



How Do We Get There ?

The Connecticut Gas Equipment and Piping Code as we know it has been (will be) repealed



The 2015 Connecticut Fire Prevention Code,
 The 2015 Connecticut Fire Safety code and
 The 2015/16 Connecticut State Building Code



The 2012 Connecticut IRC

Will make reference to the NFPA National Fuel Gas Code 2012



2015 Connecticut Fire Prevention Code

• (NEW) Sec. 29-291a-1a. The Connecticut State Fire Prevention Code: Title and Administration

- (a) The Regulations of the Department of Administrative Services, sections 29-291a-1a to 29-291a-10a, inclusive, of the Regulations of Connecticut State Agencies and their adopted standards, shall be known as the Connecticut State Fire Prevention Code, hereinafter referred to as "the code" or "this code".

2015 Connecticut Fire Prevention Code

Sec. 29-291a-1a (cont)

- The provisions of sections 29-291a-1a to 29-291a-10a, inclusive, of the Regulations of Connecticut State Agencies **shall not apply** to detached one- and two-family dwellings nor to multiple single-family dwellings attached side-by-side (townhouse) not more than three stories in height each with dwelling having a separate means of egress

The 2012 Connecticut IRC



2015 Connecticut Fire Prevention Code

- **(NEW) Sec. 29-291a-2a. Relationship to State Fire Safety and Building Codes**
- (a) The requirements of the CSFPC **shall not supersede** the requirements of either the CSFSC or The SBC
- (b) Where any provision of this code conflicts with or duplicates any provision of either the CSFSC or SBC, the CSFSC or the SBC shall prevail.

2015 Connecticut Fire Prevention Code

Sec. 29-291a-2a. (cont)

- (c) Where the CSFSC or SBC are silent on an issue, the provisions of this code shall apply.....
- (d) No person shall remove or modify any fire protection system installed or maintained under the provisions of the CSFSC or the SBC, unless otherwise permitted by those codes.
 - Buildings and structures, and parts thereof, shall be maintained in a safe condition. Devices or safeguards which are required by the CSFSC or the SBC shall be maintained in conformance with the code edition under which installed.

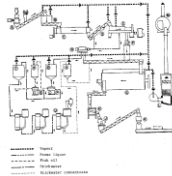
2015 Connecticut Fire Prevention Code

- **(NEW) Sec. 29-291a-3a. Scope of this Code**
- (a) The scope includes, but is not limited to, the following:
 - (1) Inspections of
 - permanent and temporary buildings,
 - processes,
 - equipment,
 - systems and
 - other fire and related life safety situations.

2015 Connecticut Fire Prevention Code

Sec. 29-291a-3a. Scope of this Code (cont)

- (2) Review of design and construction plans, drawings, and specifications for life safety systems,
- fire protection systems,
- access,
- water supplies,
- processes, and
- hazardous materials and
- other fire and life safety issues.



2015 Connecticut Fire Prevention Code

Sec. 29-291a-3a. (Scope cont)

- (3) Fire and life safety education of,
 - fire brigades,
 - employees,
 - responsible parties and
 - the general public.
- (4) New and Existing occupancies and conditions.
- (5) Access requirements for fire department operations.

ON-SITE SAFETY TRAINING



2015 Connecticut Fire Prevention Code

Sec. 29-291a-3a. (scope cont)

- (6) Hazards from outside fires in,
 - vegetation,
 - trash,
 - building debris and
 - other materials.



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2015 Connecticut Fire Prevention Code

Sec. 29-291a-3a. (scope cont)

- (7) Regulation and control of special events including, but not limited to,
 - assemblage of people,
 - exhibits,
 - trade shows,
 - amusement parks,
 - haunted houses,
 - outdoor events and
 - other similar special temporary and permanent occupancies.



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2015 Connecticut Fire Prevention Code

Sec. 29-291a-3a. (scope cont)

- (8) Interior finish,
 - decorations,
 - furnishings, and
 - other combustibles that contribute to fire spread,
 - fire load and smoke production.



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2015 Connecticut Fire Prevention Code Sec. 29-291a-3a. (cont)

- (9) Storage, use, processing, handling, and
 - on-site transportation of
 - flammable and combustible gases,
 - liquids and solids.
- (10) Storage, use, processing, handling and
 - on-site transportation of hazardous materials.
- **(11) Conditions affecting fire fighter safety.**



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2015 Connecticut Fire Prevention Code

- **(NEW) Sec. 29-291a-5a. Variations or exemptions**
 - practical difficulty or
 - unnecessary hardship,
 - or is otherwise adjudged unwarranted,
- **(NEW) Sec. 29-291a-6a. Abatement of hazards; Penalty**



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2015 Connecticut Fire Prevention Code (NEW) Sec. 29-291a-8a Adopted Standard

- The following standard promulgated by the National Fire Protection Association (NFPA) is hereby adopted as part of sections 29-291a-1a to 29-291a-10a, inclusive, of the Regulations of Connecticut State Agencies:
- NFPA 1 Fire Code, of the National Fire Protection Association, (NFPA 1), 2012 edition, with relevant appendices, except as amended, altered or deleted and by the addition of certain provisions as indicated in section 29-291a-9a of the Regulations of Connecticut State Agencies.

