

***American National Standard/
CSA Standard For***

*Non-Recirculating Direct Gas-Fired
Industrial Air Heaters*



AMERICAN NATIONAL STANDARD
ANSI Z83.4-2003

CSA STANDARD
CSA 3.7-2003

Second Edition - 2003

This Standard is based on
the Standards for

NON-RECIRCULATING DIRECT GAS-FIRED
INDUSTRIAL AIR HEATERS

Z83.4-1999 • CSA 3.7-M99
Z83.4a-2001 • CSA 3.7a-2001
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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.

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Responsibility of approving American National Standards rests with the

*American National Standards Institute, Inc.
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Preface

This publication represents a basic standard for safe operation, substantial and durable construction, and acceptable performance of non-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 non-recirculating direct gas-fired industrial air heaters 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 non-recirculating direct gas-fired industrial air 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 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 (Interim CSA) Gas Equipment Standards Steering Committee, 178 Rexdale Boulevard, Etobicoke, Ontario, Canada M9W 1R3.

Safe and satisfactory operation of non-recirculating direct gas-fired industrial air heaters 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.

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., 11 West 42nd Street, New York, N.Y. 10036, (212) 642-4900.

EFFECTIVE DATE: An organization using this standard for product evaluation as a part of its certification program will normally establish the date by which all products certified by that organization should comply with this standard. In Canada the Standards Committee and the Interprovincial Gas Advisory Council normally stipulate an effective date for the standard.

History of the development of the Standard For Non-Recirculating Direct Gas-Fired Industrial Air Heaters

(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, 1989, 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 July 14-16, 1992 meeting, the Z21/CGA Joint Subcommittee on Standards for Gas-Fired, Heavy-Duty Forced Air Heaters group agreed to prepare a draft bi-national standard for Direct Gas-Fired Industrial Air Heaters. During its November 7-8, 1996 meeting the joint subcommittee agreed to send the draft standard for public review and comment.

The first draft harmonized standard was based on current coverage from the American National Standards/Canadian Gas Association Standards for Direct Gas-Fired Non-recirculating Make-up Air Heaters, ANSI Z83.4, Direct Gas-Fired Make-up Air Heaters, CGA-3.7, the Direct Gas Fired Door Air Heaters, Z83.17 and CGA-3.12, and Direct Gas Fired Industrial Air Heaters, Z83.18.

Following reconsideration and modification of the proposed draft standard, in light of comments received, the joint heavy duty heaters subcommittee at its July 2-23, 1997 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 Non-Recirculating Direct Gas-Fired Industrial Air Heaters, as modified by the joint subcommittee, was approved by the Z21/83 Committee by letter ballot dated August 10, 1998 and by the CGA Standards Steering Committee by letter ballot dated October 6, 1997.

The first edition of the American National Standard/CSA Standard for Non-Recirculating Direct Gas-Fired Industrial Air Heaters was approved by the Canadian Interprovincial Gas Advisory Council on July 7, 1999, and by the American National Standards Institute, Inc., on November 9, 1999.

American National Following the procedures outlined above, further revisions to this standard, Z83.4• CSA 3.7, were made in line with industry developments. The second edition of the American National Standard/CSA Standard for Non-Recirculating Direct Gas-Fired Industrial Air Heaters was approved by the Interprovincial Gas Advisory Council on September 11, 2003, and by the American National Standards Institute, Inc., on November 26, 2003.

Previous editions of the harmonized Non-Recirculating Direct Gas-Fired Industrial Air Heaters, and addenda thereto, approved by the Interprovincial Gas Advisory Council and the American National Standards Institute are as follows:

Z83.4-1999 • CSA 3.7-M99
Z83.4a-2001 • CSA 3.7a-2001
Z83.4b-2002 • CSA 3.7b-2002

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

ANSI Z83.4-2003 • CSA 3.7-2003

NOTE: *This the 2003 edition of Z83.4 • CSA 3.7 incorporates changes to the 1999 edition and addenda thereto. Changes, other than editorial, are denoted by a vertical line in the margin.*

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Contents

Page

PART I. CONSTRUCTION

1.1	Scope	1
1.2	General Construction	1
1.3	Assembly	2
1.4	Accessibility	3
1.5	Main Burners	3
1.6	Combustion Air Control	3
1.7	Orifices and Orifice Fittings	4
1.8	Automatic Gas Ignition Systems	4
1.9	Flame Safeguards	5
1.10	Valve Trains	6
1.11	Manual Gas Valves.....	6
1.12	Gas Supply Lines	7
1.13	Atmospheric Vents and Gas Reliefs or Bleeds	8
1.14	Automatic Valves and Safety Shutoff Valves.....	9
1.15	Gas Appliance Pressure Regulators	9
1.16	Discharge Air, Purge, Limit Controls and Interlocks	9
1.17	Thickness of Materials.....	11
1.18	Fan Motors	11
1.19	Fans.....	12
1.20	Air Filters	12
1.21	Protection of Service Personnel.....	12
1.22	Operating and Installation Instructions.....	14
1.23	Marking.....	17

