

EMERGENCY LIGHTING

A SPECIFIERS & INSTALLERS GUIDE



INTRODUCTION

Why it's critical to get it right

In an emergency it is the building owner's duty to ensure that people can get to a place of safety. Occupants, who may be unfamiliar with a building, need clear lighting and signposting to safe locations and emergency equipment. If there is a mains blackout, emergency lighting will reduce panic and could save lives.

The price of getting it wrong

As the "responsible person" whoever is in charge of the building, whether that is the employer, the owner or facilities manager, is legally responsible for fire safety, protecting lives and the building. And the cost of getting it wrong can be a six-figure fine or even prison. Part of that responsibility is ensuring that they get their emergency lighting system right.

Emergency lighting essentials

While not all evacuations occur when there is a loss of light, if there is a blackout then sudden darkness could cause confusion and panic.

The job of emergency lighting is to minimise this panic and help people to get to a place of safety calmly.

Exit signs show people where they need to go by marking emergency exits, pathways, obstacles, and any changes in direction. Escape lighting provides a minimum illumination if there is a loss of mains power to help reduce panic and identify any obstacles and safety equipment.

About this guide

The purpose of this guide is to help you as the specifier and/or installer advise your customer on the best emergency lighting system for their building to help them comply with their legal duties.

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FACTORS AFFECTING THE SPECIFICATION

The “responsible person” for the building must conduct a thorough risk assessment to identify any hazards and then remove or reduce the risk from them.

As the specifier for emergency lighting, you can help them consider what factors will help people get to safety and how this will affect the emergency lighting specification and system design.





Who Uses the Building?

Who uses the building, how they use it, and how familiar they are with its layout is important when designing an emergency lighting system.

Age and health

When planning escape routes, think about people with reduced mobility and other impairments.

Eyesight deteriorates with age so it can take longer to identify signage. It also means that you will need to consider where you place emergency lighting to clearly identify escape routes and hazards. You need to plan where to place the lighting and consider higher illumination.

Familiarity

How well do the people using the building know its layout? If the public use it, or someone who is unfamiliar with the space, then an emergency can cause a panic.

In this situation you should specify maintained, or always on exit signs.

Awareness

Think about how aware people are when they use the building. There are situations where people are less alert, such as in an entertainment venue or if they are asleep in a hotel.

If they are likely to respond more slowly to an emergency, then make sure that any signage and escape routes are clearly lit.



What Tasks are People Doing?

Ask yourself how safely people can stop their tasks in an emergency.

If they can do so under very-low illumination levels such as in an office, in a shop or in general circulation areas, then you may only need to specify escape and anti-panic lighting.

For areas where people need to use a control panel you will need to illuminate both this and the task to ensure that they can stop the process and safely evacuate the area. This might include warehouses, kitchens, light industrial areas and first aid areas.

For spaces where people are doing high-risk tasks or which take time to stop, you will need to provide full illumination in an emergency. Examples include foundries, hospital operating theatres or airport control towers.



High Risk Buildings

The size and/or complexity of a building can sometimes make evacuation more difficult or in some cases, there may only be one major escape route.

High rise buildings

A high-rise building is defined as any building with at least seven stories or a height of more than 18 metres.

Although there may be no dangerous tasks occurring, it will take longer to evacuate these buildings, particularly if people are asleep when the emergency happens.

This may mean that the emergency lighting needs to be on for longer and you need higher illumination levels as people negotiate long enclosed staircases.

Older buildings

Older buildings can also pose a higher risk to people since they often do not meet newer building regulations. They will probably not have enough escape routes, and they might not be wide enough. The buildings may also be constructed from materials that are flammable or produce smoke or toxins if there is a fire.

In these buildings you should provide higher illumination levels for longer periods of time to help reduce panic.

Large public gatherings

Some buildings such as stadiums or theatres may not be dangerous but could pose a risk due to the number of people that need evacuating. This can lead to panic and crushing.

You will need to specify maintained exit signs to ensure that they clearly direct people to exit points.



EMERGENCY LIGHTING

SPECIFYING A SYSTEM

There are a number of different emergency lighting systems and products available in the market. Several factors will influence what technologies and products you specify. In this section we outline your options.





