ANSI Z83.25-2017 • CSA 3.19-2017

CSA Group

Direct gas-fired process air heaters

Legal Notice for Standards

Canadian Standards Association and CSA America, Inc. (operating as "CSA Group") develop standards through a consensus standards development process approved by the Standards Council of Canada and the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA Group administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document's fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party's intellectual property rights. CSA Group does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA Group makes no representations or warranties regarding this document's compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA GROUP, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA GROUP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA Group is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA Group accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA Group is a private not-for-profit company that publishes voluntary standards and related documents. CSA Group has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA Group and the users of this document (whether it be in printed or electronic form), CSA Group is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA Group's and/or others' intellectual property and may give rise to a right in CSA Group and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by licence or by law, CSA Group reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA Group shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF format.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.

CSA Group

Revision History

ANSI Z83.25-2017 • CSA 3.19-2017, Direct gas-fired process air heaters

Revision from previous edition	Revision symbol (in margin)
Annex B	Δ

Standards Update Service

ANSI Z83.25-2017 • CSA 3.19-2017
March 2017

Title: *Direct gas-fired process air heaters*

To register for e-mail notification about any updates to this publication
- go to **shop.csa.ca**
- click on **CSA Update Service**

The **List ID** that you will need to register for updates to this publication is **2424397**.

If you require assistance, please e-mail **techsupport@csagroup.org** or call 416-747-2233.

Visit CSA Group's policy on privacy at **www.csagroup.org/legal** to find out how we protect your personal information.

CSA Group

The Canadian Standards Association (operating as CSA Group), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Groups standards development by volunteering their time and skills to Committee work and supporting CSA Groups objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Groups total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Groups standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard, Toronto, Ontario,
Canada M9W 1R3

American National Standards Institute

The American National Standards Institute (ANSI), Inc. is the nationally recognized coordinator of voluntary standards development in the United States through which voluntary organizations, representing virtually every technical discipline and every facet of trade and commerce, organized labor and consumer interests, establish and improve the some 10,000 national consensus standards currently approved as American National Standards.

ANSI provides that the interests of the public may have appropriate participation and representation in standardization activity, and cooperates with departments and agencies of U.S. Federal, state and local governments in achieving compatibility between government codes and standards and the voluntary standards of industry and commerce.

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.

ANSI approval of standards is intended to verify that the principles of openness and due process have been followed in the approval procedure and that a consensus of those directly and materially affected by the standards has been achieved. ANSI coordination is intended to assist the voluntary system to ensure that national standards needs are identified and met with a set of standards that are without conflict or unnecessary duplication in their requirements.

Responsibility of approving American standards rests with the
American National Standards Institute, Inc.
25 West 43rd Street, Fourth floor
New York, NY 10036

ANSI Z83.25-2017 • CSA 3.19-2017
Direct gas-fired process air heaters

American National Standards Institute, Inc.

IGAC

Interprovincial Gas Advisory Council

CSA Group

Approved on June 14, 2016 by ANSI
Approved on June 26, 2016 by IGAC
Effective in Canada February 1, 2018
Published in March 2017 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3

*To purchase standards and related publications, visit our Online Store at **shop.csa.ca***
or call toll-free 1-800-463-6727 or 416-747-4044.

ISBN 978-1-4883-0325-8

Contents

Interprovincial Gas Advisory Council (IGAC)

J.R. Marshall	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada	*Chair*
M.E. Davidson	Province of New Brunswick Dept of Public Safety, Fredericton, New Brunswick, Canada	*Vice-Chair*
J. Renaud	Régie du bâtiment du Québec, Montréal, Québec, Canada	*Vice-Chair*
A. Asif	Government of Nunavut, Dept. of Community and Government Services, Regina, Saskatchewan, Canada	
D. Balcha	SaskPower, Winnipeg, Manitoba, Canada	*Non-voting*
R. Brousseau	Régie du Bâtiment du Québec, Montréal, Québec, Canada	*Alternate*
P. Christensen	Yukon Government Community Services, Whitehorse, Yukon, Canada	
P. Fowler	Nova Scotia Dept of Labour and Advanced Education, Dartmouth, Nova Scotia, Canada	
Z.J. Fraczkowski	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada	*Alternate*
C. Guay	Standards Council of Canada, Ottowa, Ontario, Canada	*Non-voting*
D.N. Hird	SaskPower, Regina, Saskatchewan, Canada	
S.C. Manning	Alberta Municipal Affairs Safety Services, Edmonton, Alberta, Canada	
R. McRae	Government of the NWT Public Works & Services, Yellowknife, Northwest Territories, Canada	

