



Requirements for Emergency Lighting Systems

A. Specification

1. The Emergency Lighting Systems shall comply with British Standard 5266-1:1999 and BS EN 1838:1999 except that exit sign shall comply with Section 5.10 of the Code of Practice for Minimum Fire Service Installations and Equipment.
2. Batteries used shall be heavy duty and of rechargeable (Secondary) type; batteries of primary cells of any type whatsoever will not be acceptable.
3. Batteries shall be installed in a room approved for this purpose by the Building Authority, Housing Authority or Director of Architectural Services, as appropriate, unless :-
 - (i) the battery is an enclosed type and its entire installation shall conform to BS6133:1995 with capacity not exceeding 400 ampere-hours; or
 - (ii) the battery is valve regulated sealed type conforms to BS6290-4:1997 as specified in section 8 of FSD Circular Letter 4/96 Part XI.
4. All batteries for the emergency lighting circuits shall be kept fully charged at all times.
5. Power Supply
 - (i) For cinemas/theatres/premises accommodating 500 persons or less, the emergency lighting system shall be capable of maintaining the stipulated lighting level for a period of not less than 1 hour with power supplied either from a dedicated Uninterruptible Power Supply (UPS) system or from a central battery DC supply system; or
 - (ii) For cinemas/theatres/premises accommodating more than 500 persons, the emergency lighting system shall be :-
 - a) maintained for a period of not less than 2 hours with power supplied either from a dedicated UPS system or from a central battery DC supply; or

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- b) maintained for a period of not less than 1 hour with power supplied either from a dedicated UPS system or from a central battery DC supply on the condition that the supply system is backed up by an emergency generator conformed to the standard as stipulated in the Code of Practice for Minimum Fire Service Installations and Equipment and dedicated for fire service installations.
6. If a central battery DC supply system is used for the Emergency Lighting System, it shall be operated at a normal battery voltage of not less than 24 volts and not more than 120 volts D.C. from a common bank.
7. An automatic trickle charger with mains input and suitable output, fitted with meters, regulators, pilot lights, testing facilities and warning signals in both visual and audio forms, shall be provided for the UPS system or central battery DC supply system. The visual and audio warning signals shall be terminated in the management office of the cinema/theatre/premises or a place agreed with the Fire Services Department to alert the management of system fault. The charger shall be capable of fully re-charging the batteries in not more than 12 hours, if the emergency lighting is not also backed up by emergency generator. For emergency lighting systems backed up by emergency generator, the time required to fully recharge the battery system shall not more than 24 hours.
8. The supply from the batteries shall feed a main distribution fuse board and thence be subdivided to four subdistribution fuse boards, as follows:-
- Exit lighting
 - Stair lighting
 - Auditorium lighting
 - Stage lighting
9. Outgoing circuits shall be suitably protected by fuses to British Standard 88:1988 or miniature circuit breakers to BS EN 60898:1991.
10. The emergency lighting system shall be wired in M.I.C.C. cable to BS EN 60702-1:2002, BS EN 60702-2:2002 and BS 6207-3:2001 as appropriate or other power supply cable conforms to BS 6387:1994 Cat. CWZ or other international standards acceptable to the Director of Fire Services and be fully segregated from the general distribution system.
11. All lighting fittings in the emergency lighting system shall comply with the non-flammability (resistance to flame and ignition) provisions specified in BS EN 60598-2-22:1999 and external parts shall also be subjected to the 850°C glowing/hot wire test; any burning parts thereof should self-extinguish within 30 seconds. Such lighting fittings shall be permanently fixed in position.

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12. Upon failure of the main lighting system or in the event of power failure, the emergency lighting system shall automatically light up to at least 90% of the stipulated illumination level within 5 seconds.

B. Other Requirements

13. Batteries in celluloid containers shall not be installed, stored or used.
14. A margin allowance of 12½ % of the total required battery capacity (amperehour rating not voltage) shall be provided, i.e. 100% + 12½ % = 112½ %.
15. A diagram showing details of the distribution system and the circuit wiring of the emergency lighting system shall be erected at the main distribution board.
16. The minimum illumination provided at floor level by the emergency lighting system shall be:-

Staircase / exit route	not less than 2 lux
Nightclub, restaurant, dance hall, or premises where people have freedom of movement and there are loose fixtures and fittings.	not less than 1 lux.
Cinemas and theatres (auditorium)	not less than 0.5 lux

measured at the mid-point between any two emergency lighting fittings. A discretionary tolerance of minus 10% is permitted and all readings shall be taken by an illuminance meter.

17. All luminaires shall have equal lumen output and distribution characteristics giving equal intensity of light in all material directions. Each luminaire shall be so sited as to avoid impairment of vision from glare. Luminaires, except where so specified and approved, shall be mounted at a height of not less than 2 metres.
18. The maximum permissible period for visual adaptation shall not exceed 5 seconds at any point on the premises.
19. The minimum number of fittings required in any installation shall not be less than two (N.B. if only one fitting was provided and a lamp filament failure occurred, a hazardous situation would result.)
20. In the event of failure of the main lighting, the public shall, unless the capacity of the battery is sufficient to maintain the specified conditions for not less than four hours, within one hour be required to leave the building and they shall not be re-admitted until the general lighting has been fully restored and the emergency system recharged.

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21. In the case of battery systems, the control and safety devices installed shall be regularly tested as follows :-
 - (i) Connections between the battery and the source of charging current shall be such that in no circumstances shall the battery discharge other than to the emergency lighting circuits.
 - (ii) A rectifier for battery charging should be provided for that purpose only and shall be so regulated that the battery cannot discharge appreciably under normal conditions.
22. Voltage and hydrometer tests, where appropriate, shall be carried out weekly and recorded in a register.
23. Once every month a discharge test, for 1 minute at the 10-hour discharge rate, shall be carried out and the results shall be entered in a register. The on-load voltage of each cell after this test shall be not less than 2.01 volts for lead acid and 1.25 volts for “NiFe” or nickel-cadmium. For other types of battery, advice(s) from the manufacturer of the battery/system shall be sought and that shall also be acceptable to the Director of Fire Services.
24. Relevant test report(s)/certificate(s) issued by a testing organization recognized by the Fire Services Department or a local university laboratory competent to certify the properties regarding resistance to flame and ignition and performance of the emergency lighting shall be submitted to the Fire Services Department.

Fire Services Department
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