SLOVENSKI STANDARD

SIST HD 21.15 S1:2006

01-december-2006

Kabli s plastomerno izolacijo za naznaļ ene napetosti do vkljuļ no 450/750 V - 15. del: Enoģilni kabli, izolirani z brezhalogensko plastomerno snovjo, za stalna oģiļ enja

Cables of rated voltages up to and including 450/750 V and having thermoplastic insulation - Part 15: Single core cables, insulated with halogen-free thermoplastic compound, for fixed wiring

Starkstromleitungen mit thermoplastischer Isolierhülle fur Nennspannungen bis 450/750 V - Teil 15: Halogenfreie Aderleitungen mit thermoplastischen Werkstoffen für feste Verlegung

Conducteurs et câbles isolés avec des matériaux thermoplastiques de tension assignée au plus égale a 450/750 V - Partie 15: Monoconducteurs pour installation fixe, isolés avec un mélange thermoplastique sans halogene

Ta slovenski standard je istoveten z: **HD 21.15 S1:2006**

ICS:

29.060.20 Kabli Cables

SIST HD 21.15 S1:2006 **en**

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

HD 21.15 S1

September 2006

ICS 29.060.20

English version

Cables of rated voltages up to and including 450/750 V and having thermoplastic insulation
Part 15: Single core cables, insulated with halogen-free thermoplastic compound, for fixed wiring

Conducteurs et câbles isolés avec des matériaux thermoplastiques de tension assignée au plus égale à 450/750 V
Partie 15: Monoconducteurs pour installation fixe, isolés avec un mélange thermoplastique sans halogène

Starkstromleitungen mit thermoplastischer Isolierhülle mit Nennspannungen bis 450/750 V
Teil 15: Halogenfreie Aderleitungen mit thermoplastischen Werkstoffen für feste Verlegung

This Harmonization Document was approved by CENELEC on 2006-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document at national level.

Up-to-date lists and bibliographical references concerning such national implementations 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, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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. HD 21.15 S1:2006 E

Foreword

This Harmonization Document was prepared by the Technical Committee CENELEC TC 20, Electric cables, from Vilamoura Notification BT(ES/NOT)5 and introduces a range of single core cables equivalent to those in HD 21.3 but with halogen-free thermoplastic insulation. The text of the draft was submitted to the formal vote and was approved by CENELEC as HD 21.15 S1 on 2006-09-01 without any modification.

The following dates were fixed:

– latest date by which the existence of the HD has to be announced at national level	(doa)	2007-03-01
– latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement	(dop)	2007-09-01
– latest date by which the national standards conflicting with the HD have to be withdrawn	(dow)	2008-09-01

HD 21 has the following parts:

HD 21.1 S4	General requirements
HD 21.2 S3	Test methods
HD 21.3 S3	Non-sheathed cables for fixed wiring
HD 21.4 S2	Sheathed cables for fixed wiring (Reprint)
HD 21.5 S3	Flexible cables (cords)
HD 21.6	(Spare)
HD 21.7 S2	Single core non-sheathed cables for internal wiring for a conductor temperature of 90 °C
HD 21.8 S2	Single core non-sheathed cables for decorative chains
HD 21.9 S2	Single core non-sheathed cables for installation at low temperatures
HD 21.10 S2	Extensible leads
HD 21.11 S1	Cables for luminaires
HD 21.12 S1	Heat-resistant flexible cables (cords)
HD 21.13 S1	Oil resistant PVC sheathed cables with two or more conductors
HD 21.14 S1	Flexible cables (cords), insulated and sheathed with halogen-free thermoplastic compounds
HD 21.15 S1	Single core cables, insulated with halogen-free thermoplastic compound, for fixed wiring

Contents

1 Scope 4
2 Normative references 4
3 Terms and definitions 5
4 Single-core non-sheathed cable with rigid conductor for general purposes 5
4.1 Code designation 5
4.2 Rated voltage 5
4.3 Construction 5
4.4 Tests 6
4.5 Smoke emission of cable 6
4.6 Guide to use 6
5 Single-core non-sheathed cable with flexible conductor for general purposes 8
5.1 Code designation 8
5.2 Rated voltage 8
5.3 Construction 9
5.4 Tests 9
5.5 Smoke emission of cable 9
5.6 Guide to use 9
6 Single-core non-sheathed cable with rigid conductor for internal wiring 11
6.1 Code designation 11
6.2 Rated voltage 11
6.3 Construction 12
6.4 Tests 12
6.5 Smoke emission of cable 12
6.6 Guide to use 12
7 Single-core non-sheathed cable with flexible conductor for internal wiring 14
7.1 Code designation 14
7.2 Rated voltage 14
7.3 Construction 14
7.4 Tests 14
7.5 Smoke emission of cable 14
7.6 Guide to use 14
Annex A (normative) Requirements for halogens 16
Annex B (normative) Determination of halogens – Elemental test 18
Annex C (informative) Proposed amendment to HD 516 S2 20

