SLOVENSKI STANDARD
SIST HD 21.9 S2:1998

01-februar-1998

Kabli s polivinilkloridno izolacijo za naznačene napetosti do vključno 450/750 V - 9. del: Enožilni neoplaščeni kabli za polaganje pri nizkih temperaturah

Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 9: Single core non-sheathed cable for installation at low temperatures

Polyvinylchlorid-isolierte Leitungen mit Nennspannungen bis 450/750 V - Teil 9: Einadrige Leitungen ohne Mantel zur Verlegung bei tiefen Temperaturen

Conducteurs et câbles isolés au polychlorure de vinyle, de tension assignée au plus égale à 450/750 V - Partie 9: Conducteurs pour installations fixes à basse température

Ta slovenski standard je istoveten z: **HD 21.9 S2:1995**

ICS:

29.060.20 Kabli Cables

SIST HD 21.9 S2:1998 **en**

HARMONIZATION DOCUMENT HD 21.9 S2

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

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Descriptors: Electric cable, insulated cable, insulated conductor, polyvinyl chloride, electric installation, test method, test at low temperature

English version

Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V
Part 9: Single core non-sheathed cable for installation at low temperatures

Conducteurs et câbles isolés au polychlorure de vinyle, de tension assignée au plus égale à 450/750 V
Partie 9: Conducteurs pour installations fixes à basse température

Polyvinylchlorid-isolierte Leitungen mit Nennspannungen bis 450/750 V
Teil 9: Einadrige Leitungen ohne Mantel zur Verlegung bei tiefen Temperaturen

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).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

HD 21 was originally adopted by CENELEC on 9th July 1975.

Edition 2 of HD 21 was implemented on 1st January 1984, and at that time contained five parts.

Since 1984, new parts have been published, original parts amended, and in addition HD 505 has superseded HD 385 as the cross-reference for test methods.

This edition 2 of HD 21.9 has been introduced to cover the complete revision of the overall dimensions, in line with EN 60719, and was approved by TC 20 at its London meeting in October 1993 to go forward to UAP.

HD 21 now has the following parts:

HD 21.1 S2	-	General requirements
HD 21.2 S2	-	Test methods
HD 21.3 S3	-	Non sheathed cables for fixed wiring
HD 21.4 S3	-	Sheathed cables for fixed wiring
HD 21.5 S3	-	Flexible cables (Cords)
HD 21.6	-	(Spare)
HD 21.7 S2	-	Single core non-sheathed cables for internal wiring (90 °C conductor temperature)
HD 21.8 S1	-	Single core non-sheathed cables for decorative chains
HD 21.9 S2	-	Single core non-sheathed cables for installations at low temperatures
HD 21.10 S1	-	Extensible leads

This Harmonization Document was prepared by the Technical Committee CENELEC TC 20, Electric cables.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as HD 21.9 S2 on 1994-12-06.

The following dates were fixed:

– latest date by which the existance 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 HD 21.9 S1:1990 before 1995-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1996-12-01.

NORMATIVE REFERENCES

References are made, in this Part 9 of HD21, to other parts of this HD and to other ENs or HDs as follows:

HD 383	Conductors of insulated cables (Endorsing IEC 228 and 228A)
HD 405.1	Tests on electric cables under fire conditions. Part 1: Test on a single vertical cable (Endorsing IEC 332-1)
HD 505	Common test methods for insulating and sheathing materials of Electric Cables (Endorsing IEC 811)
EN 60719	Calculation of the low and upper limits for the average outer dimensions of cables with circular copper conductors and of rated voltages up to and including 450/750V

INFORMATIVE REFERENCE

Reference is made in this Part 9 of HD 21 to the following other HD:

HD 516	Guide to the use of low voltage harmonised cables

In all cases a reference to another EN or HD implies the latest edition of that document

CONTENTS

1. Scope

This particular part (Part 9) of the HD details the particular specifications for polyvinyl chloride insulated single core non-sheathed cables for fixed wiring of rated voltage Uo/U 450/750V, intended for installation at low temperatures.

All cables shall comply with the appropriate requirements given in Part 1 and the individual types of cable shall each comply with the particular requirements of this Part 9.

NOTE: The overall dimensions of the cables of this Part of HD 21 have been calculated in accordance with EN 60719.

2. Single core non-sheathed cable with rigid conductor for installation at low temperatures

2.1 Code designation

H07V3-U, for cables with solid conductors;
H07V3-R, for cables with stranded rigid conductors.

2.2 Rated voltage

450/750V.

Note: 600/1000V when this cable is used in fixed installations, with mechanical protection, within switchgear and controlgear : see HD 516.

2.3 Construction

2.3.1 Conductor

Number of conductors : 1
The conductors shall comply with the requirements of HD 383:
Class 1 for solid conductors;
Class 2 for stranded conductors.

