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## COMMITTEE ON NATIONAL FUEL GAS CODE

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**DATE:** August 30, 2021  
**TO:** Technical Committee on National Fuel Gas Code (ASC Z223/NFPA 54)  
**FROM:** Frank Mortimer, Chairman  
**SUBJECT:** First Draft Meeting Agenda

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### September 13, 16, 17, 20-24, 27, and 28, 2021

*\* Times shown are Eastern Time*

1:00 PM – 1:15 ..... Call to Order and Self Introductions  
1:15 – 1:20 ..... Adoption of Agenda  
1:20 – 1:30 ..... Announcements  
1:30 – 1:45 ..... NFPA Revision Process Overview  
1:45 – 5:00 ..... Business

- 1. .. Public Inputs
- 2. .. Task Groups
  - a. Industrial Coverage
  - b. Combustion Air and ACH
- 3. .. Safety Recommendation P-19-007 from NTSB
- 4. .. New Business

5:00 PM ..... Adjourn

#### Attachments:

1. Minutes
2. NFPA 54 Committee List
3. Z223 Committee Roster
4. Public Inputs
5. Safety Recommendation P-19-007 from NTSB and correspondence

#### ASC Z223/NFPA 54 Secretary

Luis Escobar ♦ American Gas Association ♦ 400 N. Capitol Street, N.W. ♦ Washington, DC, 20001  
Tel.: 202.824.7058 ♦ Email: [lescobar@aga.org](mailto:lescobar@aga.org) ♦ Fax: 202.824.9122

**Attachment 1**

Second Draft Meeting Minutes

July 8 – 9, 2019, Atlanta, GA

**ASC Z223/NFPA 54 Secretary**

Luis Escobar ♦ American Gas Association ♦ 400 N. Capitol Street, N.W. ♦ Washington, DC, 20001  
Tel.: 202.824.7058 ♦ Email: [lescobar@aga.org](mailto:lescobar@aga.org) ♦ Fax: 202.824.9122

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**COMMITTEE ON NATIONAL FUEL GAS CODE**

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**Minutes****National Fuel Gas Code Committee  
*Omni Atlanta Hotel at CNN Center  
Atlanta, Georgia  
July 8-9, 2019***

1. Call to Order and Self Introductions: Chair, Frank Mortimer, call the meeting to order and members and guests introduced themselves. (See attached attendance)
2. Adoption of Agenda: The agenda was approved as distributed in the 7/1/19 email.
3. Announcements:
  - a. Fire alarms and Exits: Participants were made aware of the fire alarms and exists.
  - b. AGA and NFPA Antitrust Guidelines: Participants were made aware of the antitrust guidelines.
4. Membership Review:
  - a. ASC Z223 Committee Updates – A revised Roster (7-1-19) and committee balance as of 7/1/19 was distributed. The membership roster and interest category balance were reviewed. The committee is in balance in accordance with its operating procedures.
  - b. NFPA 54 Committee Updates – The membership roster was reviewed. The NFPA Standards Council is responsible for maintaining committee balance and was noted that it is in balance.
5. Approval of Committee Meeting Minutes: The November 2018 full committee meetings minutes were approved as distributed.
6. Future Meeting Schedule: The proposed 2019-2020 meeting schedule was reviewed. The committee discussed the need for an off-cycle meeting typically held after the publication of the new edition. The committee determined that the Secretary should hold the suggested November 17-18, 2020, date on the schedule and coordinate with the Chair and NFPA staff as to whether there are enough agenda topics to convene the meeting. The Secretary is also to coordinate with the Chair, based on the future NFPA 54 public input due date, the meeting dates for the 2021 advisory panels and full committee meetings. These meetings are typically held in the fall. The committee suggested a western U.S. location for the next full committee meeting.
7. The NFPA staff liaison provided a presentation on the review process and the allowed motion options.

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**COMMITTEE ON NATIONAL FUEL GAS CODE**

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8. Consideration of Public Comment: The committee reviewed and acted on all public comments and developed Second Revisions. The committee actions that result in a second revisions will be the standing action on the letter ballot. Approved actions from the letter ballot will be incorporated into the Second Draft Report. The ASC Z223 committee will placed out for public comment any changes from the First Draft and process any comments in accordance with their operating procedures. NFPA membership will be able to review the Second Draft report and be provided with the opportunity to submit NITMANs for discussion at the NFPA Technical section in 2020. Refer to [www.nfpa.org/54](http://www.nfpa.org/54) or [www.aga.org/nfgc](http://www.aga.org/nfgc) for the Second Revisions Report and for the Report on Public Comments.
9. Other Discussions: The committee discussed the following issues:
  - A. Replacement Table 6.3.1(d) – The committee approved a second draft revision to replace the current propane pipe sizing table 6.3.1(d) with a corrected version as provided in the meeting materials. It was discovered that the current table is missing pipe length rows 70 ft and 90 ft, and the capacities shown in the table greater than 60 ft are overstated. The reason for this was when all piping tables were recalculated for the 2006 edition’s expanded length tables, the capacities were directly copied from an Excel spreadsheet that had the 70 ft and 90 ft increment, resulting in the incorrect assignment of capacities above 60 ft.
  - B. NTSB Recommendation on Methane Detectors – Provided in the meeting materials was the preliminary NTSB report provided at their April 23, 2019, public meeting on the building and explosion and fire that occurred in Silver Spring, MD on August 10, 2016. NFPA reported that they have received a letter from NTSB that includes their recommendation that NFPA 54 adopt an installation requirement for methane detectors in all residential buildings. NFPA reported that they have are in the process of forming a new standards committee to develop an installation standard for methane detectors. NFPA is coordinating with GTI and others on the standard’s development. It was also reported that the Fire Protection Research Foundation in sponsorship with the American Gas Association is initiating a research project to examine detector performance and their placement within occupancies. There was consensus that NFPA 54 may not be the appropriate standard to address the installation of methane detectors. It was noted that other model building and fire safety code committees have the expertise to determine detector installation effectiveness such as was done for carbon monoxide, smoke, and radon.
  - C. Possible Panel Projects
    - a. Industrial Coverage – The committee discussed the need to establish some or all installation requirements for industrial applications separately from residential and commercial requirements. Many requirements appropriate for residential and commercial installations may also impact industrial installation but may not be appropriate. There may be a need for more focused industrial coverage can be

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## COMMITTEE ON NATIONAL FUEL GAS CODE

separated in separate sections or chapters. A Task Group was formed with Franklin Switzer (Chair), Mike Gorham, Gregg Gress, Ted Lemoff, and Andy Thielen. The Task Group was charged to identify the requirements within 54 that may need to be revised to accommodate industrial applications and to draft coverage. Franklin is to develop a work statement and forward to Frank Mortimer for review. Two documents were mentioned that might be of use include the discontinued NFPA 54A and the current Canadian B149.3.

- b. Possible Combining Sections 10.15 Illuminating, and 10.31 Outdoor Decorative Appliances – The Appliance Panel was assigned the task to consider if section 10.15 and 10.31 could be either combined or located near each other. An initial review by the Panel’s Chair found that these are appliances are sufficiently different and do not need to be combined. Appliance panel to review further.
  - c. NFPA Data – Home Cooking Fires – A committee member is asking whether there is there interest in reviewing NFPA home cooking fires reports and if so to request the NFPA Fire Analysis Department to develop a report in time for the next Appliance Panel meeting. It was noted that the NFPA statistics include outdoor grill fires and may overstate the number of actual gas in-house home fires. UL reported that they have formed a task group to explore the issue. With UL task group underway the committee determined that there is no need to pursue a sperate action.
  - d. Combustion Air and ACH – There may be a need to revisit the combustion air requirements to link it to commonly used blower door testing procedures and ASHRAE published air change factors. A Task Group is formed including: Thomas Andrew, Jim Brewer, Paul Cabot, Diane Jakobs, and Andy Thielen. Chair charged the TG to bring a plan to the next committee meeting.
10. New Business: No new business was raised. The committee thanked Secretary Cabot for his dedication and service prior to his early 2020 retirement.
11. Adjourn: The meeting was adjourned at 9:30AM on July 9.

## NFPA 54 Second Draft Meeting Attendance

July 8 – 9, 2019

### Committee Members in Attendance:

Frank Mortimer, Chair	Alex Ing, NFPA Staff Liaison
Paul Cabot, Recording Secretary	Thomas Andrews
Jonathan Brania	James Brewer
Thomas Crane	Gerald Davis
Mike Deegan	Mark Fasel
Richard Gilbert	Enrique Gonzalez
Mike Gorham	Gregg Gress
Roger Griffith	Peter Holmes
Diane Jakobs	Jeff Kleiss
Theodore Lemoff	Andrea Papageorge
Phillip Ribbs	April Richardson
Eric Smith	Jason Stanek
Franklin Switzer	Kody Daniel
Ralph Euchner	Pennie Feehan
Jean McDowell	John Puskar
Phillip Stephens	Bruce Swiecicki
Andy Thielen	Kent Thompson
Robert Torbin	Marek Kulik

### Guests in Attendance:

Chris Byer, Piedmont Natural Gas	Paul Gugliotta, National Grid
Jim Ranfone, AGA	Kent Thompson, Railroad Commission of Texas
Bill Stultz, EMC Insurance	Matthew Knotts, Piedmont Natural Gas
Shannon Corcoran, AHRI	Jonathan Sargeant, Omegaflex
Larry Gill, Ipex USA LLC	Matthew Tocci, Ipex USA LLC
Gaetano Altomave, Ipex USA LLC	

**Attachment 2**

**NFPA 54 Committee List**

**ASC Z223/NFPA 54 Secretary**

Luis Escobar ♦ American Gas Association ♦ 400 N. Capitol Street, N.W. ♦ Washington, DC, 20001  
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# Address List No Phone

08/30/2021

Alex Ing

## National Fuel Gas Code

**NFG-AAA**

<b>Frank J. Mortimer</b> <b>Chair</b> American Property Casualty Insurance Association (APCI) /EMC Insurance Company 717 Mulberry Street PO Box 712 Des Moines, IA 50303-0712 <b>Alternate: Kody N. Daniel</b>	<b>I 07/29/2013</b> <b>NFG-AAA</b>	<b>Luis Romeo Escobar</b> <b>Recording Secretary (NV)</b> American Gas Association 400 N. Capitol Street NW, #450 Washington, DC 20001	<b>IM 04/02/2020</b> <b>NFG-AAA</b>
<b>Thomas J. Andrews</b> <b>Principal</b> Michigan Technical Education Center 235 S. Grand Avenue, #1105 Lansing, MI 48909	<b>SE 04/03/2019</b> <b>NFG-AAA</b>	<b>Michael W. Bethany</b> <b>Principal</b> Gas Piping Safety Services (GPSS) 1088 Brookpoint Drive Medina, OH 44256	<b>SE 04/02/2020</b> <b>NFG-AAA</b>
<b>Jonathan Brania</b> <b>Principal</b> UL LLC 12 Laboratory Drive Research Triangle Park, NC 27709-3995 <b>Alternate: Travis F. Hardin</b>	<b>RT 12/08/2015</b> <b>NFG-AAA</b>	<b>James P. Brewer</b> <b>Principal</b> Rooftop Safety USA LLC 1812 Haby Lane Virginia Beach, VA 23464 <b>National Chimney Sweep Guild</b>	<b>IM 01/01/1990</b> <b>NFG-AAA</b>
<b>Charles R. Brown</b> <b>Principal</b> AEI Corporation 8197 W. Brandon Drive Littleton, CO 80125 <b>Alternate: Zachary John Jason</b>	<b>SE 08/11/2020</b> <b>NFG-AAA</b>	<b>Chris Dale Byers</b> <b>Principal</b> Piedmont Natural Gas 100 Woodruff Industrial Lane Greenville, SC 29607	<b>U 12/06/2019</b> <b>NFG-AAA</b>
<b>Thomas R. Crane</b> <b>Principal</b> Crane Engineering 2355 Polaris Lane North Suite 120 Plymouth, MN 55447 <b>Alternate: Andy John Thielen</b>	<b>SE 4/17/1998</b> <b>NFG-AAA</b>	<b>Gerald G. Davis</b> <b>Principal</b> Williams Meter Company 7930 Cryden Way, Suite 100 Forestville, MD 20747	<b>IM 8/9/2012</b> <b>NFG-AAA</b>
<b>Mark Fasel</b> <b>Principal</b> Viega LLC 7338 Jackie Court Indianapolis, IN 46221 <b>Alternate: Lisa Reiheld</b>	<b>M 04/05/2016</b> <b>NFG-AAA</b>	<b>Alberto Jose Fossa</b> <b>Principal</b> NEWEN Creative Engineering Rua Caropá 72 Vila Madalena, SP 05447-000 Brazil <b>NFPA Latin American Section</b>	<b>SE 10/4/2001</b> <b>NFG-AAA</b>
<b>Richard L. Gilbert</b> <b>Principal</b> Texas Propane Gas Association 705 North Jackson Avenue Livingston, TX 77351 <b>Alternate: Jean L. McDowell</b>	<b>IM 1/10/2002</b> <b>NFG-AAA</b>		



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## National Fuel Gas Code

**NFG-AAA**

<b>Enrique Trejo Gonzalez</b> <b>Principal</b> International Association of Plumbing & Mechanical Officials (IAPMO) Senior Code Development Administrator 4755 East Philadelphia Street Ontario, CA 91761 <b>International Association of Plumbing &amp; Mechanical Officials</b> <b>Alternate: Hugo Aguilar</b>	<b>E</b> 04/04/2017 <b>NFG-AAA</b>	<b>Mike Gorham</b> <b>Principal</b> Northwest Gas Company 1608 NW 4th Street Grand Rapids, MN 55744 <b>National Propane Gas Association</b> <b>Alternate: Bruce J. Swiecicki</b>	<b>IM</b> 1/1/1991 <b>NFG-AAA</b>
<b>Roger W. Griffith</b> <b>Principal</b> Griffith Engineering P.O. Box 702 Jefferson City, TN 37760	<b>U</b> 08/03/2016 <b>NFG-AAA</b>	<b>Adam Habegger</b> <b>Principal</b> Van-Packer Company 302 Mill Street Buda, IL 61314	<b>M</b> 04/14/2021 <b>NFG-AAA</b>
<b>Steen Hagensen</b> <b>Principal</b> ENERVEX 1685 Bluegrass Lakes Parkway Alpharetta, GA 30004	<b>M</b> 1/16/1998 <b>NFG-AAA</b>	<b>William T. Hamilton</b> <b>Principal</b> UGI Utilities Inc. 225 Morgantown Road P.O. Box 13009 Reading, PA 19612-3009 <b>American Gas Association</b> Northwest	<b>IM</b> 04/05/2016 <b>NFG-AAA</b>
<b>Peter T. Holmes</b> <b>Principal</b> Maine Fuel Board 35 State House Station Augusta, ME 04333-0035 <b>Alternate: John P. Doucette</b>	<b>E</b> 9/30/2004 <b>NFG-AAA</b>	<b>Nasir Hussain</b> <b>Principal</b> Combustion Science & Engineering, Inc. 8940 Old Annapolis Road Suite L Columbia, MD 21045 <b>Alternate: Haavard Boehmer</b>	<b>SE</b> 04/02/2020 <b>NFG-AAA</b>
<b>Zuhair M. Ibrahim</b> <b>Principal</b> Ibrahim & Associates LLC 22647 Ventura Boulevard #432 Woodland Hills, CA 91364	<b>SE</b> 04/02/2020 <b>NFG-AAA</b>	<b>Diane Jakobs</b> <b>Principal</b> Rheem 5600 Old Greenwood Road Fort Smith, AR 72921 <b>Air-Conditioning, Heating, &amp; Refrigeration Institute</b> Central Heating <b>Alternate: Robert Torbin</b>	<b>M</b> 04/03/2019 <b>NFG-AAA</b>
<b>James Kendzel</b> <b>Principal</b> American Supply Association 1200 N. Arlington Heights Rd #150 Itasca, IL 60143	<b>U</b> 08/08/2019 <b>NFG-AAA</b>		

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**NFG-AAA**

<b>Jeff Kleiss</b> <b>Principal</b> Lochinvar 300 Maddox Simpson Parkway Lebanon, TN 37090 <b>Air-Conditioning, Heating, &amp; Refrigeration Institute</b> Water Heating <b>Alternate: Phillip W. Stephens</b>	<b>M</b> 04/03/2019 <b>NFG-AAA</b>	<b>Marek Kulik</b> <b>Principal</b> Technical Standards and Safety Authority Fuels Safety Program 345 Carlingview Drive Toronto, ON M9W 6N9 Canada	<b>E</b> 08/17/2015 <b>NFG-AAA</b>
<b>Theodore C. Lemoff</b> <b>Principal</b> TLemoff Engineering 13821 Callisto Avenue Naples, FL 34109-0574 <b>Alternate: John R. Puskar</b>	<b>SE</b> 10/18/2011 <b>NFG-AAA</b>	<b>Timothy McNulty</b> <b>Principal</b> RM Manifold Group Inc., dba US Draft Company 220 South Sylvania Avenue Suite 207 Fort Worth, TX 76111	<b>M</b> 08/08/2019 <b>NFG-AAA</b>
<b>William J Murray</b> <b>Principal</b> Corning Incorporated 30 Foothill Road Elmira, NY 14903 <b>Alternate: Jeremy R Conjura</b>	<b>U</b> 08/08/2019 <b>NFG-AAA</b>	<b>Tung Nguyen</b> <b>Principal</b> Emerson Automation Solution 3200 Emerson Way McKinney, TX 75071	<b>M</b> 04/11/2018 <b>NFG-AAA</b>
<b>Andrea Lanier Papageorge</b> <b>Principal</b> Southern Company Gas Manager, Codes and Standards 10 Peachtree Place Location 1367 Atlanta, GA 30309 <b>American Gas Association</b> Eastern <b>Alternate: Ralph Euchner</b>	<b>IM</b> 7/23/2008 <b>NFG-AAA</b>	<b>Phillip H. Ribbs</b> <b>Principal</b> PHR Consultants 206 Cypress Park Santa Cruz, CA 95060 <b>California State Pipe Trades Council</b>	<b>L</b> 10/23/2003 <b>NFG-AAA</b>
<b>April Dawn Richardson</b> <b>Principal</b> Railroad Commission of Texas 1701 North Congress Avenue PO Box 12967 Austin, TX 78711 <b>Alternate: Kent Lowery Thompson</b>	<b>E</b> 12/08/2015 <b>NFG-AAA</b>	<b>Jon Scott Russell</b> <b>Principal</b> Clearwater Gas System 777 Maple Street Clearwater, FL 33755 <b>American Public Gas Association</b>	<b>U</b> 12/02/2020 <b>NFG-AAA</b>
<b>Brian Ryglewicz</b> <b>Principal</b> Chimney Design Solutions Inc. 649 Lafayette Avenue, Suite 3 Hawthorne, NJ 07506	<b>M</b> 08/08/2019 <b>NFG-AAA</b>	<b>Joel E. Sipe</b> <b>Principal</b> Exponent, Inc. 3824 Ardley Avenue Oakland, CA 94602	<b>SE</b> 08/24/2021 <b>NFG-AAA</b>

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## National Fuel Gas Code

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<b>Eric C. Smith</b> <b>Principal</b> State of Nevada Nevada LP-Gas Board PO Box 338 Carson City, NV 89702 <b>International Fire Marshals Association</b>	<b>E 03/07/2013</b> <b>NFG-AAA</b>	<b>Jason Stanek</b> <b>Principal</b> Metropolitan Utilities District (MUD) 3100 South 61st Avenue Omaha, NE 68106 <b>American Gas Association</b> Southwest	<b>IM 04/05/2016</b> <b>NFG-AAA</b>
<b>Franklin R. Switzer, Jr.</b> <b>Principal</b> S-afe, Inc. P.O. Box 404 Big Flats, NY 14814-0404	<b>SE 8/5/2009</b> <b>NFG-AAA</b>	<b>Pennie L. Feehan</b> <b>Voting Alternate</b> Pennie L. Feehan Consulting 1997 S. Camino Real Palm Springs, CA 92264 <b>Copper Development Association Inc.</b>	<b>M 10/20/2010</b> <b>NFG-AAA</b>
<b>Fred Grable</b> <b>Voting Alternate</b> International Code Council 4051 West Flossmoor Road Country Club Hills, IL 60478 <b>International Code Council</b>	<b>E 10/29/2012</b> <b>NFG-AAA</b>	<b>John Kory</b> <b>Voting Alternate</b> CSA America, Inc. 8501 East Pleasant Valley Road Independence, OH 44131-5516	<b>RT 03/05/2012</b> <b>NFG-AAA</b>
<b>Hugo Aguilar</b> <b>Alternate</b> International Association of Plumbing & Mechanical Officials (IAPMO) 5001 East Philadelphia Street Ontario, CA 91761 <b>Principal: Enrique Trejo Gonzalez</b>	<b>E 04/03/2019</b> <b>NFG-AAA</b>	<b>Haavard Boehmer</b> <b>Alternate</b> Combustion Science and Engineering 8940 Old Annapolis Road Suite L Columbia, MD 21043 <b>Principal: Nasir Hussain</b>	<b>SE 08/11/2020</b> <b>NFG-AAA</b>
<b>Jeremy R Conjura</b> <b>Alternate</b> Corning Incorporated 11773 Lower Drive Corning, NY 14830 <b>Principal: William J Murray</b>	<b>U 08/08/2019</b> <b>NFG-AAA</b>	<b>Kody N. Daniel</b> <b>Alternate</b> American Property Casualty Insurance Association (APCI) /EMC Insurance Companies 717 Mulberry Street Des Moines, IA 50309-3810 <b>Principal: Frank J. Mortimer</b>	<b>I 04/08/2015</b> <b>NFG-AAA</b>
<b>John P. Doucette</b> <b>Alternate</b> State of CT Department of Administrative Services Office of State Fire Marshal 450 Columbus Boulevard Suite 1304 Hartford, CT 06103 <b>Principal: Peter T. Holmes</b>	<b>E 1/16/1998</b> <b>NFG-AAA</b>	<b>Ralph Euchner</b> <b>Alternate</b> PSNC Energy 800 Gaston Road Gastonia, NC 28506 <b>American Gas Association</b> Eastern <b>Principal: Andrea Lanier Papageorge</b>	<b>IM 12/07/2018</b> <b>NFG-AAA</b>

