

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Luminaire –  
Part 2-22: Particular requirements – Luminaire for emergency lighting**

**Luminaire –  
Partie 2-22: Règles particulières – Luminaire pour éclairage de secours**

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## REDLINE VERSION

## VERSION REDLINE



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## CONTENTS

FOREWORD.....	3
<b>INTRODUCTION to Amendment 1 .....</b>	<b>6</b>
22.1 Scope.....	7
22.2 Normative references.....	7
22.3 Terms and definitions .....	8
22.4 General test requirements .....	11
22.5 Classification of luminaires .....	12
22.6 Marking .....	12
22.7 Construction .....	14
22.8 Creepage distances and clearances .....	16
22.9 Provision of earthing.....	16
22.10 Terminals .....	17
22.11 External and internal wiring .....	17
22.12 Protection against electric shock .....	17
22.13 Endurance test and thermal test.....	17
22.14 Resistance to dust and moisture.....	19
22.15 Insulation resistance and electric strength.....	19
22.16 Resistance to heat, fire and tracking.....	19
22.17 Photometric data .....	19
22.18 Changeover operation .....	22
22.19 High temperature operation .....	22
22.20 Battery chargers for self-contained emergency luminaires .....	22
22.21 Test devices for emergency operation .....	23
Annex A (normative) Batteries for self-contained emergency luminaires .....	24
Annex B (normative) Luminaire classification .....	26
Annex C (normative) Luminance measurements .....	28
Annex D (informative) Rest mode and inhibition mode facilities.....	29
Annex E (normative) Requirements for self-contained portable emergency luminaires .....	30
E.1 General.....	30
E.2 Scope of requirements provided in Annex E.....	30
E.3 Terms and definitions.....	30
E.4 General test requirements.....	31
E.5 Classification of luminaires .....	31
E.6 Marking.....	32
E.7 Construction .....	32
E.8 Changeover operation.....	34
E.9 High temperature operation.....	34
E.10 Thermal test.....	34
<b>Bibliography.....</b>	<b>35</b>

Table 1 – Voltage limits for discharge durations up to the end of declared battery life.....	18
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### LUMINAIRES –

#### Part 2-22: Particular requirements – Luminaires for emergency lighting

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**IEC 60598-2-22 edition 4.1 contains the fourth edition (2014-06) [documents 34D/1119/FDIS and 34D/1131/RVD], its corrigenda 1 (2015-03) and 2 (2016-04), and its amendment 1 (2017-09) [documents 34D/1296/FDIS and 34D/1304/RVD].**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.**



International Standard IEC 60598-2-22 has been prepared by subcommittee 34D:  
Luminaires of IEC technical committee 34: Lamp and related equipment.

This fourth edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Clause 22.3, addition of definitions for PELF and Self-contained portable emergency luminaire;
- b) Clause 22.5, updated with the introduction of requirements for non-replaceable lamp and batteries;
- c) Clause 22.6, improved requirements to confirm that the charge indication is correctly connected to the circuit together with other clarifications regarding the control gear and the remote box with its connecting cable to the emergency luminaire;
- d) Clause 22.12, improved requirements to ensure that the luminaire shall not become unsafe;
- e) Clause 22.16, full revision of the photometric testing to align with ISO and CIE;
- f) Clause 22.17, now only references the requirements which are now covered in IEC 61347-2-7;
- g) Clause 22.19, now only references the requirements which are now covered in IEC 61347-2-7;
- h) Annex A, now includes nickel metal hydride batteries and reference to cell types in IEC 61951-1;
- i) Annex B, minor changes to the classifications;
- j) Annex C, Figure C.1 deleted in favour of a revised text;
- k) Annex E, the additional requirements covering self-contained portable emergency luminaires

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This standard is to be read in conjunction with IEC 60598-1 *Luminaires – Part 1: General requirements and tests*.

A list of all parts in the IEC 60598 series, published under the general title *Luminaires*, can be found on the IEC website.

In this standard, the following print types are used:

- requirements: in roman type
- *test specifications: in italic type*
- notes: in small roman type.



The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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WITHDRAWN

## INTRODUCTION to Amendment 1

The light output of LED light sources depends also on the temperature at which it is operated. Typically the temperature is controlled by a heat sink on which it is mounted (e.g. luminaire surface).

