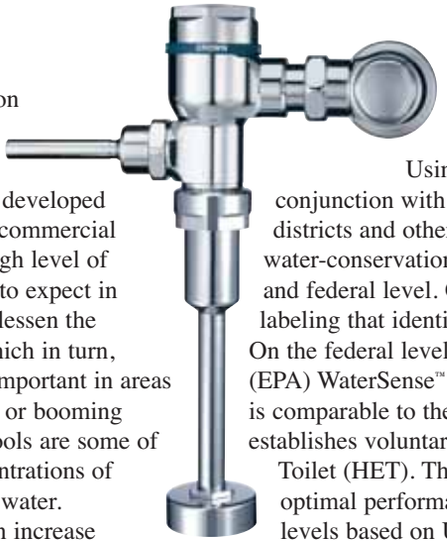
Maximizing **Water Conservation** and **Hygiene** in School Design



Sloan Valve Company is helping education facilities do more with less – again.

To help minimize the effect of an increasing demand for water, Sloan has developed innovative products that reduce consumption of commercial plumbing fixtures and continue to provide the high level of performance educational institutions have come to expect in recent years. As a result, Sloan has been able to lessen the impact a school has on its local environment, which in turn, allows communities to grow. This is especially important in areas facing prolonged regional drought, urban sprawl or booming populations because, in many communities, schools are some of the largest facilities and house the highest concentrations of daytime population, creating a huge demand for water. Even in regions with abundant water supplies, an increase in demand stresses local capacity, resulting in more expensive water.

Sloan – THE Leader in Water Conservation Since 1906

Since the invention of the Royal® Flushometer 100 years ago, Sloan Valve Company has been at the forefront of water conservation. Just as Flushometers replaced overhead tank toilets to become the industry standard, ultra-low-consumption products – and in some cases, zero-consumption fixtures – will become the gold standard.

Using its leadership position and working in conjunction with construction associations, municipal water districts and other stakeholders, Sloan is helping develop water-conservation standards that are feasible at the local, state and federal level. One new conservation effort is product labeling that identifies both performance and flush volume. On the federal level, the Environmental Protection Agency's (EPA) WaterSense™ water efficiency labeling program, which is comparable to the successful ENERGY STAR® program, establishes voluntary specification criteria for a High Efficiency Toilet (HET). The program includes a standard to ensure optimal performance in addition to maximum consumption levels based on Uniform North American Requirements (UNAR), which includes a soybean mixed media extraction test.

As defined, an HET fixture has an effective flush volume that does not exceed 1.28 gpf/4.8 Lpf. Further, for fixtures to qualify for the product-labeling program, a performance standard requires a minimum extraction of 350 grams of soybean media. The fixtures must also meet applicable sections of ASME A112.19.2-2003, A112.19.5-2005 and A112.19.14-2001.

South Forsyth High School Saves with Waterfree Urinals

Waterfree Urinals Now in All District Specs

Forsyth County School District engineer George Petty was faced with a weekly bill of $7,500 for pumping the septic fields at a single location when he decided that enough was enough.

"South Forsyth High School was on a septic system, and we were having trouble because the field could not take the liquid," said Petty. "We were pumping three times a week, 10,000 gallons each time at $0.25 a gallon."

Petty decided that a wholesale retrofit of the school's "regular" urinals with waterfree models was the best way to address the situation. "We changed out all of the urinals in the South Forsyth High School – 50 in total," Petty said.

Like traditional urinals, waterfree models connect to a drainline to transport waste to the main sewer, but only after it travels through a cartridge that acts as a funnel, allowing liquid from the bowl to flow into the filtering cartridge that holds a biodegradable sealant liquid.

Petty explained that waterfree urinals made sense for the water-conscious school district. "We have 'low-flow everything' – faucets with 0.5 gallon per minute aerators, and of course, the waterfree urinals. We're looking to save water wherever we can."

The success of waterfree urinals at South Forsyth High School gained the attention of other educators in the area. "I've had several administrators ask about them and I tell them we've had no problems at all. I definitely recommend them – and I have to several school systems," Petty said.

To keep pace with the population growth in greater Atlanta, the Forsyth County School District is now building three new schools. "Those buildings will also have waterfree urinals," said Petty. "In fact, waterfree urinals are now specified in all of our construction documents. They are the accepted standard."

Although the labeling program is currently a residential program, these high standards are an excellent benchmark and will ultimately be applied to commercial fixtures, which you would find in school applications.

Conserving Water is Critical

The California Urban Water Conservation Council (CUWCC) published a comprehensive analysis of water needs in a December 2005 draft report to the EPA titled, "Alliance for Water Efficiency: Issues & Options." The report cited a 1997 study that calculated an investment need of $280 billion for drinking-water infrastructure and an updated wastewater system during the next 20 years. A subsequent EPA Gap Analysis report in 2002 identified capital investment needs of $274 billion for the drinking water infrastructure and $388 billion for wastewater utilities investment through 2019. Projections by the EPA show gaps of $102 billion and $122 billion, respectively, between necessary investments and current levels of revenue to upgrade these systems. These statistics underscore the need for new water-conservation technologies to be implemented on a wide-scale basis.

