BS EN 62722-1:2016
Incorporating corrigendum March 2016

BSI Standards Publication

Luminaire performance —

Part 1: General Requirements

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 62722-1:2016. It is derived from IEC 62722-1:2014. It supersedes DD IEC/PAS 62722-1:2011 which will be withdrawn on 8 October 2017.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags 〚C〉 〈C〛.

The UK participation in its preparation was entrusted by Technical Committee CPL/34, Lamps and Related Equipment, to Subcommittee CPL/34/4, Luminaires.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2016.
Published by BSI Standards Limited 2016

ISBN 978 0 580 93802 3

ICS 29.140.40

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2016.

Amendments/corrigenda issued since publication

Date	Text affected
31 March 2016	CENELEC common modifications implemented

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62722-1

January 2016

ICS 29.140.40

English Version

Luminaire performance - Part 1: General requirements (IEC 62722-1:2014 , modified)

Performance des luminaires - Partie 1: Exigences générales (IEC 62722-1:2014 , modifiée)

Arbeitsweise von Leuchten - Teil 1: Allgemeine Anforderungen (IEC 62722-1:2014 , modifiziert)

This European Standard was approved by CENELEC on 2015-11-09. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2016 CENELEC All rights of exploitation in any form and by any means reserved worldwide for CENELEC Members.

Ref. No. EN 62722-1:2016 E

European foreword

The text of document 34D/1132/FDIS, future edition 1 of IEC 62722-1, prepared by SC 34D "Luminaires" of IEC/TC 34 "Lamps and related equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62722-1:2016.

A draft amendment, which covers common modifications to IEC 62722-1:2014 (34D/1132/FDIS), was prepared by CLC/TC 34Z "Luminaires and associated equipment" and approved by CENELEC.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-11-09
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-11-09

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62722-1:2014 are prefixed “Z”.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Regulation (EC) No. 245/2009, see informative Annex ZZ, which is an integral part of this document.

Endorsement notice

The text of the International Standard IEC 62722-1:2014 was approved by CENELEC as a European Standard with agreed common modifications.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
-	-	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 13032-2	2004
IEC 60598-1	-	Luminaires - Part 1: General requirements and tests	EN 60598-1	-
IEC 60598-2	series	Luminaires - Part 2: Particular requirements	EN 60598-2	series
IEC 60598-2-22	-	Luminaires - Part 2-22: Particular requirements - Luminaires for emergency lighting	EN 60598-2-22	-
IEC 62722-2	series	Luminaire performance - Part 2: Particular requirements	EN 62722-2	series
CIE 34	1977	Road lighting lantern and installation data: photometrics, classification and performance	-	-
CIE 43	1979	Photometry of floodlights	-	-
CIE 121	1996	The photometry and goniophotometry of luminaires	-	-
CIE 121 SPI	2009	The photometry and goniophotometry of luminaires - supplement 1: luminaires for emergency lighting	-	-

Annex ZZ
(informative)

Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EC) No 245/2009 aimed to be covered

This European standard has been prepared under a Commission's standardisation request M/495_Am3 to provide one voluntary means of conforming to the ecodesign requirements of Commission Regulation (EC) No 245/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps, and repealing Directive 2000/55/EC of the European Parliament and of the Council [OJ L 76, 24.3.2009, p. 17–44].

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding ecodesign requirements of that Regulation and associated EFTA Regulations.

Table ZZ.1 – Correspondence between this European Standard and Commission Regulation (EC) No 245/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps, and repealing Directive 2000/55/EC of the European Parliament and of the Council [OJ L 76, 24.3.2009, p. 17–44] and Commission's standardisation request M/495_Am3

Ecodesign requirements of Regulation No 245/2009 [OJ L 76, 24.3.2009, p. 17–44]	**Clause(s) / sub-clause(s) of this EN**	**Remarks / Notes**
Power consumption when the operated lamps do not emit any light in normal operating conditions	Clause 7 (rated standby power) and Clause B.8	
CEN flux code or photometric file [a] (for Information on Best Available Technology on the market)	Clause 6	
Maintenance instructions to ensure that the luminaire maintains, as far as possible, its original quality throughout its lifetime	9.2	
Disassembly instructions.	9.3	

a See Annex V "Indicative benchmarks for fluorescent and high intensity discharge products (for information)", item 4 "Luminaire product information".

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2: Other Union legislation may be applicable to the products falling within the scope of this standard.

CONTENTS

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62722-1 has been prepared by subcommittee 34D: Luminaires, of IEC technical committee 34: Lamps and related equipment.

