

**CUMULATIVE ANALYSIS  
OF UNIFORM  
PLUMBING CODE CHANGES™**

**2003 Edition**

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The following pages contain comments about changes to the 2000 edition of the UNIFORM PLUMBING CODE™ (UPC™) that were made to develop the 2003 edition of the UPC. Some of the comments made are general in nature because the existing language was significantly changed by amendment, deletion or replacement of existing code language. Deleted materials are shown by strikeouts and new materials are underlined.

## **Section 203.0**

### ~~Administrative Authority~~

**Authority Having Jurisdiction** — The organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installations, or procedures. The authority having jurisdiction shall be a federal, state, local or other regional department or an individual such as a plumbing official; mechanical official; labor department official; health department official; building official or others having statutory authority. In the absence of a statutory authority, the Authority Having Jurisdiction may be some other responsible party. This definition shall include the Authority Having Jurisdiction's duly authorized representative.

**Analysis:** The term Administrative Authority has been deleted and replaced by the term Authority Having Jurisdiction in all of the chapters and appendices of the UPC. This change was made to make the code consistent with language used in other codes and standards. This change also makes the term consistent with the IAPMO rules and regulations.

## **Section 205.0**

**Code** – A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.

**Analysis:** The term code has been amended to make the code consistent with language used in other codes and standards. This change also makes the term consistent with the IAPMO rules and regulations.

## **Section 207.0**

**Essentially Nontoxic Transfer Fluid** – Essentially non-toxic at practically non-toxic, Toxicity Rating Class 1 (reference "Clinical Toxicology of Commercial Products" by Gosselin, Smith, Hodge, & Braddock).

**Analysis:** This definition is for a new term used in Appendix L, Section L 3.0 and gives a reference where the user of this code can find more information.

## Section 214.0

**Labeled** – Equipment or materials bearing a label of a listing agency (accredited conformity assessment body). See Listed (third party certified).

**Analysis:** This definition was changed to reflect other changes made in this code and common usage of the term.

**Listed (Third party certified)** – Equipment or materials included in a list published by a listing agency (accredited conformity assessment body) that maintains periodic inspection on 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.

**Analysis:** This definition was changed to reflect other changes made in this code and the common usage of the term in other codes and standards.

**Listing Agency** – An agency accredited by an independent and authoritative conformity assessment body to operate a material and product listing and labeling (certification) system and which is accepted by the Administrative Authority Authority Having Jurisdiction which is in the business of listing or labeling. The system includes initial and ongoing product testing, and which maintains a periodic inspection program on current production of listed (certified) products, and which makes available a published report of such listing in which specific information is included that the material or product conforms to applicable standards ~~has been tested to approved standards~~ and found safe for use in a specific manner.

**Analysis:** This definition was changed to reflect other changes made in this code and common usage of the term.

## Section 218.0

**PE-AL-PE** – Polyethylene-Aluminum-Polyethylene.

**P E X-A L-P E X** – Cross-linked Polyethylene-Aluminum-Cross-linked Polyethylene

**Analysis:** These new abbreviations were added to define new terms used in this code.

## Section 221.0

**Shall** – ~~A mandatory term~~ Indicates a mandatory term requirement.

**Analysis:** The term shall has been amended to make the code consistent with language used in other codes and standards. This change also makes the term consistent with the IAPMO rules and regulations.

**Standard** — A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

**Analysis:** This new term has been added to the code to make it consistent with language used in other codes and standards. This change also makes the term consistent with the IAPMO rules and regulations.

## Section 224.0

### Vented Appliance Categories

~~**Category I** is an appliance which operates with a non-positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent.~~

~~**Category II** is an appliance which operates with a non-positive vent static pressure and with a vent gas temperature that may cause excessive condensate production in the vent.~~

~~**Category III** is an appliance which operates with a positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent.~~

~~**Category IV** is an appliance which operates with a positive vent static pressure and with a vent gas temperature that may cause excessive condensate production in the vent.~~

**Analysis:** These definitions were deleted because of the harmonization efforts of the UPC Technical Committee to harmonize this code with the National Fuel Gas Code.

**301.1.1 Approvals.** All pipe, pipe fittings, traps, fixtures, material, and devices used in a plumbing system shall be listed or labeled (third party certified) by a listing agency (accredited conformity assessment body) and shall conform to approved applicable recognized standards referenced in this Code, and shall be free from defects. Unless otherwise provided for in this Code, all materials, fixtures, or devices used or entering into the construction of plumbing systems, or parts thereof, shall be submitted to the ~~Administrative Authority~~ Authority Having Jurisdiction for approval, ~~and shall conform to approved applicable recognized standards and shall be free from defects.~~ All pipe, pipe fittings, traps, fixtures, material, and devices used in a plumbing system shall be listed or labeled by a listing agency.

**Analysis:** The modification was necessary to retain the current nomenclature in the IAPMO and NFPA codes. At the same time, the proposal introduces the concept of nationally and internationally recognized terms addressing product approval. Further revisions were made to maintain consistency with NFPA boiler plate language alternative product approval.

