IEC/PAS 62722-1

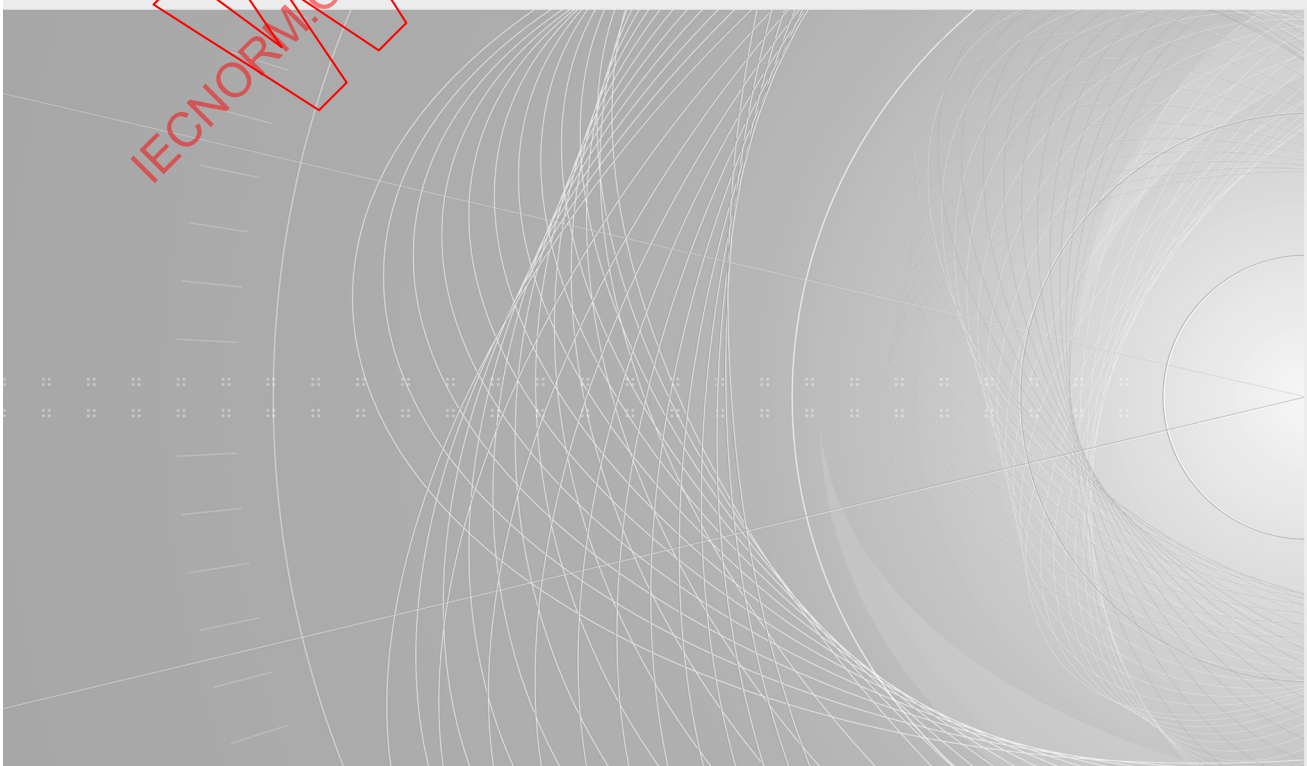
Edition 1.0 2011-06

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

colour inside

Luminaire performance –
Part 1: General requirements



IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

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

About IEC publications

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

- Catalogue of IEC publications: www.iec.ch/searchpub
The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub
Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org
The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv
If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: csc@iec.ch
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00

IEC/PAS 62722-1

Edition 1.0 2011-06

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

colour inside

Luminaire performance – Part 1: General requirements

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRICE CODE N

ICS 29.140.40

ISBN 978-2-88912-567-8

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.

