The Future is Touch-free

Sensor-operated products lead the way as restrooms adapt to COVID-19

by **Mark Lawinger**

Photos courtesy Sloan

THE COVID-19 PANDEMIC IS CREATING A NEW NORMAL ACROSS ALL WALKS OF LIFE. THE REALITY IS CERTAIN ELEMENTS OF SOCIETY AND INFRASTRUCTURE WILL FOREVER BE CHANGED DUE TO THE MEASURES THAT HAVE COME ALONG WITH THE VIRUS—INCREASED LEVELS OF SANITATION, MINIMIZED HAND-TO-HAND CONTACT, AND THE RISE OF WORK FROM HOME CULTURE, TO NAME A FEW. THE COMMERCIAL RESTROOM IS NO EXCEPTION TO THESE OVERHAULS.

Users now expect touch-free restroom products, as improved hygiene is first and foremost on the hearts and minds of people all across the world. In fact, as one of the most visited places in any commercial building, the restroom is playing a leading role in mitigating the spread of viruses, bacteria, and other germs.

There was already a movement toward specifying sensor-operated restroom products even before COVID-19 and social distancing entered our vocabulary, but the hazardous effects of cross-contamination on products in public spaces have only amplified the need for these automatic fixtures.

Germs spread after they have been left on a surface and are then touched by a healthy person. When one takes into account the fact thousands of users go in and out of public restrooms each day, 'high-touch' faucet and flushometer handles can be breeding grounds for bacteria.

To combat these concerns, touch-free products—from motion-activated door sensors and light switches to touch-free faucets and flushometers—are being installed across all areas of the commercial restroom. However, it is important to understand which sensor-activated products are most conducive to specific environments. Additionally, as more facilities scramble to convert their existing restrooms from manual to touch-free operation, it is critical to understand the retrofit process and what it entails.

Sensor flushometers, equipped with reclaimed water features, are designed to withstand the harsh conditions presented by reclaimed water while conserving water at the same time.

The perks of touch-free faucets

Consistent handwashing is one of the best ways to remove germs, avoid getting sick, and prevent the spread of germs to others.

However, it is important to conduct the handwashing process correctly, following the Centers for Disease Control and Prevention (CDC) guidelines. It also goes a long way if the faucet does not need to be touched.

Hence, sensor-operated faucets are critical to mitigating cross-contamination in the restroom. In fact, automatic faucets are literally guiding users through the handwashing process by providing step-by-step instructions via liquid crystal display (LCD) screens. These faucets are popular in healthcare facilities and walk the user through an initial rinse, a soap and scrub process, and an additional rinse by providing a countdown for each step. This information can also be stored to provide healthcare facilities with actionable information on handwashing statistics right down to the specific faucet to determine compliance with CDC guidelines.

Maintenance teams across the world are also able to enjoy the perks of automatic faucet shutoff by simply twisting the solenoid on many models, and no special tools are required to access or change components. Typically, maintenance personnel must lie down on the floor or stoop underneath the sink to turn off the water supply valve. It is more convenient to turn it off at the faucet, and saves time (and knees and backs).

There are two touch-free faucet sensing types—infrared and capacitance (proximity) sensors. The former senses the reflection of infrared light when a valid 'target' is within range while the latter picks up the electrical field surrounding a 'target.' In both cases, the range can be adjusted. For infrared sensing an infrared beam of light is sent out from an emitter. Once the light hits a target (user of the fixture) it reflects or bounces back to a receiver. The faucet then processes whether or not it has sensed a valid target before it decides to turn on or stay off. All of this 'thinking' occurs within milliseconds and is imperceptible to the average person. With capacitance sensing the sensor can detect the small electrical 'signal' all living things emit from their bodies. Once a person comes within range, it arms the sensor, preparing it to flush.

The hygienic benefits of sensor-operated faucets speak for themselves, but there are numerous other advantages of automatic faucets. Thanks to the Internet of Things (IoT), automatic faucets are smarter than ever. Facilities teams can now adjust settings, monitor fixture and water use, and diagnose wirelessly—all right from their fingertips. The Vanderbilt University Medical Center (VUMC), Nashville, Tennessee, is seeing these benefits firsthand, as its new faucets feature an underdeck control box that reduces the service time needed by its maintenance team and provides the ability to remotely monitor each individual unit from an interconnected smartphone app. With the ability to conduct weekly check-ins on specific fixtures throughout the facility, VUMC's team is able to accurately measure and report water use.

Sensor-operated faucets also deliver sustainability benefits through their energy harvesting capabilities. These faucets can provide solar energy harvesting by

Thanks to the physical vapor deposition (PVD) properties of the nickel finish, fingerprints and watermarks do not appear on the products, minimizing maintenance concerns and contributing to their aesthetic value.

using ambient light to extend battery life up to 10 years in low-to-moderate use facilities, while turbine energy harvesting uses the energy of moving water to extend the battery life up to 10 years in moderate-to-high use venues. The current battery life for flushometers is six years and three years for faucets (the latter tends to be activated more frequently).