This first edition cancels and replaces IEC PAS 62722-1 published in 2011 and constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC PAS 62722-1.

a) The inclusion of more precise requirements for the comparison of the photometric distribution shape, with the comparison method given in Annex D.
b) Further regional standards added to the schedule given in Annex A

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

FDIS	Report on voting
34D/1132/FDIS	34D/1141/RVD

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

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

A list of all the 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 publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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

INTRODUCTION

The first edition of a performance standard for luminaires (general requirements) 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 be reasonably expected. Information to support responsible environmental use is also included. Part 2 of the IEC 62722-2 series will be introduced where additional performance requirements for specific types of light source are required.

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.

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 standard are for the luminaires in a condition representative of new manufacture, with any specified initial aging procedures completed.

IEC 62722-1 covers requirements for luminaires to support energy efficient use and responsible environmental management to the end of life. The object of this Part 1 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 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 standard.

〈C〉 For some types of general purpose luminaires (e.g. decorative), the provision of all performance data under the scope of this standard may not be appropriate.

For special purpose luminaires (e.g. emergency escape lighting), the provision of selected basic performance data under the scope of this standard only could be appropriate (e. g. input power). 〈C〉

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

〈C〉 EN 13032-2:2004, *Light and lighting – Measurement and presentation of photometric data of lamps and luminaires – Part 2: Presentation of data for indoor and outdoor work places* 〈C〉

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*

CIE 34:1977, *Road lighting lantern and installation data: Photometrics, classification and performance*

CIE 43:1979, *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 the IEC 60598-1 as well as the following apply.

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

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.

3.3
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.

3.4
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.

3.5
light output ratio <of a luminaire>
LOR
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.

3.6
rated value
quantitative value for a characteristic of a luminaire for specific operating conditions specified in this standard, or in applicable standards, or assigned by the manufacturer or responsible vendor

3.7
test voltage
voltage at which tests are carried out

3.8
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 the manufacturer's installation instructions.

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

4.3 Luminaires shall meet all requirements of this Part 1 and where applicable also the additional requirements of the IEC 62772-2 series appropriate to the type of light source used by the luminaire. Where detailed in the IEC 62772-2 series, alternative methods of measurement or limits to those given in this Part 1 may be specified.

4.4 Where it is specified by this standard 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 by this standard.

4.5 Luminaires for tungsten filament lamps may 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 ILCOS code according to IEC 61231 is recommended. Further details may be necessary to identify the type of lamp.

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

〔C〉 **4.Z1** Where a Commission Regulation specifies limits for parameters, these limits shall be used instead of the limits specified in this standard 〈C〉

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

〚C〛 When a CEN flux code is provided, it shall be calculated in accordance with EN 13032-2. 〚C〛

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

d) rated emergency lighting charging power.

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.

When measured at its rated supply voltage, under conditions specified by 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, variation in accordance with parameters stated in IEC standards for light sources, controlgear, and luminaire standards may occur.

NOTE Luminaire efficacy data can be derived from LOR × (Rated light source lumens × BLF)/Input power watts at rated supply voltage.

9 Environmental data

9.1 Materials information

The manufacturer shall ensure 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.

9.3 Disassembly 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.

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

Canada, Mexico and USA

IES-LM75-01	Goniophotometer Types and Photometric Coordinates
IES-LM-63-02	Standard File Format for the Electronic Transfer of Photometric Data and Related Information
IES-LM-58-94	Guide to Spectroradiometric Measurements
IES-LM-77-09	Intensity Distribution of Luminaires and Lamps Using Digital Screen Imaging Photometry
ANSI/IES-RP-16-07	Nomenclature and Definitions for Illuminating Engineering

Japan

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

Annex B
(normative)

Measurement method of total power of luminaires and associated powers

B.1 General

This annex provides details of the measurement for luminaire supply power, stand-by losses and emergency lighting charging power.

Electrical measurements are to 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 occur. Measurements of luminaire electrical characteristics performed under the scope of this standard 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 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 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(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.

〚C〛 The power consumption when the operated lamps do not emit any light in normal operating conditions is measured excluding the power consumed by sensors, network connections and other auxiliary loads. 〚C〛

B.9 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.

Annex C
(informative)

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

C.1 General

The following pictograms 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, the shape of the lamp can be changed to be representative of the actual lamp being used.

