SVENSK STANDARD SS 424 14 16

Fastställd	Utgåva	Sida	Ansvarig kommitté
2012-02-15	10	1 (1+100)	SEK TK 20

Kraftkablar – PEX-isolerad kabel med märkspänning 7/12 kV till 21/36 kV – Konstruktion och provning

Power cables – XLPE-insulated cables of rated voltages 7/12 kV to 21/36 kV – Specifications for design and testing

Som svensk standard för kraftkablar med märkspänning 7/12 kV till 21/36 kV gäller följande av CENELEC utarbetade HD-dokument:

HD 620 S2 Distribution cables with extruded insulation for rated voltages from 3,6/6 (7,2) kV up to and including 20,8/36 (42) kV, part 1, part 10 section M. Se bilaga A.

HD 622 S1 + A1 + A2 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, part 1, part 3 section G. Se bilaga B.

Nationellt förord

CENELECs HD-dokument är inte allmänt tillgängliga utan utgör underlag för utgivning av nationell standard. Av praktiska skäl och med CENELECs medgivande har endast sådana delar av HD 620 och HD 622 som företrädesvis tillämpas i Sverige återgivits i bilaga A och B till denna standard. I denna utgåva (utgåva 10) av SS 424 14 16 har bilaga A och B uppdaterats. I bilaga A har Part 1 ersatts med ny text och Part 5 och Part 6 har ersatts av Part 10. Förändringen innebär att texten för enledare samt treledare kombinerats. Vidare har en återgång till de äldre grövre skärmareorna gjorts.

Kopior av de kompletta HD-dokumenten, eller utdrag ur dessa, kan beställas hos SEK Svensk Elstandard.

Kabelspecifikationerna i HD 620 och HD 622 hänvisar beträffande speciella provningsmetoder till HD 605. Den motsvarande svenska standarden är SS 424 14 19.

Underlag för belastningsberäkningar för kablar med märkspänning 12 och 24 kV, och som tidigare funnits i SS 424 14 24, återges för information i bilaga C till denna standard.

Tidigare fastställd svensk standard SS 424 14 16, utgåva 9, 2008, gäller ej fr o m 2012-12-01.

ICS 29.060.20

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Bilaga A (56 sidor)

Förteckning över de delar av CENELEC HD 620 S2 som ingår i bilaga A i denna standard

Part 1	General requirements	
Part 10	XLPE insulated single-core cables and thre-core cables and single core pre-assembled cables	
	Section M	Cables with PE sheath (Type 10M-1) and PVC sheath (Type 10M-2)

Bilaga B (32 sidor)

Förteckning över de delar av CENELEC HD 622 S1 uppdaterad till och med amendment A2 som ingår i bilaga B i denna standard

Part 1	General requirements	
Part 3	Single and three core cables containing halogenated materials	
	Section 3G	Single and three core cables with copper or aluminium, round or sector shaped conductors

Bilaga C (8 sidor)

Kraftkablar – Belastningsförmåga hos kablar med märkspänning 12 till 24 kV

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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 60228	Conductors of insulated cables (IEC 60228)
EN 60229	Electric cables – Tests on extruded oversheaths with a special protective function (IEC 60229)
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 cables – Common test methods (IEC 60811 series)
EN 60885-3	Electrical test methods for electric cables – Part 3: Test methods for partial discharge measurements on lengths of extruded power cables (IEC 60885-3)
HD 605	Electric cables – Additional test methods
HD 632	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)
IEC 60183	Guide to the selection of high-voltage cables
IEC 60287 series	Electric cables – Calculation of the current rating

1 General

1.1 Scope

HD 620 applies to cables with extruded insulation and for rated voltages $U_o/U(U_m)$ from 3,6/6 (7,2) kV up to 20,8/36(42) kV used in power distribution systems of voltages not exceeding the maximum r.m.s. value of the system voltage U_m.

This Part (Part 1) specifies the general requirements applicable to these cables, unless otherwise specified in the particular sections of this HD.

Test methods specified are given EN 60228, EN 60229, EN 60332-1-2, EN 60811, EN 60885-3, HD 605 and HD 632.

Attention should be drawn to the fact that a significant number of sections include references to long term tests which are collected in HD 605. These long-term tests are considered as necessary and reflect the best available knowledge for the existing cable design. They are related to specific designs and different philosophies concerning adequate measures against the influence of water. However it is the firm intention to reduce this large number of different tests, but more experience should be gained before starting to rationalise this important matter.

The particular types of cables are specified in Parts 9 to 11.

NOTE Cables originally in Parts 3, 4, 5, 6, 7 and 8 have now been withdrawn.

