

# 3M

## Cold Shrink Terminations



3M supplies everything required to reliably terminate a wide range of cables. In addition to tape termination kits, 3M also provide one-piece Cold Shrink Silicone insulation kits for shielded cables up to 46kV. Superior silicone rubber insulators ensure high moisture and contamination resistance. Over 25 years ago, 3M pioneered Cold Shrink technology. Since then, field use and laboratory

analysis have repeatedly proven its merits and reliability. Through constant innovation, we have refined Cold Shrink products making them better than ever. They are easier to apply and built to withstand even the most punishing environmental conditions. Enhanced performance at a lower installed cost continues to make 3M the preferred choice for Cold Shrink Solutions.



# Cold Shrink Terminations for 3-Core XLPE Cables

## 1000 Series Termination Kits

The 1000 Series Cold Shrink Termination Kits are designed to terminate 11kV 3-core XLPE cables. The system utilizes the pre-stretched tube concept. Silicone rubber Cold Shrink tubes are used over the cores as insulators and a Cold Shrink sheath seal, resembling a three-fingered glove, to deal the crutch of the termination. Other materials included in the kit are the high-K stress control tube; No.13 and 33 tapes, putty and TR cable preparation kit. For outdoor applications the Cold Shrink tubular insulators and Cold Shrink sheath seal are made from silicone rubber, which provides required protection against contamination and tracking. In high contamination areas, skirted tubes equipped with rain sheds are used. Detailed instructions are supplied with the kit.

## 4000 Series Termination Kits

The 4000 Series Cold Shrink Termination Kits have been designed to terminate 22kV 3-core XLPE cables. Indoor kits use 3M's EPDM Cold Shrink Tubes. The outdoor kits utilize track and UV resistant Cold Shrink tubes. For high contaminated areas, Cold Shrink skirted tubes take care of tracking and flashover.

## 6000 Series Termination Kits

The 6000 Series Cold Shrink Termination Kits have been designed to terminate 33kV 3-core XLPE cables. The outdoor low contaminated area kit utilizes UV resistant Cold Shrink silicone tubes, for high contaminated outdoor areas an additional Cold Shrink skirted tube per phase is added to take care of tracking and flashover.



### Selection Chart

Kit No.	Area of Use	Cable Size	Working Voltage	Cores
<b>1000 Series Cold Shrink Termination Kits</b>				
1001-LC-B	Indoor, Low Contamination	16 - 35 mm <sup>2</sup>	11 kV	3-Core
1002-LC-B	Indoor, Low Contamination	50 - 120 mm <sup>2</sup>	11 kV	3-Core
1003-LC-B	Indoor, Low Contamination	150 - 185 mm <sup>2</sup>	11 kV	3-Core
1004-LC-B	Indoor, Low Contamination	240 - 300 mm <sup>2</sup>	11 kV	3-Core
1001-HC-B	Outdoor, High Contamination	16 - 35 mm <sup>2</sup>	11 kV	3-Core
1002-HC-B	Outdoor, High Contamination	50 - 120 mm <sup>2</sup>	11 kV	3-Core
1003-HC-B	Outdoor, High Contamination	150 - 185 mm <sup>2</sup>	11 kV	3-Core
1004-HC-B	Outdoor, High Contamination	240 - 300 mm <sup>2</sup>	11 kV	3-Core
<b>4000 Series Cold Shrink Termination Kits</b>				
4001-LC-B	Low Contamination	35 - 70 mm <sup>2</sup>	22 kV	3-Core
4002-LC-B	Low Contamination	95 - 120 mm <sup>2</sup>	22 kV	3-Core
4003-LC-B	Low Contamination	150 - 185 mm <sup>2</sup>	22 kV	3-Core
4004-LC-B	Low Contamination	240 - 300 mm <sup>2</sup>	22 kV	3-Core
4001-HC-B	High Contamination	35 - 70 mm <sup>2</sup>	22 kV	3-Core
4002-HC-B	High Contamination	95 - 120 mm <sup>2</sup>	22 kV	3-Core
4003-HC-B	High Contamination	150 - 185 mm <sup>2</sup>	22 kV	3-Core
4004-HC-B	High Contamination	240 - 300 mm <sup>2</sup>	22 kV	3-Core
<b>6000 Series Cold Shrink Termination Kits</b>				
6001-LC	Low Contamination	35 - 120 mm <sup>2</sup>	33 kV	3-Core
6002-LC	Low Contamination	150 - 240 mm <sup>2</sup>	33 kV	3-Core
6001-HC	High Contamination	35 - 120 mm <sup>2</sup>	33 kV	3-Core
6002-HC	High Contamination	150 - 240 mm <sup>2</sup>	33 kV	3-Core