**301.1.2 Marking.** Each length of pipe and each pipe fitting, trap, fixture, material, and device used in a plumbing system shall have cast, stamped, or indelibly marked on it, the maker's manufacturer's mark or name, the weight and quality of the product, which shall

readily identify the manufacturer to the end user of the product when such marking is required by the approved standard that applies. When required by the approved standard that applies the product shall be marked with the weight and the quality of the product. All materials and devices used or entering into the construction of plumbing and drainage systems, or parts thereof, shall be marked and identified in a manner satisfactory to the ~~Administrative Authority~~ Authority Having Jurisdiction. All such marking shall be done by the manufacturer. Field marking shall not be acceptable.

**Analysis:** The word "maker" was changed to "manufacturer" because manufacturer is more acceptable and maker is not defined. The proposed new text separates the issue of "weight and quality of the product" from the identification of the manufacturer. This paragraph already clearly states that the markings are to be in accordance with the standard that applies. If multi-component products require special or additional markings these are addressed in the approved standard.

**301.1.3 Standards.** Standards listed or referred to in this chapter or other chapters cover materials which will conform to the requirements of this Code, when used in accordance with the limitations imposed in this or other chapters thereof and their listing. Where a standard covers materials of various grades, weights, quality, or configurations, there may be only a portion of the listed standard which is applicable. Design and materials for special conditions or materials not provided for herein may be used only by special permission of the ~~Administrative Authority~~ Authority Having Jurisdiction after the ~~Administrative Authority~~ Authority Having Jurisdiction has been satisfied as to their adequacy. A list of accepted plumbing materials standards is included in Table 14-1. All IAPMO Installation Standards are included in Appendix I for the convenience of the users of this Code. They are not considered as a part of this Code unless formally adopted as such by the Authority Having Jurisdiction.

**Analysis:** This change was made to define that the IAPMO Installation Standards are not a part of the code unless they are specifically adopted by the Authority Having Jurisdiction. This additional reference builds on and reinforces language in existing section 101.4.3 of this code.

**301.2 Alternate Materials and Methods Equivalency.** Nothing in this Code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this Code. Technical documentation shall be submitted to the Authority Having Jurisdiction to demonstrate equivalency. The system, method, or device shall be approved for the intended purpose by the Authority Having Jurisdiction.

**Analysis:** The modification was necessary to retain the current nomenclature in the IAPMO and NFPA codes. At the same time, the proposal introduces the concept of nationally and internationally recognized terms addressing product approval. Further revisions were made to maintain consistency with NFPA boiler plate language for alternative product approval.

**313.5** Piping subject to undue corrosion, erosion, or mechanical damage shall be protected in an approved manner.

**Analysis:** The word “undue” is subjective.

**313.7** All piping penetrations of fire resistance rated walls, partitions, floors, floor/ceiling assemblies roof/ceiling assemblies, or shaft enclosures shall be protected in accordance with the requirements of the Building Code, IAPMO Installation Standards and Chapter 15 “Firestop Protection” ~~for DWV and Stormwater Applications.~~

**Analysis:** The title of Chapter 15 has been changed and the requirements in chapter 15 cover more than DWV and Stormwater systems.

**313.9** Plastic and copper piping run through framing members to within one (1) inch (25.4 mm) of the exposed framing shall be protected by steel nail plates not less than 18 gauge.

**Exception:** See Section 1211.9 3.4.

**Analysis:** There was an editorial change to correct a reference number.

**Table 3-2**

<b>Table 3-2</b>			
<b>Materials</b>	<b>Type of Joints</b>	<b>Horizontal</b>	<b>Vertical</b>
Copper Tube and Pipe	Soldered <u>or</u> Brazed <del>or-welded</del>	1-1/2inch and smaller, 6 feet (1829 mm), 2 inch (50 mm) and larger, 10 feet (3048 mm)	Each floor, not to exceed 10 feet (3048 mm) <sup>5</sup>
<u>PEX-AL-PEX</u>	<u>Metal Insert and</u> <u>Metal Compression</u>	<u>1/2 inch (12 mm)*</u> , <u>3/4 inch (20 mm)*</u> , <u>1 inch (25 mm)*</u> , <u>*all lengths 98 inches (2489 mm)</u>	<u>Base and each floor.</u> <u>Provide midstory guides</u>
<u>PE-AL-PE</u>	<u>Metal Insert and</u> <u>Metal Compression</u>	<u>1/2 inch (12 mm)*</u> , <u>3/4 inch (20 mm)*</u> , <u>1 inch (25 mm)*</u> , <u>*all lengths 98 inches (2489 mm)</u>	<u>Base and each floor.</u> <u>Provide midstory guides</u>

**Analysis:** These requirements were added to provide support requirements for these new materials.

**316.1.6 Solvent Cement Plastic Pipe Joints.**

Plastic pipe and fittings designed to be joined by solvent cementing shall comply with appropriate IAPMO Installation Standards.

ABS pipe and fittings shall be cleaned and then joined with listed solvent cement(s).

CPVC ~~and PVC~~ pipe and fittings shall be cleaned and then joined with listed primer(s) and solvent cement(s).

**Exception:** Listed solvent cements that do not require the use of primer shall be permitted for use with CPVC pipe and fittings, manufactured in accordance with ASTM D2845, 1/2 inch through 2 inches in diameter.

