

Emergency lighting —

Part 1: Code of practice for the emergency lighting of premises

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Committees responsible for this British Standard

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Association of County Councils
British Cables Association
British Fire Consortium
Chartered Institution of Building Services Engineers
Cinema Exhibitors Association
Department of Trade and Industry, Consumer and Competition Policy Directorate
Electrical Contractors Association
Electricity Association
Engineering Industries Association
GAMBICA (BEAMA Ltd.)
Industry Committee for Emergency Lighting
Institute of Fire Prevention Officers
Institute of Fire Safety
Institution of Electrical Engineers
Institution of Lighting Engineers
Lighting Industry Federation Ltd.
London District Surveyors Association
London Fire and Emergency Planning Authority
National Illumination Committee of Great Britain
National Inspection Council for Electrical Installation Contracting
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Foreword

This part of BS 5266 has been prepared by Subcommittee CPL/34/9. Together with BS EN 50172:2004, it supersedes BS 5266-1:1999, which is withdrawn. It also supersedes CP 1007:1955, which is withdrawn.

The 1999 edition of this standard no longer covered the levels of illumination required as these are dealt with in BS EN 1838:1999 (also numbered BS 5266-7:1999). References to BS EN 1838:1999/BS 5266-7:1999 are made at the relevant points in the text.

The standard has now been revised again to remove recommendations and guidance on the characteristics of emergency lighting systems that are now specified in BS EN 50172:2004 (also numbered BS 5266-8:2004). References to BS EN 50172:2004/BS 5266-8:2004 are made at the relevant points in the text.

This part of BS 5266 has thus become a base document, which, in addition to giving basic guidance on emergency lighting, provides a guide to navigation of the other parts of the BS 5266 series.

This revision of BS 5266-1 is applicable to cinemas, and also to other premises used for entertainment, some of which were excluded from the 1999 edition.

BS EN 50172:2004, 4.1 specifies compliance with the wiring rules given in HD 384/HD 60364. The UK applicable parts of HD 384/HD 60364 are implemented in the IEE Wiring Regulations (BS 7671).

This revision of BS 5266-1 incorporates changes necessitated by the publication of BS EN 50172. It does not represent a full review or revision of the standard, which will be undertaken in due course.

The other parts of this standard are:

- *Part 2: Code of practice for electrical low mounted way guidance systems for emergency use;*
- *Part 3: Specification for small power relays (electromagnetic) for emergency lighting applications up to and including 32 A;*
- *Part 4: Code of practice for design, installation, maintenance and use of optical fibre systems;*
- *Part 5: Specification for components parts of optical fibre systems;*
- *Part 6: Code of practice for non-electrical low mounted way guidance systems for emergency use — Photoluminescent systems;*
- *Part 7: Lighting applications — Emergency lighting* (Also numbered BS EN 1838);
- *Part 8: Emergency escape lighting systems* (Also numbered BS EN 50172).

The aim of this standard is to promote wider understanding of the different types of emergency lighting system which may be employed and to give guidance on their correct application to the varied requirements of different categories of premises.

The recommendations given in this standard have been drawn up to encourage uniformity of application, based on providing adequate safety to persons in the event of interruption of the normal lighting and having due regard to the hazard level and degree of familiarity of occupants with particular premises. The standard recognizes that, in addition to ensuring safe unobstructed means of escape from the premises at all times, an important function of emergency lighting is to make possible the immediate location and operation of fire alarm points and fire fighting equipment, and another is to minimize the chance of panic arising in enclosed spaces, such as lifts. Although the standard makes recommendations for the provision of emergency lighting in a wide variety of premises, the fact that particular types of premises are mentioned in Clause 10 does not necessarily mean that all such premises will be required by law to have emergency lighting installed. For certain types of premises the provisions of this standard may be supplemented or replaced by alternative requirements at the discretion of the enforcing authority.

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.

This part of BS 5266 is intended for use in conjunction with BS EN 1838:1999/BS 5266-7:1999 and BS EN 50172:2004/BS 5266-8:2004.

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.