Tables

Table 1 - General data for Types H07Z1-U and H07Z1-R 7
Table 2 - Tests for Types H07Z1-U and H07Z1-R 8
Table 3 - General data for Type H07Z1-K 10
Table 4 - Tests for Type H07Z1-K 11
Table 5 - General data for Types H05Z1-U and H05Z1-R 13
Table 6 - Tests for Types H05Z1-U and H05Z1-R 13
Table 7 - General data for Type H05Z1-K 15
Table 8 - Tests for Type H05Z1-K 15
Table A.1 16
Table A.2 17

1 Scope

This Part 15 details the particular specifications for single-core non-sheathed cables for fixed wiring at rated voltages up to and including 450/750 V, insulated with halogen-free thermoplastic compound and having low emission of smoke and corrosive gases when exposed to fire. For cables rated at 450/750 V there are two types, Type 1 and Type 2.

Type 2 cables are required to meet a more severe test for resistance to flame propagation (EN 50266-2-4) than Type 1, and have particular suitability for installation in bunches (see also Annex C).

The maximum permissible conductor temperature is 70 °C.

All cables shall comply with the appropriate requirements given in Part 1 of HD 21 and with the particular requirements of this Part 15.

NOTE 1 The overall dimensions of cables in HD 21.15 S1 have been calculated in accordance with EN 60719.

NOTE 2 Low emission of smoke is checked in accordance with EN 61034-2. Low emission of corrosive gases is checked as part of the check for absence of halogens (see Annex A).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50266 Series	Common test methods for cables under fire conditions - Test for vertical flame spread of vertically-mounted bunched wires or cables
EN 50267-2-1	Common test methods for cables under fire conditions - Tests on gases evolved during combustion of materials from cables - Part 2-1: Procedures - Determination of the amount of halogen acid gas
EN 50267-2-2	Part 2-2: Procedures - Determination of degree of acidity of gases for materials by measuring pH and conductivity
EN 50356	Method for spark testing of cables
EN 50363-7	Insulating, sheathing and covering materials for low voltage energy cables - Part 7: Halogen-free, thermoplastic insulating compounds
EN 50395	Electrical test methods for low voltage energy cables
EN 50396	Non electrical test methods for low voltage energy cables
HD 21 Series	Cables of rated voltages up to and including 450/750 V and having thermoplastic insulation
HD 516	Guide to use of low voltage harmonized cables
EN 60228	Conductors of insulated cables (IEC 60228)

EN 60332-1-2	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame (IEC 60332-1-2)
EN 60684-2	Flexible insulating sleeving - Part 2: Methods of test (IEC 60684-2)
EN 60719	Calculation of the lower and upper limits for the average outer dimensions of cables with circular copper conductors and of rated voltage up to and including 450/750 V (IEC 60719)
EN 60811 Series	Insulating and sheathing materials of electric and optical cables - Common test methods (IEC 60811 Series)
EN 61034-2	Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements (IEC 61034-2)

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
Type 1 cable
cable meeting the requirements for resistance to flame spread as given in EN 60332-1-2

3.2
Type 2 cable
cable meeting the requirements for resistance to flame spread as given in EN 60332-1-2 and additionally as given in EN 50266-2-4

4 Single-core non-sheathed cable with rigid conductor for general purposes

4.1 Code designation

H07Z1-U, for cables with solid conductors;

H07Z1-R, for cables with stranded rigid conductors.

4.2 Rated voltage

450/750 V

NOTE 600/1 000 V, when this cable is used in fixed installations with mechanical protection, within switchgear and controlgear (see HD 516).

4.3 Construction

4.3.1 Conductor

Number of conductors: 1

The conductors shall comply with the requirements given in EN 60228:

– class 1 for solid conductors;

– class 2 for stranded conductors.

4.3.2 Separator

A separator of suitable material may be applied around the conductor.

4.3.3 Insulation

The insulation shall be thermoplastic compound TI 7, to EN 50363-7, applied around the conductor.

The insulation thickness shall comply with the specified value given in Table 1, column 3.

The insulation resistance shall be not less than the values given in Table 1, column 6.

4.3.4 Overall diameter

The mean overall diameter shall be within the limits given in Table 1, columns 4 and 5.

4.3.5 Outer marking

The cable shall have the marking H07Z1-U (or –R as appropriate) printed or embossed on, or indented into, the insulation. The marking, which shall meet the requirements of 3.2 and 3.3 of Part 1, shall be legible.

An additional mandatory marking, to differentiate Type 1 cable from Type 2 cable, shall be applied as follows:

– for Type 1 cables the marking shall be TYPE 1;

– for Type 2 cable the marking shall be TYPE 2.

The additional marking shall be placed immediately after the marking of the code, and shall meet the requirements of 3.2 and 3.3 of Part 1, and shall be legible.

NOTE Type 2 cables may have an additional voluntary marking to satisfy national requirements. Such markings should not conflict with any of the markings required by the standard.