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08/30/2021

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## National Fuel Gas Code

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<b>Travis F. Hardin</b>	<b>RT 04/03/2019</b>	<b>Zachary John Jason</b>	<b>SE 08/24/2021</b>
<b>Alternate</b> UL LLC 12 Laboratory Drive Research Triangle Park, NC 27709-0163 <b>Principal: Jonathan Brania</b>	<b>NFG-AAA</b>	<b>Alternate</b> Advanced Engineering Investigations Corporation (AEI Corporation) 8197 West Brandon Drive Littleton, CO 80125 <b>Principal: Charles R. Brown</b>	<b>NFG-AAA</b>
<b>Jean L. McDowell</b>	<b>IM 04/03/2019</b>	<b>John R. Puskar</b>	<b>SE 08/17/2017</b>
<b>Alternate</b> McDowell Owens Engineering Inc. 740 East 13th Street Houston, TX 77008 <b>Texas Propane Gas Association</b> <b>Principal: Richard L. Gilbert</b>	<b>NFG-AAA</b>	<b>Alternate</b> Prescient Technical Services LLC 2078 Ridge Road Hinckley, OH 44233 <b>Principal: Theodore C. Lemoff</b>	<b>NFG-AAA</b>
<b>Lisa Reiheld</b>	<b>M 12/02/2020</b>	<b>Phillip W. Stephens</b>	<b>M 04/03/2019</b>
<b>Alternate</b> Viega LLC 282 Stone Meadow Circle Loudonville, OH 44842 <b>Principal: Mark Fasel</b>	<b>NFG-AAA</b>	<b>Alternate</b> Weil Mclain 500 Blaine Street Michigan City, IN 46360 <b>Air-Conditioning, Heating, &amp; Refrigeration Institute</b> Water Heating <b>Principal: Jeff Kleiss</b>	<b>NFG-AAA</b>
<b>Bruce J. Swiecicki</b>	<b>IM 1/1/1995</b>	<b>Andy John Thielen</b>	<b>SE 04/03/2019</b>
<b>Alternate</b> National Propane Gas Association 19530 Southfield Lane Tinley Park, IL 60487 <b>National Propane Gas Association</b> <b>Principal: Mike Gorham</b>	<b>NFG-AAA</b>	<b>Alternate</b> Crane Engineering 2355 Polaris Lane North Suite 120 Plymouth, MN 55447 <b>Principal: Thomas R. Crane</b>	<b>NFG-AAA</b>
<b>Kent Lowery Thompson</b>	<b>E 12/07/2018</b>	<b>Robert Torbin</b>	<b>M 04/03/2019</b>
<b>Alternate</b> Railroad Commission Of Texas Po Box 12967 Austin, TX 78711-2967 <b>Principal: April Dawn Richardson</b>	<b>NFG-AAA</b>	<b>Alternate</b> Omega Flex, Inc. 70 Flanagan Drive Framingham, MA 01701 <b>Air-Conditioning, Heating, &amp; Refrigeration Institute</b> Central Heating <b>Principal: Diane Jakobs</b>	<b>NFG-AAA</b>
<b>Alex Ing</b>			
<b>Staff Liaison</b> National Fire Protection Association One Batterymarch Park Quincy, MA 02169	<b>NFG-AAA</b>		

**Attachment 3**

**Z223 Committee Roster**

**ASC Z223/NFPA 54 Secretary**

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# **ROSTER**

**7/21/2021**

Z223

**ACCREDITED STANDARDS COMMITTEE ON  
NATIONAL FUEL GAS CODE, Z223**

**SCOPE:** Development of a safety code for gas piping systems on consumers' premises and the installation of gas utilization equipment and accessories for use with fuel gases such as natural gas, manufactured gas, liquefied petroleum gas in the vapor phase, liquefied petroleum gas-air mixtures, or mixtures of these gases, including:

- a. The design, fabrication, installation, testing, operation and maintenance of gas piping systems from the point of delivery to the connections with each gas utilization device. Piping systems covered by this code are limited to a maximum operating pressure of 125 psig. For purposes of this code, the point of delivery is defined as the outlet of the meter set assembly or the outlet of the service regulator or service shutoff valve where no meter is provided.
- b. The installation of gas utilization equipment, related accessories, and their combustion air and venting systems.

**CHAIRMAN:** Frank Mortimer

**ADMINISTRATIVE SECRETARIAT:** Luis Romeo Escobar

**NFPA LIAISON:** Alex Ing

Year Appointed	Name and Company	Membership Category	Term Expiration Date
<b>Air-Conditioning, Heating and Refrigeration Institute</b>			
2020	<b>Shannon Corcoran</b> Lead Regulatory Advisor Air-conditioning, Heating, & Refrigeration Institute 2311 Wilson Blvd, Suite 400, Arlington, VA 22201 703-293-4864 <a href="mailto:scorcoran@ahrinet.org">scorcoran@ahrinet.org</a>	M	None
2018	<b>Diane Jakobs, PhD</b> Manager, Regulatory & Technical Affairs Rheem Manufacturing Company 5600 Old Greenwood Road P.O. Box 17010 Fort Smith, AR 72908 479.648.4114 <a href="mailto:diane.jakobs@rheem.com">diane.jakobs@rheem.com</a>	M	12/31/21
2017	<b>Jeff Kleiss</b> Product Certification Engineer Lockinvar, LLC 300 Maddox Simpson Pkwy Lebanon, TN 37090 615.889.8900 x2224 <a href="mailto:jkleiss@lochinvar.com">jkleiss@lochinvar.com</a>	M	12/31/21

Year Appointed	Name and Company	Membership Category	Term Expiration Date
2017	<b>Phillip Stephens</b> Engineering Regulatory and Compliance Manager Weil-McLain 500 Blaine Street Michigan City, Indiana 46360 219.873.0446 <a href="mailto:pstephens@weil-mclain.com">pstephens@weil-mclain.com</a>	M	12/31/20
2017	<b>Robert Torbin</b> Director of Codes and Standards Omega Flex Inc. 213 Court Street Suite 701 Middletown, CT 06457 508.877.9239 <a href="mailto:bob.torbin@omegaflex.net">bob.torbin@omegaflex.net</a>	M	12/31/20
<b>American Gas Association</b>			
2019	<b>Christopher Byers</b> Manager CNG Design, Construction, and Operations Piedmont Natural Gas Company, Inc. 1712 Three and Twenty Road Easley, SC 29642 864.286.7909 <a href="mailto:christopher.byers@duke-energy.com">christopher.byers@duke-energy.com</a>	ES	06/30/22
2007	<b>Andrea L. Papageorge</b> Manager, Building and Gas Codes and Standards Southern Company Gas Ten Peachtree Place, 17 <sup>th</sup> Floor Atlanta, GA 30309 404.584.3756 <a href="mailto:apapageo@southernco.com">apapageo@southernco.com</a>	ES	06/30/24
2020	<b>Ralph E. Euchner</b> Operations Manager PSNC Energy, A SCANA Company 800 Gaston Road Gastonia, NC 28056 704.810.3331 <a href="mailto:reuchner@scana.com">reuchner@scana.com</a>	ES	6/30/23
2015	<b>Jason S. Stanek</b> Director, Commercial & Contractor Services Metropolitan Utilities District 1723 Harney Street Omaha, NE 68102-1960 402.504.7983 <a href="mailto:Jason_stanek@mudnebr.com">Jason_stanek@mudnebr.com</a>	ES	6/30/24



Year Appointed	Name and Company	Membership Category	Term Expiration Date
2020	<u>Alternate 1</u> <b>Stan Smith</b> Comm. Compliance & Installation Manager Oak Ridge Utility District PO Box 4189 Oak Ridge, TN 37830 865.220.6064 <a href="mailto:ssmith@orud.org">ssmith@orud.org</a>	ES	6/30/23
2018	<u>Alternate 2</u> <b>Paul Gugliotta</b> Senior Engineer National Grid 175 East Old Country Road Hicksville, NY 11801-4257 516.545.3841 <a href="mailto:Paul.Gugliotta@nationalgrid.com">Paul.Gugliotta@nationalgrid.com</a>	ES	6/30/24
<b>American Public Gas Association</b>			
2020	<b>Jon Russell</b> Safety & Regulatory Compliance Manager Clearwater Gas System 777 Maple St Clearwater, FL 33755 727.562.4900 x7434 <a href="mailto:johnscott.russell@myclearwater.com">johnscott.russell@myclearwater.com</a>	ES	None
<b>Association of Home Appliance Manufacturers</b>			
2016	<b>Matthew B. Williams</b> Director, Standards Association of Home Appliance Manufacturers 1111 19 <sup>th</sup> St NW, Suite 402 Washington, DC 20036 202.872.5955 x317 <a href="mailto:mwilliams@aham.org">mwilliams@aham.org</a>	M	None
<b>Copper Development Association</b>			
2010	<b>Pennie L. Feehan</b> Pennie L. Feehan Consulting Plumbing & Mechanical Codes & Standards Specialist 2393 S Brentwood Dr. Palm Springs, CA 92264 760.980.0830 <a href="mailto:penniefeehan@me.com">penniefeehan@me.com</a>	M	None

Year Appointed	Name and Company	Membership Category	Term Expiration Date
2020	<u>Alternate</u> <b>Andrew G. Kireta, Jr.</b> Vice President Copper Development Association P.O. Box 940 Franklin, IN 46131 317.346.6442 <a href="mailto:andy.kiretajr@copperalliance.us">andy.kiretajr@copperalliance.us</a>	M	None
<b>Hearth, Patio &amp; Barbecue Association</b>			
2019	<b>Eric Adair, P.E.</b> Sr. Manager - Codes & Standards Hearth, Patio & Barbecue Association 1901 N Moore St Suite 600 Arlington, VA 22209 707.694.1057 <a href="mailto:adair@hpba.org">adair@hpba.org</a>	M	None
<b>International Association of Plumbing and Mechanical Officials</b>			
2017	<b>Enrique Trejo Gonzalez</b> Senior Code Development Administrator 4755 E. Philadelphia Street Ontario, CA 91761 909.230.5535 <a href="mailto:enrique.gonzalez@iapmo.org">enrique.gonzalez@iapmo.org</a>	EA	None
2017	<u>Alternate</u> <b>Hugo Aguilar, P.E.</b> Vice President of Codes and Standards 4755 E. Philadelphia Street Ontario, CA 91761 909.472.4111 <a href="mailto:hugo.aguilar@iapmo.org">hugo.aguilar@iapmo.org</a>	EA	None
<b>International Code Council</b>			
2021	<b>Gregg Gress</b> Consultant International Code Council 8448 S 100 W North Judson, IN 46366 202.603.0792 <a href="mailto:greggagress@gmail.com">greggagress@gmail.com</a>	EA	None
2020	<u>Alternate</u> <b>LaToya Carraway</b> Technical Staff International Code Council 888.422.7233 x4347 <a href="mailto:lcarraway@iccsafe.org">lcarraway@iccsafe.org</a>	EA	None

Year Appointed	Name and Company	Membership Category	Term Expiration Date
<b>International Fire Marshals Association</b>			
2016	<b>Eric C. Smith</b> Chief Inspector Nevada LP-Gas Board PO Box 338 Carson City, NV 89702 <a href="mailto:chiefinspector@nvlpgasboard.com">chiefinspector@nvlpgasboard.com</a>	EA	None
<b>National Association of Home Builders</b>			
2021	<b>Daniel Buuck</b> Senior Program Manager, Codes and Standards National Association of Home Builders 1201 15th Street, NW Washington, DC 20005 202.266.8366 <a href="mailto:dbuuck@nahb.org">dbuuck@nahb.org</a>	I-M	None
2019	<u>Alternate</u> <b>Vladimir Kochkin</b> Director, Codes and Standards National Association of Home Builders 1201 15th Street, NW Washington, DC 20005 202.266.8574 <a href="mailto:vkochkin@nahb.org">vkochkin@nahb.org</a>	I-M	None
<b>National Chimney Sweep Guild</b>			
1990	<b>Jim P. Brewer</b> President Magic Sweep Corporation 1812 Haby Lane Virginia Beach, VA 23464 757.435.0407 <a href="mailto:jbrewer@magic-sweep.com">jbrewer@magic-sweep.com</a>	I-M	None
<b>National Fire Protection Association</b>			
2019	<b>Alex Ing</b> Associate Engineer National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7954 617.984.7707 <a href="mailto:AIng@nfpa.org">AIng@nfpa.org</a>	NFPA Staff Liaison	None
<b>National Propane Gas Association</b>			
1990	<b>Michael R. Gorham</b> Northwest LP-Gas Company 1608 NW 4 Street Grand Rapids, MN 55744-2104 612.390.5619 <a href="mailto:mike@nwgas.com">mike@nwgas.com</a>	ES	None

Year Appointed	Name and Company	Membership Category	Term Expiration Date
1994	<u>Alternate</u> <b>Bruce Swiecicki, PE</b> Senior Technical Advisor National Propane Gas Association 342 N. LaGrange Road Suite 353 Frankfort, IL 60423 815.806.9035 <a href="mailto:bswecicki@npga.org">bswecicki@npga.org</a>	ES	None
<b>Organizations and Individuals</b>			
2018	<b>Thomas Andrews</b> MiTEC Deputy Director / Technical Educator Michigan Technical Education Center 235 S Grand Avenue Lansing, MI 48999 517.256.5810 <a href="mailto:andrewst3@michigan.gov">andrewst3@michigan.gov</a>	SE	None
2011	<b>Dmitry Antonov</b> Engineering Team Leader Intertek Testing Services NA Inc. 3933 US Route 11 South Cortland, NY 13045-9715 607.758.6460 <a href="mailto:dmitry.antonov@intertek.com">dmitry.antonov@intertek.com</a>	AR-TL	None
2019	<b>Michael Bethany, PE</b> President Gas Piping Safety Service 1088 Brookpoint Drive Medina, OH 44256 440.590.6771 <a href="mailto:mike.bethany@gaspipingsafetyservices.com">mike.bethany@gaspipingsafetyservices.com</a>	SE	None
2016	<b>Jonathan Brania</b> Principal Engineer Underwriters Laboratories LLC 12 Laboratory Drive Research Triangle Park, NC 27709-3995 919.549.1768 <a href="mailto:jonathan.brania@ul.com">jonathan.brania@ul.com</a>	AR-TL	None
2019	<u>Alternate</u> <b>Travis Hardin</b> Principal Engineer Manager Underwriters Laboratories LLC 12 Laboratory Drive Research Triangle Park, NC 27709 919.549.1670 <a href="mailto:travis.f.hardin@ul.com">travis.f.hardin@ul.com</a>	AR-TL	None

Year Appointed	Name and Company	Membership Category	Term Expiration Date
1998	<p><b>Thomas R. Crane</b>  President  Crane Engineering  2355 Polaris Lane North  Suite 120  Plymouth, MN 55447  763.557.9090  <a href="mailto:trcrane@engsys.com">trcrane@engsys.com</a></p>	SE	None
2017	<p><u>Alternate</u>  <b>Andy Thielen</b>  Senior Managing Consultant/P.E.  2355 Polaris Lane North  Suite 120  Plymouth, MN 55447  763.447.2751  <a href="mailto:aithielen@engsys.com">aithielen@engsys.com</a></p>	SE	None
2017	<p><b>Mark Fasel</b>  Codes and Standards Manager  Viega LLC  7338 Jackie Court  Indianapolis, IN 46221  317.447.2956  <a href="mailto:mark.fasel@viega.us">mark.fasel@viega.us</a></p>	M	None
1998	<p><b>Steen Hagensen</b>  President &amp; CEO  ENERVEX Inc.  1685 Bluegrass Lakes Parkway  Alpharetta, GA 30004  770.587.3238  <a href="mailto:steenh@enervex.com">steenh@enervex.com</a></p>	M	None
2019	<p><b>Peter Holmes</b>  Sr. Inspector  Maine Fuel Board  35 State House Station  Augusta, ME 04333  207.446.2826  <a href="mailto:peter.t.holmes@maine.gov">peter.t.holmes@maine.gov</a></p>	EA	None
2011	<p><b>Theodore C. Lemoff</b>  Consultant  13821 Callisto Avenue  Naples, FL 34109  617.308.0159  <a href="mailto:tlemoffengineering@gmail.com">tlemoffengineering@gmail.com</a></p>	SE	None



Year Appointed	Name and Company	Membership Category	Term Expiration Date
<b>Railroad Commission of Texas</b>			
2017	<b>April Dawn Richardson</b> Alternative Fuels Safety Director Railroad Commission of Texas 1701 North Congress Wm. B. Travis State Office Building Austin, TX 78711 512.463.3935 <a href="mailto:april.richardson@rrc.texas.gov">april.richardson@rrc.texas.gov</a>	EA	None
2019	<u>Alternate</u> <b>Kent Lowery Thompson</b> Safety Specialist, Licensing and Compliance Manager Alternative Fuels Safety Railroad Commission of Texas P.O. Box 12967 Austin, TX 78711-2967 512.936.4146 <a href="mailto:Kent.thompson@rrc.texas.gov">Kent.thompson@rrc.texas.gov</a>	EA	None
<b>State of Connecticut - Office of State Fire Marshal</b>			
1998	<b>John P Doucette</b> Fire and Life Safety Specialist State of Connecticut DAS Office of State Fire Marshal 450 Columbus Boulevard, Suite 1304 Hartford, CT 06103 860.713.5057 <a href="mailto:john.doucette@ct.gov">john.doucette@ct.gov</a>	EA	None
<b>Texas Propane Gas Association</b>			
2019	<b>Richard Gilbert</b> Senior Technical Advisor Texas Propane Gas Association 705 N. Jackson Ave Livingston, TX 77351 936.328.4070 <a href="mailto:Richardgilbert5970@yahoo.com">Richardgilbert5970@yahoo.com</a>	ES	None
2019	<u>Alternate</u> <b>Jean McDowell</b> President McDowell Owens Engineering, Inc. 740 E 13 <sup>th</sup> Street Houston, TX 77008 713.299.7275 <a href="mailto:j.mcdowell@mcdowellowens.com">j.mcdowell@mcdowellowens.com</a>	ES	None

## MEMBERSHIP BY CATEGORY

To ensure a substantial balance of interests on the Committee, not more than one third of the membership shall come from any one classification.

	<b>TOTAL</b>	<b>%</b>
<b>Applied Research/Testing Laboratory (AR-TL):</b>	<b>3</b>	<b>9</b>
<b>Energy Supplier (ES):</b>	<b>7</b>	<b>21</b>
<b>Enforcing Authority (EA):</b>	<b>8</b>	<b>18</b>
<b>Installer/Maintainer (I-M):</b>	<b>2</b>	<b>6</b>
<b>Insurance (I):</b>	<b>1</b>	<b>3</b>
<b>Manufacturers (M):</b>	<b>10</b>	<b>29</b>
<b>Special Expert (SE):</b>	<b>5</b>	<b>15</b>
<b>TOTAL:</b>	<b>34</b>	<b>100</b>



# PANEL LISTING

## Z223 ADVISORY PANEL ON APPLIANCE INSTALLATION

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Gregg Gress (Panel Chair)

Jim Brewer  
Gerald Davis  
Alberto Fossa  
Peter Holmes  
Jeff Kleiss

Ted Lemoff  
Andrea Papageorge  
Phillip Ribbs  
Bruce Swiecicki  
Franklin Switzer

## Z223 ADVISORY PANEL ON PIPING

---

Franklin Switzer (Panel Chair)  
Tom Crane  
Gerald Davis  
Jesus Dominguez  
Mark Fasel  
Pennie Feehan  
Michael R. Gorham  
Gregg Gress

Paul Gugliotta  
William Hamilton  
Peter Holmes  
Ted Lemoff  
John Puskar  
Phillip Ribbs  
Bruce Swiecicki  
Bob Torbin

## Z223 ADVISORY PANEL ON VENTING

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Jim P. Brewer (Panel Chair)  
Tom Crane  
Gerald Davis  
Alberto Fossa  
Gregg Gress  
Roger Griffith  
Mike Gorham  
Paul Gugliotta  
Steen Hagensen

Peter Holmes  
Jeff Kleiss  
Ted Lemoff  
Andrea Papageorge  
John Puskar  
Phillip Ribbs  
Bruce Swiecicki  
Franklin Switzer

## MEMBERSHIP CATEGORIES

(1) Applied Research/Testing Laboratory ( <b>AR-TL</b> )	A representative of an independent testing laboratory or independent applied research organization that promulgates or applies standards.
(2) Energy Supplier ( <b>ES</b> )	A representative of an entity that supplies energy to installations covered by the standard
(3) Enforcing Authority ( <b>EA</b> )	A representative of an agency, organization or governmental body that promulgates and/or enforces standards.
(4) Installer/Maintainer ( <b>I-M</b> )	A representative of an entity that is in the business of installing or maintaining a product, assembly, system, or portion thereof, that is affected by the standard.
(5) Insurance ( <b>I</b> )	A representative of an insurance company, broker, agent, bureau, or inspection agency.
(6) Manufacturer ( <b>M</b> )	A representative of a maker or marketer of a product, assembly, system, or portion thereof, that is affected by the standard.
(7) Special Expert ( <b>SE</b> )	A person not representing any of the previous classifications, but who has special expertise in the scope of the standard, or portion thereof.