PVC pipe and fittings shall be cleaned and joined with primer(s) and solvent cement(s).

**Analysis:** This change recognizes an additional method of joining CPVC pipe and fittings.

**316.1.9 Pressed Fitting.** A mechanical connection for joining copper tubing which used a crimping tool to affix the o-ring seal copper or copper alloy fitting to the tubing. The tubing shall be inserted into the fitting and the crimp shall be made using the tool recommended by the manufacturer.

**Analysis:** The addition of these fittings will allow for another method of joining copper tubing.

**316.3.1** Fixture connections between drainage pipes and water closets and floor outlet service sinks and urinals shall be made by means of approved brass, hard lead, ABS, PVC, or iron flanges caulked, soldered, solvent cemented, rubber compression gaskets, or screwed to the drainage pipe. The connection shall be bolted with an approved gasket, washer, or setting compound between the fixture and the connection. The bottom of the flange shall be set on an approved firm base.

**Analysis:** The addition of these fittings will allow another method of attaching a water closet to vertical piping.

**320.0 Medical Gas and Vacuum Systems.** All such piping shall be installed, tested and verified in compliance with the appropriate consensus standards referenced in Chapter 14 and the requirements of Chapter 13. The Authority Having Jurisdiction shall require evidence of the competency of the installers and verifiers.

**Analysis:** This additional reference reinforces the requirements in Chapter 13 and Chapter 14 especially where to find the standards for the qualification of installers and verifiers.

~~**402.1** The maximum discharge flow rates for plumbing fixture fittings shall be in accordance with applicable standards referenced in Chapter 3 and listed in Table 14-1.~~

**Analysis:** This change clarifies the code in that all plumbing fixture fittings must now meet ASME A112.18.1.

~~**402.5** Non-Metered Faucets. Lavatory faucets shall be designed and manufactured so that they will not exceed a water flow rate of 2.2 gallons (8.4 liters) per minute.~~

**Analysis:** This change clarifies the code in that all plumbing fixture fittings must now meet ASME A112.18.1.

~~402.7 Kitchen Faucets. Faucets for kitchen sinks shall be designed and manufactured so that they will not exceed a water flow rate of 2.2 gallons (8.4 liters) per minute.~~

**Analysis:** This change clarifies the code in that all plumbing fixture fittings must now meet ASME A112.18.1.

~~402.8 402.5 Emergency Safety Showers Heads. Shower heads shall be designed and manufactured so that they will not exceed a water supply flow rate of 2.5 gallons (9.5 liters) per minute. Emergency safety showers shall not be limited in their water supply flow rates.~~

~~Exception: Emergency safety showers.~~

**Analysis:** This change clarifies the code in that all plumbing fixture fittings must now meet ASME A112.18.1. The section number was editorially changed because other changes were made to this code.

### **403.0 Materials – Alternates**

~~Special use fixtures may be made of soapstone, chemical stoneware, or may be lined with lead, copper base alloy, nickel-copper alloy, corrosion-resisting steel, or other materials especially suited for the use for which the fixture is intended.~~

Special use fixtures shall be made of one of the following:

a. Soapstone

b. Chemical stoneware

c. Copper based alloy

d. Nickel based alloy

e. Corrosion resistant steel

f. Other materials lined with lead

g. Other materials suited for the intended use of the fixture.

**Analysis:** This has been amended to make the code consistent with language used in other codes and standards. This change also makes the terms consistent with the IAPMO rules and regulations.

**411.6 Overflows in Flush Tanks.** Flush tanks shall be provided with overflows discharging into the water closet or urinal connected thereto. Overflows supplied as original parts with the fixture and shall be of sufficient size to prevent tank flooding at the maximum rate at which the tank is supplied with water under normal operating conditions and when installed per manufacturer's instructions.

**Analysis:** The revised language clarifies the language of the code to show the overflows are to be maintained as installed per the manufacturer's instructions.

**412. 5** Shower receptors are plumbing fixtures and shall conform to the general requirements therefore contained in Section 401.0. Each such shower receptor shall be constructed of vitrified china or earthenware, ceramic tile, porcelain enameled metal

or of such other material as may be acceptable to the ~~Administrative Authority~~ Authority Having Jurisdiction. No shower receptor shall be installed unless it conforms to acceptable standards as referenced in ~~Chapter 3 and listed in~~ Table 14-1 or until a specification or a prototype or both of such receptor has first been submitted to and approval obtained from the ~~Administrative Authority~~ Authority Having Jurisdiction.

**Analysis:** Standards for showers are not referenced in Chapter 3.

#### **414.1 Limitation of Hot Water Temperature for Public Lavatories**

Hot water delivered from public use lavatories shall be limited to a maximum temperature of 120°F. The water heater thermostat shall not be considered a control for meeting this provision.

**Analysis:** Temperature control was added to help prevent dangerous burns at these fixtures.

**421.0 Limitation of Hot Water in Bathtubs.** The maximum hot water temperature discharging from the bathtub filler shall be 120°F.

