



**2018**

**SOUTH CAROLINA  
FUEL GAS CODE**

2018 South Carolina Fuel Gas Code

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# PREFACE

## Introduction

The *International Fuel Gas Code*® (IFGC®) establishes minimum requirements for fuel gas systems and gas-fired appliances using prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new fuel gas system and appliance designs. This 2018 edition is fully compatible with all of the *International Codes*® (I-Codes®) published by the International Code Council® (ICC®), including the *International Building Code*®, *International Energy Conservation Code*®, *International Existing Building Code*®, *International Fire Code*®, *International Green Construction Code*®, *International Mechanical Code*®, *International Plumbing Code*®, *International Private Sewage Disposal Code*®, *International Property Maintenance Code*®, *International Residential Code*®, *International Swimming Pool and Spa Code*®, *International Wildland-Urban Interface Code*®, *International Zoning Code*® and *International Code Council Performance Code*®.

The I-Codes, including this *International Fuel Gas Code*, are used in a variety of ways in both the public and private sectors. Most industry professionals are familiar with the I-Codes as the basis of laws and regulations in communities across the U.S. and in other countries. However, the impact of the codes extends well beyond the regulatory arena, as they are used in a variety of nonregulatory settings, including:

- Voluntary compliance programs such as those promoting sustainability, energy efficiency and disaster resistance.
- The insurance industry, to estimate and manage risk, and as a tool in underwriting and rate decisions.
- Certification and credentialing of individuals involved in the fields of building design, construction and safety.
- Certification of building and construction-related products.
- U.S. federal agencies, to guide construction in an array of government-owned properties.
- Facilities management.
- “Best practices” benchmarks for designers and builders, including those who are engaged in projects in jurisdictions that do not have a formal regulatory system or a governmental enforcement mechanism.
- College, university and professional school textbooks and curricula.
- Reference works related to building design and construction.

In addition to the codes themselves, the code development process brings together building professionals on a regular basis. It provides an international forum for discussion and deliberation about building design, construction methods, safety, performance requirements, technological advances and innovative products.

## Development

This 2018 edition presents the code as originally issued, with changes reflected in the 2003 through 2015 editions and further changes approved by the ICC Code Development Process through 2017 and standard revisions correlated with ANSI Z223.1-2018. A new edition such as this is promulgated every 3 years.

This code is founded on principles intended to establish provisions consistent with the scope of a fuel gas code that adequately protects public health, safety and welfare; provisions that do not unnecessarily increase construction costs; provisions that do not restrict the use of new materials, products or methods of construction; and provisions that do not give preferential treatment to particular types or classes of materials, products or methods of construction.

## Format

The *International Fuel Gas Code* is segregated by section numbers into two categories—“code” and “standard”—all coordinated and incorporated into a single document. The sections that are “code” are designated by the acronym “IFGC” next to the main section number (e.g., Section 101). The sections that are “standard” are designated by the acronym “IFGS” next to the main section number (e.g., Section 304). A subsection may be individually redesignated as an “IFGS” section where it is located under an “IFGC” main section.

## Maintenance

The *International Fuel Gas Code* is kept up to date through the review of proposed changes submitted by code enforcement officials, industry representatives, design professionals and other interested parties. Proposed changes are carefully considered through an open code development process in which all interested and affected parties may participate.

The ICC Code Development Process reflects principles of openness, transparency, balance, due process and consensus, the principles embodied in OMB Circular A-119, which governs the federal government’s use of private-sector standards. The ICC process is open to anyone; there is no cost to participate, and people can participate without travel cost through the ICC’s cloud-based app, *cdp-Access*<sup>®</sup>. A broad cross section of interests are represented in the ICC Code Development Process. The codes, which are updated regularly, include safeguards that allow for emergency action when required for health and safety reasons.

