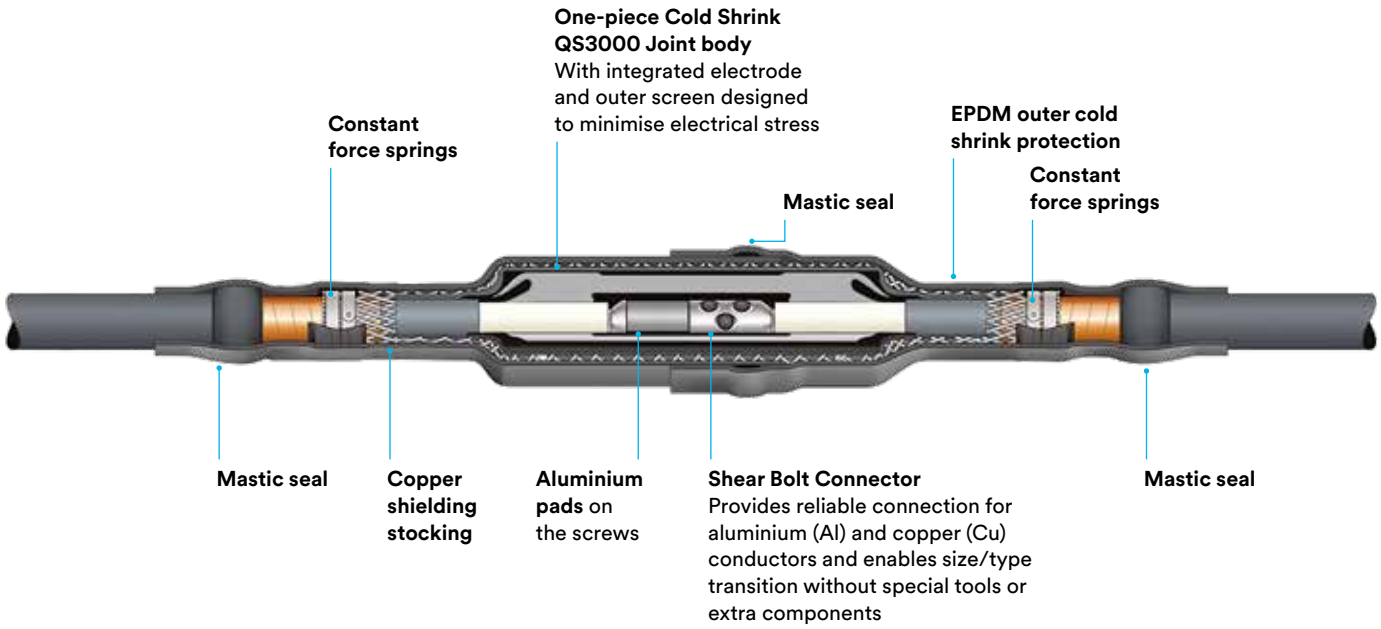
The cold shrink joint body consists of a one-piece moulded design made of silicone rubber, while the cold shrink rejacketing is made of ethylene propylene diene monomer (EPDM) rubber PST tubes for physical and sealing protection.

The 3M QS3000 joint bodies for 72.5 kV are fully tested according to IEC 60840.

Product Features

- One-piece silicone rubber joint body for 72.5 kV
- Each joint body is 100% factory tested for greater reliability
- No special tools required
- Application range cross sections from 150 mm² to 1600 mm² (insulation diameter range 35.9 mm–74.0 mm)

3M™ Cold Shrink QS3000 Joint assembly



Scan to view installation.

3M™ Cold Shrink QS3000 Joint Kit Portfolio

Kit Contents

The joint kit includes 3M™ Cold Shrink QS3000 Silicone splice body consisting of integrated stress control device, conductive electrode, silicone elastomer insulation and outer semi-conductive layer. Also included are a copper screen shielding sleeve, constant force springs and thick walled EPDM rubber cold shrink tubes to re-build the cable outer jacket.