**Analysis:** Temperature control was added to help prevent dangerous burns at these fixtures.

### **Table 4-1 Minimum Plumbing Facilities<sup>1</sup>**

Each building shall be provided with sanitary facilities, including provisions for the physically handicapped as prescribed by the Department having jurisdiction. For requirements for the handicapped, ICC/ANSI A117.1 1992, Accessible and Usable Buildings and Facilities, may be used.

<sup>2</sup> Building categories not shown on this table shall be considered separately by the Authority Having Jurisdiction.

**Analysis:** The title of the standard was corrected and the year of the standard was deleted to follow the way other standards are referenced within the text of this code. Footnote<sup>2</sup> was added to help clarify how to determine fixture usage when the category is not listed in the chart.

## **Chapter 5**

This Chapter has been extensively changed to make it consistent with the language used in the National Fuel Gas Code (NFGC) NFPA 54 and other standards covering the installation of water heaters and installation of other fuels used for the heating of hot water. Many of the changes have been taken directly from the NFGC and in many cases the specific section has been referenced such as [NFPA 54:9.28.1.1]. Some of the major changes or areas of change are as follows:

New definitions have been added to aide the user to be able to understand the Code.

Additional information has been added to explain chimney construction and where to find additional information about them.

Tables have been added to give specific information about clearances to combustibles and forms of protection.

Appendix C information on sizing of venting systems was moved into this Chapter.

Drawings have been added to show the methods of bringing combustion air into a building.

ANNEX G and J were added to the this Chapter to aide in understanding how to size the venting system.

The Code now recognizes the new flammable vapor technology for those heaters installed in residential garages and other areas where flammable vapors may be present.

Strikeout and underlining of this Chapter has not been made because virtually all of the Chapter has been changed. For additional information please contact the IAPMO Codes and Education Department.

**603.3.6** Backflow preventers for hot water over 110°F (43.3°C) shall be a ~~listed~~ type designed to operate at temperatures of 110°F (43.3°C) or more rendering any portion of the assembly inoperative.

**Analysis:** The term listed was removed to clarify the code language and section 301.1.1 requires approval of "... All pipe, pipe fittings ...". Section 301.1.1 further states "... shall be listed or labeled ...".

**603.4.1 Water Closet and Urinal Flushometer Valve s** shall be equipped with an an ~~listed~~ atmospheric vacuum breaker. The vacuum breaker shall be installed on the discharge side of the flushometer valve with the critical level at least six (6) inches (152 mm) or the distance according to its listing above the overflow rim of a water closet bowl or the highest part of a urinal.

**Analysis:** The term listed was removed to clarify the code language and section 301.1.1 requires approval of "... All pipe, pipe fittings ...". Section 301.1.1 further states "... shall be listed or labeled ...".

**603.4.2 Water Closet and Urinal Tanks** shall be equipped with a ~~listed~~ ballcock. The ballcock shall be installed with the critical level at least one (1) inch (25.4 mm) above the

full opening of the overflow pipe. In cases where the ballcock has no hush tube, the bottom of the water supply inlet shall be installed one (1) inch (25.4 mm) above the full opening of the overflow pipe.

**Analysis:** The term listed was removed to clarify the code language and section 301.1.1 requires approval of "... All pipe, pipe fittings ...". Section 301.1.1 further states "... shall be listed or labeled ...".

~~**603.4.4.2** For alternate design see Appendix L.~~

**Analysis:** This reference was deleted to clarify the code because alternate methods are already referenced in section 301.2 Alternate Materials and Methods.

**603.4.7 Potable Water Outlets with Hose A t t a c h m e n t s**, other than water heater drains, boiler drains, and clothes washer connections, shall be protected by a ~~listed~~ non-removable hose bib type backflow preventer, a ~~listed~~ non-removable hose bibb type vacuum breaker or by an listed atmospheric vacuum breaker installed at least six (6) inches (152 mm) above the highest point of usage located on the discharge side of the last valve. In climates where freezing temperatures occur, a listed self-draining frost proof hose bibb with an integral backflow preventer or vacuum breaker shall be used.

**Analysis:** The term listed was removed to clarify the code language and section 301.1.1 requires approval of "... All pipe, pipe fittings ...". Section 301.1.1 further states "... shall be listed or labeled ...".

~~**603.4.8 Faucets with Pull-Out Spouts** shall be in compliance with the appropriate standards listed in Table 14-1 that include these specific types of faucets and require an atmospheric vacuum breaker or vent to atmosphere to protect the water supply.~~

**Analysis:** This change clarifies the code in that all plumbing fixture fittings must now meet ASME A112.18.1.

**603.4.9 Water Cooled Compressors, De-greasers** or any other water cooled equipment shall be protected by a ~~listed~~ backflow preventer installed in accordance with the requirements of this Chapter.

**Note:**

Water cooled equipment which produces back-pressure shall be equipped with the appropriate protection.

**Analysis:** The term listed was removed to clarify the code language and section 301.1.1 requires approval of "... All pipe, pipe fittings ...". Section 301.1.1 further states "... shall be listed or labeled ...".

**603.4.10 Water Inlets to Water Supplied Aspirators** shall be equipped with a ~~listed~~ vacuum breaker installed in accordance with its listing requirements and this chapter. The

discharge shall drain through an airgap. When using the tailpiece of a fixture to receive the discharge of an aspirator, the airgap shall be located above the flood level rim of the fixture.

