

Emergency lighting *a practical guide*

MOTIVATION

The design, specification, installation and application of emergency lighting requires a combination of flair and knowledge. Safety is the paramount consideration, and risk assessment has to be codified in a very specific way. Testing has also become an important factor. We hope that the following notes will help you to understand your obligations, and facilitate the choice of product or system. But please contact us for any additional information, or clarification of any of the issues covered.

SAFETY DIRECTIVE

The EC Safety Signs Directive regulates the specification and application of directional fire safety signs for all exits, emergency exits and escape routes. It replaces the existing EXIT logo,



BS2560. You should note that whilst BS5499, a combination of wording and pictogram, is still acceptable on existing installations until replaced within a reasonable period of time, you have to gain the approval of the regulatory authority for its usage.

To be sure, you should now specify, stock and install only the Signs Directive compliant types, which satisfies the BS5266 requirement that –

'signs at all exits, emergency exits and escape routes, such that the position of any exit, or route to it, is easily recognised and followed in any emergency'.

All the relevant products in this catalogue are designed with the Directive in mind.

1 Exit and/or Route Indicators

Whitecroft Lighting offers a range of luminaires equipped with a variety of text and pictograms conforming to ISO 6309. However, whilst functionality is paramount with products of this nature, considerable effort is committed to ensure that these luminaires are also stylish.



Egress Double p113

2 Stand-alone Emergency Luminaires

This range of products will satisfy most emergency lighting applications. The sealed bulkhead version is particularly suitable for the external lighting of exits.

Although these types of luminaires are designed to be as unobtrusive as possible, such a system may be at odds with the aesthetics and architecture of the building. Whitecroft Lighting has therefore developed the next group of products for this reason:



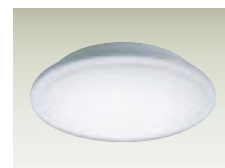
Weatherproof p110

3 Standard Luminaires with Emergency Facility

Standard luminaires specified within an area for their aesthetics as well as general lighting performance may be supplied in whatever numbers are required with a factory fitted conversion unit to provide emergency lighting in the event of a mains supply failure. This allows the overall design concept to be maintained whilst still providing emergency lighting to the required standards.

There are a number of modes in which emergency lighting may operate. Whitecroft Lighting, in general, designs its products to function in the 'Maintained' mode. This means that, for example, in a twin lamp luminaire the fitting may be switched on and off as normal, but with one lamp automatically powered up and illuminated at reduced output in the event of mains failure. This will occur irrespective of whether the fitting is switched on or off at the time of mains failure.

The principle type of emergency luminaire in the Whitecroft Lighting range is termed 'Self contained', utilising internal electronics and rechargeable batteries to power the lamp in the event of mains failure. Whitecroft Lighting will also provide luminaires for other types of system where defined, such as for Central Battery



Horizon p92

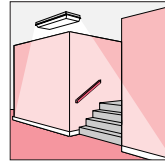
WHERE TO LOCATE YOUR LUMINAIRE

Emergency lighting has to perform a specific function, and there are specific regulations that govern their location in a building.

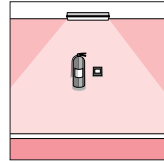
The siting of exit signs must conform to BS 5266 Pt 1:1988 and prEN 1838 1S3217:1989. Signs are required at all exits, emergency exits and escape routes, so that the location of any exit or route to that exit can be easily recognised and followed in the event of an emergency evacuation. The first priority is to determine the luminaire positioning to illuminate 'points of reference'.

If the emergency exit itself is out of sight, or its location is not immediately evident, a directional sign should be installed to guide people during an evacuation towards the exit or emergency exit. Some areas require emergency lighting because of the particular risk they represent, although they might not form part of the designated escape route.

