



DEPARTMENT OF ADMINISTRATIVE SERVICES

PROPOSED CHANGE OF THE CONNECTICUT STATE BUILDING CODE AND FIRE SAFETY CODE

DATE SUBMITTED: April 14, 2024

CODE INFORMATION

Proposed change to: [x] Building Code [] Fire Safety Code

Code section(s): P2801 IRC Chapter 28 "Water Heaters"

PROponent INFORMATION

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PROPOSAL INFORMATION

Description of change and reason for change (attach additional information as needed):

Add temperature control requirement language for health & safety similar to IPC section 607

Proposed text change, addition or deletion (attach additional information as needed):

Additional text, see attached

Supporting data and documents (attach additional information as needed)

The temperature control devices on standard "tank" water heaters are insufficient, see attach [x]

[] This Proposal is original material. (Note: Original material is considered to be the submitter's own idea based on or as a result of his/her own experience, thought or research and, to the best of his/her knowledge, is not copied from another source.)

[x] This Comment is not original material, its source (if known) is as follows: (such as material / code development proposal from a prior development cycle or proposal submitted to model code committee etc.) Carried over from IPC with alterations appropriate for IRC

[] I would like to make an in-person presentation of my proposal.

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Proponent's Signature

Roger Stolting Printed Name

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Reasoning for requiring the addition of a thermostatic Mixing/Tempering Valve to tank type water heater installations and/or systems.

- Manufacturers actually recommend this addition to “reduce” the risk of scalding
- Repeated small draws of water can cause the hot and cold water in the tank to “stack” in layers. If this happens, the water can be as much as thirty degrees hotter than the thermostat setting.
- Defects or problems with thermostat(s), or other malfunctions may and often do result in higher than expected water temperatures. (I used to always keep replacement thermostats in my service van)
- In atmospheric gas or oil water heaters the thermostats are in the lower section of tank, the burner is under tank and if there is any hardness in the water sediment will accumulate. This sediment creates an insulation barrier allowing the ability of steam to form bubbling to the top creating stratification in the tank with excessive high temp in the top layer. We regularly used to install a bypass between the top & bottom of tank to help with equalizing the temp on oil fired heaters.
- The high limit safety controls integrated in heaters are designed to shut heater down only when temps are at extreme high limit, above 150 and as high as 180 degrees F.
- Adding a “thermostatic” mixing/tempering valve necessitates the tank temperature to be set higher than mixing valve set point, ideally 10 degrees plus or the valves will not work properly. This also will help with bacteria/Legionella control which is a real thing. Outbreaks do occur often.
- Vermont has required water storage at 140 degrees for several years now, mixing valves are installed on all water heaters there.
- **The Electrification Initiative is pushing for more electricity based water heaters. Whether Heat Pump or conventional electric resistance. The recovery rate on electric water heaters is substantially reduced compared to fossil fuel units. This is now pushing higher storage temperatures to offset the reduced recovery.**
- Most all Mixing/Tempering valve manufacturers offer a “Direct connect” version allowing for fast competitive installations.
- Adding a mixing/tempering valve to a tank water heater stabilizes leaving water temperatures as well as increases the first hour delivery. For instance, if the temp on heater is set to 140 degrees with a 120 degree mixing valve setting the capacity of a 50 gal heater would perform like that of a 65 gal. heater (based on 50 cold temp entering)
- Unlike tank technology, gas tankless water heaters measure the water temp in multiple locations including the discharge temp and will precisely control the discharge temp by controlling the fuel input as well as internal electronic mixing valve(s). Tankless water heater manufacturers as well as “Combi” heaters that **do** need/require mixing valves call them out in the install instructions. That said requiring tankless water heaters installs to have added mixing valves when not necessary in hard and moderately water conditions can prematurely case their coils to scale. The higher the temperature settings on this technology the faster they scale thus requiring more maintenance as well as operating at lower efficiencies.

In conclusion, requiring mixing valves on tank type water heaters adds safety, helps eliminate a breeding ground for bacteria, increases the usable amount of hot water & stabilizes water temperatures at a reasonable install cost expense.

New “added” Language to Chapter 28

“Water Heaters” of the 2024 IRC:

P2801.1.1 Temperature limiting means.

A thermostat control for a water heater shall only serve as the temperature limiting means for the purposes of complying with the requirements of this code for maximum allowable *hot* or *tempered water* delivery temperature at fixtures where the water heater complies with ASSE 1082.

P2801.1.2 Tempered water temperature control.

Tempered water shall be controlled by one the following:

1. A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 and set to not greater than 110°F (43°C).
2. A thermostatic mixing valve conforming to ASSE 1017.
3. A water heater conforming to ASSE 1082
4. A tankless gas or electric water heater with integrated control(s) that maintain discharge accuracy within 5 degrees of setting

This provision shall not supersede the requirement for protective shower valves in accordance with Section P2708.4 (Shower Control Valves).

P2801.1 becomes P2801.2 Drain Valves

P2801.2 becomes P2801.3 Installation

P2801.3 Becomes P2801.4 Location

P2801.4 Becomes P2801.5 Prohibited Location

P2801.5 Becomes P2801.6 Required Pan

P2801.5.1 Becomes P2801.6.1 Pan Size & Drain

P2801.5.2 Becomes P2801.6.2 Pan Drain Termination

P2801.5.3 Becomes P2801.6.3 Appliance, Equipment & Insulations in Pans

P2801.6 Becomes P2801.7 Water Heaters Installed in Garages

P2801.7 Becomes P2801.8 Water Heater Seismic Bracing

P2801.8 Becomes P2801.9 Lead Content