



BSI Standards Publication

Electric cables – Specification for 300/500 V screened electric cables having low emission of smoke and corrosive gases when affected by fire, for use in walls, partitions and building voids – Multicore cables

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 20, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 30 April 2011. It was prepared by Subcommittee GEL/20/17, *Low voltage cables*, under the authority of Technical Committee GEL/20, *Electric cables*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 8436:2004, which is withdrawn.

Relationship with other publications

The new edition takes account of:

- BS EN 60228 (replacing BS 6360) on conductors;
- BS EN 50363 (replacing certain parts of BS 7655) on materials;
- BS EN 60332-1-2 (replacing BS EN 50265-2-1) and BS EN 61034 (replacing BS EN 50268) on reaction to fire performance tests;
- BS EN 62230 (replacing BS EN 50356) on spark testing.

Information about this document

This is a full revision of the standard, and introduces the following principal changes:

- a) the range of cables specified is extended;
- b) the marking arrangements are clarified;
- c) the fundamental safety test relating to nail penetration is improved;
- d) the relationship between the sizes and types of protective devices (circuit breakers) is clarified.

Product certification/inspection/testing. Users of this British Standard are advised to consider the desirability of third-party certification/inspection/ testing of product conformity with this British Standard. Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

Hazard warnings

WARNING. This British Standard calls for the use of substances and/or procedures that can 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

Presentational conventions

The provisions in 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.

Contractual and legal considerations

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 cannot confer immunity from legal obligations.

Attention is drawn to the following regulations:

The Electricity Safety, Quality and Continuity Regulations 2002 [1]

1 Scope

- This British Standard specifies requirements and test methods for the construction and performance of cables that:
- have a thermosetting insulation of rated voltage 300/500 V;
- emit limited amounts of smoke (see 15.5) and corrosive gases when subjected to relevant tests;
- are primarily intended for use in walls, partitions and building voids;
- have a screen that can carry the fault current required for a selected size and type of protective device, that operates within a given time if the cable is penetrated by a nail or similar fixing (see 16.4).

To achieve a satisfactory safety performance of the cable when installed, both the selection of protective device and the maximum current rating is critical.

NOTE 1 See Clause 12 for the requirements of the safe selection of protective devices and maximum current rating of cables.

It is applicable to 2-core, 3-core and 4-core cables with an uninsulated, full-size circuit protective conductor and metallic screening.

NOTE 2 A guide to the use of the cables specified in this British Standard 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 5099, *Electric cables – Voltage levels for spark testing*

BS 7655-1.2, *Specification for insulating and sheathing materials for cables – Part 1: Cross-linked elastomeric insulating compounds – Section 1.2: General 90 °C application*

BS 7655-1.3, *Specification for insulating and sheathing materials for cables – Part 1: Cross-linked 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 7671:2008, *Requirements for electrical installations – IEE Wiring Regulations – Seventeenth edition*

BS EN 10230-1:2000, *Steel wire nails – Part 1: Loose nails for general applications*

BS EN 13603:2002, *Copper and copper alloys – Test methods for assessing protective tin coatings on drawn round copper wire for electrical purposes*

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 50363-5, *Insulating, sheathing and covering materials for low voltage energy cables – Part 5: Halogen-free, cross-linked insulating compounds*

BS EN 60228, *Conductors of insulated cables*

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

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

BS EN 60898, *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations*

BS EN 61009-1, *Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) – Part 1: General rules*

BS EN 61034-1, *Measurement of smoke density of cables burning under defined conditions – Part 1: Test Apparatus*

BS EN 61034-2:2005, *Measurement of smoke density of cables burning under defined conditions – Part 2: Test procedure and requirements*

BS EN 62230, *Electric cables – Spark-test method*

IEC 60050-461, *International Electrotechnical Vocabulary – Part 461: Electric cables*

3 Terms and definitions

For the purposes of this British Standard the terms and definitions given in IEC 60050-461 and the following apply.

3.1 cable manufacturer

organization that has the capability to both produce and control the conformity of cable made to this standard

NOTE See Clause 11.1, a) for information on marking the cable with the cable manufacturer's name and identifier.

3.2 let-through energy, I^2t

energy let-through value of a device, measured in amperes squared seconds (A^2s)

3.3 routine tests, R

tests made on all production cable lengths to demonstrate their integrity

3.4 sample tests, S

tests made on samples of completed cable, or components taken from a completed cable, adequate to verify that the product meets the design requirements

3.5 type tests, T

tests made before supplying, on a general commercial basis, a type of cable covered by this standard, in order to demonstrate satisfactory performance characteristics to meet the intended application

NOTE These tests are of such a nature that after they have been made, they need not be repeated unless changes are made in the cable material, design or type of manufacturing process, which might change the performance characteristics.

3.6 values

3.6.1 approximate value

value which is only indicative

NOTE Values described as "approximate" do not constitute requirements to be checked by measurement.

3.6.2 nominal value

value by which a quantity is designated

NOTE Nominal values usually give rise to values to be checked by measurements taking into account specified tolerances.

3.7 voltages

3.7.1 maximum voltage, U_m

maximum sustained power-frequency voltage between phase conductors for which the cable is suitable

3.7.2 rated voltage, U

nominal power-frequency voltage between phase conductors for which the cable is suitable

3.7.3 rated voltage, U_o

nominal power-frequency voltage between conductor(s) and earth for which the cable is suitable

4 Voltage designation

The cables shall be designated by the rated voltages U_o and U , expressed in the form U_o/U . The rated voltage recognized for the purpose of this British Standard shall be 300/500 V.

5 Conductors

The conductors shall conform to BS EN 60228, class 1, 2 or 5. The insulated conductors shall be plain or tinned annealed copper. The uninsulated circuit protective conductors shall be tinned annealed copper and shall be of the same nominal cross-sectional area as the insulated conductors.

Tinned coated wires shall conform to BS EN 13603:2002, Clause 5.

The class of conductor shall be the same for all conductors in any single cable. The uninsulated circuit protective conductor shall be of the same class as the insulated conductors.

6 Insulation

6.1 Type

The insulation shall be one of the following types:

- EI 5, as specified in BS EN 50363-5;
- GP 4 or GP 6, as specified in BS 7655-1.2;
- GP 8, as specified in BS 7655-1.3.