In particular, attention is drawn to the Regulatory Reform (Fire Safety) Order 2005 [1], which was placed on the statute book on 7 June 2005 and will be implemented on 1 April 2006, the Building Regulations 2000 [2], the Fire (Scotland) Act 2005 [3], the Building (Scotland) Regulations 2004 [4] and the Building Regulations (Northern Ireland) 2000 [5].

Attention is also drawn to the Fire Precautions (Workplace) Regulations 1997 [6], which will be withdrawn by the implementation of the Regulatory Reform (Fire Safety) Order 2005 [1] on 1 April 2006.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iii, a blank page, pages 1 to 25 and a back cover.

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1 Scope

This part of BS 5266 gives recommendations and guidance on the factors that need to be considered in the design of, and the installation and wiring of, the electrical emergency lighting systems specified in BS EN 50172/BS 5266-8 in order to provide the lighting parameters specified in BS EN 1838/BS 5266-7. Guidance on the illumination needed for safe movement, and recommendations for lighting in areas with fixed seating, are also given.

This part of BS 5266 is not applicable to dwellings; its provisions, however, are applicable to common access routes within multi-storey dwellings.

NOTE 1 Central power supply systems for electrical emergency lighting systems are specified in BS EN 50171. Luminaires for emergency lighting systems are specified in BS EN 60598-2-22.

NOTE 2 A summary of the hierarchy of standards covering the different aspects of emergency lighting systems 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 7629-1, *Specification for 300/500 V fire resistant electric cables having low emission of smoke and corrosive gases when affected by fire — Part 1: Multicore cables.*

BS 7629-2, *Specification for 300/500 V fire resistant electric cables having low emission of smoke and corrosive gases when affected by fire — Part 2: Multipair cables.*

BS 7671, *Requirements for electrical installations. IEE Wiring Regulations. Sixteenth edition.*

BS 7846, *Electric cables — 600/1 000 V armoured, fire resistant cables having thermosetting insulation and low emission of smoke and corrosive gases when affected by fire.*

BS EN 1838:1999 (also numbered BS 5266-7:1999), *Lighting applications — Emergency lighting.*

BS EN 50171:2001, *Central power supply systems.*

BS EN 50172:2004 (also numbered BS 5266-8:2004), *Emergency escape lighting systems.*

BS EN 60598-2-22:1999, *Luminaires — Part 2: Particular requirements — Section 2-22: Luminaires for emergency lighting.*

BS EN 60702-1, *Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V — Part 1: Cables.*

BS EN 60702-2, *Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V — Part 2: Terminations.*

3 Terms and definitions

For the purposes of this part of BS 5266 the terms and definitions given in BS EN 1838:1999/BS 5266-7:1999, BS EN 50171:2001, BS EN 50172:2004/BS 5266-8:2004, BS EN 60598-2-22:1999 and the following apply.

3.1

emergency lighting

lighting provided for use when the supply to the normal lighting fails
[BS EN 1838:1999/BS 5266-7:1999, 3.1]

3.2

escape route

route designated for escape to a place of safety in the event of an emergency
[BS EN 50172:2004/BS 5266-8:2004, 3.2]

3.3**emergency escape lighting**

that part of emergency lighting that provides illumination for the safety of people leaving a location or attempting to terminate a potentially dangerous process before doing so
[BS EN 1838:1999/BS 5266-7:1999, **3.3**]

3.4**standby lighting**

that part of emergency lighting provided to enable normal activities to continue substantially unchanged
[BS EN 1838:1999/BS 5266-7:1999, **3.7**]

3.5**emergency exit**

way out that is used during an emergency [BS EN 50172:2004/BS 5266-8:2004, **3.8**]

3.6**final exit**

terminal point of an escape route [BS EN 50172:2004/BS 5266-8:2004, **3.9**]

3.7**slave luminaire**

luminaire for maintained or non-maintained operation which is energized from a central emergency power system that is not contained within the luminaire

NOTE Adapted from BS EN 60529-2-22:1999, **22.3.9**.