For this reason, the calculation of the ratio of the electrical parameter ( $EOF_x$ ) will be introduced in the LED controlgear standards IEC 61347-2-13 and IEC 61347-2-7, as the direct measurement of EBLF is not practicable.

In particular  $EOF_1$  is defined as the ratio of the current in emergency mode from constant current controlgear divided by the nominal current of LED ( $I_{\text{normal mode}}$ ):

$$EOF_1 = I_{\text{emergency}} / I_{\text{normal mode}}$$

Knowing that the light output of an LED light source is nearly<sup>1</sup> directly proportional with the forward current flowing through it, it is possible to calculate the luminous flux of the luminaire in emergency mode by using the  $EOF_1$  or  $I_{\text{emergency}}$  from constant current controlgear.

This document contains a proposal for the modification of IEC 60598-2-22 to use the factor  $EOF_1$  or  $I_{\text{emergency}}$  in the luminaire.

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<sup>1</sup> Any non-linearity due to the increased efficacy at lower operation temperature leads to an increased tolerance of the light output in the emergency mode but always positive.

## LUMINAIRES –

### Part 2-22: Particular requirements – Luminaires for emergency lighting

#### 22.1 Scope

This part of IEC 60598 specifies requirements for emergency luminaires for use with electrical lamps on emergency power supplies not exceeding 1 000 V.

This part does not cover the effects of non-emergency voltage reductions on luminaires incorporating high pressure discharge lamps.

This part gives general requirements for emergency lighting equipment.

This part continues to use the term “lamp” which also includes “light source(s)” where appropriate.

#### 22.2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60073, *Basic and safety principles for man-machine interface, marking and identification – Coding principles for indication devices and actuators*

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IEC 60155, *Glow-starters for fluorescent lamps*

~~IEC 60364-5-56, *Electrical installations of buildings – Part 5: Selection and erection of electrical equipment – Chapter 56: Safety services*~~

IEC 60598-1, *Luminaires – Part 1: General requirements and tests*

IEC 60896-21, *Stationary lead-acid batteries - Part 21: Valve regulated types - Methods of test*

IEC 61056-1, *General purpose lead-acid batteries (valve-regulated types) - Part 1: General requirements, functional characteristics - Methods of test*

IEC 61347-2-2, *Lamp controlgear - Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps*

IEC 61347-2-3, *Lamp control gear - Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps*

IEC 61347-2-7, *Lamp controlgear – Part 2-7; Particular requirements for battery supplied electronic controlgear for emergency lighting (self-contained)*

IEC 61347-2-12, *Lamp controlgear - Part 2-12: Particular requirements for d.c. or a.c. supplied electronic ballasts for discharge lamps (excluding fluorescent lamps)*

IEC 61347-2-13, *Lamp controlgear - Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules*

IEC 61951-1, *Secondary cells and batteries containing alkaline or other non-acid electrolytes. Portable sealed rechargeable single cells – Part 1: nickel-cadmium*

IEC 61951-2, *Secondary cells and batteries containing alkaline or other non-acid electrolytes. Portable sealed rechargeable single cells – Part 2: Nickel-metal hydride*

IEC 62034, *Automatic test systems for battery powered emergency escape lighting*

ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs. Part 1: Design principles for safety signs and safety markings*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs. Part 4: Colorimetric and photometric properties of safety sign materials*

ISO 30061:2007, *Emergency lighting*

CIE 121 SP1, *The photometry of emergency luminaires*

CIE S025, *Test Method for LED Lamps, LED Luminaires and LED Modules*

## 22.3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60598-1 as well as the following apply:

### 22.3.1

#### **emergency lighting**

lighting for use when the supply to the normal lighting fails; it includes emergency escape lighting, high-risk task-area lighting and standby lighting

### 22.3.2

#### **emergency escape lighting**

that part of emergency lighting that provides illumination for the safety of people leaving an area or attempting to terminate a dangerous process before vacating an area

### 22.3.3

#### **standby lighting**

that part of emergency lighting that enables normal activities to continue substantially unchanged

### 22.3.4

#### **high-risk task-area lighting**

part of emergency lighting provided to ensure 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 occupants of the premises

### 22.3.5

#### **maintained emergency luminaire**

luminaire in which the emergency lighting lamps are energized at all times when normal or emergency lighting is required

### **22.3.6**

#### **non-maintained emergency luminaire**

luminaire in which the emergency lighting lamps are in operation only when the supply to the normal lighting fails

### **22.3.7**

#### **combined emergency luminaire**

luminaire containing two or more lamps, at least one of which is energized from the emergency lighting supply and the others from the normal lighting supply

Note 1 to entry: A combined emergency luminaire is either maintained or non-maintained.