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 which have a direct or indirect bearing on safety;
- and to specify methods for checking conformity with those requirements.

PART 10:
XLPE INSULATED SINGLE-CORE AND THREE-CORE CABLES, AND SINGLE-CORE PRE-ASSEMBLED CABLES

SECTION M:
SINGLE AND THREE-CORE CABLES WITH PE SHEATH (TYPE 10M-1) AND PVC SHEATH (TYPE 10M-2)

References

Section M of Part 10 of HD 620 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 Section M of Part 10 of HD 620 only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 60228	Conductors of insulated cables (IEC 60228)
EN 60229	Electric cables – Tests on extruded oversheaths with a special protective function (IEC 60229)
EN 60230	Impulse tests on cables and their accessories (IEC 60230)
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 60332-3-24	Tests on electric and optical fibre cables under fire conditions - Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category C (IEC 60332-3-24)
EN 60811 series	Insulating and sheathing materials of electric and optical cables – Common test methods (IEC 60811 series)
HD 605	Electric cables – Additional test methods
IEC 60183	Guide to the selection of high-voltage cables
IEC 60287 series	Electric cables – Calculation of the current rating
IEC 60502-2	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1,2 kV) up to 30 kV (U_m = 36 kV) – Part 2: Cables for rated voltages from 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV)

1 General

This standard specifies the construction, dimensions and test requirements of power cables with XLPE-insulation, for rated voltage (U) of 10, 20 or 30 kV and for fixed installation.

(a) Insulating materials

The insulation used in this standard shall consist of cross-linked polyethylene and correspond to HD 620-1, Table 2A, compound DIX11.

(b) Rated voltage

6/10(12), 12/20(24) and 18/30(36) kV

(i) Definitions see HD 620-1, Subclause 2.3

(ii) Cables covered by this standard are suitable for Category B (rated voltage 6/10(12) kV and 12/20(24) kV) and for Category A (rated voltage 18/30(36) kV) according to IEC 60183.

(c) Highest permissible conductor temperatures

(i) Normal operation	90 °C
(ii) Short circuit temperatures (5 s maximum temperature)	250 °C

(d) Sheathing materials

The sheathing material shall be suitable for the maximum rated conductor temperature. It shall consist of polyvinylchloride or polyethylene and correspond to HD 620-1, Table 4A, compound DMV28 or Table 4B, compound DMP10.

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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 50266 (series)	Common test methods for cables under fire conditions – Test for vertical flame spread of vertically-mounted bunched wires or cables.
EN 50267 (series)	Common test methods for cables under fire conditions - Tests on gases evolved during combustion of materials from cables.
EN 50268 (series)	Measurement of smoke density of electric cables burning under defined conditions.
EN 50334	Marking by inscription for the identification of cores of electric cables
EN 60228	Conductors of insulated cables
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
EN 60811 (series)	Insulating and sheathing materials of electric cables - Common test methods
HD 21	Cables of rated voltages up to and including 450/750 V and having thermoplastic insulation
HD 22	Cables of rated voltages up to and including 450/750 V and having crosslinked insulation
HD 605	Electric cables – Additional test methods

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.

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 50266, EN 50267, EN 50268, EN 60228, EN 60332-1-2, EN 60811, HD 21, HD 22 and HD 605, which are referenced in the particular sections where relevant.

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

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.

SECTION G

SINGLE OR THREE-CORE CABLES WITH COPPER OR ALUMINIUM, ROUND OR SECTOR-SHAPED CONDUCTORS

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REFERENCES

Section G of Part 3 of HD 622 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 Section G of Part 3 of HD 622 only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 50266	Common test methods for cables under fire conditions – Test for vertical flame spread of vertically-mounted bunched wires or cables
EN 60228	Conductors of insulated cables
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
EN 60811	Common test methods for insulating and sheathing materials of electric cables
HD 605	Electric cables: Additional test methods
IEC 60229	Tests on cable oversheaths which have a special protective function and are applied by extrusion
IEC 60502-2	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1,2 kV) up to 30 kV (U_m = 36 kV) - Part 2: Cables for rated voltages from 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV)

1 Scope

This section specifies requirements for and dimensions of single core and three-core XLPE-insulated and PVC-sheathed cables having higher fire propagation performance.

The maximum continuous conductor temperature shall not exceed 90 °C. The maximum temperature for short-circuit conditions is 250 °C.

This section covers the following class of cable:

1 and 3-core screened cables having copper or aluminium, round or sector shaped conductors rated 6/10(12) kV. Design and test parameters for cables rated 12/20(24)kV and 18/30(36)kV can be found in HD 620 Part 5 Section M and Part 6 Section M.