SLOVENSKI STANDARD
SIST HD 624.6 S1:1996

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Materials used in communication cables - Part 6: Halogen free flame retardant insulation compounds

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Werkstoffe für Kommunikationskabel -- Teil 6: Halogenfreie flammwidrige Isoliermischungen

Matériaux utilisés dans les cables de communication -- Partie 6: Mélanges pour enveloppes isolantes sans halogène et avec propagation retardée de flamme

Ta slovenski standard je istoveten z: **HD 624.6 S1:1995**

ICS:

29.035.20	Plastični in gumeni izolacijski materiali	Plastics and rubber insulating materials

SIST HD 624.6 S1:1996 **en**

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

HD 624.6 S1

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ICS 33.040.50 29.040.20

Descriptors: Flame retardant insulation compounds

English version

Materials used in communication cables
Part 6: Halogen free flame retardant insulation compounds

Matériaux utilisés dans les cables de communication
Partie 6: Mélanges pour enveloppes isolantes sans halogène et avec propagation retardée de flamme

Werkstoffe für Kommunikationskabel
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This Harmonization Document was approved by CENELEC on 1994-12-06. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

Up-to-date lists and bibliographical references concerning such national implementation may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

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CENELEC

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

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Foreword

This Harmonization Document was prepared by the Technical Committee CENELEC TC 46X, Communication cables.

The text of the draft was submitted to the formal vote and was approved by CENELEC as HD 624.6 S1 on 1994-12-01.

The following dates were fixed:

- latest date by which the existence of the HD has to be announced at national level (doa) 1995-06-01
- latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 1995-12-01
- latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 1995-12-01

For products which have complied with the relevant national standard before 1995-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-12-01.

This document forms part of a series of standards on materials used in communication cables which will include the following parts:

Part 1: PVC insulation compounds
Part 2: PVC sheathing compounds
Part 3: PE insulation
- Table 1: Solid
- Table 2: Cellular (including foam-skin)

Part 4: PE sheathing
Part 5: Polypropylen insulation
Part 6: Halogen free flame retardant insulation compounds
Part 7: Halogen free flame retardant thermoplastic sheathing compounds
Part 8: Filling compounds for filled cables

The different parts include specific requirements for communication cables; common characteristics are aligned as far as possible on existing Harmonization Documents, if any, and in as far as these may apply to communication cables.

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	HD 505.1.1 § 9.1			
	Tensile strength - median,min.		MPa	10	9
	Elongation at break - median,min.		%	125	125
2.2	After ageing	HD 505.1.2 § 8.1			
	Ageing conditions - temperature - duration		°C h	135 ± 2 7 x 24	100 ± 2 7 x 24
	Tensile strength - variation,max.		%	± 30	± 30
	Elongation at break - median,min. - variation,max.		% %	– ± 30	100* ± 40
3	**Heat shock**	HD 505.3.1 § 9.1		Not applicable	
	Test conditions - temperature - duration Result to be obtained		°C h	– –	130 ± 2 1 no crack
4	**Behaviour at low temperature**				
	Bending at low temperature	HD 505.1.4 § 8.1			
	Test conditions - temperature Result to be obtained		°C	- 15 ± 2 no crack	- 15 ± 2 no crack
5	**Shrinkage**	HD 505.1.3 § 10			
	Test conditions - sample length - temperature - duration Result to be obtained, max		mm °C h %	200 100 1 4	200 100 1 4
6	**Pressure at high temperature**	HD 505.3.1 § 8.1		Not applicable	
	Test conditions - temperature - duration (for all values of cable diameter) Result to be obtained - depth of indentation median,max.		°C h %	– – –	80 ± 2 4 50

* Provisional value

Halogen free flame retardant insulation compounds

	Characteristics	Test method	Unit	Grades	
				Cross linked insulation	Thermoplastic insulation
7	**Oxygen Index (note 1)**	HD 405.3	%		
8	**Corrosivity**	HD 602		To meet	To meet
9	**Smoke opacity (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 (note 3)**	IEC 250			Typical value (Under consideration)
13	**Dissipation factor (note 3)**	IEC 250			Typical value (Under consideration)
14	**Hot set test** Test conditions - temperature - duration - load Result to be obtained - elongation, max - permanent set, max	HD 505.2.1 § 9	 °C min N/cm^2 % %	 200 ± 3 15 20 175 25	Not applicable

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 draft method according to IEC xxx* 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.

General comments :

In case of specific application, additional performances (i.e chemical resistance, UV resistance, water absorbtion...) could be needed. Relevant test methods and requirements shall be included in the relevant cable specification.

The insulating materials of this specification are used for single insulated wires and/or insulated conductors in the cable cores which have to meet the requirements specified in the relevant cable specification in accordance with existing Harmonization Documents about flame propagation, evolution of corrosive gases, smoke opacity and toxicity.

Other insulating materials (eg. PE,...) may be used when fire performances are specified on complete cables only.

* *presently IEC 89(Sec)35*

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