Self-Contained vs Central Battery

Most buildings will have self-contained emergency luminaires which have their own battery and control unit. The battery will remain on charge from the mains lighting circuit unless the luminaires lose the mains power supply, at which point it provides the power to maintain lighting.

A central battery system (CBS), or central power system, uses one central battery to power emergency luminaires if there is a power outage. There can also be batteries per floor in a cupboard or riser. This depends on the design and available space.

Maintained vs Non Maintained

Maintained emergency fittings can be turned on / off when the mains power is on, so it can operate when the occupiers need either normal lighting or emergency lighting.

Non-maintained emergency luminaires will only switch on when a building's power fails.

Important note

What battery backup you specify for the emergency lighting system will depend on the use of the building and the evacuation strategy. You will need:

- 3-hour duration if evacuation is not immediate, or where early re-occupation may be required.

Manual or Automatic Testing?

The standards state that emergency lighting needs testing regularly to ensure that they still operate correctly. There are two tests, one for emergency light operation which should take place monthly, and an annual battery duration test. Depending on the risk assessment, the testing maybe more frequent.

Depending on the building there are three ways of completing these tests; manually, a self-test or automatically using a DALI 2 system.

Manual Test

The simplest, but most time-consuming solution, is to test each luminaire locally by pressing its test button or turning its key switch. This switches off the mains power to that fitting to force it into emergency mode.

The operator will do the inspection in real time by walking around the premises and testing each fitting.

Self-Test

A self-test unit will automatically perform its own test with any failure indicated by an LED on the fitting, which will blink or change colour.

The operator will still need to visually check and record the LED indicator status of each fitting.

Automatic Testing

Using DALI 2 compliant systems, automatic testing removes the time and hassle of the other two approaches. It also ensures that the building owner completes and records the tests to ensure ongoing compliance.

The appointed person simply schedules the tests to suit the building occupiers' needs and to meet the regulations. The system then performs the test and records the results. Depending on the building management system, the appointed person will then either check the electronic logbook or receive a message about any faulty units and arrange for their maintenance or replacement.

the sec②nd floor
blue dock·10

EMERGENCY LIGHTING

PRODUCT SELECTION

Emergency lighting products show people where they need to go in an emergency and ensure that they have enough light to get there safely. This section deals with the product types that you need to specify.



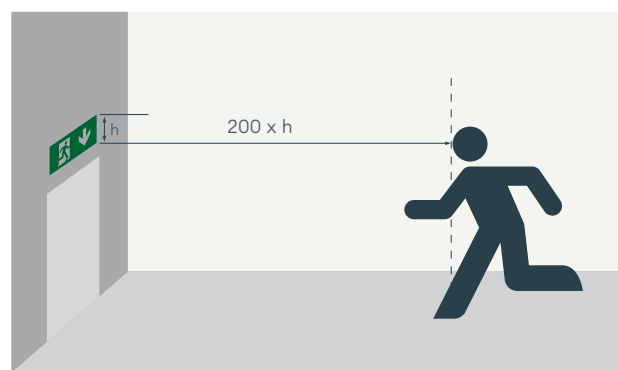
Exit Signs

Exit signs show people where the fire exits are and how to get there safely. The pictogram of the well-known green man is backlit to provide luminance to EN 60598-2-22 and EN 1838. The sign colours must also provide a contrast of between 5:1 and 15:1 so that they are clearly visible and understood.

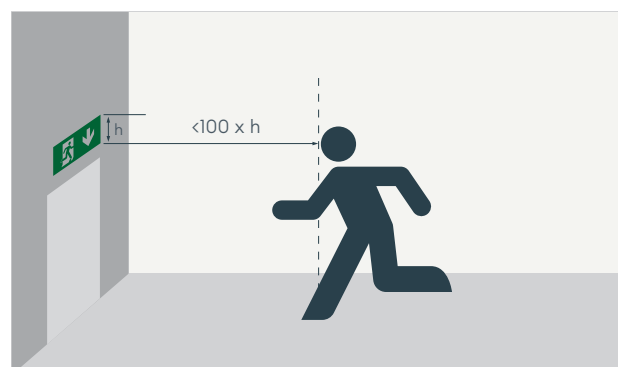
Maximum Viewing Distances

Maximum viewing distances are detailed for all sign formats in EN 1838: 2013. While internally illuminated exit signs are pre-tested to ensure compliance, you must take extra care if the sign is externally illuminated and site an emergency luminaire within 2 metres of it.

