

Electricity Specification 400D4

Issue 5 March 2024

Plastic Ducts, Conduit & Accessories



Amendment Summary

ISSUE NO. DATE	DESCRIPTION
Issue 4 October 2021	New template applied throughout. Ducting and accessories reviewed and updated. Prepared by: D M Talbot Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, Engineering and Technical Director
Issue 5 March 2024	New template for ES Documents applied Reference to CP410, Chapter 6 for Shallow cables added. Commodity Codes updated for High Strength PVC (1500N) ducts and 200/188mm High Strength (1500N) PVC duct commodity code added Commodity Codes for flexible conduit updated Prepared by: P. Howell Approved by: Policy Approval Panel and signed on its behalf by Paul Turner, PAP Chairperson

1 Contents

1	Contents	3
2	Scope	4
3	Definitions	4
4	General Requirements for Approvals and Testing	5
	4.1 Product not to be Changed	5
	4.2 Electricity North West Limited Technical Approval	5
	4.3 Quality Assurance	5
	4.4 Formulation	5
	4.5 Identification Markings	5
	4.6 Minimum Life Expectancy	5
	4.7 Product Conformity	5
	4.8 Confirmation of Conformance	5
5	Requirements for Type and Routine Testing	5
	5.1 Requirement for Type Tests at Suppliers Premises	5
	5.2 Requirement for Routine Tests at the Supplier's Premises	5
6	Technical Particulars	6
7	Duct Schedules	6
	7.1 ENA TS 12-24 Class 1 Ducts and Accessories	6
	7.2 ENA TS 12-24 Class 2 Ducts and Accessories	9
	7.3 ENA TS 12-24 Class 3 Ducts	9
	7.4 BS EN 61386-1 Very Heavy Impact Conduit and Accessories	10
	7.5 BS EN 61386-23 Flexible Conduit	11
	7.6 End Caps	11
8	Documents Referenced	12
9	Keywords	12
	Appendix A – Detail for Non-Coilable uPVC Ducts to Class 1 / 2	14
	Appendix B – Detail for Class 3 Coilable HDPE Ducts	15
	Appendix C – Conformance Declaration	16

All Rights Reserved

The copyright of this document, which contains information of a proprietary nature, is vested in Electricity North West Limited. The contents of this document may not be used for purposes other than that for which it has been supplied and may not be reproduced, either wholly or in part, in any way whatsoever. It may not be used by, or its contents divulged to, any other person whatsoever without the prior written permission of Electricity North West Limited.

2 Scope

This Specification comprises general requirements for the Approval and testing of plastic ducts used for buried cable installations, plastic conduit for above ground electrical installations and associated accessories employed on the electricity distribution network owned by Electricity North West Limited (Electricity North West).

3 Definitions

Approval	Sanction by the Electricity North West Underground Circuits Policy Manager that specified criteria have been satisfied
Contract	The agreement between Electricity North West and the Contractor for the execution of the Works including therein all documents to which reference may properly be made to ascertain the rights and obligations of the parties under the said agreement.
Contractor	The person or person's firm or company, including personal representatives, successors and permitted assigns, who's Tender has been accepted by Electricity North West.
ENWL	Electricity North West Limited
HDPE	High Density Polyethylene
ID/OD	Inside diameter/Outside diameter
Specification	The Specifications and schedules (if any) agreed by the parties for the purpose of the Contract.
Sub-Contractor	Any person (other than the Contractor) named in the Contract for any part of the Works or any person to whom any part of the Contract has been sub-let with the consent in writing of the Electricity North West Underground Circuits Policy Manager, and the legal representatives, successors and assigns of such person.
Supplier	Any person or person's firm or company who supplies goods to Electricity North West or to its Contractor.
Tender	An offer in writing to execute work or supply goods at a fixed price.
Tenderer	The person or person's firm or company, including personal representatives, successors and permitted assigns, invited by Electricity North West to submit a Tender.
uPVC	Unplasticized polyvinyl chloride A rigid, chemically resistant form of PVC.

4 General Requirements for Approvals and Testing

4.1 Product not to be Changed

Compliance with this clause shall be in accordance with ES001.

4.2 Electricity North West Limited Technical Approval

Compliance with this clause shall be in accordance with ES001.

4.3 Quality Assurance

Compliance with this clause shall be in accordance with ES001.

4.4 Formulation

Compliance with this clause shall be in accordance with ES001.

4.5 Identification Markings

Compliance with this clause shall be in accordance with ES001.

4.6 Minimum Life Expectancy

The minimum life expectancy of all products covered by this Specification is 60 years.

4.7 Product Conformity

Compliance with this clause shall be in accordance with ES001.

4.8 Confirmation of Conformance

The Tenderer shall complete the conformance declaration sheets in [Appendix C](#).

Failure to complete these declaration sheets may result in an unacceptable bid.

5 Requirements for Type and Routine Testing

Compliance with this clause shall be in accordance with ES001.

5.1 Requirement for Type Tests at Suppliers Premises

Compliance with this clause shall be in accordance with ES001.

5.2 Requirement for Routine Tests at the Supplier's Premises

Compliance with this clause shall be in accordance with ES001

6 Technical Particulars

Cable ducts and accessories shall comply with the requirements of the Energy Networks Association Technical Specification (ENA TS) 12-24 and any additional specifications detailed in the Technical Particulars and Schedules.

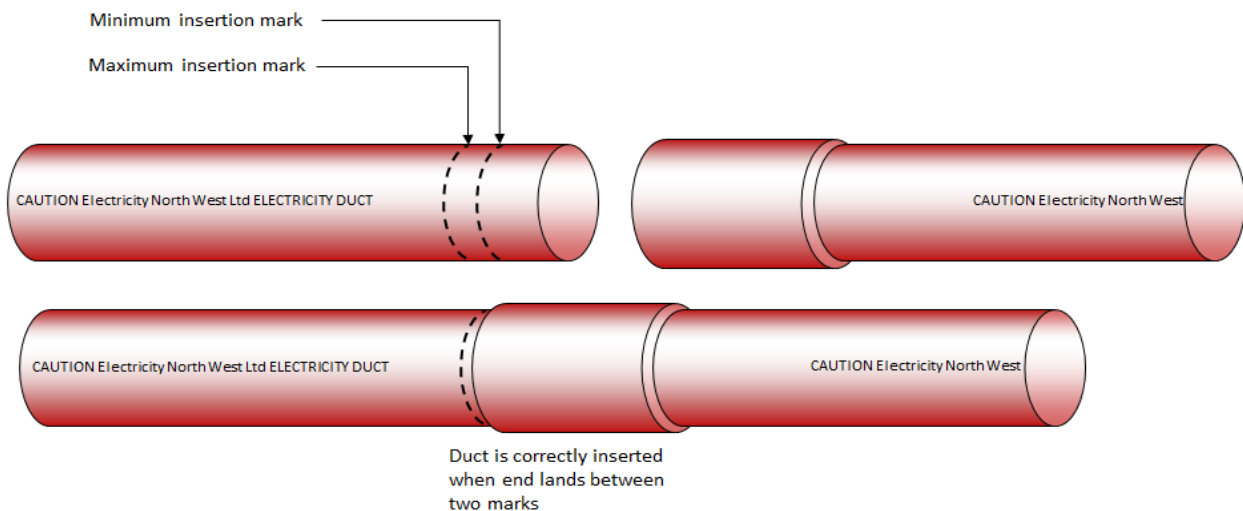
Cable ducts and accessories shall be red unless specified otherwise. Red colour shall be to BS 5252: 04.

The duct shall be marked “CAUTION Electricity North West Ltd ELECTRICITY DUCT” and shall include the Class of duct, the manufacturers name, date of manufacturer and manufacturer's reference number for traceability. The marking shall be laser printed or equivalent agreed with the ENWL Circuits Policy Manager.

The markings shall be on three print lines, 120 degrees apart.

Two parallel dotted lines shall be added to the male end of every duct length which signifying the minimum and maximum point to ensure the duct is correctly inserted into the female end. (The purpose of this line is to ensure correct fitment during installation.)

