

INTERNATIONAL STANDARD



**Luminaire performance –
Part 1: General requirements**

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INTERNATIONAL STANDARD



**Luminaire performance –
Part 1: General requirements**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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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.

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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Annex B (normative)

Measurement method of total power of luminaires and associated powers

B.1 General

Annex B provides details of the measurement for luminaire supply power, ~~stand-by losses~~ **standby power**, **networked standby power** and emergency lighting charging power.

Electrical measurements ~~are to~~ **shall** be made at the luminaire supply terminals.

For production light sources and controlgear used in luminaires, variations in accordance with parameters stated in IEC standards ~~may~~ **can** occur. Measurements of luminaire electrical characteristics performed under the scope of this document should be made with lamps and controlgear that are representative of their rated values, or with corrections made to take account for any variation from these.

B.2 Test measurement of luminaire power during normal operation

The object of the test is to measure the luminaire total input power during normal operation with any associated ~~stand-by losses~~ **standby power**, **networked standby power** and emergency lighting charging power at standard reproducible conditions that are close to the conditions of service for which the luminaire is designed. Ideally, these luminaire electrical measurements should be made during photometric tests.

B.3 Standard test conditions

Test conditions for photometric measurements shall be in accordance with CIE 121:1996, Clause 4.

B.4 Electrical measuring instruments

Voltmeters, ampere meters and wattmeters shall ~~conform to~~ **comply with** the requirements for Class Index 0,5 or better (precision grade).

B.5 Test luminaires

Tests are made on a single sample. The luminaire shall be representative of the manufacturer's regular product. The luminaire should be mounted in the position in which it is designed to operate.

B.6 Test voltage

The test voltage at the supply terminals to the luminaire shall be the rated voltage. In the case of luminaires with a voltage range, the manufacturer shall declare the value at which the test shall be made.

B.7 Luminaire power

The luminaire power shall be the value obtained in accordance with Clauses B.1 to B.6. The value shall include the power of all ~~lamp~~ light source(s), controlgear and other component(s), for normal full output operating mode or at maximum light output if the luminaire includes a dimming controlgear. Measurements shall be made at the luminaire input terminals.

B.8 Luminaire standby power ~~with lamps off~~

~~The luminaire standby power shall be measured with the lamps off and the luminaire operating in standby mode only if applicable. For controlled luminaires, this is the power to the detectors, for emergency luminaires this is the steady state power for charging the batteries. Measurements shall be made at the luminaire input terminals.~~

The measurement of standby power of a luminaire shall be performed according to IEC 63103:2020.

B.9 Luminaire networked standby power

The measurement of networked standby power of a luminaire shall be performed according to IEC 63103:2020.

B.10 Emergency lighting charging power

~~For self-contained emergency luminaires, the luminaire power for maintaining the charge in the batteries shall be measured only with batteries in fully charged condition with lamps off. If the input power varies with time, the power is determined as the arithmetic mean value of the total power measured over a 24 h period following full charging of the emergency lighting batteries. Measurements shall be made at the luminaire input terminals.~~

For self-contained emergency luminaires, the measurement of the emergency lighting charging power shall be performed according to IEC 63103 in charging maintenance mode as defined in IEC 63103:2020, 3.13. The test shall be performed according to IEC 63103:2020, 5.3.2 following full charging of the emergency lighting batteries.

Annex C

(informative)

Pictograms to assist the communication of instructions for maintenance through life and end of life recycling

C.1 General

The pictograms given in Figure C.1, Figure C.2 and Figure C.3 may be used to assist the communication of instructions for maintenance through life and end of life recycling.

NOTE For all pictograms showing a lamp light source, the shape of the lamp light source can be changed to be representative of the actual lamp light source being used.

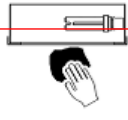
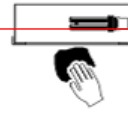
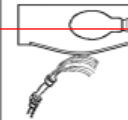
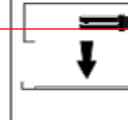
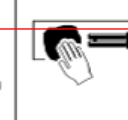
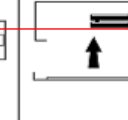
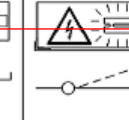
C.2 Instructions for luminaire servicing (see Figure C.1)

Replace aged or failed lamp	Switch off Switch off supply	Open luminaire	Remove old lamp Send to recycling centre	Fit new lamp Insert the new lamp into lamp holder	Refit optic	Make functional test

Replace aged or failed light source	Switch off Switch off supply to luminaire	Open luminaire	Remove old light source Send to recycling centre	Fit new light source Insert the new lamp into lamp holder	Refit optic	Make functional test

