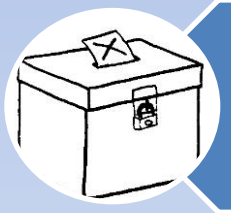

Greetings from Las Vegas
Public Review Draft Summary
2015 National Fuel Gas Code
PLAZA
LAS VEGAS CLUB
CASINO
PIONEER
Coin Castle
$2,100.00
ASGE Meeting - June 4, 2013

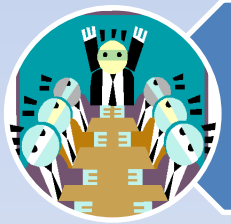
2015 Edition Revision Status

ASC Z223 / NFPA 54 October Meeting

- Action on 123 Public and Committee Input
- 68 Accepted



Ballot on First Public Review Document Under Way



Public Review This Spring

Committee Meeting on Public Comments June 18-19, 2013

BECS COMMITTEE POSITIONS
Z223.1/NFPA 54, 2015 Edition
Public/Committee Input & First Revisions

Panel Action[1]	Committee Action[1]	PI # / FR #	Section/Code Impacted	Submitte		
-	A	- / FR 16	2.3.2 ASTM Publications	Committe		changes.
A	R See FR 16	PI 22 / -	ASTM E26	Hirschler – GBH	None[2]	
-	A	PI 8 / FR 39	2.3.3 Update		None[2]	
A	A	- / FR 25	3.3.4 Air Sh		None[2]	DELETE – Term not used.
H	R See CI 57	PI 32 / -	3.3.5 Anode – New Anode Definition	Volgstadt – Volgstadt and	ject - No evidence was provided that the code's currently performance-based language requiring corrosion protection is equate to prevent wide-scale corrosion res of customer piping systems.	
A	A	PI 46 / FR 9	3.3.6.8 Nonre Heat Applian Medium-Heat		None[2]	
A	A	- / FR 37	3.3.9 Automatic Vent Damper	Committee	None[2]	REVISE – Create one general definition and eliminate sub categories
A	A	- / FR 26	3.3.11.3 Low Pressure Boi			
H	R See CI 57	PI 31 /	3.3.18 Cathodic Protection New Definition	Associates	inadequate to prevent wide-scale corrosion failures of customer piping systems.	
A	A	- / FR 33	3.3.24 Consumption	Committee	None[2]	DELETE – Term not used.
A	A	- / FR 34	3.3.28 Design Certification	Committee	None[2]	DELETE – Term not used.
A	A	- / FR 36	3.3.29.5 Vent Damper Device	Committee	None[2]	DELETE – Term not used.
A	A	- / FR 29	3.3.31 Domestic Laundry Stove	Committee	None[2]	DELETE – Term not used.

REVISED REVISION CYCLE PROCESS

PI = Public Input

FR = First Revision

CI = Committee Input – Public comment is requested, may or may not be adopted

[1] A=Accept; FR=First Revision; CI=Committee Input; H=Hold; PI=Public Input; R=Resolve Public Input

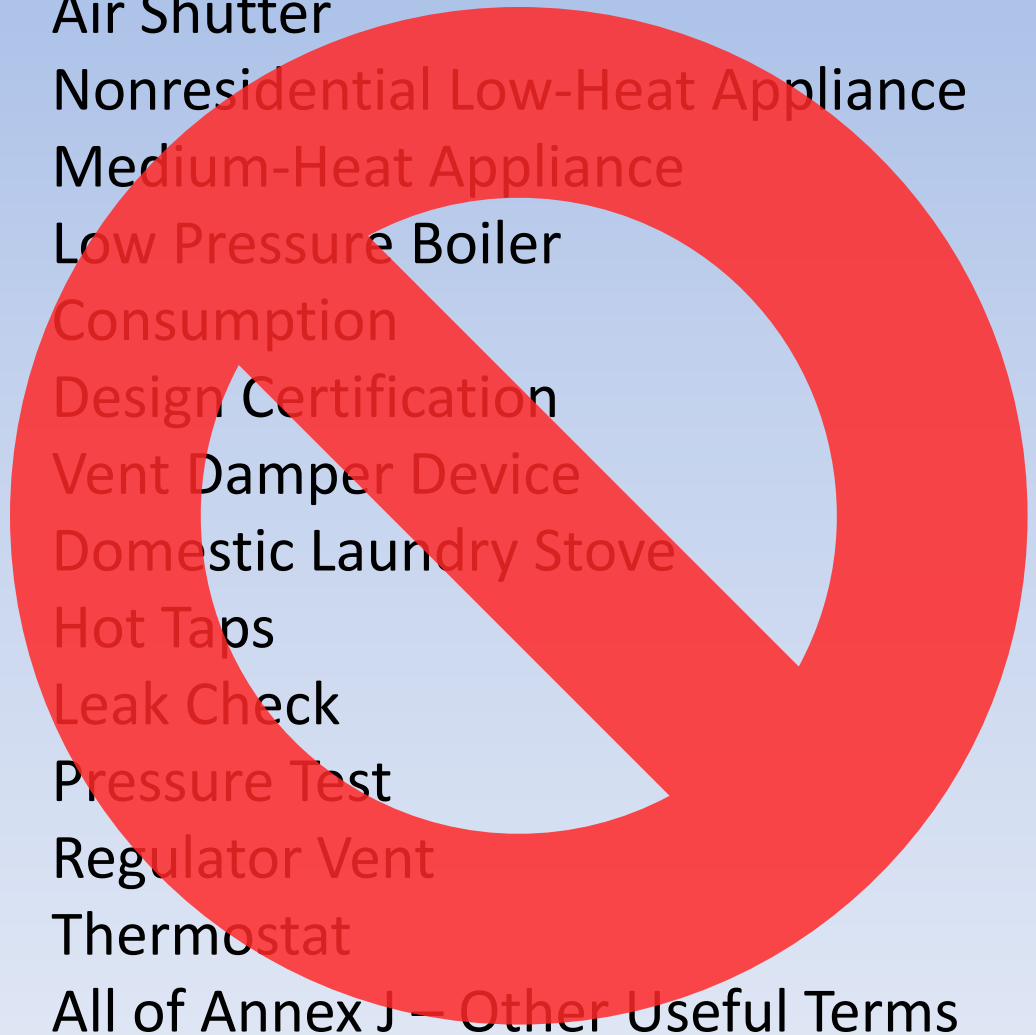
[2] No position or not discussed.

