SLOVENSKI STANDARD
oSIST prEN 50626-2:2020

01-september-2020

Podzemni kanalski sistem za zaščito in upravljanje izoliranih električnih ali komunikacijskih kablov - 2. del: Posebne zahteve za kanale za posebno uporabo

Conduit systems buried underground for the protection and management of insulated electrical cables or communication cables - Part 2: Particular requirements for conduits for special applications

Erdverlegte Elektroinstallationsrohrsysteme für den Schutz und die Führung isolierter elektrischer Kabel oder Fernmeldekabel – Teil 2: Besondere Anforderungen für Elektroinstallationsrohre für Sonderanwendungen

Systèmes de conduits enterrés dans le sol pour la protection et la gestion des câbles électriques isolés ou des câbles de communication - Partie 2: Exigences particulières pour conduits destinés aux applications spéciales

Ta slovenski standard je istoveten z: **prEN 50626-2**

ICS:

29.120.10	Inštalacijske cevi za električne namene	Conduits for electrical purposes

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English Version

Conduit systems buried underground for the protection and management of insulated electrical cables or communication cables - Part 2: Polyethylene (PE), Polypropylene (PP) or Unplasticized poly(vinyl chloride) (PVC-U) conduit systems - Requirements for solid wall conduits, fittings and the system used in special applications

Systèmes de conduits enterrés dans le sol pour la protection et la gestion des câbles électriques isolés ou des câbles de communication - Partie 2: Exigences particulières pour conduits destinés aux applications spéciales

Erdverlegte Elektroinstallationsrohrsysteme für den Schutz und die Führung isolierter elektrischer Kabel oder Fernmeldekabel - Teil 2: Besondere Anforderungen für Elektroinstallationsrohre für Sonderanwendungen

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2020-09-17.

It has been drawn up by CLC/TC 213.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Contents

Page

European foreword

This document (prEN 50626-2:2020) has been prepared by CLC/TC 213, “Cable management systems”.

This document is currently submitted to the second Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dor + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dor + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

Introduction

CENELEC TC 213 is responsible for the development of the EN 50626 series, which consists of two separate parts, each covering different products/applications.

This document covers requirements and tests for conduit systems buried underground for the protection and management of insulated conductors and/or power cables or communication cables having a specified performance time and which are leak-tight solid wall conduit systems and manufactured in PE, PP and PVC-U.

prEN 50626-1 covers requirements and tests for conduit systems buried underground for the protection and management of insulated conductors and/or power cables or communication cables.

For on-site storage, use CEN/TR 1046 as a guidance.

A conduit system buried underground that conforms to this document is deemed to be safe for use.

This is a European Standard for cable management products used for electro-technical purposes. It relates to the Council Directives on the approximation of laws, regulations and administrative provisions of the Member States relating to Low Voltage Directive 2014/35/EU through consideration of the essential requirements of this directive.

This document is supported by separate standards to which references are made.

1 Scope

This document specifies requirements and tests for PE, PP and PVC-U leak-tight solid wall conduit systems with circular cross section, manufactured individually or as part of an assembly having a specified performance time and buried underground to a maximum depth of 6 m for the protection and management of insulated conductors and/or power cables or communication cables.

Applications that require leak-tight solid wall conduit systems are:

— installation of cables in conduits by blowing;

— installation of cables in conduits by floating;

— trenchless installation of conduits.

This document is applicable to conduits with or without integral socket and fittings.

NOTE 1 Conduits in which cables are installed by blowing or floating can also be installed by conventional methods.

NOTE 2 Installation of cables can also be done by pulling and pushing.

NOTE 3 Within a thermoplastic conduit system, fittings made of other materials can be used but they are not specified in this document.

NOTE 4 It is the responsibility of the purchaser or specifier to take into account any relevant national regulations and installation practices or codes when selecting the products to be installed, based on the characteristics specified in this document.

NOTE 5 Microducts are covered by the relevant part of the EN 60794 series.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 681-1:1996,[1] *Elastomeric seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 1: Vulcanized rubber*

EN 681-2:2000,[2] *Elastomeric Seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 2: Thermoplastic elastomers*

EN 1905:1998, *Plastics piping systems - Unplasticized poly(vinyl chloride) (PVC-U) pipes, fittings and material - Method for assessment of the PVC content based on total chlorine content*

EN 12099:1997, *Plastics piping systems - Polyethylene piping materials and components - Determination of volatile content*

prEN 50626-1:2020, *Conduit systems buried underground for the protection and management of insulated electrical cables or communication cables - Part 1: General requirements*

CEN/TR 1046:2013, *Thermoplastics piping and ducting systems - Systems outside building structures for the conveyance of water or sewage - Practices for underground installation*

[1] A impacted by EN 681-1:1996/A1:1998, EN 681-1:1996/A2:2002 and EN 681-1:1996/A3:2005.

