# SLOVENSKI STANDARD
# SIST HD 604 S1:1998/A1:1998

**01-februar-1998**

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**Elektroenergetski kabli za napetosti 0,6/1 kV in 1,9/3,3 kV s posebnimi ognjevzdržnimi lastnostmi za uporabo v elektrarnah**

0,6/1 kV and 1,9/3,3 kV power cables with special fire performance for use in power stations

Starkstromkabel mit besonderen Eigenschaften im Falle eines Brandes für Kraftwerke und einer Nennspannung von 0,6/1 kV und 1,9/3,3 kV



Câbles d'énergie 0,6/1 kV et 1,9/3,3 kV ayant un comportement au feu particulier et destinés aux centrales électriques



**Ta slovenski standard je istoveten z:** **HD 604 S1:1994/A1:1997**

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**ICS:**

| | | |
|---|---|---|
| 13.220.40 | Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju | Ignitability and burning behaviour of materials and products |
| 29.060.20 | Kabli | Cables |

**SIST HD 604 S1:1998/A1:1998** **en**

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

# HD 604 S1/A1

March 1997

UDC 621.315.2:621.039.53
ICS 29.060.20; 13.220.40

Descriptors: Electric cable, electric power station, fire behaviour, specification, characteristics, dimension, test, marking

English version

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This amendment A1 modifies the Harmonization Document HD 604 S1:1994; it was approved by CENELEC on 1996-12-09. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this amendment on a national level.

Up-to-date lists and bibliographical references concerning such national implementation may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in two official versions (English, French).

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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**Foreword**

This amendment to HD 604 S1:1994 has been prepared by WG 10 of CENELEC TC 20 'Electric Cables'. CENELEC TC 20 confirmed at its Athens meeting (November 1995) that the amendment should go to the Unique Acceptance Procedure.

As well as the listed additions and amendments to the particular sections of Parts 3-5, the title and scope of the HD have been amended in order to accomodate cables rated 1,9/3,3 kV, which had temporarily been included in HD 622 S1.

NOTE: During the preparation of this amendment, HD 505 (Sections 1.1 to 4.1 inclusive) has been replaced by EN 60811 (Sections 1-1 to 4-1 inclusive).

In general the updating of these references has not been included in this amendment unless a complete section has been introduced or replaced, but users should refer to EN 60811 for the most up-to-date information. The clause numbers for the test methods in EN 60811 are identical to those in HD 505.

The draft was submitted to the Unique Acceptance Procedure in March 1996 and was approved by CENELEC as amendment A1 to HD 604 S1:1994 on 1996-12-09. By decision of the Technical Board (D81/139) this HD exists only in English and French.

The following dates were fixed:

- latest date by which the existence of the amendment has to be announced at national level (doa) 1997-06-01
- latest date by which the amendment has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 1997-12-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1997-12-01

CONTENTS

(HD 604 S1:1994 plus Amendment No. 1)



Notes: [1] Amendment No. 1 introduces some changes to the text
[2] Amendment No. 1 completely revises the Particular Section
[3] New Section introduced by Amendment No. 1

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# Part 1 : General Requirements

*Replace pages 1-1, 1-2, 1-4, 1-5 and 1-6 by the following:*

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# HD 604 S1:1994
# 0,6/1,0 AND 1,9/3,3 kV POWER CABLES WITH SPECIAL FIRE PERFORMANCE FOR USE IN POWER STATIONS

## PART 1 : GENERAL REQUIREMENTS

REFERENCES

Part 1 of HD 604 incorporates by dated or undated reference, provisions from other publications. These references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to Part 1 of HD 604 only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

| | | |
|---|---|---|
| EN 60811 | : | Common test methods for insulating and sheathing materials of electric cables |
| HD 21 | : | PVC insulated cables of rated voltages up to and including 450/750V |
| HD 22 | : | Rubber insulated cables of rated voltages up to and including 450/750V |
| HD 186 | : | Marking by inscription for the identification of cores of electric cables having more than five cores |
| HD 383 | : | Conductors of insulated cables |
| HD 405 | : | Tests on electric cables under fire conditions |
| HD 602 | : | Test on gases evolved during the combustion of materials from cables: Determination of degree of acidity (corrosivity) of gases by measuring pH and conductivity |
| HD 605 | : | Electric cables: Additional test methods |
| HD 606 | : | Measurement of smoke density of electric cables burning under defined conditions |
| IEC 96-1 | : | Radio frequency cables Part 1: General requirements and measuring methods |

CONTENTS

# 0.6/1.0 AND 1.9/3.3 kV CABLES WITH SPECIAL FIRE PERFORMANCE FOR USE IN POWER STATIONS

## Part 1 - General Requirements

## 1. General

### 1.1 Scope

HD 604 applies to rigid and flexible conductor cables for fixed installations having a rated voltage Uo/U of 0.6/1kV or 1.9/3.3kV. The insulation and sheaths may be either thermoplastic or thermosetting, halogenated or halogen free. The cables are mainly intended for use in power generating plants and sub-stations. All cables have specific fire performance requirements. Cables designed to be installed within the containment area of nuclear power plants (LOCA cables), or cables specifically designed to be radiation resistant are not included in this HD.

