

Company Directive

STANDARD TECHNIQUE: CA3X

Relating to E 5 Numbers for 33kV Cable Jointing Materials

Policy Summary

This ST document contains the jointing materials and their relevant E 5 item numbers required for 33kV Jointing.

Only materials stated in this ST are approved for use on WPD's 33kV Underground Cable System unless the Policy Manager, Avonbank, has granted prior permission.

This ST has not been written as a training document. It is not intended to be exhaustive in content and you must refer to your supervisor if you require training or instruction.

You shall work safely and skilfully, utilising the training/instruction you have already received, relating to the contents of this document and its cross-references.

You must make sure that you understand your job instructions and that you have the necessary tools and equipment for the job.

Author: Peter White

Implementation Date: March 2017

Approved by



Policy Manager

Date:

14 March 2017

All references to Western Power Distribution or WPD must be read as National Grid Electricity Distribution or NGED

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IMPLEMENTATION PLAN

Introduction

This new document contains the jointing materials and their item numbers required for 33kV Jointing.

Main Changes

This is a new document.

Impact of Changes

All current 33kV Jointers throughout the company will need to undertake a short conversion course prior to using the new cold applied jointing system there will then be a phased change from the existing jointing systems over to the new harmonized cold applied jointing system.

Implementation Actions

There will be a structured approach to the phased change-over to the new harmonized cold applied jointing system where the old jointing system being used until all current 33kV Jointers in a Depot have been trained and the stores of that particular Depot are purged of the old jointing system.

A short period of formal training will be required.

Implementation Timetable

Once 33kV Jointers have been on the conversion course then this Standard Technique can be implemented with immediate effect.

Document Revision & Review Table		
Date	Comments	Author
March 2017	This is a new document.	Peter White

ST: CA3X E 5 NUMBERS FOR 33kV CABLE JOINTING MATERIALS

This ST document contains the jointing materials and their item numbers required for 33kV Jointing.

Only materials stated in this ST are approved for use on WPD's 33kV underground cable system unless the Policy Manager, Avonbank, has granted prior permission.

When selecting materials appropriate to the required joint/termination, it will be necessary to reference the material list found in the relevant Jointing Procedure.

Any reference to single core EPR cable equally applies to single core XLPE cable.

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4.1 33kV CABLES

EPR

185mm ² Cu. EPR Single core	41940
300mm ² Cu. EPR Single core	60609
400mm ² Cu. EPR Single core	41942
630mm ² Cu. EPR Single core	41943
800mm ² Cu EPR Single core	61684

NOTE on existing cable designs: -

- 1) PILC refers to single core Paper Insulated Lead Covered cable.
- 2) H Cable refers to the three phase, paper insulated, screened cable under a single lead sheath, normally with a steel wire armour.
- 3) HSL Cable refers to a three phase, paper insulated, screened cable where each phase has its own lead sheath, normally with a common steel wire armour.
- 4) XLPE Pb sheath is single core XLPE insulated, lead sheath, MDPE oversheath cable.
- 5) EPR CWS is a single core design EPR insulated, copper wire screen, MDPE oversheath cable.
- 6) 3 Core XLPE is a three core, XLPE insulated, copper tape screen, steel wire armour, PVC oversheath cable.

4.2 JOINT - BASE MODULES - BM

Lovink Joints

BM M85	185/400mm ² to 185/400mm ² single core EPR	61532
BM M105	500/630mm ² to 630mm ² single core EPR	61533
BM M125	185/400mm ² H or HSL, to 185/400mm ² EPR	61534
BM M125	185/400mm ² 3 core XLPE SWA, to 185/400mm ² EPR	61534
BM M105	800 / 1000mm ² EPR, to 800 / 1000mm ² EPR	61625