**Attachment 4**

Public Inputs

**ASC Z223/NFPA 54 Secretary**

Luis Escobar ♦ American Gas Association ♦ 400 N. Capitol Street, N.W. ♦ Washington, DC, 20001  
Tel.: 202.824.7058 ♦ Email: [lescobar@aga.org](mailto:lescobar@aga.org) ♦ Fax: 202.824.9122

**Public Input No. 21-NFPA 54-2021 [ Section No. 1.1.1.1(E) ]****(E)**

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

**Statement of Problem and Substantiation for Public Input**

Since the US Chemical Safety Board asked for purging to be addressed in an enhanced manner in this document, and that was done, it makes sense to also state this requirement in this section of the document.

**Submitter Information Verification****Submitter Full Name:** John Puskar**Organization:** Prescient Technical Services L**Street Address:****City:****State:****Zip:****Submittal Date:** Sun May 02 15:57:01 EDT 2021**Committee:** NFG-AAA

**Public Input No. 22-NFPA 54-2021 [ Section No. 1.1.1.1(F) ]****(F)**

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

**Statement of Problem and Substantiation for Public Input**

I think we mean both combustion and ventilation air, if that is the intent, then the "," needs to be deleted.

**Submitter Information Verification****Submitter Full Name:** John Puskar**Organization:** Prescient Technical Services L**Street Address:****City:****State:****Zip:****Submittal Date:** Sun May 02 15:59:17 EDT 2021**Committee:** NFG-AAA

**Public Input No. 23-NFPA 54-2021 [ Section No. 1.1.1.2 ]****1.1.1.2**

This code shall not apply to the following items:

- (1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system
- (2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes
- (3) Raw material (feedstock) applications except for piping to special atmosphere generators
- (4) Oxygen-fuel gas cutting and welding systems
- (5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen
- (6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants
- (7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions
- (8) LP-Gas installations at utility gas plants
- (9) Liquefied natural gas (LNG) ~~installations~~ installations other than fuel gas systems within the scope of NFPA 54
- (10) Fuel gas piping in electric utility power plants
- (11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters
- (12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing
- (13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat
- (14) Installation of LP-Gas systems for railroad switch heating
- (15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles
- (16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas
- (17) Building design and construction, except as specified herein
- (18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192
- (19) Fuel gas systems using hydrogen as a fuel
- (20) Construction of and maintenance of appliances

**Statement of Problem and Substantiation for Public Input**

- (9) The exclusion of LNG plants from the requirements of the Code is revised to recognize that LNG plant use fuel gas or for boilers, fired heaters and other applications. This proposal was developed in conjunction with a task force of the LNG committee.
- (20) Clarify the non-application. Maintenance of appliances is also not covered in NFPA 54.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff  
**Organization:** TLemoff Engineering  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Mon May 03 10:05:01 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 116-NFPA 54-2021 [ Section No. 2.2 ]

### 2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, 2021 [edition](#).

NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*, 2018 [edition](#).

NFPA 51, *Standard for the Design and Installation of Oxygen–Fuel Gas Systems for Welding, Cutting, and Allied Processes*, 2018 [edition](#).

NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, 2019 [edition](#).

NFPA 58, *Liquefied Petroleum Gas Code*, 2020 [edition](#).

NFPA 70<sup>®</sup>, *National Electrical Code*<sup>®</sup>, 2020 [edition](#).

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*, 2019 [edition](#).

NFPA 88A, *Standard for Parking Structures*, 2019 [edition](#).

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2021 [edition](#).

NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems*, 2021 [edition](#).

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2021 [edition](#).

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances*, 2019 [edition](#).

NFPA 409, *Standard on Aircraft Hangars*, 2016 [edition](#).

NFPA 715, *Standard for the Installation of Fuel Gases Detection and Warning Equipment*, 2023 [edition](#).

NFPA 780, *Standard for the Installation of Lightning Protection Systems*, 2020 [edition](#).

NFPA 853, *Standard for the Installation of Stationary Fuel Cell Power Systems*, 2020 [edition](#).

NFPA 1192, *Standard on Recreational Vehicles*, 2021 [edition](#).

### Statement of Problem and Substantiation for Public Input

Inclusion of NFPA 715 as a “reference publication” is consistent with NFPA 54 “Applicability” (Section 1.1.1) references to “equipment, and related accessories” shown the charging statement (Section 1.1.1.1) and Section 1.1.1.1(F).

### Submitter Information Verification

**Submitter Full Name:** Renee Lani

**Organization:** American Public Gas Association

**Affiliation:** American Public Gas Association

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Mon May 31 10:27:52 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 124-NFPA 54-2021 [ Section No. 2.2 ]

### 2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, 2021 [edition](#).

NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*, 2018 [edition](#).

NFPA 51, *Standard for the Design and Installation of Oxygen–Fuel Gas Systems for Welding, Cutting, and Allied Processes*, 2018 [edition](#).

NFPA 52, *Vehicular Natural Gas Fuel Systems Code*, 2019 [edition](#).

NFPA 58, *Liquefied Petroleum Gas Code*, 2020 [edition](#).

NFPA 70<sup>®</sup>, *National Electrical Code*<sup>®</sup>, 2020 [edition](#).

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*, 2019 [edition](#).

NFPA 88A, *Standard for Parking Structures*, 2019 [edition](#).

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2021 [edition](#).

NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems*, 2021 [edition](#).

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2021 [edition](#).

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances*, 2019 [edition](#).

NFPA 409, *Standard on Aircraft Hangars*, 2016 [edition](#).

[NFPA 715](#), *Standard for the Installation of Fuel Gases Detection and Warning Equipment*, 2023 [edition](#).

NFPA 780, *Standard for the Installation of Lightning Protection Systems*, 2020 [edition](#).

NFPA 853, *Standard for the Installation of Stationary Fuel Cell Power Systems*, 2020 [edition](#).

NFPA 1192, *Standard on Recreational Vehicles*, 2021 [edition](#).

### Statement of Problem and Substantiation for Public Input

Inclusion of NFPA 715 as a “reference publication” is consistent with NFPA 54 “Applicability” (Section 1.1.1) references to “equipment, and related accessories” shown the charging statement (Section 1.1.1.1) and Section 1.1.1.1(F).

### Submitter Information Verification

**Submitter Full Name:** Ted Williams

**Organization:** Natural Gas Direct, LLC

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Jun 01 16:05:26 EDT 2021

**Committee:** NFG-AAA





## Public Input No. 87-NFPA 54-2021 [ Section No. 2.3.2 ]

### 2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, (610) 832-9585. www.astm.org

ASTM A53, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless*, 2018.

ASTM A106, *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service*, 2019.

ASTM A254, *Standard Specification for Copper-Brazed Steel Tubing*, 2012.

ASTM A268, *Standard Specification for Seamless and Welded Ferritic and Martensitic Stainless Steel Tubing for General Service*, 2010, reaffirmed 2016.

ASTM A269, *Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service*, 2015a.

ASTM A312, *Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes*, 2018a.

ASTM B88, *Standard Specification for Seamless Copper Water Tube*, 2016.

ASTM B210, *Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes*, 2019.

ASTM B241, *Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube*, 2016.

ASTM B280, *Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service*, 2018.

ASTM D2513, *Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings*, 2018a.

ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C*, 2019.

ASTM E2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*, 2018.

ASTM F1973, *Standard Specification for Factory Assembled Anodeless Risers and Transition Fittings in Polyethylene (PE) and Polyamide 11 (PA11) and Polyamide 12 (PA12) Fuel Gas Distribution Systems*, 2013, reaffirmed 2018.

ASTM F2509, *Standard Specification for Field-Assembled Anodeless Riser Kits for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing*, 2015.

ASTM F2945, *Standard Specification for Polyamide 11 Gas Pressure Pipe, Tubing, and Fittings*, 2018.

ASTM F1281, *Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe*

## Statement of Problem and Substantiation for Public Input

PEX-AL-PEX has been used for gas service and distribution for over 15 years under numerous ISO, EU, and Australian standards. ASTM F1281 was first published in the year 2000 and includes allowance for use with gases that are compatible with the pipe and fittings.

## Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 88-NFPA 54-2021 [Section No. 5.5.4.1]</a>	
<a href="#">Public Input No. 90-NFPA 54-2021 [Section No. 7.1.7.1]</a>	
<a href="#">Public Input No. 91-NFPA 54-2021 [New Section after 7.2]</a>	

## Submitter Information Verification

**Submitter Full Name:** William Chapin  
**Organization:** Professional Code Consulting  
**Affiliation:** Ferguson Enterprises  
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submission Date:** Fri May 28 08:13:37 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 118-NFPA 54-2021 [ Section No. 2.3.5 ]

### 2.3.5 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096. [www.ul.com](http://www.ul.com)

UL 103, ~~Chimneys, Factory-Built, Residential~~ Chimneys for Residential, Type and Building Heating Appliances, 2010, revised 2017.

UL 378, Draft Equipment, 2006, revised 2013.

UL 441, Gas Vents, 2016, revised 2019.

UL 467, Grounding and Bonding Equipment, 2013.

UL 641, Type L Low-Temperature Venting Systems, 2010, revised 2018.

UL 651, Schedule 40 and 80 Rigid PVC Conduit and Fittings, 2011, revised 2018 2019.

UL 959, Medium Heat Appliance Factory-Built Chimneys, 2010, revised 2014 2019.

UL 1738, Venting Systems for Gas Burning Appliances, Categories II, III and IV, 2010, revised 2014 2021.

UL 1777, Chimney Liners, 2015, revised 2019.

UL 2158A, Clothes Dryer Transition Ducts, 2013, revised 2017.

UL 2561, 1400 Degree Fahrenheit Factory-Built Chimneys, 2016, revised 2018. ~~UL-378, Draft Equipment~~, 2006, revised 2013.

UL 2989, Outline of Investigation for Tracer Wire, 2016

### Statement of Problem and Substantiation for Public Input

Update UL publications to the most recent edition. UL 2989 was developed to establish specific construction and performance testing criteria to determine the suitability of wire for use underground as a detectable tracer wire.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 119-NFPA 54-2021 [Section No. 7.1.7.3.1]	

### Submitter Information Verification

**Submitter Full Name:** Kelly Nicoletto  
**Organization:** UL LLC  
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**Submittal Date:** Mon May 31 12:25:26 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 24-NFPA 54-2021 [ Section No. 3.3.4.4.1 ]****3.3.4.4.1 Baking and Roasting Oven.**

~~An~~ A non-residential oven primarily intended for volume food preparation that is composed of one or more sections or units of the following types: (1) cabinet oven, an oven having one or more cavities heated by a single burner or group of burners; (2) reel-type oven, an oven employing trays that are moved by mechanical means; or (3) sectional oven, an oven composed of one or more independently heated cavities.

**Statement of Problem and Substantiation for Public Input**

Revised as the 3 types of ovens are not used in the Code. Also, the term "non-residential" is added to clarify that this is not a residential oven. The term is used only in 10.11.2 (other than definitions) where clearance to combustible materials requirements are stated. The requirement appears to be applicable to non-residential cooling appliances only. The definition could be deleted, as the term is self evident.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff  
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**Submittal Date:** Mon May 03 10:11:10 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 25-NFPA 54-2021 [ Section No. 3.3.4.4.2 ]****3.3.4.4.2 – Gas Counter Appliance.**

An appliance such as a gas coffee brewer and coffee urn and any appurtenant water heating appliance, food and dish warmer, hot plate, and griddle.

**Statement of Problem and Substantiation for Public Input**

This is a list of appliances and not a Definition.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff

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**Submittal Date:** Mon May 03 10:14:50 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 26-NFPA 54-2021 [ Section No. 3.3.4.5 ]

~~3.3.4.5 – Gas Counter Appliances.~~

~~See 3.3.4.4.2 .~~

### Statement of Problem and Substantiation for Public Input

3.3.4.4.2 is deleted in PI 25. This reference is no longer valid. If a definition of Gas Counter Appliance is needed it should be added.

### Submitter Information Verification

**Submitter Full Name:** Theodore Lemoff

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**Submittal Date:** Mon May 03 10:31:34 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 27-NFPA 54-2021 [ Section No. 3.3.4.6 ]****3.3.4.6 Household Cooking Appliance.**

An appliance for domestic food preparation, providing at least one function of (1) top or surface cooking, (2) oven cooking, or (3) broiling.

**3.3.4.6.1 – Household-Broiler-Cooking-Appliance.**

A unit that cooks primarily by radiated heat.

**3.3.4.6.2 – Household-Built-In-Unit-Cooking-Appliance.**

A unit designed to be recessed into, placed upon, or attached to the construction of a building, but not for installation on the floor.

**Statement of Problem and Substantiation for Public Input**

Terms proposed to be deleted are not used in the Code. Section 10.14 covers Household Cooking Appliances.

**Submitter Information Verification**

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**Submittal Date:** Mon May 03 10:35:26 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 28-NFPA 54-2021 [ Section No. 3.3.24 ]****3.3.24 – Copper Alloy.**

A homogenous mixture of two or more metals in which copper is the primary component, such as brass and bronze.

**Statement of Problem and Substantiation for Public Input**

Delete definition. The term is obvious, and a definition is not needed. The definition is equivalent to the definition in Merriam Webster on line dictionary.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff

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**Submittal Date:** Mon May 03 10:41:25 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 29-NFPA 54-2021 [ Section No. 3.3.24 ]****3.3.24 – Copper Alloy.**

A homogenous mixture of two or more metals in which copper is the primary component, such as brass and bronze.

**Statement of Problem and Substantiation for Public Input**

Delete definition. The term is obvious, and a definition is not needed. The definition is equivalent to the definition in Merriam Webster on line dictionary.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff

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**Submittal Date:** Mon May 03 10:43:40 EDT 2021

**Committee:** NFG-AAA



**Public Input No. 30-NFPA 54-2021 [ Section No. 3.3.48 ]****3.3.48 Gas Convenience Outlet.**

A ~~permanently mounted~~ permanently installed , hand-operated device providing a means for connecting and disconnecting an appliance or an appliance connector to the gas supply piping.

**Statement of Problem and Substantiation for Public Input**

Installed is the preferred term used widely elsewhere in the Code.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff

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**Submittal Date:** Mon May 03 10:45:23 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 33-NFPA 54-2021 [ Section No. 3.3.56.7 ]****3.3.56.7** Water Heater.

An appliance for supplying hot water for ~~domestic~~ residential or commercial purposes.

**Statement of Problem and Substantiation for Public Input**

The terms residential and domestic are used in the code and appear to mean the same thing. These terms are both used in appliance standards to mean use in residences, and not commercial or industrial occupancies. Examples:

ANSI Z21.8, Installation of Domestic Gas Conversion Burners,  
UL 103, Chimneys, Factory-Built, Residential Type and Building Heating Appliances.  
ANSI Z21.1 Household Cooking Gas Appliances, use "domestic" and does not use "residential".

The term "residential occupancy" is used in building codes

**Submitter Information Verification**

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**Submittal Date:** Thu May 06 14:32:30 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 32-NFPA 54-2021 [ Section No. 3.3.58 ]****3.3.58**

~~Hot Plate~~

:

~~See 3.3.4.4.2, Gas Counter Appliance.~~

~~3.3.58.~~

1

~~Domestic~~

**Hot Plate.**

A fuel gas-burning appliance consisting of one or more open-top-type burners installed on short legs or a base.

**Statement of Problem and Substantiation for Public Input**

1. The definition of gas counter appliance is proposed to be deleted in a separate PI.
2. The term "domestic hot plate" is not used in the Code other than in definitions. As the term "hot plate" is used the definition is revised to be consistent with use of the term in the Code.

**Submitter Information Verification**

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**Submittal Date:** Thu May 06 13:57:21 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 34-NFPA 54-2021 [ New Section after 3.3.60 ]****3.3.61 Interruption of service . . Disconnection or discontinuation of fuel gas to the point of delivery of a fuel gas piping system.****Statement of Problem and Substantiation for Public Input**

The term "interruption of service" is used in 4.2 and 8.2.3. As used in 4.2 the term appears to mean what is being proposed as a new definition. As used in 8.2.3 it has been interpreted to mean depressurization of all or part of a fuel gas piping system.

The Propane Education and Research Council includes a glossary in their training manuals, including:

**INTERRUPTION OF SERVICE.**

A term used to describe when the vapor pressure in the vapor distribution system is no longer sufficient to allow the appliance to operate.

There does not appear to be a definition of the term "interruption of service" in other documents used by the gas industry. A definition is needed to ensure that code users understand the committee's intent of the meaning.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff

**Organization:** TLemoff Engineering

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**Submission Date:** Thu May 06 14:37:36 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 17-NFPA 54-2021 [ Section No. 3.3.64.2 ]****3.3.64.2 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.

**Additional Proposed Changes**

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Non_combustible_definition.docx	non combustible definition	

**Statement of Problem and Substantiation for Public Input**

Currently there are two definitions for non-combustible material in NFPA 54. Section 3.3.64.2 and Section 4.4 both have conflicting definitions. Section 4.4 also has annex material related to the section. I provided this public input as a reminder for the committee to discuss and align the definitions.

**Submitter Information Verification**

**Submitter Full Name:** Mark Fasel

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**Submittal Date:** Thu Apr 08 09:19:31 EDT 2021

**Committee:** NFG-AAA

**4.4\* Noncombustible Material.** A material that complies with any of the following shall be considered a noncombustible material:

- (1) 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.
- (2) A material that is reported as passing ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C*.
- (3) A material that is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*.

**Public Input No. 127-NFPA 54-2021 [ New Section after 3.3.84.1 ]****3.3.84.2 Draft Control Regulator**

A listed damper device attached to a chimney, vent connector, breeching, or flue gas manifold to control the vent, vent connector or chimney pressure.

**Statement of Problem and Substantiation for Public Input**

Draft control dampers or draft control devices are usually placed inside the chimney, vent or vent connector to automatically maintain the required appliance outlet pressure. These devices are common and should be addressed by NFPA 54.

**Submitter Information Verification**

**Submitter Full Name:** Timothy McNulty

**Organization:** Rm Manifold Group Inc., Dba Us

**Street Address:**

**City:**

**State:**

**Zip:**

**Submittal Date:** Tue Jun 01 16:13:52 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 126-NFPA 54-2021 [ Section No. 3.3.84.1 [Excluding any Sub-Sections] ]**

A device that functions to maintain a desired draft in the appliance by automatically ~~reducing~~ maintaining the draft to the desired value.

**Statement of Problem and Substantiation for Public Input**

Some modern appliances require a positive outlet pressure and the draft regulator is required to maintain the required draft in excess or absence of draft.

**Submitter Information Verification**

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**Submittal Date:** Tue Jun 01 16:10:23 EDT 2021

**Committee:** NFG-AAA



**Public Input No. 35-NFPA 54-2021 [ Section No. 3.3.97 ]****3.3.97** Tubing.

Semirigid conduit of copper, steel, aluminum, corrugated stainless steel tubing (CSST), polyethylene or plastic polyamide .

**Statement of Problem and Substantiation for Public Input**

To clarify that not all plastics are allowed in the Code.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff

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**Submittal Date:** Thu May 06 14:42:28 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 94-NFPA 54-2021 [ Section No. 3.3.97 ]****3.3.97** Tubing.

Semirigid conduit of copper, steel, aluminum, corrugated stainless steel tubing (CSST), crosslinked polyethylene-aluminum-crosslinked polyethylene composite tubing (PEX-AL-PEX), or plastic.

**Statement of Problem and Substantiation for Public Input**

Adds PEX-AL-PEX composite tubing to existing definition.

**Submitter Information Verification**

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**Organization:** Professional Code Consulting

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**Submittal Date:** Fri May 28 11:14:11 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 36-NFPA 54-2021 [ Section No. 4.1 ]****4.1** Qualified Agency.

The following shall be performed only by a qualified agency:

- (1) The design, installation, testing, purging, and replacement of gas piping, appliances, equipment, and accessories
- (2) The repair and servicing of ~~appliances and~~ of equipment

**Statement of Problem and Substantiation for Public Input**

Servicing of appliances is not within the scope of the Code.

**Submitter Information Verification**

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**Submittal Date:** Thu May 06 14:51:15 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 31-NFPA 54-2021 [ Section No. 5.1.1 ]

### 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, the location of isolation valves, and accommodations for meeting the safe purging requirements of this document in Chapter 8.

### Statement of Problem and Substantiation for Public Input

It's vitally important to identify shut offs/isolation valves and to identify in the design that purge related safety requirements and accommodations have been considered.

### Submitter Information Verification

**Submitter Full Name:** John Puskar  
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**Street Address:**  
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**Submittal Date:** Mon May 03 11:45:40 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 42-NFPA 54-2021 [ New Section after 5.1.2 ]

### 5.1.2.1

If the capacity of the system is determined to be inadequate for the additional appliances, one of the following modifications shall be made to provide required minimum gas pressures to each appliance:

- a) The existing system shall be enlarged as required.
- b) Separate gas piping of adequate capacity shall be provided.
- c) The gas pressure can be increased. If the gas pressure is increased changes shall be made to provide overpressure protection to protect all existing appliances, if required.

### Statement of Problem and Substantiation for Public Input

In my experience, it is sometimes an option to increase the gas pressure to accommodate additional gas loads. This can be done safely with an evaluation of appliance pressure capabilities and changes to overpressure protection devices.

### Submitter Information Verification

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**Submittal Date:** Sat May 08 16:51:10 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 39-NFPA 54-2021 [ Section No. 5.1.2 ]

### 5.1.2 Addition to Existing System.

When additional appliances are being connected to a gas piping system, the existing piping shall be checked to determine whether it has adequate capacity. ~~If the capacity of the system is determined to be inadequate for the additional appliances, the existing system shall be enlarged as required, or separate gas piping of adequate capacity shall be provided.~~ as per section 5.3 of this document.

### Statement of Problem and Substantiation for Public Input

This section contains two requirements, contrary to the manual of style for NFPA documents. This section also does not give the user guidance as to how to conduct such an assessment.

