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A TMB Publication | July 2010



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Inside this issue:

- 2010 Manufacturer Spotlights
- The Importance of Providing a Proper Hydration Environment
- Choosing the Appropriate Actuator for a Control Valve

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- International Building Code (IBC) Sec. 719.7,
- General Services Administration (GSA) P-100
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- IAPMO PS94 2008 Sec. 3.5 ASTM E84 25/450 Testing

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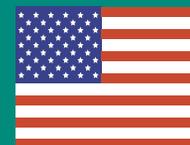
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High-efficiency Flushometers — Which types are right based on building age, drain conditions and other factors?

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Choosing the Appropriate Actuator for a Control Valve

Valve actuators provide remote operation of control valves, which is very essential for increased working safety.

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The Importance of Providing a Proper Hydration Environment

Make drinking water more accessible and appealing.

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Thumbs up for Hands-Free

Manufacturers have expended numerous resources and utilized state-of-the-art technologies to enhance hands-free efficiencies.

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Symmons Industries: Trusted in the Plumbing Industry for More Than 70 Years

Symmons offers a variety of durable, reliable and beautifully designed plumbing fittings for residential and commercial applications.

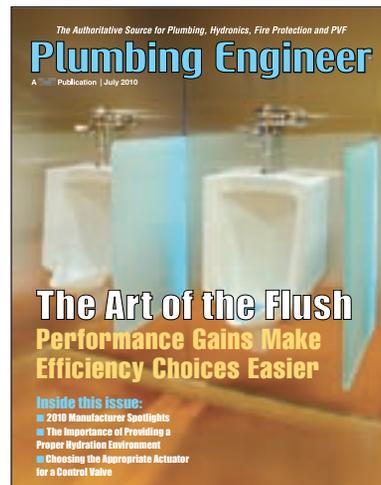
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Plumbing Engineer

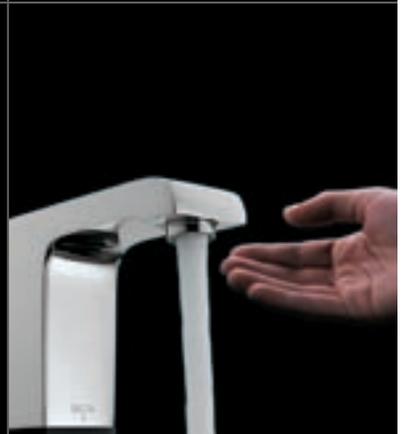
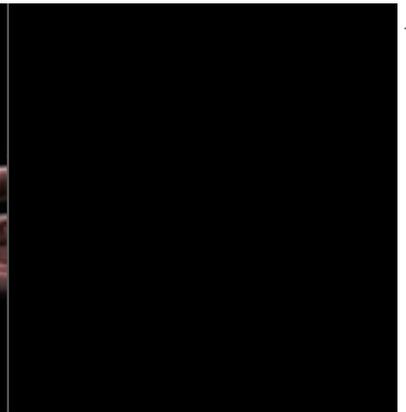
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From the desk of Tom Brown

By Tom M. Brown
President

A successful 20 years

Twenty years ago, on July 2, 1990, I purchased *Plumbing Engineer* and started my own publishing company after serving as *PE*'s publisher for eight years. Since then, the journey for me has been an exciting one. Together, we've seen the magazine grow from its humble beginnings to accounting for nearly 70% of the market share, and I couldn't have done it without the combined efforts of TMB Publishing's dedicated sales, editorial and design staff, and the never-ending loyalty of our advertisers and readers.

In the July/August 1990 issue, I wrote that our goal was to "provide high-quality editorial coverage for the plumbing engineer who designs and specifies systems/products for commercial, industrial and institutional buildings" and that for manufacturers we would continue to offer "top market coverage at a reasonable cost" and maintain a circulation "dedicated to reach engineers involved in plumbing specifications." While *Plumbing Engineer* has gone through some changes over the years — both minor and major — those same core principles have remained in place and we don't plan to renege on that promise.

So, on behalf of the entire staff at TMB Publishing, I thank each and everyone of you, our devoted readers and advertisers, and I hope you'll continue to support and champion the magazine for another successful 20 years. ■



Kevin C. Krull (left), VP/Secretary, general counsel, Elsevier Business Press and Tom Brown after the sale of *Plumbing Engineer* in 1990.

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Leonard Valve’s series of emergency mixing valves still provide the same quality and performance and are now certified to the new ASSE 1071 standard.

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Key performance requirement is Cold Water Failure, Section 1.2.6, stating that “upon cold water failure, the hot water shall continue to flow at a rate not to exceed the values listed in Table 1.”

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Circle 8 on Reader Reply Form on page 57



Table 1

Flow @ 30.0 psi ± 0.5 psi (206.9 kPa ± 3.4 kPa) differential		Permissible temperature variation above or below set point		Maximum allowable flow with cold water shut off	
GPM	L/min	°F	°C	GPM	L/min
<7.0	<26.5	+3.0/-5.0	+1.7/-2.8	0.5	1.9
7.0<20.0	<26.5<75.7	+5.0/-8.0	+2.8/-4.4	1.0	3.8
20.0<40.0	<75.7<151.4	+7.0/-12.0	+3.9/-6.7	1.5	5.7
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Industry News

Acorn Engineering & Jay R. Smith announce affiliation and unification

CITY OF INDUSTRY, CALIF. & MONTGOMERY, ALA. — Acorn Engineering Company and Smith Industries Inc announced a new business alliance and a jointly owned company. Effective June 15, 2010, Jay R. Smith Mfg.



Jay L. Smith and Don Morris

Co., a Division of Smith Industries will join the Acorn Engineering family of companies, and Acorn Engineering will be a 50 percent owner of Smith Industries. The name of the company will remain Jay R. Smith Mfg.

Co., a Division of Smith Industries, Inc.

Jay R. Smith (Smith Industries) and Earl L. Morris (Elmco Sales Inc. and Acorn Engineering) were both modern-day pioneers in the industry and founders of their individual companies. They each developed strong companies and were partners and friends from 1954 (when Elmco became a Jay R. Smith Mfg. Co. representative) until they passed away. The instant relationship and personal bond transcends three generations and continues with the Smith and Morris families.

Jay L. Smith, Don Morris, and Don's brother, Dennis Morris, second generation sons of Jay R. and Earl, have continued their business and personal relationships for more than 50 years. The next generation of Smith's and

Morris' (Jay L. Smith's daughters, Dr. Holly L. Roth and Debbie Smith, and Don Morris' children, Kristin Kahle,



Randall Morris and Barrett Morris) pledge to continue what their grandfathers started. The Smith and Morris families will be represented on the new Board of Directors.

The new alliance of Acorn Engineering and Smith Industries will be the foundation for an exceptionally strong company and will be competitively anchored in the industry. For the realigned Smith Industries, Don Morris will assume the role of chief executive officer (CEO) of Smith Industries, Jay R. Smith Mfg. Co. Division and the Canadian subsidiary. Jay L. will continue as president and chairman of the Board of Directors. The management teams of both Acorn Engineering and Jay R. Smith Mfg. Co. will remain the same.

A. O. Smith enters into tankless water heater joint venture with Takagi

MILWAUKEE — A. O. Smith Corporation and Takagi Industrial Co. Ltd. of Fuji-city, Shizuoka, Japan, announced that they are establishing a joint venture to market and manufacture tankless water heaters in North America. As part of the joint venture, A. O. Smith will take over the management of Takagi's existing North American sales and distribution organization, maintaining Takagi's North American headquarters in Irvine, Calif. The companies expect the transaction to close in the third quarter.

"This venture is an important investment by A. O. Smith that will further expand our offering of high-efficiency water heating products," said Ajita G. Rajendra, president of A. O. Smith Water Products Company. "It represents a rare opportunity to combine Takagi's well-known brand and world-class tankless technology with the strong brands, customer relationships, and extensive distribution of A. O. Smith."

Through the joint venture, A. O. Smith will offer a full line of tankless gas water heaters under its own brands in

association with the Takagi brand and will assume responsibility for the Takagi brand in the U.S. and Canada.

Takagi currently manufactures a full line of gas tankless water heater models in Japan for residential and commercial applications including the recently released "second generation" 92 percent efficient T-H2 model designed for residential or light commercial applications. Upon achieving an appropriate volume threshold, the joint venture will bring manufacturing jobs to the United States and establish a production operation to support the growing needs of the business.

Privately held Takagi is one of Japan's leading manufacturers of tankless water heating products and was the first to begin marketing tankless water heaters in the United States in 1994.

Aalberts to acquire 100% of Conbraco shares

AALBERTS INDUSTRIES N.V., based in The Netherlands, has reached agreement with the management of Conbraco Industries Inc. to acquire 100% of the shares. Conbraco Industries is a leading manufacturer of a complete package

More Industry News on page 10



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Industry News

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of bronze, brass, steel and stainless steel valves and a range of backflow preventers sold mainly in the commercial, industrial and consumer market (retail) under the strong brand name "Apollo" Valves. The acquisition will be effected after finalizing all formalities and approvals, which is expected mid-July 2010.

Conbraco Industries, "Apollo" Valves, is a key player in the North American market for ball valves, safety, relief and check valves, strainers and a new patented range of stainless steel and casted backflow preventers for the commercial and fire protection markets. Additionally, the company has a strong position in the industrial market with U.S.-made steel and stainless steel valves. Toward the consumer products market, Conbraco Industries offers different product lines and a complete service through a separate business unit.

With more than 1,000 employees, Conbraco Industries generates an annual revenue of approximately \$200 million. Conbraco Industries operates three manufacturing facilities in South Carolina: two in Pageland and one in Conway. The head office is based in Matthews, N.C.

Conbraco Industries was founded in 1928 by Clarence Mosack, grandfather of the current generation. The president of Conbraco Industries, Glenn Mosack, and his management team, will remain with the company.

Based on three strong brands, the "Apollo" Valves together with EPC (Elkhart Products) metallic fitting range and the LASCO Fittings' plastic fittings and other products, Aalberts Industries Flow Control can realize a more complete offering to the residential, commercial, consumer market, fire protection and industrial market in North America. The specification, sales and distribution channels of these three organizations will be working together to realize a strengthened and focused sales approach per market segment.

The "Apollo" Valves range consists of many products which can also be sold through the existing sales and distribution network in Europe, where Aalberts Industries is present with own sales organizations in almost every country. Especially the product program of safety, relief and check valves and backflow preventers for commercial buildings is an extension of the portfolio in Europe.

Additionally, Conbraco Industries' product portfolio for the industrial sector opens new markets in Europe. There are many opportunities for cross-selling that can be jointly developed, which will strengthen the market position in Europe. The dedicated management and sales approach and experience of Conbraco Industries' business unit Consumer Markets gives a lot of potential in the future by introducing European product lines and concepts through the existing channels in the United States.

Engineering firm Buro Happold North America wins NYSSPE 'Project of the Year'

NEW YORK — The New York Chapter of the New York State Society of Professional Engineers (NYSSPE) honored Buro Happold with the 2010 Project of the Year Award. Buro Happold was recognized for its work on the first section of the High Line — Manhattan's abandoned elevated railroad

Continued on page 12



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Industry News

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that was transformed into an urban park. Buro Happold provided structural engineering in support of the new landscape architecture and architecture components and mechanical, electrical and plumbing engineering services.

Buro Happold faced challenges of incorporating the existing structure with the new infrastructure, at 30 feet above the ground. A number of the existing girders had to be removed to make room for staircases from the former railroad down to the street. Buro Happold engineers created a new drainage system to serve the new elevated park. A new mechanical system was also designed with an extensive electrical system for lighting and security.

U.S. Department of Veterans Affairs Designates UPC, UMC as Codes of Practice at veterans cemeteries nationwide

WASHINGTON — Effective July 16, the Uniform Plumbing Code® (UPC) and Uniform Mechanical Code® (UMC) will be the only codes of practice permitted by the federal government to be used for the establishment, expansion and improvement of State veterans cemeteries funded through grants by the U.S. Department of Veterans Affairs (VA) in instances where no local or state code exists or local/state codes are less stringent than the UPC/UMC.

The Department of Veterans Affairs on June 16 issued this final rule amending the regulations governing grants the VA makes to States for the above stated purposes. The ruling changes the referenced codes to the International Association of Plumbing and Mechanical Officials' (IAPMO) Uniform Codes from those produced by another code development organization.

The Uniform Plumbing Code® (UPC) and Uniform Mechanical Code® (UMC) are the only plumbing and mechanical codes of practice to be designated as American National Standards by the American National Standards Institute (ANSI).

“VA grants to states for the funding of veterans cemeteries represent a sig-

nificant amount, meaning a great deal of work is being done on behalf of these fallen heroes and their families,” said GP Russ Chaney, IAPMO executive director. “IAPMO is honored to have our codes designated as the codes most worthy of honoring their service to our nation through the preparation and enhancement of their final resting place.”

The VA is implementing through regulation new statutory authority to provide grants for the operation and maintenance of State veterans cemeteries (Operation and Maintenance Projects) as authorized by the Dr. James Allen Veteran Vision Act of 2007.

Rinnai extends warranty on condensing tankless units used in recirc apps

PEACHTREE CITY, GA. — Rinnai Corp. has extended the heat exchanger warranty on RC98HPe, RC98HPi, RC80HPe and RC80HPi condensing tankless water heaters used in recirculating applications from three years to 12 years. The new warranty pertains to recirculating systems that are controlled through an aquastat/ thermostat, a timer or an on-demand system. The change means that Rinnai® brand condensing tankless products used in qualified recirculating systems will now feature the same 12-year heat exchanger warranty as all residential installations.

The warranty change is effective immediately on all new Rinnai brand condensing tankless unit installations with qualified recirculation systems and is not retroactive. For more information about Rinnai, www.rinnai.us.

SolarLogic hosts installer training

SANTA FE, N.M. — SolarLogic LLC, a Santa Fe start-up aimed at enabling any heating contractor across the U.S. to install solar heating, hosted its first training for installers by special invitation. This

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July 2010

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 10. Short Spec in Word Document Format. Formats that are not shown but also available for project downloads:
 Long Spec in Word Document Format, Short/ Long Spec (PDF Format) and Drawings Only



Industry News

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follows deployment of first-generation SolarLogic products in homes in New Mexico and Virginia and represents a key milestone in SolarLogic's plans for delivering its products and services to the larger market at the end of 2010.

SolarLogic first made headlines in 2009 when the company won a local Economic Development Grant from the City of Santa Fe. Since then, the company's focus has been on developing its flagship products, the SLIC (SolarLogic Integrated Controller) and the SLASH-D (SolarLogic-Assisted Solar Heating Design). The combination of these two products manages the inherent complexity in solar heating system design and control, removing the burden of expertise from the installer. The training this month focused on the SLIC and was attended by heating contractors from New Mexico, Colorado and Virginia who will be installing the SLIC in homes this year. For more information, www.solarlogicllc.com.

3M advances topic of clean agent fire suppression on Facebook

LAS VEGAS — 3M announced that it has launched a Facebook page called, 3M Novec 1230 Fire Protection Fluid that is designed to advance the science of clean agent

fire suppression. The company is inviting those who design and install fire suppression systems to join the discussion and share ideas, tips, success and challenges.

The 3M Novec 1230 Fire Protection Fluid Facebook page provides an exciting platform to communicate directly with other industry specialists about environmental regulations that affect the fire protection engineer, clarify applications, discuss technical questions and best practices and provide trouble shooting support. For more info, www.3m.com.

IAPMO to offer backflow training, certification at conference

ONTARIO, CALIF. — The International Association of Plumbing and Mechanical Officials (IAPMO) will present a Backflow Prevention Assembly Repairer training and certification course at its 81st Annual Education and Business Conference, Sept. 26-30, in Seattle.

This 20-hour course for individuals seeking to become a certified Backflow Prevention Assembly Repairer culminates with a 50-question certification exam through the American Society of Sanitary Engineering (ASSE), publisher of the American National Standards Institute (ANSI) recognized Professional Qualification Standards (ASSE Series 5000). ASSE certification is recognized throughout the United States and internationally.

For more information, www.iapmodwbp.org.



Product tester #473

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Industry Movers

Armstrong helps shape industry standards for energy assessment

THREE RIVERS, MICH. — A representative from Armstrong International was selected to participate in the development of the newly released American Society of Mechanical Engineers (ASME) standards for energy assessments in steam systems. Nevena Iordanova, senior utility systems engineer for Armstrong, collaborated with other industry leaders in a year-long initiative to formulate requirements for conducting and reporting the results of a steam system energy assessment that encompasses the entire steam system from energy inputs and steam generation and cogeneration through distribution to users and condensate return.

ASME selected Iordanova for her knowledge of steam systems and applied experience in energy system audits. “Armstrong is a global leader in energy management and auditing and I was pleased to help author the standards for companies to follow to achieve energy efficiencies and optimal performance of their steam system,” said Iordanova. According to Iordanova, the approach applied in writing the ASME energy assessment standards strives to help companies assess the details of their utilities consumption, equipment usage and processes, and identify the most prospective projects and areas for improvement.

More importantly, it provides a higher level of understanding and knowledge among management and employees of their systems for predicting and assessing interactive dynamics of the system. An ASME compliant assessment would be a guiding document and a base for multiyear energy performance plans.

Sweeney Rogers Geraghty announces business development manager

RAYNHAM, MASS. — Sweeney Rogers Geraghty announced that Jeff Woods has joined the organization in the role of business development manager for the Mestek Products Division. Woods got his start in the industry at Sweeney Rogers Corporation in 2000. He has since held positions at Mestek, Inc. as Northeastern Regional Manager for RBI Boilers and national sales manager for SpacePak Central Air Conditioning. He was most recently employed in the Business Development Department at Emerson Swan.

Sweeney-Rogers’ recent merger with the Frederick-Geraghty rep agency created an opportunity for an increased focus on their products manufactured by Mestek, Inc.



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The Building Information Modeling Report

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MCAA Introduces BIM TECHNOLOGY course

ROCKVILLE, MD. — The Mechanical Contractors Association of America, Inc. (MCAA) announced a new course, BIM TECHNOLOGY. The two-day course will be held Monday, October 11 — Tuesday, October 12, 2010 in Chicago. The association also will reprise its popular BIM for Mechanical Contractors introductory-level course on Monday, May 17, 2010 in Baltimore.

BIM TECHNOLOGY for Mechanical Contractors will present a logical, solid process for selecting BIM tools. It will explore significant applications and categories of tools across project phases and the positive effect BIM processes provide for quantity take off, shop drawing and fabrication, and construction scheduling. This course will also explore the positive impact models have on estimating, scheduling, and coordinating.

The goal of the course is to facilitate participants becoming BIM champions within their organizations. In a highly participatory, team-oriented learning event that balances group discussion and team assignments in an instructor-led format, participants will learn, understand and appreciate the:

- Phases of a BIM project;
 - Categories of BIM technology;
 - Specific BIM applications;
 - Need for planning/organizing to use BIM tools;
 - Requirement to embed tools into process; and
 - Process for selecting relevant BIM tools.
- Leading industry technology vendors will provide free product demonstrations in the evening on Monday, October 11, so that participants can get a first-hand look at what can be accomplished with BIM technology.

Both courses will take place under the expert guidance of David Morris, director of Virtual Construction for EMCOR Group. Morris has more than 30 years of experience performing and directing all phases of piping and mechanical systems for commercial, hospitality, industrial, and power generation construction. His current duties include improving BIM processes and sharing best detailing and virtual design practices across the 80 EMCOR Group companies.

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For additional information and a registration form, visit www.mcaa.org/education or contact Dennis Langley at dlangley@mcaa.org.

Bell & Gossett announces new BIM library featuring Revit® drawings

MORTON GROVE, ILL. — ITT Bell & Gossett announces a new extensive online library of 3D Building Information Modeling (BIM) content files in Autodesk® Revit® 2010. A total of 113 Revit families and 5,252 types have been created for the following HVAC product lines:

- Pumps: VSX, Series 1510, 1531, 80, 80-SC, 60, and 90;
- Pump Accessories: Suction Diffusers & Triple Duty Valves;
- Engineered Specialties: Rolairtrols and B&D Expansion Tanks; and
- U-Tube Heat Exchangers.

Bell & Gossett contracted with CADworks®, one of two certified Autodesk Content Network providers in the world, to transform its HVAC product drawing files into Revit families, which are parametric components that serve as the basis for all designs. Users can select the files directly in Autodesk Revit with a one-time download of the Bell & Gossett Content Module at <http://www.cadworks.net/bellgossett> and can pick the appropriate models from the Content Library.

Raypak offers Revit BIM files online, CD

OXNARD, CALIF. — Raypak, Inc. now has available Autodesk Revit BIM files for its entire product line on a mini CD. It includes the complete families of commercial boilers, water heaters and storage tanks; i.e. Raytherm™, Hi Delta™, MVB™, XTherm™ and XFyre™. Revit files, a mainstay of the Autodesk cache of software products, facilitate the opportunity for architects and engineers to drop selected products directly into their Autodesk Revit building projects. They allow the designer to drop in product dimension, clearance, and connection specifications. Raypak Revit files may be downloaded at www.raypak.com.

July 2010



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Designer's Guide

Timothy Allinson, P.E., Murray Co., Long Beach, Calif.



The 'Poopy Paper' receives national attention

The *Orange County Register*, a local paper here in So Cal, recently ran a piece about William (Kelly) Hutchinson and his award-winning paper about plumbing. It seems that Kelly, 14, was given a class assignment to write about the innovation he believed had the greatest effect on history. His paper, reprinted below with permission from the author and his parents, was selected by the staff of his Shorecliffs Middle School in San Clemente to compete in the Orange County History Day Competition. Kelly's paper won. He went on to the state competition and he won that, too. From there, he was off to the National History Day Competition in Washington, DC.

Kelly's peers wrote about the Red Cross, nuclear bomb, and submarine, and Kelly himself initially wanted to write about the hand gun. But the more research he did, the more he realized the significance of plumbing and how its development through the 18th and 19th centuries curbed diseases.

His family and peers initially teased him about his selected topic and nicknamed it the "Poopy Paper." But the teasing quickly stopped when he won the county and state competitions. Unfortunately, the competition in DC was fierce and broad reaching — from as far away as Germany and Taiwan, and Kelly did not win. But the fact that his plumbing paper made it so far is highly significant.

Reading about all this thrilled me, as I have long said that our industry needs an image upgrade in the minds of America's youth, and Kelly has done just that. I contacted Kelly's father and he sent me a copy of the paper. For brevity I have deleted the footnotes, which is unfortunate since it was his credible use of 30 sources that was the key to his success. If you are interested in seeing the paper in its original form with footnotes and references please let me know and I will email you a digital copy.

The Sanitation Revolution: The Innovation of Sewers and Indoor Plumbing in the 19th and 20th Centuries

William Hutchinson
Junior Division
Historical Paper

— When asked to think of great technological breakthroughs in history, many people mention such flashy inventions as television or computers. But if we narrow the focus to those innovations that have had the greatest impact on human welfare, and for the most people, few innovations can compare with public sewer systems and indoor plumbing. When the *British Medical Journal* polled experts in 1999 about what they considered the greatest medical advance since 1840, the majority picked public sanitation, ranking it above even antibiotics and anesthesia. Without a doubt, the widespread adoption of sanitation systems and indoor plumbing in the early 20th century

was the most significant innovation in nearly doubling the average lifespan of Europeans and Americans, rapidly decreasing deadly diseases and creating a healthier, more comfortable living environment for the modern world.

The idea of building sewers to carry waste away from houses and cities is thousands of years old. Like many other grand innovations, the concept of indoor plumbing and sewers has been around since ancient times. It can be seen in ancient Roman and Babylonian civilizations, where there were primitive toilets and closed sewers for all to use. After 2,000 years, all of the mechanisms and devices used for controlling sewage had crumbled, and the world had no idea how to properly dispose of human feces. Over the years, many important scientists and inventors such as Leonardo da Vinci and William Byrd looked back on the Roman plumbing fixtures and pipelines and experimented with different forms of flushing water closets and sewage systems, but their ambitious plans never left the drawing board.

Before the invention of large-scale enclosed public sewer systems, large towns and cities were heavily polluted. During the Middle Ages, the common folk dumped their chamber pots of waste right into their backyards and streets. As a result, living in cities and towns meant constant, daily contact with urine and feces. Much of the time, the waste would flow into ground wells and the city water supplies. The rich and middle class emptied all of their waste into giant open cesspools, or cesspits, located in their basements. The stench was unimaginable. In 1186, in the palace of the Holy Roman Emperor in Efurt, Germany, the fumes from the palace cesspool caused the floorboards to gradually rot. Once, during a large gathering, the floors collapsed and hundreds of the emperor's guests fell through into the cesspool and drowned in human excrement.

Life was not much better in the New World. English settlers used chamber pots and other crockery items to spread their waste into fields and rivers, or used primitive outhouses that consisted of wood benches hanging over holes in the ground. The waste was stored in underground chambers called cesspits, often located very close to houses. They did not know that as the populations of cities and towns grew, such casual methods of discharging refuse would lead to major pollution problems and various outbreaks of epidemics. "Here in Massachusetts, it is no uncommon thing to find (in rural homes) a well for water supply in close juxtaposition with collections of foul and disgusting matter in vaults of privies, cesspools, pig-styes or banyards," wrote Harvard-educated civil engineer Edward S. Philbrick in his 1881 book, *American Sanitary Engineering*, commenting on the horrible living conditions of the common people. "A city government erected within ear-shot of our oldest institution for learning still compels every householder to hoard in immediate vicinity of his dwelling, the vilest refuse of his family to ferment

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Designer's Guide

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and decompose in the soil," added Philbrick, one of the pioneers of American sanitary engineering.

