ANSI Z21.13-2014 • CSA 4.9-2014

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Gas-fired low pressure steam and hot water boilers

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Gas-fired low pressure steam and hot water boilers

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IGAC

International Gas Advisory Council

CSA Group

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Preface

This is the Fifth edition of ANSI Z21.13 • CSA 4.9, *Gas-fired low pressure steam and hot water boilers*.

This Standard was prepared by the Z21/CSA Joint Technical Sub-Committee on Standards for Gas-Fired Steam and Hot Water Boilers under the jurisdiction of the Technical Committee on Gas Appliances and Related Accessories, the Z21/83 Technical Committee on Performance and Installation of Gas Burning Appliances and Related Accessories, and the Strategic Steering Committee on Standards for Fuel Burning Appliances, and had been formally approved by the Technical Committee(s), American National Standards Institute, and the Interprovincial Gas Advisory Council.

Interpretations: The Strategic Steering Committee on Standards for Fuel Burning 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 committee interpretation has not already been published, CSA'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 publication 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 publication.*

4) *This Standard is subject to periodic review, and suggestions for their 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:*

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b) *relevant clause, table, and/or figure number;*
c) *wording of the proposed change; and*
d) *rationale for the change.*

5) *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.

History of the development of the Standards for Gas-Fired Low Pressure Steam and Hot Water Boilers

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 first draft of this harmonized standard was based on current coverage from the American National Standard for Gas-fired low-pressure steam and hot water boilers, Z21.13-1991, Z21.13a-1993, Z21.13b-1994, and the Canadian Gas Association Standards CGA 3.3-1976, Industrial and commercial atmospherically fired vertical flue boilers and hot water supply heaters, and CGA 4.9-1969, Gas-Fired Steam and Hot Water Boilers.

Following reconsideration and modification of the proposed draft standard, in light of comments received, the joint subcommittee at its December 2, 1998 meeting, recommended the proposed draft standard to Accredited Standards Committee Z21/83 and the (Interim CSA) Standards Steering Committee for approval.

The proposed draft of the harmonized standard for gas-fired low-pressure steam and hot water boilers, as modified by the joint subcommittee, was approved by the Z21/83 Committee at its April 15, 1999 meeting, and by the CSA Standards Steering Committee on Gas Appliances and Related Accessories by letter ballot dated April 9, 1999.

The second edition of the American National Standard/CSA Standard for Gas-fired low-pressure steam and hot water boilers was approved by the Canadian Interprovincial Gas Advisory Council on May 18, 2004, and by the American National Standards Institute, Inc., on June 23, 2004.

The third edition of the American National Standard/CSA Standard for Gas-fired low-pressure steam and hot water boilers was approved by the Canadian Interprovincial Gas Advisory Council on January 4, 2010, and by the American National Standards Institute, Inc., on October 30, 2009.

The fourth edition of the American National Standard/CSA Standard for Gas-fired low-pressure steam and hot water boilers, was approved by the Canadian Interprovincial Gas Advisory Council on March 13, 2013, and by the American National Standards Institute, Inc., on March 7, 2013.

This, the fifth edition of the American National Standard/CSA Standard for Gas-fired low-pressure steam and hot water boilers, was approved by the Canadian Interprovincial Gas Advisory Council on DATE, and by the American National Standards Institute, Inc., on November 26, 2013.

The previous edition of the Gas-fired low-pressure steam and hot water boilers standard, and addenda there to, approved by the Interprovincial Gas Advisory Council and American National Standards Institute, Inc. are as follows:

ANSI Z21.13-2000 • CSA 4.9-2000
ANSI Z21.13a-2002 • CSA 4.9a-2002
ANSI Z21.13b-2003 • CSA 4.9b-2003

ANSI Z21.13-2004 • CSA 4.9-2004
ANSI Z21.13a-2005 • CSA 4.9a-2005
ANSI Z21.13b-2007 • CSA 4.9b-2007

ANSI Z21.13-2010 • CSA 4.9-2010
ANSI Z21.13a-2010 • CSA 4.9a-2010
ANSI Z21.13b-2012 • CSA 4.9b-2012

ANSI Z21.13–2013 • CSA 4.9–2013

The following identifies the designation and year of this edition of the standard:

ANSI Z21.13-2013 • CSA 4.9-2013

Note: *This edition of Z21.13 • CSA 4.9 incorporates changes to the Fourth Edition issued in 2013. Changes other than editorial are noted in the margin.*

ANSI Z21.13-2014 • CSA 4.9-2014
Gas-fired low pressure steam and hot water boilers

1 Scope

1.1

This Standard applies to newly produced gas-fired low-pressure steam and hot water boilers with gas inlet pressure ratings not exceeding 0.5 psi (3.5 kPa) and having input ratings of less than 12,500,000 Btu/hr (3 663 389 W) (see Clause 3), hereinafter referred to as boilers*, constructed entirely of new unused parts and materials, for operation at or below the following pressures and temperatures:

Steam heating boilers
15 psi (103.42 kPa) steam pressure

Hot water heating boilers
160 psi (1.10 MPa) water pressure
250°F (121°C) water temperature

Hot water supply boilers
160 psi (1.10 MPa) water pressure
250°F (121°C) water temperature

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.