Mar 24



7 Duct Schedules

7.1 ENA TS 12-24 Class 1 Ducts and Accessories

These ducts and accessories shall meet the requirements of ENA TS 12-24, Class 1 and comply with [Appendix A](#).

Ducting for trenchless cable installations shall be suitable for friction welding.

Bespoke preformed bends may be required from time-to-time. The Supplier shall be required to supply these items on request.

The “high strength” 1500N rated PVC duct is included to replace the use of steel ducts in shallow-laid trenches as specified in ES400E4/ ES400E5 and Chapter 6 of CP410.

Mar 24

Table 1: ENA TS 12-24 Class 1 Ducts

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable duct, non-coilable, uPVC, single socket, red, 103mm internal diameter, 6m length	229619
Cable duct, non-coilable, uPVC, single socket, red, 103mm internal diameter, 3m length	229620
Cable duct, non-coilable, uPVC, single socket, red, 150mm internal diameter, 3m length	229590
Cable duct, non-coilable, uPVC, single socket, red, 150mm internal diameter, 6.6m length	229597
Cable duct, non-coilable, uPVC, single socket, red, 188mm internal diameter, 6m length	229621
Cable duct, non-coilable, uPVC, single socket, red, 188mm internal diameter, 3m length	229622

Table 2: High strength PVC Ducts (1500N rated to ENA TS 12-24)

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable duct, non-coilable, uPVC, HIGH STRENGTH (1500N), red, 100mm internal diameter, 3m length	300321
Cable duct, non-coilable, uPVC, HIGH STRENGTH (1500N), red, 146mm internal diameter, 3m length	300322
Cable duct, non-coilable, uPVC, HIGH STRENGTH (1500N), red, 188mm internal diameter, 3m length	300323

Mar 24

Table 3: ENA TS 12-24 Class 1 Duct Accessories

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable duct accessory, uPVC, coupling (slip), red, 103mm internal diameter duct (bag of 50)	229628
Cable duct accessory, uPVC, coupling (slip), red, 150mm internal diameter duct (bag of 15)	229095
Cable duct accessory, uPVC, coupling (slip), red, 188mm internal diameter duct (bag of 5)	229629
Cable duct accessory, uPVC, preformed bend (single socket end), 11.25°, red, 1200mm bending radius, 150mm internal diameter duct	229490
Cable duct accessory, uPVC, preformed bend (single socket end), 11.25°, red, 1200mm bending radius, 103mm internal diameter duct	229623
Cable duct accessory, uPVC, preformed bend (single socket end), 11.25°, red, 3900mm bending radius, 188mm internal diameter duct	229626
Cable duct accessory, uPVC, preformed bend (single socket end), 11.25°, red, 3900mm bending radius, 150mm internal diameter duct	229515
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 1200mm bending radius, 150mm internal diameter duct	229550
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 1200mm bending radius, 103mm internal diameter duct	229618
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 3900mm bending radius, 188mm internal diameter duct	229627
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 3900mm bending radius, 150mm internal diameter duct	229516
Cable duct accessory, uPVC, preformed bend (single socket end), 45°, red, 1200mm bending radius, 150mm internal diameter duct	229560
Cable duct accessory, uPVC, preformed bend (single socket end), 45°, red, 1200mm bending radius, 103mm internal diameter duct	229624
Cable duct accessory, uPVC, preformed bend (single socket end), 90°, red, 1200mm bending radius, 150mm internal diameter duct	229570
Cable duct accessory, uPVC, preformed bend (single socket end), 90°, red, 1200mm bending radius, 103mm internal diameter duct	229625

7.2 ENA TS 12-24 Class 2 Ducts and Accessories

Ducts shall meet the requirements of ENA TS 12-24 and shall comply with [Appendix A](#). The hockey stick is detailed in drawing I-400D4-GA-001.