In order to ensure that organizations with a direct and material interest in the codes have a voice in the process, the ICC has developed partnerships with key industry segments that support the ICC’s important public safety mission. Some code development committee members were nominated by the following industry partners and approved by the ICC Board:

- American Gas Association (AGA)
- American Institute of Architects (AIA)

The code development committees evaluate and make recommendations regarding proposed changes to the codes. Their recommendations are then subject to public comment and council-wide votes. The ICC’s governmental members—public safety officials who have no financial or business interest in the outcome—cast the final votes on proposed changes.

The contents of this work are subject to change through the code development cycles and by any governmental entity that enacts the code into law. For more information regarding the code development process, contact the Codes and Standards Development Department of the International Code Council.

While the I-Code development procedure is thorough and comprehensive, the ICC, its members and those participating in the development of the codes disclaim any liability resulting from the publication or use of the I-Codes, or from compliance or noncompliance with their provisions. The ICC does not have the power or authority to police or enforce compliance with the contents of this code.

## Code Development Committee Responsibilities (Letter Designations in Front of Section Numbers)

In each code development cycle, proposed changes to the code are considered at the Committee Action Hearings by the International Fuel Gas Code Development Committee, whose action constitutes a recommendation to the voting membership for final action on the proposed change. Proposed changes to a code section that has a number beginning with a letter in brackets are considered by a different code development committee. For example, proposed changes to code sections that have [BS] in front of them (e.g., [BS] 302.1) are considered by the IBC—Structural Code Development Committee at the Committee Action Hearings.

The content of sections in this code that begin with letter designations is maintained by other code development committees in accordance with the following:

- [A] = Administrative Code Development Committee;
- [BF] = IBC—Fire Safety Code Development Committee;
- [BG] = IBC—General Code Development Committee;
- [BS] = IBC—Structural Code Development Committee;
- [E] = International Energy Conservation Code Development Committee;
- [F] = International Fire Code Development Committee; and
- [M] = International Mechanical Code Development Committee.
- [P] = International Plumbing Code Development Committee

For the development of the 2021 edition of the I-Codes, there will be two groups of code development committees and they will meet in separate years.

<b>Group A Codes (Heard in 2018, Code Change Proposals Deadline: January 8, 2018)</b>	<b>Group B Codes (Heard in 2019, Code Change Proposals Deadline: January 7, 2019)</b>
<b>International Building Code</b> – Egress (Chapters 10, 11, Appendix E) – Fire Safety (Chapters 7, 8, 9, 14, 26) – General (Chapters 2–6, 12, 27–33, Appendices A, B, C, D, K, N)	Administrative Provisions (Chapter 1 of all codes except IECC, IRC and IgCC, administrative updates to currently referenced standards, and designated definitions)
<b>International Fire Code</b>	<b>International Building Code</b> – Structural (Chapters 15–25, Appendices F, G, H, I, J, L, M)
<b>International Fuel Gas Code</b>	<b>International Existing Building Code</b>
<b>International Mechanical Code</b>	<b>International Energy Conservation Code—Commercial</b>
<b>International Plumbing Code</b>	<b>International Energy Conservation Code—Residential</b> – IECC—Residential – IRC—Energy (Chapter 11)
<b>International Property Maintenance Code</b>	<b>International Green Construction Code</b> (Chapter 1)
<b>International Private Sewage Disposal Code</b>	<b>International Residential Code</b> – IRC—Building (Chapters 1–10, Appendices E, F, H, J, K, L, M, O, Q, R, S, T)
<b>International Residential Code</b> – IRC—Mechanical (Chapters 12–23) – IRC—Plumbing (Chapters 25–33, Appendices G, I, N, P)	
<b>International Swimming Pool and Spa Code</b>	
<b>International Wildland-Urban Interface Code</b>	
<b>International Zoning Code</b>	
<b>Note:</b> Proposed changes to the ICC <i>Performance Code</i> ™ will be heard by the code development committee noted in brackets [ ] in the text of the ICC <i>Performance Code</i> ™.	