2.3.2 Insulation

The insulation shall be polyvinyl chloride compound of Type TI 4, applied around the conductor.

The insulation thickness shall comply with the specified value given in Part 9, Table I, column 3.

The insulation resistance shall be not less than the value given in Part 9, Table I, column 6.

2.3.3 Overall diameter

The mean overall diameter shall be within the limits given in Part 9, Table I, columns 4 and 5.

2.4 Tests

Compliance with the requirements of Part 9, sub-clause 2.3 shall be checked by inspection and by the tests given in Part 9, Table II.

2.5 Indication of origin and temperature marking

In addition to the general requirement of Part 1, clause 3, a continuous marking using the symbol 'V3', indicating suitability for installation at low temperature, shall be applied by printing, indenting or embossing on the insulation.

2.6 Guide to use (Informative)

See HD 516

Table I

General data for Types H07V3-U and H07V3-R

1	2	3	4	5	6
Nominal cross-sectional area of conductors (mm²)	Class of conductor (HD 383)	Thickness of insulation Specified value (mm)	Mean overall diameter Lower limit (mm)	Mean overall diameter Upper Limit (mm)	Minimum insulation resistance at 70°C (Mohm.km)
1.5	1	0.7	2.6	3.2	0.011
1.5	2	0.7	2.7	3.3	0.010
2.5	1	0.8	3.2	3.9	0.010
2.5	2	0.8	3.3	4.0	0.009
4	1	0.8	3.6	4.4	0.0085
4	2	0.8	3.8	4.6	0.0077
6	1	0.8	4.1	5.0	0.0070
6	2	0.8	4.3	5.2	0.0065
10	1	1.0	5.3	6.4	0.0070
10	2	1.0	5.6	6.7	0.0065
16	2	1.0	6.4	7.8	0.0050
25	2	1.2	8.1	9.7	0.0050
35	2	1.2	9.0	10.9	0.0043
50	2	1.4	10.6	12.8	0.0043
70	2	1.4	12.1	14.6	0.0035
95	2	1.6	14.1	17.1	0.0035
120	2	1.6	15.6	18.8	0.0032
150	2	1.8	17.3	20.9	0.0032
185	2	2.0	19.3	23.3	0.0032
240	2	2.2	22.0	26.6	0.0032
300	2	2.4	24.5	29.6	0.0030
400	2	2.6	27.5	33.2	0.0028

Table II

Tests for Types H07V3-U and H07V3-R

1	2	3	4	5
Ref. No.	Tests	Category of test	Test method described in	
			HD	Clause
1.	Electrical tests			
1.1	Resistance of conductors	T, S	21.2	2.1
1.2	Voltage test at 2500V	T, S	21.2	2.2
1.3	Insulation resistance at 70°C	T, S	21.2	2.4
1.4	Long term resistance of insulation to d.c.	T	21.2	2.5
1.5	Absence of faults on insulation	R	21.2	2.6
2.	Provisions covering constructional and dimensional characteristics			
2.1	Checking of compliance with constructional provisions	T, S	21.1	Inspection and manual tests
2.2	Measurement of thickness of insulation	T, S	21.2	1.9
2.3	Measurement of overall diameter	T, S	21.2	1.11
3.	Mechanical properties of insulation			
3.1	Tensile test before ageing	T	505.1.1	9.1
3.2	Tensile test after ageing	T	505.1.2	8.1.3.1
3.3	Loss of mass test	T	505.3.2	8.1
4.	Pressure test at high temperature	T	505.3.1	8.1
5.	Tests at low temperature			
5.1	Bending test on insulation (+)	T	505.1.4	8.1
5.2	Elongation test for insulation (*)	T	505.1.4	8.3
5.3	Impact test for insulation	T	505.1.4	8.5
6.	Heat shock test	T	505.3.1	9.1
7..	Test under fire conditions	T	405.1	-

(+) Only applicable to cores having mean overall diameters up to and including 12.5mm
(*) Only applicable if the mean overall outer diameter of the core exceeds 12.5mm

3. Single core non-sheathed cable with flexible conductor for installation at low temperatures

3.1 Code designation

H07V3-K

3.2 Rated voltage

450/750V

Note: 600/1000V, when this cable is used in fixed installations with mechanical protection, within switchgear and controlgear : see HD 516

3.3 Construction

3.3.1 Conductor

Number of conductors : 1
The conductors shall comply with the Class 5 requirements given in HD 383.

3.3.2 Insulation

The insulation shall be polyvinyl chloride compound of Type TI 4, applied around the conductor.

The insulation thickness shall comply with the specified value given in Part 9, Table III, column 2.

The insulation resistance shall be not less than the value given in Part 9, Table III, column 5.