SLOVENSKI STANDARD
SIST HD 22.12 S2:2007

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Kabli z omreženo izolacijo za naznačene napetosti do vključno 450/750 V – 12. del: Temperaturno odporne vrvice EPR in zvijavi kabli

Cables of rated voltages up to and including 450/750 V and having cross-linked insulation -- Part 12: Heat resistant EPR cords and flexible cables

Starkstromleitungen mit vernetzter Isolierhülle für Nennspannungen bis 450/750 V – Teil 12: Wärmebeständige Schlauchleitungen mit EPR-Isolierhülle

Conducteurs et câbles isolés avec des matériaux réticulés de tension assignée au plus égale a 450/750 V – Partie 12: Câbles souples a isolation EPR résistant a la chaleur

Ta slovenski standard je istoveten z: **HD 22.12 S2:2007**

ICS:

29.060.20	Kabli	Cables

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HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

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HD 22.12 S2

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ICS 29.060.20

Supersedes HD 22.12 S1:1996 + A1:1999

English version

Cables of rated voltages up to and including 450/750 V and having cross-linked insulation – Part 12: Heat resistant EPR cords and flexible cables

Conducteurs et câbles isolés avec des matériaux réticulés de tension assignée au plus égale à 450/750 V – Partie 12: Câbles souples à isolation EPR résistant à la chaleur

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This Harmonization Document was approved by CENELEC on 2006-12-01. 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).

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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. HD 22.12 S2:2007 E

Foreword

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 22.12 S2 on 2006-12-01.

This Harmonization Document supersedes HD 22.12 S1:1996 + A1:1999.

The following dates were fixed:

– latest date by which the existence of the HD has to be announced at national level	(doa)	2007-06-01
– latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement	(dop)	2007-12-01
– latest date by which the national standards conflicting with the HD have to be withdrawn	(dow)	2008-12-01

HD 22, Cables of rated voltages up to and including 450/750 V and having cross-linked insulation, now has the following parts:

HD 22.1 S4	General requirements
HD 22.2 S3 [1)]	Test methods
HD 22.3 S4	Heat resistant silicone rubber insulated cables
HD 22.4 S4	Cords and flexible cables
HD 22.5	(Spare)
HD 22.6 S2	Arc welding cables
HD 22.7 S2	Cables with increased heat resistance for internal wiring for a conductor temperature of 110 °C
HD 22.8 S2	Polychloroprene or equivalent synthetic elastomer sheathed cable for decorative chains
HD 22.9 S3	Single core halogen-free non-sheathed cables for fixed wiring having low emission of smoke
HD 22.10 S2	EPR insulated and polyurethane sheathed flexible cables
HD 22.11 S2	EVA cords and flexible cables
HD 22.12 S2	Heat resistant EPR cords and flexible cables
HD 22.13 S2	Halogen-free flexible cables having low emission of smoke
HD 22.14 S3	Cords for applications requiring high flexibility
HD 22.15 S2	Multicore cables insulated and sheathed with heat resistant silicone rubber
HD 22.16 S2	Water resistant polychloroprene or equivalent synthetic elastomer sheathed cables

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[1)] HD 22.2 is superseded by EN 50395 and EN 50396.

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1 Scope

This Part 12 of the HD details the particular specifications for heat-resistant EPR or equivalent synthetic elastomer insulated and heat-resistant EPR or CSP or equivalent synthetic elastomer sheathed cords and flexible cables, of rated voltages up to and including 450/750 V, for use with a conductor temperature not exceeding 90 °C.

Each cable shall comply with the appropriate requirements given in Part 1 of this HD and the particular requirements of this part.

NOTE The overall dimensions of the cables in this part of HD 22 have been calculated in accordance with EN 60719.