Code change proposals submitted for code sections that have a letter designation in front of them will be heard by the respective committee responsible for such code sections. Because different committees hold Committee Action Hearings in different years, it is possible that some proposals for this code will be heard by committees in both 2018 (Group A) and the 2019 (Group B) code development cycles.

For instance, every section of Chapter 1 of this code is designated as the responsibility of the Administrative Code Development Committee, which is part of the Group B portion of the hearings. This committee will hold its Committee Action Hearings in 2019 to consider all code change proposals for Chapter 1 of this code and proposals for Chapter 1 of all I-Codes except the *International Energy Conservation Code*, *International Residential Code* and *International Green Construction Code*. Therefore, any proposals received for Chapter 1 of this code will be assigned to the Administrative Code Development Committee for consideration in 2019.

It is very important that anyone submitting code change proposals understands which code development committee is responsible for the section of the code that is the subject of the code change proposal. For further information on the code development committee responsibilities, please visit the ICC website at [www.iccsafe.org/scoping](http://www.iccsafe.org/scoping).

## Marginal Markings

Solid vertical lines in the margins within the body of the code indicate a technical change from the requirements of the 2015 edition. Deletion indicators in the form of an arrow (➡) are provided in the margin where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted.

➡ = Indicates where a paragraph or item has been deleted from the requirements of the 2015 *International Fuel Gas Code*.

> = Indicates model code language deleted by the State of South Carolina.

█ = Indicates a technical change from the requirements of the 2015 *International Fuel Gas Code*.

|| = Indicates a State of South Carolina amendment has been made to the 2018 *International Fuel Gas Code*.

## Coordination of the International Codes

The coordination of technical provisions is one of the strengths of the ICC family of model codes. The codes can be used as a complete set of complementary documents, which will provide users with full integration and coordination of technical provisions. Individual codes can also be used in subsets or as stand-alone documents. To make sure that each individual code is as complete as possible, some technical provisions that are relevant to more than one subject area are duplicated in some of the model codes. This allows users maximum flexibility in their application of the I-Codes.

## Italicized Terms

Words and terms defined in Chapter 2, Definitions, are italicized where they appear in code text and the Chapter 2 definition applies. Where such words and terms are not italicized, common-use definitions apply. The words and terms selected have code-specific definitions that the user should read carefully to facilitate better understanding of the code.

## Adoption

The International Code Council maintains a copyright in all of its codes and standards. Maintaining copyright allows the ICC to fund its mission through sales of books, in both print and electronic formats. The ICC welcomes adoption of its codes by jurisdictions that recognize and acknowledge the ICC's copyright in the code, and further acknowledge the substantial shared value of the public/private partnership for code development between jurisdictions and the ICC.

The ICC also recognizes the need for jurisdictions to make laws available to the public. All I-Codes and I-Standards, along with the laws of many jurisdictions, are available for free in a nondownloadable form on the ICC's website. Jurisdictions should contact the ICC at [adoptions@iccsafe.org](mailto:adoptions@iccsafe.org) to learn how to adopt and distribute laws based on the *International Fuel Gas Code* in a manner that provides necessary access, while maintaining the ICC's copyright.

To facilitate adoption, several sections of this code contain blanks for fill-in information that needs to be supplied by the adopting jurisdiction as part of the adoption legislation. For this code, please see:

Section 101.1. Insert: [NAME OF JURISDICTION]

Section 106.6.2. Insert: [APPROPRIATE SCHEDULE]

Section 106.6.3. Insert: [PERCENTAGES IN TWO LOCATIONS]

Section 108.4. Insert: [SPECIFY OFFENSE] [AMOUNT] [NUMBER OF DAYS]

Section 108.5. Insert: [AMOUNTS IN TWO LOCATIONS]





# EFFECTIVE USE OF THE INTERNATIONAL FUEL GAS CODE

The *International Fuel Gas Code* (IFGC) is a model code that regulates the design and installation of fuel gas distribution piping and systems, appliances, appliance venting systems, combustion air provisions, gaseous hydrogen systems and motor vehicle gaseous-fuel-dispensing stations. The definition of fuel gas includes natural, liquefied petroleum and manufactured gases and mixtures of these gases.

