3M Science. Applied to Life.™

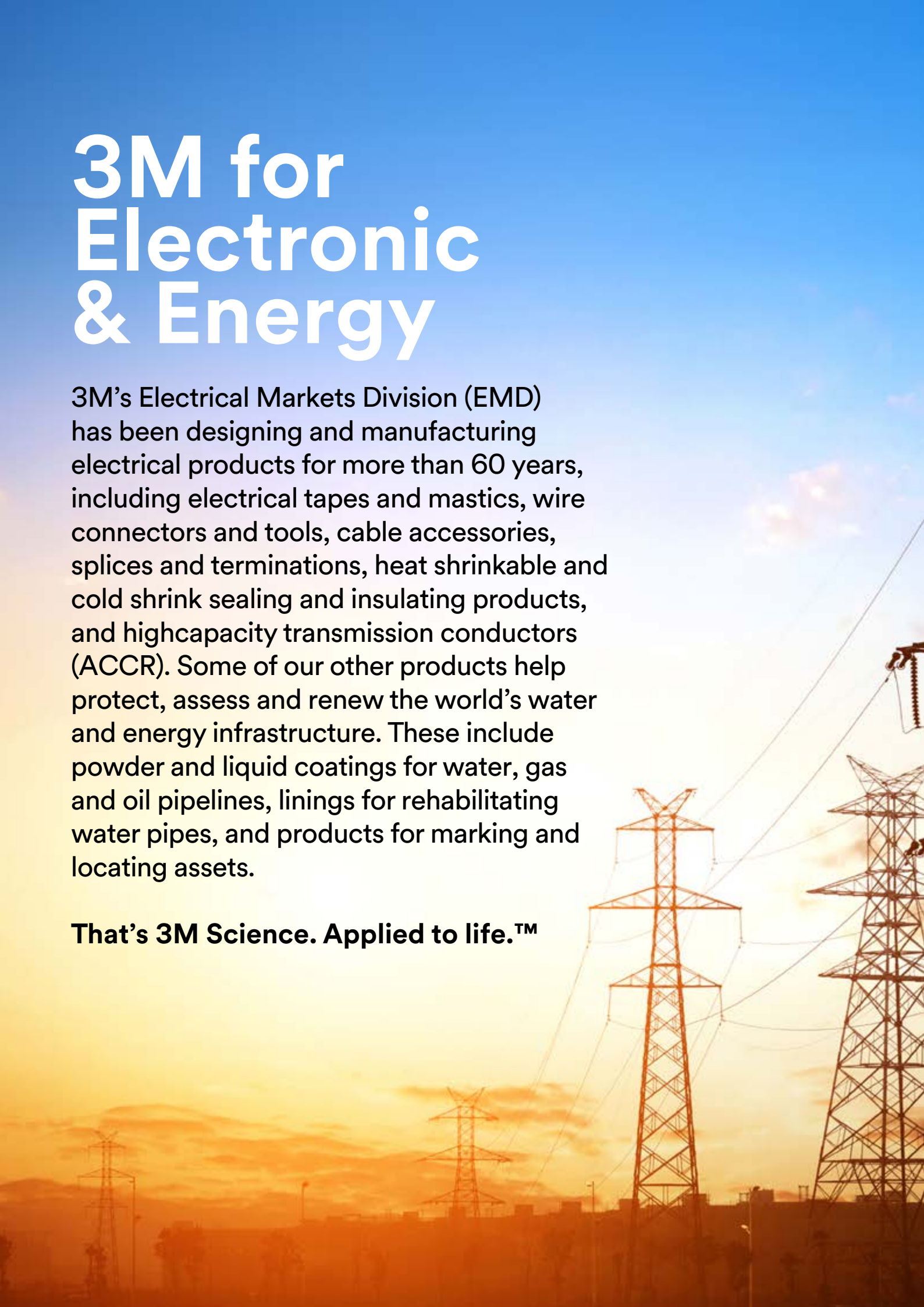
Electrical Solutions you can rely on.

Medium Voltage Cable Accesories

3M for Electronic & Energy

3M's Electrical Markets Division (EMD) has been designing and manufacturing electrical products for more than 60 years, including electrical tapes and mastics, wire connectors and tools, cable accessories, splices and terminations, heat shrinkable and cold shrink sealing and insulating products, and highcapacity transmission conductors (ACCR). Some of our other products help protect, assess and renew the world's water and energy infrastructure. These include powder and liquid coatings for water, gas and oil pipelines, linings for rehabilitating water pipes, and products for marking and locating assets.

That's 3M Science. Applied to life.™



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Over 40 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're easier to apply and built to withstand some of the most punishing environmental conditions. Enhanced performance at a lower installed cost continues to make 3M the preferred choice for cold shrink solutions.