Figure C.1 – Instructions for luminaire servicing

~~C.3 Instructions for luminaire cleaning (see Figure C.2)~~

Clean luminaire	Switch off Switch off	Wipe outside optic	Wash outside optic	Remove optic	Clean inside luminaire	Refit optic	Make functional test
							

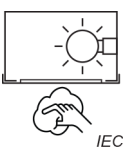
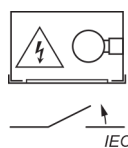
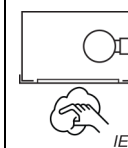
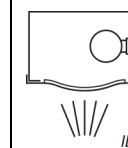
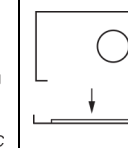
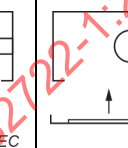
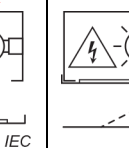
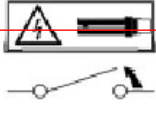
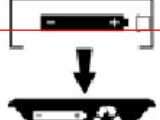
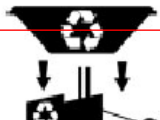
Clean luminaire	Switch off Switch off supply to luminaire	Wipe outside optic	Wash outside optic	Remove optic	Clean inside luminaire	Refit optic	Make functional test
 IEC	 IEC	 IEC	 IEC	 IEC	 IEC	 IEC	 IEC

Figure C.2 – Instructions for luminaire cleaning

~~C.4 Instructions for luminaire disposal (see Figure C.3)~~

Switch off Switch off supply to luminaire	Remove lamp for disposal	Remove battery for disposal	Remove luminaire for disposal	Dispatch materials to recycling plant
				

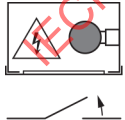
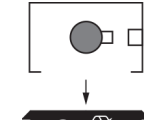
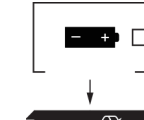
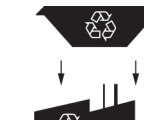
Switch off Switch off supply to luminaire	Remove light source for recycling	Remove battery for recycling	Remove luminaire for recycling	Dispatch materials to recycling plant
 IEC	 IEC	 IEC	 IEC	 IEC

Figure C.3 – Instructions for ~~luminaire disposal~~ end of life dismantling

Annex D (normative)

Photometric distribution data for luminaires

D.1 General

For the photometric distribution data of luminaires, Annex D provides information and requirements for the measurement resolution, methods of comparison, and acceptable variation to the declared data of the manufacturer.

D.2 Measurement resolution of photometric distribution data

The consistency of photometric distribution data largely depends on the number of planes C and angles γ used for the measurement and presented as final data. The half planes C used to measure the intensity of the light shall cover all of the space from 0° to 360° with steps of ΔC and $\Delta \gamma$ as specified below.

Maximum intervals between the angles of measurement shall be as follows.

- a) Luminaires for general lighting and luminaires for emergency lighting: $\Delta C = 15^\circ$, $\Delta \gamma = 5^\circ$.
- b) Floodlight and spotlight luminaires: Planes V and angles H as specified in CIE 043, depending on the type of light beam and its angular aperture, with close stepping around the $I_{\max}$ value. The reading can also be taken using the C - γ system, provided the steps are equivalent to those ~~prescribed by~~ specified in CIE 043.
- c) Street lighting luminaires: Planes C and angles γ as detailed in CIE 034.

D.3 Method of comparison and acceptable limits of variation

D.3.1 General

The photometric distribution of the luminaire shall be measured and the light intensity is compared to the manufacturer's declared data on the main half planes (C_0 ; C_{90} ; C_{180} ; C_{270}); and also on the C half plane containing the maximum intensity value, $C_{I_{\max}}$. For distributions containing peak intensity ($C_{I_{\max}}$) in more than one half plane, this comparison shall be made in the same C -plane.

For luminaires exhibiting axial symmetry the comparison is made only on the main half planes (C_0 ; C_{90} ; C_{180} ; C_{270}).

Before any comparison it should be ensured that the declared luminaire data and measured luminaire data have been made for the same mounting orientation of the luminaire. If this is not the case, the distribution may be rotated as long as this does not change any intensity values in the process. Additionally the data shall be in the same units (cd/klm or cd).

The normalized maximum intensity value (cd/klm) of each half plane (C_0 ; C_{90} ; C_{180} ; C_{270} ; $C_{I_{\max}}$), is compared with the corresponding five angles γ : $I_{\max}$ and the four nearest intensity readings in the same C half plane.