Such poor sanitary precautions led to the spreading of deadly infectious diseases such as typhoid fever, cholera, malaria, and polio in both Europe and North America. As a result, the life expectancy of the average person gradually declined until it was reduced to less than 45 years of age in the late 19th century. A landmark case study in public health and sanitation history, called the Broad Street Well Epidemic, definitively established the link between sewage-contaminated drinking water and disease. In London, 1854, the deadly disease of cholera swept through

Reading about all this thrilled me, as I have long said that our industry needs an image upgrade in the minds of America's youth, and Kelly has done just that.

the Soho neighborhood in London. Cholera is caused by bacteria that attack the intestines so violently that victims die within hours of excruciating dehydration from diarrhea. A British medical inspector named Dr. John Snow investigated the situation. Snow interviewed the families of the victims of the outbreak and learned that nearly all of the victims drank water from a well on Broad Street. "Within two-hundred-and-fifty yards of the spot where Cambridge Street joins Broad Street, there were upwards of five hundred fatal attacks of cholera in ten days," wrote Snow, in the investigative report he wrote up at the time. Later, he discovered that the mother of a girl afflicted with cholera had dumped her daughter's waste bucket into a leaking cesspool, only three feet from the Broad Street well — a major source of city drinking water. He believed that those drinking from the Broad Street well were inadvertently consuming microscopic bits of human waste (Dr. Snow didn't know about bacteria yet) that was causing the cholera that would ultimately lead them to their deaths. Dr. Snow removed the pump handle from the Broad Street well, cutting off people's access to its water, and new cholera cases, he believed, began to decline. Experts today debate whether removing the pump handle actually stopped the epidemic or whether it was already declining when Dr. Snow acted.

Investigating such epidemics as the cholera epidemic in London in 1854, scientists began seeing the connection between infectious disease and human waste. The contagion theory of disease (originally proposed by Agostino Bassi in 1844) was gaining ground in medicine. Edward Jenner, an early pioneer of bacterial anatomy, was one of the first to question the theory that diseases were spread through contaminated air (called "miasma") instead of through contact with bacteria-filled substances. Gradually by the late 1800s, medical scientists and health inspectors

came to believe that there had to be dramatic separation between human waste and drinking water.

In the late 19th century, two technological innovations occurred that dramatically improved the science of sanitation: the development of the modern toilet or water closet, and closed sewer systems, made up of large buried pipes, to carry waste away from cities. The toilet was the easy part. Functioning toilets had been around since the 16th century. A British nobleman named John Harrington built what he called a "privy of perfection" for his godmother, Queen Elizabeth I, in 1596. The fixture, imperfect but functioning, flushed waste away, but lacked venting to remove noxious fumes. Nearly two centuries later, around 1775, a watchmaker and innovator named Alexander Cummings constructed an effective flushing water closet based on Harrington's toilet and other mediocre plumbing devices. In 1829, a 26-year-old architect named Isaiah Rogers took the principles of Cummings' invention and developed his own toilet. Rogers' innovation could carry the dirty water away and pump out its contents. But it also added vents through the roof to carry out sewer gas, an essential innovation. Rogers installed his indoor plumbing invention in the Tremont Hotel in Boston, which boasted the first hotel bathrooms in history. "Water was drawn from a metal storage tank set on top of the roof, the recently-invented steam pump raising the water on high," according to an article in a technical journal. "A simple water carriage system removed the excretal water to the sewerage system. As with other individual buildings of the time, each had its own source of water and removal."

By the 1890s, government leaders realized that the only way to ensure clean drinking water and sanitary conditions was through the creation of massive, city-wide sewer projects that ripped up entire cities. By then, engineers had learned how to channel dirty water through pipes and vent the air properly. They also learned how to filter, screen and eventually treat sewage before it was merely dumped into nearby lakes, rivers or the sea. "Disposal by dilution has retained greater favor in the United States than in England because of the larger bodies of water available for receiving the sewage," wrote two civil engineers in 1916. "Dilution is now under fire, however, from some health officers and their engineers, who oppose the discharge of merely screened and settled sewage into rivers or lakes furnishing water for potable purposes."

Few people could have imagined that indoor plumbing and sewer systems would have such a dramatic impact on both the quality of life and human longevity. "The effects of sanitary improvement have been already manifested to an extent greater than could have been anticipated," noted American civil engineer George E. Waring, Jr., in his 1867 book, *Draining for Profit and Draining for Health*. When London installed closed sewers and abolished cesspools between 1848 and 1854, for example, the death rate overall went from 23 deaths per 1,000 people to 7 — a 70% decrease in just a decade. Similar dramatic results were seen in Paris and Berlin. "Half the problems of unsanitary water have been solved in a single generation," said Nobel laureate and physician Dr. George Whipple in

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Designer's Guide

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1911, in the book *Technology and Industrial Efficiency*, speaking of North America. "Ten million people in cities now have a clean and safe water supply which has thereby increased their comfort and health." Experts in the early 1900s estimated that public sanitation systems saved thousands, perhaps millions of lives by preventing the spread of infectious diseases. For example, according to Whipple, the death rate in 1860 from typhoid fever was 50 per 1,000 people. Thanks to clean drinking water, Whipple asserted, the death rate had been cut by more than in half, to about 20 per 1,000 people.

While public health researchers agree that sanitation innovations had a huge impact on reducing infectious diseases, some contend that improved nutrition and better housing for the working poor were equally, if not more, important, in promoting better health and greater longevity. "Although the sanitary movement of the nineteenth century and the development of bacteriology substantially lowered death rates from enteric diseases, other serious health problems still existed," asserts medical historian Warren Winkelstein, Jr. "One was the appalling and ubiquitous rate of infant mortality." Some experts believe that sanitation innovations are given too much credit for increasing health and quality of life. Carl Schramm, author of *Good Capitalism, Bad Capitalism*, writing in the *Stanford Social Innovation Review*, argues that it was not sanitation innovations alone but also the availability of increased quantities of nutritional food that led people to a healthier, longer life. "The falling costs and increasing quality of food, clothing, and shelter made Americans healthier and more resistant to diseases," concludes Schramm. However, as important as improved early child care, antibiotics, and better food and housing were in improving living conditions, none of these advances alone could have made much of a difference if epidemic disease had not been suppressed through sanitation innovations.

"In the Middle Ages, the average human life expectancy did not reach into the teen years, not only because of the extremely high mortality that heavily skewed the data, but also because Europeans, and much of the world during this time, lived in an unhealthy milieu of filth, poor hygiene and nearly non-existent sanitation," notes medical historian Miguel A. Fario, Jr., M.D., adding that "hygiene and sanitation have resulted in unprecedented longevity." Due to significant innovations in public sanitation and similar advances in medical hygiene, the Centers for Disease Control and Prevention estimate that the average life expectancy for Americans has increased by about 30 years since 1900.

There is no doubt that many technological and medical advances in the late 19th and early 20th centuries had major impacts on improving human health. However, the proof that public sewers and indoor plumbing played a critical role in promoting human survival can be seen today in recent events. For example, the recent devastating earthquake in Haiti demonstrated what life would be like without modern sewage systems and clean drinking water. The major problem facing rescue workers in Haiti was the destruction of the island nation's sewer system, the contamination of drinking water and the subsequent spread of

bacteria and disease. Matters are even worse in India, where more than 638 million people lack basic sanitary necessities such as clean water and good hygiene. "We go to the toilet on the street," a young Indian resident from the city Kolkata told the *Los Angeles Times* in March 2010. "I know other people have to walk in it, but you don't have much choice if you have to go." According to a 2010 report by the United Nations Children's Fund and the World Health Organization, 39% of the world population, more than 2.6 billion people, still live without basic sanitation facilities and an estimated 1.5 million children under age five die each year from diseases linked to unsanitary living conditions.

The problem of where and how we dispose of human waste remains a controversial issue even in the United States. In March 2010, Orange and Los Angeles Counties filed a lawsuit over the recent decision by Kern County voters no longer to accept truckloads of sewage sludge from these southern counties being spread on their fields. According to a report in the *Orange County Register*, the city of Los Angeles alone dumps over 450,000 tons of "biosolids" in Kern County's fields and meadows annually. "The way folks in Kern County look at it, the city slickers are using their county as a giant toilet — and they don't like it one bit," wrote Gordon Dillow in the *Orange County Register*. The problem of getting rid of sewage sludge safely is growing nationwide and will remain an issue well into the future. Scientists are currently researching innovative new ways to recycle biosolids or even utilize them in new green energy production.

In the end, modern sanitation systems may not be perfect, as the controversy over sludge disposal shows, but this innovation has succeeded in nearly doubling the life expectancy of the average person, creating a better, easier environment to live in, and preventing the spreading of many contagious diseases. It is hard to even comprehend, at times, how far scientists and innovators have come and how much they have accomplished. The protection and purification of drinking water, and the elimination of disease-carrying human waste, have improved the quality of life for billions of people worldwide. Though at times, we may take certain things for granted, it is our duty as Americans to truly appreciate the innovations in sanitation that have dramatically changed the course of our world. Our next goal should be to bring these life-saving sanitation innovations to the suffering people in poor countries worldwide. — ■

Timothy Allinson is a senior professional engineer with Murray Co., Mechanical Contractors, in Long Beach, Calif. He holds a BSME from Tufts University and an MBA from New York University. He is a professional engineer licensed in both mechanical and fire protection engineering in various states, and is a LEED accredited professional. Allinson is a past-president of ASPE, both the New York and Orange County Chapters. He can be reached at laguna_tim@yahoo.com.

The views and opinions expressed in this column are those of the author and do not reflect those of *Plumbing Engineer* nor its publisher, TMB Publishing.



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Code Update

Ron George, CPD
President, Ron George Design & Consulting Services



2012 Plumbing Code Update

Both model code organizations have held their recent code hearings for the 2012 edition of the model plumbing Codes. The International Code Council held their final action Plumbing Code hearings on May 14 - 23, 2010 at the Dallas Sheraton Hotel. The International Association of Plumbing and Mechanical Officials (IAPMO), which published the Uniform Codes, held their meetings April 26 - 30 in Milwaukee. Both model code organizations are introducing "green" code requirements. In the past, these green initiatives might have been called "energy and water conservation" or "sustainable" building design requirements, but now in the green marketing era, everyone needs to have a green product. The green codes have sections on alternative water and waste water system requirements such as gray water, reclaimed water, rainwater harvesting, and on-site treated water. There are still a few code activities that need to take place before the 2012 editions of the codes will be printed. The following text discusses the code activities in the two model plumbing code development cycles.

Code Development Process notes:

The code change process is being slightly modified; revised Code Development Process includes maintaining the current 3-year publication cycle with a single cycle of code development proposals and hearings between code editions. In the past, the code cycle had two 18-month-long code development and hearing cycles per 3-year code cycle. The new code change process for ICC and IAPMO will be implemented as follows:

ICC Code Change Process

1. Transitional Process – 2009/2010 only
 - A. Single Code Development Hearing (CDH) for all codes in 2009
 - B. Two Final Action Hearings (FAH) in 2010 – modified Groups A and B (see below)
 - C. Publish 2012 edition in April/2011
2. New Process – 2012/2013 and going forward for the 2015 edition of the International Codes
 - A. Code committee application deadline (all codes): June 1, 2011
 - B. Codes split into two groups: Group A and Group B
 1. **Group A:** International Building Code (IBC); International Fuel Gas Code (IFGC); International Mechanical Code (IMC); International Plumbing Code (IPC); International Private Sewage Disposal Code (IPSDC):
 - a. Code change deadline: January 3, 2012
 - b. Code Development Hearing: April/May 2012

c. Final Action Hearing: October/November 2012 (in conjunction with Annual Conference)

2. **Group B:** Admin (Ch. 1 of all International Codes); International Existing Building Code (IEBC); International Energy Conservation Code (IECC); International Fire Code (IFC); International Green Construction Code (IGCC); International Performance Code (IPerfPC) (Performance Code for Buildings and Facilities); International Property Maintenance Code (IPMC); International Residential Code (IRC); International Wildland, Urban Interface Code (IWUIC); International Zoning Code (IZC):

- a. Code change deadline: January 3, 2013
- b. Code Development Hearing: April/May 2013
- c. Final Action Hearing: October/November 2013 (in conjunction with Annual Conference)

- C. Publish 2015 edition in April/2014
- D. Repeat for subsequent editions

ICC 2009/2010 Cycle Notes:

1. Revised code change deadline of June 1 posted on March 16.
2. Distribution: Because of the huge expense of printing and shipping, and in an effort to be green, complimentary code development cycle document distribution will be limited to CDs mailed to those who are on ICC's code change document mailing list and those who submit a return coupon. The proposed code changes are available for download online. Published versions of the code change documents will not be distributed or supplied at the hearings.
3. Code Development Hearings: The Baltimore Code Development Hearings included all 13 I-Codes. The hearings were held in the conventional two track format with the hearings split before and after the Annual Conference during the periods of October 24 – 31 and November 4 – 11.
4. Final Action Hearing Code Groupings:

Modified Group A: Were held May 14 – 23, 2010, in Dallas

- IBC – International Building Code (Fire Safety, General, Means of Egress, Structural)
- IEBC – International Existing Building Code
- IFC – International Fire Code
- IFGC – International Fuel Gas Code
- IMC – International Mechanical Code
- IPC – International Plumbing Code

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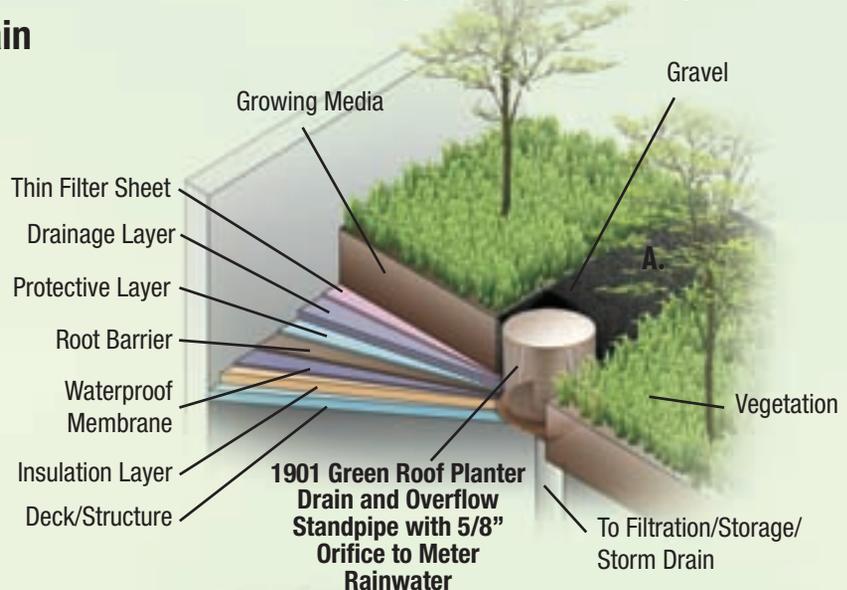
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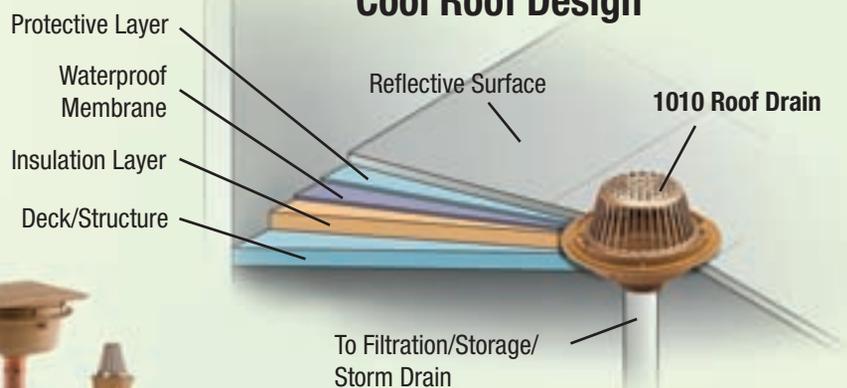
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Code Update

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IRC — International Residential Code (Building, Mechanical, Plumbing)

IWUIC — International Wildland Urban Interface Code
Modified Group B: Will be held Oct 28 – Nov 1, 2010,

Charlotte, NC

Administrative sections of all International codes
 IECC — International Energy Conservation Code
 IPMC — International Property Maintenance Code
 IRC — International Residential Code (Energy)
 IZC — International Zoning Code

International Association of Plumbing & Mechanical Officials (IAPMO) Uniform Codes update

The International Association of Plumbing & Mechanical Officials is in the process of updating their model codes for Plumbing, Mechanical, Solar Energy and Swimming Pools, Spas and Hot Tubs for the 2012 code cycle. The timeline for updating these codes is shown below:

Uniform Solar Energy Code (USEC) and Uniform Swimming Pool Spa and Hot Tub Code (USPSHTC) Code Development timeline

Uniform Solar Energy Code USEC and Uniform Swimming Pool, Spa and Hot Tub Code (USPSHTC) Code Development Timeline for 2012 Code Cycle

April 12, 2010 — Call for Proposals

August 2, 2010 — Deadline for submission of proposals

September 27, 2010 — Distribute proposals to committees

October 18, 2010 — Technical Committee meetings

November 11, 2010 — Initial ballot to Technical Committee

November 26, 2010 — Receipt of initial ballots, Circulation of comments

December 10, 2010 — Final closing date for ballots, including receipt of vote changes based on re-circulated comments

February 21, 2011 — Distribution of Report on Proposals (ROP)

April 4, 2011 — Call for Comments

August 1, 2011 — Deadline for submission of comments

September 26, 2011 — Distribute comments to committees

October 31, 2011 — Technical Committee meetings

November 21, 2011 — Initial ballots to Technical Committees

December 5, 2011 — Receipt of initial ballots, Circulation of comments

December 26, 2011 — Final closing date for ballots, including receipt of vote changes based on re-circulated comments

February 6, 2012 — Distribution of Report on Comments (ROC)

April 17, 2012 — Receipt of initial ballots, Re-circulate comments to Technical Committee members

April 27, 2012 — Final closing date of ballots and receipt of vote changes based on re-circulated comments

June 8, 2012 — Deadline for notification of intent to

file written petition to Executive Committee

July 9, 2012 — Executive Committee meet to address petitions.

Summer/Fall 2012 — Issue 2012 Uniform Codes

Uniform Plumbing Code (UPC) and Uniform Mechanical Code (UMC) Code Development timeline

May 4-8, 2009 — Technical Committee Meetings

October 12, 2009 — Call for Code Change Proposals

February 1, 2010 — Deadline for submission of Code Change Proposals

April 26-30, 2010 — Technical Committee Meetings, Code Change Testimony Hearings

June 7, 2010 — Final closing date for Committee Ballots

August 2, 2010 — Distribution of Final Report on Hearings

September 27-30 — IAPMO Annual Education and Business Conference, Assembly consideration Session, Seattle

October 4, 2010 — Call for Comments on code Changes

January 4, 2011 — Deadline for Submission of Comments

March 25, 2011 — Distribute Comments to technical committees

May 2-6, 2011 — Technical Committee Meetings

May 16, 2011 — Initial ballots to Technical Committees

May 30, 2011 — Receipt of initial ballots, Circulation of comments to Technical Committees

June 8, 2011 — Final closing date for ballots

(Including receipt of vote changes based on distribution of comments.)

August 22, 2011 — Distribution of Report on Comments (ROC)

September 25-29, 2011 — IAPMO Annual Education and Business Conference, Technical Meeting Convention
 Ballot of Technical Committees on membership amendments from the floor.

(Two-thirds approval required by technical committee)

October 17, 2011 — Technical Committee receives Initial Ballots with re-circulated comments.

October 28, 2011 — Final closing date for ballots and receipt of vote changes based on re-circulated comments.

November 9-11, 2011 — Standards Council Meeting

December 9, 2011 — Deadline for notification of intent to file written petition to the Board of Directors.

January 24, 2012 — Board of Directors meet to discuss petitions.

Summer/Fall 2012 — Issue 2012 Uniform Codes. ■

Ron George is president of Ron George Design & Consulting Services. He has served as Chairman of the International Residential Plumbing & Mechanical Code Committee. To contact Ron, write to him at rgdc@rongeorgesdesign.com.

The views and opinions expressed in this column are those of the author and do not reflect those of *Plumbing Engineer* nor its publisher, TMB Publishing.

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FPE Corner

Samuel S. Dannaway, PE,
President, S.S. Dannaway Associates, Inc., Honolulu



Protection of sprinklers against damage by earthquakes – Part 2

In last month's column I attempted to discuss when seismic protection is required. Also, discussed was the basic approach to providing seismic protection, i.e., incorporating measures to both 1) protect the sprinkler system from displacement due to story drift and 2) keep the piping fairly rigid when supported by a wall, floor or roof that is expected to move as a unit.

The article concluded with describing methods used to protect from displacement due to story drift, including introducing flexibility with flexible couplings and seismic separation assemblies and by providing adequate clearance for pipe penetrations.

This article will deal with the measures needed to keep the rigid — sway bracing and restraint.

Seismic sway bracing is intended to secure the piping from moving in certain directions. The three categories of sway bracing used in NFPA 13 are lateral, longitudinal, and four-way. Lateral sway bracing is intended to prevent the piping from moving perpendicular to the piping run in the horizontal plane. Longitudinal sway bracing prevents movement back and forth along the axis of the pipe which

In the "old days" many designers incorrectly provided earthquake protection by laying out sway bracing at maximum permitted intervals and meeting the other requirements described above and called it a day.

is also in the horizontal plane. Four-way sway bracing is intended to prevent movement of the piping in a horizontal plane and up and down vertically.

Let's start looking at sway bracing design with some of the basic criteria. First sway braces must not be installed in a manner where it will interfere with sprinkler spray discharge (you may recall this requirement from an earlier discussion on obstructions to sprinklers).

Lateral sway braces must be provided on all feed mains and cross mains and on branch lines with piping 2¹/₂ inches in diameter or greater. For feed mains and cross mains the bracing must be provided regardless of pipe diameter.

Spacing of lateral bracing shall not exceed 40 feet on center. In practice you will find that much lower spacing is normally needed to bracing piping to reasonably meet load limits on the bracing and fasteners (more about loads next month).

A lateral brace must also be provided within the last six feet of piping and the last section of piping on a feed or

cross main must have a sway brace. A lateral brace also may serve as a longitudinal brace for perpendicular piping. The 2010 edition of NFPA 13 clarified this allowance by requiring the brace to be within 2 feet of the pipe needing longitudinal bracing and the piping on which the brace is installed must be equal to or larger in diameter.

As noted last month, any flexible couplings installed on mains other than those required to meet seismic flexibility requirements must be provided with a lateral sway bracing with 24 inches of every other coupling but may not exceed the 40-foot spacing. To avoid this requirement rigid couplings must be used. Thus it is important to check in the field to ensure that the proper couplings are installed. It is not uncommon to see all couplings on the job are either all flexible or all rigid. Some manufacturers have tell-tale markings on their couplings so that inspectors can identify the type of coupling without requiring a close-up look.

Now as with many other requirements there are exceptions which allow us to avoid the requirement for lateral bracing. Piping attached with wrap around U-hooks or U-hooks that attached the piping directly to the underside of the structure. Another exception is for piping attached with rods that are less than 6 inches long. This distance must be measured from the point of fastening to the top of the pipe, not just the length of the rod.

Basic requirements for longitudinal sway bracing include installation on maximum 80-foot intervals with a longitudinal brace within 40 feet of the end of the pipe. This requirement applies to feed mains and cross mains. Similar to lateral bracing, a longitudinal brace may also serve as a lateral brace for perpendicular piping provided it is located within 2 feet of the pipe needing lateral. There is no requirement that the piping on which the brace is installed be equal to or larger in diameter, but I believe this is an oversight and will be corrected with the next edition of NFPA 13.

It is also noted that 4-way sway bracing also can be used to serve as both a lateral and longitudinal bracing for mains attached to the riser served by the brace. Four-way braces are normally provided for risers. They are required at the top of risers that are exceeding 3 feet. They are not required for riser nipples serving sprinklers. The braces are to be installed on risers at 25 feet intervals. Bracing may be attached to horizontal mains as long as they are installed within 24 inches of riser centerline and account for horizontal as well as vertical loads.

Four-way braces are exempted from riser nipples and from risers penetrating floors with clearance through the floor not exceeding NFPA 13, paragraph 9.3.4 limits. (Question: How does one not exceed the requirements of 9.3.4 when 9.3.4 states minimum clearances?)

It almost goes without saying that piping connecting

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July 2010

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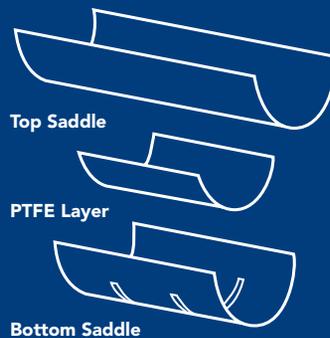
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FPE Corner

Continued from page 32

buildings expected to move differentially must not be bracing at the connection and that bracing may not be attached to seismic separation assemblies.

In addition to bracing there is another method of protection intended to rigidly connect the piping to the structure. This is the seismic restraint. A restraint as intended by NFPA 13 provides a lesser degree of protection for piping as it is not required to meet all the load requirements pertaining to bracing. Restraints are intended to be used to protect branch lines and sprinklers on branch lines. They are intended to prevent whipping of branch lines that can cause sprinklers or piping to impact with the structure. Restraint is required at the end sprinkler on a branch line and at intervals as specified in tables contained in NFPA 13. Restraints are also required on sprig ups that are 4 feet or longer. Restraints may be omitted where hanger rods are less than 6 inches measured from the fastener connection to the top of the pipe. I often get the question about whether single sprinkler branch lines need restrict. The answer is maybe. If there is a possibility the sprinkler can impact the structure during an earthquake restraint is needed. Often people will argue that a line serving only one sprinkler is not a branch line. NFPA 13 is not clear on this item so I recommend one must do what the AHJ requires.