4.3 JOINT - CABLE DEPENDING MODULES - CM

Lovink Joints

CM MG85PILC 0.1in ²	70-95mm ² PILC cable	61640
CM MG85PILC 0.2in ²	120-185mm ² PILC cables	61641
CM M85PILC 0.4in ²	240-400mm ² PILC cables	61642
CM M105PILC 0.75in ²	500mm ² PILC cables	61649
CM M105PILC 1in ²	500/630mm ² PILC cables	61650
CM M105PILC 1.5in ²	800/1000mm ² PILC cables	61651
CM MX85EPRSCCWS	185 to 300mm ² Single core EPR	61636
CM MX85EPRSCCWS	300 to 400mm ² Single core EPR	61637
CM MX85XLPE Pb185	185 to 240mm ² Single core XLPE Pb sheath	61638
CM MX85XLPE Pb300	300 to 400mm ² Single core XLPE Pb sheath	61639
CM MX105EPRCWS185	185 to 300mm ² Single core EPR	61643
CM MX105EPRCWS400	400mm ² Single core EPR	61644
CM MX105EPRCWS630	500/630mm ² Single core EPR	61645
CM MX105EPRCWS630	800/1000mm ² Single core EPR	61646
CM MX105XLPE Pb630	630mm ² Single core XLPE Pb sheath	61647
CM MX105XLPE Pb800	800/1000mm ² Single core XLPE Pb sheath	61648
CM MG125 1x3 HSL 185	MK125 185-300mm ² HSL 0,3-0,5 in ²	61632
CM MG125 1x3 HSL 400	MK125 300-400mm ² HSL 0.5-0,6in ²	61633
CM MG125 1x3 H 185	MK125 185-300mm ² H 0.3-0,5in ²	61630
CM MG125 1x3 H 400	MK125 400mm ² H 0,6in ²	61631
CM MG125 1x3 H 400	MK125 shaped 400mm ² H cable	61656
CM MG125 1x3 H 0.1in ²	MK125 0.1-0.15in ² H cable	61657
CM MG125 1x3 H 0.2in ²	MK125 0.2-0.25in ² H cable	61658
CM MG125 3x1 CWS 185	MK125 185-300mm ² EPR cable	61626
CM MG125 3x1 CWS 400	MK125 400mm ² EPR cable	61627

CM MG125 3x1 XLPE Pb 185	MK125 185-300mm ² XLPE Pb cable	61628
CM MG125 3x1 XLPE Pb 400	MK125 400mm ² XLPE Pb cable	61629
CM MG125 1x3 XLPE SWA 185	MK125 185-300mm ² 3 Core XLPE cable	61634
CM MG125 1x3 XLPE SWA 400	MK125 400mm ² 3 Core XLPE cable	61635
33kV Splitter kit	33kV Splitter kit	61678
FTBM	Foam Tape Build up Module	40753

4.4 RESIN MODULES

Lovink Joints

RM – B	(M85, M105, Base Modules)	61665
RM – C	(M105, M125 Base Module)	61666
RM – H	(M125 Resin Module)	61659
RM – F	LOVISIL BAG 4,8 litre	61667
500mL	Lovisil Topping up bottle	41253

4.5 STOP END MODULES

Lovink Joints

SEM M85	Stop End Module	61539
SEM M105	Stop End Module	61540

4.6 TERMINATION MODULES

Ensto Indoor terminations

PEM-CIT1_4204L_II	185 to 300mm ² EPR CWS (set of 3)	60363
PEM-CIT1_4205L_II	400/630mm ² EPR CWS (set of 3)	60364
PEM-CIT1_4204L_II	185/400mm ² XLPE Pb sheath (set of 3)	60359
PEM-CIT1_4205_II	400/630mm ² XLPE Pb sheath (set of 3)	60360
CIT1_4206PB	800/1000mm ² XLPE Pb sheath (set of 3)	61522

Ensto Outdoor terminations

PEM-COT1_4204L_II	150 to 300mm ² EPR CWS (set of 3)	60365
PEM-COT1_4205L_II	400/630mm ² EPR CWS (set of 3)	60366
PEM-COT1_4204L_II	150/400mm ² XLPE Pb sheath (set of 3)	60361
PEM-COT1_4205L_II	400/630mm ² XLPE Pb sheath (set of 3)	60362
CIT1_4206PB	800/1000mm ² XLPE Pb sheath (set of 3)	61522

Outer Cone Separable Connectors Interface C - Euromold

Note: - A simple check to see if you have the right separable connector is to check what prefix is shown before the Euromold / Nexans outer cone separable connectors box the prefix for 36kV maximum voltage is given as **(M) 4....**

(M) 430TB/G-30-TMBC120-30014.5	630A 185mm ² Separable connector - set 3	42483
(M) 440TB/G-25-TMBC120-300MWS	630A 300mm ² Separable connector - each	61525
(M) 440TB/G-32-TMBC400-630-MWS	1250A 400mm ² Separable connector - each	42484
(M) 440TB/G-P2-32-TMBC400-630-MWS	1250A 630mm ² separable connector - each	42485
M400CP *	Connector Plug	42499
400PB-10SA-36N *	Surge diverter separable connector	42500
400PB 10SA-45N *	Surge diverter separable connector (Cornwall)	42501
TR400-950-C S480 *	Test Rod	42502

Note: - * All these items are on a Call Off Contract with Nexans and are usually stock items, these items require a call off purchase order being raised in E 5 on Nexans.

