SPECIFICATION FOR LUMINAIRES
PART 1 : GENERAL REQUIREMENTS AND TESTS

AMENDMENT NO. 1

May 2007

1. *Add* IEC 60598-1 : 2003 Amendment 1 : 2006-07.

2. In the IEC Amendment, the page numbers refer to that of IEC 60598-1 : 2003. The following table shows the corresponding pages in this Singapore Standard.

IEC Page Number	SS Page Number
3	5
9	8
17	13
193	101
335	182
359	184
363	186

FOREWORD

This amendment has been prepared by subcommittee 34D:Luminaires, of IEC technical committee 34:Lamps and related equipment.

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

FDIS	Report on voting
34D/857/FDIS	34D/864/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result 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- withdrawn,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.

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CONTENTS

Add, on page 9, the title of the new Annex V, as follows :

Annex V (normative) Alternative thermal test for thermoplastic luminaires

Page 17

0.2 Normative references

Add, to the existing list, the reference to IEC 61558-1, as follows:

IEC 61558-1:2005, *Safety of power transformers, power supplies, reactors and similar products – Part 1: General requirements and tests*

Page 193

12.7 Thermal test in regard to fault conditions in lamp controlgear or electronic devices in plastic luminaires

Replace the title and content of the existing subclause 12.7 by the following:

12.7 Thermal test for thermoplastic luminaires in regard to fault conditions in lamp control gear or electronic devices

The test applies only to luminaires with a thermoplastic housing not fitted with a mechanical temperature-independent support, as per 4.15.2.

NOTE This test should not be applied to independent transformers with their own enclosure, complying with IEC 61558 series and to independent control gears with their own enclosure, complying with IEC 61347 series.

12.7.1 Test for luminaires without temperature sensing controls

12.7.1.1 Test for luminaires incorporating fluorescent lamps ≤ 70W

Three luminaires shall be tested under the conditions specified in items a), b), c), e), and h) of 12.4.1. In addition the following applies:

The ballast under test (which has the most thermal influence on the fixing points, mounting surface and exposed parts, fitted inside the luminaire according to luminaire design) shall be supplied directly at 1,1 times the rated voltage for 4 h (conditioning period), according to Figure 32.

If more than one ballast is used inside the luminaire, only one of them shall be checked in fault condition; the other(s) shall be supplied at 1,1 times the rated supply voltage, in normal operation with the relevant lamp (s) in the circuit (up to the end of the test).

Following the first initial conditioning period, the supply voltage to the ballast under test shall be increased by 20 % of the rated supply voltage and then left for a period of 15 min. If no failure of the ballast occurs during this period the supply voltage to the ballast under test shall be increased repeatedly in steps of 10 % of the rated supply voltage at 15 min intervals until ballast failure occurs.

Care shall be taken in order to avoid the supply voltage, for the circuit not subjected to the test, increasing during the fault condition (to check this, it is necessary to keep measured the ballast current). After the ballast failure, the luminaire shall be allowed to cool to ambient temperature.

The test is applicable to tubular fluorescent luminaires with lamp ≤70 W; for higher powered ballasts, the tests of 12.7.1.2 shall be applied.

Electronic control gears and small wound devices incorporated in them are exempted from these requirements.

Annex V provides an alternative method to the tests prescribed in this clause. The reference method is given in the present 12.7.1.

NOTE In order to perform this fault test, a protection should be used for the supply circuit, but it should not influence the test result.

A 20A fuse, as specified in IEC 60269, may be suggested.

Compliance

Following the test, the luminaire shall be inspected to ensure that the components have been retained in place.

Parts of the luminaire enclosure providing protection against electric shock shall continue to protect live parts against access with the standard test finger, as specified in Clause 8.

Because of the high current that may be present during this test, appropriate protection of the test circuit shall be provided (see Note above). Care shall be taken to ensure that any protection device does not affect the outcome of the test and the ballast breakdown has occurred at the conclusion of the test; and that the ballast failure is due to winding rupture.

