AMERICAN SUPPLY ASSOCIATION

ASA Mechanical System Code Committee -
Summary Report on May 2021 UMC and UPC Committee Hearings

UNIFORM MECHANICAL CODE				
Proposal	**Chapter**	**Summary of Proposed Revision**	**Committee Position**	**Comments**
012	2. Definitions	Revise text **203.0 Appliance.** A device that utilizes fuel or electricity as an energy source to produce light, heat, power, refrigeration, or air conditioning ~~or compressed fuel gas~~. This definition also ~~shall~~ includes ~~a~~ vented decorative appliances and electric storage or tankless water heaters.	Accept	**ASA Position:** Opposed. By adding more specific references you create a situation of exclusion of energy sources or equipment not specifically referenced but intended to be covered in the definition. **UMC Discussion:** Motion to reject based on eliminate alternate energy sources. Motion failed by a vote of 11 yes to 1 no. Motion to accept as submitted passed with a vote of 19 yes, to 6 no
013	2. Definitions	**203.0 Appliance.** A device that utilizes an energy source to produce light, heat, power, refrigeration, air conditioning, or compressed fuel gas. This definition also shall include a vented decorative appliance. Vented Appliance. An appliance designed and installed in such a manner that all products of combustion are conveyed directly from the appliance to the outdoor atmosphere through an approved chimney or vent system	Accept	**ASA Position:** Opposed. Use of term "directly" could be interpreted to not allow draft vents. Also, language includes mandatory requirements. **UMC Discussion:** Motion to accept passed with a vote of 24 yes to 1 no.
016	2. Definitions	Revision appears to be editorial and moves all of the definitions for the various types of boilers (e.g. Automatic, hot water heating, low-pressure hot water heating, etc.) as sub-definitions under the main definition for boiler.	Accept	**ASA Position:** Support **UMC Discussion:** Motion to accept with an editorial change to put the term "boiler" in front of each of the sub-definitions. Motion passed based on unanimous consent.
022	2. Definitions	**206.0 Dual Purpose Water Heater.** An appliance utilized as a heat source for both space and domestic hot water applications.	Accept	**UMC Discussion:** Motion to accept. This item was accepted by the UPC.

027	2. Definitions	207.0 **Expansion Tank.** A vessel used to protect closed systems from excessive fluid pressure.	Accept	**UMC Discussion:** Motion to accept as modified based on unanimous consent. Modification was to delete the term "fluid". Motion passed based on unanimous consent.
029	2. Definitions	208.0 **Flue Collar.** That portion of an appliance for the attachment of a draft hood, vent connector, or venting system [NFPA 54:3.3.44]	Accept	**UMC Discussion:** Motion to accept based on unanimous consent.
030	2. Definitions	**209.0 Gas.** A substance used as fuel, such as natural, liquefied petroleum (LP-Gas), and mixtures of these gases, with gas-air mixtures within the flammable range. **Fuel Gas.** Natural, manufactured, liquefied petroleum, or a mixture of these. **Flue Gas.** Products of combustion with excess air in appliance flues or heat exchangers. **Liquefied Petroleum Gas (LP-Gas).** Means and includes a material composed predominantly of any of the following hydrocarbons or mixtures of them: propane, propylene, butanes (normal butane or isobutane), and butylenes. When reference is made to liquefied petroleum gas in this code, it shall refer to liquefied petroleum gases in this code, it shall refer to liquefied petroleum gases in either the liquid or gaseous state. **Utility Gas.** See Fuel Gas.	Accept	**UMC Discussion:** Motion to accept passed based on unanimous consent.
031	2. Definitions	**209.0 Gas Piping.** An installation of pipe, valves, or fittings that are used to convey fuel gas, installed on any premises or in a building~~, but shall not include:~~ ~~(1) A portion of the service piping.~~ ~~(2) An approved piping connection 6 feet (1829 mm) or less in length between an existing gas outlet and a gas appliance in the same room with the outlet.~~	Accept	**UMC Discussion:** Motion to approve as submitted. Motion passed based on unanimous consent.
038	2 Definitions	**Joint ~~Press Connect~~ Elastomeric.** A ~~permanent mechanical~~ removable or non-removable joint consisting of an elastomeric seal and corrosion-resistant grip	Approve as Modified	**UMC Discussion:**

		ring. ~~The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.~~		Motion to accept as modified passed with a vote of 13 yes, 12 no and 1 abstention.
039	2. Definitions	**Listed (Third Party Certified).** Equipment or materials included in a list published by a listing agency (accredited conformity assessment body) that maintains periodic inspection of current production of listed equipment or mater and whose listing states either that the equipment or material complies with approved standards or has been tested and found suitable for use in a specified manner. Terms used to identify listed equipment, products, or materials include "listed," "certified," or other terms as determined appropriate by the listing agency.	Reject	**UMC Discussion:** Motion to reject passed based on unanimous consent.
040	2. Definitions	**214.0 Load.** The heat output of the storage during discharge. The product of the mass flowrate, specific thermal capacity, and temperature increase of the water or heat transfer fluid as it passes through a system.	Reject	**ASA Position:** Oppose. The term is used in different ways throughout the code appendices and could related to structural, CO2 levels or other areas beyond heating/cooling. **UMC Discussion:** Motion to reject passed based on unanimous consent.
048	2 Definitions	**Add following definition:** **Vacuum Relief Valve.** A device that automatically allows air to enter the piping sys ions that could siphon water from the system and prevent excessive vacuum in a pressure vessel.	Reject	**UMC Discussion:** Motion to reject due to wording being subject to interpretation. Motion passed based on unanimous consent.
051	2 Definitions	**Relocate existing definitions for gas vents under a new definition for vent:** **Vent.** A pipe or other conduit composed of factory-made components, containing a passageway for conveying combustion products and air to the atmosphere, listed and labeled for use with a specific type or class of appliance. **Type B Gas Vent.** A factory-made gas vent listed by a nationally recognized testing agency for venting listed or approved appliances equipped to burn only gas. **Type B-W Gas Vent.** A factory-made gas vent listed by a nationally recognized testing agency for venting listed or approved gas-fired vented wall furnaces.	Accept	**UMC Discussion:** Motion to accept as submitted passed based on 13 yes to 9 no and 1 abstention.

		Type L Gas Vent. A venting system consisting of listed vent piping and fittings for use with oil-burning appliances listed for use with Type L or with listed gas appliances.		
064	3 General Requirements	**305.0 Location.** **305.5 Drainage Pan.** Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, ~~or~~ floor-subfloor assembly or where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than 3/4 of an inch (20 mm) diameter drain to an approved location. The terminating end of the drainpipe shall be readily visible. Such pan shall be not less than 11/2 inches (38 mm) in depth.	Accept	**UMC Discussion:** Motion to accept passed by unanimous consent.
065	3 General Requirements	**305.0 Location.** **305.5 Drainage Pan.** Where an ~~water heater~~ appliance or equipment is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking ~~water heater~~ appliance or equipment, a watertight pan of corrosion-resistant materials shall be installed beneath the ~~water heater~~ appliance or equipment in accordance with the following: (1) The drainage pan shall be provided with not less than 3/4 of an inch (20 mm) diameter drain to an approved location. (2) ~~Such~~ The drainage pan shall be not less than 11/2 inches (38 mm) in depth. (3) Where a drain pipe is installed the material of the piping shall be rated for the temperature rating of the appliance or equipment and shall be approved for use with the liquid being discharged.	Reject	**ASA Position:** Oppose. Overly restrictive and would require pans even where there is no condensate. Also, temperature requirements are over restrictive. **UMC Discussion:** Motion to reject passed based on unanimous consent.
176	8 Chimneys and Vents 10. Boilers and Pressure Vessels 12 Hydronics	Revise following phrase in sections of Chapters 8, 10 and 12 related to factory built chimneys and dual purpose water heaters. "Listed ~~or~~ and labeled"	Accept as Modified	**UMC Discussion:** Motion to modify by deleting the entire phrase "Listed and labeled" and replace with "comply" was accepted based on unanimous consent.

201	10 Boilers and Pressure Vessels	**1001.1 Applicability**. The requirements of this chapter shall apply in the construction, installation, operation, repair, and alteration of boilers and pressure vessels. Low-pressure boilers shall comply with this chapter and Section 904.0. **Exceptions:** (1) through (8) remain unchanged. (9) Pressure vessels used in specific appliances shall comply with Chapter 9.	Accept	**UMC Discussion:** Concern was noted that ASME has been attempting to set standards for pressure vessels in appliances and this change would help to prevent that from happening. Motion to accept passes by unanimous consent.
204	10 Boilers and Pressure Vessels	Revisions made to the formula for determining minimum capacity for a diaphragm-type hot water system expansion tanks.	Accept	**UMC Discussion:** Motion passed based on unanimous consent.
205	10 Boilers and Pressure Vessels	**1005.0 Safety or Relief Valve Discharge.** **1005.2 Discharge Piping.** The discharge piping serving a temperature relief valve, pressure relief valve, or combination of both shall have no valves, obstructions, or means of isolation and provided with the following: (1) Equal to the size of the valve outlet and shall discharge full size to the flood level of the area receiving the discharge and pointing down. (2) Materials shall be rated at not less than the operating temperature of the system and approved for such use. (3) Discharge pipe shall discharge independently by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) and not less than 6 inches (152 mm) above the ground and pointing downwards. (4) Discharge in such a manner that does not cause personal injury or structural damage. (5) No part of such discharge pipe shall be trapped or subject to freezing. (6) The terminal end of the pipe shall not be threaded. (7) Discharge from a relief valve into a water heater pan shall be prohibited. (8) Discharge to a termination point that is readily observable by the building occupants. If the discharge termination point is not readily observable, discharge monitoring is required.	Accept as Modified	**ASA Position:** Oppose. Last sentence is not enforceable. **UMC Discussion:** **Motion to modify as follows:** (8) Discharge to a termination point that is readily ~~observable~~ visible ~~by the building occupants. If the discharge termination point is not readily observable, discharge monitoring is required.~~ Motion passed with a vote of 19 yes, 8 no, 1 abstention
225	11. Refrigeration	**1109.0 Refrigeration Piping, Containers, and Valves.** **1109.2 Joints.** Iron or steel pipe joints shall be of approved threaded, flanged, or welded types. Exposed threads shall be tinned or coated with an approved corrosion inhibitor. Copper or copper alloy pipe joints of iron pipe size shall be of approved threaded, flanged, ~~press connect~~ or brazed types. Copper tubing joints and connections shall be connected by approved flared, lapped, swaged, or brazed joints~~, soldered joints, or mechanical joints that comply with UL 207~~	Accept	**UMC Discussion** Motion to accept passed based on a vote of 13 yes, 11 no and 1 abstention.

		~~either individually or as part of an assembly or a system by an approved nationally recognized laboratory.~~ Piping and tubing shall be installed so as to prevent vibration and strains at joints and connections.		
249	12 Hydronics	**1206.0 Pressure and Safety Devices.** **1206.2 Discharge Piping.** The discharge piping serving a temperature relief valve, pressure relief valve, or combination of both shall have no valves, obstructions, or means of isolation and be provided with the following: **1.** ~~Equal~~ Not less than to the size of the valve outlet and shall discharge full size to the flood level of the area receiving the discharge and pointing down. **2.** Materials shall be rated at not less than the operating temperature of the system and approved for such use or shall comply with ASME A112.4.1. **3.** Discharge pipe shall discharge independently by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) and not less than 6 inches (152 mm) above the ground and pointing downwards. **4.** Discharge in such a manner that does not cause personal injury or structural damage. **5.** No part of such discharge pipe shall be trapped or subject to freezing. **6.** The terminal end of the pipe shall not be threaded. **7.** Discharge from a relief valve into a water heater pan shall be prohibited. (8) The discharge termination point shall be readily observable.	Accept as Modified	**UMC Discussion:** Motion to accept as modified with a strikeout of the term “observable” in footnote (8) and replacing it with “visible”

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Proposal	Chapter	Summary of Proposed Revision	Committee Position	Comments
100	2. Definitions and 5. Water Heaters	**Add following new definition:** **Water Heater, Dual Purpose.** An appliance utilized as a heat source for both space heating and domestic hot water applications. **Add following footnote to Table 501.1 Water Heaters:** * Dual purpose water heaters shall be installed in accordance with this code and the manufacturer's installation instructions.	Accept	**UPC Committee Discussion:** Motion to approve passed be a vote of 16 yes to 3 no
101	5. Water Heaters	Significant updates to Chapter 5, Water Heaters to update text to be consistent with NFPA 54	Accept	**UPC Committee Discussion:** Motion to accept as submitted approved by consent.
102	5. Water Heaters	**504.0 Water Heater Requirements.** **504.3 Clearance.** (remaining text unchanged) ~~**504.3.2 Unlisted Water Heaters.** Unlisted water heaters shall be installed with a clearance of 12 inches (305 mm) on all sides and rear. Combustible floors under unlisted water heaters shall be protected in an approved manner. [NFPA 54:10.27.2.2]~~ **504.3.2 Unlisted Water Heaters.** Except as otherwise permitted in this code, unlisted water heaters shall be approved by the Authority Having Jurisdiction prior to being installed. Clearance for unlisted water heaters shall be not less than 12 inches (305 mm) on all sides. Combustible floors under unlisted water heaters shall be protected in an approved manner.	Accept	**UPC Committee Discussion:** Motion to accept as submitted approved by consent.
103	5. Water Heaters	**504.0 Water Heater Requirements.** **504.4 Pressure Limiting Devices.** A water heater installation shall be provided with overpressure protection using an approved, listed device	Accept	**UPC Committee Discussion:** Motion to accept approved based on a vote of 19 yes to 3 no

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		installed in accordance with the terms of its listing and the manufacturer's installation instructions. Pressure relief devices shall have a pressure setting greater than the water service pressure and not exceed 150 psi (1034 kPa) as required in Section 608.4.		
104	5. Water Heaters	**507.0 Appliance and Equipment Installation Requirements.** **507.5 Drainage Pan.** Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking water heater, a watertight pan of corrosion- resistant materials shall be installed beneath the water heater in accordance with the following: (1) The drainage pan shall be provided with not less than 3/4 of an inch (20 mm) diameter drain to an approved location. ~~(2) Such~~ The drainage pan shall be not less than 1½ inches (38 mm) in depth. Where a drain pan pipe is installed, the material of the piping shall be rated for the temperature rating of the water heater and shall be approved for use with the liquid being discharged.	Accept as Modified	**UPC Committee Discussion:** Motion to amend (1) to read by adding another sentence "The terminated end of the drain pipe shall be readily visible." Motion to approve as modified passed with a vote of 19 yes to 2 no
105	5. Water Heaters	**507.0 Appliance and Equipment Installation Requirements.** **507.5 Drainage Pan.** Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, ~~or~~ floor-subfloor assembly or where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than ¾ of an inch (20 mm) diameter drain to an approved location. The terminating end of the drainage shall be readily visible. Such pan shall be not less than 1½ inches (38 mm) in depth.	Reject	**UPC Committee Discussion:** Motion to reject based on accept as modified item 104. Motion passed based on consent.
106	5. Water Heaters	**507.0 Appliance and Equipment Installation Requirements.** **507.5 Drainage Pan.** Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly or where structural damage could result~~s~~ from a leaking water heater, a watertight pan of corrosion-resistant materials not less than 1-1/2 inches (38 mm) in depth shall be installed beneath the water heater	Reject	**UPC Committee Discussion:** Motion to reject based on accept as modified item 104. Also, structural damage is not defined. Not appropriate to reference the material table. Motion to reject passed by consent.

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		with a drain not less than 3/4 ~~of an~~ inch (20 mm) and ~~diameter drain~~ of materials shown in Table 701.2, to an approved location. Discharge from a relief valve into a water heater pan shall be prohibited. ~~Such pan shall be not~~ less than ~~1-1/2 inches (38 mm) in depth.~~		
107	5. Water Heaters	**507.0 Appliance and Equipment Installation Requirements.** **507.5 Drainage Pan.** Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly or where structural damage could result~~s~~ from a leaking water heater, a watertight pan of corrosion-resistant materials, not less than 1½ inches (38 mm) in depth, shall be installed beneath the water heater with a drain not less than ¾ of an inch (20 mm) ~~diameter drain~~ to an approved location. Discharge from a relief valve into a water heater pan shall be prohibited. ~~Such pan shall be not less than 1½ inches (38 mm) in depth.~~	Reject	**UPC Committee Discussion:** Motion to reject based on accept as modified item 104. Also, structural damage not defined. Motion to reject passed by consent.
108	5. Water Heaters	**507.13 Installation in Residential Garages.** 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 heating elements, switches, burners, and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. {[NFPA 54:9.1.10.1]}	Accept	**UPC Committee Discussion:** Motion to accept passed based on consent.
110	5. Water Heaters	**507.26 Accessibility for Service.** All appliances shall be located with respect to building construction and other equipment so as to permit access ~~to the appliance~~ for repair or replacement of the appliance. Sufficient clearance shall be maintained to permit removal of the appliance; 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. [{NFPA 54:9.2.1}]	Accept	**UPC Committee Discussion:** Motion to accept passed.

