



**HOCHIKI**

*a guide to*

# **BS5266**

*The design, installation and  
wiring of emergency lighting  
systems*

Hochiki Europe  
is a member of



Industry Committee  
for Emergency Lighting

## Welcome to Hochiki Europe's A Guide to BS5266

This booklet is designed to provide essential information on key points from BS5266 specifically identified as being important for the designer/installer of emergency lighting systems. It should **never** be utilised as any form of substitute for the standard itself.

**Remember, the correct positioning of exit signage and emergency lighting is essential in saving lives.**

Further detailed information can be acquired from the standard, contact BSI directly for your copy, or visit their web site:



[www.bsi-global.com](http://www.bsi-global.com)

Alternatively contact our Customer Support Department who will be pleased to help clarify any questions regarding the standard:

**+44 (0)1634 260133 (Option 2)**  
**psupport@hochikieurope.com**

# Why Emergency Lighting?

An Emergency Lighting System is essential

To show clearly the escape routes from a building

To allow safe movement (to exits) moving at walking pace without stumbling

To help prevent panic in an emergency and during evacuation

To show the location of and identify fire equipment, for example fire extinguishers and manual call points

To permit safety operations such as administering first aid

*NOTE: Although not compulsory, floor mounted and way guidance systems would be in addition to overhead lighting*

There is no dispute that emergency lighting is required to help people escape safely and quickly from a building. Using signs to show the escape route(s) is an essential part of emergency lighting, because those signs must be visible during a mains failure.

In addition to providing for escape, emergency lighting should illuminate any fire equipment, such as portable extinguishers and manual call points, either on the escape route or elsewhere, and permit safety operations such as first aid and fire fighting.

## Emergency Lighting Requirements

In the UK, the Fire Safety legislation requires emergency lighting to be provided in the following premises:

- *Offices and shops*
  - *Community halls*
  - *Schools*
  - *Hotels and hostels*
  - *Common areas in houses in multiple occupation*
  - *Premises that provide care*
  - *Pubs, clubs and restaurants*
  - *Tents and marquees*
  - *Factories and warehouses*
- **If artificial lighting is installed, emergency lighting is likely to be required:**
    - *on escape routes*
    - *in open areas larger than 60m<sup>2</sup> (or smaller if risk assessed)*
    - *to show exit signs*
  - **1 hour minimum duration (autonomy) of emergency lighting:**
    - *must fully recharge within 24 hours before reoccupation*
    - *premises must be evacuated immediately*
  - **3 hour duration of emergency lighting required for:**
    - *sleeping risk (hotels)*
    - *licensed premises and places of entertainment*
    - *premises requiring early reoccupation (schools, hospitals)*

Because of the two types being allowed, in the UK, 3 hour duration emergency lighting is almost exclusively used, to avoid confusion and multiple product types.

An advantage of using 3 hour duration where 1 hour is the minimum requirement is that if the mains fails for just 1 hour, there is still 2 hours duration remaining in the batteries, allowing an immediate reoccupation of the premises. If 1 hour duration had been used, the batteries would have no remaining capacity and would take up to 24 hours to recharge, delaying the reoccupation of the premises.

## Other Requirements and Legislation for Emergency Lighting (EL)

Compliance with BS 5266 parts 1, 7 and 8 would be adequate for most premises, but some Local Authorities have Licensing Schemes and Registration Schemes for certain types of premises, where the risks are higher, for example:



Premises licenced for the sale of alcohol



Very old premises



Premises where large numbers of people are gathered together

**It is always advisable to check with the Local Authority to see if they have their own special requirements for emergency lighting.**

## Types of Emergency Lighting Luminaires

- Self Contained
- Centrally Supplied
- Combined
- Compound
- Satellite



All emergency lighting operates when the supply to normal lighting fails



Luminaires can house one or more lamps, one or more of which can be used for emergency operation

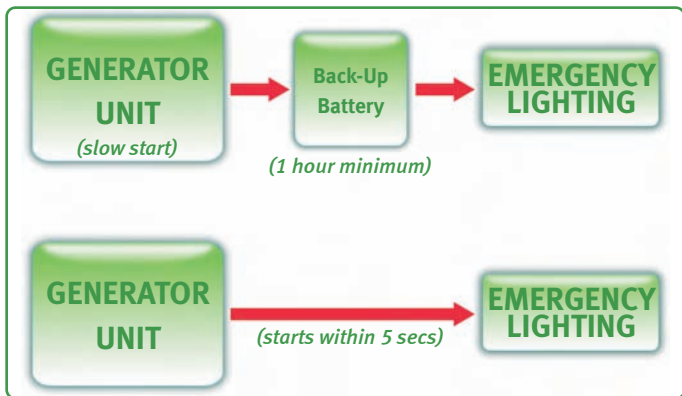


Exit signs can be externally or internally illuminated by emergency lighting

Emergency luminaires shall provide 50% of the rated lumen output claimed by the manufacturer during operation in emergency mode 5 seconds after failure of the normal supply and full-rated lumen output after 60 seconds and continuously to the end of the rated duration of emergency operation.