Minimum Order Quantity = 1

Kit reference	Cross section (mm^2)	Diameter over cable jacket max. (mm)	Diameter over primary insulation (mm)	Earth screen cross section (mm^2)	Connector included
AD-72XA1-20-N-50C	150–630 (800 solid)	65	35.9–56.2	50	No
AD-72XB1-20-N-150C	150–630 (800 solid)	65	35.9–56.2	150	No
AD-72XA1-20-SP1-50C	300–630 (800 solid)	65	35.9–56.2	50	Yes
AD-72XB1-20-SP1-150C	300–630 (800 solid)	65	35.9–56.2	150	Yes
AD-72XB1-25-SP1-150C	150–630	73	40.0–56.2	150	Yes
AD-72XA1-30-N-50C	630–1600	100	54.0–74.0	50	No
AD-72XB1-30-N-150C	630–1600	100	54.0–74.0	150	No
AD-72XA1-30-SP2-50C	630–800 (1000 solid)	100	54.0–66.0	50	Yes
AD-72XB1-30-SP2-150C	630–800 (1000 solid)	100	54.0–66.0	150	Yes
AD-72XA1-30-SP3-50C	800–1000	100	54.0–71.0	50	Yes
AD-72XB1-30-SP3-150C	800–1000	100	54.0–71.0	150	Yes
AD-72XA1-30-SP4-50C	1000–1200	100	60.0–72.0	50	Yes
AD-72XB1-30-SP4-150C	1000–1200	100	60.0–72.0	150	Yes

3M™ High Voltage Separable Connector Kit

3M™ High Voltage Separable Connector Kits offer high performance and reliability, helping wind farm operators secure long-term operational stability for the power generated by wind turbines in hostile environments.

Designed to be installed on non-armoured polymeric insulated cables up to 72.5 kV, they provide an efficient solution for connecting and disconnecting high voltage power in electrical systems, providing a secure connection for power transmission. The kits are easy to install.

3M Separable Connector Kits EE-Type meet International standard specifications of IEC 60840 and comply with Bushing Type F acc. EN 50673 standard.

3M Surge Arrester kit TDA 72.5 / 196kV is also available.

Product Features

- Easy to install
- Multiple cable screen solutions covered. Cable lug for screening wires is not included.
- Max. System Voltage Umax 72.5 kV
- Cable conductor cross-sections range 70-630 mm^2

Front T-Type Connector

Rear T-Type Connector

Surge Arrester

Scan to learn more.

3M™ High Voltage Separable Connector Kit Portfolio

Kit Contents

Each kit contains all the necessary components to install one 3M separable connector, including all connection devices. Various cable screen solutions can be covered. Cable Lug for screening wires not included.

Minimum Order Quantity = 1

	Cable dimensions		Separable Connector		
Kit reference	**Cross section (mm²)**	**Diameter over Primary Insulation (mm)**	**Adapter size**	**Body Type**	**Application Range Cable Lug [mm²]**
EE-72-XB1-C-S1-T	70-95	29.5-35.0	C	T-Body	25-95
EE-72-XB1-D-S1-T	70-95	33.5-40.0	D	T-Body	25-95
EE-72-XB1-D-S2-T	120-300	33.5-40.0	D	T-Body	120-300
EE-72-XB1-E-S2-T	120-300	38.5-45.5	E	T-Body	120-300
EE-72-XB1-E-S3-T	300-630	38.5-45.5	E	T-Body	300-630
EE-72-XB1-F-S3-T	300-630	44.0-52.0	F	T-Body	300-630
EE-72-XB1-C-S1-R	70-95	29.5-35.0	C	Rear T-Body	25-95
EE-72-XB1-D-S1-R	70-95	33.5-40.0	D	Rear T-Body	25-95
EE-72-XB1-D-S2-R	120-300	33.5-40.0	D	Rear T-Body	120-300
EE-72-XB1-E-S2-R	120-300	38.5-45.5	E	Rear T-Body	120-300
EE-72-XB1-E-S3-R	300-630	38.5-45.5	E	Rear T-Body	300-630
EE-72-XB1-F-S3-R	300-630	44.0-52.0	F	Rear T-Body	300-630

	Maximum system voltage (Um)	Continuous operating voltage (Uc)	Nominal discharge current (In)	Residual voltage of lightning impulse current
TDA 72.5 / 196kV Surge Arrester	72.5kV	60kV	10kA	≤196kV

As cable accessory experts, we can help you make the change to 3M Cold Shrink Technology.

Experts from 3M are available to provide options for you to evaluate and help select a solution optimized for your requirements.

50+ years

For over 50 years, 3M has been providing dependable solutions for low and medium voltage installations.

As the voltage class increases, so do the challenges faced on the job site.

All 3M high voltage cable accessories are backed by a global network of technical support, sales and supply chain specialists.

Offering more than high voltage cable accessories, 3M provides reliable solutions with a consistent track record around the globe. Every pre-moulded component (joint body and stress cone) is 100% electrical factory tested and every solution is backed by the strong reputation 3M has in the industry. Work with a partner you can trust as you manage the energy transition.

For more information, please visit **3M.co.uk/HighVoltage** or contact us at 08705 360036.

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