

SASO IEC 60598-2-13

LUMINAIRES –

Part 2-13: Particular requirements –

Ground recessed luminaires

Date of SASO Board of Directors Approval	:	1432(H)– – (2011– –)
Date of Publication in the Official Gazette	:	1432(H)– – (2011– –)
Date of Enforcement of this Standard	:	1433(H)– – (2012– –)

CONTENTS

FOREWORD	خطأ! الإشارة المرجعية غير معروفة.....
13.1	Scope4
13.2	General test requirements4
13.3	Definitions4
13.4	Classification.....4
13.5	Marking.....4
13.6	Construction.....5
13.7	Creepage distances and clearances 10
13.8	Provisions for earthing..... 10
13.9	Terminals 10
13.10	External and internal wiring 10
13.11	Protection against electric shock 10
13.12	Endurance test and thermal test 10
13.13	Resistance to dust, solid objects and moisture 11
13.14	Insulation resistance and electric strength 11
13.15	Resistance to heat, fire and tracking 11
Annex A (informative) Guide to good installation practice	12

INTRODUCTION

The Saudi Standards ,Metrology and Quality Organization (SASO) has adopted the International Standard IEC 60598-2-13 /2006Ed 1.0 “LUMINAIRES – Part 2-13: Particular requirements – Ground recessed luminaires” issued by the International Electrotechnical Commission (IEC). It has been adopted without any technical modifications with a view to its approval as a Saudi standard

LUMINAIRES –

Part 2-13: Particular requirements – Ground recessed luminaires

13.1 Scope

This Part 2 of IEC 60598 specifies requirements for ground recessed luminaires incorporating electric light sources for operation from supply voltages up to 1 000 V, for indoor or outdoor use, e.g. in gardens, yards, carriageways, parking lots, cycleways, footways, pedestrian areas, swimming pools areas outside zones for SELV, nurseries and similar applications.

This part does not cover ground recessed luminaires for motorised roads and for airfields already specified in IEC 61827¹.

13.1.1 Normative references

The references of Section 0 of IEC 60598-1 apply.

13.2 General test requirements

The provisions of Section 0 of IEC 60598-1 apply.

13.3 Definitions

The definitions of Section 1 of IEC 60598-1 apply together with the following:

13.3.1

ground recessed luminaire

luminaire suitable to be installed in the ground, having the supply connections and electrical components located below ground level

13.3.2

rated maximum surface temperature

T

the highest temperature on the accessible outer surface, under normal operating conditions according to 13.12

13.4 Classification

Luminaires shall be classified in accordance with Section 2 of IEC 60598-1.

13.5 Marking

The provisions of Section 3 of IEC 60598-1 apply together with the requirements of 13.5.1 to 13.5.3

13.5.1 Rated load in N, according to 13.6.1 (in the manufacturer's instructions).

¹ IEC 61827: *Electrical installation and beaconing of aerodromes – Characteristics of inset and elevated luminaires used in aerodromes.*

13.5.2 Rated maximum surface temperature T in °C; T marking to be given on the luminaire according to second column (B) of Table 3.1 of IEC 60598-1 and/or in the manufacturer's instructions and catalogues.

13.5.3 Information, in the manufacturer's instructions, concerning the external connecting box, if necessary.

Compliance is checked by inspection.

13.6 Construction

The provisions of Section 4 of IEC 60598-1 apply together with the requirements of 13.6.1 to 13.6.5

NOTE More samples could be necessary to perform all the tests, some of them possibly being destroyed.

13.6.1 Resistance to static load

Luminaires shall withstand the minimum static load according to the manufacturer's instructions.

Compliance is checked by the following test:

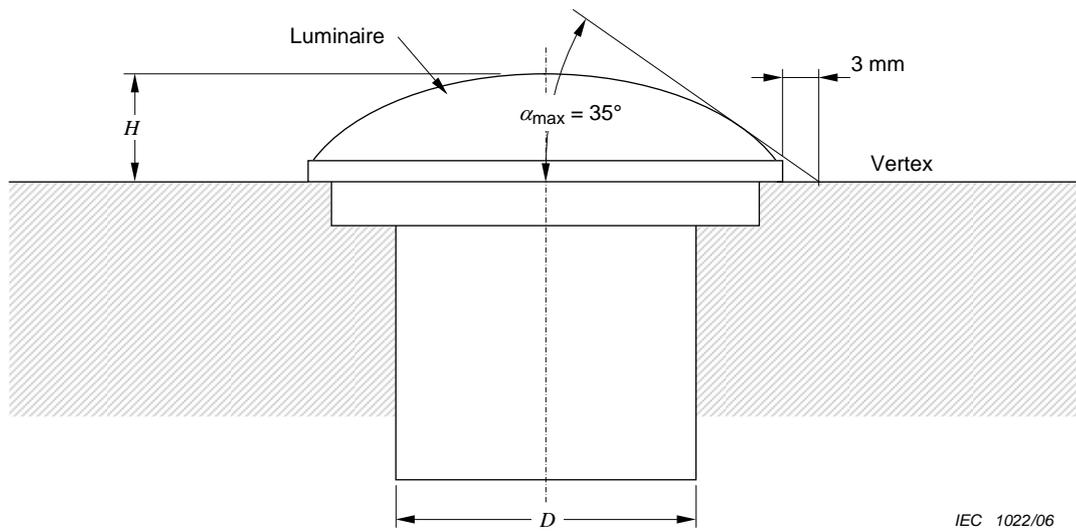
The sample is mounted as in normal use, in accordance with the manufacturer's instructions. The test load, to be maintained with a tolerance of $\pm 3\%$, shall be applied to the top side of the luminaire by a cylindrical rubber punch having the following characteristics:

- diameter = 50 mm, or luminaire diameter D (see Figure 1) if smaller than 50 mm;*
- hardness "shore A" = 65 ± 5 ;*
- thickness $\cong 50$ mm*

It shall be set in such a way that, during the test, the vertical axis is perpendicular and coincides with the geometrical centre of the translucent cover (see Figure 2).

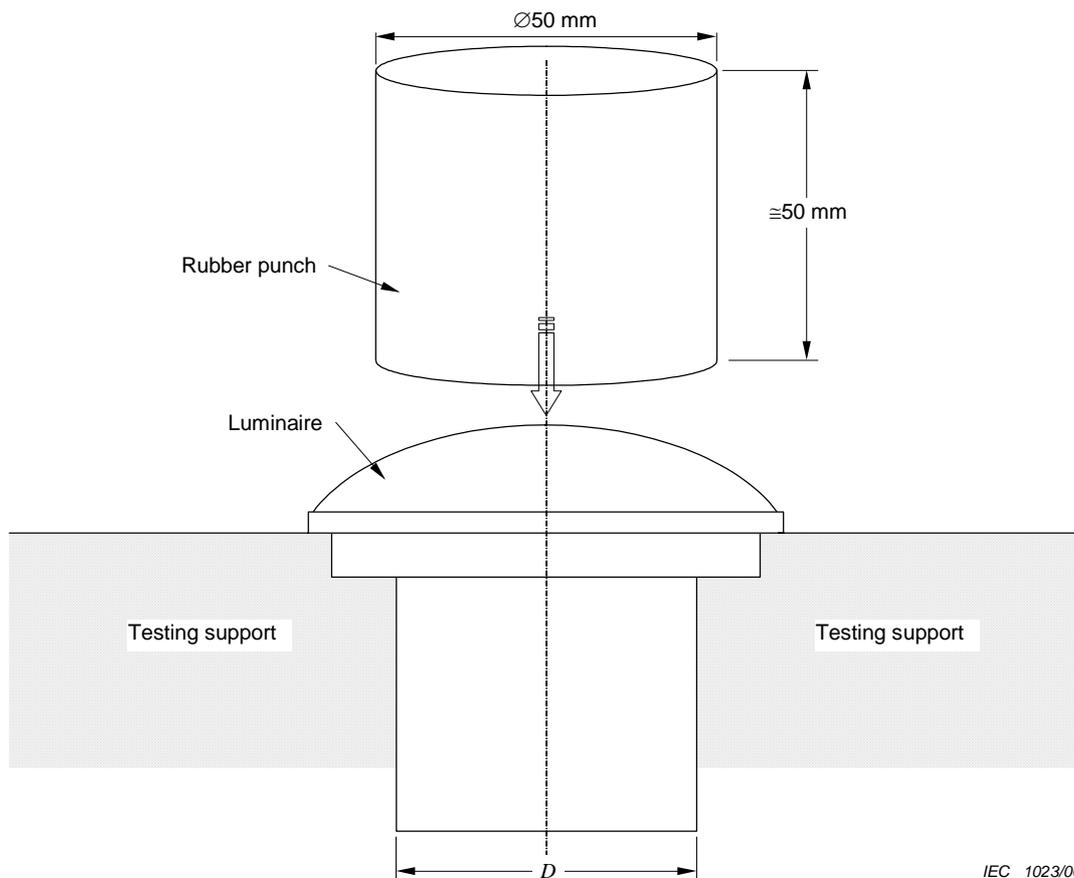
The load shall then be applied uniformly by the rubber punch, at a rate not greater than 5 000 N/min. The maximum load shall be applied for 1 min.

