

## Test Report PPR-3204

**Test object:** CSTO-7132 42kV charcoal grey SiR

**Test performed:** CENELEC HD 629.1 S2:2006+A1:2008 table 4 (Sequence A3)  
Outdoor Termination for extruded insulation cables

**Pages:** 14

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## PPR-3204

**Subject of Test:** Outdoor Termination CSTO-7132 for 42kV Single Core Polymeric Cables

**Date of Tests:** January 2016 – November 2016

**Requirements:** CENELEC HD 629.1 S2:2006+A1:2008 table 4 A3

**Manufacturer:** Tyco Electronics Raychem GmbH Laboratories, Ottobrunn - Germany

**Location of Tests:** Tyco Electronics Raychem GmbH Laboratories, Ottobrunn - Germany

**Test Purpose:** Qualification according to CENELEC HD 629.1 S2 table 4, sequence A3. Performance testing.

**Reference:** Laboratory Book ED1113

**Test Results:** *All samples passed the test requirements in accordance with the CENELEC HD 629.1 S2:2006+A1:2008 table 4 A3 20,8/36(42)kV specification.*

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## 1 CENELEC TEST for CSTO Outdoor Termination

### 1.1 Test Programme

The test sequence of the CSTO Outdoor Termination for 18/30(36)kV was done in accordance with HD 629.1.S2 table 4, page 13.

Table 1: Indoor Terminations for extruded insulation cables

	Test	Test clause of EN 61442	Test sequence			Test requirements
			A1	A2	A3	
1	Salt Fog test	13			X	1000 h duration at 26 kV, 16mS/cm
2	Salt Fog test	13			X	1000 h duration at 26 kV, 16mS/cm
3	Salt Fog test	13			X	1000 h duration at 26 kV, 16mS/cm
4	Salt Fog test	13			X	1000 h duration at 26 kV, 16mS/cm

## 1.2 Test Samples

### **Cable:**

Manufacturer:	NEXANS
Type:	NA2XS(F)2Y 18/30kV
Construction:	XLPE extruded
Conductor:	Aluminium
Cross section:	95mm <sup>2</sup>
Voltage rating:	36 kV
Length of test loops:	approx. 3,6 m
Number of loops:	2
Number of terminations:	4

### **Product:**

Kit Description:	CSTO-7132-ML-4-13
Termination body:	2304322-1 CSTO-35-BD-18-533-SS
Sealant tape:	S1278-1-13
Cable lug:	BLMT 95/240-13

### **Installation:**

Instruction sheet:	EPP-2828-8/16
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### 1.3 Identification of test cable

Rated voltage  $U_0/U$  ( $U_m$ ): 18/30 (36) kV

Construction:  1-core  3-core  Individually screened

Overall screen

Conductor:  Al  Cu

Stranded  Solid

Circular  Shaped

120mm<sup>2</sup>  150mm<sup>2</sup>  185mm<sup>2</sup>

Other cross section: 95mm<sup>2</sup>

Insulation:  XLPE

EPR  HEPR

Insulation screen:  Bonded  Strippable

Metallic screen:  Wire  Tape  Extruded

Armour:  Wire  Tape

Over sheath:  PVC  PE (state type)

Waterblocking, if any:  In conductor  Under oversheath

Diameters: Conductor: mm 11.5

Insulation: mm 29.0

Insulation screen: mm 30.5

Oversheath: mm 37.5

Cable marking: NEXANS VDE0278 NA2XS(F)2Y 1x95 RM/25 30kV 2005

## 1.4 Test Sequence A3

## 1.5 Salt Fog Test according to Section 13 EN 61442

The 1000 h Salt Fog test was done according to Section 13 EN 61442.

A.C. voltage of 26 kV<sub>rms</sub>, 50 Hz was applied between the conductor and the grounded screen for 1000 h. The voltage was continuously increased within 10 seconds to the specified value and was then held constant during the required test period.

The water with a conductivity of 16 +/- 2 mS/cm was sprayed at a rate of 0,4 +/- 0,1 l/h per cubic metre of the test chamber. The 1000h test was repeated 4 times on the same samples.