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Referenced Haz Mat Codes

- **2.1 General.**
- The documents or portions thereof listed in this chapter are referenced within this code and shall be considered part of the requirements of this document to the extent called for by this code.
- Where a conflict between a requirement of this code and a referenced document exists, the provisions of this code shall prevail.

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Referenced Haz Mat Codes

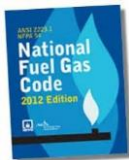
- (Add) **2.1.1** The Connecticut State Fire Prevention Code (CSFPC) recognizes that it is sometimes impractical to continually upgrade existing buildings or installations to comply with all the requirements of the following referenced publications.
- Existing buildings or installations that do not comply with the provisions of the following referenced publications shall be permitted to be continued in service, provided the lack of conformity with these standards does not present a serious hazard to occupants as determined by the authority having jurisdiction.

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Referenced Haz Mat Codes



- NFPA 54 National Fuel Gas Code, 2012 edition



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2015/16 Connecticut Fire Safety Code

- Part III will deal with New Installations/Construction of buildings and will make reference to the NFPA 54 National Fuel Gas Code



2015/16 Connecticut State Building Code

- will deal with New Installations/Construction of buildings and will make reference to the NFPA 54 National Fuel Gas Code



2015/16 International Residential Code

- will deal with New Installations/Construction of one and two family homes will make reference to the NFPA 54 National Fuel Gas Code and specifically Chapter 24



2015/16 Connecticut State Building Code

PERMITS B/O

2015 Connecticut Fire Prevention Code Regulations

- Fire Prevention Code Chapter 58 Gas Equipment and Piping
- **58.1 General Provisions**
- **58.1.1 Application**
- **58.1.1.1** The installation of fuel gas piping systems, fuel gas utilization equipment, and related accessories shall comply with the requirements of Chapter 58, the CSFSC, SBC and NFPA 54 *National Fuel Gas Code*.



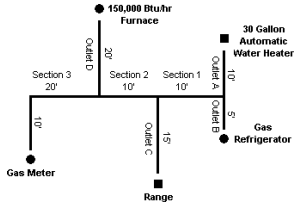
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2015 Connecticut Fire Prevention Code Regulations

- Fire Prevention Code Chapter 58 Gas Equipment and Piping
- **(Add) 58.1.1.2** Fuel gases include
 - natural gas,
 - manufactured gas,
 - liquefied petroleum gas in the vapor phase only,
 - liquefied petroleum gas-air mixtures, and
 - mixtures of these gases, plus gas air mixtures within the flammable range with the fuel gas or the flammable component of a mixture being a commercially distributed product.

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2015 Connecticut Fire Prevention Code Regulations



2012 National Fuel Gas Code

- Chapter 1 Administrative
- Chapter 2 Referenced Publications
- Chapter 3 Gas Piping Installation
- Chapter 4 General
- Chapter 5 Gas Piping System Design, Materials, and Components
- Chapter 6 Pipe Sizing
- Chapter 7 Gas Piping Installation
- Chapter 8 Inspection, Testing, and Purging
- Chapter 9 Appliance, Equipment, and Accessory Installation
- Chapter 10 Installation of Specific Appliances
- Chapter 11 Procedures to Be Followed to Place Appliance in Operation
- Chapter 12 Venting of Appliances
- Chapter 13 Sizing of Category I Venting Systems

2012 National Fuel Gas Code

- Coverage of piping systems shall extend from the point of delivery to the appliance connections.
- The maximum operating pressure shall be **125 psi** (862 kPa).
- Requirements for piping systems shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation, and maintenance.
- Requirements for appliances, equipment, and related accessories shall include installation, combustion, and ventilation air and venting.







