

NFPA[®] 54 ANSI Z223.1

National Fuel Gas Code

2012 Edition



NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization



IMPORTANT NOTICES AND DISCLAIMERS CONCERNING AGA and NFPA® DOCUMENTS

NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF AGA and NFPA DOCUMENTS

NFPA codes, standards, recommended practices, and guides, of which the document contained herein is one, and AGA's Z223.1 are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the AGA and the NFPA administer the process and establish rules to promote fairness in the development of consensus, they do not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in their codes and standards.

The AGA and NFPA disclaim liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this document. The AGA and the NFPA also make no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making this document available, the AGA and the NFPA are not undertaking to render professional or other services for or on behalf of any person or entity. Nor are the AGA and the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The AGA and the NFPA have no power, nor do they undertake, to police or enforce compliance with the contents of this document. Nor do the AGA and the NFPA list, certify, test or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the AGA and the NFPA and is solely the responsibility of the certifier or maker of the statement.

Important Notices and Disclaimers continued on inside back cover.

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING AGA AND NFPA® DOCUMENTS
(Continued from inside front cover)

ADDITIONAL NOTICES AND DISCLAIMERS

Updating of AGA and NFPA Documents

Users of NFPA codes, standards, recommended practices, and guides and AGA Z223.1 should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of Tentative Interim Amendments. An official AGA or NFPA document at any point in time consists of the current edition of the document together with any Tentative Interim Amendments and any Errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments or corrected through the issuance of Errata, consult appropriate NFPA publications such as the National Fire Codes® Subscription Service, visit the NFPA website at www.nfpa.org, or contact the AGA or NFPA at the address listed below.

Interpretations of AGA and NFPA Documents

A statement, written or oral, that is not processed in accordance with the interpretation procedures of the Z223 Committee or Section 6 of the NFPA Regulations Governing Committee Projects shall not be considered the official position of the Z223 Committee or the NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

Patents

The AGA and NFPA do not take any position with respect to the validity of any patent rights referenced in, related to, or asserted in connection with an AGA or NFPA Document. The users of AGA and NFPA Documents bear the sole responsibility for determining the validity of any such patent rights, as well as the risk of infringement of such rights, and the AGA and NFPA disclaim liability for the infringement of any patent resulting from the use of or reliance on AGA and NFPA Documents.

AGA and NFPA adhere to the policy of the American National Standards Institute (ANSI) regarding the inclusion of patents in American National Standards (“the ANSI Patent Policy”), and hereby give the following notice pursuant to that policy:

NOTICE: The user’s attention is called to the possibility that compliance with an AGA or NFPA Document may require use of an invention covered by patent rights. AGA and NFPA take no position as to the validity of any such patent rights or as to whether such patent rights constitute or include essential patent claims under the ANSI Patent Policy. If, in connection with the ANSI Patent Policy, a patent holder has filed a statement of willingness to grant licenses under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, copies of such filed statements can be obtained, on request, from NFPA. For further information, contact the NFPA at the address listed below.

Law and Regulations

Users of AGA and NFPA documents should consult applicable federal, state, and local laws and regulations. The AGA and NFPA do not, by the publication of their codes, standards, recommended practices, and guides, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

This document is copyrighted by the AGA and the NFPA. It is made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of safe practices and methods. By making this document available for use and adoption by public authorities and private users, the AGA and the NFPA do not waive any rights in copyright to this document.

Use of AGA and NFPA documents for regulatory purposes should be accomplished through adoption by reference. The term “adoption by -reference” means the citing of title, edition, and publishing information only. Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument. In order to assist NFPA in following the uses made of its documents, adopting authorities are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. For technical assistance and questions concerning adoption of AGA and NFPA documents, contact the AGA or the NFPA at the address below.

For Further Information

All questions or other communications relating to AGA and NFPA codes, standards, recommended practices, and guides and all requests for information on AGA and NFPA procedures governing their codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to AGA or NFPA documents during regular revision cycles, should be sent to AGA headquarters, addressed to the attention of the Secretary, Accredited Standards Committee Z223, 400 N. Capitol Street, N.W., Washington, DC 20001 and to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

For more information about NFPA, visit the NFPA website at www.nfpa.org.

For more information about AGA, visit the AGA website at www.aga.org.

