# IEC 62031

Edition 2.0 2018-03

# REDLINE VERSION

colour inside

## LED modules for general lighting – Safety specifications

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# LED MODULES FOR GENERAL LIGHTING – SAFETY SPECIFICATIONS

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**This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.**

International Standard IEC 62031 has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

This second edition cancels and replaces the first edition published in 2008, Amendment 1:2012 and Amendment 2:2014. This edition constitutes a technical revision.

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

a) the scope was clarified as well as the wording in several other clauses;
b) the normative references were updated;
c) the definitions for "replaceable LED module", "non-replaceable LED module" and "non-user replaceable LED module" were introduced while other definitions covered by IEC 62504 have been removed;
d) the marking clause was restructured and a table added to provide an informative overview;
e) the marking requirements for built-in LED modules were changed;
f) the entry for the marking with the working voltage was revised;
g) the provisions for terminals and heat management were revised;
h) Annex B was deleted;
i) information for luminaire design with regard to working voltage and water contact was introduced;
j) an abnormal temperature test was introduced.

The text of this International Standard is based on the following documents:

| FDIS | Report on voting |
|---|---|
| 34A/2052/FDIS | 34A/2061/RVD |

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

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

NOTE In this standard, the following print types are used:

– Requirements proper: in roman type.
– *Test specifications: in italic type*.
– Explanatory matter: in smaller roman type.

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~~INTRODUCTION~~

~~The first edition of a safety standard for LED modules for general lighting applications acknowledges the need for relevant tests for this new source of electrical light, sometimes called “solid state lighting”.~~

~~The provisions in the standard represent the technical knowledge of experts from the fields of the semiconductor industry and those of the traditional electrical light sources.~~

~~Two types of LED modules are covered: with integral and external control gear.~~

# LED MODULES FOR GENERAL LIGHTING – SAFETY SPECIFICATIONS

## 1 Scope

This document specifies general and safety requirements for light-emitting diode (LED) modules:

- non-integrated LED modules ~~without integral control gear~~ (LEDni modules) and semi-integrated LED modules (LEDsi modules) for operation under constant voltage, constant current or constant power;
- ~~self-ballasted~~ Integrated LED modules (LEDi modules) for use on DC supplies up to 250 V or AC supplies up to 1 000 V at 50 Hz or 60 Hz.

LED modules within the scope of this document can be integral, built-in or independent.

This document is not applicable for LED lamps.

NOTE ~~1 The safety requirements for separate control gear are specified in IEC 61347-2-13.~~ The performance requirements for ~~separate control gear~~ LED modules are specified in ~~IEC 62384~~ IEC 62717.

~~NOTE 2 Requirements for LED modules with integrated control gear and equipped with a lamp cap (self-ballasted lamp), intended for mains voltage general lighting service retrofit applications (thereby replacing existing lamps with identical lamp caps) are specified in IEC 60968 (an amendment to the present edition or a new edition with extended scope is in preparation).~~

~~Requirements for LED modules with integrated control gear and equipped with a lamp cap (self-ballasted lamp), intended for non-mains voltage general lighting service retrofit applications (thereby replacing existing lamps with identical lamp caps) are under consideration.~~

~~NOTE 3 Where in the requirements of this standard both types of LED modules, with and without integral control gear, are addressed, the word "modules" is used instead. Where only the expression "LED module(s)" is used, it is understood to refer to the type without integral control gear.~~

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60598-1:~~2003~~ 2014, *Luminaires – Part 1: General requirements and tests*~~1)~~
IEC 60598-1:2014/AMD1:2017

~~IEC 60838-2-2, *Miscellaneous lampholders – Part 2-2: Particular requirements – Connectors for LED modules*~~

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61347-1:~~2007~~ 2015, *Lamp controlgear – Part 1: General and safety requirements*
IEC 61347-1:2015/AMD1:2017

~~IEC 61347-2-13:2006, *Lamp controlgear – Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules*~~

~~1) A consolidated 6.1 (2006) exists, that includes IEC 60598-1 (2003) and its Amendment 1 (2006).~~

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

IEC 62504, *General lighting – Light emitting diode (LED) products and related equipment – Terms and definitions*

IEC TR 62778:2014, *Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires*

ISO 4046-4:~~2002~~ 2016, *Paper, board, pulp and related terms – Vocabulary – Part 4: Paper and board grades and converted products*

ISO 7089:2000, *Plain washers – Normal series – Product grade A*

# IEC 62031

Edition 2.0 2018-03

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

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## LED modules for general lighting – Safety specifications

**Modules à LED pour éclairage général – Spécifications de sécurité**



IEC 62031:2018-03(en-fr)

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LED modules within the scope of this document can be integral, built-in or independent.