### Submitter Information Verification

**Submitter Full Name:** John Puskar  
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**Zip:**  
**Submittal Date:** Sat May 08 16:43:23 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 43-NFPA 54-2021 [ Section No. 5.4.4 ]****5.4.4 Maximum Operating Pressure in Buildings.**

The maximum operating pressure for any 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 joints are welded or brazed.
- (2) The piping is joined by fittings listed to ANSI LC 4/CSA 6.32, *Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems*, and installed according to the manufacturer's installation instructions.
- (3) The piping joints are flanged and all pipe-to-flange connections are made by welding or brazing.
- (4) The piping is located in a ventilated chase or otherwise enclosed for protection against accidental gas accumulation.
- (5) The piping is located inside buildings or separate areas of buildings used exclusively for one of the following:
  - (6) Industrial processing or heating
  - (7) Research
- (8) Warehousing
  - (a) Boiler or mechanical rooms
- (9) The piping is a temporary installation for buildings under construction.
- (10) The piping serves appliances or equipment used for agricultural purposes.
- (11) The piping system is an LP-Gas piping system with an operating pressure greater than 20 psi (138 kPa) and complies with NFPA 58.

**Statement of Problem and Substantiation for Public Input**

Although warehouses can be large in volume compared to natural gas loads, they also have lots of material handling equipment moving through them which can compromise piping systems. There have been many unit heaters and piping systems hit by forklift trucks. It would enhance the cause of safety to require this piping to be welded. It makes no sense to allow warehouses this exemption and not air craft hangers. Welding this piping in warehouses would not be burdensome considering that they are typically space heat loads and not a large percentage of this piping would need to be above 5 psig.

**Submitter Information Verification**

**Submitter Full Name:** John Puskar  
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**Submittal Date:** Sat May 08 17:17:55 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 44-NFPA 54-2021 [ Section No. 5.5.1.2 ]

### 5.5.1.2 Used Materials.

Pipe, fittings, valves, or other materials shall not be used again ~~unless they are~~ for a new appliance installation or revision unless the following conditions are met:

a) ~~They are~~ free of foreign materials.

b) ~~The original design intent and capability have been ascertained to be adequate for the service intended~~ not been compromised from any damage including corrosion, wear, thread damage, nicks, gouges, dents, or other deformities.

c) Identifying markings that indicate the original specifications exist .

### Statement of Problem and Substantiation for Public Input

This requirement did not identify the bounds or scope for reusing components, it also did not identify what "ascertain" meant. It is also impossible in most cases to ascertain something if there are no identifying markings on the components.

### Submitter Information Verification

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**Submittal Date:** Sat May 08 17:24:11 EDT 2021

**Committee:** NFG-AAA



**Public Input No. 96-NFPA 54-2021 [ Section No. 5.5.2.2 ]****5.5.2.2** Steel, Stainless Steel, and Wrought Iron.

- (1) Steel, stainless steel, and wrought iron pipe shall not be installed underground on the downstream side of a gas meter.
- (2) Steel, stainless steel, and wrought -iron pipe shall be at least Schedule 10 and shall comply with the dimensional standards of ANSI/ASME B36.10M, *Welded and Seamless Wrought Steel Pipe*, and one of the following:
  - (1) (a) ASTM A53, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless*
  - (2) (b) ASTM A106, *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service*
  - (3) (c) ASTM A312, *Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes*

**Statement of Problem and Substantiation for Public Input**

## Justification:

Anodes installed to protect steel pipe underground on the downstream side of the gas meter over time, stop providing the necessary protection, thereby creating a potential hazard. The only way to ensure that the steel pipe is protected is to monitor electrically.

The piping downstream of meter typically is not subject to regulatory oversight and there is no entity to enforce that once protection is installed that it will be monitored and stay protected.

By prohibiting these materials underground that require cathodic protection on the downstream of the meter reduces the need for complex engineering, installation, and monitoring of the cathodic protection systems.

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

**Submitter Information Verification**

**Submitter Full Name:** Lane Miller  
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**Submission Date:** Fri May 28 15:24:38 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 11-NFPA 54-2021 [ New Section after 5.5.3.6 ]

5.5.3.7 Multi-layer piping. Multi-layer piping consisting of one or more metallic layers co-extruded with one or more layers of polymeric materials shall be listed for use with fuel gas.

### Statement of Problem and Substantiation for Public Input

A new type of gas piping products consisting of a thin layer of aluminum with inner and outer polymeric layers is being used for fuel gas. There are no standards in this code for these products for fuel gas use and listing is being required for safety. New sections 5.5.3.7 and 5.5.9 are added to provide requirements for multi-layer piping products.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 12-NFPA 54-2021 [New Section after 7.1.8]	

### Submitter Information Verification

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**Submission Date:** Thu Mar 25 10:16:13 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 88-NFPA 54-2021 [ Section No. 5.5.4.1 ]

### 5.5.4.1 Standard and Marking.

#### 5.5.4.1.1

Polyethylene plastic pipe, tubing, and fittings used to supply fuel gas shall conform to ASTM D2513, *Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings*. Pipe to be used shall be marked "gas" and "ASTM D2513."

#### 5.5.4.1.2

Polyamide pipe, tubing, and fittings shall be identified in and conform to ASTM F2945, *Standard Specification for Polyamide 11 Gas Pressure Pipe, Tubing, and Fittings*. Pipe to be used shall be marked "gas" and "ASTM F2945."

#### 5.5.4.1.3

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

#### 5.5.4.1.4

Crosslinked PEX-Aluminum-PEX (PEX-AL-PEX) composite pipe, tubing and fittings used to supply and or distribute fuel gas shall conform to ASTM F1281. Such pipe shall be marked "Gas" and "ASTM F1281".

### Statement of Problem and Substantiation for Public Input

PEX-AL-PEX has been used for gas supply and distribution for over 15 years under numerous ISO, EU, and Australian standards. ASTM F1281 was first published in the year 2000 and includes allowance for use with gases that are compatible with the pipe and fittings.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<u>Public Input No. 87-NFPA 54-2021 [Section No. 2.3.2]</u>	
<u>Public Input No. 90-NFPA 54-2021 [Section No. 7.1.7.1]</u>	
<u>Public Input No. 91-NFPA 54-2021 [New Section after 7.2]</u>	

### Submitter Information Verification

**Submitter Full Name:** William Chapin  
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**Submittal Date:** Fri May 28 09:08:46 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 121-NFPA 54-2021 [ Section No. 5.5.4.2 ]****5.5.4.2\* Regulator Vent Piping.**

Plastic pipe and fittings used to connect regulator vents to remote vent terminations shall be PVC conforming to UL 651, *Schedule 40 and 80 Rigid PVC Conduit and Fittings*. - PVC vent piping shall not be installed indoors.

**Statement of Problem and Substantiation for Public Input**

Since the 2001 edition, NFPA 58 "LP-Gas Code" has allowed the use of PVC conforming to ANSI/UL 651 to be exposed to the indoors where used to vent second stage regulators that are installed indoors. This practice is currently prohibited in the National Fuel Gas Code, but there is good reason to reconsider this position.

- Using black iron or galvanized pipe or larger diameter copper tubing could impose excessive stresses on the regulator housing. When regulators had 1/4-inch vent openings, small diameter tubing used to extend vents imposed minimal stress on the regulator. However, regulators now install 1/2-, 3/4-, and 1-inch vent openings which lead to much greater stresses on the housing.
- UL 651 PVC conduit is tested for limited resistance to fire. However, LP-gas second stage and line pressure regulators, which are both approved for use inside buildings, are not required to be fire resistant. Regulators contain components which have low melting points. Plastic regulator vent caps and adjusting screws will melt at temperatures as low as 225°F, and the elastomer materials of regulator diaphragms and seat discs will fail at approximately 400°F. Therefore, there is no enhancement of safety in mandating fire-resistant vent piping, when the regulator assembly itself is not tested for fire resistance.
- A related concern is that where a large structure is involved in fire, regulator vent piping may be exposed to fire while the regulator itself may not be. It is important to note that under most circumstances, regulator vent piping does not contain gas—it only carries gas when the regulator is in vent discharge mode. If the regulator itself is not involved in a fire, there is no reasonable expectation to believe that it will vent fuel gas and therefore involvement of the vent piping alone in a fire does not pose any additional safety risk.

**Submitter Information Verification**

**Submitter Full Name:** Bruce Swiecicki  
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**Affiliation:** NPGA Technology, Standards and Safety Committee  
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**Submittal Date:** Tue Jun 01 10:22:03 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 37-NFPA 54-2021 [ Section No. 5.5.4.3 ]****5.5.4.3 Anodeless Risers.**

Anodeless risers shall comply with the following:

- (1) Factory-assembled anodeless risers shall be recommended by the manufacturer for the gas used and shall be leak tested by the manufacturer in accordance with written procedures.
- (2) Service head adapters and field-assembled anodeless risers incorporating service head adapters shall be recommended by the manufacturer for the gas used and shall be design-certified to meet the requirements of Category I of ASTM D2513, *Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings*, and 49 CFR 192.281(e). The manufacturer shall provide the user qualified installation instructions as prescribed by 49 CFR 192.283(b).
- (3) The use of plastic pipe, tubing, and fittings in anodeless risers in undiluted LP-Gas piping systems shall be in accordance with NFPA 58.

**Statement of Problem and Substantiation for Public Input**

Revised to be clearer and enhance enforceability. The first revision requires that the tubing be "selected" for the conditions, which is clearer than "suitable" which is subjective. The second revision removes the second "shall", which is not needed.

**Submitter Information Verification**

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**Submittal Date:** Thu May 06 14:54:45 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 97-NFPA 54-2021 [ Section No. 5.5.4.3 ]****5.5.4.3 Anodeless Risers.**

Anodeless risers shall comply with the following:

- (1) ~~Factory-assembled anodeless risers shall be recommended by the manufacturer for the gas used and shall be leak tested by the manufacturer in accordance with written procedures.~~
- (2) ~~Service head adapters and field-assembled anodeless risers incorporating service head adapters shall be recommended by the manufacturer for the gas used and shall be design-certified to meet the requirements of Category I of ASTM D2513, Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings, and 49 CFR 192.281(e). The manufacturer shall provide the user-qualified installation instructions as prescribed by 49 CFR 192.283(b).~~

The

- (3)
  - (1) Only risers that are anodeless shall be installed.
  - (2) Anodeless risers shall meet either the requirements of [ASTM F2509](#) or [ASTM F1973](#).
- (4)
  - (3) The use of plastic pipe, tubing, and fittings in undiluted LP-Gas piping systems shall be in accordance with NFPA 58.

**Statement of Problem and Substantiation for Public Input**

Justifications:

- (1) Metallic underground gas carrying pipe or tubing is prone to failure due to corrosion. Anodeless risers eliminate these potential hazards.
- (2) Risers that are not anodeless are required to be protected for corrosion. Anodes installed to protect a riser over time, stop providing the necessary protection thereby creating a potential hazard. The only way to ensure that the riser is protected is to monitor electrically. There is no entity to enforce that once protection is installed that it will be monitored and stay protected.
- (3) Anodeless risers manufactured in accordance with either of these two standards ensure that they been proven by test that they are suitable for gas service without hazards associated with underground corrosion.

If the suggestions for 5.5.2.2 are adopted this will also eliminate risers that require anodes.

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

**Submitter Information Verification**

**Submitter Full Name:** Lane Miller  
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**Submission Date:** Fri May 28 15:31:13 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 45-NFPA 54-2021 [ Section No. 5.5.5 ]****5.5.5 Workmanship and Defects.**

Gas pipe, tubing, and fittings shall ~~be clear and free~~ meet the following requirements:

- a) ~~They shall be free~~ from cutting burrs and defects in structure or threading. ~~and~~ .
- b) ~~They~~ shall be clear and thoroughly brushed and chip and scale blown. ~~Defects in pipe, tubing, and fittings shall not be repaired.~~ to remove any debris.
- c) ~~Defective pipe, tubing, and fittings shall be replaced,~~ not repaired .

**Statement of Problem and Substantiation for Public Input**

The revision submitted more clearly describes the intended requirements of this section and provides better wording that is less confusing.

**Submitter Information Verification**

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**Submittal Date:** Sat May 08 17:36:26 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 98-NFPA 54-2021 [ Section No. 5.5.6 ]

### 5.5.6 Metallic Pipe Threads.

**5.5.6.1** No pipe threads shall be installed underground.

**5.5.6.2** Specifications for Pipe Threads.

Metallic pipe and fitting threads shall be taper pipe threads and shall comply with ANSI/ASME B1.20.1, *Pipe Threads, General Purpose, Inch*.

**5.5.6.2.3** Damaged Threads.

Pipe with threads that are stripped, chipped, corroded, or otherwise damaged shall not be used. Where a weld opens during the operation of cutting or threading, that portion of the pipe shall not be used.

**5.5.6.3.4** Number of Threads.

Field threading of metallic pipe shall be in accordance with Table 5.5.6.3.4.

Table 5.5.6.3-4 Specifications for Threading Metallic Pipe

<u>Iron Pipe</u>	<u>Approximate</u>	<u>Approximate</u>
<u>Size</u>	<u>Length of</u>	<u>No. of Threads</u>
<u>(in.)</u>	<u>Threaded Portion</u>	<u>to Be Cut</u>
	<u>(in.)</u>	
½	¾	10
¾	¾	10
1	7/8	10
1¼	1	11
1½	1	11
2	1	11
2½	1½	12
3	1½	12
4	1¾	13

For SI units, 1 in. = 25.4 mm.

**5.5.6.4.5\*** Thread Joint Sealing.

**5.5.6.4.5.1**

Threaded joints shall be made using a thread joint sealing material.

**5.5.6.4.5.2**

Thread joint sealing materials shall be compatible with the pipe and fitting material on which the compounds are used.

**5.5.6.4.5.3**

Thread joint sealing materials shall be non-hardening and shall be resistant to the chemical constituents of the gases to be conducted through the piping.

## Statement of Problem and Substantiation for Public Input

Justification:

Pipe threads underground become the area which corrosion attacks first leading to leakage. Leaks close to a structure or within a trench line have been known to migrate through the soil and into a structure causing hazardous conditions

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

## Submitter Information Verification

**Submitter Full Name:** Lane Miller

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**Affiliation:** Norton McMurray Manufacturing Company ("NORMAC")

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**Submittal Date:** Fri May 28 15:37:12 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 47-NFPA 54-2021 [ New Section after 5.5.6.2 ]****5.5.6.2.1**

Where a weld opens during the operation of cutting or threading, that portion of the pipe shall not be used.

**Statement of Problem and Substantiation for Public Input**

This change is to meet with the manual of style requirements.

**Submitter Information Verification**

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**Submittal Date:** Sat May 08 17:47:44 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 46-NFPA 54-2021 [ Section No. 5.5.6.2 ]****5.5.6.2 Damaged Threads.**

Pipe with threads that are stripped, chipped, corroded, or otherwise damaged shall not be used. ~~Where a weld opens during the operation of cutting or threading, that portion of the pipe shall not be used.~~ \_

**Statement of Problem and Substantiation for Public Input**

In keeping with the manual of style an additional section is being added for what was deleted.

**Submitter Information Verification**

**Submitter Full Name:** John Puskar

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**Submittal Date:** Sat May 08 17:46:12 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 54-NFPA 54-2021 [ Section No. 5.5.7 [Excluding any Sub-Sections] ]

The type of piping joint used shall be ~~suitable~~ :

- (1) ~~Selected~~ for the pressure and temperature conditions and ~~shall be selected giving consideration to~~
- (2) ~~selected for~~ joint tightness and mechanical strength under the service conditions. ~~The joint shall be able~~
- (3) ~~able~~ to sustain the maximum end force due to the internal pressure and any additional forces due to temperature expansion or contraction, vibration, fatigue, or the weight of the pipe and its contents.

### Statement of Problem and Substantiation for Public Input

Revised to be clearer and enhance enforceability. Also, separated into separate sub paragraphs with one requirement in each. "Selected" is substituted for "Suitable", which is subjective.

### Submitter Information Verification

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**Submittal Date:** Mon May 10 09:59:54 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 75-NFPA 54-2021 [ Section No. 5.5.7.5 ]****5.5.7.5 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.
- (2) Fittings used with steel, stainless steel, or wrought-iron pipe shall be steel, stainless steel, copper alloy, malleable iron, or cast iron.
- (3) Fittings used with copper or copper alloy pipe shall be copper or copper alloy.
- (4) Fittings used with aluminum alloy pipe shall be aluminum alloy.
- (5) *Cast-Iron Fittings.* Cast-iron fittings shall comply with the following:
  - (6) Flanges shall be permitted.
  - (7) Bushings shall not be used.
  - (8) Fittings shall not be used in systems containing flammable gas-air mixtures.
  - (9) Fittings in sizes 4 in. (100 mm) and larger shall not be used indoors unless approved  
  
by the authority having jurisdiction.
- (a)
- (b) Fittings in sizes 6 in. (150 mm) and larger shall not be used unless approved  
  
by the authority having jurisdiction.
- (a)
- (10) *Aluminum Alloy Fittings.* Threads shall not form the joint seal.
- (11) *Zinc-Aluminum Alloy Fittings.* Fittings shall not be used in systems containing flammable gas-air mixtures.
- (12) *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:
  - (13) Used within the fitting manufacturer's pressure-temperature recommendations
  - (14) Used within the service conditions anticipated with respect to vibration, fatigue, thermal expansion, or contraction
  - (15) Acceptable to the authority having jurisdiction
- (16) When pipe fittings are drilled and tapped in the field, the operation shall be in accordance with the following:
  - (17) The operation shall be performed on systems having operating pressures of 5 psi (34 kPa) or less.
  - (18) The operation shall be performed by the gas supplier or their designated representative.
  - (19) The drilling and tapping operation shall be performed in accordance with written procedures prepared by the gas supplier.
  - (20) The fittings shall be located outdoors.
  - (21) The tapped fitting assembly shall be inspected and proven to be free of leaks.

**Statement of Problem and Substantiation for Public Input**

Revised in 2 locations to substitute "approved" for "approved by the Authority Having Jurisdiction (AHJ).

The term is redundant as "Authority Having Jurisdiction" (AHJ) is defined in 3.3.2 as being acceptable to the AHJ. The term "approved" is used 39 times in the Code in 5.5.7.2, 5.5.7.3, 5.14 (1), 7.1.5 (1), 7.1.6 (1), 7.2.1 (2), 7.3.5.1, 7.11.6.1, 8.1.1.4, 8.1.5.2 (2x), 9.1.1 (2x), 9.6.5, 9.6.6.2, 10.2.5, 10.3.4 Exception No. 2, 10.3.5, 10.3.7, 10.3.6, 10.3.7, 10.14.2.2 (3) and (4), 10.20.3, 10.21.2 Exceptions No. 1 and No. 2, 10.28, 12.3.2.1, 12.6.1.3 (1) and (3), 12.8.1, 12.8.3.3 (3), 12.9.2, 12.11.6.3 (3), 12.13.2.1 (2x), 12.16 (2) and (5), 13.1.9, 13.2.18.

**Submitter Information Verification**

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<b>Submittal Date:</b>	Mon May 10 14:55:00 EDT 2021
<b>Committee:</b>	NFG-AAA

**Public Input No. 7-NFPA 54-2021 [ New Section after 5.5.8 ]**

**5.5.9 Multi-layer piping fittings. Multi-layer piping shall be joined with listed fittings in accordance with the manufacturer's installation instructions.**

**Statement of Problem and Substantiation for Public Input**

A new gas piping product consisting of a thin layer of aluminum with inner and outer polymeric layers is being used for fuel gas. There are no standards in this code for these products for fuel gas use and it is proposed to add a listing requirement for safety.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff

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**Submittal Date:** Mon Mar 22 15:27:54 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 78-NFPA 54-2021 [ Section No. 5.5.9.1 ]****5.5.9.1– \* \_\_ Flange Specifications.****5.5.9.1.1**

Cast iron flanges shall be in accordance with ANSI/ASME B16.1, *Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250*.

**5.5.9.1.2**

Steel flanges shall be in accordance with the following: ANSI/ASME B16.5, *Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24 Metric/Inch Standard*, or ANSI/ASME B16.47, *Large Diameter Steel Flanges: NPS 26 through NPS 60 Metric/Inch Standard*.

**5.5.9.1.3**

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

**5.5.9.1.4**

Ductile iron flanges shall be in accordance with ANSI/ASME B16.42, *Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300*.

\* Add Annex A.5.5.9.1.

The ISO 7005-1, -2, and -3 flange standards allows for two types of globally relevant flange systems. There is the Class system per ASME B16 series and the PN system per the EN 1092-x series. The EN 1092-x series in equivalent pressure ratings are identical to Class 125, 150, 300. However, unlike the Class system, the PN system has lower pressure ratings, which allows the designer to engineer the piping / connections to the pressure required for the application, which are more fitted for typical NFPA 54 pressures, rather than forcing a 5 PSI application to use minimum Class 150 ANSI Flanges, which are rated for 285 PSI at room temperatures. Just as different Classes of flanges have different bolt patterns, the lower pressure rated flanges per the PN system have a different bolt pattern. If using the PN system, use the equivalent PN flange.

If using the PN system, the requirements for bolts, dissimilar flange connections, flange facing, flange gaskets and gasket specifications apply also these connections.

**Statement of Problem and Substantiation for Public Input**

There is no safety issue designing piping systems using the PN system for pressures 125 PSI or less. Additionally, there are already listed valves on the market using the PN system of flanged connections, and the PN system has been installed on gas piping systems and gas trains over the past 20 years. Finally, just as different pressure Classes do not mate, PN and Classes do not mate except in a few cases where they are harmonized.

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**Submission Date:** Thu May 13 15:48:06 EDT 2021

**Committee:** NFG-AAA



**Public Input No. 48-NFPA 54-2021 [ New Section after 5.5.10.4 ]****5.5.10.4.1**

When flanges are separated, and before gaskets are replaced the following conditions shall be met:

- a) Flange surfaces shall be inspected for pitting, corrosion and other surface defects.
- b) Flanges that do not meet the minimum requirements of ASME PCC-1 shall be replaced.
- c) Flanges that contain grooved faces shall be thoroughly and carefully restored.