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## Cold Shrink Terminations for 3-Core MIND Paper Insulated Cables

### 2000 Series Termination Kits

The 2000 Series Cold Shrink Termination Kits have been designed to terminate 11kV 3-core PILC Belted cables. The kit utilizes track and UV resistant silicone tubes and can therefore be used indoors as well as in high contaminated outdoor areas. Outdoor kits make use of 3M's Cold Shrink skirted tube. The crutch of the termination is sealed with a silicone rubber Cold Shrink sheath seal. The crutch seal is filled with specially formulated resin, which effectively excludes all air and provides additional protection against moisture.



### 3000 & 5000 Series Termination Kits

The 3000 and 5000 Series Cold Shrink Termination Kits have been designed to terminate 11kV and 22kV 3-core MIND paper insulated screened cables. The kit utilizes track and UV resistant silicone tubes and can therefore be used indoors as well as in high contaminated outdoor areas. Outdoor kits make use of 3M's Cold Shrink skirted tube. The kit includes Scotch 2220 Stress Control tape which possesses a dielectric constant of 30 and also a high resistivity. The tape changes the voltage distribution in the electrical field surrounding the termination. Lines of flux are regulated to equalize the electrical stresses in a controlled manner along the entire termination area where the shield has been removed. A specially formulated resin fills the crutch seal for additional moisture protection.

### Selection Chart

Kit No.	Area of Use	Cable Size	Working Voltage	Cores
<b>2000 Series Cold Shrink Termination Kits</b>				
2001-B	Indoor	16 - 50 mm <sup>2</sup>	11 kV	3-Core
2002-B	Indoor	70 - 95 mm <sup>2</sup>	11 kV	3-Core
2003-B	Indoor	120 - 185 mm <sup>2</sup>	11 kV	3-Core
2004-B	Indoor	240 - 300 mm <sup>2</sup>	11 kV	3-Core
2001-E-B	Outdoor	16 - 50 mm <sup>2</sup>	11 kV	3-Core
2002-E-B	Outdoor	70 - 95 mm <sup>2</sup>	11 kV	3-Core
2003-E-B	Outdoor	120 - 185 mm <sup>2</sup>	11 kV	3-Core
2004-E-B	Outdoor	240 - 300 mm <sup>2</sup>	11 kV	3-Core
<b>3000 Series Cold Shrink Termination Kits</b>				
3001-B	Indoor	16 - 35 mm <sup>2</sup>	11 kV	3-Core
3002-B	Indoor	50 - 95 mm <sup>2</sup>	11 kV	3-Core
3003-B	Indoor	120 - 150 mm <sup>2</sup>	11 kV	3-Core
3004-B	Indoor	185 mm <sup>2</sup>	11 kV	3-Core
3005-B	Indoor	240 mm <sup>2</sup>	11 kV	3-Core
3006-B	Indoor	300 mm <sup>2</sup>	11 kV	3-Core
3001-E-B	Outdoor	16 - 35 mm <sup>2</sup>	11 kV	3-Core
3002-E-B	Outdoor	50 - 95 mm <sup>2</sup>	11 kV	3-Core
3003-E-B	Outdoor	120 - 150 mm <sup>2</sup>	11 kV	3-Core
3004-E-B	Outdoor	240 - 300 mm <sup>2</sup>	11 kV	3-Core
<b>5000 Series Cold Shrink Termination Kits</b>				
5001-LC	Low Contamination	35 - 120 mm <sup>2</sup>	22 kV	3-Core
5002-LC	Low Contamination	150 - 185 mm <sup>2</sup>	22 kV	3-Core
5003-LC	Low Contamination	240 - 300 mm <sup>2</sup>	22 kV	3-Core
5001-HC	High Contamination	35 - 120 mm <sup>2</sup>	22 kV	3-Core
5002-HC	High Contamination	150 - 185 mm <sup>2</sup>	22 kV	3-Core
5003-HC	High Contamination	240 - 300 mm <sup>2</sup>	22 kV	3-Core