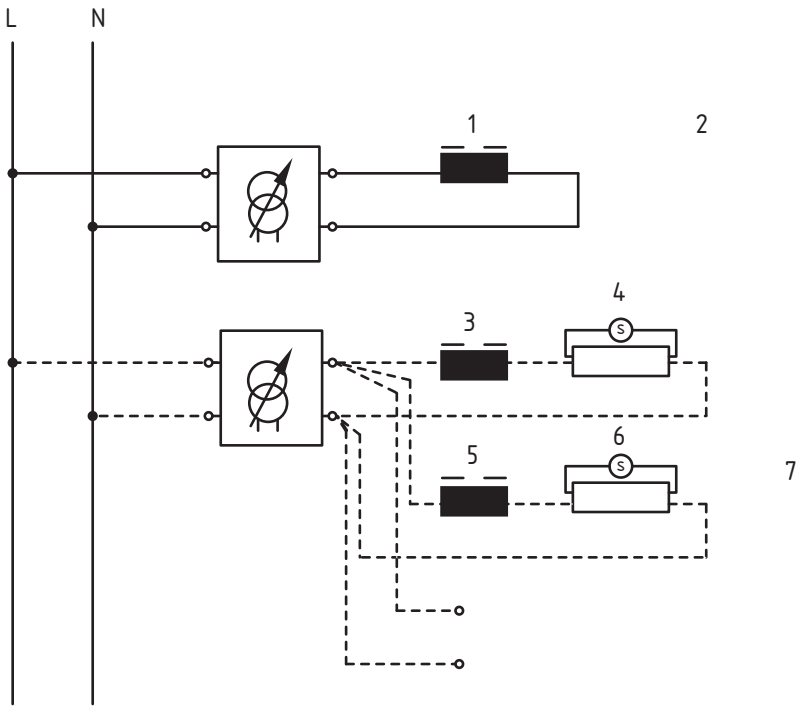

Figure 32 – Arrangement for voltage drop test

Key

1 ballast

2 Fault condition: Ballast under test directly supplied

3 ballast

4 lamp

5 ballast

6 lamp

7 Other ballasts, supplied at 1.1 rated supply voltage with the lamps in the curcuit

12.7.1.2 Test for luminaires with discharge lamps, fluorescent lamps >70 W, transformers >10 VA

The luminaire shall be tested under the conditions specified in items a), c), e), f) and h) of 12.4.1. In addition, the following applies.

20 % of the lamp circuits in the luminaire, and not less than one lamp circuit, shall be subjected to abnormal conditions (see item a) of 12.5.1)

The circuits which have the most thermal influence on the fixing point and exposed parts shall be chosen and other lamp circuits shall be operated at rated voltage under normal conditions.

The circuits, subjected to abnormal conditions, shall be operated at 1,1 times the rated voltage (or the maximum of the rated voltage range). When conditions are stable, the highest winding temperature**,** the highest temperature of fixing points and the most thermally influenced exposed parts shall be measured. It is not necessary to measure the temperature of small wound devices that are incorporated within electronic circuits.

Compliance

The values of the ambient temperature and the temperature measured at 1,1 times the rated voltage (or the maximum of the voltage range) are used for the linear regression formula in calculating the temperature of fixing points and other exposed parts in relation to ballast/transformer winding temperature of 350 °C. The thermoplastic material is then subjected to the ball pressure test as described in 13.2.1 at the estimated temperature determined by linear regression, but not less than 75 °C. The diameter of the impression shall be measured and shall not exceed 2 mm.

NOTE This is a fault condition test and the additional 25 °C of 13.2.1 does not apply.

12.7.1.3 Test for luminaires with short circuit proof transformers ≤10 VA

The fault test shall be carried out, according to the test method in 12.7.1.2, to small transformers with power up to 10 VA; at the end of the first period of 4 h, the secondary winding shall be short circuited.

The short circuit current shall be allowed to continue until transformer failure occurs; transformers that are mounted in their own enclosure (e.g. emergency inverter) and have shown to comply with their relevant safety standard are deemed to comply with this sub-clause without the need for test.

Compliance

Following the test, the luminaire shall be inspected to ensure that the components have been retained in place.

Parts of the luminaire enclosure providing protection against electric shock shall continue to protect live parts against access with the standard test finger, as specified in Clause 8.

Because of the high current that may be present during this test, appropriate protection of the test circuit shall be provided (see Note to 12.7.1.1). Care shall be taken to ensure that any protection device does not affect the result of the test; and the transformer breakdown has occurred at the conclusion of the test.

12.7.2 Test for luminaires with temperature sensing controls internal/external to the ballast or transformer

The luminaires shall be set up for this test as described in the first three paragraphs of 12.7.1.2.

The circuits subjected to abnormal conditions shall be operated with a slowly and steadily increasing current through the windings, until the temperature sensing control operates.

Time intervals and increments in current shall be such that thermal equilibrium between winding temperatures and temperature of fixing points and most thermally influenced exposed parts is achieved as far as practicable. During the test, the highest temperature of the spots tested shall be continuously measured.

