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December 2011

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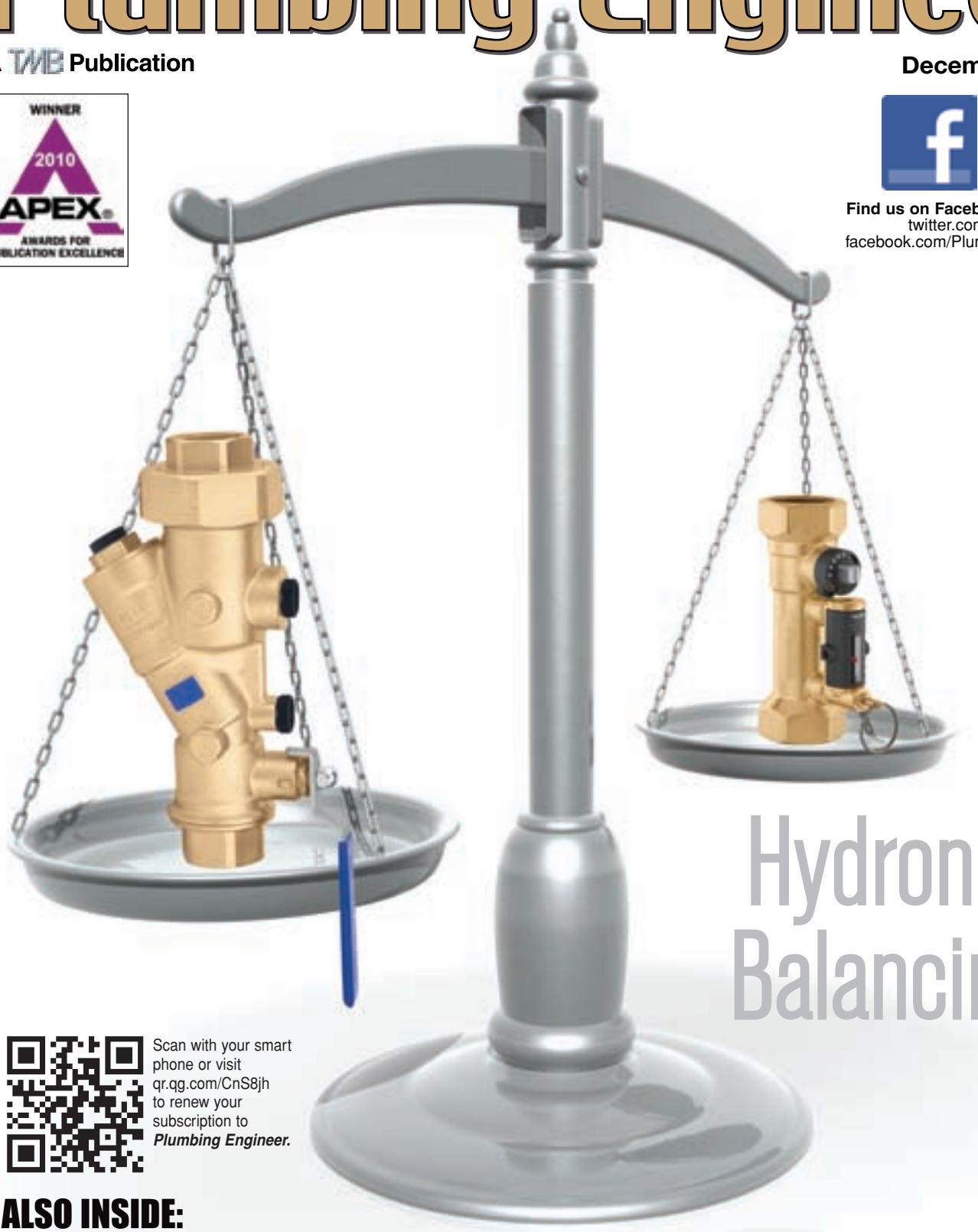

Hydronic Balancing

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ALSO INSIDE:

- The Science of Mixing Valves
- Internet Usage Survey
- Healthcare Facility Plumbing Design, Part 2