PART II. PERFORMANCE

2.1	General	21
2.2	Test Gases	22
2.3	Test Pressure and Burner Adjustments	22
2.4	Basic Test Arrangement	23
2.5	Air Throughput Measurement	23
2.6	High Temperature Limit Control System	24
2.7	Air Flow Sensing Systems	25
2.8	Operating Temperature Control System.....	27
2.9	Combustion	27
2.10	Burner Operating Characteristics.....	30
2.11	Piloted Ignition Systems	30
2.12	Direct Ignition Systems.....	32
2.13	Gas Appliance Pressure Regulators	33
2.14	Automatic Valves	33
2.15	Burner and Heater Input Rating Determination	33
2.16	Manifold and Control Assembly Capacity.....	34
2.17	Wall, Floor (Optional), Ceiling, Electrical Equipment and Wiring Temperatures.....	34
2.18	Electrical Continuity, Leakage and Dielectric Strength	35
2.19	Heaters for Outdoor Installation	36
2.20	Rain and Wind Tests for Inlet Air Openings.....	38
2.21	Marking Material Adhesion and Legibility.....	39

Contents (Continued)

Page

TABLES.

Table I.	Maximum Ignition System Timings.....	42
Table II.	Minimum Acceptable Wall Thickness for Nonferrous Semi-rigid Tubing	42
Table III.	Maximum Tubing and Fitting Temperatures	43
Table IV.	Minimum Corrosion Protection of Ferrous Materials Used in the Construction of Outside Casings of Heaters for Outdoor Installation	44
Table V.	Characteristics of Test Gases	45
Table A-I.	45
Table A-II.	Minimum Average Thickness of Sheet-metal Junction Boxes*	46
Table A-III.	Insulation Thickness of Factory Wiring Exposed in Burner or Fan Compartment.....	47
Table A-IV.	Electrical Clearances, Inch (mm)	48
Table A-V.	Maximum Allowable Rise above Room Temperature for Various Component Parts.....	49

FIGURES.

Figure 1.	Accessibility and Protection.....	51
Figure 2.	Test Set-Up.....	52
Figure 3.	Distribution of Traverse Points for Round Duct Derived from <i>ANSI/ASHRAE 51 (ANSI/AMCA 210)</i>	53
Figure 4.	Traverse Points for Rectangular Ducts.....	54
Figure 5.	Arrangement of Spray Heads and Associated Piping for Simulated Rainstorm Test.....	55
Figure 6.	Spray Head Assembly and Details of Construction.....	55

EXHIBIT A.	Items Unique to the United States	56
EXHIBIT B.	Items Unique to Canada.....	63
EXHIBIT C.	List of Reference Standards.....	66

PART III.	Manufacturing and Production Tests.....	69
------------------	---	----

PART IV.	Definitions	71
-----------------	-------------------	----

APPENDIX A.	Pertinent References to ANSI Y14.15	79
APPENDIX B.	Wire Color Designations.....	80
APPENDIX C.	Recommended Wire Color Usage.....	81

Contents (Continued)

	Page
APPENDIX D. Preferred Graphic Symbols of Commonly Used Items, Extracted from Standard ANSI/IEEE 315, Graphic Symbols for Electrical and Electronics Diagrams, and Abbreviations for These Items	82
APPENDIX E. Table of Conversion Factors.....	84

Note

This standard contains SI (Metric) equivalents to the yard/pound quantities, the purpose being to allow the standard to be used in SI (Metric) units. (*IEEE/ASTM-SI 10* or *CAN/CSA Z234.1* are used as a guide in making metric conversion from yard/pound quantities.) If a value for a measurement and an equivalent value in other units, the first stated is to be regarded as the requirement. The given equivalent value may be approximate. If a value for a measurement and an equivalent value in other units, are both specified as a quoted marking requirement, the first stated unit, or both shall be provided.

American National Standards/CSA Standards For Non-Recirculating Direct Gas-Fired Industrial Air Heaters

Part I: Construction

1.1 Scope

1.1.1 This standard applies to newly produced, direct gas-fired industrial air heaters of the non-recirculating type, hereinafter referred to as heaters, whose purpose is to offset building heat loss. All air to the heater shall be ducted directly from outdoors and the products of combustion generated by the heater are released into the air stream being heated.

Heaters covered by this standard are intended for use in industrial and commercial applications. Heaters covered by this standard are not intended for use in any area containing sleeping quarters. The installation shall conform with local codes, or in the absence of local codes, in accordance with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54*, or the *Natural Gas and Propane Installation Code, CSA B149.1*.

This standard applies to heaters designed for heated discharge air temperature of 160°F (71°C) or less.

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.

1.1.2 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.

1.1.3 Items unique to the U.S. are shown in Exhibit A.

1.1.4 Items unique to Canada are shown in Exhibit B.

1.1.5 Exhibit C contains a list of standards specifically referenced in this standard, and sources from which these referenced standards may be obtained.

1.1.6 All references to p.s.i. through this standard are to be considered gage pressure unless other wise specified.

1.2 General Construction

1.2.1 The heater shall be constructed entirely of new, unused parts and material. The construction of the heater shall be such that it will not show signs of becoming warped, bent, broken or otherwise damaged during the initial test installation or during any of the tests specified herein, so as to prevent its compliance with any of these provisions and whether specifically covered by the various