Copyright © 2011 National Fire Protection Association® and the American Gas Association. All Rights Reserved.

NFPA® 54-2012

ANSI Z223.1-2012

National Fuel Gas Code

2012 Edition

This edition of ANSI Z223.1/NFPA 54, *National Fuel Gas Code*, was prepared by the Technical Committee on National Fuel Gas Code, and acted on by NFPA at its June Association Technical Meeting held June 12–15, 2011, in Boston, MA. It was issued by the Standards Council on August 11, 2011, with an effective date of August 31, 2011, and supersedes all previous editions.

This edition of ANSI Z223.1/NFPA 54 was approved as an American National Standard on August 31, 2011. The ANSI designation is Z223.1-2012. The NFPA designation is NFPA 54-2012.

Origin and Development of ANSI Z223.1/NFPA 54

This code offers criteria for the installation and operation of gas piping and gas equipment on consumers' premises. It is the cumulative result of years of experience of many individuals and many organizations acquainted with the installation of gas piping and equipment designed for utilization of gaseous fuels. It is intended to promote public safety by providing requirements for the safe and satisfactory utilization of gas.

Changes in this code can become necessary from time to time. When any revision is deemed advisable, recommendations should be forwarded to the Secretary, Accredited Standards Committee Z223, 400 N. Capitol St. NW, Washington, DC 20001, and the Secretary, Standards Council, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

Prior to 1974, the following three codes covered the installation of gas piping and appliances:

- (1) *American National Standard Installation of Gas Appliances and Gas Piping*, ANSI Z21.30 (NFPA 54)
- (2) *Installation of Gas Piping and Gas Equipment on Industrial Premises and Certain Other Premises*, ANSI Z83.1 (NFPA 54A)
- (3) *Fuel Gas Piping*, ASME B31.2

The first edition of the code was issued in 1974. It combined the requirements of the three predecessor documents. The American Gas Association and the National Fire Protection Association have continued co-sponsorship of the code following the first edition.

The second edition of the code, incorporating pertinent portions of B31.2, was issued in 1980, and reorganized the code to the current format. The third, fourth, fifth, sixth, and seventh editions were issued in 1984, 1988, 1992, 1996, and 1999, respectively. The scope of the code was expanded in 1988 to include piping systems up to and including 125 psi (862 kPa).

The 2002 edition revised the requirements for air for combustion and ventilation to recognize changes in building construction practices. Also, coverage of sizing of gas piping systems was updated.

The 2006 edition incorporated expanded steel, copper, and polyethylene pipe sizing tables. Requirements for appliance shutoff valves were revised to allow manifold systems with all shutoff valves in one location up to 50 ft (15 m) from the most remote appliance, and the chapters were reorganized by application.

Changes to the 2009 edition included allowing press-connect fittings for gas piping systems, new requirements for bonding of CSST piping systems, expanded CSST sizing tables to recognize additional available sizes, new coverage of outdoor decorative appliances, and a new requirement to seal the annular space around the side wall vent penetrations.

In the 2012 edition, Section 8.3 on purging of fuel gas piping was extensively revised to require outdoor purging of piping larger than 2 in. nominal pipe size or piping operating at pressures above 2 psig (14 kPa) and monitoring of the outdoor purging point. Pipe 2 in. (50 mm) or smaller or with an operating pressure of 2 psig (14 kPa) or less can be purged indoors through a burner, with a gas detector, or by using written procedures.

In addition, the requirements for bonding of CSST were revised to require the bonding connection to metallic pipe or fitting between the point of delivery and the first downstream CSST fitting, rather than at the building entrance. New requirements for overpressure protection for regulators exceeding 2 psi (14 kPa) were added, and the requirements for "Room large in comparison with size of appliance" were deleted because changes in boiler and furnace design make this no longer relevant.

Prior editions of this document have been translated into languages other than English, including Spanish.



