



# SLOVENSKI STANDARD

## SIST HD 622 S1:1998

01-februar-1998

---

**Power cables having rated voltages from 3,6/6 (7,2) kV up to and including 20,8/36 (42) kV with special fire performance for use in power stations**

Power cables having rated voltages from 3,6/6 (7,2) kV up to and including 20,8/36 (42) kV with special fire performance for use in power stations

Starkstromkabel mit Nennspannungen von 3,6/6 (7,2) kV bis 20,8/36 (42) kV mit verbessertem Verhalten im Brandfall für Kraftwerke

Câbles d'énergie de tension assignée de 3,6/6 (7,2) kV à 20,8/36 (42) kV inclus, ayant un comportement au feu particulier et destinés aux centrales électriques

<https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

**Ta slovenski standard je istoveten z: HD 622 S1:1996**

---

**ICS:**

29.060.20      Kabli      Cables

**SIST HD 622 S1:1998**      en

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST HD 622 S1:1998

<https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

HARMONIZATION DOCUMENT  
DOCUMENT D'HARMONISATION  
HARMONISIERUNGSDOKUMENT

**HD 622 S1**

June 1996

ICS 29.060.20

Descriptors: Power distribution, power station, electric cable, insulated cable, thermoplastic resin, thermosetting resin, fire resistance, definition, specification, characteristics, test, marking

English version

**Power cables having rated voltages from 3,6/6 (7,2) kV up to and including 20,8/36 (42) kV with special fire performance for use in power stations**

Câbles d'énergie de tension assignée de 3,6/6 (7,2) kV à 20,8/36 (42) kV inclus, ayant un comportement au feu particulier et destinés aux centrales électriques

Starkstromkabel mit Nennspannungen von 3,6/6 (7,2) kV bis 20,8/36 (42) kV mit verbessertem Verhalten im Brandfall für Kraftwerke

(standards.iteh.ai)

SIST HD 622 S1:1998

<https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

This Harmonization Document was approved by CENELEC on 1995-11-28. 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 such national implementation may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document 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

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST HD 622 S1:1998

<https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

HARMONIZATION DOCUMENT  
DOCUMENT D'HARMONISATION  
HARMONISIERUNGSDOKUMENT

HD 622 S1

June 1996

ICS 29.060.20

Descriptors: Power distribution, power station, electric cable, insulated cable, thermoplastic resin, thermosetting resin, fire resistance, definition, specification, characteristics, test, marking

English version

**Power cables having rated voltages from 3,6/6 (7,2) kV up to  
and including 20,8/36 (42) kV with special fire performance  
for use in power stations**

Câbles d'énergie de tension assignée  
de 3,6/6 (7,2) kV à 20,8/36 (42) kV  
inclus, ayant un comportement au feu  
particulier et destinés aux centrales  
électriques

Starkstromkabel mit Nennspannungen  
von 3,6/6 (7,2) kV bis 20,8/36 (42) kV  
mit verbessertem Verhalten im Brandfall  
für Kraftwerke

(standards.iteh.ai)

[SIST HD 622 S1:1998](https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998)

<https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

This Harmonization Document was approved by CENELEC on 1995-11-28. 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 such national implementation may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document 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



Page 0-2  
 HD 622 S1:1996  
 Part 0

## Foreword

This Harmonisation Document was prepared by WG10 of CENELEC Technical Committee TC20, Electric Cables. It was agreed by TC20 at its Helsinki meeting (May 1994) to be submitted for formal vote by National Committees.

The document contains the following Parts, arranged according to the main constructional features of the cables covered:

Part 1: General requirements

Part 3: Single core and three core cables containing halogenated materials

Part 4: Single core and three core cables with halogen free materials.

There is no Part 2, which was to have covered Additional Test Methods. These have been combined with the corresponding Part from HD 620 (Distribution cables with extruded insulation for rated voltages from 3,6/6(7,2)kV up to and including 20,8/36(42)kV) to form a separate document, HD 605/A1.