The purpose of the code is to establish the minimum acceptable level of safety and to protect life and property from the potential dangers associated with the storage, distribution and usage of fuel gases and the byproducts of combustion of such fuels. The code also protects the personnel that install, maintain, service and replace the systems and appliances addressed by this code.

With the exception of Section 401.1.1, the IFGC does not address utility-owned piping and equipment (i.e., anything upstream of the point of delivery). See the definition of "Point of delivery" and Section 501.8 for other code coverage exemptions.

The IFGC is primarily a specification-oriented (prescriptive) code with some performance-oriented text. For example, Section 503.3.1 is a performance statement, but Chapter 5 contains prescriptive requirements that will cause Section 503.3.1 to be satisfied.

The IFGC applies to all occupancies including one- and two-family dwellings and townhouses. The IRC is referenced for coverage of one- and two-family dwellings and townhouses; however, in effect, the IFGC provisions are still applicable because the fuel gas chapter in the IRC (Chapter 24) is composed entirely of text extracted from the IFGC. Therefore, whether using the IFGC or the IRC, the fuel gas provisions will be identical. The IFGC does not apply to piping systems that operate at pressures in excess of 125 psig for natural gas and 20 psig for LP-gas (note exception in Section 402.7).

The general Section 105.2 and the specific Sections 304.8, 402.3, 503.5.5 and 503.6.10 allow combustion air provisions, pipe sizing and chimney and vent sizing to be performed by approved engineering methods as alternatives to the prescriptive methods in the code.

## Arrangement and Format of the 2018 IFGC

The format of the IFGC allows each chapter to be devoted to a particular subject, with the exception of Chapter 3, which contains general subject matters that are not extensive enough to warrant their own independent chapter.

**Chapter 1 Scope and Administration.** Chapter 1 establishes the limits of applicability of the code and describes how the code is to be applied and enforced. A fuel gas code, like any other code, is intended to be adopted as a legally enforceable document, and it cannot be effective without adequate provisions for its administration and enforcement. The provisions of Chapter 1 establish the authority and duties of the code official appointed by the authority having jurisdiction and also establish the rights and privileges of the design professional, contractor and property owner.

**Chapter 2 Definitions.** Chapter 2 is the repository of the definitions of terms used in the body of the code. Codes are technical documents and every word, term and punctuation mark can impact the meaning of the code text and the intended results. The code often uses terms that have a unique meaning in the code and the code meaning can differ substantially from the ordinarily understood meaning of the term as used outside of the code.

The terms defined in Chapter 2 are deemed to be of prime importance in establishing the meaning and intent of the code text that uses the terms. The user of the code should be familiar with and consult this chapter because the definitions are essential to the correct interpretation of the code and because the user may not be aware that a term is defined.

**Chapter 3 General Regulations.** Chapter 3 contains broadly applicable requirements related to appliance location and installation, appliance and systems access, protection of structural elements

and clearances to combustibles, among others. This chapter also covers combustion air provisions for gas-fired appliances.

**Chapter 4 Gas Piping Installations.** Chapter 4 covers the allowable materials for gas piping systems and the sizing and installation of such systems. It also covers pressure regulators, appliance connections and overpressure protection devices. Gas piping systems are sized to supply the maximum demand while maintaining the supply pressure necessary for safe operation of the appliances served.

