



# SLOVENSKI STANDARD

## SIST HD 21.12 S1:1998

01-februar-1998

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**Kabli s polivinilkloridno izolacijo za naznačene napetosti do vključno 450/750 V - 12. del: Toplotno odporni zvižavi kabli (vrvice)**

Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 12: Heat-resistant flexible cables (cords)

Polyvinylchlorid-isolierte Leitungen mit Nennspannungen bis 450/750 V - Teil 12: Wärmebeständige flexible Leitungen

Conducteurs et câbles isolés au polychlorure de vinyle de tension assignée au plus égale à 450/750 V - Partie 12: Câbles souples résistant à la chaleur

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**Ta slovenski standard je istoveten z: HD 21.12 S1:1994**

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**ICS:**

29.060.20      Kabli      Cables

**SIST HD 21.12 S1:1998      en**

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HARMONIZATION DOCUMENT

HD 21.12 S1

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

October 1994

ICS 29.060.20

Descriptors: Electrical installation, insulated conductor, insulated cable, flexible cable, polyvinyl chloride, heat resistance, particular specification, construction, dimension, test, marking

## ENGLISH VERSION

Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V  
Part 12: Heat-resistant flexible cables (cords)

Conducteurs et câbles isolés  
au polychlorure de vinyle de  
tension assignée au plus égale à  
450/750 V - Douzième partie:  
Câbles souples résistant à la  
chaleur

Polyvinylchlorid-isolierte  
Leitungen mit Nennspannungen bis  
450/750 V - Teil 12:  
Teil 12: Wärmebeständige  
flexible Leitungen

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This Harmonization Document was approved by CENELEC on 1994-07-05.  
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 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

This Part 12 of HD 21, as prepared by Technical Committee CENELEC TC 20 was submitted to the formal vote in January 1994.

The text of the draft was approved by CENELEC as HD 21.12 S1 on 5 July 1994.

The following dates were fixed:

- latest date of announcement  
of the HD at national level (doa) 1995-01-15
- latest date of publication of  
a harmonized national standard (dop) 1995-07-15
- latest date of withdrawal of  
conflicting national standards (dow) 1995-07-15

For products which have complied with the relevant national standard before 1995-07-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1996-07-15.

References are made in this Part 12 of HD 21 to other Parts of this HD and to other Harmonisation Documents and European Standards as follows:

HD 383	Conductors of insulated cables
HD 405.1	Tests on electric cables under fire conditions - Part 1: Test on a single vertical cable
HD 505	Common test methods for insulating and sheathing materials of electric cables
HD 516	Guide to use of low voltage harmonised cables
EN 60719	Calculation of the lower and upper limits for the average outer dimensions of cables with circular copper conductors and of rated voltages up to and including 450/750 V

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

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**POLYVINYL CHLORIDE INSULATED CABLES OF RATED VOLTAGES  
UP TO AND INCLUDING 450/750V**

**PART 12 : HEAT-RESISTANT FLEXIBLE CABLES (CORDS)**

1. **Scope**

This part (Part 12) of the HD details the particular specifications for heat-resistant polyvinyl chloride insulated and sheathed flexible cables (cords) of rated voltage up to and including 300/500V, for a rated conductor temperature not exceeding 90°C.

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.

**NOTE:** The overall dimensions of the cables in clauses 2 and 3 of this Part of HD 21 have been calculated in accordance with EN 60719.

2. **Heat-resistant light PVC-sheathed cord for a maximum conductor temperature of 90°C**

2.1 **Code designation**

H03V2V2-F for circular cords

H03V2V2H2-F for flat cords

2.2 **Rated voltage**

300/300V

2.3 **Construction**

2.3.1 **Conductor**

Number of conductors: 2, 3 and 4

The conductors shall be in accordance with the requirements of Class 5, given in HD 383.

2.3.2 **Insulation**

The insulation shall be polyvinyl chloride compound of Type T1 3 applied around each conductor.

The insulation thickness shall comply with the specified value given in Part 12, Table I, column 2.

The insulation resistance shall be not less than the values given in Part 12, Table I, column 6.

2.3.3 **Assembly of cores**

Circular cord: the cores shall be twisted together.

Flat cord: the cores shall be laid parallel.

### 2.3.4 Sheath

The sheath shall be polyvinyl chloride compound of Type TM 3 applied around the cores.

The sheath thickness shall comply with the specified value given in Part 12, Table I, column 3.

The sheath may fill the spaces between the cores, thus forming a filling, but it shall not adhere to the cores. The assembly of cores may be surrounded by a separator, which shall not adhere to the cores.

The assembly of circular cord shall have a practically circular cross-section.

### 2.3.5 Overall dimensions

The mean overall diameter of circular cords and the mean overall dimensions of flat cords shall be within the limits given in Part 12, Table I, columns 4 and 5.

