

Plumbing Codes / Product Standards/ Products

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As assistance in helping determine how the Plumbing Industry controls products, I will present information that relates the major 'levels' in the industry.

CODES

Plumbing codes are the authority created by legislation within a jurisdiction. Codes are where all requirements for plumbing products originate.

Model Plumbing Codes are written by third party organizations for adoption (sometimes with modification) by jurisdictional authorities (states, counties, cities, provinces etc.) to control the design, construction modification and repair of plumbing systems.

Plumbing Systems include the potable water supply and distribution pipes, plumbing fixtures and traps; water-treating or water-using equipment; soil waste and vent pipes; sanitary and storm sewers and building drains; in addition to their respective connections, devices and appurtenances within a structure or premises.

Plumbing Fixtures are receptacles or devices that are either permanently or temporarily connected to the water distribution system and demands a supply of water therefrom; discharges waste water, liquid-borne waste materials or sewage either directly or indirectly to the drainage system, **i.e. sink, tub and commode are fixtures; faucets or shower heads are not fixtures.**

Plumbing Devices and Appurtenances are manufactured devices, prefabricated assemblies or on-the-job assemblies of component parts that is an adjunct to the basic piping system plumbing fixtures. It demands no additional water supply and does not add any discharge load to a fixture or to the drainage system. **(Our Mixing Valves, Backflow Preventers and Pressure Regulating Valves are essentially devices or appurtenances.)**

Plumbing Product Performance Standards

Plumbing Product Performance Standards are referenced in plumbing codes for applicable required products.

Product Performance Standards are documents which incorporate test procedures for devices, fixtures, appliances and materials pertaining to plumbing and piping systems which are in the interest of protecting the public health. These product standards shall include requirements for safety, health, construction, maintenance, performance and/or operation for equipment and materials for plumbing and piping systems.

UPC-2006 (The UPC has a few east coast and many west coast states that have adopted it.)

The Uniform Plumbing Code shall apply to the erection, installation, alteration, repair, relocation, replacement, addition to use, or maintenance of plumbing systems within this jurisdiction.

Interesting Sections for Honeywell Products

413.1 Limitation of Hot Water Temperature for Public Lavatories.

Hot water delivered for 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.

414.5 Limitations of Hot Water in Bathtubs and Whirlpool Bathtubs.

The maximum hot water temperature discharging from the bathtub and whirlpool bathtub filler shall be limited to 120° F. The water heater thermostat shall not be considered a control for meeting this provision.

418.0 Shower and Tub-Shower Combination Control Valves.

Showers and tub-shower combinations in all buildings shall be provided with individual control valves of the pressure balance, thermostatic, or combination pressure balance / thermostatic mixing valve type that provide scald and thermal shock protection. These valves shall conform to ASSE 1016. Gang showers, when supplied with a single temperature-controlled water supply pipe, may be controlled by a master thermostatic mixing valve in lieu of individually controlled pressure balance, thermostatic, or combination pressure balance / thermostatic mixing valves. Handle position stops shall be provided on such valves and shall be adjusted per the manufacturers instructions to deliver a maximum mixed water setting of 120° F (49° C). The water heater thermostat shall not be considered a suitable control for meeting this provision.

603.0 Cross-Connection Control No person shall install any water operated equipment or mechanism, or use any water-treating or chemical or substance if it is found that such equipment, mechanism, chemical or substance may cause pollution or contamination of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention device or assembly.

603.2.4 Double Check Valve Backflow Prevention Assembly (DC) A double check valve backflow prevention assembly consists of two independently acting internal loaded check valves, four properly located test cocks, and two isolation valves.

Honeywell has no product that meets any Backflow Preventer requirements under the UPC. ASSE 1012 and ASSE 1024 devices are not allowed (BP700 and BP900 models).

608.2 Excessive Water Pressure. Where static water pressure in the water supply piping is in excess of 80 pounds per square inch (552kPa), an approved type pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to 80 psi or less. Such regulators shall control the pressure to all water outlets in the building unless otherwise approved by the jurisdiction equipped with a properly sized and sloped bore-sighted drain to daylight, shall be protected from body or disconnecting the supply piping...

IPC 2006

101.2 Scope. The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems within this jurisdiction...

Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the *International Residential Code*.

Definitions:

Hot Water - water at a temperature equal to or greater than 110° F (43° C).

Tempered Water - water having a temperature range between 85° F (29° C) and 110° F (43° C).

408.3 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to a maximum temperature of 110° F (43° C) by a water temperature limiting device conforming to ASSE 1070.

416.5 Tempered water for public hand-washing facilities. Tempered water shall be delivered from public hand-washing facilities through an approved water temperature limiting device that conforms to ASSE 1070.

424.5 Bathtub and whirlpool bathtub valves. The hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a maximum temperature of 120° F (49° C) by water temperature limiting device that conforms to ASSE 1070, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section 424.3.

501.2 Water heater as space heater. Where a combination potable water heating and space heating system requires water for space heating at temperatures higher than 140° F (60° C), a master thermostatic mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable hot water distribution system to a temperature of 140° F (60° C) or less. The potability of the water shall be maintained throughout the system.

501.6 Water temperature control in piping from tankless heaters. The temperature of water from tankless water heaters shall be a maximum of 140 °F (60 °C) when intended for domestic uses...

607.1 Where required. In residential occupancies, hot water shall be supplied to all plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance purposes. In nonresidential occupancies, hot water or tempered water shall be supplied for bathing and washing purposes. Tempered water shall be supplied through a water temperature limiting device that conforms to ASSE 1070 and shall limit the tempered water to a maximum of 110 °F (43°C). This requirement shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

613.1 Temperature-actuated mixing valves. Temperature-actuated mixing valves which are installed to reduce water temperatures to defined limits, shall comply with ASSE 1017.