Each Parts 3 and 4 are further divided into particular sections and, by decision of the Technical Board (D68/047) National Committees need at present only implement in their national language those sections having national applicability. The obligation remains however to announce the full HD in public by titles and numbers, and also to withdraw any conflicting national standards.

Page numbering reflects the arrangement into Parts and particular sections, e.g. Page 4-C-3 is page 3 of particular section C of Part 4.

References to other HDs, ENs and international standards are given in the particular parts or sections.

The draft was submitted to the formal vote and was approved by CENELEC as HD 622 S1 on 1995-11-28. 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 HD has to be announced at national level (doa) 1996-06-01
- latest date by which the HD has to be implemented at national level by publication of a harmonised national standard or by endorsement (dop) 1996-12-01
- latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 1996-12-01

## Contents

## Part 1 General requirements

## Part 3 Single core and three core cables containing halogenated materials

- 3-A (Spare)
- 3-B (Spare)
- 3-C1 Three core PVC insulated and sheathed, non-radial field cables with aluminium conductors and metallic tape armour
- 3-C2 Single core XLPE insulated and PVC sheathed cables with aluminium conductors and metallic screen
- 3-C3 Three core EPR insulated and CSP sheathed, non-radial field cables with aluminium conductors and metallic screen
- 3-D (Spare)
- 3-E (Spare)
- 3-F Single and three core cables containing halogenated materials for 6, 10 and 15 kV
- 3-G Single and three core cables containing halogenated materials, circular or shaped conductors
- 3-H Single and three core cables with halogenated materials and with aluminium or steel wire armouring

## Part 4 Single core and three core cables with halogen-free materials

- 4-A Single and three core cables with halogen-free materials for 12, 17.5 and 24 kV
- 4-B Single and three core cables with halogen-free materials and aluminium laminate or copper wire screens
- 4-C Single core cable or assemblies with halogen free materials
- 4-D Single core cables with halogen free materials
- 4-E EPR insulated with halogen free sheath, three core armoured cables
- 4-F Single or three core cables with copper or aluminium conductors
- 4-G (Spare)
- 4-H Single and three core cables with non-halogenated materials and with aluminium or steel wire armouring
- 4-I Single core cables with halogen free materials and with aluminium alloy wire armouring

Page 0-4  
HD 622 S1:1996  
Part 0

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST HD 622 S1:1998

<https://standards.iteh.ai/en/standards/SIST-HD-622-S1-1998/5-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

**'BLANK PAGE'**



HD 622 S1:1996

POWER CABLES HAVING RATED VOLTAGE FROM  
3.6/6 (7.2) kV UP TO AND INCLUDING 20.8/36 (42) kV  
WITH SPECIAL FIRE PERFORMANCE FOR USE IN POWER STATIONS

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST HD 622 S1:1998](https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998)

<https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

Page 1-2  
 HD 622 S1:1996  
 Part 1

Contents		Page
1	General	1-4
	1.1 Scope	1-4
	1.2 Object	1-4
2	Definitions	1-4
	2.1 Definitions relating to insulating and sheathing compounds	1-4
	2.2 Definitions relating to the tests	1-5
	2.3 Rated voltage	1-6
3	Marking	1-6
	3.1 Indication of origin	1-6
	3.2 Additional marking	1-7
	3.3 Durability	1-7
	3.4 Legibility	1-7
	3.5 Common marking	1-8
	3.6 Use of the name CENELEC	1-8
4	Core identification	1-8
5	General requirements for the construction of cables	1-8
	5.1 Conductors	1-8
	5.2 Conductor screening	1-9
	5.3 Insulation	1-9
	5.4 Assembly of cores and fillers and binder tape	1-10
	5.5 Inner covering (bedding)	1-10
	5.6 Inner sheath	1-11
	5.7 Metallic coverings	1-11
	5.8 Outer sheath	1-12
	5.9 Non-metallic components of halogen-free cables	1-13
6	Tests on completed cables	1-13
7	(Spare)	1-13
8	(Spare)	1-13
9	Guide to use and selection of cables	1-13

## References

Part 1 of HD 622 S1 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 622 S1 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 insulated and sheathing materials of electric cables
- HD 21 - Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V
- HD 22 - Rubber insulated cables of rated voltages up to and including 450/750 V
- HD 186 - Marking by inscription for the identification of cores of electric cables having more than 5 conductors
- 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.

