

Australian/New Zealand Standard™

Recessed luminaire barriers



AS/NZS 5110:2011

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The following are represented on Committee EL-041:

Australasian Fire and Emergency Service Authorities Council
Australian Industry Group
Certification Interests (New Zealand)
Consumers Federation of Australia
Electrical Compliance Testing Association
Electrical Regulatory Authorities Council
Energy Efficiency and Conservation Authority of New Zealand
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-041, Lamps and Related Equipment.

This Standard incorporates Amendment No. 1 (February 2013). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of this Standard is to provide requirements to assess the safety of recessed luminaire barriers. Barriers may be an additional means to improve the following:

- (a) The safety of buildings and installations by separation of possibly flammable elements, such as timber joists or ceilings, insulation (bulk, formed or loose fill), debris and the like from recessed luminaires.
- (b) The safety of buildings and installations by separating materials, such as insulation (bulk, formed or loose fill), debris and the like, from the recessed luminaire, and to prevent such materials from impacting on the thermal characteristics of recessed luminaires.
- (c) The thermal performance of recessed luminaires.

This Standard provides classifications, construction and marking requirements, and test procedures for recessed luminaire barriers to achieve uniform compliance criteria for any barrier that may be called up by other Standards, codes, commercial contracts, building specifications, regulatory requirements or the like.

Barriers compliant with this Standard may be suitable barriers to be referenced by other Standards (such as AS/NZS 3000, *Electrical installations (known as the Australian/New Zealand Wiring Rules)*, or AS 3999, *Thermal insulation in dwellings—Bulk insulation—Installation requirements*, or NZS 4246, *Energy efficiency—Installing insulation in residential buildings*, or any specific commercial contract on installation of recessed luminaires, subject to any restrictions or conditions of use, installation or other requirements stated in those Standards or contracts.

If the barrier has electrical components (e.g. a thermal cut out) the tests in this Standard may be used as part of the requirements to show compliance, if appropriate, with AS/NZS 3820, *Essential safety requirements for electrical equipment*.

‘Text deleted’

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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Australian/New Zealand Standard
Recessed luminaire barriers

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE**1.1.1 General**

This Standard specifies the safety requirements for barriers for recessed luminaires to provide adequate separation from combustible building elements, insulation, and/or debris to reduce the fire risk to any surrounding material and to ensure no damage to the recessed luminaire.

Barriers can be collars, covers or complete enclosures intended to ensure combustible materials do not come in contact with hot surfaces.

This Standard specifies requirements for barriers in relation to classification, construction, testing, marking and manufacturer's instructions.

This Standard applies to any barrier intended for application to an existing or new luminaire (see Clause 1.1.3).

The recessed luminaire barrier's effect on building properties such as acoustic characteristics, movement of moisture and thermal 'R' rating is excluded from the scope of this Standard.

1.1.2 In Australia only**A**

This Standard applies to permanent or removable barriers that are incorporated into luminaire fittings.

NOTE: For such fittings, AS/NZS 60598.2.2 provides requirements for the luminaire.

Any luminaire incorporating a permanent or removable recessed luminaire barrier and not marked 'Do Not Cover', apart from meeting the requirements of this Standard, needs to meet the appropriate tests in AS/NZS 60598.2.2.

Recessed luminaires marked as 'Do Not Cover' are excluded from this Standard as they do not include a permanent or removable recessed luminaire barrier.

NOTES:

- 1 'Do Not Cover' luminaires are marked with the IEC symbol shown in Figure 1.
- 2 This does not preclude a luminaire being tested and classified as a 'single combination' barrier.

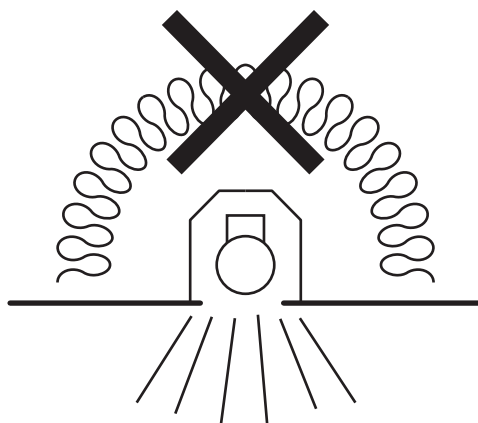


FIGURE 1 IEC SYMBOL* FOR 'DO NOT COVER' LUMINAIRES

1.1.3 In New Zealand only

NZ

Barriers are also intended to maintain adequate separation from all material and so reduce the influence of any surrounding material on the thermal characteristics of the recessed luminaire, ensuring the environment of the luminaire is not compromised, thus ensuring no harm to the luminaire. 'Harm' is anything that could cause the luminaire to fail, shut down, reduce its output or efficiency, adversely affect its thermal or any other properties and such like.

This Standard does not apply to permanent or removable barriers that are incorporated into new luminaire fittings, as AS/NZS 60598.2.2 provides requirements for these luminaire/barrier combinations.

1.2 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

NOTE: Documents referenced for informative purposes are listed in Appendix A.

AS

- | | |
|------------|---|
| 1530 | Methods of fire tests on building materials, components and structures |
| 1530.1 | Part 1: Combustibility test for materials |
| 60068 | Environmental testing—Tests |
| 60068.2.75 | Part 2.75: Test Eh: Hammer tests |
| 60529 | Degrees of protection provided by enclosures (IP code) |
| AS/NZS | |
| 3000 | Electrical installations (known as the Australian/New Zealand Wiring Rules) |
| 3112 | Approval and test specification—Plugs and socket-outlets |
| 60598 | Luminaires |
| 60598.1 | Part 1: General requirements and tests |
| 60598.2.2 | Part 2.2: Particular requirements—Recessed luminaires (IEC 60598.2.2:1996, MOD) |
| 60695 | Fire hazard testing |
| 60695.2.11 | Part 2.11: Glowing-hot wire based test methods—Glow-wire flammability test method for end-products |
| 60695.11.5 | Part 11.5: Test flames—Needle-flame test method—Apparatus, confirmatory test arrangement and guidance |

* IEC symbol source: IEC 60598-1 Ed.7.0, *Luminaires—Part 1: General requirements and tests*.

AS/NZS

61558 Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1 100 V

61558.2.6 Part 2.6: Particular requirements for safety isolating transformers and power supply units incorporating safety isolating transformers (IEC 61668-2-6 Ed 2, MOD)

NZS

4246 Energy efficiency—Installing insulation in residential buildings

IEC

60449 Voltage bands for electrical installations of buildings

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

1.3 DEFINITIONS

For the purposes of this Standard the following definitions apply.

NOTE: Where the terms ‘voltage’ and ‘current’ are used, they imply the r.m.s. values unless otherwise stated.

1.3.1 Ballast

A unit inserted between the supply and one or more discharge lamps which, by means of inductance, capacitance or resistance, single or in combination, serves mainly to limit the current of the lamp(s) to the required value.

1.3.2 ‘Not used’

1.3.3 Extra low voltage (ELV)

Voltage that does not exceed 50 V a.c. r.m.s. or 120 V ripple free d.c. between conductors, or between any conductor and earth (voltage band I of IEC 60449).

NOTE: ‘Ripple free’ is conventionally defined for sinusoidal ripple voltage as a ripple content of not more than 10% r.m.s.; the maximum peak value does not exceed 140 V for a nominal 120 V ripple-free d.c. system, 70 V for a nominal 60 V ripple-free d.c. system, and 35 V for a nominal 30 V ripple-free system.

1.3.4 Independent lamp control gear (auxiliary equipment/auxiliary control gear)

Lamp control gear (see Definition 1.3.7) consisting of one or more separate elements so designed that it, or they, can be mounted separately outside a luminaire with protection according to the marking on the lamp control gear and without any additional enclosure. Examples include ballasts, transformers, step-down convertors, LED drivers, plug-in ballast/transformer and the like.

1.3.5 Installation wiring

A system of wiring in which cables are fixed or supported in position in accordance with the appropriate requirements of AS/NZS 3000.

1.3.6 Interconnecting cable

Wiring or wiring assembly between the main parts of a luminaire as supplied by the luminaire manufacturer and which can be regarded as being part of the luminaire.

NOTE: A wiring assembly may contain a combination of different wiring, e.g. to feed through the supply voltage, to provide earthing, to supply starting and working voltages and wiring providing functional connection. Examples of applications are between a luminaire and a control gear box or a mounting box.

A1

1.3.7 Lamp control gear

One or more components between the supply and one or more lamps which may serve to transform the supply voltage, limit the current of the lamp(s) to the required value, provide starting voltage and preheating current, prevent cold starting, correct power factor or reduce radio interference.

1.3.8 Luminaire

An apparatus that distributes, filters or transforms the light transmitted from one or more lamps and which includes all the parts necessary for supporting, fixing and protecting the lamps, but not the lamps themselves, and where necessary, the circuit auxiliaries together with the means for connecting them to the supply.

NOTE: A luminaire with integral non-replaceable lamps is regarded as a luminaire, except that the tests are not applied to the integral lamp or integral self-ballasted lamp.

1.3.9 Mounting surface

Part of any building, furniture or other structure that a luminaire may in any way be attached to, suspended from, stood on or placed upon in normal use and which will or is intended to support the luminaire–barrier combination.

1.3.10 Non-combustible material

A material that, in the form in which it is used and under the condition anticipated, will not ignite, burn, support combustion, or release flammable vapours when subject to fire or heat (see AS 1530.1).

1.3.11 Normally flammable (combustible) material

Material having an ignition temperature of at least 200°C and that will not deform or weaken at this temperature.

NOTES:

- 1 Examples include wood and materials based on wood of more than 2 mm thickness, and plasterboard.
- 2 The ignition temperature and the resistance of normally flammable materials to deformation or weakening are based on widely accepted values determined during a test period of 15 min.

1.3.12 Plug-ballast/transformer

A ballast or transformer incorporated in an enclosure provided with an integral plug as the means of connection to the electrical supply.

1.3.13 Readily flammable (combustible) material

Material that cannot be classified as either normally flammable or non-combustible. Examples include wood fibre and materials based on wood of up to 2 mm thickness of each layer if corrugated/laminated.

1.3.14 Recessed luminaire

A luminaire intended by the manufacturer to be fully or partly recessed into a mounting surface.

NOTE: The term applies to luminaires for operation in enclosed cavities, and to luminaires for mounting through a surface.

1.3.15 Recessed luminaire barrier (barrier)

An enclosure, guard, collar, barrier or cover, used with recessed luminaires to maintain adequate separation from all loose material or fixed (combustible) materials and intended to prevent the ingress of readily flammable (combustible) material from coming into contact with hot surfaces (i.e. hot surfaces of a recessed luminaire, lamp, any auxiliary equipment or barrier electrical components within the barrier, or even an internal barrier within the barrier).

NOTES:

- A1 |
- 1 In this Standard, a recessed luminaire barrier is referred to as 'barrier'.
 - 2 When required, this will assist with compliance with requirements of AS/NZS 3000, AS 3999, NZS 4246 or other requirements such as the Building Code of Australia (BCA) and the New Zealand Building Code.

1.3.16 Safety extra low voltage (SELV)

An ELV in a circuit which is insulated from the mains supply by an insulation not less than that between the primary and secondary circuits of a safety isolating transformer according to AS/NZS 61558.2.6 or equivalent.

NOTE: Maximum voltage lower than 50 V a.c. r.m.s. or 120 V ripple free d.c. may be specified in particular requirements, especially when direct contact with current-carrying parts is allowed.

1.3.17 Socket-outlet

Accessory having socket-contacts designed to engage with the pins or blades of a mains plug and having terminals for the connection of cables or cords and complying with AS/NZS 3112.

1.3.18 Thermal insulation

Thermal insulation in the form of:

- (a) *Loose fill insulation* Loose fill and post formed insulating materials that comprise multiple individual particles that are blown or sprayed by equipment into their final location. Examples include cellulose fibre, wool, granulated glasswool, granulated rockwool, polyurethane expanding foams.
- (b) *Formed insulation* Formed and preformed insulating materials that are pre-shaped in a manufacturing facility and include materials that are supplied in compression packaging. These materials are typically cut and placed into position by hand and include glasswool, rockwool, polyester supplied in segmented batt or blanket form and expanded polystyrene foam boards.
- (c) *Membranes* Membranes and reflective membranes are building materials that may or may not be an insulating material themselves but through the products ability to trap insulating air pockets and reflect radiation may provide thermal resistance to effect the operating conditions of electrical equipment nearby (e.g. aluminium foil faced or lined plastic and paper membranes).

NOTE: For detailed definitions of the different type of insulation refer to AS/NZS 4859.1.

1.3.19 Type test

Test or series of tests made on a type test sample for the purpose of checking compliance of the design of a given product with the requirements of the relevant Standard.

1.3.20 Type test sample

Sample consisting of one or more similar units submitted by the manufacturer or the responsible vendor for the purpose of a type test.

SECTION 2 CLASSIFICATION OF BARRIERS

2.1 GENERAL

This Section describes the classification of barriers. Where barriers have specific characteristics they may be required to meet particular requirements in addition to the general requirements that apply to all barriers. To specify these particular requirements it is necessary to define barriers according to such characteristics.

A1 | **‘Text and note deleted’**

Barriers shall be classified according to—

- A1 | (a) luminaire suitability (see Clause 2.8);
- (b) depth of insulation (Clause 2.2);
- (c) degree of protection against ingress of dust, solid objects and moisture (Clauses 2.3 and 2.4);
- (d) installation (Clause 2.5);
- A1 | (e) impact (Clause 2.6);
- (f) insulation (Clause 2.7); and
- (g) protrusion above insulation.

A1 | **‘Text and note deleted’**

2.2 DEPTH CLASSIFICATION

2.2.1 Rated depth of insulation

2.2.1.1 200 mm—not covered

Barriers classified as ‘200 mm—not covered’ shall be suitable for installation up to a depth of 200 mm when tested in accordance with this Standard and be marked in accordance with Clause 3.2.

2.2.1.2 Greater than 200 mm—not covered

Barriers classified as ‘greater than 200 mm—not covered’ shall be suitable for installation up to a depth of insulation as marked on the barrier when tested in accordance with this standard and be marked in accordance with Clause 3.2.

2.2.2 Coverable (Australia only)

A

- A1 | Barriers classified as ‘coverable’ shall be suitable for installation with all depths of insulation, including the insulation covering the rear or top of the barrier, when tested in accordance with this Standard and be marked in accordance with Clause 3.2.

2.2.3 Coverable (New Zealand only)

NZ

In New Zealand barriers shall not be classified as ‘coverable’.

A1 | 2.3 INGRESS CLASSIFICATION

2.3.1 Low ingress protection

Barriers classified as ‘low ingress protection’ shall comply with Clause 5.5 ‘Ingress test’ of this Standard.

NOTE: This classification is intended to be a minimum level of ingress protection to exclude animals, insulation and debris entering the barrier.

A1 | 2.3.2 Medium ingress protection

Barriers classified as 'medium ingress protection' shall comply with Clause 5.5 'Ingress test' of this Standard and comply with IP4X requirements of AS 60529.

NOTE: This classification is intended to have a level of ingress protection that excludes insects as well as the minimum level ingress protection from animals, insulation and debris entering the barrier.

A1 | 2.3.3 High ingress protection

Barriers classified as 'high ingress protection' shall comply with Clause 5.5 'Ingress test' of this Standard and comply with IP6X requirements of AS 60529.

NOTE: This classification is intended to have a level of ingress protection that excludes dust as well as insects, and have the minimum level ingress protection from animals, insulation and debris entering the barrier.

A1 | 2.3.4 Low ingress protruding protection

Barriers classified as 'low ingress protruding protection' shall meet the requirement for 'low ingress protection' as per Clause 2.3.1.

In addition, the barrier top surface shall meet the following:

- (a) Protrude at least 75 mm above the rated depth of insulation.
- (b) Have an open area of at least 80% of the downlight penetration area.

A1 | 2.4 'Not used'**2.5 INSTALLATION CLASSIFICATION****2.5.1 Installation from above**

This classification applies to barriers suitable for installation from above the mounting surface.

2.5.2 Installation from below

This classification applies to barriers suitable for installation from below the mounting surface.

NOTE: This does not preclude these barriers from being installed from above.

2.6 IMPACT CLASSIFICATION**2.6.1 Light impact duty**

Barriers classified as 'light impact duty' shall comply with the requirements of this Standard with an IK rating of IK06.

2.6.2 Medium impact duty

Barriers classified as 'medium impact duty' shall comply with the requirements of this Standard with an IK rating of IK08 or above.

2.6.3 High impact duty

Barriers classified as 'high impact duty' shall comply with the requirements of the Standard with an IK rating of IK10.

2.7 INSULATION CLASSIFICATION**2.7.1 Restricted**

The classification, 'restricted' applies to barriers that are tested for use with formed insulation or membrane insulation only.