

Australian Standard™

**Atmospheric icing of structures**

This Australian Standard was prepared by Committee BD-006, General Design Requirements and Loading on Structures. It was approved on behalf of the Council of Standards Australia on 3 March 2005.  
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**Atmospheric icing of structures**

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## PREFACE

This Standard was prepared by the Standards Australia Committee BD-006, General Design Requirements and Loading on Structures.

This Standard is identical with and has been reproduced from ISO 12494:2001, *Atmospheric icing of structures*.

The objective of this Standard is to provide designers of structures and those collecting data on ice formation in Australia with general guidance on assessment of ice accumulations and loadings on structures for use in structural design. It is intended to be used as further background to AS/NZS 1170.3.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text 'this International Standard' should read 'this Australian Standard'.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to equivalent Australian Standards as follows:

<i>Reference to International Standard</i>		<i>Australian Standard</i>	
ISO		AS	
2394	General principles on reliability for structures	510	General principles on reliability for structures
4354	Wind actions on structures (Note that the reference in Clause 8.1 is incorrectly stated as ISO 4355)	1170 1170.2	Structural design actions Part 2: Wind actions

It should be noted that the clauses or combinations of actions do not align with the format set out in AS/NZS 1170.0. The ice classes, associated masses and drag factors are based on accumulations with an annual probability of exceedance of 1/50. A special study should be carried out to establish the appropriate adjustments to make to factors and to establish combination factors to use with any collected data.

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## INTRODUCTION

This International Standard describes ice actions and can be used in the design of certain types of structures.

It should be used in conjunction with ISO 2394, and also in conjunction with relevant CEN standards.

This International Standard differs in some aspects from other International Standards, because the topic is poorly known and available information is inadequate. Therefore, it contains more explanations than usual, as well as supplementary descriptions and recommendations in the annexes.

Designers might find that they have better information on some specific topics than those available from this International Standard. This may be true, especially in the future. They should, however, be very careful not to use only parts of this International Standard partly, but only as a whole.

The main purpose of this International Standard is to encourage designers to think about the possibility of ice accretions on a structure and to act thereafter.

As more information about the nature of atmospheric icing becomes available during the coming years, the need for updating this International Standard is expected to be more urgent than usual.

Guidance is given as a NOTE, after the text for which it is a supplement. It is distinguished from the text by being in smaller typeface. This guidance includes some information and values which might be useful during practical design work, and which represents results that are not certain enough for this International Standard, but may be useful in many cases until better information becomes available in the future.

Designers are therefore welcome to use information from the guidance notes, but they should be aware of the intention of the use and also forthcoming results of new investigations and/or measurements.

## AUSTRALIAN STANDARD

# Atmospheric icing of structures

## 1 Scope

### 1.1 General

This International Standard describes the general principles of determining ice load on structures of the types listed in 1.2.

In cases where a certain structure is not directly covered by this or another standard or recommendation, designers may use the intentions of this International Standard. However, the user should always consider carefully the applicability of the standard (recommendation) to the structure in question.

The practical use of all data in this International Standard is based upon certain knowledge of the site of the structure. It is necessary to have information about the degree of "normal" icing amounts (= ice classes) for the site in question. For many areas, however, no information is available.

Even in such cases this International Standard can be useful, because local meteorologists or other experienced persons should be able to, on the safe side, estimate a proper ice class. Using such an estimate in the structural design will result in a much safer structure, than designing without any considerations for problems due to ice.

**CAUTION** It is extremely important to design for **some ice**, instead of **no ice**, and then the question of whether the amount of ice was correct is of less importance. In particular, the action of wind can be increased considerably due to both increased exposed area and increased drag coefficient.

### 1.2 Application

This International Standard is intended for use in determining ice mass and wind load on the iced structure for the following types of structure:

- masts;
- towers;
- antennas and antenna structures;
- cables, stay, guy ropes, etc.;
- ropeways (cable railways);
- structures for ski-lifts;
- buildings or parts of them exposed to potential icing;
- towers for special types of construction such as transmission lines, wind turbines, etc.

Atmospheric icing on electrical overhead lines is covered by IEC (International Electrotechnical Commission) standards.