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113	5. Water Heaters	• **Venting of Gas Appliances.** Low-heat and medium-heat gas appliances shall be vented in accordance with this chapter. Other gas appliances shall be vented in accordance with NFPA 211 or other applicable standards. **Appliances Fueled by Other Fuels.** Appliances fueled by fuels other than gas shall be vented in accordance with NFPA 211 and the appliance manufacturer's instructions.	Reject	**UPC Committee Discussion:** It was noted the NFPA references scope is not fully appropriate. Gas appliances are vented in accordance with NFPA 54.NFPA 31 covers oil burning concerning 509.3 Motion to reject was approved by consent.
114	5. Water Heaters	**509.0 Venting of Appliances.** **509.6.1.1 Insulation Protection Shield.** Where a vent passes through an insulated assembly, an approved metal shield constructed of steel having a thickness of not less than 26 gauge shall be installed between the vent and insulation. The shield shall extend not less than 2 inches (51 mm) above the insulation and be secured to the structure in accordance with the manufacturer's installation instructions.	Accept	**UPC Committee Discussion:** Motion to accept approved by consent.
141	6. Water Supply and Distribution	**604.0 Materials.** **604.13 Water Heater Connectors.** Flexible metallic (copper and stainless steel), reinforced flexible, braided stainless steel, or polymer braided with EPDM core connectors that connect a water heater to the piping system shall comply with ASME A112.18.6/CSA B125.6. Copper, copper alloy, or stainless steel flexible connectors shall not exceed 24 inches (610 mm). PEX, PEX-AL-PEX, PE-AL-PE, or PE-RT tubing shall not be installed within the first 18 inches (457 mm) of piping connected to a water heater. **Exception:** PEX, PEX-AL-PEX, PE-AL-PE, or PE-RT tubing shall be permitted directly to tankless water heaters intended for domestic water applications.	Reject	**ASA Position:** Oppose **UPC Committee Discussion:** Motion to reject passed based on a vote of 13 yes to 11 no.
157	6. Water Supply and Distribution	607.2 **Potable Water Tanks.** Potable water supply tanks, with and without bladders/diaphragms, interior tank coatings, or tank liners intended to supply drinking water shall comply with NSF 61. **607.2.1 Non-Pressurized Potable Water Tanks.** ~~**607.3 Venting.**~~ Non-pressurized potable water tanks ~~Tanks used for potable water~~ shall be tightly	Reject	**ASA Position:** Oppose since the standard is only related to well systems. **UPC Committee Discussion:**

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Proposal	Chapter	Summary of Proposed Revision	Committee Position	Comments
		covered and vented in accordance with the manufacturer's installation instructions. Such vent shall be screened with a corrosion-resistant material of not less than number 24 mesh. ~~**607.4 Overflow.**~~ Tanks shall have an overflow not less than a 16 square inch (0.01 m^2) ~~overflow~~ that is screened with a corrosion-resistant material of not less than number 24 mesh. 607.2.2 **Pressurized Potable Water Tanks.** ~~**607.5 Valves.** Pressurized tanks shall be provided with a~~ Pressurized potable water tanks shall comply with ANSI/WSC PST 2000. A listed pressure-relief valve installed in accordance with the manufacturer's installation instructions. The relief valve shall be ~~discharged~~ in accordance with Section ~~608.5~~ 608.0. Where a potable water supply tank is located above the fixtures, appliances, or system components it serves, it shall be equipped with a vacuum relief valve that complies with CSA Z21.22.		Move to reject passed by consent for the reason ASA opposes.
158	6. Water Supply and Distribution	**608.2 Excessive Water Pressure.** Where static water pressure in the water supply piping is exceeding 80 psi (552 kPa), an approved-type pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to 80 psi (552 kPa) or less. Pressure regulators for potable water distribution systems shall comply with ASSE 1003 and NSF 61. Pressure regulator(s) equal to or exceeding 11/2 inches (40 mm) shall not require a strainer. For line sizes greater than 3 inches (80 mm), an automatic control (pressure regulating) valve shall be utilized.	Reject	**UPC Committee Discussion:** Motion to reject due to being overly restrictive. It was noted that ASSE 1003 goes up to 4 in. Motion passed based on consent.
159	6. Water Supply and Distribution	Revisions to 608.0 Water Pressure, Pressure Regulators, Pressure relief valves and Vacuum Relief Valves including the following: - Requiring when a pressure regulator valve is required the developed length of supply piping shall be computed from the building side of the valve. - Basing pressure determinations on 80% of reduced pressure	Reject	**UPC Committee Discussion:** Motion to reject based on adds requirements that have not been justified. Motion passed by consent.

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Proposal	**Chapter**	**Summary of Proposed Revision**	**Committee Position**	**Comments**
		- Adding "a licensed plumbing contractor or" to the exception statement.		
160	6. Water Supply and Distribution	**608.0 Water Pressure, Pressure Regulators, Pressure Relief Valves, and Vacuum Relief Valves.** **608.2 Excessive Water Pressure.** **(no change to first and second paragraphs)** An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. Expansion tanks used in potable water systems intended to supply drinking water shall comply with NSF 61. The expansion tank shall be properly sized, securely fastened to the structure, and installed in accordance with the manufacturer's installation instructions and listing. Systems designed by registered design professionals shall be permitted to use approved pressure relief valves in lieu of expansion tanks provided such relief valves have a maximum pressure relief setting of 100 psi (689 kPa) or less. 607.3 **Expansion Tanks, and Combination Temperature and Pressure-Relief Valves.** A water system provided with a check valve, backflow preventer, or other normally closed device that prevents dissipation of building pressure back into the water main, independent of the type of water heater used, shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. Prepressurized water expansion tanks shall comply with IAPMO Z1088. Such expansion tank or other approved device shall be installed on the building side of the check valve, backflow preventer, or other device and shall be sized, securely fastened to the structure, and installed in accordance with the manufacturer's installation instructions.	Accept	**UPC Committee Discussion:** Accept as submitted. Motion accepted based on consent.

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Proposal	Chapter	Summary of Proposed Revision	Committee Position	Comments
161	6. Water Supply and Distribution	Add exception to **608.3 Expansion Tanks, and Combination Temperature and Pressure-Relief Valves.** **Exception:** An expansion tank is not required for an instantaneous non-storage water heater. All other provisions of Section 608.3 still apply.	Accept	**UPC Committee Discussion:** Some concern that pressure in the tank is independent of the type of water heater. Motion to accept passed based on consent.
162	6. Water Supply and Distribution	**608.0 Water Pressure, Pressure Regulators, Pressure Relief Valves, and Vacuum Relief Valves.** **608.7 Vacuum Relief Valves.** Where the elevation of an entire ~~a~~ hot-water storage tank or an indirect water heater is ~~located at an elevation~~ above the fixture outlets in the hot-water system, a vacuum relief valve that complies with CSA Z21.22 shall be installed on the storage tank or heater. **Exception:** Storage tanks which have an internal anti-siphon port in their fill tube shall not be required to install a vacuum relief valve.	Reject	**UPC Committee Discussion:** Motion to reject based on change in elevation is not justified and exception lacks clarity. Motion to reject passed based on consent.
205	8.Indirect Wastes	The additional pan or the additional drain line connection shall be provided with a drain pipe of not less than 3/4 of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed. The terminating ends of condensate drain lines shall be marked to identify whether such condensate drain line is from a primary or secondary drain.	Reject	**UPC Committee Discussion:** Motion to reject proposal passed based on consent approval
206	8. Indirect Wastes	(1) A water level detecting device that will shut off the equipment or appliance in the event the primary drain is blocked. Such detecting devise shall be installed inside the primary pan above the primary drain and below the flood level rim of the pan.	Approve	**UPC Committee Discussion:** Move to approve as modified to place after installed, "in accordance of manufacturer's instructions" and delete the rest of the text. Motion passed based on consent approval.
207	8. Indirect Wastes	(3) An additional separate drain line at a level that is higher than the primary drain line connection of the drain pan.	Accept	**UPC Committee Discussion:** Motion to accept as submitted passed based on consent approval.
303	Appendix L. Sustainable Practices	Add following to L 501.4 Recirculating Pump Controls	Accept	**UPC Committee Discussion:** Motion to accept passed based on 11 yes to 10 no.

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Proposal	Chapter	Summary of Proposed Revision	Committee Position	Comments
		L 501.4.1 Hot Water On-Demand Pumping Systems. Hot water on-demand pumping systems manually actuated or automatically activated hot water pumping systems shall comply with IAPMO PS 115.		
304	Appendix L. Sustainable Practices	**L 503.3.4 Hot Water System Design.** Hot water systems shall comply with ~~Section L 503.3.4(1) and Section L 503.3.4(2).~~ the following: (1) ~~Recirculation systems shall comply with the provisions of Section L 501.3.~~ Circulating hot water systems shall be arranged so that the circulating pump(s) are capable of being turned off (automatically or manually) where the hot water system is not in operation. **Exception:** For hospitals, custodial care facilities, nursing homes, hotels, or motels, devices that automatically turn off the circulation pump(s) shall not be utilized. (2) Where used to maintain storage tank water temperature, circulation pump(s) shall be equipped with controls limiting operation to a period from the start of the heating cycle to a maximum of 5 minutes after the end of the heating cycle.	Reject	**UPC Discussion** Motion to reject approved by consent

2021

UMC® TECHNICAL COMMITTEE MEETING MONOGRAPH

VIRTUAL MEETING | **MAY 17 – 21, 2021**

Proposals

Item #: 012

UMC 2024 Section: 203.0

SUBMITTER: Arnie Rodio
Self

RECOMMENDATION:
Revise text

203.0 – A –
Appliance. A device that utilizes fuel or electricity as an energy source to produce light, heat, power, refrigeration, or air conditioning~~, or compressed fuel gas~~. This definition also ~~shall~~ includes ~~a~~ vented decorative appliances and electric storage or tankless water heaters.

SUBSTANTIATION:
The change removes enforceable language that is not permitted in a definition per the Manual of Style. The update also removes “compressed fuel gas” as it is used out of context and is now addressed under “fuel.”

Furthermore, the additional language to the “Appliance” definition reintroduces electric water heaters into the mechanical code.

Proposals

Item #: 013

UMC 2024 Section: 203.0

SUBMITTER: David Dias
Sheet Metal Workers Local 104

RECOMMENDATION:
Add new text

203.0 – A –
Appliance. A device that utilizes an energy source to produce light, heat, power, refrigeration, air conditioning, or compressed fuel gas. This definition also shall include a vented decorative appliance.

Vented Appliance. An appliance designed and installed in such a manner that all products of combustion are conveyed directly from the appliance to the outdoor atmosphere through an approved chimney or vent system.

SUBSTANTIATION:
This code change adds a definition for “Vented Appliance” as the term is used in the code but is currently not defined. The proposed definition clearly describes the term.

Proposals

Item #: 016

UMC 2024 Section: 203.0, 204.0, 210.0, 214.0, 215.0, 218.0, 225.0

SUBMITTER: Randy Young
Northern CA Valley Sheet Metal Training JATC

RECOMMENDATION:
Revise text

[The terms are being relocated only]

203.0 – A –
~~**Automatic Boiler.** A boiler equipped with certain controls and limit devices.~~

204.0 – B –
~~**Boiler, High-Pressure.** A boiler for generating steam at gauge pressures in excess of 15 psi (103 kPa), or for heating water to a temperature in excess of 250°F (121°C) or at a gauge pressure in excess of 160 psi (gauge pressure of 1103 kPa). [NFPA 211:3.3.14.2]~~

210.0 – H –
~~**Hot-Water-Heating Boiler.** A boiler having a volume exceeding 120 gallons (454 L), a heat input exceeding 200 000 Btu/h (58.6 kW), or an operating temperature exceeding 210°F (99°C) that provides hot water to be used externally to itself.~~

214.0 – L –
~~**Low-Pressure Hot-Water-Heating Boiler.** A boiler furnishing hot water at pressures not exceeding 160 psi (1103 kPa) and at temperatures not exceeding 250°F (121°C).~~
~~**Low-Pressure Steam-Heating Boiler.** A boiler furnishing steam at pressures not exceeding 15 psi (103 kPa).~~

215.0 – M –
~~**Miniature Boiler.** A power boiler having an internal shell diameter of 16 inches (406 mm) or less, a gross volume of 5 cubic feet (0.14 m^3) or less, a heating surface of 20 square feet (1.86 m^2) or less (not applicable to electric boilers), and not exceeding 100 psi (689 kPa).~~

218.0 – P –
~~**Package Boiler.** A class of boiler defined herein and shall be a boiler equipped and shipped complete with fuel-burning equipment, automatic controls and accessories, and mechanical draft equipment.~~
~~**Power Boiler.** A boiler in which steam is generated at pressures exceeding 15 psi (103 kPa).~~
~~**Power Hot Water Boiler (High Temperature Water Boiler).** A boiler used for heating water or liquid to a pressure exceeding 160 psi (1103 kPa) or to a temperature exceeding 250°F (121°C).~~
~~**Steam-Heating Boiler.** A boiler operated at pressures not exceeding 15 psi (103 kPa) for steam.~~

225.0 – W –
~~**Water Heater or Hot-Water-Heating Boiler.** An appliance designed primarily to supply hot water for domestic or commercial purposes and equipped with automatic controls limiting water temperature to a maximum of 210°F (99°C).~~

204.0 – B –
Boiler. A closed vessel used for heating water or liquid, or for generating steam or vapor by direct application of heat from combustible fuels or electricity.

Automatic Boiler. A boiler equipped with certain controls and limit devices.
Boiler, High-Pressure. A boiler for generating steam at gauge pressures in excess of 15 psi (103 kPa), or for heating water to a temperature in excess of 250°F (121°C) or at a gauge pressure in excess of 160 psi (gauge pressure of 1103 kPa). [NFPA 211:3.3.14.2]
Hot-Water-Heating Boiler. A boiler having a volume exceeding 120 gallons (454 L), a heat input exceeding 200 000 Btu/h (58.6 kW), or an operating temperature exceeding 210°F (99°C) that provides hot water to be used externally to itself.
Low-Pressure Hot-Water-Heating Boiler. A boiler furnishing hot water at pressures not exceeding 160 psi (1103 kPa) and at temperatures not exceeding 250°F (121°C).
Low-Pressure Steam-Heating Boiler. A boiler furnishing steam at pressures not exceeding 15 psi (103 kPa).
Miniature Boiler. A power boiler having an internal shell diameter of 16 inches (406 mm) or less, a gross volume of 5 cubic feet (0.14 m^3) or less, a heating surface of 20 square feet (1.86 m^2) or less (not applicable to electric boilers), and not exceeding 100 psi (689 kPa).
Package Boiler. A class of boiler defined herein and shall be a boiler equipped and shipped complete with fuel-burning equipment, automatic controls and accessories, and mechanical draft equipment.
Power Boiler. A boiler in which steam is generated at pressures exceeding 15 psi (103 kPa).
Power Hot Water Boiler (High Temperature Water Boiler). A boiler used for heating water or liquid to a pressure exceeding 160 psi (1103 kPa) or to a temperature exceeding 250°F (121°C).
Steam-Heating Boiler. A boiler operated at pressures not exceeding 15 psi (103 kPa) for steam.
Water Heater or Hot-Water-Heating Boiler. An appliance designed primarily to supply hot water for domestic or commercial purposes and equipped with automatic controls limiting water temperature to a maximum of 210°F (99°C).

SUBSTANTIATION:
This code change relocates the definitions relating to boilers below the definition of "Boiler" for ease of use in locating boiler-related terms.

Proposals

Item #: 022

UMC 2024 Section: 206.0

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Add new text

206.0 – D –
Dual Purpose Water Heater. An appliance utilized as a heat source for both space heating and domestic hot water applications.

SUBSTANTIATION:
UMC Sections 1002.5, 1202.3,1203.2, 1207.3, and 1219.1 reference Dual Purpose Water Heaters. Therefore, a definition for the term is being added to clarify what a dual purpose water is and the intent of the code.

Proposals

Item #: 027

UMC 2024 Section: 207.0

SUBMITTER: Lance MacNevin, P.Eng.
Chair, USHGC Technical Committee

RECOMMENDATION:
Add new text

207.0 – E –
Expansion Tank. A vessel used to protect closed systems from excessive fluid pressure.

SUBSTANTIATION:
The term “expansion tank” is used throughout the UMC along with provisions for such tanks. These types of tanks provide protection because they accept the increase in thermal fluid volume as a result of thermal expansion. They also assist in system startup and operation by acting as a mechanism which accepts entrained air. The provided definition is necessary as it pertains to various systems within the UMC and clarifies that these tanks are meant to protect such closed systems from excessive pressures.

The change correlates with the actions taken by the USHGC Technical Committee. This is necessary to ensure correlation between the codes.

Proposals

Item #: 029

UMC 2024 Section: 208.0

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Add new text

208.0 – F –
Flue Collar. That portion of an appliance designed for the attachment of a draft hood, vent connector, or venting system. [NFPA 54:3.3.44]

SUBSTANTIATION:
A new definition for “Flue Collar” is being added as the term is currently used in the code but not defined. The definition correlates with NFPA 54 and the existing definition in the UPC.

Proposals

Item #: 030

UMC 2024 Section: 209.0

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Add new text

209.0 – G –

Gas. A substance used as fuel, such as natural, liquefied petroleum (LP-Gas), and mixtures of these gases, with gas-air mixtures within the flammable range.

Fuel Gas. Natural, manufactured, liquefied petroleum, or a mixture of these.
Flue Gas. Products of combustion with excess air in appliance flues or heat exchangers.
Liquefied Petroleum Gas (LP-Gas). Means and includes a material composed predominantly of any of the following hydrocarbons or mixtures of them: propane, propylene, butanes (normal butane or isobutane), and butylenes. When reference is made to liquefied petroleum gas in this code, it shall refer to liquefied petroleum gases in either the liquid or gaseous state.
Utility Gas. See Fuel Gas.

SUBSTANTIATION:
Definitions are being added for “Gas,” “Flue Gas,” and “Utility Gas” to add clarity to the code. The definitions for the terms are consistent with industry standards. The definitions for “Fuel Gas” and “Liquefied Petroleum Gas (LP-Gas)” are being relocated to under the new definition of “Gas.”

Proposals

Item #: 031

UMC 2024 Section: 209.0

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

209.0 – G –
Gas Piping. An installation of pipe, valves, or fittings that are used to convey fuel gas, installed on any premises or in a building~~.~~ ~~, but shall not include:~~
~~(1) A portion of the service piping.~~
~~(2) An approved piping connection 6 feet (1829 mm) or less in length between an existing gas outlet and a gas appliance in the same room with the outlet.~~

(below shown for reference only)

1302.0 Coverage of Piping System.
1302.1 General. Coverage of piping systems shall extend from the point of delivery to the appliance connections. For other than undiluted liquefied petroleum gas (LP-Gas) systems, the point of delivery shall be the outlet of the service meter assembly or the outlet of the service regulator or service shutoff valve where no meter is provided. For undiluted LP-Gas systems, the point of delivery shall be considered to be the outlet of the final pressure regulator, exclusive of line gas regulators where no meter is installed. Where a meter is installed, the point of delivery shall be the outlet of the meter. [NFPA 54:1.1.1.1(A)]

1312.0 Appliance and Equipment Connections to Building Piping.
1312.3.1 Indoor. Indoor gas hose connectors shall be used only to connect laboratory, shop, and ironing appliances requiring mobility during operation and installed in accordance with the following:
(1) An appliance shutoff valve shall be installed where the connector is attached to the building piping.
(2) The connector shall be of minimum length and shall not exceed 6 feet (1829 mm).
(3) The connector shall not be concealed and shall not extend from one room to another or pass through wall partitions, ceilings, or floors. [NFPA 54:9.6.2(1)]

SUBSTANTIATION:
The change is removing the term “shall” from the definition for “Gas Piping” as the IAPMO Manual of Style indicates that definitions shall not be written in mandatory language.

The language in (1) in not necessary as it is already covered under the 1302.1 (General) indicating that gas piping systems extend from the point of delivery.

The change also removes (2), the “limit of 6 feet” and “within the same room” for gas connectors as it does not belong in a definition. Furthermore, the limit of 6 feet is already addressed in Section 1312.3.1 (Indoor) for nonmetallic gas hose connectors.

Proposals

Item #: 038

UMC 2024 Section: 212.0

SUBMITTER: Donald (DJ) Berger
Self

RECOMMENDATION:
Revise text

212.0 – J –
Joint, ~~Press-Connect~~ Elastomeric. A ~~permanent mechanical~~ removable or non-removable joint consisting of an elastomeric seal or an elastomeric seal and corrosion-resistant grip ring. ~~The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.~~

SUBSTANTIATION:
The word “Press-Connect” describes one type of technology using elastomeric materials for the joint seal. By revising the definition with the word “Elastomeric” this definition may be expanded to include similar joining technologies employing an elastomeric material for its seal, e.g., push-fit, grooved, bolted, compression repair couplings, etc. The words “permanent mechanical” are inconsistent with other “permanent” and “mechanical” joint definitions within this section of the 2021 UMC. By revising the definition with the removal of the phrase “The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer,” the definition would be inclusive of similar joining technologies employing elastomeric materials. This revision would provide additional consistency within the code as the 2021 UMC has specific sections that provide information on how joints are to be made.

