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**ANSI Z21.86-2008
CSA 2.32-2008**
(reaffirmed 2014)

Vented Gas-Fired Space Heating Appliances

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ANSI Z21.86-2008
CSA 2.32-2008

American National Standard/
CSA Standard for
**Vented Gas-Fired Space
Heating Appliances**

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AMERICAN NATIONAL STANDARD
ANSI Z21.86-2008

CSA STANDARD
CSA 2.32-2008

Fifth Edition - 2008

This Standard is based on the Standard for
Vented Gas-Fired Space Heating Appliances
ANSI Z21.86-2004 • CSA 2.32-2004
and ANSI Z21.86a-2005 • CSA 2.32a-2005,
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APPROVED



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***American National Standards Institute, Inc.
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10036***

Preface

This publication represents a basic standard for safe operation, substantial and durable construction, and acceptable performance of vented gas-fired space heating appliances. It is the result of years of experience in the manufacture, testing, installation, maintenance, inspection and research on vented gas-fired space heating appliances 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 vented gas-fired space heating appliances, 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 Accredited Standards Committee Z21/83, 8501 East Pleasant Valley Road, Cleveland, Ohio 44131, or the Chairman of CSA Technical Committee on Gas Appliances and Related Accessories, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6.

Safe and satisfactory operation of vented gas-fired space heating appliances 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.

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History Of Development Of The Standard For Vented Gas-Fired Space Heating Appliances

(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.

At its August 12-13, 1992 meeting, the Z21/CGA Joint Subcommittee on Standards for Vented Gas-Fired Warm Air Heaters formed a working group to prepare a draft bi-national standard to encompass all the gas space heating product standards. A letter ballot dated January 25, 1996 was issued for joint subcommittee approval to send the draft standard for public review and comment.

The first draft harmonized standard was based on coverage from the American National Standard for Gas-Fired Room Heaters, Volume I, Vented Room Heaters, ANSI Z21.11.1-1991, Addenda ANSI Z21.11.1a-1993, and Addenda ANSI Z21.11.1b-1995; the American National Standard for Gas-Fired Gravity and Fan Type Direct Vent Wall Furnaces, ANSI Z21.44-1995; the American National Standard for Gas-Fired Gravity and Fan Type Vented Wall Furnaces, ANSI Z21.49-1992, Addenda ANSI Z21.49a-1993 and Addenda ANSI Z21.49b-1995; the American National Standard for Gas-Fired Gravity and Fan Type Floor Furnaces, ANSI Z21.48-1992, Addenda ANSI Z21.48a-1995 and Addenda ANSI Z21.48b-1995; the National Standard of Canada for Gas-Fired Room Heaters, CAN1-2.1-M86, Amendment "a" dated August 1986 and Amendment "2" dated January 1989; The Canadian National Standard for Gas-Fired Gravity and Fan Type Direct Vent Wall Furnaces, CAN1-2.19-M81; and the National Standard of Canada for Gas-Fired Gravity and Fan Type Vented Wall Furnaces, CAN/CGA-2.5-M86, Amendment "1" dated August 1986 and Amendment "2" dated January 1989. The first draft was issued for review and comment in February 1996.

Following reconsideration and modification of the proposed draft standard, in light of comments received, the joint vented heater subcommittee at its April 30-May 1, 1996 meeting, recommended the proposed draft standard to Accredited Standards Committee Z21 and the CGA Standard Steering Committee for approval.

The proposed draft of the harmonized standard for vented gas-fired space heating appliances, as modified by the joint subcommittee, was approved by the Z21 Committee by letter ballot dated October 14, 1996, and by the CGA Standards Steering Committee by letter ballot dated February, 1997.

The first edition of the American National Standard/CSA Standard for Gas-Fired Vented Space Heating Appliances was approved by the Canadian Interprovincial Gas Advisory Council on November 25, 1997, and by the American National Standards Institute, Inc., on January 28, 1998.

Following the procedures outlined above, further revisions to this standard, Z21.86 • CSA 2.32, were made in line with industry developments. The second edition of the American National Standard/CSA Standard for Gas-Fired Vented Space Heating Appliances was approved by the Canadian Interprovincial Gas Advisory Council on August 7, 1998, and by the American National Standards Institute, Inc., on September 10, 1998.

Following the procedures outlined above, further revisions to this standard, Z21.86 • CSA 2.32, were made in line with industry developments. The third edition of the American National Standard/CSA Standard for Gas-Fired Vented Space Heating Appliances was approved by the Canadian Interprovincial Gas Advisory Council on August 22, 2000, and by the American National Standards Institute, Inc., on November 15, 2000.

The fourth edition of the harmonized gas-fired vented space heating appliances standard was approved by the Interprovincial Gas Advisor Council on January 15, 2004 and the American National Standards Institute, Inc. on July 11, 2003.

This the fifth edition of the harmonized gas-fired vented space heating appliances standard was approved by the Interprovincial Gas Advisor Council on April 3, 2008, and the American National Standards Institute, Inc. on March 28, 2008.

Previous editions of the harmonized gas-fired vented space heating appliances standard, and addenda thereto, approved by the Interprovincial Gas Advisory Council and the American National Standards Institute are as follows:

Z21.86-1998 • CSA 2.32-M98
Z21.86a-1998 • CSA 2.32a-M98
Z21.86b-1998 • CSA 2.32b-M98

Z21.86-2000 • CSA 2.32-2000
Z21.86a-2002 • CSA 2.32a-2002
Z21.86b-2002 • CSA 2.32b-2002

Z21.86-1998 • CSA 2.32-M98
Z21.86a-1999 • CSA 2.32a-M99
Z21.86b-1999 • CSA 2.32b-M99

Z21.86-2004 • CSA 2.32-2004
Z21.86a-2005 • CSA 2.32a-2005
Z21.86b-2007 • CSA 2.32b-2007

NOTE: This edition of Z21.86 • CSA 2.32 incorporates changes to the 2004 edition of Z21.86 • CSA 2.32 and addenda thereto. Changes, other than editorial, are denoted by a vertical line in the margin.

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American National Standard/CSA Standard For Gas-Fired Space Heating Appliances

Part I: Construction

1.1 Scope

1.1.1

This standard applies to newly produced vented gas-fired space heating appliances (see Part XII, Definitions), hereinafter referred to as appliance(s), constructed entirely of new, unused parts and materials, and having input ratings up to and including 400,000 Btu/hr (117 228 W).

These appliances are:

- 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 (propane) (also see 2.2e); and
- e. For use with LP gas-air mixtures.

The construction of vented gas-fired space heating appliances for use with the above-mentioned gases is covered under Part I.

The performance of vented gas-fired space heating appliances for use with the above-mentioned gases is covered under Part II.

1.1.2

This standard applies only to the following appliance types, as defined in Part XII, Definitions:

- a. Gravity vented wall furnace;
- b. Fan-type vented wall furnace;
- c. Fan-type vented wall furnace with cooling unit;
- d. Vented room heater;
- e. Gravity direct vent wall furnace;
- f. Fan-type direct vent wall furnace; and
- g. Floor furnace.