BS 8519:2020

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# Selection and installation of fire-resistant power and control cable systems for life safety, fire-fighting and other critical applications — Code of practice

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# Contents



 

**Summary of pages**
This document comprises a front cover, and inside front cover, pages i to iv, pages 1 to 40, 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 30 June 2020. It was prepared by Technical Committee FSH/1, *Fire safety cables*. A list of organizations represented on this committee can be obtained on request to the committee manager.

## Supersession

This British Standard supersedes BS 8519:2010, which is withdrawn.

## Information about this document

This is a full revision of BS 8519, and introduces the following principal changes:

- definitions added for:
  - average power output;
  - selectivity (discrimination);
  - building fabric enclosure;
  - cable protective system;
  - electrical equipment enclosure; and
  - other critical systems;
- added recognition of other critical systems, other than life safety or fire-fighting applications;
- added reference to fuel storage requirements in BS EN 12101-10 (Clause **6**);
- added recommendation to include fuel polishing equipment (Clause **6**);
- added information on uninterruptable power supplies, UPS (Clause **6**);
- added life safety generator recommendations;
- added roof-mounted generator recommendations;
- correction made to Table 1 sub-main power distribution minimum cable category;
- Clause **7** generally updated for high voltage (HV) and low voltage (LV) cable routes;
- Clause **9** revised to include further recommendations for the automatic transfer switch;
- Clause **12** revised to include the recommendation for internal and external fire stopping to maintain the switchroom fire compartmentation and the need to cater for the thermal expansion of the cable protective enclosure;
- added further detailed recommendations included in Clause **12** for the design and selection of the cable enclosure support systems;
- Clause **17** junction boxes revised test protocol identified;
- Clause **18** fire-resistant busbar systems added;
- Clause **19** inverter text relocated to new subclause **20.2**, smoke control systems;
- Clause **20** multi-zoned smoke ventilation systems text relocated to new subclause **20.2**, smoke control systems;

 

- new Clause **20** added providing recommendations for life safety and fire-fighting applications; and
- new informative Annex A on selection and specification of uninterruptable power supplies (UPS).

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at bsigroup.com/standards, or by contacting the Customer Services team.

Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

### Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

### Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

The word "should" is used to express recommendations of this standard. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

### 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.**

 

## Introduction

Buildings continue to develop in terms of increased size and height, and complexity of active fire protection. This has led to solutions being developed which require a high level of performance from the building services components, including the electrical supplies. This British Standard is primarily intended for designers, contractors, fire engineers, regulators and enforcers, including building control bodies, fire authorities and health and safety inspectors.

It is primarily concerned with cables which need to maintain their circuit integrity during a fire for life safety and fire-fighting purposes. However, the recommendations of this British Standard can also be used for cables which need to maintain their circuit integrity during a fire because the function they support is critical for business continuity, property protection or environmental protection.

The presence of potential hazards, including fire, mechanical and water damage, are referred to throughout this British Standard.

This British Standard identifies electrical loads defined as life safety and fire-fighting. It identifies the factors to be accounted for by the engineer when selecting and specifying the performance requirements of the electrical distribution system needed to maintain circuit integrity under defined fire conditions for a specified period, referred to as the fire survival time.

It makes reference to the recommendations of BS 9999 and BS 9991, with regard to the design and installation of the electrical distribution systems for life safety and fire-fighting equipment.

This British Standard also makes reference to three categories of circuits required to maintain their circuit integrity under defined fire conditions for varying fire survival times of 30 min, 60 min and 120 min. Appropriate cable tests are identified for each cable category derived from applicable British Standards assessing cable performance under conditions of fire as might be expected in an actual fire incident.

This British Standard aims to ensure that the level of circuit fire integrity is not compromised by other components of the whole electrical distribution system, including cable glands, terminations, joints and cable support systems.

It also identifies the need for dual redundant electrical supplies run via diverse cable routes, installed within separate compartments, and the need to incorporate automatic changeover devices located within the same compartment as the life safety, fire-fighting or other critical equipment.

 

## 1 Scope

This British Standard gives recommendations and guidance on the selection and installation of fire-resistant power and control cable systems which need to maintain their circuit integrity for life safety and fire-fighting. It also gives specific recommendations for electrical system design for such applications, and for fire survival times.

This British Standard is primarily intended for use in buildings which, due to their size, height, form or use, require the installation of life safety and fire-fighting systems, e.g. sprinkler pumps, wet riser pumps, smoke control systems, fire-fighting and evacuation lifts or other systems as required by the fire engineered strategy.

It covers:

- the source of supply;
- the distribution voltage [high voltage (HV) or low voltage (LV)]; and
- the appropriate location of the main intake rooms, HV switchrooms, LV switchrooms, transformer rooms, generator rooms, risers, fire life safety equipment plant rooms and fire-fighting/evacuation lift motor rooms/shafts.

The British Standard can also be used for systems which need to maintain their circuit integrity during a fire because the function they support is critical for business continuity, property protection or environmental protection reasons.

This British Standard does not give recommendations for those installations covered in BS 5839-1, BS 5839-8, BS 5839-9 and BS 5266-1, but makes reference to these standards.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document.[1)] For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 3643-1, *ISO metric screw threads — Part 1: Principles and basic data*

BS 3643-2, *ISO metric screw threads — Part 2: Specification for selected limits of size*[2)]

BS 5266-1, *Emergency lighting — Part 1: Code of practice for the emergency lighting of premises*

BS 5306-1, *Code of practice for fire extinguishing installations and equipment on premises — Part 1: Hose reels and foam inlets*

BS 5839-1, *Fire detection and fire alarm systems for buildings — Part 1: Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises*

BS 5839-8, *Fire detection and fire alarm systems for buildings — Part 8: Code of practice for the design, installation, commissioning and maintenance of voice alarm systems*

BS 5839-9, *Fire detection and alarm systems for buildings — Part 9: Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems*

BS 7273-4, *Code of practice for the operation of fire protection measures — Part 4: Actuation of release mechanisms for doors*

BS 7346 (all parts), *Components for smoke and heat control systems*

1) Documents that are referred to solely in an informative manner are listed in the Bibliography.
2) This British Standard also gives an informative reference to BS 3643-2:2007.

 