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Test method for resistance to fire of cables required to maintain circuit integrity under fire conditions

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Publishing and copyright information

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Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 16, an inside back cover and a back cover.

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 2013. It was prepared by Subcommittee GEL/20/18, *Fire testing*, under the authority of Technical Committee GEL/20, *Electric cables*. A list of organizations represented on these committees can be obtained on request to their secretary.

Supersession

This British Standard supersedes BS 6387:1994, which is withdrawn.

Information about this document

This is a full revision of the standard, which now gives only a test method for fire resistance characteristics of cables. Physical and electrical tests and their relevant requirements are now given in the appropriate product standards. Other test methods for the fire resistance of cables have been developed since the previous revision of BS 6387. These include BS 8434 and BS 8491, catering for specific applications, installations and end-user markets.

The test method given in this British Standard consists of three component protocols, designated C, W and Z. These are technically unchanged from the previous edition. Previous editions of BS 6387 have included categories based on other protocols (A, B, S, X and Y). These are now regarded as obsolete.

When separate test pieces from the same sample of cable are tested to each of these three protocols, these together comprise the full test. When the requirements of each one of the protocols are met, the cable may be designated as "category CWZ". In detail:

a) Protocol C subjects the cable under test to a flame via direct impingement corresponding to a temperature attack of 950 °C ±40 °C.

b) Protocol W subjects the cable under test to a flame via direct impingement corresponding to a temperature attack of 650 °C ±40 °C with direct application of water simulating a sprinkler system.

c) Protocol Z subjects the cable under test to a flame via direct impingement corresponding to a temperature attack of 950 °C ±40 °C with indirect application of mechanical shock.

Product standards might refer to only one of the protocols C or W or Z in, respectively, Clauses **6**, **7** or **8** but, in such cases, may not use the designation "category CWZ".

It is emphasized that fire tests do not assess a fire hazard, nor can the results of fire tests alone guarantee safety. They only provide information to assist in the assessment of the suitability of a cable for a given application.

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.
The test methods given in this British Standard might involve the use of dangerous voltages and temperatures. Suitable precautions should be taken against the risks of shock, burning, fire and explosion that might be involved, and against any noxious fumes that might be produced.

Use of this document

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.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its methods are expressed as a set of instructions, a description, or 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.

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1 Scope

This British Standard gives a test method for resistance to fire of cables required to maintain circuit integrity under fire conditions. It is applicable to cables of rated voltage not exceeding 600/1 000 V and of overall diameter less than or equal to 20 mm.

The test given in this British Standard is applicable to cables having two or more insulated conductors, whether or not the cables incorporate other metallic elements such as armour, screen or circuit protective conductor. The test is also applicable to cables having one insulated conductor provided that the cable incorporates at least one other metallic element. The test is not applicable to cables having one insulated conductor but no other metallic element.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN 60584-1, *Thermocouples – Part 1: Reference tables (IEC 60584-1)*

BS EN 60695-4, *Fire hazard testing – Part 4: Terminology concerning fire tests for electrotechnical products*

BS EN ISO 13943, *Fire safety – Vocabulary*

IEC 60269-3:2010, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications) – Examples of standardized systems of fuses A to F*

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS EN ISO 13943, BS EN 60695-4 and the following apply.

3.1 rated voltage, U_0
nominal power-frequency voltage between conductor(s) and earth, for which the cable is suitable

3.2 rated voltage, *U*
nominal power-frequency voltage between phase conductors for which the cable is suitable

4 Categorization of cables

Cables shall be tested to each of the three protocols, namely:

- resistance to fire alone, Protocol C (Clause **6**);
- resistance to fire with water, Protocol W (Clause **7**);
- resistance to fire with mechanical shock, Protocol Z (Clause **8**).

Cables passing all three protocols shall be designated Category CWZ.

*NOTE 1 Product standards might refer to only one of the protocols in Clauses **6, 7** or **8** but in such cases, they may not use the designation "Category CWZ".*

NOTE 2 Previous editions of this British Standard have included categories based on other protocols (A, B, S, X and Y). These are now regarded as obsolete.