4.6 TERMINATION MODULES (Continued)

Inner Cone Separable Connectors Size 3 – Innex.

Innex Size 3 Base Module Set of 3	42550
Innex Size 3 185mm ² CWS Module Set of 3	42552
Innex Size 3 240mm ² CWS Module Set of 3	42553
Innex Size 3 400mm ² CWS Module Set of 3	42554
Innex Size 3 630mm ² CWS Module Set of 3	42555
Innex Size 3 Lead Sheath Module Set of 3	42551

Inner Cone Separable Connectors Size 3 – Pfisterer.

Pfisterer Size 3 - Base Module Set of 3	61548
Pfisterer Size 3 - 185mm ² CWS Module Set of 3	61550
Pfisterer Size 3 - 300mm ² CWS Module Set of 3	61551
Pfisterer Size 3 - 400mm ² CWS Module Set of 3	61552
Pfisterer Size 3 - 630mm ² CWS Module Set of 3	61553
Pfisterer Size 3 - Lead Sheath Module C Set of 3	61558
Pfisterer Size 3 - Lead Sheath Module D Set of 3	61559
Pfisterer Size 3 XL - Base Module Set of 3	61549

Inner Cone Separable Connectors Size 3 – Pfisterer Branch Joint.

Pfisterer Size 3 - Branch joint body* Set of 3	61555
Pfisterer Size 3 - Branch joint frame*	61556
Pfisterer Size 3 - Phosphor bronze bell housings * Set of 3	61557
Pfisterer Size 3 – Surge diverter *	61560
Pfisterer Size 3 – Surge diverter (Cornwall) *	61561

Note: - * All these items are on a Call Off Contract with Pfisterer and there is a 12 week lead time for the joint bodies and the Phosphor bronze size 3 inner cone connectors, these items require a call off purchase order being raised in E 5 on Pfisterer.

4.7 JOINT – CONNECTORS (Phase conductors)

VTPB 21UTB	(50-185mm ² Straight)	30870
VTPB 27UTB	(120-300mm ² Straight)	60906
VTPC 28UTB	(120-400mm ² Straight)	34415
VTPC36UTB	(400-630mm ² Straight)	40416
VTPC44UTB	(630-1000mm ² Straight)	61683

4.8 JOINT – CONNECTORS (Screen wires)

BTC 360 Brass tunnel connector	(4 to 60mm ² Straight)	42959
BCNE-3 UTB		39089

4.9 TERMINATION CONNECTORS

VETB 21-12/16UTB	(50/185mm ² EPR Indoor)	34256
VETC28-12/16UTB	(185-400mm ² EPR Indoor)	34413
VETC33-12/16UTB	(400-630mm ² Indoor)	34255
VETC44 12/16UTB	(630-1000mm ² Indoor) (under development)	TBA
VETB 21-12 OHUTB	(50/185mm ² EPR Outdoor)	37606
VETC28-12 OHUTB	(185 - 400mm ² EPR Outdoor)	30874
VETC33-12 OHUTB	(400-630mm ² Outdoor)	40417
VETC44-12OHUTB	(630-1000mm ² Outdoor)	61567

Note: - Indoor = Cable box; **Outdoor** = pole termination.

VETB21 PxxDyy-UTB	(185mm ² EPR Indoor Pin)	*
VETB28 PxxDyy-UTB	(300mm ² EPR Indoor Pin)	*
VETB33 PxxDyy-UTB	(400/630mm ² EPR Indoor Pin)	*
VETB33 PxxDyy-UTB	(400/630mm ² EPR Indoor Pin)	*

Note: - Items 34413 and 30874 are to be used only on 300mm² Cu EPR

*** Asterisk marked connectors are direct order from connector manufacturer (Tyco)**

4.10 HEATSHRINK ITEMS

End Caps

95-115mm Ø	31185
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Sealing Sleeves

WCSM 120/40 x 350	31170
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WCSM 90/25 x 250	31169
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MCSM 90/36x350	31163
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Repair Sleeve

CRSM 53/13-1500	31217
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CRSM 84/20-1500	31218
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4.11 COLDSHRINK ITEMS

3M End Caps

11 - 20mm Ø	EC 1	41693
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15.9 – 30.1mm Ø	EC 2	41692
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26 – 49.2mm Ø	EC 3	41691
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45.5 – 84.3mm Ø	EC 4	41690
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4.12 EARTHING ITEMS

BET 35-12	39108
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BET 60-12	39109
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BET 120-12	39110
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4.13 OUTDOOR (POLE) TERMINATION MISCELLANEOUS ITEMS