Proposals

Item #: 039

UMC 2024 Section: 214.0

SUBMITTER: John Taecker
UL LLC

RECOMMENDATION:
Revise text

214.0 – L –
Listed (Third Party Certified). Equipment or materials included in a list published by a listing agency (accredited conformity assessment body) that maintains periodic inspection of current production of listed equipment or materials and whose listing states either that the equipment or material complies with approved standards or has been tested and found suitable for use in a specified manner. Terms used to identify listed equipment, products, or materials include "listed," "certified," or other terms as determined appropriate by the listing agency.

SUBSTANTIATION:
The proposed revision to the definition for "Listed" recognizes that listing organizations may use other terms to identify "listed" equipment, products, or materials. An example of other terms used that meet the definition of "listed" include "certified." The term "certified" is a more globally recognized term used by listing organizations compared to the term "listed."

Proposals

Item #: 040

UMC 2024 Section: 214.0

SUBMITTER: Lance MacNevin, P.Eng.
Chair, USHGC Technical Committee

RECOMMENDATION:
Add new text

214.0 – L –
Load. The heat output of the storage during discharge. The product of the mass flowrate, specific thermal capacity, and temperature increase of the water or heat transfer fluid as it passes through a system.

SUBSTANTIATION:
A definition is needed in the UMC for the term “Load,” which is used in throughout the code. The change correlates with the USHGC. This is necessary to ensure correlation between the codes.

Proposals

Item #: 048

UMC 2024 Section: 224.0

SUBMITTER: Adam Segura
Self

RECOMMENDATION:
Add new text

224.0 – V –
Vacuum Relief Valve. A device that automatically allows air to enter the piping system to prevent conditions that could siphon water from the system and prevent excessive vacuum in a pressure vessel.

(below shown for reference only)

1005.5 Vacuum Relief Valve. Hot-water heating systems that are subjected to a vacuum while in operation or during shutdown shall be protected with a vacuum relief valve. Where the piping configuration, equipment location, and valve outlets are located below the boiler elevation, the system shall be equipped with a vacuum relief valve at the highest point.

SUBSTANTIATION:
The proposed language adds the definition of a vacuum relief valve as used in a plumbing or mechanical system. The valve is not only protecting the pressure vessel from excessive vacuum, but also preventing conditions that could siphon the water from system and possibly cause damage to water heater and equipment. See Section 1005.5 (Vacuum Relief Valve).

Proposals

Item #: 051

UMC 2024 Section: 222.0, 224.0

SUBMITTER: Randy Young
Northern CA Valley Sheet Metal Training JATC

RECOMMENDATION:
Revise text

222.0 – T –

~~**Type B Gas Vent.** A factory-made gas vent listed by a nationally recognized testing agency for venting listed or approved appliances equipped to burn only gas.~~
~~**Type B-W Gas Vent.** A factory-made gas vent listed by a nationally recognized testing agency for venting listed or approved gas-fired vented wall furnaces.~~
~~**Type L Gas Vent.** A venting system consisting of listed vent piping and fittings for use with oil-burning appliances listed for use with Type L or with listed gas appliances.~~

224.0 – V –

Vent. A pipe or other conduit composed of factory-made components, containing a passageway for conveying combustion products and air to the atmosphere, listed and labeled for use with a specific type or class of appliance.

[The terms below are being relocated only]

> **Type B Gas Vent.** A factory-made gas vent listed by a nationally recognized testing agency for venting listed or approved appliances equipped to burn only gas.
> **Type B-W Gas Vent.** A factory-made gas vent listed by a nationally recognized testing agency for venting listed or approved gas-fired vented wall furnaces.
> **Type L Gas Vent.** A venting system consisting of listed vent piping and fittings for use with oil-burning appliances listed for use with Type L or with listed gas appliances.

SUBSTANTIATION:
The code change adds a definition for “Vent” to improve the code as well as relocates and combines the existing vent types for ease of locating the terms.

Proposals

Item #: 064

UMC 2024 Section: 305.5

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

305.0 Location.

305.5 Drainage Pan. Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, ~~or~~ floor-subfloor assembly or where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than 3/4 of an inch (20 mm) diameter drain to an approved location. The terminating end of the drainpipe shall be readily visible. Such pan shall be not less than 11/2 inches (38 mm) in depth.

SUBSTANTIATION:
The proposed change will clarify that Section 305.5 is applicable to all water heaters, regardless of the type of water heater. The intent of the section is to prevent damage from occurring in the surrounding vicinity of the water heather should a leak occur.

Proposals

Item #: 065

UMC 2024 Section: 305.5

SUBMITTER: Bob Adler
Self

RECOMMENDATION:
Revise text

305.0 Location.

305.5 Drainage Pan. Where an ~~water heater~~ appliance or equipment is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking ~~water heater~~ appliance or equipment, a watertight pan of corrosion-resistant materials shall be installed beneath the ~~water heater~~ appliance or equipment in accordance with the following:
(1) The drainage pan shall be provided with not less than 3/4 of an inch (20 mm) diameter drain to an approved location.
(2) ~~Such~~ The drainage pan shall be not less than 11/2 inches (38 mm) in depth.
(3) Where a drain pan pipe is installed, the material of the piping shall be rated for the temperature rating of the appliance or equipment and shall be approved for use with the liquid being discharged.

SUBSTANTIATION:
The new text will add provisions which clarify that piping used on hot water applications shall be rated for such temperatures as there are drain lines to be used for cold water applications only.

Proposals

Item #: 176

UMC 2024 Section: 802.5.1.1, 1002.5, 1202.2, 1203.2

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Revise text

802.0 Venting of Appliances.

802.5 Masonry, Metal, and Factory-Built Chimneys. (remaining text unchanged)
802.5.1 Factory-Built Chimneys. (remaining text unchanged)
802.5.1.1 Decorative Shrouds. Decorative shrouds addressed in Section 802.5.4.3 shall be listed ~~or~~ and labeled in accordance with UL 103 for factory-built residential chimneys, UL 127 for factory-built fireplaces, or UL 1482 for solid-fuel room heaters.

1002.0 Standards.

1002.5 Dual Purpose Water Heaters. Water heaters utilized for combined space- and water-heating applications shall be listed ~~or~~ and labeled in accordance with the standards referenced in Table 1203.2, and shall be installed in accordance with the manufacturer's installation instructions.

1202.0 Protection of Potable Water Supply.

1202.2 Chemical Injection. Where systems include an additive, chemical injection or provisions for such injection, the potable water supply shall be protected by a reduced-pressure principle backflow prevention assembly listed ~~or~~ and labeled in accordance with ASSE 1013. Such additive or chemical shall be compatible with system components.

1203.0 Capacity of Heat Source.

1203.2 Dual Purpose Water Heaters. Water heaters utilized for combined space-heating and water-heating applications shall be listed ~~or~~ and labeled in accordance with the standards referenced in Table 1203.2, and shall be installed in accordance with the manufacturer's installation instructions. The total heating capacity of a dual purpose water heater shall be based on the sum of the potable hot water requirements and the space heating design requirements corrected for hot water first-hour draw recovery.

SUBSTANTIATION:
This proposal changes "listed or labeled" to "listed and labeled" to clarify the intention of the language.

Proposals

Item #: 201

UMC 2024 Section: 1001.1(9)

SUBMITTER: John Taecker
UL LLC

RECOMMENDATION:
Revise text

1001.0 General.
1001.1 Applicability. The requirements of this chapter shall apply in the construction, installation, operation, repair, and alteration of boilers and pressure vessels. Low-pressure boilers shall comply with this chapter and Section 904.0.
Exceptions:
(1) through (8) remain unchanged.
(9) Pressure vessels used in specific appliances shall comply with Chapter 9.

SUBSTANTIATION:
The product certification standards referenced in Chapter 9 provide specific requirements for pressure vessels and parts under pressure within those specific appliances. This proposal recognizes these requirements are already addressed in Chapter 9 (Installation of Specific Appliances).

Proposals

Item #: 204

UMC 2024 Section: 1004.4

SUBMITTER: Lance MacNevin, P.Eng.
Chair, USHGC Technical Committee

RECOMMENDATION:
Revise text

1004.0 Expansion Tanks.

1004.4 Minimum Capacity of Closed-Type Tank. The minimum capacity for a gravity-type hot water system expansion tank shall be in accordance with Table 1004.4(1). The minimum capacity for a forced-type hot water system expansion tank shall be in accordance with Table 1004.4(2)~~,~~ or Equation 1004.4(1). ~~Equation 1004.4 shall not be used for diaphragm-type expansion tanks.~~ The minimum capacity for a diaphragm-type hot water system expansion tank shall be in accordance with Table 1004.4(2) or Equation 1004.4(2).

[~~(~~Equation 1004.4(1)]

$$V_t \text{ (forced-type)} = \frac{(0.00041t - 0.0466)\, Vs}{\left(\frac{Pa}{Pf} - \frac{Pa}{Po} \right)}$$

[Equation 1004.4(2)]

$$V_t \text{ (diaphragm-type)} = \frac{(0.00041t - 0.0466)\, Vs}{\left(1 - \frac{Pf}{Po} \right)}$$

Where:
V_t = Minimum volume of expansion tank, gallons (L).
V_s = Volume of system, not including expansion tank, gallons (L).
t = Average operating temperature, °F (°C).
P_a = Atmospheric pressure, ~~feet H_2O absolute~~ pounds per square inch (kPa).
P_f = Fill pressure, feet ~~H_2O absolute~~ pounds per square inch (kPa).
P_o = Maximum operating pressure, ~~feet H_2O absolute~~ pounds per square inch (kPa).
For SI units: 1 gallon = 3.785 L, °C = (°F-32)/1.8, 1 foot of water = 2.99 kPa

(below shown for reference only)

TABLE 1004.4(1)
EXPANSION TANK CAPACITIES FOR GRAVITY HOT WATER SYSTEMS[1]

INSTALLED EQUIVALENT DIRECT RADIATION[2] (square feet)	TANK CAPACITY (gallons)
Up to 350	18
Up to 450	21
Up to 650	24
Up to 900	30
Up to 1100	35
Up to 1400	40
Up to 1600	2 to 30
Up to 1800	2 to 30
Up to 2000	2 to 35
Up to 2400	2 to 40

For SI units: 1 gallon = 3.785 L, 1 square foot = 0.0929 m^2

Notes:

[1] Based on a two-pipe system with an average operating water temperature of 170°F (77°C), using cast-iron column radiation with a heat emission rate of 150 British thermal units per square foot hour [Btu/(ft^2•h)] (473 W/m^2) equivalent direct radiation.

[2] For systems that exceed 2400 square feet (222.9 m^2) of installed equivalent direct water radiation, the required capacity of the cushion tank shall be increased on the basis of 1 gallon (4 L) tank capacity per 33 square feet (3.1 m^2) of additional equivalent direct radiation.

TABLE 1004.4(2)
EXPANSION TANK CAPACITIES FOR FORCED HOT WATER SYSTEMS[1]

SYSTEM VOLUME[2] (gallons)	TANK CAPACITY DIAPHRAGM TYPE (gallons)	TANK CAPACITY NON-DIAPHRAGM TYPE (gallons)
100	9	15
200	17	30
300	25	45
400	33	60
500	42	75
1000	83	150
2000	165	300

For SI units: 1 gallon = 3.785 L

Notes:

[1] Based on an average operating water temperature of 195°F (91°C), a fill pressure of 12 psig (83 kPa), and an operating pressure of not more than 30 psig (207 kPa).

[2] Includes volume of water in boiler, radiation, and piping, not including expansion tank.

SUBSTANTIATION:

Diaphragm tanks are included in Table 1004.4(2), but Equation 1004.4(1) pertains to non-precharged tanks. Including the precharged tank equation is required to allow for more accurate tank sizing.

Sizing the tank is the primary thermal consideration when installing a tank into a system. For precharged tanks, including properly charged diaphragm and bladder tanks, the starting pressure when water first starts to enter the tank is equal to the initial precharge pressure. Hence, the equation reduces to Equation 1004.4(2). If Equation

1004.4(1) is used to calculate the volume of a diaphragm tank, the tank will be oversized for the system.

The change correlates with the actions taken by the USHGC Technical Committee. This is necessary to ensure correlation between the codes.

A link for supporting documentation is as follows:
http://www.taylor-engineering.com/Websites/taylorengineering/articles/ASHRAE_Journal_-_The_Fundamentals_of_Expansion_Tanks.pdf

Proposals

Item #: 205

UMC 2024 Section: 1005.2(8)

SUBMITTER: Jim Erhardt
Watts Water Technologies

RECOMMENDATION:
Revise text

1005.0 Safety or Relief Valve Discharge.

1005.2 Discharge Piping. The discharge piping serving a temperature relief valve, pressure relief valve, or combination of both shall have no valves, obstructions, or means of isolation and provided with the following:
(1) Equal to the size of the valve outlet and shall discharge full size to the flood level of the area receiving the discharge and pointing down.
(2) Materials shall be rated at not less than the operating temperature of the system and approved for such use.
(3) Discharge pipe shall discharge independently by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) and not less than 6 inches (152 mm) above the ground and pointing downwards.
(4) Discharge in such a manner that does not cause personal injury or structural damage.
(5) No part of such discharge pipe shall be trapped or subject to freezing.
(6) The terminal end of the pipe shall not be threaded.
(7) Discharge from a relief valve into a water heater pan shall be prohibited.
(8) Discharge to a termination point that is readily observable by the building occupants. If the discharge termination point is not readily observable, discharge monitoring is required.

SUBSTANTIATION:
Continuous low-level discharge (“dribble”) of T&P valve due to over-pressure (failed expansion tank, lack of secondary pressure relief device for thermal expansion, etc.) with hard water conditions can cause build-up of scale in the relief valve discharge port. Such obstruction of discharge port can compromise the relieving capacity of the valve and pose a safety risk to building occupants. Remote monitoring of relief valve discharge will ensure that the condition is immediately known.

Proposals

Item #: 225

UMC 2024 Section: 1109.2, Table 1701.1

SUBMITTER: Donald (DJ) Berger
Self

RECOMMENDATION:
Revise text

1109.0 Refrigeration Piping, Containers, and Valves.

1109.2 Joints. Iron or steel pipe joints shall be of approved threaded, flanged, or welded types. Exposed threads shall be tinned or coated with an approved corrosion inhibitor. Copper or copper alloy pipe joints of iron pipe size shall be of approved threaded, flanged, ~~press-connect~~ or brazed types. Copper tubing joints and connections shall be connected by approved flared, lapped, swaged, or brazed joints~~, soldered joints, or mechanical joints that comply with UL 207 either individually or as part of an assembly or a system by an approved nationally recognized laboratory~~. Piping and tubing shall be installed so as to prevent vibration and strains at joints and connections.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
~~UL 207-2009~~	~~Refrigerant-Containing Components and Accessories, Nonelectrical (with revisions through June 27, 2014)~~	~~Refrigeration Components~~	~~1109.2~~

(portions of table not shown remain unchanged)

SUBSTANTIATION:
Section 1109.2 of the UMC originally listed only those joint types for refrigeration piping which have been time tested for soundness. Fittings for each joining process were required to be manufactured in accordance with recognized ASME and ASTM Standards, with the intent of the code being a leak-free piping system installed to safely contain the refrigerant within it.

The use of press-connect technology on copper or copper alloy pipe joints of iron pipe size, as well as the use of press-connect technology on copper tubing joints and connections, was introduced into the 2018 UMC through ROP #154 and finally approved into the UMC as being tested per the industry standard, UL 207. It is my intention to substantiate that UL 207 was misapplied for the allowance of press-connect technology into this section of the 2021 UMC.

The Scope: Section 1.1 of the UL 207-2009 Refrigerant-Containing Components and Accessories, Nonelectrical (with revisions through June 27, 2014) clearly states which nonelectrical refrigerant-containing components and accessories are covered by the requirements of the UL 207. The subsequent paragraph of the Scope; Section 1.2 (a), clearly states “These requirements do not apply to: Electrical valves and electric refrigeration controllers, hermetic refrigerant motor compressors, tubing fittings such as flare or compression type fittings, and the like, which are covered in or as part of separate, individual requirements.”

There is an existing ASME B16.51 Copper and Copper Alloy Press-Connect Pressure Fittings Standard listed in the 2021 UMC, but that standard does not include ASTM B280 copper and copper alloy piping or the use of press-connect technology as a joining process for refrigeration piping.

As press-connect technology for fittings would be covered by other recognized standards, such as the ASME B31.5 Refrigeration Piping and Heat Transfer Components, it is my opinion that the UL 207 was incorrectly substantiated by the Submitter of the original proposal.

Additionally, Section 1109.1 Materials, of the 2021 UMC clearly states “Refrigerant piping shall be metallic.” As press-connect fittings rely upon a non-metallic elastomeric seal to contain refrigerant, press-connect technology for refrigerant piping applications would be considered as non-compliant with the requirements of the 2021 UMC.

As the UMC Technical Committee did not recognize the error in the Submitter’s substantiation, I am requesting the UMC Technical Committee to consider my substantiation for this proposal.

UL 207-2009, Refrigerant Containing Components and Accessories, Nonelectrical (with revisions through June 27, 2014), was incorrectly referenced for this section of the 2021 UMC. As there are no additional sections of the 2021 UMC that reference this standard, there is no reason to retain it in the code. Therefore, UL 207 should be deleted from Table 1701.1.

Proposals

Item #: 249

UMC 2024 Section: 1206.2, Table 1701.1

SUBMITTER: Lance MacNevin, P.Eng.
Chair, USHGC Technical Committee

RECOMMENDATION:
Revise text

1206.0 Pressure and Safety Devices.

1206.2 Discharge Piping. The discharge piping serving a temperature relief valve, pressure relief valve, or combination of both shall have no valves, obstructions, or means of isolation and be provided with the following:
(1) ~~Equal~~ Not less than to the size of the valve outlet and shall discharge full size to the flood level of the area receiving the discharge and pointing down.
(2) Materials shall be rated at not less than the operating temperature of the system and approved for such use or shall comply with ASME A112.4.1.
(3) Discharge pipe shall discharge independently by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) and not less than 6 inches (152 mm) above the ground and pointing downwards.
(4) Discharge in such a manner that does not cause personal injury or structural damage.
(5) No part of such discharge pipe shall be trapped or subject to freezing.
(6) The terminal end of the pipe shall not be threaded.
(7) Discharge from a relief valve into a water heater pan shall be prohibited.
(8) The discharge termination point shall be readily observable.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ASME A112.4.1-2009 (R2019)	Water Heater Relief Valve Drain Tubes	Discharge Piping	1206.2(2)

(portions of table not shown remain unchanged)

Note: ASME A112.4.1 meets the requirements for mandatory reference standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The revision to Section 1206.2 item (1) is needed as there are cases where PEX and PE-RT tubing require insert fittings to reduce inner diameters. Requiring the piping to be greater than the valve outlet prevents the PEX tubing inner diameter from being smaller than the valve outlet. ASME A112.4.1 is being included as it is applicable to discharge piping provisions and provides performance requirements and test methods applicable to water heater relief valve drain (or runoff) tubes for use with relief valves having a steam rating of 105,000 Btu/hr or less.