Restraints are also not required on sprinkler armovers or drops. One must be careful with very long drops to sprin-

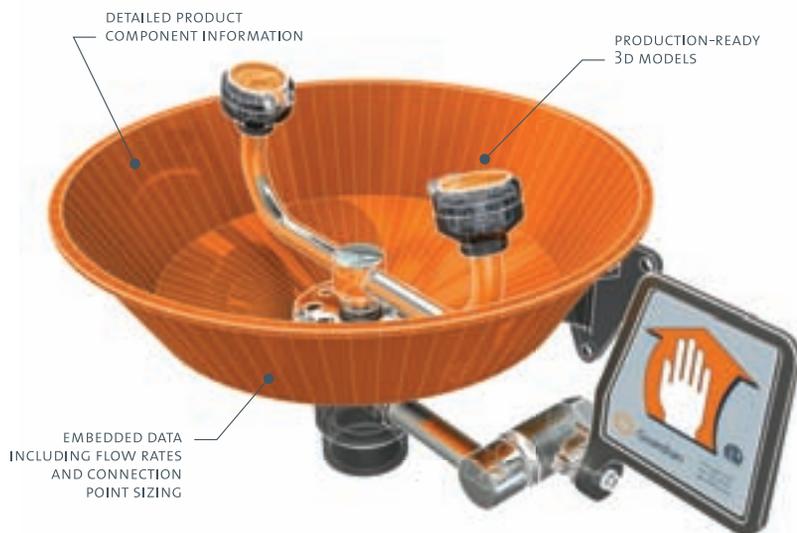
klers. One intuitively can reason that long drops should be restrained, and some members of the NFPA 13 Technical Committee on Hanging and Bracing would agree. However, no one has figured out how to do this practically since what is there that the long drop can be restrained to. That is why NFPA 13 is currently indicating no requirement for drops.

In the "old days" many designers incorrectly provided earthquake protection by laying out sway bracing at maximum permitted intervals and meeting the other requirements described above and called it a day. Now, of course, we know better (or do we). Now we also must carefully consider the loads involved when sizing and spacing the bracing. This will be the topic of next month's article. ■

Samuel S. Dannaway, PE, is a registered fire protection engineer and mechanical engineer with bachelor's and master's degrees from the University of Maryland Department of Fire Protection Engineering. He is past president and a Fellow of the Society of Fire Protection Engineers. He is president of S. S. Dannaway Associates, Inc., a 15-person fire protection engineering firm with offices in Honolulu and Guam. He can be reached via email at SDannaway@ssdfire.com.

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Solar Solutions

Bristol Stickney, technical director, Cedar Mountain Solar Systems, Santa Fe, N.M.



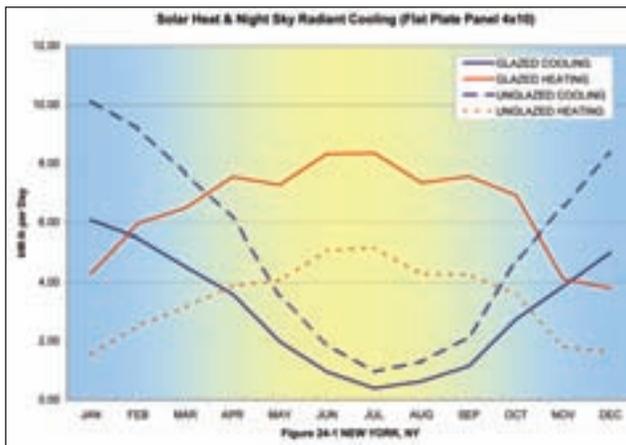
Flat plate collectors – heating vs. cooling by climate

Last month I introduced some of the computer software available to model and analyze solar heating installations in virtually any climate. Using this type of software with its detailed weather data and the ability to export data to supplementary spreadsheets allows the solar heating designer to answer questions and visualize the range of performance like never before. Let me show you what I mean with a practical example.

In the past few months, an increasing number of people have been asking me about using flat plate solar thermal panels for both daytime solar heating and night time radiant cooling. The inevitable design questions come up in nearly every project:

1. Can I use unglazed panels for both heating and cooling all year round?
2. How much better will the glazed panels perform in winter compared to unglazed?
3. If I use glazed panels only, is it worth while to run them at night for summer cooling?
4. How much solar heat and how much night cooling will each type of panel provide?

Of course the answers to these questions depend entirely on the climate at each different project, since solar heat

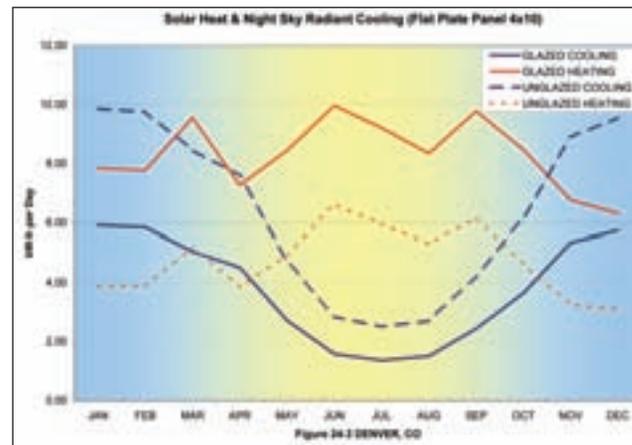


production and radiant cooling availability are driven entirely by local weather and temperature patterns. Since the solar heating computer models give virtually instant access to thousands of climate locations, this seems like an ideal way to answer these questions quickly and thoroughly.

Modeling the temps and solar heat available with SAM

I decided to try the free solar design program from NREL called SAM (Solar Adviser Model). This software allows the user to enter the collector efficiency ratings (available from the SRCC tests) and then calculates the solar heat output hour by hour using TMY or EPW weather

data. A built-in routine called Data View (DView) allows you to graph the weather data and the simulation results hourly, daily or monthly. Once you see a graph you like, you can right click on the graph, and a menu allows you to export the data seen on that graph into a text file that is



compatible with the Excel spreadsheet.

My goal was to compare data from various collectors in various climates on a month by month basis. SAM allows the user to keep the same collector configuration and instantly change climates, so building a spreadsheet using several different collectors in a number of different climates proved to be a rapid process.

My method was to enter one glazed collector and one unglazed panel of the same size into the program at a fixed tilt and orientation. Then change the climate location and plot the results on a graph using Excel. Since SAM does not include the capability to analyze Night Sky Radiant Cooling (NSRC), I plan to use the climate data provided by SAM and some additional spreadsheet calculations to accomplish that.

The following conditions were assumed in these collector simulation models:

Panel Size — 4x 10 , 40 ft², (3.7 m²)

Tilt — 45 degrees

Orientation — South (within 5 degrees)

Net heating & cooling energy will be used (pump energy is deducted)

Solar heating temperatures are assumed to be within the normal DHW range.

Comfort cooling for mass floors uses 75F fluid provided to the cooling panel.

Glazed panels use selective surface black absorbers with single glass.

Unglazed panels are black plastic non-selective rectangular tube plates.

Estimating NSRC using the “Dew Point Method”

The dew point method for estimating NSRC heat loss

Continued on page 38

July 2010

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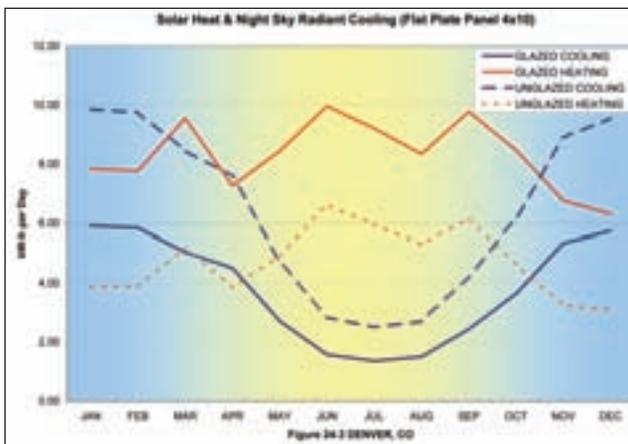
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Solar Solutions

Continued from page 36

rates is based on an original study that I completed in 2006 along with co-researchers Mark Chalom and Kate Snyder



and support from the State of New Mexico. One of the findings from this study was that the following formula (Equation 24-1) provides a reasonably simple way of estimating the cooling potential for NSRC in various climates using Dew Point and Air Temperature.

$$Q=U*A*[T_{in}-(T_{dew}+(T_{air}-T_{dew})/2)] \text{ \{Equation 24-1\}}$$

The terms in Equation 24-1 are defined as follows:

Q - Btu/hr - Heat Loss (Cooling) available per Hour from a radiator plate
(Multiply times 10 hours for typical Heat Loss per Night.)
(Divide by 3413 to convert to Heat Loss per night in units of kilo-Watt Hours.)

U - Btu/hr-ft²-°F - Heat Loss Coefficient for a collector/radiator panel.
(Determined by the author by field measurement.)

e.g. glazed=1.22, unglazed = 1.98

(The most common radiator plates typically fit into a range from 1 to 2. Radiator plates with glazing, selective surfaces, widely spaced tubing and poor thermal contact between the fluid and the plate surface will have lower values. Plates that are 'fully wetted', closely spaced tubes, no selective surface and good thermal contact between the fluid and the surface will have higher values.)

A - ft² - Area of the cooling panel. e.g. 40 ft²

T_{in} - °F - Fluid inlet temperature entering the panel
e.g. 75F for direct floor cooling. Higher temperatures for cooling jobs.

T_{air} -°F - Ambient (dry bulb) outdoor air temperature.

T_{dew} -°F - Dew Point outdoor air temperature.

Using the temperatures provided by SAM, (T_{air} and T_{dew}), this equation can be used to estimate the cooling available very quickly using a spreadsheet.

Annual heating and cooling graphs

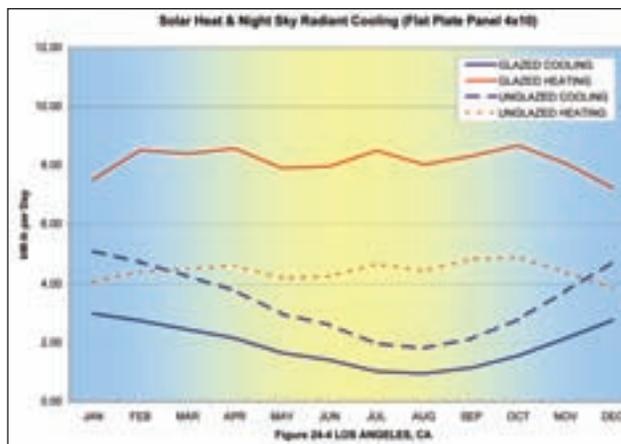
The results of this series of computer models are shown in the graphs, Figure 24-1 through Figure 24-4. Four sam-

ple climate locations are shown month by month with the solar heat available and the NSRC cooling potential for both a glazed and an unglazed collector panel. With these results, we can begin to answer the questions posed at the top of this article for each of these climate locations.

Looking at these graphs, we can observe some interesting general trends, some obvious some not so obvious.

- Glazed panels tend to produce twice as much heat as unglazed panels.
- Unglazed panels tend to produce twice as much cooling as glazed panels.
- Unglazed panels don't heat very well in winter in climates like New York.
- Unglazed panels heat surprisingly consistently in climates like LA and Miami.
- NSRC cooling is an energy resource that mirrors the solar heating resource.
- NSRC comfort cooling does not work in high humidity (like Miami in summer).
- A couple of panels may be enough to cool a single room in drier climates.
- Plenty of 'free' cooling is available through the year in the non-summer months.

Keep in mind that these graphs were constructed for home heating and cooling applications where comfort cooling fluid from hydronic floors is typically around 75F.



Much more radiant cooling can be accomplished at higher fluid temperatures. So for example, if some process required cooling fluid at 100F, twice as much NSRC heat loss can be achieved at this higher temperature. For commercial buildings and industrial processes, NSRC cooling even in winter is not such a crazy idea.

Brand names, organizations, suppliers and manufacturers are mentioned in these articles only to provide examples for illustration and discussion and do not constitute any recommendation or endorsement. Calculations and estimates are for example only, and not for intended for any particular design application. ■

Bristol Stickney has been designing, manufacturing, repairing and installing solar hydronic heating systems for more than 30 years. He holds a Bachelor of Science in Mechanical Engineering and is a licensed Mechanical Contractor in New Mexico. He is the Chief Technical Officer for SolarLogic LLC in Santa Fe, N.M., and is involved in training programs for solar heating professionals. For more information visit www.solarlogicllc.com.

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Pump and circumstance

I am the proud father of four college graduates, and this being the time of year of many graduations, my thoughts naturally turn to higher education, brought to most of us through the School of Hard Knocks, and at great expense. Some of us, however, take the courses, pay the tuition and won't learn.

Which brings me to pumps and a particular circumstance. I can tell this now that he's gone.

Smokey is currently on the other side of the lawn, but when he was with us, he was magnificent in his thick-headedness. As is the case with some in this trade, Smokey was born with the entire world's knowledge already in his head and didn't feel he ever had to ask for advice. He would take on heating jobs with the total confidence that comes with a thick skull, and when things went south, he would continue to move in the wrong direction because that is the nature of a man who already knows everything. Physics, biology and mathematics mean nothing to such men.

Smokey believed that cigarettes were harmless because his father had had an uncle who smoked until he was nearly 90 years old, and if it was possible for that man to smoke for so many years without ill effect, then all the doctors in the world were wrong. For Smokey, the exception was the rule, and he was that exception.

Smokey used one match in the morning to get himself lit off and this was only because he had to sleep for a bit at night. If he could have kept last night's last cigarette burning through the wee hours, he would have used its still-glowing butt to get himself going at first light, but no one makes such a cigarette, so he used the one match and sucked smoke all day, as though it was a religious calling.

He asked for my help one day, but in a way that fit his character, meaning that he didn't actually ask for help (men who know everything require no help). He merely called to say that I really needed to see this horrible air separator, which was never able to vent all the air from this heating system that he had just installed because it wasn't as good as the ones they used to make.

"It vents whenever the pumps are running," he said. "It's never finished. I hate it, and you should hate it, too. You should write about it in the magazines and tell everyone to stop buying this air separator because it never stops venting. It can't get the job done."

"Where is all this air coming from?" I asked.

"The air separator is making it," Smokey said, and there was not a trace of doubt in his voice. The man was born with his mind made up.

So we got together on the job, which had radiant tubing in a concrete slab. It was Smokey's first radiant job, but that was not a problem because Smokey already knew all there was to know about radiant floor heating. "You put the tubing in the concrete," he said. "You heat the water, and you pump it through the tubing. The building gets hot."

See what I mean? Magnificent.

It was around 9:30 in the morning, and Smokey was bashing his second box of Marlboros for the day into his left palm before tearing at the cellophane with his teeth. "These pumps suck, too," he said. "I want you to tell people about them. Tell them not to buy them."

"Why?" I asked.

"Look at how many you need to get the job done!" he said.

There were six of them, and Smokey had bolted them together, flange to flange, and on the return side of this cast-iron boiler.

"You get a special on these circulators?" I asked.

"That's how many you need to get anything moving through the tubing," he said. He lit another Marlboro and left the stub of the last one burning on the edge of the boiler.

"How much tubing do you have on this job?" I asked.

"I don't know," he said, "probably more than a thousand feet."

There were no manifolds. The boiler had a 1 1/2" supply, which Smokey had reduced to 3/8" after leaving the air separator (which never seemed to be able to finish the job). The single tube then entered the concrete floor like a deep-space voyager and eventually returned from the concrete on the other side of the boiler, where it connected to an air vent that was the size of a can of Budweiser. The first of the six circulators followed. From there, it was a hydronic daisy chain of pure pressure. It looked like the Six Flags of heating.

"You don't believe in radiant circuits, do you?" I said.

"Wadda ya mean?"

"A thousand feet of tubing, broken up into, say, five 200-foot circuits?"

"Too many chances for leaks," Smokey said.

"You buried more than a thousand feet of three-eighth-inch tubing as one long piece, didn't you?"

Smokey lit another Marlboro, spit a fleck of biomaterial, and nodded. "Yep."

"That's why you need all these pumps," I said.

"I know," he said. "One's not strong enough. You should write about that."

"Oh, I will," I said. "And that's quite a boiler bypass."

Smokey had piped a half-inch copper line from the supply side of the boiler to the suction side of his circulator railroad. There was a ball valve in the line for balance. It was closed.

"Gotta protect the boiler from low temp," Smokey said.

"I'll bet the boiler comes up to temperature quickly."

"Like a rocket," Smokey said. "But you're here for that lousy air separator. Listen to that thing."

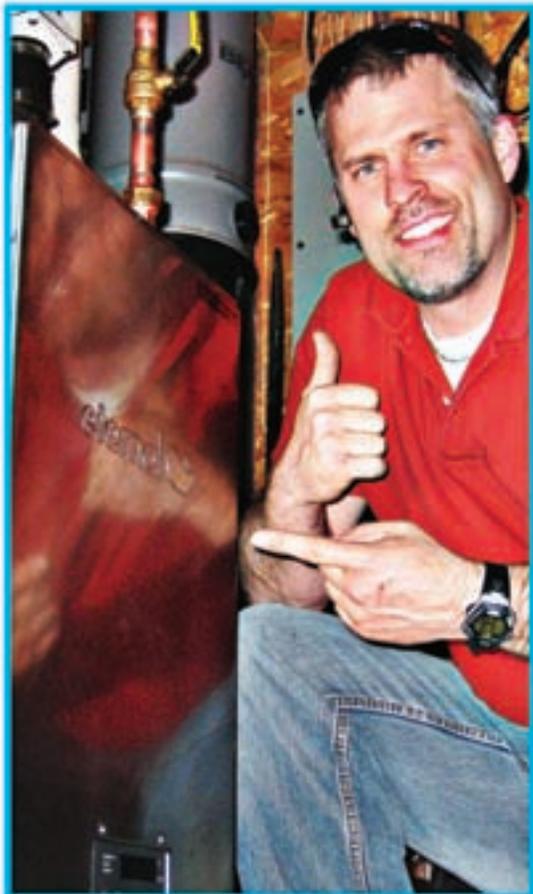
It was whooshing, all right. It was nearly as loud as the Budweiser-size air vent on the suction side of Smokey's circulator sculpture. He was staring at the air separator and shaking his head. "Garbage," he said, exhaling a cloud of smoke, which I watched swirl right into the Bud vent.

Continued on page 42

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I have been a heating & cooling contractor for 10 years & have installed several tankless water heaters over the years, all different names too! I recently had several issues with one that I installed, mainly water temperature spikes, cold water & low pressure. My customer suffered with this for over a year until I finally got fed up and started researching what was on the market & found Eternal Water Heater. I looked at their website and liked what I saw, but still was not convinced! I had been sold on other so called "tankless" water heaters that solved the cold water sandwich & pressure drop issues, so the rep from Eternal personally came out to my jobsite, sunk the hook and reeled me in! I will never install anything other than Eternal Water Heaters. My customer is finally getting what I promised him and the installation was simple!

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"Have you ever noticed," I said, "how blowing and sucking sound about the same?"

"Wadda ya mean?" Smokey asked.

"I mean how air, when moving quickly through a hole, makes about the same sound, whether it's going this way or that way. Blowing or sucking? Ever notice that?"

"Can't say as I have," Smokey said.

He lit another smoke, blew out, and once again, the Bud vent sucked it right in.

"Do you know about the point of no pressure change? How it's at the place where the compression tank is? And if you pump toward that point with a big enough pump, or with, say, six pumps piped in series, stem to stem like this, you're going to get quite a negative pressure on the suction side of that pump. Or pumps."

"Huh?"

"Blow some more smoke that way," I said, pointing to the Bud vent. He did. The vent sucked in the smoke nearly as quickly as Smokey was blowing it out.

"Wow!" Smokey said. "A system after my own heart!"

"Now watch over here," I said, pointing at the air separator. He did. "You won't see the smoke come out because this isn't a hookah."

"Huh?"

"You're sucking in air because you're pumping at the point of no pressure change with lots of pumps in series. The combined pump differential pressure is greater than

the system's static fill pressure. That's why the vent is sucking. The air is probably eating this boiler. The air separator is trying its best to get rid of the air that the vent is sucking in," I said. "Sucking and blowing."

"I hate that thing," Smokey said.

"Under the circumstances," I said, "I think you should be thanking it."

"I hate it. You're not going to help me get even by writing about this, are you?" Smokey snarled.

"I will when it's time," I said.

"When's that?"

"When you graduate," I said.

And now it's time. ■

Dan Holohan began his love affair with the heating industry in 1970. Today, Dan writes a monthly column for Plumbing Engineer's sister publication, Phc News. He's written a dozen popular books on subjects ranging from steam heating to teaching technicians. From Maine to Hawaii, and from Florida to Alaska, Dan has taught more than 50,000 people at his seminars. He is well known throughout the heating industry for his entertaining, anecdotal style of speaking.

The views and opinions expressed in this column are those of the author and do not reflect those of *Plumbing Engineer* nor its publisher, TMB Publishing.



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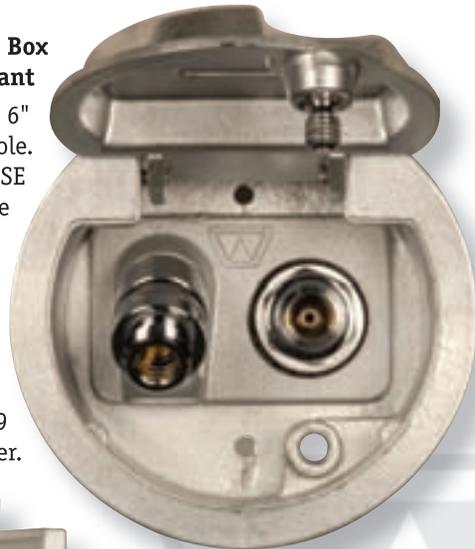


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Performance Gains Make Efficiency Choices Easier



A Pittsburgh Penguins fan participates in the Student Flush event in June, which tested the plumbing system in the new CONSOL Energy Center. Photo © 2010 Pittsburgh Penguins

By Rick Nortier

It's not a question of should a facility have high-efficiency Flushometers but of which types are right based on building age, drain conditions and other factors.

Professionals are showing greater willingness to use high-efficiency Flushometers as long as they can be assured that these systems meet third-party standards for high performance — and their high expectations. The technologies behind today's Flushometers have come a long way over the past few decades, and the high-efficiency commercial systems rival what's happening on the residential side of the market in terms of increasing performance while decreasing water usage.

Yet, there are many factors to consider beyond just technology before deciding which system is right for a particular facility. The options are many, and the EPA WaterSense® program is a good place to start when deciding which factors will pertain to the facility.

For a High-Efficiency Toilet (HET) to meet the require-

ments of ASME A.112.19.2, it must flush at a maximum of 1.28 gpf. HETs must also successfully remove at least 350 grams of waste, according to MaP test score guidelines, to adhere to the EPA's WaterSense specifications for HETs. Flushing at 1.28 gpf or less, HETs use at least 20% less water than the conventional 1.6 gpf water closet and can offer substantial water reductions, especially when replacing older water closets using 3.5 gpf or more. Dual-flush Flushometers, which have an aggregate flush volume below the 1.28 gpf threshold when accounting for an average 2:1 usage ratio of two reduced water-consumption flushes at 1.1 gpf for every one standard 1.6 gpf flush, are HETs.

A High-Efficiency Urinal (HEU) must have a maximum flush volume that is equal to or less than 0.5 gpf, which

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Flushometers

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is at least 50% less than the 1.0 gpf maximum for standard urinals. Although performance tests such as MaP are not currently conducted on HEUs, the WaterSense specification states that HEUs have to "...ensure both sustainable, efficient water use and a high level of user satisfaction with flushing performance."

The best case scenario is achieved when the Flushometer and fixture are optimized to work together in order to guarantee the intended flush volume is maintained while fully evacuating the fixture. Flushometers and vitreous china fixtures are available both separately and as engineered combinations from many manufacturers, and professionals need



The LEED Silver-certified Target Field — which has UPPERCUT dual-flush Flushometers and other Sloan products in its restrooms — easily passed its "worst-case scenario" testing.

to choose which approach best suits their needs. It's not all about cost; performance is really the key issue, and professionals need to do their homework.

The research and testing division of the International Association of Plumbing and Mechanical Officials (IAPMO), for instance, tests and certifies plumbing products to ensure they are in compliance with plumbing codes and standards. The IAPMO Web site, among others, lists plumbing fixtures and fittings that have passed its testing (see the product listings at www.iapmo.org). Such listings give insight into mix-and-match or packaged combination decisions.

New construction has the advantage of starting with the latest flushing technologies, as well as system design practices. HETs and HEUs are natural choices for both performance and water savings.

Plumbing retrofit and renovation project choices differ for existing buildings, however. Facility owners who want to reduce water consumption by moving to HETs, yet still have the older 3.5 gpf water closets, would be well advised to change out their fixtures and fittings. In that case, the decision comes down to: Would a 1.28 gpf or a 1.6/1.1 gpf dual-flush system work best? When making plumbing upgrades, consider both the age of the building and the condition of the drains.

When a facility switches from 3.5 gpf to 1.6 gpf water closets, it still experiences similar peak flow rate demand on its system. For slightly shorter durations, a system may need to supply a higher flow rate to initiate siphonic

action in the bowl. Just because the flush volume is reduced, it does not mean that the peak flow rate is reduced. To the contrary, it is even more important to have a strong water supply, because the same amount of energy is needed to move waste adequately with less water.

On the downstream, consider the drains: For an older building that was designed for 3.5 gpf water closets and has been in operation for many years, it may be advisable to video the drains. A diagnostic camera inspection can offer a clear understanding of drain conditions before determining what would work best. Possible obstructions, the distance to the stack and even the pitch can be evaluated, ensuring no "surprises" after the upgrade. Evacuating the fixture does not mean much if the waste cannot be efficiently moved through the drain system.