**Temperature limits of battery and control gear are critical and should not be exceeded. Some lamps have special characteristics so it is important to check control gear and lamp compatibility.**

## Generator Systems



Where generator systems are used for emergency lighting a back up battery will also be required to cover the time taken for the generator to start and run to full power.

However, if the generator starts and runs within 5 seconds, a battery for the emergency lighting would not be required providing the emergency lumen output meets the 50% at 5 seconds and the full rated output by 60 seconds .

## Categories of Emergency Lighting

- **Non-Maintained**
- **Maintained**
- **Combined (*was Sustained*)**

BS 5266 refers to both category and mode of operation in this respect.

A **non-maintained** luminaire only operates when the normal supply to the mains lighting fails. It does not operate with healthy mains.

A **maintained** luminaire also operates when the normal supply to the mains lighting fails, but can be switched on and off in the normal way when mains is healthy.

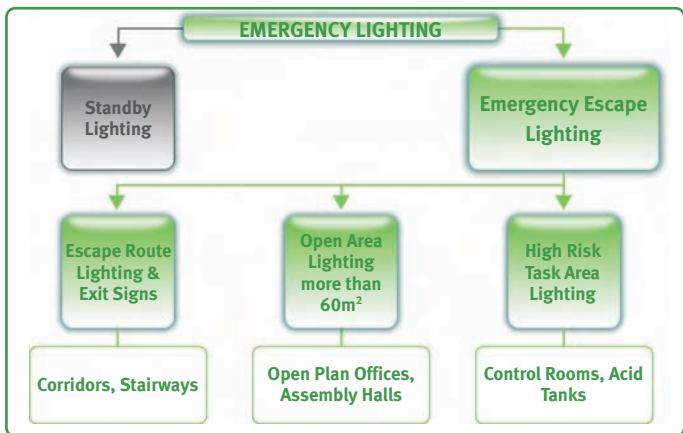
A **combined** luminaire has more than one lamp, but one is dedicated to emergency use and operates when the mains fails. Historically combined luminaires were called sustained.

The non-emergency lamp(s) are mains operated and normally the emergency lamp is non-maintained; this would be called Combined-NM.

However the emergency lamp could be maintained, so that all lamps operate in the mains healthy mode, but only one in the mains failed mode; this would be called Combined-M.

## Emergency Lighting Forms

Standby lighting may be used so that commercial or industrial processes can continue during a mains failure, for example using a generator. If the standby lighting complies with aspects of BS 5266, then it can be used for emergency lighting. Within emergency escape lighting the three specific forms apply:



**Escape route** emergency lighting may be for a corridor, or for delineated routes such as pedestrian routes in a covered car park. Where there is no marked or delineated route open area lighting should be used.

**Open areas** used as escape routes and open areas larger than 60m<sup>2</sup>, for example, large offices, assembly rooms, large common areas.

**High risk task areas**, which require a higher level of light whilst the danger exists. This would often be for a lot less than the usual 1h or 3h duration. High risk task area emergency lighting would be to make a dangerous machine, process or area safe, or in a control room to make safe remote processes.

## Escape Sign Illumination

Escape signs may be either externally illuminated or internally illuminated, but in either case all signs and notices will need illumination to ensure they are conspicuous and legible.

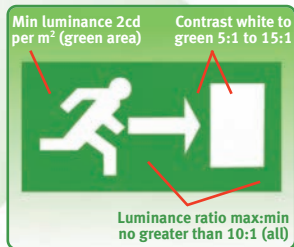


Signs or notices of the photo-luminescent type are not a substitute for appropriate emergency lighting and should only be used where other forms of illumination are present.

## Escape Sign Luminance

**Minimum Luminance** - the luminance of any area of the [green] safety colour of the sign shall be at least  $2 \text{ cd/m}^2$  in all relevant viewing directions (see annex A in BS 5266-7).

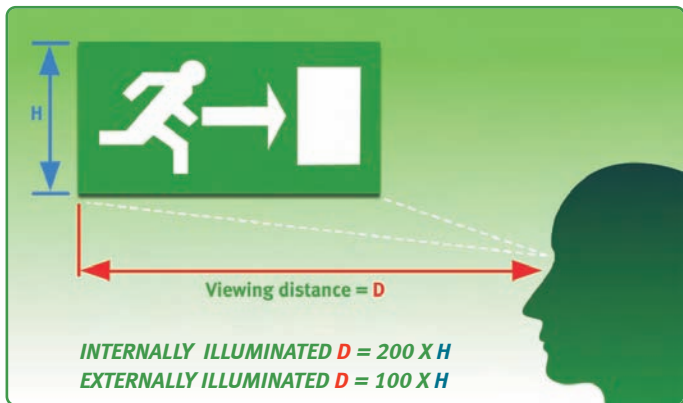
**Luminance ratio** - the ratio of the maximum to the minimum luminance within either white or the safety colour shall be not greater than 10:1 (i.e. all areas). *NOTE: High variation of adjacent points should be avoided.*



**Contrast** - the ratio of the luminance  $L_{\text{white}}$  to the luminance  $L_{\text{colour}}$  shall be not less than 5:1 and not greater than 15:1.