**Analysis:** The term listed was removed to clarify the code language and section 301.1.1 requires approval of "... All pipe, pipe fittings ...". Section 301.1.1 further states "... shall be listed or labeled ...".

~~**603.17 Faucets with Hose Attached Sprays** shall vent to atmosphere under backsiphonage conditions.~~

**Analysis:** This change clarifies the code in that all plumbing fixture fittings must now meet ASME A112.18.1.

**604.1** Water distribution pipe, building supply water pipe and fittings shall be of brass, copper, cast iron, CPVC, galvanized malleable iron, galvanized wrought iron, galvanized steel, PEX, or other approved materials. Asbestos-cement, ~~CPVC~~, PE, PVC, ~~or PEX~~, PEX-AL-PEX, or PE-AL-PE water pipe manufactured to recognized standards may be used for cold water building supply distribution systems outside a building. ~~CPVC~~, PEX, PEX-AL-PEX water pipe, tubing, and fittings, manufactured to recognized standards may be used for hot and cold water distribution systems within a building. PE-AL-PE water pipe and fittings may be used for cold water distribution systems within a building. All materials used in the water supply system, except valves and similar devices shall be of a like material, except where otherwise approved by the ~~Administrative Authority~~ Authority Having Jurisdiction.

**Analysis:** These changes add additional specific materials that can be used to install potable water systems.

~~**604.3** In addition to the required incised marking, all hard drawn copper tubing shall be marked by means of a continuous and indelibly colored stripe at least one quarter (1/4) inch (6.4 mm) in width, as follows: Type K, green; Type L, blue; Type M, red; Type DWV, yellow. All hard drawn copper tubing, in addition to the required incised marking, shall be marked in accordance with sections 19.3.1 and 19.3.2 of ASTM B 88-99. The colors shall be: Type K, green; Type L, blue; Type M, red; Type DWV, yellow.~~

**Analysis:** This change was made to indicate where marking requirements can be found for hard drawn copper tubing.

**604.11 PEX.** Cross-linked polyethylene (PEX) tubing shall be marked with the appropriate standard designation(s) listed in Table 14-1 for which the tubing has been ~~listed as~~ approved. Pex tubing shall be installed in compliance with the provisions of this section.

**Analysis:** The term listed was removed to clarify the code language and section 301.1.1 requires approval of "... All pipe, pipe fittings ...". Section 301.1.1 further states "... shall be listed or labeled ...".

**604.11.1 PEX Fittings.** Metal insert fittings, and metal compression fittings, and cold expansion fittings used with PEX tubing shall be manufactured to and marked in accordance with the standards for the fittings in Table 14-1.

**Analysis:** This change references an additional fitting that can be used to install PEX piping systems.

**604.13 PEX-AL-PEX and PE-AL-PE Crosslinked Polyethylene-Aluminum-Crosslinked Polyethylene (PEX-AL-PEX) and Polyethylene-Aluminum-Polyethylene (PE-AL-PE) composite pipe** shall be marked with the appropriate standard designation(s) listed in Table 14-1 for which the piping has been listed or approved. PEX-AL-PEX and PE-AL-PE piping shall be installed in compliance with the provisions of this section.

**604.13.1 PEX-AL-PEX and PE-AL-PE Fittings.** Fittings used with PEX-AL-PEX and PE-AL-PE piping shall be manufactured to and marked in accordance with the standard for the fittings in Table 14-1.

**604.13.2 Water Heater Connections.** PEX-AL-PEX or PE-AL-PE tubing shall not be installed within the first eighteen inches (18) (457 mm) of piping connected to a water heater.

**Analysis:** These changes add additional specific installation requirements for these piping systems. The eighteen inches length limitations stated in Section 604.13.2 was added to protect the non-metallic piping system, from the heat generated in the water heater and additionally transferred by the vent connector on fuel fired water heater.

**605.5** A control valve shall be installed immediately ahead of each water supplied appliance and immediately ahead of each slip joint ~~or non-metallic fixture supply~~ or appliance supply.

Parallel water distribution systems shall provide a control valve either immediately ahead of each fixture being supplied, or installed at the manifold and shall be identified with the fixture being supplied.

**Analysis:** This change provides clarification on where to place a control valve on parallel water distribution systems.

**609.1 Installation.** All water piping shall be adequately supported in accordance with Section 314.0 ~~to the satisfaction of the Administrative Authority~~. Burred ends shall be reamed to the full bore of the pipe or tube. Changes in direction shall be made by the appropriate use of fittings, except that changes in direction in copper tubing may be made with bends, provided that such bends are made with bending equipment which does not deform or create a loss in the cross-sectional area of the tubing. Changes in direction are allowed with flexible pipe and tubing without fittings in accordance with the manufacturer's

installation instructions. Provisions shall be made for expansion in hot water piping. All piping, equipment, appurtenances, and devices shall be installed in a workman-like manner in conformity with the provisions and intent of the Code. All water service yard piping shall be at least twelve (12) inches (305 mm) below the average local frost depth. The minimum cover shall be twelve (12) inches (305 mm) below finish grade.

**Analysis:** The reference to Section 314.0 tells the user of the code where the pipe support requirements are located in the code.