The addition of item (8) makes it clear that the termination point of the drainage line must be visible in order to detect leaks or failed valves. The change correlates with the actions taken by the UPC and USHGC Technical Committees. This is necessary to ensure correlation between the codes.

2021

UPC® TECHNICAL COMMITTEE MEETING MONOGRAPH

VIRTUAL MEETING | **MAY 3 – 7, 2021**

Proposals

Item #: 100

UPC 2024 Section: 206.0, Table 501.1(1)

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Revise text

TABLE 501.1(1)
WATER HEATERS

TYPE*	STANDARD
Electric, Household Storage	UL 174
Oil-Fired Storage Tank	UL 732
Gas-Fired, 75 000 Btu/h or less, Storage	CSA Z21.10.1
Gas, Above 75 000 Btu/h, Storage and Instantaneous	CSA Z21.10.3
Electric, Commercial Storage	UL 1453
Solid Fuel-Fired	UL 2523
Electric Instantaneous	UL 499

For SI units: 1000 British thermal units per hour = 0.293 kW
* Dual purpose water heaters shall be installed in accordance with this code and the manufacturer's installation instructions.

206.0 - D -

Water Heater, Dual Purpose. An appliance utilized as a heat source for both space heating and domestic hot water applications.

SUBSTANTIATION:
The code is currently silent on dual purpose type water heaters. There are types water heaters specially designed to supply both potable water fixtures and space heating systems. The addition of this language will serve as a safety measure to ensure such designs are not overlooked. Also, the addition of a definition will clarify the intent of the code.

Proposals

Item #: 101

UPC 2024 Section: Chapter 5

SUBMITTER: IAPMO Staff - Update Extracts
NFPA 54 Extract Update

RECOMMENDATION:
Revise text

CHAPTER 5
WATER HEATERS

~~**504.3.2 Unlisted Water Heaters.** Unlisted water heaters shall be installed with a clearance of 12 inches (305 mm) on all sides and rear. Combustible floors under unlisted water heaters shall be protected in an approved manner. [NFPA 54:10.27.2.2]~~

504.5 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, listed device installed in accordance with the terms of its listing and the manufacturer's installation instructions. {NFPA 54:10.26.5}
504.6 Temperature, Pressure, and Vacuum Relief Devices. Temperature, pressure, and vacuum relief devices or combinations thereof, and automatic gas shutoff devices shall be installed in accordance with the terms of their listings and the manufacturer's installation instructions. A shutoff valve shall not be placed between the relief valve and the water heater or on discharge pipes between such valves and the atmosphere. The hourly British thermal units (Btu) (kW•h) discharge capacity or the rated steam relief capacity of the device shall be not less than the input rating of the water heater. {NFPA 54:10.26.6}. Discharge piping shall be installed in accordance with Section 608.5.

506.1 General. Air for combustion, ventilation, and dilution of flue gases for appliances installed in buildings shall be obtained by application of one of the methods covered in Section 506.2 through Section 506.7.3. Where the requirements of Section 506.2 are not met, outdoor air shall be introduced in accordance with methods covered in Section 506.4 through Section 506.7.3.
Exception: This provision shall not apply to ~~direct-vent~~ direct vent appliances. ~~{~~{NFPA 54:9.3.1.1}~~}~~

506.2.2 Known Air Infiltration Rate Method. Where the air infiltration rate of a structure is known, the minimum required volume shall be determined as follows [NFPA 54:9.3.2.2]:
(1) For appliances other than fan-assisted, calculate using the following Equation 506.2.2(1). [NFPA 54:9.3.2.2(1)]

[Equation 506.2.2(1)]

$$\text{Required Volume}_{other} \geq \frac{21\ \text{ft}^3}{ACH}\left(\frac{I_{other}}{1000\ \text{Btu/h}}\right)$$

(2) For fan-assisted appliances, calculate using the following Equation 506.2.2(2). [NFPA 54:9.3.2.2(2)]

[Equation 506.2.2(2)]

$$\text{Required Volume}_{fan} \geq \frac{15\ \text{ft}^3}{ACH}\left(\frac{I_{fan}}{1000\ \text{Btu/h}}\right)$$

Where:
I_{other} = All appliances other than fan-assisted input in (Btu/h)
I_{fan} = Fan-assisted appliance input in (Btu/h)
ACH = Air change per hour (percent of volume of space exchanged per hour, expressed as a decimal)
For SI units: 1 cubic foot = 0.0283 m^3, 1000 British thermal units per hour = 0.293 kW

(3) For purposes of these calculations, an infiltration rate greater than 0.60 ACH shall not be used ~~in the equations in Section~~ Equation 506.2.2(1) and ~~Section~~ Equation 506.2.2(2). [NFPA 54:9.3.2.2(3)]

506.6 Engineered Installations. Engineered combustion air installations shall provide an adequate supply of combustion, ventilation, and dilution air ~~and shall be approved by the Authority Having Jurisdiction~~ determined using engineering methods. [NFPA 54:9.3.5]

507.7 Type~~s~~ of Gas(es). The appliance shall be connected to the fuel gas for which it was designed. No attempt shall be made to convert the appliance from the gas specified on the rating plate for use with a different gas without consulting the installation instructions, the serving gas supplier, or the appliance manufacturer for complete instructions. Listed appliances shall not be converted unless permitted by and in accordance with the manufacture's installation instructions. [NFPA 54:9.1.3]
507.8 Safety Shutoff Devices for Unlisted LP-Gas Appliance Used Indoors. Unlisted appliances for use with undiluted ~~liquefied petroleum gases~~ LP-Gases and installed indoors, except attended laboratory equipment, shall be equipped with safety shutoff devices of the complete shutoff type. [NFPA 54:9.1.4]

507.18 ~~Adequate Capacity of Piping~~ 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. ~~Where~~ If the capacity of the system is determined to be inadequate for the additional appliances, the existing system shall be enlarged as ~~necessary~~ required, or separate gas piping of adequate capacity shall be ~~run from the point of delivery to the appliance~~ provided. [NFPA 54:~~9.1.16~~ 5.1.2]
507.19 Avoiding Strain on Gas Piping. Appliances shall be supported and connected to the piping so as not to exert undue strain on the connections. [NFPA 54:~~9.1.17~~ 9.1.16]
507.20 Gas Appliance Pressure Regulators. Where the gas supply pressure is higher than that at which the appliance is designed to operate or varies beyond the design pressure limits of the appliance, a gas appliance pressure regulator listed in accordance with ANSI Z21.18/CSA 6.3 shall be installed. [NFPA 54:~~9.1.18~~ 9.1.17]
~~**507.21 Venting of Gas Appliance Pressure Regulators.** Venting of gas appliance pressure regulators shall comply with the following requirements:~~
~~(1) Appliance pressure regulators requiring access to the atmosphere for successful operation shall be equipped with vent piping leading outdoors or, if the regulator vent is an integral part of the appliance, into the combustion chamber adjacent to a continuous pilot, unless constructed or equipped with a vent limiting means to limit the escape of gas from the vent opening in the event of diaphragm failure.~~
~~(2) Vent limiting means shall be employed on listed appliance pressure regulators only.~~
~~(3) In the case of vents leading outdoors, means shall be employed to prevent water from entering this piping and also to prevent blockage of vents by insects and foreign matter.~~
~~(4) Under no circumstances shall a regulator be vented to the appliance flue or exhaust system.~~
~~(5) In the case of vents entering the combustion chamber, the vent shall be located so the escaping gas is readily ignited by the pilot and the heat liberated thereby does not adversely affect the normal operation of the safety shutoff system. The terminus of the vent shall be securely held in a fixed position relative to the pilot. For manufactured gas, the need for a flame arrester in the vent piping shall be determined.~~
~~(6) A vent line(s) from an appliance pressure regulator and a bleed line(s) from a diaphragm-type valve shall not be connected to a common manifold terminating in a combustion chamber. Vent lines shall not terminate in positive-pressure-type combustion chambers. [NFPA 54:9.1.19]~~

(renumber remaining sections)

507.22 Bleed Lines for Diaphragm-Type Valves. Bleed lines shall comply with the following requirements:
(1) Diaphragm-type valves shall be equipped to convey bleed gas to the outdoors or into the combustion chamber adjacent to a continuous pilot.
(2) In the case of bleed lines leading outdoors, means shall be employed to prevent water from entering this piping and also to prevent blockage of vents by insects and foreign matter.
(3) Bleed lines shall not terminate in the appliance flue or exhaust system.
(4) In the case of bleed lines entering the combustion chamber, the bleed line shall be located so the bleed gas is readily ignited by the pilot and the heat liberated thereby does not adversely affect the normal operation of the safety shutoff system. The terminus of the bleed line shall be securely held in a fixed position relative to the pilot. For manufactured gas, the need for a flame arrester in the bleed line piping shall be determined.

(5) A bleed line(s) from a diaphragm-type valve and a vent line(s) from an appliance pressure regulator shall not be connected to a common manifold terminating in a combustion chamber. Bleed lines shall not terminate in positive-pressure-type combustion chambers. [NFPA 54:~~9.1.20~~ 9.1.18]

507.23 Combination of Appliances and Equipment. Any combination of appliances, equipment, attachments, or devices used together in any manner shall comply with the standards that apply to the individual appliance and equipment. [NFPA 54:~~9.1.21~~ 9.1.19]

507.24 Installation Instructions. The ~~installing agency~~ installer shall conform to the appliance and equipment manufacturer~~'s~~'s' recommendations in completing an installation. The ~~installing agency~~ installer shall leave the manufacturer~~'s~~'s' installation, operating, and maintenance instructions ~~in a location~~ on the premises ~~where they are readily available for reference and guidance of the Authority Having Jurisdiction, service personnel, and the owner or operator~~. [NFPA 54:~~9.1.22~~ 9.1.20]

507.25 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 ~~provisions of its listing and~~ the manufacturer's installation instructions. [NFPA 54:9.1.21]

508.2.2 Electrical Power. ~~All a~~Appliances requiring an external source of electrical power ~~for its operation~~ shall be installed in accordance with NFPA 70. ~~provided with the following:~~

~~(1) A readily accessible electrical disconnecting means within sight of the appliance that completely de-energizes the appliance.~~

~~(2) A 120 V ac grounding-type receptacle outlet on the roof adjacent to the appliance on the supply side of the disconnect switch.~~ [NFPA 54:9.4.2.3]

508.4 Appliances in Attics and Under-Floor Spaces. An attic ~~or under-floor space~~ in which an appliance is installed shall be accessible through an opening and passageway~~, not less than~~ at least as large as the largest component of the appliance, and not less than 22 inches by 30 inches (559 mm by 762 mm). [NFPA 54:9.5.1]

508.4.4 Lighting and Convenience Outlet. A permanent 120 V receptacle outlet and a ~~lighting fixture~~ luminaire shall be installed near the appliance. The switch controlling the ~~lighting fixture~~ luminaire shall be located at the entrance to the passageway. [NFPA 54:9.5.3]

509.1.1 Installation. Listed chimneys and vents shall be installed in accordance with Section 509.0 and the manufacturer~~'s~~'s' installation instructions. [NFPA 54:12.2.1]

509.2.6 Direct-Vent Appliances. Listed ~~direct-vent~~ direct vent appliances shall be installed in accordance with the manufacturer's installation ~~instructions and Section 509.8.2~~. [NFPA 54:~~12.3.5~~ 12.3.5.1]

509.2.6.1 Through-the-Wall Vent Termination. Through-the-wall vent terminations for listed direct-vent appliances shall be in accordance with Section 509.8.1. [NFPA 54:12.3.5.2]

509.2.7 Appliances with Integral Vents. Appliances incorporating integral venting means shall be installed in accordance with ~~the manufacturer's installation instructions,~~ Section 509.8 ~~and Section 509.8.1~~. [NFPA 54:12.3.6]

~~**509.3.3.5 Exit Terminals.** The exit terminals of mechanical draft systems shall be not less than 7 feet (2134 mm) above finished ground level where located adjacent to public walkways and shall be located as specified in Section 509.8 and Section 509.8.1 of this code. [NFPA 54:12.4.3.6]~~

509.3.4 Ventilating Hoods and Exhaust Systems. Where automatically operated appliances, other than ~~commercial cooking~~ food service appliances, are vented through a ventilating hood or exhaust system equipped with a damper or with a power means of exhaust, provisions shall be made to allow the flow of gas to the main burners only when the damper is open to a position to properly vent the appliance and when the power means of exhaust is in operation. [NFPA 54:12.4.4.1]

509.5.1 Factory-Built Chimneys. Factory-built chimneys shall be listed in accordance with UL 103, UL 959, or UL 2561. ~~Factory-built chimneys shall be installed in accordance with the manufacturer's installation instructions.~~ Factory-built chimneys used to vent appliances that operate at positive vent pressure shall be listed for such application. [NFPA 54:12.6.1.1]

509.5.5 Size of Chimneys. The effective area of a chimney venting system serving listed appliances with draft hoods, Category I appliances, and other appliances listed for use with Type B vents shall be in accordance with one of the following methods:

(1) Those listed in Section 510.0.

(2) ~~For sizing an individual chimney venting system for a single appliance with a draft hood, t~~The effective areas of the

vent connector and chimney flue of a venting system serving a single appliance with a draft hood shall be not less than the area of the appliance flue collar or draft hood outlet or greater than seven times the draft hood outlet area.
(3) ~~For sizing~~ The effective area of the chimney flue of a ~~chimney~~ venting system ~~connected to~~ serving two appliances with draft hoods~~, the effective area of the chimney flue~~ shall be not less than the area of the larger draft hood outlet plus 50 percent of the area of the smaller draft hood outlet or greater than seven times the smaller draft hood outlet area.
(4) Chimney venting systems using mechanical draft shall be sized in accordance with ~~approved~~ engineering methods.
(5) Other ~~approved~~ engineering methods. [NFPA 54:12.6.3.1]

509.5.6.1 Standard. Chimneys shall be lined in accordance with NFPA 211.
~~**Exception:** Existing chimneys shall be permitted to have their use continued when an appliance is replaced by an appliance of similar type, input rating, and efficiency, where the chimney complies with Section 509.5.6 through Section 509.5.6.3 and the sizing of the chimney is in accordance with Section 509.5.5.~~ [NFPA 54:12.6.4.2]
509.5.6.2 Cleanouts. Cleanouts shall be examined and where they do not remain tightly closed when not in use, they shall be repaired or replaced. [NFPA 54:12.6.4.3]

509.6.2.1 Category I Appliances. The sizing of natural draft venting systems serving one or more listed appliances equipped with a draft hood or appliances listed for use with a Type B gas vent, installed in a single story of a building, shall be in accordance with one of the following:
(1) The provisions of Section 510.0.
(2) Vents serving fan-assisted combustion system appliances, or combinations of fan-assisted combustion system and draft hood-equipped appliances, shall be sized in accordance with Section 510.0 or other ~~approved~~ engineering methods.
(3) For sizing an individual gas vent for a single, draft hood-equipped appliance, the effective area of the vent connector and the gas vent shall be not less than the area of the appliance draft hood outlet or greater than seven times the draft hood outlet area.
(4) For sizing a gas vent connected to two appliances with draft hoods, the effective area of the vent shall be not less than the area of the larger draft hood outlet plus 50 percent of the area of the smaller draft hood outlet or greater than seven times the smaller draft hood outlet area.
(5) ~~Other approved engineering practices~~ Engineering methods. [NFPA 54:12.7.4.1]

509.6.2.3 Category II, Category III, and Category IV Appliances. The sizing of gas vents for Category II, Category III, and Category IV appliances shall be in accordance with the appliance manufacturer~~'s~~' instructions. The sizing of plastic pipe specified by the appliance manufacturer as a venting material for Category II, III, and IV appliances shall be in accordance with the appliance manufacturers' instructions. [NFPA 54:12.7.4.3]
509.6.2.4 Sizing. Chimney venting systems using mechanical draft shall be sized in accordance with ~~approved~~ engineering methods. [NFPA 54:12.7.4.4]

509.6.3 Gas Vents Serving Appliances on More than One Floor. ~~A~~ Where a common vent ~~shall be permitted~~ is installed in a multistory installation~~s~~ to vent Category I appliances located on more than one floor level, ~~provided~~ the venting system ~~is~~ shall be designed and installed in accordance with ~~approved~~ engineering methods. ~~For the purpose of this section, c~~Crawl spaces, basements, and attics shall be considered as floor levels. [NFPA 54:12.7.5.1]

509.7.4 Size of Single-Wall Metal Pipe. Single-wall metal piping shall comply with the following requirements:
(1) A venting system of a single-wall metal pipe shall be sized in accordance with one of the following methods and the appliance manufacturer's instructions:
(a) For a draft hood-equipped appliance, in accordance with Section 510.0.
(b) For a venting system for a single appliance with a draft hood, the areas of the connector and the pipe each shall not be less than the area of the appliance flue collar or draft hood outlet, whichever is smaller. The vent area shall not be greater than seven times the draft hood outlet area.
(c) ~~Other approved e~~Engineering methods.
(2) Where a single-wall metal pipe is used and has a shape other than round, it shall have an equivalent effective area equal to the effective area of the round pipe for which it is substituted and the minimum internal dimension of the pipe shall be 2 inches (50 mm).
(3) The vent cap or a roof assembly shall have a venting capacity not less than that of the pipe to which it is attached. [NFPA 54:12.8.5]

509.8 Through-the-Wall Vent Termination. Through-the-wall vent termination shall be in accordance with Section 509.8.1 through Section 509.8.3.
~~A mechanical draft venting system shall terminate at least 3 feet (914 mm) above any forced air inlet located within 10 feet (3048 mm) (See Figure 509.8).~~
~~**Exceptions:**~~
~~(1) This provision shall not apply to the combustion air intake of a direct-vent appliance.~~
~~(2) This provision shall not apply to the separation of the integral outdoor air inlet and flue gas discharge of listed~~

~~outdoor appliances. [NFPA 54:12.9.1]~~
~~**509.8.1 Mechanical Draft Venting System.** A mechanical draft venting system of other than direct-vent type shall terminate at least 4 feet (1219 mm) below, 4 feet (1219 mm) horizontally from, or 1 foot (305 mm) above any door, operable window, or gravity air inlet into any building. The bottom of the vent terminal shall be located at least 12 inches (305 mm) above finished ground level. [NFPA 54:12.9.2]~~
~~**509.8.2 Direct-Vent Appliance.**~~
509.8.1 Clearance for Through-the-Wall Vent Termination. The clearance~~s~~ for through-the-wall direct~~-vent~~ and non-direct vent terminals shall be in accordance with Table ~~509.8.2~~ 509.8.1 and Figure 509.8.1. ~~The bottom of the vent terminal and the air intake shall be located not less than 12 inches (305 mm) above finished ground level.~~
Exception: The clearances in Table 509.8.1 shall not apply to the combustion air intake of a direct vent appliance. [NFPA 54:~~12.9.3~~12.9.1]
~~**509.8.3 Category I through Category IV and Noncategorized Appliances.** Through-the-wall vents for Category II and Category IV appliances and noncategorized condensing appliances shall not terminate over public walkways or over an area where condensate or vapor could create a nuisance or hazard or could be detrimental to the operation of regulators, relief valves, or other equipment. Where local experience indicates that condensate is a problem with Category I and Category III appliances, this provision shall also apply.~~
~~Drains for condensate shall be installed in accordance with the appliance and the vent manufacturer's installation instructions. [NFPA 54:12.9.4]~~