**Statement of Problem and Substantiation for Public Input**

Nothing in this document addresses the condition of flanges for reuse.

This link talks more about flange faces and requirements for reuse.<https://fliphtml5.com/mcff/yktq/basic>

**Submitter Information Verification**

**Submitter Full Name:** John Puskar

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**Submittal Date:** Sat May 08 17:56:40 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 55-NFPA 54-2021 [ Section No. 5.6.2.2 ]****5.6.2.2**

Gas meters shall not be placed where they will be subjected to damage, ~~such as adjacent to~~ .

**A.5.6.2.2** Locations that may be subjected to damage include being adjacent to a driveway, under a fire escape, in public passages, halls, or where they will be subject to excessive corrosion or vibration.

**Statement of Problem and Substantiation for Public Input**

The list of examples is relocated to Annex A. Lists of this type are never complete, and therefore can be misleading.

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**Submittal Date:** Mon May 10 10:09:01 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 56-NFPA 54-2021 [ Section No. 5.6.3 ]****5.6.3 Supports.**

Gas meters shall be supported or connected to rigid piping so as not to exert a strain on the meters. Where flexible connectors are used to connect a gas meter to downstream piping at ~~mobile homes in mobile~~ manufactured homes in manufactured home parks, the meter shall be supported by a post or bracket placed in a firm footing or by other means providing equivalent support.

**Statement of Problem and Substantiation for Public Input**

The term "mobile home" is no longer used. Manufactured housing is the correct term.

**Submitter Information Verification**

**Submitter Full Name:** Theodore Lemoff

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**Submittal Date:** Mon May 10 11:10:40 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 99-NFPA 54-2021 [ Section No. 5.6.3 ]

### 5.6.3 Supports.

Gas meters shall be supported or connected to rigid piping so by a meter bracket or other non-gas carrying support as not to exert a strain on the meters. Anodeless risers shall not be used to support a gas meter. Where flexible connectors are used to connect a gas meter to downstream down-stream piping at mobile homes in mobile home parks, the meter shall be supported by a post or bracket placed in a firm footing or by other means providing equivalent support.

### Statement of Problem and Substantiation for Public Input

Justification:

Gas meters are being installed without any support other than the anodeless riser. If the riser settles underground, strain is exerted on the threaded connections above ground causing leaks.

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

### Submitter Information Verification

**Submitter Full Name:** Lane Miller  
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**Submission Date:** Fri May 28 15:41:24 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 18-NFPA 54-2021 [ Section No. 5.7.2 ]****5.7.2 Listing.**

Line pressure regulators shall be listed in accordance with ANSI Z21.80/CSA 6.22, *Line Pressure Regulators*, where the outlet pressure is set to 2 psi or less and the downstream appliance is rated for 0.5 PSI or less.

**Statement of Problem and Substantiation for Public Input**

There are high capacity (over 12,000,000 btu/hr) industrial appliances and applications that are rated for pressures higher than 0.5 PSI but are operating at low pressures (e.g 1 PSI). Such applications cannot use an ANSI Z21.80 line pressure regulator. For example, ANSI Z21.80 line pressure regulators require a min flow rate of 0.15 ft<sup>3</sup>/hr and regulators used on industrial applications cannot flow this low of flow.

**Submitter Information Verification**

**Submitter Full Name:** Kevin Carlisle

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**Submittal Date:** Wed Apr 28 17:15:42 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 38-NFPA 54-2021 [ Section No. 5.7.2 ]****5.7.2 Listing.**

Line pressure regulators shall be listed in accordance with ANSI Z21.80/CSA 6.22, *Line Pressure Regulators*, ~~where the outlet pressure is set to 2 psi or less .~~

**Statement of Problem and Substantiation for Public Input**

The requirement should apply to all line pressure regulators, and not only to line pressure regulators with an outlet pressure of 2 psig or less. ANSI Z21.80/CSA 6.22 covers line pressure regulators with outlet pressures up to 10 psig.

**Submitter Information Verification**

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**Submittal Date:** Fri May 07 13:31:58 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 13-NFPA 54-2021 [ New Section after 5.7.6 ]**

**Regulator Removal.** A union shall be installed either upstream or downstream of a regulator with threaded pipe connections.

**Statement of Problem and Substantiation for Public Input**

A requirement for a union upstream or downstream of a threaded regulator is added in 5.7 to facilitate regulator replacement. Flanged regulators do not require a union for replacement.

**Submitter Information Verification**

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**Submittal Date:** Mon Apr 05 13:19:56 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 19-NFPA 54-2021 [ Section No. 5.14 ]

### 5.14 Pressure Regulator and Pressure Control Venting.

The venting of the atmospheric side of diaphragms in line pressure regulators, gas appliance regulators, and gas pressure limit controls shall be in accordance with all of the following:

- (1) An independent vent pipe to the outdoors, sized in accordance with the device manufacturer's instructions, shall be provided where the location of a device is such that a discharge of fuel gas will cause a hazard. For devices other than appliance regulators, vents are not required to be independent where the vents are connected to a common manifold designed in accordance with engineering methods to minimize backpressure in the event of diaphragm failure and such design is approved.

*Exception No. 1: A regulator and vent limiting means combination listed as complying with ANSI Z21.80/CSA 6.22, Line Pressure Regulators, shall not be required to be vented to the outdoors.*

*Exception No. 2: A listed gas appliance regulator factory equipped with a vent limiting device is not required to be vented to the outdoors.*

*Exception No. 3: A listed gas pressure control factory equipped with a vent limiting device and complying with UL 353 or UL 60730-2-6 shall not be required to be vented to the outdoors.*

- (2) Materials for vent piping shall be in accordance with Section 5.5.
- (3) The vent terminus shall be designed to prevent the entry of water, insects, and other foreign matter that could cause blockage.
- (4) Vent piping shall be installed to minimize static loads and bending moments placed on the regulators and gas pressure control devices.
- (5) Vents shall terminate not less than 3 ft (0.9 m) from a possible source of ignition.
- (6) At locations where a vent termination could be submerged during floods or snow accumulations, an antiflood-type breather vent fitting shall be installed, or the vent terminal shall be located above the height of the expected flood waters or snow.
- (7) Vent piping from pressure regulators and gas pressure controls shall not be connected to a common manifold that serves a bleed line from a diaphragm-type gas valve.

### Statement of Problem and Substantiation for Public Input

UL 353 and UL 60730-2-6 are two standards under which gas pressure switches are listed, and both of these standards have requirements for vent limiting devices.

### Submitter Information Verification

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**Submittal Date:** Wed Apr 28 17:22:20 EDT 2021

**Committee:** NFG-AAA



**Public Input No. 10-NFPA 54-2021 [ Section No. 6.1 [Excluding any Sub-Sections] ]**

Where the pipe size is to be determined using any of the methods in 6.1.1 through 6.1.3, the diameter of each pipe segment shall be obtained from the pipe sizing tables in Section 6.2- ~~or Section 6.3~~ -or- , the sizing tables included in a listed piping system manufacturer's installation instructions, or from the sizing equations in Section 6.4. For SI units, 1 ft<sup>3</sup> = 0.028 m<sup>3</sup>, 1 ft = 0.305 m, 1 in. w.c. = 0.249 kPa, 1 psi = 6.894 kPa, 1000 Btu/hr = 0.293 kW.

**Statement of Problem and Substantiation for Public Input**

To make 6.1 consistent with the 5.3.3. Sizing Methods Include the tables in CSST manufacturer's design and installation guides.

**Submitter Information Verification**

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**Organization:** TLemoff Engineering

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**Submittal Date:** Wed Mar 24 15:51:35 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 5-NFPA 54-2021 [ Section No. 6.1.3 ]****6.1.3 Hybrid Pressure.**

The pipe size for each section of higher pressure gas piping shall be determined using the longest length of piping sizing methods in 6.1.1 or 6.1.2 from the point of delivery to the most remote each line pressure regulator in the system . The pipe size from the line pressure regulator to each outlet for each section of the lower pressure gas piping shall be determined using the length of piping from the regulator to the most remote outlet served by the regulator sizing methods in 6.1.1 or 6.1.2 from each line pressure regulator to each outlet served by that regulator .

**Statement of Problem and Substantiation for Public Input**

Revised to clarify that a hybrid pressure system can have two or more elevated and reduced pressure sections, and can be sized in accordance with all of the methods listed in 6.1.

**Submitter Information Verification**

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**Submittal Date:** Mon Mar 22 15:14:35 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 101-NFPA 54-2021 [ New Section after 7.1.1.2 ]****7.1.1.3**

Anodeless risers shall not be installed in firepits.

**Statement of Problem and Substantiation for Public Input**

Justification:

Anodeless risers are being installed too close to and in firepits causing the plastic piping within the riser to melt and cause leaks.

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

**Submitter Information Verification**

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**Submittal Date:** Fri May 28 15:46:36 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 100-NFPA 54-2021 [ Section No. 7.1.1.2 ]****7.1.1.2**

Underground plastic piping and anodeless risers 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.

**Statement of Problem and Substantiation for Public Input**

Justification:

Anodeless risers are being installed too close to and in firepits causing the plastic piping within the riser to melt and cause leaks.

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

**Submitter Information Verification**

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**Submittal Date:** Fri May 28 15:43:52 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 102-NFPA 54-2021 [ New Section after 7.1.3 ]

### 7.1.3.1 Design and Approvals

All cathodic protection systems installed shall be designed and approved by a qualified corrosion engineer.

### Statement of Problem and Substantiation for Public Input

Justification:

Cathodic protection systems are not being designed correctly on facilities downstream of the gas meter and are failing due to corrosion.

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

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**Submittal Date:** Fri May 28 15:49:14 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 103-NFPA 54-2021 [ Section No. 7.1.3 [Excluding any Sub-Sections] ]**

Steel pipe and steel tubing installed underground shall be installed in accordance with the 7.1.3.1 through 7.1.3.9 10.

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

**Submitter Information Verification**

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**Submittal Date:** Fri May 28 15:52:02 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 104-NFPA 54-2021 [ Section No. 7.1.3.1 ]****7.1.3.4 – 2**

Zinc coating (galvanizing) shall not be deemed adequate protection for underground gas piping.

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

**Submitter Information Verification**

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**Submittal Date:** Fri May 28 15:53:03 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 105-NFPA 54-2021 [ Section No. 7.1.3.2 ]****7.1.3.2 – 3**

Underground piping shall comply with one or more of the following unless approved technical justification is provided to demonstrate that protection is unnecessary:

- (1) The piping shall be made of corrosion-resistant material that is suitable for the environment in which it will be installed.
- (2) Pipe shall have a factory-applied, electrically insulating coating. Fittings and joints between sections of coated pipe shall be coated in accordance with the coating manufacturer's instructions.
- (3) The piping shall have a cathodic protection system installed, and the system shall be maintained in accordance with 7.1.3.34 or 7.1.3.67.

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

**Submitter Information Verification**

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**Committee:** NFG-AAA



**Public Input No. 57-NFPA 54-2021 [ Section No. 7.1.3.2 ]****7.1.3.2**

Underground piping shall comply with one or more of the following unless approved technical justification is provided to demonstrate that protection is unnecessary for installation without corrosion protection :

- (1) The piping shall be made of corrosion-resistant material that is suitable for the environment in which it will be installed.
- (2) Pipe shall have a factory-applied, electrically insulating coating. Fittings and joints between sections of coated pipe shall be coated in accordance with the coating manufacturer's instructions.
- (3) The piping shall have a cathodic protection system installed, and the system shall be maintained in accordance with 7.1.3.3 or 7.1.3.6.

**Statement of Problem and Substantiation for Public Input**

As written the requirement is confusing. "Approved is defined in 3.3.2 as acceptable to the Authority Having Jurisdiction (AHJ). As defined, "approved technical justification" has been reviewed by the AHJ and accepted. The requirement appears to define approved, which is not needed for terms defined in the Code.

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**Submittal Date:** Mon May 10 11:13:59 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 106-NFPA 54-2021 [ Section No. 7.1.3.3 ]****7.1.3.3 4**

Cathodic protection systems shall be monitored by testing and the results shall be documented. The test results shall demonstrate one of the following:

- (1) A pipe-to-soil voltage of  $-0.85$  volts or more negative is produced, with reference to a saturated copper-copper sulfate half cell
- (2) A pipe-to-soil voltage of  $-0.78$  volts or more negative is produced, with reference to a saturated KCl calomel half cell
- (3) A pipe-to-soil voltage of  $-0.80$  volts or more negative is produced, with reference to a silver-silver chloride half cell
- (4) Compliance with a method described in Appendix D of Title 49 of the Code of Federal Regulations, Part 192

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

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**Submittal Date:** Fri May 28 15:56:23 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 107-NFPA 54-2021 [ Section No. 7.1.3.4 ]****7.1.3.4 – 5**

Sacrificial anodes shall be tested in accordance with the following:

- (1) Upon installation of the cathodic protection system, except where prohibited by climatic conditions, in which case the testing shall be performed not later than 180 days after the installation of the system
- (2) 12 to 18 months after the initial test
- (3) Upon successful verification testing in accordance with (1) and (2), periodic follow-up testing shall be performed at intervals not to exceed 36 months

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

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**Submission Date:** Fri May 28 15:57:04 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 108-NFPA 54-2021 [ Section No. 7.1.3.5 ]****7.1.3.5 – 6**

Systems failing a test shall be repaired not more than 180 days after the date of the failed testing. The testing schedule shall be restarted as required in 7.1.3.4(1) and 7.1.3.4(2), and the results shall comply with 7.1.3.3.

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

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**Committee:** NFG-AAA

**Public Input No. 109-NFPA 54-2021 [ Section No. 7.1.3.6 ]****7.1.3.6 – 7**

Impressed current cathodic protection systems shall be inspected and tested in accordance with the following schedule:

- (1) The impressed current rectifier voltage output shall be checked at intervals not exceeding two months.
- (2) The pipe-to-soil voltage shall be tested at least annually.

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

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**Committee:** NFG-AAA

**Public Input No. 110-NFPA 54-2021 [ Section No. 7.1.3.7 ]****7.1.3.7 – 8**

Documentation of the results of the two most recent tests shall be retained.

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

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**Submittal Date:** Fri May 28 15:58:47 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 111-NFPA 54-2021 [ Section No. 7.1.3.8 ]****7.1.3.8 – 9**

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

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

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**Committee:** NFG-AAA

**Public Input No. 112-NFPA 54-2021 [ Section No. 7.1.3.9 ]****7.1.3.9 10**

Steel risers, other than anodeless risers, connected to plastic piping shall be cathodically protected by means of a welded anode not be installed .

**Statement of Problem and Substantiation for Public Input**

Renumbering after proposing the addition of a new 7.1.3.1

Justification:

Risers that are not anodeless are required to be protected for corrosion. Anodes installed to protect a riser over time, stop providing the necessary protection. The only way to ensure that the riser is protected is to monitor electrically. There is no entity to enforce that once protection is installed that it will be monitored and stay protected.

Respectfully submitted on the behalf of Norton McMurray Manufacturing Company ("NORMAC").

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**Submittal Date:** Fri May 28 16:01:58 EDT 2021

**Committee:** NFG-AAA





## Public Input No. 90-NFPA 54-2021 [ Section No. 7.1.7.1 ]

### 7.1.7.1 Connection of Plastic Piping.

Plastic piping shall be installed outdoors, underground only.

*Exception No. 1: PEX-AL-PEX composite piping systems when installed in accordance with Section 5.5.4.*

*Exception No. 2: Plastic piping shall be permitted to terminate aboveground where an anodeless riser is used.*

*Exception No. 2 3 : Plastic piping shall be permitted to terminate with a wall head adapter aboveground in buildings, including basements, where the plastic piping is inserted in a piping material permitted for use in buildings.*

### Statement of Problem and Substantiation for Public Input

PEX-AL-PEX composite piping systems have characteristics of both metallic and plastic systems and can be construed as either metallic or plastic pipe depending on the familiarity of the system. Proven as a safe system to supply gas appliances in buildings for over 15 years, this system should not be classified as just another "plastic pipe". Other change proposals being submitted further prescribe the proper sizing and installation of these systems.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 88-NFPA 54-2021 [Section No. 5.5.4.1]</a>	
<a href="#">Public Input No. 87-NFPA 54-2021 [Section No. 2.3.2]</a>	
<a href="#">Public Input No. 91-NFPA 54-2021 [New Section after 7.2]</a>	

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**Submittal Date:** Fri May 28 09:26:40 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 119-NFPA 54-2021 [ Section No. 7.1.7.3.1 ]

### 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
- (3) Tracer wire listed and labeled in accordance with UL 2989

### Statement of Problem and Substantiation for Public Input

UL 2989 was developed to establish specific construction and performance testing criteria to determine the suitability of wire for use underground as a detectable tracer wire.

The tests include:

- Physical Properties of Insulation
- Mechanical Water Absorption
- Cold-Bend Test
- Crushing Resistance
- Impact Resistance
- Unwinding of Low Temperature
- Dielectric-Voltage Withstand

Including the specific reference to UL 2989 clarifies what products are specifically designed for the specific purpose of tracer wires. UL currently has 15 manufacturers that have tracer wire listed to UL 2989.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
Public Input No. 118-NFPA 54-2021 [Section No. 2.3.5]	

### Submitter Information Verification

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## Public Input No. 12-NFPA 54-2021 [ New Section after 7.1.8 ]

[7.1.9 Multi-layer piping.](#)

[7.1.9.1 Multi-layer piping shall be installed outdoors, underground only.](#)

[7.1.9.2 Multi-layer piping shall be permitted to terminate above-ground where an anodeless riser is used.](#)

### Statement of Problem and Substantiation for Public Input

A new type of gas piping products consisting of a thin layer of aluminum with inner and outer polymeric layers is being used for fuel gas. As there are no installation requirements for this product it is recommended that it's installation be limited to outdoor underground locations, consistent with 7.5.2.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 11-NFPA 54-2021 [New Section after 5.5.3.6]</a>	

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## Public Input No. 91-NFPA 54-2021 [ New Section after 7.2 ]

### 7.2.8 PEX-AL-PEX.

PEX-AL-PEX piping systems shall be installed in accordance with this code and the manufacturers installation instructions.

### Statement of Problem and Substantiation for Public Input

Like CSST, this language emphasizes the need to follow the code and the installation instructions to ensure proper installation for the specific application.

### Related Public Inputs for This Document

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 87-NFPA 54-2021 [Section No. 2.3.2]</a>	
<a href="#">Public Input No. 88-NFPA 54-2021 [Section No. 5.5.4.1]</a>	
<a href="#">Public Input No. 90-NFPA 54-2021 [Section No. 7.1.7.1]</a>	
<a href="#">Public Input No. 92-NFPA 54-2021 [Section No. 7.3.2]</a>	

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**Public Input No. 92-NFPA 54-2021 [ Section No. 7.3.2 ]****7.3.2 Fittings in Concealed Locations.**

Fittings installed in concealed locations shall be limited to the following types:

- (1) Threaded elbows, tees, couplings, 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/CSA 6.32, *Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems*
- (5) [Fittings listed to be used with PEX-AL-PEX piping systems](#)

**Statement of Problem and Substantiation for Public Input**

ASTM F1281 contains testing requirements for both the pipe and fitting system together as the fittings are typically designed to be used with the individual piping system only and fittings cannot be listed to ASTM F1281 individually.

**Related Public Inputs for This Document**

<u>Related Input</u>	<u>Relationship</u>
<a href="#">Public Input No. 91-NFPA 54-2021 [New Section after 7.2]</a>	

**Submitter Information Verification**

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**Submission Date:** Fri May 28 10:49:14 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 76-NFPA 54-2021 [ Section No. 7.3.5.2 ]

### 7.3.5.2 Other Occupancies.

In other than industrial occupancies and where approved ~~by the authority having jurisdiction~~, gas piping embedded in concrete floor slabs constructed with Portland cement shall be surrounded with a minimum of 1½ in. (38 mm) of concrete and shall not be in physical contact with other metallic structures such as reinforcing rods or electrically neutral conductors. All piping, fittings, and risers shall be protected against corrosion in accordance with 7.2.2. Piping shall not be embedded in concrete slabs containing quickset additives or cinder aggregate.

### Statement of Problem and Substantiation for Public Input

Revised to substitute "approved" for "approved by the Authority Having Jurisdiction (AHJ).

The term is redundant as "Authority Having Jurisdiction" (AHJ) is defined in 3.3.2 as being acceptable to the AHJ. The term "approved" is used 39 times in the Code in 5.5.7.2, 5.5.7.3, 5.14 (1), 7.1.5 (1), 7.1.6 (1), 7.2.1 (2), 7.3.5.1, 7.11.6.1, 8.1.1.4, 8.1.5.2 (2x), 9.1.1 (2x), 9.6.5, 9.6.6.2, 10.2.5, 10.3.4 Exception No. 2, 10.3.5, 10.3.7, 10.3.6, 10.3.7, 10.14.2.2 (3) and (4), 10.20.3, 10.21.2 Exceptions No. 1 and No. 2, 10.28, 12.3.2.1, 12.6.1.3 (1) and (3), 12.8.1, 12.8.3.3 (3), 12.9.2, 12.11.6.3 (3), 12.13.2.1 (2x), 12.16 (2) and (5), 13.1.9, 13.2.18.

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**Committee:** NFG-AAA

**Public Input No. 93-NFPA 54-2021 [ Section No. 7.5.2 ]****7.5.2 Plastic Pipe.**

Plastic pipe bends shall comply with the following:

- (1) The pipe shall not be damaged, and the internal diameter of the pipe shall not be effectively reduced.
- (2) Joints shall not be located in pipe bends.
- (3) The radius of the inner curve of such bends shall ~~not be less than 25 times the inside diameter of the pipe~~ be in accordance to the manufacturers instructions .
- (4) Where the piping manufacturer specifies the use of special bending tools or procedures, such tools or procedures shall be used.