2012 National Fuel Gas Code Shall Not Apply To

- 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 acrylonitrile 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 field 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 appliances used by the serving gas supplier in distribution of gas, other than unutilized LP-Gas
 - (17) Building design and construction, except as specified herein
 - (18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA1192, Standard on Recreational Vehicles
 - (19) Fuel gas systems using hydrogen as a fuel
 - (20) Construction of appliances

2012 National Fuel Gas Code

- **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

2012 National Fuel Gas Code

- 1.4 Equivalency.**
The provisions of this code are not intended to prevent the use of any material, method of construction, or installation procedure not specifically prescribed by this code, provided any such alternative is acceptable to the authority having jurisdiction.

The authority having jurisdiction shall require that sufficient evidence be submitted to substantiate any claims made regarding the safety of such alternatives

2012 National Fuel Gas Code

Chapter 3 Definitions

- Appliance (equipment)
- Approved
- Automatic Gas Shutoff Device
- Concealed Gas Piping
- Decorative Appliance for Installation in a Vented Fireplace
- Decorative Appliance, Vented
- Direct Vent Appliances
- Gas Utilization Equipment
- Labeled



2012 National Fuel Gas Code

Chapter 3 Definitions (con't)

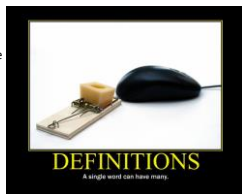
- Listed
- Outdoor Cooking Gas Appliance
- Piping
- Piping System
- Pressure Limiting Device
- Purge
- Quick-Disconnect Device
- Regulator, Gas Appliance



2012 National Fuel Gas Code

Chapter 3 Definitions (con't)

- Regulator, LP-Gas, First Stage
- Regulator, LP-Gas, Second Stage
- Regulator, Monitoring
- Regulator, Pressure
- Regulator, Series
- Regulator, Service
- Regular Vent
- Room Heater, Unvented



2012 National Fuel Gas Code

Chapter 3 Definitions (con't)

- Room Heater, Vented Safety Shutoff Device
- Service Meter Assembly
- Sources of Ignition
- Space, Confined/Unconfined
- Valve



2012 National Fuel Gas Code

The following sections shall comply with respective sub-sections:

4.1 Qualified Agency.

Installation, testing, purging, and replacement of gas piping, appliances, or accessories, and repair and servicing of equipment, shall be performed only by a qualified agency.

Note: Licensed Contractors and Journeymen

4.2 Interruption of Service

When the gas supply is to be turned off, it shall be the duty of the qualified agency to notify all affected users. Where two or more users are served from the same supply system, precautions shall be exercised to ensure that service only to the proper user is turned off.

4.3 Prevention of Accidental Ignition



2012 National Fuel Gas Code

Chapter 5

Gas Piping System Design, Materials, and Components



2012 National Fuel Gas Code

5.1 Piping Plan:

- **5.1.1 Installation of Piping System.** Where required by the authority having jurisdiction, a piping sketch or plan shall be prepared before proceeding with the installation. The plan shall show the proposed location of piping, the size of different branches, the various load demands, and the location of the point of delivery

2012 National Fuel Gas Code

- **5.1.2 Addition to Existing System.**
- **5.1.2.1** When additional appliances are being connected to a gas piping system, the existing piping shall be checked to determine whether it has adequate capacity.
- **5.1.2.2** If inadequate, the existing system shall be enlarged as required, or separate gas piping of adequate capacity shall be provided.

NOTE: Gas Generators addition to existing piping may be too small!!!

2012 National Fuel Gas Code

- 5.2 Provision for Location of Point of Delivery.**
- 5.3 Interconnections between gas piping systems.**
- 5.4 Sizing of Gas Piping Systems.**

2012 National Fuel Gas Code 5.5 Piping System Operating Pressure Limitations.

- **5.5.1 Maximum Design Operating Pressure.** The maximum design operating pressure for piping systems located inside buildings shall not exceed 5 psi (34 kPa) unless one or more of the following conditions are met:



- (1) The piping system is welded.
- (2) The piping is located in a ventilated chase or otherwise enclosed for protection against accidental gas accumulation.
- (3) The piping is located inside buildings or separate areas of buildings used exclusively for one of the following:
 - (a) Industrial processing or heating
 - (b) Research
 - (c) Warehousing
 - (d) Boiler or mechanical rooms
- (4) The piping is a temporary installation for buildings under construction.
- (5) The piping serves appliances or equipment used for agricultural purposes.
- (6) The piping system is an LP-Gas piping system with a design operating pressure greater than 20 psi (138 kPa) and complies with NFPA 58, *Liquefied Petroleum Gas Code*.