A. Peters	Manitoba Office of the Fire Commissioner, Winnipeg, Manitoba, Canada	
B.W. Reid	Department of Environment, Energy and Forestry, Charlottetown, Prince Edward Island, Canada	
A. Simard	Government of the Northwest Territories Public Works and Services, Inuvik, Northwest Territories, Canada	*Non-voting*
G. Tremblett	Service NL, Newfoundland & Labrador, St. John's, Newfoundland and Labrador, Canada	
C. Valliere	Alberta Municipal Affairs Safety Services, Edmonton, Alberta, Canada	*Alternate*
M.A. Wani	Government of Nunavut Dept of Community & Government Svcs, Iqaluit, Nunavut, Canada	
B. Wyatt	British Columbia Safety Authority (BCSA), Kelowna, British Columbia, Canada	

Technical Committee on Performance and Installation of Gas Burning Appliances and Related Accessories

B.J. Swiecicki	National Propane Gas Association, Washington, District of Columbia, USA *Category: Gas Supplier*	*Chair*
M.W. Wilber	Crane Engineering, Plymouth, Minnesota, USA *Category: General Interest*	*Vice-Chair*
M. Ali	Association of Home Appliance Manufacturers (AHAM), Washington, District of Columbia, USA *Category: Manufacturer*	*Alternate*
J. Brania	Underwriters Laboratories Inc., Melville, New York, USA *Category: Research/Testing*	
J. Cutts	The Home Depot, Atlanta, Georgia, USA *Category: General Interest*	
M. Deegan	Clearwater Gas System, Clearwater, Florida, USA *Category: Government and/or Regulatory Authority*	
M. Diesch	Lennox International Inc., Carrollton, Texas, USA *Category: Manufacturer*	
J.M. Emmel	Virginia Tech, Blacksburg, Virginia, USA *Category: Consumer/User*	
G. Gress	International Code Council, Chicago, Illinois, USA *Category: Government and/or Regulatory Authority*	
C. Grider	Intertek Testing Services NA Inc., Cortland, New York, USA *Category: Research/Testing*	*Alternate*

T.F. Hardin	Underwriters Laboratories Inc., Research Triangle Park, North Carolina, USA *Category: Research/Testing*	*Alternate*
D. Hubbard	Intertek Commercial & Electrical, Chagrin Falls, Ohio, USA *Category: Research/Testing*	
D.M. Jakobs	Rheem Manufacturing Company Air Conditioning Division, Fort Smith, Arkansas, USA *Category: Manufacturer*	
R.A. Jordan	Consumer Product Safety Commission, Rockville, Maryland, USA	*Non-Voting*
S. Kristjansson	Sempra Energy Utility, Los Angeles, California, USA *Category: Gas Supplier*	*Alternate*
A. Lanier Papageorge	The Southern Company Gas, Atlanta, Georgia, USA *Category: Gas Supplier*	
G. McPherson	Sturgis, South Dakota, USA *Category: General Interest*	
F. Myers	Fort Worth, Texas, USA *Category: General Interest*	
G.J. Potter	Heater Technologies, LLC, Marthasville, Missouri, USA *Category: Manufacturer*	
T. Poulin	A.O. Smith Enterprises Ltd., Fergus, Ontario, California	*Non-voting*
J.A. Ranfone	American Gas Association Inc., Washington, District of Columbia, USA *Category: Gas Supplier*	
N.W. Rolph	Lochinvar, LLC, Lebanon, Tennessee, USA *Category: Manufacturer*	*Alternate*

I. Sargunam	Bloomington, Indiana, USA *Category: General Interest*	
C. Souhrada	North American Association of Food Equipment Manufacturers, Chicago, Illinois, USA *Category: Manufacturer*	
F.A. Stanonik	Air-Conditioning, Heating, and Refrigeration Institute, Arlington, Virginia, USA	*Non-Voting*
T. Stroud	Hearth Patio & Barbecue Association, Seattle, Washington, USA *Category: General Interest*	
C. Suchovsky	Burner Technology Unlimited, Inc, Walton Hills, Ohio, USA *Category: General Interest*	
H. Virgil	Brownsburg, Indiana, USA *Category: Consumer/User*	
A.B. Sherwin	St. Louis Community College, St. Louis, Missouri, USA *Category: Consumer/User*	
M.B. Williams	Association of Home Appliance Manufacturers (AHAM), Washington, District of Columbia., USA *Category: Manufacturer*	
L. Willmore	Southern California Gas Company, Los Angeles, California, USA *Category: Gas Supplier*	
J. Novkovic	CSA Group, Cleveland, Ohio, USA	*Program Manager*
S.M. Corcoran	CSA Group, Cleveland, Ohio, USA	*Project Manager*