4.4 Tests

Compliance with the requirements of 4.3, shall be checked by inspection and by the tests given in Table 2.

4.5 Smoke emission of cable

When tested in accordance with the method and procedure given in EN 61034-2, all sizes of cable in HD 21.15 S1 shall exceed 60 % light transmittance throughout the test.

4.6 Guide to use

See Annex C.

Table 1 - General data for Types H07Z1-U and H07Z1-R

1	2	3	4	5	6
Nominal cross-sectional area of conductors	Class of conductor (EN 60228)	Thickness of insulation	Mean overall diameter		Minimum insulation resistance at 70 °C
		Specified value	Lower limit	Upper limit	
mm^2		mm	mm	mm	MΩ·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 9
4	1	0,8	3,6	4,4	0,008 7
4	2	0,8	3,8	4,6	0,008 2
6	1	0,8	4,1	5,0	0,007 4
6	2	0,8	4,3	5,2	0,007 0
10	1	1,0	5,3	6,4	0,007 2
10	2	1,0	5,6	6,7	0,006 7
16	2	1,0	6,4	7,8	0,005 6
25	2	1,2	8,1	9,7	0,005 3
35	2	1,2	9,0	10,9	0,004 6
50	2	1,4	10,6	12,8	0,004 6
70	2	1,4	12,1	14,6	0,004 0
95	2	1,6	14,1	17,1	0,003 9
120	2	1,6	15,6	18,8	0,003 5
150	2	1,8	17,3	20,9	0,003 5
185	2	2,0	19,3	23,3	0,003 5
240	2	2,2	22,0	26,6	0,003 4
300	2	2,4	24,5	29,6	0,003 3
400	2	2,6	27,5	33,2	0,003 1
500	2	2,8	30,5	36,9	0,003 0
630	2	2,8	34,0	41,1	0,002 7

Table 2 - Tests for Types H07Z1-U and H07Z1-R

1	2	3	4	5
Ref No.	Tests	Category of test	Test Method described in	
			HD / EN	Clause
1	**Electrical tests**			
1.1	Resistance of conductors	T, S	50395	5
1.2	Voltage test at 2 500 V	T, S	50395	6
1.3	Insulation resistance at 70 °C	T, S	50395	8.1
1.4	Long term resistance of insulation to d.c.	T	50395	9
1.5	Absence of faults in insulation	R	50395	10
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	50396	4.1
2.3	Measurement of overall diameter	T, S	50396	4.4
3	**Insulation material tests**	T	50363-7	
4	**Impact test at –15 °C**	T	60811-1-4	8.5
5	**Test for integrity of insulation under overload condition** (Under consideration)			
6	**Tests under fire conditions**			
6.1	Test on single vertical cable [a]	T	60332-1-2	-
6.2	Test on bunched wires [b]	T	50266-2-4	-
6.3	Smoke emission	T	61034-2	-
6.4	Assessment of halogens for all non-metallic materials	T, S	21.15	Annex A

[a] Applicable to Type 1 and Type 2 cables.

[b] Only applicable to Type 2 cables.

5 Single-core non-sheathed cable with flexible conductor for general purposes

5.1 Code designation

H07Z1-K

5.2 Rated voltage

450/750 V

NOTE 600/1 000 V, when this cable is used in fixed installations with mechanical protection, within switchgear and controlgear (see HD 516).

5.3 Construction

5.3.1 Conductor

Number of conductors: 1

The conductors shall comply with the requirements given in EN 60228 for Class 5 conductors.

5.3.2 Separator

A separator of suitable material may be applied around the conductor.

5.3.3 Insulation

The insulation shall be thermoplastic compound TI 7, to EN 50363-7, applied around the conductor.

The insulation thickness shall comply with the specified value given in Table 3, column 2.

The insulation resistance shall be not less than the values given in Table 3, column 5.

5.3.4 Overall diameter

The mean overall diameter shall be within the limits given in Table 3, columns 3 and 4.

5.3.5 Outer marking

The cable shall have the marking H07Z1-K printed or embossed on, or indented into, the insulation. The marking, which shall meet the requirements of 3.2 and 3.3 of Part 1, shall be legible.

An additional marking, to differentiate Type 1 cable from Type 2 cable, shall be applied as follows:

– for Type 1 cables the marking shall be TYPE 1;

– for Type 2 cable the marking shall be TYPE 2.

The additional mandatory marking shall be placed immediately after the marking of the code, and shall meet the requirements of 3.2 and 3.3 of Part 1, and shall be legible.

NOTE Type 2 cables may have an additional voluntary marking to satisfy national requirements. Such markings should not conflict with any of the markings required by the standard.

5.4 Tests

Compliance with the requirements of 5.3, shall be checked by inspection and by the tests given in Table 4.

5.5 Smoke emission of cable

When tested in accordance with the method and procedure given in EN 61034-2, all sizes of cable in HD 21.15 S1 shall exceed 60 % light transmittance throughout the test.

5.6 Guide to use

See Annex C.