Electronic options

Facilities can either install a complete, new sensor-operated Flushometer or convert an existing manual Flushometer to sensor operation with a retrofit sensor kit. The decision between installing a new sensor-operated Flushometer or converting an existing manual Flushometer to electronic operation depends on the project at hand. For new construction, or old restrooms with aesthetically challenged fittings (such as chrome worn away from years of abuse or harsh cleaning), it is best to specify all new electronic Flushometers. The latest generation of these products has superior optics that better identify the user, resulting in fewer false activations.

Advancements in electronics have allowed manufacturers to improve their sensing and logic algorithms to offer users more benefits, including options such as deferred flushing, which flushes urinals at preset timed intervals instead of after every user. This setting saves water and allows for faster turnaround when there are lines of men waiting for urinals, which is useful in stadiums, theaters and other facilities that expect heavy traffic for brief periods of time. Another feature, sentinel flush, refreshes the fixture and trap seal by automatically flushing after a preset period of non-use.

Many existing manual Flushometers can be upgraded to electronic operation using retrofit kits. Retrofits are typically battery-powered units, which make them ideal for restrooms where main AC wiring is inaccessible or cost-prohibitive. Solar-powered Flushometers, which draw energy from any natural or artificial light source to power the sensor, offer the benefit of battery-powered installation with the additional advantage of significantly extending battery life through the solar panel.

For restrooms that have accessible main AC connections, especially those in high-traffic facilities that would quickly surpass the energy lifetime of battery-powered flushing units, low voltage transformer-powered retrofit models are a good option. Transformers for complete sensor Flushometers or retrofits include plug-in and foot- or box-mount styles, which can operate multiple fittings. Some transformers can power as many as 10 water closet or urinal Flushometers. Installers should allow a minimum of 15 VA of current rating per solenoid; manufacturers can advise on

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Flushometers

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proper transformer sizing based on the number of fittings.

Dual-Flush: Less Water, More Savings

Dual-flush Flushometers are rising in popularity, partly because they easily meet HET performance standards as proven by independent testing. The public is increasingly interested in doing its part for the environment, and building owners largely support that — as long as it's economically feasible.

Dual-flush functionality for water closets is a win-win: Restroom users can choose a reduced or regular flush, depending on solid or liquid waste, and the reduction in water consumption results in lower water and wastewater utility bills. Dual-flush functionality typically saves about a half-gallon of water in its reduced flush cycle, and can be manually or electronically activated.

Once it has been decided that dual-flush functionality is right for the restrooms, the fixture choice then becomes manual or electronic. In smaller buildings, it may be more advantageous to install manual dual-flush Flushometers in restrooms because they have a regular set of users. These users are more familiar with (and conscientious about) the facility, which means they are more likely to learn how to manually operate a dual-flush Flushometer to its full potential. In a large commercial building with a transient population, however, it is more difficult to train users on proper fixture usage. For these restrooms, electronic dual-flush Flushometers, which automatically initiate the appropriate flush cycle depending on the amount of time the user remains in the sensor range, are ideal.

Dual-flush functionality can be purchased as separate retrofit conversion kits or as part of complete Flushometer systems. A manual retrofit kit consists of a dual-flush handle

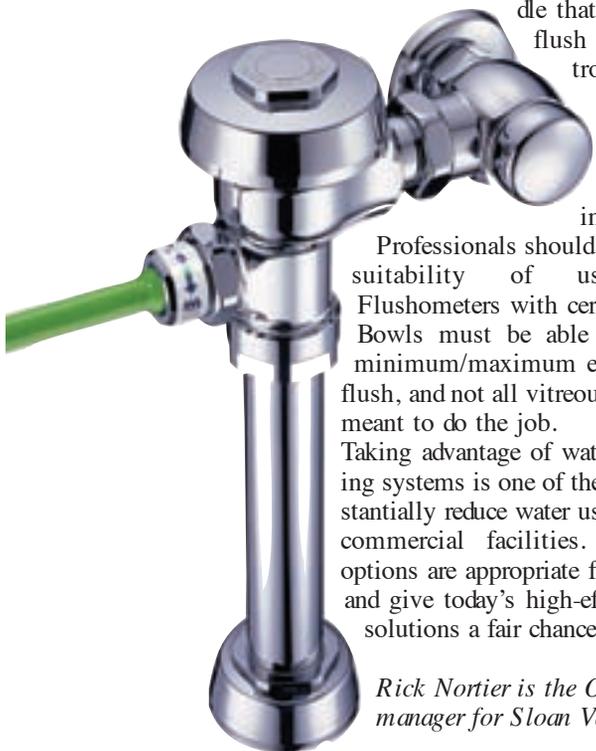
that replaces a regular flush handle. An electronic kit includes an electronic assembly body that installs in place of the existing valve body.

Professionals should also determine the suitability of using dual-flush Flushometers with certain water closets. Bowls must be able to handle greater minimum/maximum extremes with dual flush, and not all vitreous china models are meant to do the job.

Taking advantage of water-efficient plumbing systems is one of the best ways to substantially reduce water usage in all kinds of commercial facilities. Consider which options are appropriate for certain projects, and give today's high-efficiency plumbing solutions a fair chance. ■

Rick Nortier is the OPTIMA® product manager for Sloan Valve Company.

Sloan UPPERCUT dual flush



New stadiums simulate restroom rushes with synchronized flushes

When management for the Pittsburgh Penguins NHL team hosted its Student Flush event in June, their motive was twofold: They wanted to reward faithful student fans by giving them a first glimpse of its new CONSOL Energy Center, which is due to open later this summer, and they needed to test their plumbing system to ensure that their restrooms could stand up to big crowds on game days.

Thousands of students entered a drawing for the 250 open spots for the plumbing test event at the stadium, which has a total of 360 Crown® 1.28 gpf water closet Flushometers and 155 Royal® 0.5 gpf urinal



Flushometers from Sloan Valve. The synchronized flushing test in restrooms throughout the stadium, initiated by directions given through the public address system, yielded no surprises or hitches in the plumbing.

In 2009, the Minnesota Twins held a similar event for its new Target Field stadium, which has 286 urinal Flushometers and 610 water closet Flushometers, including manual dual-flush UPPERCUT® models, all from Sloan. The test is a great way “to ensure that your plumbing mains, both domestic water and sanitary, are intact and that your systems are functioning properly,” said Kip Olson, project manager for Metropolitan Mechanical Contractors, Eden Prairie, Minn., which has conducted similar tests before.

Olson says that although such tests are held under very controlled conditions, they do a good job of testing the city's water delivery to the building, as well as the wastewater system. He adds that tests such as the one done at Target, which at its height pumped about 2,000 gallons of water per minute through the system, help answer questions such as: Can we deliver a certain number of gallons per minute through the main, and can we discharge a certain number of gallons per minute of sanitary water back to the city's system?

“You are going for a worst-case scenario when you test a sanitary main,” said Olson. Thankfully, the LEED® Silver-certified Twins' stadium also passed the test with flying colors. ■

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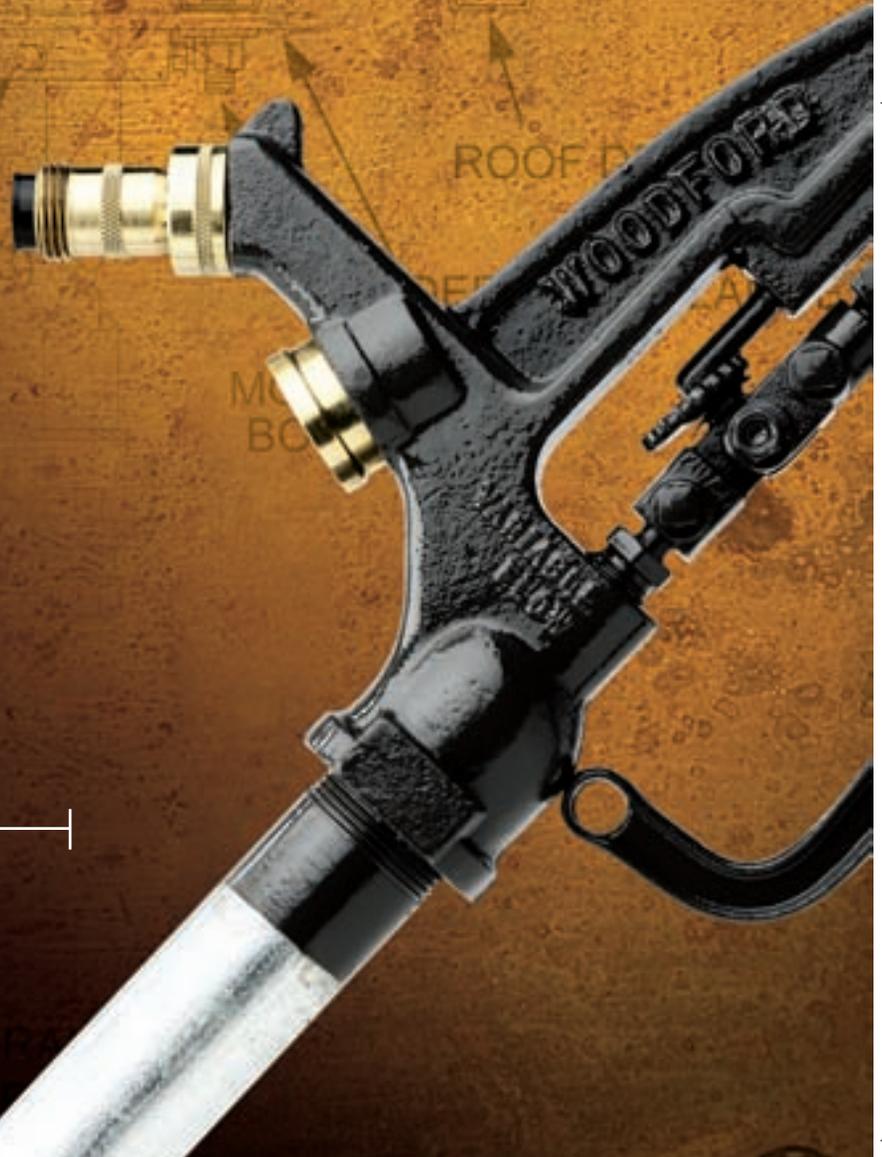
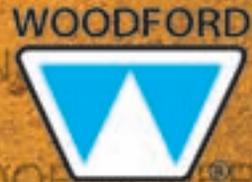
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Choosing the Appropriate Actuator for a Control Valve

By Chikezie Nwaoha

A control valve is the final control element in any process system because it is the final element that ultimately manipulates the value of the variable in the control process (see fig 1). The control valve usually has a control linkage, which is known as an actuator. The actuator accepts a signal from an independent source and in response positions (opening or closing) the valve to the required or designed position. Valve actuators provide remote operation of control valves, which is very essential for increased working safety and environment. Actuators can be moved into position by either hydraulic, air/gas or electric signals. And, they are used to position a valve to either more closed, more open, fully closed or fully open. There are different types of control valve actuators, and they are classified according to the type of supply that is required for activation. They are: pneumatic valve actuators, electric valve actuators and hydraulic valve actuators.



Figure 1. A control loop assembly.

Pneumatic Valve Actuators: This is a type of control valve actuator that can adjust the position of the valve by converting air pressure into rotary motion or linear motion. Rotary motion actuators are used on butterfly valves, plug valves and ball valves, and they position from open to closed by a 90-degree turn. Meanwhile, linear motion actuators are used on globe valves, diaphragm valves, pinch valves, angle valves and gate valves, and they employ a sliding stem that controls the position of the element (closure). Pneumatic valve actuators can be single-acting, in that air actuates the valve in one direction and a compressed spring actuates the valve in the other direction. Single-acting devices can be either reverse-acting (spring-to-extend) or direct-acting



(spring-to-react). The operating force is generated from the pressure of the compressed air. Choosing between reverse-acting and direct-acting is dependent on the safety requirements (in an event of compressed supply air failure), response/activation time, air supply pressure, etc. For example, for safety reasons, steam valves must close on failure of air supply.

Pneumatic valve actuators have the advantage of simple construction, requiring little maintenance and quick valve response time to changes in the control signal.

Electric Valve Actuators: This is another type of valve actuators that is compact with a large stem thrust. They are usually used in systems where pneumatic supply is not needed or available. The electric valve actuator is more complex than the pneumatically operating valve actuator. When the control valves are spread out over large distances, as in the situation with pipelines, then an electric valve actuator should be chosen for purely economic reasons. This is because electrical energy is cheaper and easier to transport than instrument air and hydraulic fluid. An electric valve actuator depends on an electrical power source for its signal, and in response to the signal automatically adjusts the valve to a desired position. It makes use of a single-phase or a three-phase AC/DC motor to move a combination of gears in order to produce the desired level of torque. Subsequently, the rotational motion is converted into a linear motion of the valve stem via a gear wheel and a worm transmission. Electric valve actuators are mostly used on linear motion valves, globe valves and gate valves. They also are allowed on quarter-turn valves — like butterfly valves, ball valves and other quarter valves. Linear electric valves are installed in systems where tight tolerances are required. While rotary electric valve actuators are suitable

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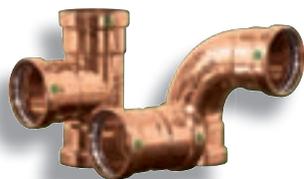
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Actuators

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for use in packaging applications and electric power industries, etc., electric valve actuators have a disadvantage of valve response, which can be as low as 5 seconds/min — in some varying systems might be very slow.

Hydraulic Valve Actuators: Hydraulic valve actuators usually employ a simple design, with a minimum of mechanical parts. Hydraulic valve actuators convert fluid pressure into linear motion, rotary motion, or both. Like electric actuators, they are also used on both quarter-turn valves and linear valves. In the case of quarter-turn valves, the hydraulic fluid provides the thrust that is mechanically converted to rotary motion to adjust the valve. For linear valves, the pressure of the hydraulic fluid acts on the piston to provide the thrust in a linear motion, which is a good fit for gate or globe valves. Hydraulic valve actuators are used particularly in situations where a large stem thrust is required such as the steam supply in turbines or the movement of large valves in chimney flues. In a situation where very large valves are to be actuated, it is often advisable to install the actuators on mechanical gearboxes in order to provide an increased output (torque). There are different types of hydraulic valve actuators that convert linear motion to rotary motion. For example, while diaphragm actuators are generally used with linear motion valves, they also can be used for rotary motion valves if they are outfitted with linear-to-rotary motion linkage. Likewise, lever and link actuators transfer the linear motion of a piston cylinder or diaphragm to rotary motion. Rack-and-pinion actuators transfer the linear motion of a piston cylinder to rotary motion, and scotch yoke actuators convert linear motion to rotary motion as well. For safety reasons, most hydraulic actuators are provided with failsafe features of either Fail Open, Fail Close, or Fail Stay Put. For a control system to be effective, the control valve must adjust to its desired position as quickly and efficiently as possible. To achieve this, the right valve actuator must be selected for the application. Therefore, it could be said that the valve actuator specification process is

more important than the selection of the control valve itself. To ensure the right valve actuator is chosen for a given process, critical site information, such as the availability of power supply, hydraulic fluid pressure and air pressure, must be considered. In addition, the stroke time of the valve, failsafe position, control signal input and safety factors also must be given due consideration.

For control to be very effective, it is imperative that a control valve adjusts to its desired position as quickly as possible. To achieve this, the right valve actuator must be selected for the right application. Therefore, when the various types of control valve actuators are available and their individual features given, the selection of the correct control valve actuator becomes as critical as selecting the control valve.

Finally, in selecting the right valve actuator for a given process, critical site information, like the availability of power supply, hydraulic fluid pressure and air pressure, must be considered. In addition, the stroke time of the valve, fail safe position, control signal input and safety factors, etc., also are taken into consideration. ■



Chikezie Nwaoha, B.Eng has a bachelor's degree in Petroleum Engineering from Federal University of Technology, Owerri. He has

also completed a term as an operator (student trainee) with Port Harcourt Refining Company (PHRC, www.nnpc-group.com/phrc.htm) in Nigeria, and is currently working on several research projects involving flow systems design. As part of his research, Nwaoha has authored a number of engineering articles in leading international journals. Nwaoha is a member of SPE, ASME, AIChE, IMechE, ICE, IGEM, and the Nigerian Gas Association (NGA, www.nigeriangasassociation.org). He can be reached at chikezienwaoha@yahoo.com.

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The Importance of Providing a Proper Hydration Environment

By Mike Markovsky

Make drinking water accessible and appealing

We can all relate to that unmistakable sensation we call thirst, but what most of us do not know is that it comes about in an advanced stage of dehydration. Physical dehydration is dangerous and can have a profound impact on employees work performance and a businesses' success, depending on each individual's state of dehydration and awareness of thirst signals.

Recently, the harmful effects of personal dehydration have begun to come into focus in the industrial environment. It's been estimated that up to 80% of the U.S. adult population goes through their normal day in at least a mildly dehydrated state. A growing body of evidence points to dehydration as one of the most widespread and least understood dangers on the job.

A number of studies have linked dehydration to lower physical and mental performance. For example, Wasterlund and Chaseling¹ studied forest workers in a controlled environment, where one group was properly hydrated and the other dehydrated to an extent of about 1% of body weight loss. The result was a 12% decrease in productivity from the dehydrated group.

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There are many more studies that attained comparable results. With respect to mental performance, Gopinthan et al.² studied the effects of dehydration on decision-making and cognitive performance; the study concluded that visual motor tracking, short-term memory, attention and arithmetic efficiency were all impaired at dehydration levels of 2% of body weight or more.

Assessing hydration status

The conventional wisdom of "eight glasses a day" doesn't hold water (pun intended) when one considers the wide variety of body sizes, shapes, states of wellness and the level of outside influences to which each individual is subjected daily.

Assessing urine color, although it has limitations, is one of the best methods of superficially monitoring hydration. This obviously personal assessment certainly involves the individual employee's commitment and best intentions.

Hydration action planning

Improving overall employee hydration is best accomplished through the use of a three-pronged approach: education, assessment, and implementation of best practices for encouraging fluid intake during the work day.

Continued on page 100

February 2010



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Plumbing Engineer's 2010 Manufacturer Spotlight



The bath upgrade that ups your sales

The Symmons Temptrol® valve has been a staple in the plumbing industry since 1939. The valve is known for its durability and remains behind the wall in many homes and commercial properties. Working with the Symmons valve now offers plumbing contractors the opportunity to provide their customers with additional services and products for a complete bath upgrade.



TA-4 renewable seats (left), and TA-10 Spindle.

Solutions that drive sales

The brass, bronze and stainless steel construction of the Temptrol valve is the reason why it is extremely durable and why once installed, it rarely ever needs to be replaced. If maintenance is needed on the valve, it only requires the replacement of a few key parts, the spindle and the renewable seats. During valve upgrades the trim and handle must be removed, which provides the opportunity for the plumbing contractor to give their customer a new look for their bath.

The Symmons trim replacement kit makes it easy for the contractor to update the valve and upgrade the trim at the same time. The kit includes the TA-10 spindle, TA-4 renewable seats and a premium trim for the valve. These products are offered in one box clearly marked with the contents, making it a one-stop shopping experience for the contractor.

Adding value for the customer

Installing a new premium trim to any tub/shower enhances the bath décor for the end user. Additionally, Symmons premium bath collections offer coordinating lavatory faucets and showerheads which provide the opportunity for the plumbing contractor to offer a complete bath upgrade in one visit.

The Symmons trim replacement kit positions the

plumbing contractor as a problem solver and a useful resource to their customer. The Symmons trim replacement kit allows the contractor to show how easy and cost-effective it can be to upgrade the look of the bath. With this product, a service call for a valve repair can turn into an opportunity for an affordable bath facelift and additional plumbing services.

Also, during the upgrade, the contractor can suggest ways for the customer to save money and reduce water consumption with the installation of Symmons water-efficient lavatory faucets and showerheads.

While servicing the customer's valve the plumbing contractor can provide the end-user with valuable information about the products they have installed in their property. The Symmons Temptrol valve not only provides design options with the premium trim replacement program but Symmons products are also available in low flow, saving the end-user money.

Solutions that help the industry grow

Contractors are becoming more vocal about their product needs and manufacturers, like Symmons Industries, are



Symmons trim replacement kits give the contractor a marketing tool to show customers how easy and cost-effective it is to upgrade their baths' appearance.

willing to learn from those in the field so that together they can create products that will grow the industry.

The push for solution-based product development will enable a contractor to be more productive and to offer their customers more product options. The Symmons trim replacement kit has proven to be a solution-based product for the contractor and a tool for educating the end user on budget-friendly bath makeovers.

Symmons is proud to offer products that are relevant to the marketplace and offer the opportunity for additional sales. ■

For more information about the Symmons trim replacement program, please visit www.symmonstrim.com.

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Plumbing Engineer's 2010 Manufacturer Spotlight



Leonard Thermostatic Mixing Valves Vital to New State-of-the-Art Hospital in Illinois



When a new medical center is under construction, a plumbing contractor must be assured that the thermostatic mixing valves chosen for the project will not only provide required water temperature control, but that they will also function precisely without fault, time after time.

Such is the case at Sherman Hospital, a state-of-the-art replacement building in the Chicago suburb of Elgin, Ill. The 645,000-square-foot, \$310 million structure opened in December 2009. The hospital's plumbing contractors and engineering consultants agreed that Leonard Valve Company's thermostatic mixing valves were perfectly suited to meet the new hospital's needs.

"Truthfully, it was Leonard's reputation that made us choose them," said Darrin Smutzer, project manager for plumbing contractor Mechanical Inc., Freeport, Ill. He sought feedback from other contractors regarding Leonard, and "We could not find an instance where one has failed.

"We found nothing but positive comments about Leonard," Smutzer continued. "All the potential valve manufacturers were submitting information within the specifications, so we talked to the engineering consultants and asked what they'd like to see in the project. They confidently said to go with Leonard."

The new hospital, on a 154-acre site, has a six-story patient tower equipped with 255 private patient beds, a two-story diagnostic and treatment center, and a cancer center. About 50 Leonard products are installed at the new hospital, including various size thermostatic mixing valves and emergency mixing valves for eye washing, drench

showers and group shower controls, as well as point-of-use valves, all provided by local Leonard representative Inland Sales Group, Willowbrook, Ill.

"We're putting in 30 larger valves that take care of a whole floor or a whole section of the hospital and about 20 point-of-use valves each for a single shower or a lab," Smutzer said. "It's key that these valves do not fail. It's a big liability if, for example, someone was in a shower that was supposed to be tempered, and it didn't work. I'm comfortable that Leonard's product line will help us avoid such situations."

Other factors also bolstered Smutzer's confidence regarding Leonard. The availability of their products was a plus — their production time would meet their demands, as well. "Basically, we chose Leonard because of the price, availability, confidence in the product and the fact that they presented a complete submittal. It was beneficial because the bid included all the details, exactly as we needed them."

Count on Leonard for Accuracy in Complex Installations

Leonard Valve offers a wide range of mixing valves and temperature control products that are ideal for healthcare facilities, schools, laboratories, prisons, and other commercial and institutional installations.



Classic or New Generation High-Low Systems, for instance, are so precise that they can provide accurately mixed water from extreme lows to extreme high flow requirements. Accuracy at both of these extremes is

critical, and Leonard's Classic and New Generation High-Low Systems deliver.

Emergency mixing valves, such as drench shower systems and combination face/eye wash systems, must also work reliably — every time. The DURAtrol® solid, bi-metal thermostat on these valves is highly responsive and compensates for supply temperature and pressure fluctuations. ■



Visit Leonard Valve at www.leonardvalve.com, call (800) 222-1208 or e-mail: info@leonardvalve.com.

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The New Generation of Stain



Push-Fit Stainless Steel Drainage System

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Over the last 20 years Josam Company has pioneered the use of a Push-Fit Stainless Steel Drainage System. Our success has allowed us to gather information from users of our products in various industries. This information has enabled Josam to make enhancements to our line and to provide stainless steel products that meet the demands of the marketplace. With the incorporation of these improvements, Josam Company is pleased to introduce their new and innovative line of stainless steel drainage products.

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Plumbing Engineer's
2010
**Manufacturer
 Spotlight**



Historic Attraction Taps Historical Faucet Data for Planning

Facilities personnel for the Mackinac Parks Service use Palm® Pilot-compatible software from Chicago Faucets to gain wider understanding of park usage.

Tourist attractions tend to exhibit extreme highs and lows in facility usage: when it's busy season, visitors put tremendous demands on site facilities. During low season, it's time to assess the busy season and how to best manage resources moving forward.

Because restrooms are particularly hard hit by the large swings in demand, facilities managers are continuously challenged to figure out how to provide optimal service when attendance is high. That's been the case for the Mackinac Parks Service in Michigan, which runs numer-



Geberit Commander allows tool-free control for Chicago Faucets' HyTronic® and E-Tronic® 40 series of electronic faucets.

ous attractions that are heavily visited in the summer, yet hosts far fewer tourists after Labor Day weekend.

Mike Sutton, park manager for attractions such as Colonial Michilimackinac, Historic Mill Creek and Old Mackinac Point Lighthouse, says that his team uses data from an off-beat source to track visitor counts: Palm® Pilot-based software intended for administering the restrooms' electronic faucets from Chicago Faucets.

"With that handheld unit, you can tell how many times a day a faucet turns on, compare men's to women's restrooms, and take a total count for the day," says Sutton. The Geberit Commander® software has yielded interesting tracking data, including the fact that a single Chicago faucet in one of the restrooms was used 6,500 times in July, which is at the height of the tourist season.

This data has enabled the park service to approximate traffic patterns and determine the percentage of visitors who frequented one detached restroom building versus another. Sutton adds that having this information has been extremely helpful in planning facility management schedules, such as cleaning and maintenance, as well as future building development.

The Geberit Commander software has allowed Sutton's facilities team to track restroom usage by location and the Chicago Faucets serial number, and then plot the data for each of these faucets on their desktop PCs.

Geberit Commander allows tool-free control for Chicago Faucets' HyTronic® and E-Tronic® 40 series of electronic faucets.

