

INTERNATIONAL STANDARD



Luminaire performance –
Part 1: General requirements

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LUMINAIRE PERFORMANCE –

Part 1: General requirements

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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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62722-1:2014. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 62722-1 has been prepared by subcommittee 34D: Luminaires, of IEC technical committee 34: Lighting. It is an International Standard.

This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

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

- a) The reference to and use of the measurement methods for non-active power consumption in accordance with IEC 63103 have been added.
- b) The pictograms of Annex C have been updated to represent modern light sources.

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

Draft	Report on voting
34D/1658/FDIS	34D/1660/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62722 series, published under the general title *Luminaire performance* can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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- withdrawn,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

IMPORTANT – The "colour inside" logo on the cover page of this document 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 part of IEC 62722 is a performance standard for luminaires (general requirements) and acknowledges the need for defining performance data to be provided, the presentation of this data, the basis of its measurement, and the associated tolerances that ~~may~~ can be reasonably expected. Information to support responsible environmental use is also included. Future Parts 2 of the IEC 62722 series ~~will~~ can be introduced where additional performance requirements for specific types of light sources are required. The structure of these performance standards also allows for the possibility of Part 3 of the IEC 62722 series to be introduced in the future should standardization of performance criteria linked to specific luminaire applications be determined as necessary (e.g. floodlighting, street lighting).

~~The provisions in this standard represent the technical knowledge of experts from the fields of the luminaire industry and associated components such as lamps and controlgear.~~

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LUMINAIRE PERFORMANCE –

Part 1: General requirements

1 Scope

This part of IEC 62722 covers specific performance and environmental requirements for luminaires, incorporating electric light sources for operation from supply voltages up to 1 000 V. Unless otherwise detailed, performance data covered under the scope of this document are for the luminaires in a condition representative of new manufacture, with any specified initial aging procedures completed.

This document covers requirements for luminaires to support energy efficient use and responsible environmental management to the end of life. The object of this document is to provide a set of requirements which are considered to be generally applicable to most types of luminaires. Where additional performance requirements for specific types of light source are relevant, these are specified in the IEC 62722-2 series. The IEC 62722-2 series ~~may~~ can also cover a wider scope of performance aspects appropriate to the particular light source technology.

~~NOTE The structure of these performance standards also allows for the possibility of Part 3 standards to be introduced in the future should standardisation of performance criteria linked to specific luminaire applications be determined as necessary (e.g. floodlighting, street lighting, etc.).~~

~~It is the intention that the requirements of this Part 1 are to be met by the provision of information and data provided by the luminaire manufacturer (or responsible vendor). Conformity is considered to be met by the provision of the requested information. Any verification of data is to be conducted by the measurement requirements of this standard.~~

Semi-luminaires are not covered under the scope of this document.

For some types of luminaires (e.g. decorative ~~or~~ household) the provision of performance data under the scope of this document ~~may~~ is not ~~be~~ appropriate.

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 60050-845, *International Electrotechnical Vocabulary (IEV) – Part 845: Lighting* (available at <http://www.electropedia.org>)

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

IEC 60598-2 (all parts), *Luminaires – Part 2: Particular requirements*

~~IEC 60598-2-22, *Luminaires – Part 2-22: Particular requirements – Luminaires for emergency lighting*~~

IEC 62722-2 (all parts), *Luminaire performance – Part 2: Particular requirements*

IEC 63103:2020, *Lighting equipment – Non-active mode power measurement*

IEC TS 63105, *Lighting systems and related equipment – Vocabulary*

CIE 034:1977, *Road lighting lantern and installation data: Photometrics, classification and performance*

CIE 043:1979, *Photometry of floodlights*

CIE 121:1996, *The photometry and goniophotometry of luminaires*

~~CIE 121-SP1:2009, *The photometry and goniophotometry of luminaires – Supplement 1: Luminaires for emergency lighting*~~

~~NOTE – Annex A provides details of regional standards the use of which are preferred in some countries.~~

3 Terms and definitions

For the purposes of this document the terms and definitions given in IEC 60598-1, IEC 60050-845 and IEC TS 63105 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

input power

electrical power from the mains supply consumed by the luminaire including the operation of all electrical components necessary for its intended functioning

3.2

standby mode

<of luminaire> mode when the equipment is connected to a supply voltage with the illumination function off, while capable of being activated by an external trigger not being a trigger from a network

Note 1 to entry: Examples of external triggers are sensing or timing.

[SOURCE: IEC 63103:2020, 3.10, modified – The domain was changed to cover luminaires.]