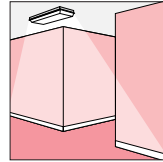
Determine the positioning of emergency lighting luminaires



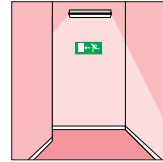
Near stairs and near changes of level



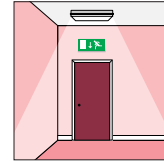
Near (within 2 metres) of fire fighting equipment and alarm call points



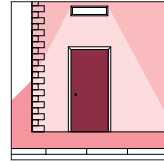
Near each intersection of corridors



Near each change of direction

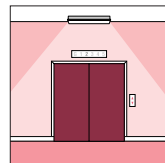


To illuminate exit doors and safety signs

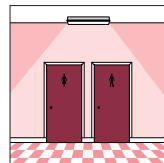


Outside and near to each final exit

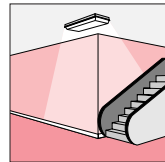
Areas of particular risk



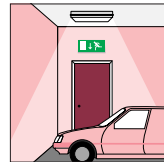
Passenger lift cars



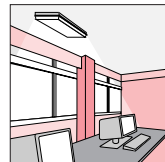
Toilets and large tiled areas of greater than 8m² gross area



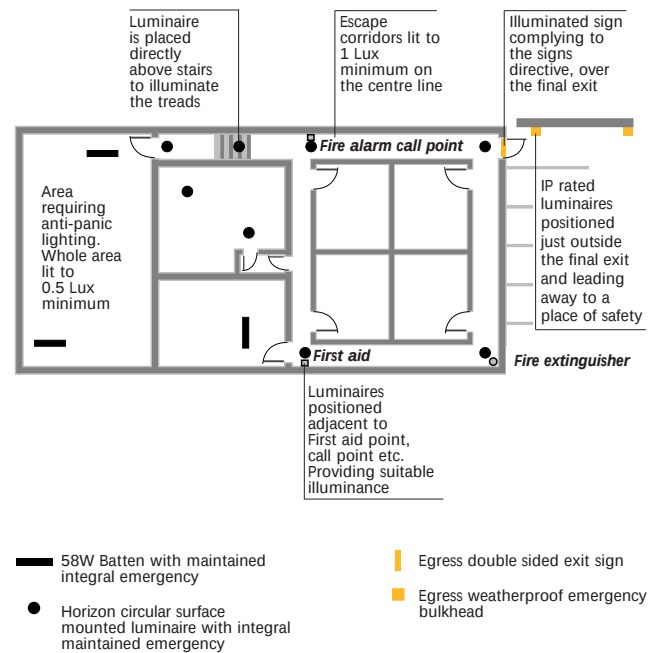
Moving stairways and walkways



Pedestrian escape routes from covered and multi-storey car parks



Motor generator, control and plant rooms



LEVELS OF LUMINANCE

You will need to work to **BS5266 Pt 1:1988**, which requires 0.2lux minimum on the centre line of defined Emergency escape routes. Higher levels have to be used if there are particular risks to be guarded against. **Standard IS3217:1989** requires a minimum of 0.5 lux on the centre line of defined Emergency escape routes.

When you are looking at open areas, these standards require a minimum of 1 lux average over the whole area.

In common with other electrical services, emergency lighting is moving towards harmonised standards, which will supersede the existing national standards for emergency escape routes, open (anti-panic) areas and high-risk task areas. The level for emergency escape routes will require a minimum of 1 lux, but there might be some scope to maintain the UK standard of 0.2 lux if the route can be shown to be 'permanently unobstructed'.

An emergency lighting design for open areas, with a floor area in excess of 60msq, which will be referred to as Open (Anti-Panic) areas, where no fixed escape route is required, must use a minimum of 0.5 lux anywhere on the floor (excluding a 0.5m border around the room). This is similar to the current 1 lux average, although the specification is different.

The new High Risk Task areas needs at least 10% of the normal mains lighting level, or a minimum of 15 lux,

to be provided within 0.5 seconds of loss of supply. This level must be kept until the normal service is restored.

When changing from BS2560 to the European Directive (ED) sign, you will probably require additional illumination, as the new pictogram format with a larger area of green will significantly reduce luminaire light output.

Please call us if you need to be updated on any of these changes.

Emergency lighting *a practical guide continued*

SPACING

You should also be aware of the viewing distances of signs. The maximum allowable viewing distances for BS 5499 signs, and signs of the Signs Directive format, are:

- 200 x legend panel height if internally illuminated;
- 100 x legend panel height if externally illuminated.

