IEC 60598-2-22

Edition 4.0 2017-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

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

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

IEC 60598-2-22:2014-06/AMD1:2017-09(en-fr)

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FOREWORD

This amendment has been prepared by subcommittee 34D: Luminaires, of IEC technical committee 34: Lamps and related equipment.

The text of this amendment is based on the following documents:

FDIS	Report on voting
34D/1296/FDIS	34D/1304/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

$$EOF_I = I_{emergency} / I_{normal\ mode}$$

Knowing that the light output of an LED light source is nearly[1] directly proportional with the foreward current flowing through it, it is possible to calculate the luminous flux of the luminaire in emergency mode by using the EOF_I or $I_{emergency}$ from constant current controlgear.

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

[1] *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.*

22.2 Normative references

Delete the reference to IEC 60354-5-56

Add the following new reference:

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

22.3 Terms and definitions

22.3.23

Replace the existing note 1 to entry with the following new note 1 to entry:

Note 1 to entry: PELF = LDL × EBLF
where LDL is the rated luminous flux of fluorescent or discharge lamp, this is taken as the initial lighting design lumens at 100 h.

Add, at the end of 22.3, the following new terminological entry:

22.3.28
practical emergency light source flux
PELSF
minimum luminous flux of the light source observed during the rated duration of the emergency mode

Note 1 to entry: For LED light sources:

a) if EOF_l is given: PELSF = LDL x EOF_l

b) if $I_{emergency}$ from constant current controlgear is defined: PELSF = LDL x ($I_{emergency}$ / $I_{normal\ mode}$)
where LDL is the lumen output of the LED module under the condition corresponding to the operation in the luminaire (identical tp) operated at the same current ($I_{normal\ mode}$).

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

22.7 Construction

In the first paragraph, replace the last two sentences with the following new text:

In addition, emergency luminaires with automatic testing systems shall comply with the additional requirements of IEC 62034 as identified in Annex K of IEC 61347-2-7.

22.7.2

In the first paragraph, replace the text "… IEC 61347-2-7, IEC 61347-2-3: Annex J, IEC 61347-2-2, IEC 61347-2-12 and IEC 61347-2-13 as appropriate*" with the following new text:*

IEC 61347-2-2, IEC 61347-2-3: IEC 61347-2-7, IEC 61347-2-12 and IEC 61347-2-13 as appropriate and with the additional safety requirements for electronic controlgear for emergency lighting in the appropriate annex of the standards (e.g. Annex J of IEC 61347-2-3)."

22.7.10

Delete the existing third paragraph and add the following new note:

NOTE Installation details can be found in IEC 60364-5-56.

22.17 Photometric data

22.17.1

Replace the existing text with the following new text:

The manufacturer shall make available the intensity distribution data necessary for the calculation of the emergency lighting installation according to ISO 30061. The intensity data in emergency mode may be provided in candelas or in relative cd/1 000 lm. If the values are declared in candelas, the manufacturer shall provide the emergency luminaire rated luminous flux derived from the intensity distribution table.

Compliance is checked by direct measurements in emergency operating condition taking into account the test operating condition described in 22.17.3 or by measurements in normal operating condition and calculation as described in 22.17.2.

22.17.2

Replace "Void" with the following new text:

If values are declared in cd/1 000 lm, the manufacturer shall also provide the reference flux in emergency mode.

In the case of luminaires with tubular fluorescent lamps or other discharge lamps the reference flux is the practical emergency light source flux PELF calculated as the rated flux of the lamp multiplied by the EBLF of the associated emergency ballast.

In the case of luminaires with LED light source the reference flux is:

– the practical emergency light source flux PELSF

  The value may be calculated as the light source luminous flux of the LED module (LDL) in reference condition corresponding to the luminaire (at the same t_p) and at rated current ($I_{\text{normal mode}}$) multiplied by the EOF_I or ($I_{\text{emergency}}$ / $I_{\text{normal mode}}$) of the associated constant current emergency controlgear.