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

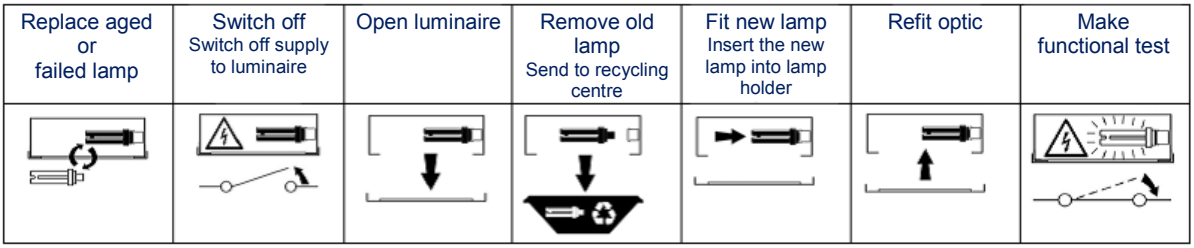

Figure C.1 – Instructions for luminaire servicing

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

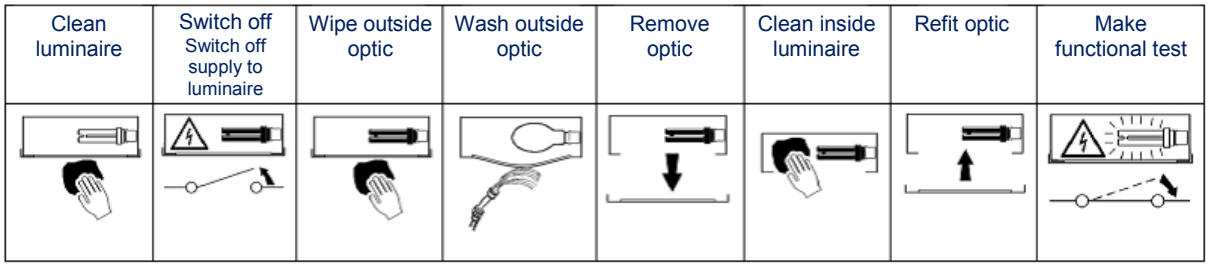

Figure C.2 – Instructions for luminaire cleaning

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

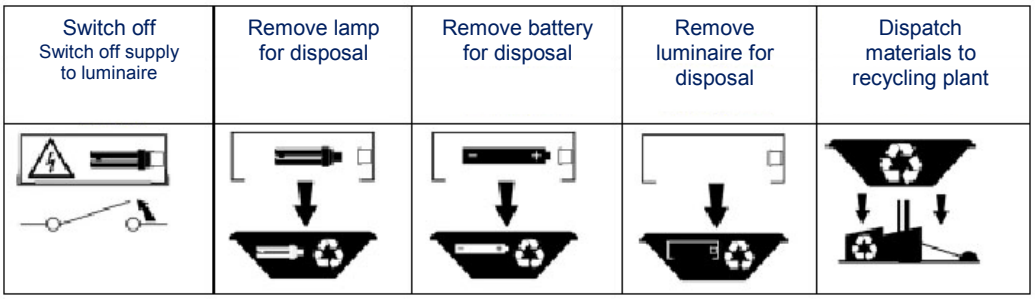

Figure C.3 – Instructions for luminaire disposal

Annex D
(normative)

Photometric distribution data for luminaires

D.1 General

For the photometric distribution data of luminaires, this annex 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: ΔC = 15°, $\Delta\gamma$ = 5°

b) Floodlight and spotlight luminaires: Planes V and angles H as specified in CIE 43, 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 CIE 43.

c) Street lighting luminaires: Planes C and angles γ as detailed by CIE 34.

D.3 Method of comparison and acceptable limits of variation

D.3.1 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 normalised 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 5 angles γ: I_{max} and the 4 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 – Some 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 ±20 % of the manufacturer's declared data.

Possible scenarios for acceptance are as follows.

D.3.2 For each main half plane – C_0; C_{90}; C_{180}; C_{270}

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

If the I_{max} and the 4 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 ± ΔC. If the I_{max} and the 4 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 4 γ intensity readings nearest I_{max} fall within the specified tolerance and the γ angle shift is less than or equal to Δγ, 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 ± ΔC. If the I_{max} and the 4 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 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 4 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 4 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 4 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 4 γ intensity readings nearest I_{max} fall within the specified tolerance and the C plane shift is less than or equal to ΔC and γ angle shift is less than or equal to $\Delta\gamma$, the verdict is PASS, otherwise the verdict is FAIL.

D.3.4 Conformity

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 luminaire given in Clause D.2. The manufacturer's data may have been given using closer intervals.

Bibliography

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

〈C〉 NOTE Harmonized as EN 61231.

EN 13032-1:2004+A1:2012, *Light and lighting – Measurement and presentation of photometric data of lamps and luminaires – Part 1: Measurement and file format*

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*

EN 13201-3:2003, *Road lighting – Part 3: Calculation of performance* 〈C〉

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

〈C〉 EN 61341:2011, *Method of measurement of centre beam intensity and beam angle(s) of reflector lamps (IEC/TR 61341:2010)*

EN 62504:2014, *General lighting – Light emitting diode (LED) products and related equipment – Terms and definitions (IEC 62504:2014)* 〈C〉

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

———————

This page deliberately left blank

This page deliberately left blank

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

All the data, software and documentation set out in all British Standards and other BSI publications are the property of and copyrighted by BSI, or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. Details and advice can be obtained from the Copyright & Licensing Department.

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.