Technical Committee on Gas Appliances and Related Accessories

T.W. Poulin	A. O. Smith Enterprises Ltd., Fergus, Ontario, Canada *Category: Producer Interest*	*Chair*
A. Gould	Reliance Comfort Ltd. Partnership dba Reliance Home Comfort, Cambridge, Ontario, Canada *Category: User Interest*	*First Vice-Chair*
D.N. Hird	SaskPower, Regina, Saskatchewan, Canada *Category: Regulatory Authority*	*Second Vice-Chair*
A. Abdel-Rehim	A. O. Smith Enterprises Ltd., Fergus, Ontario, Canada	*Non-voting*
P.A. Baker	Maxitrol Company, Port Dover, Ontario, Canada *Category: Producer Interest*	
J. Boros	Rheem Sales Co. Inc., AKA Rheem Manufacturing Co., Montgomery, Alabama, USA	*Non-voting*
C. Côté	Gaz Métro, Montréal, Québec, Canada *Category: User Interest*	
B. Diel	M.B. Sturgis Inc., St. Louis, Missouri, USA	*Non-voting*
G. Fabbruzzo	Enbridge Gas Distribution, Toronto, Ontario, Canada *Category: User Interest*	
Z.J. Fraczkowski	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada *Category: Regulatory Authority*	
C. Gibbs	Guelph, Ontario, Canada *Category: General Interest*	

A. Gould	Reliance Comfort LP, Cambridge, Ontario, Canada *Category: User Interest*	
C. Grider	Intertek Testing Services NA Inc., Cortland, New York, USA	*Non-voting*
D.R. Jamieson	GHP Group Inc, Oakville, Ontario, Canada *Category: Producer Interest*	
C.E. Jorgenson	British Columbia Safety Authority (BCSA), New Westminster, British Columbia, Canada *Category: Regulatory Authority*	
S. Katz	S. Katz and Associates Inc., North Vancouver, British Columbia, Canada *Category: User Interest*	
J.R. Marshall	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada	*Non-voting*
M. Massuer	Intertek Testing Services NA Inc., Cortland, New York, USA	*Non-voting*
J. Melling	SaskPower, Saskatoon, Saskatchewan, Canada	*Non-voting*
J. Overall	Toronto, Ontario, Canada	*Non-voting*
G.B. Prociw	Union Gas Limited, Chatham, Ontario, Canada *Category: User Interest*	
B.J. Swiecicki	National Propane Gas Association, Frankfort, Illinois, USA	*Non-voting*
M. Thomas	Natural Resources Canada CanmetENERGY, Ottawa, Ontario, Canada	*Non-voting*
M. Travers	Reliance Comfort L.P, Cambridge, Ontario, Canada	*Non-voting*
P. Verhas	Dettson Industries, Inc., Sherbrooke, Québec, Canada	

R. Vlasic	Union Gas Limited, London, Ontario, Canada	*Non-voting*
J. Novkovic	CSA Group, Cleveland, Ohio, USA	*Program Manager*
C.L. Rake	CSA Group, Cleveland, Ohio, USA	*Project Manager*

Joint Z83/CSA Technical Subcommittee on Standards for Gas-Fired Heavy-Duty Forced Air Heaters

T.C. Slaby	Heatco Inc., Cartersville, Georgia, USA	*Chair*
G.J. Potter	Heater Technologies, LLC, Marthasville, Missouri, USA	*Vice-Chair*
K. Alphs	Modine Manufacturing Company Commercial HVAC&R Division, Racine, Wisconsin, USA	
P.A. Baker	Maxitrol Company, Port Dover, Ontario, Canada	*Alternate*
R. Blasko	Reznor, LLC., Mercer, Pennsylvania, USA	
K.J. Carlisle	Karl Dungs Inc, Blaine, Minnesota, USA	
D.C. Delaquila	Aquila Consulting, LLC, Warren, Ohio, USA	*Non-voting*
Z.J. Fraczkowski	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada	*Non-voting*
S. Halasa	Beckett Gas Inc., North Ridgeville, Ohio, USA	
K. Ingersoll	AbsolutAire, Inc., Kalamazoo, Michigan, USA	
J.M. Jagers	Mestex, A Division of Mestek, Inc., Dallas, Texas, USA	
R.T. Jauch, Jr.	CES Group, LLC, Oklahoma City, Oklahoma, USA	

