

3M™ High Voltage Cable Accessories  
For 115kV, 123kV, 138kV and 145kV Applications



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## A Cable Accessory Expert

Cable accessories are a critical part of the electrical network. As the voltage class increases, so do the challenges faced on the job site. In order to ensure the reliability of your network, you need a cable accessory expert, you need 3M.

For nearly 40 years, 3M has been providing dependable solutions for low and medium voltage installations. 3M has developed a core technology platform for constructing cable accessories. Now, this proven technology is available for high voltage applications up to 138 kv (IEEE) / 145 kv (IEC).



### 3M™ Core Technology Platform

## A Trusted Supplier

3M offers more than high voltage cable accessories. We provide peace of mind. 3M has provided reliable cable accessories with a consistent track record around the globe. Every pre-molded component (joint body and stress cone) is 100% electrical factory tested and every solution is backed by the strong reputation 3M commands in the industry. If you're ready to work with a supplier you can trust, you're ready to work with 3M.



## We're with you in the trenches

Even the most innovative technology will have little benefit, unless it is matched to the application and correctly applied. That's why all 3M high voltage cable accessories are backed by a global network of technical support, sales and supply chain specialists. Their expertise is always available to help suggest alternatives for you to evaluate and select a solution optimized for your requirements – with training, installation assistance, custom configurations and more. 3M offers kit consultation to help meet each project's individual needs.

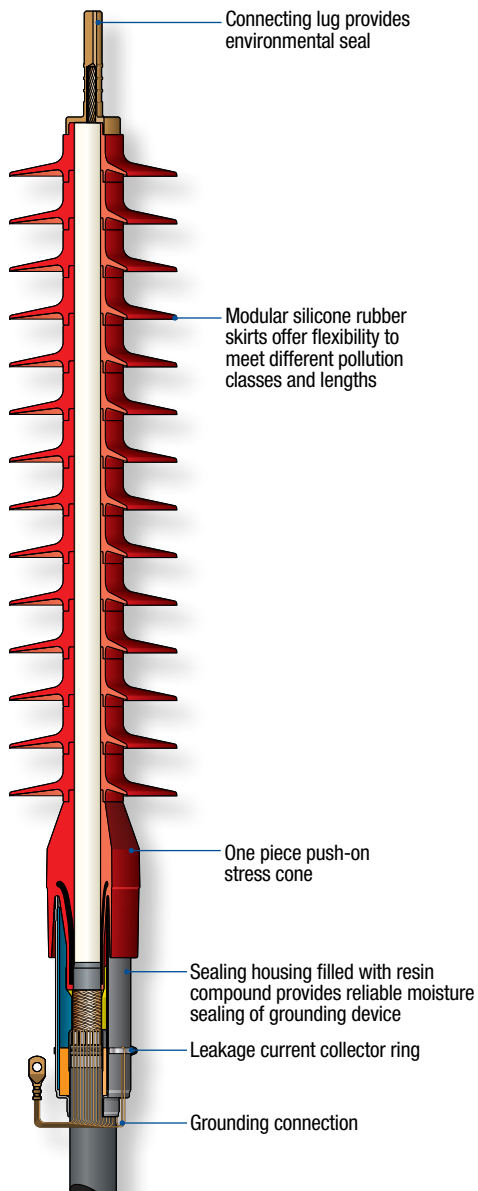


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## 3M™ Dry Termination TD Family for up to 123kV Applications



### Description

- Push-on dry termination, for indoor or outdoor installations

### Applications

- Conductor size up to 2,500 kcmil (1,000mm<sup>2</sup>)
- Can accommodate a variety of pollution classes and lengths
- Not self-supporting, requires holding structure

