SLOVENSKI STANDARD
SIST EN 50290-2-23:2002

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

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 50290-2-23:2001**

ICS:

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

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ICS 29.035.20; 33.120.10 Supersedes HD 624.3 S1:1994 + A2:1994

English version

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

This European Standard was prepared by a joint working group of the Technical Committees CENELEC TC 46X, Communication cables, and CENELEC TC 86A, Optical fibres and optical fibre cables.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50290-2-23 on 2001-05-01.

This European Standard supersedes HD 624.3 S1:1994 + A2:1994.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-04-01

This European Standard has been prepared under the European Mandate M/212 given to CENELEC by the European Commission and the European Free Trade Association.

1 Scope

This Part 2-23 of EN 50290 gives specific requirements for PE insulated compounds used for communication cables.

It is to be read in conjunction with Part 2-20 of EN 50290.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 60811-1-1:1995 Insulating and sheathing materials of electric and optical cables - Common test methods -- Part 1-1: General application - Measurement of thickness and overall dimensions - Tests for determining the mechanical properties (IEC 60811-1-1:1993)

EN 60811-1-2:1995 Insulating and sheathing materials of electric cables - Common test methods Part 1-2: General application -- Thermal ageing methods (IEC 60811-1-2:1985 + corr. May 1986 + A1:1989)

EN 60811-1-3:1995 Insulating and sheathing materials of electric and optical cables - Common test methods -- Part 1-3: General application - Methods for determining the density - Water absorption tests - Shrinkage test (IEC 60811-1-3:1993)

EN 60811-4-1:1995 Insulating and sheathing materials of electric cables - Common test methods -- Part 4: Methods specific to polyethylene and polypropylene compounds -- Section 1: Resistance to environmental stress cracking - Wrapping test after thermal ageing in air - Measurement of the melt flow index - Carbon black and/or mineral content measurement in PE (IEC 60811-4-1:1985 + corr. May 1986 + A2:1993)

EN 60811-4-2:1999 Insulating and sheathing materials of electric and optical fibre cables - Common test methods -- Part 4: Methods specific to polyethylene and polypropylene compounds -- Section 2: Tensile strength and elongation at break after pre-conditioning - Wrapping test after thermal ageing in air - Measurement of mass increase - Long-term stability test - Test method for copper-catalysed oxidative degradation (IEC 60811-4-2:1990, modified)

3 Requirement

In case of specific applications, additional performances could be needed. Relevant test methods and requirements shall be included in the detail specification of the cable.

Table 1 - PE solid insulation compounds

Characteristics		Test method	Unit	Grades	
				L/MD	HD
1	Maximum rated temperature of cable for which the compound can be used		° C	70	80
2	Density *	EN 60811-1-3 clause 8	g/cm3	≤ 0,940	>0,940
3	Melt flow index*	EN 60811-4-1 clause 10	g/10 min	≤ 0,5 ≤ 2,5**	≤ 1,0
4	Mechanical characteristics	EN 60811-1-1 9.1			
4.1	Tensile strength - median,min.		MPa	10	18
4.2	Elongation at break - median,min.		%	300	300
5	Shrinkage - temperature - duration Result to be obtained - max.	EN 60811-1-3 clause 10	° C h %	100 ± 2 1 5	115 ± 2 1 5
6	Elongation at break after ageing for unfilled cables - temperature - duration Result to be obtained - median,min.	EN 60811-1-2 clause 8	 ° C h %	 100 ± 2 10 x 24 300	 100 ± 2 10 x 24 300
7	Performances after pre-conditioning for filled cables - temperature - duration	EN 60811-4-2 8.2	 ° C h	 60/70 ± 2 7 x 24	 60/70 ± 2 7 x 24
7.1	Elongation at break Result to be obtained - median,min. - variation,max.	EN 60811-4-2 8.4/8.6	 % %	 200 ± 30	 200 ± 30
7.2	Wrapping 1) Result to be obtained after exposure in wrapped conditions - temperature - duration	EN 60811-4-2 10.5/10.6	 ° C h	 No crack 70 ± 2 24	 No crack 70 ± 2 24

* to be given by the supplier on the basic resin

** for particular application

Table 1 (continued)

Characteristics		Test method	Unit	Grades	
				L/MD	HD
8	Wrapping after ageing - temperature - duration Result to be obtained	EN 60811-4-2 clause 10	 ° C h	 100 ± 2 14 x 24 No crack	 100 ± 2 14 x 24 No crack
9	Long term stability test [2)] - temperature - duration Result to be obtained	EN 60811-4-2 annex A	 ° C h	 100 ± 2 42 x 24 No crack	 100 ± 2 42 x 24 No crack
10	Mass increase for filled cables - temperature - duration Result to be obtained - max.	EN 60811-4-2 clause 11	 ° C h %	 60/70 ± 2 10 x 24 13	 60/70 ± 2 10 x 24 13

1) Only to be carried out if elongation at break cannot be done (i.e. if the insulation cannot be removed from the conductor without damage and/or the insulation thickness is less than 0,8 mm).

2) For monitoring both raw materials and cables, OIT test may be performed in accordance with EN 60811-4-2 annex B with typical minimum value of 15 min.
Alternatively, the test may be carried out prior to extrusion on granules in presence of a piece of copper conductor with typical minimum value of 30 min.
For information only, OIT after pre-conditioning may be recorded.

Table 2 - PE cellular insulation (including foam-skin)

	Characteristics	Test method	Unit	Grades		
				A	B	C*
1	Maximum rated temperature of cable for which the compound can be used		° C	70	70	70
2	Density *	EN 60811-1-3 clause 8	g/cm3	To be recorded	To be recorded	To be recorded
3	Melt flow index**	EN 60811-4-1 clause 10	g/10 min	To be recorded	To be recorded	To be recorded
4	Mechanical characteristics	EN 60811-1-1 9.1				
4.1	Tensile strength - median,min.		MPa	3,5	5	8
4.2	Elongation at break - median,min.		%	125	150	300
5	Shrinkage - temperature - duration Result to be obtained, max.	EN 60811-1-3 clause 10	° C h %	100 ± 2 1 5	100 ± 2 1 5	100 ± 2 1 5
6	Elongation at break after ageing for unfilled cables - temperature - duration Result to be obtained - median,min.	EN 60811-1-2 8.1	° C h %	80 ± 2*** 7 x 24 125	80 ± 2*** 7 x 24 125	100 ± 2 7 x 24 200
7	Performances after pre-conditioning for filled cables - temperature - duration	EN 60811-4-2 8.2	° C h	60/70 ± 2 7 x 24	60/70 ± 2 7 x 24	60/70 ± 2 7 x 24
7.1	Elongation at break Result to be obtained - median,min.	EN 60811-4-2 clause 8	%	100	100	200
7.2	Wrapping 1) Result to be obtained after exposure in wrapped conditions - temperature - duration	EN 60811-4-2 clause 9	° C h	No crack 70 ± 2 24	No crack 70 ± 2 24	No crack 70 ± 2 24

* for particular foam-skin application

** to be given by the supplier on the basic resins (cellular and skin)

*** when cellular part is based on HD resin the ageing temperature shall be 100° C