



SLOVENSKI STANDARD SIST EN 50290-2-21:2002

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Nadomešča:

SIST HD 624.1 S1:1996

Komunikacijski kabli - 2-21. del: Skupna pravila za načrtovanje in konstrukcija - Izolacijske zmesi iz PVC

Communication cables - Part 2-21: Common design rules and construction - PVC insulation compounds

Kommunikationskabel - Teil 2-21: Gemeinsame Regeln für Entwicklung und Konstruktion - PVC-Isoliermischungen

Câbles de communication - Partie 2-21: Règles de conception communes et construction - Mélanges en PVC pour enveloppes isolantes

Ta slovenski standard je istoveten z: EN 50290-2-21:2001

ICS:

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

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EUROPEAN STANDARD

EN 50290-2-21

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ICS 29.035.20; 33.120.10

Supersedes HD 624.1 S1:1994

English version

Communication cables
Part 2-21: Common design rules and construction -
PVC insulation compounds

Câbles de communication
Partie 2-21: Règles de conception
communes et construction -
Mélanges en PVC pour enveloppes
isolantes

Kommunikationskabel
Teil 2-21: Gemeinsame Regeln für
Entwicklung und Konstruktion -
PVC-Isoliermischungen

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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

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 50290-2-21 on 2001-03-01.

This European Standard supersedes HD 624.1 S1:1994.

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- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-04-01

Annexes designated "normative" are part of the body of the standard.

In this standard, annex A is normative.

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.

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1 Scope

This Part 2-21 of EN 50290 gives specific requirements for PVC insulation 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 60811-1-4:1995 | Insulating and sheathing materials of electric and optical cables - Common test methods -- Part 1-4: General application - Tests at low temperature (IEC 60811-1-4:1985 + corr. May 1986 + A1:1993) |
| EN 60811-3-1:1995 | Insulating and sheathing materials of electric and optical cables - Common test methods -- Part 3-1: Methods specific to PVC compounds - Pressure test at high temperature - Tests for resistance to cracking (IEC 60811-3-1:1985 + corr. May 1986) |
| EN 60811-3-2:1995 | Insulating and sheathing materials of electric cables - Common test methods Part 3: Methods specific to PVC compounds -- Section 2: Loss of mass test - Thermal stability test (IEC 60811-3-2:1985 + corr. May 1986 + A1:1993) |
| ISO 868:1985 | Plastics and ebonite -- Determination of indentation hardness by means of a durometer (Shore hardness) |

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 - PVC insulation compounds

Characteristics		Test method	Unit	Grades			
				TI51	TI52	TI53	TI54
1	Maximum rated temperature at cable for which the compound can be used		° C	70	70	90	70
2	Density	EN 60811-1-3 clause 8	g/cm ³	To be recorded			
3	Hardness	ISO 868	Shore A Shore D	To be recorded			
4	Mechanical characteristics						
4.1	In state of delivery	EN 60811-1-1 9.1					
4.11	Tensile strength – median, min.		MPa	12,5	10	15	17
4.12	Elongation at break – median, min.		%	125	150	150	125
4.2	After ageing Ageing conditions – temperature – duration	EN 60811-1-2 8.1	° C h	80 ± 2 7 x 24	80 ± 2 7 x 24	135 ± 2 14 x 24	80 ± 2 7 x 24
4.21	Tensile strength – median, min. – variation, max.		MPa %	12,5 ± 20	10 ± 20	15 ± 25	17 ± 25
4.22	Elongation at break – median, min. – variation, max.		% %	125 ± 20	150 ± 20	150 ± 25	125 ± 25
5	Loss of mass Ageing conditions – temperature – duration Loss of mass, max.	EN 60811-3-2 8.1	° C h mg/cm ²	80 ± 2 7 x 24 2,0	80 ± 2 7 x 24 2,0	115 ± 2 14 x 24 1,5	100 ± 2 7 x 24 2,0
6	Heat shock Test conditions – temperature – duration Result to be obtained	EN 60811-3-1 9.1	° C h	150 ± 2 1 No crack	150 ± 2 1 No crack	150 ± 2 1 No crack	150 ± 2 1 No crack

Table 1 (continued)

Characteristics		Test method	Unit	Grades			
				TI51	TI52	TI53	TI54
7	Pressure test at high temperature Test conditions – temperature – duration Result to be obtained - depth of indentation median, max.	EN 60811-3-1 8.1	° C h	80 ± 2 4	70 ± 2 4	90 ± 2 4	80 ± 2 4
			%	50	50	50	50
8	Behaviour at low temperature						
8.1	Bending test at low temperature Test conditions – temperature Result to be obtained	EN 60811-1-4 8.1	° C	– 15 ± 2 No crack	– 15 ± 2 No crack	– 15 ± 2 No crack	– 15 ± 2 No crack
8.2	Elongation test at low temperature Test conditions – temperature Elongation min.	EN 60811-1-4 8.3	° C %	– 15 ± 2 20	– 15 ± 2 20	– –	– –
9	Volume resistivity, min. - at max. rated temp. at cable - at 20 ° C	Annex A	Ω.m Ω.m	10 ⁸ 10 ¹¹	10 ⁸ 10 ¹¹	10 ⁷ 10 ¹⁰	10 ⁹ 10 ¹²
10	Thermal stability at 200 ° C, min.	EN 60811-3-2 clause 9	min	–	–	240	80
11	Shrinkage ¹⁾ , max. Test conditions – temperature – duration	EN 60811-1-3 clause 10	% ° C min	4 150 ± 2 15	4 150 ± 2 15	–	–
12	Dielectric constant ²⁾	Under consideration					

1) When required in cable detail specification.

2) When required the dielectric constant shall be measured at 1 kHz. Typical values are under consideration.

Annex A (normative)

Volume resistivity

This test shall be made on insulated conductor sample.

The sample shall be immersed in water previously heated to the specified temperature, a length of about 0,25 m at each end of the sample being kept above the water.

The length of the samples, the temperature of the water and the duration of immersion are given in the relevant cable specification.

A d.c. voltage between 80 V and 500 V shall then be applied between the conductor and the water.

The insulation resistance shall be measured 1 min after application of the voltage.

The volume resistivity shall be calculated from the measured insulation resistance by the following formula :

$$\rho = \frac{2\pi \ell R}{\log_e \frac{D}{d}}$$

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where

ρ = volume resistivity, in Ω m;

R = measured insulation resistance, in Ω ;
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ℓ = length of the sample, in m;

D = outer diameter of the insulation, in mm;

d = inner diameter of the insulation, in mm.