



# SLOVENSKI STANDARD

## SIST EN 1838:1999

01-november-1999

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### Razsvetljava - Zasilna razsvetljava

Lighting applications - Emergency lighting

Angewandte Lichttechnik - Notbeleuchtung

Eclairagisme - Eclairage de secours

Ta slovenski standard je istoveten z: EN 1838:1999

[SIST EN 1838:1999  
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#### ICS:

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**SIST EN 1838:1999**

**en**

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English version

## Lighting applications - Emergency lighting

Eclairagisme - Eclairage de secours

Angewandte Lichttechnik - Notbeleuchtung

This European Standard was approved by CEN on 22 March 1999.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 169 "Light and lighting", the secretariat of which is held by DIN

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 1999, and conflicting national standards shall be withdrawn at the latest by October 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

It is intended to replace in part national standards relating to emergency lighting luminous requirements. It should be read in conjunction with the standards being produced by CEN/TC 169 WG7 "Measurement and presentation of photometric data" and in conjunction with prEN 50172 "Emergency escape lighting systems".

Users of this EN, prepared in the field of application of Article 118 A of the EC Treaty, should be aware that standards have no formal legal relationship with Directives which may have been made under Article 118 A of the Treaty. In addition, national legislation in the Member states may contain more stringent requirements than the minimum requirements of a Directive based on Article 118 A. Information on the relationship between the national legislation implementing Directives based on Article 118 A and this EN may be given in a national foreword of the national standard implementing this EN.

## Introduction

Emergency lighting is provided for use when the supply to the normal lighting fails and is therefore powered from a source independent of that supplying the normal lighting.

For the purposes of this standard emergency lighting is regarded as a generic term of which there are a number of specific forms, as shown in figure 1.

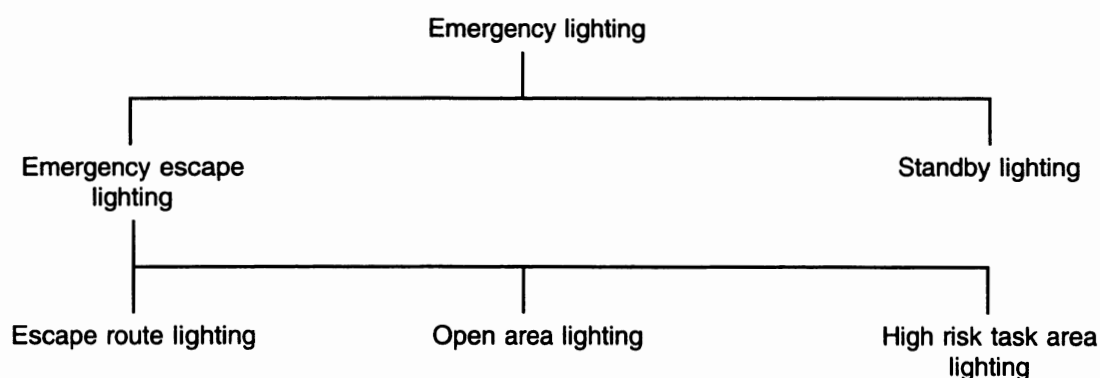


Figure 1: Specific forms of emergency lighting

The requirements given in this standard are a minimum for design purposes and are calculated for the full rated duration period and end of design life of the equipment; the contribution to illumination by reflected light is ignored.

The overall objective of emergency escape lighting is to enable safe exit from a location in the event of failure of the normal supply.

The objective of escape route lighting is to enable the safe exit from a location for occupants by providing appropriate visual conditions and direction finding on escape routes and in special locations, and to ensure that fire fighting and safety equipment can be readily located and used.

The objective of open area (anti-panic) lighting is to reduce the likelihood of panic and to enable safe movement of occupants towards escape routes by providing appropriate visual conditions and direction finding. The flow of light for escape routes or open areas should be downward to the working plane but illumination should also be provided to any obstruction up to 2 m height above that plane.

The objective of high risk task area lighting is to contribute to the safety of people involved in a potentially dangerous process or situation and to enable proper shut down procedures to be carried out for the safety of other occupants of the location.

There are emerging techniques that when applied to escape routes in addition to conventional emergency lighting luminaires can enhance their effectiveness in an emergency. These techniques are not included in this standard.

Vision varies from person to person, both by the amount of light required to perceive an object clearly and in the time taken to adapt to changes in the illuminance. In general, older people need more light and take a longer time to adapt to low illuminance on a hazard or escape route.

Much anxiety and confusion can be alleviated by strategically placed signs indicating the way out of a location. It is very important that exits are clearly signposted and are visible, whenever the location is occupied.