~~**509.8.4**~~ **509.8.2 Annular Spaces.** Where vents, including those for direct-vent appliances or combustion air intake pipes, penetrate outside walls of buildings, the annular spaces around such penetrations shall be permanently sealed using approved materials to prevent entry of combustion products into the building. [NFPA 54:~~12.9.5~~ 12.9.2]
~~**509.8.5**~~ **509.8.3 Vent Terminals.** Vent systems for Category IV appliances that terminate through an outside wall of a building and discharge flue gases perpendicular to the adjacent wall shall be located not less than 10 feet (3048 mm) horizontally from an operable opening in an adjacent building.
Exception: This shall not apply to vent terminals that are 2 feet (610 mm) or more above or 25 feet (7620 mm) or more below operable openings. [NFPA 54:~~12.9.6~~ 12.9.3]

509.9 Condensation Drain. Provision shall be made to collect and dispose of condensate from venting systems serving Category II and Category IV appliances and noncategorized condensing appliances ~~in accordance with Section 509.8.3~~. [NFPA 54:12.10.1]
509.9.1 Installation ~~**Local Experience.** Where local experience indicates that condensation is a problem, provision shall be made to drain off and dispose of condensate from venting systems serving Category I and Category III appliances in accordance with Section 509.8.3.~~ Drains for condensate shall be installed in accordance with the appliance and vent manufacturers' installation instructions. [NFPA 54:12.10.2]

509.10.1.4 Medium-Heat Appliances. Vent connectors for medium-heat appliances shall be constructed of factory-built, medium-heat chimney sections or steel of a thickness not less than that specified in Table 509.10.1.4 and shall comply with the following:
(1) A steel vent connector for an appliance with a vent gas temperature in excess of 1000°F (538°C) measured at the entrance to the connector shall be lined with medium-duty fire brick or the equivalent.
(2) The lining shall be at least $2^1/2$ inches (64 mm) thick for a vent connector having a diameter or greatest cross-sectional dimension of 18 inches (457 mm) or less.
(3) The lining shall be at least $4^1/2$ inches (114 mm) thick laid on the $4^1/2$ inches (114 mm) bed for a vent connector having a diameter or greatest cross-sectional dimension greater than 18 inches (457 mm).
(4) Where f~~F~~actory-built chimney sections~~, if employed,~~ are installed, they shall be joined together in accordance with the chimney manufacturer's instructions. [NFPA 54:12.11.2.5]

509.10.2 Size of Vent Connector. A vent connector for an appliance with a single draft hood or for a Category I fan-assisted combustion system appliance shall be sized and installed in accordance with Section 510.0 or ~~other approved~~ engineering methods. [NFPA 54:12.11.3.1]
509.10.2.1 Manifold. ~~For~~ Where a single appliance having more than one draft hood outlet or flue collar is installed, the manifold shall be constructed according to the instructions of the appliance manufacturer. Where there are no instructions, the manifold shall be designed and constructed in accordance with ~~approved~~ engineering ~~practices~~ methods. As an alternative method, the effective area of the manifold shall equal the combined area of the flue collars or draft hood outlets, and the vent connectors shall have a minimum 1 foot (305 mm) rise. [NFPA 54:12.11.3.2]
509.10.2.2 Size. Where two or more appliances are connected to a common vent or chimney, each vent connector shall be sized in accordance with Section 510.0 or ~~other approved~~ engineering methods. [NFPA 54:12.11.3.3]
As an alternative method applicable only where all of the appliances are draft hood-equipped, each vent connector shall have an effective area not less than the area of the draft hood outlet of the appliance to which it is connected. [NFPA 54:12.11.3.4]
509.10.2.3 Height. Where two or more appliances are vented through a common vent connector or vent manifold, the

common vent connector or vent manifold shall be located at the highest level consistent with available headroom and clearance to combustible material and sized in accordance with Section 510.0 or ~~other approved~~ engineering methods. [NFPA 54:12.11.3.5]
As an alternative method applicable only where there are two draft hood-equipped appliances, the effective area of the common vent connector or vent manifold and all junction fittings shall be not less than the area of the larger vent connector plus 50 percent of the area of the smaller flue collar outlet. [NFPA 54:12.11.3.6]

12.11.7 Connector Junctions. Where vent connectors are joined together, the connection shall be made with a manufactured tee or wye fitting. [NFPA 54:12.11.7]

(renumber remaining section)

509.10.6 Slope. A vent connector shall be installed without any dips or sags and shall slope upward toward the vent or chimney at least $^{1}/4$ inch per foot (20.8 mm/m).
Exception: Vent connectors attached to a mechanical draft system installed in accordance with appliance and the draft system manufacturer~~'~~s' instructions. [NFPA 54:~~12.11.7~~ 12.11.8]

509.10.7.1 Single Wall Connector. The maximum horizontal length of a single-wall connector shall be 75 percent of the height of the chimney or vent, except for engineered systems. [NFPA 54:~~12.11.8.1~~ 12.11.9.1]
509.10.7.2 Type B Double Wall Connector. The maximum horizontal length of a Type B double-wall connector shall be 100 percent of the height of the chimney or vent, except for engineered systems. The maximum length of an individual connector for a chimney or vent system serving multiple appliances, from the appliance outlet to the junction with the common vent or another connector, shall be 100 percent of the height of the chimney or vent. [NFPA 54:~~12.11.8.2~~ 12.11.9.2]
509.10.8 Support. A vent connector shall be supported for the design and weight of the material employed to maintain clearances and prevent physical damage and separation of joints. [NFPA 54:~~12.11.9~~ 12.11.10]
509.10.9 Chimney Connection. Where entering a flue in a masonry or metal chimney, the vent connector shall be installed above the extreme bottom to avoid stoppage. [NFPA 54:12.11.11.1] Where a thimble or slip joint is used to facilitate removal of the connector, the connector shall be firmly attached to or inserted into the thimble or slip joint to prevent the connector from falling out. [NFPA 54:12.11.11.2] Means shall be employed to prevent the connector from entering so far as to restrict the space between its end and the opposite wall of the chimney flue. [NFPA 54:~~12.11.10~~12.11.11.3]
509.10.10 Inspection. The entire length of a vent connector shall be readily accessible for inspection, cleaning, and replacement. [NFPA 54:~~12.11.11~~ 12.11.12]
509.10.11 Fireplaces. A vent connector shall not be connected to a chimney flue serving a fireplace unless the fireplace flue opening is permanently sealed. [NFPA 54:~~12.11.12~~ 12.11.13]

509.10.12.1 Medium-Heat Appliances. Vent connectors for medium-heat appliances shall not pass through walls or partitions constructed of combustible material. [NFPA 54:~~12.11.13.2~~ 12.11.14.2]

509.12 Appliances Requiring Draft Hoods ~~and Draft Controls~~. Vented appliances shall be installed with draft hoods.
Exception: Dual oven-type combination ranges; ~~incinerators; direct vent~~ direct vent appliances; fan-assisted combustion system appliances; appliances requiring chimney draft for operation; single-firebox boilers equipped with conversion burners with inputs ~~exceeding~~ greater than 400 000 Btu/h (117 kW); appliances equipped with blast, power, or pressure burners that are not listed for use with draft hoods; and appliances designed for forced venting. [NFPA 54:12.13.1]
509.12.1 Installation. A draft hood supplied with or forming a part of a listed vented appliance shall be installed without alteration, exactly as furnished and specified by the appliance manufacturer. [NFPA 54:12.13.2]
If a draft hood is not supplied by the appliance manufacturer where one is required, a draft hood shall be installed, be of a listed or approved type, and, in the absence of other instructions, be of the same size as the appliance flue collar. Where a draft hood is required with a conversion burner, it shall be of a listed or approved type. [NFPA 54:12.13.2.1]
~~Where a draft hood of special design is needed or preferable, the installation shall be approved and in accordance with the recommendations of the appliance manufacturer. [NFPA 54:12.13.2.2]~~

509.13 Manually Operated Dampers. A manually operated damper shall not be placed in any appliance vent connector. Fixed baffles and balancing baffles shall not be classified as manually operated dampers. [NFPA 54:12.14.1] Balancing baffles shall be mechanically locked in the desired position before placing the appliance in service. [NFPA 54:12.14.2] Balancing baffles shall be listed in accordance with UL 378. [NFPA 54:12.14.3]
509.14 Automatically Operated Vent Dampers. An automatically operated vent damper shall be ~~of a~~ listed ~~type.~~ [NFPA 54:12.15]
509.15 Obstructions. Devices that retard the flow of vent gases shall not be installed in a vent connector, chimney, or vent. The following shall not be considered as obstructions:
(1) Draft regulators and safety controls specifically listed for installation in venting systems and installed in

accordance with the manufacturer's installation instructions.
(2) Approved draft regulators and safety controls designed and installed in accordance with ~~approved~~ engineering methods.
(3) Listed heat reclaimers and automatically operated vent dampers installed in accordance with the manufacturer~~'~~s' installation instructions.
(4) Vent dampers serving listed appliances installed in accordance with Section 510.1 or Section 510.2 or ~~other approved~~ engineering methods.
(5) Approved economizers, heat reclaimers, and recuperators installed in venting systems of appliances not required to be equipped with draft hoods, provided the appliance manufacturer's instructions cover the installation of such a device in the venting system and performance in accordance with Section 509.3 and Section 509.3.1 is obtained. [NFPA 54:12.16]

510.1.6 Corrugated Chimney Liner~~s Reduction~~. Listed corrugated metallic chimney liner systems in masonry chimneys shall be sized by using Table 510.1.2(1) or Table 510.1.2(2) for Type B vents with the maximum capacity reduced by 20 percent (0.80 x maximum capacity) and the minimum capacity as shown in Table 510.1.2(1) or Table 510.1.2(2).
Corrugated metallic liner systems installed with bends or offsets shall have their maximum capacity further reduced in accordance with Section 510.1.2. The 20 percent reduction for corrugated metallic chimney liner systems includes an allowance for one long radius 90 degree (1.57 rad) turn at the bottom of the liner. [NFPA 54:13.1.7]

510.1.8 Vertical Vent Upsizing Using ~~the~~ 7 ~~x~~ Times Rule. Where the vertical vent has a larger diameter than the vent connector, the vertical vent diameter shall be used to determine the minimum vent capacity, and the connector diameter shall be used to determine the maximum vent capacity. The flow area of the vertical vent shall not exceed seven times the flow area of the listed appliance categorized vent area, flue collar area, or draft hood outlet area unless designed in accordance with ~~approved~~ engineering methods. [NFPA 54:13.1.9]

510.1.13 ~~Single Run of Vent~~ Multiple Vertical Vent Sizes. In a single run of vent or vent connector, more than one diameter and type shall be permitted to be used, provided that all the sizes and types are permitted by the tables. [NFPA 54:13.1.14]

510.1.16 ~~Engineering Methods~~ Sizing Vents Not Covered by Tables. ~~For~~ Where a vent height~~s~~ is lower than 6 feet (1829 mm) ~~and~~ or higher than shown in Table 510.1.2(1) through Table 510.2(9), an engineering method~~s~~ shall be used to calculate the vent capacity ~~capacities~~. [NFPA 54:13.1.17]

510.2 ~~Multiple Appliance Vent Table 510.2(1) through Table 510.2(9)~~ Obstructions and Vent Dampers. (remaining text unchanged) [NFPA 54:13.2.1]

510.2.12 Vent Height. ~~For~~ The available total height (*H*) for multiple appliances ~~all located~~ on ~~one~~ the same floor~~, available total height (*H*)~~ shall be measured from the highest draft hood outlet or flue collar up to the level of the outlet of the common vent. [NFPA 54:13.2.13]
510.2.13 Multistory ~~Installations~~ Vent Height. ~~For multistory installations,~~ Where appliances are located on more than one floor, the available total height (*H*) for each segment of the system shall be the vertical distance between the highest draft hood outlet or flue collar entering that segment and the centerline of the next higher interconnection tee. [NFPA 54:13.2.14]

510.2.15 ~~Vent Type~~ Multistory Type B Vents Required ~~Installations~~. (remaining text unchanged) [NFPA 54:13.2.16]
510.2.16 ~~Offsets in~~ Multistory Vent Offsets and Capacity ~~Installations~~. (remaining text unchanged) [NFPA 54:13.2.17]
510.2.17 Vertical Vent Size Limitation. Where two or more appliances are connected to a vertical vent or chimney, the flow area of the largest section of vertical vent or chimney shall not exceed seven times the smallest listed appliance categorized vent areas, flue collar area, or draft hood outlet area unless designed in accordance with ~~approved~~ engineering methods. [NFPA 54:13.2.18]
510.2.18 Multiple Input Ratings. ~~For appliances with more than one input rate, t~~The minimum vent connector capacity (FAN Min) of appliances with more than one input rate shall be determined from the tables and shall be less than the lowest appliance input rating~~., and t~~The maximum vent connector capacity (FAN Max or NAT Max) shall be determined from the tables and shall be greater than the highest appliance input rating. [NFPA 54:13.2.19]

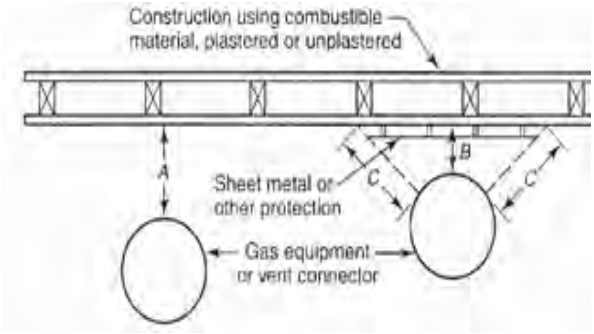
TABLE 509.4
TYPE OF VENTING SYSTEM TO BE USED
[{NFPA 54: TABLE 12.5.1}]

APPLIANCES	TYPE OF VENTING SYSTEM	LOCATION OF REQUIREMENTS
Listed Category I appliances Listed appliances equipped with draft hood Appliances listed for use with Type B gas vent	Type B gas vent	Section 509.6
	Chimney	Section 509.5
	Single-wall metal pipe	Section 509.7
	Listed chimney lining system for gas venting	Section 509.5.3
	Special gas vent listed for these appliances	Section 509.4.3
Listed vented wall furnaces	Type B-W gas vent	Section 509.6
Category II, Category III, and Category IV appliances	As specified or furnished by manufacturers of listed appliances	Section 509.4.1 and Section 509.4.3
Appliances that can be converted to use solid fuel Unlisted combination gas- and oil-burning appliances Combination gas- and solid fuel-burning appliances Appliances listed for use with chimneys only Unlisted appliances	Chimney	Section 509.5
Listed combination gas- and oil-burning appliances	Type L vent	Section 509.6
	Chimney	Section 509.5
Decorative appliance in vented fireplace	Chimney	UMC Section 911.2
Gas-fired toilets	Single-wall metal pipe	Section 509.7
Direct-vent appliances	—	Section 509.2.6
Appliances with integral vents	—	Section 509.2.7

TABLE 509.7.3.4(1)
CLEARANCES FOR CONNECTORS
{{NFPA 54: TABLE 12.8.4.4}}*

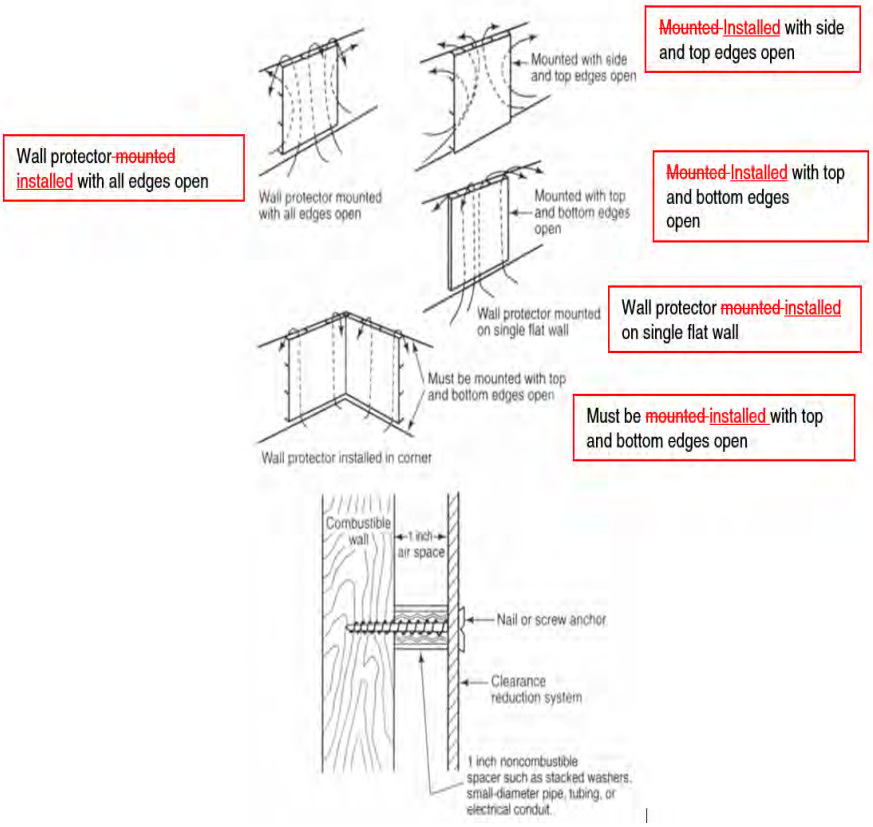
MINIMUM DISTANCE FROM COMBUSTIBLE MATERIAL (inches)				
APPLIANCE	**LISTED TYPE B GAS VENT MATERIAL**	**LISTED TYPE L VENT MATERIAL**	**SINGLE-WALL METAL PIPE**	**FACTORY-BUILT CHIMNEY SECTIONS**
Listed appliances with draft hoods and appliances listed for use with Type B gas vents	As listed	As listed	6	As listed
Residential boilers and furnaces with listed gas conversion burner and with draft hood	6	6	9	As listed
Residential appliances listed for use with Type L vents	Not permitted	As listed	9	As listed
Unlisted residential appliances with draft hood	Not permitted	6	9	As listed
Residential and low-heat appliances other than those above	Not permitted	9	18	As listed
Medium-heat appliances	Not permitted	Not permitted	36	As listed

For SI units: 1 inch = 25.4 mm
* These clearances shall apply unless the installation instructions of a listed appliance or connector specify different clearances, in which case the listed clearances shall apply.



