SLOVENSKI STANDARD
SIST EN 50290-2-23:2014

01-januar-2014

Komunikacijski kabli - 2-23. del: Skupna pravila načrtovanja in konstrukcija - Izolacija PE

Communication cables - Part 2-23: Common design rules and construction - PE insulation

Kommunikationskabel - Teil 2-23: Gemeinsame Regeln für Entwicklung und Konstruktion - PE-Isoliermischungen

Câbles de communication - Partie 2-23: Règles de conception communes et construction - Polyéthylène pour enveloppes isolantes

Ta slovenski standard je istoveten z: **EN 50290-2-23:2013**

ICS:

29.035.20	Plastični in gumeni izolacijski materiali	Plastics and rubber insulating materials
33.120.10	Koaksialni kabli. Valovodi	Coaxial cables. Waveguides

SIST EN 50290-2-23:2014 **en**

EUROPEAN STANDARD

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EN 50290-2-23

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English version

Communication cables - Part 2-23: Common design rules and construction - Polyethylene insulation for multi-pair cables used in access telecommunication networks: Outdoor cables

Câbles de communication - Partie 2-23: Règles de conception communes et construction - Polyéthylène pour enveloppes isolantes

Kommunikationskabel - Teil 2-23: Gemeinsame Regeln für Entwicklung und Konstruktion – Polyethylen-Isoliermischungen für vielpaarige Kabel in Telekommunikationsnetzwerken: Außenkabel

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CENELEC

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Contents

Foreword

This document (EN 50290-2-23:2013) has prepared by CLC/TC 46X "Communication cables".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2014-09-16
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2016-09-16

This document supersedes EN 50290-2-23:2001.

EN 50290-2-23:2013 includes the following significant technical changes with respect to EN 50290-2-23:2001:

– The document has been entirely restructured.

– The main change is the introduction of the new Table 1 for the test to be performed on granules.

This document should be read in conjunction with Part 2-20 of EN 50290, the product standard EN 50407 (all parts) and other applicable product standards.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

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).

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

EN 50290-2, *Communication cables*, is divided into the following sub-parts:

– *Part 2-1: Common design rules and construction*;

– *Part 2-2: Common design rules and construction — Polyethylene insulation for multi element metallic data cables for indoor application* [currently at Enquiry stage];

– *Part 2-3: Common design rules and construction — Polyethylene insulation for coaxial cables* [currently at Enquiry stage];

– *Part 2-4: Common design rules and construction — Polypropylene insulation for coaxial cables* [currently at Enquiry stage];

– *Part 2-20: Common design rules and construction — General*;

– *Part 2-21: Common design rules and construction — PVC insulation compounds*;

– *Part 2-22: Common design rules and construction — PVC sheathing compounds*;

– *Part 2-23: Common design rules and construction — PE insulation* [the present document];

– *Part 2-24: Common design rules and construction — PE sheathing*;

– *Part 2-25: Common design rules and construction — Polypropylene insulation for compounds*;

– *Part 2-26: Common design rules and construction — Halogen free flame retardant insulation compounds*;

– *Part 2-27: Common design rules and construction — Halogen free flame retardant thermoplastic sheathing compounds*;

– *Part 2-28: Common design rules and construction — Filling compounds for filled cables*;

– *Part 2-29: Common design rules and construction — Cross-linked PE insulation compounds*;

– *Part 2-30: Common design rules and construction — Poly(tetrafluoroethylene-hexafluoropropylene) (FEP) insulation and sheathing*;

– *Part 2-32: Common design rules and construction — Halogen free insulation compounds for flame retardant and fire resistant cables* [currently at Enquiry stage].

1 Scope

This European Standard gives specific requirements for PE compounds to be used for the insulation of telephone wire for external plant.

Using raw material and type test data as outlined in this standard, the raw material supplier will have sufficient data to demonstrate compliance and warrant that the material is suitable for the specified application.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50290-2-20, *Communication cables — Part 2-20: Common design rules and construction — General*

EN 60216 (all parts), *Electrical insulating materials — Thermal endurance properties (IEC 60216, all parts)*

EN 60811-401, *Electric and optical fibre cables — Test methods for non-metallic materials — Part 401: Miscellaneous tests — Thermal ageing methods — Ageing in an air oven (IEC 60811-401)*

EN 60811-407, *Electric and optical fibre cables — Test methods for non-metallic materials — Part 407: Miscellaneous tests — Measurement of mass increase of polyethylene and polypropylene compounds (IEC 60811-407)*

EN 60811-408, *Electric and optical fibre cables — Test methods for non-metallic materials — Part 408: Miscellaneous tests — Long-term stability test of polyethylene and polypropylene compounds (IEC 60811-408)*

EN 60811-501, *Electric and optical fibre cables — Test methods for non-metallic materials — Part 501: Mechanical tests — Tests for determining the mechanical properties of insulating and sheathing compounds (IEC 60811-501)*

