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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Lamps for road vehicles – Performance requirements

Lampes pour véhicules routiers – Exigences de performances

IEC 60810:2014-12(en-fr)

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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.
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International Standard IEC 60810 has been prepared by subcommittee 34A: Lamps, of IEC technical committee 34: Lamps and related equipment.

This fourth edition cancels and replaces the third edition, published in 2003, its Amendments 1 (2008) and 2 (2013). This edition constitutes a technical revision.

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

a) introduction of new gas discharge light sources;

b) introduction of requirements for non-replaceable filament lamps;

c) introduction of requirements and test conditions for LED packages.

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

FDIS	Report on voting
34A/1797/FDIS	34A/1818/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.

The committee has decided that the contents of this publication 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

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- withdrawn,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

LAMPS FOR ROAD VEHICLES – PERFORMANCE REQUIREMENTS

1 Scope

This International Standard is applicable to lamps (filament lamps, discharge lamps and LED light sources) to be used in headlamps, fog-lamps and signalling lamps for road vehicles. It is especially applicable to those lamps which are listed in IEC 60809. However, the standard may also be used for other lamps falling under the scope of this standard.

It specifies requirements and test methods for the measurement of performance characteristics such as lamp life, luminous flux maintenance, torsion strength, glass bulb strength and resistance to vibration and shock. Moreover, information on temperature limits, maximum lamp outlines and maximum tolerable voltage surges is given for the guidance of lighting and electrical equipment design.

For some of the requirements given in this standard, reference is made to data given in tables. For lamps not listed in such tables, the relevant data are supplied by the lamp manufacturer or responsible vendor.

The performance requirements are additional to the basic requirements specified in IEC 60809. They are, however, not intended to be used by authorities for legal type-approval purposes.

NOTE 1 In the various vocabularies and standards, different terms are used for "incandescent lamp" (IEC 60050-845:1987, 845-07-04) and "discharge lamp" (IEC 60050-845:1987, 845-07-17). In this standard, "filament lamp" and "discharge lamp" are used. However, where only “lamp” is written both types are meant, unless the context clearly shows that it applies to one type only.

NOTE 2 This standard does not apply to luminaires.

NOTE 3 In this standard, the term LED light source is used, in other standards the term LED lamps can be used to describe similar products.

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 60050 (all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org/)

IEC 60061-1, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 1: Lamp caps*

IEC 60068-2-6:1995, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14, *Environmental testing – Part 2–14: Tests – Test N: Change of temperature*

IEC 60068-2-43, *Environmental testing – Part 2-43: Tests – Test Kd: Hydrogen sulphide test for contacts and connections*

IEC 60068-2-60, *Environmental testing – Part 2: Tests – Test Ke: Flowing mixed gas corrosion test*

IEC 60410:1973, *Sampling plans and procedures for inspection by attributes*

IEC 60809:2014, *Lamps for road vehicles*

CISPR 25, *Vehicles, boats and internal combustion engines – Radio disturbance characteristics – Limits and methods of measurement for the protection of on-board receivers*

United Nations, *Agreement concerning the adoption of uniform technical prescription for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions.*[1]
Available from Internet: www.unece.org/trans/main/wp29/wp29regs.html (website checked 2014-08-19)

Addendum 37: Regulation No. 38, *Uniform provisions concerning the approval of rear fog lamps for power-driven vehicles and their trailers*

Addendum 47: Regulation No 48, *Uniform provisions concerning the approval of vehicles with regard to the installation of lighting and light-signalling devices*

Addendum 122: Regulation No. 123, *Uniform provisions concerning the approval of adaptive front-lighting systems (AFS) for motor vehicles*

Addendum 100: Regulation No. 101, *Uniform provisions concerning the approval of passenger cars powered by an internal combustion engine only, or powered by a hybrid electric power train with regard to the measurement of the emission of carbon dioxide and fuel consumption and/or the measurement of electric energy consumption and electric range, and of categories M1 and N1 vehicles powered by an electric power train only with regard to the measurement of electric energy consumption and electric range*

Addendum 127: Regulation No. 128, *Uniform provisions concerning the approval of light emitting diode (LED) light sources for use in approved lamp units on power-driven*

JESD22-A100D, *Cycled temperature humidity bias life test*

JESD22-A101C, *Steady-state temperature humidity bias life test*

JESD22-A104D, *Temperature cycling*

JESD22-A105C, *Power and temperature cycling*

JESD22-A106B, *Thermal shock*

JESD22-A108D, *Temperature, bias, and operating life*

JESD22-A113F, *Preconditioning of plastic surface mount devices prior to reliability testing*

JESD22-A115C, *Electrostatic discharge (ESD) sensitivity testing machine model (MM)*

JESD22-B101B, *External visual*

JESD22-B103B, *Vibration, variable frequency*

JESD22-B110B, *Mechanical shock*

JESD22-B106D, *Resistance to solder shock for through-hole mounted devices*

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[1] Also known as *The 1958 Agreement*. In the text of this standard the regulations under this agreement are referred to as, for example, UN Regulation 37 or R37.