2012 National Fuel Gas Code

- **5.6 Acceptable Piping Materials and Joining Methods**



5.6.1.2 Used Materials. Pipe, fittings, valves, or other materials shall not be used again unless they are free of foreign materials and have been ascertained to be adequate for the service intended

2012 National Fuel Gas Code

- **5.6.2 Metallic Pipe:**
- **5.6.3 Metallic Tubing**
- **5.6.3.4 Corrugated Stainless Steel.** Corrugated stainless steel tubing shall be listed in accordance with ANSI LC 1/CSA 6.26, *Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing*.
- *Trac Pipe, Gas Tite, Pro-Flex Lowes, Home Depot Stuff*

2012 National Fuel Gas Code

- **5.6.4 Plastic Pipe, Tubing, and Fittings.**
 - **5.6.4.2* Regulator Vent Piping.** Plastic pipe and fittings used to connect regulator vents to remote vent terminations shall be PVC conforming to ANSI/UL 651, *Schedule 40 and 80 Rigid PVC Conduit and Fittings*. PVC vent piping shall not be installed indoors.

2012 National Fuel Gas Code

- 5.6.5 Workmanship and Defects.**
- 5.6.6 Protective Coating.**



2012 National Fuel Gas Code

- **5.6.7 Metallic Pipe Threads**
- **5.6.7.4* Thread Joint Compounds.** Thread joint compounds shall be resistant to the action of LP-Gas or to any other chemical constituents of the gases to be conducted through the piping.

NOTE: Pipe Dope Such As;
Hercules, PRO DOPE is NOT for use on LP-Gas systems



2012 National Fuel Gas Code

- **5.6.8 Metallic Piping Joints and Fittings**
- **5.6.8.2 Tubing Joints.** Tubing joints shall be made with approved gas tubing fittings, be brazed with a material having a melting point in excess of 1000°F (538°C), or be made by pressconnect fittings complying with ANSI LC-4, *Press-Connect Copper and Copper Alloy Fittings for Use in Fuel Gas Distribution Systems*. Brazing alloys shall not contain more than 0.05 percent phosphorus

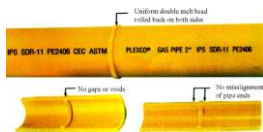
• NOTE: EXAMPLE VIEGA

2012 National Fuel Gas Code

- **5.6.8.4 Metallic Pipe Fittings (In Part).** Metallic fittings shall comply with the following:
- (8) *Special Fittings.* Fittings such as couplings, proprietary-type joints, saddle tees, gland-type compression fittings, and flared, flareless, or compression-type tubing fittings shall be as follows:
 - (a) Used within the fitting manufacturer's pressure- temperature recommendations
 - (b) Used within the service conditions anticipated with respect to vibration, fatigue, thermal expansion, or contraction
 - (c) Installed or braced to prevent separation of the joint by gas pressure or external physical damage
 - (d) Acceptable to the authority having jurisdiction

2012 National Fuel Gas Code

5.6.9 Plastic Piping, Joints, and Fittings.



2012 National Fuel Gas Code

- **5.6.10 Flanges**
- **5.6.10.1 Flange Facings.** Standard facings shall be permitted for use under this code. Where 150 psi (1034 kPa) steel flanges are bolted to Class 125 cast-iron flanges, the raised face on the steel flange shall be removed.

2012 National Fuel Gas Code

- **5.6.11 Flange Gaskets**
- **5.6.11.3** Full-face gaskets shall be used with all bronze and cast-iron flanges.



2012 National Fuel Gas Code

- 5.7 Gas Meters.** (Premises NOT Gas Co.)
- 5.7.2 Location.
- 5.7.4 Supports.
- 5.7.4 Protection.
- 5.7.5 Identification.



NOTE: Trailer Parks

2012 National Fuel Gas Code

5.8 Gas Pressure Regulators. (Premises NOT Gas Co.)

5.8.1 Where Required.

5.8.2 Listing

5.8.4 Location

5.8.5 Regulator Protection

5.8.6 Venting:

Line Gas Pressure Regulators & Second Stage LP-Gas Regulators.
Gas Appliance Pressure Regulators in accordance with Sections 5.8.6.1 and 5.6.8.2.

5.8.7 Bypass Piping.

5.8.8 Identification:







2012 National Fuel Gas Code

5.9 Overpressure Protection Devices.

- **5.9.1.2** The pressure regulating, limiting, and relieving devices shall be maintained, inspection procedures shall be devised or instrumentation installed to detect failures or malfunctions of such devices, and replacements or repairs shall be made.