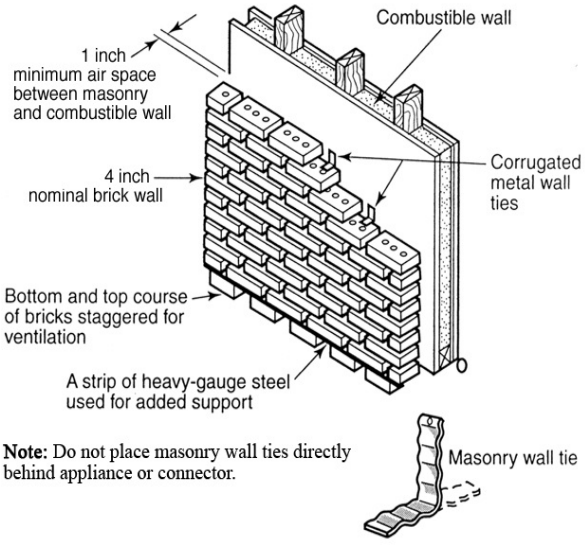
Notes:
[1] A – Equals the clearance with no protection specified in Table 509.7.3.4(1) and Table 509.7.3.4(2) and in the sections applying to various types of equipment.
[2] B – Equals the reduced clearance permitted in accordance with Table 509.7.3.4(2).
[3] The protection applied to the construction using combustible material shall extend far enough in each direction to make C equal to A.

FIGURE 509.7.3.4(1)[1, 2, 3]
EXTENT OF PROTECTION NECESSARY TO REDUCE CLEARANCES FROM GAS APPLIANCE OR VENT CONNECTORS
[NFPA 54: FIGURE ~~10.3.2.3(a)~~ 10.3.3.3(a)]



For SI units: 1 inch = 25.4 mm
Note: Masonry walls shall be attached to combustible walls using wall ties. Spacers shall not be used directly behind appliance or connector.

FIGURE 509.7.3.4(2)
WALL PROTECTOR CLEARANCE REDUCTION SYSTEM
[NFPA 54: FIGURE ~~10.3.2.3(b)~~ 10.3.3.3(b)]



For SI units: 1 inch = 25.4 mm

FIGURE 509.7.3.4(3)
MASONRY CLEARANCE REDUCTION SYSTEM
[NFPA 54: FIGURE ~~10.3.2.3(c)~~ 10.3.3.3(c)]

TABLE 509.7.3.4(2)
REDUCTION OF CLEARANCES WITH SPECIFIED FORMS OF PROTECTION[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11]
[NFPA 54: TABLE ~~10.2.3~~10.2.4]

TYPE OF PROTECTION APPLIED TO AND COVERING ALL SURFACES OF COMBUSTIBLE MATERIAL WITHIN THE DISTANCE SPECIFIED AS THE REQUIRED CLEARANCE WITH NO PROTECTION [SEE FIGURE 509.7.3.4(1) THROUGH FIGURE 509.7.3.4(3)]	WHERE THE REQUIRED CLEARANCE WITH NO PROTECTION FROM APPLIANCE, VENT CONNECTOR, OR SINGLE-WALL METAL PIPE IS:									
	36 (inches)		18 (inches)		12 (inches)		9 (inches)		6 (inches)	
	ALLOWABLE CLEARANCES WITH SPECIFIED PROTECTION (inches)									
	USE COLUMN 1 FOR CLEARANCES ABOVE APPLIANCE OR HORIZONTAL CONNECTOR. USE COLUMN 2 FOR CLEARANCES FROM APPLIANCES, VERTICAL CONNECTOR, AND SINGLE-WALL METAL PIPE.									
	ABOVE COLUMN 1	SIDES AND REAR COLUMN 2	ABOVE COLUMN 1	SIDES AND REAR COLUMN 2	ABOVE COLUMN 1	SIDES AND REAR COLUMN 2	ABOVE COLUMN 1	SIDES AND REAR COLUMN 2	ABOVE COLUMN 1	SIDES AND REAR COLUMN 2
(1) 3 1/2 inch thick masonry wall without ventilated air space	—	24	—	12	—	9	—	6	—	5
(2) 1/2 of an inch insulation board over 1 inch glass fiber or mineral wool batts	24	18	12	9	9	6	6	5	4	3
(3) 0.024 inch (nominal 24 gauge) sheet metal over 1 inch glass fiber or mineral wool batts reinforced with wire on rear face with ventilated air space	18	12	9	6	6	4	5	3	3	3
(4) 3 1/2 inch thick masonry wall with ventilated air space	—	12	—	6	—	6	—	6	—	6
(5) 0.024 inch (nominal 24 gauge) sheet metal with ventilated air space	18	12	9	6	6	4	5	3	3	2
(6) 1/2 of an inch thick insulation board with ventilated air space	18	12	9	6	6	4	5	3	3	3
(7) 0.024 inch (nominal 24 gauge) sheet metal with ventilated air space over 0.024 inch (nominal 24 gauge) sheet metal with ventilated air space	18	12	9	6	6	4	5	3	3	3
(8) 1 inch glass fiber or mineral wool batts sandwiched between two sheets 0.024 inch (nominal 24 gauge) sheet metal with ventilated air space	18	12	9	6	6	4	5	3	3	3

For SI units: 1 inch = 25.4 mm~~, °C = (°F-32)/1.8~~

Notes:

1 Reduction of clearances from combustible materials shall not interfere with combustion air, draft hood clearance and relief, and accessibility of servicing.

2 All clearances shall be measured from the outer surface of the combustible material to the nearest point on the surface of the appliance, disregarding any intervening protection applied to the combustible material.

3 Spacers and ties shall be of noncombustible material. No spacer or tie shall be used directly opposite the

appliance or connector.

4 Where all clearance reduction systems use a ventilated air space, adequate provision for air circulation shall be provided as described. [See Figure 509.7.3.4(2) and Figure 509.7.3.4(3)]

5 At least 1 inch (25.4 mm) shall be between clearance reduction systems and combustible walls and ceilings for reduction systems using a ventilated air space.

6 Where a wall protector is ~~mounted~~ installed on a single flat wall away from corners, it shall have a minimum 1 inch (25.4 mm) air gap. To provide adequate air circulation, the bottom and top edges, or only the side and top edges, or all edges shall be left open.

7 Mineral wool batts (blanket or board) shall have a minimum density of 8 pounds per cubic foot (lb/ft^3) (128 kg/m^3) and a minimum melting point of 1500°F (816°C).

8 Insulation material used as part of a clearance reduction system shall have a thermal conductivity of 1.0 British thermal unit inch per hour square foot degree Fahrenheit [Btu•in/(h•ft^2•°F)] [0.1 W/(m•K)] or less.

9 At least 1 inch (25.4 mm) shall be between the appliance and the protector. ~~In no case shall t~~The clearance between the appliance and the combustible surface shall not be reduced below that allowed in this table.

10 All clearances and thicknesses are minimum; larger clearances and thicknesses are acceptable.

11 Listed single-wall connectors shall be installed in accordance with the terms of their listing and the manufacturer's installation instructions.

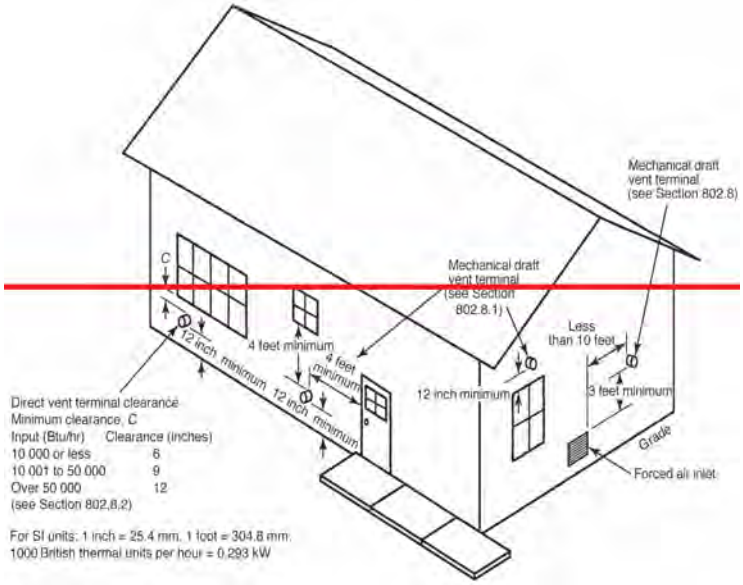
TABLE ~~509.8.2~~ 509.8.1
THROUGH-THE-WALL DIRECT-VENT TERMINATION CLEARANCES
[NFPA 54: TABLE ~~12.9.3~~ 12.9.1]

~~DIRECT-VENT APPLIANCE INPUT RATING~~	~~THROUGH-THE-WALL VENT TERMINAL CLEARANCE FROM ANY AIR OPENING INTO A BUILDING (inches)~~
~~10 000 Btu/h and less~~	~~6~~
~~Greater than 10 000 Btu/h and not exceeding 50 000 Btu/h~~	~~9~~
~~Greater than 50 000 Btu/h and not exceeding 150 000 Btu/h~~	~~12~~
~~> 150 000 Btu/h~~	~~In accordance with the appliance manufacturer's instructions and in no case less than the clearances specified in Section 509.8.1.~~

FIGURE CLEARANCE	CLEARANCE LOCATION	MINIMUM CLEARANCES FOR DIRECT VENT TERMINALS	MINIMUM CLEARANCES FOR NON-DIRECT VENT TERMINALS
A	Clearance above finished grade level, veranda, porch, deck, or balcony	12 inches	12 inch
B	Clearance to window or door that is openable	6 inches for appliances </= 10 000 Btu/hr 9 inches for appliances > 10 000 Btu/hr </= 50 000 Btu/hr 12 inches for appliances > 50 000 Btu/hr </= 150 000 Btu/hr Appliances > 150 000 Btu/hr, in accordance with the appliance manufacturer's instructions and not less than the clearances specified for non-direct vent terminals in row B	4 feet below or to side of opening or 1 foot above opening
C	Clearance to non-openable window	None unless otherwise specified by the appliance manufacturer	
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (610 mm) from the center line of the terminal	None unless otherwise specified by the appliance manufacturer	

E	Clearance to unventilated soffit	None unless otherwise specified by the appliance manufacture
F	Clearance to outside corner of building	None unless otherwise specified by the appliance manufacture
G	Clearance to inside comer of building	None unless otherwise specified by the appliance manufacture
H	Clearance to non-mechanical air supply inlet to building and the combustion air inlet to any other appliance	Same clearance as specified for row B
I	Clearance to a mechanical air supply inlet	10 feet horizontally from inlet or 3 feet above inlet
J	Clearance above paved sidewalk or paved driveway located on public property or other areas where condensate or vapor can cause a nuisance or hazard	7 feet and not located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard
K	Clearance to underside of veranda, porch, deck, or balcony	12 inches where the area beneath the veranda, porch, deck, or balcony is open on not less than two sides. The vent terminal is prohibited in this location where only one side is open.

For SI Units: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1000 British thermal units per hour = 0.293 kW



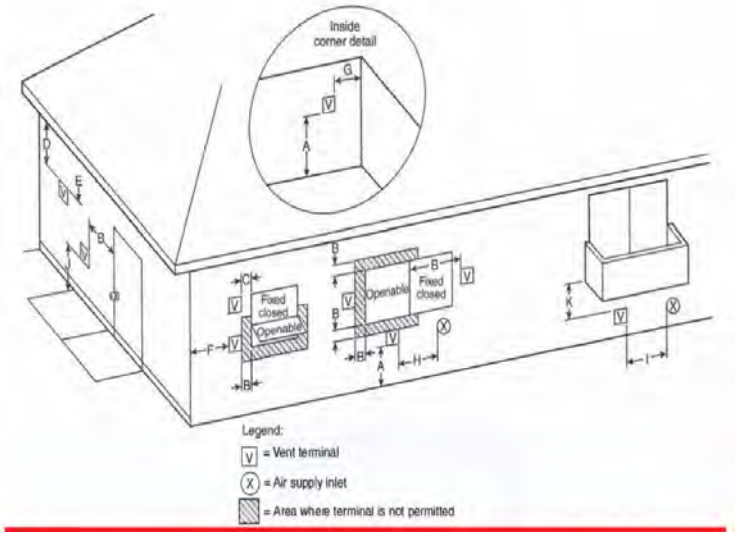


FIGURE ~~509.8~~ 509.8.1
EXIT TERMINALS OF MECHANICAL DRAFT AND DIRECT-VENT VENTING SYSTEMS
[NFPA 54: FIGURE ~~A.12.9~~12.9.1]

SUBSTANTIATION:
The above sections have been revised to correlate with NFPA 54-2021 (latest version) in accordance with IAPMO's Regulations Governing Committee Projects (Extract Guidelines).

Proposals

Item #: 102

UPC 2024 Section: 504.3.2

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Revise text

504.0 Water Heater Requirements.

504.3 Clearance. (remaining text unchanged)

~~**504.3.2 Unlisted Water Heaters.** Unlisted water heaters shall be installed with a clearance of 12 inches (305 mm) on all sides and rear. Combustible floors under unlisted water heaters shall be protected in an approved manner. [NFPA 54:10.27.2.2]~~

504.3.2 Unlisted Water Heaters. Except as otherwise permitted in this code, unlisted water heaters shall be approved by the Authority Having Jurisdiction prior to being installed. Clearance for unlisted water heaters shall be not less than 12 inches (305 mm) on all sides. Combustible floors under unlisted water heaters shall be protected in an approved manner.

SUBSTANTIATION:
New Section 504.3.2 is being proposed to replace the existing language. As currently written, there is no direction for the approval that is required of the AHJ. These provisions are important and required for the installation of unlisted water heaters such as boilers. This new section will address that issue and rewrites the provisions in a more concise and clear manner.

Proposals

Item #: 103

UPC 2024 Section: 504.4

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

504.0 Water Heater Requirements.

504.4 Pressure Limiting Devices. A water heater installation shall be provided with overpressure protection using an approved, listed device installed in accordance with the terms of its listing and the manufacturer's installation instructions. Pressure relief devices shall have a pressure setting greater than the water service pressure and not exceed 150 psi (1034 kPa) as required in Section 608.4.

(for information only)

608.4 Pressure Relief Valves. Each pressure relief valve shall be an approved automatic type with drain, and each such relief valve shall be set at a pressure of not more than 150 psi (1034 kPa). No shutoff valve shall be installed between the relief valve and the system.

SUBSTANTIATION:
The proposed language is being added for clarity and safety of the end user. The UPC requires the plumbing water supply to be limited to 80 psi. While manufacturers usually install a pressure relief valve rated at 150 psi, there are over the counter relief valves rated at 75 psi which will cause the pressure to release. To prevent such incidences, the language will ensure the P&T valve is above the water supply pressure.

Proposals

Item #: 104

UPC 2024 Section: 507.5

SUBMITTER: Bob Adler
Self

RECOMMENDATION:
Revise text

507.0 Appliance and Equipment Installation Requirements.

507.5 Drainage Pan. Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater in accordance with the following:
(1) The drainage pan shall be provided with not less than 3/4 of an inch (20 mm) diameter drain to an approved location.
(2) ~~Such~~ The drainage pan shall be not less than 1½ inches (38 mm) in depth.
(3) Where a drain pan pipe is installed, the material of the piping shall be rated for the temperature rating of the water heater and shall be approved for use with the liquid being discharged.

SUBSTANTIATION:
The new text will add provisions which clarify that piping used on hot water applications shall be rated for such temperatures as there are drain line to be used for cold water applications only. Additionally, the provisions for the drainage pan are being placed in a list which makes the provisions easy to find.

Proposals

Item #: 105

UPC 2024 Section: 507.5

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

507.0 Appliance and Equipment Installation Requirements.

507.5 Drainage Pan. Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, ~~or~~ floor-subfloor assembly or where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than ¾ of an inch (20 mm) diameter drain to an approved location. The terminating end of the drainpipe shall be readily visible. Such pan shall be not less than 1½ inches (38 mm) in depth.

SUBSTANTIATION:
The proposed change will clarify that Section 507.5 is applicable to all locations where a leaking water heater can cause damage and not only the locations indicated in the section. The intent of the section is to prevent damage from occurring in the surrounding vicinity of the water heather should a leak occur. Additionally, the terminating end of the drain pipe shall be visible to alert the owner or inspector that the water heater is leaking.

Proposals

Item #: 106

UPC 2024 Section: 507.5

SUBMITTER: Arnie Rodio
Self

RECOMMENDATION:
Revise text

507.0 Appliance and Equipment Installation Requirements.

507.5 Drainage Pan. Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly or where structural damage could result~~s~~ from a leaking water heater, a watertight pan of corrosion-resistant materials not less than 1-1/2 inches (38 mm) in depth shall be installed beneath the water heater with a drain not less than 3/4 ~~of an~~ inch (20 mm) and ~~diameter drain~~ of materials shown in Table 701.2, to an approved location. Discharge from a relief valve into a water heater pan shall be prohibited. ~~Such pan shall be not less than 1-1/2 inches (38 mm) in depth.~~

SUBSTANTIATION:
The proposed changed defines why the drainage pan is required. It's not for any or every kind of damage, it is there to mitigate structural damage. The change moves the last sentence to where it belongs but also defines what material is required for the drain by referencing Table 701.2 (Materials for Drain, Waste, Vent Pipe and Fittings). The prohibition in Section 608.5(7) is that you cannot drain the pressure relief into the drainage pan and is shown here for clarity. This is a common mistake and needs to be stated in both sections.

Proposals

Item #: 107

UPC 2024 Section: 507.5

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

507.0 Appliance and Equipment Installation Requirements.

507.5 Drainage Pan. Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly or where structural damage could results from a leaking water heater, a watertight pan of corrosion-resistant materials, not less than 1½ inches (38 mm) in depth, shall be installed beneath the water heater with a drain not less than ¾ of an inch (20 mm) ~~diameter drain~~ to an approved location. Discharge from a relief valve into a water heater pan shall be prohibited. ~~Such pan shall be not less than 1½ inches (38 mm) in depth.~~

SUBSTANTIATION:
This change clarifies the intent of why the pan is required. It's not any or every kind of damage, it is there to mitigate structural damage. Also, the same prohibition of not allowing discharging the relief valve into a water heater pan is in Section 608.5(7). It is a common mistake and needs to be stated in both sections.

Proposals

Item #: 108

UPC 2024 Section: 507.13

SUBMITTER: Arnie Rodio
Self

RECOMMENDATION:
Revise text

507.0 Appliance and Equipment Installation Requirements.

507.13 Installation in Residential Garages. 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 heating elements, switches, burners, and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. {{NFPA 54:9.1.10.1}}

SUBSTANTIATION:
Requirements for electric water heaters have been missing since the 2003 UPC. The reasons for this may no longer exist and are perhaps unimportant. The fact is that electric water heaters are still installed by plumbers and still need inspections. What document do plumbers and inspectors seek for these installation requirements.
Elements and switches (thermostats) are just as dangerous as burners and burner ignition devices, perhaps more so with the advent of FVIR for gas burning water heaters.

Proposals

Item #: 110

UPC 2024 Section: 507.26

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

507.0 Appliance and Equipment Installation Requirements.

507.26 Accessibility for Service. All appliances shall be located with respect to building construction and other equipment so as to permit access ~~to the appliance~~ for repair or replacement of the appliance. Sufficient clearance shall be maintained to permit removal of the appliance; 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. ~~{{~~NFPA 54:9.2.1~~}}~~

SUBSTANTIATION:
The Code requires access for the repair of appliances in Section 507.26, but does not require access for the removal of appliances without the need to remove building construction or other appliances.

