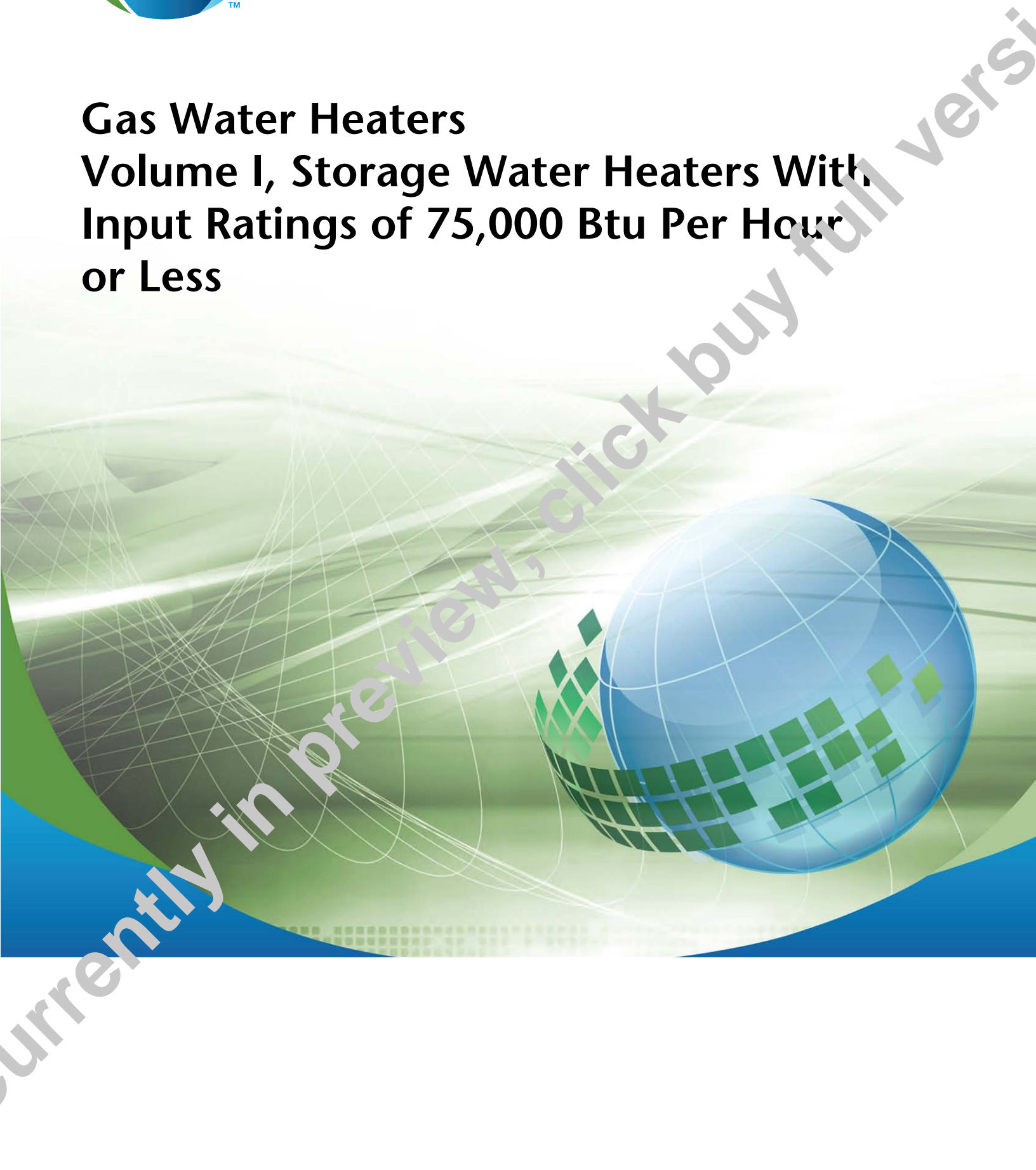




ANSI Z21.10.1-2013
CSA 4.1-2013

Gas Water Heaters
Volume I, Storage Water Heaters With
Input Ratings of 75,000 Btu Per Hour
or Less



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ANSI Z21.10.1-2013

CSA 4.1-2013

Fifth Edition - 2013
This Standard is based on the Standard for
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Volume 1, Storage Water Heaters With Input
Ratings of 75,000 Btu per Hour or Less
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and ANSI Z21.10.1a-2009 • CSA 4.1a-2009,
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Preface

This publication represents a basic standard for safe operation, substantial and durable construction, and acceptable performance of storage gas water heaters with input ratings of 75,000 Btu per hour or less. It is the result of years of experience in the manufacture, testing, installation, maintenance, inspection and research on storage gas water heaters with input ratings of 75,000 Btu per hour or less designed for utilization of gas. There are risks of injury to persons inherent in appliances that, if completely eliminated, would defeat the utility of the appliance. The provisions in this standard are intended to help reduce such risks while retaining the normal operation of the appliance.

Nothing in this standard is to be considered in any way as indicating a measure of quality beyond compliance with the provisions it contains. It is designed to allow compliance of storage gas water heaters with input ratings of 75,000 Btu per hour or less, the safety construction and performance of which may exceed the various provisions specified herein. In its preparation, recognition has been given to the possibilities of improvement through ingenuity of design. As progress takes place, revisions may become necessary. When they are believed desirable, recommendations or suggestions should be forwarded to the Chairman of Z21/83 Committee, CSA America, 8501 East Pleasant Valley Road, Cleveland, Ohio 44131; or the Chairman of CSA Technical Committee, 5060 Spectrum Way, Mississauga, Ontario, Canada L4W 5N6.

