



CSA/ANSI Z21.10.3:19 • CSA 4.3:19
National Standard of Canada
American National Standard



Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous



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Preface

This is the ninth edition of CSA/ANSI Z21.10.3 • CSA 4.3, *Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*. It supersedes the previous editions published in 2017, 2015, 2014, 2013, 2011, 2004, 2001, and 1998.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the Joint Technical Subcommittee on Gas-Fired Water Heaters under the jurisdiction of the Z21/83 Technical Committee on Performance and Installation of Gas Burning Appliances and Related Accessories and the Strategic Steering Committee on Fuels and Appliances. It has been formally approved by the Z21/83 Technical Committee, the Canadian Technical Committee on Gas Appliances and Related Accessories, and the Interprovincial Gas Advisory Council.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

This Standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

Interpretations: The Strategic Steering Committee on Fuels and Appliances has provided the following direction for the interpretation of standards under its jurisdiction: “The literal text shall be used in judging compliance of products with the safety requirements of this Standard. When the literal text cannot be applied to the product, such as for new materials or construction, and when a relevant CSA committee interpretation has not already been published, CSA Group’s procedures for interpretation shall be followed to determine the intended safety principle.”

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 Standard 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 Standard.*
- 4) *To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include “Request for interpretation” in the subject line:*
 - 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) *where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.*

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at standardsactivities.csa.ca.

- 5) *This Standard is subject to review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include “Proposal for change” in the subject line:*
 - a) *Standard designation (number);*
 - b) *relevant clause, table, and/or figure number;*
 - c) *wording of the proposed change; and*
 - d) *rationale for the change.*

History of the development of CSA/ANSI Z21.10.3 • CSA 4.3

Note: *This history is informative and is not part of the standard.*

With the onset of the Free Trade Agreement between the United States and Canada on January 2, 1988, significant attention was given to the harmonization of the United States and Canadian safety standards addressing gas-fired equipment for residential, commercial, and industrial applications. It was believed that the elimination of the differences between the standards would remove potential trade barriers and provide an atmosphere in which North American manufacturers could market more freely in the United States and Canada. The harmonization of these standards was also seen as a step toward harmonization with international standards. Joint subcommittees were established to facilitate the standards harmonization process between the United States and Canada.

The draft harmonized standard was based on current coverage from the American National Standard for *Gas Water Heaters, Volume III, Storage Water Heaters, with Input Rating above 75,000 Btu Per Hour, Circulating and Instantaneous*, ANSI Z21.10.3-1993 and Addenda Z21.10.3a-1994, Z21.10.3b-1994, Z21.10.3c-1996 and the Canadian Standard for *Circulating Tank, and Instantaneous and Large Automatic Storage Type Gas Water Heaters*, CAN1-4.3-M85. The draft was subsequently issued for public review and comment during April 1996.

Following reconsideration and modification of the proposed draft standard, in light of comments received, the joint water heater subcommittee, at its July 24-25, 1996 meeting, recommended the proposed draft to the Z21 Committee and the CGA Standards Steering Committee for approval.

The proposed draft of the harmonized standard for gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous, as modified by the joint subcommittee at its meeting of July 24-25, 1996, was approved by the Z21/83 Committee at its April 17, 1997 meeting and by the CGA Standards Steering Committee on May 6, 1997.

The first edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters, with input rating above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on September 10, 1997 and by the American National Standards Institute Inc. on March 19, 1998.

The second edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on August 1, 2001 and by the American National Standards Institute, Inc. on December 20, 2001.

The third edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on September 7, 2004 and by the American National Standards Institute, Inc. on July 2, 2004.

The fourth edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on January 15, 2009 and by the American National Standards Institute, Inc. on June 20, 2008.

The fifth edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on March 25, 2013 and by the American National Standards Institute, Inc. on February 25, 2013.

The sixth edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on August 7, 2014 and by the American National Standards Institute, Inc. on July 2, 2014.

The seventh edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on August 7, 2015 and by the American National Standards Institute, Inc. on October 5, 2015.

The eighth edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on August 18, 2017 and by the American National Standards Institute, Inc. on August 21, 2017.

This, the ninth edition of the harmonized Z21/CSA Standard for *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, was approved by the Canadian Interprovincial Gas Advisory Council on October 9, 2019 and by the American National Standards Institute, Inc. on September 23, 2019.

The previous editions of the *Gas water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous*, and addenda thereto, approved by the Interprovincial Gas Advisory Council and American National Standards Institute, Inc. are as follows:

Z21.10.3-1998 • CSA 4.3-M98	Z21.10.3-2001 • CSA 4.3-2001
Z21.10.3a-2000 • CSA 4.3a-M00	Z21.10.3a-2003 • CSA 4.3a-2003
Z21.10.3b-2000 • CSA 4.3b-2000	Z21.10.3b-2004 • CSA 4.3b-2004
ANSI Z21.10.3-2004 • CSA 4.3-2004	Z21.10.3-2011 • CSA 4.3-2011
ANSI Z21.10.3a-2007 • CSA 4.3a-2007	
ANSI Z21.10.3b-2008 • CSA 4.3b-2008	
Z21.10.3-2013 • CSA 4.3-2013	Z21.10.3-2014 • CSA 4.3-2014
Z21.10.3-2015 • CSA 4.3-2015	Z21.10.3-2017 • CSA 4.3-2017

The following identifies the designation and year of the ninth edition of the Standard:

CSA/ANSI Z21.10.3:19 • CSA 4.3:19

Note: This edition of CSA/ANSI Z21.10.3 • CSA 4.3 incorporates changes to the 2017 edition. Changes, other than editorial, are denoted by a delta in the margin.

CSA/ANSI Z21.10.3:19 • CSA 4.3:19 Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous

1 Scope

1.1

This Standard applies to newly produced, large automatic storage water heaters having input ratings above 75,000 Btu/hr (21 980 W), instantaneous water heaters, circulating water heaters including booster water heaters (see Clause [3](#), Definitions), hereinafter referred to as water heaters or appliances, constructed entirely of new, unused parts and materials:

- a) for use with natural gas;
- b) for use with manufactured gas;
- c) for use with mixed gas;
- d) for use with liquefied petroleum gases;
- e) for use with LP gas-air mixtures;
- f) for recreational vehicle installation for use with liquefied petroleum gases only (see Clause [4.1.27](#));
- g) for manufactured home (mobile home) installation convertible for use with natural gas and liquefied petroleum gases when provision is made for the simple conversion from one gas to the other (see Clause [4.1.26](#));
- h) for recreational vehicle installation convertible for use with natural gas and liquefied petroleum gases when provision is made for the simple conversion from one gas to the other (see Clause [4.1.27](#)); and
- i) for use with combination potable water/space heating applications (see Clauses [3](#), Definitions, and Clause [4.1.30](#)).

Automatic storage water heaters having input ratings of 75,000 Btu/hr (21 980 W) or less are covered in Volume I.

1.2

Instantaneous water heaters with input ratings of 200,000 Btu/h (58 614 W) or less, which are designed to deliver water at a controlled temperature of less than 180 °F (82 °C), are subject to Federal minimum efficiency requirements for residential water heaters or covered in Clause [8](#), Items unique to Canada, are exempt from recovery, thermal efficiencies and standby loss, and related markings required by this Standard.

1.3

Direct vent water heaters anticipated by this Standard are essentially balanced flue appliances with the air intake and vent outlet in close proximity. Other designs are to be subjected to such additional tests as believed necessary at the discretion of the testing agency.