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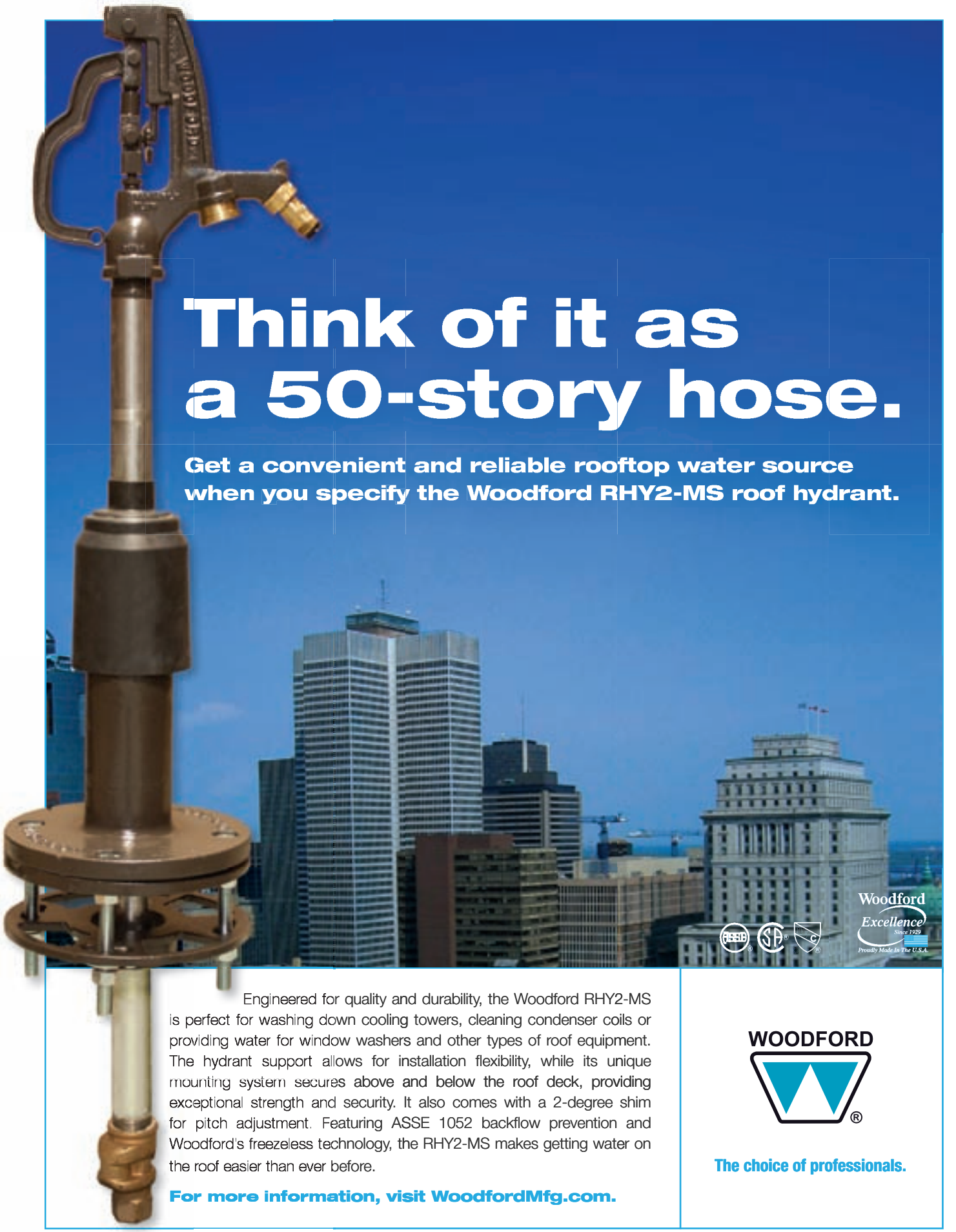

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The Hydronic Balancing Act

Balancing is important if you want to get the highest performance, best efficiency and ultimate heat transfer.

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The Science of Mixing Valves

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Healthcare Facility Plumbing Design, Part 2

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Internet Usage Survey

The 2nd Annual Plumbing Engineer Internet Usage Survey is tallied and the results are here.

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COLUMNS

INDUSTRY NEWS & OTHER DEPARTMENTS

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Editor's Letter

John Mesenbrink, editorial director
editor@plumbingengineer.com

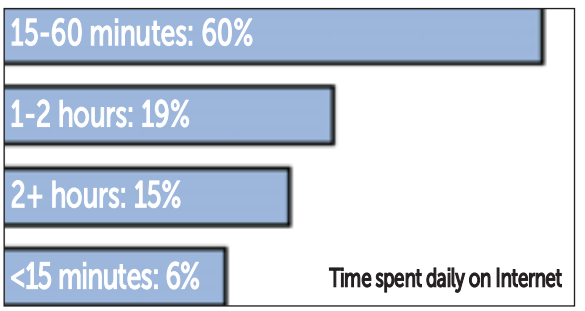
Internet survey reveals usage, trends

Plumbing Engineer's 2nd Annual Internet Usage Survey is tallied, and the results are in. We would like to thank those who participated. It was an overwhelming response. *Plumbing Engineer* is always interested in the work habits of engineers, especially as it pertains to the Internet. We think we have a pretty good sample size. Nearly 700 engineers responded this year! From time spent on the Internet to social media networking, the results are fascinating, to say the least.