rev. 11-07-12

FR - REVISION

Deleted Definitions

Air Shutter
Nonresidential Low-Heat Appliance
Medium-Heat Appliance
Low Pressure Boiler
Consumption
Design Certification
Vent Damper Device
Domestic Laundry Stove
Hot Taps
Leak Check
Pressure Test
Regulator Vent
Thermostat
All of Annex J – Other Useful Terms



FR - REVISION

Consolidated/Revised Definitions

Electrically Operated
Mechanically Actuated
Thermally Actuated

→ Automatic Vent Damper

High-Static Pressure
Low-Static Pressure

→ Unit Heater

FR - REVISION

Revised Definitions

Combustible

3.3.67.1 Combustible (Material). ~~As pertaining to materials adjacent to or in contact with heat-producing appliances, vent connectors, gas vents, chimneys, steam and hot water pipes, and warm air ducts shall mean materials made of or surfaced with wood, compressed paper, plant fibers, or other materials that are capable of being ignited and burned. Such material shall be considered combustible even though flame-proofed, fire-retardant treated, or plastered.~~ A material that, in the form in which it is used and under the conditions anticipated, will ignite and burn; a material that does not meet the definition of noncombustible. [NFPA 101; 3.3.169.1].

Noncombustible

3.3.67.2 Noncombustible Material. A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat. ~~Materials that are reported as passing ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C,* are considered to be noncombustible materials.~~

FR - REVISION

Revised Definitions

Vent

3.3.106 ~~Vent. A passageway used to convey flue gases from appliances or their vent connectors to the outdoors.~~

~~3.3.106.1 Common Vent. That portion of a vent or chimney system that conveys products of combustion from more than one appliance.~~

3.3.106~~.2~~ Gas Vent. A passageway composed of listed factory-built components assembled in accordance with the manufacturer's installation instructions for conveying vent gases from appliances or their vent connectors to the outdoors.

3.3.106.1 Common Vent. That portion of a vent or chimney system that conveys vent products from more than one appliance.

3.3.106.2.1 ~~Gas Vent,~~ Special Type Gas Vent. Gas vents for venting listed Category II, III, and IV appliances.

3.3.106.2.2 ~~Gas Vent,~~ Type B Gas Vent. A gas vent for venting listed gas appliances with draft hoods and other Category I appliances listed for use with Type B gas vents.

3.3.106.2.3 ~~Gas Vent,~~ Type B-W Gas Vent. A gas vent for venting listed wall furnaces.

3.3.106.2.4 ~~Gas Vent,~~ Type L Vent. A gas vent for venting appliances listed for use with Type L vents and appliances listed for use with Type B gas vents.

~~3.3.106.3 Regulator Vent. The opening in the atmospheric side of the regulator housing permitting the in and out movement of air to compensate for the movement of the regulator diaphragm.~~

FR - NEW

General Requirements

Prevention of Accidental Ignition

4.3.1 Potential Ignition Sources.
Where work is being performed on piping that contains or has contained gas, the following shall apply:
(1) Provisions for electrical continuity shall be made before alterations are made in a metallic piping system.
(2) Smoking, open flames, lanterns, welding, or other sources of ignition shall not be permitted.
(3) A metallic electrical bond shall be installed around the location of cuts in metallic gas pipes made by other than cutting torches. Where cutting torches, welding, or other sources of ignition are to be used , it shall be determined that all sources of gas or gas–air mixtures have been secured and that all flammable gas or liquids have been cleared from the area. Piping shall be purged as required in Section 8.3 before welding or cutting with a torch is attempted.
(4) Artificial illumination shall be restricted to listed safety-type flashlights and safety lamps. Electric switches shall not be turned on or turned off.

FR - REVISION

Piping System Design

Calculating Maximum Demand

New guidance added to Annex A

5.4.2* Maximum Gas Demand.

5.4.2.1* The volumetric flow rate of gas to be provided ~~[in cubic feet (cubic meters) per hour]~~ shall be ~~calculated using the manufacturers' input ratings~~ the sum of the maximum input of the appliances served~~, adjusted for altitude. Where the input rating is not indicated, the gas supplier, appliance manufacturer, or a qualified agency shall be contacted, or the rating from Table 5.4.2.1 shall be used for estimating the volumetric flow rate of gas to be supplied~~.

Altitude adjustment to new 5.4.2.2

Table 5.4.2.1 Approximate Gas Input for Typical Appliances

Appliance	Input Btu/hr (Approx.)
Space Heating Units	
Warm air furnace	
Single family	100,000
Multifamily, per unit	60,000
Hydronic boiler	
Single family	100,000
Multifamily, per unit	60,000
Space and Water Heating Units	
Hydronic boiler	
Single family	120,000
Multifamily, per unit	75,000
Water Heating Appliances	
Water heater, automatic storage 30 to 40 gal tank	35,000
Water heater, automatic storage 50 gal tank	50,000
Water heater, automatic instantaneous	
Capacity at 2 gal/min	142,800
Capacity at 4 gal/min	285,000
Capacity at 6 gal/min	428,400
Water heater, domestic, circulating or side-arm	35,000
Cooking Appliances	
Range, free standing, domestic	65,000
Built-in oven or broiler unit, domestic	25,000
Built-in top unit, domestic	40,000
Other Appliances	
Refrigerator	3,000
Clothes dryer, Type 1 (domestic)	35,000
Gas fireplace direct vent	40,000
Gas log	80,000
Barbecue	40,000
Gas light	2,500

For SI units: 1 Btu/hr = 0.293 W.

