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Scald prevention

Hotel benefits from digital mixing station installation.

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Lexington Plumbing and Heating's Ian Walters checks a Powers, A Watts Brand, IntelliStation digital mixing station.

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Tech Topic: Scald prevention

Historic downtown Portland hotel wins rave reviews — for hot water.



OUR COVER THIS MONTH

This month's **pme** cover story focuses on the important topic of scald prevention and the use of digital mixing stations to combat that problem. On the cover is **Ian Walters**, service manager for Kansas City, Missouri-based Lexington Plumbing and Heating Co., checking the operating conditions of a Powers, a Watts Brand, IntelliStation digital mixing system. **Photo courtesy of Watts.**

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Historic downtown Portland hotel wins rave reviews — for hot water

Digital mixing station pays benefits for domestic hot water system.



The Embassy Suites in Portland, Oregon has benefited from the installation of a digital mixing system.

Embassy Suites in Portland, Oregon, consistently wins high reviews online — many of which give the enthusiastic thumbs-up for the 276-room historic hotel, an architectural masterpiece built in 1912.

One review said he had two pet peeves: An uncomfortable bed (the bed there passed with flying colors) and the lack of hot water, or extreme delivery temperature swings.

Apparently, he was once told by a hotel operator at another hotel that “technical problems” made it impossible for him take a warm shower for an hour or more. He went on to say that downtown Portland’s Embassy Suites provided hot water fast, and plentifully. He rated them 5 of 5 stars.

Two years ago, hotel managers smartly decided to install a digital mixing station for their domestic water system.

Water temp: what’s the big deal?

For many years, according to Embassy Suites chief engineer **Phil Cox**, domestic water was heated in three, 1,500-gallon tanks through copper tube bundles that exchanged Btu from two steam boilers. No thermostatic mixing was involved.



Embassy Suites Chief Engineer Phil Cox scrolls through critical system performance data at the IntelliStation’s touch screen interface.

“Heat was moved directly over from the boilers, on priority, into the big steam bundles to meet hot water demand by room guests,” Cox explains. “This was the way kitchen, laundry, janitorial and guest-room water was heated for 20-some years.

“We realized that there were potential problems to the temperature swings that guests experienced. We weren’t comfortable with that inconsistency, even though we were fairly successful at maintaining 120 to 125°F water temps leaving the tanks.”

Cox notes there also was the risk of microbial growth in the tanks if storage temps went too low.

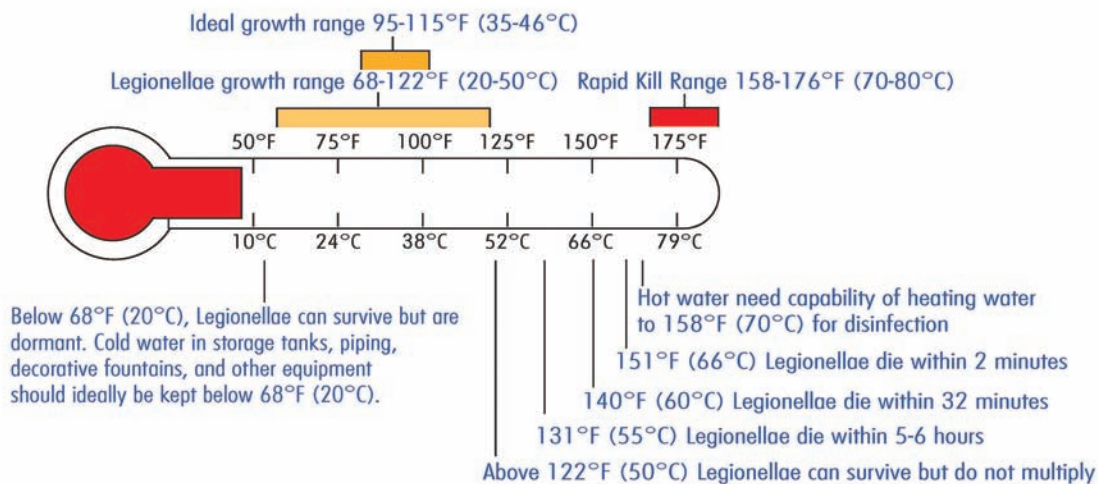
Photos courtesy of Watts Water Technology

Large domestic water systems risks

Legionella

According to the Centers for Disease Control, proper maintenance of water distribution systems is key to preventing illness from water-borne bacteria such as Legionella. CDC statistics show that 8,000 to 18,000 people are hospitalized with Legionnaires' disease in the U.S. each year. Managers of commercial and institutional facilities know that selecting and controlling proper water temperature in their storage and delivery systems plays an important part in preventing germ growth.

Legionella Growth Chart



Scalding

Uncontrolled and unmonitored water distribution systems can create high-temperature scalding hazards in bathtubs, sinks and showers. Digital mixing systems make it easy to select and set safe water temperatures for large domestic water systems.

Thermal shock

The thermal shock of a rapid and uncomfortable change in shower water temperature can cause a fall or serious injury. With digital mixing, stable mixed water is delivered to ASSE-listed thermostatic point-of-use devices (shower or sink valves) to minimize this risk.

Key markets

Hotels/resorts, correctional, nursing/long-term care, office and schools/universities.

"And, finally, if we stored water at higher temps to eliminate the risk of microbes in the big storage tanks, we created the risk of too-high water temperatures at points of use — sinks and showerheads."

Cox explains that news of digital mixing technology — ideal for hospitals, nursing homes and casinos, for instance — was available, and well-suited to hotel retrofits, too.

"Considering the routine maintenance and ongoing challenge of constantly fine-tuning our efforts to keep guests comfortable — and it was no small challenge, given the lack of precise control of storage temperatures — we made a proactive decision to eliminate all problems with one solution — digital mixing," he continues. "Fortunately, our manufacturers rep firm was eager to help."

Sales engineer **Luke Erickson** with manufacturers rep firm, Stone-Drew/Ashe & Jones based in Seattle with offices in Vancouver, Spokane and Kennewick, Washington, met with Cox and others at the hotel. While visiting the hotel, Erickson also discovered another facet of the challenge at the hotel: Pressure differential.

"The expected delivery pressure from the municipal water supply was 80 psi," Erickson says. "In reality, several times a day, delivery pressures dropped to 38 or 40 psi [chiefly during peak use, city-wide] — at times when hotel managers most wanted to maintain proper pressure and temperature settings."

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Tech Topic: Scald Prevention

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The screen shows the 125° F mixed outlet water temperature being sent through the mixed water loop to guest rooms and public restrooms. The 2.8 V is a monitoring correlation, indicating valve position to control signal.

Enter digital mixing

"We wanted to solve a problem before it grew," Cox adds. "We were glad to learn the task could be completed with the use of new technology, and with relative ease."

Erickson introduced Cox to the Powers, a Watts brand, IntelliStation, assuring him that the system was capable not only in managing consistent temperatures throughout the hotel's entire water system but, by design, responds to municipal pressure fluctuations based on their impact to water temperature change.

"It's one of the key functions of contemporary digital mixing controls," Cox says. "They're equipped with technology that continually monitors temperature, flow and pressure. The digital controls make constant adjustments based on the differential between mixed outlet temperature and pre-programmed outlet set point."

Simple thermostatic mixing valves can't do that. Large pressure and temperature swings are difficult to manage, requiring that they be reset routinely, and that systems be rebalanced.

Portland-based Lovett Services won the installation contract. As one of the area's

leading commercial/industrial plumbing firms, their pros are familiar with the challenge of decommissioning and draining-down entire hotel-sized plumbing systems.

To avoid downtime to the greatest extent possible, they did as much prefabrication of piping to and from the digital mixing station as possible. Most of the onsite work was completed in the middle of the night to reduce downtime inconvenience.

Lovett technicians were able to install the digital mixing station in about four hours' time.

"The technology went right to work. Shortly after we completed the supply and return connections, the system did an awesome job of controlling water temperature to all points of use in the hotel," he says.

Now, storage temperatures are set at 150°, and supply temps are consistently delivered at 125°, plus-or-minus 2°.

"Having that level of consistency within a big, old hotel is a real accomplishment," Benson notes.

Digital mixing + recirculation

Designers of large plumbing systems are now discovering that a digital mixing system is the most effective way to deliver properly mixed water throughout a hot water recirculation loop.

For even greater control, these systems can be installed as part of an ASSE-compliant water distribution system, including point-of-use mixing valves at each fixture in the plumbing system. This ensures hot water storage

temperatures can be kept at levels lethal to pathogens, then mixed to safer temperature levels both at points of distribution and use.

Other key advantages to digital mixing include:

- Supports energy conservation through more efficient water temperature management—and, in turn, reduces energy costs;
- Integrates with building automation systems to support integrated building management.
- Supports consistent delivery of hot water on-demand wherever and whenever it is needed, in accordance with building codes;
- Systems are field-configurable without the need for a laptop or special software and can be integrated into a building automation system to allow remote monitoring and control of water temperatures;
- Rather than experiencing the constant headache of boiler room problems and system troubleshooting, Cox and his staff merely schedule routine maintenance checks on a six-month cycle; and

- With digital mixing, hotel facility managers have yet to receive a hot water complaint — with hot water arriving at taps and showers quickly and at a safe, consistent temperature.

"When guests are happy, and especially if they're offering online reviews with multiple stars, facility engineers, hotel managers and building owners are happy," Cox concludes. "We can't ask for much more than that." **pme**



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