Table 4: ENA TS 12-24 Class 2 Ducts & Accessories

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable duct, non-coilable, uPVC, single socket, red, 38/32mm (OD/ID), 2m length	229586
Cable duct accessory, uPVC, coupling (slip), red, 32mm internal diameter duct	229091
Cable duct accessory, uPVC, hockey stick, 2-part, red & white, 400mm bending radius, 32mm internal diameter duct (Dwg I-400D4-GA-001)	229512
Cable duct accessory, uPVC, preformed bend (single socket end), 22.5°, red, 400mm bending radius, 32mm internal diameter duct	229482
Cable duct accessory, uPVC, preformed bend (single socket end), 45°, red, 400mm bending radius, 32mm internal diameter duct	229474
Cable duct accessory, uPVC, preformed bend (single socket end), 90°, red, 400mm bending radius, 32mm internal diameter duct	229466
Cable duct accessory, uPVC, saddle (with 8mm fixing holes), white, 32mm internal diameter duct	229504

7.3 ENA TS 12-24 Class 3 Ducts

These ducts shall meet the requirements of ENA TS 12-24, Class 3. They shall comply with [Appendix B](#).

Table 5: ENA TS 12-24 Class 3 Ducts

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable duct, coilable, HDPE, red, 38/32mm (OD/ID), 50m length	234966
Cable duct, coilable, HDPE, red, 63/52mm (OD/ID), 50m length	229580

Mar 24

7.4 BS EN 61386-1 Very Heavy Impact Conduit and Accessories

Very heavy impact conduit and accessories shall meet the requirements of BS EN 61386-1.

Saddles shall be black “flat type”.

Table 6: BS EN 61386-1 Very Heavy Impact Conduit

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable conduit, PVC, very heavy impact, black, 25/20mm, 3m length	229720
Cable conduit, PVC, very heavy impact, black, 32/27mm, 3m length	229721

Table 7: BS EN 61386-1 Very Heavy Impact Conduit Accessories

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable conduit accessory, uPVC, coupling, black, 25mm OD conduit	229726
Cable conduit accessory, uPVC, coupling, black, 32mm OD conduit	229727
Cable conduit accessory, uPVC, saddle, black, 25mm OD conduit	229728
Cable conduit accessory, uPVC, saddle, black, 32mm OD conduit	229729
Cable conduit accessory, uPVC, 90°, black, 150mm bending radius, 25mm OD conduit with 2 Black Couplings	229724
Cable conduit accessory, uPVC, 90°, black, 200mm bending radius, 25mm OD conduit with 2 Black Couplings	229725

7.5 BS EN 61386-23 Flexible Conduit

This flexible conduit and accessories shall meet the requirements of BS EN 61386-23. (Note that BS EN 61386-23 needs to be read in conjunction with BS EN 61386-1).

Table 8: BS EN 61386-23 Flexible Conduit

APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable duct, flexible conduit, black, 25mm/20mm, 10m length	300334
Cable duct, flexible conduit, black, 32mm/27mm, 10m length	300335

Mar 24

7.6 End Caps

Table 9: Other Accessories

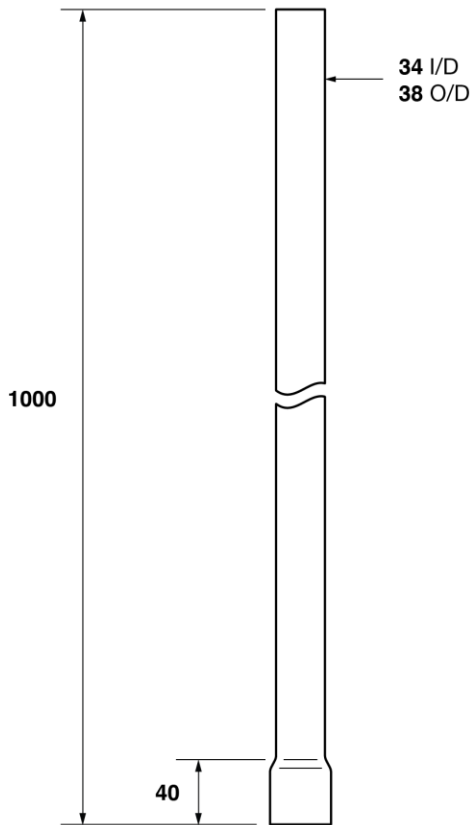
APPROVED DESCRIPTION (FOR PURCHASING AND PRODUCT LABELLING)	ENWL COMMODITY CODE
Cable duct accessory, uPVC, Spigot end cap, red, 103mm internal diameter	229616
Cable duct accessory, uPVC, Spigot end cap, red, 150mm internal diameter	229615
Cable duct accessory, uPVC, Spigot end cap, red, 188mm internal diameter	229650
Cable duct accessory, Cable Lube	229699