FR - NEW

Piping System Design

Annex A – New methods

A.5.4.2.1 Some older appliances do not have a nameplate. In this case Table A.5.4.2.1 or an estimate of the appliance input should be used. The input can be based on:

- A rating provided by the manufacturer,
- The rating of similar appliances,
- Recommendations of the gas supplier,
- Recommendations of a qualified agency,
- A gas flow test.
- Measurement of the orifice size of the appliance.

The requirement of 5.4.1 that the piping system provide sufficient gas to each appliance inlet must be complied with.

Table A.5.4.2.1

Appliance	Input Btu/hr (Approx.)
Space Heating Units	
Warm air furnace	
Single family	100,000
Multifamily, per unit	60,000
Hydronic boiler	
Single family	100,000
Multifamily, per unit	60,000
Space and Water Heating Units	
Hydronic boiler	
Single family	120,000
Multifamily, per unit	75,000
Water Heating Appliances	
Water heater, automatic storage 30 to 40 gal tank	35,000
Water heater, automatic storage 50 gal tank	50,000
Water heater, automatic instantaneous	
Capacity at 2 gal/min	142,800
Capacity at 4 gal/min	285,000
Capacity at 6 gal/min	428,400
Water heater, domestic, circulating or side-arm	35,000
Cooking Appliances	
Range, free standing, domestic	65,000
Built-in oven or broiler unit, domestic	25,000
Built-in top unit, domestic	40,000
Other Appliances	
Refrigerator	3,000
Clothes dryer, Type 1 (domestic)	35,000
Gas fireplace direct vent	40,000
Gas log	80,000
Barbecue	40,000
Gas light	2,500

For SI units: 1 Btu/hr = 0.293 W.

FR - REVISION

Piping Materials

NEW- Prohibition on PVC & CPVC for fuel gas piping

5.6.4.1.3 Polyvinyl chloride (PVC) and cholorinated polyvinyl chloride (CPVC) plastic pipe, tubing, and fittings shall not be used to supply fuel gas.

FR - REVISION

Piping System Design

Fittings

5.6.8.4 Metallic Pipe Fittings.
Metallic fittings shall comply with the following:
(1) Threaded fittings in sizes larger than 4 in. (100 mm) shall not be used ~~unless acceptable to the authority having jurisdiction~~ .

(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) …
(b) …
(c) ~~Installed or braced to prevent separation of the joint by gas pressure or external physical damage~~
(d) …

(9) Pipe fittings shall not be drilled and tapped.

NEW

FR - REVISION

Piping Materials

Acceptable Flanges

All Applicable Flanges Added

5.6.10 Flanges. ~~All flanges shall comply with~~

5.6.10.1 Flange Specifications.

5.6.10.1.1 Cast Iron Flanges shall be in accordance with:
ASME/ANSI B16.1 - 2010 – Gray Iron Pipe Flanges and Flanged Fittings~~, Class~~
: Classes 25, 125, and 250~~; ANSI/ASME B16.20, *Metallic Gask ets for Pipe Flanges, Ring Joint Spiral Wound and Jack eted* ; or MSS SP-6, *Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings.* The pressure–temperature ratings shall equal or exceed that required by the application.~~

5.6.10.1.2 Steel Flanges shall be in accordance with: ASME/ANSI B16.5 - 2009 - Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24 Metric/Inch Standard, orASME/ANSI B16.47 - 2011 - Large Diameter Steel Flanges: NPS 26 through NPS 60 Metric/Inch Standard

5.6.10.1.3 Non-Ferrous Flanges shall be in accordance with: ASME/ANSI B16.24 – 2011 - Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600. 900, 1500, and 2500

5.6.10.1.4 Ductile Iron Flanges shall be in accordance with: ASME/ANSI B16.42 - 2011 - Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300

5.6.10.2 Dissimilar Flange Connections. Raised Face flanges shall not be joined to Flat Faced Cast Iron, Ductile Iron or Non-Ferrous material flanges.

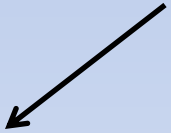
CI - REVISION

Piping Materials

Acceptable Gaskets

5.6.11.1
Acceptable materials shall include the following:
(1) Metal (plain or corrugated)
(2) Composition
(3) Aluminum "O" rings ~~and~~
(4) spiral-wound metal gaskets
(5) Rubber-faced phenolic
(6) Elastomeric

All Applicable Gasket Materials Added



5.6.11.2 ~~When a flanged joint is opened, the gasket shall be replaced.~~ Gasket Specifications.
5.6.11.2.1 Metallic flange gaskets shall be in accordance with: ASME/ANSI B16.20 – 2011 Metallic Gaskets for Pipe Flanges: Ring-Joint, Spiral-Wound and Jacketed
5.6.11.2.2 Non-metallic flange gaskets shall be in accordance with: ASME/ANSI B16.21 – 2011 Nonmetallic Flat Gaskets for Pipe Flanges
5.6.11.3 Full-face flange gaskets shall be used with ~~all bronze and cast~~ non-~~iron~~ -steel flanges.
5.6.11.4 When a flanged joint is separated, the gasket shall be replaced.

CI - REVISION

Overpressure Protection

Extensive rewrite to reflect large commercial/industrial installations

5.9 Overpressure Protection ~~Devices~~.

5.9.1 ~~General~~ Where required. ~~Overpressure~~ Where the serving gas supplier delivers gas at a pressure greater than 2 psi for piping systems serving appliances designed to operate at a gas pressure of 14 in. wc or less, overpressure protection devices shall be ~~provided to prevent the pressure in the piping system from exceeding that value that would cause unsafe operation of any connected and properly adjusted appliances~~ installed. Piping systems serving equipment designed to operate at inlet pressures greater than 14 in. wc shall be equipped with overpressure protection devices as required by the applicable equipment construction and/or installation codes and standards for the connected quipment.

5.9.~~1.1.~~2 Pressure limitation requirements. ~~The requirements of this section shall be met and a piping system deemed to have overpressure protection where a service or line pressure regulator plus one other device are installed such that the following occur:~~

~~(1) Each device limits the pressure to a value that does not exceed the maximum working pressure of the downstream system.~~

~~(2) The individual failure of either device does not result in overpressure of the downstream system.~~

5.9.2.1 Where piping systems are required to be equipped with overpressure protection devices by paragraph 5.9.1 each overpressure protection device shall be adjusted to limit the gas pressure to each connected appliance to 2 psi or less upon a wide-open failure of the primary line pressure regulator.

CI - REVISION

Overpressure Protection

Extensive rewrite to incorporate commercial/industrial installations

5.9~~.1.2~~ .2.2 ~~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.~~ Each overpressure protection device installed to meet the requirements of this section shall be capable of limiting the pressure to its connected appliances as required by this section independently of any other pressure control equipment in the piping system.

~~5.9.1.3 A pressure relieving or limiting device shall not be required where the following conditions exist:~~

~~(1) The gas does not contain materials that could seriously interfere with the operation of the service or line pressure regulator.~~

~~(2) The operating pressure of the gas source is 60 psi (414 kPa) or less.~~

~~(3) The service or line pressure regulator has all of the following design features or characteristics:~~

~~(4) Pipe connections to the service or line regulator do not exceed 2 in. (50 mm) nominal diameter.~~

~~(5) The regulator is self-contained with no external static or control piping.~~

~~(6) The regulator has a single port valve with an orifice diameter no greater than that recommended by the manufacturer for the maximum gas pressure at the regulator inlet.~~

~~(7) The valve seat is made of resilient material designed to withstand abrasion of the gas, impurities in the gas, and cutting by the valve and to resist permanent deformation where it is pressed against the valve port.~~

~~(8) The regulator is capable, under normal operating conditions, of regulating the downstream pressure within the necessary limits of accuracy and of limiting the discharge pressure under no-flow conditions to not more than 150 percent of the discharge pressure maintained under flow conditions.~~

CI - REVISION

Overpressure Protection

Extensive rewrite to incorporate commercial/industrial installations

5.9.2.3 ~~Devices~~ Each gas piping system for which an overpressure protection device is required by this section shall be designed and installed so that a failure of the primary pressure control device(s) is detectable.

5.9.2.4 Each pressure relief valve shall be designed to maintain downstream pressure at or below the limits specified in paragraph 5.9.2.1 at a gas flow rate equal to or greater than that supplied to it by a regulator failed wide open at the regulator's design operating inlet pressure.

5.9.3 Overpressure Protection Devices.

5.9.2 3 .1 Pressure relieving or pressure limiting devices shall be one of the following:

~~(1) Spring-loaded relief device~~

~~(2) Pilot-loaded back pressure regulator used as a relief valve designed so that failure of the pilot system or external control piping causes the regulator relief valve to open~~

~~(3) A monitoring regulator installed in series with the service or line pressure regulator A series~~

(1) Pressure relief valve

(2) Monitoring regulator

~~(4)~~ (3)Series regulator installed upstream from the ~~service or~~ line regulator and set to continuously limit the pressure on the inlet of the ~~service or~~ line regulator to the maximum ~~working pressure of the downstream piping system~~

(4) Values specified by 5.9.2.1 or less

(5) An a~~A~~utomatic shutoff device installed in series with the ~~service or~~ line pressure regulator and set to shut off when the pressure on the downstream piping system reaches the maximum ~~working pressure or some other predetermined pressure less than the maximum working pressure~~ values specified by 5.9.2.1 or less. This device shall be designed so that it will remain closed until manually reset.

~~(6) A liquid seal relief device that can be set to open accurately and consistently at the desired pressure~~

CI - REVISION

Overpressure Protection

Extensive rewrite to incorporate commercial/industrial installations

5.9.~~2~~ 3.2 The devices in ~~5.9.2.1~~ 5.9.3.1 shall be installed either as ~~an~~ integral ~~part~~ parts of the ~~service or~~ line pressure ~~regulator~~ regulators or as separate units. Where separate pressure relieving or pressure limiting devices are installed, they shall comply with ~~5.9.3~~ 5.9.4 through ~~5.9.8~~ 5.9.9.

5.9.~~3~~ 4Construction and Installation. All pressure relieving or pressure limiting devices shall meet the following requirements:

(1) Be constructed of materials so that the operation of the device is not impaired by corrosion of external parts by the atmosphere or of internal parts by the gas.

corrosion of external parts by the atmosphere or of internal parts by the gas.

(2) Be designed and installed so they can be operated to determine whether the valve is free. The devices shall also be designed and installed so they can be tested to determine the pressure at which they operate and be examined for leakage when in the closed position.

5.9.4 5 External Control Piping. External control piping shall be ~~protected from falling objects, excavations, or other causes of damage and shall be~~ designed and installed so that damage to any control piping does not render both the regulator and the overpressure protective device inoperative.

5.9.~~5~~ 6 Setting. Each pressure limiting or pressure relieving device shall be set so that the gas pressure supplied to the connected appliances does not exceed ~~a safe level beyond the maximum allowable working pressure for the piping and appliances connected~~ the limits specified in 5.9.2.1.

CI - REVISION

Overpressure Protection

Extensive rewrite to incorporate commercial/industrial installations

5.9.~~6~~ 7 Unauthorized Operation. Where unauthorized operation of any shutoff valve ~~makes~~ could render a pressure relieving valve or pressure limiting device inoperative, one of the following shall ~~apply~~ be accomplished :
(1) Lock the valve in the open position. Instruct authorized personnel in the importance of leaving the shutoff valve open and of being present while the shutoff valve is closed so that it can be locked in the open position before leaving the premises.
(2) Install duplicate relief valves, each having adequate capacity to protect the system, and arrange the isolating valves or three-way valve so that only one ~~safety device~~ relief valve can be rendered inoperative at a time.
5.9.~~7~~ 8 Vents .
5.9.~~7~~ 8 .1 The discharge stacks, vents, or outlet parts of all pressure relieving and pressure limiting devices shall be located so that gas is safely discharged to the outdoors. Discharge stacks or vents shall be designed to prevent the entry of water, insects, or other foreign material that could cause blockage.
5.9.~~7~~ 8 .2 The discharge stack or vent line shall be at least the same size as the outlet of the pressure relieving device.
5.9.~~8~~ 9 Size of Fittings, Pipe, and Openings.
The fittings, pipe, and openings located between the system to be protected and the pressure relieving device shall be sized to prevent hammering of the valve and to prevent impairment of relief capacity.