This document is not applicable for LED lamps.

NOTE The performance requirements for LED modules are specified in IEC 62717.

## 2 Normative references

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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# MODULES À LED POUR ÉCLAIRAGE GÉNÉRAL – SPÉCIFICATIONS DE SÉCURITÉ

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La Norme internationale IEC 62031 a été établie par le sous-comité 34A: Lampes, du comité d'études 34 de l'IEC: Lampes et équipements associés.

Cette deuxième édition annule et remplace la première édition parue en 2008, l'Amendement 1:2012 et l'Amendement 2:2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) le domaine d'application a été clarifié ainsi que la formulation de plusieurs autres articles;
b) les références normatives ont été mises à jour;
c) les définitions de "module à LED remplaçable", "module à LED non remplaçable" et "module à LED non remplaçable par l'utilisateur" ont été introduites tandis que d'autres définitions couvertes par l'IEC 62504 ont été supprimées;

d) l'article relatif au marquage a été restructuré et un tableau a été ajouté pour donner un aperçu informatif;

e) les exigences de marquage pour les modules à LED à monter ont été modifiées;

f) l'article relatif au marquage pour la tension de service a été révisé;

g) les dispositions relatives aux bornes et à la gestion thermique ont été révisées;

h) l'Annexe B a été supprimée;

i) des informations relatives à la conception des luminaires concernant la tension de service et le contact avec l'eau ont été introduites;

j) un essai de température anormale a été introduit.

Le texte de cette Norme internationale est issu des documents suivants:

| FDIS | Rapport de vote |
|---|---|
| 34A/2052/FDIS | 34A/2061/RVD |

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

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

NOTE Dans la présente Norme, les caractères d'imprimerie suivants sont utilisés:

– Exigences proprement dites: caractères romains.

– *Modalités d'essais: caractères italiques*.

– Notes: petits caractères romains.

Le comité a décidé que le contenu de ce document 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 au document recherché. A cette date, le document sera

- reconduit;
- supprimé;
- remplacé par une édition révisée, ou
- amendé.

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# MODULES À LED POUR ÉCLAIRAGE GÉNÉRAL – SPÉCIFICATIONS DE SÉCURITÉ

## 1 Domaine d'application

Le présent document spécifie les exigences générales et les exigences de sécurité relatives aux modules à diodes électroluminescentes (LED):

- modules à LED non intégrés (modules LEDni) et les modules à LED semi-intégrés (modules LEDsi) pour fonctionnement sous tension constante, courant constant ou puissance constante;
- modules à LED intégrés (modules LEDi) pour utilisation sur des alimentations à courant continu jusqu'à 250 V ou à courant alternatif 50 Hz ou 60 Hz jusqu'à 1 000 V.

Les modules à LED compris dans le domaine d'application du présent document peuvent être à intégrer, à monter ou indépendants.

Ce document n'est pas applicable pour les lampes à LED.

NOTE Les exigences de performance pour les modules à LED sont spécifiées dans l'IEC 62717.

## 2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60598-1:2014, *Luminaires – Partie 1: Exigences générales et essais*
IEC 60598-1:2014/AMD1:2017

IEC 61032:1997, *Protection des personnes et des matériels par les enveloppes – Calibres d'essai pour la vérification*

IEC 61347-1:2015, *Appareillages de lampes – Partie 1: Exigences générales et exigences de sécurité*
IEC 61347-1:2015/AMD1:2017

IEC 62471:2006, *Sécurité photobiologique des lampes et des appareils utilisant des lampes*

IEC 62504, *Éclairage général – Produits à diode électroluminescente (DEL) et équipements associés – Termes et définitions*

IEC TR 62778:2014, *Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires* (disponible en anglais seulement)

ISO 4046-4:2016, *Papier, carton, pâtes et termes connexes – Vocabulaire – Partie 4: Catégories et produits transformés de papier et de carton*

ISO 7089:2000, *Rondelles plates – Série normale – Grade A*