[2] As impacted by EN 681-2:2000/A1:2002 and EN 681-2:2000/A2:2005.

EN ISO 472:2001, *Plastics - Vocabulary (ISO 472:1999)*

EN ISO 580:2005, *Plastics piping and ducting systems - Injection-moulded thermoplastics fittings - Methods for visually assessing the effects of heating (ISO 580:2005)*

EN ISO 1043-1:2011,[3] *Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics (ISO 1043-1:2001)*

EN ISO 1133-1:2011, *Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 1: Standard method (ISO 1133-1:2011)*

EN ISO 1167-1:2006, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 1: General method (ISO 1167-1:2006)*

EN ISO 1167-2:2006, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 2: Preparation of pipe test pieces (ISO 1167-2:2006)*

EN ISO 1183-1:2019, *Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2019)*

EN ISO 1183-2:2019, *Plastics - Methods for determining the density of non-cellular plastics - Part 2: Density gradient column method (ISO 1183-2:2019)*

EN ISO 2505:2005, *Thermoplastics pipes - Longitudinal reversion - Test method and parameters (ISO 2505:2005)*

EN ISO 2507-1:2017, *Thermoplastics pipes and fittings - Vicat softening temperature - Part 1: General test method (ISO 2507-1:1995)*

EN ISO 3126:2005, *Plastics piping systems - Plastics components - Determination of dimensions (ISO 3126:2005)*

EN ISO 3451-1:2019, *Plastics - Determination of ash - Part 1: General methods (ISO 3451-1:2019)*

EN ISO 3451-5:2002, *Plastics - Determination of ash - Part 5: Poly(vinyl chloride) (ISO 3451-5:2002)*

EN ISO 6259-1:2015, *Thermoplastics pipes - Determination of tensile properties - Part 1: General test method (ISO 6259-1:2015)*

EN ISO 9852:2017, *Unplasticized poly(vinyl chloride) (PVC-U) pipes - Dichloromethane resistance at specified temperature (DCMT) - Test method (ISO 9852:2007)*

EN ISO 9969:2016, *Thermoplastics pipes - Determination of ring stiffness (ISO 9969:2016)*

EN ISO 11357-6:2018, *Plastics - Differential scanning calorimetry (DSC) - Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT) (ISO 11357-6:2018)*

EN ISO 13259:2018, *Thermoplastics piping systems for underground non-pressure applications - Test method for leaktightness of elastomeric sealing ring type joints (ISO 13259:2018)*

ISO 3127:1994, *Thermoplastics pipes - Determination of resistance to external blows - Round-the-clock method*

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[3] As impacted by EN ISO 1043-1:2011/A1:2016.

ISO 6259-2:1997, *Thermoplastics pipes - Determination of tensile properties - Part 2: Pipes made of unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly (vinyl chloride) (PVC-C) and high-impact poly (vinyl chloride) (PVC-HI)*

ISO 18373-1:2007, *Rigid PVC pipes - Differential scanning calorimetry (DSC) method - Part 1: Measurement of the processing temperature*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 472:2001 and EN ISO 1043-1:2011[3] and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
performance time
predicted service time of the installed conduit

Note 1 to entry: The service time considers continuous external loads and occasional internal loads. Both types of loads are to be considered when the predicted service time is declared

3.2
solid wall conduit
conduit with smooth external surface and where the internal surface may be smooth or with internal longitudinal grooves

3.3
non-virgin material
own or external reprocessed material or recycled material

3.4
own reprocessed material
material prepared from rejected unused conduits and conduit fittings, including trimmings from the production, that will be reprocessed in a manufacturer's plant after having been previously processed by the same manufacturer by a process such as moulding or extrusion and for which the complete formulation is known

3.5
external reprocessed material
material prepared from unused thermoplastics products regardless of where those products were manufactured

3.6
recycled material
material prepared from used thermoplastic products which have been cleaned and crushed or ground

3.7
agreed specification
specification of the relevant material characteristics agreed between the supplier of the non-virgin material and the conduits and/or conduit fittings manufacturer

4 Symbols and abbreviations

4.1 Symbols

A_{min}	minimum length of engagement
d_{em}	mean outside diameter
d_n	nominal outside diameter
d_{sm}	mean inside diameter of a socket
e_{min}	minimum wall thickness
e_2	wall thickness of a socket
e_3	wall thickness in the groove area
L_{1min}	length of spigot

4.2 Abbreviations

DN	nominal size
DN/OD	nominal size, outside diameter related
OIT	oxidation induction time
PE	polyethylene
PP	polypropylene
PVC-U	unplasticized poly(vinyl chloride)
SDR	standard dimension ratio
SN	nominal ring stiffness
TIR	true impact rate

5 Material

5.1 Unplasticized poly(vinyl chloride) (PVC-U)

The material shall be a mixture of PVC-U to which are added additives, and if applicable non-virgin material, that shall allow the final product to comply with the requirements of this document.