**Samples:** CSTO-35-BD-18-533-SS



virgin



virgin



virgin



virgin



after 1000h washed



after 1000h washed



after 1000h washed



after 1000h washed



after 2000h



after 2000h



after 2000h



after 2000h

Samples CSTO Loop 1 +2



after 3000h washed



after 3000h washed



after 3000h washed



after 3000h washed



after 4000h washed



after 4000h washed



after 4000h washed



after 4000h washed



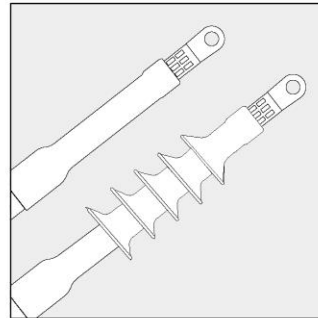
## 1.6 Summary Test Results

The samples passed, no tracking occurred, erosion depth did not exceed 2mm or 50% of the installed insulation thickness. Result: All samples passed

## 1.7 Installation instruction



**Raychem**  
from TE Connectivity



**Installation Instruction**  
**EPP-2828-8/16**

**Raychem**  
**Termination for Screened**  
**Single Core Polymeric Cable**  
**without Armour**

**Type: CSTI/CSTO**  
**Indoor/Outdoor**

**36 kV / 42 kV**

To view the TE Energy website:



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## Before Starting

Check to ensure that the kit you are going to use is suitable for the size of cables being jointed.

Refer to the kit label and the title of the installation instruction.

Components or working steps may have been modified since you last installed this product.

Carefully read and follow the steps in the installation instruction.

## General Instructions

Clean and degrease all parts that will come into contact with adhesive.

If a solvent is used follow the manufacturer's handling instructions.

Check cable ends for ingress of moisture before starting with cable preparation.

For easy strip screen layers always use a round file to cut radially through the core screen.

The Information contained in these installation instructions is for use only by installers trained to make electrical power installations and is intended to describe the correct method of installation for this product. However, TE Connectivity has no control over the field conditions which influence product installation.

It is the user's responsibility to determine the suitability of the installation method in the user's field conditions. TE Connectivity's only obligations are those in TE Connectivity's standard Conditions of Sale for this product and in no case will TE Connectivity be liable for any other incidental, indirect or consequential damages arising from the use or misuse of the products.

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## Cable Preparation

### Before Starting

Check to ensure that the kit you are going to use fits the cable.  
 Refer to the kit label and the title of the installation instruction.  
 Components or work steps may have been improved since you last installed this product.  
 Carefully read and follow the steps in the installation instruction.

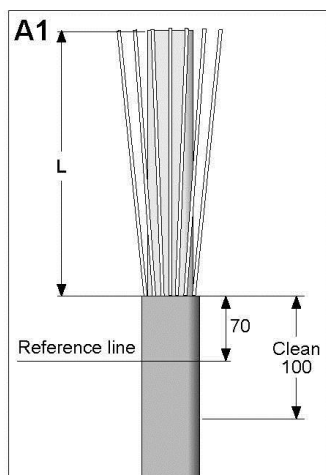
Table for cutback dimensions

Mechanical lug BLMT	Cable	Termination
	Cross Section	Indoor/Outdoor 36 kV/42 kV
	mm <sup>2</sup>	mm
BLMT 25/95	95	435
BLMT 35/150	50 Cu	460
BLMT 35/150	150 Al	450
BLMT 35/150	95 Al	450
BLMT 95/240	185	475
BLMT 95/240	240	440
BLMT 185/400	185	475
BLMT 185/400	400	445
BLMT 500/630	500 Al	485
BLMT 500/630	630 Al	485
BLMT 500/630	630 Cu	485
BLMT 800/1000	1000 Al	460

#### For cable cross section 50 - 630 mm<sup>2</sup>

Cut the cable to the required length.  
 Remove the oversheath according to L. Clean and degrease the end of the oversheath for approximately 100 mm.

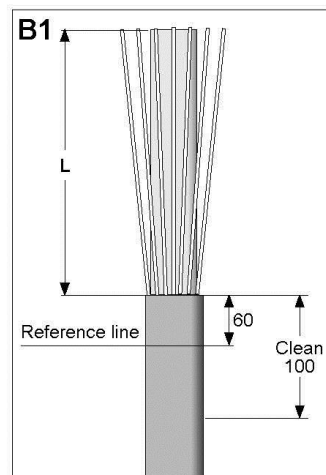
Mark a line 70 mm below the oversheath cut.



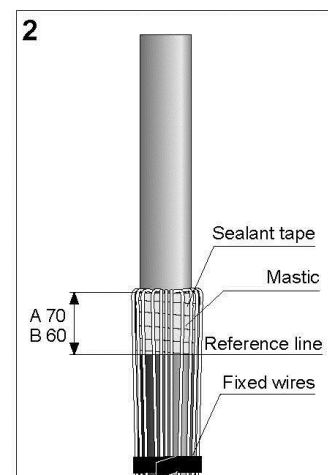
#### For cable cross section 800 - 1000 mm<sup>2</sup>

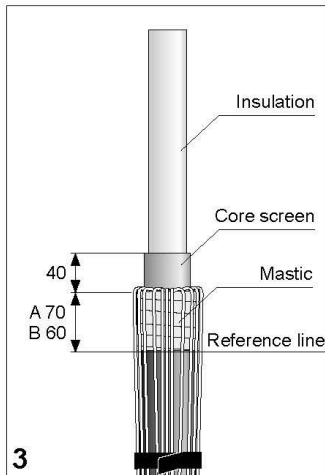
Cut the cable to the required length.  
 Remove the oversheath according to L. Clean and degrease the end of the oversheath for approximately 100 mm.