T. Kwon	Air-Conditioning, Heating, and Refrigeration Institute, Arlington, Virginia, USA	
P. Lengauer	Reznor, LLC, Mercer, Pennsylvania, USA	*Alternate*
B. Mickelson	Honeywell International Inc, Golden Valley, Minnesota, USA	
D. Neufeldt	Sure Flame Products, A Division of Haul-All Equipment Ltd., Lethbridge, Alberta, Canada	
D.M. Perry	Maxon - A Honeywell Company, Muncie, Indiana, USA	
V. Quiring	Engineered Air, Division of Airtex Manufacturing Partnership, Calgary, Alberta, Canada	
S. Richter	Roberts Gordon LLC, Buffalo, New York, USA	
J.J. Schlachter	Maxitrol Company, Southfield, Michigan, USA	
S. Schneider	Lennox Industries, Inc., Carrollton, Texas, USA	
S. Stallings	Applied Air, a Division of Mestex, LTD., Dallas, Texas, USA	
J. Stanley	Karl Dungs Inc., Blaine, Minnesota, USA	*Alternate*
C. Suchovsky	Burner Technology Unlimited, Inc, Walton Hills, Ohio, USA	
M. Thomas	Natural Resources Canada CanmetENERGY, Ottawa, Ontario, Canada	
S. Wang	Lenuan Heating Appliances Co., Ltd., Foshan, Guangdong, China	*Non-voting*

A. Yilmaz	Air-Conditioning, Heating, and Refrigeration Institute, Arlington, Virginia, USA	*Alternate*
J. Novkovic	CSA Group, Cleveland, Ohio, USA	*Program Manager*
S.M. Corcoran	CSA Group, Cleveland, Ohio, USA	*Project Manager*

Preface

This is the third edition of ANSI Z83.25 • CSA 3.19, Standard for *Direct gas-fired process air heaters*. It supersedes the previous edition published in 2015.

This Standard was prepared by the Z83/CSA Joint Technical Sub-Committee on Standards for Gas-Fired Heavy Duty Forced Air Heaters 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.

This publication represents a basic standard for safe operation, substantial and durable construction, and acceptable performance of Recirculating direct gas-fired industrial air heaters. It is the result of years of experience in the manufacture, testing, installation, maintenance, inspection, and research on appliances designed for the 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 function 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 direct gas-fired process heaters, 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 technical advances take place, revisions may become necessary. When they are believed desirable, recommendations or suggestions should be forwarded to the CSA Group, 8501 East Pleasant Valley Road, Cleveland, Ohio 44131. A proposal form is provided in the back of this document.

Safe and satisfactory operation of a direct gas-fired process heater depends to a great extent upon its proper installation, use, and maintenance. It should be installed in accordance with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54*, manufacturers' installation instructions, and local municipal codes.

Users of this American National Standard are advised that the devices, products, and activities within its scope may be subject to regulation at the Federal, 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, state, or local regulations 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.

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 Group'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) *This Standard contains SI (Metric) units corresponding to the yard/pound quantities, the purpose being to allow the standard to be used in SI (Metric) units. (IEEE/ASTM SI 10, American National Standard for Metric Practice, or ISO 80000-1:2009, Quantities and units – Part 1: General, is 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 a corresponding value in other units are both specified as a quoted marking requirement, the first stated unit, or both, are to be provided.*

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.*

4) *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.*

5) *This Standard is subject to review at least every five years, suggestions for its 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:*

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

6) *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 development of the Standard for Direct gas-fired process air heaters

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 equipment.

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.

A Z83/CGA joint Subcommittee on Standards for Heavy Duty Heaters was then established, based on memberships of the Z83 subcommittee for Gas-Fired Heavy Duty Forced Air Heaters, and the CGA committees for Unit Heaters/Duct Furnaces, Make-up Air Heaters, and Door Heaters.

Membership on the joint heavy duty heaters subcommittee encompasses representatives from the U.S. and Canadian manufacturing industry, gas suppliers (natural and LP), regulatory authorities, and general interest.

To facilitate the reporting structure of joint subcommittees, a CGA Standards Steering Committee on Gas Burning Appliances and Related Accessories was established to parallel Accredited Standards Committees Z21 and Z83.

The first meeting of the Z83/CGA joint heavy duty heaters subcommittee was held on July 14-16, 1992 in Toronto.

The Joint Technical Sub-Committee (TSC) on Standards for Gas-Fired Heavy Duty Forced Air Heaters adopted the proposed draft standard for Direct Gas-Fired Process Air Heaters for distribution for review and comment at its May 10, 2006 meeting.