After the test the sample shall comply with the conformity requirements of IEC 60598-1, Subclause 4.13.1 (i.e.: as applied following the mechanical impact test).



IEC 1022/06

Figure 1 – Basic dimensions quoted in Annex A



IEC 1023/06

Figure 2 – Static load test apparatus

13.6.2 Resistance to torque and shear loads

Luminaires designed to be used in areas where motor vehicles may circulate, carriageways, parking areas, etc. (see items 3 and 4 in Table A.1) shall withstand the forces exerted by a turning, braking or accelerating tire.

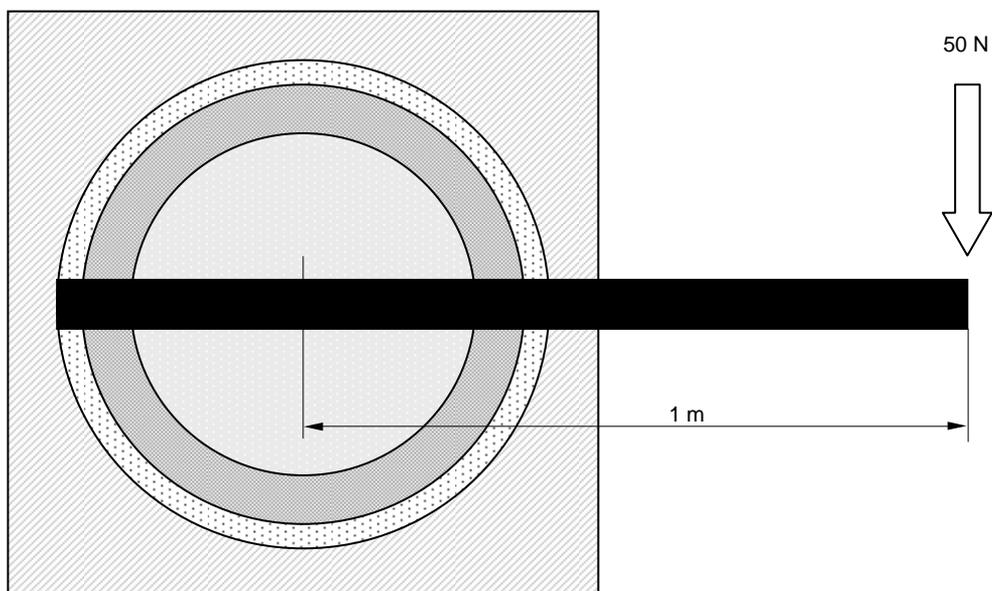
Compliance is checked by the tests of 13.6.2.1 and 13.6.2.2

13.6.2.1 Torque test

Parts of luminaire that may be subjected to rotational force shall have adequate mechanical strength. The joints between these parts shall be subject to a 50 N torque force for one minute (see Figure 3). Each joint shall be tested separately.

After the test, the sample shall comply with the conformity requirements of IEC 60598-1, Subclause 4.13.1 (i.e. as applied following mechanical impact test)

NOTE The test is intended to check both the components fixing and the luminaire to ground fixing.



Push force applied to bar = 50 N/60 s (example)

IEC 1024/06

Figure 3 – Illustration of torque test

13.6.2.2 Shear load test

With the same test arrangement of 13.6.2.1, a pull force of 5 kN shall be applied to the same parts progressively for not less than 5 s but not more than 10 s and released lengthwise to the end of the bar for 20 times (see Figure 4) in the direction of the carriage centreline intended for the installation of the luminaire, if any.

After the test the sample shall comply with the conformity requirements of IEC 60598-1, Subclause 4.13.1 (i.e. as applied following mechanical impact test).