- **WHO IS ENFORCE**

2012 National Fuel Gas Code

- 5.10 Back Pressure Protection**
- 5.11 Low Pressure Protection**
- 5.12 Shutoff Valves.**
- 5.13 Excess Flow Valves**
- 5.14 Expansion and Flexibility**

2012 National Fuel Gas Code
Chapter 6 Pipe Sizing

- 6.1* Pipe Sizing Methods.**
- 6.1.1* Longest Length Method.**
- 6.1.2* Branch Length Method.**
- 6.1.3 Hybrid Pressure.**

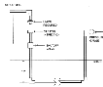
2012 National Fuel Gas Code

- **6.2 Tables for Sizing Gas Piping Systems Using Natural Gas.**
- Table 6.2(a) through Table 6.2(x) shall be used to size gas piping in conjunction with one of the methods described in 6.1.1 through 6.1.3.
- **6.3 Tables for Sizing Gas Piping Systems Using Propane.**
- Table 6.3(a) through Table 6.3(m) shall be used to size gas piping in conjunction with one of the methods described in 6.1.1 through 6.1.3.

2012 National Fuel Gas Code

Chapter 7 Gas Piping Installation

- **7.1 Piping Underground.**
- **7.1.1 Clearances.** Underground gas piping shall be installed with **sufficient clearance** from any other underground structure to avoid contact therewith, to allow maintenance, and to protect against damage from proximity to other structures. In addition, underground plastic piping shall be installed with sufficient clearance or shall be insulated from any source of heat so as to prevent the heat from impairing the serviceability of the pipe.



2012 National Fuel Gas Code

- **7.1.2 Protection Against Damage.**
- **7.1.3 Protection Against Corrosion.**
- **7.1.4 Protection Against Freezing.**
- **7.1.5 Piping Through Foundation Wall.**
- **7.1.6 Piping Beneath Buildings**
- **7.1.7 Plastic Piping.**

2012 National Fuel Gas Code

7.2 Installation of Piping.

7.2.1 Piping installed aboveground shall be securely supported and located where it will be protected from physical damage.

Where passing through an exterior wall, the piping shall also be protected from corrosion by coating or wrapping with an inert material approved for such applications.

The piping shall be sealed around its circumference at the point of the exterior penetration to prevent the entry of water, insects, and rodents.

Where piping is encased in a protective pipe sleeve, the annular spaces between the gas piping and the sleeve and between the sleeve and the wall opening shall be sealed.



2012 National Fuel Gas Code

- **7.2.2 Building Structure.**
- **7.2.3 Gas Piping to be Sloped.**
- **7.2.4 Prohibited Locations.**

- **7.2.4* Prohibited Locations.** Gas piping inside any building shall not be installed in or through a clothes chute, chimney or gas vent, dumbwaiter, elevator shaft, or air duct, other than combustion air ducts.

2012 National Fuel Gas Code

• **7.2.5 Hangers, Supports, and Anchors.**

- **7.2.5.1** Piping shall be supported with metal pipe hooks, metal pipe straps, metal bands, metal brackets, metal hangers, or building structural components, suitable for the size of piping, of adequate strength and quality, and located at intervals so as to prevent or damp out excessive vibration. Piping shall be anchored to prevent undue strains on connected appliances and equipment and shall not be supported by other piping. Pipe hangers and supports shall conform to the requirements of ANSI/MSS SP-58, *Pipe Hangers and Supports — Materials, Design and Manufacture*.

2012 National Fuel Gas Code

7.2.6 Removal of Piping. Where piping containing gas is to be removed, the line first shall be disconnected from all sources of gas and then thoroughly purged with air, water, or inert gas before any cutting or welding is done.

2012 National Fuel Gas Code

7.3 Concealed Piping in Buildings.

7.3.1 General.

- **7.3.2 Fittings in Concealed Locations.** Fittings installed in concealed locations shall be limited to the following types:
 - (1) Threaded elbows, tees, and couplings
 - (2) Brazed fittings
 - (3) Welded fittings
 - (4) Fittings listed to ANSI LC 1/CSA 6.26, *Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST)*, or ANSI LC 4, *Press-Connect Copper and Copper Alloy Fittings for Use in Fuel Gas Distribution Systems*

2012 National Fuel Gas Code

7.3.3 Piping in Partitions.

7.3.4 Tubing in Partitions.

7.3.5 Piping in Floors.

2012 National Fuel Gas Code

7.4 Piping in Vertical Chases.

- Pressure Reduction (if required)
- Construction
- Ventilation

7.5 Gas Pipe Turns. Changes in direction of gas pipe shall be permitted to be made by the use of fittings, factory bends, or field bends

- Metallic Pipe
- Plastic Pipe
- Elbows

2012 National Fuel Gas Code

7.6 Drip and Sediment Traps.

7.6.1 Provide Drips Where Necessary.

7.6.2 Location of Drips.

7.6.3 Sediment Traps

The installation of sediment traps shall be in accordance with 9.6.7

NOTE: STRESS THE DIFFERENCE

No Drips For Connecticut!!!! According to Utilities



SEDIMENT TRAP

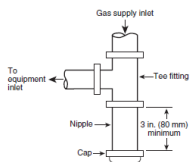


FIGURE 9.6.7 Method of Installing a Tee Fitting Sediment Trap.