Proposals

Item #: 113

UPC 2024 Section: 509.2, 509.3

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Add new text

509.0 Venting of Appliances.

509.2 Venting of Gas Appliances. Low-heat and medium-heat gas appliances shall be vented in accordance with this chapter. Other gas appliances shall be vented in accordance with NFPA 211 or other applicable standards.

509.3 Appliances Fueled by Other Fuels. Appliances fueled by fuels other than gas shall be vented in accordance with NFPA 211 and the appliance manufacturer's instructions.

(renumber remaining sections)

Note: NFPA 211 meets the requirements for a mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The UPC only addresses low and medium heat appliances. The new language will guide the user of the code to the appropriate standard NFPA 211 for other gas appliances. NFPA 211 (Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances) applies to the design, installation, maintenance, and inspection of all chimneys, fireplaces, venting systems, and solid fuel-burning appliances. The standard covers the removal of waste gases; the reduction of fire hazards associated with the construction and installation of chimneys, fireplaces, and venting systems for residential, commercial, and industrial appliances; and the installation of solid fuel-burning appliances.

Proposals

Item #: 114

UPC 2024 Section: 509.6.1.1

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Revise text

509.0 Venting of Appliances.

509.6.1.1 Insulation Protection Shield. Where a vent passes through an insulated assembly, an approved metal shield constructed of steel having a thickness of not less than 26 gauge shall be installed between the vent and insulation. The shield shall extend not less than 2 inches (51 mm) above the insulation and be secured to the structure in accordance with the manufacturer's installation instructions.

SUBSTANTIATION:
The existing language does not contain guidance regarding the minimum gauge required for insulation shield passing through insulated areas such as attics. The proposed language will add the minimum shield thickness. The proposed 26 gauge minimum thickness is found in other manufacturer requirements.

Proposals

Item #: 141

UPC 2024 Section: 604.13

SUBMITTER: Lance MacNevin
Plastics Pipe Institute

RECOMMENDATION:
Revise text

604.0 Materials.

604.13 Water Heater Connectors. Flexible metallic (copper and stainless steel), reinforced flexible, braided stainless steel, or polymer braided with EPDM core connectors that connect a water heater to the piping system shall comply with ASME A112.18.6/CSA B125.6. Copper, copper alloy, or stainless steel flexible connectors shall not exceed 24 inches (610 mm). PEX, PEX-AL-PEX, PE-AL-PE, or PE-RT tubing shall not be installed within the first 18 inches (457 mm) of piping connected to a water heater.
Exception: PEX, PEX-AL-PEX, PE-AL-PE, or PE-RT tubing shall be permitted to be connected directly to tankless water heaters intended for domestic water applications.

SUBSTANTIATION:
PPI has conducted significant research on the topic of direct connection of plastic piping materials to tankless water heaters. The findings of the research were published in 2020 as "PPI Recommendation H: Direct Connection of Plastic Piping Materials to Tankless Water Heaters for Domestic (i.e. residential) Applications" published at https://plasticpipe.org/pdf/recommendation-h-direct-connection-tankless.pdf

The core findings are summarized in this paragraph: “Piping systems using the materials CPVC, PE-RT, PEX, and PP, which carry a pressure/ temperature rating of 100 psi at 180°F (690 kPa @ 82°C), and which are intended and certified for hot and cold potable water distribution systems according to industry standards and relevant codes, may be connected directly to tankless water heaters which are intended for domestic (i.e. residential) applications, unless prohibited by local plumbing code or the specific water heater manufacture.”

Therefore, there is no reason to prohibit direction connection of these piping materials to tankless water heaters intended for domestic water applications. The proposed Exception will bring the UPC into harmonization with current industry practices which are supported in PPI Recommendation H.

The term "domestic" is well-established within this code. See definition for "Water Heater" in Chapter 2, Section 414.1, Section 609.12, and Table 610.3 as examples.

Proposals

Item #: 157

UPC 2024 Section: 607.2, 607.2.1, 607.2.2, Table 1701.1

SUBMITTER: Erin Coffman
Water Systems Council

RECOMMENDATION:
Revise text

607.0 Potable Water Supply Tanks.

607.2 Potable Water Tanks. Potable water supply tanks, with and without bladders/diaphragms, interior tank coatings, or tank liners intended to supply drinking water shall comply with NSF 61.
607.2.1 Non-Pressurized Potable Water Tanks. ~~607.3 Venting.~~ Non-pressurized potable water tanks ~~Tanks used for potable water~~ shall be tightly covered and vented in accordance with the manufacturer's installation instructions. Such vent shall be screened with a corrosion-resistant material of not less than number 24 mesh. ~~**607.4 Overflow.**~~ Tanks shall have an overflow not less than a 16 square inch (0.01 m^2) ~~overflow~~ that is screened with a corrosion-resistant material of not less than number 24 mesh.
607.2.2 Pressurized Potable Water Tanks. ~~607.5 Valves.~~ ~~Pressurized tanks shall be provided with a~~ Pressurized potable water tanks shall comply with ANSI/WSC PST 2000. A listed pressure-relief valve installed in accordance with the manufacturer's installation instructions. The relief valve shall be ~~discharged~~ in accordance with Section ~~608.5~~ 608.0. Where a potable water supply tank is located above the fixtures, appliances, or system components it serves, it shall be equipped with a vacuum relief valve that complies with CSA Z21.22.

(below shown for reference only)

608.0 Water Pressure, Pressure Regulators, Pressure Relief Valves, and Vacuum Relief Valves.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ANSI/WSC PST 2000-2016	Performance Requirements for pressurized potable water storage tanks	Water Supply components	607.2.2

(portions of table not shown remains unchanged)

Note: ANSI/WSC PST 2000 meets the requirements for a mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The current code language does not provide requirements for pressurized potable water tanks. These are pressurized tanks are critical to water well supply systems. Requirements are necessary for safety aspects and dependable performance standards.

Proposals

Item #: 158

UPC 2024 Section: 608.2

SUBMITTER: Bob Gardner
Watts Water Technologies

RECOMMENDATION:
Revise text

608.0 Water Pressure, Pressure Regulators, Pressure Relief Valves, and Vacuum Relief Valves.

608.2 Excessive Water Pressure. Where static water pressure in the water supply piping is exceeding 80 psi (552 kPa), an approved-type pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to 80 psi (552 kPa) or less. Pressure regulators for potable water distribution systems shall comply with ASSE 1003 and NSF 61. Pressure regulator(s) equal to or exceeding 11/2 inches (40 mm) shall not require a strainer. For line sizes greater than 3 inches (80 mm), an automatic control (pressure regulating) valve shall be utilized. Such regulator(s) shall control the pressure to water outlets in the building unless otherwise approved by the Authority Having Jurisdiction. Each such regulator and strainer shall be accessibly located aboveground or in a vault equipped with a properly sized and sloped boresighted drain to daylight, shall be protected from freezing, and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping.

Pipe size determinations shall be based on 80 percent of the reduced pressure where using Table 610.4.

An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. Expansion tanks used in potable water systems intended to supply drinking water shall comply with NSF 61. The expansion tank shall be properly sized and installed in accordance with the manufacturer's installation instructions and listing. Systems designed by registered design professionals shall be permitted to use approved pressure relief valves in lieu of expansion tanks provided such relief valves have a maximum pressure relief setting of 100 psi (689 kPa) or less.

Note: NSF 61 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
Adding of "and NSF 61" - For consistency purposes when stating the requirements for components being used in potable water distribution systems. Examples of this is Section 607.2 "Potable water supply tanks, interior tank coatings, or tank liners intended to supply drinking water shall comply with NSF 61" and "Expansion tanks used in potable water systems intended to supply drinking water shall comply with NSF 61," also in Section 608.2.

Adding of "For line sizes greater than 3 inches, an automatic control (pressure regulating) valve shall be utilized." – For line sizes 3 inches or larger, direct acting valves are not cost conducive nor the optimized device for this application. Where direct acting regulators will have volume losses and introduce a turbulent flow path, ACV's will sustain volume more efficiently.

Proposals

Item #: 159

UPC 2024 Section: 608.2 – 608.2.2

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

608.0 Water Pressure, Pressure Regulators, Pressure Relief Valves, and Vacuum Relief Valves.

608.2 Excessive Water Pressure. Where static water pressure in the potable or nonpotable water supply piping ~~is exceeding~~ exceeds 80 psi (552 kPa), an approved-type pressure regulator preceded by an adequate strainer shall be installed and the downstream static pressure reduced to 80 psi (552 kPa) or less. Pressure regulators for potable water distribution systems shall comply with ASSE 1003. Pressure regulator(s) ~~equal to or exceeding~~ 1 ½ inches (40 mm) or more shall not require a strainer. ~~Such regulator(s) shall control the pressure to water outlets in the building unless otherwise approved by the Authority Having Jurisdiction.~~ Each such regulator and strainer shall be accessibly located aboveground or in a vault equipped with a properly sized and sloped ~~boresighted~~ drain to daylight, shall be protected from freezing, and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping.

~~Pipe size determinations shall be based on 80 percent of the reduced pressure where using Table 610.4.~~

608.2.1 Developed Length and Pressure Adjustments. When using Table 610.4, and a pressure regulator valve is required in the building supply, the developed length of supply piping shall be computed from the building side of that valve.

Available pressure determinations shall be based on 80 percent of the reduced pressure.

608.2.2 Expansion Tanks. An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. Expansion tanks used in potable water systems intended to supply drinking water shall comply with NSF 61. The expansion tank shall be properly sized, ~~and~~ installed, and supported in accordance with the manufacturer's installation instructions and listing.

Exception: Systems designed by a licensed plumbing contractor or registered design professionals shall be permitted to use approved pressure relief valves in lieu of expansion tanks provided such relief valves have a maximum pressure relief setting of 100 psi (689 kPa) or less.

(below shown for reference only)

TABLE 610.4
FIXTURE UNIT TABLE FOR DETERMINING WATER PIPE AND METER SIZES
(portions of table not shown remain unchanged)

SUBSTANTIATION:
The proposed change reconfigured the existing Section 608.2 to group requirements together.
Currently there is no specific requirement to control water pressure for non potable water supply piping. It seems that if it is required for potable water applications it should also be required for nonpotable use in Chapter 15 and 16.

Simplify, to make the section more readable; ‘1-1/2 inch or larger’ is simpler language.

The section on regulators is being stricken: Impossible in most installations. The pressure regulator can only ‘control’ the pressure of the water it discharges. Other factors such as thermal expansion can/will affect the water pressure downstream of the regulator. If the regulator was able to control the pressure to the water outlets, an expansion tank would not be required.

“Boresighted” is a term related to the optical alignment of a firearm, in this application it is practically impossible and is unnecessary language.

New section 608.2.1 replaces the previous one sentence paragraph. Adds language existing in Appendix A 107.2 while maintaining the 80% multiplier.

Further substantiation for new section 608.2.1 comes from UPC A & A Committee:
Q: To determine the building supply line using Table 610.4, the pressure range, max. length, and WSFU's are used to determine pipe size.
For this question, the data is: over 60, 100 feet, and 24 WSFU's demand.
A 3/4" meter with a 1" building supply is required.
If the supply line pressure is 110 psi and a pressure regulator is installed 40 feet from the meter and 60 feet from the "furthest outlet", and reduced to 70 psi;

How does the language in section 608.2 (Pipe size determinations shall be based on 80 percent of the reduced pressure where using Table 610.4 apply?

Where is the 20% reduction applied?
On the WSFU's?
On the supply line prior to the regulator?
After the regulator?

A: Per Section 608.2 of the 2012 UPC, “pipe size determinations shall be based on 80 percent of the reduced pressure when using Table 610.4”. If the reduced pressure at the pressure reducing valve is 70 psi the downstream piping from the PRV would be sized using Table 610.4 at 56 psi with “60 feet developed length to the furthest outlet.”

Then new section 608.2.2 (Expansion Tanks) breaks this portion into what is required, adding support language for expansion tanks and what is excepted.

The last change separates what is an exception to the previous languages, as an exception.

Proposals

Item #: 160

UPC 2024 Section: 608.2, 608.3

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

608.0 Water Pressure, Pressure Regulators, Pressure Relief Valves, and Vacuum Relief Valves.

608.2 Excessive Water Pressure. Where static water pressure in the water supply piping is exceeding 80 psi (552 kPa), an approved-type pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to 80 psi (552 kPa) or less. Pressure regulators for potable water distribution systems shall comply with ASSE 1003. Pressure regulator(s) equal to or exceeding 11/2 inches (40 mm) shall not require a strainer. Such regulator(s) shall control the pressure to water outlets in the building unless otherwise approved by the Authority Having Jurisdiction. Each such regulator and strainer shall be accessibly located aboveground or in a vault equipped with a properly sized and sloped boresighted drain to daylight, shall be protected from freezing, and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping.

Pipe size determinations shall be based on 80 percent of the reduced pressure where using Table 610.4.

An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. Expansion tanks used in potable water systems intended to supply drinking water shall comply with NSF 61. The expansion tank shall be properly sized, securely fastened to the structure, and installed in accordance with the manufacturer's installation instructions and listing. Systems designed by registered design professionals shall be permitted to use approved pressure relief valves in lieu of expansion tanks provided such relief valves have a maximum pressure relief setting of 100 psi (689 kPa) or less.

608.3 Expansion Tanks, and Combination Temperature and Pressure-Relief Valves. A water system provided with a check valve, backflow preventer, or other normally closed device that prevents dissipation of building pressure back into the water main, independent of the type of water heater used, shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. Prepressurized water expansion tanks shall comply with IAPMO Z1088. Such expansion tank or other approved device shall be installed on the building side of the check valve, backflow preventer, or other device and shall be sized, securely fastened to the structure, and installed in accordance with the manufacturer's installation instructions.

A water system containing storage water heating equipment shall be provided with an approved, listed, adequately sized combination temperature and pressure-relief valve, except for listed nonstorage instantaneous heaters having an inside diameter of not more than 3 inches (80 mm). Each such approved combination temperature and pressure-relief valve shall be installed on the water-heating device in an approved location based on its listing requirements and the manufacturer's installation instructions. Each such combination temperature and pressure-relief valve shall be provided with a drain in accordance with Section 608.5.

SUBSTANTIATION:
Expansion tanks range in sizes and types. Many tanks are being left to be supported by the piping onto which it is mounted, however this is a concern as piping is not meant to be a supporting device, actually piping is required to be supported, not the other way around. The addition of this language will require that all expansion tanks be supported where the installation instructions fail to mention this.

Proposals

Item #: 161

UPC 2024 Section: 608.3

SUBMITTER: Arnie Rodio
Self

RECOMMENDATION:
Revise text

608.3 Expansion Tanks, and Combination Temperature and Pressure-Relief Valves. A water system provided with a check valve, backflow preventer, or other normally closed device that prevents dissipation of building pressure back into the water main, independent of the type of water heater used, shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. Prepressurized water expansion tanks shall comply with IAPMO Z1088. Such expansion tank or other approved device shall be installed on the building side of the check valve, backflow preventer, or other device and shall be sized and installed in accordance with the manufacturer's installation instructions.

A water system containing storage water heating equipment shall be provided with an approved, listed, adequately sized combination temperature and pressure-relief valve, except for listed nonstorage instantaneous heaters having an inside diameter of not more than 3 inches (80 mm). Each such approved combination temperature and pressure-relief valve shall be installed on the water-heating device in an approved location based on its listing requirements and the manufacturer's installation instructions. Each such combination temperature and pressure-relief valve shall be provided with a drain in accordance with Section 608.5.

Exception: An expansion tank is not required for an instantaneous non-storage water heater. All other provisions of Section 608.3 still apply.

SUBSTANTIATION:
Water does not compress so when it is heated and it expands it can create damaging pressure. Expansion tanks are designed to compensate for this. Instantaneous water heaters do not store water so there is no water to expand and create the excess pressure. Water is heated on demand only so there is no issue of the water heating, expanding and building pressure as the water is flowing out by the demand.

Proposals

Item #: 162

UPC 2024 Section: 608.7

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

608.0 Water Pressure, Pressure Regulators, Pressure Relief Valves, and Vacuum Relief Valves.

608.7 Vacuum Relief Valves. Where the elevation of an entire ~~a~~ hot-water storage tank or an indirect water heater is ~~located at an elevation~~ above the fixture outlets in the hot-water system, a vacuum relief valve that complies with CSA Z21.22 shall be installed on the storage tank or heater.
Exception: Storage tanks which have an internal anti-siphon port in their fill tube shall not be required to install a vacuum relief valve.

SUBSTANTIATION:
Introducing air to the interior of a dip tube will “break” a siphon in all cases. Water heaters with anti-siphon ports in the top of their dip tubes are not subject to siphonage. Storage tanks which have an indirect heat source (a heat exchanger within the storage tank, or hot water circulated from the heat source to the storage tank) may or may not have an internal means of preventing siphonage.
Those which are not designed or installed in a manner which specifically prevents siphonage shall be provided with a vacuum relief valve to provide the necessary anti-siphon protection. When any configuration of piping or tank design and installation could result in potential siphoning of the tanks contents, an appropriate vacuum relief valve must be installed as instructed by the manufacturer.

Proposals

Item #: 205

UPC 2024 Section: 814.2

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

814.0 Condensate Waste and Control.

814.2 Condensate Control. Where any equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow, a drain line shall be provided and shall be drained in accordance with Section 814.1. An additional protection method for condensate overflow shall be provided in accordance with one of the following:
(1) A water level detecting device that will shut off the equipment or appliance in the event the primary drain is blocked.
(2) An additional watertight pan of corrosion-resistant material, with a separate drain line, installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain.
(3) An additional drain line at a level that is higher than the primary drain line connection of the drain pan.
(4) An additional watertight pan of corrosion-resistant material with a water level detection device installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain and to shut off the equipment.

The additional pan or the additional drain line connection shall be provided with a drain pipe of not less than 3/4 of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed. The terminating ends of condensate drain lines shall be marked to identify whether such condensate drain line is from a primary or secondary drain.

SUBSTANTIATION:
It is important to determine where the condensate is coming from. If you see two condensate lines near each other it is impossible to determine whether is is a primary of the secondary drain. An inspector or owner will not be able to identify an emergency that needs attention until the inspector or owner physically looks inside the drain pans to see where it was coming from. Identifying the condensate lines will allow the appropriate action to be taken quickly and prevent unnecessary damage.

Proposals

Item #: 206

UPC 2024 Section: 814.2

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

814.0 Condensate Waste and Control.

814.2 Condensate Control. Where any equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow, a drain line shall be provided and shall be drained in accordance with Section 814.1. An additional protection method for condensate overflow shall be provided in accordance with one of the following:
(1) A water level detecting device that will shut off the equipment or appliance in the event the primary drain is blocked. Such detecting devise shall be installed inside the primary pan above the primary drain and below the flood level rim of the pan.
(2) An additional watertight pan of corrosion-resistant material, with a separate drain line, installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain.
(3) An additional drain line at a level that is higher than the primary drain line connection of the drain pan.
(4) An additional watertight pan of corrosion-resistant material with a water level detection device installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain and to shut off the equipment.

The additional pan or the additional drain line connection shall be provided with a drain pipe of not less than 3/4 of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed.