### Features

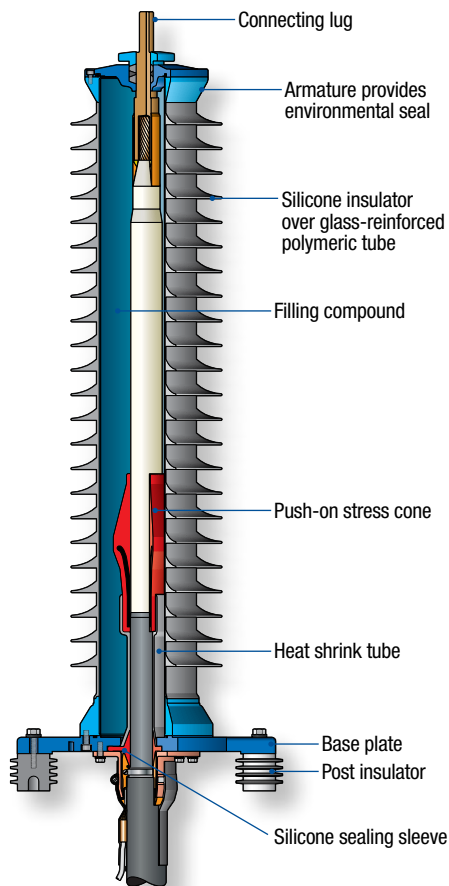
- Light weight
- Dry design – does not require liquid dielectric
- Can be installed at any angle or inverted
- Silicone modular termination
- No special maintenance required
- Proven push-on technology



Example of installation on overhead line tower



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## 3M™ Wet Silicone Termination TS Family for up to 145kV Applications

### Description

- Self-supporting, outdoor termination with silicone insulator

### Applications

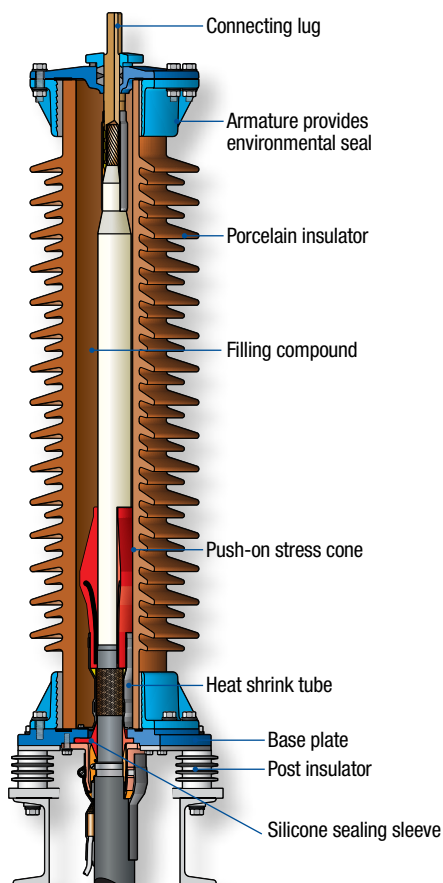
- Conductor size up to 2,000 kcmil (1,200 mm<sup>2</sup>)
- Can accommodate a variety of pollution classes and lengths
- Maximum installation angle of 30°

### Features

- One-piece pre-molded 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
- Less sensitive to earthquakes, vibrations and thermal variations
- Internal shear bolt connection eliminates need for crimp-type connections

### Optional

- Arcing horns
- Variety of lengths available



## 3M™ Wet Porcelain Termination TP Family for up to 145kV Applications

### Description

- Self-supporting, outdoor termination with porcelain insulator

### Applications

- Conductor size up to 2,000 kcmil (1,200 mm<sup>2</sup>)
- Can accommodate a variety of pollution classes and lengths
- Maximum installation angle of 30°

### Features

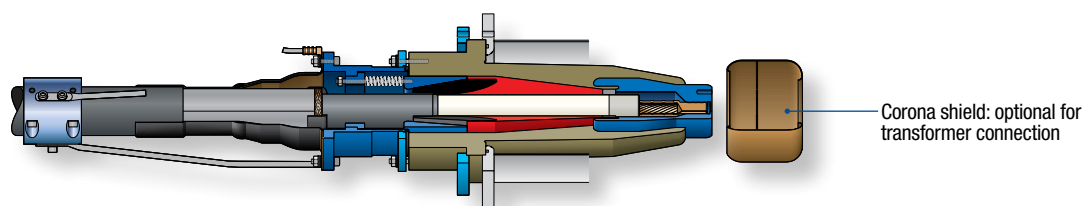
- One-piece pre-molded silicone stress cone
- Short built-in length
- Porcelain insulator
- Good environmental performance
- Internal shear bolt connection eliminates need for crimp-type connections

### Optional

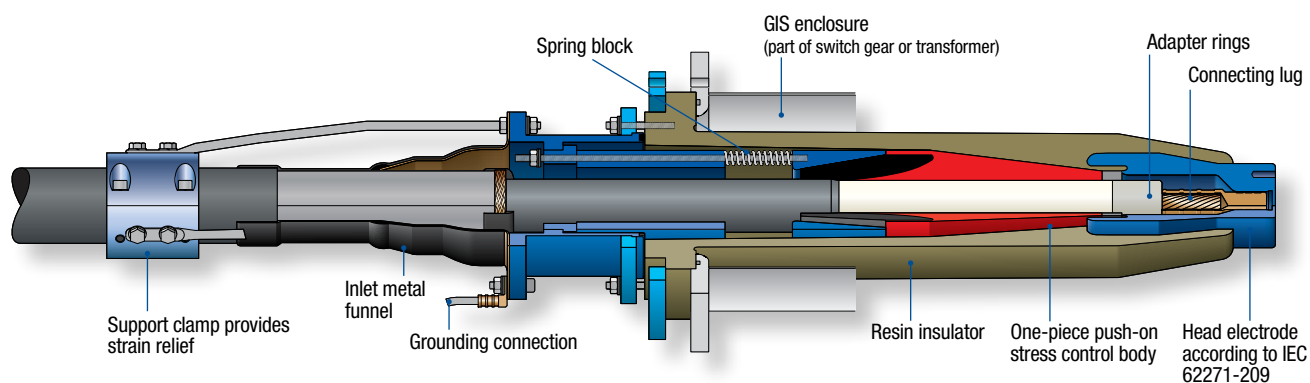
- Arcing horns
- Variety of lengths available



# 3M™ Termination TG Family for Gas Insulated Switchgear and Transformer Connections up to 145kV



3M™ Short Termination TG D/S for Gas Insulated Switchgear and Transformer Connections, dimensions according to IEC 60859, Table 2 (dry type)



3M™ Long Termination TG D/L for Gas Insulated Switchgear and Transformer Connections, dimensions according to IEC 60859, Table 4 (fluid filled)

## Description

- Pre-molded “dry-type” termination for gas-insulated-switchgears and transformers

## Applications

- Conductor size up to 2,000 kcmil (1,200 mm<sup>2</sup>)
- Available for short (470 mm / 18.5 in) and long (757 mm / 29.8 in) installation lengths

## Features

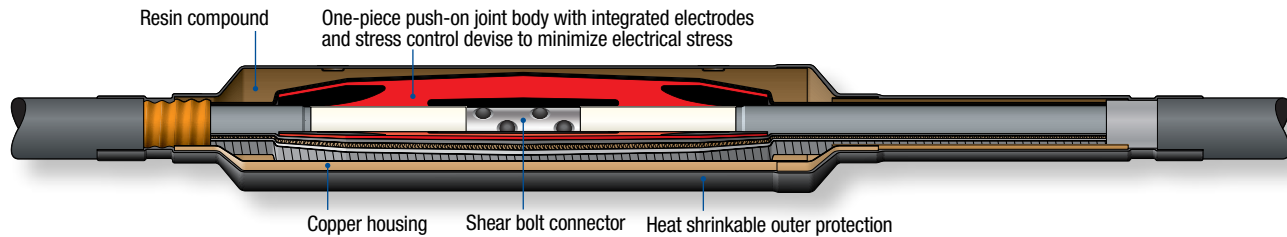
- One-piece silicone rubber stress cone
- Resin insulator can be mounted to GIS equipment at manufacturer’s location
- Dry design – does not require liquid dielectric

## Optional

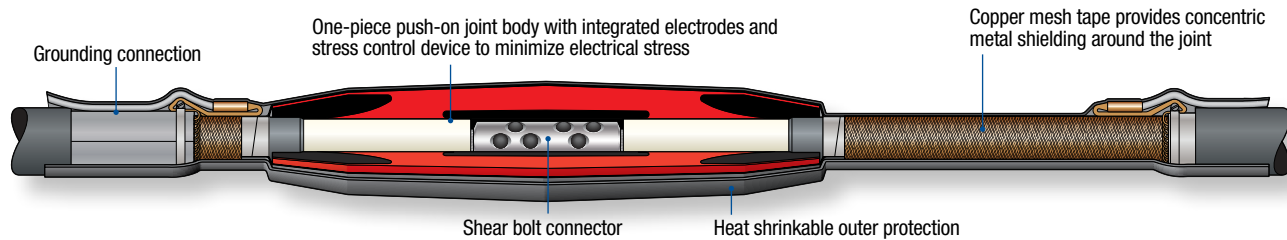
- Corona shield for transformer connection
- Socket



