

X

इंटरनेट

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार" Mazdoor Kisan Shakti Sangathan "The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ" Jawaharlal Nehru "Step Out From the Old to the New"

मानक

IS 10322-5-2 (2012): Luminaires, Part 5: Particular Requirements, Section 2: Recessed Luminaires [ETD 24: Illumination Engineering and Luminaries]



611111111

Made Available By Public, Resource, Org





RIGHT TO INFORMATION "ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता Bhartrhari-Nītiśatakam "Knowledge is such a treasure which cannot be stolen"

"ज्ञान से एक नये भारत का निर्माण″ Satyanarayan Gangaram Pitroda "Invent a New India Using Knowledge"



BLANK PAGE



PROTECTED BY COPYRIGHT

भारतीय मानक

प्रदीपक

भाग 5 विवरणात्मक अपेक्षाएँ अनुभाग 2 रिसेस्ड प्रदीपक

(पहला पुनरीक्षण)

Indian Standard

LUMINAIRES

PART 5 PARTICULAR REQUIREMENTS Section 2 Recessed Luminaires

(First Revision)

ICS 29.140.40

© BIS 2012

BUREAU OF INDIAN STANDARDS MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG NEW DELHI 110002 Illumination Engineering and Luminaires Sectional Committee, ETD 24

FOREWORD

This Indian Standard (Part 5/Sec 2) (First Revision) 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 was first published in 1985. This revision has been undertaken primarily to align the existing standard with latest International Standard.

This standard covers the requirements of Recessed Luminaires. This standard covers the safety and photometric requirements.

This standard is one among the series of Indian Standards which deals with luminaires. This series consists of the following Parts and Sections:

Part 1	General requirements
Part 5	Particular requirements
Section 1	Fixed general purpose luminaires
Section 3	Luminaires for road and street lighting
Section 4	Portable general purpose luminaires
Section 5	Flood lights
Section 6	Handlamps
Section 7	Lighting chains
Section 8	Luminaires for emergency lighting

Annex A is for information only.

This standard is to be read in conjunction with IS 10322 (Part 1): 2010 'Luminaires : Part 1 General requirements'. For the sake of convenience, the clauses of this standard correspond to those of IS 10322 (Part 1), instead of reproducing full text of each clause; reference to relevant clauses of IS 10322 (Part 1) has been given.

This standard is based on IEC 60598-2-2 : 1997 'Luminaires — Part 2: Particular requirements, Section 2 Recessed luminaires' issued by the International Electrotechnical Commission (IEC) except for the following deviations:

Photometric requirements have 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, 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

PART 5 PARTICULAR REQUIREMENTS

Section 2 Recessed Luminaires

(First Revision)

1 SCOPE

This standard (Part 5/Sec 2) specifies requirements for recessed luminaires for use with tungsten filament, tubular fluorescent, LED, LED modules and other discharge lamps on supply voltage not exceeding 1 000 V. This standard does not cover air-handling luminaires. This standard does not apply to air-handling or liquid-cooled luminaires. It is to be read in conjunction with those Sections of Part 1 to which reference is made.

2 REFERENCES

10.11

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

· · · ·

IS No.	Title
694 : 1990	PVC insulated cables for working
	voltages up to and including 1 100 V
9968 (Part 1):	Elastomer insulated cables: Part 1
1988	For working voltages up to and
	including 1 100 V
10322 (Part 1):	Luminaires: Part 1 General require-
2010	ments and tests (first revision)
13383 (Part 1):	Photometry of luminaires - Method
1992	of measurement: Part 1 Luminaires
	for use in interior lighting

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 10322 (Part 1/Sec 1) shall apply.

4 GENERAL TEST REQUIREMENTS

The provisions of IS 10322 (Part 1/Sec 0) shall apply. The tests described in each appropriate section of IS 10322 (Part 1) shall be carried out in the order listed in IS 10322 (Part 5/Sec 2).

A procedure measuring ambient temperature in an installation is given in Annex A.

5 CLASSIFICATION OF LUMINAIRES

Luminaires shall be classified in accordance with the provisions of IS 10322 (Part 1/Sec 2).

6 MARKING

The provisions of IS 10322 (Part 1/Sec 3) shall apply, together with the following additional markings requirements.

6.1 Insulating Ceiling F Mark, Symbol



Recessed luminaire suitable for mounting in normally flammable surfaces where thermal insulating material may cover the luminaire.

All recessed luminaires not marked with the

symbol F shall have a warning notice on an

attached label or given in the manufacturer's instruction leaflet supplied with the luminaire, that the luminaire shall, under no circumstances, be covered with insulating matting or similar material.

6.2 BIS Certification Marking

The luminaries may also be marked with the Standard Mark.

6.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 CONSTRUCTION

The provisions of IS 10322 (Part 1/Sec 4) shall apply except that for recessed parts the impact energy and spring compression required for the test specified in **4.13** of IS 10322 (Part 1/Sec 4) shall be as given in Table 1.

