

Australian Standard[®]

**Emergency escape lighting and exit
signs for buildings**

**Part 3: Emergency escape luminaires
and exit signs**



This Australian Standard® was prepared by Committee LG-007, Emergency Lighting in Buildings. It was approved on behalf of the Council of Standards Australia on 16 March 2005. This Standard was published on 12 May 2005.

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 - Australian Building Codes Board
 - Australian Chamber of Commerce and Industry
 - Australian Electrical and Electronic Manufacturers Association
 - Building Industry Authority NZ
 - Business New Zealand
 - Department of Commerce (NSW)
 - IES: The Lighting Society
 - National Electrical and Communications Association
 - New Zealand Electrical Regulatory Authorities
 - Property Council of Australia
-

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Australian Standard[®]

Emergency escape lighting and exit signs for buildings

Part 3: Emergency escape luminaires and exit signs

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee LG-007, Emergency Lighting in Buildings, to supersede AS/NZS 2293.3:1995 *Emergency evacuation lighting for buildings, Part 3: Emergency luminaires and exit signs*. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian, rather than an Australian/New Zealand Standard.

This Standard incorporates Amendment No. 1 (February 2010) and Amendment No. 2 (December 2012). 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 AS (/NZS) 2293 series comprises three Parts as follows:

AS(/NZS)

- 2293 Emergency escape lighting and exit signs for buildings
- 2293.1 Part 1: System design, installation and operation
- 2293.2 Part 2: Inspection and maintenance
- 2293.3 Part 3: Emergency escape luminaires and exit signs (this Standard)

The objective of the AS 2293 series of Standards is to provide all those associated with the design, construction, installation, certification and maintenance of all the individual components of an emergency escape lighting and exit signage scheme, and the scheme as a whole, with the requirements and guidelines to provide an installation that will ensure an acceptable level of illumination to the nominated areas for the safe evacuation of occupants from those areas in an emergency situation.

The objective of this Standard is to provide designers, manufacturers and certifiers of emergency escape luminaires and exit signs with the relevant requirements for such products in order to facilitate the production of luminaires that will provide an acceptable level of emergency escape lighting to a space when installed in compliance with AS 2293.1.

The principal reason for this edition of the Standard is to specify requirements for exit signs employing internationally accepted pictorial elements instead of the previously used word 'Exit'. Also, the basic terminology used to describe the subject matter of the Standard has been modified to be compatible with that used in IEC 60598-2-22 *Luminaires, Part 2-22: Particular requirements—Luminaires for emergency lighting*. The terminology now used, and reflected in the new series title, recognizes the term emergency lighting as including four categories of lighting, each provided with an alternative energy supply, as follows:

- (a) Emergency escape lighting.
- (b) Illuminated emergency exit signs.
- (c) High risk task area lighting.
- (d) Standby lighting.

Of these categories, items (a) and (b) are the newly adopted terms that refer to the two types of emergency lighting that are required by law in Australia and comprise the scope of the AS 2293 series of Standards. Items (c) and (d) are types of lighting that have a limited history in this country and which are not covered by this series of Standards.

This Standard incorporates the following significant changes from the previous edition:

- (i) Replacement of word 'exit' with pictorial element.

- (ii) As this Standard is not a joint Australian/New Zealand document, there is no content specific to New Zealand only.
- (iii) The adoption of terminology from IEC 60598-2-22.

Electronic files of all basic pictorial elements are grouped under the heading 'Image files for exit signs specified in AS 2293.3' and attached to this document as a CD Rom in the case of a paper copy of the Standard and as a zip file in the case of an electronic copy. These files reproduce the contents of Figure 3.1 in a form suitable for directly creating complying pictorial elements over a range of sizes. It should be noted these files are provided as an assistance to the user only and do not form part of this Standard.

It is anticipated that, within the life of this publication, the approval and test specification for luminaires – AS 3137, will be superseded and replaced by a new Standard designated AS/NZS 60598.2.22.

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.

This Standard distinguishes between documents cited as normative references and those referenced for information only. Those belonging to the former category are listed in the clause titled 'Normative references' while those of the latter type are listed in the bibliography.

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STANDARDS AUSTRALIA

Australian Standard

Emergency escape lighting and exit signs for buildings

Part 3: Emergency escape luminaires and exit signs

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for the design, construction, performance and testing of emergency escape luminaires and exit signs. It applies both to emergency escape luminaires and exit signs that are centrally supplied, and to emergency escape luminaires and exit signs of the self-contained type.

NOTES:

- 1 Appendix A lists the essential data and preferred format of test reports for emergency escape luminaires and exit signs.
- 2 A sample declaration of the compliance of emergency escape luminaires and exit signs with this Standard is given in Appendix B.

1.2 APPLICATION

It is anticipated that this Standard will be indirectly referenced, via a direct reference to AS 2293.1 in the May 2006 edition of the Building Code of Australia, thereby superseding the previous edition from the AS/NZS 2293 series.

A1 Exit signs shall comply with all the requirements of the subsequent clauses of the Standard in order to be classified as an emergency escape luminaire. All the requirements of the Standard shall also be met simultaneously and certified to achieve conformity.

1.3 NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this document.

AS/(NZS)

- | | |
|---------|--|
| 2293 | Emergency escape lighting and exit signs for buildings |
| 2293.1 | Part 1: System design, installation and operation |
| 2293.2 | Part 2: Inspection and maintenance |
| 3100 | Approval and test specification—General requirements for electrical equipment |
| 3137 | Approval and test specification—Luminaires (light fittings) |
| 60598 | Luminaires |
| 60598.1 | Part 1: General requirements and tests |
| IEC | |
| 61951 | Secondary cells and batteries containing alkaline or other non-acid electrolytes—Portable sealed rechargeable single cells |
| 61951-1 | Part 1: Nickel-cadmium |
| 61056 | General purpose lead-acid batteries (valve-regulated types) |
| 61056-1 | Part 1: General requirements, functional characteristics—Methods of test |

ISO

3864 Safety colours and safety signs

3864-1 Part 1: Design principles for safety signs in workplaces and public areas

1.4 DEFINITIONS

1.4.1 General

For the purpose of this Standard, the definitions given in AS 2293.1 and those below apply.

NOTE: Some of the definitions below appear in AS 2293.1 but, being specific to exit signs, are repeated here for convenience.

1.4.2 Definitions of exit sign type

1.4.2.1 *Standard internally illuminated exit sign*

A sign consisting of white symbols on a green background, in accordance with Figure 3.1, both being light emitting or light transmitting.

1.4.2.2 *Low illuminance area internally illuminated exit sign*

A sign consisting of light emitting or light transmitting green symbols on an opaque background. Referred to herein as a 'low illuminance area exit sign'.

1.4.2.3 *Externally illuminated exit sign*

A sign consisting of white symbols on a green background, in accordance with Figure 3.1, illuminated by an incident source comprising an emergency luminaire located in front of the plane of the sign face.

1.4.3 Definitions specific to exit sign appearance

1.4.3.1 *Additional background and optional additional background*

Additional background areas are those areas on the face of an exit sign that are not part of any pictorial element but are of the same colour as the background portion/s of the pictorial element/s. An additional background of at least the same area as the pictorial element must be included on a single element sign. Any areas of the face of a sign apart from the pictorial elements, additional background as defined above and allowable borders shall be designated as optional additional background.

Refer to Figures 1.1 and 3.4(b).

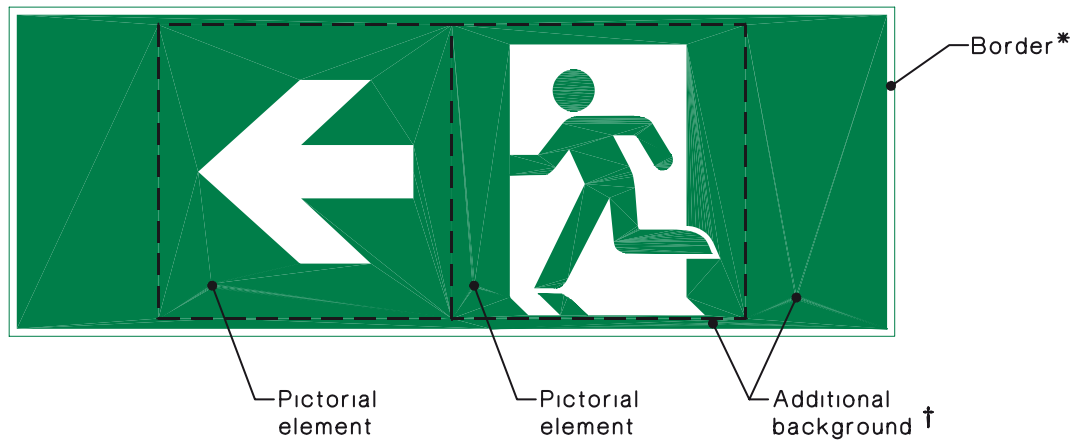
1.4.3.2 *Border*

Any transilluminated white area of the face of the sign outside both the elements and any additional green background. Refer to Figure 1.1 and Clause 3.3.5.

1.4.3.3 *Pictorial element*

A combined symbol (i.e. arrow or figure in doorway) and contrasting background, forming a visual 'building block', one or more such building blocks being used with or without other elements to create an exit sign display. Refer to Figure 1.1.

A1



LEGEND

- * = Optional Only allowed on self illuminated exit signs
- † = Optional on two element sign
- - - = Boundary of pictorial element (Notional only Does not appear on sign)

FIGURE 1.1 CONSTITUENT ELEMENTS OF EXIT SIGN FACE

1.5 ELECTROMAGNETIC COMPATIBILITY

Electromagnetic compatibility (EMC) requirements are specified by the Australian Communications Authority.

SECTION 2 GENERAL REQUIREMENTS FOR EMERGENCY ESCAPE LUMINAIRES

2.1 COMPLIANCE WITH AS 3137

Emergency escape luminaires shall comply with the requirements of AS 3137 unless otherwise specified in this Standard.

2.2 LUMINAIRE CLASSIFICATION

Emergency escape luminaires shall be classified in accordance with Appendix C and shall be appropriately marked.

2.3 ILLUMINATION AT SWITCH ON

2.3.1 Maximum delay

Emergency escape luminaires shall provide a light output of at least—

- (a) 10% of the reference value within 1 s of energization; and
- (b) 80% of the reference value within 15 s of energization.

The reference value shall be taken as the luminous intensity assigned in terms of the classification procedure of Paragraph C3.2 of Appendix C.

The requirements of Items (a) and (b) shall apply both when the emergency escape luminaires are initially switched on (i.e. cold start) and when the emergency escape luminaires are switched on immediately after operation for a period of 15 min (i.e. hot start).

NOTE: The provision of a light output of at least 10% of the reference value within 1 s of energization is specified to minimize the possibility of panic occurring among the occupants of the building.

2.3.2 Conditions for assessing compliance with Clause 2.3.1

For the purpose of assessing compliance with the requirements of Clause 2.3.1, the following conditions shall apply:

- (a) Before the emergency escape luminaires are operated they shall be conditioned by connection to the normal supply in an ambient atmosphere at $25 \pm 2^\circ\text{C}$ for a period of at least 1 h.
- (b) Centrally-supplied emergency escape luminaires shall be operated at their rated voltage or, where marked for operation within a range of voltages, the lowest marked voltage.
- (c) Self-contained emergency escape luminaires shall utilize their in-built battery supply but the battery shall be in the fully charged state at the commencement of each assessment.

For the assessment of light output required following a 15 min period of operation, the battery shall be in the fully charged state at the commencement of that period of operation. Loss of supply shall be simulated immediately afterwards for assessment of compliance with the light output criteria.

2.4 MARKING

In addition to the information required by AS 3137, each emergency escape luminaire shall be legibly and durably marked with the following information, as applicable.

This information shall be marked on the body of the luminaire and not on the diffuser or other optical control media:

- (a) Luminaire classification(s) determined in accordance with Appendix C in respect of the following factors, as applicable:
 - (i) Differences in the luminous intensities emitted in the transverse (C_0) and longitudinal (C_{90}) vertical planes (see Paragraph C3.1).
 - (ii) Lamps of differing lumen output with which it may be used (see Paragraph C3.1).
 - (iii) Alternative forms in which the luminaire may be used (see Paragraph C2.2).
 - (iv) Designed mounting positions (see Paragraph C2.3).
- (b) Marking to identify the orientation of the C_0 plane through the luminaire (see Appendix C) where the luminaire has a different classification in the C_0 and C_{90} planes. This marking shall be clearly visible during installation and subsequent inspection of the completed lighting system. For luminaires where the C_0 plane is not obvious, it may be designated by the location of the identification symbol of Figure 2.1 at the appropriate position on the surroundings of the luminaire body, i.e. by placing the symbol on the C_0 axis relative to the light source.
- (c) The identification symbol specified in Figure 2.1. The symbol shall be black and white in colour and not less than 10 mm in diameter. It shall be located in a position where it will be visible from below when the luminaire is installed, except in cases where no appropriate surface exists on the luminaire e.g. where only diffusing media or similar are visible below the ceiling.



FIGURE 2.1 IDENTIFICATION SYMBOL FOR EMERGENCY ESCAPE LUMINAIRES

- (d) Information necessary to ensure correct lamp replacement. This shall include the following as applicable:
 - (i) For fluorescent lamps, a statement of acceptable lamp technologies that will not detrimentally affect such aspects as lumen output or the life of control gear. Statements of unacceptable technologies may also be included. Examples of technologies to be considered include tri-phosphor lamps and 'amalgam' lamps.
 - (ii) For incandescent lamps, a statement of the minimum acceptable nominal lumen output.
 - (iii) The colour temperature of acceptable lamps.
NOTE: This will typically be designated by colour designation or colour temperature, e.g. 'cool white' or '4000°K'
- (e) Warning notice regarding isolation of the electrical supply or supplies, if necessary, to ensure the safety of persons working on the emergency luminaire or the integrity of operation of the emergency luminaire.

(See also Clause 4.9).

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SECTION 3 GENERAL REQUIREMENTS FOR EXIT SIGNS

A1

3.1 COMPLIANCE REQUIREMENTS

3.1.1 Compliance with AS 3137

Exit signs shall comply with the requirements of AS 3137 unless otherwise specified in this Standard.

3.1.2 Compliance with this Standard

Exit signs shall comply with all the requirements of Section 3.

NOTE: Photometric classification in accordance with Appendix C in itself does not indicate compliance with this Section.

3.2 TYPES OF EXIT SIGN

For the purpose of applying this Standard, an exit sign shall be classified as one of three types as follows:

- (a) As a standard internally illuminated exit sign in accordance with Clause 1.4.2.1.
- (b) As a low illuminance area exit sign in accordance with Clause 1.4.2.2.
- (c) As an externally illuminated exit sign in accordance with Clause 1.4.2.3.

3.3 APPEARANCE OF EXIT SIGN FACE

3.3.1 Basic pictorial elements and shape

The basic pictorial elements from which the face of any exit sign is constructed shall be in direct proportion to the applicable elements displayed in and specified by Figure 3.1.

NOTE: These elements are as per ISO 3864-1.

A2

An exit sign shall consist of one or more of these elements, combined only in accordance with one of the combinations specified in Figure 3.2 or Figure 3.3.

The green section of an exit sign shall be in the shape of a rectangle or square. The use of variations to these basic shapes (e.g. large-radius corners proposed due to manufacturing considerations) shall be acceptable only where specifically agreed by the relevant regulatory authority. The green section of an exit sign shall not be in the shape of a circle, nor of a triangle.

NOTE: This requirement is in keeping with the principles of the meaning of various sign shapes set out in ISO 3864-1.

3.3.2 Optional additional elements

A1

As well as the basic pictorial elements, an exit sign face may also contain additional background and optional additional background in accordance with Clause 3.3.4, and in the case of a standard self-illuminated exit sign only, a white border in accordance with Clause 3.3.5.

3.3.3 Location of elements

A1

Where a sign consists of one pictorial element (i.e. that displayed in Figure 3.1(b)) this element shall be located in the centre of the additional background. (See also Clause 3.3.4.)

Where a sign consists of two pictorial elements, these shall be immediately adjacent to each other and located in the centre of any optional additional background.

3.3.4 Additional background

A1

Where a standard internally illuminated or externally illuminated exit sign has only a single pictorial element, the face of the sign shall include additional background of an area at least equal to the total area of the pictorial element and this additional background shall comply with the requirements of Clause 3.4.2 (d).

Both additional background and optional additional background shall comply with the requirements of Clause 3.3.6.

3.3.5 Borders

For a standard self illuminated sign and for an externally illuminated sign, white transilluminated areas lying outside the areas of green background shall be acceptable on condition that any such areas—

- (a) form a continuous border around the green background; or
- (b) form lines of even thickness either at the sides or above and below the green background areas; or
- (c) comprise a total projected area not more than 20% of the combined area of the pictorial elements plus additional background.

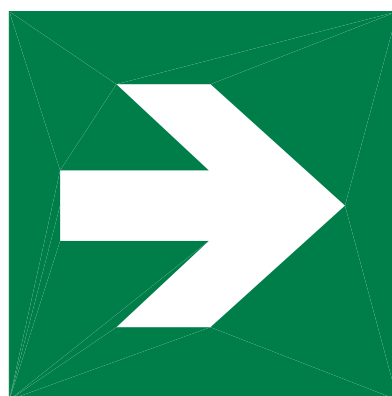
Borders shall not be permitted on low illuminance area exit signs.



(a) Left facing



(b) Right facing

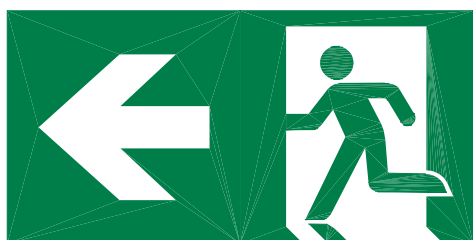


(c) Arrow

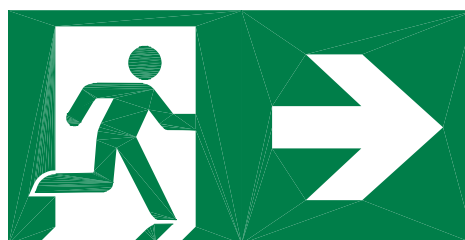
FIGURE 3.1 PICTORIAL ELEMENTS



(a) Straight on from here
(Refer to Clause 3.3.4)



(b) Left from here



(c) Right from here

FIGURE 3.2 FORMATS AND MEANINGS OF PICTORIAL ELEMENTS

A2



(a) No additional background

LEGEND:
 = Opaque background
 (Dark colour preferred)



(b) With additional background



(c) Left from here



(d) Right from here

NOTE: Some black and white printers might produce a poor representation of this figure.

FIGURE 3.3 EXAMPLES OF COMPLYING LOW ILLUMINANCE EXIT SIGN

3.3.6 Colours

3.3.6.1 General

For all types of sign, the colour of any additional background shall be identical to that of the background within the pictorial element/s.

3.3.6.2 Standard internally illuminated exit signs

The white and green colour portions of the face of a self-illuminated exit sign shall lie within the areas defined by the chromaticity coordinates specified in Table 3.1.

TABLE 3.1
CHROMATICITY COORDINATES

Colour		1	2	3	4
White	<i>x</i>	0.290	0.265	0.370	0.460
	<i>y</i>	0.260	0.310	0.405	0.425
Green	<i>x</i>	0.285	0.285	0.170	0.026
	<i>y</i>	0.707	0.441	0.364	0.399

NOTES:

- 1 These chromaticity coordinates are sourced from ISO/DIS 3864-4, *Graphical symbols—Safety colours and safety signs—Part 4: Colorimetric and photometric properties of safety signs materials*, Table 2—Colour regions: Chromaticity coordinates and luminance for maintained internally illuminated safety sign colours.
- 2 The boundary for the green colour is extended towards the yellow boundary such that $x = 0.285$.

3.3.6.3 Low illuminance area exit signs

The symbols on the face of a low illuminance self illuminated sign shall be green as per the requirements specified in Clause 3.3.2.

The background shall be opaque and a colour other than green. A dark colour is recommended.

3.3.6.4 Externally illuminated exit sign

The green and white portions of an externally illuminated exit sign shall comply with the relevant colour specification requirements specified in Clause 3.3.6.2.

3.3.7 Size of pictorial elements

3.3.7.1 Minimum size

The minimum pictorial element height for any exit sign shall be 100 mm.

Refer also to Clause 3.5.

3.3.7.2 Maximum size

There shall be no limit on the maximum pictorial element height.

3.3.7.3 Recommended sizes

It is recommended that the pictorial element height on any exit sign correspond to one of the following discrete sizes.