3.3

networked standby mode

<of luminaire> mode when the equipment is connected to a supply voltage with the illumination function off, while capable of being activated by an external trigger being a trigger from a network

[SOURCE: IEC 63103:2020, 3.11, modified – The domain was changed to cover luminaires.]

3.4

standby power

~~electrical power from the mains supply consumed by the luminaire under normal operating conditions, with the lamps switched off via a control signal~~

<of luminaire> average power consumption in the standby mode

~~Note 1 to entry: Standby power is expressed in watts.~~

~~Note 2 to entry: For emergency lighting luminaires this does not include the emergency lighting charging power.~~

3.5

networked standby power

<of luminaire> average power consumption in the networked standby mode

3.6

emergency lighting charging power

electrical power from the mains supply consumed by the charging circuit of emergency luminaires to keep the battery charged

~~Note 1 to entry:—Emergency lighting charging power is expressed in watts.~~

Note 1 to entry: In IEC 63103:2020 the mode reproducing the condition where the emergency lighting charging power is consumed is named "charging maintenance mode" (as defined in 3.13 of that document).

Note 2 to entry: Emergency lighting charging power is only valid for self-contained emergency luminaires.

3.7

luminaire efficacy

ratio of the luminaires total luminous flux versus its input power at rated supply voltage, excluding any emergency lighting charging power

~~Note 1 to entry:—Luminaire efficacy is expressed in lumens per watt.~~

3.8

LOR

light output ratio

<of luminaire> ratio of the total luminous flux of the luminaire, measured under specified practical conditions with its own light sources and equipment, to the sum of the individual luminous fluxes of the same light sources when operated outside the luminaire with the same equipment, under specified conditions

~~Note 1 to entry:—This note applies to the French language only.~~

3.9

rated value

quantitative value for a characteristic of a luminaire for specific operating conditions specified in this document, or in applicable standards, or assigned by the manufacturer or responsible vendor

3.10

test voltage

voltage at which tests are carried out

3.11

BLF

ballast lumen factor

ratio of the luminous flux of the light source when the ballast under test is operated at its rated voltage, to the luminous flux of the same lamp operated with the appropriate reference ballast supplied at its rated voltage and frequency

4 General requirements

4.1 Luminaires shall be tested complete with the light source and controlgear specified by the manufacturer. Except where otherwise specified, the luminaire, light source and controlgear shall be tested as new, and installed as for normal use, ~~having regard to~~ in accordance with the manufacturer's installation instructions.

4.2 Luminaires shall meet the requirements of the relevant parts of the IEC 60598-2 series that are appropriate to their design.

4.3 Luminaires shall meet all the requirements of this document and where applicable also the additional requirements of the ~~IEC 62772-2~~ IEC 62722-2 series appropriate to the type of light source used by the luminaire. Where detailed in the ~~IEC 62772-2~~ IEC 62722-2 series, alternative methods of measurement or limits to those given in this document may be specified.

4.4 Where it is specified in this document that data is to be provided, this data may be supplied by the manufacturer in printed or electronic formats, via the manufacturer's catalogues, website, or similar, unless otherwise specified in this document.

4.5 Luminaires for tungsten filament lamps ~~may~~ can be photometrically rated, electrically rated and efficacy-rated with lamps of any wattage not exceeding the marked maximum, and any technology (e.g. halogen, self-ballasted compact fluorescent or self-ballasted LED), if these lamps are covered by an available IEC safety standard and are shown to comply with that standard. For these luminaires, the number of lamps, their technology and their wattage shall be given in the luminaire manufacturer's catalogue, website or similar.

The use of an international lamp coding system (ILCOS) code according to IEC 61231 is recommended. Further details ~~may~~ can be necessary to identify the type of lamp.

The requirements of this document shall be met by the provision of information and data provided by the luminaire manufacturer (or responsible vendor). Compliance is considered to be met by the provision of the requested information. Any verification of data is conducted by the measurement requirements of this document.

4.6 The luminaire manufacturer shall be prepared to provide information for the specific light source used for the test.

5 Light sources and components of luminaires

Any light sources and components delivered with the luminaire shall comply with the requirements of the IEC performance standards that are appropriate to them.

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6 Photometric data

Photometric data shall be available for the luminaire and any optical attachments or accessories that the luminaire has been specified for use with. The following photometric data shall be provided.

a) Light output ratio (LOR) or the total luminous flux of the luminaire

NOTE 1 The relevant part of the IEC 62722-2 series can specify which of these are to be provided.

b) Luminous intensity distribution

Photometric data shall be provided for luminaires in accordance with an established international or regional format as appropriate for the type of luminaire, and with luminous intensity distribution data according to the luminaire's intended application. Data shall be available in electronic file format to facilitate its use by lighting design software.