## Escape Sign Viewing Distances

The viewing distances (D) specified in BS 5266 part 7 are:



200 x the height (H) of the sign for internally illuminated (self illuminated) signs

100 x the height (H) of the sign for externally illuminated (remotely illuminated) signs

Signs should preferably be clearly visible, face on to where people will be looking, not on the ceiling or at an oblique angle.

## Illuminance Requirements

This table summarises the illuminance requirements for emergency lighting for the three "FORMS" of area. Within emergency escape lighting for BS 5266-7, BS EN 1838, the three specific forms of emergency lighting apply:

FORMS	BS 5266-7 (EN 1838)	Max/Min ratio and uniformity
ESCAPE ROUTE	1.0 Lux min on centre line	Up to 40:1 max : min
OPEN AREA	0.5 Lux minimum	Up to 40:1 max : min
HIGH RISK	10% of normal or 15 Lux min	Up to 10:1 average to min uniformity

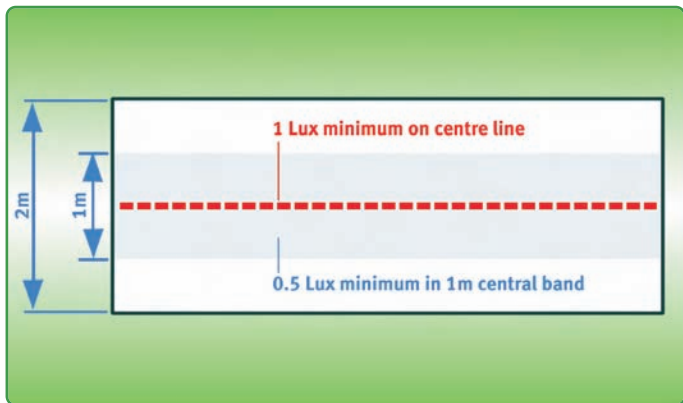
**Escape Routes** (eg corridors, stairways etc) and exit (safety) signs, where illuminance of 1 Lux along the centre line of the escape route should be achieved.

**Open Areas** greater than 60m<sup>2</sup>, for example, large offices, assembly rooms or common areas require anti-panic lighting with a minimum luminance of 0.5 Lux (*see also page 14*).

**High Risk Task Areas** which require a higher level of light but often for a shorter duration to make a dangerous machine, process or area safe, or in a control room to make safe remote processes. **For high risk task areas the illuminance should generally be 10% of the normal mains illuminance** or at least 15 Lux - whichever is the greater and within a minimum response time of 0.5s .

## Escape Routes Up To 2m Wide

For escape routes up to 2m wide the illuminance should be a minimum of 1 Lux along the centre line and a minimum of 50% of that (0.5 Lux) in the 1m central band.



If for certain reasons, for example to help the elderly, 5 Lux is required along the centre line, this would correspond to 2.5 Lux in the 1m central band.

To avoid bright and dark areas contrasting and slowing down the evacuation, the maximum to minimum ratio should be no greater than 40 : 1, where the minimum is 1 Lux, the maximum would be 40 Lux.

## Wider Escape Routes

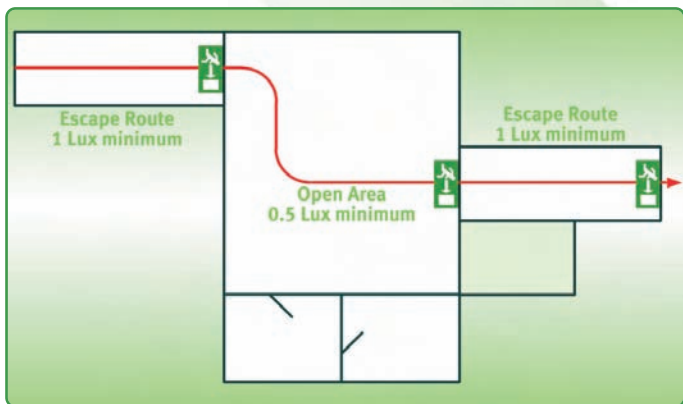
Where the escape route is wider than 2m it can be regarded as a number of 2m wide strips, or more simply as an open area.

## Open Areas

For open areas of 60m<sup>2</sup> or greater the area should be illuminated to a minimum of 0.5 Lux with a maximum to minimum ratio of 40:1.

A 0.5m strip around the perimeter of the area can be ignored.

Therefore, the maximum illumination should not exceed 20 Lux.