4 Consultation and records**4.1 Consultation**

Consultation between the owner/developer and/or occupier of the premises, the architect, the lighting engineer, the installation contractor, the enforcing authorities (e.g. the building control and fire authorities), the electricity authority and any others concerned, should be arranged at a very early stage. In addition to the recommendations of this standard, it is important that the requirements of any national and/or local legislation which may apply to the premises in question are fully recognized and discussed at this time. This includes the need for a risk assessment (see **5.2**).

4.2 Supply of plans

The supply of plans is specified in BS EN 50172:2004/BS 5266-8:2004, **5.1**.

NOTE It is important that the plans are obtained at an early stage for use during the consultations recommended in **4.1**.

4.3 Records

Records and reporting are specified in BS EN 50172:2004/BS 5266-8:2004, Clause **6**.

NOTE Recommendations on the measuring of illuminance of emergency lighting are given in Annex B.

5 Need for emergency lighting**5.1 General**

When the supply to normal lighting of premises fails, emergency lighting may be required. Throughout this standard reference to “emergency lighting” covers “emergency escape lighting” in particular, but also includes any element of standby lighting which may be used for emergency escape lighting.

5.2 Risk assessment

Under the Management of Health and Safety At Work Regulations 1999 [7], every employer is required to carry out a risk assessment to identify the risks to people who enter the employer’s premises; the employer is required to take measures on the basis of the risk assessment to safeguard building occupants. These measures need to include the provision of safe means of escape, including, where necessary, emergency lighting, taking into account the needs of people with disabilities, in particular people with visual impairment.

5.3 Emergency escape lighting

General requirements for emergency escape lighting are specified in BS EN 50172:2004/BS 5266-8:2004, 4.1 and BS EN 1838:1999/BS 5266-7:1999, 4.1.

Escape route lighting is covered in BS EN 50172:2004/BS 5266-8:2004, 4.3 and BS EN 1838:1999/BS 5266-7:1999, 4.2.

Open area (anti-panic) lighting is covered in BS EN 50172:2004/BS 5266-8:2004, 4.4 and BS EN 1838:1999/BS 5266-7:1999, 4.3.

High risk task area lighting is covered in BS EN 50172:2004/BS 5266-8:2004, 4.5 and BS EN 1838:1999/BS 5266-7:1999, 4.4.

5.4 Standby lighting

Standby lighting is specified in BS EN 50172:2004/BS 5266-8:2004, 4.6 and BS EN 1838:1999/BS 5266-7:1999, 4.5.

6 Illumination for safe movement

6.1 General

The safe movement of persons along escape routes towards and through the exits provided to a place of safety depends upon the illumination and the ability to see hazards, changes of level and direction.

6.2 Vision and visibility

The stimulus for vision is not the light which falls on objects but the light reflected to the eyes. Different objects are distinguished by contrast, the changes in light reflected to the eyes. A light coloured object on a dark background can be made conspicuous with far less light than a dark coloured object on a dark background.

The amount of light falling on an object (illuminance) is affected not merely by the power and position of the lamps used for illumination but also by reflection from the surroundings. In many interior spaces, a high proportion of the light falling on any surface comes from light from the light sources reflected by other surfaces in the room. Where the walls, floor and ceiling are light in colour, up to 60 % of the illuminance at floor level may have been reflected from the walls or ceiling.

In a room where the decorative finishes are dark in colour (i.e. have low reflectance), the contribution of reflected light to the illuminance is much smaller. The reflected light may be negligible in, say, a discotheque or restaurant, where the carpets, walls and ceiling have been deliberately kept dark in colour to produce a feeling of intimacy and relaxation.

All potential obstructions or hazards on an escape route should be light in colour with contrasting surround. Such hazards include the nosings of stair treads, barriers and walls at right angles to the direction of movement.

In restricted spaces such as corridors, light coloured decoration throughout is an advantage. Prominent edges to vertical surfaces at changes of direction can assist emergency evacuation.

Special consideration should be given to emergency escape lighting for people with visual impairments. Further guidance is given in BRE information paper 9/97 [8].