Table D.1 provides some examples of the nearest values to be selected for comparison.

Table D.1 – Examples of nearest values to be selected for comparison

	Case 1 e.g. C ₉₀	C plane		Case 2 e.g. C ₁₈₀	C plane		Case 3 e.g. C ₂₇₀	C plane
γ 5		176			197			(186)
γ 10		(178)			(135)			197
γ 15		(186)			(125)			(135)
γ 20		197			(98)			(125)
γ 25		(135)			(86)			(98)
γ 30		(125)			76			86
γ 35		98			56			70
γ 40		86			50			66
γ 45		76			40			50
γ 50		56			35			20
Peak value is given in bold text.								
Nearest values used for comparison are given in brackets.								

For distributions where no clear peak or multiple peaks are present, it should be ensured the comparison of intensity values are made between the same corresponding angles.

The measured data is acceptable if the corresponding values are within $\pm 20\%$ of the manufacturer's declared data.

Possible scenarios for acceptance are given in D.3.2 and D.3.3.

D.3.2 Scenarios for each main half plane: C₀; C₉₀; C₁₈₀; C₂₇₀

D.3.2.1 Scenario 1 – Maximum intensities occur in the same γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance the verdict is PASS (checked for each half plane).

If the above verdict is not PASS this check can be repeated with the half plane C shifted within the interval $C \pm \Delta C$. If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance, the verdict is PASS, otherwise the verdict is FAIL (checked for each half plane).

D.3.2.2 Scenario 2 – Maximum intensities occur in a different γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance and the γ angle shift is less than or equal to $\Delta\gamma$, the verdict is PASS (checked for each half plane).

If the above verdict is not PASS, this check can be repeated with the half plane C shifted within the interval $C \pm \Delta C$. If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance the verdict is PASS, otherwise the verdict is FAIL (checked for each half plane).

NOTE ΔC is the maximum measurement step for the specific luminaire type.

D.3.3 Scenarios for half plane: C $I_{\max}$ **D.3.3.1 Scenario 1 – Maximum intensity occurs in same C plane and same γ angle**

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance, the verdict is PASS, otherwise the verdict is FAIL.

D.3.3.2 Scenario 2 – Maximum intensity occurs in same C plane and different γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance and the γ angle shift is less than or equal to $\Delta\gamma$, the verdict is PASS, otherwise the verdict is FAIL.

D.3.3.3 Scenario 3 – Maximum intensity occurs in a different C plane and same γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance and the C plane shift is less than or equal to ΔC , the verdict is PASS, otherwise the verdict is FAIL.

D.3.3.4 Scenario 4 – Maximum intensity occurs in a different C plane and different γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance and the C plane shift is less than or equal to ΔC and the γ angle shift is less than or equal to $\Delta\gamma$, the verdict is PASS, otherwise the verdict is FAIL.

D.3.4 Conformity Compliance

Where a PASS conclusion is reached from one of the identified scenarios for D.3.2 (C_0 ; C_{90} ; C_{180} ; C_{270}) and D.3.3 (C $I_{\max}$) the measured luminaire is considered as representative of the manufacturer declared data.

The Δ angles used for the angular shifts described in D.3.2 and D.3.3 are the maximum intervals described for the different types of luminaires given in Clause D.2. It is possible that closer intervals are used in the manufacturer's declared data ~~may have been given using closer intervals.~~

Bibliography

IEC 61231, *International lamp coding system (ILCOS)*

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

~~EN 15193:2007, *Energy performance of buildings – Energy requirements for lighting*~~

~~IMQ Rules, *Product Certification – Lighting Fittings and Accessories*~~

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Luminaire performance –
Part 1: General requirements**

**Performance des luminaires –
Partie 1: Exigences générales**

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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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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.

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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 can be reasonably expected. Information to support responsible environmental use is also included. Future Parts 2 of the IEC 62722 series 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).

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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 can also cover a wider scope of performance aspects appropriate to the particular light source technology.

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 is not 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 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*

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

<of luminaire> average power consumption in the standby mode

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: 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

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

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, 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 62722-2 series appropriate to the type of light source used by the luminaire. Where detailed in the 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 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 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.

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 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 shall take account of manufacturing tolerances. When measurements are made, additional allowance for laboratory measurement uncertainty shall also 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.

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 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 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, specific requirements according to local regulations can apply.

9.3 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, 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.