For luminaires fitted with manual-reset thermal cut-out, the test shall be repeated six times allowing 30 min intervals between tests. At the end of each 30 min interval, the cut-out shall be reset.

For luminaires fitted with auto-reset thermal cut-out, the tests shall be continued until a stable temperature is achieved.

In order to perform the test on transformers, see also 15.3.5 of IEC 61558-1:2005. The temperature sensing controls external to the transformer shall be checked according to 20.4, 20.5 and 20.6 of IEC 61558-1:2005.

Compliance

The highest temperature of the fixing points and most thermally influenced exposed parts, shall be recorded. The thermoplastic material is then subjected to the ball pressure test as described in 13.2.1 at the maximum recorded temperature but not less than 75 °C. The diameter of the impression shall be measured and shall not exceed 2 mm.

NOTE 1 This is a fault condition test and the additional 25 °C of 13.2.1 does not apply.

NOTE 2 ‘Fixing points’ means both the fixing points of components and the fixing points of a luminaire to the mounting surface.

NOTE 3 ‘Exposed part’ means the outer surface of the luminaire enclosure.

NOTE 4 According to the requirements of 12.7, measurement of exposed parts is restricted to those parts providing the luminaire/component fixing or parts providing a protective barrier against accidental contact with live parts, according to Clause 8.

NOTE 5 The hottest part of the thermoplastic material section requiring test is measured. This may often be on the internal surface of a luminaire enclosure, not the outer surface.

NOTE 6 The material temperature limits defined are with respect to materials under both mechanical load and no mechanical load.

NOTE 7 The application of Annex N should be made together with the requirements of 4.15.

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Annex R – Bibliography

Add, to the existing list, the following new reference:

IEC 60269, *Low-voltage fuses*

Page 359

Annex S – Schedule of amended subclauses containing more serious/critical requirements which require products to be retested

Add the following new paragraph:

Luminaires shown to be in compliance with the more onerous test of 12.7, as specified in Edition 5 of IEC 60598-1, are deemed to comply without re-testing.

Page 363

Add the following new Annex V:

Annex V
(normative)

Alternative thermal test for thermoplastic luminaires

The following test method can be used as an alternative to the reference test of 12.7.1.1 for luminaires without temperature sensing controls, incorporating fluorescent lamp ≤70 W. In case of doubt, the test method of 12.7.1.1 applies.

V.1 Thermal test in regard to fault conditions in lamp controlgear or electronic devices without temperature sensing controls in thermoplastic luminaires for fluorescent lamps ≤ 70W

The luminaire shall be tested under the conditions specified in items a), c), e), f), and h) of 12.4.1. In addition, the following also applies.

20 % of the lamp circuits in the luminaire, and not less than one lamp circuit, shall be subjected to abnormal conditions (see 12.5.1, item a)).

The circuits which have the most thermal influence on the fixation point and exposed parts shall be chosen and other lamp circuits shall be operated at rated voltage under normal conditions.

The circuits subjected to abnormal conditions shall be operated at 1,1 times (the rated voltage or the maximum of the rated voltage range). When conditions are stable, the highest winding temperature and highest temperature of fixing points and of most thermally influenced exposed parts shall be measured. It is not necessary to measure the temperature of small wound devices that are incorporated within electronic circuits.

Compliance

The values of the ambient temperature and the temperature measured at 1,1 times (the rated voltage or the maximum of the voltage range) are used for the linear regression formula in calculating the temperature of fixing points and other exposed parts in relation to a ballast/transformer winding temperature of 350 °C. The thermoplastic material is then subjected to the ball pressure test as described in 13.2.1 at the estimated temperature determined by linear regression, but not less than 75 °C. The diameter of the impression shall be measured and shall not exceed 2 mm.

NOTE 1 This is a fault condition test and the additional 25 °C of 13.2.1 does not apply.

In applying the requirements of 4.15 and 12.7 the following notes are to be referred to.

NOTE 2 ‘Fixing points’ means both the fixing points of components and the fixing points of a luminaire to the mounting surface.

NOTE 3 ‘Exposed part’ means the outer surface of the luminaire enclosure.

NOTE 4 According to the requirements of 12.7, measurement of exposed parts is restricted to those parts providing the luminaire/component fixing or parts providing a protective barrier against accidental contact with live parts, as required by Section 8 .

NOTE 5 The hottest part of the thermoplastic material section requiring test is measured. This may often be on the internal surface of a luminaire enclosure not the outer surface.

NOTE 6 The material temperature limits defined in 12.7 are with respect to materials under both mechanical load and no mechanical load.

NOTE 7 The application of Annex N should be made together with the requirements of 4.15.