## 1 General

### 1.1 Scope

HD 622 applies to rigid cables for fixed installations having rated voltages  $U_o/U$  ( $U_m$ ) from 3.6/6 (7.2) kV up to and including 20.8/36 (42) kV used in systems of voltages not exceeding the maximum r.m.s. value of the system voltage  $U_m$ .

NOTE: Section H of both Part 3 and Part 4 temporarily includes cables rated 1.9/3.3 kV. It is intended to transfer these to another publication as soon as possible.

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.

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 and HD 606 which are referenced in the particular sections where relevant.

The particular types of cables are specified in Parts 3 and 4.  
<https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

### 1.2 Object

The objects of this Harmonisation Document are:

- to standardise cables that are safe and reliable when properly used;
- to state the characteristics and manufacturing requirements directly or indirectly bearing on safety;
- 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 suitably 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, compound so as to comply with the requirements given in the particular sections.

<https://standards.iteh.ai/catalog/standards/sist/288b8135-d8df-4531-97bf-1cc6c6ce3cbc/sist-hd-622-s1-1998>

**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, as 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 scheme.

### 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 tests (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  $U_0/U$  ( $U_m$ ) expressed in kV:

$U_0$  is the r.m.s. value between any insulated conductor and earth (metal covering of the cable or the surrounding medium); e.g.  $U_0 = 3.6$  kV.

$U$  is the r.m.s. value between any two phase-conductors of a multicore cable or of a system of single-core cables; e.g.  $U = 6.0$  kV.

$U_m$  is the maximum r.m.s. value of the highest system voltage for which the equipment may be used; e.g.  $U_m = 7.2$  kV.

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.

## 3 Marking

### 3.1 Indication of origin

Cables shall be provided with an identification of origin consisting of the continuous marking of the manufacturer's name or trademark, or (if legally protected) identification number, by one of the two following alternative methods:

- a) printed tape within the cable;
- b) printing, indenting or embossing on the outer surface of the cable.

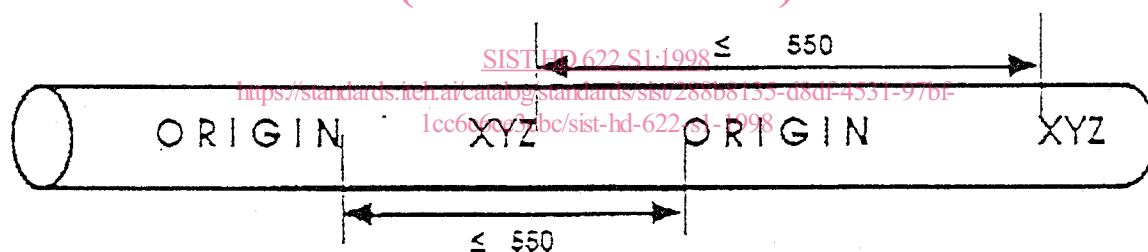
### 3.1.1 Continuity of marks

Unless otherwise specified in the particular sections, 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:

- 550 mm if the marking is on the outer surface of the cable;
- 275 mm if the marking is on a tape.

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.

The diagram below shows an example of the marking as used on the outer surface of the cable, where the word "ORIGIN" is for the mandatory information required for sub-clause 3.1, and "XYZ" is one of the other mandatory marks.



### 3.2 Additional marking

Additional marking may be specified in the particular sections.

### 3.3 Durability

Printed markings shall be durable. Compliance with this requirement shall be checked by the test given in sub-clause 2.5.4 of HD 605.

The printed legend shall be legible after the test.

### 3.4 Legibility

All markings shall be legible. Printed markings shall be in contrasting colours.