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 13032-2:2017	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-LM-75-19	Goniophotometer Types and Photometric Coordinates
IES-LM-63-19	Standard File Format for the Electronic Transfer of Photometric Data and Related Information
IES-LM-58-20	Spectroradiometric Measurement Methods for Light Sources
IES-LM-77-20	Intensity Distribution Measurement of Luminaires and Lamps Using Digital Screen Imaging Photometry
ANSI/IES- 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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Annex B (normative)

Measurement method of total power of luminaires and associated powers

B.1 General

Annex B provides details of the measurement for luminaire supply power, standby power, networked standby power and emergency lighting charging power.

Electrical measurements shall be made at the luminaire supply terminals.

For production light sources and controlgear used in luminaires, variations in accordance with parameters stated in IEC standards can occur. Measurements of luminaire electrical characteristics performed under the scope of this document should be made with lamps and controlgear that are representative of their rated values, or with corrections made to take account for any variation from these.

B.2 Test measurement of luminaire power during normal operation

The object of the test is to measure the luminaire total input power during normal operation with any associated standby power, networked standby power and emergency lighting charging power at standard reproducible conditions that are close to the conditions of service for which the luminaire is designed. Ideally, these luminaire electrical measurements should be made during photometric tests.

B.3 Standard test conditions

Test conditions for photometric measurements shall be in accordance with CIE 121:1996, Clause 4.

B.4 Electrical measuring instruments

Voltmeters, ampere meters and wattmeters shall comply with the requirements for Class Index 0,5 or better (precision grade).

B.5 Test luminaires

Tests are made on a single sample. The luminaire shall be representative of the manufacturer's regular product. The luminaire should be mounted in the position in which it is designed to operate.

B.6 Test voltage

The test voltage at the supply terminals to the luminaire shall be the rated voltage. In the case of luminaires with a voltage range, the manufacturer shall declare the value at which the test shall be made.

B.7 Luminaire power

The luminaire power shall be the value obtained in accordance with Clauses B.1 to B.6. The value shall include the power of all light source(s), controlgear and other component(s), for normal full output operating mode or at maximum light output if the luminaire includes a dimming controlgear. Measurements shall be made at the luminaire input terminals.

B.8 Luminaire standby power

The measurement of standby power of a luminaire shall be performed according to IEC 63103:2020.

B.9 Luminaire networked standby power

The measurement of networked standby power of a luminaire shall be performed according to IEC 63103:2020.

B.10 Emergency lighting charging power

For self-contained emergency luminaires, the measurement of the emergency lighting charging power shall be performed according to IEC 63103 in charging maintenance mode as defined in IEC 63103:2020, 3.13. The test shall be performed according to IEC 63103:2020, 5.3.2 following full charging of the emergency lighting batteries.

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Annex C (informative)

Pictograms to assist the communication of instructions for maintenance through life and end of life recycling

The pictograms given in Figure C.1, Figure C.2 and Figure C.3 may be used to assist the communication of instructions for maintenance through life and end of life recycling.

NOTE For all pictograms showing a light source, the shape of the light source can be changed to be representative of the actual light source being used.

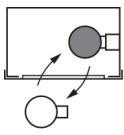
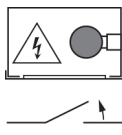
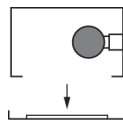
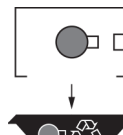
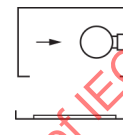
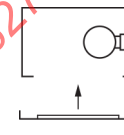
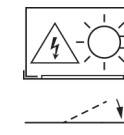
Replace aged or failed light source	Switch off Switch off supply to luminaire	Open luminaire	Remove old light source Send to recycling centre	Fit new light source Insert the new lamp into lamp holder	Refit optic	Make functional test
 IEC	 IEC	 IEC	 IEC	 IEC	 IEC	 IEC

Figure C.1 – Instructions for luminaire servicing

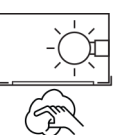
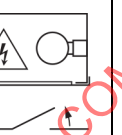
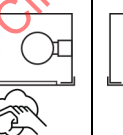
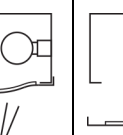
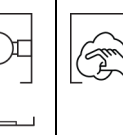
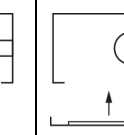
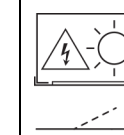
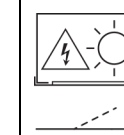
Clean luminaire	Switch off Switch off supply to luminaire	Wipe outside optic	Wash outside optic	Remove optic	Clean inside luminaire	Refit optic	Make functional test
 IEC	 IEC	 IEC	 IEC	 IEC	 IEC	 IEC	 IEC