When tested in accordance with the test methods as specified in Table 1 using the indicated parameters, the formulation shall have characteristics conforming to the requirements given in Table 1, for the chosen performance time 25, 50 or 100 years.

NOTE If the 100 year test is passed, the requirements for 25 and 50 year are deemed to be fulfilled.

Table 1 — Formulation characteristics of PVC-U conduits

Characteristic	Requirements	Test parameters		Test method
Resistance to internal pressure for performance time minimum 25 year	No failure during the test period	End caps	Type A or Type B	EN ISO 1167-1:2006 and EN ISO 1167-2:2006
		Orientation	Free	
		Number of test pieces	3	
		Test temperature	60 °C	
		Circumferential stress	2,0 MPa	

Characteristic	Requirements	Test parameters		Test method
		Conditioning period	Shall conform to EN ISO 1167-1:2006	
		Type of test	Water-in-water	
		Test period	165 h	
Vicat (VST) for performance time minimum 25 year	≥ 76 °C			EN ISO 2507-1:2017
Resistance to internal pressure for performance time minimum 50 year	No failure during the test period	End caps	Type A or Type B	EN ISO 1167-1:2006 and EN ISO 1167-2:2006
		Orientation	Free	
		Number of test pieces	3	
		Test temperature	60 °C	
		Circumferential stress	8,0 MPa	
		Conditioning period	Shall conform to EN ISO 1167-1:2006	
		Type of test	Water-in-water	
		Test period	165 h	
Vicat (VST) for performance time minimum 50 year	≥ 79 °C			EN ISO 2507-1:2017
Resistance to internal pressure for performance time minimum 100 year	No failure during the test period	End caps	Type A or Type B	EN ISO 1167-1:2006 and EN ISO 1167-2:2006
		Orientation	Free	
		Number of test pieces	3	
		Test temperature	60 °C	
		Circumferential stress	10 MPa	
		Conditioning period	Shall conform to EN ISO 1167-1:2006	
		Type of test	Water-in-water	
		Test period	1000 h	
Vicat (VST) for performance time minimum 100 year	≥ 79 °C			EN ISO 2507-1:2017

5.2 Polypropylene (PP)

The material shall be a mixture of PP to which are added additives, and if applicable non-virgin material, that shall allow the final product to comply with the requirements of this document.

When tested in accordance with the test methods as specified in Table 2 using the indicated parameters, the compound shall have characteristics conforming to the requirements given in Table 2, for the chosen performance time 25, 50 or 100 years.

NOTE If the 100 year test is passed, the requirements for 25 and 50 year are deemed to be fulfilled.

Table 2 — Compound characteristics of PP conduits

Characteristic	Requirements	Test parameters		Test method
Resistance to internal pressure performance time minimum 25 year	No failure during the test period	End caps	Type A or Type B	EN ISO 1167-1:2006 and EN ISO 1167-2:2006
		Test temperature	80 °C	
		Orientation	Free	
		Number of test pieces	3	
		Circumferential stress	1,0 MPa	
		Conditioning period	Shall conform to EN ISO 1167-1:2006	
		Type of test	Water-in-water	
		Test period	140 h	
Melt mass-flow rate performance time minimum 25 year	≤ 2,5 g/10 min	Temperature Loading mass	230 °C 2,16 kg	EN ISO 1133-1:2011
Resistance to internal pressure performance time minimum 50 year	No failure during the test period	End caps	Type A or Type B	EN ISO 1167-1:2006 and EN ISO 1167-2:2006
		Test temperature	80 °C	
		Orientation	Free	
		Number of test pieces	3	
		Circumferential stress	3,7 MPa	
		Conditioning period	Shall conform to EN ISO 1167-1:2006	
		Type of test	Water-in-water	
		Test period	165 h	
Melt mass-flow rate performance time minimum 50 year	≤ 1,5 g/10 min	Temperature Loading mass	230 °C 2,16 kg	EN ISO 1133-1:2011
Resistance to internal pressure performance time minimum 100 year	No failure during the test period	End caps Test temperature Orientation Number of test pieces Circumferential stress Conditioning period Type of test Test period	Type A or Type B 95 °C Free 3 2,5 MPa Shall conform to EN ISO 1167-1:2006 Water-in-water 1000 h	EN ISO 1167-1:2006 and EN ISO 1167-2:2006
Melt mass-flow rate performance time minimum 100 year	≤ 1,5 g/10 min	Temperature Loading mass	230 °C 2,16 kg	EN ISO 1133-1:2011
Thermal stability, OIT	≥ 8 min	Temperature	200 °C	EN ISO 11357-6:2018