



SLOVENSKI STANDARD

SIST HD 632 S1:1999

01-november-1999

Power cables with extruded insulation and their accessories for rated voltages above 36 kV (Um = 42 kV) up to 150 kV (Um = 170 kV)

Power cables with extruded insulation and their accessories for rated voltages above 36 kV (Um = 42 kV) up to 150 kV (Um = 170 kV)

Starkstromkabel mit extrudierter Isolierung und ihre Garnituren für Nennspannungen über 36 kV (Um = 42 kV) bis 150 kV (Um = 170 kV)

Câbles d'énergie à isolation extrudée et leurs accessoires pour des tensions assignées supérieures à 36 kV (Um = 42 kV) et jusqu'à 150 kV (Um = 170 kV)

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Ta slovenski standard je istoveten z: HD 632 S1:1998

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29.060.20 Kabli Cables

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HARMONIZATION DOCUMENT
DOCUMENT D'HARMONISATION
HARMONISIERUNGSDOKUMENT

HD 632 S1

March 1998

ICS 29.060.20

Descriptors: Electrical power distribution, electrical installation, electric cable, single-core cable, insulated cable, polymeric resin, construction, characteristics, test

English version

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This Harmonization Document was approved by CENELEC on 1998-01-01. 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, Czech Republic, 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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Central Secretariat: rue de Stassart 35, B - 1050 Brussels



FOREWORD

HD 632 was prepared by the Technical Committee CENELEC TC20, Electric cables.

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

- Part 1 General test requirements
- Part 2 Additional test methods
- Part 3 Test requirements for cables with XLPE insulation and metallic screen and their accessories
- Part 4 Test requirements for cables with XLPE insulation, metallic screen and metal-laminated sheath and their accessories
- Part 5 Test requirements for cables with XLPE insulation and metallic sheath and their accessories
- Part 6 Test requirements for cables with EPR insulation and metallic screen and their accessories
- Part 7 Test requirements for cables with EPR insulation, metallic screen and metal-laminated sheath and their accessories
- Part 8 Test requirements for cables with EPR insulation and metallic sheath and their accessories
- Part 9 Test requirements for cables with PE or HDPE insulation and metallic screen and their accessories
- Part 10 Test requirements for cables with PE or HDPE insulation, metallic screen and metal-laminated sheath and their accessories
- Part 11 Test requirements for cables with PE or HDPE insulation and metallic sheath and their accessories

Each of Parts 3-11 inclusive 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 arrangements 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 632 S1 on 1998-01-01. 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) 1998-03-01
- latest date by which the HD has to be implemented at national level by publication of a harmonised national standard or by endorsement (dop) 1998-10-01
- latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 1998-10-01

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HD 632 S1:1998

POWER CABLES WITH EXTRUDED INSULATION
AND THEIR ACCESSORIES
FOR RATED VOLTAGES ABOVE 36 kV ($U_m = 42$ kV) UP TO 150 kV ($U_m = 170$ kV)

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PART 1 - GENERAL TEST REQUIREMENTS
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1. GENERAL

1.1 Scope

This standard specifies test requirements for power cables with extruded insulation, of the types listed in sub-clause 1.5, and their accessories, of rated voltage, U , above 36 kV ($U_m = 42$ kV) up to and including 150 kV ($U_m = 170$ kV), for fixed installations intended for transmission and distribution systems, and for use in power generating plants and sub-stations.

However, the summary of tests as listed in one only of the Particular Sections in Parts 3 to 11 of this HD is mandatory for the particular cables ordered.

In these Parts each Section is an individual alternative to Part 1.

Depending on the design and the system conditions, additional or even fewer tests or other requirements which are not described in the Part 1 can be specified in these Particular Sections of Parts 3 to 11.

The requirements apply to single-core cables and three-core cables with separate cores and to their accessories for usual conditions of installation and operation, but not to special cables and their accessories, such as those designed for submarine cables, for which modification to the standard tests may be necessary or special test conditions may need to be devised.

1.2 Normative references

[SIST HD 632 S1:1999](https://standards.iteh.ai/catalog/standards/sist/46ad4c03-8e95-40d0-abc-33bdfc556703/sist-hd-632-s1-1999)

Part 1 of HD 632 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 632 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 48	Impulse tests on cables and their accessories (Endorsing IEC 60230)
HD 383	Conductors of insulated cables (Endorsing IEC 60228 and 60228A)
HD 405	Tests on electric cables under fire conditions
HD 588.1	High voltage test techniques - Part 1: General definitions and test requirements (Endorsing IEC 60060-1)
HD 605	Electric cables : Additional test methods
IEC 60183	Guide to selection of high voltage cables
IEC 60229	Tests on cable oversheaths which have a special protective function and are applied by extrusion
IEC 60885	Electrical test methods for electric cables.

1.3 Rated voltages

In this standard the symbols U_o , U and U_m are used to designate the rated voltages of cables and accessories, where these symbols have the meanings given in IEC 60183.

1.4 Relationship of test voltages to rated voltages

Where test voltages are specified in this standard as multiples of the rated voltage U_o , the value of U_o for the determination of the test voltages shall be as specified in Table 1.

For cables and accessories of rated voltage not shown in the table, the value of U_0 for determination of test voltage may be the same as for the nearest rated voltage which is given, provided that the value U_m for the cable and accessory is not higher than the corresponding value in the table. Otherwise, and particularly if the rated voltage is not close to one of the values in the table, the value of U_0 on which the test voltages are based shall be the specific rated value, (i.e. U) divided by $\sqrt{3}$.

The test voltages in the standard are based on the assumption that the cables and accessories will be used on systems of Category A, as defined in IEC 60183.

1.5 Cable insulating materials

This standard applies to cables insulated with the materials listed in the following table, which also specifies for cables with each type of insulant the maximum operating conductor temperatures on which the specified test conditions are based.

Insulating compound	Maximum conductor temperature	
	Normal operation ¹⁾ (°C)	Short circuit ²⁾ (°C)
Low density thermoplastic polyethylene (PE)	70	130 ³⁾
High density thermoplastic polyethylene (HDPE)	80	160 ³⁾
Cross-linked polyethylene (XLPE)	90	250
Ethylene propylene rubber ⁴⁾ (EPR)	90	250

Notes:

1) The possibility of allocating maximum temperatures for emergency operation for limited periods, together with the need for a corresponding test specification, is under consideration. At present the operation at higher temperatures of cables tested according to this standard is not recommended.

2) Normally short circuit durations are of 5 seconds unless specified differently in the particular sections.

3) For PE and HDPE, short circuit temperatures up to 20°C in excess of those shown may be acceptable with suitable semiconducting layers over the conductor and the insulation and by agreement with the manufacturer.

4) Under the EPR compound it is intended to cover not only the normal Ethylene Propylene Rubber but also the Ethylene Propylene Rubber Hard grade (HEPR). The test requirements and test methods specific to HEPR are included in the particular Parts and Sections concerning HEPR insulated cables.

1.6 Precautions against water penetration in cables

As tests for radial water penetration are not available, a water impermeable barrier around the cable is recommended. A test for longitudinal water penetration is given in sub-clause 5.6.16.

The test is not intended to be applied to cables designed for submarine use, where more specific requirements apply.