8 CREEPAGE DISTANCES AND CLEARANCES

The provisions of IS 10322 (Part 1/Sec 11) shall apply.

 Table 1 Impact Energy and Spring Compression (Clause 7)

SI No	Part to be Tested	Impact Energy	Compression
		Nm	mm
(1)	(2)	(3)	(4)
i)	Parts (other than ceramic) providing protection against electric shock	0.35	17
ii)	Ceramic parts and all other parts of the luminaires	0.20	13

9 PROVISION FOR EARTHING

The provisions of IS 10322 (Part 1/Sec 7) shall apply.

10 TERMINALS

The provisions of IS 10322 (Part 1/Sec 14 and 15) shall apply.

11 EXTERNAL AND INTERNAL WIRING

The provisions of IS 10322 (Part 1/Sec 5) shall apply.

Flexible cables or cords used as a means of connection to the supply, when supplied by the luminaire manufacturer, shall be at least equal in their mechanical and electrical properties to those specified in IS 694 or IS 9968 (Part 1) and shall be capable of withstanding without deterioration the highest temperature to which they may be exposed under normal conditions of use. Materials other than PVC and rubber are suitable, if the above requirements are met, but in this instance the particular specifications of the above standards do not apply.

Compliance shall be checked by the tests specified in **13**.

NOTE — The use of flexible cables and cords with recessed luminaires is appropriate for the following reasons:

- a) The flexible cable or cord cannot be easily touched as it is out of reach within the recess;
- b) To facilitate installation of the luminaire into the recess; and
- c) To permit the adjustment of adjustable recessed luminaires.

12 PROTECTION AGAINST ELECTRIC SHOCK

The parts of the luminaire and components within the ceiling space or cavity shall provide the same degree of protection against electric shock as the luminaire parts below the ceiling space.

NOTE — The ceiling space or cavity is regarded as accessible for installation and maintenance, and the barriers do not provide adequate protection against electric shock.

Compliance is checked by inspection.

13 ENDURANCE TESTS AND THERMAL TESTS

The provisions of IS 10322 (Part 1/Sec 12) shall apply along with the requirements given in **13.1**.

13.1 Wiring, for connection to the supply, which passes into or can touch the luminaire, shall not reach unsafe temperature.

Compliance shall be checked by the following tests:

The luminaire is connected to the supply using the cable provided with the luminaire or using a cable in accordance with the marking on the luminaire or, if not marked, as specified in the manufacturer's instruction sheet; otherwise PVC cable complying with IS 694 is used.

The hottest point is found (along the internal route or on the outer surface of the luminaire) with which the cable is likely to lie in contact during normal service. The cable is lightly held in contact at this point and the temperature of the insulation at the point of contact is measured as described in Annex F of IS 10322 (Part 1).

The operating temperature of the cable shall not exceed the limits given in Table 2.

Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of **12.4**, **12.5** and **12.6** of IS 10322 (Part 1/Sec 12) after the test(s) of **9.2** but before the test(s) of **9.3** of IS 10322 (Part 1/Sec 9) specified in **14**.

Comparison Compari

Sl No.	Designation of Cable	Limit of Operating Temperature
(1)	(2)	(3)
i)	Cable (including sleeves) provided with the luminaire	The maximum temperature specified in Table 12.2 of IS 10322 (Part 1)
ii)	Cable not provided with the luminaire:	
	a) luminaires with cable temperature marking	The marked temperature
	b) luminaires without cable temperature marking	The maximum temperature specified in Table 12.2 of IS 10322 (Part 1) for ordinary PVC not subject to mechanical stress

14 RESISTANCE TO DUST AND MOISTURE

The provisions of IS 10322 (Part 1/ Sec 9) shall apply.

For luminaires with an IP classification greater than IP20 the order of the tests specified in IS 10322 (Part 1/ Sec 9) shall be as specified in **13**.

15 INSULATION RESISTANCE AND ELECTRIC STRENGTH

The provisions of IS 10322 (Part 1/ Sec 10) shall apply.

16 RESISTANCE TO HEAT, FIRE AND TRACKING

The provisions of IS 10322 (Part 1/ Sec 13) shall apply.

17 PHOTOMETRIC TEST

The photometric performance shall be determined by the test method given in IS 13383 (Part 1). The general guidance regarding the photometric data to be provided by the manufacturers of the luminaire is given in Annex B.

ANNEX A

(Clause 4)

MEASUREMENT OF AMBIENT TEMPERATURE IN AN INSTALLATION

A-1 Considerable care is needed in deciding whether a recessed luminaire is operating within its thermal limits in an existing lighting installation. It is even more difficult to predict whether a luminaire will be satisfactory in a proposed installation and a mock-up is usually required. In the past, there have been instances of overheating of luminaires, for example, overheating owing to the presence of heating services above the ceiling plane.

