SLOVENSKI STANDARD
SIST EN 50290-2-26:2002

01-september-2002

Nadomešča:
SIST HD 624.6 S1:1996

Communication cables - Part 2-26: Common design rules and construction - Halogen free flame retardant insulation compounds (Note: Applies only in conjunction with EN 50290-2-20)

Communication cables -- Part 2-26: Common design rules and construction - Halogen free flame retardant insulation compounds

Kommunikationskabel -- Teil 2-26: Gemeinsame Regeln für Entwicklung und Konstruktion - Halogenfreie flammwidrige Isoliermischungen

Câbles de communication -- Partie 2-26: Règles de conception communes et construction - Mélanges pour enveloppes isolantes sans halogène et avec propagation retardée de flamme

Ta slovenski standard je istoveten z: **EN 50290-2-26:2002**

ICS:

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

SIST EN 50290-2-26:2002 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50290-2-26

January 2002

ICS 29.035.20; 33.120.10

Supersedes HD 624.6 S1:1995

English version

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Kommunikationskabel
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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

Ref. No. EN 50290-2-26:2002 E

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 50290-2-26 on 2001-11-01.

This European Standard supersedes HD 624.6 S1:1995.

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)	2002-08-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2004-08-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annexe 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.

1 Scope

This Part 2-26 of EN 50290 gives specific requirements for halogen free flame retardant insulation compounds used in 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 60811-2-1:1998	Insulating and sheathing materials of electric and optical cables - Common test methods -- Part 2-1: Methods specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests (IEC 60811-2-1:1998)
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)
HD 405.3 S1:1993	Tests on electric cables under fire conditions -- Part 3: Tests on bunched wires or cables (IEC 60332-3:1992)
IEC 60250:1969	Recommended methods for the determination of the permittivity and dielectric dissipation factor of electrical insulating materials at power, audio and radio frequencies including metre wavelengths
IEC 60754-2:1991 + A1:1997	Test on gases evolved during combustion of materials from cables - Determination of degree of acidity of gases by measuring pH and conductivity

3 Requirements

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

Table 1 - Halogen free flame retardant insulation compounds

	Characteristics	Test method	Unit	Grades	
				Cross linked insulation	Thermoplastic insulation
1	Maximum rated temperature at cable for which the compound can be used		° C	90	70
2	Mechanical characteristics				
2.1	In state of delivery	EN 60811-1-1			
2.11	Tensile strength - median, min.	9.1	MPa	10	9
2.12	Elongation at break - median, min.		%	125	125
2.2	After ageing	EN 60811-1-2 8.1			
	Ageing conditions - temperature - duration		° C h	135 ± 2 7 x 24	100 ± 2 7 x 24
2.21	Tensile strength - variation, max.		%	± 30	± 30
2.22	Elongation at break - median, min. - variation, max.		% %	– ± 30	100 [1)] ± 40
3	Heat shock	EN 60811-3-1 9.1		Not applicable	
	Test conditions - temperature - duration		° C h	– –	130 ± 2 1
	Result to be obtained				No crack
4	Behaviour at low temperature				
	Bending at low temperature Test conditions - temperature	EN 60811-1-4 8.1	° C	- 15 ± 2	- 15 ± 2
	Result to be obtained			No crack	No crack
5	Shrinkage	EN 60811-1-3 clause 10			
	Test conditions - sample length - temperature - duration		mm ° C h	200 100 1	200 100 1
	Result to be obtained, max.		%	4	4
6	Pressure at high temperature	EN 60811-3-1 8.1		Not applicable	
	Test conditions - temperature - duration (for all values of cable diameter)		° C h	– 	80 ± 2 4
	Result to be obtained - depth of indentation median, max		 %	– –	 50

1) Provisional value

Table 1 (continued)

Characteristics		Test method	Unit	Grades	
				Cross linked insulation	Thermoplastic insulation
7	Oxygen Index (see note 1)	HD 405.3	%		
8	Corrosivity	IEC 60754-2		To meet	To meet
9	Smoke opacity (see note 2)				
10	Toxicity	Under consideration			
11	Volume resistivity, min. - at maximum rated temperature at cable - at 20 ° C Test conditions - sample length, min - immersion duration	Appended	Ω.m m h	10^8 (provisional value) 10^{10} (provisional value) 5 2	10^8 (provisional value) 10^{10} (provisional value) 5 2
12	Dielectric constant (see note 3)	IEC 60250			Typical value (Under consideration)
13	Dissipation factor (see note 3)	IEC 60250			Typical value (Under consideration)
14	Hot set test Test conditions - temperature - duration - load	EN 60811-2-1 9	 ° C min N/cm^2	 200 ± 3 15 20	Not applicable
14.1 14.2	Result to be obtained - elongation, max. - permanent set, max.		 % %	 175 25	

NOTE 1 Oxygen index measurement has been found to be a suitable indicator to guide selection and monitoring of materials used in cables which have to meet the fire performance tests specified in the relevant cable specification.

NOTE 2 For selection of materials used in cables, IEC 60695-6 may be considered.

NOTE 3 When required the dielectric constant and dissipation factor, shall be measured at 1 MHz, and at other required values. 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.

A D.C. voltage of between 80 V and 500 V shall be then 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:

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

where

ρ = volume resistivity, in Ω meters
R = measured insulation resistance, in Ω
ℓ = length of the sample, in meters
D = outer diameter of the insulation, in mm
d = inner diameter of the insulation, in mm.