

# INTERNATIONAL STANDARD

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## Atmospheric icing of structures

*Charges sur les structures dues à la glace*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12494 was prepared by Technical Committee ISO/TC 98, *Bases for design of structures*, Subcommittee SC 3, *Loads, forces and other actions*.

Annexes A to E of this International Standard are for information only.

## 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.



# 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, stays, guy ropes, etc.;
- rope ways (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.