Technical Committee on National Fuel Gas Code

Thomas R. Crane, *Chair*
Crane Engineering, MN [SE/SE]

Paul W. Cabot, *Nonvoting Secretary*
American Gas Association, DC [IM]

Hugo Aguilar,† International Association of Plumbing & Mechanical Officials, CA [EA]

Edward Angelone, National Grid, NY [IM/ES]
Rep. American Gas Association

David Berning,† A.O. Smith Water Products Company, SC [M]
Rep. Air-Conditioning, Heating and Refrigeration Institute

James P. Brewer, Magic Sweep Corporation, VA [IM/I-M]
Rep. National Chimney Sweep Guild

Thomas E. Buchal, Intertek Testing Services, NY [RT/AR-TL]

Todd W. Buechler, Fairmont Specialty Insurance, IL [I/I]

Dan Buuck,† National Association of Home Builders, DC [I-M]

S. Ron Caudle,† Southern California Gas Company, CA [ES]

Sidney L. Cavanaugh,† Cavanaugh Consulting, CA [I-M]
Rep. United Association

Sharon E. Coates, State of Arkansas, AR [E/EA]
Rep. International Fire Marshals Association

Mike Deegan, Clearwater Gas System, FL [U/ES]
Rep. American Public Gas Association

John Doucette,† Connecticut Department of Public Safety, CT [EA]

Glen A. Edgar, Selkirk Corporation, OH [M/M]
Rep. Air-Conditioning, Heating, and Refrigeration Institute

Pennie L. Feehan,† Pennie L. Feehan Consulting, CA [M]
Rep. Copper Development Association

Alberto Jose Fossa,* MDJ, Assessoria & Engenharia Consultiva, Brasil [SE]
Rep. NFPA Latin American Section

Ronnie Ray Frazier, Atmos Energy Corporation, TX [IM/ES]
Rep. American Gas Association

Mike Gorham, Northwest Gas Company, MN [IM/ES]
Rep. National Propane Gas Association

Gregg Gress, International Code Council, IL [E/EA]

Steen Hagensen, EXHAUSTO Inc., GA [M/M]

Jacob Hall,* Rheem Water Heater Division, AL [M]
Rep. Air-Conditioning, Heating, and Refrigeration Institute

Karl Harn, City of Portland, OR [E/EA]

Rep. Oregon Mechanical Officials Association [EA]
Patricio J. Himes, Sistemas de Energia, Mexico [U/ES]

Rep. Asociación Mexicana de Distribuidores de Gas
Peter Hoekstra,† Association of Home Appliance Manufacturers, VA [M]

Peter T. Holmes,* State of Maine, ME [E]

Adam S. Muliawan,* International Association of Plumbing & Mechanical Officials, CA [E]

Brian C. Olson,* U.S. Department of the Interior, CO [U]

James T. Osterhaus, Railroad Commission of Texas, TX [E/EA]

Andrea Lanier Papageorge, AGL Resources, GA [IM/ES]
Rep. American Gas Association

Dale Powell,* Copper Development Association, PA [M]

Phillip H. Ribbs,* PHR Consultants, CA [E]
Rep. California State Pipe Trades Council

Earl Righmier, AERCO International, Inc., NJ [M]
Rep. Air-Conditioning, Heating, and Refrigeration Institute

Bryan Rocky, Johnson Controls, Inc., KS [M]
Rep. Air-Conditioning, Heating, & Refrigeration Institute

Joseph Mike Romano,† TECO Peoples Gas, FL [ES]
Rep. American Gas Association

Matt Sigler,* International Association of Plumbing & Mechanical Officials, CA [E]

Kenneth Sons,† U.S. Department of the Interior, CO [EA]

Robert E. Stack, CSA America, Inc., OH [RT/AR-TL]

Jeffrey A. Stackpole, AON Global Risk Consulting, MI [I/I]

Thomas R. Stroud,† Health, Patio and Barbeque Association, [M]

Franklin R. Switzer, Jr., S-safe, Inc., IN [SE]

Robert Wozniak, Underwriters Laboratories Inc., NY [RT/AR-TL]

Stephen M. Yapchanyk,† Con Edison, NY [ES]
Rep. American Gas Association

Alternates

David Berning,* A.O. Smith Water Products Company, SC [M]

(Alt. to J. Hall)

Duane W. Brown,† Ranger Insurance Company, TX [I]

(Alt. to T. W. Buechler)

Lawrence Brown,† National Association of Home Builders, DC [IM]

(Alt. to D. Buuck)

John Doucette,* Connecticut Department of Public Safety, CT [E]

(Alt. to P. T. Holmes)

Pennie L. Feehan,* Pennie L. Feehan Consulting, CA [M]

(Alt. to D. Powell)