JESD51-50:2012-04, *Overview of methodologies for the thermal measurement of single- and multi-chip, single- and multi-pnjunction light-emitting diodes (LEDs)*

JESD51-51:2012-04, *Implementation of the electrical test method for the measurement of real thermal resistance and impedance of light-emitting diodes with exposed cooling surface*

JESD51-52:2012-04, *Guidelines for combining CIE 127-2007 total flux measurements with thermal measurements of leds with exposed cooling surface*

JESD51-53:2012-05, *Terms, definitions and units glossary for LED thermal testing*

ANSI/IPC/ECA J-STD-002C, *Solderability tests for component leads, terminations, lugs, terminals and wires*

ANSI/ESDA/JEDEC JS-001-2012, *Joint JEDEC/ESDA standard for electrostatic discharge sensitivity testing human body model (HBM) – component level*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-845 and IEC 60809, as well as the following apply.

3.1
life
total time (expressed in hours) during which a lamp has been operated before it becomes useless

Note 1 to entry: For filament lamps, it is considered to be so according to one of the following criteria:

a) the end of life is the time when the filament fails;

b) the life of a dual-filament lamp is the time until either filament fails, if the lamp is tested in a switching cycle involving alternative operation of both filaments

3.2
characteristic life
T (or T_c)
constant of the Weibull distribution indicating the time up to which 63,2 % of a number of tested lamps of the same type have ended their individual lives

3.3
life B3
constant of the Weibull distribution indicating the time during which 3 % of a number of the tested lamps of the same type have reached the end of their individual lives

3.4
luminous flux maintenance
ratio of the luminous flux of a lamp at a given time in its life to its initial luminous flux, the lamp being operated under specific conditions

Example 1 L_{70} is the time in hours to 70 % luminous flux maintenance.

Example 2 L_{50} is the time in hours to 50 % luminous flux maintenance.

3.5
initial luminous flux
luminous flux of a lamp measured after the ageing specified in Annex C of IEC 60809:2014, for filament lamps or in Annex D of this standard for discharge lamps or in Annex I of this standard for LED light sources

3.6
rated value
value of a characteristic specified for operation of a lamp at test voltage and/or other specified conditions

3.7
pinch temperature limit
maximum admissible pinch temperature to ensure satisfactory lamp performance in service

3.8
solder temperature limit
maximum admissible solder temperature to ensure satisfactory lamp performance in service

3.9
maximum lamp outline
contour limiting the space to be reserved for the lamp in the relevant equipment

3.10
heavy-duty lamp
lamp declared as such, by the manufacturer or responsible vendor, which shall comply with the heavy-duty test conditions specified in Table B.2 of this standard in addition to the requirements specified in IEC 60809

3.11
life B_{10}
constant of the Weibull distribution indicating the time during which 10 % of a number of the tested lamps of the same type have reached the end of their individual lives

3.12
LED package
solid state device embodying a p-n junction, emitting optical radiation when excited by an electric current

Note 1 to entry: Examples are shown in Figure 1.

Note 2 to entry: In UN terminology the term "LED" is used with the same definition.

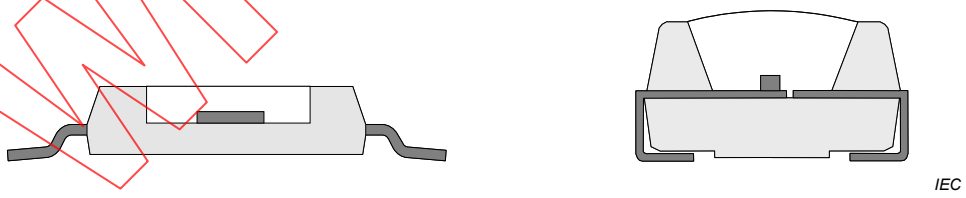

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Figure 1 – Examples of LED packages

3.13
LED light source
light source where the visible radiation is emitted from one or more LED(s)

Note 1 to entry: An LED light source may or may not require an additional electronic control gear and may or may not require additional provisions for thermal management.

3.13.1
LED module
LED light source which can only be replaced with the use of mechanical tools

Note 1 to entry: LED modules are generally considered as components for use in trades, professions or industries and are generally not intended for sale to the general public.