SLOVENSKI STANDARD
SIST HD 22.16 S2:2007

01-julij-2007

Nadomeģļ a:
SIST HD 22.16 S1:2002

Kabli z omreģeno izolacijo za naznaļ ene napetosti do vkljuļ no 450/750 V ï 16. del: Kabli, oplaģļ eni s proti vodi odpornim polikloroprenom ali ustreznim sintetiļ nim elastomerom

Cables of rated voltages up to and including 450/750 V and having cross-linked insulation -- Part 16: Water resistant polychloroprene or equivalent synthetic elastomer sheathed cables

Starkstromleitungen mit vernetzter Isolierhülle für Nennspannungen bis 450/750 V - Teil 16: Wasserbeständige schwere Schlauchleitungen mit Mantel aus Polychloropren oder gleichwertigem synthetischen Elastomer

Conducteurs et câbles isolés avec des matériaux réticulés de tension assignée au plus égale a 450/750 V - Partie 16: Câbles sous gaine en polychloroprene ou élastomere synthétique équivalent résistant a l'eau

Ta slovenski standard je istoveten z: **HD 22.16 S2:2007**

ICS:

29.060.20 Kabli Cables

SIST HD 22.16 S2:2007 **en;fr;de**

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

HD 22.16 S2

February 2007

ICS 29.060.20

Supersedes HD 22.16 S1:2000

English version

Cables of rated voltages up to and including 450/750 V and having cross-linked insulation - Part 16: Water resistant polychloroprene or equivalent synthetic elastomer sheathed cables

Conducteurs et câbles isolés avec des matériaux réticulés de tension assignée au plus égale à 450/750 V - Partie 16: Câbles sous gaine en polychloroprène ou élastomère synthétique équivalent résistant à l'eau

Starkstromleitungen mit vernetzter Isolierhülle für Nennspannungen bis 450/750 V - Teil 16: Wasserbeständige schwere Schlauchleitungen mit Mantel aus Polychloropren oder gleichwertigem synthetischen Elastomer

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 22.16 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 22.16 S2 on 2006-12-01.

This Harmonization Document supersedes HD 22.16 S1:2000.

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 has been superseded by EN 50395 and EN 50396

Contents

1 Scope

This Part 16 of the HD details the particular specifications for water resistant EPR insulated, polychloroprene or other equivalent synthetic elastomer sheathed flexible cables of rated voltages up to and including 450/750 V, meant for applications in fresh water up to 10 m depth and water temperatures up to 40 °C.

NOTE 1 Special regulations may apply to the use of cables in and around swimming pools and other locations, and to applications involving drinking water.

NOTE 2 In respect of external environmental conditions as codified in HD 384.3 this cable is classified “AD 8“ – Submersion - Possibility of permanent and total covering by water.

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

NOTE 3 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 Water-resistant polychloroprene or other equivalent synthetic elastomer sheathed flexible cable

3.1 Code designation

H07RN8-F.

3.2 Rated voltage

450/750 V.

3.3 Construction

3.3.1 Conductor

Number of conductors : 1, 2, 3, 4 or 5.

The conductors shall comply 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 Type EI 4 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 Tape

An optional non-hygroscopic tape may be applied on each core.

Where the insulation of conductors having a nominal cross-section in excess of 4 mm² is covered with a non-hygroscopic tape, it shall be helically wound with an overlap of at least 1 mm.

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

3.3.5 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 non-hygroscopic tape may be applied around the core assembly before application of the sheath, provided that the finished cables shall not have any substantial cavity in the outer interstices between the cores.

3.3.6 Sheath

The core or core assembly 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 type EM 2 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 type EM 2 to EN 50363-2-1

- or in two layers, with the inner layer made of one of the rubber compounds type, EM 2 or EM 3 to EN 50363-2-1, and the outer layer of the rubber compound type EM 2 to EN 50363-2-1.

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

For non-electrical tests on sheaths in two layers see Part 1, Subclause 5.5.2.2.

3.3.7 Overall diameter

The mean overall diameter shall be within the limits given in Table 1, columns 6 and 7.

3.3.8 Outer markings

The cable shall have the marking H07RN8-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 Subclause 3.3 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 H07RN8-F