**Statement of Problem and Substantiation for Public Input**

The maximum bend radius is determined by the flexibility, wall thickness, and size of the pipe. This bend radius is specified by the manufacturer and it is not needed to have an installer measure the actual inner diameter to calculate the bend radius required.

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**Committee:** NFG-AAA

**Public Input No. 58-NFPA 54-2021 [ Section No. 7.7.2.1 ]****7.7.2.1**

Each outlet, including a valve, shall be closed gastight with a threaded plug or cap immediately after installation and shall be left closed until the appliance or equipment is connected thereto. When an appliance or equipment is disconnected from an outlet and the outlet is not to be used again immediately, it shall be capped or plugged gastight whether or not there is gas supplied to the piping system.

*Exception No. 1: Laboratory appliances installed in accordance with 9.6.2(1) shall be permitted.*

*Exception No. 2: The use of a listed quick-disconnect device with integral shutoff or listed gas convenience outlet shall be permitted.*

**Statement of Problem and Substantiation for Public Input**

I have worked on incidents where outlets have not been plugged or capped after an appliance was removed. It has been claimed that there was no need to cap or plug the outlet because the gas supply to the piping system had been interrupted. While this claim is not supported by the Code, this proposal intends to make it clearer that the cap all outlets is applicable whether there is gas supply or not.

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**Submittal Date:** Mon May 10 11:17:18 EDT 2021

**Committee:** NFG-AAA



**Public Input No. 59-NFPA 54-2021 [ Section No. 7.11.5.2 ]****7.11.5.2 Electrical Requirements.**

Where gas-mixing machines are installed in well-ventilated areas, the type of electrical equipment shall be in accordance with *NFPA 70* for ~~general service conditions unless other hazards in~~ unclassified areas unless other hazards require classification of the area prevail . Where gas-mixing machines are installed in small detached buildings or cutoff rooms, ~~the electrical equipment and wiring shall be installed in accordance with *NFPA 70* for hazardous locations (Articles 500 and 501, Class I, Division 2)~~ building shall be classified Class I, Division 2 .

**Statement of Problem and Substantiation for Public Input**

The requirement is revised to use terminology consistent with the National Electrical Code as this is an electrical requirement. The term "general service" is not used in the National Electrical Code and is replaced with the more appropriate term "unclassified area". The second sentence is revised for clarity.

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**Submittal Date:** Mon May 10 11:20:21 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 8-NFPA 54-2021 [ Section No. 7.12.1 ]****7.12.1** 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~~ an appliance within the system that is connected to the ~~appliance~~ equipment grounding conductor of the circuit supplying that appliance.

**Statement of Problem and Substantiation for Public Input**

7.12.1 is updated to indicate that a single appliance within the gas piping system connected to the grounding conductor is sufficient to serve to bond the gas piping system. The paragraph is also updated to change 'appliance grounding conductor' to 'equipment grounding conductor' to make the language consistent with NFPA 70, National Electrical Code®.

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**Submission Date:** Mon Mar 22 15:32:35 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 9-NFPA 54-2021 [ Section No. 7.12.3 ]****7.12.3 Arc-Resistant Jacketed CSST.**

~~CSST listed with CSST with~~ an arc-resistant jacket or coating system shall be listed as arc-resistant in accordance with CSA/ANSI LC 1/CSA 6.26, Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing,

~~7.12.3.1 Arc-resistant jacketed CSST shall be electrically continuous and bonded to an effective ground fault current path. Where any CSST component of a piping system does not have an arc-resistant jacket or coating system, the bonding requirements of~~

~~7.12.3.2 shall apply.~~ Arc-resistant jacketed CSST shall be considered to be bonded ~~when it~~ where the piping system is connected to ~~appliances that are~~ an appliance within the system that is connected to the ~~appliance equipment~~ grounding conductor of the circuit supplying that appliance

~~7.12.3.3 Where any CSST used in a piping system does not have an arc-resistant jacket or coating system, the bonding requirements of 7.12.2 shall apply~~

**Statement of Problem and Substantiation for Public Input**

7.12.3 is updated to indicate that a single appliance within the gas piping system connected to the grounding conductor is sufficient to serve to bond the gas piping system. The same paragraphs are also updated to change 'appliance grounding conductor' to 'equipment grounding conductor' to make the language consistent with NFPA 70, National Electrical Code. The requirement is separated into separate paragraphs for clarity.

7.12.3.2 is revised to clarify what "it" is referring to. Omega Flex is aware that a number of AHJs have misinterpreted this requirement.

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**Submission Date:** Mon Mar 22 15:37:31 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 60-NFPA 54-2021 [ Section No. 7.14.1 ]****7.14.1**

All electrical connections between wiring and electrically operated control devices in a piping system shall conform to the requirements of All wiring shall be in accordance with NFPA 70.

**Statement of Problem and Substantiation for Public Input**

Revised to be applicable to all wiring, not just piping systems.

**Submitter Information Verification**

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**Submittal Date:** Mon May 10 11:25:43 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 61-NFPA 54-2021 [ Section No. 7.14.2 ]****7.14.2**

~~Any essential safety control depending on electric current as the operating medium shall be of a type that shuts off (fail safe) the flow of gas in the event of current. Electrically powered safety controls shall fail safe and shut off the flow of gas in the event of electrical failure.~~

**Statement of Problem and Substantiation for Public Input**

Revised for clarity.

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**Submittal Date:** Mon May 10 11:28:23 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 80-NFPA 54-2021 [ New Section after 8.1.1 ]

### 8.4 Abandoned Fuel Gas Piping

Where fuel gas piping is in service over 5 psig that has been abandoned in place for a period of more than 24 months, it shall be purged and the contents displaced with an inert substance.

### Statement of Problem and Substantiation for Public Input

There have been catastrophic incidents in industrial facilities where gas lines have been out of service for years and then demolition contractors or mechanical integrity issues have caused releases.

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**Submittal Date:** Tue May 18 08:07:19 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 77-NFPA 54-2021 [ Section No. 8.1.1.3 ]****8.1.1.3**

Where repairs or additions are made following the pressure test, the affected piping shall be tested. Minor repairs and additions are not required to be pressure tested, provided that the work is inspected and connections are tested with a noncorrosive leak-detecting fluid or other leak-detecting methods approved ~~by the authority having jurisdiction~~ .

**Statement of Problem and Substantiation for Public Input**

Revised to substitute "approved" for "approved by the Authority Having Jurisdiction (AHJ).

The term is redundant as "Authority Having Jurisdiction" (AHJ) is defined in 3.3.2 as being acceptable to the AHJ. The term "approved" is used 39 times in the Code in 5.5.7.2, 5.5.7.3, 5.14 (1), 7.1.5 (1), 7.1.6 (1), 7.2.1 (2), 7.3.5.1, 7.11.6.1, 8.1.1.4, 8.1.5.2 (2x), 9.1.1 (2x), 9.6.5, 9.6.6.2, 10.2.5, 10.3.4 Exception No. 2, 10.3.5, 10.3.7, 10.3.6, 10.3.7, 10.14.2.2 (3) and (4), 10.20.3, 10.21.2 Exceptions No. 1 and No. 2, 10.28, 12.3.2.1, 12.6.1.3 (1) and (3), 12.8.1, 12.8.3.3 (3), 12.9.2, 12.11.6.3 (3), 12.13.2.1 (2x), 12.16 (2) and (5), 13.1.9, 13.2.18.

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**Submittal Date:** Mon May 10 15:09:07 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 62-NFPA 54-2021 [ Section No. 8.1.4.2 ]****8.1.4.2**

The test pressure to be used shall be no less than 1½ times the proposed maximum working pressure, but not less than 3 psi (20 kPa), ~~irrespective of design pressure~~ . Where the test pressure exceeds 125 psi (862 kPa), the test pressure shall not exceed a value that produces a hoop stress in the piping greater than 50 percent of the specified minimum yield strength of the pipe.

**Statement of Problem and Substantiation for Public Input**

The phrase “irrespective of design pressure” is deleted as it is not needed. The 3 psi limit is clear.

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**Submittal Date:** Mon May 10 11:33:28 EDT 2021

**Committee:** NFG-AAA



**Public Input No. 63-NFPA 54-2021 [ Section No. 8.1.5.2 ]****8.1.5.2**

The leakage shall be located by means of an approved-gas-listed combustible-gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods.

**Statement of Problem and Substantiation for Public Input**

1. The term "gas detector" is not consistent with the use of "combustible gas indicator" and "combustible gas detector" in 8.3, Purging. The term "combustible gas indicator" is an instrument with a percent readout, while a "combustible gas detector" is an instrument that indicates the presence of fuel gas above a preset amount by a vibration or a sound. It is believed that the term "gas detector" here is the simpler "combustible gas detector". The term "gas detector" is used only in this requirement.
2. Approved is deleted and listed is substituted to be consistent with 8.3.3.2 which requires listing of combustible gas detectors.

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**Submittal Date:** Mon May 10 11:39:05 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 1-NFPA 54-2020 [ Section No. 8.2.3 ]****8.2.3\* Leak Check.**

Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the piping system, readily accessible, shall be checked for leakage. Where leakage is indicated, the gas supply shall be shut off until the necessary repairs have been made.

**REFERENCE ONLY:**

3.3.1.1 Readily Accessible. Having direct access without the

need of removing or moving any panel, door, or similar

covering of the item described.

**Additional Proposed Changes****File Name****Description Approved**

.1606520366051

**Statement of Problem and Substantiation for Public Input**

Based on NFPA 54, 2021 edition, Chapter 8 information, immediately after introducing gas back into a system that has been shut-off and restored after an interruption of service, a leak test is required but no inspection is mentioned and therefore not indicated as required under this section.

The current wording does not allow for a piping system leak check as it is allowable to leak test from exterior of the structure and therefore confirmation is not possible that the system, as defined in 3.3.95.6, was leak tested. There is no knowledge that all branch line valves, if any, within the structure, are open. If any are closed and later opened, uncapped or unplugged outlets serves as a leak.

The section, 8.2.3 Leak Check, cannot comply with its' own requirements. Therefore, the requirements of the section must be modified. This modification is a change to the 2021 edition suggested for the 2024 edition of NFPA 54.

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**Submission Date:** Fri Nov 27 18:37:06 EST 2020

**Committee:** NFG-AAA

**Public Input No. 64-NFPA 54-2021 [ Section No. 8.2.3 ]****8.2.3\* Leak Check.**

Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the piping system shall be checked for leakage. Where leakage is indicated, the gas supply shall be shut off until the necessary repairs have been made. Where minor repairs have been made in accordance with 8.1.1.3, no additional leak checks shall be required.

**Statement of Problem and Substantiation for Public Input**

This requirement applies to all turn-ons after an interruption of service. Paragraph 8.1.1.3 provides a special case where only minor repairs have been made and allows a simpler alternate to a pressure test. This revision provides a similar option for leak checks where only minor repairs have been made.

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**Submittal Date:** Mon May 10 11:59:46 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 50-NFPA 54-2021 [ Section No. 9.1.6.1 ]****9.1.6.1**

Where corrosive or flammable process fumes or gases, such as carbon monoxide, hydrogen sulfide, ammonia, chlorine, and halogenated hydrocarbons

as  
are present in quantities that can present a hazard to fired equipment by these materials entering combustion air ,  
means for their safe disposal shall be provided.  
the following shall apply:

a) A detection system with alarms and an operational interlock shall be provided to shut down the equipment and provide notice should an unsafe condition occur.

d) A means to control the concentration of the priority contaminant shall be provided along with an alarm and operational interlock to shut down the equipment and provide notice should an unsafe condition occur.

b) Fired appliances shall be located in a mechanical room separate or partitioned off from other areas with provisions for combustion and dilution air from outdoors.

c) Direct vent appliances shall be used in accordance with the appliance manufacturer's installation instructions.

**Statement of Problem and Substantiation for Public Input**

The current requirement is vague and does not identify a) that there needs to be a hazardous quantity available, many industrial spaces have some amount of carbon monoxide, b) means of removal means nothing, our real objective is that if there's a hazard we don't want to operate the equipment and if that's the case we should say so.

**Submitter Information Verification**

**Submitter Full Name:** John Puskar

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**Submittal Date:** Sat May 08 18:55:42 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 49-NFPA 54-2021 [ Section No. 9.1.6.2 ]****9.1.6.2**

~~Non-direct-vent appliances installed in beauty shops, barber shops, or other facilities where~~

Where chemicals that generate corrosive or flammable products such as aerosol sprays are routinely used the following shall apply to fired appliances where these materials can enter combustion air:

a) Fired appliances shall be located in a mechanical room separate or partitioned off from other areas with provisions for combustion and dilution air from outdoors.

b) Direct vent

~~appliances in such facilities shall~~

appliances shall be used in accordance with the appliance manufacturer's installation instructions.

**Statement of Problem and Substantiation for Public Input**

This revision was made to make this provision more clear and to also emphasize that this requirement applies to many more areas that barber shops and or beauty shops.

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**Submittal Date:** Sat May 08 18:45:00 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 53-NFPA 54-2021 [ Section No. 9.1.7 ]****MOVE TO SECTION 9.3 AIR FOR COMBUSTION****9.1.7** Process Air.

In addition to air needed for combustion in commercial or industrial processes, process air shall be provided as required for cooling of appliances, equipment, or material; for controlling dew point, heating, drying, oxidation, dilution, safety exhaust, odor control, and air for compressors; and for comfort and proper working conditions for personnel.

**Statement of Problem and Substantiation for Public Input**

THIS SHOULD BE LOCATED IN SECTION 9.3, AIR FOR COMBUSTION

**Submitter Information Verification**

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**Submittal Date:** Sat May 08 19:32:22 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 82-NFPA 54-2021 [ New Section after 9.1.8.1 ]

### 9.1.8.1\*

Floor loadings are typically provided as pounds per square foot load capability for a given type of floor construction. Installers should consult with architects or structural engineers to discuss the route that appliances or equipment would take into a building along with final installed locations. Considerations should also include the type of base used, and the possibility of live or dynamic loads to occur with the equipments operation. Consideration should also be given for the transmission of vibrations to the structure and piping connections.

### Statement of Problem and Substantiation for Public Input

This annex material attempts to provide guidance for the PI I submitted suggesting that the information about structural loadings should be more concise and better directed.

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**Submittal Date:** Fri May 21 20:03:18 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 81-NFPA 54-2021 [ Section No. 9.1.8.1 ]****9.1.8.1- \***

Appliances and equipment shall be furnished either with load distributing bases or with a sufficient number of supports to prevent damage to either the building structure or the appliance and the equipment not exceed design floor loading .

**Statement of Problem and Substantiation for Public Input**

I am submitting this along with revisions to the next section and annex material since all of these collectively attempt to deal with floor loadings. I do not believe we should be addressing this at all. This is a fire code and not a structural design code. However, I am submitting this in any case to actually make this a requirement that is more practical overall and gives the user more guidance than previously was the case.

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**Submittal Date:** Fri May 21 20:00:07 EDT 2021  
**Committee:** NFG-AAA



**Public Input No. 83-NFPA 54-2021 [ Section No. 9.1.8.2 ]****9.1.8.2**

At the locations selected for installation of appliances and equipment, the dynamic and static load carrying capacities of the building structure shall be checked to determine whether they are adequate to carry the additional loads. The appliances and equipment shall be supported and shall be connected to the piping so as not to exert undue stress on the connections. All piping, flue gas, and combustion air systems shall be installed such that no static equipment loads are transmitted to them.

**Statement of Problem and Substantiation for Public Input**

I believe that the previous language asked for multiple requirements. It's also not clear how someone would evaluate for dynamic loads and who that would be submitted to. I have also addressed the entire floor loading issue in my previous PI. This attempts to make this one requirement that is concise and identifies what we are actually trying to accomplish and that is not having the equipment in any way supported from any piping.

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**Submittal Date:** Fri May 21 20:10:22 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 51-NFPA 54-2021 [ Sections 9.1.10, 9.1.11, 9.1.12 ]****PROPOSE MOVING ALL OF THESE SECTIONS TO THE END OF CHAPTER 10**

Sections 9.1.10, 9.1.11, 9.1.12

**9.1.10** Installation in Residential Garages.

**9.1.10.1**

Appliances in residential garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that all burners and burner ignition devices are located not less than 18 in. (460 mm) above the floor unless listed as flammable vapor ignition resistant.

**9.1.10.2**

Such appliances shall be located or protected so they are not subject to physical damage by a moving vehicle.

**9.1.10.3**

Where appliances are installed in a separate, enclosed space having access only from outside of the garage, such appliances shall be permitted to be installed at floor level, providing the required combustion air is taken from the exterior of the garage.

**9.1.11** Installation in Commercial Garages.

**9.1.11.1** Parking Structures.

Appliances installed in enclosed, basement, and underground parking structures shall be installed in accordance with NFPA 88A.

**9.1.11.2** Repair Garages.

Appliances installed in repair garages shall be installed in accordance with NFPA 30A.

**9.1.12** Installation in Aircraft Hangars.

Heaters in aircraft hangars shall be installed in accordance with NFPA 409.

**Statement of Problem and Substantiation for Public Input**

These items are all about specific installations that fit with chapter 10 much better than here in chapter 9, if nothing else we should put them together at the end of section 9.1 as the last items, its very confusing to have them in the middle of general requirements like this.

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**Submittal Date:** Sat May 08 19:17:42 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 65-NFPA 54-2021 [ Section No. 9.1.15 ]****9.1.15** Extra Device or Attachment.

No device or attachment shall be installed on any appliance that ~~could in any way~~ could impair the combustion of gas.

**Statement of Problem and Substantiation for Public Input**

An unnecessary modifier is deleted. The requirement is clear and enforceable without "in any way".

**Submitter Information Verification**

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**Organization:** TLemoff Engineering

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**Submittal Date:** Mon May 10 12:03:28 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 52-NFPA 54-2021 [ Section No. 9.1.16 ]****9.1.16\*** Avoiding Strain on Gas Piping.

Appliances shall be supported and connected to the piping so as not to exert undue strain on the connections. Mechanical loads can be transferred to appliance fuel trains and valves in many ways that can include fuel piping that is not supported properly, thermal expansion of systems that the appliance is connected to, and and or from vibrations. In some cases appliance gas trains contain aluminum bodied valves and threaded fittings which cannot reliably maintain their integrity with mechanical loads. In some cases listed or properly rated flexible connectors can be a solution.

**Statement of Problem and Substantiation for Public Input**

The term "undue" really bothers me. I don't have a great answer for this but it seems annex material might help.

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**Submittal Date:** Sat May 08 19:20:47 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 84-NFPA 54-2021 [ Section No. 9.1.21 ]****9.1.21** Protection of Outdoor Appliances.

Appliances not listed for outdoor installation but installed outdoors shall be provided with protection to the degree that the environment requires. ~~Appliances listed for outdoor installation shall be permitted to be installed without protection in accordance with the manufacturer's installation instructions.~~

**Statement of Problem and Substantiation for Public Input**

This item contains two requirements which is against the manual of style. The requirement I removed is redundant and in fact in the section immediately above we already tell the user to follow the manufacturers instructions.

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**Submittal Date:** Fri May 21 20:23:01 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 66-NFPA 54-2021 [ Section No. 9.2.1 ]****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 for service.~~

**9.2.1.1** ~~Clearances shall permit servicing the appliance.~~

**9.2.1.2** ~~the passageway to and servicing area adjacent to attic appliances shall be floored.~~

**A.9.2.1** ~~Service of appliances includes 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 and other required service procedures .~~

**Statement of Problem and Substantiation for Public Input**

Editorial revisions and relocation of specific examples to Annex A. The paragraph is separated as multiple requirements are included.

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**Submission Date:** Mon May 10 13:10:19 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 85-NFPA 54-2021 [ Section No. 9.2.1 ]****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 to provide clearance for the following:

- a) cleaning of heating surfaces; the replacement of filters, blowers, motors, burners, controls, and vent connections; the lubrication
- b) replacement of serviceable components and filters
- c) lubrication of moving parts where necessary; the
- d) adjustment and cleaning of burners and pilots; and the proper
- e) proper functioning of explosion vents, if provided.

9.2.1.2 For attic installation, the passageway and servicing area adjacent to the appliance shall be floored.

**Statement of Problem and Substantiation for Public Input**

The version I have submitted removes multiple requirements

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**Submittal Date:** Fri May 21 20:26:10 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 86-NFPA 54-2021 [ Section No. 9.3.1.5 ]****9.3.1.5**

~~Where~~ Combustion air system design and function shall be validated and documented with an acceptance test where all exhaust fans, clothes dryers, and kitchen ventilation systems interfere with the operation of appliances, make-up air shall be provided systems and all air consuming appliances are operated simultaneously and carbon monoxide readings are taken at flue gas outlets to verify operation within manufacturers acceptable range.

9.1.3.6 Where the combustion air systems acceptance test fails the combustion air system will be redesigned and retested until it can be demonstrated to provide safe appliance operations .

**Statement of Problem and Substantiation for Public Input**

The previous language was not enforceable. Every year there are many deaths and injuries related to carbon monoxide. This could help. Calling out the need for someone to have to add make-up air as the only remedy, is confusing. It seems to imply a mechanical make-up air system when what we really mean is by any of the methods we identify. Everyone has seen instances where very little thought is given to proper combustion air, and its not just about design, its about, "does it really work", lots of things can get screwed up in the installation part. A test, a demonstration, a witnessing of commissioning, is the only thing that gets this done and proven.

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**Submittal Date:** Fri May 21 21:13:45 EDT 2021

**Committee:** NFG-AAA





## Public Input No. 113-NFPA 54-2021 [ New Section after 9.6.1 ]

### **9.6.1.6 Disconnected Open Connector Protection**

Each connector shall have a suitable plug or cap connected with a wire or strap no more than 24" from the end of the connector opening for installation to the open connector whenever the connector is disconnected from the appliance.