CI - REVISION

Excess Flow Valves

New EFV Listing Standard

5.13 Excess Flow Valve(s). Where automatic excess flow valves are installed, they shall be listed to ANSI Z21.93/CSA 6.30 and shall be sized and installed in accordance with the manufacturers' instructions.

FR - REVISION

Piping Tables

Table 6.2(c) Schedule 40 Metallic Pipe

Gas	Natural
Inlet pressure	Less than 2 psi
Pressure Drop	3.0 in. w.c.
Specific Gravity	0.60

Pipe Size (in.)									
Nominal:	½	¾	1	1¼	1½	2	2½	3	4
Actual ID:	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	4.026
Length (ft)	Capacity in Cubic Feet of Gas per Hour								
10	454	949	1,787	3,669	5,497	10,588	16,875	29,832	43,678
20	312	652	1,228	2,522	3,778	7,277	11,598	20,503	30,020

Table entries rounded off to 3 significant digits

4 in. Column Capacity Corrections

Table 6.2(d) Schedule 40 Metallic Pipe

Gas	Natural
Inlet pressure	Less than 2 psi
Pressure Drop	6.0 in. w.c.
Specific Gravity	0.60

Pipe Size (in.)									
Nominal:	½	¾	1	1¼	1½	2	2½	3	4
Actual ID:	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	4.026
Length (ft)	Capacity in Cubic Feet of Gas per Hour								
10	660	1,380	2,600	5,338	7,999	15,405	24,553	43,405	63,551
20	454	949	1,787	3,669	5,497	10,588	16,875	29,832	43,678

CI - REVISION

Corrosion Protection

7.1.3 * ~~**Protection Against Corrosion.** Gas piping in contact with earth or other material that could corrode the piping shall be protected against corrosion in an approved manner. When dissimilar metals are joined underground, an insulating coupling or fitting shall be used. Piping shall not be laid in contact with cinders. Uncoated threaded or socket welded joints shall not be used in piping in contact with soil or where internal or external crevice corrosion is known to occur.~~ **Corrosion Protection of Piping.** Steel pipe and tubing installed underground shall be installed in accordance with the following:

7.1.3.1* Steel piping installed underground shall have a cathodic protection system in accordance with 7.1.3.3 unless technical justification is approved.

Complete Rewrite – New requirements replace "approved manner"

Steel pipe shall have a cathodic protection system

Unless technical justification is approved

CI - REVISION

Corrosion Protection

Other Underground Piping – 3 Methods

7.1.3.2 Underground piping shall comply with one of the following requirements:
(A) Piping shall be made of corrosion-resistant material that is suitable for the environment in which it will be installed.
(B) Piping shall be manufactured with a corrosion-resistant coating, or have a coating applied prior to being placed into service. Fittings and joints between coated pipe shall be coated.
(C) Piping shall have a cathodic protection system installed and the system shall be maintained in accordance with 7.1.3.3.

1. Made of corrosion resistant material

2: Have protective coating

3: Have Cathodic protection

CI - REVISION

Corrosion Protection

Cathodic protection requirements

Monitored, tested and documented

7.1.3.3 * Cathodic protection systems shall be monitored by testing and the results shall be documented and shall be one of the following:

Specified voltages

(A) Producing a voltage of −0.85 volts or more negative, with reference to a saturated copper-copper sulfate half cell

(B) Producing a voltage of −0.78 volts or more negative, with reference to a saturated KCl calomel half cell.

(C) Producing a voltage of −0.80 volts or more negative, with reference to a silver-silver chloride half cell.

(D) Any other method described in Appendix D of Title 49 of the Code of Federal Regulations, Part 192.

CI - REVISION

Corrosion Protection

Anodes tested

Testing schedule

Replacement

Documentation

7.1.3.4* Sacrificial anodes shall be tested in accordance with the following schedule:
(A) Upon installation of the cathodic protection system, unless prohibited by climatic conditions, in which case testing shall be performed within 180 days after the installation of the system.
(B) 12 to 18 months after the initial test.
(C) Upon successful verification testing in accordance with (A) and (B) periodic follow-up testing shall be performed at intervals not to exceed 36 months.
(D) Systems failing a test shall be repaired as soon as practical unless climatic conditions prohibit this action, in which case the repair shall be made not more than 180 days thereafter.
The testing schedule shall be restarted as required in 7.1.3.4 (A) and (B), and the results shall comply with 7.1.3.3.
(E) Documentation of the results of the two most recent tests shall be retained.

CI - REVISION

Corrosion Protection

Impressed current systems

Testing and inspection

7.1.3.5 Impressed current cathodic protection systems shall be inspected and tested in accordance with the following schedule:
(A) The sources of impressed current shall be inspected and tested at intervals not exceeding two months.
(B) Impressed current cathodic protection installations shall be inspected and tested annually.

Existing requirement for insulating dissimilar materials

7.1.3.6 Where dissimilar metals are joined underground, an insulating coupling or fitting shall be used .

FR- REVISION

Piping Installation

Tracer Systems

Allows Designed Systems

7.1.7.3 Tracer Wire. An electrically continuous corrosion-resistant tracer ~~wire (minimum AWG 14) or tape~~ shall be buried with the plastic pipe to facilitate locating. ~~One~~

7.1.7.3.1 The tracer shall be one of the following:

1. A product specifically designed for that purpose
2. Insulated copper conductor not less than 14 AWG

7.1.7.3.2 Where tracer wire is used, access shall be provided from aboveground or one end of the tracer wire or tape shall be brought aboveground at a building wall or riser.

CI - REVISION

Piping Installation

NEW- Bond Length Not to Exceed 75 Ft.