6.3 Minimum illuminance and adaptation

6.3.1 General

Visual acuity varies considerably from one person to another with regard to the amount of light required to perceive an object clearly and the time taken to adapt to changes in the illuminance (visual adaptation). In general, older people need more light to follow an escape route and have longer visual adaptation times.

The maximum period which should be allowed to elapse between failure of the normal supply and the switch-on of the emergency lighting depends upon the rate at which panic may be expected to mount in a particular building. It also depends upon the time taken to adapt to the new, and normally much lower, illuminance provided by the emergency lighting. The illuminances in this standard have been determined from experience and practical test.

6.3.2 Defined escape routes and response times

NOTE Illuminances, including the provision of appropriate illuminance at exit doors and other positions to be emphasized, and response times, are specified in BS EN 1838:1999/BS 5266-7:1999, Clause 4. The text below contains the detail of the UK “A”-deviation given in BS EN 1838:1999/BS 5266-7:1999, Annex B.

For routes that are permanently unobstructed and up to 2 m wide, the horizontal illuminance at floor level on the centre line of the escape route should be not less than 0.2 lx but preferably 1 lx. For points of emphasis the minimum horizontal illuminance at the floor along the centre line of the escape route should be not less than 1 lx. In addition, for escape routes up to 2 m wide, 50 % of the route width should be lit to a minimum of 50 % of the minimum horizontal illuminance value at the centre line.

The emergency lighting detailed in this clause should be provided within 5 s of the failure of the normal lighting supply, but at the discretion of the enforcing authority this period may be extended to a maximum of 15 s in premises likely to be occupied for the most part by persons who are familiar with them and the escape routes.

A wider escape route can be treated as a number of 2 m wide bands or as an open area.

6.3.3 Open areas and response times

Illuminances and response times for open areas are given in BS EN 1838:1999/BS 5266-7:1999, 4.3.

6.3.4 Design conditions

Reference should be made to BS EN 1838:1999/BS 5266-7:1999.

The recommended illuminances that are given as a minimum or average should be regarded as the lowest value acceptable during the rated duration, taking into account the effects of reduction in voltage, voltage drop in the system wiring, battery ageing, lamp ageing and the accumulation of dirt and dust.

Calculations of illuminance, except where uplighting is used, should be made ignoring reflectance.

Recommendations on the measuring of illuminance of emergency lighting are given in Annex B.

NOTE Further guidance on design can be found in CIBSE/SLL publication LG12 *Emergency lighting design guide* [9].

6.4 Uniformity and diversity of illuminance

Uniformity of illuminance is specified in BS EN 1838:1999/BS 5266-7:1999, 4.4.2 and diversity (ratio of maximum to minimum illuminance) is given in BS EN 1838:1999/BS 5266-7:1999, 4.2.2 and 4.3.2.

Care should be taken to avoid abrupt changes between excessive dark and light areas on the floor of the escape route. It is therefore necessary to illuminate the route reasonably uniformly.

6.5 Glare

Limitation of disability glare is specified in BS EN 1838:1999/BS 5266-7:1999, 4.2.3, 4.3.3 and 4.4.3.

6.6 Identification of exits and escape routes by signs

The luminance of escape route signs is specified in BS EN 1838:1999/BS 5266-7:1999, Clause 5.

BS EN 50172:2004/BS 5266-8:2004, Note to 4.2, recommends that a maintained mode of operation should be considered for illumination of emergency escape route signs in locations where occupants may be unfamiliar with the building.

Safety signs for emergency escape should be in accordance with BS 5499-5 and BS 5499-4. The mounting height of the signs should be in accordance with BS 5499-4:2000, 4.6.

7 Emergency lighting design

7.1 General

Emergency lighting is provided for use when the normal lighting fails and has therefore to be powered from a source independent of that supplying the normal lighting (see 7.10).

7.2 Failure of normal supply to part of a premises

Operation of emergency escape lighting in the event of failure of part of the normal lighting supply is specified in BS EN 50172:2004/BS 5266-8:2004, 5.2.