

UPC 2015 – (610.14)

Item # 215 Comment

Hot Water Distribution – Insulation Requirements

Add new text as follows:

**610.14 Pipe Insulation.** Insulation of domestic hot water piping shall be in accordance with Section 610.14.1 and Section 610.14.2.

**610.14.1 Insulation Requirements.** All domestic hot water piping shall be insulated.

**610.14.2. Pipe Insulation Wall Thickness.** Hot water pipe insulation shall have a minimum wall thickness at least equal to the diameter of the pipe for any pipe up to 2 inches (50 mm) in diameter. Insulation wall thickness shall be not less than 2 inches (50 mm) for any pipe of 2 inches (50 mm) or more in diameter.

**Exception:**

- (1) Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.
- (2) Hot water piping between the fixture control valve or supply stop and the fixture or appliance shall not be required to be insulated.

**REASON STATEMENT:**

- This proposal, as originally filed, was intended to address the excess purging of water through a hot water piping system. Based on the comments made by the Technical Committee, as well as discussions with various experts and proponents, this proposal is intended to accomplish that original purpose.
- Cold or tepid water in the initial draw from a hot water outlet is often unusable for its intended purpose, and is frequently purged, resulting in a waste of water, energy, and time for building occupants. Insulating the hot water piping has the effect of reducing the time it takes for hot water to arrive at the outlet (time-to-tap) and reducing the amount of water wasted while waiting for the hot water (volume-to-hot). Insulating the hot water piping also has the effect of reducing the energy losses during use and when the water in the pipe cools down between uses.
- In 2009, an analysis led by Robert Hendron of the National Renewable Energy Laboratory (which is attached) quantified the waste of hot water in initial draws waiting for water to reach 105° F. Modeling the plumbing typical of a 3-bedroom, 2-bath, single-story home found that an estimated 12 percent of all hot water used on an annual basis is wasted. Purging at showers, kitchen sinks, and lavatory faucets was responsible for 95 percent of the estimated total of nearly 3,000 gallons of hot water wastage annually. Pipe insulation can reduce this waste of hot water and energy by 15 to 30 percent. Of course, many new homes are built with more hot water outlets than this model's base case, and with hot water distribution systems that are far less efficient.

- Also attached is a summary of the benefits of pipe insulation, including estimated costs.