8 Documents Referenced

DOCUMENTS REFERENCED	
Health and Safety at Work Act 1974	
Control of Substances Hazardous to Health Regulations 2002	
Manual Handling Operations Regulations 1992	
BS EN ISO 9000:	Quality management systems.
BS EN ISO 14001:	Environmental management systems. Requirements with guidance for use.
BS EN 61386:	Specification for conduit systems for cable management.
BS 5252:	Framework for colour co-ordination for building purposes.
ENA TS 12-24:	Plastic Ducts for Buried Electric Cables.
CP311	ENWL Equipment Approval Policy and Process
ES001	ENWL Main Specifications

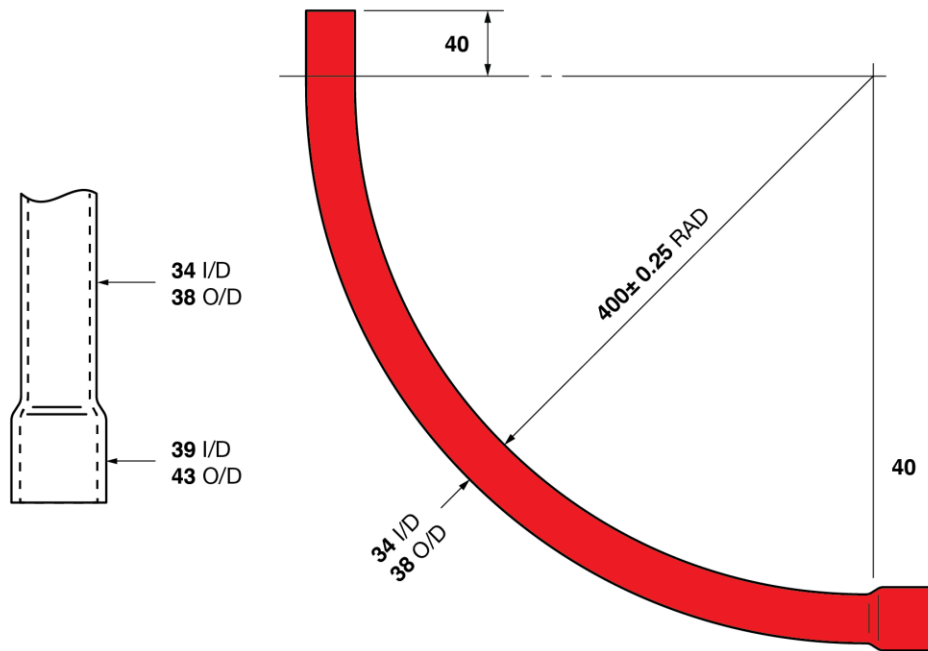
9 Keywords

Cable; duct; service



NOTES

1. COLOURS AND MARKINGS SHALL BE AS SPECIFIED IN ES400D4
2. SOCKET TAPERED TO GIVE ENGAGEMENT BETWEEN 1/3 AND 2/3 OF THE LENGTH
3. COLOUR OF THE BEND TO BE RED AND THE STRAIGHT SECTION TO BE WHITE



COMMODITY CODE 299512

CABLE DUCT ACCESSORY
uPVC, HOCKEY STICK,
2-PART, RED & WHITE, FOR 32mm
INTERNAL DIAMETER DUCT

Scale:
nts

Appendix A – Detail for Non-Coilable uPVC Ducts to Class 1 / 2

A1 Duct Internal Diameter (Mean)

32mm ducting = 32.0mm – 32.5mm.

100mm ducting = 100.0mm – 100.5mm

103mm ducting = 103.0mm – 103.5mm.