The Chicago Faucet Company is part of the Geberit Group, a European market leader and global provider of sanitary technology. Since 1901, The Chicago Faucet Company, located in Des Plaines, Illinois, has offered commercial and residential products built to stand the test of time. A combination of the best engineering, finest materials and quality workmanship has made Chicago Faucets the specified choice in many of the finest building projects throughout North America.

As a European market leader, the Geberit Group is a global provider in the area of plumbing technology with sales of CHF 2.2 billion and about 5,600 employees in 40 countries worldwide. ■

For additional information, contact The Chicago Faucet Company at 2100 South Clearwater Drive, Des Plaines, IL 60018, or call 800-323-5060. You can also visit Chicago Faucets at www.chicagofaucets.com.

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hi.

The HyTronic®

Say hi to the HyTronic® - the most reliable electronic faucet you can buy.

The HyTronic from Chicago Faucets has been built and tested with one goal in mind: to be the most reliable electronic faucet on the market. Water tight electronics and vandal resistant features, combined with a long-life lithium battery, ensure reliable performance for years to come. The twin-beam infrared system responds quickly and minimizes false activations. In addition, above deck components and remote diagnostic technology allow for fast, trouble-free installation and easy maintenance.

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Plumbing Engineer's 2010 Manufacturer Spotlight



Watts OneFlow® ...

A viable alternative to Water Softening for Hardness and Scale Control

Problem: Building owners, property managers, chief engineers and facility maintenance personnel all face the same challenge in battling the ill-effects of hard water. Protecting a commercial plumbing system from damaging lime deposits, called scale build-up, can bring great expense, both up-front and ongoing, to any commercial property. Ignoring scale control is never a good option because eventually the cost for repairs or replacement will offset the initial savings. For years the only proven technology for scale protection in commercial



Gregg Josey has enjoyed the maintenance free scale protection offered by OneFlow's technology for nearly 5 years now. A simple media change out, once every 3 years is all that's needed to keep the system running scale free

buildings had been a water softener. Water softeners, however, have their own set of problems. They require electricity to operate. They waste hundreds of gallons during back-wash and regeneration cycles. They require salt (tons of it). And over time, they sometimes stop working.

Gregg Josey, chief engineer at Embassy Suite in Tempe, Arizona was faced with this dilemma back in late '05. Should he replace the old water softener that was installed years ago but just recently failed or should he try this new scale control technology that would be less costly upfront and save the company nearly 70% in operating costs (mostly in salt and water discharge savings)?

Solution: The hotel had numerous points of entry for municipally supplied water and the water hardness measured between 12 and 14 grains per gallon. As a result it was practical only to treat the water destined for the "hot side" of the plumbing system. In this case the boiler, heat exchange surfaces, tempering valves and the hot water distribution system would be protected by this new scale control technology. The technology behind Watts OneFlow system had been developed in Germany and used throughout Europe for several years before coming to the United States.

OneFlow is a media-based scale control technology that can be used in Point of Entry applications to protect whole buildings (hot & cold side). Selecting the appropriate size OneFlow system is easy. Peak Flow Rate is all that's required to size a commercial system. Point of Use systems are also offered to protect specific pieces of equipment that may be more prone to scale from water hardness.

Gregg Josey has enjoyed the maintenance free scale protection offered by OneFlow's technology for nearly 5 years now. A simple media change out, once every 3 years is all that's needed to keep the system running scale free. Consider the salt savings (not to mention the savings his back has enjoyed by not having to lift the 50 pound salt bags) this hotel property has benefited from during this same period! ■

For more information on Watts OneFlow, please visit our website at www.TheScaleSolution.com

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Discover the New Frontier in Scale Prevention

OneFlow[®]

The Intelligent Scale Solution

Building owners, property managers and facility engineers have fought the battle against scale and its destructive byproducts for too long. Now there is a better solution that is environmentally friendly and virtually maintenance free. OneFlow prevents scale by transforming dissolved hardness minerals into harmless, inactive microscopic crystal particles. These particles make their way through plumbing systems without latching on to pipes, fixtures, valves or heating elements. Scientifically tested and certified for performance, OneFlow provides scale control results backed by years of successful field applications. Make the intelligent choice in scale prevention, OneFlow from Watts.

For more information, visit our web site TheScaleSolution.com



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WATTS[®]
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Plumbing Engineer's 2010 Manufacturer Spotlight

SANIFLO
A Group SFA Company

Saniflo Plumbing Proves to be a "Champ" In University of Arkansas Arena Luxury Suites

When the University of Arkansas decided to upgrade its 19,000-seat Bud Walton Arena with 12 new luxury suites, a problematic building configuration made it impractical to install conventional plumbing. That left the athletic department in a quandary.

Quality and dependability were paramount, since the high-end suites were designed to accommodate the school's major donors. Each one had to be built to exacting standards, complete with wet bar and private restroom. The problem was solved when SFA Saniflo above-floor



Inside one of the 12 luxury suites at Bud Walton Arena in Fayetteville, Ark.: Instead of conventional plumbing, the wet bar and private restroom use Saniflo above-floor plumbing technology.

plumbing technology was chosen for the complex job.

Six of the suites were to be built on each end of the Razorbacks' basketball court. "The challenge is that the north side of the arena is built on grade, and the south side is built with a floor below it," explains Senior Associate Athletic Director Jerry Pufall.

"For the south side, we could have done a traditional, core-drilled plumbing line through the floor and tied it into the existing sewer and water system."

But that wasn't an option on the arena's north side, which would have required tearing out concrete. "We would've had to trench into the concourse, and there were concerns about structural integrity if we got into grade beams," says Pufall, explaining that cutting into the beams could be risky and would've been cost-prohibitive.

Enter GA Engineers, Inc., of Fayetteville, which researched the problem and recommended Saniflo macerating technology to resolve it. Unlike traditional plumbing, macerating systems work aboveground, with no need for digging to install sewer lines. Saniflo presented the perfect answer, explains John Rodney (J. Rod) Barenilla, P.E., Plumbing Department Manager for the firm. "There was no way to route the sanitary sewer. You'd have to tunnel all the way through the building, or hundreds of feet. That would be difficult, if not impossible."

Pufall and his staff were unfamiliar with the alternative plumbing technology, so GA Engineers conducted a demonstration. "They did their homework, researched it and were very confident that it could be used in our application," he says. "We really were impressed with what we saw. They put all kinds of things in the toilet to show us the capacity. One of the demonstrations was to toss in a bunch of paper towels to see if the system could handle them. The technology was amazing."

After seeing the demonstration, Pufall was convinced that above-floor plumbing was the way to go for the new suites on the north side. But the demonstration was so impressive, the decision was made to install Saniflo's Sanibest macerating systems in the six south-side suites as well.

"We felt that Saniflo was an extremely positive experience for the university and this application," Pufall says. "It turned out to be a champ and worked great for us." ■

For more information on Saniflo macerating systems, call 1-800-571-8191; or visit www.saniflo.com



Close-up view of Sanibest Saniflo's Sanibest macerating systems in the luxury suites at Bud Walton Arena.

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- 5 inlets
- Onboard visual LED alarm
- Pumps up to 36 ft. vertically or 328 ft. horizontally

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Plumbing Engineer's 2010 Manufacturer Spotlight



Navien America Launches Innovative Condensing Combination Gas Boiler

Navien America Inc., the pioneer in high efficiency tankless water heaters, introduced its new Condensing Combination wall hung boiler in response to the rapidly growing demand for a tankless unit that fulfills a combination of heating applications.

Navien's Condensing Combination Boiler is versatile and ideal for domestic water heating and space-heating applications, including in-floor radiant heating, base-board heating, and fan assistance-air handler heating applications. It also features Navien's signature condensing technology and uses PVC venting which lowers the cost of installation and simplifies the process significantly. The Combi unit has all the traditional lifestyle benefits of Navien tankless technology and can offer substantial energy savings for end consumers.

The Combination Fin-type stainless-steel heat exchanger, stainless-steel condensing heat exchanger and premixed burner are components that make this product so unique. The Combi unit has an integrated primary and secondary heat exchanger that are made of stainless steel which prevents corrosion and ensures a longer lifespan over copper parts. The Stainless-steel components also maintain temperature consistency even during long periods of use. With the Combi model, Hydronic heating is made possible due to the stainless-steel's capacity to maintain low and consistent temperature levels and the unit captures as much condensation as possible making it highly efficient.

The "combi" unit is green-friendly and utilizes an "ECO" Pre-mixed Burner that generates at least 20% less CO₂ and about 75% less harmful air pollutants such as NO_x emission.

Also, an Outdoor Sensor can be connected to Navien's Condensing Combi water heater and the unit can automatically regulate the heating temperature according to changes in the temperature outdoors. Also, the Combi unit features a powerful "anti-freeze protection" device which serves as a safeguard against extremely cold temperatures.

The Combi unit also has a special Automatic Water Fill Valve and automatically fills water into space heating systems, in the event the unit senses low water.

"We are excited about the Condensing Combination model and we expect it to be very well accepted by contractors, wholesalers and consumers across North America" said Ted Kwak, President of Navien America. "Navien's Combination unit uses condensing technology and can fulfill many domestic water heating applications. It is easy to install with the use of PVC venting and cost effective and installers and contractors will appreciate the Combi unit for

its versatility."

The Combi unit also has an ASA Control System that maintains a consistent, comfortable temperature throughout the home at all times which even takes into account the home's design as well as outside temperatures. The secret to this system involves a built-in thermostat which senses even the slightest temperature changes. The Combi's space-heating application calculates the amount of heat required based on the difference between the return-water temperature and the indoor temperature, then automatically adjusts and controls the temperature accordingly.



Navien's Condensing Combination Boiler is ideal for domestic water heating and space-heating application and, features Navien's signature condensing technology that uses PVC venting for easier, more economical installation. Its stainless steel heat exchanger, condensing heat exchanger and premixed burner ensure long life, reliable operation and consistent temperature levels.

Professional contractors can purchase these innovative, Condensing Combination tankless gas water heaters, along with the rest of the Navien's product line at major plumbing wholesale houses across the United States and Canada. ■

Log on to www.navienamerica.com.

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Navien Condensing

Combination Gas Boiler



FEDERAL TAX CREDIT
Save 30% of the cost,
up to \$1,500!

Take advantage of Navien's state-of-the-art technology and benefit to customers!

In Today's Market, Cost Savings are Important!

Now customers will enjoy lower installation costs and cash in on low annual operating costs and receive the best payback, compared to conventional combination systems.

- Endless hot water supply (2-3 showers at the same time)
- Ultra condensing efficiency (CAFUE=0.92)
- Space saving design
- 3" SCH 40 PVC venting up to 100' with a maximum of 6 elbows
- Optimal and stable operation
- Eco friendly Navien technology
- Easy installation
- Best warranty



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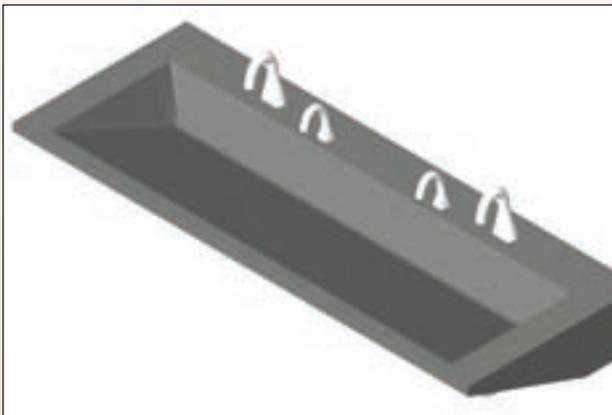
Plumbing Engineer's 2010 Manufacturer Spotlight



Bradley's Growing BIM Families Enhance Commercial Washroom Product Line

As Building Information Modeling (BIM) transforms the building and plumbing industries, Bradley Corp., announces the launch of comprehensive BIM files supporting its commercial handwashing fixtures, washroom accessories, valves, showers and lockers. An early adopter of this revolutionary building technology, Bradley is among only 10% of building product manufacturers that are actively building BIM models.

With the powerful ability to design entire buildings and



every element in them in a precise and virtual 3D environment, the BIM process represents the new standard that is changing commercial construction. BIM allows users to design and document in meticulous detail and accuracy, significantly cutting building and construction costs up to 20%, according to industry experts. Architects and builders using BIM can test and simulate plans without having to build the models themselves, which incurs extra time and materials expenses.

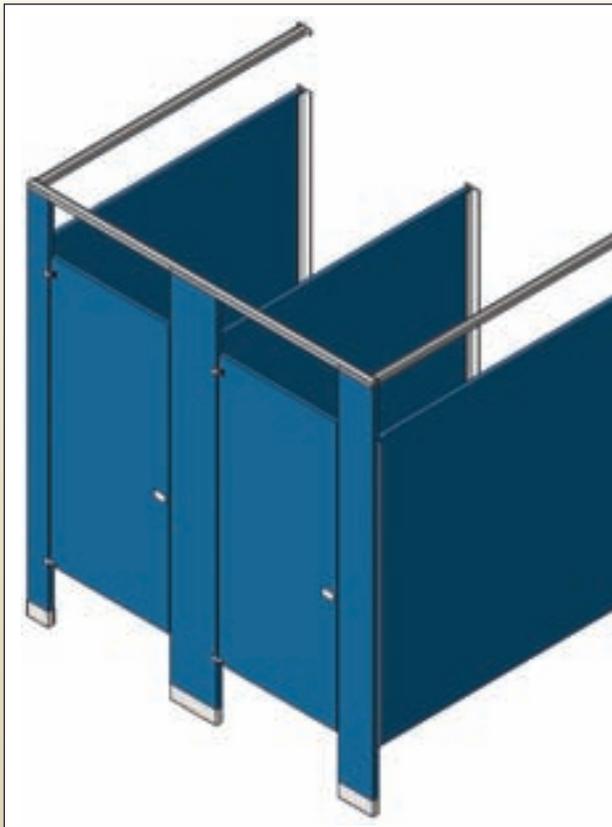
Bradley's growing portfolio of BIM product line families take full advantage of the power of the BIM process, greatly simplifying the planning and ordering process for architects, engineers and contractors as they develop their building projects. Built with powerful Revit software, Bradley's BIM files contain rich pools of data to assist and enhance the process of planning and specifying projects. Many Revit family components contain sophisticated features and options not usually found in other manufacturers' files.

As Bradley's BIM product line families are continually updated and enhanced, BIM files for many of Bradley's commercial washroom products are already up and running, and include its thermostatic mixing valves, several group lavatory systems, restroom partitions, a variety of wash-

room accessories and solid plastic lockers.

A complete and current list of Bradley's BIM file families is available online: www.bradleycorp.com/bim/products/bim/. The easy-to-navigate web site allows users to easily download products individually or in groups. In addition, users can sign up to follow Bradley's latest BIM updates on Twitter, which issues 'tweets' when new models are added to Bradley's website.

For more than 85 years, Bradley Corporation has designed and manufactured commercial washfountains, and



today is the industry's comprehensive source for plumbing fixtures, washroom accessories, restroom partitions, emergency fixtures and solid plastic lockers. Headquartered in Wisconsin, Bradley serves the commercial, industrial, health care, recreation, education, and corrections markets worldwide. For more information, contact Bradley, Telephone: (800) Bradley; Fax: (262) 251-5817; www.bradleycorp.com.

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**IT'S
TIME**

GET THE LEAD

OUT



Bradley got the lead out. Now it's your turn.

Lead-free requirements went into effect January 1, 2010. Bradley Corp was the first manufacturer to meet those requirements and now has third party certification. Bradley's Navigator lead-free thermostatic mixing valves are pre-assembled, 100% factory tested and deliver unparalleled performance. The time has come for lead-free compliance. It's time for Bradley.



CA AB 1953
defines lead-free
as less than 0.25%



***BIM files now available for all
Bradley TMVs – see website for details!***

bradleycorp.com/products/tmv | **800.BRADLEY** | Plumbing fixtures | Washroom accessories | Lenox® lockers | Mills® partitions

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Plumbing Engineer's 2010 Manufacturer Spotlight



Indirect Water Heaters

Easy Installation: The Heat-Flo indirect is designed with the installer in mind. All connections are on top for a neat, clean installation. The smooth wall stainless coil will collect less lime and sediment and deliver full output for years. The brass drain and relief valves are factory installed, and a Honeywell L4080B is included.

Quality Design and Construction: An all 316L stainless tank and coil, a flexible thermoplastic jacket, and R-12 insulation add up to quality second to none.



Hot Water Storage Tanks

Considering an instantaneous water heater or a plate heat exchanger for your hot water application, but you have some dump loads?

Solution: Pipe the high efficiency heat source to a well insulated all stainless storage tank. Our storage tanks have 4 - 1" connections on top. Two for cold and hot, and two for heat source in and out. Heat source in and out can be hydraulically isolated from cold and hot water draws. Units

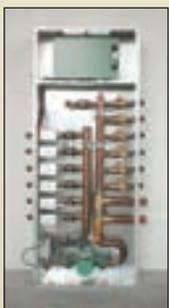
can be applied to any heat source whether it is a tankless coil, a desuperheat coil on a heat pump, or a plate heat exchanger on a high efficiency boiler. The units are easy to install and are available in 30, 40, 50, 60, 80, and 115 gallons.

Residential and Commercial

- Available in 30, 40, 50, 60, 80, and 115 gallons.
- 40 and 60 gallon units are available in Low Boy models.
- 80 and 115 gallon units are available with High output coils
- 60, 80, and 115 gallon units are available with double coils for solar and other applications.
- Bank together 80 and 115 Gallon units with high water heating demands

Solar Hot Water Tank with Dual Coils

Our dual-coil domestic hot water storage tanks are made in 60, 80 and 115 gallon units. The lower heat exchanger coil can be connected to solar collectors, and the upper heat exchanger coil can be connected to a boiler for backup. The units are provided with two 3/8" ID thermal wells to control each coil independently. A 1/2" recirc. return port is provide on all dual coil units. All stainless tanks and coils, a flexible thermoplastic jacket, and R-12 insulation add up to a quality product that is easy to install. Multiple units can be backed together for commercial applications.



Primary/Secondary Hydronic Subsystem

The Heat-Flo Hydronic Sub-system is a pre-piped, pre-wired, 4 zone hydronic control and distribution system. The system can be used with almost any type of heat emitters including radiant floor heating, conventional finned tube baseboard, or hydronic fan-coils.

- Dimensions: 21" wide x 45.5" high x 7" deep
- Weight: 95 lbs.
- Electrical Requirement: 115 volt, 60 Hz. 6.0 Amps

The system includes the following features and components:

- Taco ZVC406-3 Zone

Controller, pre-wired.

- Built in Primary/Secondary Valve; use as a pre-piped secondary system, or as a pre-piped primary system by changing the valve position.
- Full 1 1/4" supply and return manifolds
- Taco 008 circulator pump
- Air purge vent
- 4 zones pre-piped and pre-wired

Supply side — includes a full port ball valve to shutoff a zone, and a motorized zone valve with an end switch on each of the 4 supplies. Zone valves are low pressure drop. Cv = 5.0. The zone valves are pre-wired to the system control. On a call for heat, the control energizes the zone valve. Any of the 6 end switches will start the circulator pump and pump water

out to the zone(s).

Return side — includes a full port low pressure drop purge/shutoff valve on each return. The valves can be positioned to run full port, shut-off, or purge.

All piping connections are easily assessable to the installer. All supply connections are on the left side of the unit, and all return connections are on the right side of the unit. The plumbing connections to the zones are all 3/4". Boiler connections are 1 1/4".

- A "fast-fill" water supply connection includes a standard swivel female hose connection to quickly purge air out of the system at startup.
- Includes an 8 ft., 110 volt supply cord.

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Solar Hot Water Storage Tank with Dual Coils

- Abundant Hot Water
- Low Operating Cost
- Long Life

Heat-Flo
HEATING PRODUCTS

Heat-Flo
offers quality
all-stainless
Solar Hot Water Storage Tanks
with **Dual Coils.**

Made in the USA

FEATURES AND BENEFITS INCLUDE

Quality Design and Construction

- Tanks and Coils are all stainless
- Large smooth coils deliver high output for years
- Low heat loss. R-12+

Easy installation

- All connections on top
- Brass drain and relief valves are factory installed
- Two thermal wells to control each coil independently

Models are available in 115, 80, and 60 gallon tanks.

Ph. 508-422-9880 | Fax 508-422-9881
sales@heat-flo.com | www.heat-flo.com

Heat-Flo
HEATING PRODUCTS

Plumbing Engineer's 2010 Manufacturer Spotlight



Gerber Plumbing Fixtures LLC committed to water conservation and the environment

As a partner in the U.S. Environmental Protection Agency (EPA) WaterSense Program, Gerber Plumbing Fixtures LLC is committed to water conservation and the environment, without sacrificing product quality or performance. The company's robust product line of water conserving, High Efficiency Toilets (HETs) are engineered to use 20 percent less water than the standard 1.6 gallons per flush (gpf) toilet. According to the EPA, using an HET model like Gerber's (in place of a 1.6 gallon flush toilet) can save the average family of four up to 8,760 gallons of water each year.

Recent studies have shown that toilet flushing constitutes around 30 to 40 percent of domestic water consumption, and for the hospitality industry, this translates to an even greater potential for cost savings and water reduction. This is why it is Gerber's mission to offer HETs that perform extremely well and provide ample water savings with each flush.



For ease and convenience, the Gerber Maxwell Dual Flush HET (shown here) features a two-button actuator to visibly recognize between the 1.1 and 1.6 gallons per flush (gpf) flushing options.

Avalanche 1.28 LS features a reliable Fluidmaster® Leak Sentry™ Pro Fill valve that eliminates toilet run-on when not in use, a revolutionary feature in terms of reducing water usage. Moreover, like most of Gerber's HETs, the Avalanche 1.28 uses only 1.28 gallons of water per flush, therefore conserving a significant amount of water with each use.

As a product innovator, Gerber's new Viper™ 1.28 HET, currently pending certification by WaterSense, is a two-piece toilet that offers exceptional flushing performance coupled with significant water savings.

The Viper toilets are Gerber's deepest gravity product line possessing exceptional bulk waste removal. The Viper 1.28 has a three-inch flush valve and includes powerful front rim jets, providing a superior flush utilizing only 1.28 gallons of water.

In addition to the Viper and Avalanche HETs, Gerber this year unveiled the Wicker Park 1.28 HET, which is the company's most contemporary designed product family. These HETs have a three-inch flush valve and are fueled by Gerber's XP-3 flushing technology with dual feed jets.

Using the least amount of water per flush in Gerber's HET product offering is the Ultra Flush 1.1™ gpf HET which reduces water to 1.1 gallons per flush. The top-rated Ultra Flush® pressure-assist flushing platform has been repeatedly ranked as one of the top performing and best toilet values available.

Gerber's Ultra Flush technology uses the standard water supply to pressurize the air inside the tank and drive water into the bowl with accelerated force, providing superior waste removal and bowl cleaning.

Last but not least is the Maxwell offering of HETs including the Maxwell 1.28 and Maxwell Dual Flush 1.1/1.6 gpf. The Maxwell Dual Flush HET

comes with a two-button actuator to clearly identify between the 1.1 and 1.6 gpf flushing options. Furthermore, the toilet is engineered with a large water surface and Gerber's syphonic front jet flushing action which properly cleans the bowl with a single flush.

Gerber's wide assortment of HETs are manufactured to be environmentally friendly and do not need to be flushed more than once to do their job. And the products flush quietly! ■

For more information on Gerber's HET, visit www.gerberonline.com or www.gerbergreenonline.com.



The stylish, contemporary Wicker Park 1.28 gpf high efficiency toilets (top) are now available in Gerber's comfort height ADA compliant ErgoHeight™ with a 17-inch high elongated bowl option.

Gerber's best-buy rated Avalanche model toilet (bottom) expands with the Avalanche™ 1.28 Leak Sentry (LS) and the Avalanche™ gravity one piece toilets. The Avalanche 1.28 LS features a consistent Fluidmaster® Leak Sentry™ Pro Fill valve that eliminates toilet run-on when not in use, thereby saving water.

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LOOKING FOR A
HIGH-PERFORMANCE
LOW-FLOW TOILET?
HAVE A SEAT.



Avalanche

1.28 GPF



www.gerberonline.com



GERBER

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Plumbing Engineer's 2010 Manufacturer Spotlight



Bradford White ICON System™ and Accessory Package Kits

Bradford White's ICON System™ gas control valve is now standard equipment on most Bradford White residential and light duty commercial products* at no additional cost.



Developed in collaboration with Honeywell®, the new control valve features intelligent diagnostics that prompt the installer during start-up and provide ten different codes to assist in troubleshooting. The Bradford White ICON System® also offers microprocessor control and monitoring for more consistent and accurate water temperature levels. Additionally, the system utilizes exclusive performance software that provides enhanced first hour delivery ratings and tighter temperature differentials, an integrated Piezo igniter and pilot-on-indication for ease of start-up, millivolt power to eliminate hardwiring, and a separate immersed thermowell that eliminates the need to drain the tank when removing or replacing the gas valve. Also available are universal replacement kits that allow for direct replacement of a Bradford White ICON System™ control valve or a previous generation gas control valve on most existing Bradford White models.

"The development of the Bradford White ICON™ System has taken over four years of hard work on the part of Bradford White and Honeywell. The result is a sophisticated yet simple control valve with energy and time saving features that benefit contractors, wholesalers and consumers alike," says Bradford White's Mike Gordon, VP Engineering.

Since the introduction of the ICON System™, Bradford

White also unveiled its new Bradford White ICON System™ Accessory Packages. The new accessory packages work in conjunction with the ICON System™ gas control to provide homeowners with additional benefits such as comprehensive leak protection and better, more energy efficient performance including up to 36% savings on energy usage and an increase in usable hot water by as much as 50% or more.