# 3M™ Push-on Joint SC & SS Family for up to 145kV Applications



3M™ Push-On Joint SS with an in-line configuration, copper housing and heat shrink re-jacketing



3M™ Push-On Joint SC with a cross bond configuration and heat shrink jacket

## Description

- One-piece, push-on silicone rubber joint for in-line and cross bond applications with different re-jacketing and grounding options

## Applications

- Conductor size up to 2,000 kcmil (1,200mm<sup>2</sup>)
- In-line and cross bond design available

## Features

- One piece silicone rubber push-on joint body
- Shear bolt connector included
- Connectors for round compacted or round segmented cable available
- Flexible design accommodates different shielding and cable re-jacketing systems

## Optional

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



Example of link box with surge voltage limiters (SVL)

## Available Grounding Systems

- Removable links
- Surge voltage limiters (SVL)
- Cross bond boxes





## Tools

The right tools for cable preparation and installation are essential to ensure long-term reliability of the network. 3M is available to discuss the appropriate standard and special tools required for your installation.

### Cable Preparation

These tools are recommended to prepare the cable for all installations

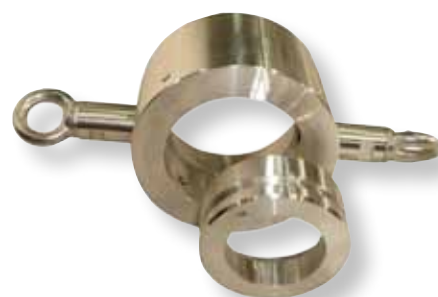
- Straightening bar, angle-type
- Heating sleeve with temperature control unit
- Roll-type peeling device
  - SH 80: for cables with max diameter over outer semicon of 80mm
  - SH 130: for cables with max diameter over outer semicon of 130mm



Peeling Tool

### Accessory Installation Tools

3M high voltage cable accessories must be installed using installation tools specifically designed for each accessory. Reference the chart below for specific information about the tools required for each product.



Mounting device for TG/TP/TS

### Special Installation Tools for High Voltage Cable Accessories

	TD	TS & TP	TG D/S & TG D/L	SC & SS
Al chain block YALE 750 kg (without plate)	x	x	x	x
Al-clamp	x	x	x	x
Inset for mounting device TG/TP/TS (according to cable cross section)		x		
Installation frame for SC/SS (2 sizes available)				x
Installation rod				x
Lubrication tool	x	x	x	x
Mounting device SC/SS				x
Mounting device TG includes handles (according to cable cross section)			x	
Mounting device TG/TP/TS		x		
Mounting device TD includes handles (according to cable cross section)	x			
Swap wrench				x



Base plate for mounting device SC/SS



Belt Mover

**Note:** Alternative installation tools are also available. Contact 3M for more information.



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## Certification & Selection Guide for 3M™ Terminations and Joints

Product	IEEE 115 kV	IEC 123 kV	IEEE 138 kV	IEC 145 kV	Applicable Certifications
Dry Termination	TD 115	TD 123			IEC 60840
Porcelain Wet Termination	TP 115	TP 123	TP 138	TP 145	IEC 60840
Silicone Wet Termination	TS 115	TS 123	TS 138	TS 145	IEC 60840
GIS Short	TG D/S 115	TG D/S 123	TG D/S 138	TG D/S 145	IEC 60840
GIS Long	TG D/L 115	TG D/L 123	TG D/L 138	TG D/L 145	IEC 60840
In-Line Joint	SC 115	SC 123	SC 138	SC 145	IEC 60840
Cross Bond Joint	SS 115	SS 123	SS 138	SS 145	IEC 60840

Note: All cross sectional drawings represent typical product construction, grounding design can be adapted for different cable constructions.

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### Important Notice

All cross sectional drawings represent typical product construction, installation materials may vary. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use.

### Warranty; Limited Remedy; Limited Liability.

3M's product warranty is stated in its Product Literature available upon request. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**

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