### **Statement of Problem and Substantiation for Public Input**

Many accidents occur every year because connectors are left disconnected and gas either leaks through isolation valves or they are not shut properly or valves are accidentally turned on. if we require a plug or cap to be immediately there we dramatically enhance the chances of the end being capped or plugged.

### **Submitter Information Verification**

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**Submittal Date:** Sat May 29 15:54:35 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 67-NFPA 54-2021 [ Section No. 9.7.3 ]****9.7.3 Electrical Circuit.**

The electrical circuit employed for operating the automatic main gas control valve, automatic pilot, room temperature thermostat, limit control, or other electrical devices used with the appliances shall be in accordance with the wiring ~~diagrams certified or approved-~~ diagrams provided by the original appliance manufacturer.

**Statement of Problem and Substantiation for Public Input**

Currently the wiring diagram must be "certified" or "approved". The term certified is defined as "genuine, authentic" by Merriam Webster online dictionary. Approved is defined in 3.3.2 as acceptable to the authority having jurisdiction. There is no indication of who can certify the wiring diagram, or what the AHJ should use to determine if the wiring diagram is acceptable. As it appears that the intent of the requirement is to require that the installer use wiring diagrams provided by the appliance manufacturer, the requirement is revise to say that.

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**Submittal Date:** Mon May 10 13:18:30 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 70-NFPA 54-2021 [ Section No. 10.11.2 ]****10.11.2** Clearance for Listed Appliances.

Floor-mounted food service appliances, ~~such as ranges for hotels and restaurants, deep fat fryers, unit broilers, kettles, steam cookers, steam generators, and baking and roasting ovens,~~ shall be installed at least 6 in. (150 mm) from combustible material ~~except that at least a 2 in. (50 mm) clearance shall be maintained between~~ except the clearance from a draft hood and combustible material shall be at least 2 inches .

**10.11.2.1** Floor-mounted food service appliances listed for installation at lesser clearances shall be installed in accordance with the manufacturer's installation instructions.

**10.11.2.2** Appliances designed and marked "For use only in noncombustible locations" shall not be installed elsewhere.

**Statement of Problem and Substantiation for Public Input**

1. A list of the types of floor-mounted food service appliances is not needed in the Code. Move to Annex A if needed.
2. Editorial revisions to clarify minimum clearances
3. Separated into main and sub paragraphs as multiple requirements are provided.

**Submitter Information Verification**

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**Submittal Date:** Mon May 10 13:36:39 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 71-NFPA 54-2021 [ Section No. 10.12.3 ]****10.12.3** Clearance for Appliances.

Food service counter appliances, where installed on combustible surfaces, shall be installed with a minimum horizontal clearance of 6 in. (150 mm) from combustible material, except that ~~at least a 2 in. (50 mm) clearance shall be maintained between the~~ clearance from a draft hood and combustible material shall be at least 2 inches . Food service counter appliances listed for installation at lesser clearances shall be installed in accordance with the manufacturer's installation instructions.

**Statement of Problem and Substantiation for Public Input**

Revised editorially to more clearly state the requirements.

**Submitter Information Verification**

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**Submittal Date:** Mon May 10 13:54:12 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 68-NFPA 54-2021 [ Section No. 10.17.2 ]****10.17.2** Protection Above ~~Domestic~~ Residential Units.

~~Domestic~~ Residential open-top broiler units shall be provided with a metal ventilating hood not less than 0.0122 in. (0.3 mm) thick with the following clearances:

**10.17.2.1** a clearance of not less than ¼ in. (6 mm) between the hood and the underside of combustibile material or metal cabinets.- A

**10.17.2.2** A clearance of at least 24 in. (610 mm) ~~shall be maintained~~ between the cooking top and the combustibile material or metal cabinet, and the hood shall be at least as wide as the open-top broiler unit and centered over the unit.- Domestic

**10.17.2.3** Residential open-top broiler units incorporating an integral exhaust system and listed for use without a ventilating hood shall not be required to be provided with a ventilating hood if ~~where~~ installed in accordance with 10.13.3.1(1).

**Statement of Problem and Substantiation for Public Input**

The terms residential and domestic are used in the code and appear to mean the same thing. These terms are both used in appliance standards to mean use in residences, and not commercial or industrial occupancies. Examples: ANSI Z21.8, Installation of Domestic Gas Conversion Burners, UL 103, Chimneys, Factory-Built, Residential Type and Building Heating Appliances. ANSI Z21.1 Household Cooking Gas Appliances, use "domestic" and does not use "residential". The term "residential occupancy" is used in building codes

As the term "residential" is well understood, and the term "domestic" is not as well understood.

The requirement is separated into multiple paragraphs per the NFPA Manual of Style.

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**Submittal Date:** Mon May 10 13:21:47 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 69-NFPA 54-2021 [ Section No. 10.26.5 ]****10.26.5** Temperature Limiting Devices.

A water heater installation or a hot water storage vessel installation shall be provided with overtemperature protection by means of an ~~approved~~, a listed device installed in accordance with the manufacturer's installation instructions.

**Statement of Problem and Substantiation for Public Input**

As written the listed device must also be approved by the AHJ. This is somewhat contradictory, as listed devices are not normally required to be approved, and no guidance is provided to the AHJ on what to consider when approving other than listed devices. As this device is critical for safety the AHJ should not be allowed to authorize non-listed safety devices.

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**Submission Date:** Mon May 10 13:29:05 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 114-NFPA 54-2021 [ Section No. 11.6 ]****11.6\*** Checking the Draft.

Draft hood–equipped appliances shall be ~~checked to~~ checked to verify that there is no draft hood spillage after 5 minutes of main burner operation under the following conditions:

- a) Building or structure envelope is complete and intact such that it represents future operating conditions of the appliance .
- b) All combustion air systems, and or openings are in place.
- c) All air consuming appliances and exhaust fans are on and operational.

**Statement of Problem and Substantiation for Public Input**

Checking draft means nothing unless there is actually a completed and enclosed building envelope representative of the final structure. It also means nothing if conditions representative of the final configuration for combustion air and other exhaust fans and or operating appliances are not functional.

**Submitter Information Verification**

**Submitter Full Name:** John Puskar

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**Submission Date:** Sat May 29 16:40:26 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 72-NFPA 54-2021 [ Section No. 12.3.2 [Excluding any Sub-Sections] ]**

The following appliances shall not be required to be vented:

- (1) Listed ranges
- (2) Built-in ~~domestic~~ residential cooking units listed and marked for optional venting
- (3) Listed hot plates
- (4) Listed Type 1 clothes dryers exhausted in accordance with Section 10.4
- (5) A single listed booster-type (automatic instantaneous) water heater, when designed and used solely for the sanitizing rinse requirements of a dishwashing machine, provided that the appliance is installed with the draft hood in place and unaltered, if a draft hood is required, in a commercial kitchen having a mechanical exhaust system [Where installed in this manner, the draft hood outlet shall not be less than 36 in. (910 mm) vertically and 6 in. (150 mm) horizontally from any surface other than the appliance.]
- (6) Listed refrigerators
- (7) Counter appliances
- (8) Room heaters listed for unvented use
- (9) Direct gas-fired make-up air heaters
- (10) Other appliances listed for unvented use and not provided with flue collars
- (11) Specialized appliances of limited input such as laboratory burners or gas lights

**Statement of Problem and Substantiation for Public Input**

The terms residential and domestic are used in the code and appear to mean the same thing. These terms are both used in appliance standards to mean use in residences, and not commercial or industrial occupancies. Examples:

ANSI Z21.8, Installation of Domestic Gas Conversion Burners,

UL 103, Chimneys, Factory-Built, Residential Type and Building Heating Appliances.

ANSI Z21.1 Household Cooking Gas Appliances, use "domestic" and does not use "residential".

The term "residential occupancy" is used in building codes

As the term "residential" is well understood, and the term "domestic" is not as well understood.

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**Submission Date:** Mon May 10 14:14:32 EDT 2021

**Committee:** NFG-AAA





## Public Input No. 115-NFPA 54-2021 [ New Section after 12.4.3 ]

### **12.4.3.6 Induced Draft Systems**

Induced draft systems shall be installed such that no air leakage occurs to the negative side of the system that would compromise performance.

### **Statement of Problem and Substantiation for Public Input**

There is a section for verifying no air leakage from the positive side of an induced draft system to prevent CO escape to an occupied space. However, if air leaks into the negative side of such a system its capacity is reduced and the appliance performance, especially the combustion system and the ability to remove flue products, is compromised.

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**Submittal Date:** Sat May 29 16:49:08 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 128-NFPA 54-2021 [ New Section after 12.7.4.3 ]

### **12.7.4.3.1 Total Btu Inut**

The chimney or vent system shall be sized for the total btu input.

### **Statement of Problem and Substantiation for Public Input**

Many systems are currently being sized for partial load instead of the total btu. The theory is the appliances are sized for redundancy, so the vent or chimney system should be sized for the required btu instead of the total btu. In practice, building operations change over time and may require more btu's than the original design. while the total appliance btu might be able to compensate for the change the chimney or vent system cannot.

### **Submitter Information Verification**

**Submitter Full Name:** Timothy McNulty

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**Submittal Date:** Tue Jun 01 16:44:42 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 123-NFPA 54-2021 [ New Section after 12.14.2 ]

### 12.14.2.1

Where a balancing baffle is employed, provision shall be made to prevent the flow of gas to the main burners when the balancing baffle is not performing so as to satisfy the operating requirements of the appliance for safe performance.

### Statement of Problem and Substantiation for Public Input

Balancing baffles are fixed baffles placed in the vent connector that may have not been approved by the appliance or vent manufacturer. There is no requirement in UL378, Z21.66 or other venting standards to interlock the baffle with the appliance upon failure. If the balancing baffle were to fail in a draft hooded or system with a barometric draft regulator, placed downstream of the draft regulator, this would present a significant safety hazard to occupants in the room. Each connector should prove the proper draft and in case of the baffle failure the appliance should be shut down.

### Submitter Information Verification

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**Submittal Date:** Tue Jun 01 15:56:45 EDT 2021  
**Committee:** NFG-AAA

**Public Input No. 74-NFPA 54-2021 [ Section No. 12.15 ]**

**12.15** ~~Automatically Operated Vent~~ Automatic Vent Dampers.  
An ~~automatically-operated~~ automatic vent damper shall be listed.

**Statement of Problem and Substantiation for Public Input**

Title and text revised to match the definition in 3.3.7.

**Submitter Information Verification**

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**Submittal Date:** Mon May 10 14:49:58 EDT 2021  
**Committee:** NFG-AAA



## Public Input No. 73-NFPA 54-2021 [ Section No. A.5.3.2.1 ]

### A.5.3.2.1

Some older appliances do not have a nameplate. In this case Table A.5.3.2.1 or an estimate of the appliance input should be used. The input can be based on the following:

- (1) A rating provided by the manufacturer
- (2) The rating of similar appliances
- (3) Recommendations of the gas supplier
- (4) Recommendations of a qualified agency
- (5) A gas flow test
- (6) Measurement of the orifice size of the appliance

The requirement of 5.3.1 that the piping system provide sufficient gas to each appliance inlet must be complied with.

Table A.5.3.2.1 Approximate Gas Input for Typical Appliances

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

### Statement of Problem and Substantiation for Public Input

The terms residential and domestic are used in the code and appear to mean the same thing. These terms are both used in appliance standards to mean use in residences, and not commercial or industrial occupancies. Examples:

ANSI Z21.8, Installation of Domestic Gas Conversion Burners,

UL 103, Chimneys, Factory-Built, Residential Type and Building Heating Appliances.

ANSI Z21.1 Household Cooking Gas Appliances, use "domestic" and does not use "residential".

The term "residential occupancy" is used in building codes

This proposal substitutes "residential" for "domestic" in 4 locations, and deletes "(domestic)" after Clothes dryer, Type 1. The term "Type 1" clothes dryer is used in the code and the reference to either domestic or residential is not needed in this location.

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**Submittal Date:** Mon May 10 14:42:53 EDT 2021  
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## Public Input No. 117-NFPA 54-2021 [ New Section after D.1 ]

### D.2

Where accumulation of gas inside of a building is detected by odor or by activation of a combustible gas detector or system designed and installed in accordance with NFPA 715, "Standard for the Installation of Fuel Gases Detection and Warning Equipment", 2023 edition," procedures called for under Section D.1 of this annex should be followed.

### Statement of Problem and Substantiation for Public Input

Current text of Annex D needs to include recommended actions in response to odor recognition and combustible gas detector and systems, the latter designed and installed in accordance with NFPA Standard 715.

### Submitter Information Verification

**Submitter Full Name:** Renee Lani

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**Submittal Date:** Mon May 31 10:33:00 EDT 2021

**Committee:** NFG-AAA



## Public Input No. 125-NFPA 54-2021 [ New Section after D.1 ]

### D.2

Where accumulation of gas inside of a building is detected by odor or by activation of a combustible gas detector or system designed and installed in accordance with NFPA 715, "Standard for the Installation of Fuel Gases Detection and Warning Equipment, 2023 edition," procedures called for under Section D.1 of this annex should be followed.

### Statement of Problem and Substantiation for Public Input

Current text of Annex D needs to include recommended actions in response to odor recognition and combustible gas detector or system activation, the latter designed and installed in accordance with NFPA Standard 715. Currently, the Annex does not recommend action of occupants in the event of odor or leak detection.

### Submitter Information Verification

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**Submittal Date:** Tue Jun 01 16:09:56 EDT 2021

**Committee:** NFG-AAA



**Public Input No. 120-NFPA 54-2021 [ Section No. K.1.2.8 ]****K.1.2.8** UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096. [www.ul.com](http://www.ul.com)

UL 651, *Schedule 40 and 80, Type EB and A, Rigid PVC Conduit and Fittings*, 2011, revised 2018 2019 .

UL 795, *Commercial-Industrial Gas Heating Equipment*, 2016, revised 2020 .

**Statement of Problem and Substantiation for Public Input**

Update UL publications to the most recent edition.

**Submitter Information Verification**

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**Submission Date:** Mon May 31 12:33:54 EDT 2021

**Committee:** NFG-AAA

**Public Input No. 95-NFPA 54-2021 [ New Section after K.3 ]**

[Add new annex L](#)

**Additional Proposed Changes**

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
.1622218442834	House Piping Renewal/Repair	
.1622218606192	Proposed new annex L	
LC1045_Internal_Epoxy_Pipe_Coating_for_Fuel_Gas_002_.pdf	New Annex L	

**Statement of Problem and Substantiation for Public Input**

Proposed new annex would address repair and renewal of existing gas house piping systems

**Submitter Information Verification**

**Submitter Full Name:** George Ragula  
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**Submittal Date:** Fri May 28 11:55:23 EDT 2021  
**Committee:** NFG-AAA

## PMG LISTING CRITERIA FOR INTERNAL EPOXY BARRIER COATING MATERIAL FOR REHABILITATION OF METALLIC FUEL GAS PIPE

### LC1045

Approved Date: December 2020

### PREFACE

Plumbing, mechanical and fuel gas (PMG) listings issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the *International Plumbing Code*®, *International Mechanical Code*®, *International Residential Code*®, *Uniform Plumbing Code* and *Uniform Mechanical Code*. Section 105.2 of the *International Plumbing Code*® reads as follows:

**Alternative materials, methods and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material or method of construction shall be approved where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes.

ICC-ES may consider alternate listing criteria, provided the listing applicant submits valid data demonstrating that the alternate listing criteria are at least equivalent to the listing criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features of the codes, ICC-ES retains the right to refuse to issue or renew a listing, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

***Listing criteria are developed solely for use by ICC-ES for purposes of issuing ICC-ES PMG listings.***

## 1.0 INTRODUCTION

**1.1 Purpose:** The purpose of this listing criteria is to establish requirements for internal epoxy barrier pipe coating materials for rehabilitation of metallic fuel gas pipe to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), listing.

**1.2 Scope:** This listing criteria is intended to establish the minimum criteria necessary for the use of a proprietary, mechanically mixed, blended, epoxy barrier coating that is mechanically applied to the interior of above and below ground ½" to 2" rigid metallic fuel gas pipe within the building footprint. This epoxy barrier coating is intended for use in pipelines that transport natural (NG) and liquid propane (LP) gases, where resistance to gas permeation, ground movement, internal corrosion, leaking joints, pinholes, and chemical attack are required. Any non-metallic pipe sections, and any gasketed connections or valves shall be removed before coating and replaced as applicable after coating installation. These criteria do not address the coating of plastic, corrugated, or other flexible gas pipe.

**1.2.1** The coating shall not be installed on non-metallic pipe or main gas line applications.

**1.2.2** In the case of a remediated metallic fuel gas pipe, the internal coating is intended to be adherent to the substrate and to act as a barrier coating with respect to the prevention of internal corrosion and the sealing of minor pinhole leaks. The coating is not intended (or expected) to function in any kind of structural capacity, other than the sealing of threaded joints and sealing of limited pin-hole corrosion (within the range of the calculated allowable leakage), with the primary gas pressure containment continuing to be provided by the structural host pipe.

### **1.3 Codes and Referenced Standards:**

Note: Any standard referenced herein shall be the current edition of that standard. In instances where the applicable code references a different edition of a given standard, the applicant shall also provide documentation of conformance with the code referenced standard edition.

**1.3.1** *International Fuel Gas Code*<sup>®</sup> (IFGC). International Code Council.

**1.3.2** *International Residential Code*<sup>®</sup> (IRC). International Code Council.

**1.3.3** ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus, ASTM International.

**1.3.4** ASTM D543, Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents, ASTM International.

- 1.3.5** ASTM D638, Standard Test Method for Tensile Properties of Plastics, ASTM International.
- 1.3.6** ASTM D714, Standard Test Method for Evaluation of Blistering of Paints, ASTM International.
- 1.3.7** ASTM D1434, Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting, ASTM International.
- 1.3.8** ASTM D2240, Standard Test Method for Rubber Property — Durometer Hardness, ASTM International.
- 1.3.9** ASTM D2247, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity, ASTM International
- 1.3.10** ASTM D3167, Standard Test Method for Floating Roller Peel Resistance of Adhesives, ASTM International
- 1.3.11** ASTM D4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers, ATM International (see alternative ISO 4624)
- 1.3.12** ASTM D5402, Standard Practice for Assessing the Solvent Resistance of Organic Coatings using Solvent Rubs, ASTM International
- 1.3.13** ASTM E2105, Standard Practice for General Techniques of Thermogravimetric Analysis (TGA) Coupled with Infrared Analysis (TGA/IR), ASTM International.
- 1.3.14** ASTM G62, Standards Test Methods for Holiday Detection in Pipeline Coatings, ASTM International.
- 1.3.15** AWWA C210, Liquid-Epoxy Coating and Lining for Steel Water Pipe and Fittings, American Water Works Association.
- 1.3.16** CAN-CSA-Z245.20, Plant-Applied External Coatings for Steel Pipe, CSA Group.
- 1.3.17** ISO 8503-1, Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces, ISO.
- 1.4** Definitions: Definitions shall be in accordance with the referenced standards.

## 2.0 BASIC INFORMATION

**2.1 Product Description:** A proprietary, mechanically mixed, blended, epoxy barrier coating system that is applied by an air vortex to the interior of above and below ground rigid metallic fuel gas pipe within the building footprint.

**2.1.1 Product and Packaging Identification:** The product packaging shall be permanently and legibly marked with the manufacturer's name or trademark, and the product name. The product shall bear the PMG® listing mark. The ICC-ES listing number shall be placed on the listed product's packaging or installation instructions. The methods of field identification of the lined piping shall be specified.

**2.2 Applicability for Use:** The minimum barrier coating wall thickness, pipe sizes that can be coated and piping material and existing piping imperfections that can be coated shall be in accordance with the manufacturer's specifications.

**2.3 Condition Assessment and Applicability for Use:** The system manufacturer's installation instructions shall specify the required host pipe condition assessment measures.

**2.3.1 Host Pipe Condition Assessment – External:** A visual external piping survey of as close to 100% as possible of the existing, exposed (not concealed within the structure of the building) pipework to be coated shall be undertaken to identify any signs of external corrosion or damage.

**2.3.1.1 Wall Thickness Loss – External:** Where external corrosion is identified, an assessment of its extent shall be completed by estimating the % loss of wall thickness. The estimated % loss of wall thickness shall be calculated by dividing the depth of any external corrosion by the wall thickness of the pipe.

**Example:**

Depth of corrosion measured with a pit gauge = 2mm

Wall thickness of pipe without corrosion = 2.9mm

% loss of wall thickness =  $(2/2.9) \times 100 = 68\%$

Any external corrosion location with calculated wall thickness loss greater than 50% shall be deemed unsuitable for coating. Note: Localized pin-holing that does not exceed the Permissible Leakage Limit requirements, as described below, may be coated.

**2.3.1.2: Inaccessible Pipes:** Where entry to any location within the building prevents the external visual inspection of the pipework, a decision will be made after consultation with the building and/or asset owner as to whether to proceed with the coating process.

**2.3.2 Host Pipe Condition Assessment – Internal:** By assessing the level of internal corrosion and cleaning requirements, combined with measuring the pre-renovation leakage rate of the pipe, the installing contractor can further assess the host pipe condition to determine applicability for coating.

**2.3.2.1 Permissible Leakage:** The coating system manufacturer's installation instructions shall include a means of Pressure Loss Analysis with Permissible Leakage Limit requirements for the host piping system as an additional assessment of the condition of the host pipe and the applicability for coating.

**2.3.2.1.1 Permissible Leakage Calculator:** The system manufacturer shall provide a scientifically validated Permissible Leakage Calculator for use with their coating system to determine whether the barrier coating can be successfully applied to the interior of a host pipe system. The Permissible Leakage Calculator shall rely upon site measured pressure drops in proportion to the volume of the pipe to determine a volume threshold ( $\text{m}^3 \text{hr}^{-1}$ ) which shall dictate applicability for use.