Richard Gilbert, Railroad Commission of Texas, TX [E/EA]

(Alt. to J. T. Osterhaus)

Brian Olson,† U.S. Department of the Interior, CO [EA]
(Alt. to K. Sons)

Dale Powell,† Copper Development Association, PA [M]
(Alt. to P. L. Feehan)

Joseph Mike Romano,* TECO Peoples Gas, FL [IM]
(Alt. to R. R. Frazier)

Matt Sigler,† International Association of Plumbing & Mechanical Officials, CA [E]
(Alt. to H. Aguilar)

Lynne Simnick, International Association of Plumbing & Mechanical Officials, CA [E]
(Alt. to A. S. Muliawan)

Bruce J. Swiecicki, National Propane Gas Association, IL [IM/ES]
(Alt. to M. Gorham)

Denise Beach, NFPA Staff Liaison

*NFPA 54 Committee only. †Z223 Committee only.

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

The National Fuel Gas Code Committee is a committee functioning jointly under American National Standards Institute Accredited Standard Committee Z223 procedures and the National Fire Protection Association and, accordingly, the national Fuel Gas Code bears two designations, ANSI Z223.1 and NFPA 54. In the ANSI context, the code is prepared by the Accredited Standards Committee on National Fuel Gas Code, Z223, sponsored by the American Gas Association (Administrative Secretariat). In the NFPA context the committee is an NFPA Technical Committee submitted to ANSI under NFPA audited designation.

Committee Scope: This Committee shall have primary responsibility for documents on safety code for gas piping systems on consumers' premises and the installation of gas utilization equipment and accessories for use with fuel gases such as natural gas, manufactured gas, liquefied petroleum gas in the vapor phase, liquefied petroleum gas-air mixtures, or mixtures of these gases, including: (a) The design, fabrication, installation, testing, operation, and maintenance of gas piping systems from the point of delivery to the connections with each gas utilization device. Piping systems covered by this Code are limited to a maximum operating pressure of 125 psig. For purposes of this Code, the point of delivery is defined as the outlet of the meter set assembly, or the outlet of the service regulator or service shutoff valve where no meter is provided. (b) The installation of gas utilization equipment, related accessories, and their ventilation and venting systems.