### **22.3.8**

#### **self-contained emergency luminaire**

luminaire providing maintained or non-maintained emergency lighting in which all the elements, such as the battery, the lamp, the control unit and the test and monitoring facilities, where provided, are contained within the luminaire or adjacent to it (that is, within 1 m cable length)

### **22.3.9**

#### **centrally supplied emergency luminaire**

luminaire for maintained or non-maintained operation which is energized from a central emergency power system that is not contained within the luminaire

### **22.3.10**

#### **compound self-contained emergency luminaire**

self-contained luminaire providing maintained or non-maintained emergency lighting and also providing emergency supply for operating a satellite luminaire

### **22.3.11**

#### **satellite emergency luminaire**

luminaire for maintained or non-maintained operation which derives emergency operation supply from an associated compound self-contained emergency luminaire

### **22.3.12**

#### **control unit**

unit or units comprising a supply changeover system, a battery charging device and, where appropriate, a means for testing

Note 1 to entry: This unit may also contain the lamp controlgear.

### **22.3.13**

#### **normal supply failure**

condition in which the normal lighting can no longer provide a minimum illuminance for emergency escape purposes and when the emergency lighting should become operative

### **22.3.14**

#### **emergency luminaire rated luminous flux**

lumen output as claimed by the luminaire manufacturer, 60 s (0,5 s for high-risk task-area luminaires) after failure of the normal supply, and continuously maintained to the end of rated duration of operation

### **22.3.15**

#### **rated duration of emergency operation**

time, as claimed by the manufacturer, that the rated emergency lumen output is provided

### 22.3.16

#### **normal mode**

state of a self-contained emergency luminaire that is ready to operate in emergency mode while the normal supply is on

Note 1 to entry: In the case of a normal supply failure, the self-contained luminaire automatically changes over to the emergency mode.

### 22.3.17

#### **emergency mode**

state of a self-contained emergency luminaire that provides lighting when energized by its internal power source, the normal supply having failed

### 22.3.18

#### **rest mode**

state of a self-contained emergency luminaire that has been intentionally extinguished while the normal supply is off and that, in the event of restoration of the normal supply, automatically reverts to normal mode

### 22.3.19

#### **maximum overcharge rate**

maximum continuous charge rate that may be applied to a fully charged battery

### 22.3.20

#### **remote inhibiting facility**

means for inhibiting remotely a luminaire associated with an emergency lighting system

### 22.3.21

#### **remote inhibiting mode**

state of a self-contained emergency luminaire which is inhibited from operating by a remote device while the normal supply is on and in case of a normal supply failure the luminaire does not change-over to emergency mode

### 22.3.22

#### **internally illuminated safety sign**

self-contained or centrally supplied emergency luminaire intended to provide specific safety message obtained by a combination of colour and geometric shapes

Note 1 to entry: Details are given in ISO 3864-1 and ISO 3864-4.

### 22.3.23

#### **practical emergency lamp flux**

PELF

minimum luminous flux of the lamp observed during the rated duration of the emergency mode

Note 1 to entry:  $PELF = LDL \times EBLF$

where LDL is the rated ~~lumen output of the light source and, for discharge light sources~~ luminous flux of ~~fluorescent or discharge lamp~~, this is taken as the initial lighting design lumens at 100 h.

Note 2 to entry: This note applies to the French language only.

### 22.3.24

#### **self-contained portable emergency luminaire**

portable luminaire providing emergency lighting where all of the elements, such as the battery, the lamp(s), the control unit, a manual switch for switching on or off one or more lamp and the test and monitoring facilities, where provided, are contained within the luminaire which can be detached from its base unit for use in the emergency mode