### Performance Tests

	Scotch® 2220 Tape	Scotch® 70 Silicone Rubber Tape
Colour	Grey	Munsel Grey
Thickness	0.762 mm	0.30 mm
Tensile Strength	2.97 N/mm	2.05 N/mm
Elongation at Break	275 %	450 %
Dielectric Strength	13.77 kV/mm	34.4 kV/mm

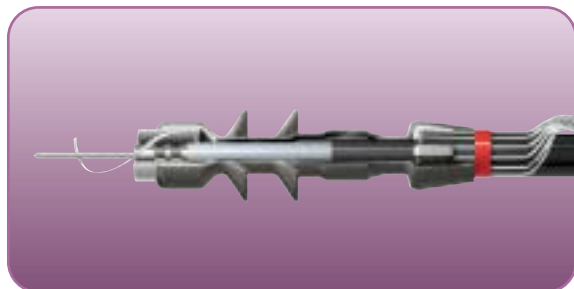
	Cold Shrink Silicone Tube	Cold Shrink EPDM Tube
Colour	Munsel Grey	Black
Thickness	-	-
Tensile Strength	8.28 N/mm <sup>2</sup>	12 N/mm
Elongation at Break	-	-
Dielectric Strength	20 kV/mm	16 kV/mm



TERMINATIONS

# 3M

## Cold Shrink Quick Term Termination Kits



3M Cold Shrink QT-II and QT-III terminations are designed using 3M developed track resistant silicone rubber and high-K stress control material in conjunction with 3M's unique Cold Shrink delivery system.

The QT-II and QT-III terminations are supplied pre-stretched on a removable core. Removal of the core (unwind) after positioning the termination allows the product to shrink into position, providing a tight seal.

3M Cold Shrink terminations offer easy installation and reliable performance when terminating indoor and outdoor medium voltage cables.

QT-II and QT-III Cold Shrink Silicone rubber is specifically formulated as a high track resistant material with hydrophobicity (water repelling action) to insure a long life expectancy.

These Cold Shrink terminations are lightweight for either free-hanging or bracket mounting arrangements.

3M offers you two options for choosing Cold Shrink termination:

- The QT-III utilizes the latest technology with built-in high-K stress controlling mastic and silicone sealing mastic resulting in much more user-friendly application.
- The QT-II offers many of the same advantages and benefits as the QT-III, but does require several additional steps during the installation.

TERMINATIONS

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## Cold Shrink Quick Term Termination Kits

### Features:

- Hydrophobic Silicone Body
- Built-in sealing and stress controlling compounds
- Designed to meet IEEE 48.VDE 0278 and IEC 502 standards
- Installation requires no silicone tape grease
- Minimal training required
- All materials included in a kit
- Compact to fit into smaller equipment
- No heat, flames or special tools needed
- More than 25 years of proven field experience

### Benefits:

- Improved long term reliability
- Superior track and erosion resistance
- Optimum high-K stress control
- Easier, faster installation
- Easy cable preparation
- Lower installed cost
- Simple, straight forward installation
- High reliability