In addition the maximum viewing distance from the externally illuminated sign is 100x the height of the sign panel. It is 200x for an internally illuminated sign.



Internally illuminated signs



Externally illuminated signs

Product Options

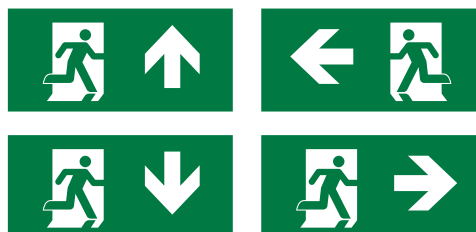
There are different mounting options available for exit signage. You can install them on the wall, from the ceiling or even suspend them. You can also select single- or double-sided signage and specify different viewing distance specifications to suit numerous room sizes and applications.

Wall mounted exit signs cover a number of locations and have different mounting options. They are available in both single and double-sided options and different viewing distance specifications to suit various rooms sizes and applications.



Recommended Signage

For best practice you should use the pictogram format recommended by EN ISO 7010:2012 E002 5266:2016.



Safety Luminaires

Safety luminaires are all in one units that light escape routes, open areas, or high-risk tasks if there is a power outage.

Emergency Bulkheads

These are typically surface mounted. They offer a high IP rating and robustness with excellent energy efficiency.

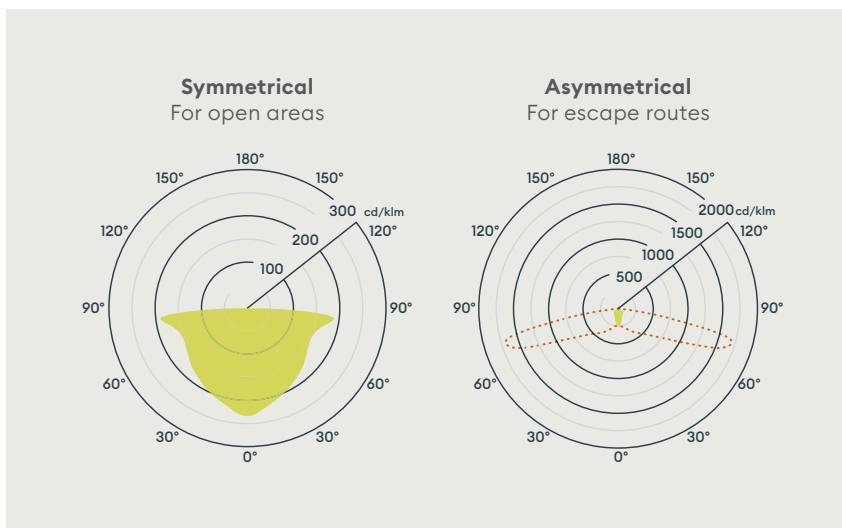


Emergency Spotlights

These offer a more discrete solution than bulkheads when aesthetics are important. Depending on the installation requirements, you can specify them as either surface mounted or recessed options.



In some products such as our Salvus Route or Salvus Surface, you can change the lens to suit either open areas or escape routes such as corridors.



Beam Lights

These are emergency luminaires that allow you to target light in whichever direction you need it.

They are particularly useful in high-risk areas such as factory floors, warehouses, or where there are lots of people in an enclosed space such as shopping centres or entertainment venues.

You can also use them to focus on safety equipment or control panels where you need concentrated illumination for a task.





EMERGENCY LIGHTING

DESIGNING A COMPLIANT SYSTEM

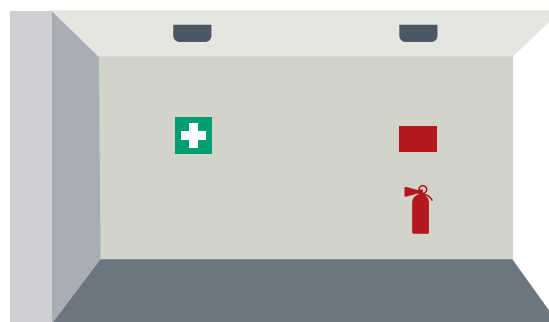
There are a number of standards to ensure that you specify fit for purpose emergency lighting.