The packages include a fully programmable 7-day, 4 period/day LCD digital control that can be attached to the water heater or mounted remotely throughout the house, leak detection that includes an audible alarm and optional automatic cold water shut off valve, and an enhanced integrated mixing device with multiple optional water connections that is quick and easy to install.



For more details and to watch a video about the new Bradford White ICON System™ Accessory Packages, please visit www.bradfordwhite.com.

Bradford White Water Heaters is a full line manufacturer of residential, commercial and industrial products for water heating, space heating, combination heating and storage applications. The company is headquartered in Ambler, PA and has manufacturing facilities in Middleville, MI, Nile, MI, and Rochester, NH and a distribution center in Mississauga, ON Canada. ■

**All Atmospheric Vent and Direct Vent Residential and Light Duty Models except High Performance and Mobile Home Models.*

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Now We're 4 For 4! **CLEAR**Report

by Clear Seas Research

The Brand Most Purchased by Contractors FOUR YEARS IN A ROW!



We're the Talk of the Industry. Here's a Sampling of Contractor Reviews...

"The largest portion of our tanks installed are Bradford White natural draft, we like the FVIR system"

"(They) have a great engineering department"

"Water Heater with the best gas control valve on the market"

"Solid, long lasting and easy to repair"

"My dealer and Bradford White could not be any better than they are"

"We service Bradford White and have thousands of dollars (worth) of their parts and never use them"

"Not sold retail"

"Support of PHCC"

"American Made"

"Bradford is just all around (a) better heater and company"

"Fit and finish of their product is first class"

And the number one response... "Quality"



For the Fourth Consecutive Year, Bradford White remains the tank water heater brand most purchased by Plumbing and Heating Contractors. **We are also, again, the most recommended brand.**

The comments above are just a few taken from the 2009 CLEARReport™ by Clear Seas Research. We wanted to let your industry colleagues speak for us. They prove that our commitment to the trade and our pledge to provide a premium product at the best possible price is the way to do business.

Thank you for your continued support. We'll keep striving, innovating, and working hard every day to be the water heater brand of choice for all plumbing and heating professionals. Remember, if your wholesaler doesn't carry Bradford White, ask why!



www.bradfordwhite.com

Built to be the Best™

To Find A Wholesaler Call **800.523.2931**

*Ranking is based on the 2006, 2007, 2008 and 2009 CLEARReports by Clear Seas Research. Please visit www.clearseasresearch.com for additional information. © 2010, Bradford White Corporation. All rights reserved.

Plumbing Engineer's 2010 Manufacturer Spotlight



American Standard Sponsors Free Specification Service That Saves Time, Money

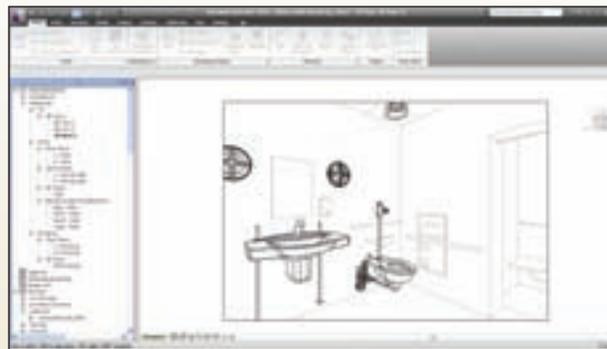
For more than a century, specifying engineers have turned to American Standard for the industry's largest and most comprehensive commercial plumbing offering. Our 2008 mergers with Crane and Fiat vastly expanded our breadth of product solutions, as well as the technical and service supports offered by American Standard.

One such support service is a free, online plumbing specification system that is very popular among plumbing engineers and specifiers. American Standard is among the few full-service plumbing manufacturers to sponsor Allied Technical Service (ATS), www.atsspec.net, which provides comprehensive plumbing specifications, complete with written specifications, drawings, fixture schedules, AutoCAD blocks, Building Information Modeling (BIM) families and budget pricing.

"American Standard leads the industry with the most extensive BIM object library available," says American Standard commercial vice president Jeremy Cressman, LEED AP. "With more than 3,800 combined 3D BIM nested families now online, all project specifications can be easily dropped into a BIM model, saving hours of time and thousands of dollars."

To illustrate, Cressman says that a toilet will be nested together with the appropriate seat, carrier and flush valve, to generate one combination Revit file. The online service provides information on which to build a complete plumbing specification, and this eliminates the need to

search through catalogs to compile the information needed for an accurate design package.



From BIM library to installation, American Standard Brands provides tools to simplify the total bathroom solution.

The site allows engineers and architects to create a specification for most projects in less than an hour, saving a design firm both time and money.

The service's unique one-stop shop, "Online Plumbing Specification System," offers a variety of helpful tools, including a Green Product (LEED) area, Luxury Product options, a CAD/BIM library and an advanced product search feature for finding specific products.

In addition, the service offers designers the option of uploading their own office masters — or using ATS Suggested Projects templates — for their projects. The online service also automatically notifies users of product changes such as updated manufacturer model numbers, product changes and prices and building code requirements.

According to Cressman, ATS is the only no-cost, no-catch plumbing specification information system provided to all mechanical consulting engineers, architects and interior designers in the North American marketplace.

The website provides designers a variety of options for their spec format, including Microsoft Word and Excel and PDF. In addition, the newly released fixture schedule format allows designers to compile a complete fixture schedule in under an hour.

To learn more — with no cost or obligation — log onto www.atsspec.net, and see why American Standard is at the forefront of plumbing technology and innovation.



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It practically installs itself.
Don't worry, you still get paid.

Hundreds of styles ready
to complement any décor.

Faucet drains that seal tightly and
lift rods that never need adjusting.

Drains come with pre-assembled
parts and install without tools.

Speed Connect® faucet drains come pre-assembled, making installation fast and easy. Welcome to *style that works better™ for you.*

American Standard
Style That Works Better



Plumbing Engineer's 2010 Manufacturer Spotlight

POWERS™
A Watts Water Technologies Company

TempTAP™ Thermostatic Faucets: Simplify Your ASSE 1070 Specification

Burns to the hand are common. Although the hand is only a small surface area, a hand burn can be challenging because of its importance for everyday life. Hand burns can be particularly problematic because of the risk for long-term disability.



TempTAP faucets are available in two stylish models - standard and gooseneck.

TempTAP brings a top-down perspective to ASSE 1070 and plumbing code compliance. These faucets are simple because innovative design moves the tempering function inside the faucet.

ASSE 1070 compliance now requires one device, not two, saving valuable installation time and money. Maintenance and set-up are a snap as well because all key components are easily accessible from above the sink,

including the adjustable high-temperature limit stop. No more concerns about installers working in cramped poorly lit spaces that often result in unsightly, under-counter installations. And fewer connections mean fewer potential leak points and callbacks, strengthening the integrity of your specification.

TempTAP™ thermostatic faucets can provide all the protection your facilities need; these thermostatic faucets are designed for use where a premium is placed on user safety, especially for children and the elderly. Hospitals, assisted living facilities, nursing homes, schools, hotels and residences are all ideal locations for TempTAP protection.

While TempTAP may look like a stylish, single-lever faucet on the outside, it's something much more than that on the inside. Think of Clark Kent versus his caped superhero alter-persona. TempTAP is what its' name plainly implies: it's safe. TempTAP is not just a faucet, but more importantly an ASSE 1070 thermostatic tempering device.

At the heart of TempTAP is a versatile, long-lasting paraffin thermostat designed to protect users from severe variations in outlet temperature caused by changes in supply-line pressure and temperature. They're the first faucet to earn an ASSE 1070 listing. With TempTAP, tempering is accomplished just inches from the user where it's most effective.

TempTAP faucets are available in two stylish models - standard and gooseneck. From retrofit to new construction, the sleek contemporary styling ensures that TempTAP will look as beautiful as it works. The solid brass construction of is chrome-plated to a mirror-like finish for a lifetime of beauty and protection. The faucets may be installed with or without the base plate, with or without the drain pop-up, and longer ADA-compliant handles are available too.

Finally, TempTAP faucets are smart: they help to save energy, minimize the spread of bacteria, and provide peace of mind with compliance to new lead-free plumbing laws.

TempTAP faucets are available with reduced flow outlets from 0.5 gpm to 1.5 gpm which can save hundreds or even thousands of gallons of water per year, and help earn LEED certification. Select models have earned the WaterSense® label for water conservation. The precision tempering capabilities of TempTAP allow boilers to operate at higher temperatures and maintain peak efficiency. According to the Centers for Disease Control, boilers that maintain 140°F or higher help control potentially harmful bacteria in the water. Hotter water means less is required to maintain set point.

For the latest in lavatory tempering and ASSE 1070 compliance, ride the next wave, ride TempTAP. ■

For more information, visit our web site at www.powerscontrols.com/temptap

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Introducing TempTAP™ The First ASSE 1070 Listed Thermostatic Faucet



TempTAP™ was designed with you in mind, to make ASSE 1070 lavatory tempering faster, simpler and safer. By integrating the tempering valve inside the faucet, thermostatic protection is just inches away from the point-of-use, where it's most effective. And now, thermostatic installation is above the sink, where it is easy to access. TempTAP features a powerful paraffin actuator that responds to pressure and temperature changes. TempTAP meets the latest lead free laws, has received the EPA's WaterSense® label, and complies with ADA activation requirements. So for your next specification, reach for TempTAP.

The faucet designed with you in mind — for greater peace of mind.



TempTAP™ Thermostatic Faucets

www.powerscontrols.com/temptap

POWERS™

A Watts Water Technologies Company

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Plumbing Engineer's 2010 Manufacturer Spotlight



SeeWater focuses on development of new innovations



SeeWater is a shareholder-owned manufacturing firm that is located in San Jacinto, CA, one hour southeast of Los Angeles. Since 1995, See Water's primary business has focused on the innovative design and development of proprietary controls that have the unique ability to differentiate between oil and water.

The company designs and manufactures water pump controls, high liquid alarms and water pump control panels for the pump professionals including the line of Oil Smart® Technology used in the plumbing, utility, industrial, and petroleum industries.

Oil Smart® Control System

With the unique ability to differentiate between oil and water, the Original Oil Smart® Elevator Sump Pump System has yielded significant environmental and economic benefits by preventing the discharge of oil in dewatering pumping operations satisfying state and federal codes for the prevention of oil spills.

When placed in an elevator sump pump, the Oil Smart® Switch controls a water discharge pump so that the pump is activated when the detector "sees water." When the water level falls to the point that the detector senses the oil floating on top of the water, the switch automatically commands the pump to shut down. The Oil Smart® System provides alarm capabilities to alert maintenance personnel of a high oil or high water conditions.

SeeWater has also designed an Oil Smart® System where oil and water are removed from the elevator sump. Water is automatically discharged as normal, while oil is sent to a separate holding tank. The company has a variety of system options available to engineers.

Control Panel Design Shop

In addition to Oil Smart products, SeeWater offers a complete line of custom controls and electronic/float wastewater/sewage control panels that comply with industry standards. At SeeWater, custom controls "are standard and we'll work with you to meet or exceed any specification."

With a diverse range of electronic design capabilities, SeeWater specializes in the development of reliable motor/control protection and proprietary alternating relay circuit boards to provide state-of-the-art control panels to customers. All panels come complete with complete monitoring capabilities and visual indicators to always know the status of the application. The unmatched customer support and balanced design/manufacturing vertical integration setup at SeeWater results in complete customer trust and efficient panel design.

The Future

One of the most recent innovations from SeeWater is the Adjustable SCS Pump Controller. Using Self Calibrating Sensor (SCS) technology, the sensors will adjust to the changing environment and are tested to outlast float switches and other common pump controls. The pump down time is pre-determined and set to meet any



size pump application. The unique SCS technology has other capabilities including a programmable memory chip to program sensor pump commands.

See Water will continue to focus on the development of new innovative electronics/technology that enables positive changes and innovations for the pump industry and the environment. ■

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THE ORIGINAL OIL SMART® ELEVATOR SUMP PUMP AND ALARM SYSTEM

Safely Pumping Water Without the Risk of
Pumping Oil into the Environment Since 1995.



- Applications:**
- Elevator Sumps
 - Underground Vaults
 - Underground Storage Tanks
 - Transformer Containment Barriers



• **PUMP OIL and WATER!** •

Attention Engineers: SeeWater's NEW Oil/Water Smart Pump System provides automatic separation and removes oil and water from elevator sumps. Oil is pumped to a designated holding area while the water is discharged normally.

Fail-Safe Technology since 1995.



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- Tested and Proven for over 15 Years
- Satisfies federal, state and local codes
 - ASME A17.1 Compliant
- 100% ARRA Compliant (Made in the USA)

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Plumbing Engineer's 2010 Manufacturer Spotlight

Introducing the latest in energy saving products from Stiebel Eltron

New Accelera® 300 Heat Pump Water Heaters



A new concept in water heating, the Accelera® 300 heat pump water heater works like an air conditioner but instead of moving the heat outdoors, it puts it into an 80 gal. water tank. As an added bonus, it cools and dehumidifies the surrounding air.

The new Accelera® 300 reduces hot water costs up to 80%. Heat pumps have been around for decades, but a heat pump water heater is a brand new concept. The Accelera® 300 works like an air conditioner but instead of dumping the heat outdoors, it puts it into the 80 gal tank of water. Additionally, it cools and dehumidifies the surrounding air and the tank insulation minimizes stand-by losses.

The beauty of heat pump water heating technology is that the amount of electrical energy needed to create hot water is greatly reduced compared to a conventional electric tank type water heater. The Accelera® 300 can extract up to 80% of its energy requirements from the energy in the air around it. The Accelera's compressor and fan consume only 1kWh of electricity to generate the heat equivalent of 3 – 5kWh.

The efficiency of the unit goes up with increasing ambient air temperatures. This groundbreaking efficiency redefines what a water heater is capable of, and what savings can really mean! In a warm climate, the unit can either be placed in the garage where it takes heat from the ambient air, or inside the house, where it helps with the air conditioning load. In a cooler climate, the unit is typically placed in the basement where it also acts as a dehumidifier. You get hot water at a discount and a dry basement as well.

The Accelera® 300 is Energy Star certified and eligible for a 30% federal tax credit through 2010 on materials and labor, as well as any state or local tax or rebate incentives.

STIEBEL ELTRON

Simply the Best

Tempra® Series Tankless, On-Demand, Electric Water Heaters

The next generation Tempra® and new Tempra® Plus models are now available! Enhancements include: output to 140°, upgraded heavy-duty electronics, single flow sensor, easy access hinged cover, larger inlet filter screen. Tempra® Plus models have a digital display for °F or °C readout and Advanced Flow Control™ to automatically adjust flow rate to maintain set point temperature. Further, the Tempra® series is now an ideal back-up for solar thermal systems.

Stiebel Eltron Tempra® tankless, on-demand, electric water heaters are designed for whole house and various commercial applications. The Tempra® features the latest advanced microprocessor control that allows the exact water temperature to be set via a dial on the front cover. The advanced technology ensures that the water temperature will not deviate from the set point.



Stiebel Eltron's Tempra® tankless, on-demand, electric water heaters for whole house and commercial applications feature an advanced microprocessor control that allows the exact water temperature to be set using a dial on the front cover.

The compact, energy efficient Tempra® provides an unlimited supply of hot water, heated as it flows through the unit. Stand-by heat losses, so common in conventional tank-type systems, are completely eliminated thereby reducing water heating bills by 15-20%. Designed and manufactured in Germany to North American standards, the rugged, space saving Tempra® (17" x 15" x 5") contains all copper piping and heating elements and ensures many years of reliable service. ■

There is an industry leading 3-year warranty on all Stiebel Eltron tankless, on-demand, electric water heaters, 10 years on all Accelera® 300 heat pump water heaters. For more information please visit our website at www.stiebel-eltron-USA.com or call us at (800) 582-8423.

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INTRODUCING THE ACCELERA® 300 HEAT PUMP WATER HEATER: ACCELERATE YOUR SAVINGS!

New!



Energy from nature.

The new Accelera® 300 can extract up to 80% of its energy requirements from the air around it. Heat pumps have been around for decades, but a heat pump water heater is a brand new concept. The Accelera® 300 works like an air conditioner - but instead of dumping the heat outdoors, it puts it into the water.

The Accelera's compressor and fan consume only 1 kWh of electricity to generate the heat equivalent of 3 - 5 kWh. The efficiency of the unit goes up with increasing ambient air temperatures. This ground breaking efficiency redefines what a water heater is capable of, and what savings can really mean !

**FEDERAL TAX CREDIT:
SAVE 30% UP TO \$1,500
OF THE TOTAL SYSTEM COST!**

- 10 YEAR WARRANTY
- 2.5 ENERGY FACTOR
- 80 GALLON STORAGE CAPACITY
- REDUCES HOT WATER COSTS BY UP TO 80 %
- COOLS AND DEHUMIDIFIES THE AIR AROUND IT
- LOW STAND-BY LOSSES THROUGH GOOD INSULATION



TOLL FREE **800.582.8423**

www.stiebel-eltron-usa.com



STIEBEL ELTRON
Simply the Best

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Plumbing Engineer's 2010 Manufacturer Spotlight



Moen Incorporated: Reliable Products for Residential and Commercial Applications

Moen® Incorporated offers a diverse selection of thoughtfully designed, on-trend kitchen and bath products for residential and commercial applications. Moen has a unique global presence, with offices and manufacturing facilities in the U.S., Latin America, Canada and the Asia/Pacific region. In the U.S., the company is organized into separate and unique segments, to maintain flexibility and speed in meeting customer needs, including Retail and Wholesale Units; Creative Specialties International, a bath accessories and home safety division; and Moen's Commercial Division.

As the number one faucet brand in North America, customers have come to rely on Moen to deliver dependable products and service. Dedicated to exceptional durability, innovation and sophisticated style, Moen's full line of faucets, showerheads, sinks and accessories are designed to exceed expectations. And Moen's Commercial Division is no exception.



Moen Commercial products – including faucets, electronic flush valves and showering systems – are built for the most demanding environments.

Moen Commercial Products: Built for the Real World

Moen Commercial products – including faucets, electronic flush valves and showering systems – are built for the most demanding environments. These products can withstand the wear and tear of heavy daily usage found in most commercial buildings. Key features of Moen Commercial products include durability, vandal-resistance, accessibility, hygiene and energy savings.

Moen Commercial products boast sturdy, solid brass construction and durable finishes that stand up to harsh industrial cleaners. These faucets and flush valves also offer unique vandal-resistant features, such as recessed, shielded faucet aerators,

stainless steel handle stops and tamper-proof screws that can only be serviced with the help of a special tool. Benefits like slow-closing solenoids in faucets and piston technology for flush valves prevent water hammer, requiring little or no product maintenance.

Products Built for Accessibility

Universal design and accessibility are key considerations for Moen Commercial products. Faucets and flush valves offer ADA-compliant elements, allowing users to operate with minimal force, using only one hand, without requiring pinching or twisting of the wrist. Shower systems are also easy-to-operate and include an accurate pressure balancing valve to prevent shower shock and improve safety.

Products Built for Hygiene

For environments like healthcare, school and office facilities, where germs are a primary concern, Moen Commercial offers M•Power™ – a complete line of hands-free products that offer the ultimate in sanitary protection. Sensor eyes in all Moen M•Power faucets and flush valves feature advanced electronics that limit false sensing and over-flushing, ensuring the right amount of water is used every time. In the event of a power failure, manual override buttons keep faucets and flush valves operational, ensuring a safe and clean restroom.

Products Built for Water and Cost Savings

Moen recently expanded its Commercial product line to include several new water-saving options – like Eco-Performance shower systems, plus new M•Power Pint and Dual flush valves – that can contribute toward a building's eligibility for LEED® (Leadership in Energy and Environmental Design) certification in the Water Use Reduction category. Other water-saving products in the Moen Commercial portfolio include M•Press™ metering and M•Power sensor-operated faucets that help building owners and managers significantly reduce water consumption without a noticeable difference in user experience.

Most importantly, all Moen Commercial faucets, flush valves and showerheads offer a five-year warranty to protect against leaks, drips and finish defects. Should a repair or replacement part be necessary, parts are readily available through distributors nationwide.

Lower lifetime costs for Commercial facilities and an industry-leading warranty – all backed by the reliability for which Moen is known. That's why Moen Commercial products are Built for the Real World. For more information, go to www.moencommercial.com. ■

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He's not only the reigning chess champ of Cedar Hills Village.
He's also our top product design consultant.

At Moen Commercial, we spend many afternoons with folks like Karl. Because the better we know him, the better we're able to design solutions that meet the unique needs of the elderly. Our faucets, flush valves and shower systems offer ergonomic handles for those with limited mobility or dexterity, temperature controls to prevent scalding, and innovative hands-free technology. Plus, these products comply with Universal Design principles and ADA standards, and are backed with a limited 5-year warranty. All to ensure quality, safety and accessibility. You see, we understand that a tough chess opponent isn't the only challenge Karl faces throughout the day.

To learn more about how our products are built for the real world, visit www.moencommercial.com or call 800-BUY-MOEN.



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COMMERCIAL

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Plumbing Engineer's 2010 Manufacturer Spotlight



The Noritz Commercial Advantage: Modular Approach Satisfies Heavy Hot-Water Demand Cost-Effectively

This past spring, Noritz America launched a new tankless water heating training program to support the special needs of mechanical engineers and contractors involved in designing and building hot-water systems for commercial and industrial applications. The program is currently available, free-of-charge, to qualified professionals at all five Noritz office locations: Atlanta, Chicago, Dallas, New York, and the company's U.S. headquarters in Fountain Valley, Calif.

The new training program highlights the Noritz modular approach to commercial and industrial tankless water heating systems. By "modular," we mean two or more self-contained, interchangeable tankless water heaters working in unison to meet any hot-water demand — even that of very large hotel or multi-family project.



In a multi-unit commercial system, the tankless water heaters will communicate with one another to generate enough output to meet demand and to "smooth" that load among the various operating units in a way that extends system life.

In a multi-unit commercial system, the tankless water heaters will communicate with one another to generate enough output to meet demand and to "smooth" that load among the various operating units in a way that extends system life. The typical firing sequence is as follows:

- The first tankless water heater activates as soon as there is a demand for hot water within the system; i.e., someone turns on a shower.
- That first unit continues to provide all the needed hot water until demand exceeds 80% of the unit's capacity.
- Once demand surpasses the first unit's preset capacity,

it is equalized among two or more units while still meeting high-volume demand.

Noritz's fully modulating burner technology can track and meet any hot-water demand with pinpoint accuracy, matching energy consumption to present requirements. As a result, a multi-system can offer large turndown ratios that respond cost effectively to dramatic fluctuations in demand.

Modular at Miyako: An excellent example is the new Miyako Hybrid Hotel in Torrance, Calif., which achieved a LEED Silver certification for new construction (v2.2) in 2009. This seven-story facility uses eight Noritz N-1321M-ASME Tankless Water Heaters to deliver up to 105.6 gallons of 100°F to 180°F water per minute (gpm) to its 208 guest rooms — each of which includes a Japanese-style soaking tub that calls for a high-demand, hot-water system. In addition, a second set of six N-1321M-ASME units provides hot water at a rate of 79.2 gpm to the hotel's full-service shiatsu spa and a Japanese restaurant.

These flow rates are necessarily high to meet the constantly fluctuating demands for hot water in a large, modern hotel. But the modulating burner technology in the 14 water heaters keeps system response to these fluctuating demands as precise and, therefore, as efficient as possible. The goal is to minimize energy usage while fully supporting hotel operations and maximizing guest comfort.

Key benefits: A Noritz modular tankless system offers three critical, money-saving benefits to a commercial application:

- **Redundancy:** Any one of the units in a multi-system can be taken offline and serviced without depriving the operation of hot water. The other tankless units will continue to meet the demand for hot water.
- **Efficiency:** Modulating technology tracks energy use to current demand, helping to curb water-heating costs — especially during off-peak periods.
- **Versatility:** Like their residential counterparts, Noritz commercial tankless water heaters can be installed outdoors or indoors. The diminutive size and weight of these water heaters allow them to be wall-hung or racked, minimizing their footprint even in indoor installations, freeing up valuable floor space for other uses. In addition, each tankless unit can be individually vented or common vented. ■

Learn more about the Noritz modular approach to commercial water heating by attending a free training session. Call toll-free: 888.382.6568; or visit www.noritz.com/commercial

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State of the Art

COMMERCIAL HOT WATER



Noritz offers a full-line of compact commercial water heaters for any application.

- Modular Multi-System- 1 to 24 units
- Modulation- Up to 545:1 multi-system turn down ratio
- Precise and efficient load tracking
- Intelligent System- System controller unit communication
- Redundancy- Built-in reliability
- High Volume- Up to 316 GPM; 9.1 million btuh

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Plumbing Engineer's 2010 Manufacturer Spotlight



ACORN ENGINEERING COMPANY
Manufacturers of Engineered Plumbing Products

A Whole Building Approach to Green Commercial Plumbing

Picture a bathroom in a commercial or hospitality setting containing a multi-station basin manufactured from 80 percent recycled stainless steel, discreetly fitted with a tankless water heater and featuring the most efficient water-saving engineering possible. Add in low-flow toilets, in addition to waterless or pint-flow urinals. If the entire building works on vacuum plumbing, each toilet fixture instead uses only 0.5 gallons per flush, and if the entire building's water use is controlled via an electronic metering system, conservation can be specified right down to each point of use via a computer network.

All of these water and energy-saving fixtures and systems are custom-manufactured by Acorn Engineering and its Family of Companies. It's all part of a "whole building" approach to security, with products that are easy to specify, easy to install and maintain, and reduce a facility's costs while saving water and energy.



Acorn Aqua delivers low-flow drinking fountains and coolers as standard with a "green spec" flow rate. Each drinking fountain is equipped with a 0.45 gpm low-flow bubbler for water savings.