7.13.2* CSST. CSST gas piping systems shall be bonded to the electrical service grounding electrode system.

7.13.2.1 The bonding jumper shall connect to a metallic pipe or fitting between the point of delivery and the first downstream CSST fitting.

7.13.2.2 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.

7.13.2.3 The length of the jumper between the connection to the gas piping system and a grounding electrode system shall not exceed 75 ft (23 m). Any additional electrodes shall be bonded to the electrical service grounding electrode system.

7.13.2.4 Where a gas piping manifold is installed, it shall also be bonded to the electrical service grounding electrode system.

NEW- Manifold to be Bonded

FR- REVISION

Piping Installation

Concealed Fittings

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, caps and plugs ← **Allows caps and plugs**

(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*

FR- NEW

Shutoff Valves

7.3.6 Shutoff Valves in Tubing Systems. Shutoff valves in tubing systems in concealed locations shall be rigidly and securely supported independently of the tubing.

Requires Support for Valves on Tubing Systems

FR- REVISION

Repair Garages

In accordance with NFPA 30A

9.1.11.2 Repair Garages. Appliances installed in repair garages shall be installed in ~~a detached building or room, separated from repair areas by walls or partitions, floors, or floor–ceiling assemblies that are constructed so as to prohibit the transmission of vapors and that have a fire resistance rating of not less than 1 hour, and that have no openings in the wall separating the repair area within 8 ft (2.4 m) of the floor. Wall penetrations shall be firestopped. Air for combustion purposes shall be obtained from the outdoors. The heating room shall not be used for the storage of combustible materials.~~

~~*Exception No. 1: Overhead heaters where installed not less than 8 ft (2.4 m) above the floor shall be permitted.*~~

~~Exception No. 2: Heating appliances for vehicle repair areas where there is no dispensing or transferring of Class I or Class II flammable or combustible liquids or LP-Gas shall be installed in~~ accordance with NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages .

FR- NEW

Existing Appliances

Building Envelope Changes - Weatherization”

9.1.24* Existing Appliances. Where building envelope components of existing buildings are replaced or altered, the existing appliance installations shall be inspected to verify compliance with the provisions of 9.3 and Chapter 12. Where the appliance installations do not comply with 9.3 and Chapter 12, they shall be altered as necessary to be in compliance with such.

Verify Combustion Air and Venting

CI - REVISION

Existing Appliances

Complete rewrite

Applies to Most Appliances

Annex G
Recommended Procedure for Safety Inspection of an Existing Appliance Installation

This annex is not a part of the requirements of this code but is included for informational purposes only.

G.1 General. The following procedure is intended as a guide to aid in determining that an appliance is properly installed and is in a safe condition for continued use. Where a gas supplier performs an inspection their written procedures should be followed.

G.1.1 Application. This procedure is intended for existing residential installations of a furnace, boiler, room heater, water heater, cooking appliance, fireplace appliance and clothes dryer. This procedure should be performed prior to any attempt to modify the appliance, the installation, and building envelope.

G.1.5 Detectors Instruments. The inspection procedures include measuring for fuel gas and carbon monoxide (CO) and will require the use of combustible gas detector (CGD) and CO detector. It is recommended that both types of detectors be listed. Prior to any inspection the detectors should be calibrated or tested in accordance with the manufacturer's instructions. In addition, it is recommended that the detectors have the following minimum specifications.

a. Gas Detector: The CGD should be capable of indicating the presence of the type of fuel gas for which it is to be used (e.g. natural gas or propane). The combustible gas detector should be capable of the following:

PPM: Numeric display with a parts per million (ppm) scale from 1 percent to 900 ppm in 1 ppm increments.

LEL: Numeric display with a percent lower explosible limit (% LEL) scale from 0 percent to 100 percent in 1 percent increments.

FR- REVISION

Combustion Air

REVISED – Does not apply to power burner appliances

9.3.1.2
Appliances of other than natural draft design ~~and other than~~, appliances not designated as Category I vented appliances, and appliances equipped with power burners shall be provided with combustion, ventilation, and dilution air in accordance with the appliance manufacturer's instructions.

FR- REVISION

Connecting Appliances

9.6.1 Connecting Appliances and Equipment. Appliances and equipment shall be connected to the building piping in compliance with 9.6.4 through 9.6.6 by one of the following:

(1) …
(2) …
(3) …
(4) …
(5) …
(6) ...

Clarify that these sections also apply

Relocated as new standalone sections 9.6.1.1 & 9.6.1.2

~~(7) In 9.6.1 (2), 9.6.1 (3), 9.6.1 (4), 9.6.1 (5), and 9.6.1 (6), the connector or tubing shall be installed so as to be protected against physical and thermal damage. Aluminum alloy tubing and connectors shall be coated to protect against external corrosion where they are in contact with masonry, plaster, or insulation or are subject to repeated wettings by such liquids as water (except rain water), detergents, or sewage.~~

~~Materials addressed in 9.6.1 (2), 9.6.1 (3), 9.6.1 (4), 9.6.1 (5), and 9.6.1 (6) shall not be installed through an opening in an appliance housing, cabinet, or casing, unless the tubing or connector is protected against damage.~~

(8) Unlisted gas hose connectors for use in laboratories and educational facilities in accordance with 9.6.3.

New coverage for UNLISTED gas hoses in labs

FR- NEW

Connecting Appliances

9.6.3 Injection (Bunsen) burners used in laboratories and educational facilities shall be permitted to be connected to the gas supply by an unlisted hose.

Permits UNLISTED gas hoses in labs

FR- REVISION

Specific Appliances

Clearances around Cooking Tops

10.12.5 Combustible Material Adjacent to Cooking Top. ~~Any portion of combustible material adjacent to a cooking top section of a food service range, even though listed for close-to-wall installation, that is not shielded from the wall by a high shelf, warming closet, and so on, shall be protected as specified in 10.12.2 for a distance of at least~~ Listed and unlisted food service ranges shall be installed to provide clearance to combustible material of not less than 18 in. (460 mm) horizontally for a distance up to 2 ft (0.6 m) above the surface of the cooking top where the combustible material is not completely shielded by high shelving, warming closet, or other system . Reduced combustible material clearances are permitted where protected in accordance with Table 10.2.3.

