

Australian/New Zealand Standard™

Luminaires

Part 2.1: Particular requirements—Fixed general purpose luminaires



AS/NZS 60598.2.1:2014

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The following are represented on Committee EL-041:

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Electrical Compliance Testing Association
Electrical Regulatory Authorities Council
Energy Efficiency and Conservation Authority of New Zealand
Fair Trading NSW
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Australian/New Zealand Standard™

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Part 2.1: Particular requirements—Fixed general purpose luminaires

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-041, Lamps and Related Equipment, to supersede AS/NZS 60598.2.1:1998 on publication.

This Standard incorporates Amendment No. 1 (May 2016) and Amendment No. 2 (April 2019). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of this Standard is to provide the lighting industry with essential safety requirements for fixed general purpose luminaires.

A1 | The objective of Amendment 1 is to update requirements for double-capped LED lamps and include essential safety requirements for T8 to T5 lamp converters.

A2 | The objective of Amendment 2 is to correct the fuse classification, remove requirements for Type B LED lamps and include photobiological requirements in Appendix A.

The objective of this revision is to include essential safety requirements for double-capped LED lamps.

This Standard is based on, but not equivalent to, IEC [60]598-2-1:1979, *Luminaires, Part 2-1: Particular requirements—Fixed general purpose luminaires*, and includes its Amendment No.1 (1987).

A1 | Extensive reference is made to AS/NZS 60598.1. The requirements of AS/NZS 60598.1 are varied in this Standard for fixed general purpose luminaires. Variations for double-capped LED lamps are provided in Appendix A. Variations for T8 to T5 lamp converters are provided in Appendix B.

A1 | The essential safety requirements in AS/NZS 3820, *Essential safety requirements for electrical equipment*, that could be applicable to fixed general purpose luminaires, double-capped LED lamps and T8 to T5 lamp converters are covered by this Standard, taken in conjunction with any other relevant requirements affecting safety.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a standard.

A1 | For this Standard the terms ‘clause’ and ‘section’ give effect to the same meaning and may be used interchangeably within this Standard.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard

Luminaires

Part 2.1: Particular requirements—Fixed general purpose luminaires

1 SCOPE

This Standard specifies requirements for fixed general purpose luminaires incorporating electric light sources for operation on supply voltages less than 1000V AC RMS or 1500V ripple-free DC (high voltage). It is to be read in conjunction with those sections of AS/NZS 60598.1 to which reference is made. This Standard also specifies requirements for double-capped LED lamps (Appendix A) and T8 to T5 lamp converters (Appendix B). Appendix A is to be read in conjunction with those sections of AS/NZS 60598.1 to which reference is made. Appendix B is to be read in conjunction with those sections of AS/NZS 60598.1 and AS/NZS 61347.2.3 or AS/NZS 61347.1 to which reference is made.

2 REFERENCED DOCUMENT

The following document is referred to in this Standard:

AS/NZS

60598 Luminaires

60598.1 Part 1: General requirements and tests (IEC 60598-1, Ed. 7.0 (2008) MOD)

61347 Lamp controlgear

61347.1 Part 1: General and safety requirements (IEC 61347-1:2015, MOD)

61347.2.3 Part 2.3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps (IEC 61347-2-3:2011, MOD)

IEC

60127 Miniature fuses (series)

3 GENERAL TEST REQUIREMENTS

The provisions of Section 0 of AS/NZS 60598.1 apply. The tests described in each appropriate section of AS/NZS 60598.1 shall be carried out in the order listed in this Standard.

4 DEFINITIONS

For the purposes of this Standard, the definitions of Section 1 of AS/NZS 60598.1 apply.

5 CLASSIFICATION OF LUMINAIRES

Luminaires shall be classified in accordance with the provisions of Section 2 of AS/NZS 60598.1.

6 MARKING

The provisions of Section 3 of AS/NZS 60598.1 apply.

LED luminaires with G5 or G13 lampholders shall be marked with the following warning:

A2

WARNING: NOT FOR USE WITH ANY FLUORESCENT LAMP—FOR USE ONLY WITH TYPE A LED LAMPS

‘Text deleted’

The warning label shall be durable and the font size shall be a minimum of 5 mm for letters and numbers and 5 mm for symbols and shall be visible during lamp replacement.

NOTE: Manufacturers should specify minimum requirements for the operations of their lamps, including spacing, enclosure design and temperature limitations.

7 CONSTRUCTION

The provisions of Section 4 of AS/NZS 60598.1 apply.

A1

LED luminaires or new luminaires designed for T8 to T5 converters with G5 and G13 lampholders shall include a fuse to protect a fluorescent lamp that is inadvertently installed.

Each fuse shall—

A2

- (a) be of the 250 V HBC type;
- (b) have a 2 A max. quick-acting type rating; and
- (c) be used to protect a maximum of two lamps.

8 CREEPAGE DISTANCES AND CLEARANCES

The provisions of Section 11 of AS/NZS 60598.1 apply.

9 PROVISION FOR EARTHING

The provisions of Section 7 of AS/NZS 60598.1 apply.

10 TERMINALS

The provisions of Sections 14 and 15 of AS/NZS 60598.1 apply.

11 EXTERNAL AND INTERNAL WIRING

The provisions of Section 5 of AS/NZS 60598.1 apply.

12 PROTECTION AGAINST ELECTRIC SHOCK

The provisions of Section 8 of AS/NZS 60598.1 apply.

13 ENDURANCE TESTS AND THERMAL TESTS

The provisions of Section 12 of AS/NZS 60598.1 apply.

Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of Clauses 12.4, 12.5 and 12.6 of Section 12 of AS/NZS 60598.1 after the test(s) of Clause 9.2 but before the test(s) of Clause 9.3 of Section 9 of AS/NZS 60598.1 specified in Clause 14 of this Standard.

14 RESISTANCE TO DUST AND MOISTURE

The provisions of Section 9 of AS/NZS 60598.1 apply.

For luminaires with an IP classification greater than IP20 the order of the tests specified in Section 9 of AS/NZS 60598.1 shall be as specified in Clause 13 of this Standard.

15 INSULATION RESISTANCE AND ELECTRIC STRENGTH

The provisions of Section 10 of AS/NZS 60598.1 apply.

16 RESISTANCE TO HEAT, FIRE AND TRACKING

The provisions of Section 13 of AS/NZS 60598.1 apply.

APPENDIX A

SAFETY REQUIREMENTS FOR DOUBLE-CAPPED LED LAMPS

(Normative)

A1 GENERAL

A1.1 Scope

This Appendix specifies the safety and interchangeability requirements of double-capped LED lamps. This includes requirements to show compliance of double-capped LED lamps with—

- (a) G5 or G13 lamp caps intended for replacing, in existing luminaires, fluorescent lamps with corresponding G5 or G13 caps;
- (b) other lamp cap types intended for replacing, in existing luminaires, incandescent, tungsten halogen or other lamp types with the corresponding lamp caps; and
- (c) any lamp cap type, intended for inserting in new luminaires for double-capped lamps in lieu of fluorescent, incandescent, tungsten halogen or other lamp types.

This Appendix includes requirements for double capped lamps for retrofit or new luminaires. These lamps may have integral, built-in or independent control gear.

The requirements of this Appendix relate only to type testing.

NOTES:

- 1 Where the term 'lamp(s)' is used in this Appendix, it stands for 'double-capped LED light source(s) [lamp(s)]', except where it is obviously assigned to another type(s) of lamp(s).
- 2 This Appendix does not apply to self-ballasted LED lamps within the scope of AS/NZS IEC 62560.

A1.2 Application

This Appendix is to be read in conjunction with AS/NZS 60598.1, with all provisions applying unless varied herein. Where the term 'luminaire' is used in AS/NZS 60598.1, it shall be replaced with the term 'lamp'. The tests described in each appropriate section of AS/NZS 60598.1 shall be carried out in the order listed in this Appendix.

A1.3 Testing

In general, all tests are carried out on each type of lamp or, where a range of similar lamps is involved, for each power in the range or on a representative selection from the range.

Specially prepared samples for testing may be required if lamps cannot be opened without being permanently damaged, or have other characteristics that prevent tests from being applied or assessed.

Specially prepared samples may need to be prepared after inspection of the lamp and components and examination of the circuit diagram. Samples may require such special preparation as the output terminals being short-circuited, or lamps may need to be specially prepared so that a fault condition can be simulated to ensure adequate testing (e.g. to comply with the fault condition test requirements of AS/NZS 61347.1). Unassembled samples or samples without potting may need to be supplied.

A1.4 Specific requirements of this Appendix

A lamp(s) shall be deemed to comply with this Appendix only if it complies with all the appropriate requirements of this Appendix and passes the relevant tests specified herein.

A1.5 Requirements of relevant test specifications

Equipment and components incorporated in a lamp that is safety dependant shall comply with the appropriate requirements of any relevant test specification, unless such requirements are varied herein.

A1.6 LED lamp connection types

A1

This Appendix applies to all double-capped LED lamps.

For double-capped LED lamps with G5 lamp cap and T5 lamp configuration, or G13 lamp caps and T8 lamp configuration, for use as replacement of fluorescent lamps, all Paragraphs of this Appendix apply.

NOTE: Standard lamp caps (including G5 and G13) are shown in IEC 60061 and fluorescent lamps (including T5 and T8) are shown in IEC 60081.

For double-capped LED lamps with other lamp cap types, or lamp configuration, or alternate supply connections other than the lamp cap, all Paragraphs of this Appendix apply, except for the following:

- (a) Paragraph A4.2.
- (b) Paragraphs A5.2(h), A5.2(i), A5.3 and A5.4.
- (c) Paragraph A6.1(b).
- (d) Paragraph A7.4.
- (e) Paragraph A8.

A2 REFERENCED DOCUMENTS

The following documents are referred to in this Appendix:

AS

2293 Emergency escape lighting and exit signs for buildings

2293.3 Part 3: Emergency escape luminaires and exit signs

AS/NZS

60155 Glow-starters for fluorescent lamps

60598 Luminaires

60598.1 Part 1: General requirements and tests (IEC 60598-1, Ed. 7.0 (2008) MOD)

A1

60695 Fire hazard testing

60695.11.5 Part 11.5 Test flames—Needle-flame test method—Apparatus, confirmatory test
: arrangement and guidance

60950 Information technology equipment—Safety

60950.1 Part 1: General requirements (IEC 60950-1, Ed.2.2 (2013), MOD)

61347 Lamp controlgear

61347.1 Part 1: General and safety requirements (IEC 61347-1:2015, MOD)

AS/NZS IEC

62560 Self-ballasted LED-lamps for general lighting services by voltage > 50 V—
Safety specifications (IEC 62560, Ed. 1.0 (2011) MOD)

62471 Photobiological safety of lamps and lamp systems

62471.2 Part 2: Guidance on manufacturing requirements relating to non-laser optical
radiation safety

IEC

60061 Lamp caps and holders together with gauges for the control of interchangeability and safety

60061-1 Part 1: Lamp caps

60061-3 Part 3: Gauges

60081 Double-capped fluorescent lamps—Performance specifications

60127 Miniature fuses (series)

A1

61000 Electromagnetic compatibility (EMC)

61000-4-5 Part 4-5: Testing and measurement techniques—Surge immunity test

61032 Protection of persons and equipment by enclosures—Probes for verification

61195 Double-capped fluorescent lamps—Safety specifications

A3 DEFINITION

For the purposes of this Appendix, the following definition applies:

A3.1 Double-capped LED lamp

Tubular LED light source which may be used as a replacement for another type of lamp.

NOTE: Typical types of lamps that may be replaced include linear fluorescent lamps.

A4 CLASSIFICATIONS OF LAMP(S)**A4.1 Class**

Lamps shall be classified in accordance with the provisions of Section 2 of AS/NZS 60598.1. Lamps shall be classified as class II or class III for protection against electric shock.

A class III lamp shall have class II construction and comply with all of the requirements for protection against electric shock for a class II lamp at a nominal rating of 240 V a.c.

A4.2 Type

A2

LED lamps shall be classified as Type A.

Type A LED lamps shall be constructed such that one end of the lamp has the lamp cap pins electrically bridged and the other end of the lamp has the line and neutral supply connected to the pins of that lamp cap.

NOTE: Lamps formerly referred to as Type B LED lamps, that were constructed such that one end of the lamp has the lamp cap pins electrically isolated from each other and the other end of the lamp has the line and neutral supply connected to the pins of that lamp cap, no longer conform with this Standard.

A5 MARKING**A5.1 General**

The Test of Marking of Clause 3.4 of AS/NZS 60598.1 shall be used to determine the durability of the markings specified in A5.2 to A5.4.

A5.2 Marking on the lamp

Lamps shall be clearly and durably marked with the following markings, the size of which shall be a minimum of 2 mm:

- (a) Mark of origin (this may take the form of a trademark, or be the manufacturer's name or the name of the responsible vendor).
- (b) Rated supply voltage or voltage range (marked 'V' or 'volts').

- (c) Rated wattage (marked 'W' or 'watts').
- (d) Rated frequency (marked in 'Hz').
- (e) A value for allowable case temperature t_c and a marked point of measurement.
- (f) Model number.
- (g) IP rating if greater than IP20.
- (h) Markings to identify the line and neutral supply connections of the lampholder.
- A2 | (i) The lamp type shall be marked with the text 'Type A', as per the appropriate subfigure of Figure A1, to indicate the lamp cap configuration.

A1 | For LED lamps that have lamp caps not on the ends of the lamp, and are only for use with a luminaire that has a means of automatic double pole disconnection operative when the lamp is replaced, the following warning shall be marked on the lamp body:

WARNING: This lamp is only for use with a luminaire that has a means of automatic double-pole disconnection operative when the lamp is replaced.

NOTE: An example of this type of connection would be a LED lamp with S14 lampholder connections.

A2

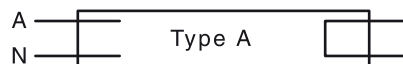


FIGURE A1 LAMP CAP CONFIGURATION FOR TYPE A LED LAMPS

A5.3 Warning label for the luminaire

The following warning label shall be supplied with the lamp:

A2

WARNING: NOT FOR USE WITH ANY FLUORESCENT LAMP—FOR USE ONLY WITH TYPE A LED LAMPS

'Text deleted'

The warning label shall be durable and the font size shall be a minimum of 5 mm for letters and numbers and 5 mm for symbols.

The instructions for the warning label shall state that the installer, when installing the lamp, is to ensure that this label is placed in a prominent position on the luminaire and visible when the lamp is installed.

A5.4 Marking of associated components

If lamps need to be used with a component which replaces the starter, the component to replace the starter shall be marked as shown in Figure A2.

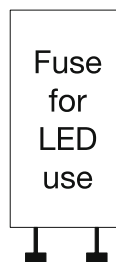


FIGURE A2 STARTER REPLACEMENT