Technical reference
Legislation & requirements

—
01 Emergency lighting technical reference

The requirement for emergency lighting originates from the Fire Precautions Act 1971 and was further enforced by the Fire Precautions (Workplace) Regulations 1997 (Amended 1999).

The Regulatory Reform (Fire Safety) Order, FSO came into force in October 2006 and now replaces all previous fire safety legislation.

The key considerations from the Fire Safety Order are:

- The FSO creates one simple fire safety legislative control for all workplaces/non-domestic premises
- Control is fire risk assessment based, with the responsibility for fire safety resting with the 'responsible person' for the premises
- All persons inside the building/in the vicinity who might be affected by a fire must be protected
- Employees will be required to act upon the fire risk assessment, make remedial arrangements accordingly and maintain the fire precautions
- Failure to comply with the rules would be a breach of law, with the consequence of enforcement or prohibition notices being served

The fire safety risk assessment is a legal requirement, and where a site has 5 or more employees the risk assessment must be documented.

Fire certificates under the Fire Precautions Act 1971 are now no longer valid. Guidance documents on the new Fire Safety legislation have been published and the appropriate ones must be consulted as part of the overall fire risk assessment.

Other important legislation and regulations, such as The Buildings Regulations and The Health and Safety "Safety Signs and Signals" Regulations 1996, also have a requirement for emergency lighting and must be considered as part of the design and specification.

—
02 Figure A.
Exit sign boards have a maximum viewing distance defined as 100 x the height of the sign (h), in metres
—
03 Figure B.
For illuminated exit signs, the maximum viewing distance is defined as 200 x the height of the sign (h), in metres

The Regulatory Reform (Fire Safety) Order, FSO came into force in October 2006 and has replaced all previous fire safety legislation.

The requirement for emergency lighting originates from the Fire Precautions Act 1971 and was further enforced by the Fire Precautions (Workplace) Regulations 1997 (Amended 1999).

The key considerations from the Fire Safety Order are:

- The FSO creates one simple fire safety legislative control for all workplaces/non-domestic premises
- Control is fire risk assessment based, with the responsibility for fire safety resting with the 'responsible person' for the premises
- All persons inside the building/in the vicinity who might be affected by a fire must be protected
- Employees will be required to act upon the fire risk assessment, make remedial arrangements accordingly and maintain the fire precautions
- Failure to comply with the rules would be a breach of law, with the consequence of enforcement or prohibition notices being served

The fire safety risk assessment is a legal requirement, and where a site has 5 or more employees the risk assessment must be documented.

Fire certificates under the Fire Precautions Act 1971 are now no longer valid. Guidance documents on the new Fire Safety legislation have been published and the appropriate ones must be consulted as part of the overall fire risk assessment.

Other important legislation and regulations, such as The Buildings Regulations and The Health and Safety "Safety Signs and Signals" Regulations 1996, also have a requirement for emergency lighting and must be considered as part of the design and specification. A number of standards have been devised to provide guidance on application of emergency lighting in line with legislative requirements, and to determine the quality of product to be specified.

The major standards to be considered when designing a high-level emergency lighting system are:

- **BS 5266-1, BS EN 1838:2013, BS 5266-8**
  These sections of the standards set the guidelines for installation of emergency lighting, where to locate emergency luminaires and exit signs and the minimum lighting levels required. Note that BS 5266-7 has been superseded by BS EN 1838:2013.
- **BS EN 60598.2.22**
  This is the product standard which establishes the performance requirements of emergency lighting luminaires and internally illuminated exit signs
- **IEC 62034**
  This standard defines the requirement for automated testing systems for emergency lighting
- **Lighting Industry Association & ICEL**
  Guides and registration schemes provided by the Industry Committee for Emergency Lighting which define enhanced performance requirements for the differing types of emergency lighting, backed by independent testing

Exit signs
Designated legend formats
European pictogram format SI341 signs are acceptable, as are ISO 7010 format signs, although there should not be a mixture of both within an installation.

