

Electric cables — 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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Committees responsible for this British Standard

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- BEAMA Installation Ltd.
- British Approvals Service for Cables
- British Cables Association
- British Plastics Federation
- Chartered Institution of Building Services
- Department of Trade and Industry — Consumer Safety Unit
- Electricity Association
- Energy Industries Council
- Engineering Industries Association
- ERA Technology Ltd.
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Foreword

This British Standard has been prepared by Subcommittee GEL/20/17.

The cables specified in this British Standard are primarily intended for use in walls, partitions and building voids where there is a high risk that they could be penetrated by nails and similar sharp objects. The cables contain an earthed metallic covering which is in contact with a full size uninsulated circuit protective conductor. This provides screening and a verifiable earth fault path for the fault current when penetrated by nails etc., and, when connected to a suitably selected protective device, offers electrical protection by disconnection of the circuit, not offered by cables of conventional construction.

The cables are also designed to produce low levels of smoke and corrosive gases when affected by fire. For the purposes of this British Standard, corrosive (and acid) gases are deemed to be those which are determined as hydrochloric acid (HCl). Cables covered by this British Standard have limited evolution of smoke and corrosive gases when assessed under the fire conditions specified in BS EN 50268 and BS EN 50267-2-1. In this British Standard, the level of corrosive (and acid) gases is determined by measurement of hydrochloric acid (HCl) in accordance with BS EN 50267-2-1. The cables specified in this British Standard are suitable for operation at a maximum sustained conductor temperature of 70 °C.

WARNING. This British Standard calls for the use of 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.

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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 15 and a back cover.

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1 Scope

This British Standard specifies requirements for construction and performance, and gives methods of test, for electric cables having thermosetting insulation of rated voltage 300/500 V and low emission of smoke and corrosive gases when affected by fire.

It is applicable to 2-core, 3-core and 4-core cables with uninsulated circuit protective conductor and metallic screening, intended for use in walls, partitions and building voids.

NOTE A guide to the use of the cables specified in this British Standard is given in Annex A. A summary of the tests applicable to the cables is given in Annex B.

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 4727-2:Group 08, *Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms — Part 2: Terms particular to power engineering — Group 08: Electric cables.*

BS 5099, *Electric cables — Voltage levels for spark testing.*

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.*

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

BS EN 50267-2-1, *Common test methods for cables under fire conditions — Part 2-1: Test on gases evolved during combustion of materials from cables — 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 50356, *Method for spark testing of cables.*

BS EN 60811-1-1, *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.*

3 Terms and definitions

For the purposes of this British Standard the definitions given in BS 4727-2: Group 08 apply, together with the following.

3.1

let-through energy I^2t

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

3.2 values

3.2.1

approximate value

value which is only indicative

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

3.2.2

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.

3.3 voltages

3.3.1

maximum voltage U_m

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

3.3.2

rated voltage U

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

3.3.3

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 .

NOTE The rated voltage recognized for the purpose of this British Standard is 300/500 V.

5 Conductors

The conductors shall conform to BS 6360, 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.

The class of conductor shall be the same for all conductors in any single cable.

6 Insulation

6.1 Type

The insulation shall be type GP 8 as specified in BS 7655-1.3.

6.2 Application

The insulation shall be applied closely to the conductor by the extrusion process and cross-linked to form a compact and homogeneous layer.

When the application is tested by removing the insulation from the conductor, there shall be no damage to the insulation itself, the conductor, or the tin coating, if any.

6.3 Thickness

The thickness of the insulation, when determined by taking the average of a number of measurements in accordance with Annex C, shall be not less than the value given in Table 1, and the smallest of the measured values shall not fall below the value given in Table 1 by more than 0.1 mm + 10 %.

6.4 Spark test

When tested in accordance with BS EN 50356, using the test voltages specified in BS 5099, there shall be no breakdown of the insulation.

6.5 Corrosive and acid gas emission from insulation during combustion

When tested in accordance with BS EN 50267-2-1, the level of HCl shall be not greater than 0.5 %.