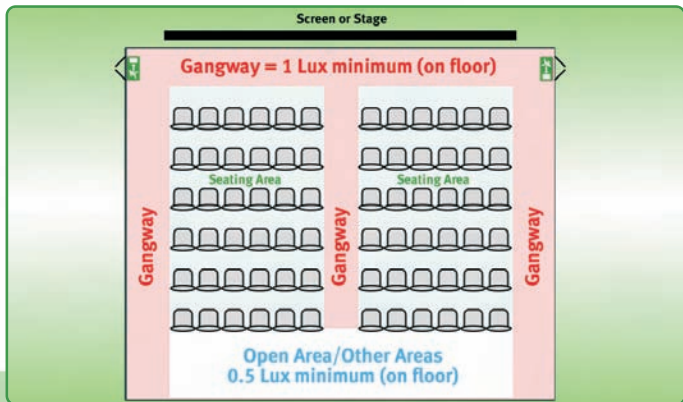


## Non-residential - Recreation

This class includes such premises as theatres, cinemas, concert halls, exhibition halls, sports halls, public houses and restaurants.

The people using such premises can be expected to be unfamiliar with the layout. Also it may be desirable to reoccupy the premises once the normal lighting has been restored, or to delay evacuation after the initial failure of the normal supply, should this be permitted. Based on these considerations, it is recommended that 3 h duration emergency lighting should be installed.

Where the normal lighting may be dimmed or turned off, in a cinema or theatre for example, a maintained emergency lighting system (luminaires and exit signs) should be installed. However, it is not necessary for the full emergency lighting level to be provided when the normal lighting system is functioning.



**NOTE:** Provided cinema and theatre seating is fixed to the floor, the seating rows will direct people to the aisles, so these do not need to be treated as open areas. Cinema and theatre auditoria are closely monitored by the local authority and designers should consult with the authorities to establish the exact requirements.

## Basic Requirements

Luminaires should comply with the requirements of their product safety standard BS EN 60598-2-22.

## Special Requirements

In the Risk Assessment any special requirements will be identified. For example where the elderly, or those with impaired eyesight or mobility are likely to be present, increased illuminance may be required.

**High risk task areas** require higher illuminance but only in the relevant area, at the task, and while the hazard exists. The normal lighting level will need to be established because the high risk task area emergency lighting will need to be 10% of that or 15 Lux, whichever is the greater. See also BS5266 Part 10 for items identified to meet the Fire Safety legislation.



## Maintained or Non-Maintained?

There may be local regulations applying to the type of premises. The relevant authorities should be consulted. This is of particular importance for licensed premises, places of entertainment, where the public have access, hospital or residential care or sleeping risk. So, in general:

- 1** Research any local regulations
- 2** Establish use of premises
- 3** Would occupants be “unfamiliar” with the building and the escape routes? If unfamiliar, **maintained exit signs are recommended.**
- 4** Premises used as sleeping accommodation includes hospitals, nursing homes, hotels, guest houses, clubs, colleges and schools. Persons using premises of this kind may be unfamiliar with their overall layout and/or may be infirm therefore **maintained exit signs are required.**
- 5** Non-residential premises used for recreation such as theatres, cinemas, concert halls, exhibition halls, sports halls, public houses and restaurants. The people using such premises can be expected to be unfamiliar with the layout. Where the normal lighting may be dimmed or turned off (cinema or theatre), a **maintained emergency lighting system should be installed.**
- 6** Non-residential premises such as town halls, libraries, shops, shopping malls, art galleries and museums. The majority of persons present in this class of premises will be unfamiliar with the layout, and evacuation may involve discharging large numbers of persons (from large shops) or gathering together smaller numbers of persons from large dispersed areas. Therefore **maintained exit signs are required.**

## Locating Luminaires

Generally luminaires (emergency lights) should be installed in the following locations:

### Points of Emphasis

At all points of emphasis on escape routes or in open areas, such as changes in floor level (steps), changes of direction (corners), first aid points, manual call points etc. See pages 20 ~ 23 for a full list and further details.

### Areas of Particular Risk

Although they cannot form part of the defined escape routes from premises the following types of areas are considered to need emergency lighting because of the particular risks :

- (a) **Passenger Lift Cars** - although they may be part of the escape route in exceptional circumstances, they may present a problem if the public are trapped in them in the event of a supply failure .
- (b) **Moving stairways (escalators) and moving walkways** - to allow users to safely leave them in case of a failure of the normal supply.
- (c) **Motor generator, control and plant rooms** - require battery supplied emergency lighting to help maintenance or operating personnel in an emergency.
- (d) **Pedestrian escape routes from covered and multi-storey car parks.**

## Toilets, Lobbies and Closets

Facilities exceeding 8 sq metres gross area should be provided with emergency lighting as if they were open areas. Toilets for disabled use, and any multiple closet facilities without borrowed light, should have emergency illumination from at least one luminaire.

NOTE: Provision of emergency lighting in accordance with this sub-clause does not necessitate the provision of emergency lighting in toilets designed to accommodate only a single able bodied person or en suite toilets or bathrooms in hotel bedrooms.



## Locating Luminaires - Points of Emphasis



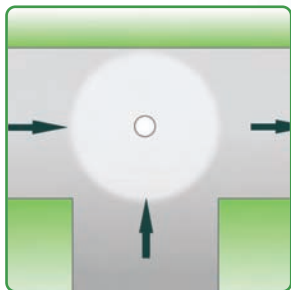
### Near Stairs

Each tread should receive direct light from the installed emergency lighting luminaire(s), so that the minimum luminance on each stair tread is 1 Lux.