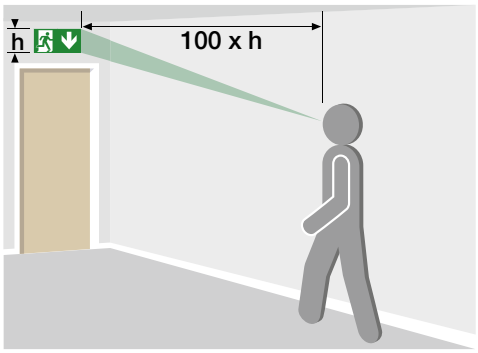

ISO 7010


EU-format, SI-341

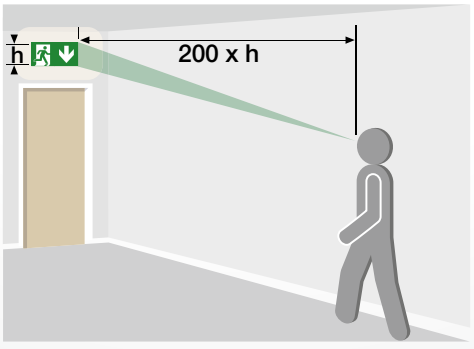
Text only signs are no longer acceptable and should have been withdrawn.

SI-341: UK legislation, Statutory Instrument 341

Maximum viewing distances



—
02



—
03


—
01

Technical reference
Legislation & requirements

—
01 Near an exit door
—
02 New stairs and changes of level
—
03 Near each piece of fire-fighting equipment or manual call point
—
04 Near changes in direction
—
05 Near each piece of fire-fighting equipment or manual call point
—
06 Near each First Aid point

General requirements for emergency lighting (BS 5266-1, BS EN 1838:2013, BS 5266-8)
If emergency lighting is required it should:

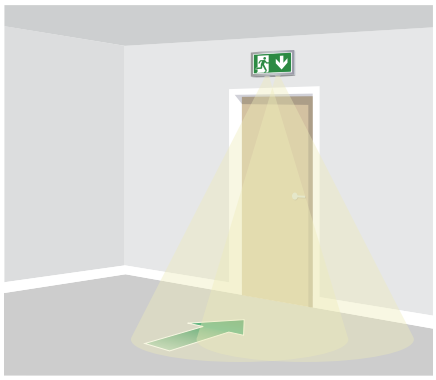
- Indicate the escape routes clearly with exit signs so there is no doubt which is the way out
- Ensure fire safety equipment such as fire alarm call-points, fire extinguishers etc can be located
- Illuminate escape routes, and open areas used in escape routes so that obstacles can be avoided
- Provide illumination for high risk task areas to allow the processes to be shut down safely

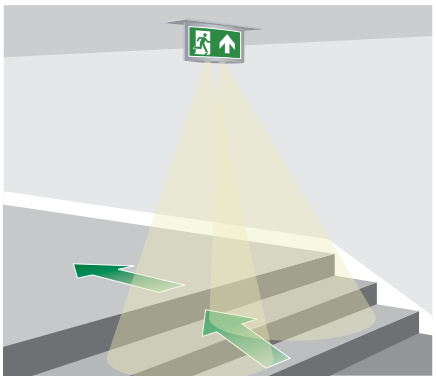
Any point on an escape route or leading to it must have an exit sign so that direction of travel is never in doubt. Internally illuminated exit signs offer the most effective method of achieving the requirement, and have a viewing distance twice that of exit signboards - see below.

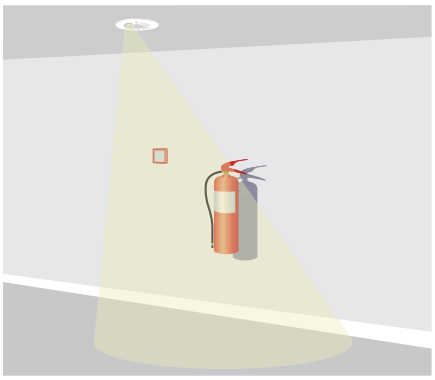
Note: where exit sign boards are installed, these must now have 5 lux illuminance on the sign to meet the requirements on BS 5266 / EN 1838 - for practical purposes unachievable through use of converted mains luminaires.

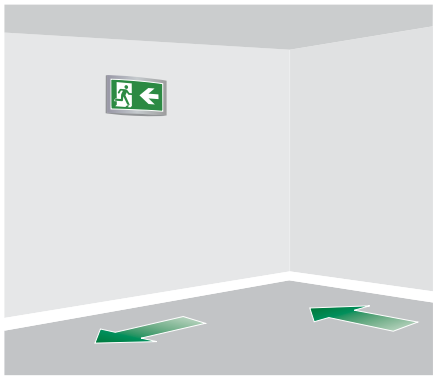
Points of emphasis
An escape route luminaire shall be positioned to give emphasis on potential danger points, as well as for safety and fire equipment.