EN50172 States that Emergency Lighting Shall:

- Clearly indicate escape routes
- Provide illumination for safe movement towards and through exits
- Ensure that fire alarms and firefighting equipment are easily located
- The design must also consider the luminaire type and its light output in accordance with EN 1838:2013 and EN 60598-2-22.

Lighting Points of Emphasis

Every emergency lighting design must locate luminaires to reveal specific hazards and highlight safety equipment and signs. These are known as points of emphasis.



Near each first aid post

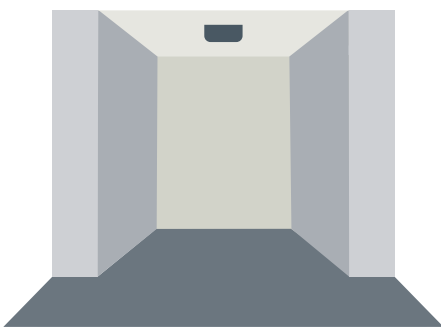
Near each piece of fire fighting equipment and call point



At each change in direction



At designated exits and outside to a place of safety



At each intersection of corridors



Near stairs so that each tread receives direct light. Also near any change of floor level

High Risk Locations













The original risk assessment will have identified any locations in the building that need special attention. These might include production lines or control rooms that manage dangerous processes.

EN 1838:2013 states that the maintained illuminance on the reference plane must be not less than 10% of the required illuminance for that task and should never be less than 15 lux.

This might mean that you need a higher output from your emergency lighting or consider converting some of your mains lighting to also provide emergency lighting.

Example of an Emergency Lighting Design



- | | |
|---|---|
|  Safety luminaire with open area optic |  Call point |
|  Handrail luminaire for escape route |  Fire extinguisher |
|  Safety luminaire with focused optic |  Fire alarm panel |
|  Outdoor lighting |  Open area identified |
|  Bollard lighting |  Escape route identified |
|  Exit lighting |  Escape route identified |



Escape Routes

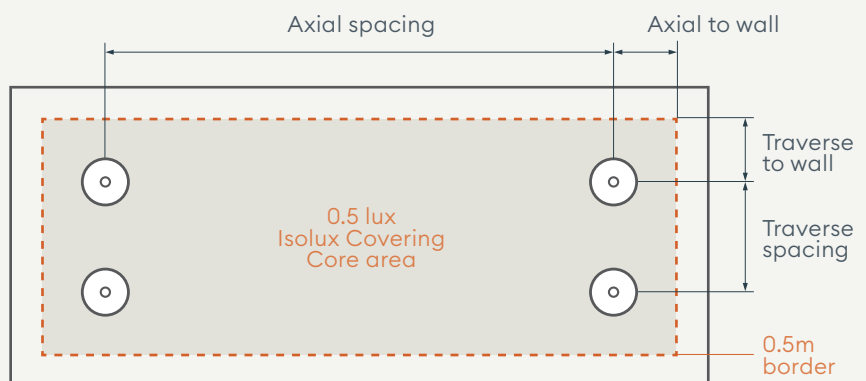
After lighting the points of emphasis, you must add further luminaires to ensure minimum illuminance of escape routes.

Every escape route compartment must have at least two luminaires in case one fails, and it must provide a minimum of 1 lux at floor level.

Open Areas

For open areas of larger than 60m², or if it has an escape route passing through it, you must provide enough emergency lighting to achieve a minimum of 0.5 lux at ground level.

