IS 16107 (Part 1) : 2012
(Reaffirmed 2017)
(Reaffirmed 2024)

भारतीय मानक

सहायकांग कार्यकारिता

भाग 1 सामान्य अपेक्षाएँ

Indian Standard

LUMINAIRES PERFORMANCE

PART 1 GENERAL REQUIREMENTS

ICS 29.140.99

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 2012 **Price Group 2**

Illumination Engineering and Luminaires Sectional Committee, ETD 24

FOREWORD

This Indian Standard (Part 1) was adopted by the Bureau of Indian Standards, after the draft finalized by the Illumination Engineering and Luminaires Sectional Committee had been approved by the Electrotechnical Division Council.

This standard specifies the performance requirements for luminaires for general lighting services for supply voltages up to and including 250 V a.c. The other part in the series is:

Part 2 LED luminaires

The general and safety requirements have been covered in IS 10322 (Part 1) : 2012 'Luminaires: Part 1 General requirements and tests (*first revision*)'.

This standard acknowledges the need for defining performance data to be provided, the mode of presentation of this data, the basis of its measurement, and the associated tolerances that may be reasonably expected from the supplier of luminaires.

This standards is divided into four sections covering general requirements, terminology, photometric and electrical data and environmental data.

Information to support responsible environmental use is included (*see* Annex B).

Information on the parameters shown in Table 1 shall be provided by the manufacturer or responsible vendor on the product datasheets, leaflets or website in addition to the mandatory marking given in IS 10322 (Part 1).

Where additional performance requirements for specific types of light source are relevant, these are specified in Part 2 of this standard. Part 2 may also cover a wider scope of performance aspects appropriate to the particular light source technology.

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

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

This standard is based on IEC/PAS 62772-1(February 2011) 'Luminaires performance — Part 1: General requirements' issued by the International Electrotechnical Commission (IEC) with following modifications:

Schedule of type test and acceptance test has been incorporated.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

LUMINAIRES PERFORMANCE

PART 1 GENERAL REQUIREMENTS

SECTION 0 GENERAL

0.1 SCOPE

This standard (Part 1) 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 specified, performance data covered are for the luminaire in a condition representative of new manufacture, with any specified initial aging procedures completed.

This standard (Part 1) covers requirements for luminaires to support energy efficient use and responsible environmental management to the end of life. The object of this standard is to provide a set of requirements which are considered to be generally applicable to most types of luminaire.

It is the intention that the requirements of this standard 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. Luminaires shall be complete.

0.2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
10322 (Part 1) : 2012	Luminaires: General requirement and tests (*first revision*)
(Part 5/Sec 8) : 2012	Particular requirements, Section 8 Emergency lighting
16106 : 2012	Method of electrical and photometric measurements of solid-state lighting (LED) products
16107 (Part 2/ Sec 1) : 2012	Luminaires performance: Part 2 Particular requirements, Section 1 LED luminaire

0.3 GENERAL REQUIREMENTS

0.3.1 Luminaires shall meet the requirements of IS 10322 (Part 1) and the relevant sections that are appropriate to their design.

0.3.2 Luminaires shall meet all requirements of this standard and where applicable also the additional requirements of Part 2 and its relevant section appropriate to the type of light source used by the luminaries. Where detailed in Part 2 and its relevant section alternative methods of measurement or limits to those given in this standard may be specified. Any deviations in the methods of measurement or limits to those given in this standard, may be specified in relevant sections of Part 2.

0.3.3 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 any other similar means.

0.4 LIGHT SOURCES AND COMPONENTS OF LUMINAIRES

Any light sources and components delivered with the luminaire shall comply with the requirements of the relevant Indian Standards that are appropriate to them.

0.5 LIST OF OTHER PART AND SECTIONS OF THIS STANDARD

IS 16107 (Part 2/Sec 1)

NOTE — Other sections of Part 2 on luminaires with light sources other than LED are under consideration.

SECTION 1 TERMINOLOGY

1.1 GENERAL

For the purpose of this standard, the definitions given

in IS 10322 (Part 1), relevant sections of Part 2 and the following shall apply.

1.1.1 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.

1.1.2 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.

1.1.3 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.

1.1.4 Rated Emergency Lighting Charging Power — Electrical power from the mains supply consumed by the charging circuit of emergency luminaires, measured in watts.

1.1.5 Luminaire Efficacy — Ratio of the luminaires, total lumen output *versus* its rated input power, excluding any parasitic power losses, expressed as lumens/watt.

1.1.6 Light Output Ratio (LOR) (of a Luminaire) — 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.

1.1.7 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.

1.1.8 Test Voltage — Voltage at which tests are carried out.

SECTION 2 PHOTOMETRIC AND ELECTRICAL DATA

2.1 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.

When measured in accordance with IS 16106, the light output ratio (LOR) of the luminaire shall not vary by more than 10 percent 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).

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

NOTES

1 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.

2 For the photometric performance of emergency luminaires when operating in emergency mode [*see also* IS 10322 (Part 5/ Sec 8)].

Luminaires for tungsten filament lamps may be photometrically rated, electrically rated and efficacy-rated with lamps of any wattage below the marked maximum, and any technology (for example halogen, self-ballasted compact fluorescent or self-ballasted LED), if these lamps are covered by the relevant Indian Standard on safety 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.