The draft of the proposed harmonized standard was issued for public review in September 2006. All comments relating to the draft were duly considered by the joint heavy duty heaters TAG at its meeting on May 17, 2007. The resulting draft of the proposed harmonized standard was submitted for approval by the Z21/83 Committee and the CGA Technical Committee.

The first edition of the harmonized Z83/CSA Standard for Direct gas-fired process air heaters was approved by the Canadian Interprovincial Gas Advisory Council on November 26, 2007, and by the American National Standards Institute, Inc. on January 14, 2008.

The second edition of the harmonized Z83/CSA Standard for Direct gas-fired process air heaters was approved by the Canadian Interprovincial Gas Advisory Council on February 5, 2015, and by the American National Standards Institute, Inc. on January 8, 2015.

This, the third edition of the harmonized Z83/CSA Standard for Direct gas-fired process air heaters was approved by the Canadian Interprovincial Gas Advisory Council on June 26, 2016, and by the American National Standards Institute, Inc. on June 14, 2016.

The previous edition of the harmonized Direct gas-fired process air heaters, and addenda thereto, approved by the Interprovincial Gas Advisory Council and the American National Standards Institute are as follows:

Z83.25-2008 • CSA 3.19-2008

Z83.25a-2013 • CSA 3.19a-2013

Z83.25-2015 • CSA 3.19-2015

The following identifies the designation and year of the third edition of the Standard:

ANSI Z83.25-2017 • CSA 3.19-2017

Note: *This, the 2017 edition of Z83.25 • CSA 3.19, incorporates changes to the 2015 edition. Changes, other than editorial, are denoted by a delta in the margin.*

ANSI Z83.25-2017 • CSA 3.19-2017
Direct gas-fired process air heaters

1 Scope

1.1
This Standard applies to newly produced, direct gas-fired process air heaters of the recirculating or non-recirculating type (see Clause 3, Definitions), hereinafter referred to as heaters, whose primary purpose is to provide process heating to non-occupied spaces within commercial and industrial buildings and may also include operation as a non-recirculating ventilation air heater (see Clause 3), if the heater is operated during periods when the space is occupied.

Heaters covered under this Standard are limited to a maximum discharge temperature of 250 °F (121 °C).

Heaters covered by this Standard are not intended for use in any area containing sleeping quarters. The installation conforms with local codes, or in the absence of local codes, in accordance with the *National Fuel Gas Code, ANSI Z223.1*, or the *Natural Gas and Propane Installation Codes, CAN/CSA B149.1*.

This Standard is intended to cover only complete packaged heaters with integral air moving components, i.e., those which are designed by, cataloged by, and built on a repetitive basis by the manufacturer.

1.2
When the heater operates with people present within the space being served by this heater, it is configured so that the performance window of the heater operation will be in compliance with the applicable provisions associated with the ventilation air heater mode contained in this Standard.

1.3
When the heater is operated in the bake cycle mode, the combustion by-products generated by the heater have not been defined since it is intended to operate in this mode in the non-occupied condition only.

1.4
When the heater is utilized as a paint booth heater, it must be operated as a non-recirculating ventilation air heater during the spraying operation and may be operated as a recirculating heater in the bake or drying mode provided all of the conditions identified in Clauses 4.1.11, 4.1.12, 4.15.3, 4.15.12, 4.15.13, 4.15.14, 4.21.12, 4.21.13, 4.21.14, 4.21.15, 4.21.16, 4.21.17, 4.21.18, 4.21.19, and 4.21.20, if applicable, are met.

1.5
Process air heaters that operate in the bake cycle mode only (does not operate in the occupied mode) are not required to comply with the following construction provisions: Clauses 4.15.5-b) and 4.21.1-m)-iii).

1.6
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.

1.7
Items unique to the U.S.A. are shown in Clause 6.

1.8
Items unique to Canada are shown in Clause 7.

1.9
Clause 2, Reference publications, contains a list of standards specifically referenced in this Standard, and sources from which these referenced standards may be obtained.

1.10
All references to “psi” through this Standard are to be considered gage pressure unless otherwise specified.

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; “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 (non-mandatory) to define their application.

2 Reference publications
This Standard refers to the following publications, and where such reference is made, it is to the edition listed below.

CSA Group

CSA C22.1-15
Canadian Electrical Code, Part 1

CSA C22.2 No. 3-M1988 (R2014)
Electrical Features of Fuel-Burning Equipment

CSA C22.2 No. 77-14
Motor with Inherent Overheating Protection