Fortunately, it has been proven that reductions in water demand can lead to deferral or downsizing of water-supply and wastewater capital projects. Recognizing the impact that can be made at the local level, the goal of the CUWCC is to organize the involvement of water-conservation stakeholders and to develop plumbing-fixture standards that could evolve toward even more efficient

products. The CUWCC cites examples of technology currently available on the market, including 0.5 gpf urinals, which if required more frequently at the local level, would significantly decrease indoor water consumption throughout the country.

Installation of other water-conservation products, such as waterfree urinals, 0.5 gpf flush urinals, 1.0 gpf/3.8 Lpf pressure-assist toilets and dual-flush technology for both tank and Flushometer applications, are additional solutions that can make a significant local impact.

Sloan's High-Tech Solution

Along with its full line of low-consumption products, Sloan also pioneered other, more advanced means for controlling water consumption in schools. Its Programmed Water Technologies (PWT®) division, a manufacturer of networked water-control systems, allows administrators to control operation of any toilet, sink or shower within a facility. Instead of allowing students to flow water at will, school officials control consumption by setting parameters. These parameters can be placed on individual fixtures or an entire area, such as locker rooms, depending on the concern at any given school. Similarly, showers and faucets cannot be left running because the system controls the duration of water flow, as well as the permissible hours of operation.

Sloan's PWT networked water-control systems enable administrators to remotely monitor and control select plumbing fixtures in a facility, either in real time or on an automatic, pre-selected basis, using either a central station computer or a hand-held Palm® device. Any fixture within the networked system can be shut down immediately for emergencies or maintenance.

Initial Cost vs. Life-Cycle Cost

A recent presentation by Harvey M. Bernstein, Vice President, Industry Analytics, Alliances & Strategic Initiatives, McGraw-Hill Construction, states that building owners can expect an average operating cost decrease of 8 to 9 percent when applying green building tactics and that the educational sector is expected to have the largest growth – 65 percent – in green building compared to all others in the market.

With the average age of U.S. schools reaching 40 years and high increases in both K-12 and college construction projected, the educational sector will be looked at as the example to teach the rest of the building industry about the benefits of green building. Bernstein's report also quantifies water reductions up to 30 percent and overall annual utility cost savings of 20 to 40 percent for new facilities and 20 to 30 percent for renovations.

These figures suggest that the building industry is short-changing itself by putting more emphasis on initial cost than on life-cycle cost, which is the factor most important to school districts. Manual faucets, for example, will be "a cheaper quote" when trying to secure a contract. However, specifying touchless sensor-operated faucets with 0.5-gpm aerators is the more fiscally conservative choice over the life of the building, which on average is 42 years for U.S. schools.

The obvious benefit of touchless faucets is increased hygiene (see sidebar Please Don't Pass the Salt) but water savings and decreased sewage rates are how electronic faucets close the cost gap on their manual counterparts in just a short time. Designed to operate for a pre-set amount of time when a user's hands are in the "active area" that triggers the sensor to allow water flow, touchless faucets use significantly less water than manual units. That's because manual faucets in school restrooms usually are left running while a person lathers and dries their hands, as opposed to sensor-operated faucets that turn off during this stage. This is an immediate advantage for water savings.

What This Means to the Architect

Unlike previous generations, new water-conserving products have had extensive field evaluations, which will prove invaluable for architect specifications. They should reduce the fear of unfounded manufacturer claims, ensure customer satisfaction, and provide a feeling of confidence in today's advancing technological solutions for water conservation.

For example, Waterfree urinals have been in use for the past 15 years throughout the world. Half-gallon urinals have been available for the past 18 years. Fractional flush urinals, also called High Efficiency Urinals (HEU), have been around for decades. In fact, Sloan Valve Company has been making this type of product for Naval applications for more than 50 years. For water closets, dual-flush technology has been available for over 10 years and 1.0-gallon pressure-assist units have been available for more than six years.

Whether your interest is meeting local codes, reducing construction costs and impact fees, or promoting LEED® initiatives, Sloan Valve Company is meeting these needs for the "now" generation of water-consuming products.

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Please Don't Pass the Salt

Because touching contaminated surfaces transfers germs, it takes only one person to expose the rest of their cafeteria companions to whatever may be on their hands after a trip to the bathroom.

Although handwashing is cited by most authorities, including the Centers for Disease Control and Prevention, as the single-most effective means to avoid illness, touching contaminated plumbing fixtures when washing is just like forsaking the task completely. Touchless plumbing fixtures, therefore, are the most effective products to install to ensure a healthy, hygienic environment.

"Sensor-operated plumbing fixtures interrupt the transfer of disease. If you don't have to touch anything, you can't pick up germs," says Dr. Charles Gerba, a professor for the University of Arizona Department of Soil, Water and Environmental Science. "Toilets with auto flushers, faucets that turn on and off themselves, I think they're a great way to prevent the spread of the Norwalk Virus, dysentery and other illnesses."

Gerba's research of restrooms unearthed many interesting – and some obvious – facts about hygiene and methods to promote it in a facility. For example, the regular use of disinfectants keeps a restroom cleaner. Gerba further explains that disinfectants have a residual effect: the fixture stays cleaner throughout the day, not just after initial cleaning.

"And surprisingly, the dirtiest area in the bathroom, as far as germs are concerned, is the sink itself. Most specifically, the handles to the faucet tap have many germs on them," says Dr. Gerba. "That's because when you wash, bacteria is shed from the hands and collects in the damp sink area, which is a perfect breeding ground for more germs. That's why touchless fixtures are needed in restrooms."