NOTE 1 In this case the LOR of the luminaire has influence on the calculation of the emergency rated luminaire flux.

– the emergency luminaire rated luminous flux

  This value shows the rated luminous flux of the luminaire in normal mode ($I_{\text{normal mode}}$) multiplied by the EOF_I or ($I_{\text{emergency}}$ / $I_{\text{normal mode}}$) of the associated constant current emergency controlgear.

NOTE 2 In this case the LOR of the luminaire is considered as 1.

The factor EOF_I can only be used under the following conditions:

– The forward current of the LED is controlled by the controlgear only.
– All LEDs mounted in the luminaire are supplied both in normal operating conditions and in emergency mode.
– The luminaire luminous flux and/or the LED light source luminous flux is measured at $I_{\text{normal mode}}$ corresponding to the $I_{\text{normal mode}}$ of the controlgear (e.g. in the case of a luminaire to be used with independent controlgear).
– The current in emergency mode is equal or lower than $I_{\text{normal mode}}$ (EOF_I equal or lower than 1).

NOTE 3 The use of emergency output factors different from EOF_I (e.g. EOF_U or EOF_P) are not part of the scope of 22.17.2. They can only be used for design purposes and not for testing.

22.17.3

Replace "Void" with the following new text:

Emergency luminaires shall provide at least 50 % of the level declared photometric data claimed by the manufacturer during operation in emergency mode 5 s after failure of the normal supply, and full rated photometric performance after 60 s and continuously to the end of the rated duration of the emergency operation. Emergency luminaires used for high-risk task-area lighting shall provide 100 % of the level declared photometric data within 0,5 s after failure of the normal supply, and continuously to the end of the rated duration of the emergency operation.

Compliance is checked by measurement, including the necessary calculation where required, and the following test conditions:

a) for self-contained luminaires in emergency mode during operation from the internal batteries after a 24 h charge at 0,9 times the minimum rated voltage;

b) for centrally supplied luminaires, the measurements for 5 s and 60 s shall be made at maximum supply voltage and all other measurements at 0,9 times the minimum rated supply voltage when stable photometric conditions have been reached.

Measurements for both self-contained emergency luminaires and centrally supplied emergency luminaires shall be made using a new lamp which has been aged according to the appropriate lamp standard for initial luminous flux measurements.

Photometric measurements shall be made in accordance with the requirements of CIE 121 SP1 taking into account the specific type of light source of the luminaire. For LED luminaires, measurements shall be made according to the requirements of CIE S025. For emergency safety signs, the photometric distribution requirements of 22.17.1 do not apply. However, they do apply for the emergency lighting component if the sign also has an emergency lighting function.

All values shall be at least the minimum declared data.

NOTE 1 For verification purposes, if photometric data are declared in cd/1 000 lm, they can be recalculated in candelas taking into account the practical emergency lamp flux. In case of non-compliance, the luminous flux of the lamp used can be checked in reference conditions and the measured photometric data can be corrected to the rated value of the lamp.

NOTE 2 The verification of intensity distribution in relative values of the emergency luminaire and EBLF (or PELF) of the circuit can be made independently of each other.

Annex B

In the first sentence of list item c), replace "possible five characters" *with* "possible seven characters"

Add the following new bibliography:

Bibliography

IEC 60364-5-56, *Low-voltage electrical installations – Part 5-56: Selection and erection of electrical equipment – Safety services*

AVANT-PROPOS

Le présent amendement a été établi par le sous-comité 34D:Luminaires, du comité d'études 34 de l'IEC: Lampes et équipements associés.

Le texte de cet amendement est issu des documents suivants:

FDIS	Rapport de vote
34D/1296/FDIS	34D/1304/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cet amendement.

Le comité a décidé que le contenu de cet amendement et de la publication de base ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

INTRODUCTION à l'Amendement 1

Le flux lumineux des sources lumineuses à LED dépend aussi de la température à laquelle elles fonctionnent. Généralement, la température est contrôlée par un dissipateur thermique sur lequel la source est montée (par exemple la surface du luminaire).