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 50334	Marking by inscription for the identification of cores of electric cables
EN 50363-1	Insulating, sheathing and covering materials for low voltage energy cables – Part 1: Cross-linked elastomeric insulating compounds
EN 50363-2-1	Insulating, sheathing and covering materials for low voltage energy cables – Part 2-1: Cross-linked elastomeric sheathing compounds
EN 50395	Electrical test methods for low voltage energy cables
EN 50396	Non electrical test methods for low voltage energy 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 60811 series	Insulating and sheathing materials of electric and optical fibre cables - Common test methods (IEC 60811 series)

3 Ordinary heat-resistant and low temperature resistant EPR or equivalent synthetic elastomer insulated and sheathed cord and cable for a maximum conductor temperature of 90 °C

3.1 Code designation

H05BB-F.

3.2 Rated voltage

300/500 V.

3.3 Construction

3.3.1 Conductor

Number of conductors: 2, 3, 4 or 5.

The conductors shall be in accordance with the requirements given in EN 60228 for Class 5 conductors. The wires may be plain or tinned.

3.3.2 Separator

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

3.3.3 Insulation

The insulation shall be rubber compound of Type EI 6 to EN 50363-1 applied around each conductor.

The insulation shall be applied by extrusion.

The insulation thickness shall comply with the specified value given in Table 1, column 2.

3.3.4 Assembly of cores and filler, if any

The cores shall be twisted together.

A centre filler may be used.

3.3.5 Sheath

The sheath shall be rubber compound of Type EM 6 to EN 50363-2-1 applied around the cores.

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

The sheath shall be extruded in a single layer and applied in such a way that it fills the spaces between the cores.

The sheath shall be capable of being removed without damage to the cores.

The colour of sheath is not specified, but if black is used it shall be subject to the test for carbon black content given in Table 2, with a requirement for a minimum level as given for EM 6 in EN 50363-2-1.

3.3.6 Overall diameter

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

3.3.7 Outer markings

The cable shall have the marking H05BB-F printed or embossed on, or indented into, the outer surface of the sheath. The marking, which shall meet the requirements of Subclauses 3.2 and 3.3 of Part 1, shall be legible.

3.4 Tests

Compliance with the requirements of 3.3 of this Part 12 shall be checked by inspection and by the tests given in Table 2.

The requirements to be met for the compatibility test shall be as given in Annex A.

3.5 **Guide to use** (informative)

See HD 516.

Table 1 - Dimensions of type H05BB-F

1	2	3	4	5
Number and nominal cross-sectional area of conductors	**Thickness of insulation** **Specified value**	**Thickness of sheath** **Specified value**	**Mean overall diameter**	
			Lower limit	**Upper limit**
mm^2	mm	mm	mm	mm
2 x 0,75	0,6	0,8	5,7	7,4
2 x 1	0,6	0,9	6,1	8,0
2 x 1,5	0,8	1,0	7,6	9,8
2 x 2,5	0,9	1,1	9,0	11,6
3 x 0,75	0,6	0,9	6,2	8,1
3 x 1	0,6	0,9	6,5	8,5
3 x 1,5	0,8	1,0	8,0	10,4
3 x 2,5	0,9	1,1	9,6	12,4
3 x 4	1,0	1,2	11,3	14,5
3 x 6	1,0	1,4	12,8	16,3
4 x 0,75	0,6	0,9	6,8	8,8
4 x 1	0,6	0,9	7,1	9,3
4 x 1,5	0,8	1,1	9,0	11,6
4 x 2,5	0,9	1,2	10,7	13,8
4 x 4	1,0	1,3	12,7	16,2
4 x 6	1,0	1,5	14,2	18,1
5 x 0,75	0,6	1,0	7,6	9,9
5 x 1	0,6	1,0	8,0	10,3
5 x 1,5	0,8	1,1	9,8	12,7
5 x 2,5	0,9	1,3	11,9	15,3