The construction of boilers for use with the above-mentioned gases is covered under Clause 4.

The performance of boilers for use with the above-mentioned gases is covered under Clause 5.

** See Clause 7 (7.2.1) for boilers covered in Canada which exceed the above limits in gas inlet pressure and/or input ratings.*

1.2

This Standard applies to indoor type boilers, of other than the direct vent which are categorized according to vent pressure and temperature as either Category I, Category II, Category III or Category IV (see Clause 3), and to outdoor type boilers.

1.3

This Standard also applies to direct vent boilers (see Clause 3). A direct vent boiler anticipated by this Standard is essentially a balanced flue appliance with the air intake and vent outlet in proximity. Other designs shall be subjected to such additional tests as believed necessary at the discretion of the testing agency.

1.4
See Clause 7 for the Canadian Method of test to determine combustion efficiency for indoor boilers and the thermal efficiency for both indoor and outdoor boilers.

1.5
If a value for measurement as given in this Standard is followed by an equivalent value in other units, the first stated value is to be regarded as the specification.

1.6
This Standard contains SI (Metric) corresponding 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 10 or ISO 80000-1:2009 Quantities and units – Part 1: General are used as a guide in making metric conversion from yard/pound quantities.) If a value for a measurement and a corresponding value in other units are stated, the first stated value is to be regarded as the requirement. The given corresponding value may be approximate. If a value for a measurement and corresponding value in other units are both specified as a quoted marking requirement, the first stated unit, or both shall be provided.

1.7
All references to pressure throughout this Standard are to be considered gauge pressure, unless otherwise specified.

1.8
Clause 7 contains provisions unique to, and required by, Canada.

2 Reference publications

CSA Group

CSA B51-2009
Boiler, Pressure Vessel and Pressure Piping Code

CSA C22.1-2012
Canadian Electrical Code, Part 1

CAN/CSA C22.2, No. 0.3-2009
Test Methods for Electrical Wires and Cables

CSA C22.2 No. 0.15-2012
Adhesive Labels

CSA C22.2 No. 3-M1988 (R2009)
Electrical Features of Fuel-Burning Equipment

CSA C22.2 No.24-93 (R2008)
Temperature Indicating and Regulating Equipment

CSA C22.2, No. 49-2010
Flexible Cords and Cables

CSA C22.2 No.77-95 (R2004)
Motors With Inherent Overheating Protection

CSA C22.2 No. 199-2007 (R2012)
Combustion Safety Controls and Solid-State Igniters for Gas- and Oil-Burning Equipment

CSA C22.2 No. 210.2-2011
Appliance Wiring Material Products

CAN1-6.4-M79 (R2001)
Automatic Gas Ignitions System and Components

CSA C22.2 No. 239-2009
Control and Instrumentation Cables

CAN/CSA-2.17-M91 (R2009)
Gas-Fired Appliances For Use at High Altitude

CSA B149.1-2010
Natural Gas and Propane Installation Code

CSA-P.2-2007
Testing Methods for Measuring Annual Fuel Utilization Efficiencies of Residential Gas-Fired Furnaces and Boilers

CAN1-3.1-77 (R2006)
Industrial and Commercial Gas-Fired Package Boilers

ANSI Z21.15-1997 (R2008) • CSA 9.1-M97 and Addenda ANSI Z21.15a-2001 (R2008) • CSA 9.1a-2001 and Addenda ANSI Z21.15b-2006 (R2008) • CSA 9.1b-2006
Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves

ANSI Z21.17-1998 (R2009) • CSA 2.7-M98
Domestic Gas Conversion Burners

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

ANSI Z21.20-2005 (R2010) and Addenda ANSI Z21.20a-2008 (R2010)
Automatic Gas Ignition Systems and Components

ANSI Z21.21-2012 • CSA 6.5-2012
Automatic Valves for Gas Appliances

ANSI Z21.35-2005 (R2010) • CSA 6.8-2005 (R2010)
Pilot Gas Filters

ANSI Z21.66-1996 (R2012) • CSA 6.14-M96 R2012)
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