Figure C.2 – Instructions for luminaire cleaning

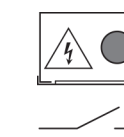
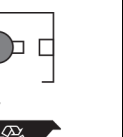
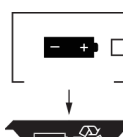
Switch off Switch off supply to luminaire	Remove light source for recycling	Remove battery for recycling	Remove luminaire for recycling	Dispatch materials to recycling plant
 IEC	 IEC	 IEC	 IEC	 IEC

Figure C.3 – Instructions for end of life dismantling

Annex D (normative)

Photometric distribution data for luminaires

D.1 General

For the photometric distribution data of luminaires, Annex D provides information and requirements for the measurement resolution, methods of comparison, and acceptable variation to the declared data of the manufacturer.

D.2 Measurement resolution of photometric distribution data

The consistency of photometric distribution data largely depends on the number of planes C and angles γ used for the measurement and presented as final data. The half planes C used to measure the intensity of the light shall cover all of the space from 0° to 360° with steps of ΔC and $\Delta \gamma$ as specified below.

Maximum intervals between the angles of measurement shall be as follows.

- a) Luminaires for general lighting and luminaires for emergency lighting: $\Delta C = 15^\circ$, $\Delta \gamma = 5^\circ$.
- b) Floodlight and spotlight luminaires: Planes V and angles H as specified in CIE 043, depending on the type of light beam and its angular aperture, with close stepping around the $I_{\max}$ value. The reading can also be taken using the C - γ system, provided the steps are equivalent to those specified in CIE 043.
- c) Street lighting luminaires: Planes C and angles γ as detailed in CIE 034.

D.3 Method of comparison and acceptable limits of variation

D.3.1 General

The photometric distribution of the luminaire shall be measured and the light intensity is compared to the manufacturer's declared data on the main half planes (C_0 ; C_{90} ; C_{180} ; C_{270}); and also on the C half plane containing the maximum intensity value, $C_{I_{\max}}$. For distributions containing peak intensity ($C_{I_{\max}}$) in more than one half plane, this comparison shall be made in the same C -plane.

For luminaires exhibiting axial symmetry the comparison is made only on the main half planes (C_0 ; C_{90} ; C_{180} ; C_{270}).

Before any comparison it should be ensured that the declared luminaire data and measured luminaire data have been made for the same mounting orientation of the luminaire. If this is not the case, the distribution may be rotated as long as this does not change any intensity values in the process. Additionally the data shall be in the same units (cd/klm or cd).

The normalized maximum intensity value (cd/klm) of each half plane (C_0 ; C_{90} ; C_{180} ; C_{270} ; $C_{I_{\max}}$), is compared with the corresponding five angles γ : $I_{\max}$ and the four nearest intensity readings in the same C half plane.

Table D.1 provides some examples of the nearest values to be selected for comparison.

Table D.1 – Examples of nearest values to be selected for comparison

	Case 1 e.g. C ₉₀	C plane		Case 2 e.g. C ₁₈₀	C plane		Case 3 e.g. C ₂₇₀	C plane
γ 5		176			197			(186)
γ 10		(178)			(135)			197
γ 15		(186)			(125)			(135)
γ 20		197			(98)			(125)
γ 25		(135)			(86)			(98)
γ 30		(125)			76			86
γ 35		98			56			70
γ 40		86			50			66
γ 45		76			40			50
γ 50		56			35			20
Peak value is given in bold text.								
Nearest values used for comparison are given in brackets.								

For distributions where no clear peak or multiple peaks are present, it should be ensured the comparison of intensity values are made between the same corresponding angles.

The measured data is acceptable if the corresponding values are within $\pm 20\%$ of the manufacturer's declared data.

Possible scenarios for acceptance are given in D.3.2 and D.3.3.

D.3.2 Scenarios for each main half plane: C₀; C₉₀; C₁₈₀; C₂₇₀

D.3.2.1 Scenario 1 – Maximum intensities occur in the same γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance the verdict is PASS (checked for each half plane).

If the above verdict is not PASS this check can be repeated with the half plane C shifted within the interval $C \pm \Delta C$. If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance, the verdict is PASS, otherwise the verdict is FAIL (checked for each half plane).

D.3.2.2 Scenario 2 – Maximum intensities occur in a different γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance and the γ angle shift is less than or equal to $\Delta\gamma$, the verdict is PASS (checked for each half plane).