**2.3.2.1.2 Leakage Point Repairs:** Localized host pipe repairs can be utilized to bring the permissible leakage within acceptable tolerances.

**2.4 Installation Instructions:** The barrier coating shall be installed in accordance with the manufacturer's instructions, and the applicable requirements of the relevant codes and reference standards in Section 1.3. The system manufacturer's installation instructions shall specify the certification requirements for the installing contractor (which shall include a training program) and the required equipment and means for proper installation. The system manufacturer's installation instructions shall specify the pre-coating field preparation measures, the parameters governing the proper application of the coating, and the post-installation pipe system labeling requirements.

**2.4.1 Host Pipe Preparation for Coating:** The system manufacturer's installation instructions shall include a description of the required methods of host pipe condition assessment and suitable methods of host pipe preparation (cleaning and ensuring an adequate "anchor tooth").

**2.4.1.1 Pipe Cleaning:** The manufacturer's installation instructions shall include guidance regarding the visual observation of the quality and cleanliness of the pipe to be coated.

2.4.1.1.1 As a minimum requirement, the cleaned surface, when viewed without magnification, shall be free of visible concentrations of oil, grease, dirt, mill scale, rust, and previously applied, disbanded coatings. Evenly dispersed, very light shadows, streaks, and discolorations caused by stains of mill scale, rust and old coatings shall be permitted to remain on no more than 33 percent of the surface. Slight residues of rust and old coatings shall be permitted to be left in the craters of pits if the original surface is pitted.

2.4.1.1.2 After host pipe preparation, the contractor shall use a visual field comparator as per ISO 8503-1 and manufacturer's specifications to verify proper anchor tooth at a minimum of either 4 locations or 25% of the entry and exit points, whichever is greater.

**2.4.2 Pipe Coating:** The manufacturer's installation instructions shall be followed and shall include instructions on proper resin mixing procedures, coating application parameters (including volume calculators and shot plans), identification of key "hold and witness" points for quality assurance during construction, and piping system reassembly and recommissioning requirements.

**2.4.3 Post-Installation Labeling:** The manufacturer's installation instructions shall include a requirement for labeling the system to indicate that an epoxy coating has been applied to the piping. The labeling shall include a prohibition on the use of flame or heat to repair any part of the piping system. The label shall indicate the name of the manufacturer of the coating and shall include a disclaimer not to replace the pipes without contacting the coating manufacturer. The labels can either be permanent decals or tags approved by the Authority Having Jurisdiction and shall be located outside of the pipe at all valves changed outs, at curb stop valves, at pipe access points and in systems along pipes at intervals not to exceed 20 feet except for existing piping located in concealed and inaccessible areas.

### **3.0 SYSTEM QUALIFICATION AND PERFORMANCE REQUIREMENTS**

**3.1 Test Samples:** Qualification test pipe samples shall be prepared by the coating system manufacturer for each applicable host pipe material specified by the manufacturer; steel panels are also prepared by the coating system manufacturer for generalized representative qualification testing. Each of the samples shall be coated according to the manufacturer's installation instructions and allowed to cure for 24 hours at room temperature. The samples shall be subjected to the tests specified in Sections 4.2 through 4.5.



**3.1.1 Sample Preparation:** Manufacturer pipe samples and steel panels required for laboratory testing are to be suitably coated for use as representative samples to simulate the quality of the as-built coating system intended for use in the piping system. Preparation of the sample surface prior to coating may include abrasive blasting to achieve a proper surface profile. The desired “anchor tooth” reading will be determined by the manufacturer as per field application specifications. A wet film preparation device such as a Film Coating Applicator can be used to evenly apply the epoxy onto the surface of the test panel.

**3.2 Qualification Testing Submittals:** The qualification (validation) test data used to qualify a coating system for use is not project performance specific, but rather system design specific. These tests shall be recognized as qualification tests to be performed once for each class of installed coating and do not require repeating unless the materials and/or methods are altered; qualification testing requirements are explicitly not intended to be used as post-construction field verification requirements.

**3.2.1 Thickness Measurement:** After curing, the coating thickness shall be measured using an appropriate device for determining Dry Film Thickness (DFT) of coatings. Coatings shall meet the minimum required thickness within the allowable tolerance range [e.g. 250 microns (allowable tolerances of +1000/-90)]. DFT readings shall be taken from at least four points evenly distributed around the test sample. For example: 3, 6, 9, & 12 o'clock for pipe samples.

**3.2.2 Pull-off Adhesion Strength Test:** A manufacturer's plate sample shall be laboratory tested for resistance to pull-off of the epoxy barrier coating in accordance with ASTM D4541. The minimum pull-force adhesion shall be 2500 psi, as per Protocol 2. (Note that the precision and bias statements for this test show considerable variability across round robin testing results.)

**3.2.3 Hardness Test:** A manufacturer's plate sample shall be laboratory tested in accordance with ASTM D2240 for durometer hardness. The hardness of the coating shall comply with the manufacturer's published tolerances.

**3.2.4 Chemical Resistance Test:** Manufacturer prepared samples shall be laboratory tested according to ASTM D 543, Practice B for resistance to the chemicals listed in table 1. Weight of the test specimens shall not increase by more than 14% nor decrease by more than 3% and test specimens shall retain at least 80% both of its hardness, when measured in accordance with Test Method ASTM D2240, and of peeling strength, when measured in accordance with Test Method ASTM D3167.

**Table 1: Chemical Resistivity List of Reagents**

Liquids	Test Composition
Water (External and Internal)	Freshly prepared distilled water (in accordance with Practice D 543)
Gasoline (External)	Gasoline-Automotive Spark-Ignition Engine Fuel per Specification D 4814
Gas Condensate (Internal)	70 % volume isooctane + 30 % volume toluene
Methanol	20 % volume methanol + 80 % volume distilled water
Triethylene Glycol	10 % volume triethylene glycol + 90 % volume distilled water
Brine Solution	10 % mass NaCl solution made up with a balance of distilled water
Mineral Oil	100 % White Mineral Oil USP, specific gravity 0.830 to 0.860, Saybolt at 100°F: 125 to 135 s, in accordance with Practice D 543
Isopropanol	10 % volume isopropanol + 90 % volume distilled water
Sulfuric Acid	5 % weight (of total solution) H <sub>2</sub> SO <sub>4</sub> in distilled water
Surfactants	5 % mass (of solution weight) dehydrated pure white soap flakes (dried 1 h at 105°C) dissolved in distilled water, in accordance with Practice D 543
Mercaptans	2 % volume tertiary butyl mercaptan + 98 % volume mineral oil, white, USP

**3.2.5 Gas Blistering:** A manufacturer's test panel shall be laboratory tested for gas blistering and appearance in accordance with ASTM D714.

**3.2.5.1 Humidity resistance:** A manufacturer's test panel shall be laboratory tested with 100% relative humidity exposure as specified in ASTM D2247 for 500 hours. There shall be no blistering or delamination.

**3.2.7 Salt spray resistance:** A manufacturer's test panel shall be subjected to salt spray conditioning as specified in ASTM B117 for 500 hours. There shall be no blistering, delamination.

**3.2.8 Gas Permeability:** A manufacturer's test panel shall be subjected to laboratory testing for gas permeability in accordance with ASTM D1434. For reference data only because there is no pass or fail requirement.

**3.2.9 Evolved Gas Analysis:** A manufacturer's test panel shall be subjected to laboratory testing for evolved gas analysis in accordance with ASTM E2105.

**3.2.10 Rating Class Determination:** A manufacturer's test panel shall be subjected to micro-sectioning in accordance with CAN-CSA-Z245.20 to evaluate the rating class.

**3.2.11 Cissing and Pin Holing:** A manufacturer's test panel shall be subjected to laboratory testing for Holiday Detection in accordance with Method A of ASTM G62.

**3.2.12 Cure Schedule Determination:** The manufacturer's Recommended Cure Schedules shall be supported by laboratory validation testing in accordance with ASTM D5402 with a minimum of 10 "double rubs" using isopropyl alcohol in order to qualitatively validate an adequate cure schedule for safe return to service.

**3.2.13 Validation of Construction Thickness:** The ability to deliver the specified coating thickness shall be scientifically validated.

**3.2.13.1** A test assembly simulating typical site conditions shall be set up for coating application utilizing a 1-inch-diameter pipe that is 50 feet in length. Fittings shall be used to simulate an actual installation.

**3.2.13.2** The test assembly shall be coated in accordance with the coating tables in the manufacturer's installation instructions.

**3.2.13.3** The coated assembly shall be allowed to cure at room temperature for 24 hours.

**3.2.13.4** The thickness of the coating shall be measured at both the last fitting and at the outlet end of the test assembly. The minimum "as-built" coating thickness shall be as specified by the manufacturer [e.g. 250 microns] with an allowable tolerance of +1000 / -90 microns.

**3.2.13.5** A mathematical evaluation of the coating tables in the manufacturer's installation instructions shall be performed, based on the test results for the 1-inch pipe, to confirm that the minimum coating thickness can be provided.

#### **4.0 QUALITY CONTROL / VERIFICATION TEST METHODS AND REQUIREMENTS**

Post-construction, representative samples from the project shall verify as-built compliance with the key performance property requirements.

**4.1 Post-Construction Thickness Verification:** Field thickness verification measurements shall be performed at every entry and exit point with Dry Film Thickness (DFT) readings taken from at least four points evenly distributed around the pipe ends to verify performance compliance of the epoxy barrier coating material with the required minimum thickness. The minimum "as-built" coating thickness shall be as specified by the manufacturer [e.g. 250 microns] with an allowable tolerance of +1000 / -90 microns.

#### **4.2 Verifying Safe Return to Service**

**4.2.1 CCTV visual inspection:** The contractor shall internally inspect as much of the coated piping system as is practical with a CCTV camera system to visually confirm proper application. A recording of the CCTV inspections shall be provided.

**4.2.2 Epoxy cure verification:** Adequate curing for safe return to service shall be field verified at every entry and exit point with 10 "double rubs" with isopropyl alcohol inside the coated pipe, as per ASTM D5402.

**4.2.3 Pressure test:** Prior to acceptance and return to operation, all sections of the coated piping system shall be pressure tested in accordance with the requirements of Section 406 (IFGS) "Inspection, Testing, and Purging" of the ICC International Fuel Gas Code.

## **5.0 LISTING RECOGNITION**

**5.1** The listing shall state that this coating process is not approved as a method for structurally repairing and concealing large fractures, holes, leaks or other structural imperfections in the piping system; the primary gas pressure containment will continue to be provided by the host pipe.

**5.2** The listing shall specify the minimum thickness of the epoxy barrier coating material.

**5.3** The listing shall specify the type of rigid pipe material allowed to be coated with the epoxy barrier coating and shall not be applied for operation across fittings or joints which are designed to allow mechanical flexibility in the system.

**5.4** The listing shall specify the minimum and maximum pipe (1/2" to 2") which may be lined with the applicant's system.

**5.5** The listing shall contain flow tables identifying the flow rate and pressure drop at various velocities.  
(waiting to hear back if this is possible with coated pipes transporting gas)

**5.6** The listing shall contain the minimum surface preparation requirements for the inside wall of the pipe prior to coating of the pipe or tubing.

**5.7** The listing shall state that the installing contractor must be trained and certified by the coating manufacturer and only personnel or contractor's approved and authorized by the manufacturer of the coating system are allowed to use the process approved under the evaluation report.

**5.8** The listing shall state that all non-metallic components, as well as gasketed joints, and valves shall be removed prior to installation of the coating.

**5.9** The listing shall state that corrugated metal pipe are outside of the scope of evaluation.

**5.10** The coating shall not be used on plastic, corrugated, or other flexible fuel gas pipe.

**5.11** The SDS or TDS shall include the flashpoint data for the raw resin, as per the SDS or TDS for the raw material supplier's resin.

**5.12** The listing shall state that the contractor shall internally inspect as much of the coated piping system as is practical with a CCTV camera system to visually confirm proper application and pressure tests for leaks in the presence of the code official or the official's designated representative. In addition, the system shall be approved for the intended purpose by the authority having jurisdiction. Technical documentation shall be submitted to the authority having jurisdiction.

**5.13** The listing shall state that all appliances shall be disconnected prior to the installation of the coating and the appliances shall not be reinstalled until after full curing has occurred. Any older or damaged valves are to be replaced with applicable code approved valves for the flow and pressure demand in the system. Appliances shall be turned on and observed for proper operation after installation.

**5.14** The listing shall state that the epoxy barrier coating shall only be used in pipelines that transport natural (NG) and liquid propane (LP) gases.

**Attachment 5**

Safety Recommendation P-19-007

From NTSB and Correspondence

**ASC Z223/NFPA 54 Secretary**

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NFPA 54 National Fuel Gas Code Technical Committee: Review the Safety Recommendation P-19-007 and correspondence between NFPA and NTSB, and develop a response to the NTSB.

NFPA Staff note: A draft of NFPA 715, Standard for the Installation of Fuel Gases Detection and Warning Equipment, has been developed and the 2023 edition is in the Second Draft stage. The current draft of NFPA 715 covers “the selection, design, application, installation, location, performance, inspection, testing, and maintenance of fuel gas detection and warning equipment in buildings and structures” (1.1.2) and contains “requirements for the selection, installation, operation, and maintenance of equipment that detects concentrations of fuel gases that could pose a life or property safety risk” (1.1.3) but does not require detection systems in any occupancy.

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NTSB Safety Recommendation P-19-007: <https://data.nts.gov/carol-main-public/sr-details/P-19-007>

TO THE NATIONAL FIRE PROTECTION ASSOCIATION: In coordination with the Gas Technology Institute and the International Code Council, revise the National Fuel Gas Code, National Fire Protection Association 54 to require methane detection systems for all types of residential occupancies with gas service. At a minimum, the provisions should cover the installation, maintenance, placement of the detectors, and testing requirements.

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From NTSB  
To National Fire Protection Association  
Date 12/16/2019  
Type Official Correspondence  
Response We note that you have distributed our investigative report, Building Explosion and Fire, Silver Spring, Maryland, August 10, 2016 (PAR-19-01), to the National Fuel Gas Code Technical Committee, who is responsible for NFPA 54, and that you will update us on the committee’s actions after it convenes for the next revision cycle. We further note that, during its April 2019 meeting, the NFPA Standards Council approved a new technical committee to develop a standard on residential gas detection that will address the installation and placement of single and multistation residential combustible gas detectors that detect methane and liquefied petroleum gas (propane). The NFPA Council subsequently approved the new technical committee’s scope and membership roster at its August 2019 meeting.

We understand that you believe that, in lieu of revising the National Fuel Gas Code, National Fire Protection Association 54 as requested in our recommendation, creating a standard specifically for residential gas detection devices and systems achieves and exceeds the technical intent of the recommendation. We agree that, once complete, these actions will satisfy Safety Recommendation P-19-7. Pending completion and implementation of a new standard to require methane detection systems for all types of residential occupancies with gas service (to cover, at a minimum, detector installation,

maintenance, placement, and testing), Safety Recommendation P-19-7 is classified OPEN--ACCEPTABLE ALTERNATE RESPONSE.

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From National Fire Protection Association  
To NTSB  
Date 08/27/2019  
Type Official Correspondence  
Response -From L. Seth Statler, Director of Government Affairs: The first action we took was the distribution of the adopted report, NTSBIPAR-19-01, to the National Fuel Gas Code Technical Committee, who are responsible for NFPA 54.

They already were scheduled to meet as part of their Second Draft meeting on the next code revision, but staff believed it was important to provide the committee with early notification of the NTSB recommendation. The report was provided as part of the agenda for the committee's July 8, 2019 meeting. Because this was the Second Draft stage of the code development process, it was not appropriate for them to take action at this time with respect to the recommendation. However, NFPA staff will continue to update NTSB on the actions of this committee when it convenes for the next revision cycle.

Three members of your staff - Julie Perrot, Rachael Gunaratnum, and Sean Lynum - joined NFPA Senior Director Guy Colonna and myself on a conference call held July 26, 2019 to discuss our proposed approach to standards development intended to address the Board recommendation. Several activities are underway to address the NTSB concerns.

Even before learning of the incident and the Board's investigation, NFPA received a "new project initiation request" in August 2018 from a stakeholder active with NFPA 54. In response to incidents like Silver Spring and many others throughout the US, the request seeks action by the NFPA Standards Council to consider establishing a new technical committee to develop a new standard on residential gas detection. Specifically, the request recommends that the new standard address installation and placement of single and multi-station residential combustible gas detectors that specifically detect common fuel gases, such as natural gas (methane) and liquefied petroleum gas (LPG or propane).

The NFPA Standards Council approved the request during its April 2019 meeting, and at its recent August meeting, the Council voted to approve the committee scope and membership roster for this new committee NFPA acknowledges the specific recommendation of the Board, which was to revise NFPA 54 to require residential methane gas detection with requirements addressing installation, maintenance, placement, and testing of detectors. NFPA believes that the alternative strategy to create a stand-alone standard specifically for residential gas detection devices and systems achieves and even exceeds the technical intent of your recommendation for the following reasons:

(1) As outlined in the recommendation, the NFPA 54 committee does not have the requisite expertise to develop new requirements specific to gas detection. For that reason, creating the separate committee with unique expertise only related to residential gas detection assures a final set of requirements that address all aspects of gas detection, including those in the Board's recommendation. Once developed,



NFPA 54 could be revised to refer to this new standard to ensure provisions for gas detection are included in the code in the future. Furthermore, based on comments during our discussion with your staff, the inclusion of a reference to this new residential gas detector standard within NFPA 54 enables widespread implementation of the new requirements due to the broad adoption of NFPA 54 throughout the US. It is also likely that this life safety requirement for residential gas detection could be incorporated into NFPA 101®, Life Safety Code®, as well as building and fire codes, further ensuring wide adoption.

(2) The Board's recommendation speaks specifically to methane gas detection, while NFPA 54 addresses all fuel gases (flammable gases used for gas fuel-burning appliances), which most commonly includes both natural gas (methane) as well as liquefied petroleum gas (LPG which is generally referred to as propane). NFPA believes that a separate standard that is specific to residential gas detection devices and systems would allow a result that exceeds the Board's recommendation because it covers both common fuel gases and is not limited to methane as Stated in the recommendation. A new gas detection-specific standard would be able to include requirements that recognize and address the gas behavior differences for methane and propane; for example, different lower flammable (explosive) limits (LFL or LEL) and different vapor densities (applies to whether gas rises or sinks upon release). Those two characteristics alone are essential in order to fully meet the provisions defined by the Board's recommendation. A separate standard assures that NFPA would meet or exceed the Board's request.

(3) One additional reason for the approach that NFPA has proposed involves a parallel research effort proposed by the same stakeholder who requested the new standards project. The Fire Protection Research Foundation (FPRF) functions as a separate, but affiliated, research arm for NFPA to explore research and data driven answers to questions or problems that emerge from our standards development activities. The FPRF received a request to conduct a study of the placement of the residential gas detectors in order to better guide and inform the standards development process. That project is currently seeking qualified researchers to perform the proposed work. Upon completion the results have the potential to strengthen the requirements developed by the new committee, thus another instance where the proposed NFPA approach would potentially exceed the request in the recommendation.

(4) Because the NFPA consensus standards development process attracts a diverse range of stakeholders, the awareness of this effort is broad and the process affords a forum for the widest representation of interests and stakeholder groups. As part of the ongoing solicitation of committee applicants, NFPA wants the Board to know that both ICC and GTI, co-recipients of the recommendation to address residential gas detection, have applied to the new NFPA technical committee and have been appointed to the committee as of the August Council meeting.

We appreciate the positive feedback from your staff to this alternate approach addressing the Board's recommendation. As discussed during the call, all NFPA committee meetings are open to the public, and we encourage your staff to consider attendance at the initial meeting of this committee as it begins its work in order to brief the committee on the incident, lessons learned and the specifics of the recommendation.

NFPA and its staff cannot control the process or content of any standard to be ultimately developed through our process. However, as we have demonstrated through prior interactions with your Board (high-hazard freight train derailments for example) and the Chemical Safety and Hazard Investigation

Board, we believe a new technical committee formed under ANSI consensus rules will be responsive to the important safety issues NTSB has identified in the P-19-007 recommendation.

Senior Director Guy Colonna intends to provide regular updates to your staff on the progress of these actions that have been initiated. At the same time, as the Director of Government Affairs for NFPA, I stand ready to provide assistance on this or any other issue.

We appreciate the opportunity to work with you, other members of your Board and the NTSB staff. We commend you for the very difficult but important safety role that NTSB performs.

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From NTSB

To National Fire Protection Association

Date 06/10/2019

Type Transmittal Letter

Response The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other Modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge your organization to act on the safety recommendation in this letter because we believe your organization can help reduce the risk of future accidents. For more information about NTSB and our recommendation process, please see the attached one-page summary.

On April 24, 2019, the NTSB adopted its report, Building Explosion and Fire, Silver Spring, Maryland, August 10, 2016, NTSB/PAR-19/01. The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of this investigation, the NTSB identified the following safety issues:

- The location and inspection of service regulators within a structure.
- The inspection of the gas meter assembly.
- The notification of the natural gas odor to Washington Gas Light Company.
- The detection of natural gas through odorants and methane.

Accordingly, the NTSB makes the following safety recommendation to the National Fire Protection Association. Additional information regarding this recommendation can be found in the noted section of the report.

- In coordination with the Gas Technology Institute and the International Code Council, revise the National Fuel Gas Code, National Fire Protection Association 54 to require methane detection systems for all types of residential occupancies with gas service. At a minimum, the provisions should cover the installation, maintenance, placement of the detectors, and testing requirements. (P-19-007) (See section 2.5.2.)

The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives. We would appreciate a response within 90 days, detailing the actions you have taken or intend to take to implement this recommendation. When replying, please refer to the safety recommendation by number (for example, P-19-007). We encourage you to submit your response to [Correspondence@ntsb.gov](mailto:Correspondence@ntsb.gov). If your reply exceeds 20MB, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.