Safe and satisfactory operation of storage gas water heaters with input ratings of 75,000 Btu per hour or less depends to a great extent upon its proper installation, use and maintenance. It should be installed, as applicable, in accordance with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54*; or the *Natural Gas and Propane Installation Code, CSA B149.1*.

Users of this American National Standard/CSA Standard are advised that the devices, products and activities within its scope may be subject to regulation at the Federal, Territorial, Provincial, state or local level. Users are strongly urged to investigate this possibility through appropriate channels. In the event of a conflict with this standard, the Federal, Territorial, Provincial, state or local regulation should be followed.

THIS STANDARD IS INTENDED TO BE USED BY THE MANUFACTURING SECTOR AND BY THOSE APPLYING THE EQUIPMENT AND BY THOSE RESPONSIBLE FOR ITS PROPER INSTALLATION. IT IS THE RESPONSIBILITY OF THESE USERS TO DETERMINE THAT IN EACH CASE THIS STANDARD IS SUITABLE FOR AND APPLICABLE TO THE SPECIFIC USE THEY INTEND.

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EFFECTIVE DATE: An organization using this standard for product evaluation as a part of its certification program will normally establish the date by which all products certified by that organization should comply with this standard.

History Of The Development Of Standard For Gas Water Heaters

(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 I, storage Water Heaters with Input Rating of 75,000 Btu Per Hour Or Less, ANSI Z21.10.1-1993 and Addenda Z21.10.1a-1994, Z21.10.1b-1994, Z21.10.1c-1996 and the Canadian Standard for Gas-Fired Automatic Storage Type Water Heaters with Inputs Less than 75,000 Btuh, CAN1-4.1-M85. The draft was subsequently issued for public review and comment during March 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 I, storage water heaters with input ratings of 75,000 Btu per Hour or Less, as modified by the joint subcommittee at its meeting of July 24-25, 1996, was approved by the Z21/83 Committee by 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 I, Storage Water Heaters With Input Ratings Of 75,000 Btu Per Hour Or Less, was approved by the Canadian Interprovincial Gas Advisory Council in September 10, 1997 and by the American National Standards Institute Inc. on March 3, 1998.

The second edition of the harmonized Z21/CSA Standard for Gas Water Heaters, Volume I, Storage Water Heaters With Input Ratings Of 75,000 Btu Per Hour Or Less, was approved by the Canadian Interprovincial Gas Advisory Council in 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 I, Storage Water Heaters With Input Ratings Of 75,000 Btu Per Hour Or Less, was approved by the Canadian Interprovincial Gas Advisory Council in May 18, 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 I, Storage Water Heaters With Input Ratings Of 75,000 Btu Per Hour Or Less, 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.

This, the fifth edition of the harmonized Z21/CSA Standard for Gas Water Heaters, Volume I, Storage Water Heaters With Input Ratings Of 75,000 Btu Per Hour Or Less, was approved by the Canadian Interprovincial Gas Advisory Council on February 25, 2013 and by the American National Standards Institute Inc. on January 10, 2013.

The previous editions of the Standard for Gas Water Heaters, Volume I, Storage Water Heaters With Input Ratings Of 75,000 Btu Per Hour Or Less, and addenda thereto, approved by the Interprovincial Gas Advisory Council and American National Standards Institute, Inc. are as follows:

Z21.10.1-1998 • CSA 4.1-M98	Z21.10.1-2001 • CSA 4.1-2001
Z21.10.1a-2000 • CSA 4.1a-2000	Z21.10.1a-2002 • CSA 4.1a-2002
Z21.10.1b-2000 • CSA 4.1b-2000	Z21.10.1b-2004 • CSA 4.1b-2004
Z21.10.1-2004 • CSA 4.1-2004	Z21.10.1-2009 • CSA 4.1-2009
Z21.10.1a-2006 • CSA 4.1a-2006	Z21.10.1a-2009 • CSA 4.1a-2009
Z21.10.1b-2006 • CSA 4.1b-2006	Z21.10.1b-2011 • CSA 4.1b-2011

The following identifies the designation and year of the harmonized standard:

ANSI Z21.10.1-2013 • CSA 4.1-2013

Note: This edition of Z21.10.1 • CSA 4.1 incorporates changes to the 2009 edition of Z21.10.1 • CSA 4.1 and addenda thereto. Changes are denoted by a vertical line in the margin.

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Gas Water Heaters, Volume I

Part I: Construction

1.1 Scope

1.1.1

This standard applies to newly produced, automatic storage water heaters having input ratings of 75,000 Btu/hr (21 980 W) or less (see Part IV, 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 [1.2.25](#));
- 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 [1.2.24](#));
- 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 [1.2.25](#)); and
- i. For use with combination potable water/space heating applications (see [1.2.29](#) and Part IV, Definitions).

1.1.2

This standard also applies to water heaters incorporating heat pipe heat exchangers (see [1.5, Heat Pipe Heat Exchangers](#)).

1.1.3

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 shall be subjected to such additional tests as believed necessary at the discretion of the testing agency.

1.1.4

Water heaters for installation in recreational vehicles shall be of the direct vent type.

1.1.5

This standard also applies to water heaters with draft hoods which are factory equipped with automatic vent damper devices (see Part IV, Definitions), hereinafter referred to as vent damper devices.