AcornVac Vacuum Plumbing Systems

AcornVac is one of 12 divisions from Acorn Engineering Company. The company manufactures a vacuum plumbing system that provides significant water savings as well as many other design features that work well in either retrofit or new construction. AcornVac's vacuum plumbing system provides a very efficient flush using only 1/2 gallons of water. This represents a 68% savings for both water use and sewage output over a 1.6-gallon flushometer and a 50-plus percent savings when compared to a "low flow" 1.28 gallon water closet. This can be a bona-fide LEED point contributor.

Among the many other features and benefits of vacuum plumbing is the ability to keep virtually all piping above grade. This eliminates the need for expensive saw cuts and trenching when adding or changing fixture layout. This allows plumbing fixtures to be easily and readily relocated as needed, quickly and with minimal disruption.

Chronomite Tankless Electric Water Heaters

Chronomite manufactures tankless water heaters for on-

demand, point-of-use commercial and industrial applications. A patented microprocessor technology can be preset to a specific temperature to prevent scalding, and is self-cleaning, so there is little maintenance required. The units are only operational when hot water is requested at 99 percent energy efficiency, thereby reducing hot water delivery time. Plus, it's only the size of a standard dictionary.



The Waterless Urinal has furthered Acorn Engineering's commitment to the environment

Waterless Urinal

The Waterless Urinal has furthered Acorn Engineering's commitment to the environment by utilizing a well-known technology that does not require water to flush or evacuate. Not only does the unit save water, it operates without using messy and expensive liquid replacement cartridges, thereby ensuring minimal landfill waste and making it easy to clean without voiding operation.

Plus, stainless steel is a sterile material, significantly reducing the build up of bacteria.

AcornAqua

Acorn Aqua delivers low-flow drinking fountains and coolers as standard with a "green spec" flow rate. Each drinking fountain is equipped with a 0.45 gpm low-flow bubbler for water savings. Additionally, the entire line of drinking products is certified to the highest standards regarding lead levels, including AB1953 and NSF-STD-61, Sec. 9,

Annex G lead standards. An exclusive 100 percent lead free stainless steel bubbler option ensures the safest and most sustainable source for drinking water. ■

For a complete listing of all of Acorn Engineering Company's plumbing products for institutional, commercial and industrial markets, visit www.acorneng.com

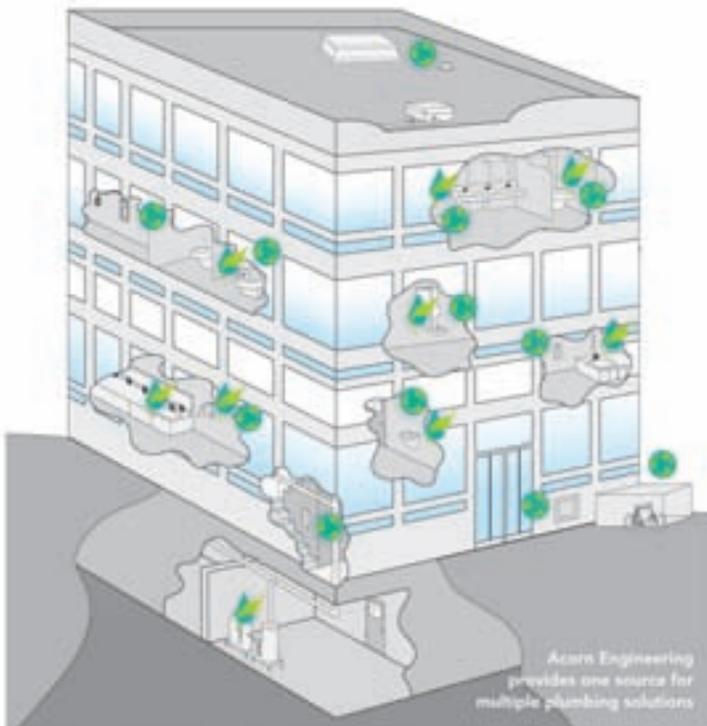
Circle 73 on Reader Reply Form on page 118

ECOLOGICAL NOMICAL

SUSTAINABLE COMMERCIAL PLUMBING SOLUTIONS



ACORN ENGINEERING COMPANY
Manufacturers of Engineered Plumbing Products



A WHOLE BUILDING APPROACH

Eco-plumbing isn't limited to **water conservation** alone. **Sustainable materials, energy efficiency and lead-free standards** are all equally important when specifying construction that is both environmentally and socially responsible.

Whatever the vision for design, function, or environmental impact, Acorn Engineering manufactures products that add up to economical and environmental benefits throughout the entire building.

Visit www.acorneng.com to view our Green Brochure online.

CHRONOMITE TANKLESS ELECTRIC WATER HEATERS

- **99% Energy Efficient**
- Water and Energy-Saving
- Lower Maintenance and Operational Costs
- Compact Design



ACORNVAC VACUUM PLUMBING SYSTEMS

- **0.5-Gallon Flush Reduces Water Use by 68%**
- No Digging/Trenching Required
- Planning and Design Flexibility
- No Mainline Clogs
- Toilets and Urinals Available

TOILETS AND URINALS AVAILABLE

TOILETS

- **0.5 gpf** when used with AcornVac system
- **1.28 gpf** High Efficiency Flush
- **1.2 gpf** In-Wall Cistern Style Flush System
- **1.6 gpf** ULF Flush

URINALS

- **0 gpf** Waterless
- **0.125 gpf** Pint flow option
- **0.5 gpf** when used with AcornVac system
- **1.6 gpf** ULF Flush



Waterless Urinal
No need for messy disposable cartridges



LEAD FREE



RECYCLED MATERIALS



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COST EFFICIENT

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Plumbing Engineer's
2010
**Manufacturer
 Spotlight**



Glue-On-Nozzle provides faster, cheaper, more secure installation

With PVC and ABS pipe becoming the easier, more cost effective alternative to cast-iron pipe in DWV applications; it was only logical that the Glue-On-Nozzle would come to be. After all, roughing-in the pipe to the finished wall, transitioning with an adaptor, and screwing the nozzle on in the correct orientation are time-consuming and arduous tasks.

The Glue-On-Nozzle solves all three issues

First, the rough-in is now a thing of the past. The plumber can simply stub-out the pipe and let the masonry workers or stucco crew finish the wall. Once completed the plumber then trims the pipe to size, and glues the nozzle onto the pipe.

Second, the additional cost and space required for an adaptor is negated since it is no longer needed. Most walls require a tight 90-degree bend and the use of an adaptor negates a lot of that space. The adaptor is also an additional cost.

Third, the time spent by the plumber installing the nozzle has been reduced to a matter of minutes. Simply apply some PVC glue, slide the nozzle onto the pipe, and he is finished.

In addition, we have the industry's first and only secure-escutcheon that installs prior to the nozzle going onto the wall meaning no more calls to an old jobsite to replace a lost or stolen escutcheon.

Using ABS pipe instead? The Glue-On-Nozzle also works with ABS by using ABS/PVC transition cement

Projects that we have been featured on include Residence Inn, Walgreen's, Target, Buffalo Wild Wings, Dunkin Donuts, Jack-In-The-Box, and hundreds of other commercial and residential establishments nationwide.

With the Glue-On-Nozzle being cheaper, faster to install and more secure the question isn't "Why would I use the G-O-N?" rather "Why would I use anything else?"

The Glue-On-Nozzle is available in sizes ranging from 2" to 12" and is sold exclusively through plumbing wholesale distribution. ■



With the Glue-On-Nozzle the plumber simply stubs-out the pipe, then trims the stub to length after the wall is finished and attaches the nozzle with cement.



An industry-exclusive secure-escutcheon installs prior to the nozzle going onto the wall — no more callbacks to replace lost or stolen escutcheons.

Circle 75 on Reader Reply Form on page 118



Glues on outside of the finished wall in minutes



U. S. PATENT NO. 7,618,067

Anti Theft Escutchcon



THE NEW INDUSTRY STANDARD

You will find the Glue-On-Nozzle on Marriot, Hilton, Residence Inn, Walgreen's, Target, Buffalo Wild Wings, Dunkin Donuts, Jack-In-The-Box, and hundreds of other establishments Nationwide.

- PVC Hub is left-hand threaded and secured for a durable and theft resistant design.
- Reduces Liability - No Sharp PVC/ABS Edges
- Bird Screens Now Available

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 phone: 480-948-9059 fax: 480-951-8697 sales@glueonnozzle.com www.glueonnozzle.com

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Plumbing Engineer's 2010 Manufacturer Spotlight



Navien America Expands Tankless Water Heater Line with achieving the Industry's Highest Efficiency Ratings

Navien America Inc., the pioneer in high efficiency tankless water heaters, complements its state-of-the-art tankless water heater line with an ultra-condensing efficiency model that offers the highest thermal efficiency ratings in the industry.

Driven by Navien's unique design and signature "ECO" Technology, Navien now offers condensing water heaters for residential, and commercial applications which qualify for ENERGY STAR ratings. Equipped with all the traditional lifestyle benefits of tankless technology, Navien Condensing 98% models can offer substantial energy savings for residential and commercial customers.

Navien's economic venting system makes them highly efficient and Navien's condensing technology results in lower annual operating costs. Navien Condensing 98% also use 3" PVC venting which offers significant cost savings in the installation process and allows for a safer and easier installation process for installers and contractors.

"We are very pleased with the Condensing 98% tankless models and to our contributions to the tankless industry and we will continue to strive for releasing green-friendly products," said Ted Kwak, President of Navien America. "With Navien Condensing 98% heaters, consumers and contractors will get the best of both worlds, the benefits of tankless and ultra condensing efficiency, which offers substantial energy savings for the end user and an easier installation process for contractors who can utilize PVC venting."

Navien Condensing 98% heaters utilize dual stainless steel heat exchangers, providing 3.8 to 4.5 times longer life-expectancy and erosion resistance over the copper heat exchangers. Navien's unique condensing heat exchanger (secondary heat exchanger) traps condensation and uses it, making the whole process incredibly efficient and economical. Navien's ECO Premixed Burner not only dramatically reduces NOx emissions but also offer the industry's lowest level of emissions. These units also use less gas, resulting in less CO2 emissions making them green-friendly.

Some of the Condensing 98% water heater models feature an optional circulation pump and mini buffer tank (model A) that eliminate cold-water stacking and offer further safety measures and hot water on demand when using external recirculation.

With Navien's 98 Ready Link Cascade System, contractors and installers can link up to 98 compact-sized Navien water heaters as one system, equating to the largest volume of hot water in the industry.

Professional contractors can purchase these innovative, Condensing 98% tankless gas water heaters, along with the rest of the Navien's product line at major plumbing wholesale houses across the United States and Canada.

Navien America, Inc. is a global leader and technology innovator of the 98% energy efficient tankless water heater. Navien America was established to open new markets in the United States and Canada for KD Navien's technologically advanced products. Navien America is eager to continuously provide high quality and innovative products that are environmentally friendly, energy efficient, and that



Navien's green-friendly Condensing Combination 98% tankless water heaters offer the benefits of tankless and ultra condensing efficiency for substantial energy savings, substantially lower emissions and easier installation. Their dual stainless steel heat exchangers provide 3.8 to 4.5 times longer life expectancy and erosion resistance than copper heat exchangers.

offer hi-tech comfort and convenience to all customers. Navien America is an official ENERGY STAR® partner of the Residential Water Heater Program. Navien offers "The Ultimate in Energy Efficiency with Hi-tech comfort." ■

Log on to www.navienamerica.com.

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navien

Condensing 98%



Tankless Gas Water Heaters



QUALIFIES FOR FEDERAL TAX CREDIT
Save 30% of the cost,
up to \$1,500!

The Ultimate in Energy Efficiency with Hi-Tech Comfort

- Easy installation and PVC venting
- 3" SCH 40 solid PVC up to 100'
- Industry's highest energy efficiency rating - 98%
- Ready Link® Cascade System
- Optional built-in recirculation system with buffer tank
- Advanced Eco Navien technology
- Extended lifecycle utilizing dual stainless steel heat exchangers
- Advanced remote control - NR-10DU
- Industry's best warranty!

Remote controller
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Plumbing Engineer's 2010 Manufacturer Spotlight



Custom built Taco 4900 Series air-dirt separator keeps chiller plant at FSU running smooth

Florida State University, home to the Seminoles, is a growing campus of almost 500 acres in Tallahassee, the state capital. As new buildings come on line the HVAC load to serve those buildings also requires expansion, which is why the school built a new satellite chiller plant in 2008. Located close by the school's medical school, the new satellite chiller plant comes with Trane supplied chillers, Taco pumps, and a custom built Taco 4900 Series Air-Dirt Separator, the biggest unit Taco has built to date.



The custom Taco 4900 Series system installed in the satellite chiller plant by Vause Mechanical of Tallahassee, has a 30" inlet pipe diameter and will handle up to 19,200 GPM when the entire plant is operating at full capacity.

The satellite chiller plant is connected to the central energy plant and serves as a "stage" plant to provide chilled water for air conditioning needs on campus. It is connected through a 1 ½ mile underground piping loop. Equipped with three 1500 ton, 200 hp Trane centrifugal chillers (plus one as backup), the plant also comes with six 200 hp Taco TA pumps, multi-purpose valves, suction diffusers, a CA expansion tank and ABB VFD units to control the pumps.

The custom Taco 4900 Series system installed in the satellite chiller plant by Vause Mechanical of Tallahassee, has a 30" inlet pipe diameter and will handle up to 19,200

GPM when the entire plant is operating at full capacity. However, the 4900 Series unit actually operates more effectively at part load conditions because the lower flow rates allow for greater air and dirt removal. The 4900 is installed in a variable flow system which can handle flow rates of 3,200 (pump design x 6), given the six Taco TA pumps

Factory representative for commercial systems, Florida Hydronics of Jacksonville has a long history of association with both FSU and Vause Mechanical and was instrumental in introducing the 4900 Series and its capabilities. Conventional separators had failed to keep up with dirt and sand in the school's HVAC system and the school was looking for a more capable unit for the new satellite chiller plant.

Taco's highly efficient 4900 Series, available in both air and air-dirt models, has been designed and constructed to ASME code. Each 4900 Series unit comes with integral PALL ring technology. PALL rings are used in the processing industry to mix gases with, or to separate gases from liquids. The use of PALL rings in hydronic air separation is unique and patented. Taco is the only U.S. manufacturer to employ PALL ring technology in its air separators.

The 4900 Series will clear a system of microbubbles, sand, dirt and corrosive rust. While air bubbles are separated by the PALL rings through a process known as coalescence, dirt particles get caught and sifted to the bottom of the tank where they can be removed through a blow-down valve. A flushing cock allows the PALL rings to be cleaned for maintenance purposes, and the ring basket can be removed from the unit by one person on units with removable covers.

In the case of the FSU satellite chiller plant, the custom 4900 Series is an air-dirt version. Robert Vaughan, the school's Utilities Superintendent, reports that the unit gets quite a regular workout: "Several months after installation," Vaughan says, "the unit was blown down for the first time and three wheel barrels of sand were removed from the separator." The large amount collected was the result of an in-rush of sand into the 4900 Series, where previously sand had collected in various parts of the system. ■

Information supplied by Taco, Inc. www.taco-hvac.com and Florida Hydronics.

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“A cleaner system lowers maintenance calls. The 4900 works great!”

– Robert Vaughan
Utilities Superintendent
Florida State University

Florida State University discovered that conventional separators couldn't keep pace with the sand and dirt in their HVAC system. So when a satellite chiller plant went up, a Taco went in. Vause Mechanical, Inc. of Tallahassee installed the custom built Taco 4900 Series Air-Dirt Separator. “It's the biggest one we've ever installed. It's a monster” says Keith Vause, a self-described “Taco man through and through”.

Three wheel barrels of sand

Robert Vaughan, FSU's Utilities Superintendent, reports that the first time the 4900 was blown down, they removed three wheel barrels of sand from the separator. “We've been very impressed with the performance of the 4900 Series Unit. There's been a significant reduction in maintenance calls now that we have a central point of cleaning.”

Advanced technology



The Taco 4900 Series is available in both air and air-dirt models and both come with our unique, patented PALL ring technology, the most effective way to clear the system of microbubbles, sand, dirt, and corrosive rust.



Read up

Learn more about the 4900 Series and Taco's energy-saving systems on our web site. Though you may not need a unit this large, you're sure to find our technology is big news.

Taco[®]
systems made **easy**[®]
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Retains nearly 100%
- **HEAVY-DUTY HEATING ELEMENT:**
Longer lifecycle
- **MULTI-EVENT TIMER CONTROL:** Energy savings
- **GREASE-LADEN SOLIDS STRAINER:** Easy hinged access
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304 heavy gauge



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Recovery Unit) grease interceptors are designed to intercept and remove large quantities of fats, oils, and grease commonly known as "fog". This fog discharged from food

service facilities and large commercial/institutional kitchens interferes with proper drainage and treatment of wastewater. Rockford's R-AGRU grease interceptors range in size from the small 20 gpm unit for installation near the kitchen sink to the large high volume units that are located outside of the kitchen area (larger units are available upon request).

PURE PERFORMANCE

What "Separates" us from the competition?

- Custom, jobsite-specific applications
- 1 to 100,000 gallon capacities
- Double



Specifications

Model	Intermittent Flow GPM	Threaded Inlet and Outlet	Gross Sludge Capacity	Top to Center of Inlet/Outlet B	Bottom to Center of Inlet/Outlet C	Width D	Length E	Height F
R.AGRU.20	20	2"	40lb.	4.5"	10"	18"	30"	14.5"
R.AGRU.25	25	2"	50lb.	4.0"	10.5"	18"	30"	14.5"
R.AGRU.35	35	4"	70lb.	4.5"	12.5"	18"	36"	17"
R.AGRU.50	50	4"	100lb.	4.5"	17"	18"	36"	17"
R.AGRU.75	75	4"	150lb.	4.5"	17"	24"	42"	21.5"
R.AGRU.100	100	4"	200lb.	4.5"	17"	24"	52"	21.5"



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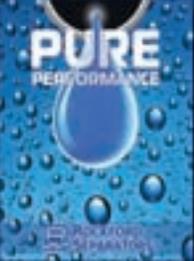
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Only Separator technology gives you the "Pure Performance" you need to prevent oils from causing serious – and expensive – problems downstream.

Only one company can give you 35 years of Separator experience, 26 varieties and over 200 sizes to choose from: Rockford Separators.

Save time, money and hassles with Pure Performance.



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wall construction



Hydration

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Education — The most critical component of keeping employees hydrated is educating the employee on understanding dehydration issues and solutions. The personal benefits of proper hydration span all facets of a person's life. The cognitive and performance-based advantages gained from good hydration at work will, obviously, be available after work, as well. From an employee's perspective, proper hydration involves a decision to monitor their hydration levels regularly, improve if necessary, and then make staying hydrated habitual regular part of their daily routine.

Companies should make hydration education an ongoing



With respect to maintenance, consider your own personal acceptance of drinking fountains in your workplace. Are the facilities for providing drinking water inviting enough for you to use them regularly?

part of employee communications. Employees should be made aware of the downside of drinking soda and coffee as it relates to hydration. Both contain caffeine, which is a diuretic that will act to further dehydrate the body. Consumption of diuretics must be compensated for by an even greater amount of water intake to offset the dehydration effects. This and other pertinent facts should be reinforced consistently through training and visual reminders.

Assessment — The best way to assess hydration status, given the variables of body mass, work routines and

other environmental and personal issues, is to monitor urine color. Urine that is clear to light yellow is a reasonable indicator of proper hydration. However, it may take up to 24 hours for the body to assimilate sufficient additional fluids to fully rehydrate itself. A key part of urine assessment is consistent hydration and consistent monitoring— with this urine color will become more stable. Local hospitals usually have staff that will be eager to help build your educational programs.

Implementation — The critical third facet in the hydration plan is making drinking water very readily accessible and appealing. While plumbing codes mandate the availability of drinking fountains in commercial buildings, they do not cover either maintenance or water quality issues. With respect to maintenance, consider your own personal acceptance of drinking fountains in your workplace. Are the facilities for providing drinking water inviting enough for you to use them regularly? Remember that you are asking employees to use these facilities more frequently than before as part of your increased hydration initiative. How does the water taste?

Many companies moved to 5-gallon jugs or single-serve bottled water over the years. While that approach can certainly encourage hydration, it is both expensive and environmentally insensitive. In the U.S. alone, we consume 50 billion single-serve (half liter) bottles of water each year and throw away 30-40 billion of those containers in landfills. Bottled water may handle the access to acceptable water issue, but it inevitably creates other problems.

Consider upgrading your existing installed drinking fountains with advanced products that encourage use and can become an active part of your hydration reminder program. Chilled water, filtered to remove any trace of chlorine, taste, odor, lead and cysts and served through a hygienic dispenser will allay most all sanitary fears.

Encouraging employee hydration can have a significant positive impact on your company's overall performance and safety record, as well as the general welfare and health of your staff. But, it requires a firm commitment on the part of management, complete buy-in from employees who will be asked to alter their personal habits and continuous reinforcement from all involved. ■

Mike Markovsky is vice president of marketing for the Haws Corporation, located in Sparks, Nevada. He can be reached at (775) 353-8378 or michaelm@hawsco.com. Haws Corporation designs, manufactures and distributes drinking fountains and emergency equipment that are ranked #1 in quality by specifiers in both product categories. The company's latest innovation, the Hydration Station™, provides great tasting, filtered water from a touch-free, hygienic dispenser. See it at www.stayhydrated.net.

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2. Gopinathan PM, Pichan G, Sharma VM: Role of dehydration in heat stress-induced variations in mental performance. *Arch Environ Health* 43:15-17, 1988.

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hour at 100° F rise

95% Thermal Efficiency

*takes a bite out
of fuel costs!*

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RH07010

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Product News

Plumbing Engineer's Product of the Month



BIM files enhance Navigator® TMV

As Building Information Modeling (BIM) revolutionizes the plumbing industry, comprehensive BIM files built with Revit software support line of Navigator® Thermostatic Mixing Valves. The only thermostatic valve company offering this service, BIM files contain rich pools of data to assist in specifying projects. **Bradley Corp.**

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Purge & fill

A unique 7-in-1 valve assembly allows the user to simultaneously drain, flush and refill any hydronic system. Eliminates six leak paths and saves nearly an hour of labor. **Webstone.**

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CADDY® PYRAMID ST Series

Strut-based Thermoplastic Supports utilize an engineered thermoplastic base with a UV stabilizer. They have a high load rating — up to 1,500 lbs — and provide uniform load distribution to help protect the roof membrane. **ERICO.**

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Bolt & gasket sets

Available in both non-asbestos and red rubber gaskets. These gaskets are available in both full face and ring style sets. Non-asbestos gasket is constructed of aramid and other synthetic fibers and bonded with nitrile rubber. Non-asbestos gaskets meet ASTM F152 and are suitable for use with water, air and a variety of industrial gases and fluids; they can also be used with steam depending on operating conditions. They carry a max temperature rating of 750° F and a max pressure limit of 1595 PSI. **Matco-Norca.**

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LavSafe™ thermostatic faucets

ASSE 1070 listed LavSafe™ commercial and residential thermostatic faucet faucets feature an internal paraffin ther-



mostat, which controls both temperature and pressure. With LavSafe™ there is no need to install a separate thermostatic valve under the sink because the tempering is done just inches from the user where it is most effective. Installation and maintenance are quick and simple. All key components are easily accessible from above sink, including the adjustable high-temperature limit stop. **Watts.**

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Her Safety Is your Responsibility!

• 14,700 fires per year* in non-adult schools

- 6,300 structural school fires per year *
- The leading area of fire origin of structural school fires is the lavatory
- 100 injuries due to school fires*
- Plastics ranked second as materials first ignited in school structural fires

U.S. Fire Administration Report on School Fires, August 2007, Vol 8, Issue 1 findings.
*Average per year

Laws, Codes & Standards Compliance

- ADA 4.19.4, ICC/ANSI A117.1, ADAAG 606.5,
- International Building Code (IBC) Sec. 719.7,
- General Services Administration (GSA) P-100
- 2009 US Army Corps of Engineers/Military Facilities Specification (ASTM E84)
- IAPMO PS94 2008 Sec. 3.5 ASTM E84 25/450 Testing Laws, Codes & Standards Compliance

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Product News

Plumbing Engineer's Product of the Month



Heat transfer appliance for commercial solar hot water

The Commercial Solar Station (HCOM) is a packaged closed-loop heat transfer appliance for accommodating large solar hot water projects of up to 100 flat plate collectors with a single module, while still larger projects can combine modules in parallel for limitless sizing potential. The HCOM plug and play appliance can work universally with any commercial project reducing all the design complexity time associated with larger installations. The HCOM operates on the same principles as Heliodyne's line of residential closed loop heat transfer appliances, the Helio-Pak. **Heliodyne.**

**Circle 105 on Reader Reply
Form on page 118**

Automatic balancing valves

Two new Low Flow Automatic Balance Valves feature a unique field adjusted cartridge that allows the user to select exact flows for specific applications. The Low Flow Circuit Sentry™ and the Low Flow Wye-Strainer are designed for automatic flow-limiting style balancing of both HVAC cooling & heating circuits and are ideally suited for small coils that keep constant fluid flow. **Bell & Gossett.**

**Circle 106 on Reader Reply
Form on page 118**



Oil/sand separators

Redesigned SIT and SOS series of steel oil/sand separators are available in two construction configurations to fit your specific jobsite application. The improved units offer greater flow rates, larger storage capacities and integral storage. Designs incorporate Diffusion Flow™ technology for the greatest separation efficiency on the market. **Schier Products.**

**Circle 107 on Reader Reply
Form on page 118**



Thermally actuated shut-off valves

FireBag is used to control the flow of natural, propane or butane gases. Many existing emergency gas shut-off devices require manual manipulation — a poor solution in emergency fire situations. The FireBag provides a much better solution by automatically discontinuing the flow of gas when the ambient temperature reaches 100° C (212° F). With this device, gas is automatically discontinued in fire situations to avert fire escalation and potential gas explosions. **Assured Automation.**

**Circle 108 on Reader Reply
Form on page 118**

Electronic dry pipe accelerator

The VIZOR Accelerator is a fully supervised, self-contained, riser-mounted, quick-opening device that reduces the time required to operate a dry pipe system with the activation of one or more automatic sprinklers. All essential components are located inside its enclosure making the



VIZOR Accelerator easy to install, set, and maintain. **Tyco Fire Suppression & Building Products.**

**Circle 109 on Reader Reply
Form on page 118**



Q: What is the name of the only gas hybrid water heater with Energy Star approval?
hint: I's, O's, & U's are vowels not used.