Control cables having a minimum conductor size of 1mm² up to 61 cores are included in addition to the range of power supply cables.

This Part 1 specifies the General Requirements applicable to these cables; additional or deviating requirements are given in the particular sections of this HD.

Test Methods are specified in EN 60811, HD 21, HD 22, HD 383, HD 405, HD 602, HD 605, HD 606 and IEC 96-1.



The particular types of cables are specified in Parts 3, 4 and 5.

### 1.2 Object



The objects of this Harmonisation Document are:

- to standardise cables that are safe and reliable when properly used, in relation to the technical requirements of the system of which they form a part;
- to state the characteristics and manufacturing requirements directly or indirectly bearing on safety,
- and to specify methods for checking conformity with those requirements.

## 2. Definitions

### 2.1 Definitions relating to insulating and sheathing compounds

#### 2.1.1 Insulating and sheathing compounds

The types of insulating and sheathing compounds covered in this HD are listed below, together with their abbreviated designations.

##### 2.1.1.1 Thermoplastic Polyvinyl Chloride compound (PVC)

Combinations of materials suitable selected, proportioned and treated, of which the characteristic constituent is polyvinyl chloride or one of its copolymers. The same term also designates compounds containing both polyvinyl chloride and certain of its copolymers.

##### 2.1.1.2 Cross-linked Ethylene Propylene Rubber (EPR)

A compound based on ethylene propylene rubber or similar (EPM or EPDM) which when cross-linked complies with the requirements given in the particular sections.

2.1.1.3 Cross-linked Polyethylene (XLPE)

A thermosetting material formed by the cross-linking of thermoplastic polyethylene compound either by chemical or irradiation methods so as to comply with the requirements given in the particular sections.

2.1.1.4 Ethylene copolymers

Thermoplastic or cross-linked materials in which the characteristic constituent is a copolymer of ethylene such as EVA, EEA, EMA, compounded so as to comply with the requirements given in the particular sections.

2.1.1.5 Chlorinated Synthetic Elastomeric compound

A vulcanised compound in which the characteristic constituent is polychloroprene rubber (PCP) or other chlorinated synthetic elastomer, such as CSP, CPE or NBR/PVC compounded so as to comply with the requirements given in the particular sections.

Note: The abbreviations PCP, CSP and CPE are those in common use. Equivalent codings according to ASTM are CR, CSM and CM.

2.1.2 Type of compound

The category in which a compound is placed according to its properties, is determined by specific tests. The type designation is not directly related to the composition of the compound.



2.2 Definitions relating to the tests



Note: Tests classified as Sample (S) or Routine (R) may be required as part of any Type Approval Schemes.

2.2.1 Type tests (Symbol T)

Tests required to be made before supplying a type of cable covered by this HD on a general commercial basis in order to demonstrate satisfactory performance characteristics to meet the intended application. These tests are of such a nature that, after they have been made, they need not be repeated unless changes are made in the cable material, design or type of manufacturing process which might change the performance characteristics.

2.2.2 Sample tests (Symbol S)

Tests made on selected lengths of completed cable, on samples of completed cable, or components taken from a completed cable adequate to verify that the finished product meets the design specifications.

2.2.3 Routine test (Symbol R)

Tests made on all production cable lengths to demonstrate their integrity.

2.2.4 Tests after installation

Tests intended to demonstrate the integrity of the cable and its accessories as installed.

2.3 Rated voltage

The rated voltage of a cable is the reference voltage for which the cable is designed, and which serves to define the electrical tests.

The rated voltage is expressed by the combination of the following values Uo/U (Um) expressed in kV:

Uo is the r.m.s value between any insulated conductor and earth (metallic covering of the cable or the surrounding medium); Uo = 0.6kV or 1.9kV

U is the r.m.s. value between any two phase-conductors of a multicore cable or of a system of single-core cables; U = 1.0kV or 3.3kV

Um is the maximum r.m.s. value of the highest system voltage for which the equipment may be used; Um = 1.2kV or 3.6kV

In an alternating current system, the rated voltage of a cable shall be at least equal to the nominal voltage of the system for which it is intended.

If used in d.c. systems, the 0.6/1.0kV cables of this HD shall have a maximum voltage against earth not exceeding 1.9kV.

Note: The suitability of cables rated 1.9/3.3kV for use in d.c. systems should be confirmed with the manufacturer before installation.



3. Marking

3.1 Indication of origin



Cables shall be provided with an identification of origin consisting of:

1. Either the manufacturer's identification thread,

2. or the continuous marking of the manufacturer's name or trademark, or (if legally protected) identification number by one of the three following alternative methods:

   a) printed tape within the cable;

   b) printing in a contrasting colour on the insulation of at least one core;

   c) printing, indenting or embossing on the outer surface of the cable.

3.1.1 Continuity of marks

Unless otherwise specified in the particular section, each specified mark shall be regarded as continuous if the distance between the end of the mark and the beginning of the next identical mark does not exceed:

550mm if the marking is on the outer surface of the cable.
275mm if the marking is

i) on the insulation of a sheathed cable
ii) on a tape within a sheathed cable

Note: A "Specified Mark" is any mandatory mark covered by this Part of the HD or by the particular requirements of Part 3 onwards of this HD.