## 1 Scope

This standard specifies the luminous requirements for emergency lighting systems installed in premises or locations where such systems are required. It is principally applicable to locations where the public or workers have access.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited in the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 60598-2-22	Luminaires – Part 2-22: Particular requirements – Luminaires for emergency lighting (IEC 60598-2-22:1997,modified)
prEN 50172	Emergency escape lighting systems
ISO 3864 : 1984	Safety colours and safety signs
IEC 50 - Chapter 845	International Electrotechnical Vocabulary - Chapter 845:Lighting

## 3 Definitions

For the purposes of this standard the following definitions apply:

**3.1 emergency lighting:** Lighting provided for use when the supply to the normal lighting fails. [IEC 50 - Chapter 845]

**3.2 escape route:** A route designated for escape in the event of an emergency.

**3.3 emergency escape lighting:** That part of emergency lighting that provides illumination for the safety of people leaving a location or attempting to terminate a potentially dangerous process before doing so.

**3.4 escape route lighting:** That part of emergency escape lighting provided to ensure that the means of escape can be effectively identified and safely used when the location is occupied.

**3.5 open area lighting** (in some countries known as anti-panic lighting): That part of emergency escape lighting provided to avoid panic and provide illumination allowing people to reach a place where an escape route can be identified.

**3.6 high risk task area lighting:** That part of emergency escape lighting that provides illumination for the safety of people involved in a potentially dangerous process or situation and to enable proper shut down procedures for the safety of the operator and other occupants of the premises.

**3.7 stand-by lighting:** That part of emergency lighting provided to enable normal activities to continue substantially unchanged. [IEC 50 - Chapter 845]

**3.8 emergency exit:** A way out that is intended to be used during an emergency.

**3.9 safety sign:** A sign which gives a general safety message, obtained by a combination of colour and geometric shape and which, by the addition of a graphic symbol of text, gives a particular safety message. [ISO 3864 : 1984]

**3.10 externally illuminated safety sign:** A sign that is illuminated, when it is required, by an external source.



**3.11 internally illuminated safety sign:** A sign that is illuminated, when it is required, by an internal source.

## 4 Emergency escape lighting

### 4.1 General

To provide visibility for evacuation purposes lighting is required in the volume of the space. In this standard the recommendation is fulfilled by the mounting of luminaires at least 2 m above the floor. Signs which are provided at all exits intended to be used in an emergency and along escape routes shall be illuminated to indicate unambiguously the route of escape to a point of safety.

Where direct sight of an emergency exit is not possible, an illuminated directional sign (or series of signs) shall be provided to assist progression towards the emergency exit.

An escape lighting luminaire complying with EN 60598-2-22 shall be sited to provide appropriate illuminance near each exit door and at positions where it is necessary to emphasize potential danger or safety equipment. The positions to be emphasized shall include the following:

- a) at each exit door intended to be used in an emergency;
- b) near (see note) stairs so that each flight of stairs receives direct light;
- c) near (see note) any other change in level;
- d) mandatory emergency exits and safety signs;
- e) at each change of direction;
- f) at each intersection of corridors;
- g) outside and near to each final exit;
- h) near (see note) each first aid post;
- i) near (see note) each piece of fire fighting equipment and call point.

Positions denoted as h) or i) if not on the escape route nor in an open area shall be illuminated to 5 lx minimum on the floor.

NOTE: For the purposes of this clause 'near' is normally considered to be within 2 m measured horizontally.

### 4.2 Escape route lighting

**4.2.1** For escape routes up to 2 m in width, the horizontal illuminances on the floor along the centre line of an escape route shall be not less than 1 lx and the central band consisting of not less than half of the width of the route shall be illuminated to a minimum of 50 % of that value.

NOTE 1: Wider escape routes can be treated as a number of 2 m wide strips or be provided with open area (anti-panic) lighting.

NOTE 2: Countries requiring different lighting levels are given in annex B.

**4.2.2** The ratio of the maximum to the minimum illuminance shall not be greater than 40:1 along the centre line of the escape route.

**4.2.3** Disability glare shall be kept low by limiting the luminous intensity of the luminaires within the field of view.

For level horizontal escape routes the luminous intensity of the luminaires shall not exceed the values in table 1 within the zone 60° to 90° from the downward vertical at all angles of azimuth (see figure 2).

For all other escape routes and areas, the limiting values shall not be exceeded at all angles (see figure 3).

1 glare zone

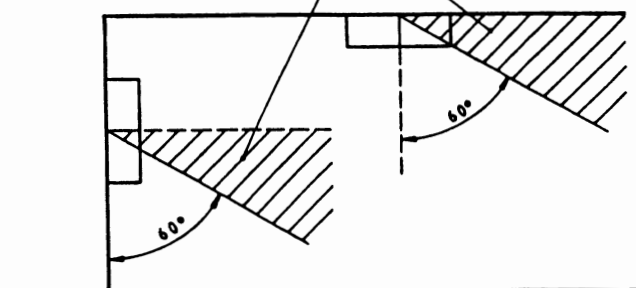
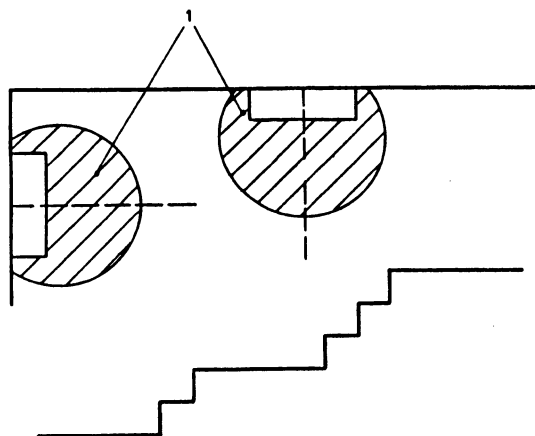


