AS/NZS 1768:2007

Australian/New Zealand Standard™

# Lightning protection


This 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 13 September 2006 and on behalf of the Council of Standards New Zealand on 6 October 2006.
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The following are represented on Committee EL-024:

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Australasian Corrosion Association
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Australian Electrical and Electronic Manufacturers Association
Australian Institute of Petroleum Ltd
Bureau of Meteorology
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# Lightning protection

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# PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-024, Protection against Lightning, to supersede AS/NZS 1768(Int):2003, *Lightning protection*.

This 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.

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 for the protection of persons and equipment within buildings from the effects of lightning.

Section 6 describes methods of lightning protection of various items not covered in earlier sections, such as communications antennas, 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 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.

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## S E C T I O N 1 S C O P E A N D G E N E R A L

### 1.1 SCOPE

This Standard sets out guidelines for the protection of persons and property from hazards arising from exposure to lightning. The recommendations specifically cover the following applications:

(a) The protection of persons, both outdoors, where they may be at risk from the direct effects of a lightning strike, and indoors, where they may be at risk indirectly as a consequence of lightning currents being conducted into the building.

(b) The protection of a variety of buildings or structures, including those with explosive or highly-flammable contents, and mines.

(c) The protection of sensitive electronic equipment (e.g. facsimile machines, modems, computers) from overvoltages resulting from a lightning strike to the building or its associated services.

The nature of lightning and the principles of lightning protection are discussed and guidance is given to assist in a determination of whether protective measures should be taken.

This Standard is applicable to conventional lightning protection systems (LPSs) that comprise air terminals, downconductors, earth termination networks and surge protective devices (SPDs). Nothing contained within this Standard either endorses or implies the endorsement of non-conventional LPSs that comprise air terminals that claim enhanced performance or downconductors that claim enhanced magnetic screening over conventional systems.

The performance of such systems is outside the scope of this Standard. Irrespective of claimed performance, air terminals shall be placed in accordance with Section 4 to comply with this Standard.

### 1.2 APPLICATION

This Standard does not override any statutory requirements but may be used in conjunction with such requirements.

Compliance with the recommendations of this Standard will not necessarily prevent damage or personal injury due to lightning but will reduce the probability of such damage or injury occurring.

### 1.3 INTRODUCTION

Thunderstorms are natural phenomena and there are no proven devices and methods capable of preventing lightning flashes. Direct and nearby cloud-to-ground lightning discharges can be hazardous to persons, structures, installations and many other things in or on them. Consideration should always be given to the application of lightning protection measures.