Thermostatic Valves: Solution to a Double-Edged Problem

Water too hot leads to scalding; not hot enough can breed *Legionella* bacteria

BY HEATH SHARP

In today's competitive business environment, plumbing contractors need products and ideas that open the door to new sales opportunities—especially when there's a solid benefit to the customer. When that benefit addresses a legitimate safety concern related to hot water storage and delivery, contractors can enjoy the classic marketing advantage of fear as a sales motivator.

With this set of market circumstances in place, it's a little surprising that the U.S. market has been slow to adopt thermostatic mixing valve technology for universal water temperature control (complying with ASSE [American Society of Safety Engineers] 1017). Exploring the "fear" aspects of this situation, consider the following:

A new research study (published in October 2002 and posted on the www.legionnella.com Web site) illustrates the seriousness of the *Legionella* bacteria health issue with its provocative title, "Legionnaires' Disease Contracted from Patient Homes: The Coming of the Third Plague?" Among other findings, the study recaps research data from around the world to document the threat of *Legionella* bacteria in residential water systems, due in part to water heaters being set below 140 degrees Fahrenheit to prevent scalding injuries.

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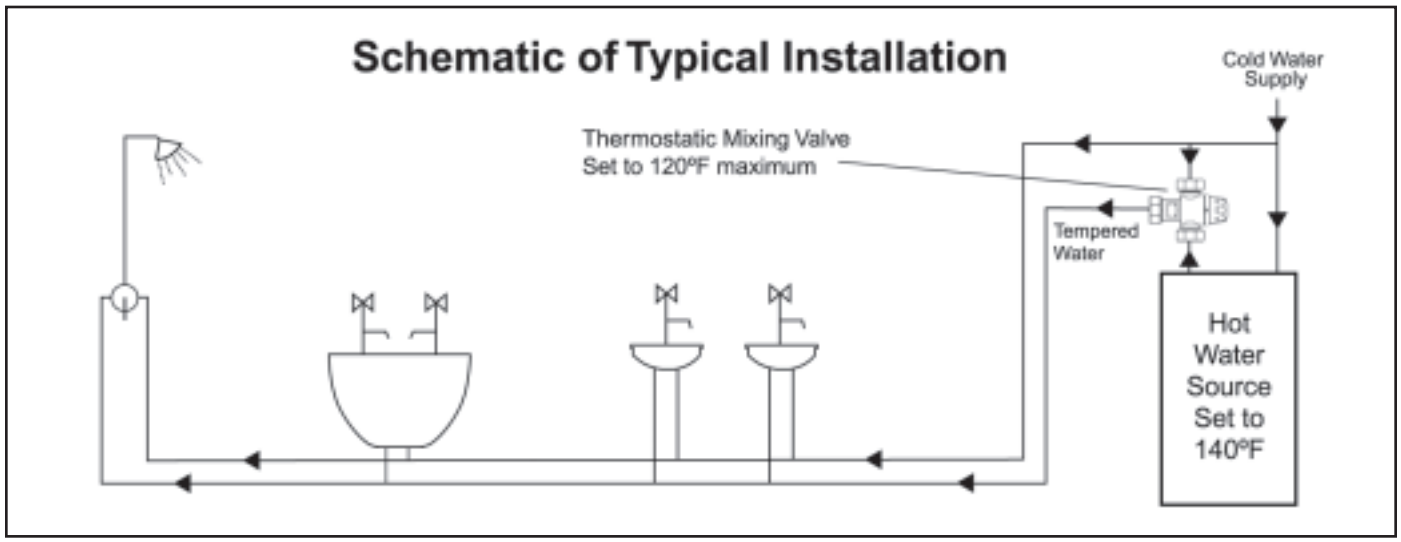
According to the U.S. Consumer Products Safety Commission, approximately 3,800 injuries and 34 deaths occur each year due to scalding from excessively hot tap water in residential settings. The National Safe Kids Campaign puts the numbers even higher, reporting some 6,500 scald injuries annually.

In an over-litigated society known for dramatic liability judgments, it should come as no surprise that there is a trade group focused exclusively on scalding injuries. The Association of Trial Lawyers of America actually has a Tap Water Burn Litigation Group with its own Web site at www.tap-water-burn.com.

It's a classic case of irony. Some water heaters are set low enough to prevent scalding, but this can allow growth of the deadly *Legionella* bacteria. Others are set high enough to kill the germs, but this can result in thousands of burn injuries and dozens of deaths each year. And the liability lawyers are grinning all the while, knowing one way or the other there's a judgment to be had.



