

Interim  
Australian/New Zealand Standard™

**Lightning protection**

### **AS/NZS 1768(Int):2003**

This Interim Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-024, Protection Against Lightning. It was approved on behalf of the Council of Standards Australia on 27 November 2003 and on behalf of the Council of Standards New Zealand on 19 November 2003. It was published on 31 December 2003.

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The following are represented on Committee EL-024:

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Australian Electrical and Electronic Manufacturers Association  
Australian Institute of Petroleum  
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# Australian/New Zealand Standard™

## Lightning protection

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## PREFACE

This Interim Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-024 on Protection against Lightning to supersede AS 1768—1991 (NZS/AS 1768—1991) *Lightning protection*.

This Interim Standard is intended to provide authoritative guidance on the principles and practices of lightning protection for a wide range of structures and systems. It is not intended for mandatory application but, if called up in a contractual situation, compliance with this Standard requires compliance with all relevant clauses of the Standard such that the level of protection will be sufficient to achieve a tolerable level of risk as determined by the risk calculation.

In general, it is not economically possible to provide total protection against all the possible damaging effects of lightning, but the recommendations in this Standard will reduce the probability of damage to a calculated acceptable level, and will minimize any lightning damage that does occur. Guidance is given on methods of enhancing the level of protection against lightning damage, if this is required in a particular situation.

Several important changes and additions have been made to this Interim Standard following a review of submissions relating to AS 1768—1991 (NZS/AS 1768—1991) and of the International Electrotechnical Commission (IEC) Technical Committee TC 81 documents on Lightning Protection.

- (a) The four IEC recommended protection levels (PL I to IV).
- (b) The ‘risk index’ approach to assessing the need for lightning protection has been replaced by a quantitative ‘risk management’ approach based on the IEC methodology and software is provided, in the form of an Excel spreadsheet, to calculate the risk for particular situations.
- (c) The thunderday maps for Australia and New Zealand have been revised.
- (d) A comprehensive set of design rules has been added as guidance for the provision of minimum requirements for air terminals, downconductors, equipotential bonding and earth terminations.
- (e) The ‘rolling sphere’ method has been extended to include the four protection levels and a modification has been introduced to allow a larger radius sphere when considering large flat surfaces.
- (f) Table 4.6 *Typical section dimensions of main current-carrying components* has been updated to reflect current technology (This was Table 4.4 in AS 1768—1991 (NZS/AS 1768—1991)).

Where a new structure is to be erected, the matter of lightning protection should be considered in the planning stage, as the necessary measures can often be affected in the architectural features without detracting from the appearance of the building. In addition to the aesthetic considerations, it is usually less expensive to install a lightning protection system during construction than afterwards.

The decision to provide lightning protection may be taken without carrying out a risk assessment or regardless of the outcome of any risk assessment, for example, where there is a desire that there be no avoidable risk. Any decision not to provide lightning protection should only be made after considering the advice provided in this Standard. Where doubt exists as to the need for lightning protection, further advice should be sought from a lightning protection designer or installer.

Unless it has been specified that lightning protection must be provided, the first decision to make is whether the lightning protection is needed. Section 2 provides guidance to assist in this decision. Section 3 provides advice on the protection of persons from lightning, mainly relating to the behaviour of persons when not inside substantial buildings. Once a decision is made that lightning protection is necessary, Section 4 provides details on interception lightning protection for the building or structure. This includes information on the size, material, and form of conductors, the positioning of air terminals and downconductors, and the requirements for earth terminations. Persons and equipment within buildings can be at risk from the indirect effects of lightning and Section 5 gives recommendations on the protective measures that may need to be applied.

Section 6 describes methods of lightning protection of various items not covered in earlier sections, such as communications aerials, chimneys, boats, fences, and trees. A clause is included on methods for protecting domestic dwellings and assorted structures in public places, where a complete protection system may not be justified, but some protection is considered desirable.

Section 7 sets out recommendations for the protection of structures with explosive or highly flammable contents. Section 8 gives advice on precautions to be taken during installation, inspecting, testing, and maintaining lightning protection systems.

A number of appendices are included that provide additional information and advice. The appendices form an integral part of this Interim Standard unless specifically stated otherwise. i.e. appendices identified as 'informative' only provide supportive or background information and are therefore not an integral part of this Standard.

This Interim Standard will have a currency of three years from its date of publication. At the conclusion of that period, it will either be superseded by another Standard, confirmed as an Interim Standard in its present form for a further two year period or be withdrawn. The decision will take into account experience with its application in Australia and New Zealand and any new information on lightning protection available from the international community of experts and technical committees such as IEC TC 81.

It should be noted that IEC TC 81 is currently restructuring its suite of lightning protection Standards, to bring all of its different Standards and Technical Reports under one numerical reference (IEC 62305). The applicability of this integrated IEC Standard will be carefully examined when revising this Interim Standard.

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