Existing coverage is rewritten to clarify.

FR- DELETION

Specific Appliances

Hot Plates & Laundry Stoves

~~**10.14 Hot Plates and Laundry Stoves.**~~

~~10.14.1 Listed domestic hot plates and laundry stoves installed on combustible surfaces shall be set on their own legs or bases. They shall be installed with minimum horizontal clearances of 6 in. (150 mm) from combustible material.~~

~~10.14.2 Unlisted domestic hot plates and laundry stoves shall be installed with horizontal clearances to combustible material of not less than 12 in. (300 mm). Combustible surfaces under unlisted domestic hot plates and laundry stoves shall be protected in an approved manner.~~

~~10.14.3 The vertical distance between tops of all domestic hot plates and laundry stoves and combustible material shall be at least 30 in. (760 mm).~~

New appliances no longer available.

FR- REVISION

Specific Appliances

Household Cooking Appliances

10.15.1 ~~Floor-Mounted Units~~ Installation. Listed floor-mounted and built-in household cooking appliances shall be installed in accordance with the manufacture's installation instructions.

10.15.2~~1.1 Clearance from Combustible Material~~ Clearances. The clearances specified as follows shall not interfere with combustion air, accessibility for operation, and servicing:

(1) Listed floor-mounted household cooking appliances, where installed on combustible floors, shall be set on their own bases or legs~~ and shall be installed in accordance with the manufacturer's installation instructions.~~

(2) Listed household cooking appliances with listed gas room heater sections shall be installed so that the warm air discharge side shall have a minimum clearance of 18 in. (460 mm) from adjacent combustible material. A minimum clearance of 36 in. (910 mm) shall be provided between the top of the heater section and the bottom of cabinets.

Outdated appliance deleted

~~(3) Listed household cooking appliances that include a solid or liquid fuel–burning section shall be spaced from combustible material and otherwise installed in accordance with the manufacturer's installation instructions for the supplementary fuel section of the appliance.~~

~~(4)~~ (3) Unlisted floor-mounted household cooking appliances shall be installed with at least a 6 in. (150 mm) clearance at the back and sides to combustible material. Combustible floors under unlisted appliances shall be protected in an approved manner.

(4) Unlisted built-in household cooking appliances shall not be installed in, or adjacent to, unprotected combustible material.

Floor-mounted and built-in units combined.

FR- REVISION

Specific Appliances

Household Cooking Appliances

New Annex A figure added

10.15.~~1.~~2.1* **Vertical Clearance Above Cooking Top.** Household cooking appliances shall have a vertical clearance above the cooking top of not less than 30 in. (760 mm) to combustible material or metal cabinets. A minimum clearance of 24 in. (610 mm) is permitted when one of the following is installed:
(1) The underside of the combustible material or metal cabinet above the cooking top is protected with not less than 1⁄4 in. (6 mm) insulating millboard covered with sheet metal not less than 0.0122 in. (0.3 mm) thick.
(2) A metal ventilating hood of sheet metal not less than 0.0122 in. (0.3 mm) thick is installed above the cooking top with a clearance of not less than 1⁄4 in. (6 mm) between the hood and the underside of the combustible material or metal cabinet, and the hood is at least as wide as the appliance and is centered over the appliance.
(3) A listed cooking appliance or microwave oven is installed over a listed cooking appliance and conforms to the terms of the upper appliance's manufacturer's installation instructions.
10.15.3 Level Installation. Cooking appliances shall be installed so that the cooking top , broiler pan, or oven racks are level.

Floor-mounted and built-in units combined.

FR- DELETION

Specific Appliances

Household Cooking Appliances

~~**10.15.2 Built-In Units.**~~

~~**10.15.2.1 Installation.** Listed built-in household cooking appliances shall be installed in accordance with the manufacturer's installation instructions. The installation shall not interfere with combustion air, accessibility for operation, and servicing. Unlisted built-in household cooking appliances shall not be installed in, or adjacent to, combustible material.~~

~~**10.15.2.2 Vertical Clearance.** Built-in top (or surface) cooking appliances shall have a vertical clearance above the cooking top of not less than 30 in. (760 mm) to combustible material or metal cabinets. A minimum clearance of 24 in. (610 mm) shall be permitted when one of the following is installed:~~

~~(1) The underside of the combustible material or metal cabinet above the cooking top is protected with not less than 1⁄4 in. (6 mm) insulating millboard covered with sheet metal not less than 0.0122 in. (0.3 mm) thick.~~

~~(2) A metal ventilating hood of sheet metal not less than 0.0122 in. (0.3 mm) thick is installed above the cooking top with a clearance of not less than 1⁄4 in. (6 mm) between the hood and the underside of the combustible material or metal cabinet, and the hood is at least as wide as the appliance and is centered over the appliance.~~

~~(3) A listed cooking appliance or microwave oven is installed over a listed cooking appliance and conforms to the terms of the upper appliance manufacturer's installation instructions.~~

~~**10.15.2.3 Horizontal Clearance.** The minimum horizontal distance from the center of the burner head(s) of a listed top (or surface) cooking appliance to vertical combustible walls extending above the top panel shall be not less than that distance specified by the permanent marking on the appliance.~~

~~**10.15.2.4 Level Installation.** Built-in household cooking appliances shall be installed so that the cooking top, broiler pan, or oven racks are level.~~