While hygienic benefits are first and foremost when it comes to faucet specification, as facilities respond to the coronavirus pandemic, the design elements coming along with them are an added bonus. Commercial restroom manufacturers have created a range of special finish options—from graphite and brushed nickel to brushed stainless and polished brass—to leave a positive, lasting impression on users. These sleek finish options can be matched with touch-free soap dispensers and hand dryers to create a unified and cohesive aesthetic across the entire restroom. The customization does not stop there. Organizations are now able to bring their brand into the restroom. Take Chicago's Shedd Aquarium for example, where the facility was able to engrave its logo on several of its faucets to bring an added level of visibility to its brand.

Do-it-all sinks

Sinks are at the center of the commercial restroom's touch-free movement. As they are now able to encapsulate every step of the handwashing and drying process, sinks now deliver benefits to end users and maintenance teams alike.

At the epicenter of this renaissance are integrated sink systems. These sink basins combine a faucet, soap dispenser, and hand dryer that work together as one touch-free and highly efficient system—all within an arm's reach. This all-in-one sink design allows users to streamline the handwashing process within the confines of one station, making it conducive to high-traffic restrooms. When the Upper Canada Mall in Newmarket, Ontario, Canada, conducted its recent renovation, it opted for integrated sinks to cater to the over seven million guests it receives each year. These sink systems are now enabling visitors to expedite the handwashing process in a sanitary method to quickly return to their shopping. Given the fact the touch-free hand dryers remain within the sink basin, it removes the need for guests to walk across the restroom with wet hands. This takes the burden off facility maintenance teams by eliminating water dripping from hands and ultimately decreases the potential of a slip-and-fall hazard.

Speaking of hand drying, not only do paper towels add an extra task for maintenance teams to attend to, they also include a potential risk for bacteria to spread. According to the *American Journal of Infection Control* (Vol. 40), researchers at Laval University in Québec City, Québec, Canada, found 17 species of bacteria on unused paper towels, with the most common being *Bacillus*, which causes food poisoning. Touch-free hand dryers eliminate the concerns about paper towels. Specifically, high-efficiency particulate air (HEPA) filters increase handwashing effectiveness in touch-free hand dryers and remove 99.7 percent of particles with a diameter of 0.3 μm (12 μin) or larger.

Lastly, not all sink materials are created equal in terms of ensuring optimal hygiene. The best hygiene comes from no porous materials, such as vitreous china and quartz. Vitreous china surfaces are easy to clean and resistant to corrosion and discoloration. Solid surfaces and quartz are resistant to staining, scratching, and heat. They are available in a wide array of colors compared to vitreous china. Solid surface is also a repairable material, thus suitable for facilities with high levels of vandalism.

Reliable retrofitting

As essential facilities rush to 'COVID-proof' their restrooms as quickly and efficiently as possible, understanding the retrofit options available to them becomes of the utmost importance.

When it comes to flushometers, there are various retrofit options for facilities to consider when converting from manual to touch-free sensor operation, and retrofit kits are the fastest way to go about these conversions in just a matter of minutes.

Touch free-operations help minimize cross-contamination.

Top mount retrofit kits are an attractive method, as they replace the cover and diaphragm assembly. This option comes in battery or solar-powered options and provides the flexibility to change flush volumes over time. Top mount retrofits require about a five- to seven-minute conversion time. Side mounts are the most popular flushometer retrofit, as they simply replace or fit right over the handle assembly, all without having to shut off the facility's water supply. The flush volume remains consistent with this option, and it can be installed in as quickly as one to five minutes. Yet, in the instance batteries are depleted and the sensor can no longer operate, true mechanical override (TMO) technology allows the user to continue to flush manually. Facilities like the University of Wyoming, Laramie, Wyoming, realized a quick and easy installation and enjoyed the peace of mind that comes with TMO.

Considerations when retrofitting lavatories include the level of retrofit. If the facility does not plan to open up the wall for a full retrofit with new supports the options for retrofit will be limited to the current category of product the site has. Any type of sink is possible if the wall is opened up, allowing for new supports. Another consideration is the power needs of the new selections. The faucet, soap dispenser, and deck-mounted hand dryer (if applicable) may require power previously unavailable near the sink. If the wall is not being opened, the facility can choose battery-powered faucets and soap dispensers.

If the facility is interested in adding an all-in-one sink they must be willing to open the wall to provide the needed support for the sink and electrical circuits. A deck- mounted hand dryer would require a dedicated 20A circuit per device. The faucets and soap dispensers can share a 15A circuit for each station.

This is certainly not the start of the touch-free era, but it is a catalyst for increasingly prevalent touch-free restrooms in the future. With hundreds—if not thousands of users—going through commercial restrooms each day, these touch-free solutions can play a major part in helping keep society safe. **CS**

ADDITIONAL **INFORMATION**

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Key Takeaways

With the COVID-19 pandemic creating a heightened sensitivity to proper hand sanitation, it is more important than ever to implement solutions that mitigate potential health risks in public environments. When one takes into account the fact thousands of users go in and out of public restrooms each day, 'high-touch' faucet and flushometer handles can be breeding grounds for bacteria. To combat these concerns, touch-free products—from motion-activated door sensors and light switches to touch-free faucets and flushometers—are being installed across all areas of the commercial restroom.

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