Contents

Chapter 1 Administration	54- 7	Chapter 7 Gas Piping Installation	54- 59
1.1 Scope	54- 7	7.1 Piping Underground	54- 59
1.2 Purpose	54- 7	7.2 Installation of Piping	54- 60
1.3 Retroactivity	54- 7	7.3 Concealed Piping in Buildings	54- 60
1.4 Equivalency	54- 8	7.4 Piping in Vertical Chases	54- 61
1.5 Enforcement	54- 8	7.5 Gas Pipe Turns	54- 61
Chapter 2 Referenced Publications	54- 8	7.6 Drips and Sediment Traps	54- 61
2.1 General	54- 8	7.7 Outlets	54- 61
2.2 NFPA Publications	54- 8	7.8 Branch Pipe Connection	54- 62
2.3 Other Publications	54- 8	7.9 Manual Gas Shutoff Valves	54- 62
2.4 References for Extracts in Mandatory Sections	54- 9	7.10 Prohibited Devices	54- 62
Chapter 3 Definitions	54- 9	7.11 Systems Containing Gas-Air Mixtures Outside the Flammable Range	54- 62
3.1 General	54- 9	7.12 Systems Containing Flammable Gas-Air Mixtures	54- 62
3.2 NFPA Official Definitions	54- 9	7.13 Electrical Bonding and Grounding	54- 63
3.3 General Definitions	54- 9	7.14 Electrical Circuits	54- 63
Chapter 4 General	54- 17	7.15 Electrical Connections	54- 63
4.1 Qualified Agency	54- 17	Chapter 8 Inspection, Testing, and Purging	54- 63
4.2 Interruption of Service	54- 17	8.1 Pressure Testing and Inspection	54- 63
4.3 Prevention of Accidental Ignition	54- 17	8.2 Piping System Leak Check	54- 64
Chapter 5 Gas Piping System Design, Materials, and Components	54- 17	8.3 Purging Requirements	54- 64
5.1 Piping Plan	54- 17	Chapter 9 Appliance, Equipment, and Accessory Installation	54- 65
5.2 Provision for Location of Point of Delivery	54- 17	9.1 General	54- 65
5.3 Interconnections Between Gas Piping Systems	54- 17	9.2 Accessibility and Clearance	54- 67
5.4 Sizing of Gas Piping Systems	54- 17	9.3 Air for Combustion and Ventilation	54- 67
5.5 Piping System Operating Pressure Limitations	54- 18	9.4 Appliances on Roofs	54- 69
5.6 Acceptable Piping Materials and Joining Methods	54- 18	9.5 Appliances in Attics	54- 69
5.7 Gas Meters	54- 20	9.6 Appliance and Equipment Connections to Building Piping	54- 70
5.8 Gas Pressure Regulators	54- 21	9.7 Electrical	54- 71
5.9 Overpressure Protection Devices	54- 21	9.8 Room Temperature Thermostats	54- 71
5.10 Back Pressure Protection	54- 22	Chapter 10 Installation of Specific Appliances	54- 71
5.11 Low-Pressure Protection	54- 22	10.1 General	54- 71
5.12 Shutoff Valves	54- 23	10.2 Air-Conditioning Appliances (Gas-Fired Air Conditioners and Heat Pumps)	54- 71
5.13 Excess Flow Valve(s)	54- 23	10.3 Central Heating Boilers and Furnaces	54- 73
5.14 Expansion and Flexibility	54- 23	10.4 Clothes Dryers	54- 75
Chapter 6 Pipe Sizing	54- 23	10.5 Conversion Burners	54- 76
6.1 Pipe Sizing Methods	54- 23	10.6 Decorative Appliances for Installation in Vented Fireplaces	54- 76
6.2 Tables for Sizing Gas Piping Systems Using Natural Gas	54- 23	10.7 Gas Fireplaces, Vented	54- 76
6.3 Tables for Sizing Gas Piping Systems Using Propane	54- 23	10.8 Non-Recirculating Direct Gas-Fired Industrial Air Heaters	54- 76
6.4 Sizing Equations	54- 23	10.9 Recirculating Direct Gas-Fired Industrial Air Heaters	54- 77
		10.10 Duct Furnaces	54- 77
		10.11 Floor Furnaces	54- 78

10.12	Food Service Appliance, Floor-Mounted	54- 79	12.11	Vent Connectors for Category I Appliances	54- 91
10.13	Food Service Appliances, Counter Appliances	54- 80	12.12	Vent Connectors for Category II, Category III, and Category IV Appliances	54- 93
10.14	Hot Plates and Laundry Stoves	54- 80	12.13	Draft Hoods and Draft Controls	54- 93
10.15	Household Cooking Appliances	54- 80	12.14	Manually Operated Dampers	54- 93
10.16	Illuminating Appliances	54- 81	12.15	Automatically Operated Vent Dampers ...	54- 93
10.17	Incinerators, Commercial-Industrial	54- 81	12.16	Obstructions	54- 93
10.18	Infrared Heaters	54- 81			
10.19	Open-Top Broiler Units	54- 81	Chapter 13	Sizing of Category I Venting Systems	54- 93
10.20	Outdoor Cooking Appliances	54- 82	13.1	Additional Requirements to Single Appliance Vent	54- 93
10.21	Pool Heaters	54- 82	13.2	Additional Requirements to Multiple-Appliance Vent	54-101
10.22	Refrigerators	54- 82	Annex A	Explanatory Material	54-112
10.23	Room Heaters	54- 82	Annex B	Sizing and Capacities of Gas Piping	54-124
10.24	Stationary Gas Engines	54- 83	Annex C	Suggested Method of Checking for Leakage	54-133
10.25	Gas-Fired Toilets	54- 83	Annex D	Suggested Emergency Procedure for Gas Leaks	54-133
10.26	Unit Heaters	54- 83	Annex E	Flow of Gas Through Fixed Orifices	54-134
10.27	Wall Furnaces	54- 83	Annex F	Sizing of Venting Systems Serving Appliances Equipped with Draft Hoods, Category I Appliances, and Appliances Listed for Use with Type B Vents	54-139
10.28	Water Heaters	54- 84	Annex G	Recommended Procedure for Safety Inspection of an Existing Appliance Installation	54-146
10.29	Compressed Natural Gas (CNG) Vehicular Fuel Systems	54- 84	Annex H	Indoor Combustion Air Calculation Examples	54-147
10.30	Appliances for Installation in Manufactured Housing	54- 84	Annex I	Example of Combination of Indoor and Outdoor Combustion and Ventilation Opening Design	54-149
10.31	Fuel Cell Power Plants	54- 84	Annex J	Other Useful Definitions	54-149
10.32	Outdoor Open Flame Decorative Appliances	54- 84	Annex K	Enforcement	54-151
			Annex L	Informational References	54-152
Chapter 11	Procedures to Be Followed to Place Appliance in Operation	54- 85	Index		54-155
11.1	Adjusting the Burner Input	54- 85			
11.2	Primary Air Adjustment	54- 85			
11.3	Safety Shutoff Devices	54- 85			
11.4	Automatic Ignition	54- 85			
11.5	Protective Devices	54- 85			
11.6	Checking the Draft	54- 85			
11.7	Operating Instructions	54- 85			
Chapter 12	Venting of Appliances	54- 85			
12.1	Minimum Safe Performance	54- 85			
12.2	General	54- 85			
12.3	Specification for Venting	54- 85			
12.4	Design and Construction	54- 86			
12.5	Type of Venting System to Be Used	54- 86			
12.6	Masonry, Metal, and Factory-Built Chimneys	54- 86			
12.7	Gas Vents	54- 88			
12.8	Single-Wall Metal Pipe	54- 89			
12.9	Through-the-Wall Vent Termination	54- 90			
12.10	Condensation Drain	54- 91			

