

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**LEDsi lamps for general lighting services with supply voltages not exceeding 50 V a.c. r.m.s. or 120 V ripple free d.c. – Safety specifications**

**Lampes à LEDsi pour l'éclairage général fonctionnant à des tensions d'alimentation ne dépassant pas 50 V en courant alternatif efficace ou 120 V en courant continu lisse – Spécification de sécurité**



## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2015 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

More than 60 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Catalogue IEC - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

#### Recherche de publications IEC - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

#### Glossaire IEC - [std.iec.ch/glossary](http://std.iec.ch/glossary)

Plus de 60 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [csc@iec.ch](mailto:csc@iec.ch).

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**LEDs lamps for general lighting services with supply voltages not exceeding 50 V a.c. r.m.s. or 120 V ripple free d.c. – Safety specifications**

**Lampes à LEDs pour l'éclairage général fonctionnant à des tensions d'alimentation ne dépassant pas 50 V en courant alternatif efficace ou 120 V en courant continu lisse – Spécification de sécurité**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 29.140

ISBN 978-2-8322-2901-9

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	7
3 Terms and definitions .....	8
4 General requirement and general test requirements .....	8
5 Marking .....	8
6 Interchangeability .....	9
6.1 Cap interchangeability .....	9
6.2 Bending moment and mass imparted by the lamp at the lampholder .....	9
7 Protection against accidental contact with live parts .....	10
8 Insulation resistance and electric strength after humidity treatment .....	10
8.1 General.....	10
8.2 Insulation resistance.....	10
8.3 Electric strength.....	10
9 Mechanical strength .....	11
9.1 Pull force .....	11
10 Cap temperature rise.....	11
11 Resistance to heat.....	11
12 Resistance to flame and ignition .....	11
13 Fault conditions .....	11
13.1 General.....	11
13.2 Compliance.....	11
14 Creepage distances and clearances .....	11
15 Abnormal operation .....	11
16 Photobiological safety.....	12
16.1 UV radiation.....	12
16.2 Blue light hazard.....	12
16.3 Infrared radiation .....	12
17 Ingress protection .....	12
18 Information for luminaire design.....	12
Annex A (informative) Information for luminaire design .....	13
A.1 Water contact .....	13
A.2 Further impact on luminaires.....	13
Bibliography.....	14
Figure 1 – Types of LED lamps with supply voltage $\leq 50V$ .....	7
Figure 2 – Lamp not suitable for use under dust and moisture .....	9
Table 1 – Interchangeability gauges, lamp cap dimensions, bending moment and mass.....	9
Table 2 – Test voltages for caps .....	11

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**LEDsi LAMPS FOR GENERAL LIGHTING  
SERVICES WITH SUPPLY VOLTAGES NOT EXCEEDING  
50 V A.C. R.M.S. OR 120 V RIPPLE FREE D.C. –  
SAFETY SPECIFICATIONS**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, accept IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62838 has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment

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

FDIS	Report on voting
34A/1852/FDIS	34A/1869/RVD

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

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

In this standard, the following print types are used:

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

The committee has decided that the contents of this 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.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

This standard provides the requirements and conditions of compliance for the safety of semi-integrated LED lamps with supply voltages equal to or less than 50 V a.c. r.m.s. or equal to or less than 120 V ripple free d.c.

The establishing of this standard does not exclude a future relocation as a sub-part of IEC 60968, self-ballasted lamps, or a merging with the standard for self-ballasted LED lamps with supply voltages greater than 50 V.

Currently in preview, click buy full version

# LEDsi LAMPS FOR GENERAL LIGHTING SERVICES WITH SUPPLY VOLTAGES NOT EXCEEDING 50 V A.C. R.M.S. OR 120 V RIPPLE FREE D.C. – SAFETY SPECIFICATIONS

## 1 Scope

This International Standard specifies the safety and interchangeability requirements, together with the test methods and conditions, required to show compliance of LED lamps with integrated means for stable operation, intended for domestic and similar general lighting purposes, having:

- a rated power up to 60 W
- a rated voltage equal to or less than 50 V a.c. r.m.s. or equal or less 120 V ripple free d.c.,
- caps according to Table 1.

NOTE 1 The value of 60 W rated power is under consideration. Heat management may require lower power.

This standard shall be used for products in conjunction with ELV lighting installations.

With reference to IEC 60364-7-715, in ELV lighting installations only SELV sources are applied. Where bare conductors are used, the maximum lamp voltage shall be 25 V a.c. or 60 V d.c.

The requirements of this standard relate only to type testing.

For lamps > 25 V a.c. or 60 V d.c., recommendations for whole production testing or batch testing are given in IEC 60598-1 Table C.1, column class III luminaire, column 4 or 5.

NOTE 2 Where in this standard the term “lamp(s)” is used, it is understood to stand for semi-integrated LED lamp(s) with supply voltages as in the scope above, except where it is obviously assigned to other types of lamps.

An overview of systems composed of LED modules, lamps and controlgear is given in IEC 62504. Supply voltage does not mean necessarily mains voltage, e.g. 230 V / 50 Hz. A semi-integrated LED lamp can also be driven on a supply voltage with 12 V a.c. or d.c. The control unit in the controlgear in a semi-integrated LED lamp then provides the conversion of 12 V a.c. or d.c. to a special current and voltage to power the LED inside the semi-integrated LED lamp. Schematically, the types of LEDni and LEDsi lamps are shown in Figure 1.