### Near Changes of Level

Steps or other changes of level should receive direct light from an emergency lighting luminaire.



### At Each Change of Direction

Emergency lighting luminaires shall be installed near each change of direction as well as near each intersection of corridors on the designated escape route.

Note: Where a point of emphasis requires a luminaire to be "near", this is stated as within 2m horizontally, as seen on a plan.

## Locating Luminaires - Points of Emphasis



### Near Fire Fighting Equipment and Manual Call Points

Within 2 metres of all fire fighting and fire alarm call points an illuminance level of 5 Lux is required. This would also apply to a fire alarm control panel on an escape route (see further details on page 23).



### Outside and Near to Each Final Exit

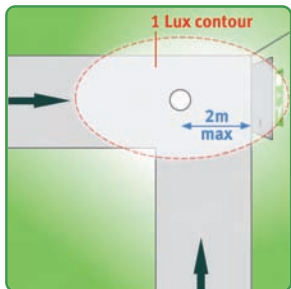
The escape route outside of the final exit(s) to a place of safety shall be illuminated.



### Near Each First Aid Point

This is a requirement included in BS 5266 part 7 1999, clause 4. All types of first aid post including first aid rooms are to be illuminated to a level of 5 Lux.

## Locating Luminaires - Points of Emphasis



### Exit Doors

Emergency lighting luminaires shall be installed (near) each exit door to provide appropriate illuminance near the door and at the threshold. However, to provide the 1 Lux on the centre line, the luminaire may need to be closer than the 2m suggested in the diagram.



### To Illuminate Safety Signs

Emergency lighting luminaires shall be installed to illuminate each escape sign and safety sign. For externally illuminated sign boards, a luminaire should be within 2m of the sign. Any further than 2m away would be unlikely to illuminate the sign sufficiently.

#### **Interpretation:**

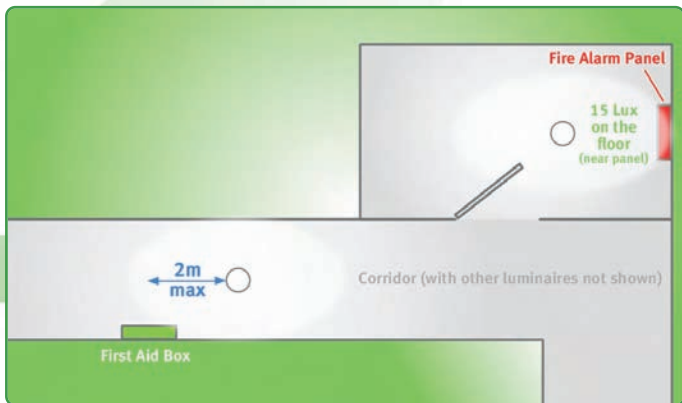
*Where a point of emphasis requires a luminaire to be "at", this is not always practical, because, for example, there might be another fitment already at the same point. The luminaire would then be placed at a suitable position no further than 2m from the point of emphasis. Remember the 1 Lux along the centre line of escape route corridors and stairways should be designed.*

## Fire Equipment & First Aid

If first aid posts, fire fighting equipment and manual call points are not on the escape route they should be illuminated to 15 Lux minimum on the floor. Sometimes the fire alarm control panel is sited in a room rather than near the entrance (in other words, escape route) in which case it should be illuminated to 15 Lux minimum on the floor.

### Interpretation:

*The 15 Lux illuminance would need to cover the floor near (within 2m of) the equipment. This is not stated in BS 5266-10, but it would be a reasonable interpretation. BS 5266-10 also states that the minimum illuminance at a first aid room should last for a minimum of 30mins. For control panels and other fire fighting equipment this duration should be extended to 'Full rated' - in other words at least that of the normal emergency lighting in the building.*



## Other Areas of Hazard

It is a requirement of the Regulatory Reform (Fire Safety) Order 2005 and equivalent legislation in Scotland and Northern Ireland that, in the event of a fire, the Responsible Person appoints staff to assist all occupants to evacuate and also to locate the source of a fire and decide upon appropriate action. In some locations this could require different applications of emergency lighting than those given in BS 5266-1, BS 5266-7 [BS EN 1838] and BS 5266-8 [BS EN 50172], which specifically concentrate on minimum light levels needed to enable occupants to evacuate the premises safely or to shut down processes.

BS 5266 part 10 addresses and provides guidance on specific hazards that can arise in a building as a result of the type or number of occupants, the design of the premises and activities carried out within it, or the actions occupants have a responsibility to perform in the event of an emergency.

The following are hazard areas that should be considered. This is not an exhaustive list, but gives examples of the methodology that can be applied. These areas could also have risks during a sudden failure of normal lighting and will probably need a higher level of illumination than that needed just for escape.



**Kitchens** - sudden failure of the normal lighting in areas where staff are preparing or transporting hot food is potentially dangerous.