If the above verdict is not PASS, this check can be repeated with the half plane C shifted within the interval $C \pm \Delta C$. If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance the verdict is PASS, otherwise the verdict is FAIL (checked for each half plane).

NOTE ΔC is the maximum measurement step for the specific luminaire type.

D.3.3 Scenarios for half plane: C $I_{\max}$ **D.3.3.1 Scenario 1 – Maximum intensity occurs in same C plane and same γ angle**

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance, the verdict is PASS, otherwise the verdict is FAIL.

D.3.3.2 Scenario 2 – Maximum intensity occurs in same C plane and different γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance and the γ angle shift is less than or equal to $\Delta\gamma$, the verdict is PASS, otherwise the verdict is FAIL.

D.3.3.3 Scenario 3 – Maximum intensity occurs in a different C plane and same γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance and the C plane shift is less than or equal to ΔC , the verdict is PASS, otherwise the verdict is FAIL.

D.3.3.4 Scenario 4 – Maximum intensity occurs in a different C plane and different γ angle

If the $I_{\max}$ and the four γ intensity readings nearest $I_{\max}$ fall within the specified tolerance and the C plane shift is less than or equal to ΔC and the γ angle shift is less than or equal to $\Delta\gamma$, the verdict is PASS, otherwise the verdict is FAIL.

D.3.4 Compliance

Where a PASS conclusion is reached from one of the identified scenarios for D.3.2 (C_0 ; C_{90} ; C_{180} ; C_{270}) and D.3.3 (C $I_{\max}$) the measured luminaire is considered as representative of the manufacturer declared data.

The Δ angles used for the angular shifts described in D.3.2 and D.3.3 are the maximum intervals described for the different types of luminaires given in Clause D.2. It is possible that closer intervals are used in the manufacturer's declared data.

Bibliography

IEC 61231, *International lamp coding system (ILCOS)*

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

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

PERFORMANCE DES LUMINAIRES –

Partie 1: Exigences générales

AVANT-PROPOS

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Cette deuxième édition annule et remplace la première édition parue en 2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition antérieure.

- a) Des références à l'IEC 63103 ont été ajoutées afin d'appliquer les méthodes de mesurage de la consommation de puissance en mode non actif.
- b) Les pictogrammes de l'Annexe C ont été mis à jour pour représenter les sources lumineuses modernes.

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

Projet	Rapport de vote
34D/1658/FDIS	34D/1660/RVD

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

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 62722, publiées sous le titre général *Performance des luminaires*, se trouve sur le site web de l'IEC.

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INTRODUCTION

La présente partie de l'IEC 62722 est une norme de performance pour les luminaires (exigences générales) et reconnaît la nécessité de définir les données de performance à fournir, la présentation de ces données, les principes de mesurage correspondants et les tolérances associées qui peuvent être raisonnablement attendues. Elle comporte également des informations pour une utilisation écoresponsable. Les futures Parties 2 de la série IEC 62722 peuvent être citées lorsque des exigences de performance supplémentaires sont exigées pour des types spécifiques de sources lumineuses. La structure de ces normes de performance ouvre également la possibilité d'ajouter ultérieurement une Partie 3 dans la série IEC 62722, si la normalisation des critères de performance associés aux applications de luminaires spécifiques est jugée nécessaire (par exemple, illumination, éclairage public).

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PERFORMANCE DES LUMINAIRES –

Partie 1: Exigences générales

1 Domaine d'application

La présente partie de l'IEC 62722 couvre les exigences de performance et d'environnement spécifiques aux luminaires, qui incorporent des sources lumineuses électriques destinées à fonctionner sous des tensions d'alimentation jusqu'à 1 000 V. Sauf disposition contraire, les données de performance couvertes par le domaine d'application du présent document s'appliquent aux luminaires qui sont dans un état représentatif d'un produit neuf, où toutes les procédures de vieillissement initial spécifiées ont été réalisées.

Le présent document couvre les exigences relatives aux luminaires dans le but de mettre en œuvre une utilisation écoénergétique et une gestion écoresponsable jusqu'à la fin de vie des luminaires. L'objet du présent document est d'établir un ensemble d'exigences qui sont présumées s'appliquer de manière générale à la plupart des types de luminaires. Lorsque des exigences de performance supplémentaires sont pertinentes pour des types spécifiques de sources lumineuses, celles-ci sont spécifiées dans la série IEC 62722-2. La série IEC 62722-2 peut également couvrir un domaine d'application plus étendu concernant les aspects de performance qui s'appliquent à la technologie d'une source lumineuse particulière.

Les semi-luminaires ne relèvent pas du domaine d'application du présent document.