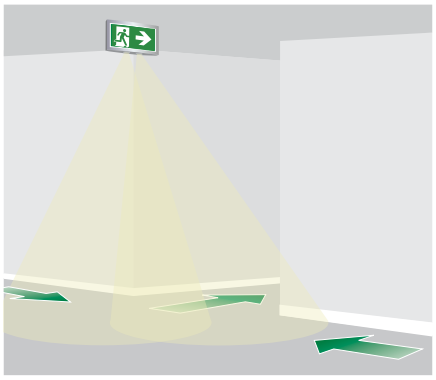
- Near all emergency exit doors
- At changes of direction along the escape route, to illuminate in both directions
- At intersection of corridors, to illuminate in both directions
- At changes in level to avoid tripping
- Near stairs, so stair flights are directly lit
- Near each piece of firefighting equipment or manual call point, to a level of 5 lux in the vertical.
- Near first aid points, to a level of 5 lux in the vertical
- At externally illuminated exit signs and other safety signs, which identify a hazard
- Near escape route equipment in place for disabled people
- Near refuges and two-way telephone positions for the disabled
- Near ‘disabled toilet’ alarm call positions
- Near to each final exit on the inside
- Near to the final exit externally, to a place of safety
- Near is defined as ‘within 2 m’ in the horizontal.

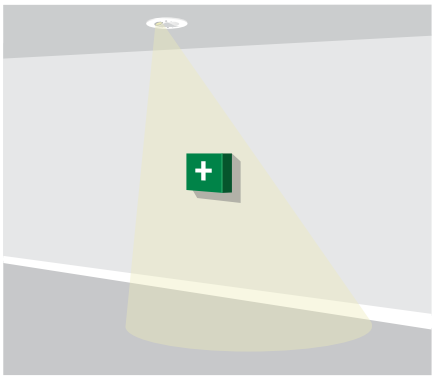

—
01

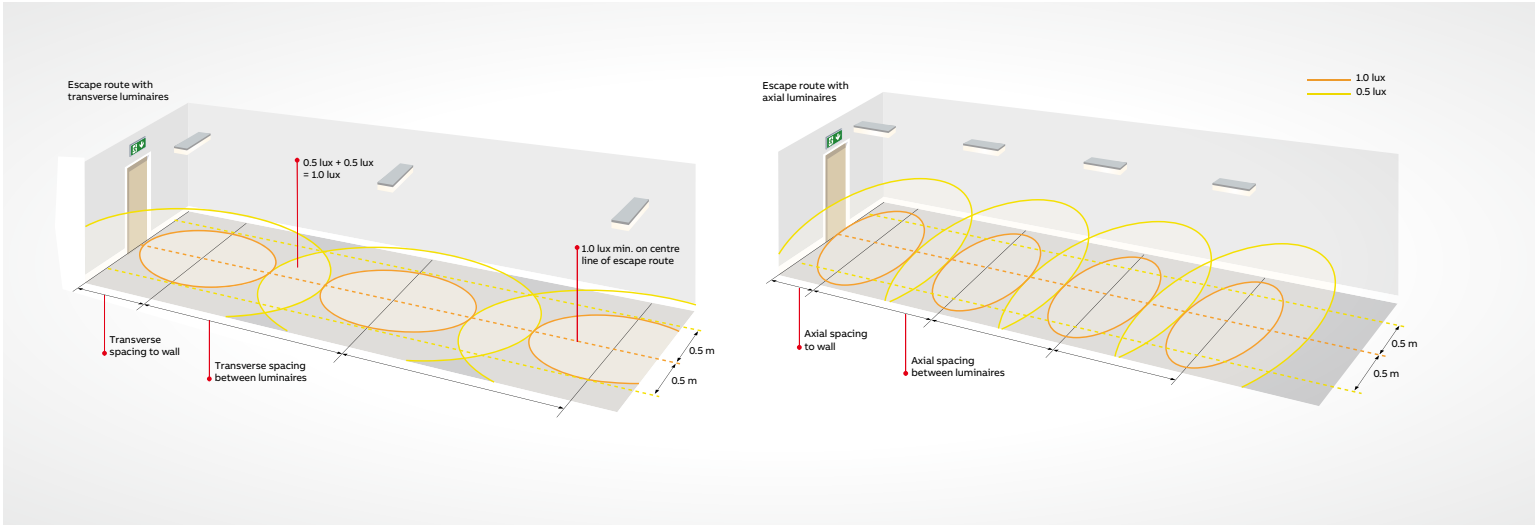

—
02


—
03


—
04


—
05


—
06



—
07

—
07 Escape routes with transverse and axial luminaires
—
08 Core areas

In addition to these points of emphasis, the following need to be considered when planning emergency lighting.

Escape routes
A defined escape route of 2 m width must be illuminated to a minimum of 1 lux along the centre line (see below).