Why move to 3M Cold Shrink?

- Fast, straightforward installation.
- No flame required.
- No special site permits needed.
- No cooling time needed before energising.
- Easier to use in enclosed areas.
- Constant radial pressure for optimised environmental performance.
- Less chance of damaging XLPE cable material.
- Extensive quality and factory testing programmes.

These cold shrink terminations are lightweight for either free-hanging or bracket mounting arrangements. 3M offers you two options for choosing a cold shrink termination. The QT- III termination utilizes the latest technology with built-in Hi-K stress controlling mastic and environmental sealing mastic resulting in a much more user-friendly application that reduces chances of errors.

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

Terminations are supplied prestretched on a removable core. Removal of the core by unwinding after positioning the termination allows the product to shrink into position, providing a living seal.

QT-II and QT-III cold shrink silicone rubber is specifically formulated as a high track-resistant material with hydrophobicity (water repelling action) and UV resistance to ensure a longlife expectancy when properly installed.

The QT-II termination offers some of the same advantages as the QT-III termination but without a few of the integrated features that the QT-III termination posesses. All terminations meet or exceed IEEE 48, IEC 60502-4 and CENELEC 629-1 (replaced VDE 0278) requirements.

Medium Voltage Cable Accesories

Cold Shrink Technology

Silicone Rubber

Cold Shrink Termination Kits

QTII (X) Series

PRODUCTION DESCRIPTION

The 3M QTII (X) Series are Silicone Rubber Cold Shrink Quick Terminating System that designed to accommodate medium voltage metallic-shielded armored non-armored, copper or aluminum conductor power cables configurations.

3M QTII (X) Series provide easy installation for indoor and outdoor applications. QT-II (X) termination is based on specially formulated, track-resistant silicone rubber insulators with built-in Hi-K stress relief. The insulators are prestretched around a spiral -wound, plastic core.

The QTII (X) Series Termination meet or exceed the specification requirements of Standards:

- IEEE Standard 48-1990, for Class 1 termination.
- CENELEC Standards HD 628-S1 and HD 629.1.S1.
- VDE Standard 0278-628 and VDE 0278-629-1.
- British Standard BS 7888-4.1.
- IEC Standard 61442 & 60502-4.
- Vietnamese Standard TCVN 5935-4.

PRODUCTION APPLICATION

- For power cables up to 42kV.
- For polymeric cables: polyethylene, XLPE, EPR.
- For 1C/ 3C copper tape, wire shield, armored/ non-armored power cables.
- For copper or aluminum conductors.
- For contaminated, pollution area, operating environment.
- For switchgear, transformer, motor lead (terminal type) bus, overhead etc. connections.

SELECTION GUIDE

	6/10(12) kV		12.7/22(24) kV		20/35(40.5) kV		22/38.5(42) kV	
	ID	OD	ID	OD	ID	OD	ID	OD
4-Skirt	✓	✓	✓					
6-Skirt				✓	✓			
8-Skirt						✓		
12-Skirt							✓	✓

KEY FEATURES

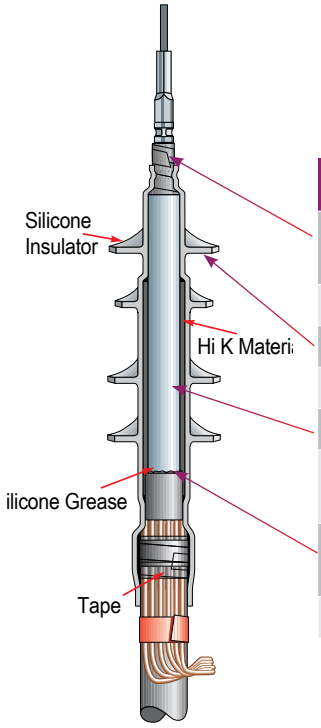
- Versatile- Install quickly and accommodates a wide range of cable sizes: from 25sqmm to 630sqmm.
- Simple hand application, no need for special installation tools.
- No torches or heat required.
- Excellent resistance to ozone and UV radiation.
- Good solvent resistant.
- Excellent thermal stability.
- High dry and wet insulation resistance.
- High flexible - accommodates all cable company bend radius recommendations.
- Reliable Seals - Termination assemblies retain resiliency and cable interface pressure after prolonged years of aging and exposure.

DETAILED COMPOSITION OF THE QTII (X)

- **QTII Termination Assembly:**

The cold shrink delivery system has repeatedly proven itself to be unsurpassed as a positive and reliable electrical insulating and moisture-sealing system for cable primary insulation interface surface.

