

# Air-, cable-, and frame-supported membrane structures



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# ***CSA Standards Update Service***

*S367-09*

*August 2009*

**Title:** *Air-, cable-, and frame-supported membrane structures*

**Pagination:** **54 pages** (vii preliminary and 47 text), each dated **August 2009**

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*CSA Standard*

*S367-09*

***Air-, cable-, and frame-supported  
membrane structures***



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*Published in August 2009 by Canadian Standards Association  
A not-for-profit private sector organization  
5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6  
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**ISBN 978-1-55491-215-5**

**Technical Editor:** Mark Braiter

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# Preface

This is the second edition of CSA S367, *Air-, cable-, and frame-supported membrane structures*. It supersedes the previous edition, published in 1981 under the title *Air-Supported Structures*.

Major changes in this edition include

- (a) design requirements for membrane-covered structures supported by any self-supporting structural system;
- (b) updated provisions for load and resistance design in accordance with the 2010 edition of the *National Building Code of Canada*; and
- (c) updated information on the resistance and performance of membrane materials.

CSA acknowledges that the development of this Standard was made possible by the generous financial support of the Membrane Structures Manufacturers Association.

This Standard was prepared by the Technical Committee on Air-, Cable-, and Frame-Supported Membrane Structures, under the jurisdiction of the Strategic Steering Committee on Structures (Design), and has been formally approved by the Technical Committee.

August 2009

## Notes:

- (1) Use of the singular does not exclude the plural (and vice versa) when the sense allows.
- (2) Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.
- (3) This publication was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.
- (4) CSA Standards are subject to periodic review, and suggestions for their improvement will be referred to the appropriate committee.
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  - Requests for interpretation should
    - (a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
    - (b) provide an explanation of circumstances surrounding the actual field condition; and
    - (c) be phrased where possible to permit a specific “yes” or “no” answer.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are published in CSA’s periodical Info Update, which is available on the CSA Web site at [www.csa.ca](http://www.csa.ca).



# S367-09

## ***Air-, cable-, and frame-supported membrane structures***

### **1 Scope**

#### **1.1**

This Standard provides requirements for the design, fabrication, installation, and maintenance of single-membrane structures that are either reinforced or unreinforced and that are air-supported, frame-supported, or cable-supported.

#### **1.2**

The general requirements, structural design methods, loadings, and limit states specified in this Standard are intended to be consistent with the *National Building Code of Canada (NBCC)*, except where more detailed or stringent requirements are necessary for the structural adequacy and the long-term serviceability of structures.

The requirements of this Standard are intended to apply to independent membrane-covered structures and structures that are contiguous with other structures and are attached through a common element.

#### **1.3**

This Standard does not apply to

- (a) multi-walled structures that are not supported by continuous air pressure;
- (b) air-beam-supported membrane structures using pressurized air as part of the support system; and
- (c) greenhouses that are not covered by Part 3 of the *NBCC*.

#### **1.4**

Other standards may be used for the design of air-, cable-, and frame-membrane supported structures where specified by this Standard. The formulas in this Standard may be supplemented by a rational design based on theory, analysis, and engineering practice acceptable to the authority having jurisdiction, provided that the nominal margins (or factors) of safety are at least equal to those specified in this Standard.

#### **1.5**

In CSA Standards, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; “may” is used to express an option or that which is permissible within the limits of the standard; and “can” is used to express possibility or capability. Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material. Notes to tables and figures are considered part of the table or figure and may be written as requirements. Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

### **2 Reference publications**

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.