### Selection Chart

Kit No.	Area of Use	Cable Size	Working Voltage	Tubular/Skirts
<b>Cold Shrink Quick Term II Silicone Rubber Termination Kits</b>				
QT-II 5671	Indoor	16 - 120 mm <sup>2</sup>	11 kV	No skirts
QT-II 5672	Indoor	150 - 500 mm <sup>2</sup>	11 kV	No skirts
QT-II 5641	Indoor / Outdoor	25 - 70 mm <sup>2</sup>	11 kV	4 skirts
QT-II 5642	Indoor / Outdoor	95 - 185 mm <sup>2</sup>	11 kV	4 skirts
QT-II 5643	Indoor / Outdoor	240 - 300 mm <sup>2</sup>	11 kV	4 skirts
QT-II 5644	Indoor / Outdoor	400 - 800 mm <sup>2</sup>	11 kV	4 skirts
QT-II 5646	Indoor / Outdoor	50 - 120 mm <sup>2</sup>	22 kV	8 skirts
QT-II 5647	Indoor / Outdoor	185 - 240 mm <sup>2</sup>	22 kV	8 skirts
QT-II 5648	Indoor / Outdoor	300 - 625 mm <sup>2</sup>	22 kV	8 skirts
QT-II 5649	Indoor / Outdoor	800 - 1000 mm <sup>2</sup>	22 kV	8 skirts
QT-II 5646	Indoor / Outdoor	50 - 70 mm <sup>2</sup>	36 kV	8 skirts
QT-II 5647	Indoor / Outdoor	95 - 150 mm <sup>2</sup>	36 kV	8 skirts
QT-II 5648	Indoor / Outdoor	185 - 500 mm <sup>2</sup>	36 kV	8 skirts
QT-II 5649	Indoor / Outdoor	625 - 800 mm <sup>2</sup>	36 kV	8 skirts
QT-II 4604	Indoor / Outdoor	25 - 300 mm <sup>2</sup>	46 kV	12 skirts
QT-II 4605	Indoor / Outdoor	400 - 800 mm <sup>2</sup>	46 kV	12 skirts
<b>Cold Shrink Quick Term III Silicone Rubber Termination Kits</b>				
QT-III 7622-T-110	Indoor	35 - 120 mm <sup>2</sup>	11 kV	Tubular
QT-III 7624-T-110	Indoor	150 - 240 mm <sup>2</sup>	11 kV	Tubular
QT-III 7625-T-110	Indoor	300 - 500 mm <sup>2</sup>	11 kV	Tubular
QT-III 7626-T-110	Indoor	630 - 1000 mm <sup>2</sup>	11 kV	Tubular
QT-III 7622-S-2	Outdoor	35 - 120 mm <sup>2</sup>	11 kV	2 skirts
QT-III 7692-S-4	Outdoor	35 - 120 mm <sup>2</sup>	11 kV	4 skirts
QT-III 7693-S-4	Outdoor	150 mm <sup>2</sup>	11 kV	4 skirts
QT-III 7694-S-4	Outdoor	185 - 240 mm <sup>2</sup>	11 kV	4 skirts
QT-III 7695-S-4	Outdoor	300 - 500 mm <sup>2</sup>	11 kV	4 skirts
QT-III 7696-S-4	Outdoor	630 - 1000 mm <sup>2</sup>	11 kV	4 skirts
QT-III 7693-T-150	Indoor	35 - 120 mm <sup>2</sup>	22 kV	Tubular
QT-III 7695-T-150	Indoor	150 - 400 mm <sup>2</sup>	22 kV	Tubular
QT-III 7696-T-150	Indoor	500 - 800 mm <sup>2</sup>	22 kV	Tubular
QT-III 7692-S-4	Outdoor	35 - 50 mm <sup>2</sup>	22 kV	4 skirts
QT-III 7693-S-4	Outdoor	70 - 120 mm <sup>2</sup>	22 kV	4 skirts
QT-III 7694-S-4	Outdoor	150 mm <sup>2</sup>	22 kV	4 skirts
QT-III 7695-S-4	Outdoor	185 - 400 mm <sup>2</sup>	22 kV	4 skirts
QT-III 7696-S-4	Outdoor	500 - 800 mm <sup>2</sup>	22 kV	4 skirts
QT-III 7683-S-8	Indoor / Outdoor	35 - 70 mm <sup>2</sup>	33 kV	8 skirts
QT-III 7684-S-8	Indoor / Outdoor	95 - 120 mm <sup>2</sup>	33 kV	8 skirts
QT-III 7685-S-8	Indoor / Outdoor	150 - 325 mm <sup>2</sup>	33 kV	8 skirts
QT-III 7686-S-8	Indoor / Outdoor	400 - 725 mm <sup>2</sup>	33 kV	8 skirts

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