EN 60811-502, *Electric and optical fibre cables — Test methods for non-metallic materials — Part 502: Mechanical tests — Shrinkage test for insulations (IEC 60811-502)*

EN 60811-510, *Electric and optical fibre cables — Test methods for non-metallic materials — Part 510: Mechanical tests — Methods specific to polyethylene and polypropylene compounds — Wrapping test after thermal ageing in air (IEC 60811-510)*

EN 60811-512, *Electric and optical fibre cables — Test methods for non-metallic materials — Part 512: Mechanical tests — Methods specific to polyethylene and polypropylene compounds — Tensile strength and elongation at break after conditioning at elevated temperature (IEC 60811-512)*

EN 60811-513, *Electric and optical fibre cables — Test methods for non-metallic materials — Part 513: Mechanical tests — Methods specific to polyethylene and polypropylene compounds — Wrapping test after conditioning (IEC 60811-513)*

EN ISO 527-1:2012, *Plastics — Determination of tensile properties — Part 1: General principles (ISO 527-1:2012)*

EN ISO 527-2:2012, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:2012)*

EN ISO 527-3:1995, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets (ISO 527-3:1995)*

EN ISO 527-4:1997, *Plastics — Determination of tensile properties — Part 4: Test conditions for isotropic and orthotopic fibre-reinforced plastic composites (ISO 527-4:1997)*

EN ISO 527-5:2009, *Plastics — Determination of tensile properties — Part 5: Test conditions for unidirectional fibre-reinforced plastic composites (ISO 527-5:2009)*

EN ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868)*

EN ISO 1133 (all parts), *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics (ISO 1133, all parts)*

EN ISO 1183 (all parts), *Plastics — Methods for determining the density of non-cellular plastics (ISO 1183, all parts)*

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

ISO 974, *Plastics — Determination of the brittleness temperature by impact*

3 Compound test requirements

The tests are to be carried out on granules or moulded plaques produced from granules of compound. This data shall be provided by the compound supplier. For compounds intended for foam application the properties shall be measured on unexpanded material. Relevant test methods, requirements and limits shall be included in any supply specification of the compound.

Specific requirements are shown in Table 1. In the case of special applications, additional requirements could be specified.

4 Cable test requirements

The anticipated performance assumes standard cable design and conventional process technology and is specified (Table 2). Using type test data the compound supplier is expected to demonstrate compliance and warrant that the material is suitable for the specified application.

In the case of special applications, additional requirements could be specified.

5 Health, Safety and Environmental Regulations

The compounds are subject to Health, Safety and Environmental requirements as defined in EN 50290-2-20. Any deviations or compliance failures shall be identified by the compound supplier.

Table 1 — Insulation compounds — Physical properties of granules

Characteristics[a]		Test method	Unit	Solid		Foam		
				LD/MD	HD	A	B	C[d]
1	Density[b]	EN ISO 1183 (all parts)	g/cm^3	≤ 0,940	>0,940	to be recorded	to be recorded	to be recorded
2a	Melt flow index[c] (190 °C/2,16 kg)	EN ISO 1133 (all parts)	g/10 min	≤ 0,5 ≤ 2,5[e]	≤ 1,0	n/a	n/a	n/a
2b	Melt flow index[c] (140 °C/5,0 kg)	EN ISO 1133 (all parts)	g/10 min	n/a	n/a	to be recorded	to be recorded	to be recorded
3	Hardness Shore D (1 s)	EN ISO 868	[-]	>50	>58	>50	>58	>58
4	Low Temperature brittleness	ISO 974	°C	< -76	< -76	< -76	< -76	< -76
5	Mechanical characteristics	EN ISO 527 (all parts)						
5.1	Tensile strength- median, min.		MPa	12	18	12	15	18
5.2	Elongation at break- median, min.		%	300	300	300	300	300
6	Oxidative Induction Time (200 °C)[f]	EN ISO 11357-6	min	>50	>50	>50	>50	>50
7	Measurement of mass increase[g] max.	EN 60811-407	%	8	6	6	6	6

[a] All values of Table 1 shall be provided by the compound supplier; see Clause 3.
[b] Tolerance for the nominal value of a specific compound is +/- 0,003 g/cm³.
[c] Tolerance for the nominal value of a specific compound is +/- 25%.
[d] For Foam-Skin application.
[e] For LLDPE or LMDPE.
[f] Alternatively, the test may be carried out on granules in presence of a piece of copper conductor with typical minimum value of 30 min.
[g] To be measured on a sample cut from a pressed plaque of 0,5 mm. Test specimen according to EN ISO 527-1:2012, Clause 5, EN ISO 527-2:2012, Clause 5, EN ISO 527-3:1995, Clause 5, EN ISO 527-4:1997, Clause 5 and EN ISO 527-5:2009, Clause 5, is a convenient sample format.