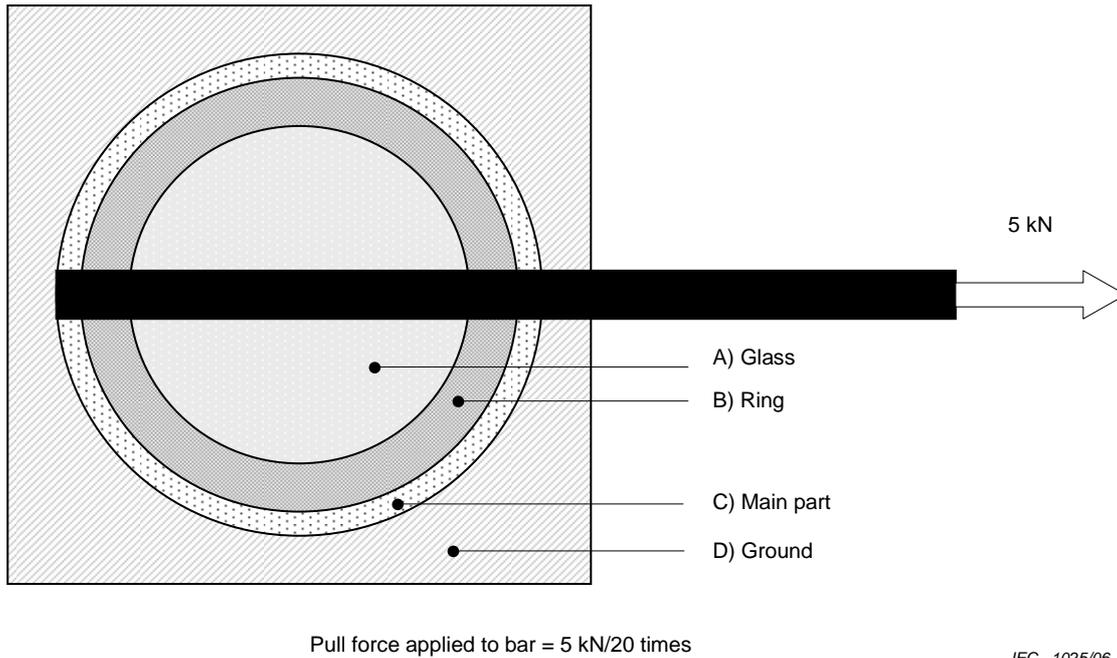


Figure 4 – Illustration of shear load test

13.6.3 Resistance to thermal shock

Glass covers shall be resistant to the effect of thermal shock.

Compliance is checked by the following test:

The luminaire and glass cover shall be preconditioned by the thermal endurance test given in 13.12 of this standard.

The luminaire shall be positioned such that as far as possible its cover glass is horizontal and facing upwards. The luminaire is operated until the maximum glass cover temperature measured during thermal test is attained. The luminaire is then switched off and disconnected from the electrical supply. Immediately following the electrical disconnection, 1 litre of iced water (maximum 5°C) shall be poured from a height of approximately 1 m onto the glass cover. The time taken to pour the water shall not exceed 5 s.

NOTE This test can result in violent shattering of glass. Appropriate safety precautions should be taken to protect persons performing this test and the surrounding environment. For example: wear protective clothing and face visor, erect screens around the test luminaire to protect surrounding area and test personnel, use a long handle flask to pour water from distance.

Compliance is checked by visual inspection and the glass shall not be broken.

13.6.4 Edges

All accessible edges shall be rounded to not less than 1,5 mm radius or equivalent chamfering.

Surfaces of the top assembly shall be smooth and free from burrs, flashes and the like.

Compliance is checked by inspection.

13.6.5 Mechanical strength

The provisions of 4.13 of IEC 60598-1 apply with a new impact energy of 5 Nm.

13.7 Creepage distances and clearances

The provisions of Section 11 of IEC 60598-1 apply.

13.8 Provisions for earthing

The provisions of Section 7 of IEC 60598-1 apply

13.9 Terminals

The provisions of Sections 14 and 15 of IEC 60598-1 apply.

NOTE In Denmark it is only allowed to bury flexible cables in the ground in temporary installations and construction site installations.

13.10 External and internal wiring

The provisions of Section 5 of IEC 60598-1 apply together with the following:

For outdoor use, the cables for the connection to the supply, when provided by the luminaire manufacturer, shall be at least equal to the mechanical and electrical characteristics of the following types:

- 60245 IEC 57 or 60245 IEC 66: rubber insulated flexible cables with circular conductors and rated voltage not exceeding 750V.
- other rubber sheathed cables 450/750 V according to regional Wiring Rules (e.g. H07RN8-F, etc.)