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

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

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
34D/998/PAS	34D/1014/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single period up to a maximum of 3 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

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 PAS 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 sections to this Part 1 will be introduced where additional performance requirements for specific types of light source are required.

The provisions in the PAS 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 PAS covers specific performance and environmental requirements for luminaires, incorporating electric light sources for operation from supply voltages up to 1 000 V where claims of operational performance are made. Unless otherwise detailed performance data covered under the scope of this PAS are for the luminaires in a condition representative of new manufacture, with any specified initial aging procedures completed.

IEC/PAS 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 PAS.

Semi-luminaires are not covered under the scope of this PAS. Luminaires shall be complete.

2 Normative references

The following referenced documents are indispensable for the application 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.

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*

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

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

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 all sections of this Part 1, the definitions given in the IEC 60598 series and relevant Part 2 sections apply together with the following:

3.1
input power
electrical power from the mains supply consumed by the light source(s), controlgear and any control circuit in the luminaire, measured in watts which includes any parasitic power when the luminaire is turned on

3.2
parasitic power
electrical power from the mains supply consumed by the charging circuit of emergency lighting luminaires and the standby power for controlgear and control devices in the luminaire when light sources are not operating, measured in watts

3.3
standby losses
electrical power from the mains supply consumed by the luminaire during the period with light sources not operating, measured in watts

NOTE For emergency lighting luminaires this does not include the emergency lighting charging power.

3.4
rated emergency lighting charging power
electrical power from the mains supply consumed by the charging circuit of emergency luminaires, measured in watts

3.5
luminaire efficacy
ratio of the luminaires total lumen output versus its rated input power, excluding any parasitic power losses, expressed as lumens per watt

3.6
light output ratio (of a luminaire)
LOR
ratio of the total flux of the luminaire, measured under specified practical conditions with its own lamps 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

3.7
rated value
quantitative value for a characteristic of a luminaire for specific operating conditions specified in this PAS, or in applicable standards, or assigned by the manufacturer or responsible vendor

3.8
test voltage
voltage at which tests are carried out

4 General requirements

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

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

4.3 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.

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 all variations of the luminaire and any optical attachments or accessories that the luminaire has been specified for use with.

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 luminaires intended application. Data shall be available in electronic file format to facilitate its use by lighting design software.

NOTE 1 Information regarding acceptable regional standards for photometric data formats is given in Annex A.

When measured in accordance with CIE 121 or CIE 121-SP1 the light output ratio (LOR) of the luminaire shall not vary by more than – 10 % of the rated value. The distribution of luminous intensity shall generally be in accordance with that declared by the manufacturer (method of comparison under consideration).

NOTE 2 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.

NOTE 3 For the photometric performance of emergency luminaires when operating in emergency mode see also IEC 60598-2-22.

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.

NOTE 4 The use of an ILCOS code according to IEC 61231 is also acceptable.

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 parasitic power of the controls only during the time with the light sources off (standby losses);

d) rated emergency lighting charging power.

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. On request, the luminaire manufacturer shall provide traceability to 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 may be derived from LOR x Rated light source lumens/Rated input power watts.

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 In some countries this information is required under the scope of local regulations.

Annex A
(normative)

Use of regional standards

In some regions the use of local standards, as alternatives to those detailed in the text of this PAS 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

Annex B
(normative)

Measurement method of total power of luminaires and associated parasitic power

B.1 Introduction

This annex provides details of the measurement for luminaire supply power and the parasitic power. The power values should be rounded to the nearest whole number for 10 W and above and shall be to two significant figures when below 10 W.

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

NOTE 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 PAS 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 and the associated parasitic 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, 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 B.1 to B.6. The value shall include losses in 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.

B.8 Luminaire parasitic (stand-by) power with lamps off

The luminaire parasitic 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.

B.9 Emergency lighting luminaire parasitic input power

For self-contained emergency luminaires, the luminaire parasitic power for maintaining the charge in the batteries shall be measured only with batteries in fully charged condition with lamps off.