Open areas (anti panic)
Open areas must be illuminated to 0.5 lux minimum in the core area (see below right). This also applies to areas with undefined escape routes, in halls or areas greater than 60 m^2.

High risk task areas
This refers to areas normally associated with moving machinery, dangerous materials or processes, and other areas of high risk where hazards may continue after mains lighting failure.

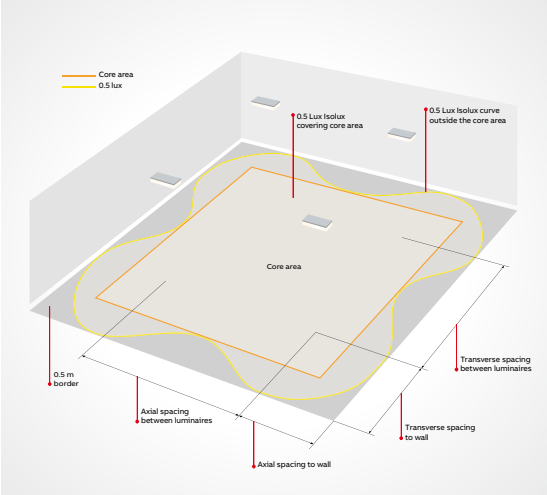
Illuminance levels should be maintained at 10% (or over) of the normal lighting level or 15 lux, provided within 0.5 seconds, to allow for safe egress and/or termination of processes. For high risk task areas, the lux requirement is calculated at the plane of the task rather than floor level.

Additional areas
Additional areas not part of the escape route still require illumination as people may be located there and/or measures may be required to ensure the safety of persons or processes. These areas include kitchens, first aid/operating rooms, lifts, refuge areas, escalators and moving walkways, toilets larger than 8 m^2 (or smaller without borrowed light), disabled toilets, small lobbies and pedestrian routes within covered car parks.

System integrity
All compartments should include two or more emergency luminaires to counter the risk of emergency luminaire failure.

Luminaire mounting height
Emergency luminaires should be mounted at least 2 m above the floor. There is no upper limit but luminaires should be fitted below smoke level if there is a significant risk of floor illumination being affected.

Stand-by lighting
If stand-by lighting is used as emergency lighting it should conform to all the requirements of emergency lighting.



—
08

Technical reference
Legislation & requirements

Specific location requirements
BS 5266 stipulates light levels, response and duration times for specific locations within premises, and for specific activities, including:
- Kitchens
- First aid rooms
- Examination and treatment rooms
- Refuge areas for the mobility impaired
- Plant rooms, switch rooms and emergency winding facilities for lifts
- Reception areas
- Crash bars or security devices at exit doors
- Inspection of the condition of fire control and indicating equipment

A table showing the illuminance recommendation for these specific locations and requirements can be found in BS 5266-1.

Emergency lighting systems
There is a varied range of emergency lighting available to suit different budgets, decors, building requirements, colours and specifications. The types and categories available for specification are:

Types of emergency lighting
- **Self-contained**
  Each luminaire contains a battery and electronic circuitry to charge batteries and operate the lamp
- **Slave**
  Luminaires are powered from a central system
- **Conversions**
  Almost any mains fluorescent luminaire can be converted for emergency use. Emergi-Lite is registered to ICEL to undertake emergency lighting conversions at our head office facility in Leeds, UK

Categories of emergency lighting
- **Non-maintained (NM)**
  Luminaires operate when the mains fail
- **Maintained (M)**
  Luminaires operate when the mains fail, but can also be operated if required using a switch when the mains supply is healthy
- **Combined Non-maintained (CNM)**
  The luminaire contains more than one lamp, one of which is mains operated, the other is for emergency use only. When the mains is healthy one or more lamps operate, but should the mains fail the emergency lamp operates
- **Combined Maintained**
  Similar to combined non-maintained, but when the mains supply is healthy both lamps operate, whereas on mains failure only one lamp operates

CE marking alone on an emergency lamp does not necessarily imply that the product will work in an emergency situation. All emergency lighting must be designed and manufactured to meet the requirements of BS EN 60598.2.22, the established product standard.

Emergency lighting products may be independently certified and approved as a means of proving quality in the product, thereby giving an enhanced level of assurance to the installer, and greater confidence and less risk in the work he performs. Emergency lighting independently tested and carrying the approval of a recognised national standards body, such as the BSI Kitemark or European ENEC mark, serves this purpose.

Testing and maintenance of emergency lighting
Fire legislation requires the safety systems within a building to be tested and maintained to ensure correct working order.

The major standards for emergency lighting establish the testing requirement, and that testing and maintenance should be done by a “competent person” (trained, with appropriate skills and experience).