A-2 The following procedure is for measuring the ambient temperature in which the luminaire operate. The t_a rating of the luminaire should be at least equal to this ambient temperature. The ambient temperature is measured in the plane of the ceiling (or other mounting surface) at the mid-point of a typical cavity. It is important that all other luminaires in the installation and all other services which may affect the thermal conditions of the luminaire are operating. The cavity is covered above the measuring point to prevent a non-typical interchange of air and so that the cover may absorb extraneous heat which would be absorbed by the luminaire.

NOTE — It may be convenient to insert for this purpose the shell of the luminaire.

A-3 The test recess used to measure operating

temperatures of recessed luminaires is intended to represent the most onerous closed recess (without other heat source) which is likely to be experienced in service. A recessed luminaire should not be installed in a cavity with a volume smaller than that of the test recess, unless the manufacturer of the luminaire has verified that operation will be satisfactory.

The test recess may also approximate to the thermal conditions above a suspended ceiling, if the larger air volume is offset by heat-emitting services. In a particular installation more onerous thermal conditions than this may exist and it is, therefore, essential to carry out a practical check. Conversely, the space above the ceiling may have free air movement and no heat-emitting services; for such an installation the t_a rating of the luminaire as determined in the test recess incorporates a temperature margin and the t_a rating may be exceeded, if the manufacturer of the luminaire has verified that operation in the particular installation will be satisfactory.

A-4 During tests to determine or check t_a rating for a luminaire, measurements of ambient temperature are made inside the draught-proof enclosure and outside the test recess in accordance with Annex F of IS 10322 (Part 1).

ANNEX B

(Clause 17)

PHOTOMETRIC DATA

B-1 Light distribution data is required for the purpose of,

- a) assessing the photometric performance of the lighting equipment; and
- b) designing lighting installations on a factual basis.

B-2 Some or all of the following items of information shall be provided by the manufacturer of the luminaire:

- a) Luminous intensity diagrams in the vertical places $C = 0^{\circ}$ and $C = 90^{\circ}$ of the reference coordinate system as indicated in Fig. 1;
- b) Light output ratio;

- c) Upward light output ratio; and
- d) Downward light output ratio.

 ${\rm NOTE}$ — Results should be expressed for 1 000 lamp lumens and relate to the standard test conditions.

B-2.1 The above data shall be stated for the condition when a clean luminaire is equipped with a lamp (or lamps) with its (their) light centre(s) in the correct normal position(s) and each having a luminous output equal to the average luminous output throughout the life of such lamps, this reference value for luminous output will be taken therefrom or a correction factor provided for adjusting the data accordingly, if it has been prepared for a lamp output other than that specified.



Fig. 1 C- γ -System

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

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'.

This Indian Standard has been developed from Doc No.: ETD 24 (5994).

VISAKHAPATNAM.

Amendments Issued Since Publication

Amen	d No.	Date of Issue	Text Affected
	BUREAU (OF INDIAN STANDARDS	
Headquarte	ers:		
Manak Bhay Telephones	van, 9 Bahadur Shah Zafar Marg, Ne 2323 0131, 2323 3375, 2323 9402	w Delhi 110 002 Website: www.bis.org.	in
Regional O	ffices:		Telephones
Central :	Manak Bhavan, 9 Bahadur Shah Za NEW DELHI 110002	ıfar Marg	$\begin{cases} 2323 \ 7617 \\ 2323 \ 3841 \end{cases}$
Eastern :	1/14 C.I.T. Scheme VII M, V. I. P. I KOLKATA 700054	Road, Kankurgachi	$\begin{cases} 2337 \ 8499, \ 2337 \ 8561 \\ 2337 \ 8626, \ 2337 \ 9120 \end{cases}$
Northern :	SCO 335-336, Sector 34-A, CHAN	DIGARH 160022	$\begin{cases} 60 \ 3843 \\ 60 \ 9285 \end{cases}$
Southern :	C.I.T. Campus, IV Cross Road, CH	ENNAI 600113	$\left\{\begin{array}{c} 2254 \ 1216, \ 2254 \ 1442 \\ 2254 \ 2519, \ 2254 \ 2315 \end{array}\right.$
Western :	Manakalaya, E9 MIDC, Marol, And MUMBAI 400093	dheri (East)	$\begin{cases} 2832 \ 9295, \ 2832 \ 7858 \\ 2832 \ 7891, \ 2832 \ 7892 \end{cases}$
Branches:	AHMEDABAD. BANGALORE. E FARIDABAD. GHAZIABAD. GU NAGPUR. PARWANOO. PAT	BHOPAL. BHUBANESHWAR JWAHATI. HYDERABAD. J. FNA. PUNE. RAJKOT. '	. COIMBATORE. DEHRADUN. AIPUR. KANPUR. LUCKNOW. THIRUVANANTHAPURAM.