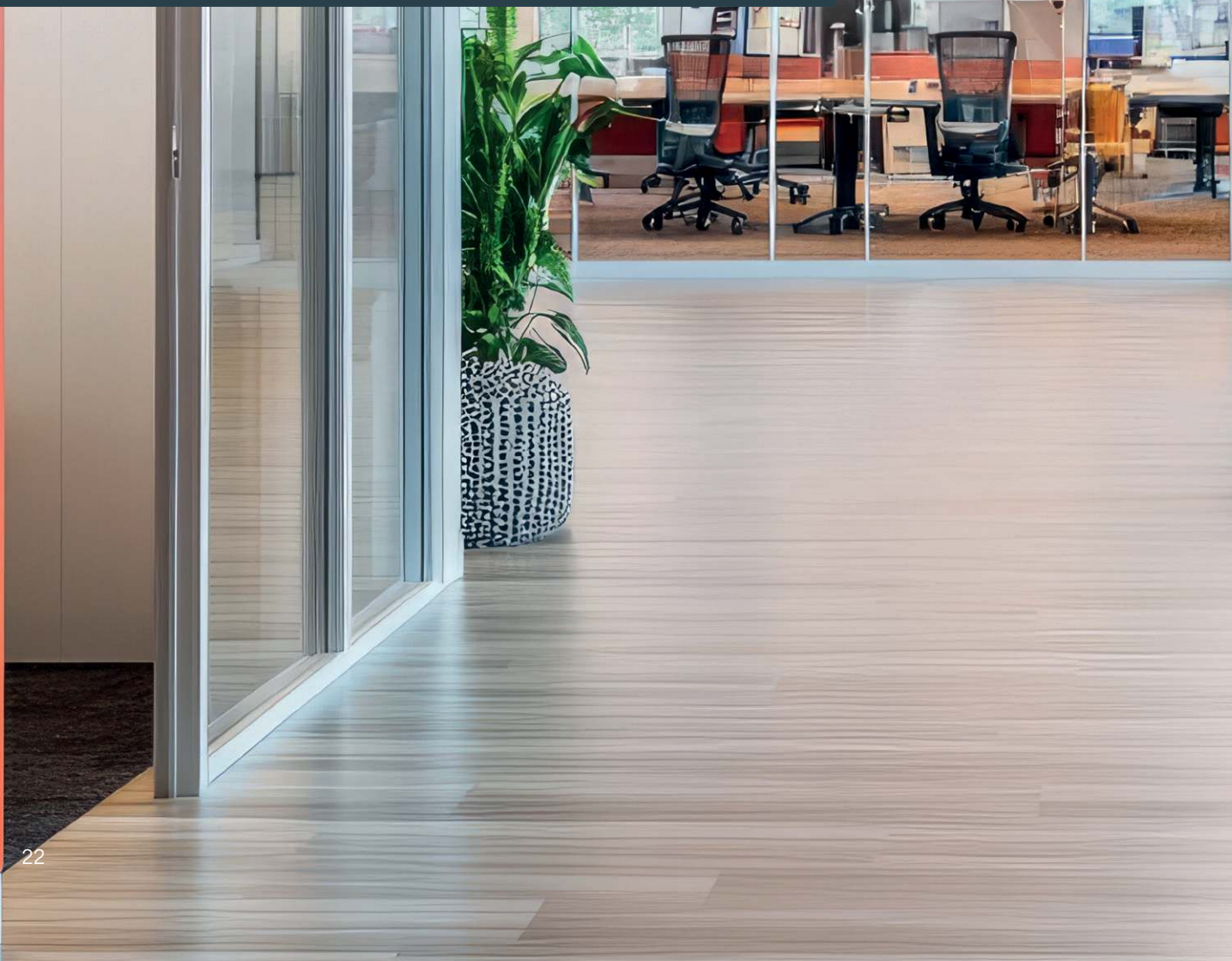
However, you only need to consider the central core area and not worry about the area that is 0.5m from the perimeter as people do not tend to move through this space.



EMERGENCY LIGHTING

HOW CAN WE HELP?

Take a look at our commercial range of lighting and emergency lighting products in our commercial catalogue or contact us on **+44 (0) 1604 495 151**, email **sales@collingwoodgroup.com**.





Design

Our projects and design team can ensure that your emergency lighting specification is compliant, either as part of an overall lighting design and specification or as a stand-alone project.

Products

Using our products you can provide a complete emergency lighting solution for commercial and industrial areas. They have:

- A 5-year warranty
- Long life LiFePO4 lithium battery
- Energy efficient LEDs with market leading Lumens/Watt



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