



SGS Australia Pty Ltd



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| TEST REPORT AS/NZS 60598.2.1 Luminaires Part 2.1: Particular requirements – Fixed general purpose luminaires | |
| Report Reference No. | S17031 |
| Compiled by (+ signature) | Yongchan Kim <i>Yongchan Kim</i> |
| Approved by (+ signature) | Jihai Zhu <i>Jihai Zhu</i> |
| Date of issue..... | Monday, 25 September 2017 |
| Contents..... | 72 Pages |
| Testing Laboratory | SGS Electrical & Electronic Testing Laboratory NATA Accredited Laboratory No. 3637 Performance and Approvals Testing |
| Address | 73 Williams Road Blackburn, VIC 3130, AUSTRALIA Telephone +61 (0)3 9875 9000 Facsimile +61 (0)3 9878 7077 ee.australia@sgs.com |
| Applicant's name | Darkon Pty Ltd |
| Address | 110 Cromwell Street, Collingwood, VIC 3066, Australia |
| Test specification: | |
| Standard | AS/NZS 60598.2.1:2014 + A1:2016 AS/NZS 60598.1:2013 |
| Test Report Form No. | 60598.2.01E-TRF |
| TRF Originator | SGS-CRS |
| Master TRF | 24/12/2016 |
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| Test item description | HIP SUSPENDED LUMINAIRE |
| Trade Mark | DARKON |
| Model/Type reference | HIP LED series (see Remarks section for detailed description) |
| Rating | 240VAC. 0.5A Max, 50/60Hz IP2X |

Possible test case verdicts:

- Test case does not apply to the test object.....: N/A
- Test object does meet the requirement: P (Pass)
- Test object does not meet the requirement: F (Fail)

Testing:

Date of receipt of test item: 10/05/2017
Date(s) of performance of tests: 05/06/2017-25/09/2017

General remarks:

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.
Clause numbers between brackets refer to clauses in AS/NZS 60598.1.

Remarks:

Variations, exclusions or additions to standard as detailed herein.

The following tests were conducted, as requested by the customer:

1. Full tests were conducted on Model HIP LED / 1165 / SUS 2M / WHT / WHT SM / OPAL V + LT60 / HO G4 / 500mA / 4K / DALI DIM.
2. Part test of clause 12.4 was applied to Model HIP LED / 1165 / SUS 2M / WHT / WHT SM / OPAL V + LT60 / HO G4 / 400mA / 4K / DALI DIM only for Tc point of LED driver (LCA 50W 100-400mA one4all Ip PRE) at 400mA.

HIP LED series had same construction and included the following models:

| Model | LED driver |
|--|-----------------------------------|
| HIP LED / 1165 / SUS 2M / WHT / WHT SM / OPAL V + LT60 / HO G4 / 500mA / 4K / DALI DIM | LCA 75W 350-1050mA one4all Ip PRE |
| HIP LED / 1165 / SUS 2M / WHT / WHT SM / OPAL V + LT60 / HO G4 / 450mA / 4K / DALI DIM | LCA 75W 350-1050mA one4all Ip PRE |
| HIP LED / 1165 / SUS 2M / WHT / WHT SM / OPAL V + LT60 / HO G4 / 400mA / 4K / DALI DIM | LCA 50W 100-400mA one4all Ip PRE |
| HIP LED / 1165 / SUS 2M / WHT / WHT SM / OPAL V + LT60 / HO G4 / 350mA / 4K / DALI DIM | LCA 50W 100-400mA one4all Ip PRE |
| HIP LED / 1165 / SUS 2M / WHT / WHT SM / OPAL V + LT60 / HO G4 / 300mA / 4K / DALI DIM | LCA 50W 100-400mA one4all Ip PRE |
| HIP LED / 1165 / SUS 2M / WHT / WHT SM / OPAL V + LT60 / HO G4 / 250mA / 4K / DALI DIM | LCA 50W 100-400mA one4all Ip PRE |

The code names used in the models:

Length: 1165 mm, mounting: SUS 2M, color: WHT, ceiling plate: WHT SM, LENS: OPALV, light tray: LT60, output: HO G4, current: 500mA – 250 mA, color temp: 4K, dimming: DALI DIM.

Summary of testing:

The products were evaluated and tested to the requirements detailed in the Remarks section, and were found to comply with those requirements.

Nameplate:



Customer declared that IP22 will be changed to IP2X

Customer declared that '/' will be inserted between OPALV+LT60 and HOG4

Customer declared that ta will be changed from 45 °C to 25 °C

| General product information | |
|--|--|
| Nature of Supply..... | a.c. |
| Class of protection against electrical shock | Class I |
| Mass (kg)..... | 4.02 |
| Degree of protection against moisture | IP2X |
| Type of luminaire | Suspended Luminaire |
| Type of lamp to be used | Non-replaceable LED |
| Connection to the mains..... | Supply cord for attachment to fixed wiring |
| Type of cord attachment..... | Type Y |
| Type of supply cord fitted | H05VV-F |
| - length of supply cord | 2.5M |
| - size of supply cord (mm ²)..... | 5 X 0.75mm ² |
| Type of mounting..... | Suspended |
| Thermal devices | None |
| Protection device | None |
| Enclosure material | Metal and thermoplastic |

| AS/NZS 60598.2.1 | | | |
|------------------|---|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 3 (0) | GENERAL TEST REQUIREMENTS | | |
| 3 (0.1) | Information for luminaire design considered | Standard Yes | — |
| 3 (0.3) | More sections applicable | No | — |
| 3 (0.4.2) | In Australia the supply voltage is 230V/400V and for testing the rated voltage is 240V/415V (ZZ) .. | Tested based on 240V | P |
| 3 (0.5.2A) | Capacitors (ZZ) | | N/A |

| | | | |
|--------------|--|---------|---|
| 5 (2) | CLASSIFICATION OF LUMINAIRES | | |
| 5 (2.2) | Type of protection..... | Class I | — |
| 5 (2.3) | Degree of protection..... | IP2X | — |
| 5 (2.4) | Luminaire only suitable for non-combustible surfaces | No | — |
| | Luminaire suitable for normally flammable surfaces..... | Yes | — |
| 5 (2.5) | Luminaire for normal use | Yes | — |
| | Luminaire for rough service | No | — |

| | | | |
|--------------|---|--------------------------|-----|
| 6 (3) | MARKING | | |
| 6 (3.2) | Mandatory markings | | P |
| | Position of the marking | | P |
| | Format of symbols/text | | P |
| 6 (-) | Warning for LED luminaires with G5 or G13 lampholders (ZZ) | | N/A |
| | Type A or Type B LED Lamps, as appropriate (ZZ) | | N/A |
| | Minimum size of 5 mm for letters and numbers and 5 mm for symbols (ZZ) | | N/A |
| | Visible during lamp replacement (ZZ) | | N/A |
| 6 (3.2.1) | Mark of origin | DARKON | P |
| 6 (3.2.2) | Rated voltage | 240 V | P |
| 6 (3.2.3) | Rated maximum ambient temperature t_a | 25 °C | P |
| 6 (3.2.4) | Symbol for class II luminaires | | N/A |
| 6 (3.2.5) | Symbol for class III luminaires | | N/A |
| 6 (3.2.6) | IP number, other than IP20 | IP2X | P |
| 6 (3.2.7) | Model number or type reference | Refer to Remarks section | P |
| 6 (3.2.8) | Rated wattage, and number of lamps | 54 W | P |
| 6 (3.2.9) | Symbol for luminaires not suitable for direct mounting on normally flammable surfaces | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Minimum size of the symbol is 25 mm for each side | | N/A |
| | The symbol is explained on the luminaire or in the instructions | | N/A |
| 6 (3.2.10) | Information concerning special lamps | | N/A |
| 6 (3.2.11) | Symbol against the use of cool-beam lamps | | N/A |
| 6 (3.2.12) | Except for type Z attachments, terminations marked to identify live, neutral and earth | | P |
| | Symbols are in accordance with IEC 60417 | | P |
| | Correct markings used for earthing termination | | P |
| | In Australia, luminaires for household use having supply cords which are not fitted with a plug shall be marked with a cord tag with the symbol for "must be installed by a licensed electrician" (ZZ) | | P |
| 6 (3.2.13) | Symbol for minimum distance from lighted objects | | N/A |
| | The minimum distance determined by the temperature test described in item j) of 12.4.1 | | N/A |
| | The symbol and explanation of its meaning given on the luminaire or in the instructions | | N/A |
| 6 (3.2.14) | Symbol for rough service luminaire | | N/A |
| 6 (3.2.15) | Symbol for luminaires designed for use with bowl mirror lamps | | N/A |
| 6 (3.2.16) | "Replace any cracked protective shield", or | | N/A |
| | The symbol as specified in Figure 1 | | N/A |
| 6 (3.2.17) | The maximum number of luminaires to be interconnected, or | 17 | P |
| | The maximum total current to be drawn for looping-in connection | 3.82 A | P |
| | The information provided within the installation instructions for fixed luminaires | | P |
| 6 (3.2.18) | Luminaires with ignitors for use with double-ended high pressure discharge lamp or double capped Fa8 tubular lamps: voltage from lamp cap to earth > 34 Vp | | N/A |
| | a) warning symbol visible during replacement of the lamp, or | | N/A |
| | b) warning notice near to the holder of a replaceable ignitor or replaceable switching element | | N/A |
| 6 (3.2.19) | Symbol for luminaires designed for use only with self-shielded tungsten halogen lamps or self-shielded metal halide lamps | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 6 (3.2.20) | Identification of means of adjustment, if necessary | | N/A |
| 6 (3.2.21) | Symbol for luminaires not suitable for covering with thermally insulated material | | N/A |
| | Minimum size of the symbol is 25 mm for each side | | N/A |
| | The symbol is explained on the luminaire or in the instructions | | N/A |
| 6 (3.2.22) | Symbol for luminaires with internal replaceable fuses | | N/A |
| | Information regarding the rated current of the fuse is provided | | N/A |
| | The time/current characteristic of the fuse is marked on the holder or in the proximity of the fuse | | N/A |
| 6 (3.3) | Additional information | | P |
| | Instructions and other texts must be written in English (ZZ) | | P |
| 6 (3.3.1) | Combination luminaires | | N/A |
| 6 (3.3.2) | Nominal frequency in Hz | 50/60Hz | P |
| 6 (3.3.3) | Operating temperature | | N/A |
| 6 (3.3.4) | Symbol or warning notice | | N/A |
| 6 (3.3.5) | Wiring diagram | | N/A |
| 6 (3.3.6) | Special conditions | | N/A |
| 6 (3.3.7) | Warnings for luminaires for use with metal halide lamps in the instructions (ZZ): | | N/A |
| | - To avoid potential unsafe lamp failure, the luminaire shall be switch off for at least 30 minutes at least once a week | | N/A |
| | - The luminaries shall be operated complete with its protective shield; or | | N/A |
| | - The luminaries shall be operated with a double jacketed lamp | | N/A |
| 6 (3.3.8) | Limitation for semi-luminaires | | N/A |
| 6 (3.3.9) | Power factor and supply current | | N/A |
| 6 (3.3.10) | Deleted (ZZ) | | — |
| 6 (3.3.11) | Luminaires with remote control | | N/A |
| 6 (3.3.12) | Clip-mounted luminaire - warning | | N/A |
| 6 (3.3.13) | Specifications of protective shields | | N/A |
| 6 (3.3.14) | Symbol for nature of supply | 50/60 Hz marked | N/A |
| 6 (3.3.15) | Rated current of socket outlet | | N/A |
| 6 (3.3.16) | Rough service luminaire | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 6 (3.3.17) | Mounting instruction for type X, type Y and type Z attachments | | P |
| 6 (3.3.18) | Non-ordinary luminaires with PVC cable | | N/A |
| 6 (3.3.19) | Protective conductor current (> 10mA and for permanent connection) stated in the instructions | | N/A |
| 6 (3.3.20) | Provided with information if not intended to be mounted within arm's reach | | N/A |
| 6 (3.3.21) | Details of components to be replaced during maintenance (ZZ) | | N/A |
| 6 (3.4) | Test with water | | P |
| | Test with hexane | | P |
| | Legible after test | | P |
| | Label attached | | P |

| | | | |
|--------------|---|--|-----|
| 7 (4) | CONSTRUCTION | | |
| 7 (-) | 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 (ZZ) | | N/A |
| | Each fuse shall (ZZ) | | N/A |
| | (a) be of the 250 V HRC type | | N/A |
| | (b) have a 2.0 A max. quick-acting type rating; and | | N/A |
| | (c) be used to protect a maximum of two lamps | | N/A |
| 7 (4.2) | Components replaceable without difficulty | | P |
| 7 (4.2A) | Capacitors fail in open-circuit mode only and is protected against fire and shock hazard (ZZ) | | N/A |
| | Capacitors are of not less than Type B capacitor with metal body and break action protection in accordance with IEC 61048 and IEC 61049 (ZZ) | | N/A |
| | Capacitors complying with ANCI/EIA-456-A shall comply with IEC 61049 and IEC 61048 (excluding 19.1.1 endurance test) (ZZ) | | N/A |
| | Voltage rating of capacitors is min. 250V at T100 or 280V at T85 (ZZ) | | N/A |
| | Capacitors likely to be permanently subjected to the supply voltage and used for radio interference suppression or for voltage dividing, complying with IEC 60384-14 (ZZ) | | N/A |
| 7 (4.3) | Wireways smooth and free from sharp edges | | P |
| 7 (4.4) | Lampholders | | N/A |
| 7 (4.4.1) | Integral lampholder | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 7 (4.4.2) | Wiring connection | | N/A |
| 7 (4.4.3) | Lampholder for end-to-end mounting | | N/A |
| 7 (4.4.4) | Positioning | | N/A |
| | - pressure test (N) : | | N/A |
| | After test the lampholder complies with relevant standard sheets and shows no damage | | N/A |
| | After test on single-capped lampholder the lampholder has not moved from its position and shows no permanent deformation | | N/A |
| | - bending test on mounting bracket (Nm)..... : | | N/A |
| | After test the lampholder has not moved from its position and shows no permanent deformation | | N/A |
| 7 (4.4.5) | Peak pulse voltage | | N/A |
| 7 (4.4.6) | Centre contact | | N/A |
| 7 (4.4.7) | Parts in rough service luminaires resistance to tracking | | N/A |
| 7 (4.4.8) | Lamp connectors | | N/A |
| 7 (4.4.9) | Caps and bases correctly used | | N/A |
| 7 (4.5) | Starter holders | | N/A |
| | Starter holder in luminaires other than class II | | N/A |
| | Starter holder class II construction | | N/A |
| 7 (4.6) | Terminal blocks | | N/A |
| | Tails | | N/A |
| | Unsecured blocks | | N/A |
| 7 (4.7) | Terminals and supply connections | | P |
| 7 (4.7.1) | Contact to metal parts | | N/A |
| 7 (4.7.2) | Test 8 mm live conductor | | P |
| | Test 8 mm earth conductor | | P |
| 7 (4.7.3) | Terminals for supply conductors | | P |
| 7 (4.7.3.1) | Welded connections: | | N/A |
| | - stranded or solid conductor | | N/A |
| | - spot welding | | N/A |
| | - welding between wires | | N/A |
| | - type Z attachment | | N/A |
| | - mechanical test according to 15.8.2 | | N/A |
| | - electrical test according to 15.9 | | N/A |
| | - ageing test according to 15.9.2.3 and 15.9.2.4 | | N/A |
| 7 (4.7.4) | Terminals other than supply connection | | N/A |
| 7 (4.7.5) | Heat-resistant wiring/sleeves | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 7 (4.7.6) | Multi-pole plug | | N/A |
| | - test at 30 N | | N/A |
| 7 (4.8) | Switches: | | N/A |
| | - adequate rating | | N/A |
| | - adequate fixing | | N/A |
| | - polarized supply | | N/A |
| | - compliance with IEC 61058-1 for electronic switches | | N/A |
| | Switches indicating an off position have air break contacts; and (ZZ) | | N/A |
| | Comply with AS/NZS 3133 or AS/NZS 61058.1 (ZZ) | | N/A |
| 7 (4.9) | Insulating lining and sleeves | | N/A |
| 7 (4.9.1) | Retainment | | N/A |
| | Method of fixing : | | N/A |
| 7 (4.9.2) | Insulated linings and sleeves | | N/A |
| | Electric strength test in accordance with section 10 | | N/A |
| | Thermal properties are checked in accordance with section 12 | | N/A |
| | Heat resistant sleeves: resistant to a temperature > 20°C to the wire temperature or | | N/A |
| | a) & c) Insulation resistance and electric strength | | N/A |
| | b) Ageing test. Temperature (°C) : | | N/A |
| 7 (4.10) | Double and reinforced insulation | | P |
| 7 (4.10.1) | No contact, mounting surface - accessible metal parts - wiring of basic insulation | | N/A |
| | Safe installation fixed luminaires | | N/A |
| | Capacitors and switches | | N/A |
| | Interference suppression capacitors according to IEC 60384-14 | | N/A |
| 7 (4.10.2) | Assembly gaps: | | P |
| | - not coincidental | | P |
| | - no straight access with test probe | | P |
| 7 (4.10.3) | Retainment of insulation: | | P |
| | - fixed | | P |
| | - unable to be replaced; luminaire inoperative | | P |
| | - sleeves retained in position | | N/A |
| | - lining in lampholder | | N/A |
| 7 (4.11) | Electrical connections | | P |

| AS/NZS 60598.2.1 | | | |
|------------------|---|--|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 7 (4.11.1) | Contact pressure | Not transmitted through insulating material. | P |
| 7 (4.11.2) | Screws: | | P |
| | - self-tapping screws | | P |
| | - thread-cutting screws | | P |
| | - at least two self-tapping screws | | P |
| 7 (4.11.3) | Screw locking: | | P |
| | - spring washer | | N/A |
| | - rivets | | N/A |
| 7 (4.11.4) | Material of current-carrying parts | | P |
| 7 (4.11.5) | No contact to wood or mounting surface | | P |
| 7 (4.11.6) | Electro-mechanical contact systems | | N/A |
| 7 (4.12) | Mechanical connections and glands | | P |
| 7 (4.12.1) | Screws not made of soft metal | | P |
| | Screws of insulating material | | N/A |
| | Torque test: torque (Nm); part..... : | LED driver mounting screw: 1.2 | P |
| | Torque test: torque (Nm); part..... : | Earthing screw: 1.2 | P |
| | Torque test: torque (Nm); part..... : | Supply terminal screw: 1.2 | P |
| 7 (4.12.2) | Screws with diameter < 3 mm screwed into metal | | N/A |
| 7 (4.12.4) | Locked connections: | | N/A |
| | - fixed arms; torque (Nm) | | N/A |
| | - lampholder; torque (Nm) | | N/A |
| | •The torque test to lampholders is not applied to lampholders retained in the luminaire by more than one fixing means | | N/A |
| | •For lampholders (other than E10, E14, E26, E27, E40, B15, B22) exposed to a rotary action, the test torque is two times the max. withdrawal torque as specified in IEC 60061-2, with a minimum of 1.2 Nm | | N/A |
| | - push-button switches; torque 0.8 Nm | | N/A |
| 7 (4.12.5) | Screwed glands; force (N)..... : | | N/A |
| 7 (4.13) | Mechanical strength | | P |
| 7 (4.13.1) | Impact tests: | | P |
| | - fragile parts; energy (Nm) | | N/A |
| | - other parts; energy (Nm)..... : | 0.35 | P |
| | 1) live parts | | P |
| | 2) linings | | N/A |
| | 3) protection | | P |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | 4) covers | | P |
| 7 (4.13.3) | Straight test finger | | P |
| 7 (4.13.4) | Rough service luminaires | | N/A |
| | - IP54 or higher | | N/A |
| | a) fixed | | N/A |
| | b) hand-held | | N/A |
| | c) delivered with a stand | | N/A |
| | d) for temporary installations and suitable for mounting on a stand | | N/A |
| 7 (4.13.6) | Tumbling barrel | | N/A |
| 7 (4.14) | Suspensions and adjusting devices | | P |
| 7 (4.14.1) | Mechanical load: | | P |
| | A) four times the weight | | P |
| | B) torque 2.5 Nm | | N/A |
| | C) bracket arm; bending moment (Nm)..... : | | N/A |
| | D) load track-mounted luminaires | | N/A |
| | E) clip-mounted luminaires, glass-shelve. Thickness (mm)..... : | | N/A |
| | metal rod. diameter (mm)..... : | | N/A |
| | Fixed luminaire or independent control gear without fixing devices | | N/A |
| 7 (4.14.2) | Load to flexible cables | | N/A |
| | Mass (kg)..... : | | N/A |
| | Stress in conductors (N/mm ²) : | | N/A |
| | Mass (kg) of semi-luminaire : | | N/A |
| | Bending moment (Nm) of semi-luminaire..... : | | N/A |
| 7 (4.14.3) | Adjusting devices: | | N/A |
| | a) Adjusting devices and means of adjustment: | | N/A |
| | - flexing test; number of cycles..... : | | N/A |
| | - strands broken | | N/A |
| | - electric strength test afterwards | | N/A |
| | b) Intended adjustment within arms reach of the luminaire shall not: | | N/A |
| | - impair the stability of the luminaire | | N/A |
| | - cause deformation of any part of the construction | | N/A |
| | - cause injury due to high temperatures | | N/A |
| | c) No excessive temperatures on the space surrounding any means of adjustment or lighted means of adjustment | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|------------------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 7 (4.14.4) | Telescopic tubes: cords not fixed to tube; no strain on conductors | | N/A |
| 7 (4.14.5) | Guide pulleys | | N/A |
| 7 (4.14.6) | Strain on socket-outlets | | N/A |
| 7 (4.15) | Flammable materials: | | P |
| | - glow-wire test 650°C | | P |
| | - spacing \geq 30 mm | | N/A |
| | - screen withstanding test of 13.3.1 | | N/A |
| | - screen dimensions | | N/A |
| | - no fiercely burning material | | P |
| | - thermal protection | | N/A |
| | - electronic circuits exempted | | N/A |
| 7 (4.15.2) | Luminaires made of thermoplastic material with lamp control gear | | N/A |
| | a) construction | | N/A |
| | b) temperature sensing control | | N/A |
| | c) surface temperature | | N/A |
| 7 (4.16) | Luminaires for mounting on normally flammable surface | | N/A |
| | No lamp control gear | (compliance with Section 12) | N/A |
| 7 (4.16.1) | Lamp control gear spacing: | | N/A |
| | - spacing 35 mm | | N/A |
| | - spacing 10 mm | | N/A |
| 7 (4.16.2) | Thermal protection: | | N/A |
| | - in lamp control gear | | N/A |
| | - external | | N/A |
| | - fixed position | | N/A |
| | - temperature marked lamp control gear | | N/A |
| 7 (4.16.3) | Design to satisfy the test of 12.6 | (see 12.6) | N/A |
| 7 (4.17) | Drain holes | | N/A |
| | Clearance at least 5 mm | | N/A |
| 7 (4.18) | Resistance to corrosion: | | N/A |
| 7 (4.18.1) | - rust-resistance | | N/A |
| 7 (4.18.2) | - season cracking in copper | | N/A |
| 7 (4.18.3) | - corrosion of aluminium | | N/A |
| 7 (4.19) | Ignitors compatible with ballast | | N/A |
| 7 (4.20) | Rough service vibration | | N/A |
| 7 (4.21) | Protective shield: | | N/A |
| 7 (4.21.1) | Shield fitted for tungsten halogen lamps or metal halide lamps | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Shield of glass for tungsten halogen lamps | | N/A |
| | Not required for luminaires used with self-shielded lamps only and marked with appropriate symbol | | N/A |
| 7 (4.21.2) | Particles from a shattering lamp not impair safety | | N/A |
| 7 (4.21.3) | No direct path | | N/A |
| 7 (4.21.4) | Impact test on shield | | N/A |
| | Glow-wire test on lamp compartment | | N/A |
| 7 (4.22) | Attachments to lamps | | N/A |
| 7 (4.23) | Semi-luminaires comply Class II | | N/A |
| 7 (4.24) | UV radiation for tungsten halogen lamps and metal halide lamps (Annex P) | | N/A |
| 7 (4.25) | No sharp point or edges | | P |
| 7 (4.26) | Short-circuit protection: | | N/A |
| 7 (4.26.1) | Uninsulated accessible SELV parts | | N/A |
| 7 (4.26.2) | Short-circuit test | | N/A |
| 7 (4.26.3) | Test chain according to figure 29 | | N/A |
| 7 (4.27) | Terminal blocks with integrated screwless earthing contacts tested according Annex V | | N/A |
| | Pull test of terminal fixing (20 N) | | N/A |
| | After test, resistance $\leq 0.05 \Omega$ | | N/A |
| | Pull test of mechanical connection (50 N) | | N/A |
| | After test, resistance $\leq 0.05 \Omega$ | | N/A |
| | Voltage drop test, resistance $\leq 0.05 \Omega$ | | N/A |

| | | | |
|---------------|---|---|---|
| 8 (11) | CREEPAGE DISTANCES AND CLEARANCES | | |
| | Working voltage (V)..... : | 240V | — |
| | Voltage form | Sinusoidal <input checked="" type="checkbox"/> Non-sinusoidal <input type="checkbox"/> | — |
| | PTI | < 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/> | — |
| | Impulse withstand category (Normal category II) (Category III Annex U) | Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/> | — |
| | Rated pulse voltage (kV)..... : | | — |
| | (1) Current-carrying parts of different polarity: cr (mm); cl (mm)..... : | Supply terminals: Cr>15mm; Cl>15mm Limit: Cr=2.5mm ; Cl=1.5mm | |

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|------------------|---|--|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | (2) Current-carrying parts and accessible parts: cr (mm); cl (mm)..... : | Between live parts of LED PCB and luminaire plastic cover surface: Cr >30mm; Cl>30mm Limit: Cr= 5mm; Cl=3mm Between live parts and Earth: Cr >5mm ; Cl>5mm Limit: Cr=2.5mm; Cl=1.5m | P |
| | (3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm)..... : | | N/A |
| | (4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm)..... : | At cord gland Cr>5mm; Cl>5mm Limit: Cr=2.5mm; Cl=1.5m | P |
| | (5) Not used | | — |
| | (6) Current-carrying parts and supporting surface: cr (mm); cl (mm)..... : | | N/A |

| | | | |
|-------------------|--|--|-----|
| 9 (7) | PROVISION FOR EARTHING | | |
| 9 (7.2.1 + 7.2.3) | Accessible metal parts | | P |
| | Metal parts in contact with supporting surface | | P |
| | Resistance $\leq 0.5 \Omega$ | | P |
| | Self-tapping screws used | | N/A |
| | Thread-forming screws | | N/A |
| | Thread-forming screw used in a groove | | N/A |
| | Earth makes contact first | | P |
| | Terminal blocks with integrated screwless earthing contacts tested according Annex V | | N/A |
| 9 (7.2.2 + 7.2.3) | Earth continuity in joints etc. | | N/A |
| 9 (7.2.4) | Locking of clamping means | | P |
| | Compliance with 4.7.3 | | P |
| | Terminal blocks with integrated screwless earthing contacts tested according Annex V | | N/A |
| 9 (7.2.5) | Earth terminal integral part of connector socket | | N/A |
| 9 (7.2.6) | Earth terminal adjacent to mains terminals | | P |
| 9 (7.2.7) | Electrolytic corrosion of the earth terminal | | P |
| 9 (7.2.8) | Material of earth terminal | | P |
| | Contact surface bare metal | | P |
| 9 (7.2.10) | Class II luminaire for looping-in | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Double or reinforced insulation to functional earth | | N/A |
| 9 (7.2.11) | Earthing core coloured green-yellow | | P |
| | All conductors coloured green, yellow or green/yellow combination shall only be connected to an earthing terminal (ZZ) | | P |
| | Length of earth conductor | | P |

| | | | |
|----------------|-------------------------------------|---------------|-----|
| 10 (14) | SCREW TERMINALS | | |
| | Separately approved; component list | (see Annex 1) | N/A |
| | Part of the luminaire | (see Annex 3) | N/A |

| | | | |
|----------------|-------------------------------------|---------------|-----|
| 10 (15) | SCREWLESS TERMINALS | | |
| | Separately approved; component list | (see Annex 1) | P |
| | Part of the luminaire | (see Annex 4) | N/A |

| | | | |
|---------------|--|-------------------------|-----|
| 11 (5) | EXTERNAL AND INTERNAL WIRING | | |
| 11 (5.2) | Supply connection and external wiring | | |
| 11 (5.2.1) | Means of connection (ZZ) | Supply cord, No plug | P |
| | In Australia, non-portable luminaires with a supply cord shall be fitted with a plug or a coupler; except (ZZ) | | N/A |
| | The luminaire has markings and instructions complying with Clause 3.2.12 (ZZ) | | P |
| | Plug portion of a luminaire with integral pins complies with Appendix J of AS/NZS 3112 (ZZ) | | N/A |
| 11 (5.2.2) | Type of cable (ZZ) | H05VV-F | P |
| | Nominal cross-sectional area (mm ²) (ZZ) | 5 X 0.75mm ² | P |
| 11 (5.2.3) | Type of attachment, X, Y or Z | Type Y | P |
| 11 (5.2.5) | Type Z not connected to screws | | N/A |
| 11 (5.2.6) | Cable entries: | | P |
| | - suitable for introduction | | P |
| | - adequate degree of protection | | P |
| 11 (5.2.7) | Cable entries through rigid material have rounded edges | | P |
| 11 (5.2.8) | Insulating bushings: | | P |
| | - suitably fixed | | P |
| | - material in bushings | | P |
| | - tubes or guards made of insulating material | | P |
| 11 (5.2.9) | Locking of screwed bushings | | P |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 11 (5.2.10) | Cord anchorage: | | P |
| | - covering protected from abrasion | | P |
| | - clear how to be effective | | P |
| | - no mechanical or thermal stress | | P |
| | - no tying of cables into knots etc. | | P |
| | - insulating material or lining | | P |
| 11 (5.2.10.1) | Cord anchorage for type X attachment: | | N/A |
| | a) at least one part fixed | | N/A |
| | b) types of cable | | N/A |
| | c) no damaging of the cable | | N/A |
| | d) whole cable can be mounted | | N/A |
| | e) no touching of clamping screws | | N/A |
| | f) metal screw not directly on cable | | N/A |
| | g) replacement without special tool | | N/A |
| | Glands not used as anchorage | | N/A |
| | Labyrinth type anchorages | | N/A |
| 11 (5.2.10.2) | Adequate cord anchorage for type Y and type Z attachment | | P |
| 11 (5.2.10.3) | Tests: | | P |
| | - impossible to push cable; unsafe | | P |
| | - pull test: 25 times; pull (N) : 80N | | P |
| | - torque test: torque (Nm)..... : 0.35Nm | | P |
| | - displacement ≤ 2 mm | 0.8mm | P |
| | - no movement of conductors | | P |
| | - no damage of cable or cord | | P |
| 11 (5.2.11) | External wiring passing into luminaire | | N/A |
| 11 (5.2.12) | Looping-in terminals | | N/A |
| 11 (5.2.13) | Wire ends not tinned | | N/A |
| | Wire ends tinned: no cold flow | | N/A |
| 11 (5.2.14) | Mains plug same protection | | N/A |
| | In the country where national legislation requires the fitting of a certain plug which does not provide the required ingress protection, adequate instructions for connection to the supply ensuring an equivalent degree of protection are provided | | N/A |
| | Class III luminaire plug | | N/A |
| | Plugs and socket-outlets for class III luminaires, where a safety isolating transformer ($\leq 3A$; $\leq 25V_{a.c.}/60V_{d.c.}$; $\leq 72W$) is delivered with: | | - |

| AS/NZS 60598.2.1 | | | |
|------------------|---|--|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - plugs not be able to enter socket-outlets of other voltage systems (according to IEC 60083) | | N/A |
| | - socket-outlets not admit plugs of other voltage systems | | N/A |
| | - socket-outlets not have the protective earth contact | | N/A |
| 11 (5.2.16) | Appliance inlets (IEC 60320) | | N/A |
| | Appliance couplers of class II type | | N/A |
| | Class II luminaires for fixed wiring incorporating an appliance coupler shall not have means to allow further luminaires to be connected (ZZ) | | N/A |
| | Luminaire couplers incorporated with the luminaire comply with IEC 61995-1 (ZZ) | | N/A |
| 11 (5.2.17) | Non-standardized inter-connecting cables properly assembled | | N/A |
| 11 (5.2.18) | All portable luminaires with a flexible supply cord shall be fitted with a plug complying with AS/NZS 3112 (ZZ) | | N/A |
| | Other luminaires with flexible cords shall be fitted with a plug complying with AS/NZS 3112; unless (ZZ) | | N/A |
| | They have the warning allowed by Clause 3.2.12 (ZZ) | | N/A |
| 11 (5.2.19) | Installation couplers incorporated within luminaires comply with the requirements of AS/NZS 61535 (ZZ) | Annex ZZ of AS/NZS 61535 was assessed. | P |
| | Luminaires incorporating installation couplers may have means to allow further luminaires to be connected by cascading provided the through wiring is rated for the current rating of the installation coupler (ZZ) | | P |
| 11 (5.3) | Internal wiring | | P |
| 11 (5.3.1) | Internal wiring of suitable size and type | | P |
| | Through wiring | | P |
| | - not delivered/ mounting instruction | | N/A |
| | - factory assembled | | P |
| | - socket outlet loaded (A) : 16A | | P |
| | - temperatures : (see Annex 2) | | P |
| | Internal wires coloured green, yellow or green/yellow combination are used for making protective earth connections only (ZZ) | | P |
| | Functional earth connections shall not be made by wires coloured green, yellow or green/yellow combination (ZZ) | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 11 (5.3.1.1) | Internal wiring connected directly to fixed wiring | | N/A |
| | Cross-sectional area (mm ²)..... : | | N/A |
| | Insulation thickness | | N/A |
| | Extra insulation added where necessary | | N/A |
| 11 (5.3.1.2) | Internal wiring connected to fixed wiring via internal current-limiting device | | N/A |
| | Adequate cross-sectional area and insulation thickness | | N/A |
| 11 (5.3.1.3) | Double or reinforced insulation for class II | | N/A |
| 11 (5.3.1.4) | Conductors without insulation | | N/A |
| 11 (5.3.1.5) | SELV current-carrying parts | | N/A |
| 11 (5.3.1.6) | Insulation thickness other than PVC or rubber | | P |
| 11 (5.3.2) | Sharp edges etc. | | P |
| | No moving parts of switches etc. | | N/A |
| | Joints, raising/lowering devices | | N/A |
| | Telescopic tubes etc. | | N/A |
| | No twisting over 360° | | P |
| 11 (5.3.3) | Openings | | N/A |
| | - bushings not removable | | N/A |
| | - bushings in sharp openings | | N/A |
| | - cables with protective sheath | | N/A |
| 11 (5.3.4) | Joints and junctions effectively insulated | | N/A |
| 11 (5.3.5) | Strain on internal wiring | | N/A |
| 11 (5.3.6) | Wire carriers | | N/A |
| 11 (5.3.7) | Wire ends not tinned | | P |
| | Wire ends tinned: no cold flow | | N/A |

| | | | |
|---------------|--|---------------------|-----|
| 12 (8) | PROTECTION AGAINST ELECTRIC SHOCK | | |
| 12 (8.2.1) | Live parts and basic insulation not accessible (ZZ) | | P |
| | This does not apply to the non-current carrying parts of caps complying with the relevant IEC standard (ZZ) | | N/A |
| | Protective cover with caution symbol is left in place during the tests and inspections (ZZ) | Non-replaceable LED | N/A |
| | The cover is held securely in position by fixings requiring the use of a tool to remove and at least two independent fixings are used (ZZ) | | N/A |
| | Live parts not accessible with standard test finger when the luminaire is installed or assembled for normal use; and | | P |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - basic insulated parts not accessible with standard test finger on portable and adjustable luminaires | | P |
| | - basic insulated parts not accessible with Ø 50 mm probe from outside, within arm's reach, on wall-mounted luminaires | | N/A |
| | Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements | | N/A |
| | Basic insulation may be accessible under lamp or starter replacement | | N/A |
| | A component intended for building-in is used on the outside of a fully assembled luminaire which can be touched by the 50 mm sphere, it shall comply with the relevant requirements applied to an independent component | | N/A |
| | Protection in any position | | P |
| | Double-ended tungsten filament lamp | | N/A |
| | Insulation lacquer not reliable | | N/A |
| | Double-ended high pressure discharge lamp | | N/A |
| | Relevant warning according to 3.2.18 fitted to the luminaire | | N/A |
| 12 (8.2.2) | Portable luminaire adjusted in most unfavourable position | | N/A |
| 12 (8.2.3) | Additional requirements for protection against electric shock: | | - |
| | a) Class II luminaire: | | N/A |
| | - basic insulated metal parts not accessible during starter or lamp replacement | | N/A |
| | - basic insulation not accessible other than during starter or lamp replacement | | N/A |
| | - glass protective shields not used as supplementary insulation | | N/A |
| | b) Class I luminaire with BC lampholder | | N/A |
| | c) Class III luminaires may have exposed current carrying parts in the SELV circuit, if | | N/A |
| | Ordinary luminaires: | | N/A |
| | - voltage under load ($\leq 25V_{a.c.} / 60V_{d.c.}$)..... : | | N/A |
| | - touch current ($\leq 0.7 \text{ mA peak} / 2.0 \text{ mA d.c.}$) if the voltage limit exceeded..... : | | N/A |
| | - no-load voltage ($\leq 35V_{\text{peak}} / 60V_{d.c.}$)..... : | | N/A |
| | If the voltages/currents exceed the limits given above, at least one side is adequately insulated (500V/1min) | | N/A |
| | Luminaires other than ordinary: | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - nominal voltage ($\leq 12\text{Va.c.} / 30\text{Vd.c.}$) | | N/A |
| | Class III luminaires are accepted only for connection to a SELV source | | N/A |
| 12 (8.2.4) | Portable luminaire: | | N/A |
| | - protection independent of supporting surface | | N/A |
| | - terminal block completely covered (ZZ) | | N/A |
| 12 (8.2.5) | Compliance with the sphere probe and standard test finger or relevant probe | | P |
| 12 (8.2.6) | Covers reliably secured | | N/A |
| | Tests on covers whose fixing is not dependent on screws and whose removal is obtained by applying a force in an approx. perpendicular direction to the mounting/supporting surface | | N/A |
| 12 (8.2.7) | Discharging of capacitors $\geq 0.5 \mu\text{F}$ | | N/A |
| | Portable plug connected luminaire with capacitor | | N/A |
| | Other plug connected luminaire with capacitor | | N/A |
| | Discharge device on or within capacitor | | N/A |
| | Discharge device mounted separately | | N/A |

| | | | |
|----------------|--|------------------------|-----|
| 13 (12) | ENDURANCE TEST AND THERMAL TEST | | |
| 13 (-) | Test order for luminaires > IP20: (12.3) - (9.2) - (12.4) - (12.5) - (12.6) - (9.3) | | P |
| 13 (12.3) | Endurance test: | | P |
| | - mounting-position | Suspended from ceiling | — |
| | - test temperature ($^{\circ}\text{C}$) | 35 | — |
| | - total duration (h) | 168 | — |
| | - supply voltage: Un factor; calculated voltage (V) | 264 | — |
| | - lamp used | Mounted LED | — |
| 13 (12.3.2) | After endurance test: | | P |
| | - no part unserviceable | | P |
| | - luminaire not unsafe | | P |
| | - no damage to track system | | N/A |
| | - marking legible | | P |
| | - no cracks, deformation etc. | | P |
| 13 (12.4) | Thermal test (normal operation) | (see Annex 2) | P |
| 13 (12.5) | Thermal test (abnormal operation) | (see Annex 2) | P |
| 13 (12.6) | Thermal test (failed windings in lamp control gear): | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| 13 (12.6.1) | Through wiring or looping-in wiring loaded by a current of (A) | | — |
| | - case of abnormal conditions | | — |
| | - electronic lamp control gear | | — |
| | - measured winding temperature (°C): at 1.1 Un : | | — |
| | - measured mounting surface temperature (°C): at 1.1 Un | | N/A |
| | - calculated mounting surface temperature (°C) . : | | N/A |
| | - track-mounted luminaires | | N/A |
| 13 (12.6.2) | Temperature sensing control | | N/A |
| | - case of abnormal conditions | | — |
| | - thermal link | | N/A |
| | - manual reset cut-out | | N/A |
| | - auto reset cut-out | | N/A |
| | - measured mounting surface temperature (°C):: | | N/A |
| | - track-mounted luminaires | | N/A |
| 13 (12.7) | Thermal test (fault conditions in lamp control gear or electronic devices incorporated in thermoplastic luminaires): | | N/A |
| 13 (12.7.1) | Luminaires without temperature sensing controls | | N/A |
| 13 (12.7.1.1) | Luminaires incorporating ballast(s) of fluorescent lamps with a lamp load ≤ 70W | | N/A |
| | Test method 12.7.1.1 or Annex W | | — |
| | Test according to 12.7.1.1: | | N/A |
| | - case of abnormal conditions | | — |
| | - ballast failure at supply voltage (V) | | — |
| | - components retained in place after the test | | N/A |
| | - test with standard test finger after the test | | N/A |
| | Test according to Annex W: | | N/A |
| | - case of abnormal conditions | | — |
| | - measured winding temperature (°C): at 1.1 Un : | | — |
| | - measured temperature of fixing point/exposed part (°C): at 1.1 Un | | — |
| | - calculated temperature of fixing point/exposed part (°C) | | — |
| | Ball-pressure test: | | N/A |
| | - part tested; temperature (°C) | | N/A |
| | - part tested; temperature (°C) | | N/A |
| 13 (12.7.1.2) | Luminaires incorporating discharge lamps, fluorescent lamps (> 70W), transformer of power > 10 VA | | N/A |

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|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - case of abnormal conditions | | — |
| | - measured winding temperature (°C): at 1.1 Un : | | — |
| | - measured temperature of fixing point/exposed part (°C): at 1.1 Un | | — |
| | - calculated temperature of fixing point/exposed part (°C)..... | | — |
| | Ball-pressure test: | | N/A |
| | - part tested; temperature (°C) | | N/A |
| | - part tested; temperature (°C) | | N/A |
| 13 (12.7.1.3) | Luminaires with inherently short-circuit proof transformer of power ≤ 10 VA | | N/A |
| | - case of abnormal conditions | | — |
| | - components retained in place after the test | | N/A |
| | - test with standard test finger after the test | | N/A |
| 13 (12.7.2) | Luminaires with temperature sensing controls internal/external to the ballast or transformer | | N/A |
| | - thermal link | Yes / No | — |
| | - manual reset cut-out | Yes / No | — |
| | - auto reset cut-out | Yes / No | — |
| | - case of abnormal conditions | | — |
| | - highest measured temperature of fixing point/exposed part (°C) | | — |
| | Ball-pressure test: | | N/A |
| | - part tested; temperature (°C) | | N/A |
| | - part tested; temperature (°C) | | N/A |

| | | | |
|---------------|--|----------------------------|-----|
| 14 (9) | RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE | | |
| 14 (-) | If IP > IP 20 the order of the test specified in clause 13 | | P |
| 14 (9.2) | Tests for ingress of dust, solid objects and moisture: | | P |
| | - classification according to IP..... | IP2X | — |
| | - mounting position during test | Mounted as per instruction | — |
| | - fixing screws tightened; torque (Nm) | | — |
| | - tests according to clauses..... | 9.2.0 | — |
| | - electric strength test afterwards | | P |
| | a) no deposit in dust-proof luminaire | | N/A |
| | b) no talcum in dust-tight luminaire | | N/A |
| | c) no trace of water on current-carrying parts or where it could become a hazard | | N/A |

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|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | d) i) For luminaires without drain holes – no water entry | | N/A |
| | d) ii) For luminaires with drain holes – no hazardous water entry | | N/A |
| | e) no water in watertight luminaire | | N/A |
| | f) no contact with live parts (IP2X) | | P |
| | f) no entry into enclosure (IP3X and IP4X) | | N/A |
| | f) no contact with live parts (IP3X and IP4X) | | N/A |
| | g) no trace of water on part of lamp requiring protection from splashing water | | N/A |
| | h) no damage of protective shield or glass envelope | | N/A |
| 14 (9.3) | Humidity test 48 h | | P |

| | | | |
|----------------|---|--------|-----|
| 15 (10) | INSULATION RESISTANCE AND ELECTRIC STRENGTH | | |
| 15 (10.2.1) | Insulation resistance test | | P |
| | Cable or cord covered by metal foil or replaced by a metal rod of mm Ø..... : | | — |
| | Insulation resistance (MΩ): | | |
| | SELV: | | N/A |
| | - between current-carrying parts of different polarity | | N/A |
| | - between current-carrying parts and mounting surface..... : | | N/A |
| | - between current-carrying parts and metal parts of the luminaire | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : | | N/A |
| | - insulating bushings as described in Section 5 .. : | | N/A |
| | Other than SELV: | | P |
| | - between live parts of different polarity | >999MΩ | P |
| | - between live parts and mounting surface | | N/A |
| | - between live parts and metal parts | >999MΩ | P |
| | - between live parts of different polarity through action of a switch | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : | >999MΩ | P |
| | - insulating bushings as described in Section 5 .. : | >999MΩ | P |
| 15 (10.2.2) | Electric strength test | | P |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Dummy lamp | | N/A |
| | Luminaires with ignitors after 24 h test | | N/A |
| | Luminaires with manual ignitors | | N/A |
| | Test voltage (V): | | P |
| | SELV: | | N/A |
| | - between current-carrying parts of different polarity | | N/A |
| | - between current-carrying parts and mounting surface..... | | N/A |
| | - between current-carrying parts and metal parts of the luminaire | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... | | N/A |
| | - insulating bushings as described in Section 5 .. | | N/A |
| | Other than SELV: | | P |
| | - between live parts of different polarity | 1480V | P |
| | - between live parts and mounting surface | | N/A |
| | - between live parts and metal parts | 1480V | P |
| | - between live parts of different polarity through action of a switch | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... | 1480V | P |
| | - insulating bushings as described in Section 5 .. | 1480V | P |
| 15 (10.3.1) | Measured touch current (limit: ≤ 0.7 mA peak) ... | 0.011mA peak | P |
| | Measured protective conductor current (mA)..... | 0.06mA | P |
| | Max. protective conductor current limit (mA r.m.s.) | 3.5mA | P |

| | | | |
|----------------|---|-----------------------------|---|
| 16 (13) | RESISTANCE TO HEAT, FIRE AND TRACKING | | |
| 16 (13.2.1) | Ball-pressure test: | | P |
| | - part tested; temperature (°C) | Supply terminal; 125°C | P |
| | - part tested; temperature (°C) | installation coupler; 125°C | P |
| | - part tested; temperature (°C) | LED driver terminal; 125°C | P |
| | - part tested; temperature (°C) | Luminaire cover; 75°C | P |
| 16 (13.3) | Parts of non-metallic material are resistant to flame and ignition (ZZ) | | P |

| AS/NZS 60598.2.1 | | | |
|------------------|---|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | This requirement does not apply to decorative trims, knobs, wiring insulation and other parts not likely to be ignited or to propagate flames from inside the luminaires (ZZ) | | N/A |
| | This clause applies to all parts, including components, even if they have been tested to their own standard (ZZ) | | P |
| 16 (13.3.1) | Parts of non-metallic material supporting connections withstand 750°C glow-wire test as per AS/NZS 60695.2.10 (ZZ) | (see appended table) | P |
| 16 (13.3.2) | All other parts of non-metallic material withstand 650°C glow-wire test as per AS/NZS 60695.2.10 (ZZ) | (see appended table) | P |
| 16 (13.3.3) | If a flame persists longer than 2 s during the 750°C glow-wire test, non-metallic parts above the connection, as specified, subjected to the needle-flame test of AS/NZS 60695.11.5 (ZZ)..... | (see appended table) | P |
| | Parts shielded by a barrier that meets the needle-flame test are not tested (ZZ) | | N/A |
| | The needle-flame test not carried out on parts that are made of material classified as V-0 or V-1 according to AS/NZS 60695.11.10; The part used in the luminaire not thinner than the classified sample (ZZ) | | N/A |
| 16 (13.3.4) | PCBs in luminaires subjected to needle-flame test of AS/NZS 60695.11.5 (ZZ)..... | (see appended table) | P |
| | Test not applicable to PCBs made of material that is V-0 rated according to AS/NZS 60695.11.10 (ZZ) | | P |
| 16 (13.4) | Resistance to tracking | | N/A |
| | Tracking test: part tested..... | | N/A |
| | Tracking test: part tested..... | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| |
|---|
| APPENDIX A SAFETY REQUIREMENTS FOR DOUBLE-CAPPED LED LAMPS (Normative) (ZZ) |
|---|

| | | |
|-----------|----------------|--|
| A1 | GENERAL | |
|-----------|----------------|--|

| | | |
|-----------|-----------------------------|--|
| A2 | REFERENCED DOCUMENTS | |
|-----------|-----------------------------|--|

| | | |
|-----------|-------------------|--|
| A3 | DEFINITION | |
|-----------|-------------------|--|

| | | | |
|-----------|--|-------|-----|
| A4 | CLASSIFICATIONS OF LAMP(S) | | |
| A4.1 | Class | | N/A |
| | Classified in accordance with the provisions of Section 2 of AS/NZS 60598.1 | | N/A |
| | Type of protection (class II or class III) : | Class | N/A |
| | Class III lamps have class II construction and comply with requirements for class II lamps at 240 V a.c. | | N/A |
| A4.2 | Type | | N/A |
| | Lamps classified as Type A or Type B : | Type | N/A |

| | | | |
|------------|--|--|-----|
| A5 | MARKING | | |
| A5.1 | General | | N/A |
| A5.1 (3.4) | Test with water | | N/A |
| | Test with hexane | | N/A |
| | Legible after test | | N/A |
| | Label attached | | N/A |
| A5.2 | Marking on the lamp | | N/A |
| | (a) Mark of origin | | N/A |
| | (b) Rated voltage or voltage range | | N/A |
| | (c) Rated wattage | | N/A |
| | (d) Rated frequency | | N/A |
| | (e) A value for allowable case temperature t_c and a marked point of measurement | | N/A |
| | (f) Model number | | N/A |
| | (g) IP rating if > IP20 | | N/A |
| | (h) Identification of line and neutral supply connections of the lampholder | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | (i) The lamp type shall be marked with the text 'Type A' or 'Type B', as per the appropriate subfigure of Figure A1, to indicate the lamp cap configuration: | | N/A |
| | 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. | | N/A |
| A5.3 | Warning label for the luminaire | | N/A |
| | Warning label supplied with the lamp: WARNING: NOT FOR USE WITH ANY FLUORESCENT LAMP—FOR USE ONLY WITH TYPE X LED LAMPS (X = A or B) | | N/A |
| | Minimum size of 5 mm for letters and numbers and 5 mm for symbols | | N/A |
| | Instructions for the installer to ensure the warning label is placed in a prominent position on the luminaire and visible when the lamp is installed | | N/A |
| A5.4 | Marking of associated components | | N/A |
| | 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. | | N/A |

| | | | |
|-----------|--|--|-----|
| A6 | INSTRUCTIONS | | |
| A6.1 | Information to be supplied with the lamp | | N/A |
| | (a) Special conditions or restrictions to be observed for lamp operation | | N/A |
| | (b) Wiring diagram for lamp installation | | N/A |
| | (b) Wiring diagram for new luminaires | | N/A |
| | (c) Information on the specification and compatibility of control gear | | N/A |
| | (d) The ambient operating temperature range, if other than 10 to 30°C | | N/A |
| | (e) The type of lamp it replaces | | N/A |
| A6.2 | Information to be supplied for emergency luminaires | | N/A |
| | Lamps not suitable for use in emergency luminaires | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Lamps suitable for use in emergency luminaires | | N/A |
| A6.3 | Information about additional components | | N/A |
| A6.4 | Warnings | | N/A |
| | Warnings included in the instructions for lamps intended for use in an existing luminaire that requires modification other than replacement of the lamp or starter | | N/A |
| | Warnings included in the instructions for lamps intended for use in a new luminaire | | N/A |
| A6.5 | Additional information | | N/A |
| | Installation instructions are provided | | N/A |
| | Adequate guidance to safely perform the retrofit or modification | | N/A |
| | Graphical instructions of necessary steps may be used | | N/A |
| | The instruction manual is in English and provided with the lamp | | N/A |
| | Instructions for fitting are supplied for lamps requiring additional mechanical support | | N/A |
| | Appropriate warnings and instructions for eye protection are provided as per AS/NZS IEC 62471.2 | | N/A |

| | | | |
|-----------|--|--|-----|
| A7 | CONSTRUCTION | | |
| A7.1 | General | | N/A |
| | Lamps function reliably and cause no danger to the user or surroundings | | N/A |
| | The provisions of Section 4 of AS/NZS 60598.1 are not applicable, except for the provisions for lampholders, double and reinforced insulation, screws and connections (mechanical), and glands. The following applies: | | N/A |
| | (a) Not exposing live parts or unearthed exposed metal parts to personal contact for the replacement of lamps and replacement or cleaning of optical components | | N/A |
| | (b) Protection against electric shock is maintained for all methods and positions of installation in normal use | | N/A |
| | (c) Metal parts are inherently non-corrosive, protected against corrosion or otherwise suitable for the purpose | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | (d) Internal wiring is considered as basic insulation only. If internal wiring can come in contact with external metal parts then sleeving, or equivalent method, that complies with the requirements for supplementary insulation shall be used to prevent contact with the external metal parts. | | N/A |
| A7.2 | Components that replace the starter | | N/A |
| | If lamps need to be used with a component that replaces the starter, the component shall have an internal 250 V HRC 2 A max. quick-acting fuse. | | N/A |
| | If lamps need to operate in combination with a component that replaces the starter, this component shall be supplied together with the lamp. This component shall comply with the dimensions, appropriate electrical, mechanical and thermal tests required by Section 1 of AS/NZS 60155 | | N/A |
| A7.3 | Emergency lamps | | N/A |
| A7.4 | Compatibility of electrical supply to the lamp | | N/A |

| | | | |
|-----------|--|--|-----|
| A8 | INTERCHANGEABILITY | | |
| | Interchangeability is ensured by the use of lamp caps in accordance with IEC 60061-1 and gauges in accordance with IEC 60061-3 | | N/A |
| | Compliance is checked by the use of the relevant gauges; or | | N/A |
| | Compliance is checked by measurement | | N/A |
| | If lamps need to operate in combination with a component which replaces the starter, this component shall be supplied together with the lamp | | N/A |
| | This component shall comply with the dimensions and electrical, mechanical and thermal tests required by Section 1 of AS/NZS 60155 | | N/A |

| | | | |
|-----------|--|--|-----|
| A9 | MASS | | |
| | The entire mass of a lamp ≤ 500 g for a G13-capped lamp or ≤ 200 g for a lamp with another type of end cap; except | | N/A |
| | An additional mechanical support is provided | | N/A |
| | The additional mechanical support is provided with the lamp | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | The additional mechanical support is double insulated and the fixing means do not penetrate the enclosure of the luminaire | | N/A |
| | All tests are conducted with the additional mechanical support in place in accordance with the manufacturer's instructions | | N/A |
| | The additional mechanical support complied with the tests of Clause 4.14 of AS/NZS 60598.1 | | N/A |

| | | | |
|------------|---|--|-----|
| A10 | DIMENSIONS | | |
| | Lamps have the dimensions of the corresponding lamps they are replacing in accordance with the relevant data sheets | | N/A |
| | These dimensional requirements do not apply to any additional support mechanisms | | N/A |
| | Compliance is checked by measurement; or | | N/A |
| | Compliance is checked by gauges as appropriate | | N/A |

| | | | |
|------------|---|--|-----|
| A11 | MECHANICAL REQUIREMENTS AND TESTS FOR CAPS | | |
| A11.1 | Construction and assembly | | N/A |
| | Caps are so constructed and assembled that they remain attached to the tubes during and after operation | | N/A |
| A11.2 | Torque test | | N/A |
| | A torque test (1 Nm for 30 s) is applied to the lamp contact pins | | N/A |
| | For lamps with adjustable caps, the lamp cap is rotated to its extreme positions before the test | | N/A |
| | During the test, the lamp cap remains firmly attached to the tube | | N/A |
| | No rotational movement between component parts of the cap exceeding 6° | | N/A |
| | After the test, the sample complies with the requirements of A16 | | N/A |
| A11.3 | Heat treatment and secure fixing test | | N/A |
| | Lamp caps are securely fixed in position and the lamp cap fixing is not affected by heat | | N/A |
| | Where two or more screws, welding or a similar mechanical connection is used for fixing the cap, the test in this clause is not applicable. However, where screws are used they and their fixings shall comply with the requirements of the torque test of Section 4 of AS/NZS 60598.1. | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | A heat treatment is applied to a new sample not previously tested | | N/A |
| | Where the lamp cap fixing uses cement or chemical bonding, the lamp cap fixing shall be subject to a treatment of 2000 ± 50 h at a temperature of 85 ± 5 °C with the lamp not energized. | | N/A |
| | After the treatment, the sample complies with torque test of A11.2 | | N/A |
| | The screws and their fixings comply with the torque test on screws of Section 4 of AS/NZS 60598.1 | | N/A |

| | | | |
|-----------------|---|--|-----|
| A12 (11) | CREEPAGE DISTANCES AND CLEARANCES | | |
| | Working voltage (V)..... : | | — |
| | Voltage form | Sinusoidal <input type="checkbox"/> Non-sinusoidal <input type="checkbox"/> | — |
| | PTI | < 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/> | — |
| | Impulse withstand category (Normal category II) (Category III Annex U) | Category II <input type="checkbox"/> Category III <input type="checkbox"/> | — |
| | Rated pulse voltage (kV)..... : | | — |
| | (1) Current-carrying parts of different polarity: cr (mm); cl (mm)..... : | | N/A |
| | (2) Current-carrying parts and accessible parts: cr (mm); cl (mm)..... : | | N/A |
| | (3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm)..... : | | N/A |
| | (4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm)..... : | | N/A |
| | (5) Not used | | — |
| | (6) Current-carrying parts and supporting surface: cr (mm); cl (mm)..... : | | N/A |

| | | | |
|------------|--|--|-----|
| A13 | PROVISION FOR EARTHING | | |
| | The provisions of Section 7 of AS/NZS 60598.1 are not applicable | | N/A |

| | | | |
|-----------------|-------------------------------------|---------------|-----|
| A14 (14) | SCREW TERMINALS | | |
| | Separately approved; component list | (see Annex 1) | N/A |
| | Part of the lamp | (see Annex 3) | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|-------------------------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| A14 (15) | SCREWLESS TERMINALS | | |
| | Separately approved; component list | (see Annex 1) | N/A |
| | Part of the lamp | (see Annex 4) | N/A |

| | | | |
|----------------|---|--|-----|
| A15 (5) | EXTERNAL AND INTERNAL WIRING | | |
| A15 (5.2) | Supply connection and external wiring | | N/A |
| A15 (5.2.1) | Means of connection | | N/A |
| | In Australia, non-portable luminaires with a supply cord shall be fitted with a plug or a coupler; except | | N/A |
| | The luminaire has markings and instructions complying with Clause 3.2.12 | | N/A |
| | Plug portion of a luminaire with integral pins complies with Appendix J of AS/NZS 3112 | | N/A |
| A15 (5.2.2) | Type of cable | | N/A |
| | Nominal cross-sectional area (mm ²) | | N/A |
| A15 (5.2.3) | Type of attachment, X, Y or Z | | N/A |
| A15 (5.2.5) | Type Z not connected to screws | | N/A |
| A15 (5.2.6) | Cable entries: | | N/A |
| | - suitable for introduction | | N/A |
| | - adequate degree of protection | | N/A |
| A15 (5.2.7) | Cable entries through rigid material have rounded edges | | N/A |
| A15 (5.2.8) | Insulating bushings: | | N/A |
| | - suitably fixed | | N/A |
| | - material in bushings | | N/A |
| | - tubes or guards made of insulating material | | N/A |
| A15 (5.2.9) | Locking of screwed bushings | | N/A |
| A15 (5.2.10) | Cord anchorage: | | N/A |
| | - covering protected from abrasion | | N/A |
| | - clear how to be effective | | N/A |
| | - no mechanical or thermal stress | | N/A |
| | - no tying of cables into knots etc. | | N/A |
| | - insulating material or lining | | N/A |
| A15 (5.2.10.1) | Cord anchorage for type X attachment: | | N/A |
| | a) at least one part fixed | | N/A |
| | b) types of cable | | N/A |

| AS/NZS 60598.2.1 | | | |
|-------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | c) no damaging of the cable | | N/A |
| | d) whole cable can be mounted | | N/A |
| | e) no touching of clamping screws | | N/A |
| | f) metal screw not directly on cable | | N/A |
| | g) replacement without special tool | | N/A |
| | Glands not used as anchorage | | N/A |
| | Labyrinth type anchorages | | N/A |
| A15 (5.2.10.2) | Adequate cord anchorage for type Y and type Z attachment | | N/A |
| A15 (5.2.10.3) | Tests: | | N/A |
| | - impossible to push cable; unsafe | | N/A |
| | - pull test: 25 times; pull (N) : | | N/A |
| | - torque test: torque (Nm)..... : | | N/A |
| | - displacement ≤ 2 mm | | N/A |
| | - no movement of conductors | | N/A |
| | - no damage of cable or cord | | N/A |
| A15 (5.2.11) | External wiring passing into luminaire | | N/A |
| A15 (5.2.12) | Looping-in terminals | | N/A |
| A15 (5.2.13) | Wire ends not tinned | | N/A |
| | Wire ends tinned: no cold flow | | N/A |
| A15 (5.2.14) | Mains plug same protection | | N/A |
| | In the country where national legislation requires the fitting of a certain plug which does not provide the required ingress protection, adequate instructions for connection to the supply ensuring an equivalent degree of protection are provided | | N/A |
| | Class III luminaire plug | | N/A |
| | Plugs and socket-outlets for class III luminaires, where a safety isolating transformer ($\leq 3A$; $\leq 25V_{a.c.}/60V_{d.c.}$; $\leq 72W$) is delivered with: | | - |
| | - plugs not be able to enter socket-outlets of other voltage systems (according to IEC 60083) | | N/A |
| | - socket-outlets not admit plugs of other voltage systems | | N/A |
| | - socket-outlets not have the protective earth contact | | N/A |
| A15 (5.2.16) | Appliance inlets (IEC 60320) | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Appliance couplers of class II type | | N/A |
| | Class II luminaires for fixed wiring incorporating an appliance coupler shall not have means to allow further luminaires to be connected | | N/A |
| | Luminaire couplers incorporated with the luminaire comply with IEC 61995-1 | | N/A |
| A15 (5.2.17) | Non-standardized inter-connecting cables properly assembled | | N/A |
| A15 (5.2.18) | All portable luminaires with a flexible supply cord shall be fitted with a plug complying with AS/NZS 3112 | | N/A |
| | Other luminaires with flexible cords shall be fitted with a plug complying with AS/NZS 3112; unless | | N/A |
| | They have the warning allowed by Clause 3.2.12 | | N/A |
| A15 (5.2.19) | Installation couplers incorporated within luminaires comply with the requirements of AS/NZS 61535 | | N/A |
| | Luminaires incorporating installation couplers may have means to allow further luminaires to be connected by cascading provided the through wiring is rated for the current rating of the installation coupler | | N/A |
| A15 (5.3) | Internal wiring | | N/A |
| A15 (5.3.1) | Internal wiring of suitable size and type | | N/A |
| | Through wiring | | N/A |
| | - not delivered/ mounting instruction | | N/A |
| | - factory assembled | | N/A |
| | - socket outlet loaded (A) | | N/A |
| | - temperatures : (see Annex 2) | | N/A |
| | Internal wires coloured green, yellow or green/yellow combination are used for making protective earth connections only | | N/A |
| | Functional earth connections shall not be made by wires coloured green, yellow or green/yellow combination | | N/A |
| A15 (5.3.1.1) | Internal wiring connected directly to fixed wiring | | N/A |
| | Cross-sectional area (mm ²)..... : | | N/A |
| | Insulation thickness | | N/A |
| | Extra insulation added where necessary | | N/A |
| A15 (5.3.1.2) | Internal wiring connected to fixed wiring via internal current-limiting device | | N/A |
| | Adequate cross-sectional area and insulation thickness | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| A15 (5.3.1.3) | Double or reinforced insulation for class II | | N/A |
| A15 (5.3.1.4) | Conductors without insulation | | N/A |
| A15 (5.3.1.5) | SELV current-carrying parts | | N/A |
| A15 (5.3.1.6) | Insulation thickness other than PVC or rubber | | N/A |
| A15 (5.3.2) | Sharp edges etc. | | N/A |
| | No moving parts of switches etc. | | N/A |
| | Joints, raising/lowering devices | | N/A |
| | Telescopic tubes etc. | | N/A |
| | No twisting over 360° | | N/A |
| A15 (5.3.3) | Openings | | N/A |
| | - bushings not removable | | N/A |
| | - bushings in sharp openings | | N/A |
| | - cables with protective sheath | | N/A |
| A15 (5.3.4) | Joints and junctions effectively insulated | | N/A |
| A15 (5.3.5) | Strain on internal wiring | | N/A |
| A15 (5.3.6) | Wire carriers | | N/A |
| A15 (5.3.7) | Wire ends not tinned | | N/A |
| | Wire ends tinned: no cold flow | | N/A |

| | | | |
|----------------|---|--|-----|
| A16 (8) | PROTECTION AGAINST ELECTRIC SHOCK | | |
| A16.1 (8.2.1) | Live parts and basic insulation not accessible | | N/A |
| | This does not apply to the non-current carrying parts of caps complying with the relevant IEC standard | | N/A |
| | Protective cover with caution symbol is left in place during the tests and inspections | | N/A |
| | The cover is held securely in position by fixings requiring the use of a tool to remove and at least two independent fixings are used | | N/A |
| | Live parts not accessible with standard test finger when the luminaire is installed or assembled for normal use; and | | N/A |
| | - basic insulated parts not accessible with standard test finger on portable and adjustable luminaires | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - basic insulated parts not accessible with Ø 50 mm probe from outside, within arm's reach, on wall-mounted luminaires | | N/A |
| | Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements | | N/A |
| | Basic insulation may be accessible under lamp or starter replacement | | N/A |
| | A component intended for building-in is used on the outside of a fully assembled luminaire which can be touched by the 50 mm sphere, it shall comply with the relevant requirements applied to an independent component | | N/A |
| | Protection in any position | | N/A |
| | Double-ended tungsten filament lamp | | N/A |
| | Insulation lacquer not reliable | | N/A |
| | Double-ended high pressure discharge lamp | | N/A |
| | Relevant warning according to 3.2.18 fitted to the luminaire | | N/A |
| A16.1 (8.2.2) | Portable luminaire adjusted in most unfavourable position | | N/A |
| A16.1 (8.2.3) | Additional requirements for protection against electric shock: | | N/A |
| | a) Class II luminaire: | | N/A |
| | - basic insulated metal parts not accessible during starter or lamp replacement | | N/A |
| | - basic insulation not accessible other than during starter or lamp replacement | | N/A |
| | - glass protective shields not used as supplementary insulation | | N/A |
| | b) Class I luminaire with BC lampholder | | N/A |
| | c) Class III luminaires may have exposed current carrying parts in the SELV circuit, if | | N/A |
| | Ordinary luminaires: | | N/A |
| | - voltage under load ($\leq 25V_{a.c.} / 60V_{d.c.}$)..... : | | N/A |
| | - touch current ($\leq 0.7 \text{ mA peak} / 2.0 \text{ mA d.c.}$) if the voltage limit exceeded..... : | | N/A |
| | - no-load voltage ($\leq 35V_{\text{peak}} / 60V_{d.c.}$)..... : | | N/A |
| | If the voltages/currents exceed the limits given above, at least one side is adequately insulated (500V/1min) | | N/A |
| | Luminaires other than ordinary: | | N/A |
| | - nominal voltage ($\leq 12V_{a.c.} / 30V_{d.c.}$) : | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Class III luminaires are accepted only for connection to a SELV source | | N/A |
| A16.1 (8.2.4) | Portable luminaire: | | N/A |
| | - protection independent of supporting surface | | N/A |
| | - terminal block completely covered | | N/A |
| A16.1 (8.2.5) | Compliance with the sphere probe and standard test finger or relevant probe | | N/A |
| A16.1 (8.2.6) | Covers reliably secured | | N/A |
| | Tests on covers whose fixing is not dependent on screws and whose removal is obtained by applying a force in an approx. perpendicular direction to the mounting/supporting surface | | N/A |
| A16.1 (8.2.7) | Discharging of capacitors $\geq 0.5 \mu\text{F}$ | | N/A |
| | Portable plug connected luminaire with capacitor | | N/A |
| | Other plug connected luminaire with capacitor | | N/A |
| | Discharge device on or within capacitor | | N/A |
| | Discharge device mounted separately | | N/A |
| A16.2 (-) | Protection against electric shock | | N/A |
| | Without any additional enclosure in the form of a luminaire, the following parts are not accessible when the lamp is installed in a lampholder | | N/A |
| | - internal metal parts | | N/A |
| | - basic insulated external metal parts (other than caps) | | N/A |
| | - live metal parts of the lamp cap | | N/A |
| | - live metal parts of the lamp itself | | N/A |
| | Metal parts of class II lamps which are insulated from live parts by basic insulation only are live parts for the purpose of this clause | | N/A |
| | External metal parts other than the current-carrying metal parts of the cap are not live or become live | | N/A |
| | The accessibility is checked with test probe B of IEC 61032, applied with a force of 10 N | | N/A |
| | Movable conductive materials are placed in the most onerous position without using a tool | | N/A |
| A16.3 (-) | Discharge capacitors | | N/A |
| | For lamps incorporating a capacitor of capacitance exceeding $0.1 \mu\text{F}$, the lamp is disconnected from the supply at the instant of voltage peak | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Voltage not exceeding 34 V after 1 s (V) | | N/A |
| A16.4 (-) | Electrical continuity | | N/A |
| | No electrical continuity between the two ends of the lamp during the insertion | | N/A |
| | Insulation resistance test between the pin(s) or contacts of one cap and the pin(s) or contacts of the other cap > 4 MΩ (MΩ) | | N/A |
| | Electric strength test between the pin(s) or contacts of one cap and the pin(s) or contacts of the other cap (4U + 2000) V | | N/A |
| | All possible combinations of single end lamp insertion into both lampholders are checked | | N/A |
| | This requirement does not apply to LED lamps that have lamp caps not on the ends of the LED lamp and are only for use with a luminaire that has a means of automatic double-pole disconnection operative when the lamp is replaced. | | N/A |

| | | | |
|-----------------|---|------------------------|-----|
| A17 (12) | ENDURANCE TEST AND THERMAL TESTS | | |
| A17.2 (12.3) | Endurance test: | | N/A |
| | - mounting-position | | — |
| | - test temperature (°C) | | — |
| | - total duration (h) | 240 h (10 x 24 cycles) | — |
| | - supply voltage: Un factor; calculated voltage (V) | | — |
| | - lamp used | | — |
| A17 (12.3.2) | After endurance test: | | N/A |
| | - no part unserviceable | | N/A |
| | - luminaire not unsafe | | N/A |
| | - no damage to track system | | N/A |
| | - marking legible | | N/A |
| | - no cracks, deformation etc. | | N/A |
| A17 (12.4) | Thermal test (normal operation) | (see Annex 2) | N/A |
| A17.3 (-) | Metallic accessible surface of the lamp not exceeding 70°C | (see Annex 2) | N/A |
| | Non-metallic accessible surface of the lamp not exceeding 85°C | (see Annex 2) | N/A |
| A17.4 (-) | The surface temperature of inaccessible parts of the lamp cap not exceeding 120°C | (see Annex 2) | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| A17 (12.5) | Thermal test (abnormal operation) | (see Annex 2) | N/A |
| A17.5 (-) | Class III lamps are in addition subject to the abnormal operation test for a 240 V a.c. rating | | N/A |
| | The lamp shall not become unsafe during this test | | N/A |
| A17 (12.6) | Thermal test (failed windings in lamp control gear): | | N/A |
| A17 (12.6.1) | Through wiring or looping-in wiring loaded by a current of (A) | | — |
| | - case of abnormal conditions | | — |
| | - electronic lamp control gear | | N/A |
| | - measured winding temperature (°C): at 1.1 Un : | | — |
| | - measured mounting surface temperature (°C): at 1.1 Un | | N/A |
| | - calculated mounting surface temperature (°C) . : | | N/A |
| | - track-mounted luminaires | | N/A |
| A17 (12.6.2) | Temperature sensing control | | N/A |
| | - case of abnormal conditions | | — |
| | - thermal link | | N/A |
| | - manual reset cut-out | | N/A |
| | - auto reset cut-out | | N/A |
| | - measured mounting surface temperature (°C):: | | N/A |
| | - track-mounted luminaires | | N/A |
| A17 (12.7) | Thermal test (fault conditions in lamp control gear or electronic devices incorporated in thermoplastic luminaires): | | N/A |
| A17 (12.7.1) | Luminaires without temperature sensing controls | | N/A |
| A17 (12.7.1.1) | Luminaires incorporating ballast(s) of fluorescent lamps with a lamp load $\leq 70W$ | | N/A |
| | Test method 12.7.1.1 or Annex W | | — |
| | Test according to 12.7.1.1: | | N/A |
| | - case of abnormal conditions | | — |
| | - ballast failure at supply voltage (V) | | — |
| | - components retained in place after the test | | N/A |
| | - test with standard test finger after the test | | N/A |
| | Test according to Annex W: | | N/A |
| | - case of abnormal conditions | | — |
| | - measured winding temperature (°C): at 1.1 Un : | | — |

| AS/NZS 60598.2.1 | | | |
|-------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - measured temperature of fixing point/exposed part (°C): at 1.1 Un | | — |
| | - calculated temperature of fixing point/exposed part (°C)..... | | — |
| | Ball-pressure test: | | N/A |
| | - part tested; temperature (°C) | | N/A |
| | - part tested; temperature (°C) | | N/A |
| A17 (12.7.1.2) | Luminaires incorporating discharge lamps, fluorescent lamps (> 70W), transformer of power > 10 VA | | N/A |
| | - case of abnormal conditions | | — |
| | - measured winding temperature (°C): at 1.1 Un : | | — |
| | - measured temperature of fixing point/exposed part (°C): at 1.1 Un | | — |
| | - calculated temperature of fixing point/exposed part (°C)..... | | — |
| | Ball-pressure test: | | N/A |
| | - part tested; temperature (°C) | | N/A |
| | - part tested; temperature (°C) | | N/A |
| A17 (12.7.1.3) | Luminaires with inherently short-circuit proof transformer of power ≤ 10 VA | | N/A |
| | - case of abnormal conditions | | — |
| | - components retained in place after the test | | N/A |
| | - test with standard test finger after the test | | N/A |
| A17 (12.7.2) | Luminaires with temperature sensing controls internal/external to the ballast or transformer | | N/A |
| | - thermal link | Yes / No | — |
| | - manual reset cut-out | Yes / No | — |
| | - auto reset cut-out | Yes / No | — |
| | - case of abnormal conditions | | — |
| | - highest measured temperature of fixing point/exposed part (°C) | | — |
| | Ball-pressure test: | | N/A |
| | - part tested; temperature (°C) | | N/A |
| | - part tested; temperature (°C) | | N/A |
| A18 | POWER REQUIREMENT | | |

| AS/NZS 60598.2.1 | | | | | |
|------------------|---|-----------------|-------|-------|---------|
| Clause | Requirement - Test | Result - Remark | | | Verdict |
| | For LED lamps intended to replace fluorescent lamps, the measured power of the combined LED lamp and any associated circuitry shall not be greater than 0.75 times the rated power of the fluorescent lamp being replaced | | | | N/A |
| | For LED lamps intended to replace other types of lamps, the measured power of the combined LED lamp and any associated circuitry shall not be greater than 1.0 times the rated power or the lamp being replaced | | | | N/A |
| | Measurement of power: Pn = rated power, P = measured power, U = test voltage | Pn (W) | P (W) | U (V) | — |
| | | | | | |

| | | | | |
|----------------|--|----|--|-----|
| A19 (9) | RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE | | | |
| A19 (9.2) | Tests for ingress of dust, solid objects and moisture: | | | N/A |
| | - classification according to IP.....: | IP | | — |
| | - mounting position during test.....: | | | — |
| | - fixing screws tightened; torque (Nm) | | | — |
| | - tests according to clauses.....: | | | — |
| | - electric strength test afterwards | | | N/A |
| | a) no deposit in dust-proof luminaire | | | N/A |
| | b) no talcum in dust-tight luminaire | | | N/A |
| | c) no trace of water on current-carrying parts or where it could become a hazard | | | N/A |
| | d) i) For luminaires without drain holes – no water entry | | | N/A |
| | d) ii) For luminaires with drain holes – no hazardous water entry | | | N/A |
| | e) no water in watertight luminaire | | | N/A |
| | f) no contact with live parts (IP2X) | | | N/A |
| | f) no entry into enclosure (IP3X and IP4X) | | | N/A |
| | f) no contact with live parts (IP3X and IP4X) | | | N/A |
| | g) no trace of water on part of lamp requiring protection from splashing water | | | N/A |
| | h) no damage of protective shield or glass envelope | | | N/A |
| A19 (9.3) | Humidity test 48 h | | | N/A |

| | | | | |
|-----------------|--|--|--|-----|
| A20 (10) | INSULATION RESISTANCE AND ELECTRIC STRENGTH | | | |
| A20 (10.2.1) | Insulation resistance test | | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Cable or cord covered by metal foil or replaced by a metal rod of mm Ø..... : | | — |
| | Insulation resistance (MΩ): | | N/A |
| | SELV: | | N/A |
| | - between current-carrying parts of different polarity..... : | | N/A |
| | - between current-carrying parts and mounting surface..... : | | N/A |
| | - between current-carrying parts and metal parts of the luminaire..... : | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : | | N/A |
| | - insulating bushings as described in Section 5 .. : | | N/A |
| | Other than SELV: | | N/A |
| | - between live parts of different polarity : | | N/A |
| | - between live parts and mounting surface : | | N/A |
| | - between live parts and metal parts : | | N/A |
| | - between live parts of different polarity through action of a switch..... : | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : | | N/A |
| | - insulating bushings as described in Section 5 .. : | | N/A |
| A20 (10.2.2) | Electric strength test | | N/A |
| | Dummy lamp | | N/A |
| | Luminaires with ignitors after 24 h test | | N/A |
| | Luminaires with manual ignitors | | N/A |
| | Test voltage (V): | | N/A |
| | SELV: | | N/A |
| | - between current-carrying parts of different polarity..... : | | N/A |
| | - between current-carrying parts and mounting surface..... : | | N/A |
| | - between current-carrying parts and metal parts of the luminaire..... : | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : | | N/A |
| | - insulating bushings as described in Section 5 .. : | | N/A |
| | Other than SELV: | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | - between live parts of different polarity | | N/A |
| | - between live parts and mounting surface | | N/A |
| | - between live parts and metal parts | | N/A |
| | - between live parts of different polarity through action of a switch..... | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... | | N/A |
| | - insulating bushings as described in Section 5 .. | | N/A |
| A20 (10.3.1) | Measured touch current (limit: ≤ 0.7 mA peak) ... | | N/A |
| | Measured protective conductor current (mA)..... | | N/A |
| | Max. protective conductor current limit (mA r.m.s.) | | N/A |

| | | | |
|-----------------|--|----------------------|-----|
| A21 (13) | RESISTANCE TO HEAT, FIRE AND TRACKING | | |
| A21 (13.2.1) | Ball-pressure test: | | N/A |
| | - part tested; temperature (°C) | | N/A |
| | - part tested; temperature (°C) | | N/A |
| A21 (13.3) | Parts of non-metallic material are resistant to flame and ignition | | N/A |
| | This requirement does not apply to decorative trims, knobs, wiring insulation and other parts not likely to be ignited or to propagate flames from inside the luminaires | | N/A |
| | This clause applies to all parts, including components, even if they have been tested to their own standard | | N/A |
| A21 (13.3.1) | Parts of non-metallic material supporting connections withstand 750°C glow-wire test as per AS/NZS 60695.2.10 | (see appended table) | N/A |
| A21 (13.3.2) | All other parts of non-metallic material withstand 650°C glow-wire test as per AS/NZS 60695.2.10 : | (see appended table) | N/A |
| A21 (13.3.3) | If a flame persists longer than 2 s during the 750°C glow-wire test, non-metallic parts above the connection, as specified, subjected to the needle-flame test of AS/NZS 60695.11.5 | (see appended table) | N/A |
| | Parts shielded by a barrier that meets the needle-flame test are not tested | | N/A |
| | The needle-flame test not carried out on parts that are made of material classified as V-0 or V-1 according to AS/NZS 60695.11.10; The part used in the luminaire not thinner than the classified sample | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| A21 (13.3.4) | PCBs in luminaires subjected to needle-flame test of AS/NZS 60695.11.5 | (see appended table) | N/A |
| | Test not applicable to PCBs made of material that is V-0 rated according to AS/NZS 60695.11.10 | | N/A |
| | In addition, double or reinforced insulation material shall be subject to the following needle flame test: | | N/A |
| | The needle flame test shall be conducted in accordance with AS/NZS 60695.11.5 with the following variations: (a) Only one sample of each material is tested. (b) The needle flame shall be applied for 30 s. | | N/A |
| A21 (13.4) | Resistance to tracking | | N/A |
| | Tracking test: part tested | | N/A |
| | Tracking test: part tested | | N/A |

| | | | |
|------------|--|--|-----|
| A22 | PHOTOBIOLOGICAL HAZARD | | |
| | The lamps do not exceed the photobiological hazard ratings for Risk Group 1, in accordance with Clause 6.1.2 of AS/NZS IEC 62471 | | N/A |
| | Lamp classification | | N/A |

| | | | |
|------------|---|--|-----|
| A23 | FAULT CONDITIONS | | |
| | The fault condition requirements of AS/NZS 61347.1 apply, including the following. Tests are conducted at (a) 264 V; and (b) 170 V, or 85 V if the wiring diagrams include series lamp circuits. | | N/A |
| | Separate samples may be used for the maximum and minimum voltage test conditions. | | N/A |
| | DC supplied control gear shall additionally be tested with the supply voltage polarity reversed. | | N/A |

| | | | |
|------------|--|--|-----|
| A24 | SURGE TEST | | |
| | The procedure shall be as follows: | | N/A |
| | (a) Place the sample on a white tissue-paper-covered pinewood surface, the sample in turn covered with a single layer of bleached cotton cheesecloth in accordance with AS/NZS 60950.1 and connected to a supply circuit of rated voltage. | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | (b) The sample shall be submitted to ten applications of a 3 kV 1.2/50 μ s surge impulse across the lamp connection pins at approximately 60 s intervals. Each application of surge voltage is to be random with respect to polarity. | | N/A |
| | Compliance shall be checked by the following: | | N/A |
| | The sample shall show no risk of fire or electric shock. | | N/A |
| | A risk of electric shock is considered to exist if | | N/A |
| | (i) there is glowing, charring or ignition of the cheesecloth or tissue-paper; or | | N/A |
| | (ii) there is breakdown of the insulation between live parts of the sample and accessible metal parts during test or when submitted to the electric withstand test of AS/NZS 60598.1. | | N/A |
| | It is acceptable that, as a result of the test, the sample is no longer operable. | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| |
|---|
| APPENDIX B SAFETY REQUIREMENTS FOR T8 TO T5 LAMP CONVERTERS (Normative) (ZZ) |
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| | | |
|-----------|----------------|--|
| B1 | GENERAL | |
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| | | |
|-----------|-----------------------------|--|
| B2 | REFERENCED DOCUMENTS | |
|-----------|-----------------------------|--|

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|-----------|-------------------|--|
| B3 | DEFINITION | |
|-----------|-------------------|--|

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|-----------|---|-----|
| B4 | CLASSIFICATIONS OF CONVERTER(S) | |
| | Converters shall be classified in accordance with the provisions of Section 2 of AS/NZS 60598.1. | N/A |
| | Converters shall be classified as class II for protection against electric shock, IP rating and for normal use. Requirements for direct mounting on normally flammable surfaces do not apply. | N/A |
| | Converters shall be classified as independent control gear in accordance with AS/NZS 61347.1. | N/A |

| | | |
|------------|--|-----|
| B5 | MARKING | |
| B5.1 | General | N/A |
| B5.1 (3.4) | Test with water | N/A |
| | Test with hexane | N/A |
| | Legible after test | N/A |
| | Label attached | N/A |
| B5.2 | Marking on the converter | N/A |
| | (a) Mark of origin | N/A |
| | (b) Rated voltage or voltage range | N/A |
| | (c) Rated wattage | N/A |
| | (d) Rated frequency | N/A |
| | (e) A value for allowable case temperature t_c and a marked point of measurement | N/A |
| | (f) Model number | N/A |
| | (g) IP rating if > IP20 | N/A |
| | (h) Wattage/lamp restriction due to interchangeability shall be specified | N/A |
| B5.3 | Warning label for the luminaire | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | Warning label supplied with the converter: WARNING: Not for use with any fluorescent lamp without T8–T5 converter installed | | N/A |
| | Minimum size of 5 mm for letters and numbers and 5 mm for symbols | | N/A |
| | Instructions for the installer to ensure the warning label is placed in a prominent position on the luminaire and visible when the converter is installed | | N/A |
| B5.4 | Marking of associated components | | N/A |

| | | | |
|-----------|--|--|-----|
| B6 | INSTRUCTIONS | | |
| B6.1 | Information to be supplied with the converter | | N/A |
| | (a) Special conditions or restrictions to be observed for converter operation | | N/A |
| | (b) Wiring diagram for converter installation | | N/A |
| | Wiring diagram for new luminaires | | N/A |
| | Wiring diagram for retrofit luminaires | | N/A |
| | (c) The ambient operating temperature range, if other than 10 to 30°C | | N/A |
| | (d) The type of lamp it replaces | | N/A |
| B6.2 | Information to be supplied for emergency luminaires | | N/A |
| | converter not suitable for use in emergency luminaires | | N/A |
| B6.3 | Information about additional components | | N/A |
| B6.4 | Warnings | | N/A |
| | Warnings included in the instructions for converter intended for use in an existing luminaire that requires modification other than replacement of the lamp or starter | | N/A |
| | Warnings included in the instructions for converter intended for use in a new luminaire | | N/A |
| B6.5 | Additional information | | N/A |
| | Installation instructions are provided | | N/A |
| | Adequate guidance to safely perform the retrofit or modification | | N/A |
| | Graphical instructions of necessary steps may be used | | N/A |
| | The instruction manual is in English and provided with the converter | | N/A |

| | | |
|-----------|---------------------|--|
| B7 | CONSTRUCTION | |
|-----------|---------------------|--|

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| B7.1 | General | | N/A |
| | converter function reliably and cause no danger to the user or surroundings | | N/A |
| | (a) Not exposing live parts or unearthed exposed metal parts to personal contact for the replacement of lamps and replacement or cleaning of optical components | | N/A |
| | (b) Protection against electric shock is maintained for all methods and positions of installation in normal use | | N/A |
| | (c) Metal parts are inherently non-corrosive, protected against corrosion or otherwise suitable for the purpose | | N/A |
| B7.2 | Components that replace the starter | | N/A |
| B7.3 | Emergency lamps | | N/A |

| | | | |
|-----------|--|--|-----|
| B8 | INTERCHANGEABILITY | | |
| | Interchangeability is ensured by the use of lamp caps in accordance with IEC 60061-1 and gauges in accordance with IEC 60061-3 | | N/A |
| | Compliance is checked by the use of the relevant gauges; or | | N/A |
| | Compliance is checked by measurement | | N/A |
| | If lamps need to operate in combination with a component which replaces the starter, this component shall be supplied together with the lamp | | N/A |
| | This component shall comply with the dimensions and electrical, mechanical and thermal tests required by Section 1 of AS/NZS 60155 | | N/A |

| | | | |
|-----------|--|--|-----|
| B9 | MASS | | |
| | The entire mass of a converter and lamp ≤ 500 g | | N/A |
| | An additional mechanical support shall not be provided | | N/A |

| | | | |
|------------|---|--|-----|
| B10 | DIMENSIONS | | |
| | Converter, Lamp combination have the dimensions of the corresponding lamps they are replacing in accordance with the relevant data sheets | | N/A |
| | Compliance is checked by measurement; or | | N/A |
| | Compliance is checked by gauges as appropriate | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| B11 | MECHANICAL REQUIREMENTS AND TESTS FOR CAPS | | |
| B11.1 | Construction and assembly | | N/A |
| | Caps are so constructed and assembled that they remain attached to the tubes during and after operation | | N/A |
| B11.2 | Torque test | | N/A |
| | A torque test (1 Nm for 30 s) is applied to the converter contact pins | | N/A |
| | For lamps with adjustable caps, the lamp cap is rotated to its extreme positions before the test | | N/A |
| | During the test, the lamp cap remains firmly attached to the tube | | N/A |
| | No rotational movement between component parts of the cap exceeding 6° | | N/A |
| | After the test, the sample complies with the requirements of A16 | | N/A |
| B11.3 | Heat treatment test | | N/A |
| | Lamp caps are securely fixed in position and the lamp cap fixing is not affected by heat | | N/A |
| | A heat treatment is applied to a new sample not previously tested | | N/A |
| | The lamp cap fixing is subject to a treatment of 2000 ± 50 h at a temperature of 85 ± 5 °C with the lamp not energized | | N/A |
| | After the treatment, the sample complies with torque test of A11.2 | | N/A |
| B12 | CREEPAGE DISTANCES AND CLEARANCES | | |
| | The provisions of Section 11 of AS/NZS 60598.1 apply. | Refer to clause 8(11) | — |
| B13 | PROVISION FOR EARTHING | | |
| | The provisions of Section 7 of AS/NZS 60598.1 are not applicable | | N/A |
| B14 | TERMINALS | | |
| | The provision of Sections 14 and 15 of AS/NZS 60598.1 apply to supply terminals only; they are not applicable to lamp caps. | | N/A |
| B15 (5) | EXTERNAL AND INTERNAL WIRING | | |
| B15 (5.2) | The provisions of section 5 of AS/NZS 60598.1 apply | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | |
|------------|---|--|-----|
| B16 | PROTECTION AGAINST ELECTRIC SHOCK | | |
| B16.1 | The provisions of section 8 of AS/NZS 60598.1 apply along with the following. | | N/A |
| B16.2 (-) | Protection against electric shock | | N/A |
| | Without any additional enclosure in the form of a luminaire, the following parts are not accessible when the lamp is installed in a lampholder | | N/A |
| | - internal metal parts | | N/A |
| | - basic insulated external metal parts (other than caps) | | N/A |
| | - live metal parts of the lamp cap | | N/A |
| | - live metal parts of the lamp itself | | N/A |
| | Metal parts of class II lamps which are insulated from live parts by basic insulation only are live parts for the purpose of this clause | | N/A |
| | External metal parts other than the current-carrying metal parts of the cap are not live or become live | | N/A |
| | The accessibility is checked with test probe B of IEC 61032, applied with a force of 10 N | | N/A |
| | Movable conductive materials are placed in the most onerous position without using a tool | | N/A |
| B16.3 (-) | Discharge capacitors | | N/A |
| | For lamps incorporating a capacitor of capacitance exceeding 0.1 μ F, the lamp is disconnected from the supply at the instant of voltage peak | | N/A |
| | Voltage not exceeding 34 V after 1 s (V)..... : | | N/A |

| | | | |
|-----------------|--|--|-----|
| B17 (12) | ENDURANCE TEST AND THERMAL TESTS | | |
| B17.2 (12.3) | Endurance test: | | N/A |
| | - mounting-position | | — |
| | - test temperature (°C) | | — |
| | - total duration (h) | | — |
| | - supply voltage: Un factor; calculated voltage (V): | | — |
| | - lamp used | | — |
| | Two tests are conducted: | | N/A |
| | (a) 1.1 \times maximum rated voltage. | | N/A |
| | (b) 0.9 \times minimum rated voltage or range. | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|---|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| B17 (12.3.2) | After endurance test: | | N/A |
| | - no part unserviceable | | N/A |
| | - luminaire not unsafe | | N/A |
| | - no damage to track system | | N/A |
| | - marking legible | | N/A |
| | - no cracks, deformation etc. | | N/A |
| B17 (12.4) | Thermal test (normal operation) | (see Annex 2) | N/A |
| B17.3 (-) | Metallic accessible surface of the lamp not exceeding 70°C | (see Annex 2) | N/A |
| | Non-metallic accessible surface of the lamp not exceeding 85°C | (see Annex 2) | N/A |
| | The surface temperature of inaccessible parts of the lamp cap not exceeding 120°C | (see Annex 2) | N/A |
| B17.4 (12.5) | Thermal test (abnormal operation) | (see Annex 2) | N/A |
| B17.5 (-) | Thermal test—Fault conditions | | N/A |
| | The tests of Clauses 12.6 and 12.7 are not applied. | | N/A |

| B18 | POWER REQUIREMENT | | | |
|-----|---|--------------------|-------|-------|
| | The measured power of the lamp and any associated circuitry is not greater than the rated power of the T8 lamp being replaced | | | N/A |
| | Measurement of power: P _n = rated power, P = measured power, U = test voltage | P _n (W) | P (W) | U (V) |
| | | | | — |

| B19 | RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE | | | |
|-----|---|-----------------------|--|-----|
| | The tests of Section 9 of AS/NZS 60598.1 apply. | Refer to clause 14(9) | | N/A |
| | The G5 lampholder G13 pins are not assessed. | | | N/A |

| B20 | INSULATION RESISTANCE AND ELECTRIC STRENGTH | | | |
|-----|---|------------------------|--|-----|
| | The provisions of Section 10 of AS/NZS 60598.1 apply. | Refer to clause 15(10) | | N/A |

| B21 | RESISTANCE TO HEAT, FIRE AND TRACKING | | | |
|-----|---|------------------------|--|-----|
| | The provisions of Section 13 of AS/NZS 60598.1 apply. | Refer to clause 16(13) | | N/A |
| | In addition double or reinforced insulation material shall be subject to the following needle flame test: | | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| | The needle flame test is conducted in accordance with AS/NZS 60695.11.5 with the following variations: | | N/A |
| | (a) Only one sample of each material is tested. | | N/A |
| | (b) The needle flame is applied for 30 s. | | N/A |

| | | | |
|-------------------------------|---|----------------------|-----|
| B22 | FAULT CONDITIONS | | |
| | The fault condition requirements of AS/NZS 61347.1 apply, including the following | | N/A |
| | Tests are conducted at | | N/A |
| | (a) 264 V; and | | N/A |
| | (b) 170 V, or 85 V if the wiring diagrams includes series lamp circuits. | | N/A |
| | DC supplied control gear shall additionally be tested with the supply voltage polarity reversed | | N/A |
| (clause 14 of AS/NZS 61347.1) | When operated under fault conditions the ballast: | | N/A |
| | - does not emit flames or molten material | | N/A |
| | - does not produce flammable gases | | N/A |
| | - protection against accidental contact not impaired | | N/A |
| | Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected | | N/A |
| | Thermally protected ballasts do not exceed the marked temperature value | | N/A |
| - (14.1) | Short-circuit of creepage distances and clearances if less than specified in clause 16 (except between live parts and accessible metal parts) | (see appended table) | N/A |
| | Distances on printed boards provided with coating according to IEC 60664-3 is used | | N/A |
| - (14.2) | Short-circuit or interruption of semiconductor devices | (see appended table) | N/A |
| - (14.3) | Short-circuit across insulation consisting of lacquer, enamel or textile | (see appended table) | N/A |
| - (14.4) | Short-circuit across electrolytic capacitors | (see appended table) | N/A |
| | During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite | | N/A |
| | After the tests the insulation resistance with d.c. 500 V (MΩ) are ≥ 1 MΩ | | N/A |
| | Temperature declared thermally protected controlgears fulfil the requirements in Annex C | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |
| B23 | BEHAVIOUR OF THE CONTROL GEAR AT END OF LAMP LIFE | | |
| | The behaviour of the control gear at end of lamp life requirements of AS/NZS 61347.2.3 apply, except the test voltages applied shall be 264 V and either of | | N/A |
| | (a) Where the converter is marked as only suitable for use with ferromagnetic control gear and type HE T5 lamps above 14 W 170 V | | N/A |
| | (b) For other converters, such as 18 W T8 series circuits 85 V. | | N/A |
| B24 | SURGE TEST | | |
| | The procedure shall be as follows: | | N/A |
| | (a) Place the sample on a white tissue-paper-covered pinewood surface, the sample in turn covered with a single layer of bleached cotton cheesecloth in accordance with AS/NZS 60950.1 and connected to a supply circuit of rated voltage. | | N/A |
| | (b) The sample shall be submitted to ten applications of a 3 kV 1.2/50 μ s surge impulse across the lamp connection pins at approximately 60 s intervals. Each application of surge voltage is to be random with respect to polarity. | | N/A |
| | Compliance shall be checked by the following: | | N/A |
| | The sample shall show no risk of fire or electric shock. | | N/A |
| | A risk of electric shock is considered to exist if | | N/A |
| | (i) there is glowing, charring or ignition of the cheesecloth or tissue-paper; or | | N/A |
| | (ii) there is breakdown of the insulation between live parts of the sample and accessible metal parts during test or when submitted to the electric withstand test of AS/NZS 60598.1. | | N/A |
| | It is acceptable that, as a result of the test, the sample is no longer operable. | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| ANNEX 1: components | | | | | | P |
|----------------------|------|----------------------------|--------------------------------------|---|----------|--------------------------|
| object/part No. | code | manufacturer/ trademark | type/model | technical data | standard | mark(s) of conformity |
| LED driver | B | TRIDONIC | LCA 75W 350-1050mA one4all lp PRE | 220-240V, 50/60Hz Prated:75W Uout:250V | - | ENEC11 |
| LED driver | B | TRIDONIC | LCA 50W 100-400mA one4all lp PRE | 220-240V, 50/60Hz Prated:50W Uout:250V | - | ENEC11 |
| Supply Terminal | B | - | 2675 | 450V, T85 | - | ENEC11 |
| Installation coupler | B | WAGO | WINSTA MINI | 250V/400V, 16A | - | KEMA-KEUR |
| LED Module | B | TRIDONIC | 28001487 | V _f =22.6/23.5V I _{rated} :325/500mA | - | - |
| Supply cord | B | TAI FULONG | H05VV-F | 5 X 0.75mm ² 300/500V | - | VDE |

The codes above have the following meaning:

- A – The component is replaceable with another one, also certified, with equivalent characteristics
- B – The component is replaceable if authorised by the test house
- C – Integrated component tested together with the appliance
- D – Alternative component

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | | | | | |
|--|--|---|--------|--------|------------------------|--------|-------|
| | ANNEX 2: temperature measurements, thermal tests of Section 12 | | | P | | | |
| | Type reference..... : | HIP LED | — | | | | |
| | Lamp used | LED as delivered | — | | | | |
| | Lamp control gear used | LCA 75W 350 - 1050mA one4all Ip PRE | — | | | | |
| | Mounting position of luminaire | Suspended from ceiling as close as practicable to corner | — | | | | |
| | Supply wattage (W) | 51.6 | — | | | | |
| | Supply current (A) | 0.22 | — | | | | |
| | Calculated power factor | | — | | | | |
| | Table: measured temperatures corrected for ta = 25 °C: | | | P | | | |
| | - abnormal operating mode..... : | | — | | | | |
| | - test 1: rated voltage | | — | | | | |
| | - test 2: 1.06 times rated voltage or 1.05 times rated wattage | 254.4V | — | | | | |
| | - test 3: Load on wiring to socket-outlet, 1.06 times voltage or 1.05 times wattage | | — | | | | |
| | - test 4: 1.1 times rated voltage or 1.05 times rated wattage | 264V | — | | | | |
| | Through wiring or lopping-in wiring loaded by a current of (A) during the tests | 254.4V, 3.82A | — | | | | |
| temperature (°C) of part | | clause 12.4 – normal | | | clause 12.5 – abnormal | | |
| | | test 1 | test 2 | test 3 | limit | test 4 | limit |
| Supply wiring insulation | | — | 44 | — | 85 | — | — |
| Supply terminal | | — | 44 | — | 90 | — | — |
| Supply cord | | — | 45 | — | 90 | — | — |
| Internal wire, PVC | | — | 50 | — | 90 | — | — |
| Tc on PCB | | — | 73 | — | 85 | — | — |
| Tc on LED driver | | — | 63 | — | 80 | — | — |
| Lens of LED | | — | 67 | — | 90 | — | — |
| Luminaire cover | | — | 42 | — | 75 | — | — |
| Test corner wall | | — | 28 | — | 90 | 25 | 130 |
| Test corner ceiling | | — | 28 | — | 90 | 25 | 130 |
| Illuminated surface at 100mm | | — | 30 | — | 90 | — | — |
| Installation coupler (Through wiring) | | — | 38 | — | 90 | — | — |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | | | | | |
|--------------------------|--|---|--------|--------|------------------------|--------|-------|
| | ANNEX 2: temperature measurements, thermal tests of Section 12 | | | P | | | |
| | Type reference..... : | HIP LED | | — | | | |
| | Lamp used | LED as delivered | | — | | | |
| | Lamp control gear used | LCA 50W 100 - 400mA one4all Ip PRE | | — | | | |
| | Mounting position of luminaire | Suspended from ceiling as close as practicable to corner | | — | | | |
| | Supply wattage (W) | 51.3 | | — | | | |
| | Supply current (A) | 0.23 | | — | | | |
| | Calculated power factor | | | — | | | |
| | Table: measured temperatures corrected for ta = 25 °C: | | | P | | | |
| | - abnormal operating mode..... : | | | — | | | |
| | - test 1: rated voltage | | | — | | | |
| | - test 2: 1.06 times rated voltage or 1.05 times rated wattage | 254.4V | | — | | | |
| | - test 3: Load on wiring to socket-outlet, 1.06 times voltage or 1.05 times wattage | | | — | | | |
| | - test 4: 1.1 times rated voltage or 1.05 times rated wattage | | | — | | | |
| | Through wiring or lopping-in wiring loaded by a current of (A) during the tests | | | — | | | |
| temperature (°C) of part | | clause 12.4 – normal | | | clause 12.5 – abnormal | | |
| | | test 1 | test 2 | test 3 | limit | test 4 | limit |
| Tc on PCB | | — | 61 | — | 85 | — | — |
| Tc on LED driver | | — | 53 | — | 80 | — | — |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | |
|-------------|---|---|-----|
| | ANNEX 3: screw terminals (part of the luminaire) | | N/A |
| (14) | SCREW TERMINALS | | N/A |
| (14.2) | Type of terminal | | — |
| | Rated current (A) | | — |
| (14.3.2.1) | One or more conductors | | N/A |
| (14.3.2.2) | Special preparation | | N/A |
| (14.3.2.3) | Terminal size | | N/A |
| | Cross-sectional area (mm ²) | | N/A |
| (14.3.3) | Conductor space (mm) | | N/A |
| (14.4) | Mechanical tests | | N/A |
| (14.4.1) | Minimum distance | | N/A |
| (14.4.2) | Cannot slip out | | N/A |
| (14.4.3) | Special preparation | | N/A |
| (14.4.4) | Nominal diameter of thread (metric ISO thread). : | M | N/A |
| | External wiring | | N/A |
| | No soft metal | | N/A |
| (14.4.5) | Corrosion | | N/A |
| (14.4.6) | Nominal diameter of thread (mm)..... : | | N/A |
| | Torque (Nm)..... : | | N/A |
| (14.4.7) | Between metal surfaces | | N/A |
| | Lug terminal | | N/A |
| | Mantle terminal | | N/A |
| | Pull test; pull (N)..... : | | N/A |
| (14.4.8) | Without undue damage | | N/A |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | |
|-------------|---|--|-----|
| | ANNEX 4: screwless terminals (part of the luminaire) | | N/A |
| (15) | SCREWLESS TERMINALS | | N/A |
| (15.2) | Type of terminal | | — |
| | Rated current (A) | | — |
| (15.3.1) | Material | | N/A |
| (15.3.2) | Clamping | | N/A |
| (15.3.3) | Stop | | N/A |
| (15.3.4) | Unprepared conductors | | N/A |
| (15.3.5) | Pressure on insulating material | | N/A |
| (15.3.6) | Clear connection method | | N/A |
| (15.3.7) | Clamping independently | | N/A |
| (15.3.8) | Fixed in position | | N/A |
| (15.3.10) | Conductor size | | N/A |
| | Type of conductor | | N/A |
| (15.5.1) | Terminals internal wiring | | N/A |
| (15.5.1.1) | Pull test spring-type terminals (4 N, 4 samples) | | N/A |
| (15.5.1.2) | Pull test pin or tab terminals (4 N, 4 samples) | | N/A |
| | Insertion force not exceeding 50 N | | N/A |
| (15.5.2) | Permanent connections: pull-off test (20 N) | | N/A |
| (15.6) | Electrical tests | | N/A |
| | Voltage drop (mV) after 1 h (4 samples) | | N/A |
| | Voltage drop of two inseparable joints | | N/A |
| | Number of cycles | | — |
| | Voltage drop (mV) after 10th alt. 25th cycle (4 samples) | | N/A |
| | Voltage drop (mV) after 50th alt. 100th cycle (4 samples) | | N/A |
| | After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) | | N/A |
| | After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) | | N/A |
| (15.7) | Terminals external wiring | | N/A |
| | Terminal size and rating | | N/A |
| (15.8.1) | Pull test spring-type terminals or welded connections (4 samples); pull (N) | | N/A |
| | Pull test pin or tab terminals or welded connections (4 samples); pull (N) | | N/A |
| (15.9) | Contact resistance test | | N/A |

| AS/NZS 60598.2.1 | | | | | | | | | | | |
|-------------------|--|---|---|---|---|-----------------|---|---|---|-----|---------|
| Clause | Requirement - Test | | | | | Result - Remark | | | | | Verdict |
| | Voltage drop (mV) after 1 h | | | | | | | | | N/A | |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Voltage drop of two inseparable joints | | | | | | | | | | |
| | Voltage drop after 10th alt. 25th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | — | |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Voltage drop after 50th alt. 100th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | — | |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Continued ageing: voltage drop after 10th alt. 25th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | — | |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Continued ageing: voltage drop after 50th alt. 100th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | — | |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |



| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | |
|-------|---|--------|
| (A23) | TABLE: tests of fault conditions | N/A |
| Part | Simulated fault | Hazard |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |

| | | |
|-------|---|--------|
| (B22) | TABLE: tests of fault conditions | N/A |
| Part | Simulated fault | Hazard |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |
| | | YES/NO |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| 16, A21 (13.3) | TABLE: Glow-wire test | | | | | | P |
|--|--|--------------------------------|--------------------------------|---|---|---|---|
| AS/NZS 60695.2.10, Clause | Specimen under test | Luminaire cover | Supply terminal | Installation coupler | Cable clammer | LED driver insulating base | |
| - | Material (TS/TP/Other) | TP | TP | TP | TP | TP | |
| - | Colour | Transluc ent white | White | Blue | Black | Clear | |
| - | How Tested (CE/SA/SC) | SC | SC | SC | SC | SC | |
| 7 | Conditioning of specimen and specified layer (24h) (Yes/No) | Yes | Yes | Yes | Yes | Yes | |
| 8.2 | Test Temperature (°C) | 650 | 750 | 750 | 650 | 650 | |
| - | Time till ignition of specimen (s) | NI | NI | 2 | NI | NI | |
| - | Time till ignition of the specified layer (s) | NI | NI | NI | NI | NI | |
| - | Time from tip application till flames ceased (s) | NI | NI | 20 | NI | NI | |
| - | Time from removal of glow-wire till flames ceased (s) | NI | NI | NI | NI | NI | |
| - | Ignition of the specified layer (Yes/No) | No | No | No | No | No | |
| - | Ignition of the wrapping tissue (Yes/No) | No | No | No | No | No | |
| - | RESULT | Pass | Pass | Pass | Pass | Pass | |
| AS/NZS 60695.2.10, Clause | Specimen under test | LED driver terminal (X1) | LED driver terminal (X2) | Transformer bobbin on LED driver (L52) | Transformer bobbin on LED driver (L51) | Transformer bobbin on LED driver (L01) | |
| - | Material (TS/TP/Other) | TP | TP | TP | TP | TP | |
| - | Colour | Cream | Cream | Black | Brown | Black | |
| - | How Tested (CE/SA/SC) | SC | SA | SA | SA | SA | |
| 7 | Conditioning of specimen and specified layer (24h) (Yes/No) | Yes | Yes | Yes | Yes | Yes | |
| 8.2 | Test Temperature (°C) | 750 | 750 | 750 | 750 | 750 | |
| - | Time till ignition of specimen (s) | 2 | 2 | NI | NI | NI | |
| - | Time till ignition of the specified layer (s) | NI | NI | NI | NI | NI | |
| - | Time from tip application till flames ceased (s) | 6 | 7 | NI | NI | NI | |
| - | Time from removal of glow-wire till flames ceased (s) | NI | NI | NI | NI | NI | |
| - | Ignition of the specified layer (Yes/No) | No | No | No | No | No | |
| - | Ignition of the wrapping tissue (Yes/No) | No | No | No | No | No | |
| - | RESULT | Pass | Pass | Pass | Pass | Pass | |
| Legend: TS-Thermosetting; TP-Thermoplastic; CE-Complete Equipment; SA-Sub-Assembly; SC-Separate Component; NI-No Ignition | | | | | | | |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | | | | | |
|--|---|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|----------|
| 16, A21 (13.3) | TABLE: Glow-wire test | | | | | | P |
| AS/NZS 60695.2.10, Clause | Specimen under test | Transformer bobbin on LED driver (L10) | Capacitor on LED driver (C01) | Capacitor on LED driver (C10) | Capacitor on LED driver (C53) | Capacitor on LED driver (C50) | |
| - | Material (TS/TP/Other) | TP | TP | TP | TP | TP | |
| - | Colour | Black | Grey | Grey | Grey | Grey | |
| - | How Tested (CE/SA/SC) | SA | SA | SA | SA | SA | |
| 7 | Conditioning of specimen and specified layer (24h) (Yes/No) | Yes | Yes | Yes | Yes | Yes | |
| 8.2 | Test Temperature (°C) | 750 | 750 | 750 | 750 | 750 | |
| - | Time till ignition of specimen (s) | NI | NI | NI | NI | NI | |
| - | Time till ignition of the specified layer (s) | NI | NI | NI | NI | NI | |
| - | Time from tip application till flames ceased (s) | NI | NI | NI | NI | NI | |
| - | Time from removal of glow-wire till flames ceased (s) | NI | NI | NI | NI | NI | |
| - | Ignition of the specified layer (Yes/No) | No | No | No | No | No | |
| - | Ignition of the wrapping tissue (Yes/No) | No | No | No | No | No | |
| - | RESULT | Pass | Pass | Pass | Pass | Pass | |
| AS/NZS 60695.2.10, Clause | Specimen under test | Capacitor on LED driver (C69) | Capacitor on LED driver (C51) | Capacitor on LED driver (C02) | LED driver insulating wrap | Cord anchorage | |
| - | Material (TS/TP/Other) | TP | TP | TP | TP | TP | |
| - | Colour | Grey | Blue | Grey | Clear | White | |
| - | How Tested (CE/SA/SC) | SA | SA | SA | SC | SC | |
| 7 | Conditioning of specimen and specified layer (24h) (Yes/No) | Yes | Yes | Yes | Yes | Yes | |
| 8.2 | Test Temperature (°C) | 750 | 750 | 750 | 650 | 650 | |
| - | Time till ignition of specimen (s) | NI | NI | NI | NI | NI | |
| - | Time till ignition of the specified layer (s) | NI | NI | NI | NI | NI | |
| - | Time from tip application till flames ceased (s) | NI | NI | NI | NI | NI | |
| - | Time from removal of glow-wire till flames ceased (s) | NI | NI | NI | NI | NI | |
| - | Ignition of the specified layer (Yes/No) | No | No | No | No | No | |
| - | Ignition of the wrapping tissue (Yes/No) | No | No | No | No | No | |
| - | RESULT | Pass | Pass | Pass | Pass | Pass | |
| Legend: TS-Thermosetting; TP-Thermoplastic; CE-Complete Equipment; SA-Sub-Assembly; SC-Separate Component; NI-No Ignition | | | | | | | |



| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | | | | | |
|--|--|----------------------|--|--|--|--|----------|
| 16, A21 (13.3) | TABLE: Glow-wire test | | | | | | P |
| AS/NZS 60695.2.10, Clause | Specimen under test | LED PCB connector | | | | | |
| - | Material (TS/TP/Other) | TP | | | | | |
| - | Colour | Cream | | | | | |
| - | How Tested (CE/SA/SC) | SA | | | | | |
| 7 | Conditioning of specimen and specified layer (24h) (Yes/No) | Yes | | | | | |
| 8.2 | Test Temperature (°C) | 750 | | | | | |
| - | Time till ignition of specimen (s) | 3 | | | | | |
| - | Time till ignition of the specified layer (s) | NI | | | | | |
| - | Time from tip application till flames ceased (s) | 6 | | | | | |
| - | Time from removal of glow-wire till flames ceased (s) | NI | | | | | |
| - | Ignition of the specified layer (Yes/No) | No | | | | | |
| - | Ignition of the wrapping tissue (Yes/No) | No | | | | | |
| - | RESULT | Pass | | | | | |
| Legend: TS-Thermosetting; TP-Thermoplastic; CE-Complete Equipment; SA-Sub-Assembly; SC-Separate Component; NI-No Ignition | | | | | | | |

| AS/NZS 60598.2.1 | | | |
|------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| 16, A21 (13.3) | TABLE: Needle-flame test | | | | | P |
|--|--|------------------|-------------------|----------------------|--|---|
| AS/NZS 60695.11.5, Clause | Specimen under test | Cable clammer | LED driver PCB | LED Module PCB | | |
| 6 | Material (TS/TP/Other) | TP | Other | Other | | |
| | Colour | Black | Green | White | | |
| | How Tested (CE/SA/SC) | SC | SC | SC | | |
| 8 | Conditioning of specimen and specified layer (24h) (Yes/No) | Yes | Yes | Yes | | |
| 7 | Duration of application of the test flame t_a (s) | 30 | 30 | 30 | | |
| 11 a) | Ignition of the test specimen (Yes/No) | Yes | Yes | Yes | | |
| | Ignition of the specified layer or wrapping tissue (Yes/No) | No | No | No | | |
| | Ignition of the surrounding parts (Yes/No) | No | No | No | | |
| 11 b) | Duration of burning t_b (s) | 3 | NI | NI | | |
| | Surrounding parts burnt away completely (Yes/No) | No | No | No | | |
| 11 | RESULT | Pass | Pass | Pass | | |
| Legend: TS-Thermosetting; TP-Thermoplastic; CE-Complete Equipment; SA-Sub-Assembly; SC-Separate Component; NI-No Ignition | | | | | | |

PHOTOGRAPHY:













