

White Paper

Eliminating Risk of Scalding in Public Handwashing

Water temperatures over 120 °F at the point-of-use are considered hazardous, with higher temperatures having the potential to cause second or third-degree burns. Simply buying a mixing valve and plumbing it into an existing water heater doesn't always meet current plumbing codes. However, by understanding the latest advancements in water tempering technologies and devices—and insuring that they are installed and maintained properly—scald injuries can be prevented.

Electric Tankless Water Heaters with Integrated Code-Compliant Mixing Valves Provide Safe Hot Water On Demand

Scalding can be caused by a variety of scenarios. In some cases, water heater thermostats are faulty, or set too high. In others, temperature regulating valves at the hot water source are malfunctioning, or missing altogether.

Scald injuries are tremendously painful and scarring can last for years or be permanent. Victims of these potentially life-changing injuries not only suffer physically, this could be coupled with anxiety, depression, or other psychological trauma—the reality is, the cost of

AccuMix II™, shown below, installed at the point-of-use under a handwashing sink.

For consistent, safe, hot water output, AccuMix II is the ideal solution in single and multi-lavatory handwashing applications in stores, restaurants, medical environments, office buildings, factories, and more.

No threat of scalding or temperature spikes, AccuMix II is the first thermostatic temperature controlled heater with a code-compliant integrated mixing valve.



scald injuries can be high. For employees, workers' compensation pays only a portion of lost wages. Some may not be able to return to their pre-injury job, requiring employers to bear the costs associated with lost productivity, reduced competitiveness, employee rehiring and retraining, as well as possible increases in their workers' compensation premiums.

TANK-TYPE WATER HEATER SCALD HAZARDS

Water heater tanks are traditionally set to 120 °F – 140 °F to prevent the development of harmful bacteria, such as Legionella. A water temperature of 140 °F can burn a child in as little as 2.5 seconds.¹

Tank-type water heaters can lack precision in water temperature control. Consumers, and even installers, may assume that water heaters can be controlled with accuracy from the thermostat setting alone— this is not correct. Setting a tank-type unit to 120 °F does not necessarily mean that the outlet water temperature will

not exceed the set temperature. Temperatures over 120 °F at the point-of-use are considered dangerous for use by at-risk groups for scald injuries, such as children, elderly, or disabled persons.

When cold water is introduced at the bottom of a tank-type water heater, the thermostatic control senses the cold water, automatically turning the burner (or heating element) on. The convective action of the hot water in the tank can cause overheating of the water at the top of the tank. This scenario is called thermal layering, which can

result in temperatures in excess of 140 °F at the top of the storage tank. When a person turns on the water, and adjusts it to a perceived comfortable temperature, the water temperature could unexpectedly—and suddenly—spike to a dangerous scalding level. It is for this reason that plumbing codes have added language mandating that the thermostatic control on the water heater **not** be used as the final temperature control to prevent scalding and thermal shock.²

KNOW THE CODES

Throughout modern history, plumbing codes have changed or been updated to adapt to current technologies and enforce understood best practices. What may

have worked before might not work now with new water heaters. Simply buying a mixing valve and plumbing it into an existing water heating system doesn't always meet the latest codes. The American Society of Sanitary Engineering (ASSE) Scald

Awareness Task Group was formed to educate and give guidance to the general public and plumbing industry on scalding hazards associated with hot water at the point-of-use.

Section 407.3 of the Uniform Plumbing Code (UPC) is titled *Limitation of Hot Water Temperature for Public Lavatories*, and states: "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." UPC 407.3, when used as the basis for municipal building code, is the actual standard which must be met from a regulatory standpoint.

In contrast, ASSE 1070 is a standard that applies to mechanical mixing valves to ensure that they comply with UPC 407.3. It states: "Water temperature limiting devices are intended to supply tempered water to plumbing supply fittings, or to be integral with plumbing supply fittings supplying tempered water; intended to reduce the risk of scalding; and not intended to protect against thermal shock. Water Temperature limiting devices shall have a fixed (non-adjustable) temperature setting; or temperature setting that can be adjusted and locked in position; or adjusted with the use of a tool to protect against ready adjustment by the user."³

A STRAIGHTFORWARD & SAFE SOLUTION

Thermostatic mixing valves, installed at the point-of-use, maintain and limit the inlet hot water to the desired outlet temperature, helping to prevent painful scalding injuries.

Essentially the mechanical mixing valve should be thought of as a cooling device; mixing enough cold water into a stream of hot water to lower the outlet temperature at the faucet to less than 120 °F. The mixing valve serves as a safety mechanism in a public lavatory to prevent scalding.

ACCUMIX II FEATURES

- Integrated ASSE 1070 certified mixing valve
- Power modulating controls with continuous self-tuning software
- Digital display and diagnostic codes
- SafeStart™ dry-fire prevention technology
- Silent operation (all units except AM012240T)
- Mounts in any orientation

To learn more, please visit: eemax.com/products-for-you/accumix_ii/



In order to meet the provisions of UPC 407.3, Eemax has added an ASSE 1070 code-compliant mechanical mixing valve to the AccuMix II Series of electric tankless water heaters. The AccuMix II heaters feature an internally calibrated mixing valve and circuit board which work together to limit the hot or tempered water delivered at the faucet. With AccuMix II, the temperature of the heater is factory-set to 105 °F for handwashing applications.

Commercial buildings are required to meet plumbing codes. Specifying AccuMix II ensures code compliance with fewer connections and simplified fittings, thus cutting down on installation time and cost. AccuMix II, with an ASSE 1070 rated integrated mixing valve, provides safe, code compliant, public handwashing. ■

REFERENCES

¹ The Pulse. "Burn Safety—Stay Out of Hot Water!" <http://www.stlouischildrens.org/articles/wellness/burn-safety-stay-out-hot-water>. Children's Hospital, St Louis., Web. 17 Oct. 2018.

² ASSE Scald Awareness Task Group "Understanding Potential Water Heater Scald Hazards." <http://www.asse-plumbing.org/WaterHeaterScaldHazards.pdf>. ASSE International Office. March 2012. Document. 22 Sept. 2018.

³ International Association of Plumbing and Mechanical Officials. "Uniform Plumbing Code." <http://www.iapmo.org>. IAPMO Group. n.d. 12 Sept. 2018.

ABOUT EEMAX, INC.

Providing endless hot water is our business. Eemax delivers a robust portfolio of electric tankless water heaters that are designed for easy, flexible installation, are engineered with advanced capabilities, and are industry-leading when it comes to innovation. Headquartered in Waterbury, CT, Eemax has a sales presence in 30 countries worldwide through plumbing wholesale distribution channels and major retail outlets. Visit eemax.com to learn more.

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