On all escape routes, luminaires should be located so that they do not exceed the maximum spacing distances, which can be from the chart below for the particular ceiling height. When you are undertaking your risk assessment (see section on risk assessment) you must note that luminaire performance

will be affected by the accumulation of dirt, particularly if the system is not regularly maintained. Existing luminaires must be checked to ensure lamps and lighting controllers are clean, undamaged and not blackened.



Look out for this icon which will tell you on which page a particular products relevant spacing table can be found in the 'Notes for Specifiers' section at the end of this catalogue.

Spacing data

LUMINAIRE SPACING ON EMERGENCY ESCAPE ROUTES														
MOUNTING HEIGHT		TRANSVERSE TO WALL (LUX)			TRANSVERSE SPACING (LUX)			AXIAL SPACING (LUX)			AXIAL TO WALL (LUX)			
														
LUMINAIRE MODEL		LUX	0.2	0.5	1.0	0.2	0.5	1.0	0.2	0.5	1.0	0.2	0.5	1.0
Sentry SEN/BH/NM/F8	2.0m	2.7	4.8	3.2	2.0	11.9	8.8	6.4	7.0	5.4	4.4	2.9	2.2	1.5
	2.5m	1.8	5.0	3.1	1.4	12.9	9.2	6.1	7.7	5.7	4.4	3.2	2.2	1.3
	3.0m	1.2	5.1	2.6	0.7	13.6	9.0	5.2	8.3	5.9	4.2	3.3	2.1	0.8
	4.0m	0.7	4.8	1.7	–	14.4	7.8	3.3	9.2	5.9	3.0	3.4	1.5	–
	6.0m	0.3	2.9	–	–	13.1	4.0	–	9.5	3.5	–	2.7	–	–

LUMINAIRE SPACING IN ANTI-PANIC OPEN AREAS						
		LUX	0.5		0.5	
Sentry SEN/BH/NM/F8	2.0m	2.7	2.8		8.0	
	2.5m	1.7	2.7		8.5	
	3.0m	1.2	2.3		8.9	
	4.0m	1.2	1.7		9.1	
	6.0m	1.2	–		7.4	

TESTING

Emergency lighting must work round the clock, and any problems have to be routinely identified and rectified. Testing and maintenance is therefore a fundamental discipline, and you should understand your obligations to BS5839: Part1; 1998, and BS5266: testing Requirements for Central & Self-Contained Systems.

Testing standards

FREQUENCY	BRITISH STANDARD BS 5266: PART 1: 1988	EUROPEAN DRAFT STANDARD pr EN50172
Daily	Check that the operation is in order	Check that the mains are healthy and that the batteries are charging
Monthly	–	Complete an operational check
Every 6 months	Operate a part duration check	–
Annually	Operate a longer duration check	Complete a full duration check on the system
Every 3 years	Operate a full duration check	–

You should note that for the monthly and annual test, records must be made available on site for inspection.

- Daily Inspection (*as per existing copy*)
- Quarterly Test (*as per existing*)
- Annual Test (*as per existing*)
- Every 2-3 Years (*as per existing*)
- Every 5 years

RISK ASSESSMENT

The purpose of emergency lighting risk assessment is to help to determine whether the existing provisions, as part of the fire precautions, are adequate, and, if not, how to improve them. A judicious design with the right emergency lighting and fire detection and alarm system can often reduce high-risk premises to normal risk. The specification should of course be based on equipment that meets the appropriate standards, correctly installed in accordance with verified performance data, regularly tested and maintained as specified.