**Response time 0.5s, Minimum Illuminance 15lx, Minimum Duration 30min.**



**First Aid Rooms** - consideration should be given to the illumination needed to complete simple medical procedures, for example, applying a bandage. **Response time 5s, Minimum Illuminance 15lx, Minimum Duration 30min.**

## Other Areas of Hazard (contd)



**Examination/Treatment Rooms** - consideration should be given to the illumination needed to complete complex procedures such as minor operations. **Response time 0.5s, Minimum Illuminance 50lx, Minimum Duration 30min.**



**Refuge Areas** - fire wardens have a responsibility to check and collect the mobility impaired from designated refuge areas, in accordance with the Regulatory Reform (Fire Safety) Order 2005. **Response time 5s, Minimum Illuminance 5lx, Minimum Duration full rated.**



**Plant Rooms/Switch Rooms** - in the event of a power supply failure, site engineers are likely to be required to enter plant rooms, switch rooms and emergency winding facilities for lifts. **Response time 5s, Minimum Illuminance 15lx, Minimum Duration full rated.**



**Inspection of Fire Panels** - the light should be sufficient to enable displays to be read accurately. **Response time 5s, Minimum Illuminance 15lx, Minimum Duration full rated.**



**Reception Area** - the reception area used to contact the fire brigade should have sufficient illumination for the telephone number to be dialled correctly. **Response time 5s, Minimum Illuminance 15lx, Minimum Duration full rated.**

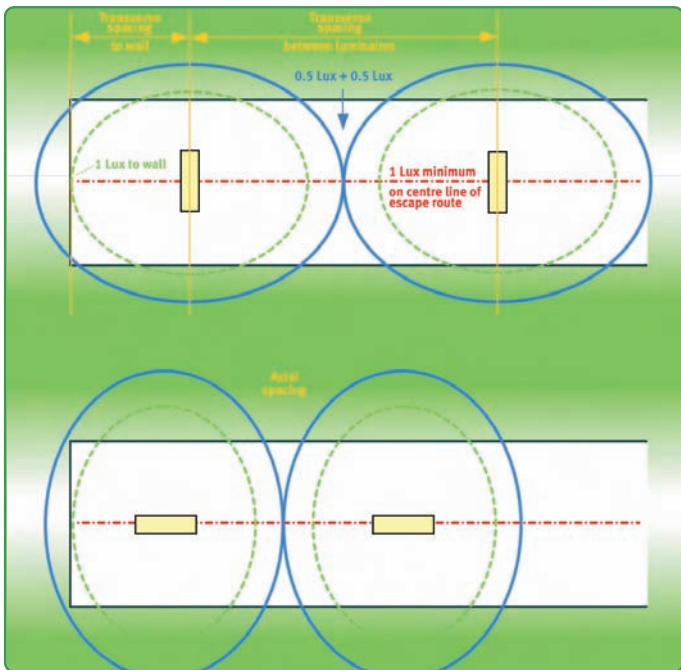


**Crash Bars at Exit Doors** - crash bars or security devices at exit doors should be sufficiently illuminated to enable them to be easily seen and operated. **Response time 5s, Minimum Illuminance 5lx, Minimum Duration full rated.**

## Spacing of Luminaires - Escape Routes

Emergency luminaires should be sited in addition to the points of emphasis:

- (a) on escape routes that may become obstructed, to 1 Lux minimum
- (b) on escape routes that may be used by the young, elderly, impaired or partially sighted, to 1 Lux minimum (consider higher levels than 1 Lux depending on impairment)



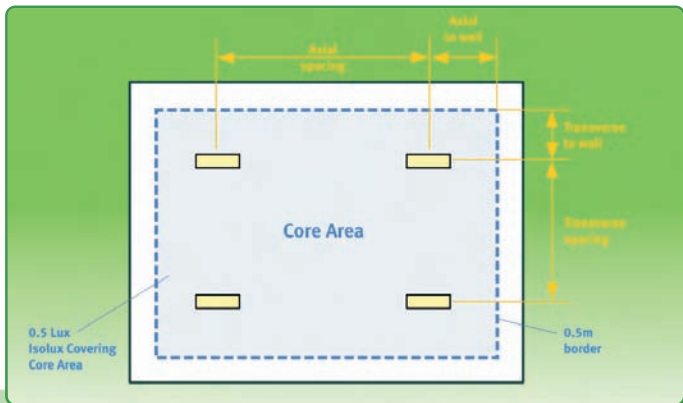
## Spacing of Luminaires - Open Areas

Emergency luminaires should be sited in open areas used as escape routes and in open areas larger than 60sq metres, to 0.5 Lux minimum.

Only the core area is considered because people do often not move through the outer 0.5m perimeter border.

The transverse and axial orientation also applies in open areas and for rectangular areas one orientation may be more efficient in utilising luminaires.

The spacings for 0.5 Lux in open areas are slightly greater than the spacings for 1 Lux on the centre line of an escape route.

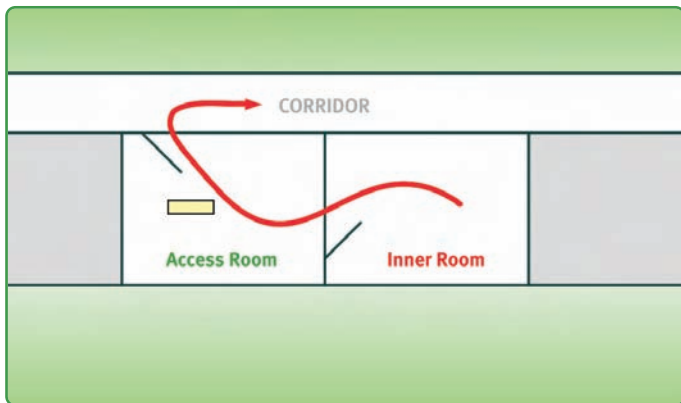


In open areas, moveable desks, chairs and other furniture can be ignored for emergency lighting, but where a partition is fixed, the 0.5m border follows the shape of the partition, and the emergency lighting has to be designed around it.

## Inner Rooms

The definition of an Inner Room is taken from the Guide to the Building Regulations, Approved Document B (2000). The interpretation would therefore be that the access room would be the escape route from the inner room and should have emergency lighting.

An exception might be if the access room was quite small and the wall and/or door to the escape corridor outside had sufficient clear or translucent panels to allow “borrowed” light (this would be subject to a risk assessment, for example would notices be adhered to the clear/translucent panels obscuring the light?).



## High Risk Task Areas

Examples of dangerous processes:

An acid tank

Any large rotating machine

A fast response is required so that the worker is not dangerously distracted when the mains fails.

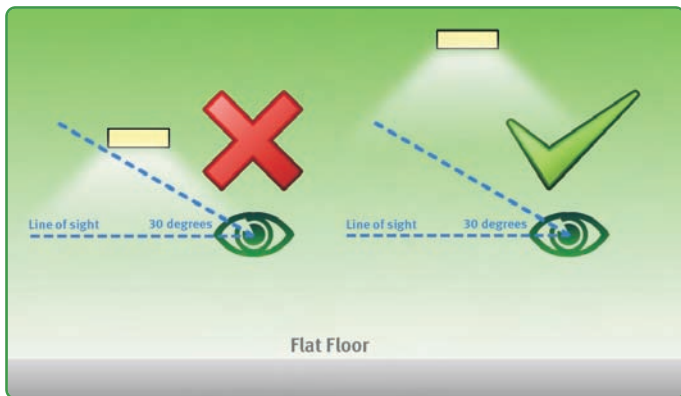


The high risk task area emergency lighting is only required “while the risk remains”. Once the machine or hazard has been safely shut down the emergency lighting can revert to the normal level (for example, 0.5 Lux for an open area). The duration required may be up to 30 minutes.

## Disability Glare

High contrasts between a luminaire and its background can produce disability glare which prevents observation of the escape route and obstructions.

If the floor is level, glare must be limited in the direct line of sight by ensuring the luminaires are within the glare limits in the line of sight and 30 degrees around line of sight.



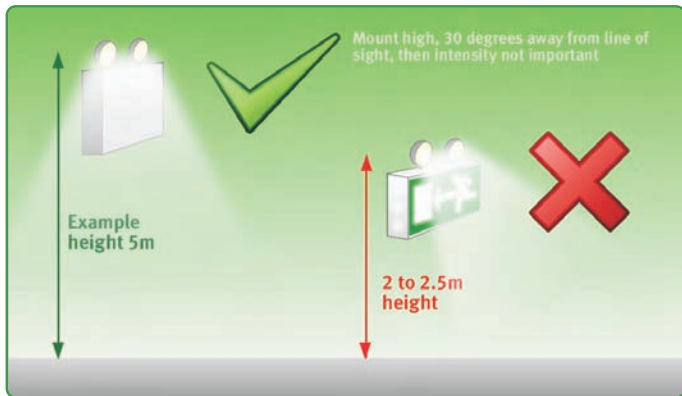
*Discomfort glare = mains lighting*

*Disability glare = emergency lighting*

The glare limits must never be exceeded if the area has changes of level.

## Disability Glare (contd)

Care is needed with projector and high output luminaires. Spot lamps have intense narrow beams and can easily cause disability glare. However if they are mounted sufficiently high and directed below the glare zone they are acceptable.



A spot lamp unit mounted near to an EXIT sign would almost certainly cause sufficient glare to make the EXIT sign illegible.

# FIREscape

[www.hochikieurope.com/firescape](http://www.hochikieurope.com/firescape)

**WINNER - BEST MEANS OF ESCAPE PRODUCT  
FIRE EXCELLENCE AWARDS 2011**



Hochiki Europe, world leaders in fire detection manufacturing introduces a brand new concept to the UK market - an innovative new Emergency Lighting system, **FIREscape**.

**FIREscape** is a unique, highly cost effective and environmentally friendly emergency lighting system based on LED technology and is the UK's first to be fully intelligent.

**FIREscape** is based around an addressable, emergency lighting control panel with battery back-up and features addressable, self contained luminaires and signage connected via traditional low-voltage (24V) cabling.

