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Second edition  
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# Atmospheric icing of structures

*Charges sur les structures dues à la glace*



Reference number  
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

The committee responsible for this document is ISO/TC 98, *Bases for design of structures*, Subcommittee SC 3, *Loads, forces and other actions*.

This second edition cancels and replaces the first edition (ISO 12494:2001), of which it constitutes a minor revision. The changes made are the following:

- [8.1](#), line 2, replaced "ISO 4355" by "ISO 4354";
- [8.3](#), [Figure 7](#), revised the right figure;
- [9.1](#), line 2, [9.2](#), line 2 to 4, replaced "exceedence" by "exceedance";
- [9.2](#), line 11, replaced "to day's" by "today's";
- [Clause 10](#), line 15, replaced "[5.3](#)" by "[5.4](#)";
- [A.2](#), [Table 3](#), line 1, replaced "the glaze mass" by "the mass of the ice, glaze or rime";
- [A.2](#), [Table 3](#), line 2, replaced "the glaze thickness" by "the thickness of the ice, glaze or rime";
- [A.2](#), [Table 3](#), line 4, replaced "the glaze density" by "the density of the ice, glaze or rime";
- [A.2](#), [Table 3](#), line 4, replaced "*r*" by " $\gamma$ ";
- [A.2](#), [Table 3](#), line 1 to 4, moved before [Table 3](#),
- [B.3.2](#), c), replaced "see [Table 2](#) and 2.3" by "see [Table 1](#) in [6.2.1](#)";
- [B.3.3](#), line 5, replaced "definitions [3.1](#) and [3.2](#)" by "definitions [B.3.1](#) and [B.3.2](#)";
- [B.3.3](#), line 6, replaced "[Table 4](#) or [5](#)" by "[Table 3](#) or [4](#)";
- [C.3](#), paragraph 6, line 4, replaced "0,7 cm<sup>-3</sup>" by "0,7 g cm<sup>-3</sup>";
- [E.4](#), b), line 1, replaced "ICG<sub>x</sub>" by "ICR<sub>x</sub>".

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[Annexes A](#) to [E](#) of this document are for information only.

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## Introduction

This document 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 document 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 document. This may be true, especially in the future. They should, however, be very careful not to use only parts of this document partly, but only as a whole.

The main purpose of this document 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 document 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 document, 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.