The objective of risk assessment is to protect people from fire, to warn people of fire, and to allow them to escape to safety. Emergency lighting plays a critical role in assisting the escape to safety. The risk assessment will include deciding on the necessary action to comply with the

Workplace Regulations within the framework of a seven-stage process:

- 1 Identification of the fire hazards.**
- 2 Consideration of the fire risk, reducing the fire hazards where possible.**
- 3 Assessments of the means of escape, reducing the escape time if necessary.**
- 4 Assessment of the need for a fire detection and alarm system.**
- 5 Recording the findings and the action taken.**
- 6 Preparation of an emergency plan, and arranging practices.**
- 7 Carrying out regular checks and maintenance to ensure safety. Safety equipment such as emergency lighting should be checked to ensure it operates as intended and is correctly maintained.**

You should understand how they apply to specific buildings. As far as new premises are concerned, the designer should have provided

adequate emergency lighting according to the Building Regulations and the designated code of practice for such installations. The employer, or responsible person, must however still carry out risk assessment to verify that other procedures such as testing, maintenance and training are followed.

For existing premises or for premises subject to a change of use, compliance with the Fire Precautions (Workplace) Regulations 1999 is a legal necessity, and may involve some enhancement to the emergency lighting installation and safety procedures.

For premises in which 5 or more persons are employed, there is a legal requirement to document significant findings, together with details of measures taken to deal with the risks identified. If there are fewer than 5 people, there is still a requirement to carry out a risk assessment, although it may not be formally recorded.

Certain buildings are exempt from the requirements, such as workplaces used only by the self-employed and private dwellings. Other workplaces are covered by their own specific requirements, such as mine shafts, sports grounds under the Fire Safety and Safety of Places of Sport Act 1987, construction sites that apply to the Construction (Health Safety and Welfare) Regulations 1996, ships, within the Docks Regulations 1988.

When you are considering a risk assessment report, look at some of the simple ways that can reduce the risk. For example, if the incoming mains electrical supply to the premises is not in an area of low risk, then staff may be exposed to unacceptable risk from lighting failure, and emergency should be provided in areas other than the escape routes to reduce that risk. If there are potential obstructions on the escape route, such as stair treads, barriers and walls at right angles, then

BS5266 advises that they should be light in colour against a contrasting background. This contrast may not be appropriate, therefore higher emergency illuminances of at least 1 Lux can be used to reduce this risk.

All emergency lighting systems should be regularly inspected and tested. The data obtained and details of any corrective action should be entered into a log book, which is held on site. We can supply you on request with a full chart showing the procedures in accordance with the recommendations of the Fire Precautions (Workplaces) Regulations.

To provide a risk assessment evaluation you will need to know about the most appropriate choice of product and design for both emergency lighting and fire protection. You will need to consider the legal requirements, the standards, any local requirements, and determine the

escape routes, the type of emergency lighting required, the mode of operation and emergency duration of the system, and the positioning of the equipment.

We have covered some of this information in these briefing notes. We can also supply you on request with a comprehensive Risk Assessment document. It includes familiarisation with the latest Signs Directive, comprehensive definitions and calculations, the suitability of different systems, and practically all you need for completing an emergency lighting design. Similar information is available in the Fire Protection document.

It also includes a detailed checklist, which can be used to ensure that every requirement is met, and logged, and a definitive list of the standards and references relating to emergency lighting and fire protection.

Reducing the risk

SITUATION	RISK	REQUIREMENTS			
		EMERGENCY LIGHTING	MAINTAINED EMERGENCY LIGHTING	HIGHER EMERGENCY LUMINANCE ≤1UX*	INCREASE EMERGENCY LIGHTING
If incoming mains electrical supply is not in an area of low risk	Staff exposed to risk from lighting failure	✓			
If lighting circuits do not correspond with the fire compartmentation	Non-maintained emergency lighting may not operate when required	✓	✓		
If older or disabled or partially sighted people are likely to be in the building	They may obstruct escape routes	✓		✓	
If there are potential obstructions on the escape route, then BS5266 and IS3217 advise that they should be lit in colour against a contrasting background	This contrast may not be appropriate	✓		✓	
If there is likely to be a presence of high physical risk	Rapid response time increased	✓			✓
If the length of the escape route is excessive	Escape time is increased	✓		✓	✓
If people such as the public or temporary workers unfamiliar with the layout of the building are likely to be present	Escape time is increased	✓		✓	✓
If the escape route passes through open areas	Escape time is increased	✓			✓
If an area is larger than 60m²	Escape time is increased	✓			✓
If 5 or more people are employed on the premises	Staff exposed to risk from lighting failure	✓	✓		