ANSI Z21.86-2016 • CSA 2.32-2016

CSA Group

Vented gas-fired space heating appliances

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Revision History

ANSI Z21.86-2016 • CSA 2.32-2016, Vented gas-fired space heating appliances

Revision from previous edition	Revision symbol (in margin)
Clauses 1.1, 1.6, 3, 4.8.1, 4.10.9, 4.11.1, 4.11.14, 4.11.15, 4.11.18, 4.26.1, 4.27.2, 4.27.3, 5.1.1, 5.1.3, 5.1.6, 5.2, 5.3.3, 5.4, 5.5.1, 5.6.1, 5.9.2, 5.10.1, 5.20, 5.22, 7.7.1, 7.9.2, 7.12.1, 7.13, 7.14.1, 7.15.1, 7.16, 8.1.1, 8.4.4, 8.5, 8.11, 8.14.2, 8.18.1, 8.18.2, 8.19.1, 8.19.9, 9.1.1, 9.2.2, 9.11, 11.9, 11.10.1, 11.11.1, 11.12, 12.17.5, 13.10.1, 13.11.1, 13.12, 14, 15, 17.1.1, 17.1.4, 18.5.4, and H.2.1 Annexes L and Q Tables 3, 5, and 17 Figures 3, 4, 5, L.1, L.2, L.3, L.4, L.5, L.6, Q.1, and Q.2	Δ

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Vented gas-fired space heating appliances

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International Gas Advisory Council

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Preface

This is the sixth edition of ANSI Z21.86 • CSA 2.32, *Vented Gas-Fired Space Heating Appliances*. It supersedes the previous editions published in 2008, 2004, 2000, and 1998.

This Standard was prepared by the Z21/CSA Joint Technical Subcommittee on Standards for Vented Gas-Fired Warm Air Heaters, under the jurisdiction of the Z21/83 Technical Committee on Performance and Installation of Gas Burning Appliances and Related Accessories, the Canadian Technical Committee on Gas Appliances and Related Accessories, and the Strategic Steering Committee on Standards for Fuel Burning Equipment, and had been formally approved by the Technical Committees, American National Standards Institute, and the Interprovincial Gas Advisory Council.

Interpretations: The Strategic Steering Committee on Standards for Fuel Burning Equipment 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 committee interpretation has not already been published, CSA Group's procedures for interpretation shall be followed to determine the intended safety principle."

Notes:

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3) *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.*

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History of the development of the Standard for Vented Gas-Fired Space Heating Appliances

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.

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-1993 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 (IGAC) on November 25, 1997, and by the American National Standards Institute, Inc. (ANSI), 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 IGAC on August 7, 1998, and by ANSI, 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 IGAC on August 22, 2000, and by ANSI, on November 15, 2000.

The fourth edition of the harmonized gas-fired vented space heating appliances standard was approved by the IGAC on January 15, 2004 and ANSI on July 11, 2003.

The fifth edition of the harmonized gas-fired vented space heating appliances standard was approved by the IGAC on April 3, 2008, and ANSI on March 28, 2008.

This, the sixth edition of the harmonized gas-fired vented space heating appliances standard was distributed for industry review during March 2012, September 2012, July 2013, November 2013, July 2014, December 2014, and March 2016. This edition has been formally approved by the Z21/83 Technical Committee on Performance and Installation of Gas Burning Appliances and Related Accessories on October 8, 2012 and October 21, 2016; the CSA Technical Committee on Gas Appliances and Related Accessories on April 18, 2012, August 14, 2016 and October 21, 2016; ANSI on December 21, 2016; and the IGAC on November 21, 2016.

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:

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ANSI Z21.86-2004 • CSA 2.32-2004	ANSI Z21.86a-2005 • CSA 2.32a-2005 ANSI Z21.86b-2007 • CSA 2.32b-2007
ANSI Z21.86-2008 • CSA 2.32-2008	

Note: *This edition of ANSI Z21.86 • CSA 2.32 incorporates changes to the 2008 edition. All changes other than editorial are denoted by a delta in the margin.*

ANSI Z21.86-2016 • CSA 2.32-2016
Vented gas-fired space heating appliances

1 Scope

Δ **1.1**

This Standard applies to newly produced vented gas-fired space heating appliances (see Clause 3, 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 for use with:

a) natural gas;
b) manufactured gas;
c) mixed gas;
d) propane gas [also see Clause 5.2(e)]; and
e) LP gas-air mixtures.

The construction of vented gas-fired space heating appliances for use with the above-mentioned gases is covered in Clause 4.