The Thermostatic Valves Solution

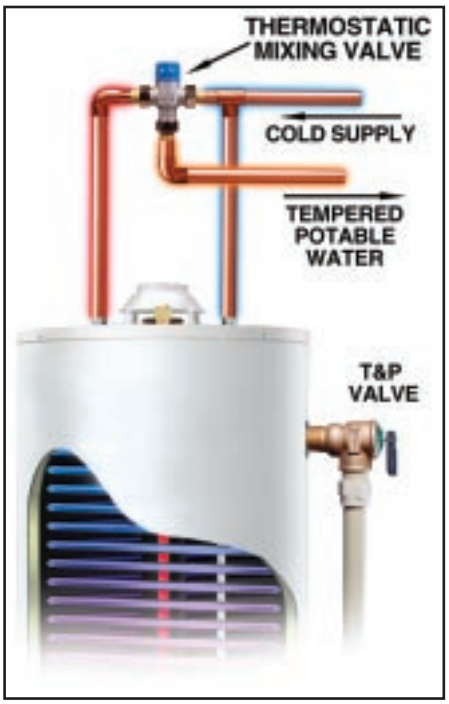
With the potential for bad press and expensive litigation, it's pretty amazing that U.S. plumbing wholesalers and contractors haven't made a faster jump to a proven solution: thermostatic mixing valves. Distinct from pressure-balancing valves traditionally intended specifically for single shower fixtures, thermostatic valves allow the water heater to be set at a germ-killing 140 degrees while dispensing water to all hot water outlets in the home at a safe 120 degrees (or lower if desired).

State and local codes in the United States don't yet universally require this solution as they do in some countries. For some years now, Australia and New Zealand have had legislation stipulating the dual requirements of high storage temperatures and controlled supply temperatures to all outlets used for bathing purposes. The growing awareness of the dangers of Legionnaires' disease and of hot tap water, along with the success of the programs in Australia and New Zealand, has led many countries to consider similar legislation. The United Kingdom and France are close to adopting similar codes, with other European countries expected to follow. Closer to home, there have been extensive discussions recently in Canada addressing this issue. The result is proposed legislation demanding high storage/low distribution temperatures to be implemented within the next several months.

While U.S. codes do not require this solution at the moment, controlling hot water to all outlets is certainly permitted. Indeed, this practice is supported by many inspectors and major contractors, and there is an increased understanding that protecting only the shower is not really acceptable given today's needs. In fact, many local codes and local interpretations of the major codes already require controlled temperature water to all outlets.

Most notably, Chicago has passed an ordinance introducing new general regulations for plumbing, with Section 18-29-607.1.1 specifically requiring water temperature to be a maximum of 115 degrees for all lavatory faucets in all public buildings. The code allows the choice of multiple solutions. The first is based on a 1017 device, such as the Heatguard 100 developed by Reliance. This style of valve is typically installed at the water heater, thus providing a safer water temperature throughout the building. The second solution is based on a 1016 device, such as the Heatguard 160, or the newer compact Heatguard 145 specifically intended for single electronic faucets.

With growing awareness that hot water from any outlet can be dangerous, it is anticipated that more codes will specify universal temperature control via a 1017-style device. In addition to allowing compliance with such code changes, thermostatic valve installation offers the following advantages:



- Controlled temperature water can be delivered to multiple outlets. Rather than just protecting a single shower, as achieved by a traditional 1016 shower valve, a 1017 distribution valve can control the water temperature to several hot water outlets.
- The water heater can be set to 140 degrees. A higher thermostat setting allows more efficient operation and delivery of hot water from the water heater, and it increases the effective volume of hot water from that heater. Consider a 75-gallon heater. At a thermostat setting of 120 degrees, the heater can deliver approximately 100 gallons of 100-degree water (when mixed with 25 gallons of 40-degree cold water at the point of use). The same heater at 140 degrees can deliver approximately 125 gallons of 100-degree water to the point of use (when mixed with 50 gallons of 40-degree cold water). This is an effective increase of 25 gallons.

Furthermore, storing water at 140 degrees minimizes the growth of *Legionella* bacteria within the water heater. The latest information indicates that Legionnaires' disease, caused by *Legionella* bacteria, is a grossly under-diagnosed condition with similar symptoms to pneumonia. According to the Centers for Disease Control and Prevention Web site (www.cdc.gov), 8,000 to 18,000 people contract Legionnaires' disease each year, with the illness fatal to some 5 to 30 percent of those infected.

These bacteria enjoy warm water environments and are thus a potential problem in hot water distribution systems. A water temperature of 120 degrees or less can provide conditions that allow *Legionella* to thrive. Increasing the stored water temperature to 140 degrees kills the majority of these bacteria.

A wider choice of point-of-use fittings is now available. The use of an ASSE 1017 distribution valve complements a wide selection of point-of-use fittings. The choice of an ASSE 1016 single-handled fitting is still available for shower fixtures and is in fact recommended as protection against thermal shock and as an additional convenience for the consumer.

If ever there was a plumbing product that offered contractors true growth potential for both new construction and the retrofit market, the thermostatic valve is it. And when the product offers customers legitimate benefits of better health and more hot water, it's a winning situation for all concerned.

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