2012 National Fuel Gas Code
Walk Line in it's entirety
Know What Your Approving!!!

7.7 Outlets.

7.7.1 Location and Installation.

7.7.2 Cap All Outlets.



2012 National Fuel Gas Code

7.8 Branch Pipe Connections

7.9 Manual Gas Shutoff Valves.

7.9.1 Valves at Regulators.

7.9.2 Valves Controlling Multiple Systems.

Accessibility of Gas Valves.

Shutoff Valves for Multiple House Lines.

Emergency Shutoff Valves. COMMENT

Shutoff valve for Laboratories:

NOTE: All Valves are NOT Good For Gas !!!



2012 National Fuel Gas Code

7.10 Prohibited Devices

7.11 Systems Containing Gas Air Mixtures Outside the Flammable limits

7.12 Systems Containing Flammable gas-air mixtures

2012 National Fuel Gas Code



7.13 Electrical Bonding and Grounding.

- **7.13.1 Pipe and Tubing Other than CSST.** Each aboveground portion of a gas piping system, other than CSST, that is likely to become energized shall be electrically continuous and bonded to an effective ground-fault current path. Gas piping, other than CSST, shall be considered to be bonded when it is connected to appliances that are connected to the appliance grounding conductor of the circuit supplying that appliance.

2012 National Fuel Gas Code

- **7.13.2* CSST.** CSST gas piping systems shall be bonded to the electrical service grounding electrode system. The bonding jumper shall connect to a metallic pipe or fitting between the point of delivery and the first downstream CSST fitting. The bonding jumper shall not be smaller than 6 AWG copper wire or equivalent. Gas piping systems that contain one or more segments of CSST shall be bonded in accordance with this section.

2012 National Fuel Gas Code

- 7.14 Electrical Circuits.
- 7.15 Electrical Connections
- Safety Controls Fail Safe

2012 National Fuel Gas Code

Chapter 8 Inspection, Testing, and Purging



2012 National Fuel Gas Code

- 8.1 Pressure Testing and Inspection.
- 8.1.1 General.
- 8.1.2 Test Medium
- 8.1.3 Test Preparation
- 8.1.4 Test Pressure.

2012 National Fuel Gas Code

- 8.1.5 Detection of Leaks or Defects.
- 8.1.1.5 A piping system shall be tested as a complete unit or in sections. Under no circumstances shall a valve in a line be used as a bulkhead between gas in one section of the piping system and test medium in an adjacent section, **unless two valves are installed in series with a valved "telltale" located between these valves.** A valve shall not be subjected to the test pressure unless it can be determined that the valve, including the valve closing mechanism, is designed to safely withstand the pressure.

2012 National Fuel Gas Code

- **8.1.5.2** The leakage shall be located by means of an approved gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods. **Matches, candles, open flames, or other methods that provide a source of ignition shall not be used.**

NOTE: CORROSIVE PRODUCTS SUCH AS 409 CANNOT BE USED TO DETECT LEAKS!!!!!!!

2012 National Fuel Gas Code

8.2 Piping System Leakage Test.

- 8.2.1 Test Gases**
- 8.2.2 Turning Gas On.**
- 8.2.3 Leak Check.**
- 8.2.4 Placing Appliances and Equipment in Operation.**

2012 National Fuel Gas Code

8.3 Purging.

- 8.3.1 Piping Systems Required to be Purged Outdoors**
- 8.3.1.1 Removal from Service.**
See Table 8.3.1
- 8.3.1.2 Placing in Operation. (Piping)**
See Table 8.3.1
- 8.3.1.3 Outdoor Discharge of Purged Gases.**

2012 National Fuel Gas Code

• **8.3.1.4* Combustible Gas Indicator.** Combustible gas indicators shall be listed and calibrated in accordance with the manufacturer's instructions. Combustible gas indicators shall numerically display a volume scale from 0 percent to 100 percent in 1 percent or smaller increments.

• **NOTE: WHO IS TRAINING YOU ON THESE METERS ?**

2012 National Fuel Gas Code

- **8.3.2 Piping systems to be purged indoors or outdoors.**
- **8.3.3 Purging appliances and equipment.**

2012 National Fuel Gas Code

Chapter 9 Appliance, Equipment and Accessory Installation
9.1 General.
9.1.1 Appliances, Equipment, and Accessories To Be Approved.