Pour certains types de luminaires (décoratifs ou domestiques, par exemple), la fourniture des données de performance couvertes par le domaine d'application du présent document n'est pas pertinente.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils 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 60050-845, *Vocabulaire électrotechnique international (IEV) – Partie 845: Eclairage* (disponible à l'adresse <http://www.electropedia.org>)

IEC 60598-1, *Luminaires – Partie 1: Exigences générales et essais*

IEC 60598-2 (toutes les parties), *Luminaires – Partie 2: Exigences particulières*

IEC 62722-2 (toutes les parties), *Performance des luminaires – Partie 2: Exigences particulières*

IEC 63103:2020, *Appareils d'éclairage – Mesure de puissance en mode non actif*

IEC TS 63105, *Lighting systems and related equipment – Vocabulary* (Disponible en anglais seulement)

CIE 034:1977, *Road lighting lantern and installation data: Photometrics, classification and performance* (disponible en anglais seulement)

CIE 043:1979, *Photometry of floodlights* (disponible en anglais seulement)

CIE 121:1996, *The photometry and goniophotometry of luminaires* (disponible en anglais seulement)

3 Termes et définitions

Pour les besoins du présent document, les termes et définitions de l'IEC 60598-1, de l'IEC 60050-845 et de l'IEC TS 63105 ainsi que les suivants s'appliquent.

L'ISO et l'IEC tiennent à jour des bases de données terminologiques destinées à être utilisées en normalisation, consultables aux adresses suivantes:

- IEC Electropedia: disponible à l'adresse <http://www.electropedia.org/>
- ISO Online browsing platform: disponible à l'adresse <http://www.iso.org/obp>

3.1

puissance d'entrée

puissance électrique fournie par le réseau d'alimentation électrique et consommée par le luminaire, notamment pour le fonctionnement de l'ensemble des composants électriques nécessaires au fonctionnement prévu du luminaire

3.2

mode veille

<d'un luminaire> mode dans lequel, lorsque l'appareil est relié à une tension d'alimentation, la fonction éclairante est désactivée, mais peut être activée par un déclencheur externe qui n'est pas un déclencheur provenant d'un réseau

Note 1 à l'article: La détection ou la temporisation sont des exemples de déclencheurs externes.

[SOURCE: IEC 63103:2020, 3.10, modifié – Le domaine a été modifié afin de couvrir les luminaires.]

3.3

mode veille en réseau

<d'un luminaire> mode dans lequel, lorsque l'appareil est relié à une tension d'alimentation, la fonction éclairante est désactivée, mais peut être activée par un déclencheur externe qui est un déclencheur provenant d'un réseau

[SOURCE: IEC 63103:2020, 3.11, modifié – Le domaine a été modifié afin de couvrir les luminaires.]

3.4

puissance en veille

<d'un luminaire> consommation d'énergie moyenne en mode veille

3.5

puissance en veille en réseau

<d'un luminaire> consommation d'énergie moyenne en mode veille connecté au réseau

3.6

puissance de charge de l'éclairage de secours

puissance électrique fournie par le réseau d'alimentation électrique et consommée par le circuit de charge des luminaires de secours afin de maintenir la batterie chargée

Note 1 à l'article: Dans l'IEC 63103:2020, le terme "mode maintenance de charge" tel qu'il est défini en 3.13 de ce document désigne le mode où la puissance de charge de l'éclairage de secours est consommée.

Note 2 à l'article: La puissance de charge de l'éclairage de secours s'applique uniquement aux blocs autonomes d'éclairage de secours.

3.7

efficacité des luminaires

rapport du flux lumineux total des luminaires à leur puissance d'entrée à la tension d'alimentation assignée, sans inclure la puissance de charge de l'éclairage de secours

3.8

LOR

rendement normalisé

<d'un luminaire> rapport du flux lumineux total du luminaire, mesuré dans les conditions pratiques spécifiées avec ses propres sources lumineuses et équipements, à la somme des flux lumineux individuels de ces mêmes sources lumineuses lorsque celles-ci fonctionnent à l'extérieur du luminaire avec les mêmes équipements, dans les conditions spécifiées

Note 1 à l'article: L'abréviation "LOR" est dérivée du terme anglais correspondant "light output ratio".