A: _____

820



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Circle 85 on Reader Reply Form on page 118



Product News

Plumbing Engineer's Product of the Month



The HydroVantage™ flush valve

Designed to create energy during each flush cycle. As water passes through the valve, the turbine spins creating electrical energy which is then stored in a rechargeable cell.

This stored energy then powers the electrical needs of the flush valve for subsequent flushes. It eliminates the need for external electrical power or battery replacement for 10+ years under normal operating conditions. The HydroVantage™ flush valve provides optimal energy efficiency, low maintenance and ease of installation compared to other available generator products. Environmental Trending™ along with 4.0 Sensor Technology™ continuously monitors ambient light levels and traffic patterns within the restroom eliminating false flushing while maximizing power savings. **Zurn Engineered Water Solutions.**

Circle 110 on Reader Reply Form on page 118



Pressure relief pneumatic test plug

Test-Tite® Pressure Relief Pneumatic Test Plug features an internal pressure, safety relief valve that reduces the risk of exceeding the proper inflation pressure. This patented design reduces the potential for damage to plugs and drain, waste and vent (DWV) systems. If the recommended pressure is exceeded by the user, the excess is released, returning the plug to its proper size and pressure. The relieved pressure exhausts through the top of the plug, and not into the test area. **IPS Corp.**

Circle 113 on Reader Reply Form on page 118



Corrugated stainless steel tubing

CounterStrike® corrugated stainless steel tubing (CSST) has received a PMG listing (PMG # 1058) from ICC Evaluation Service, Inc. (ICC-ES), providing evidence that this CSST gas piping product (with special conductive jacket) meets code requirements for gas piping. Tests conducted by a leading independent lightning laboratory have shown that CounterStrike is approximately 5,000% more resistant to damage from electrical arcing compared to standard CSST. **OmegaFlex, Inc.**

Circle 111 on Reader Reply Form on page 118

SolPak solar water heating



Company has added two new environmentally-conscious solar water heating solutions to the company's line of SolPak active solar water heating systems: tankless gas products (pictured) and Rheem Marathon™ storage tanks. With these additions, Rheem SolPak now provides contractors with an enhanced selection of energy-efficient solar options that can be tailored to any gas or electric job. **Rheem.**

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Air, dirt and hydraulic separator

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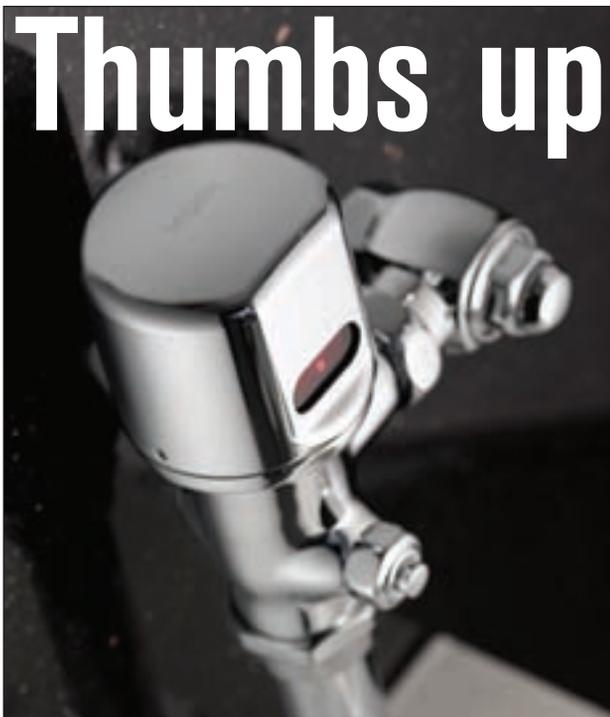


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Thumbs up for hands-free

By Kristin Myers

When you hear the words “hands-free plumbing products,” unfortunately, many envision the faucets seen years ago in airports — where users were required to frantically wave in every direction just to get the water flowing. Fortunately, hands-free products have come a long way since then, as manufacturers have expended numerous resources and utilized state-of-the-art technologies to enhance their efficiencies. Today, hands-free products are used for two primary purposes: 1) water savings and 2) hygienic benefits.

Water savings

As the worldwide population continues to grow and the scarcity of fresh, potable water increases, the demand for sustainable products is becoming ever more necessary. While this is a worldwide epidemic, in the United States alone, water managers in 36 states expect to see water shortages in the next 10 years (according to the U.S. Government Accountability Office). Fortunately, manufacturers are working ahead of the situation, and have developed a wide variety of water-saving and hands-free products which greatly reduce water waste by automatically ensuring proper shut-off.

Resource conservation issues such as energy efficiency, water conservation, and waste minimization are widely embraced by facility managers in the commercial buildings industry because of both environmental impact and cost reductions to the overall operating budget.

Installing these products saves hundreds of thousands of gallons of water without losing functionality. Hands-free products are practical for public facility restrooms due to the high amount of usage which equals high energy costs, significant health concerns and continuous cleaning and maintenance issues.

Hygienic benefits

Besides water savings, hygienic benefits are a significant

advantage of hands-free faucets. Manual fixtures can become a safety and health hazard when it comes to the spread of germs in public restrooms, due to the fact that you are touching something that countless other people touch, spreading pathogens through bodily fluids, which leads to disease and illness.

With the widespread distress and germ sensitivity regarding H1N1 and the seasonal flu, hands-free technologies have become very popular and practical. These products allow for the promotion of hygiene both for the user and the cleaning crew — which is especially important in schools and hospitals, where disease is easily spread.

Electronic faucets and flush valves also help to keep the public restroom itself cleaner. Whether it is in a school or a hospital, the facility’s overall cleanliness is often judged by the cleanliness of the restroom. If water is displaced all over the sink, it not only looks sloppy; but it’s also the ideal breeding ground for bacteria. Sensor-operated faucets reduce splashing caused by wet hands, as well as eliminate water waste — which keeps operating budgets in check as water and sewer bills escalate.

Likewise, if toilets aren’t flushed properly, both odor and bacteria can grow quickly. Sensor-operated flush valves solve this problem by removing waste and keeping the toilets operable by reducing clogs. ■

Kristin Meyers is associate product manager, Moen Commercial.

Practical Solutions

Moen Commercial offers a wide variety of water-saving products with hands-free operation, including a full line of M•Power electronic faucets and flush valves which ensure efficient water usage, low maintenance costs, cleaner restrooms and the ultimate in hygiene and sanitary protection. The most recent additions include:

- Dual flush (closet): Relies on timing and works automatically to achieve a smarter use of water by operating with a reduced flush for liquid waste and a full flush for solid waste. Ensuring that the right amount of water is used to avoid water waste for facilities while keeping restrooms clean and sanitary

- Pint flush (urinal): Boasts the lowest available flush — delivering 88 percent water savings over the traditional 1.0 gallon per flush (GPF) models, without the maintenance, expense and odor involved in waterless urinals. Not only does the pint flush outperform the waterless models, it also has the lowest operating and maintenance costs over both the waterless and other traditional flush valve styles currently on the market.

Moen Commercial’s newly redesigned M•Press metering faucet uses a .5 gallon per minute (GPM), vandal-resistant aerator, which allows for a 30 percent reduction in the cost of water usage and maintenance. This exclusive metering cartridge outperforms others with reliable flow, consistent timing and rugged construction for the most demanding environments. The pressure-independent spool provides constant timing and the highly accurate adjustment screw allows for 10 to 60 second cycles depending on user needs.

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Letters to the Editor

The Code Classroom – May 2010

Ron George,

I just read the article, "Code requirements for domestic hot water return systems with mixing valves and circulating pumps to prevent scalding." This is a very good article and very informative. Aside from the problems and resolutions in this particular case, couldn't the threat and danger of scalding be addressed, especially in an assisted living application, by installing ASSE 1016 listed temperature and pressure shower valves? Also, I would think in an assisted living application that no one living at the facility would have been able to shower without being supervised or monitored. Aside from scalding, they could fall in the shower, drown, have a heart attack, etc. Was this gentlemen allowed to shower unsupervised and unmonitored?

Thanks,

Jeff DeMoss
Systems Engineering Corporation

Thanks for the reply, Jeff.

Unfortunately, in this case the ASSE 1016 valve was installed and could not work to limit the hot water to 120 degrees Fahrenheit because the water supplied to it was already at or below 120 degrees F. The valve was a pressure balancing valve that does not compensate or adjust for any changes in incoming hot or cold temperature. This is why pressure balancing valves must be seasonally adjusted for changes in incoming cold water. In our area, the cold water can be as low as 34 degrees in the summer and as high as 82 in the summer. That is a 48 degree swing in temperature from the cold water. The maximum temperature limit stop must be readjusted seasonally to adjust for these extremes and maintain a safe hot water limit temperature. The master mixing valve in this case was maintaining 120 degrees Fahrenheit when it was flowing water during the day. When the contractor installed the master mixer, none of the maximum temperature limit stops would have high temperatures so they did not adjust any of them. The problem occurred at night when there was no flow from the hot water system. There was no way for the valve to temper the water when it was piped the way it was. If thermostatic shower valves had been installed they would have adjusted and reduced the hot water temperature to a cooler setting. Just so you know there are various terminologies for these types of facilities. Typically "nursing homes" and "skilled care facilities" are where someone needs assistance with everyday things, including bathing medication and constant supervision. Assisted living facilities are generally not considered nursing homes, because the tenants live independently in apartments with a common dining and recreation area; and they have people available to assist the residents upon request. Generally, assisted living centers or group homes do not have RNs or LPNs on staff, and although they may have someone trained in CPR, they generally do not have the same level of care as a nursing home. They generally provide one

group meal a day and the cost is significantly less than that of a nursing home or skilled care facility. Assisted living facilities generally do not fall under the state licensing and inspection requirements for nursing homes or skilled care facilities, although in a few states they might.

Ron George, CPD

Ron,

I read your article about recirc piping and was wondering if you could explain to me why the recirc line needs to be connected to the mixing valve.

I'm in Michigan and the way this is normally done here is to run the recirc line from the last fixture hot side to the bottom of the heater (by removing the boiler drain and then re-installing it with a T).

I imagine the situation you refer to is for a lot of fixtures on the same mixing valve. So how would bringing tempered water to the cold side help keep the temp DOWN?

Noah

Noah Klein — Royal Plumbing

Noah,

If you are circulating through the mixing valve you MUST bring the return line back to the cold water inlet to the water heater and to the cold water inlet to the mixing valve. If you install it the way you described it you will eventually scald someone.

This must be done because the mixing valve must have flow from both sides of the valve in order to be able to mix properly. The tempered water return is usually 10 to 20 degrees cooler than the set point of the mixing valve, if it is sized properly. If the hot water is stored in the water heater around 140 degrees F to prevent Legionellae bacteria growth, then during the off hours when there is no water use from fixtures in the system and the circulating pump is still trying to move water around in the system the mixing valve would mix 140 degree HW with 100 degree tempered water return to get 120 degree tempered water. If the hot water system design was such that the return temperature is 110, that would work also as long as the brand of temperature actuated mixing valve can handle the 10-degree temperature difference. (Some manufacturers' designs are better than others.) The mixing valve would mix 110-degree tempered water return with 140-degree HW to get 120-degree tempered water out of the mixing valve.

If you only pipe the tempered water return back to the water heater, as you described, then when the circulating pump is pushing water during periods of non-use, the mixing valve slides over to try and shut down the hot water inlet ports to maintain the set temperature. Since no cold water can enter the system, the valve tries to shut down the hot water inlet and this causes the circulating pump to dead-head. Dead heading the circulating pump causes premature wear on the pump and sometimes it causes pump cavitation failure. If the valve leaks some water through (as most do) then the full 140 to 155 degree HW tempera-

Continued on page 112

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Letters to the Editor

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ture from the water heater will leak into the tempered water piping setting up the potential for a scald incident. Most storage-type water heaters have a significant temperature fluctuation above and below their set points because the combination gas control or energy controls do not accurately control the outlet hot water temperature. This is why every manufacturer of mixing valve and some plumbing codes now require the tempered water return pipe to be split after the circulating pump and piped to the cold water inlet of the water heater and the cold water inlet to the mixing valve. That is the only way to get flow to both sides of the mixing valve during periods of no fixture usage.

Thank You,
Ron George, CPD

June 2010 – Water Conservation Efforts Unwittingly Leading to Dry Drains

Dear Mr. George:

I wanted to tell you that I found your article entitled "Water Conservation Efforts Unwittingly Leading to 'Dry Drains'" in the June 2010 Plumbing Engineer magazine enlightening. I started working for a plumbing service company in the fall of 2009. When it is quiet and my work as secretary/bookkeeper/customer service rep; i.e.: business administrator is caught up, I try to learn something about the industry I'm now involved with. I've been associated with one form of construction or another all my adult life. I find it amazing how easy it is for people to jump on the bandwagon so to speak and join some cause or another, which presents itself to "save the planet" without real scientific evidence that the cause is effective in all facets. Where one act of good will does not go without some contrary even hazardous side effect seems all too common. Your point about how saving water on one side has negative effects on the ability to "get the boat to float" downstream and into the desired place of rest made me laugh! Thanks, I needed that.

SJ

SJ,
Thanks for the kind words and may all your boats stay afloat.

Ron

Potty Parity

Hi Ron,

I am doing a search regarding the basis for determining the minimum number of plumbing fixtures as found in the plumbing codes. My question is: How were the ratios determined for each type of building classification? For example, in the UPC, Assembly places for public use require one toilet up to 100 males and three toilets up to 50 females; restaurants require one toilet up to 50 males and 50 females; elementary schools require one toilet per

30 males and one per 25 females, etc.

Is there a mathematical basis for these ratio determinations that you know of? Where do these numbers come from? Thomas Konen published research in this matter in devising a new method of probability using queuing theory (ASPE Convention 1988), but he did not include how past determinations were made regarding the number of fixtures required. Was wondering if you had any clues or know of someone who would.

Daniel P. Cole
Plumbing Inspector/Plans Examiner
ICC, IAPMO, IPIA

Dan,

I am aware of Tom Konen's paper he presented and there was also some ASPE research Foundation work done on this subject. I'm not sure there was ever an exact formula developed that works for each type of building. For example: in an assembly-type building at intermission, the load will be much higher than an office building. For example, I designed the Detroit Lions football stadium (Ford Field); it is an indoor multi-use facility. During a football game there will be one type of male to female occupancy load. During a concert for someone popular with women (Yanni), the facility may be heavily weighted toward women, but during the prom keepers convention (a male-only organization) there will be a completely different weighting toward males for fixture loading. We addressed this by having extra restrooms with water closets only between the men's and women's rooms that could be converted to male or female restrooms by changing the signage on the doors. (It still did not address the age old seat up or seat down issue.)

The problem is anyone can submit a code change to the model code organizations during the model code hearings. If they convince the code committee to vote their way, then it shall be written in the codes. It's entirely possible that someday someone is going to draft a proposed code change that states something that goes against the laws of physics like: "water shall run uphill." If it was to be approved by the code committee, it could very well be law, in some jurisdictions, that "water shall run uphill." But we all know the laws of physics apply and that cannot happen, but the code could require it to. The same thing happens to the minimum facilities tables every code change cycle. There are a lot of code change proposals to add and reduce the minimum number of fixtures. Most of the code changes are submitted based on a one-time personal experience by many people (often from an experience in an older building that does not meet current code requirements) or someone just decides to change the fixture counts on a whim. I believe if you look at the old ASPE research foundation "potty parity queuing theory" work, which I believe Tom Konen may have consulted on for the ASPE RF report, it had some language that explains why women take slightly longer than men in the bathroom and therefore need more fixtures. But it all boils down to an educated guess based on the anticipated use of the facility.

Ron

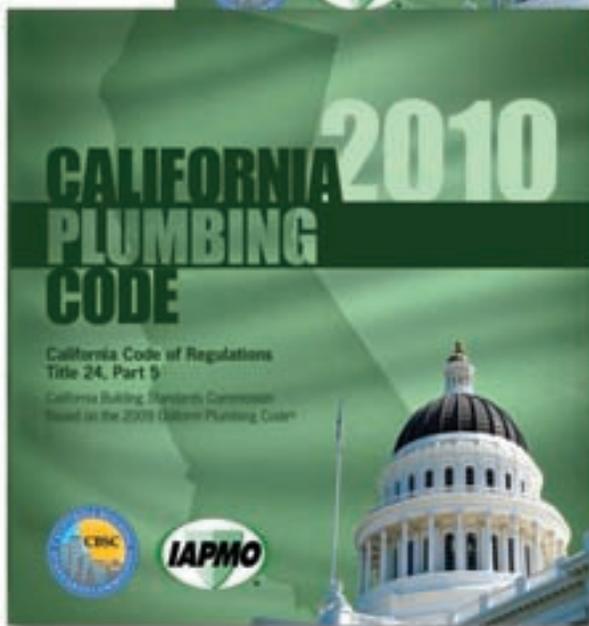
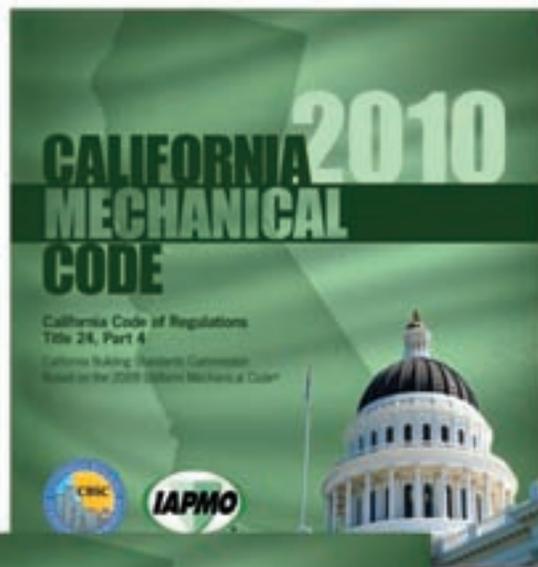
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Symmons Industries

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Symmons is a third-generation, family-owned company that was founded in 1939. Since its inception, Symmons Industries has been a premier manufacturer of commercial and residential plumbing products. Known for its pressure-balancing, anti-scald shower valve, and durable commercial products, Symmons has been trusted by plumbing contractors for more than 70 years. In 2008, Symmons re-launched the brand and expanded its product offering to include premium products for kitchen and bath. In 2002, Symmons introduced The Design Studio and continues to innovate within the custom fittings category, creating distinctive design solutions for premium hospitality and condominium projects.

Symmons offers a variety of durable, reliable and beautifully designed plumbing fittings for residential and commercial applications.

The following is an exclusive Q&A with Tim O’Keeffe, ceo, Symmons.

What are your initiatives for the company?

O’Keeffe: As the third generation of management my goal is to remain true to our commercial heritage and continue to create products that address the needs of the plumbing contractors and help them to drive their sales.



Tim O’Keeffe

Understanding the market and our customers will help us develop products that are relevant, cost-effective and solution-based. I also have a big focus on business development, product innovation and long-term company strategy. I am engaging with developers, owners and management companies to continue enhancing our business diversification strategy.

Even in this economic climate, Symmons has introduced some new commercial products. Please describe them and what it means to Symmons to be front and center in the marketplace.

O’Keeffe: Symmons is fortunate. As a result of our high quality and durable products, we’ve developed a loyal cus-

tomers following, which has enabled Symmons to remain successful in these economic times. However, the changes in the economic climate have taught us some valuable lessons, and we’ve learned to adjust product offerings to the market demands. Our customer solutions, like the Symmons trim replacement kit, were created to make the contractors more productive and provide them the opportunities for additional sales. The trim kit, for example, also provides the end user a product for bath renovations on a budget.

We strive to create products and solutions that will make our customers more successful and help grow their business.

Are there any contractor programs/incentives in place from Symmons?

O’Keeffe: We firmly believe in having incentive programs for all of our customer channels. We are open to ideas about programs and encourage all customers to contact their local Symmons representative to discuss such programs.

Is your company immersed in “green”? How?

O’Keeffe: At Symmons, green is more than just our brand color. We are pleased to offer WaterSense®-labeled lavatory faucets. In fact, most of our premium bath fittings are available in low flow. As a WaterSense partner, we are continually looking for ways to help educate contractors and homeowners on the benefits and cost savings of installing low-flow products. We are currently testing our showerheads to the specifications set forth by WaterSense and hope to offer WaterSense labeled showerheads in early 2011. We’ve also changed some of our operating procedures for our offices and manufacturing facilities to be more environmentally friendly.

Please describe Symmons’ new commercial bath suite?

O’Keeffe: In today’s market, we realized that creating products that are compatible with many uses and applications is the way to ensure sales. We’ve also learned that our designs must be timeless and transitional to match any décor. Our customers need to have product flexibility in combination with good quality, which is why we created the Dia Collection. The Dia products features a minimalist design to match any décor, which makes the collection a good fit for hospitality properties, condominiums or medical facilities. The Dia Collection features a tub/shower

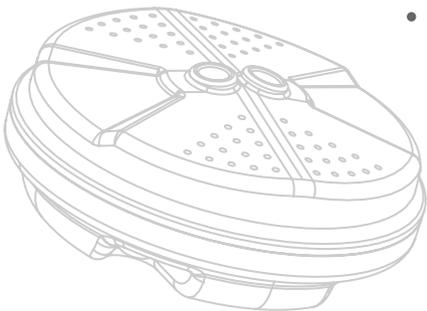
Continued on page 116

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Symmons

Continued from page 114

system, lavatory faucets both wide-spread and single post, kitchen and bar faucets. The full line offering of the Dia Collection addresses the needs of any commercial project.

What are contractors looking for as far as style and functionality in bathroom fixtures?

O'Keeffe: Durability, timeless design and easy maintenance are the main things that contractors are seeking when purchasing new products. Timeless and transitional designs that can be installed in almost any type of bath are appealing to the contractor because they can rely on one product or brand for many applications. Maintenance requiring only a few parts is another priority for the contractor because it limits the need to have large quantities of on hand inventory.

Please describe your foray into the pressure balancing and anti-scald valves.

O'Keeffe: The anti-scald and pressure balancing technology serves as the foundation of our company, as it was developed by Paul Symmons in the early 1930s. He speculated that the problem of drastic temperature change in the shower was caused by a change in water pressure. He observed that when pressure demands were made elsewhere in a plumbing system, turning on a faucet or flushing a toilet, would cause a temperature change occurred in the shower. The final result was the Temptrol valve design that not only solved the problem of water temperature fluctuation, but also revolutionized the plumbing industry. Since 1939, Symmons Industries, Inc. has been producing pressure balancing shower valves to prevent scalding incidents. The origi-

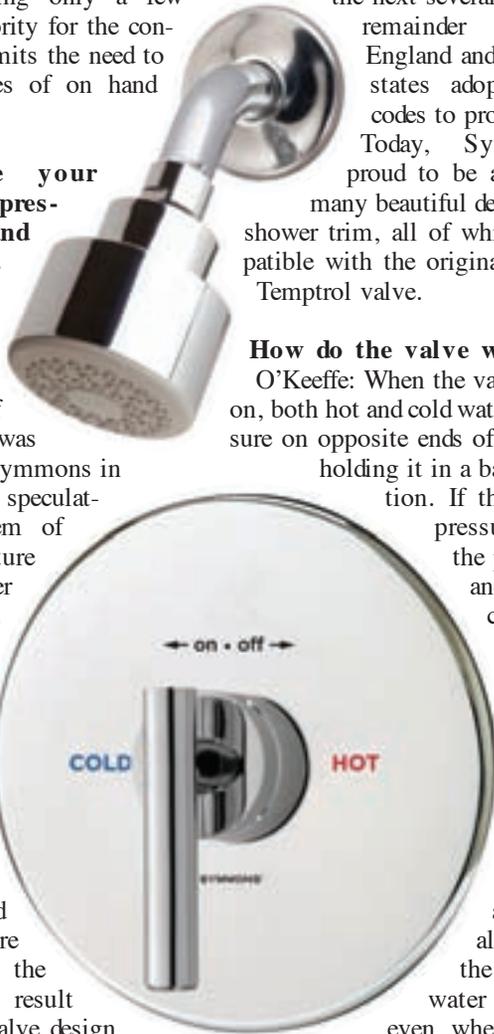
nal technology is encompassed in the Temptrol valve.

Since the expiration of the patent in 1960, Symmons has maintained its leadership position as the safest, most reliable shower system manufactured. Every assembly is tested to maintain uncompromised performance and reliability. Symmons still manufactures a durable bronze, brass and stainless steel valve.

In 1974, Massachusetts became the first state to mandate the use of safety-type valves in all showers. As a result of the legislation, Symmons has the majority of installations in houses, hotels and commercial buildings in Massachusetts. Over the next several decades, the remainder of New England and many other states adopted similar codes to protect bathers. Today, Symmons is proud to be able to offer many beautiful designs for the shower trim, all of which are compatible with the original Symmons Temptrol valve.

How do the valve work?

O'Keeffe: When the valve is turned on, both hot and cold water exert pressure on opposite ends of this piston, holding it in a balanced position. If the hot water pressure drops, the piston reacts and reduces the cold inlet opening. The pre-selected shower temperature is maintained by instantly and continually balancing the hot and cold water pressure, even when the water supply changes drastically. By maintaining the same hot to cold water ratio in the shower, the Symmons valve prevents injuries that can result from a quick reaction to unexpected temperature changes otherwise known as "shower shock."



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