146mm ducting = 146.0mm – 146.5mm.

150mm ducting = 150.0mm – 150.5mm.

188mm ducting = 188.0mm – 188.5mm.

A2 uPVC Quality

100% Virgin Material.

A3 Duct Colour: Outside Minimum Thickness

1mm.

A4 Duct Wall Thickness Requirements

Minimum wall thickness of 3.8mm required for cable pulling.

A5 Duct End – Spigot End

Spigot: plain end shall be bevelled to allow easy jointing of duct on site. Minimum thickness of plain end shall be 1.3mm. Bevel length shall be ≥ 5 mm.

A6 Push-In Marker on Plain Pipe End

Two circumferential marks are required to indicate the correct push-in distance for duct jointing for spigot and socket joints. Position to suit the socket lengths below.

A7 Duct End – Socket End

Push-type fit: 3.4mm minimum wall thickness; 110/160/200mm - 116mm socket length.

A8 Eccentricity of Socket Relative to Duct

Less than 1mm eccentricity and less than 1° angle between the centre line of the socket and the longitudinal axis of the duct – to avoid ripping of cable sheath during cable pulling.

A9 Duct Inner Surface

The duct shall have a smooth, low-friction surface completely free of ripples, sharp edges and protrusions. The friction coefficient shall be <0.28 .

A10 End Caps

A bag of 15 lightweight end caps for the ducts shall be supplied with each bale of ducts. The end caps shall be capable of fitting each duct end (i.e. inside of socket and outside of plain end).

A11 Preformed Bends for Duct

The material shall be same as the duct section. Minimum wall-thickness – 3.8mm.

Mar 24

Appendix B – Detail for Class 3 Coilable HDPE Ducts

B1 Duct Internal Diameter (Mean)

32mm ducting = 32.0mm – 32.5mm.

B3 Duct Colour: Outside Minimum Thickness

1mm.

B4 Eccentricity of Socket Relative to Duct

Less than 1mm eccentricity and less than 1° angle.

B5 Duct Inner Surface

The duct shall have a smooth, low-friction surface completely free of ripples, sharp edges and protrusions.

B6 Couplers

Slip or rubber gasket type with no internal obstructions/sharp edges. A centring ridge is required which does not protrude.

Appendix C – Conformance Declaration

SECTION-BY-SECTION CONFORMANCE WITH SPECIFICATION

The Tenderer shall declare conformance or otherwise for each product/service or range of products/services, section-by-section, using the following Conformance Declaration Codes.

Conformance Declaration Codes:

N/A =	Clause is not applicable/appropriate to the product/service.
C1 =	The product/service conforms fully with the requirements of this clause.
C2 =	The product/service conforms partially with the requirements of this clause.
C3 =	The product/service does not conform to the requirements of this clause.
C4 =	The product/service does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform.

Manufacturer:

Product/Service Description:

Product/Service Reference:

Name:

Company:

Signature:

SECTION-BY-SECTION CONFORMANCE

Section	Section Topic	Conformance Declaration Code	Remarks * (must be completed if code is not C1)
3.1	Product not to be Changed		
3.2	Electricity North West Technical Approval		
3.3	Quality Assurance		
3.4	Formulation		
3.5	Identification Markings		
3.6	Minimum Life Expectancy		
3.7	Product Conformity		
3.8	Confirmation of Conformance		
4.1	Requirements for Type Tests at the Supplier's Premises		
4.2	Requirement for Routine Tests at the Supplier's Premises		
5.	Technical Particulars		
6.1	ENA TS 12-24 Class 1 Ducts and Accessories		
6.2	ENA TS 12-24 Class 2 Ducts and Accessories		
6.3	ENA TS 12-24 Class 3 Ducts and Accessories		

6.4	BS EN 61386-1 Very Heavy Impact Conduit and Accessories		
6.5	BS EN 61386-23 Flexible Conduit		
6.6	End Caps		

* Applicable specifications shall be stated in the Remarks column where alternatives are quoted within a section. The Remarks column shall also be used to indicate cases where the products or services exceed the quoted specifications.

Additional Notes: