



# NEW ZEALAND

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AS-NZS 2063 (2008) (English): Bicycle helmets [By Authority of New Zealand Land Transport (Road User) Rule 2004 (SR 2004/427)]

*We will sell to no man,  
we will not deny or defer to any man either justice or right.*

**Magna Carta—Tūtohingā Nui**

*Kore rawa e hoko ki te tangata, e kore e whakakāhoretia,  
e tautuku rānei te tangata ki te ture, tika ranei.*



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## Bicycle helmets

## **AS/NZS 2063:2008**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CS-014, Pedal Cycle Helmets. It was approved on behalf of the Council of Standards Australia on 22 September 2008 and on behalf of the Council of Standards New Zealand on 7 November 2008.

This Standard was published on 27 November 2008.

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The following are represented on Committee CS-014:

Association of Accredited Certification Bodies  
Australian Chamber of Commerce and Industry  
Australian Competition and Consumer Commission  
Australian Cycling Federation  
Australian Industries Group  
Australian Retailers Association  
Bicycle Federation of Australia  
Bicycle Industries Australia  
Department of Fair Trading NSW Consumer Protection Agency  
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New Zealand helmet testing interests  
Retail Cycle Traders Australia  
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*This Standard was issued in draft form for comment as DR 08039.*

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# Australian/New Zealand Standard™

## Bicycle helmets

Originated in Australia as part of AS 2063—1977.  
Originated in New Zealand as NZS 5439:1986.  
Previous edition AS/NZS 2063:1996.  
Second edition 2008.  
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## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-014, Pedal Cycle Helmets to supersede AS/NZS 2063:1996, *Pedal cycle helmets*.

*This Standard incorporates Amendment No. 1 (December 2009). 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.*

Changes in this edition of the Standard from the 1996 edition include:

- (a) The adoption of the projection requirements from AS/NZS 3838:1998, *Helmets for horse riding and horse-related activities* (see Clause 5.3).
- (b) The specification of the use of ISO headforms through reference to AS/NZS 2512.1 (see Clause 6.5).
- (c) Reduction of the impact energy attenuation requirements from an allowed maximum of 300g to 250g (see Clause 7.4).
- (d) Replacing the retention system test with a dynamic strength test through reference to AS/NZS 2512.5.2 (see Clause 7.6).
- (e) Peak deflection test introduced.

NOTE: The committee is investigating the possibility of including the following specifications:

- (a) Dynamic stability test to replace the static stability test in Clause 7.3.
- (b) Lowering the loading measured by the force transducer to 350 N in 'load distribution' specification (Clause 7.5).

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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## FOREWORD

Helmets which comply with this Standard are considered suitable for cycling activities where the wearer may be thrown or fall from a height, particularly while mobile. They are not, however, to be used by motor cyclists on public roads or in other public places where the various State and Territory Traffic Regulations require the use of helmets complying with AS/NZS 1698:2006, *Protective helmets for vehicle users*, nor are they to be used for high-speed sports such as motor cycle racing and car racing.

The protection given by a helmet depends on the circumstances of the impact and the wearing of a helmet cannot always prevent death or injury. A proportion of the energy of an impact is absorbed by the helmet, thereby reducing the force of the blow sustained by the head. The structure of the helmet may be damaged in absorbing this energy and any helmet that sustains a severe blow should be replaced even if damage is not apparent.

To achieve the performance of which it is capable and to ensure stability on the head, a helmet should be as closely fitting as possible consistent with comfort, and it must be securely fastened, with the retaining strap under tension at all times.

# STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

## Australian/New Zealand Standard Bicycle helmets

### 1 SCOPE

This Standard specifies construction requirements and the basic performance requirements for impact energy attenuation, helmet stability, load distribution, strength and effectiveness of the retention system and its attachment points and peripheral vision clearance for lightweight protective helmets intended to mitigate the adverse effects of a blow to the head. Marking requirements are also specified.

Helmets that meet the specification of this Standard may not adequately control hazards and injuries associated with all cycling activities, e.g. BMX and mountain bicycles.

NOTE: A helmet complying with this Standard may incorporate special features designed to suit its use in specific activities.

### 2 OBJECTIVE

The objective of this Standard is to provide helmet wearers with lightweight helmets that provide protection against, and reduce the severity of, head injury from hazards associated with cycling.

### 3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

#### AS

- 1609 Eye protectors for motor cyclists and racing car drivers
- 2342 Development, testing and implementation of information and safety symbols and symbolic signs

#### AS/NZS

- 2512 Methods of testing protective helmets
  - 2512.1 Part 1: Definitions and headforms
  - 2512.2 Method 2: General requirements for the conditioning and preparation of test specimens and laboratory conditions
    - 2512.3.1 Method 3.1: Determination of impact energy attenuation—Helmet drop test
    - 2512.5.2 Method 5.2: Determination of strength of retention system—Dynamic strength
    - 2512.6 Method 6: Measurement of horizontal peripheral vision clearance
    - 2512.7.1 Method 7.1: Determination of stability of protective helmets—Static stability
    - 2512.8 Method 8: Measurement of peak deflection
    - 2512.9 Method 9: Determination of load distribution

### 4 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 2512.1 and the following apply:

#### 4.1 Accessory

Items not permanently attached to the helmet.

## 5 CONSTRUCTION

### 5.1 General

#### 5.1.1 Components

The helmets shall consist of—

- (a) a means of absorbing impact energy;
- (b) a means of distributing load; and
- (c) a retention system.

All components of the helmet shall be permanently attached. Removable comfort pads are not considered as part of the protective system.

#### 5.1.2 Attachment of components

None of the components, or any accessories, shall be fitted to the helmet in such a way that they are likely to cause injury to the wearer in the event of an impact.

### 5.2 Retention system

The retention system shall be designed in such a way that—

- (a) the system includes a retaining strap to be worn under the lower jaw;
- (b) the system is adjustable to produce tension on straps between all fixing points when the retaining strap is properly fastened;
- (c) any part of the retaining strap that, when properly fastened, contacts the throat on the underside of the wearer's jaw shall not be less than 15 mm wide; and

NOTE: The width requirement reflects the ability of the retaining system to distribute load in the case of an impact. Comfort pads on the retaining strap are not considered to be load bearing components.

- (d) the system meets the requirements of Clauses 7.3 and 7.6.

### 5.3 Projections

#### 5.3.1 General

Refer to Figure 1 for illustrations of types of projections and methods of measurement.

#### 5.3.2 External projections

Rigid projections and irregularities on the continuous curve of the outer surface of the helmet, except for ventilation holes and associated depressions, shall not be greater than 5 mm in height when measured normal to the general outer surface of the helmet as shown in Figure 1.

A fairing becomes a projection when the included angle is greater than 45° as shown in Figure 1. The angle of the projection only applies to flat surfaces that have been faired to the surface of the shell.

NOTE: Irregularities in the shell should be smoothed to minimize resistance to tangential impact forces brought about by the friction or snagging.

#### 5.3.3 Internal projections

The helmet should have no internal projections or irregularities likely to cause injury to the wearer in case of an accident.

A1

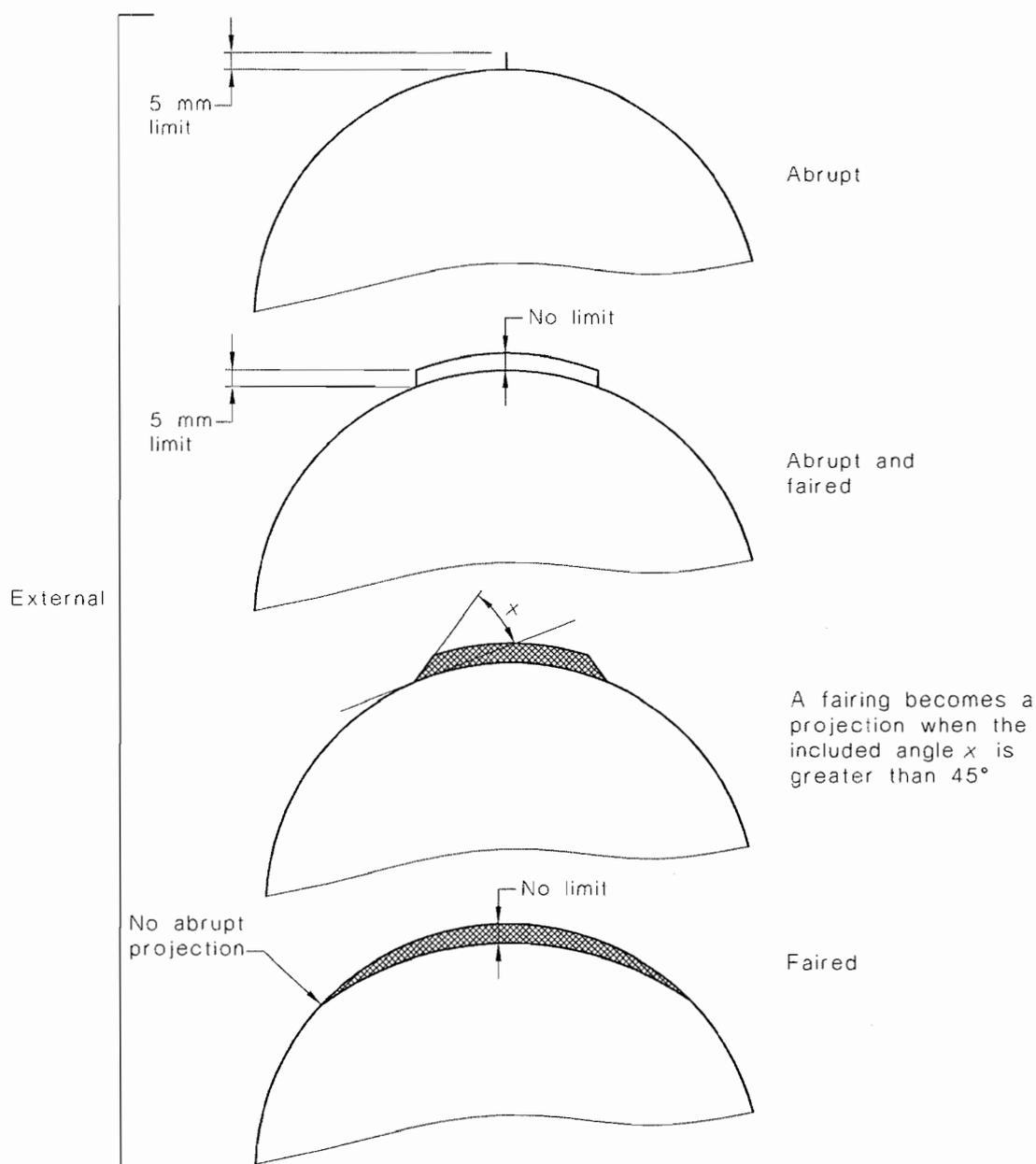


FIGURE 1 INTERNAL AND EXTERNAL PROJECTIONS

#### 5.4 Materials

Except as specifically provided for in this Standard, the characteristics of the materials used in the manufacture of helmets shall be established by the manufacturer as being suitable for the purpose.

NOTE: The manufacturer should have regard to the provisions of Appendix A.

#### 5.5 Ventilation

The helmet shall incorporate features designed to transfer heat from the head.

### 6 TEST PREPARATION

#### 6.1 General

All tests including determination of the test line shall be performed without comfort pads attached.

When a helmet is tested with size adjustment device attached (e.g. nape strap, neck harness, cradle etc.) the device shall be adjusted to obtain optimum fit (as recommended by the manufacturer) for all tests using the full headforms.

NOTES:

- 1 Type tests provide an indication only of the capacity of a model of helmet to pass subsequent production tests. Manufacturers are advised to conduct extensive exploratory tests on prototype helmets prior to the submission of sample type tests.
- 2 This Standard makes no provision for statistical sampling quality control or contractual arrangements.

## 6.2 Samples

The helmets shall be supplied to the test facility in the condition in which they are offered for sale and shall be accompanied by all attachments and accessories, including protective eye devices, normally sold with the helmet.

Ten helmets of the same model and size are required. These helmets shall be representative of production lots.

In the absence of a specific Standard for such items, it is recommended that visor and eye protectors recommended for use when cycling should conform to the requirements in AS 1609.

## 6.3 Test order

Test order shall be as given in Table 1.

**TABLE 1**  
**TEST ORDER FOR HELMETS**

Sample No.	Conditioning	Test
1	Ambient temperature	7.2 Horizontal peripheral vision clearance test 7.7 Peak deflection test 7.3 Static stability test
2	Ambient temperature	7.4 Impact energy attenuation test 7.6 Dynamic strength of retention test
3	Ambient temperature	7.5 Load distribution test 7.6 Dynamic strength of retention test
4	High temperature	7.4 Impact energy attenuation test 7.6 Dynamic strength of retention test
5	High temperature	7.5 Load distribution test 7.6 Dynamic strength of retention test
6	Low temperature	7.4 Impact energy attenuation test 7.6 Dynamic strength of retention test
7	Low temperature	7.5 Load distribution test 7.6 Dynamic strength of retention test
8	Water immersion	7.4 Impact energy attenuation test 7.6 Dynamic strength of retention test
9	Water immersion	7.5 Load distribution test 7.6 Dynamic strength of retention test
10	Spare sample	

NOTE: It is acknowledged that by requiring several tests to be performed on each individual helmet, it is possible for earlier tests to have an adverse effect on later test results. Any such effect would not invalidate the later test results.

#### 6.4 Conditioning

The samples shall be subjected to the conditioning procedures (specified in AS/NZS 2512.2 for ambient temperature, low temperature, high temperature and water immersion) in the test order specified in Table 1.

#### 6.5 Headforms

Tests shall be conducted on headform sizes A, E, J, M and O (as specified in AS/NZS 2512.1), as appropriate to the helmet's size range, except for the load distribution test (see Clause 7.5).

#### 6.6 Test sites

For both the load distribution test (Clause 7.5) and the impact energy attenuation test (Clause 7.4) the helmets shall be tested at four sites marked prior to conditioning, above the test line as defined in AS/NZS 2512.1. The distance between any two sites, measured over the surface of the helmet, shall not be less than one fifth of the headform circumference, as measured at the nominal AA line.

### 7 TEST REQUIREMENTS

#### 7.1 General

Not more than 10% by mass of any helmet as tested shall become detached as a result of testing.

#### 7.2 Horizontal peripheral vision clearance

When measured at the basic plane in accordance with AS/NZS 2512.6, the peripheral vision clearance of the helmet shall be not less than 105° on each side of the mid-sagittal plane. In addition, the brow opening of the helmet, and on peaked helmets the outer edge of the peak, shall be at least 25 mm above all points in the basic plane that are within the specified angle or peripheral vision clearance.

#### 7.3 Static helmet stability

When tested in accordance with AS/NZS 2512.7.1, using a force of  $50 \pm 0.5$  N for a period of not less than 15 s and not greater than 30 s, the helmet shall neither completely expose, nor completely obscure the test band. If the helmet has a detachable peak, the peak shall be removed for the test.

Helmets for bicycles shall be tested on the  $A_{\text{mod}}$  or  $J_{\text{mod}}$  headforms specified in AS/NZS 2512.7.1 as appropriate to the helmet's size range.

Where the helmet size range covers more than one headform size, the helmets shall be tested on both  $A_{\text{mod}}$  and  $J_{\text{mod}}$  headforms. If the helmet size falls between two headform sizes, it shall be tested on the smaller of those two headforms.

#### 7.4 Impact energy attenuation

When the helmet is tested in accordance with AS/NZS 2512.3.1, using a flat anvil only and a free-fall height of  $1500 +30, -5$  mm, the headform acceleration shall not exceed 250g peak. In addition, the cumulative duration of acceleration shall not exceed—

- (a) 3.0 ms for acceleration greater than 200g; and
- (b) 6.0 ms for acceleration greater than 150g.

### 7.5 Load distribution

When the helmet is tested in accordance with AS/NZS 2512.9 using a fall height of 1000 +15, -5 mm, the following conditions shall be met:

- (a) Loading measured by the force transducer shall not exceed 500 N measured over a circular area of 100 mm<sup>2</sup>.
- (b) The anvil shall not contact the surface of the headform.

### 7.6 Dynamic strength of the retention system

When tested in accordance with AS/NZS 2512.5.2, using a drop height of 250 -0, +5 mm, the dynamic displacement shall not exceed 30 mm.

Where the retention system consists of components which can be independently fastened without securing the complete assembly, each such component shall independently comply with the requirements of this Clause.

NOTE: Additional helmets may be required.

### 7.7 Peak deflection

When tested in accordance with AS/NZS 2512.8, using a suspended mass of 2 kg for 30 s, the peak shall not break and the deflection of the peak shall not be less than 6.0 mm. Detachable peak may be fixed to the helmet for this test if they are likely to become detached from the helmet during the test.

NOTE: Suitable fixing methods include gluing, riveting and the like.

## 8 MARKING

### 8.1 On the helmet

Each helmet shall be permanently and legibly marked in letters no less than 1.5 mm high with the following information:

- (a) Registered name and address of the manufacturer and/or Australian agent.
- (b) Shell and liner construction material(s).
- (c) Model and Brand designation.
- (d) An indication of the front or rear of the helmet.
- (e) Size.
- (f) Month and year of manufacture (may be spelled out, e.g. November 2008, or in numerals, e.g. '11/2008' or '2008/11').

Each helmet shall also be marked in such a manner that it can be easily read without removal of the comfort padding or any permanent part with the following, verbatim, instructions to the user:

- (i) Bicycle helmet—NOT intended for use in motor sports or by motor cyclists.
- (ii) Helmet can be seriously damaged by substances such as petrol, paint, adhesives, or cleaning agents.
- (iii) Make no modifications.
- (iv) Fasten helmet securely under the jaw.
- (v) If helmet shows signs of damage, destroy and replace it.
- (vi) If helmet receives a severe blow, even if apparently undamaged, destroy and replace it.

## 8.2 Durability of marking

The wording on labels fixed to the product shall be easily legible when rubbed by hand for 15 s with a piece of cloth soaked in water, allowed to dry and rubbed for 15 s with a piece of cloth soaked with liquid domestic dishwashing detergent.

## 8.3 On the package

If a helmet is packaged, the following information shall be clearly and legibly visible without removal of the helmet:

- (a) Manufacturer's registered brand name.
- (b) Model designation.
- (c) Size.
- (d) A list of the sizes available in the model range together with the nominal mass for each size.
- (e) The activity/activities for which the helmet is designed.

### NOTES:

- 1 The information in Item (e) above may be presented pictorially.
- 2 Manufacturers making a statement of compliance with this Australian/New Zealand Standard on a product, packaging or promotional material related to that product are advised to ensure that such compliance is capable of being verified.
- 3 It is the responsibility of the manufacturer to ensure that a helmet meets the design requirements of the sport(s) for which it is marked as suitable.

## 9 INSTRUCTIONS FOR USE AND CARE

In addition to the marking requirements of Clauses 8.1 and 8.2, each helmet shall be accompanied by a brochure or label that shall include the following, verbatim, in letters no less than 2.0 mm high:

- (a) No helmet can protect the wearer against all possible impacts.
- (b) The helmet is designed to be retained by a strap under the lower jaw.
- (c) To be effective, a helmet must fit and be worn correctly. To check for correct fit, place helmet on head and make any adjustments indicated. Securely fasten retention system. Grasp the helmet and try to rotate it to the front and rear. A correctly fitted helmet should be comfortable and should not move forward to obscure vision or rearward to expose the forehead.
- (d) No attachments should be made to the helmet except those recommended by the helmet manufacturer.
- (e) The helmet is designed to absorb shock by partial destruction of the shell and liner. This damage may not be visible. Therefore, if subjected to a severe blow, the helmet should be destroyed and replaced even if it appears undamaged.
- (f) The helmet may be damaged and rendered ineffective by petroleum and petroleum products, cleaning agents, paints, adhesives and the like, without the damage being visible to the user.
- (g) A helmet has a limited lifespan in use and should be replaced when it shows obvious signs of wear.
- (h) This helmet should not be used by children while climbing or doing other activities where there is a risk of hanging or strangulation if the child gets trapped whilst wearing the helmet.

Information shall also be provided, in words (with letters no less than 2.0 mm high) and pictures on the following:

- (i) Instructions on the correct method of positioning, adjustment and fastening of the helmet.
- (ii) Both the correct and incorrect fitment and wearing position of that approximate type of helmet shall be shown by a graphical representation of minimum height 25 mm. The correct wearing position, as recommended by the manufacturer, shall be shown in a circle, and the incorrect (showing the helmet tilted back at a grossly incorrect attitude) shall be shown in a circle with a slash through it. The two depictions shall be the same height.

NOTE: Information on graphic representation and the circle with slash are given in AS 2342.

- (iii) Cleaning method and agent(s).
- (iv) Details regarding suitability of helmet in relation to specific activities.
- (v) Australian distributors'/agents' name and address if not manufactured locally.

APPENDIX A  
CHARACTERISTICS OF MATERIALS USED IN THE MANUFACTURE OF  
PROTECTIVE HELMETS

(Informative)

The characteristics of the materials used in the manufacture of protective helmets should be known to remain appreciably stable under the influence of ageing, or the circumstances of use to which the helmet is normally subjected, such as exposure to sunlight, extremes of temperature and rain. Ultraviolet inhibitors should be used where necessary.

Materials used for those parts of the helmet coming into contact with the skin or hair should be known to remain appreciably stable on contact with perspiration, or skin or hair toiletries. Materials known to cause skin irritations or skin disorders should not be used.

All metal parts used in the construction of the helmet should be corrosion-resistant or should have a corrosion-resistant finish.

APPENDIX B  
RECOMMENDED MAXIMUM MASS FOR HELMETS  
(Informative)

As helmets complying with this Standard are intended for use in recreation and sport and for pedal cyclists, the bulk and mass of the helmet can be important safety factors as they affect the comfort and movement of the wearer.

The A headform size is suitable for children and the mass of helmets in this size should be as small as possible.

Further research is required before specific mass ranges can be specified. However the following recommendations are made as a guide to manufacturers who are encouraged to keep the mass within these limits:

Headform size	Recommended maximum helmet mass, g
A	300
E	400
J	500
M	600
O	700

**AMENDMENT CONTROL SHEET****AS/NZS 2063:2008**

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**Amendment No. 1 (2009)**

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**REVISED TEXT**

*SUMMARY:* This Amendment applies to Clause 5.3.3.

Published on 14 December 2009.

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NOTES

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## **Standards New Zealand**

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## **Australian/New Zealand Standards**

Under a Memorandum of Understanding between Standards Australia and Standards New Zealand, Australian/New Zealand Standards are prepared by committees of experts from industry, governments, consumers and other sectors. The requirements or recommendations contained in published Standards are a consensus of the views of representative interests and also take account of comments received from other sources. They reflect the latest scientific and industry experience. Australian/New Zealand Standards are kept under continuous review after publication and are updated regularly to take account of changing technology.

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