**609.4 Testing.** Upon completion of a section or of the entire hot and cold water supply system, it shall be tested and proved tight under a water pressure not less than the working pressure under which it is to be used. The water used for tests shall be obtained from a potable source of supply. Except for plastic piping, a fifty (50) pound per square inch (344.5 kPa) air pressure may be substituted for the water test. In either method of test, the piping shall withstand the test without leaking for a period of not less than fifteen (15) minutes.

**Analysis:** There was a concern expressed when using air to test plastic piping systems there could in certain cases, be a failure of the piping system.

**611.4 Sizing of Residential Softeners.** Residential-use water softeners shall be sized per Table 6-8.

**Table 6-8**

**Sizing of Residential Water Softeners**

<u>Required Size of Softener Connection</u>	<u>Number of Bathroom Groups Served<sup>1</sup></u>
<u>3/4 in.</u>	<u>up to 2<sup>2</sup></u>
<u>1 in.</u>	<u>up to 4<sup>3</sup></u>

<sup>1</sup> Installation of a kitchen sink and dishwasher, laundry tray and automatic clothes washer permitted without additional size increase.

<sup>2</sup> An additional water closet and lavatory permitted.

<sup>3</sup> Over four bathroom groups, the softener size shall be engineered for the specific installation.

**Analysis:** This new section and table were added to aide the user of the code in designing these important systems. Many of these systems in the past have been improperly sized.

**710.9** All such sumps and receiving tanks shall be automatically discharged and, when in any “public use” occupancy, shall be provided with dual pumps or ejectors arranged to function alternately in normal use and independently in case of overload or mechanical failure. The pumps shall have an audio and visual alarm, readily accessible, that signals pump failure or an overload condition. The lowest inlet shall have a minimum clearance of two (2) inches (51 mm) from the high water or “starting” level of the sump.

**Analysis:** These changes now clarify that the pumps are to work on an alternate basis and by having an alarm there will be less chance of sewage backup because there is a greater probably the pumps(s) will be repaired.

**712.1 Media.** The piping of the plumbing, drainage, and venting systems shall be tested with water or air except that plastic pipe shall not be tested with air. The ~~Administrative Authority~~ Authority Having Jurisdiction may require the removal of any cleanouts, etc., to ascertain if the pressure has reached all parts of the system. After the plumbing fixtures have been set and their traps filled with water, they shall be submitted to a final test.

**Analysis:** There was a concern expressed when using air to test plastic piping systems there could in certain cases, be a failure of the piping system.

### **723.0 Building Sewer Test**

Building sewers shall be tested by plugging the end of the building sewer at its points of connection with the public sewer or private sewage disposal system and completely filling the building sewer with water from the lowest to the highest point thereof, or by approved equivalent low pressure air test, ~~or by such other test as may be prescribed by the Administrative Authority.~~ The building sewer shall be watertight at all points.

**Analysis:** The revision clarifies the testing requirements for these systems. The change also removes a permissive methodology already available to the Authority Having Jurisdiction as a alternate method should the specific methods of testing not be available.

**801.2.3** Food preparation sinks, steam kettles, potato peelers, ice cream dipper wells, and similar equipment shall be indirectly connected to the drainage system by means of an airgap. Bins, sinks, and other equipment having drainage connections and used for the storage of unpackaged ice used for human ingestion, or used in direct contact with ready-to-eat food, shall be indirectly connected to the drainage system by means of airgap. Each indirect waste pipe from food handling fixtures or equipment shall be separately piped to the indirect waste receptor and shall not combine with other indirect waste pipes. The piping from the equipment to the receptor shall not be smaller than the drain on the unit, but it shall not be smaller than one-half (1/2) inch (25.4 15 mm).

**Analysis:** This change removes a conflict with Section 803.0 by requiring a one-half inch minimum indirect waste pipe. This section also adds additional clarification about the need to protect ice bins, sinks and equipment with food.

**801.4 Connections from Water Distribution System.** Indirect waste connections shall be provided for drains, overflows, or relief pipes from potable water pressure tanks, water heaters, boilers, and similar equipment which is connected to the potable water distribution system ~~by means of an airgap.~~ Such indirect waste connections shall be made by means of a water distribution airgap constructed in accordance with Table 6-3.

**Analysis:** These new changes direct the code user to the requirements for a water distribution airgap and additional clarification on where they are to be installed.

**904.1** The size of vent piping shall be determined from its length and the total number of fixture units connected thereto, as set forth in Table 7-5. The diameter of an individual vent shall not be less than one and one-fourth (1-1/4) inches (32 mm) nor less than one-half (1/2) the diameter of the drain to which it is connected. In addition, the drainage piping of each building and each connection to a public sewer or a private sewage disposal system shall be vented by means of one or more vent pipes, the aggregate cross-sectional area of which shall not be less than that of the largest required building sewer, as determined from Table 7-5. Vent pipes from fixtures located upstream from pumps, ejectors, backwater valves or other devices which in any way obstruct the free flow of air and other gases between the building sewer and the outside atmosphere shall not be used for meeting the cross-sectional area venting requirements of this section.