**Chapter 5 Chimneys and Vents.** Chapter 5 regulates the design, construction, installation, maintenance, repair and approval of chimneys, vents, venting systems and their connections to gas-fired appliances. Properly designed chimneys, vents and venting systems are necessary to conduct to the outdoors the flue gases produced by the combustion of fuels in appliances. The provisions of this chapter are intended to minimize the hazards associated with high temperatures and potentially toxic and corrosive combustion gases. This chapter addresses all of the factory-built and site-built chimneys, vents and venting systems used to vent all types and categories of appliances. It also addresses direct-vent appliances, integral vent appliances, side-wall mechanically vented appliances and exhaust hoods that convey the combustion byproducts from cooking and other process appliances.

**Chapter 6 Specific Appliances.** Chapter 6 addresses specific appliances that the code intends to regulate. Each main section applies to a unique type of gas-fired appliance and specifies the product standards to which the appliance must be listed. The general requirements found in the previous Chapters 1 through 5 also apply and the sections in Chapter 6 add the special requirements that are specific to each type of appliance.

**Chapter 7 Gaseous Hydrogen Systems.** Chapter 7 is specific to gaseous hydrogen generation, storage, distribution and utilization systems, appliances and equipment. Note that hydrogen is not within the definition of "Fuel gas," but it is, nonetheless, commonly used as a fuel for fuel-cell power generation and fuel-cell powered motor vehicles. The scope of Chapter 7 is not limited to any particular use of hydrogen (see Sections 633 and 635). Hydrogen systems have unique potential hazards because of the specific gravity of the gas, its chemical effect on materials and the fact that it is not odorized.

**Chapter 8 Referenced Standards.** Chapter 8 lists all of the product and installation standards and codes that are referenced throughout Chapters 1 through 7. As stated in Section 102.8, these standards and codes become an enforceable part of the code (to the prescribed extent of the reference) as if printed in the body of the code. Chapter 8 provides the full title and edition year of the standards and codes in addition to the address of the promulgators and the section numbers in which the standards and codes are referenced.

**Appendix A Sizing and Capacities of Gas Piping.** This appendix is informative and not part of the code. It provides design guidance, useful facts and data and multiple examples of how to apply the sizing tables and sizing methodologies of Chapter 4.

**Appendix B Sizing of Venting Systems Serving Appliances Equipped with Draft Hoods, Category I Appliances and Appliances Listed for Use with Type B Vents.** This appendix is informative and not part of the code. It contains multiple examples of how to apply the vent and chimney tables and methodologies of Chapter 5.

**Appendix C Exit Terminals of Mechanical Draft and Direct-vent Venting Systems.** This appendix is informative and not part of the code. It consists of a figure and notes that visually depict code requirements from Chapter 5 for vent terminals with respect to the openings found in building exterior walls.

**Appendix D Recommended Procedure for Safety Inspection of an Existing Appliance Installation.** This appendix is informative and not part of the code. It provides recommended procedures for testing and inspecting an appliance installation to determine if the installation is operating safely and if the appliance is in a safe condition.