2012 National Fuel Gas Code

- **9.1.2 Added or Converted Appliances.** When additional or replacement appliances or equipment is installed or an appliance is converted to gas from another fuel, the location in which the appliances or equipment is to be operated shall be checked to verify the following:
 - (1) Air for combustion and ventilation is provided where required, in accordance with the provisions of Section 9.3. Where existing facilities are not adequate, they shall be upgraded to meet Section 9.3 specifications.
 - (2) The installation components and appliances meet the clearances to combustible material provisions of 9.2.2. It shall be determined that the installation and operation of the additional or replacement appliances do not render the remaining appliances unsafe for continued operation.
 - (3) The venting system is constructed and sized in accordance with the provisions of Chapter 12. Where the existing venting system is not adequate, it shall be upgraded to comply with Chapter 12.

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- 9.1.3 Type of Gas(s).
- 9.1.4 Safety Shutoff Devices for Unlisted LP-Gas Equipment Used Indoors.
- 9.1.5 Use of Air or Oxygen under pressure.
- 9.1.6 Protection of Appliances from fumes or Gases Other than Products of Combustion.

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Chapter 9 Appliance, Equipment and Accessory Installation (cont)

- 9.1.7 Process Air
- 9.1.8 Appliance Supports
- 9.1.9 Flammable Vapors
- 9.1.10 Installation in Residential Garages
- 9.1.11 Installation in Commercial Garages
- 9.1.12 Installation in Aircraft Hangers
- 9.1.13 Appliance Physical Protection
- 9.1.14 Venting of Flue Gases
- 9.1.15 Extra Device or Attachment
- 9.1.16 Adequate capacity of piping

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Chapter 9 Appliance, Equipment and Accessory Installation (cont)

- 9.1.17 Avoid Strain on Gas Piping
- 9.1.18 Gas Appliance Pressure Regulators
- 9.1.19 Venting of Gas Appliance Pressure Regulators (in part.....)
 - (2) Vent limiting means shall be employed on listed appliance pressure regulators only.

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- 9.1.20 Bleed Line for Diaphragm-Type Valves
- 9.1.21 Combination of Appliances and Equipment
- 9.1.22 Installation Instructions THIS IS MOST IMPORTANT!!!!!!
- 9.1.23 Protection of Outdoor Appliance

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- 9.2 Accessibility and Clearance.
 - 9.2.1 Accessibility for Service.
 - 9.2.1 Accessibility for Service. All appliances shall be located with respect to building construction and other equipment so as to permit access to the appliance. Sufficient clearance shall be maintained to permit cleaning of heating surfaces; the replacement of filters, blowers, motors, burners, controls, and vent connections; the lubrication of moving parts where necessary; the adjustment and cleaning of burners and pilots; and the proper functioning of explosion vents, if provided. For attic installation, the passageway and servicing area adjacent to the appliance shall be floored.
 - NOTE: FOLLOW INSTALLATION INSTRUCTIONS!!!!

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9.2.2 Clearance to Combustible Materials.

9.2.3 Installation on carpeting.

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9.3 Air for Combustion and Ventilation

- 9.3.2 Indoor Combustion Air
- 9.3.3 Outdoor Combustion Air
- 9.3.4 Combination Indoor and Outdoor Combustion Air
- 9.3.5 Engineered Installations.
- 9.3.6 Mechanical Combustion Air Supply
- 9.3.7 Louvers, Grills and Screens
- 9.3.8 Combustion Air Ducts

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9.4 Appliances on Roofs

- 9.4.1 General
- 9.4.2 Installation of Appliances on Roofs

9.4.2.2 Appliances shall be installed on a well-drained surface of the roof. At least 6 ft (1.8 m) of clearance shall be available between any part of the appliance and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures at least 42 in. (1.1 m) in height shall be provided on the exposed side.

NOTE: DIFFERS FROM THE IMC !

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9.4.3 Access to Appliances on Roofs

- 9.4.3.2 Buildings of more than 15 ft (4.6 m) in height shall have an inside means of access to the roof, unless other means acceptable to the authority having jurisdiction are used.

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9.5 Appliances in Attics

- 9.5.1 Attic access
- 9.5.2 Work Platform
- 9.5.3 Lighting and Convenience Outlet

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- 9.6 Appliance and Equipment Connections to Building Piping.
 - 9.6.1 Connecting Appliances and Equipment.
 - 9.6.2 Use of non metallic Gas Hose Connectors.
 - Indoors
 - Outdoor.
 - 9.6.3 Connection of Portable and Mobile Industrial Appliances.