C'est la raison pour laquelle le calcul du rapport du paramètre électrique (EOF_x) sera introduit dans les normes sur les appareillages de lampes à LED, l'IEC 61347-2-13 et l'IEC 61347-2-7, la mesure directe du facteur EBLF n'étant pas réalisable en pratique.

En particulier, le facteur EOF_I est défini comme le rapport du courant en état de fonctionnement de secours provenant d'un appareillage de lampe à courant constant, divisé par le courant nominal de la LED ($I_{mode\ normal}$):

$$EOF_I = I_{secours} / I_{mode\ normal}$$

Sachant que le flux lumineux d'une source lumineuse à LED est presque[1] directement proportionnel au courant direct la traversant, il est possible de calculer le flux lumineux du luminaire en état de fonctionnement de secours en utilisant le facteur EOF_I ou $I_{secours}$ provenant d'un appareillage de lampe à courant constant.

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1 *Toute non-linéarité due à l'efficacité accrue à une température de fonctionnement plus basse conduit à une tolérance accrue du flux lumineux en état de fonctionnement de secours mais toujours positive.*

Ce document contient une proposition de modification de l'IEC 60598-2-22, afin d'utiliser le facteur EOF_l ou $I_{secours}$ dans le luminaire.

22.2 Références normatives

Supprimer la référence à l'IEC 60364-5-56

Ajouter la nouvelle référence suivante:

CIE S025, *Test Method for LED Lamps, LED Luminaires and LED Modules* (disponible en anglais seulement)

22.3 Termes et définitions

22.3.23

Remplacer la note 1 à l'article existante par la nouvelle note 1 à l'article suivante:

Note 1 à l'article: PELF = LDL × EBLF
où LDL est le flux lumineux assigné de la lampe à fluorescence, à décharge ou à LED; il est considéré comme le flux lumineux déterminé à 100 h de fonctionnement.

Ajouter, à la fin de 22.3, le nouvel article terminologique suivant:

22.3.28
flux de source lumineuse de secours pratique
PELSF
flux lumineux minimal de la source lumineuse observé pendant la durée assignée de l'état de fonctionnement de secours

Note 1 à l'article: Pour les sources lumineuses à LED:

a) si EOF_l est donné: PELSF = LDL x EOF_l

b) si $I_{secours}$ provenant d'un appareillage de lampe à courant constant est défini: PELSF = LDL x ($I_{secours}$ / $I_{mode\ normal}$)

où LDL est le flux lumineux du module de LED dans la condition correspondant au fonctionnement dans le luminaire (tp identique) fonctionnant au même courant ($I_{mode\ normal}$).

Note 2 à l'article: L'abréviation "PELSF" est dérivée du terme anglais développé correspondant "practical emergency light source flux".

22.7 Construction

Au premier alinéa, remplacer les deux dernières phrases par le nouveau texte suivant:

Les luminaires d'éclairage de secours équipés de systèmes automatiques d'essai doivent en outre satisfaire aux exigences supplémentaires de l'IEC 62034 comme indiqué à l'Annexe K de l'IEC 61347-2-7.

22.7.2

Dans le premier alinéa, remplacer le texte "... à l'IEC 61347-2-7 et à l'IEC 61347-2-3: Annexe J, IEC 61347-2-2, IEC 61347-2-12 et IEC 61347-2-13 si approprié*" par le nouveau texte suivant:*

à l'IEC 61347-2-2, l'IEC 61347-2-3, l'IEC 61347-2-7, l'IEC 61347-2-12 et l'IEC 61347-2-13 si approprié, et aux exigences de sécurité supplémentaires relatives aux appareillages électroniques pour l'éclairage de secours dans l'annexe appropriée des normes (par exemple Annexe J de l'IEC 61347-2-3).