Mark a line 60 mm below the oversheath cut.



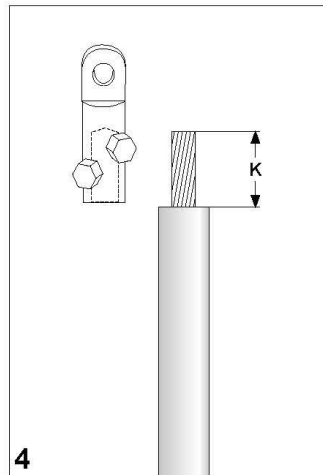
Wrap two layers of sealant tape (grey) with a small overlap and slight tension around the end of the oversheath as shown. Bend the shielding wires back onto the oversheath. Avoid crossing the individual wires. Fix the shielding wires with a tape to the oversheath.



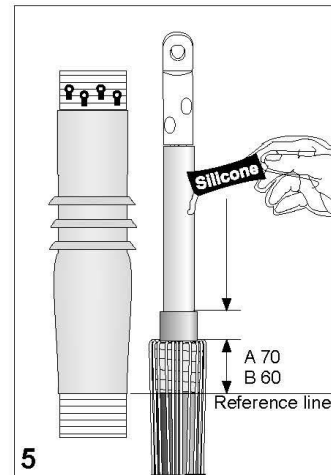


3  
Thoroughly remove the core screen to within 40 mm of the overshooth cut. The surface of the insulation should be free from all traces of conductive material. Smooth out any irregularities.

**Note:** Do not nick the insulation.



4  
Cut back the insulation according to **Mechanical lugs:**  
**K = depth of cable lug barrel hole**  
Install the cable lug and remove all sharp edges. Clean and degrease the core insulation and the lug.



5  
Apply a thin layer of silicone grease onto the insulation and the core screen cut.

Position the termination body. Pull the spiral gently until the termination body butts to the reference line.

If the termination is not correctly positioned, it is possible to gently slide it into place.

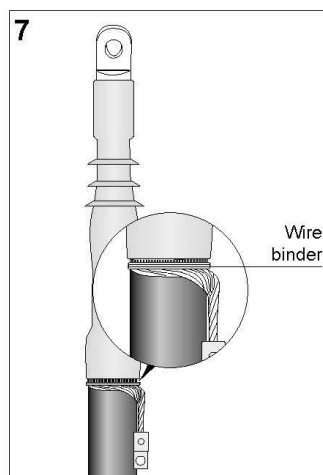
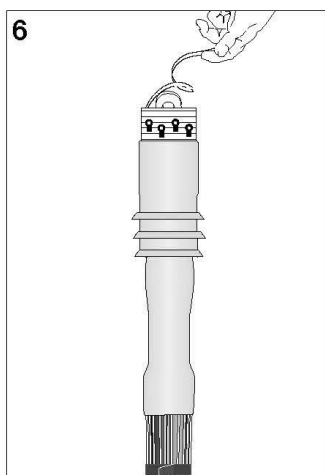
Remove the spiral holdout completely from the termination by pulling it counterclockwise.

Do not twist the spiral holdout during removal. Avoid the spiral to hook up over the termination.

Degrease and clean the termination.

Fix the shield wires with a wire binder along the lower edge of the termination body. Install the cable lug on the shield wires.

**Termination completed.**



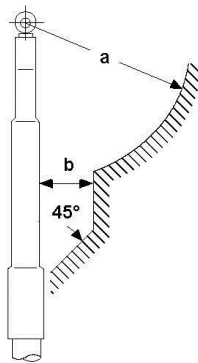
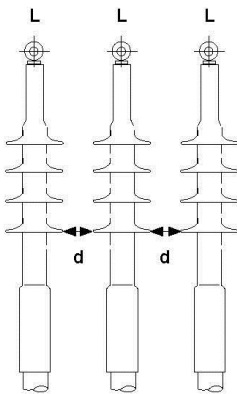
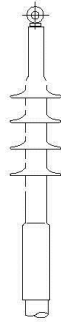
Please dispose of all waste according to local environmental regulations.



### CSTI/CSTO – Product family

Indoor

Outdoor



Min. clearances	Max. system voltage in kV	
	36	42
a Air clearance	as for local specifications	
b ph/ph and ph/ground in mm	35	45
d Between skirts in mm	25	35