Figure 2



1 glare zone

Figure 3

NOTE: High contrast between a luminaire and its background can produce glare. In escape route lighting the main problem will be disability glare, in which the brightness of the luminaires can dazzle and prevent obstructions or signs being seen.

Table 1: Disability glare limits

Mounting height above floor level h	Escape route and open area (anti-panic) lighting maximum luminous intensity $I_{\max}$	High risk task area lighting maximum luminous intensity $I_{\max}$
m	cd	cd
$h < 2,5$	500	1 000
$2,5 \leq h < 3,0$	900	1 800
$3,0 \leq h < 3,5$	1 600	3 200
$3,5 \leq h < 4,0$	2 500	5 000
$4,0 \leq h < 4,5$	3 500	7 000
$h \geq 4,5$	5 000	10 000

4.2.4 In order to identify safety colours the minimum value for the colour rendering index  $R_a$  from a lamp shall be 40. The luminaire shall not substantially subtract from this.

4.2.5 The minimum duration of the illumination of the emergency escape lighting allowed for escape purposes shall be 1 h.

4.2.6 The emergency escape route lighting shall reach 50 % of the required illuminance level within 5 s and full required illuminance within 60 s.

Compliance with clauses 4.2.1 to 4.2.4 and 4.2.6 can be checked by measurement or by comparison with authenticated data from a supplier.

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### 4.3 Open area (anti-panic) lighting

4.3.1 The horizontal illuminance shall be not less than 0,5 lx at the floor level of the empty core area which excludes a border of 0,5 m of the perimeter of the area.

4.3.2 The ratio of the maximum to the minimum anti-panic area lighting illuminance shall not be greater than 40:1.

4.3.3 Disability glare shall be kept low by limiting the luminous intensity of the luminaires within the field of view. These shall not exceed the values in Table 1 within the zone 60° to 90° from the downward vertical at all angles of azimuth (see figure 2).



**4.3.4** In order to identify safety colours, the minimum value for the colour rendering index  $R_a$  from a lamp shall be 40. The luminaire shall not substantially subtract from this.

**4.3.5** The minimum duration allowed for escape purposes shall be 1 h.

**4.3.6** The anti-panic area lighting shall reach 50 % of the required illuminance within 5 s and full required illuminance within 60 s.

Compliance with clauses 4.3.1 to 4.3.4 and 4.3.6 can be checked by measurement or by comparison with authenticated data from a supplier.

## **4.4 High risk task area lighting**

**4.4.1** In areas of high risk the maintained illuminance on the reference plane shall be not less than 10 % of the required maintained illuminance for that task, however it shall be not less than 15 lx. It shall be free of harmful stroboscopic effects.

**4.4.2** The uniformity of the high risk task area lighting illuminance shall be not less than 0,1.

**4.4.3** Disability glare shall be kept low by limiting the luminous intensity of the luminaires within the field of view. These shall not exceed the values in Table 1 within the zone 60° to 90° from the downward vertical at all angles of azimuth.

**4.4.4** In order to identify safety colours, the minimum value for the colour rendering index  $R_a$  of a lamp shall be 40. The luminaire shall not substantially subtract from this.

**4.4.5** The minimum duration shall be the period for which the risk exists to people.

**4.4.6** High risk task area lighting shall provide the full required illuminance permanently or within 0,5 s depending upon application.

Compliance with clauses 4.4.1 to 4.4.4 and 4.4.6 can be checked by measurement or by comparison with authenticated data from a supplier.

## **4.5 Stand-by lighting**

When stand-by lighting is used for emergency escape lighting purposes it shall comply with the relevant requirements of this standard.

Where a stand-by lighting level lower than the minimum normal lighting is employed, the lighting is to be used only to shut down or terminate processes.

## **5 Safety signs**

Safety signs for emergency escape and first aid signs shall meet the following requirements:

NOTE: Attention is drawn to the requirement for the format of the sign boards for safety signs specified in the Council Directive 92/58/EEC of 24 June 1992 on the minimum requirements for provision of safety and/or health signs at work.

**5.1** Safety signs shall be illuminated to at least 50 % of the required luminance within 5 s and full required luminance within 60 s.

**5.2** The colours shall conform to the requirements of ISO 3864.

**5.3** The luminance of any area of safety colour of the sign shall be at least 2 cd/m<sup>2</sup> in all relevant viewing directions (see annex A).