NOTE 2 Information regarding acceptable regional standards for photometric data formats is given in Annex A.

When the LOR is provided it shall be measured in accordance with CIE 121 and the LOR of the luminaire shall not be more than 10 % (relative) below the rated value.

When a total luminous flux is provided it shall be measured in accordance with CIE 121 and shall not be more than 10 % below the rated value.

The distribution of luminous intensity, measured in accordance with CIE 121, shall ~~generally~~ be in accordance with that declared by the manufacturer. The method of comparison for the distribution shape, and limits for acceptance are given in Annex D.

The allowed photometric variations detailed ~~are to~~ shall take account of manufacturing tolerances. When measurements are made, additional allowance for laboratory measurement uncertainty shall also ~~needs to~~ be considered.

All photometric data shall be declared for the luminaire operating at its rated supply voltage.

For the photometric performance and measurement of emergency luminaires when operating in emergency mode, see also IEC 60598-2-22 and CIE 121-SP1.

7 Electrical data

Electrical supply data shall be provided for the luminaire and shall include the following:

- a) rated supply voltage;
- b) rated input power;
- c) rated standby power if applicable;
- d) rated networked standby power if applicable;
- e) rated emergency lighting charging power if applicable.

~~Rated power values shall be rounded to the nearest whole number for 10 W and above and shall be to two significant figures when below 10 W.~~

Power values shall be reported in W with the minimum following resolution:

- ≥ 10 W: whole number;
- > 1 W and < 10 W: first decimal digit;
- ≤ 1 W: two decimal digits.

When measured at its rated supply voltage, under conditions specified in Annex B, the electrical values shall not exceed the rated values declared by the manufacturer by more than 10 %.

8 Luminaire efficacy data

Where luminaire efficacy data is provided this shall be with reference to rated light source performance data published by the light source manufacturer. The luminaire manufacturer shall be prepared to provide information of the specific light source data that has been used.

Luminaire efficacy data shall be based on the rated photometric and electrical characteristics of the luminaire. For production light source and luminaire combinations, variations in accordance with parameters stated in IEC standards for light sources, controlgear, and luminaire standards ~~may~~ can occur.

NOTE Luminaire efficacy data can be derived from $LOR \times (\text{rated light source lumens} \times BLF) / \text{Input power in watts at rated supply voltage}$.

9 Environmental data

9.1 Materials information

The manufacturer ~~shall ensure~~ is responsible for checking that materials used for the construction of the luminaire and its components are not in breach of local regulations restricting the use of specific substances considered to be hazardous to the user or environment.

NOTE Local regulations are those in force for the region of manufacture, sale and use of the luminaire.

9.2 Maintenance instructions

To assist good performance through life, the manufacturer shall provide details of the recommended maintenance operations that should be carried out.

NOTE In some countries, ~~this information is required under the scope of local regulations~~ specific requirements according to local regulations can apply.

9.3 ~~Disassembly~~ End of life dismantling instructions

To assist end of life recycling, the manufacturer shall provide instructions to assist the disassembly of the luminaire and segregation of material types.

NOTE 1 In some countries, ~~this information is required under the scope of local regulations~~ specific requirements according to local regulations can apply.

NOTE 2 Symbols to assist the communication of instructions for maintenance through life and end of life recycling are given in Annex C.

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Annex A (informative)

Use of regional standards

In some regions the use of local standards, as alternatives to those detailed in the text of this document may be preferred. Details of those that have been made known by national committees are as follows:

Europe

EN 13032-1:2004	Light and lighting – Measurement and presentation of photometric data of lamps and luminaires – Part 1: Measurement and file format
EN 13032-2: 2004 2017	Light and lighting – Measurement and presentation of photometric data of lamps and luminaires – Part 2: Presentation of data for indoor and outdoor work places
EN 13032-3:2007	Light and lighting – Measurement and presentation of photometric data of lamps and luminaires – Part 3: Presentation of data for emergency lighting of work places

Canada, Mexico and USA

IES- LM75-01 LM-75-19	Goniophotometer Types and Photometric Coordinates
IES-LM-63- 02 19	Standard File Format for the Electronic Transfer of Photometric Data and Related Information
IES-LM-58- 94 20	Guide to Spectroradiometric Measurements Methods for Light Sources
IES-LM-77- 09 20	Intensity Distribution Measurement of Luminaires and Lamps Using Digital Screen Imaging Photometry
ANSI/IES- RP-16-07 LS-1-21	Lighting Science: Nomenclature and Definitions for Illuminating Engineering

Japan

JIS C 8105-5:2011	Luminaires – Part 5: Gonio-photometric methods
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