Table 2 - Tests for types H05BB-F

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 on completed cable at 2 000 V	T,S	50395	6
1.3	Voltage test on cores according to specified insulation thickness:			
1.3.1	- at 1 500 V up to and including 0,6 mm	T	50395	7
1.3.2	- at 2 000 V exceeding 0,6 mm	T	50395	7
1.4	Absence of faults on insulation	R	50395	10
1.5	Surface resistance of sheath	T	50395	11
2	**Provisions covering constructional and dimensional characteristics**			
2.1	Checking of compliance with constructional provisions	T,S	22.1	Inspection and manual tests
2.2	Measurement of insulation thickness	T,S	50396	4.1
2.3	Measurement of sheath thickness	T,S	50396	4.2
2.4	Measurement of overall diameter			
2.4.1	- mean value	T,S	50396	4.4
2.4.2	- ovality	T,S	50396	4.4
2.5	Solderability test (plain conductors)	T	50396	8.2
3	**Insulation material tests**	T	50363-1 [b]	
4	**Sheath material tests**	T	50363-2-1 [b]	
5	**Compatibility test**	T	60811-1-2	8.1.4
6	**Impact test at -40 °C**	T	60811-1-4	8.5
7	**Mechanical strength of completed cable** [a]			
7.1	Flexing test followed, after immersion in water, by a voltage test: - at 1 500 V on cores with specified insulation thickness up to and including 0,6 mm - at 2 000 V on cores with insulation thickness exceeding 0,6 mm	T	50396 50395	6.2 7
8	**Carbon black content of sheath** (where applicable)	T	60811-4-1	11

[a] Not applicable to cables having conductors greater than 4 mm^2.

[b] This EN includes all the test methods and requirements for the material. Material to be tested is taken from the finished cable.

4 Heavy heat-resistant and low temperature resistant EPR or equivalent synthetic elastomer insulated and sheathed cord and cable for a maximum conductor temperature of 90 °C

4.1 Code designation

H07BB-F.

4.2 Rated voltage

450/750 V.

4.3 Construction

4.3.1 Conductor

Number of conductors: 1, 2, 3, 4 or 50.

The conductors shall comply with the requirements given in EN 60228 for Class 5 conductors. The wires may be plain or tinned.

4.3.2 Separator

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

4.3.3 Insulation

The insulation shall be rubber compound of Type EI 6 to EN 50363-1 applied around each conductor.

The insulation shall be applied by extrusion.

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

4.3.4 Proofed textile tape

A proofed textile tape may be applied on each core for conductor cross-sections larger than 4 mm².

The tape shall be applied to the insulation in such a manner that it can be removed without damage to the insulation.

4.3.5 Assembly of cores and filler, if any

The cores shall be twisted together.

A centre filler may be used.

In the case of cores having conductors of large cross-section a textile tape may be applied around the core assembly before application of the sheath, provided that the finalised cables shall not have any substantial cavity in outer interstices between the cores.

4.3.6 Sheath

The cores shall be covered with a sheath.

The sheath shall be made up as follows:

(a) For cables with a specified sheath thickness up to and including 2,4 mm - sheath in a single layer, rubber compound of type EM 6 to EN 50363-2-1.

(b) For cables with a specified sheath thickness greater than 2,4 mm
- either in a single layer, rubber compound of type EM 6 to EN 50363-2-1
- or in two layers, with both layers made of rubber compound of type EM 6 to EN 50363-2-1.

The thickness of sheath shall comply with the specified value given in Table 3, columns 3, 4 and 5.

The sheath applied in a single layer or the inner layer of the sheath in two layers shall, for cables with 2 to 5 cores, fill the spaces between the cores.

The sheath shall be capable of being removed without damage to the core(s). Where taped cores are employed, some transfer of proofing from the tapes to the sheath is permissible.

The colour of sheath is not specified, but if black is used it shall be subject to the test for carbon black content given in Table 4, with a requirement for a minimum level as given for EM 6 in EN 50363-2-1.

4.3.7 Overall diameter

The mean overall diameter shall be within the limits given in Table 3, columns 6 and 7.

4.3.8 Outer markings

The cable shall have the marking H07BB-F printed or embossed on, or indented into, the outer surface of the sheath. The marking, which shall meet the requirements of Subclauses 3.2 and 3.3 of Part 1, shall be legible.

4.4 Tests

Compliance with the requirements of 4.3 of this Part 12 shall be checked by inspection and by tests given in Table 4.

The requirements to be met for the compatibility test shall be as given in Annex A.

4.5 **Guide to use** (informative)

See HD 516.