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- **9.6.4 Appliance Shutoff Valves and Connections.**
- **9.6.4.2** Shutoff valves serving appliances installed in vented fireplaces and ventless firebox enclosures shall not be required to be located within 6 ft (1.8 m) of the appliance where such valves are readily accessible and permanently identified. The piping from the shutoff valve to within 6 ft (1.8 m) of the appliance shall be designed, sized, installed, and tested in accordance with Chapters 5, 6, 7, and 8.
- **9.6.4.3** Where installed at a manifold, the appliance shutoff valve shall be located within 50 ft (15 m) of the appliance served and shall be readily accessible and permanently identified. The piping from the manifold to within 6 ft (1.8 m) of the appliance shall be designed, sized, installed, and tested in accordance with Chapters 5, 6, 7, and 8.

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9.6 Appliance and Equipment Connections to Building Piping. (cont)

- 9.6.5 Quick Disconnect Devices.**
- 9.6.6 Gas Convenience Outlets.**
- 9.6.7 Sediment Trap**
- 9.6.8 Installation of Piping.**

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- 9.7 Electrical.**
- 9.7.1 Electrical Connections.**
- 9.7.2 Electrical Ignition and Control Devices**
- 9.7.3 Electrical Circuit**



Photo 3. A gas furnace supplied by a branch circuit that has a metal gas piping system supplying it.

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9.8 Room Temperature Thermostats

9.8.1 Locations

9.8.2 Drafts



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Chapter 10 Installation of Specific Equipment.

10.1 General.

10.1.1* **Application.** Listed appliances shall be installed in accordance with the manufacturers' installation instructions or, as elsewhere specified in this chapter, as applicable to the appliance.

*******Unlisted appliances shall be installed as specified in this chapter as applicable to the appliances.**

NOTE: THERE ARE FURTHER INFO ON UNLISTED IN SUB CHAPTERS DEPENDANT OF TYPE OF APPLIANCE

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- 10.2 A/C Appliance (gas Fired A/C and Heat pumps)
- 10.3 Central Heating Boilers and Furnaces
- 10.4 Clothes Dryers
- 10.5 Conversion Burners
- 10.6 Decorative Appliances in Vented Fireplaces
- 10.7 Gas Fireplaces, Vented
- 10.8 Non-Circulating Direct Gas-Fired Industrial Air Heaters
- 10.9 Recirculating Direct Gas-Fired Industrial Air Heaters
- 10.10 Duct Furnaces
- 10.11 Floor Furnaces



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- **10.23 Room Heaters.**
- **10.23.1* Prohibited Installations.** Unvented room heaters shall not be installed in bathrooms or bedrooms.
- ICC RESIDENTIAL IRC DOES NOT ALLOW FOR SOLE SOURCE OF HEAT!!!

2012 National Fuel Gas Code

Chapter 11 Procedures to be Followed to Place Equipment in Operation.

This part deals with the placing of a gas utilization equipment into operation.

11.7 Operating Instructions. Operating instructions shall be furnished and shall be left in a prominent position near the equipment for the use of the consumer.

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- **Chapter 12 : Venting of Appliances**
- **12.5.2 Plastic Piping.** Plastic piping used for venting appliances listed for use with such venting materials shall be approved.
- **12.5.3 Plastic Vent Joints.** Plastic pipe and fittings used to vent appliances shall be installed in accordance with the appliance manufacturer's installation instructions. Where primer is required, it shall be of a contrasting color.

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- **12.6.4 Inspection of Chimneys.**
- **12.6.4.1** Before replacing an existing appliance or connecting a vent connector to a chimney, the chimney passageway shall be examined to ascertain that it is clear and free of obstructions and shall be cleaned if previously used for venting solid or liquid fuel-burning appliances or fireplaces.
- **12.6.4.2** Chimneys shall be lined in accordance with NFPA211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.*

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- **12.7.3.1* Category I Appliances.** The sizing of natural draft venting systems serving one or more listed appliances equipped with a draft hood or appliances listed for use with a Type B gas vent, installed in a single story of a building, shall be in accordance with one of the following: TABLE 12.7.2
- **12.7.3.3 Category II, Category III, and Category IV Appliances.** The sizing of gas vents for Category II, Category III, and Category IV appliances shall be in accordance with the appliance manufacturer's instructions.

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- **12.11.7 Slope.** A vent connector shall be installed without any dips or sags and shall slope upward toward the vent or chimney at least 1/4 in./ft (20 mm/m).
- *Exception: Vent connectors attached to a mechanical draft system installed in accordance with appliance and the draft system manufacturers' instructions.*

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Chapter 13 Sizing of Category I Venting Systems