ANSI Z21.10.3-2011
CSA 4.3-2011

American National Standard/
CSA Standard for

Gas Water Heaters

Volume III, Storage Water Heaters With Input Ratings Above 75,000 Btu Per Hour, Circulating and Instantaneous

AMERICAN NATIONAL STANDARD
ANSI Z21.10.3-2011

CSA STANDARD
CSA 4.3-2011

Fourth Edition - 2011
This Standard is based on the Standard for
Gas Water Heaters, Volume III, Storage Water Heaters
With Input Ratings Above 75,000 Btu Per Hour, Circulating and Instantaneous
ANSI Z21.10.3-2004 • CSA 4.3-2004
and ANSI Z21.10.3a-2007 • CSA 4.3a-2007
ANSI Z21.10.3b-2008 • CSA 4.3b-2008

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ANSI represents the interests of the United States in international nontreaty organizations such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). The Institute maintains close ties with regional organizations such as the Pacific Area Standards Congress (PASC) and the Pan American Standards Commission (COPANT). As such, ANSI coordinates the activities involved in the U.S. participation in these groups.

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American National Standards Institute, Inc.
25 West 43rd Street, Fourth Floor
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10036

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 above 75,000 Btu per hour. 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 above 75,000 Btu per hour 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 above 75,000 Btu per hour, the safety construction and performance of which may exceed the various provisions specified herein. In its preparation, recognition has been given to 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 Standards Committee Z21/83, 8501 East Pleasant Valley Road, Cleveland, Ohio 44131, or the Chairman of CSA Technical Committee, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6.

Safe and satisfactory operation of storage gas water heaters with input ratings above 75,000 Btu per hour 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*; 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.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute, Inc., require that action be taken to reaffirm, revise or withdraw this standard no later than five (5) years from the date of approval. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, Inc., 25 West 43rd Street, Fourth Floor, New York, N.Y. 10036, (212) 642-4900.

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 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 by 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, Instantaneous and Circulating, 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.

This, 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 September 7, 2004 and by the American National Standards Institute, Inc. on July 2, 2004.

The previous editions of the Gas Water Heaters, Volume III, Storage Water Heaters With Input Ratings Above 75,000 Btu Per Hour, Instantaneous and Circulating, 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
Z21.10.3a-2000 • CSA 4.3a-M00
Z21.10.3b-2000 • CSA 4.3b-2000
Z21.10.3-2001 • CSA 4.3-2001
Z21.10.3a-2003 • CSA 4.3a-2003
Z21.10.3b-2004 • CSA 4.3b-2004

ANSI Z21.10.3-2004 • CSA 4.3-2004
ANSI Z21.10.3a-2007 • CSA 4.3a-2007
ANSI Z21.10.3b-2008 • CSA 4.3b-2008

Note: This the fourth edition of Z21.10.3 • CSA 4.3 incorporates changes to the third edition of Z21.10.3-2004 • CSA 4.3-2004 and addenda thereto. Changes are denoted by a vertical line in the margin.

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NOTE

This standard contains SI (Metric) equivalents to the yard/pound quantities, the purpose being to allow the standard to be used in SI (Metric) units. (Standard for use of the International System of Units (SI): The Modern Metric System, IEEE/ASTM SI I0 or Metric Practice Guide, CAN/CSA Z234.1 are used as a guide in making metric conversion from yard/pound quantities.) If a value for a measurement and an equivalent value in other units, the first stated is to be regarded as the requirement. The given equivalent value may be approximate. If a value for a measurement and an equivalent value in other units, are both specified as a quoted marking requirement, the first stated unit, or both shall be provided.

Harmonized Standard ForVolume III, Water Heaters

Part 1: Construction

1.1 Scope

1.1.1
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 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; and

e. For use with LP gas-air mixtures.

f. For recreational vehicle installation for use with liquefied petroleum gases only (see 1.2.26);

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 1.2.25); and

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 1.2.26).

i. For use with combination potable water/space heating applicationsn (see 1.2.29 and Part IV, Definition).

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

1.1.2
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.

1.1.3
Water heaters for installation in recreational vehicles shall be of the direct vent type.

1.1.4
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.