# TABLE OF CONTENTS

<p><b>CHAPTER 1 SCOPE AND ADMINISTRATION . . . . 1</b></p> <p><i>PART 1—SCOPE AND APPLICATION . . . . . 1</i></p> <p>Section</p> <p>101 General (IFGC). . . . . 1</p> <p>102 Applicability (IFGC) . . . . . 2</p> <p><i>PART 2—ADMINISTRATION AND ENFORCEMENT . . . . . 3</i></p> <p>103 Department of Inspection (IFGC) . . . . . 3</p> <p>104 Duties and Powers of the Code Official (IFGC) . . . . . 3</p> <p>105 Approval (IFGC) . . . . . 3</p> <p>106 Permits (IFGC). . . . . 4</p> <p>107 Inspections and Testing (IFGC) . . . . . 6</p> <p>108 Violations (IFGC). . . . . 7</p> <p>109 Means of Appeal (IFGC) . . . . . 8</p> <p>110 Temporary Equipment, Systems and Uses (IFGC) . . . . . 9</p> <p><b>CHAPTER 2 DEFINITIONS . . . . . 11</b></p> <p>Section</p> <p>201 General (IFGC). . . . . 11</p> <p>202 General Definitions (IFGC) . . . . . 11</p> <p><b>CHAPTER 3 GENERAL REGULATIONS . . . . . 19</b></p> <p>Section</p> <p>301 General (IFGC). . . . . 19</p> <p>302 Structural Safety (IFGC) . . . . . 20</p> <p>303 Appliance Location (IFGC) . . . . . 20</p> <p>304 Combustion, Ventilation and Dilution Air (IFGS) . . . . . 21</p> <p>305 Installation (IFGC) . . . . . 24</p> <p>306 Access and Service Space (IFGC) . . . . . 25</p> <p>307 Condensate Disposal (IFGC) . . . . . 27</p> <p>308 Clearance Reduction (IFGS) . . . . . 27</p> <p>309 Electrical (IFGC) . . . . . 28</p> <p>310 Electrical Bonding (IFGS) . . . . . 28</p> <p><b>CHAPTER 4 GAS PIPING INSTALLATIONS . . . . . 31</b></p> <p>Section</p> <p>401 General (IFGC). . . . . 31</p> <p>402 Pipe Sizing (IFGS) . . . . . 31</p>	<p>403 Piping Materials (IFGS). . . . . 32</p> <p>404 Piping System Installation (IFGC). . . . . 71</p> <p>405 Piping Bends and Changes in Direction (IFGS) . . . . . 73</p> <p>406 Inspection, Testing and Purging (IFGS) . . . . . 74</p> <p>407 Piping Support (IFGC). . . . . 76</p> <p>408 Drips and Sloped Piping (IFGC) . . . . . 76</p> <p>409 Shutoff Valves (IFGC). . . . . 76</p> <p>410 Flow Controls (IFGC) . . . . . 77</p> <p>411 Appliance and Manufactured Home Connections (IFGC) . . . . . 78</p> <p>412 Liquefied Petroleum Gas Motor Vehicle Fuel-dispensing Facilities (IFGC) . . . . . 79</p> <p>413 Compressed Natural Gas Motor Vehicle Fuel-dispensing Facilities (IFGC) . . . . . 81</p> <p>414 Supplemental and Standby Gas Supply (IFGC) . . . . . 82</p> <p>415 Piping Support Intervals (IFGS) . . . . . 83</p> <p>416 Overpressure Protection Devices (IFGS). . . . . 83</p> <p><b>CHAPTER 5 CHIMNEYS AND VENTS . . . . . 85</b></p> <p>Section</p> <p>501 General (IFGC) . . . . . 85</p> <p>502 Vents (IFGC) . . . . . 86</p> <p>503 Venting of Appliances (IFGS). . . . . 87</p> <p>504 Sizing of Category I Appliance Venting Systems (IFGS) . . . . . 96</p> <p>505 Direct-vent, Integral Vent, Mechanical Vent and Ventilation/Exhaust Hood Venting (IFGC) . . . . . 100</p> <p>506 Factory-built Chimneys (IFGC). . . . . 100</p> <p><b>CHAPTER 6 SPECIFIC APPLIANCES. . . . . 123</b></p> <p>Section</p> <p>601 General (IFGC) . . . . . 123</p> <p>602 Decorative Appliances for Installation in Fireplaces (IFGC) . . . . . 123</p> <p>603 Log Lighters (IFGC) . . . . . 123</p> <p>604 Vented Gas Fireplaces (Decorative Appliances) (IFGC) . . . . . 123</p> <p>605 Vented Gas Fireplace Heaters (IFGC). . . . . 123</p> <p>606 Incinerators and Crematories (IFGC) . . . . . 123</p> <p>607 Commercial-industrial Incinerators (IFGC) . . . . . 123</p>
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**TABLE OF CONTENTS**

