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Group**

ANSI Z83.25-2015 • CSA 3.19-2015

Direct gas-fired process air heaters

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Revision History

ANSI Z83.25-2015 • CSA 3.19-2015, Direct gas-fired process air heaters

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Direct gas-fired process air heaters



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Preface

This is the second edition of ANSI Z83.25 • CSA 3.19, Standard for *Direct gas-fired process air heaters*. It supersedes the previous edition published in 2008.

This publication represents a basic standard for safe operation, substantial and durable construction, and acceptable performance of direct gas-fired process 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*, manufacturer's 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.

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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.

This, 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.

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

ANSI Z83.25-2015 • CSA 3.19-2015

Note: *This, the 2015 edition of Z83.25 • CSA 3.19, incorporates changes to the 2008 edition. Changes, other than editorial, are denoted by a delta in the margin.*

ANSI Z83.25-2015 • CSA 3.19-2015

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 to ensure 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 C22.1-12

Canadian Electrical Code, Part 1

CSA C22.2 No. 3-M1988 (R2009)

Electrical Features of Fuel-Burning Equipment

CSA C22.2 No. 77-1995 (R2013)

Motor with Inherent Overheating Protection