Built-In Units combined with revised 10.15

FR- NEW

Specific Appliances

Household Cooking Appliances

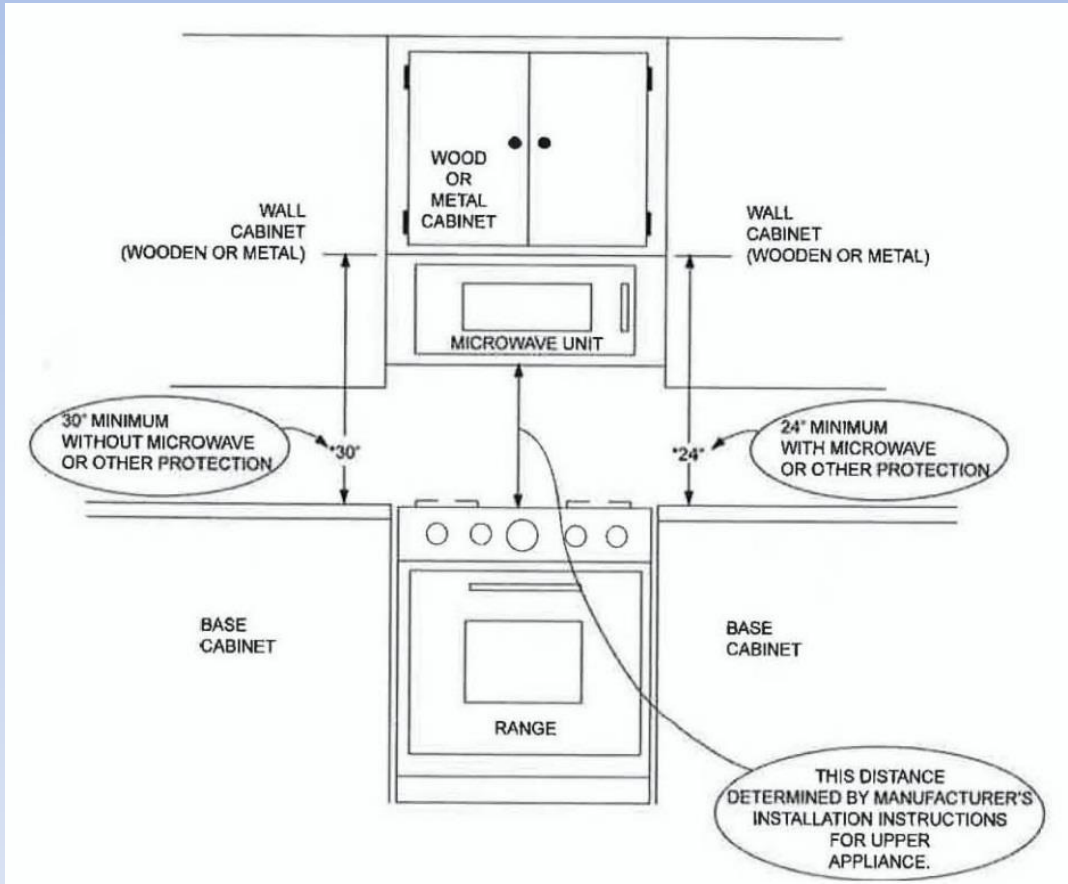


Figure A.10.15.2.1

FR- REVISION

Venting

Plastic pipe used in venting systems

12.5.2 Plastic Piping. ~~Plastic~~ Where plastic piping is used ~~for venting appliances listed for~~ to vent an appliance, the appliance shall be listed for use with such venting materials ~~shall be approved~~ and the appliance manufacturer's installation instructions shall identify the specific plastic piping material .

AHJ approval is removed

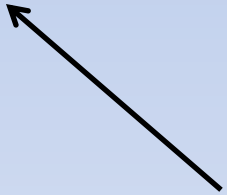
Instructions must ID specific plastic

FR- NEW

Venting

Sizing of Category II, III & IV Vents

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. The sizing of plastic pipe specified by the appliance manufacturer as a venting material for Category II, III and IV appliances shall be in accordance with the appliance manufacturers' instructions.



Added since the vent definition does not cover plastic vents

CI- DELETION

Annex C

Leak Checking

C.3 Leak Check Not Using a Meter. This test can be done using one of the following methods:

(1) *For Any Gas System.* To an appropriate checkpoint, attach a manometer or pressure gauge between the inlet to the piping system and the first regulator in the piping system, momentarily turn on the gas supply, and observe the gauging device for pressure drop with the gas supply shut off. No discernible drop in pressure should occur during a period of 3 minutes.

(2) *For Gas Systems Using Undiluted LP-Gas System Preparation for Propane.* A leak check performed on an LP-Gas system being placed back in service can be performed by using one of the following methods:

(3) By inserting a pressure gauge between the container gas shutoff valve and the first regulator in the system, admitting full container pressure to the system and then closing the container shutoff valve. Enough gas should then be released from the system to lower the pressure gauge reading by 10 psi (69 kPa). The system should then be allowed to stand for 3 minutes without showing an increase or a decrease in the pressure gauge reading.

(4) For systems serving appliances that receive gas at pressures of 1⁄2 psi (3.5 kPa) or less, by inserting a water manometer or pressure gauge into the system downstream of the final system regulator, pressurizing the system with either fuel gas or air to a test pressure of 9 in. w.c. ± 1⁄2 in. w.c. (2.2 kPa ± 0.1 kPa), and observing the device for a pressure change. If fuel gas is used as a pressure source, it is necessary to pressurize the system to full operating pressure, close the container service valve, and then release enough gas from the system through a range burner valve or other suitable means to drop the system pressure to 9 in. w.c. ± 1⁄2 in. w.c. (2.2 kPa ± 0.1 kPa). This ensures that all regulators in the system upstream of the test point are unlocked and that a leak anywhere in the system is communicated to the gauging device. The gauging device should indicate no loss or gain of pressure for a period of 3 minutes.

(5) By inserting a 30 psi (207 kPa) pressure gauge on the downstream side of the first-stage regulator, admitting normal operating pressure to the system and then closing the container valve. Enough pressure should be released from the system to lower the pressure gauge reading by 5 psi (34.5 kPa). The system should be allowed to stand for 3 minutes without showing an increase or a decrease in pressure gauge reading.

Major Issues Currently Resolved

But May Come Back

- CSST Bonding
- Requiring Listing of PVC Vent Material
- Drill/Tap Gas Piping
- Bio Gases

For More Information:

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