608 Vented Wall Furnaces (IFGC) . . . . . 123  
 609 Floor Furnaces (IFGC) . . . . . 124  
 610 Duct Furnaces (IFGC) . . . . . 124  
 611 Nonrecirculating Direct-fired Industrial  
 Air Heaters (IFGC) . . . . . 124  
 612 Recirculating Direct-fired Industrial Air  
 Heaters (IFGC) . . . . . 125  
 613 Clothes Dryers (IFGC) . . . . . 125  
 614 Clothes Dryer Exhaust (IFGC) . . . . . 125  
 615 Sauna Heaters (IFGC) . . . . . 127  
 616 Engine and Gas Turbine-powered  
 Equipment (IFGC) . . . . . 128  
 617 Pool and Spa Heaters (IFGC) . . . . . 128  
 618 Forced-air Warm-air Furnaces (IFGC) . . . . . 128  
 619 Conversion Burners (IFGC) . . . . . 129  
 620 Unit Heaters (IFGC) . . . . . 129  
 621 Unvented Room Heaters (IFGC) . . . . . 129  
 622 Vented Room Heaters (IFGC) . . . . . 129  
 623 Cooking Appliances (IFGC) . . . . . 129  
 624 Water Heaters (IFGC) . . . . . 130  
 625 Refrigerators (IFGC) . . . . . 130  
 626 Gas-fired Toilets (IFGC) . . . . . 130  
 627 Air-conditioning Appliances (IFGC) . . . . . 130  
 628 Illuminating Appliances (IFGC) . . . . . 131  
 629 Small Ceramic Kilns (IFGC) . . . . . 131  
 630 Infrared Radiant Heaters (IFGC) . . . . . 132  
 631 Boilers (IFGC) . . . . . 132  
 632 Equipment Installed in Existing  
 Unlisted Boilers (IFGC) . . . . . 132  
 633 Stationary Fuel-cell Power Systems (IFGC) . . . . . 132  
 634 Chimney Damper Opening  
 Area (IFGS) . . . . . 132  
 635 Gaseous Hydrogen Systems (IFGC) . . . . . 132  
 636 Outdoor Decorative Appliances (IFGC) . . . . . 132

**CHAPTER 7 GASEOUS HYDROGEN  
 SYSTEMS . . . . . 133**

Section

701 General (IFGC) . . . . . 133  
 702 General Definitions (IFGC) . . . . . 133  
 703 General Requirements (IFGC) . . . . . 133  
 704 Piping, Use and Handling (IFGC) . . . . . 134  
 705 Testing of Hydrogen Piping Systems (IFGC) . . . . . 135  
 706 Location of Gaseous  
 Hydrogen Systems (IFGC) . . . . . 136

707 Operation and Maintenance of Gaseous  
 Hydrogen Systems (IFGC) . . . . . 136  
 708 Design of Liquefied Hydrogen Systems  
 Associated with Hydrogen Vaporization  
 Operations (IFGC) . . . . . 136

**CHAPTER 8 REFERENCED STANDARDS . . . . . 137**

**APPENDIX A SIZING AND CAPACITIES OF  
 GAS PIPING (IFGS) . . . . . 143**

**APPENDIX B SIZING OF VENTING SYSTEMS  
 SERVING APPLIANCES  
 EQUIPPED WITH DRAFT  
 HOODS, CATEGORY I  
 APPLIANCES AND  
 APPLIANCES LISTED  
 FOR USE WITH TYPE B  
 VENTS (IFGS) . . . . . 153**

**APPENDIX C EXIT TERMINALS OF  
 MECHANICAL DRAFT AND  
 DIRECT-VENT VENTING  
 SYSTEMS (IFGS) . . . . . 163**

**APPENDIX D RECOMMENDED PROCEDURE  
 FOR SAFETY INSPECTION OF  
 AN EXISTING APPLIANCE  
 INSTALLATION (IFGS) . . . . . 165**

**INDEX . . . . . 171**