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# Power cables with XLPE insulation and metal sheath, and their accessories, for rated voltages from 66 kV ($U_m$ = 72.5 kV) to 132 kV ($U_m$ = 145 kV)

(Implementation of HD 632)

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# Foreword

## Publishing Information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 December 2012. It was prepared by Subcommittee GEL/20/16, *Medium/high voltage cables*, under the authority of Technical Committee GEL/20, *Electric cables*. A list of organizations represented on these committees can be obtained on request to the committee manager.

## Supersession

BS 7912:2012 superseded BS 7912:2001, which has been withdrawn.

BS 7912:2012+A1:2017 superseded BS 7912:2012, which has been withdrawn.

BS 7912:2012+A2:2023 supersedes BS 7912:2012+A1:2017, which is withdrawn.

## Relationship with other publications

BS 7912:2012 implemented the nationally applicable parts of Harmonization Document HD 632 S2:2008 published by the European Committee for Electrotechnical Standardization (CENELEC), in accordance with the decision of the CENELEC Technical Board.

## Information about this document

BS 7912:2012 was a full revision of the standard, and introduced the following principal changes:

- alignment with the latest version of HD 632 part 1, being itself identical to Edition 4 of IEC 60840;
- inclusion of matter relating to BS 7970, which was also revised in parallel.

Text introduced or altered by Amendments No. 1 and No. 2, respectively is indicated in the text by tags 〈A1〉 〈A1〉 and 〈A2〉 〈A2〉. Minor editorial changes are not tagged.

Amendment A1 introduces the following principal changes:

- replacement of subclause **4.6** with new text;
- replacement of Clause **9** with new text;
- expansion/restructure of Clause **10** to include accessories;
- replacement of subclause **10.1.7** (previously **10.7**) with new text;
- addition of new subclause **10.2**;
- alteration to subclause **14.1**;
- replacement of subclause D.1 with new text;
- replacement of Figure D.1 with new figure.

Amendment A2 introduces the following principal changes:

a) establishes that type test approvals for ranges of gas-immersed terminations only apply when the same gas/gas mixture and the same pressure is used as for the type test;

b) explains what to do when intended use and type test differ in gas pressure or gas type:

   1) where the intended gas pressure exceeds that used in the type test, it defines the testing required to extend the approval up to a higher gas pressure;

 

2) where the gas/gas mixture is different to that type tested, it defines the testing required to extend the approval to include the new gas type.

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The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

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## 1 Scope

This British Standard specifies tests and requirements for power cables with XLPE insulation and metal sheath and their accessories for rated voltages from 66 kV ($U_m$ = 72.5 kV) to 132 kV ($U_m$ = 145 kV) for fixed installations.

*NOTE 1 Cable systems to this standard do not normally have high electrical stresses at the conductor or insulation screen. If the calculated nominal electrical stresses at the conductor screen will be higher than 8.0 kV/mm and/or at the insulation screen higher than 4.0 kV/mm, then attention is drawn to the need to conduct a prequalification test in accordance with IEC 60840:2011, Clause **13**.*

This British Standard is applicable to single-core cables and three-core cables with separate cores and to their accessories for usual conditions of installation and operation. It is not applicable to special cables and their accessories, such as those designed for submarine cables, for which modification to the standard tests might be necessary or special test conditions might need to be devised.

*NOTE 2 Annex A gives tests and requirements for cable bonding leads. Annex B gives tests and requirements for sheath voltage limiters (SVLs), while Annex C gives tests and requirements for link housings. Annex D gives an additional water blocking test for phase conductors. Annex E gives tests and requirements for gas-immersed terminations in case of changing insulation gas.*

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits 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.

BS 7870-2:2011, *LV and MV polymeric insulated cables for use by distribution and generation utilities – Part 2: Methods of test*

BS 7970, *Electric cables – Metal foil and longitudinally welded aluminium sheath constructions of power cables having XLPE insulation for rated voltages from 66 kV ($U_m$ = 72.5 kV) to 132 kV ($U_m$ = 145 kV)*

BS EN 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

BS EN 60228, *Conductors of insulated cables*

BS EN 60229:2008, *Electric cables – Tests on extruded oversheaths with a special protective function*

BS EN 60230, *Impulse tests on cables and their accessories*

BS EN 60287-1-1, *Electric cables – Calculation of the current rating – Part 1-1: Current rating equations (100% load factor) and calculation of losses – General*

BS EN 60332-1-2:2004, *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*

BS EN 60811-201, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 201: General test – Measurement of insulation thickness*

BS EN 60811-202, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 202: General test – Measurement of thickness of non-metallic sheath*

BS EN 60811-401, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 401: Miscellaneous tests – Thermal ageing methods – Ageing in an air oven*

BS EN 60811-409, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 409: Miscellaneous tests – Loss of mass test for thermoplastic insulations and sheaths*

 