**Exception:** When connected to a common building sewer, the drainage piping of two (2) or more buildings located on the same lot and under one (1) ownership may be vented by means of piping sized in accordance with Table 7-5, provided the aggregate cross-sectional area of all vents is not less than that of the largest required common building sewer.

**Analysis:** Clarification of this section has been made on how the cross-sectional area of vents is made so the total venting system is properly sized.

**907.2** The yoke vent ~~intersection with~~ connection to the vent stack shall be placed not less than forty-two (42) inches (1067 mm) above the floor level, and the yoke vent ~~intersection with~~ connection to the drainage stack shall be by means of a wye branch fitting placed below the ~~fixture lowest drainage branch connection~~ connection serving that floor.

**Analysis:** Clarification has been added to aide the user of this code in how the yoke vent is to be installed. Some users have been confused by the definition in Section 208.0 that defines a fixture branch.

~~See also Appendix L, Alternate Plumbing Systems, for sizing vent piping systems.~~

**Analysis:** The reference to Appendix L at the end of Chapter 9 was deleted to clarify the code because alternate methods are already referenced in section 301.2 Alternate Materials and Methods.

### **1007.0 Trap Seal Protection**

Floor drain or similar traps directly connected to the drainage system and subject to infrequent use shall be ~~provided with an approved automatic means of maintaining their water seals~~ protected with a trap seal primer, except where not deemed necessary for safety or sanitation by the Administrative Authority. ~~When automatic trap priming devices are installed, they~~ Trap seal primers shall be accessible for maintenance.

**Analysis:** These changes clarify the term trap seal primer and removes extra language from this section that is not needed for code enforcement purposes.

~~**1014.7** No water jacketed grease trap or grease interceptor shall be approved or installed.~~

**Analysis:** Water-jacketed grease traps and grease interceptors are not permitted under current standards.

~~**1016.4 Alternate Design.** Alternate designs for construction or baffling of sand interceptors complying with the intent of this Code may be submitted to the Administrative Authority for approval.~~

**Analysis:** This reference was deleted to clarify the code because alternate methods are already referenced in section 301.2 Alternate Materials and Methods.

~~**1017.3 Combination Oil and Sand Interceptor.** A combination oil and sand interceptor may be installed when the design is approved in writing by the Administrative Authority.~~

**Analysis:** This section was deleted to clarify the code because alternate methods are already referenced in section 301.2 Alternate Materials and Methods.

~~**Chapter 10 – The following language was deleted from Section 1017.3 - See also Appendix H, Procedures for Sizing Commercial Kitchen Grease Interceptors.**~~

**Analysis:** This reference was deleted to clarify the code because Appendix H is non-mandatory and alternate methods are already referenced in section 301.2 Alternate Materials and Methods.

**1101.11.1 Primary Roof Drainage.** Roof areas of a building shall be drained by roof drains or gutters. The location and sizing of drains and gutters shall be coordinated with the structural design and pitch of the roof. Unless otherwise required by the Administrative Authority, roof drains, gutters, vertical conductors or leaders, and horizontal storm drains for primary drainage shall be sized based on a storm of sixty (60) minutes duration and 100-year return period (~~see Appendix D~~).

**Analysis:** The reference to Appendix D was deleted to clarify the code because Appendix D is non-mandatory.

**1101.11.2.4** Scuppers shall be sized as rectangular weirs, using hydraulic principles to determine the required length and resulting overflow head (~~see Appendix D~~). Secondary roof drains and standpipes shall be sized according to Table 11-1. Where standpipes are used, the head allowance required under section 1101.11.2.3 shall be not less than one and one-half (1-1/2) inches (38 mm).

**Analysis:** The reference to Appendix D was deleted to clarify the code because Appendix D is non-mandatory.

## **Chapter 12**

This Chapter has been extensively changed to make it consistent with the language used in the NFPA 54, National Fuel Gas Code and other standards covering the installation of fuel piping. Several of the major changes or areas of change are as follows:

Fuel gas piping systems are limited to 5 psi.

The specific prohibition against liquefied petroleum appliances in a pit or basement was removed.

CSST fuel piping systems were added to the code.

Strikeout and underlining of this Chapter has not been made because virtually all of the chapter has been changed. For additional information please contact the IAPMO Codes and Education Department.

## **Chapter 13**

This Chapter has been extensively changed to make it consistent with the language used in the NFPA 99, Standard for Health Care Facilities and other standards covering the installation of medical and vacuum piping systems. Several of the major changes or areas of change are as follows:

Additional requirements from NFPA 99, Standard for Health Care Facilities were added and or clarified

The standard for qualification system installers is referenced in the code ANSI/ASSE Standard 6010, Professional Qualification Standard for Medical Gas and Vacuum System Installers.

Strikeout and underlining of this Chapter has not been made because virtually all of the Chapter has been changed. For additional information please contact the IAPMO Codes and Education Department.

## **Chapter 14**

The Technical Committee reviewed many proposals to add or update standards that are listed in this chapter. The reference to CABO was changed to ICC because of the three (3) model code organizations merger.

## **Chapter 15**

This Chapter has been extensively changed to make it consistent with the language used in the Building Code, NFPA 5000 and other standards covering the installation of piping penetrations of required fire-resistance rated walls, partitions, floors, floor/ceiling assemblies, roof/ceiling assemblies or shaft enclosures. Several of the major changes or areas of change are as follows:

References the requirements of NFPA 5000.