Automated testing solutions are available to assist with the testing requirement, such as the Self-Test, IR2 infra-red and Naveo addressable testing solutions available from Emergi- Lite (see pages 70-75 of this catalogue for more details on these solutions).

For automated testing solutions, IEC 62034 provides specific guidance for luminaire testing, including:

- Testing should be undertaken during periods of low risk
- Tests should be performed at the appropriate times for the correct duration
- Testing should prove the emergency circuit operates correctly, and that the battery powers the luminaire for the duration of the test
- Results of the test should be reliably indicated

Within the IEC 62034 Standard, test systems for both self-contained and centrally powered emergency lighting systems are covered.

Technical reference

Checklist for emergency lighting system design

Checklist for emergency lighting system design

Point	Establish	Action
1	Establish position of fire equipment, position of hazards such as steps, each of changes of direction, stairs, first aid points etc.	Provide an emergency luminaire near (within 2 m horizontally) of these points of emphasis.
2	Establish designated exit doors, points on escape routes or where a sign is required to make the exit obvious.	Provide exit signs with arrows if necessary, observing the maximum viewing distances of the exit sign type.
3	Establish the need for external escape lighting.	Provide emergency luminaires so that people can proceed outside to a place of safety.
4	Establish the escape routes and establish mounting heights of luminaires and exit signs.	Position luminaires along parts of the escape route not already illuminated near the above points to provide 1 lux minimum along the centre line and 0.5 lux minimum in the 1 m central band. Use published data in the form of spacing tables for the luminaires to determine the positions taking into account the mounting height.
5	Establish the open areas used as escape routes and other open areas larger than 60 m^2 and establish mounting heights of luminaires above the floor.	Provide 0.5 lux minimum in the core area. Use published data (as above) to determine the positions.
6	Establish the position of lifts, escalators, toilets, control/plant rooms, pedestrian walkways in covered car parks.	Provide emergency luminaires in all of these areas.
7	Establish the location of any first aid point or fire equipment not on an escape route or open area.	Provide 5 lux emergency illuminance on the floor in the vicinity of the point. This also applies for a first aid room.
8	Establish the toilet areas.	Provide emergency lighting for toilets larger than 8 m^2, as if they were open areas. For toilets smaller than 8 m^2, unless illuminated by borrowed emergency light from another area, provide at least one emergency luminaire. Provide emergency lighting to all disabled toilets.
9	Establish any small lobbies with no borrowed light.	Provide emergency lighting.
10	Establish any central power supply (if used) is in an area of low risk away from other switchgear or plant.	Position the central power supply in its own room in fire-proof construction.
If the building use is known:		
11	Establish any need for stand-by lighting.	Provide generators as required. If the response time is longer than 5 seconds, then transitional, alternative or additional emergency lighting must be provided.
12	Establish any special needs for the occupants such as impaired mobility or impaired sight.	Provide additional emergency lighting to reduce the risk to those people to help them evacuate the premises. This applies to designated refuge areas (which may require the provision of emergency voice communication).
13	Establish the location of any high risk task areas and the normal lighting illuminance (lux) in these areas.	Provide 10% of the normal illuminance (lux) or 15 lux minimum.
14	Establish if there are any dust or dirt problems.	Allow a service factor as appropriate. 0.8 is allowed for normal areas, but for dusty environments 0.5 may be required, or alternatively instigate a regular cleaning procedure.
15	Establish any local regulations.	Provide emergency lighting to comply with the regulations.
16	Establish if there is any dimmable lighting and shopping malls.	Provide maintained emergency lighting.
17	Establish whether people would be “unfamiliar” with the escape routes.	Provide maintained exit signs.
18	Establish the use of the premises: • entertainment (including temporary such as licensed evening dance at a school) • sleeping risk • residential special care • non-residential care • public access non-residential • industrial • multi-storey dwelling over 10 storeys Note : because the duration times are varied, it is customary in the UK to use	Recommended Minimum Duration: 3 hr 3 hr 3 hr 1 hr 1 hr 1 hr 3 hr 3 hr

Note: for points 5 and 6 the luminaires positioned near points of emphasis can be moved slightly within the 2 m horizontal tolerance to fit in with the spacing or array of emergency luminaires in the escape route or open area. This checklist is for guidance purposes only and does not form an exhaustive list of all requirements to standards and legislation, which should be reviewed when undertaking emergency lighting system design. ‘60Hz’ option available on request, please contact Emergi-Lite . Please refer to ICEL (Industry Committee for Emergency Lighting) for updates and/or additional information [www.ICEL.co.uk]