Crucifix Bracket	42595
Adaptor plate	50415
Surge Diverter (set off 3)	50413
Surge Arresters 42kV Cornwall (set off 3)	30580
Cable Cleat 185mm ² EPR Trefoil two bolt	61123
Cable cleat 185mm ² EPR Single core two bolt	61122
Cable Cleat 185mm ² EPR Single core single bolt	30868
Cable Cleat 300mm ² EPR Trefoil two bolt	30869
Cable cleat 300mm ² EPR Single core two bolt	60886
Cable Cleat 300mm ² EPR Single core single bolt	61132
Cable Cleat 400mm ² EPR Trefoil two bolt	60888
Cable cleat 400mm ² EPR Single core two bolt	60886
Cable Cleat 400mm ² EPR Single core single bolt	61132
Cable Cleat 630mm ² EPR Trefoil two bolt	60889
Cable cleat 630mm ² EPR Single core two bolt	60887
Cable Cleat 630mm ² EPR Single core single bolt	61124

4.14 INDOOR TERMINATION (CABLE BOX) MISCELLANEOUS ITEMS

Note: - All gland plates shall be non-ferrous metal.

Aluminium Cable Gland EAKT 1608 (set of 3)	41266
Insulated Earth Stud	41409
Sili gasket 2	42350

4.15 TAPES

Black Cotton	32667
PVC ‘Scotch 35’ Brown	38954
PVC ‘Scotch 88’ Black	35830
PVC ‘Scotch 35’ Grey	41195
PVC ‘Scotch 35’ Blue	38953
PVC ‘Scotch 1500’ Green/Yellow	32652
PVC ‘Scotch 35’ White	38955
Scotch ‘1700P’ Temflex L1	41322
Scotch ‘1700P’ Temflex L2	41323
Scotch ‘1700P’ Temflex L3	41324
Scotch ‘1700P’ Temflex L	41327
Scotch ‘1700P’ Temflex N	41325
Scotchfil Putty	31360
Denso 50mm x 10m	32656
Scotch 5313 Black Mastic Water Blocking	39124
Cable Marker (English)	31352
Cable Marker (Welsh)	37145
ABB Rulle	40232
“VM” (19 Wide)	31350
“VM” (100 Wide)	31347
Self-Fusing Silicone Rubber Electrical “Scotch 70”	41194
Semi-conducting EPR tape Scotch 13 tape	42423
Gorilla duct tape	60928

4.16 MISCELLANEOUS ITEMS

Cable Ties (Narrow)	32644
Cable Ties (Large)	35370
Sealing Putty	31093
Whipping Thread	33625
20 swg Tinned Copper Binding Wire	32176
16 swg Tinned Copper Binding Wire	32174
Paraffin Wax (1kg bag)	39009
Emery Cloth Grade 2 (Naylor's)	31997
150 Grit Aluminium Oxide Cloth	36970
320 Grit Aluminium Oxide Cloth	36971
400 Grit Aluminium Oxide Cloth	36972
Copaslip Paste	37244
Kevlar String	36499
Cable Marker tiles	35369
Cable marker tiles pegs	42137

4.17 CLEANING/DEGREASING ITEMS

De-solvit 1000	(5 litres)	31955
De-solvit 1000 FD	(1 litre)	31954
Workhorse Dry Wipes	(Box of 152)	32596

APPENDIX A

SUPERSEDED DOCUMENTATION

This Standard Technique document ST:CA3X dated March 2017 is a new document.

APPENDIX B

ASSOCIATED DOCUMENTATION

ST: CA3A, ST: CA3C/2, ST: CA3L/2, ST: CA3M/2, ST: CA3N/2, ST: CA3O, ST: CA3S, ST: CA3V, ST: CA7D.

APPENDIX C

IMPACT ON COMPANY POLICY

Change from heat shrink and cold shrink technology jointing to cold applied jointing technology. All existing 33kV Jointers will require re-training to the cold shrink techniques.

APPENDIX D

IMPLEMENTATION OF POLICY

For WPD staff Team Managers shall ensure that all relevant 33kV Jointing staff are provided with a copy of the current 33kV Jointing Manual of which this Standard Technique forms a major part and it is implemented in South Wales and the South West implemented with immediate effect. Managers shall ensure that all staff involved in the design, installation, maintenance and operation of the 33kV system are familiar with, and follow, the requirements of this document.

Where any difficulty is encountered in the application of this Standard Technique the author shall be notified who will determine whether a variation is appropriate.

APPENDIX E

KEY WORDS

E 5 numbers for 33kV jointing materials.