NFPA 54-2012

ANSI Z223.1-2012

National Fuel Gas Code

2012 Edition

IMPORTANT NOTE: This NFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading "Important Notices and Disclaimers Concerning NFPA Documents." They can also be obtained on request from NFPA or viewed at www.nfpa.org/disclaimers.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex L. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex L.

All pressures used in this code are gauge pressure unless otherwise indicated.

Chapter 1 Administration

1.1 Scope.

1.1.1 Applicability.

1.1.1.1 This code is a safety code that shall apply to the installation of fuel gas piping systems, appliances, equipment, and related accessories as shown in 1.1.1.1(A) through 1.1.1.1(D).

(A)* Coverage of piping systems shall extend from the point of delivery to the appliance connections. For other than undiluted liquefied petroleum gas (LP-Gas) systems, the point of delivery shall be the outlet of the service meter assembly or the outlet of the service regulator or service shutoff valve where no meter is provided. For undiluted LP-Gas systems, the point of delivery shall be considered to be the outlet of the final pressure regulator, exclusive of line gas regulators where no meter is installed. Where a meter is installed, the point of delivery shall be the outlet of the meter.

(B) The maximum operating pressure shall be 125 psi (862 kPa).

Exception No. 1: Piping systems for gas-air mixtures within the flammable range are limited to a maximum pressure of 10 psi (69 kPa).

Exception No. 2: LP-Gas piping systems are limited to 20 psi (140 kPa), except as provided in 5.5.1(6).

(C) Requirements for piping systems shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation, and maintenance.

(D) Requirements for appliances, equipment, and related accessories shall include installation, combustion, and ventilation air and venting.

1.1.1.2 This code shall not apply to the following items (reference standards for some of which appear in Annex L):

- (1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system
- (2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes
- (3) Raw material (feedstock) applications except for piping to special atmosphere generators
- (4) Oxygen-fuel gas cutting and welding systems
- (5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen
- (6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants
- (7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions
- (8) LP-Gas installations at utility gas plants
- (9) Liquefied natural gas (LNG) installations
- (10) Fuel gas piping in electric utility power plants
- (11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters
- (12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing
- (13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat
- (14) Installation of LP-Gas systems for railroad switch heating
- (15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles
- (16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas
- (17) Building design and construction, except as specified herein
- (18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192, *Standard on Recreational Vehicles*
- (19) Fuel gas systems using hydrogen as a fuel
- (20) Construction of appliances

1.1.2 Other Standards. In applying this code, reference shall also be made to the manufacturers' instructions and the serving gas supplier regulations.

1.2 Purpose. (Reserved)

1.3 Retroactivity. Unless otherwise stated, the provisions of this code shall not be applied retroactively to existing systems that were in compliance with the provisions of the code in effect at the time of installation.