Requires the protection of all piping systems not just drain, waste, vent and storm water applications per Section 313.7 of the code.

Simplifies the language in the task so it is more easily understood and more easily enforced.

## **Appendix A, B, C and D**

No Technical Changes have been made. Some formatting changes have been made such as using the term Authority Having Jurisdiction.

## **Appendix E**

**Part D – Fuel Supply** This Part of the appendix has been extensively changed to make it consistent with the language used in the following NFPA Standards 501A, NFPA 54, National Fuel Gas Code, NFPA 58, Liquefied Petroleum Gas Code, NFPA 31, Standard for the Installation of Oil-Burning Equipment. Many of the changes have been taken directly from these standards and in many cases the specific section has been referenced such as [NFPA 501A: Section 2.3, 2.3.8, 2.4, and 2.4.5]. Several of the major changes or areas of change are as follows:

Table E 33.1 has replaced the existing Table E-3, the btu values in the new table are less than in the previous table.

Additional piping installation requirements have be added such a cathodic protection.

## **Appendix H**

**H 105.8.1** Grease interceptors shall be permanently and legibly marked with the following:

- (1) Manufacturer's name of trademark;
- (2) Model number;
- (3) ~~Products listed by IAPMO that are covered by this appendix shall be marked with the UPC certification mark with registration © to show compliance with this appendix Listing Mark of a listing agency; and~~

- (4) Any other marking required by law.

**Analysis:** Clarifies the placement of listing marks on products.

## **Appendix I**

"The information contained in this appendix is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this appendix may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the standard."

## **APPENDIX I**

### **INSTALLATION STANDARDS**

The following IAPMO Installation Standards are included here for the convenience of the users of the Uniform Plumbing Code. They are not considered as a part of the Uniform Plumbing Code unless formally adopted as such. These Installation Standards are independent, stand-alone documents published by the International Association of Plumbing and Mechanical Officials and are printed herein by the expressed, written permission of IAPMO.

IS 3-93<sup>E4</sup> 2000 Copper Plumbing Tube, Pipe and Fittings

IS 6-95 2000 Hubless Cast Iron Sanitary and Rainwater Systems

IS 13-94 2000 Protectively Coated Pipe

IS 20-98 2000 CPVC Solvent Cemented Hot and Cold Water Distribution Systems

IS 26-99 2002 Trenchless Polyethylene (PE) Pipe for Sewer Laterals

IS 27-2001 Odor Control Systems for Water Closets

IS 28-2002 Composite PEX AI-PEX Hot and PE-AI-PE Cold Water Distribution Systems

**Analysis:** A leading statement was added before this Appendix to indicate that the IAPMO installation standards are not developed by using the ANSI requirements for an American National Standard. The second statement was added to indicate that these installations standard are a separate series of stand-alone standards published and copyrighted by IAPMO. The standards are referenced in several areas of the code and have been published here for the convenience of the code user. Five (5) of the installation standards were revised and two (2) new installation standards have been added.

## Appendix J and K

No technical changes were made.

## Appendix L

**L 3.2** Single-wall heat exchangers shall be permitted if they satisfy all of the following requirements:

1. The heat transfer medium is either potable water or contains ~~only substances which are recognized as safe by the U.S. Food and Drug Administration~~ essentially nontoxic transfer fluids having a toxicity rating or class of 1 (see 207.0).
2. The pressure of the heat transfer medium ...

**Analysis:** The deletion of U.S. Food and Drug Administration was because the source of toxicity rating has been placed in Section 207.0 of this code "Toxicity Rating Class 1 (reference "Clinical Toxicology of Commercial Products" by Gosselin, Smith, Hodge, & Braddock)".

### **L 7.0 FOG (Fats, Oils & Greases) Disposal Systems**

#### **L 7.1 Purpose**

The purpose of this section is to provide the necessary criteria for the sizing, application and installation of FOG Disposal Systems designated as a pretreatment or discharge water quality compliance strategy.

#### **L 7.2 Scope**

FOG Disposal Systems shall be considered engineered systems and shall comply with the requirements of L 1.0 and L 2.0.

#### **L 7.3 Components, Materials and Equipment**

FOG Disposal Systems including all components, materials and equipment necessary for the proper function of the system shall comply with L 1.4 and L1.5.

#### **L 7.4 Sizing Application and Installation**

FOG Disposal Systems shall be engineered, sized, and installed in accordance with the manufacturer's specifications and as specified in IAPMO PS118-2000, as listed in Chapter 14, Table 14-1 of this Code.

#### **L 7.5 Performance**

FOG Disposal Systems shall be tested and certified as described in IAPMO PS 118-2000, as listed in Chapter 14, Table 14-1 of this Code and other national consensus standards application to FOG Disposal Systems as discharging no more than 100 mg/L FOG.

**Analysis:** The purpose of this new section L 7.0 was added to this appendix to provide clarification for the design and approval of these devices and systems that are not covered in other parts of this code.

## INDEX

The index has been reviewed to verify that when a section is referenced, it actually exists.