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# **LV and MV polymeric insulated cables for use by distribution and generation utilities —**

**Part 3: Specification for distribution  
cables of rated voltage 0.6/1 kV —**

**Section 3.12: XLPE insulated combined  
neutral and earth copper wire  
concentric cables with copper or  
aluminium conductors, having low  
emission of smoke and corrosive gases  
when affected by fire**

**(Implementation of HD 603)**

ICS 29.060.20

# Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee GEL/20, Electric cables, to Subcommittee GEL/20/2, Mains cables, 1 kV and above, upon which the following bodies were represented:

- Association of Consulting Engineers
- British Approvals Service for Cables
- British Cables Association
- British Plastics Federation
- Electricity Association
- ERA Technology Ltd.
- London Underground Ltd.
- UK Steel Association

This British Standard, having been prepared under the direction of the Electrotechnical Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 September 2001  
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## Amendments issued since publication

| Amd. No. | Date            | Comments     |
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| 14406    | 4 February 2004 | See foreword |
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|          |                 |              |
|          |                 |              |

The following BSI references relate to the work on this British Standard:  
Committee reference GEL/20/2  
Draft for comment 99/244661 DC

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## Foreword

This section of BS 7870 has been prepared by Subcommittee GEL/20/2.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A_1}$   $\langle A_1 \rangle$ . Tags indicating changes to text carry the number of the amendment. For example, text altered by amendment No. 1 is indicated by  $\boxed{A_1}$   $\langle A_1 \rangle$ .

BS 7870 implements the nationally applicable parts of Harmonization Documents HD 603, 604, 605, 620, 622, 626 and 627 published by the European Committee for Electrotechnical Standardization (CENELEC), in accordance with the decision of the CENELEC Technical Board.

BS 7870 applies to cables for fixed installations having a rated voltage  $U_0/U$  up to and including 19/33 kV, and is published as a series of separate parts and sections, as listed in the table in the foreword of BS 7870-1.

BS 7870-3.12 specifies a range of XLPE insulated combined neutral/earth (CNE) service cables having low emission of smoke and acid gases when affected by fire, implements Part 5S of HD 603 S1 A2, and is to be read in conjunction with BS 7870-1 and BS 7870-2.

A “Guide to use” for these types of cable is under consideration.

Amendment No. 1:2004 implements the changes to the identification of cores by colours, in accordance with HD 308 S2. The principal identification colours are now:

Single phase — Green-and-yellow (Earth); blue (Neutral); brown (Live).

Three phase — Green-and-yellow (Earth); blue (Neutral); brown, black, grey (Live).

Users should ensure that any interconnection between cables with these new colours and those with the pre-existing ones is carried out safely. BS 7671, as amended in parallel with this standard, gives some guidance in this respect, but does not cover all installation conditions or cable uses.

The provisions introduced by amendment No. 1:2004 are effective from 1<sup>st</sup> April 2004. The original version of this standard remains current 31<sup>st</sup> March 2006.

Annex A is normative.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

**WARNING.** This British Standard calls for the use of procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 2 to 13 and a back cover.

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## 1 Scope

This section of BS 7870 specifies requirements for the construction, dimensions and mechanical and electrical properties of concentric copper wire combined neutral/earth (CNE) service cables having a rated voltage of 0.6/1 (1.2) kV. It is applicable to cables that, when assessed by the specified tests, produce lower levels of smoke and corrosive gases under exposure to fire than cables conforming to BS 7870-3.10 and BS 7870-3.11.

It specifies requirements for the following types of cable:

- a) single phase or 3-phase;
- b) stranded copper or solid aluminium conductors;
- c) XLPE insulation and thermoplastic oversheath with low emission of smoke and acid gases when affected by fire.

This section of BS 7870 is applicable to cables that are designed for a maximum continuous conductor operating temperature of 90 °C and for a maximum short circuit conductor temperature of 250 °C.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this section of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

**[A1]** *Text deleted* **[A1]**

BS 6360, *Specification for conductors in insulated cables and cords*.

BS 7655-1.3, *Specification for insulating and sheathing materials for cables — Part 1: Elastomeric insulating compounds — Section 1.3: XLPE*.

BS 7655-6.1, *Specification for insulating and sheathing materials for cables — Part 6: Thermoplastic sheathing compounds having low emission of corrosive gases, and suitable for use in cables having low emission of smoke when affected by fire — Section 6.1: General application thermoplastic types*.

BS 7870-1, *LV and MV polymeric insulated cables for use by distribution and generation utilities — Part 1: General*.

BS 7870-2:1999, *LV and MV polymeric insulated cables for use by distribution and generation utilities — Part 2: Methods of test*.

BS EN 50265-2-1, *Common test methods for cables under fire conditions — Test for resistance to vertical flame propagation for a single insulated conductor or cable — Part 2-1: Procedures — 1 kW pre-mixed flame*.

**[A1]** BS EN 50266-2-4:2001, *Common test methods for cables under fire conditions — Test for vertical flame spread of vertically-mounted bunched wires or cables — Part 2-4: Procedures — Category C*. **[A1]**

BS EN 50267-2-1, *Common test methods for cables under fire conditions — Tests on gases evolved during combustion of materials from cables — Part 2-1: Procedures — Determination of the amount of halogen acid gas*.

BS EN 50268-1, *Common test methods for cables under fire conditions — Measurement of smoke density of cables burning under defined conditions — Part 1: Apparatus*.

BS EN 50268-2, *Common test methods for cables under fire conditions — Measurement of smoke density of cables burning under defined conditions — Part 2: Procedure*.

BS EN 60811-1-2:1995, *Insulating and sheathing materials of electric cables — Common test methods — Part 1-2: General application — Thermal ageing methods*.

BS EN 60811-1-3:1995, *Insulating and sheathing materials of electric cables — Common test methods — Part 1-3: General application — Methods for determining the density — Water absorption tests — Shrinkage test*.