Avoiding the Hidden Handwashing Hazard

By Ryan Pfund

Every year, scalding hot water burns thousands of Americans. Children, the elderly and disabled people are most susceptible to scalding burns since their skin is thinner and more sensitive to higher temperatures. The majority of scalding incidents occurs in the shower or bathtub – after all, the entire body is exposed to hot water while bathing. But another potential hazard is often overlooked – the potential of scalding in lavatories and sinks used for handwashing. If the water is hot enough, it only takes a few seconds to inflict a serious injury.

Consider this fact: a child exposed to 140°F tap water for three seconds can sustain third-degree burns that would require hospitalization and skin grafts. As the temperature of water decreases, so does the length of exposure required to inflict a burn. Still, everyone feels the pain from water temperatures over 110 degrees, even if it does not result in a severe burn.

Scalding risk is not a new topic. There have been many documented cases of scalding injuries over the years, and many of the plumbing codes that exist today are designed to prevent accidental scalding. On the surface, it seems the easiest solution is simply to turn down the hot water heater. If a hot water heater is set between 110 and 120°F , the potential for severe burning decreases. This is not always a realistic solution, however, if hot water is needed for laundry machines, dishwashers or mop sinks. And there is another danger that is not always considered with lower water temperature – Legionellae.

Legionellae is a bacterium that grows in stored water. It can cause a type of pneumonia called Legionnaires disease, which can be fatal. Its ideal growth range is 95 to 115°F, but it can grow or survive in temperatures as high as 122°F. At a higher temperature, such as 131°F, bacteria will die in about five hours. At 140°F, it takes 30 minutes for bacteria to die. Of course, these temperatures put people at risk for scalding.

The Solution

Fortunately, there are solutions available. Pressure balancing or thermostatic valves allow the water heater to be turned up to temperatures high enough to prevent Legionellae growth, but still provide scald protection to the user. Many state plumbing codes now mandate the use of these devices. It makes good sense to use these valves in showers and bathtubs where the entire body is exposed to hot water, but do not overlook the potential dangers of scalding with hand washing fixtures.

While a smaller area of the body is exposed to hot water during handwashing, and removing hands from hot water is easier than removing your entire body, the pain of only a second of hot water can still be severe and possibly dangerous. Another downside is that users will not wash their hands properly if the water is too hot. The germs from improper handwashing can lead to a whole other set of problems. The smart solution is to ensure the handwashing fixture is also protected with a thermostatic mixing valve.

Many manufacturers make thermostatic mixing valves specifically designed to control the water temperature in faucets used for washing hands. These can be placed under the counter at the point of use, which allows a higher water temperature of 120°F (or greater) to be delivered to the valve. Hot water is blended with cold water to deliver a safe temperature of about 100°F.

Once the temperature is set, a thermostatic mixing valve will hold water to the specified temperature even if incoming water temperatures change. The higher incoming water temperature helps prevent the spread of Legionellae and the thermostatic mixing valve prevents the risk of scalding.

Find the Size That Fits

Public restrooms come in many shapes and sizes with a varying number of lavatories, depending on traffic volume and the potential number of users. To accommodate these different needs, thermostatic valves are available in a range of sizes. In a restroom with just one or two lavatories, a small thermostatic valve designed to control water temperature from 0.5 gallons per minute (gpm) to 4.0 gpm can be used. These small valves can be installed directly under the sink, providing water to a variety of faucets, including single-lever, infrared or mechanical-metering faucets.

Large restrooms found in assembly spaces, such as convention centers, airports, stadiums and schools, can have

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Most lavatory systems have built-in thermostatic mixing valves that are properly sized for the handwashing station.

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dozens of lavatories. Asmall valve under each lavatory would work, but it would also be expensive. Specifying a larger valve designed to control water temperatures from 0.5 gpm to 8.0 gpm, or even 15.0 gpm, makes it possible to run many lavatories off of just one thermostatic mixing valve.

Consider the Source

Another consideration when selecting a thermostatic valve is the type of faucet used. Single-lever or two-handle faucets will have the ability to deliver more water than metered faucets. For a single-lever faucet, a small thermostatic valve will be sufficient. A larger thermostatic valve will be required for multiple faucets to accommodate water temperatures during peak demand.

Concerns about scalding during hand washing are legitimate, and a properly sized thermostatic mixing valve is the best solution.

Metering faucets, both electronic infrared and the mechanical type, generally have a 0.5 gpm flow restrictor. Two or three metering faucets can work well with one small mixing valve designed to control water temperatures from 0.5 gpm to 4.0 gpm. When there are more than three faucets, multiple valves or a larger valve will be needed to adequately control water temperatures. It is important to be sure that the valve will still perform when one 0.5 gpm faucet is running.

Lavatory systems and washfountains should also have a thermostatic valve to provide protection during hand washing. These fixtures typically have metering faucets with flow rates that range from 0.5 gpm for lavatory systems to 5.0 gpm on larger wash fountains. Group hand washing fixtures offer many advantages, including a built-in thermostatic valve properly sized for the unit. These types of products alleviate any concerns about selecting the right thermostatic valve for an application.

Concerns about scalding during hand washing are legitimate, and a properly sized thermostatic mixing valve is the best solution. Thermostatic mixing valves allow water to be heated to a temperature that will kill and prevent the growth of Legionallae, yet still protect users from scalding. It is important to consult the valve manufacturer for help in sizing and specifying the right thermostatic valve for your particular rest room application. If chosen properly, a thermostatic mixing valve can be an excellent tool for safer hand washing. ❑

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