Onepiece cold shrink termination assembly is created when silicon rubber skirted insulator is mounted over a High Dielectric Constant (High-K) stress relief on a common support core.



QT-II
Moisture Blocking Silicon Tape
Applied separately
Outer Insulator
Good track resistance
Stress Control Tube
Intergrated Termination
Silicone Grease - Stress Relief
Applied separately

SILICONE RUBBER-MATERIAL CHARACTERISTICS

- **Smooth surface:** minimum amount of contamination adhenre to the termination.
- **Hydrophobicity:** When water comes in contact with the silicone it beads up and runs off the skirts rather than completely wetting these surfaces. Thus a less conductive path is formed on the silicone and leakage currents are lowered.
- **Non-organic/ nonconductive:** degrade leakage current and arcing occurs on the surface of termination.
- **High temperature with stand:** An outstanding physical characteristic of silicone rubber is its retention of desirable properties over the wide temperature range of 100°C to 180°C.

NOTE: Length of phases depend on requirements of Customer. Installed length of 3-phase 3M QTII termination standard kits are 1m approximate.

SELECTION GUIDE

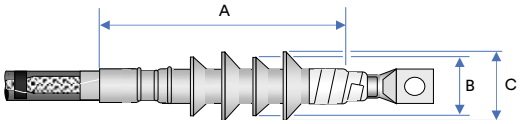
	6/10(12) kV	12.7/22(24) kV		20/35(40.5) kV		22/38.5(42) kV	
	Indoor/ Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor
1-phase	QTII (X)4S-11	QTII (X)4S-12	QTII (X)6S-12	QTII (X)6S-13	QTII (X)8S-13	QTII (X)8S-14	QTII (X)12S-14
3-phase	QTII (X)4S-31	QTII (X)4S-32	QTII (X)6S-32	QTII (X)6S-33	QTII (X)8S-33	QTII (X)8S-34	QTII (X)12S-34

QTII (X)xS-CV

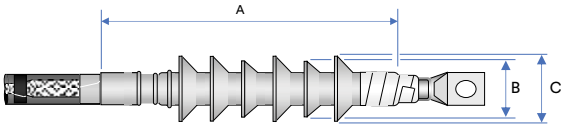
QTII : Product Name Quick Termination II
(X)xS : Type of QTII termination/body assembly (J4S, L6S, M8S; S: Skirt)
C : Number of Conductor/ Core (1, 3)
V : Class of Voltage (1: 12kV; 2: 24kV; 3: 36kV, 4: 40.5kV)

Ex.: QTII (L)6S-32 is QTII 3/C termitation, body type L 6S, outdoor application for 24kV class, 100°C to 180°C.

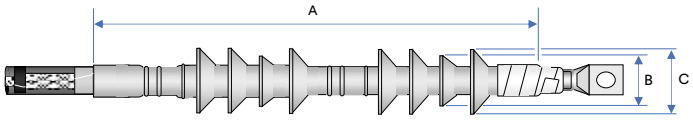
4 Skirt Termination



6 Skirt Termination



8 Skirt Termination



Number of QTII body	Cable Application Range			Dimensions (mm)				
	O.D. insulation (mm)		O.D. Jacket (mm)	Installed length (A)	Installed length (B)	Installed length (C)	Creepage Distance (1P/3P)	Arcing Distance
	Min	Max						
4 SKIRT								
J	16.3	22.9	20.3 - 30.5	250	42.4	68.1	438 / 1138	317
K	21.3	33.8	25.4 - 40.6	250	46.2	69.8	438 / 1138	317
L	27.9	41.9	33.0 - 48.3	275	50.8	82.5	489 / 1189	356
M	33.0	49.5	38.1 - 61.0	280	50.8	90.2	495 / 1195	362
6 SKIRT								
J	16.3	22.9	20.3 - 30.5	325	42.4	68.1	584 / 1284	394
K	21.3	33.8	25.4 - 40.6	325	46.2	69.8	584 / 1284	394
L	27.9	41.9	33.0 - 48.3	360	50.8	82.5	654 / 1354	432
M	33.0	49.5	38.1 - 61.0	370	50.8	90.2	660 / 1360	438
8 SKIRT								
J	16.3	22.9	20.3 - 30.5	325	42.4	68.1	584 / 1284	394
K	21.3	33.8	25.4 - 40.6	325	46.2	69.8	584 / 1284	394
L	27.9	41.9	33.0 - 48.3	360	50.8	82.5	654 / 1354	432
M	33.0	49.5	38.1 - 61.0	370	50.8	90.2	660 / 1360	438

Termination Identification & Markings

Termination Body Size
Available sizes are J, K, L & M

Production Date Code Indicator
A dash in 2 quadrants denotes 2nd quarter, etc.