The performance of vented gas-fired space heating appliances for use with the above-mentioned gases is covered in Clause 5.

1.2

This Standard applies only to the following appliance types, as defined in Clause 3, 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.

1.3

This Standard covers thermal efficiency and related markings of only those appliances whose efficiencies are not regulated in the U.S.A. by the Energy Policy and Conservation Act of 1975 and the National Energy Conservation Policy Act of 1978,* or covered in Canada by Clause 18, Items unique to Canada.

* *At the time of this printing, the above acts regulate the thermal efficiency (heating capacity) of vented appliances. For information, contact the U.S. Department of Energy, Conservation and Solar Applications, Consumer Products Efficiency Branch, 20 Massachusetts Avenue, N.W., Washington, DC 20545.*

1.4

If a value of measurement as shown in this Standard is followed by an equivalent value in other units, the first stated value is to be regarded as the specification.

1.5

All references to psi throughout this Standard are to be considered gauge pressures unless otherwise specified.

Δ

1.6

All vented gas-fired space heating appliances conform to the applicable requirements under Clauses 4 and 5. In addition, for requirements specific to product type also see:

a) Clause 6, Vented room heaters construction,
   Clause 7, Vented room heaters performance;
b) Clause 8, Gravity and fan-type direct vent wall furnaces construction,
   Clause 9, Gravity and fan-type direct vent wall furnaces performance;
c) Clause 10, Gravity and fan-type wall furnaces construction,
   Clause 11, Gravity and fan-type wall furnaces performance;
d) Clause 12, Gravity and fan-type floor furnaces construction (United States only),
   Clause 13, Gravity and fan-type floor furnaces performance (United States only); and
e) Clause 14, Vented condensing gas-fired space heating appliances construction,
   Clause 15, Vented condensing gas-fired space heating appliances performance.

1.7

Clause 17, Items unique to the United States, contains clauses that are unique to the United States.

1.8

Clause 18, Items unique to Canada, contains clauses that are unique to Canada.

1.9

Special construction clauses applicable to vented space heating appliances designed for use with an optional design-certified conversion kit are outlined under Annex H, Provisions for listed gas appliance conversion kits (optional).

1.10

Clause 2 contains a list of standards specifically referenced in this Standard, and sources from which these referenced standards may be obtained.

1.11

In this Standard, “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; and “may” is used to express an option or that which is permissible within the limits of the Standard.

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 (nonmandatory) 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.

Note: *CGA Standards, Recommended Practices, and Codes are published by CSA Group.*

CSA Group

ANSI Z21.11.2-2013
Gas-Fired Room Heaters, Volume II, Unvented Room Heaters

ANSI Z21.12-1990 (R2000), and Addenda ANSI Z21.12a-1993 (R2000) and ANSI Z21.12b-1994 (R2000)
Draft Hoods

ANSI Z21.15-2009 (R2014) • CSA 9.1-2009 (R2014) and Addenda ANSI Z21.15a-2012 (R2014) • CSA 9.1a-2012 (R2014) and ANSI Z21.15b-2013 (R2014) • CSA 9.1b-2013 (R2014)
Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves

ANSI Z21.18-2007 (R2012) • CSA 6.3-2007 (R2012) and Addenda ANSI Z21.18a-2010 (R2012) • CSA 6.3a-2010 (R2012)
Gas Appliance Pressure Regulators

ANSI Z21.20-2014 • CAN/CSA C22.2 No. 60730–2–5–14
Automatic Electrical Controls for Household and Similar Use-Part 2–5: Particular Requirements for Automatic Electrical Burner Control Systems

ANSI Z21.21-2015 • CSA 6.5-2015
Automatic Valves for Gas Appliances

ANSI Z21.23-2010
Gas Appliance Thermostats

ANSI Z21.35-2005 • CSA 6.8-2005 (R2015)
Pilot Gas Filters

ANSI Z21.50-2014 • CSA 2.22-2014
Vented gas fireplaces

ANSI Z21.66-2015 • CGA 6.14-2015
Automatic Vent Damper Devices for Use with Gas-Fired Appliances

ANSI Z21.77-2005 • CSA 6.23-2005 (R2015)
Manually Operated Piezo-Electric Spark Gas Ignition Systems and Components

ANSI Z21.78-2010 • CSA 6.20-2010 (R2015)
Combination Gas Controls for Gas Appliances

B52-13
Mechanical Refrigeration Code

B149.1-15
Natural Gas and Propane Installation Code