IRC-2006

R101.2 Scope. The provisions of the *International Residential Code for One- and Two-family Dwellings* shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above-grade in height with separate means of egress and their accessory structures.

Definitions:

Hot Water - water at a temperature equal to or greater than 110° F (43° C).

P2713.3 Bathtub and whirlpool bathtub valves. The hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a maximum temperature of 120° F (49° C) by a water temperature-limiting device that conforms to ASSE 1070, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section P2708.3.

P2721.2 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to a maximum temperature of 110° F (43° C) by a water temperature-limiting device that conforms to ASSE 1070.

P2802.2 Temperature control. Where a combination water heater-space heating system requires water for space heating at temperatures exceeding 140° F (60° C), a master thermostatic mixing valve complying with ASSE 1017 shall be installed to temper the water to a temperature of 140°F (60 °C) or less for domestic uses.

P2902 Table P2902.3 Application for Backflow Preventers allows both ASSE 1012 and ASSE 1024 type Backflow Preventers.

P2902.3.3 Backflow preventer with intermediate atmospheric vent. Backflow preventers with intermediate atmospheric vent shall conform to ASSE 1012 or CSA CAN/CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged.

P2902.5.1 Connections to boilers. The potable supply to the boiler shall be equipped with a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012 or CSA CAN/CSA B64.3. Where conditioning chemicals are introduced into the system, the potable water shall be protected by an air gap or reduced pressure principle backflow preventer complying with ASSE 1013, CSA CAN/CSA B64.3 or AWWA C511.

P2903.3.1 Maximum pressure. Maximum static pressure shall be 80 psi (551kPa). When main pressure exceeds 80 psi, an approved pressure-reducing valve conforming to ASSE 1003 shall be installed on the domestic water branch main or raiser at the connection to the water-service pipe.

P2903.4 Thermal expansion control. A means for controlling increased pressure caused by thermal expansion shall be installed where required in accordance with sections P2903.4.1 and P2903.4.2.

2005 National Plumbing Code of Canada (It invokes the National Building Code)
(With Dec 1, 2007 changes)

2.2.10.7. Water Temperature Control (See Appendix A.)

- 1) Except as provided in Sentence (2), all valves supplying fixed-location shower heads shall be individual pressure-balanced or thermostatic-mixing valves conforming to ASME A112.18.1/CSA B125.1, "Plumbing Supply Fittings."

- 2) Individual pressure-balanced or thermostatic-mixing valves shall not be required for showers having a single tempered water supply that is controlled by a master thermostatic-mixing valve conforming to CSA B125.3, "Plumbing Fittings."

- 3) All mixing valves supplying shower heads shall be of the pressure-balanced, thermostatic, or combination pressure-balanced/thermostatic type capable of
 - a) maintaining a water outlet temperature that does not exceed 49°C, and
 - b) limiting thermal shock.

- 4) The temperature of water discharging into a bathtub shall not exceed 49°C.

2.6.1.12. Service Water Heaters

- 1) Thermostat controls for electric *storage-type service water heaters* shall be set at a temperature of 60°C. (See Appendix A.)

A-2.2.10.7. Hot Water Temperature. Hot water delivered at 60°C will severely burn human skin in 1 to 5 seconds. At 49°C, the time for a full thickness scald burn to occur is 10 minutes. Children, the elderly and persons with disabilities are particularly at risk of scald burns. Compliance with Article 2.2.10.7. will reduce the risk of scalding in showers and bathtubs, and reduce the risk of thermal shock from wall-mounted shower heads.

These requirements apply to all occupancies, not just residential occupancies.

The water outlet temperature at other fixtures, such as lavatories, sinks, laundry trays or bidets, is not addressed by Article 2.2.10.7., but a scald risk may exist at such fixtures nonetheless.

A-2.6.1.12.(1) Service Water Heaters. Storing hot water at temperatures below 60°C in the hot water tank or in the delivery system may lead to the growth of Legionella bacteria. Contemporary electric water heater tanks experience temperature stratification and thus tend to have Legionella bacteria in the lower parts of the tank. Article 2.6.1.12. specifies a thermostat setting of 60°C, which addresses the concern over the growth of Legionella bacteria in electric hot water storage tanks and is enforceable without introducing unnecessary complications. The growth of Legionella bacteria is not a concern for other types of water heaters with different designs that use different fuels.

Electrically heated water heaters are shipped with the thermostat set at 60°C. Article 2.6.1.12. is included in the NPC to formalize this de facto temperature setting as a requirement. The thermostats have graduated temperature markings to allow such a setting, which is not the case with gas- or oil-heated water heaters.

The 2005 National Building Code of Canada has the following sections:

Table 7.2.1.1

Objectives F31-OS3.2 -To minimize the risk of injury to person as a result of contact with hot surfaces or substances.

Current Honeywell Valves meet the following listed **product performance standards**

Thermostatic Mixing Valves

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|------------------|---------------|---------------|------------|-----------|
| ASSE 1017 - 2003 | AM-1 Series | AM1070 Series | AMX Series | MX Series |
| ASSE 1070 - 2004 | AM1070 Series | UMV Series | | |

Pressure Regulating Valves

| | | | |
|------------------|-------------|-------------|-------------|
| ASSE 1003 - 2001 | DS05 Series | D05T Series | DS06 Series |
|------------------|-------------|-------------|-------------|

Backflow Preventers

| | |
|------------------|--------------|
| ASSE 1012 - 2002 | BP900 Series |
| ASSE 1024 - 2004 | BP700 Series |