3.9

valeur assignée

valeur quantitative d'une caractéristique d'un luminaire dans des conditions de fonctionnement spécifiques, spécifiée dans le présent document ou dans des normes applicables, ou assignée par le fabricant ou le fournisseur responsable

3.10

tension d'essai

tension à laquelle sont effectués les essais

3.11

BLF

facteur de flux lumineux d'un ballast

rapport du flux lumineux de la source lumineuse lorsque le ballast soumis à l'essai fonctionne à sa tension assignée, au flux lumineux de la même lampe qui fonctionne avec le ballast de référence approprié, alimenté à sa tension et sa fréquence assignées

Note 1 à l'article: L'abréviation "BLF" est dérivée du terme anglais correspondant "ballast lumen factor".

4 Exigences générales

4.1 Les luminaires doivent être soumis à l'essai complet avec la source lumineuse et l'appareillage de commande spécifiés par le fabricant. Sauf spécification contraire, le luminaire, la source lumineuse et l'appareillage de commande doivent être soumis à l'essai neufs et installés comme en utilisation normale, conformément aux instructions d'installation du fabricant.

4.2 Les luminaires doivent satisfaire aux exigences des parties pertinentes de la série IEC 605982-2 qui s'appliquent à leur conception.

4.3 Les luminaires doivent satisfaire à l'ensemble des exigences du présent document et, le cas échéant, aux exigences supplémentaires de la série IEC 62722-2 applicables au type de source lumineuse utilisée par le luminaire. Lorsqu'elles sont décrites dans la série IEC 62722-2, il est permis de spécifier des méthodes de mesurage ou des limites différentes de celles indiquées dans le présent document.

4.4 Lorsque le présent document spécifie que des données doivent être fournies, celles-ci peuvent être fournies par le fabricant au format imprimé ou électronique, par l'intermédiaire des catalogues du fabricant, de son site web ou par un moyen analogue, sauf spécification contraire dans le présent document.

4.5 Les luminaires pour lampes à filament de tungstène peuvent être étalonnés par photométrie, étalonnés électriquement et étalonnés en efficacité avec des lampes dont la puissance ne dépasse pas la valeur maximale marquée, et de n'importe quelle technologie (halogène, fluorescentes compactes autoballastées ou LED autoballastées, par exemple), si ces lampes sont couvertes par une norme de sécurité IEC disponible et que leur conformité à cette norme a été démontrée. Pour ces luminaires, le nombre de lampes, leur technologie et leur puissance doivent être indiqués dans le catalogue du fabricant du luminaire, sur son site web ou par un moyen analogue.

L'utilisation d'un code du système international de codification des lampes, ILCOS (International Lamp Coding System) selon l'IEC 61231 est recommandée. Des informations complémentaires peuvent être nécessaires pour identifier le type de lampe.

Les exigences du présent document doivent être remplies par la fourniture des informations et des données mises à disposition par le fabricant (ou le fournisseur responsable) du luminaire. La conformité est présumée acquise par la fourniture des informations demandées. Toute vérification des données est réalisée conformément aux exigences de mesurage du présent document.

4.6 Le fabricant du luminaire doit être prêt à fournir des informations concernant la source lumineuse spécifique utilisée pour l'essai.

5 Sources lumineuses et composants des luminaires

Les sources lumineuses et composants fournis avec le luminaire doivent satisfaire aux exigences des normes de performance IEC applicables.

6 Données photométriques

Des données photométriques doivent être disponibles pour le luminaire, ainsi que pour tous les dispositifs ou accessoires optiques pour lesquels le luminaire est conçu. Les données photométriques suivantes doivent être fournies.

a) Rendement normalisé (LOR) ou flux lumineux total du luminaire

NOTE 1 La partie applicable de la série IEC 62722-2 peut spécifier les données à fournir.

b) Répartition de l'intensité lumineuse

Des données photométriques doivent être fournies pour les luminaires dans le format international ou régional établi pour le type de luminaire et être accompagnées des données de répartition de l'intensité lumineuse selon l'application prévue du luminaire. Les données doivent être disponibles dans un format de fichier électronique afin de faciliter leur utilisation par un logiciel de conception d'éclairage.

NOTE 2 Les informations concernant les normes régionales acceptables pour les formats de données photométriques sont fournies à l'Annexe A.

Lorsqu'un LOR est fourni, celui-ci doit être mesuré conformément à la CIE 121 et il ne doit pas être inférieur de plus de 10 % (en valeur relative) à la valeur assignée.

Lorsqu'un flux lumineux total est fourni, celui-ci doit être mesuré conformément à la CIE 121 et ne doit pas être inférieur de plus de 10 % à la valeur assignée.

La répartition de l'intensité lumineuse, mesurée conformément à la CIE 121, doit être conforme à la valeur déclarée par le fabricant. La méthode de comparaison pour la forme de répartition et les limites d'acceptation sont fournies à l'Annexe D.