### 2.3.6 Outer marking

In order to distinguish cords to this part from H03VV-F and H03VVH2-F of similar size (see Part 5 of this HD) the sheath shall be marked with at least the designatory marking V2V2. The marking shall be continuous in the sense of Clause 3.1.1 of Part 1 of this HD.

## 2.4 Tests

Compliance with the requirements of Part 12, sub-clause 2.3 shall be checked by inspection and by the tests given in Part 12, Table II.

## 2.5 Guide to use

See HD 516.

**TABLE I****GENERAL DATA FOR TYPES H03V2V2-F AND H03V2V2H2-F**

1	2	3	4	5	6
Number and nominal cross-sectional area of conductors	Thickness of insulation specified value	Thickness of sheath specified value	Mean overall dimensions		Minimum insulation resistance at 90°C
			Lower limit	Upper limit	
(mm <sup>2</sup> )	(mm)	(mm)	(mm)	(mm)	(Mohm.km)
2 x 0.5	0.5	0.6	4.6 or 3.0 x 4.9	5.9 or 3.7 x 5.9	0.012
2 x 0.75	0.5	0.6	4.9 or 3.2 x 5.2	6.3 or 3.8 x 6.3	0.010
3 x 0.5	0.5	0.6	4.9	6.3	0.012
3 x 0.75	0.5	0.6	5.2	6.7	0.010
4 x 0.5	0.5	0.6	5.4	6.9	0.012
4 x 0.75	0.5	0.6	5.7	7.3	0.010

**TABLE II**  
**TESTS FOR TYPES H03V2V2-F AND H03V2V2H2-F**

1	2	3	4	5
Ref. No.	Tests	Category of test	Test method described in	
			HD	Clause
1.	<u>Electrical tests</u>			
1.1	Resistance of conductors	T, S	21.2	2.1
1.2	Voltage test on completed cable at 2000V	T, S	21.2	2.2
1.3	Voltage test on cores at 1500V	T	21.2	2.3
1.4	Insulation resistance at 90°C	T, S	21.2	2.4
1.5	Long term resistance of insulation to d.c.	T	21.2	2.5
1.6	Absence of faults on insulation	R	21.2	2.6
2.	<u>Provisions covering constructional and dimensional characteristics</u>			
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 thickness of sheath	T, S	21.2	1.10
2.4	Measurement of overall dimensions			
2.4.1	Mean value	T, S	21.2	1.11
2.4.2	Ovality	T, S	21.2	1.11
3.	<u>Mechanical properties of insulation</u>			
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.	<u>Mechanical properties of sheath</u>			
4.1	Tensile test before ageing	T	505.1.1	9.2
4.2	Tensile test after ageing	T	505.1.2	8.1.3.1
4.3	Loss of mass test	T	505.3.2	8.2
5.	<u>Pressure at high temperature</u>			
5.1	Insulation	T	505.3.1	8.1
5.2	Sheath	T	505.3.1	8.2
6.	<u>Tests at low temperature</u>			
6.1	Bending test for insulation	T	505.1.4	8.1
6.2	Bending test for sheath	T	505.1.4	8.2
6.3	Impact test	T	505.1.4	8.5
7.	<u>Heat shock test</u>			
7.1	Insulation	T	505.3.1	9.1
7.2	Sheath	T	505.3.1	9.2
8.	<u>Thermal stability at 200°C</u>			
8.1	Insulation	T	505.3.2	9
8.2	Sheath	T	505.3.2	9
9.	<u>Mechanical strength of complete cable</u>			
9.1	Flexing test	T	21.2	3.1
10.	<u>Test under fire conditions</u>	T	405.1	-



### 3. Heat-resistant ordinary PVC-sheathed cord for a maximum conductor temperature of 90°C

#### 3.1 Code designation

H05V2V2-F for circular cords  
H05V2V2H2-F for flat cords

#### 3.2 Rated voltage

300/500V

#### 3.3 Construction

##### 3.3.1 Conductor

Number of conductors: 2, 3, 4 or 5

The conductors shall be in accordance with the requirements of Class 5, given in HD 383.

##### 3.3.2 Insulation

The insulation shall be polyvinyl chloride compound of Type TI 3 applied around each conductor.

The insulation thickness shall comply with the specified value given in Part 12, Table III, column 2.

The insulation resistance shall be not less than the values given in Part 12, Table III, column 6.

##### 3.3.3 Assembly of cores and filler, if any

Circular cord: the cores and the fillers, if any, shall be twisted together;  
Flat cord: the cores shall be laid parallel.

For circular cord having two cores, the space between the cores shall be filled either by separate fillers or by the sheath filling the interstices; for other circular cords, a centre filler may be used.

Any filler shall not adhere to the cores.

##### 3.3.4 Sheath

The sheath shall be polyvinyl chloride compound of Type TM 3 applied around the cores.

The sheath thickness shall comply with the specified value given in Part 12, Table III, column 3.

The sheath may fill the spaces between the cores, thus forming a filling, but it shall not adhere to the cores. The assembly of cores may be surrounded by a separator, which shall not adhere to the cores.