SLOVENSKI PREDSTANDARD

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Kabli s plastomerno izolacijo za naznačene napetosti do vključno 450/750 V - 15. del: Enožilni kabli, izolirani in zaščiteni z brezhalogensko plastomerno snovjo, za stalna ožičenja

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

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DRAFT

HARMONIZATION DOCUMENT **prHD 21.15 S1**

DOCUMENT D'HARMONISATION

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ICS

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 draft Harmonization Document is submitted to CENELEC members for CENELEC enquiry. Deadline for CENELEC: 2005-05-13

It has been drawn up by Technical Committee CENELEC TC 20.

If this draft becomes a Harmonization Document, 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.

This draft Harmonization Document was established by CENELEC 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 draft Harmonization Document has been developed by 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. It is submitted to CENELEC Enquiry.

HD 21 now 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 (with A1 inclusive)
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 [1)]	Single core cables, insulated with halogen-free thermoplastic compound, for fixed wiring compounds and having low emission of smoke and corrosive gases when exposed to fire

1) At draft stage.

Contents

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 than Type 1.

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 B).

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 material 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 [1)]	Insulating, sheathing and covering materials for low voltage energy cables - Part 7: Halogen-free, thermoplastic insulating compounds
EN 50395 [1)]	Electrical test methods for electrical cables
EN 50396 [1)]	Non electrical test methods for electrical 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 [2)]	Conductors of insulated cables (IEC 60228)
EN 60332-1-2 [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)

1) At draft stage.

2) At ratification stage.

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 [1)]	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 Insulation

The insulation shall be thermoplastic compound TI 7, according to Annex A, 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.

4.3.3 Overall diameter

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

4.3.4 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 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.

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 D.

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 short-circuit** (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 B

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

[b] Only applicable to Type 2 cables.