Compliance is checked by inspection and by fitting the proper cable into the luminaire.

13.11 Protection against electric shock

The provisions of Section 8 of IEC 60598-1 apply.

13.12 Endurance test and thermal test

The provisions of Section 12 and Annex D of IEC 60598-1 apply together with the following:

Ground recessed luminaires shall be subjected to the relevant tests of 12.4, 12.5, 12.6 and 12.7 of IEC 60598-1 after the test(s) of 9.2 but before the test(s) of 9.3 of Section 9 of IEC 60598-1 specified in 13.13

For the tests of 12.3, 12.4, 12.5, 12.6 and 12.7 of IEC 60598-1, the luminaire is mounted in normal operating position and supplied according to IEC 60598-1 in a test recess base, according to Annex D of IEC 60598-1 for all applications; or for limited applications in accordance with the manufacturer's instructions.

For the tests of 12.4 and 12.5 the following applies:

If the light emitting surface is covered by a metal ribbing or grid, the temperature measurements shall be made on the translucent parts, if accessible to standard test finger; if not, on the external covering part.

By measurement, the temperatures of translucent covers and accessible metal parts shall not exceed the marked value according to 13.5.2

13.13 Resistance to dust, solid objects and moisture

The provisions of Section 9 of IEC 60598-1 apply, together with the following:

The order of the tests specified in Section 9 of IEC 60598-1 shall be replaced by the order given in 13.12

Luminaires shall meet at least both IP65 and IP67 requirements.

The tests shall be made with the luminaire in free air or mounted in accordance with the manufacturer's instructions.

For IP X5, the luminaire shall be placed on jet test apparatus complete with the mounting accessories (e.g. outer casing) or following the manufacturer's instructions, according to 9.2.6 of IEC 60598-1,

For IPX7, the luminaire shall be mounted as in normal use and operated until the maximum glass cover temperature measured during the thermal test is attained; then the luminaire shall be switched off and immediately immersed in water, according to 9.2.8 of IEC 60598-1. This test is not required if the manufacturer gives the clear indication that the luminaire is to be mounted in conjunction with drainage, then the luminaire has only to meet IP65,

For IP6X, the luminaire shall be placed in the dust chamber with the mounting accessories and the cable in place according to 9.2.2 of IEC 60598-1m

NOTE Facilities intended to prevent excessive internal pressure are allowed, provided that the luminaire has complied with the IP67 test.

Compliance is checked by inspection.

13.14 Insulation resistance and electric strength

The provisions of Section 10 of IEC 60598-1 apply.

13.15 Resistance to heat, fire and tracking

The provisions of Section 13 of IEC 60598-1 apply.

Annex A (informative)

Guide to good installation practice

This guide is intended to advise lighting system designers on specific luminaire applications, particularly regarding temperature limits, dimensions and resistance to static loads.

For all the choices regarding the modes of installation, preference has to be given to the National Wiring Rules.

Table A.1 – Specific luminaire applications and temperature limits, dimensions and resistance to static loads

Intended usage	Temperature <i>T</i> °C a	Height <i>H</i> mm b	Static load kN c
1) In normally non-accessible areas (according to Wiring Rules)	X	X	X
2) In restricted accessible areas (e.g. pedestrians and pedal cycles only)	100	0 d	5
3) In all other accessible areas (e.g. carriageways, parkings, etc.)	65 or 80 e	75	20
4) As above, but in areas for snow-ploughs and / or de-icing agents	65 or 80 e	0 d	20
5) In particular areas (where working temperatures may cause injuries, e.g. nurseries, swimming pools, etc.)	40	0 d	5
NOTE Care should be taken regarding the compatibility between particular environments and luminaire construction, e.g. for the presence of de-icing agents, salt atmosphere, etc.			
a Maximum value, see 13.3.2 and 13.12.			
b Maximum value, see Fig.1. From 0 to 75 mm, the top side protruding over the ground should have a slope of $\alpha_{\max} = 35^\circ$, with vertex at 3 mm out of the edge (for a suitable chamfering).			
c Minimum value, see 13.6.1.			
d Up to 5 mm in these areas and up to 25 mm when installed in no-walking places, e.g. close to walls, buildings, etc.			
e 65°C for unprotected metal and 80°C for glass. Depending on the specific type of installation (in particular for the risk assessment).			

The preliminary draft of this standard has been developed by the work composed of

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