1	2	3	4	5	6	7
Number & nominal cross sectional area of conductors	Thickness of insulation Specified value	Thickness of sheath Specified value			Mean overall diameter	
		One layer	Two layers		Lower limit	Upper limit
			Inner layer	Outer layer		
mm²	mm	mm	mm	mm	mm	mm
1 x 1,5	0,8	1,4	-	-	5,7	7,1
1 x 2,5	0,9	1,4	-	-	6,3	7,9
1 x 4	1,0	1,5	-	-	7,2	9,0
1 x 6	1,0	1,6	-	-	7,9	9,8
1 x 10	1,2	1,8	-	-	9,5	11,9
1 x 16	1,2	1,9	-	-	10,8	13,4
1 x 25	1,4	2,0	-	-	12,7	15,8
1 x 35	1,4	2,2	-	-	14,3	17,9
1 x 50	1,6	2,4	-	-	16,5	20,6
1 x 70	1,6	2,6	1,0	1,6	18,6	23,3
1 x 95	1,8	2,8	1,1	1,7	20,8	26,0
1 x 120	1,8	3,0	1,2	1,8	22,8	28,6
1 x 150	2,0	3,2	1,3	1,9	25,2	31,4
1 x 185	2,2	3,4	1,4	2,0	27,6	34,4
1 x 240	2,4	3,5	1,4	2,1	30,6	38,3
1 x 300	2,6	3,6	1,4	2,2	33,5	41,9
1 x 400	2,8	3,8	1,5	2,3	37,4	46,8
1 x 500	3,0	4,0	1,6	2,4	41,3	52
1 x 630	3,0	4,1	1,6	2,5	45,5	57
2 x 1	0,8	1,3	-	-	7,7	10,0
2 x 1,5	0,8	1,5	-	-	8,5	11,0
2 x 2,5	0,9	1,7	-	-	10,2	13,1
2 x 4	1,0	1,8	-	-	11,8	15,1
2 x 6	1,0	2,0	-	-	13,1	16,8
2 x 10	1,2	3,1	1,2	1,9	17,7	22,6
2 x 16	1,2	3,3	1,3	2,0	20,2	25,7
2 x 25	1,4	3,6	1,4	2,2	24,3	30,7

Table 1 - Dimensions of Type H07RN8-F (*continued*)

1	2	3	4	5	6	7
Number & nominal cross sectional area of conductors	**Thickness of insulation** **Specified value**	**Thickness of sheath** **Specified value**			**Mean overall diameter**	
		One layer	**Two layers**		**Lower limit**	**Upper limit**
			Inner layer	**Outer layer**		
mm²	mm	mm	mm	mm	mm	mm
3 x 1	0,8	1,4	-	-	8,3	10,7
3 x 1,5	0,8	1,6	-	-	9,2	11,9
3 x 2,5	0,9	1,8	-	-	10,9	14,0
3 x 4	1,0	1,9	-	-	12,7	16,2
3 x 6	1,0	2,1	-	-	14,1	18,0
3 x 10	1,2	3,3	1,3	2,0	19,1	24,2
3 x 16	1,2	3,5	1,4	2,1	21,8	27,6
3 x 25	1,4	3,8	1,5	2,3	26,1	33,0
3 x 35	1,4	4,1	1,6	2,5	29,3	37,1
3 x 50	1,6	4,5	1,8	2,7	34,1	42,9
3 x 70	1,6	4,8	1,9	2,9	38,4	48,3
3 x 95	1,8	5,3	2,1	3,2	43,3	54
3 x 120	1,8	5,6	2,2	3,4	47,4	60
3 x 150	2,0	6,0	2,4	3,6	52	66
3 x 185	2,2	6,4	2,5	3,9	57	72
3 x 240	2,4	7,1	2,8	4,3	65	82
3 x 300	2,6	7,7	3,1	4,6	72	90
4 x 1	0,8	1,5	-	-	9,2	11,9
4 x 1,5	0,8	1,7	-	-	10,2	13,1
4 x 2,5	0,9	1,9	-	-	12,1	15,5
4 x 4	1,0	2,0	-	-	14,0	17,9
4 x 6	1,0	2,3	-	-	15,7	20,0
4 x 10	1,2	3,4	1,4	2,0	20,9	26,5
4 x 16	1,2	3,6	1,4	2,2	23,8	30,1
4 x 25	1,4	4,1	1,6	2,5	28,9	36,6
4 x 35	1,4	4,4	1,7	2,7	32,5	41,1
4 x 50	1,6	4,8	1,9	2,9	37,7	47,5
4 x 70	1,6	5,2	2,0	3,2	42,7	54
4 x 95	1,8	5,9	2,3	3,6	48,4	61
4 x 120	1,8	6,0	2,4	3,6	53	66
4 x 150	2,0	6,5	2,6	3,9	58	73
4 x 185	2,2	7,0	2,8	4,2	64	80
4 x 240	2,4	7,7	3,1	4,6	72	91
4 x 300	2,6	8,4	3,3	5,1	80	101

Table 1 - Dimensions of Type H07RN8-F (*continued*)

1	2	3	4	5	6	7
Number & nominal cross sectional area of conductors	**Thickness of insulation** **Specified value**	**Thickness of sheath** **Specified value**			**Mean overall diameter**	
		One layer	**Two layers**		**Lower limit**	**Upper limit**
			Inner layer	**Outer layer**		
mm²	mm	mm	mm	mm	mm	mm
5 x 1	0,8	1,6	-	-	10,2	13,1
5 x 1,5	0,8	1,8	-	-	11,2	14,4
5 x 2,5	0,9	2,0	-	-	13,3	17,0
5 x 4	1,0	2,2	-	-	15,6	19,9
5 x 6	1,0	2,5	1,0	1,5	17,5	22,2
5 x 10	1,2	3,6	1,4	2,2	22,9	29,1
5 x 16	1,2	3,9	1,5	2,4	26,4	33,3
5 x 25	1,4	4,4	1,7	2,7	32,0	40,4