2.2 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); and
d) Rated emergency lighting charging power.

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

2.3 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 relevant Indian Standards for light sources, controlgear, and luminaire standards may occur.

NOTE — Luminaire efficacy data may be derived from LOR × Rated light source lumens/Rated input power, in watts.

SECTION 3 ENVIRONMENTAL DATA

3.1 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.

3.2 MAINTENANCE INSTRUCTIONS

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

NOTE — This information may be required under the scope of local regulations, if any.

3.3 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 — This information may be required under the scope of local regulations, if any.

ANNEX A

(*Clause* 2.2)

MEASUREMENT METHOD OF TOTAL POWER OF LUMINAIRES AND ASSOCIATED PARASITIC POWER

A-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 the production of light sources and controlgear used in luminaires, variations in accordance with parameters stated in Indian 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.

A-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.

A-3 STANDARD TEST CONDITIONS

Test conditions for photometric measurements shall be in accordance with IS 16106.

A-4 ELECTRICAL MEASURING INSTRUMENTS

Voltmeters, ampere meters and wattmeter's shall conform to the requirements for Class Index 0.5 or better (precision grade).

A-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.

A-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.

A-7 LUMINAIRE POWER

Luminaire power shall be the value obtained in accordance with **A-1** to **A-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.

A-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.

A-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.

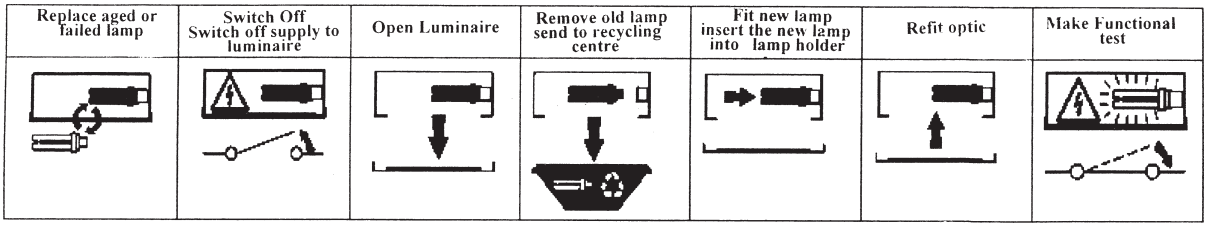
ANNEX B
(*Foreword*)

SYMBOLS TO ASSIST THE COMMUNICATION OF INSTRUCTIONS FOR MAINTENANCE THROUGH LIFE AND END OF LIFE RECYCLING

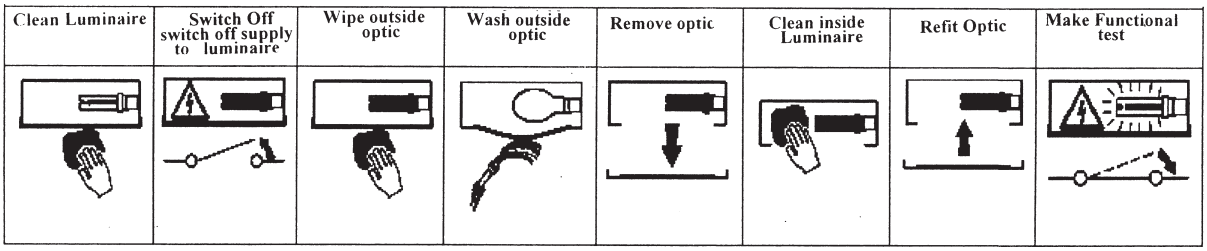
B-1 The following symbols may be used to assist the communication of instructions for maintenance through life and end of life recycling.

NOTE — For all pictograms showing a lamp the shape of the lamp may be changed to be representative of the actual lamp being used.

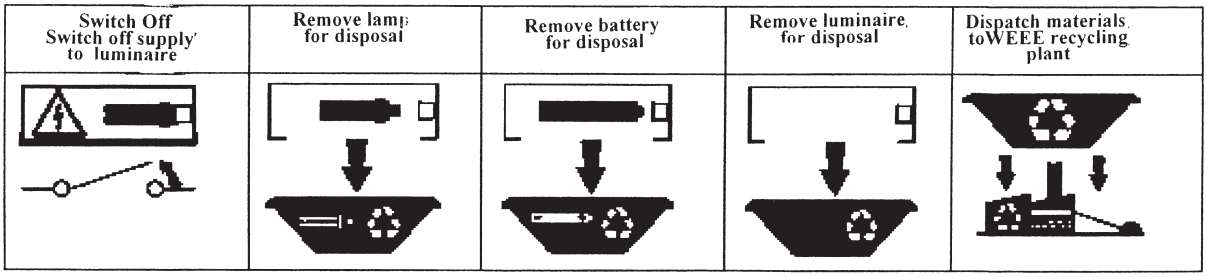
B-2 INSTRUCTIONS FOR LUMINAIRE SERVICING



B-3 INSTRUCTIONS FOR LUMINAIRE CLEANING



B-4 INSTRUCTIONS FOR LUMINAIRE DISPOSAL AT THE END OF LIFE



Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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