

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

**Part 8: Specification for multicore and multipair cables for installation above and below ground —**

**Section 8.3: Single wire armoured and PVC sheathed multicore cable with copper conductors, having reduced fire propagation performance**

**(Implementation of part of HD 627)**

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# Committees responsible for this British Standard

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British Cables Association

British Plastics Association

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## Foreword

This section of BS 7870 has been prepared by Subcommittee GEL/20/16, under the direction of Technical Committee GEL/20.

BS 7870 implements the nationally applicable parts of Harmonization Documents HD 603, HD 604, HD 605, HD 620, HD 622, HD 626 and HD 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 7870-8.3 implements HD 627:Part 5A1 and is to be read in conjunction with BS 7870-1 and BS 7870-2.

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 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 1 to 15 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 multicore XLPE, HEPR and PVC insulated and PVC sheathed cables having reduced fire propagation performance conforming to BS EN 50265-2-1 and BS EN ISO 4589-3. It specifies requirements for steel wire armoured multicore cables (2-core to 48-core) having copper conductors.

This section of BS 7870 is applicable to cables for use in and around power stations and other installations having similar cable densities.

NOTE A “guide to use” is given in Annex A.

## 2 Normative 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.

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

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 7870-6.2:1999, *LV and MV polymeric insulated cables for use by distribution and generation utilities — Part 6: Specification for 0.6/1 kV and 1.9/3.3 kV power cables with special fire performance for use in power stations — Section 6.2: XLPE or HEPR insulated and PVC sheathed cables*.

BS 7655-3.1, *Specification for insulating and sheathing materials for cables — Part 3: PVC insulating compounds — Section 3.1: Harmonized types*.

BS 7655-4.1, *Specification for insulating and sheathing materials for cables — Part 4: PVC sheathing compounds — Section 4.1: Harmonized types*.

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*.

BS EN 60811-1-1:1995, *Insulating and sheathing materials of electric cables — Common test methods — Part 1-1: General application — Measurement of thickness and overall dimensions — Tests for determining the mechanical properties*.

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*.

BS EN 60811-2-1:1995, *Insulating and sheathing materials for electric cables — Common test methods — Part 2-1: Methods specific to elastomeric compounds — Ozone resistance, hot set and mineral oil immersion tests*.

BS EN ISO 4589-3, *Plastics — Determination of burning behaviour by oxygen index — Part 3: Elevated temperature test*.

## 3 Voltage designation

Cables shall be designated by the voltages  $U_0$ ,  $U$  and  $U_m$ , expressed in the form  $U_0/U (U_m)$ .

The voltage designation of cables in this standard is 0.6/1(1.2) kV.

## 4 Conductors

Conductors shall be 1.5 mm<sup>2</sup>, 2.5 mm<sup>2</sup> or 4 mm<sup>2</sup> circular stranded copper (class 2), conforming to the requirements of BS 6360.

Conformity shall be checked by visual examination as specified in **15.2**.

NOTE A separator tape may be applied over the conductor.

## 5 Insulation

The insulation shall be XLPE, HEPR or PVC compound.

The insulation shall be applied so that it fits closely on the conductor and it shall be possible to remove it without damage to the insulation itself or to the conductor.

The insulation shall be applied by a suitable extrusion process, cross-linked where required, and shall form a compact and homogenous body.

Conformity shall be checked by the test methods specified in **15.3**.

## 6 Identification of cores

The cores shall be black or white with printed numbers in a contrasting colour.

The cores shall be numbered in sequence inside to outside from 1 to 48.

Cores shall be clearly identifiable and the printing shall be durable.

Conformity shall be checked by visual examination as specified in **15.4**.

## 7 Assembly of cores, fillers and binders

The direction of lay shall alternate for each successive layer. Up to seven cores shall be laid up with either a right- or left-hand direction of lay or an alternating right- and left-hand direction of lay.

Conformity shall be checked by visual examination as specified in **15.5**.

NOTE 1 Where necessary, fillers of suitable synthetic material may be used.

NOTE 2 At the discretion of the manufacturer, a synthetic binder tape may be applied over the laid-up cores.

## 8 Bedding layer

The bedding shall be an extruded layer of polymer compound, conforming to the requirements specified in Table 1 to Table 6.

NOTE Tapes may be applied over the bedding.

## 9 Armouring

All cables shall be armoured with a single layer of galvanized wires. The wires shall be applied with a direction of lay opposite to that of the outer layer of cores.

Joints in the steel wire armour shall be brazed or welded and any surface irregularity shall be removed. Any joint in any wire shall be not less than 1 m from the nearest joint in any other armour wire in the complete cable.

NOTE Tapes may be applied over the armour wires.

## 10 Oversheath

The oversheath shall be an extruded layer of PVC compound type TM 1, conforming to the requirements of BS 7655-4.1.