With lighting units fitting directly onto the standard Hochiki Europe sensor base (YBN-R/3) **FIREscape** offers the installer a brand new and easy solution to the installation of emergency lighting and signage.

## Low Voltage

Less than 5% energy consumption compared to traditional lighting\*<sup>1</sup>

## LED Technology

Low carbon emissions – less than 5% CO<sub>2</sub> compared to traditional lighting\*<sup>2</sup>

## Low Maintenance

Less than 1% lamp changes when compared to traditional lighting\*<sup>3</sup>



## Intelligent

Unique intelligent addressable technology allows control and testing of individual luminaires

## Simple Installation

Luminaires fit onto the standard Hochiki Europe sensor mounting base (*YBN-R/3*)

## Manufactured in the UK

Built and tested by Hochiki Europe in UK

## Graphics Software

Allows instant overview of complete system and assists in maintenance tasks

\*<sup>1</sup> Figure based on tests of 100 luminaires over 10 years

\*<sup>2</sup> Figure based on comparison of traditional fluorescent tubing with FIREscape, installation of 100 luminaires

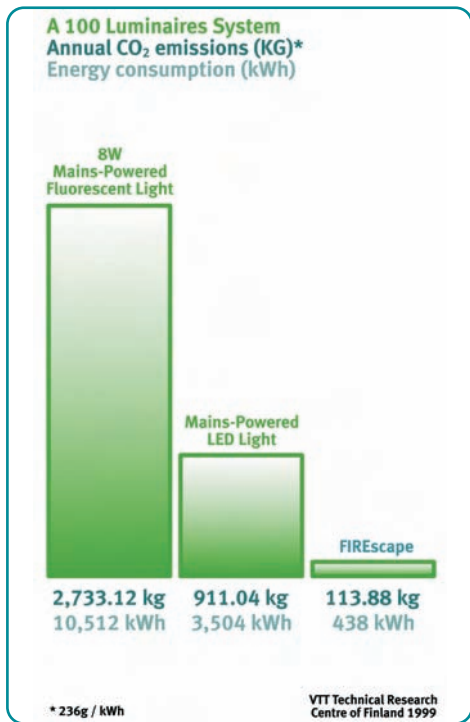
\*<sup>3</sup> Figure based on lamp changes over a ten year period for a system of 100 luminaires

## A Greener Solution to Emergency Lighting

The **FIREscape** emergency lighting system features luminaires that contain their own battery backup power source. This means the system can be cabled with regular cabling, instead of Fire Resistant cables.

The **FIREscape** emergency lighting system uses less energy and therefore produces less CO<sub>2</sub> associated with a traditional maintained and mains voltage system.

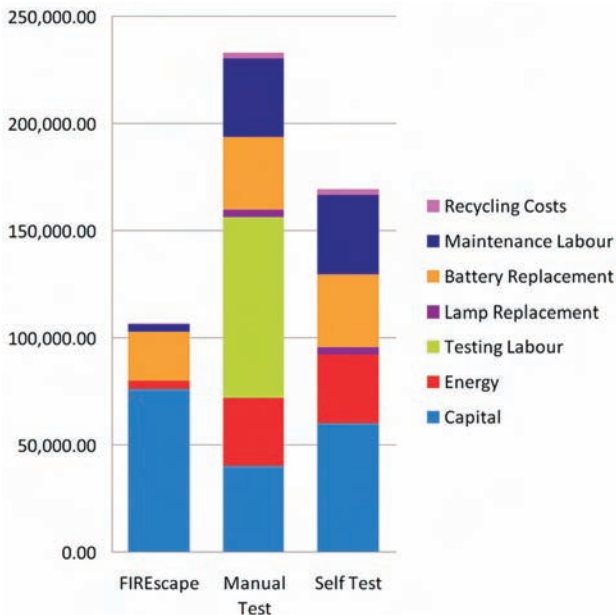
The graph (right) compares the energy consumption and CO<sub>2</sub> emissions of emergency light systems using traditional mains-powered fluorescent technology, a mains-powered LED equivalent and the low-voltage **FIREscape** system, on an annual basis in a 100-luminaires installation.



## A Greener Solution to Emergency Lighting

The graph below shows a total cost of ownership comparison based on a 1000 luminaires, 80% non-maintained 20% maintained, emergency lighting system for manual-test, self-test and Hochiki's FIREscape system, over a 10 year period. Savings of over £126,000 and 29.9 tonnes of CO<sub>2</sub> can be achieved.

### 80% non-maintained 20% maintained, emergency lighting system





**Your Safety, Our Technology.**

## **HOCHIKI EUROPE (UK) LTD**

Grosvenor Road, Gillingham Business Park,  
Gillingham, Kent, United Kingdom ME8 0SA

Telephone: +44 (0)1634 260133

Facsimile: +44 (0)1634 260132

e-mail (UK Sales): [sales@hochikieurope.com](mailto:sales@hochikieurope.com)

e-mail (Non UK Sales): [export@hochikieurope.com](mailto:export@hochikieurope.com)

[www.hochikieurope.com](http://www.hochikieurope.com)

version 1 May 2011