SUBSTANTIATION:
As written, option (1) is not clear where a water detecting device shall be installed. The language gives clear direction to the location and will prevent installers from placing such devices in the drain line.

Proposals

Item #: 207

UPC 2024 Section: 814.2

SUBMITTER: Arnie Rodio
Self

RECOMMENDATION:
Revise text

814.0 Condensate Waste and Control.

814.2 Condensate Control. Where any equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow, a drain line shall be provided and shall be drained in accordance with Section 814.1. An additional protection method for condensate overflow shall be provided in accordance with one of the following:
(1) A water level detecting device that will shut off the equipment or appliance in the event the primary drain is blocked.
(2) An additional watertight pan of corrosion-resistant material, with a separate drain line, installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain.
(3) An additional separate drain line at a level that is higher than the primary drain line connection of the drain pan.
(4) An additional watertight pan of corrosion-resistant material with a water level detection device installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain and to shut off the equipment.

The additional pan or the additional drain line connection shall be provided with a drain pipe of not less than 3/4 of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed.

SUBSTANTIATION:
The addition of "separate" ensures that the primary and secondary condensate drains are not tied together. They must be run separate in case the primary is clogged.

Proposals

Item #: 303

UPC 2024 Section: L 501.4.1

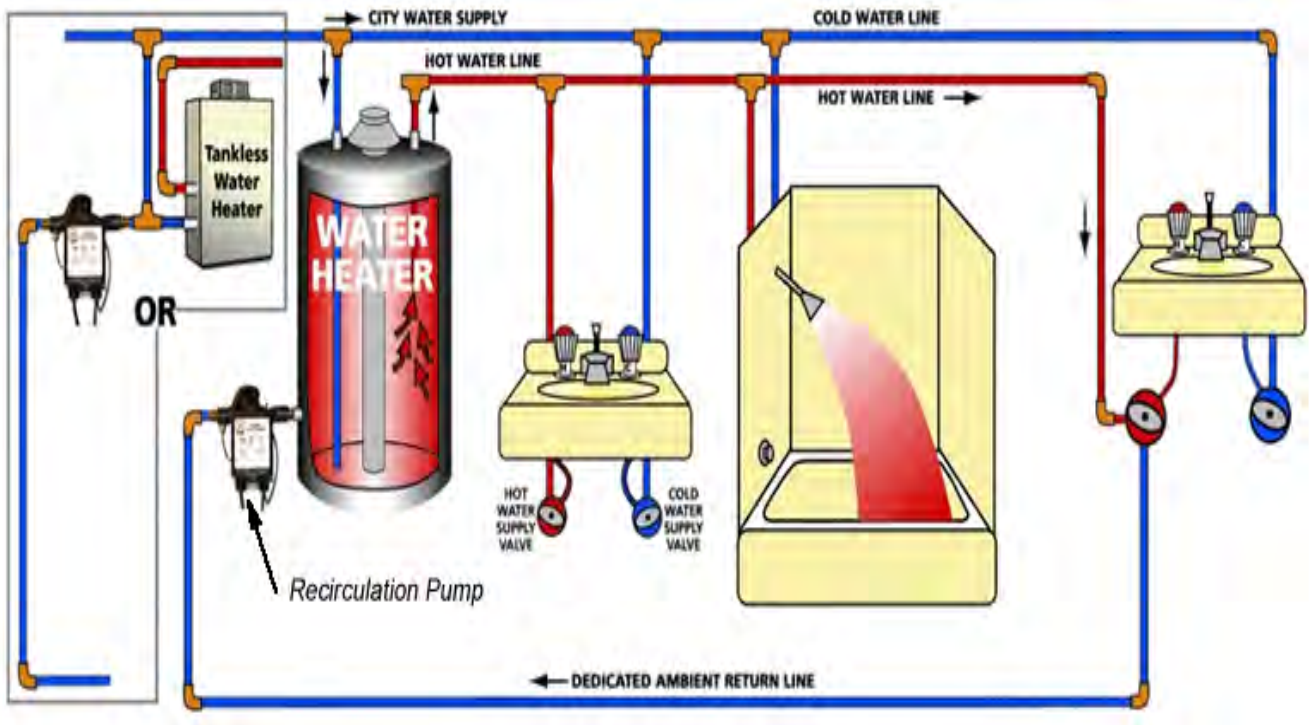
SUBMITTER: Tim Collings
Self

RECOMMENDATION:
Add new text

L 501.0 Water Heating Design, Equipment, and Installation.

L 501.4 Recirculation Pump Controls. Pump controls shall include on-demand activation or time clocks combined with temperature sensing. Time clock controls for pumps shall not let the pump operate more than 15 minutes every hour. Temperature sensors shall stop circulation where the temperature set point is reached and shall be located on the circulation loop at or near the last fixture. The pump, pump controls, and temperature sensors shall be accessible. Pump operation shall be limited to the building's hours of operation.
L 501.4.1 Hot Water On-Demand Pumping Systems. Hot water on-demand pumping systems manually actuated or automatically activated hot water pumping systems shall comply with IAPMO PS 115.

SUBSTANTIATION:
These pumping systems use a hot water return line to prime the hot water piping system upon activation. These pumping systems do not mix the hot or warm water with the cold water supply. These systems do not run continuously, they supply the hot water when activated.



Proposals

Item #: 305

UPC 2024 Section: Appendix N, Table 1701.2

SUBMITTER: Julius Ballanco, P.E.
JB Engineering and Code Consulting, P.C.
Rep. Chair, UMC Legionella Task Group

RECOMMENDATION:
Revise text

APPENDIX N
IMPACT OF WATER TEMPERATURE ON THE POTENTIAL FOR SCALDING AND LEGIONELLA GROWTH

N 101.0 General.
N 101.1 Applicability. This appendix provides guidelines on the impact of water temperature in minimizing both scalding and Legionella growth potential associated with occupiable commercial, institutional, multi-unit residential, and industrial building plumbing systems.

This Appendix shall not include single-family residential buildings. This appendix shall not be considered a risk management guidance document for scalding or Legionella.

Note: Published documents which address Legionella risk management include ASHRAE 188, ASHRAE Guideline 12, or as required by the Authority Having Jurisdiction.

There are additional factors associated with the potential for scalding and Legionella growth other than temperature.

For scalding potential, other factors include, but are not limited to, user age, health, body part, length of contact time, and water source.

For Legionella growth potential other factors include, but are not limited to, water source and plumbing system: size, design, circulation rate, water age, disinfectant residual, piping material and component complexity.

N 102.0 Definitions.
N 102.1 General. For the purpose of this appendix the following definitions shall apply:
Biofilm. Microorganisms and the slime they secrete that grow on any continually moist surface.
~~**N 102.1**~~ **Cold Water.** Water at a temperature less than 77°F (25°C).
Control. The management to maintain compliance with established criteria.
Disinfection. Chemical or physical control measures or procedures used to kill or inactivate pathogens.
~~**N 102.8**~~ **Disinfecting Hot Water.** Water at a temperature not less than 160°F (71°C).
Hazard. See Risk.
Halogenation. A chemical reaction that involves the addition of one or more halogens, including, but not limited to, chlorine, bromine, or iodine, commonly used to disinfect water systems.
~~**N 102.6**~~ **Hot Water.** Water at a temperature not less than 130°F (54°C) and less than 140°F (60°C).
~~**N 102.9**~~ **Legionella Growth Potential.** The likelihood that Legionella bacteria will reproduce.
Monitor. Observing and checking the progress or quality of (something) or measuring the physical and chemical characteristics of control measures.
Risk. The potential to cause harm resulting from exposure.
~~**N 102.10**~~ **Scald Potential.** The likelihood of burning the skin.
~~**N 102.5**~~ **Tempered Hot Water.** Water at a temperature not less than 120°F (49°C) and less than 130°F (54°C).
~~**N 102.2**~~ **Tepid Cold Water.** Water at a temperature not less than 77°F (25°C) and less than 85°F (29°C).
~~**N 102.3**~~ **Tepid Water.** Water at a temperature not less than 85°F (29°C) and less than 110°F (43°C).

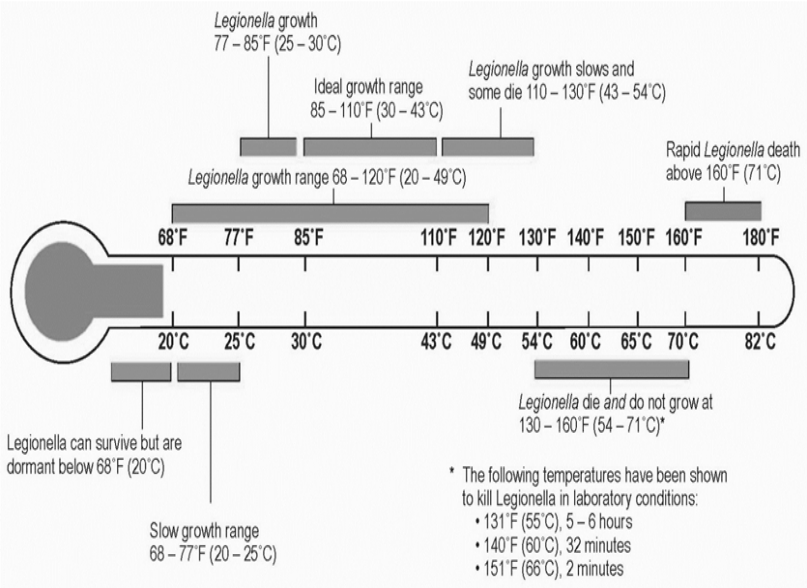
Test. The measurement of the physical, chemical, or microbial characteristics or quality of water.
~~**N 102.7**~~ **Very Hot Water.** Water at a temperature not less than 140°F (60°C) and less than 160°F (71°C).
~~**N 102.4**~~ **Warm Water.** Water at a temperature not less than 110°F (43°C) and less than 120°F (49°C).
Water Management Plan. A comprehensive risk management plan for controlling Legionella growth in building water systems.

N 103.0 Building Water System Design Documentation.
N 103.1 ~~Required~~ Design Documentation. Construction documents shall be required for new construction, renovation, refurbishment, replacement, or repurposing of an occupiable building water system, including a water management plan, and shall be submitted to the Authority Having Jurisdiction.
N 103.2 Onsite Documentation. Documentation shall be maintained onsite and shall be readily accessible to the Authority Having Jurisdiction.

N 104.0 Potential Exposure.

N 104.1 Legionella Growth Potential. The Authority Having Jurisdiction shall have the authority to require documentation to address Legionella growth potential, where water temperatures in a water distribution system are within ranges shown in ~~Table N 104.1~~ Figure N 104.1 that pose a Legionella growth potential.

FIGURE N 104.1
WATER TEMPERATURE RANGES AND LEGIONELLA GROWTH POTENTIAL*



For SI units: °C = (°F-32)/1.8

* Temperature ranges reported are experimentally determined in a laboratory setting in the absence of a realistic microbial community. Legionella can survive for longer periods of time at temperatures higher and lower than the growth temperature ranges indicated due to changes in their metabolic state and/or protection from thermal disinfection within biofilm or amoeba host organisms.

N 104.2 Scald Potential. Where the water distribution system's water temperature(s) range poses a scald potential in accordance with Table ~~N 104.1~~ N 104.2, protection shall be provided in accordance with Chapter 4.

TABLE ~~N 104.1~~ N 104.2
~~CORRELATION BETWEEN~~ WATER TEMPERATURE RANGES~~, LEGIONELLA,~~ AND SCALD POTENTIAL

WATER DESCRIPTION	TEMPERATURE (°F)	SCALD POTENTIAL~~1 *~~	~~LEGIONELLA GROWTH POTENTIAL2~~
Cold	<77	None	~~Minimal~~
Tepid Cold	>/=77 and <85	None	~~Low~~
Tepid	>/=85 and <110	None Hyperthermia is possible after long exposure in a bathtub or whirlpool tub.	~~High~~
Warm	>/=110 and <120	Minimal At 111°F, greater than 220 minutes for second-degree burn.	~~Moderate~~
Tempered Hot	>/=120 and <130	Low At 120°F, greater than 5 minutes for second-degree burn, and 10 minutes to third-degree burn; At 124°F, two minutes for second-degree burn, and 4 minutes, 10 seconds for third-degree burn.	~~Low~~
Hot	>/=130 and <140	Moderate to High At 130°F, 18 seconds for second-degree burn, and 30 seconds for third-degree burn.	~~None~~
Very Hot	>/=140 and <160	High At 140°F, three seconds for second-degree burn, and 5 seconds for third-degree burn; At 150°F, instant for second-degree burn, and less than two seconds for third-degree burn; At 158°F, instant for second-degree burn, and less than a second for third-degree burn.	~~None~~
Disinfecting Hot	>/=160	Immediate	~~None~~

~~**Notes:**~~

~~1~~ ~~*~~The infant, elderly, and infirmed have a higher potential for scalding at temperatures lower than listed.

~~2 Temperature ranges reported are experimentally determined in a laboratory setting in the absence of a realistic microbial community. Legionella can survive for longer periods of time at temperatures higher and lower than the growth temperature ranges indicated due to changes in their metabolic state and/or protection from thermal disinfection within biofilm or amoeba host organisms.~~

N 105.0 Disinfection.

N 105.1 Disinfection Documentation. Where required by the Authority Having Jurisdiction, documentation for disinfection of all building water systems shall be provided by the registered design professional in the construction documents.

~~Methods for new construction and any repaired system disinfection shall include, but not be limited to, the chlorination methods and procedures for flushing and disinfection in accordance with Section 609.10.~~

~~Other or alternative water treatment methods for disinfection shall include, but not be limited to, one of the following methods:~~

~~(1)~~ **N 105.1.1 Copper-Silver Ionization.** Copper-silver ionization methods and procedures, shall include ~~including~~ the following documentation.

(~~a~~1) Copper and silver ionization concentrations ~~shall be included in the documentation~~.

(~~b~~2) Methods and documentation for monitoring ion levels.
(~~c~~3) Electrode cleaning cycles and methods ~~shall be reported~~.

~~(2)~~ **N 105.1.2 Ultraviolet Light.** Ultraviolet light methods shall include the following documentation:
(~~a~~1) Locations of ultraviolet light units.
(~~b~~2) Cleaning cycles and methods of the quartz sleeves and housing ~~shall be documented~~.

N 105.2 Chemical Disinfection. Chemical biocide treatment shall be permitted to be used in accordance with the following:
(1) Oxidizing biocides in accordance with manufacturer's guidelines.
(2) Non-oxidizing biocides in accordance with manufacturer's guidelines.
(3) Alternating the use of different types of biocides, dose, and frequency is recommended.
(4) These treatment methods can be used for continuous, online disinfection or shock treatment online or offline.
(5) Biocides intended for potable water applications shall listed in accordance with NSF 60 and approved by the Authority Having Jurisdiction.

N 105.3 Non-Chemical Treatment. Non-chemical treatment devices shall be permitted to be used in accordance with manufacturer's guidelines.
N 105.3.1 Thermal Shock. Thermal treatment using heat shock at 158°F (70°C) for 30 minutes shall be permitted in accordance with applicable guidelines and the Authority Having Jurisdiction.
N 105.4 Frequency of Cleaning and Disinfection. Where a water management plan is implemented, the frequency of cleaning and disinfection logs shall be readily accessible to the water management team and the Authority Having Jurisdiction.
N 105.5 Control Measures. Control measures for Legionella prevention shall be evaluated for potential consequences that affect overall health risks.

N 201.0 Supply System Legionella Test Levels.
N 201.1 General. The minimum remediation action for water supply systems shall be in accordance with Table N 201.1.

TABLE N 201.1
LEGIONELLA REMEDIATION ACTIONS DOMESTIC WATER SYSTEMS

Percentage of Positive Legionella Test Sites	Remediation Action[1]
< 30	Maintain environmental assessment and Legionella monitoring in accordance with the water management plan.
>/= 30	Immediately institute short-term control measures[2] in accordance with the direction of a qualified professional,[3] and notify the Authority Having Jurisdiction, if required. · The water system shall be re-sampled no sooner than 7 days and no later than 4 weeks after disinfection to determine the efficacy of the treatment. · For persistent results, as determined by the Authority Having Jurisdiction, showing = 30 percent positive sites, long-term control measures[5] shall be implemented in accordance with the direction of a qualified professional[3] and the Authority Having Jurisdiction. · Retreat and retest. If retest is = 30 percent positive, repeat short-term control measures.[2] · With receipt of results < 30 percent positive[4], resume monitoring in accordance with the water management plan. · For persistent results, as determined by the Authority Having Jurisdiction, showing = 30 percent positive sites, long-term control measures[5] shall be implemented in accordance with the direction of a qualified professional[3] and the Authority Having Jurisdiction.

Notes:
[1] In the event that one or more cases of legionellosis are, or may be, associated with the facility, the sampling interpretation shall be in accordance with the direction of a qualified professional and the Authority Having Jurisdiction.
[2] Short-term control measures are temporary interventions that may include, but are not limited to, heating and flushing the water system, hyperchlorination, or the temporary installation of treatment such as copper silver ionization (CSI).
[3] Control measures shall be conducted in accordance with the direction of a qualified professional. A qualified professional is an Authority Having Jurisdiction licensed professional engineer; certified industrial hygienist; certified

water technologist; environmental consultant or water treatment professional with training and experience performing assessments and sampling in accordance with current standard industry protocols.

[4] Positive samples should be minimized.

[5] Long-term control measures may include supplemental disinfection treatments.

N 202.0 Emergency Response Plan.

N 202.1 General. An emergency response plan shall be provided when required by with the Authority Having Jurisdiction and shall include, but not be limited to, the following:

(1) Procedures to be followed if there are cases of Legionellosis associated with the plumbing system.

(2) Procedures to be followed if the plumbing system reaches greater than or equal to 30 percent of test sites positive for Legionella.

(3) Testing for Legionella shall be performed. Procedures shall include the type of tests to be performed, sampling, and the interpretation of test results.

(4) Procedures for emergency disinfection.

(5) Procedures for other actions identified by the water management plan to prevent exposure to contaminated water.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
NSF/ANSI/CAN 60-2020	Drinking Water Treatment Chemicals - Health Effects	Water Treatment

(portions of table not shown remain unchanged)

SUBSTANTIATION:

The UMC Legionella Task Group met several times throughout 2020 to develop a new Appendix (Impact of Water Temperature on the Potential for Legionella Growth) to establish minimum requirements for building mechanical systems to minimize Legionella growth potential within such systems. The UMC Legionella Task Group also reviewed the existing UPC Appendix N (Impact of Water Temperature on the Potential for Scalding and Legionella Growth) to correlate and further enhance the UPC Appendix N.

Included in the recommendations are a new Figure N 104.1 that is a specifically scaled for Legionella growth potential. Figure N 104.2 (formerly Figure N 104.1) remains mostly unchanged, except that the Legionella growth potential temperature ranges have been relocated into a separate figure, Figure N 104.1. This update simplifies the temperature ranges for Legionella growth potential and scald potential and adds clarity for the end user on the use of the figures and assists when acquiring the important information needed. The updates also include a distinction between chemical and non-chemical disinfection and treatment criteria, remediation guidelines for domestic water, and an emergency response plan.