Seventy-seven percent of those who responded claim that they use the Internet everyday. Of those seventy-seven percent, 56 percent are on the Web for at least 30+ minutes per day. Interestingly enough, one percent claim that they absolutely never use the Internet during work hours, which is where we sent the online questionnaire. Hmmm.

When it comes to social media usage, an astounding low 35 percent claim to be using social networking. And, surprisingly, 68 percent of the those are just getting started or planning to start in the near future. Facebook led the way with 24 percent (up 3% from 2010) followed by LinkedIn at 17% (up 4% from 2010) and Twitter was third with 11 percent — up 7% from the 2010 survey.

Of those that utilize social media as a business tool, 23 percent asked are building stronger relationships with existing customers, 22 percent have increased brand awareness and 17 percent announce services. As a result of social media usage, 15 percent increased traffic to their website, 13 percent helped generate business, 11 percent enhanced customer service and support and eight percent claimed that their overall marketing expenses have been reduced.



The "other" responses garnered for social media use were: improve communication and information flow, network with peers and industry professionals, and increase education and instruction.

Of those using social media for a business resource or competitive edge, 100 percent use the social sites for at least one hour per week. The majority of users (94%) use social media 1-5 hours per week.

When asked where engineers go to find the latest product and technical information, 90 percent of those surveyed preferred to visit manufacturer websites. Running in second, trade publications and trade publication websites received 65 percent of the vote. Catalogs garnered 55 percent of the tally.

For more on the 2011 Internet Usage Survey, turn to page 42. ■

PLUMBING ENGINEER
(USPS 567-950)
ISSN 0192-1711

PLUMBING ENGINEER (USPS 567-950) ISSN 0192-1711 is published monthly by TMB Publishing Inc., 2165 Shermer Rd., Suite A, Northbrook, IL 60062. Phone (847) 564-1127, Fax (847) 564-1264. Magazine is free to those who design and specify plumbing/piping systems in commercial, industrial, institutional and governmental buildings; as well as government officials and plumbing inspectors. Subscription rates for U.S. and Canada: $50 for one year, $90 for two years. Other countries: $300 per year. Periodical postage paid at Northbrook, IL, and additional mailing offices. POSTMASTER: Change of address should be sent to ***Plumbing Engineer***, 440 Quadrangle Dr., Suite E., Bolingbrook, IL 60440. Material and opinions contained in contributed articles are the responsibility of the authors, not of TMB Publishing Inc., *Plumbing Engineer* magazine or its Editorial Advisory Board. The publisher cannot assume responsibility for any claims made by advertisers.

Volume 39, Number 12. *Plumbing Engineer* is microfilmed by University Microfilms, Ann Arbor, MI, and indexed by Engineering Index Inc. Publications Mail Agreement No. 41499518. Return Undeliverable Canadian Addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill ON L4B 4R6

Plumbing Engineer®
A TMB Publication

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Industry News

Xylem launches as new global, pure-play water technology company

WHITE PLAINS, N.Y. — Xylem Inc. has completed its spin-off from ITT Corporation and has begun operations as a $3.2 billion standalone global water technology company. Xylem's market-leading product brands, applications expertise and technological strength enable the transport, treatment, testing and efficient use of water in public utility, residential and commercial building services, industrial and agricultural settings. The company serves customers in more than 150 countries to address critical water issues such as growing water scarcity, aging infrastructure and more stringent environmental regulations. Xylem began regular trading on the New York Stock Exchange on November 1, 2011, under the ticker symbol XYL and will be listed on the Standard & Poor's 500 Index.

"I'm extremely proud to announce the launch of a unique company, the product of more than 100 years of experience in the water business and the collective work and expertise of our nearly 12,000 employees and our strategic partners around the world," said Gretchen McClain, president and CEO of Xylem. "While our name has changed with the spinoff, our customers will find in Xylem the same commitment to providing local service to meet their specific needs while leveraging our global network, technological strength and applications expertise."

Xylem serves a $30 billion segment of the global water equipment and services market through a distribution network consisting of a direct sales force and independent channel partners. The company's products and services address the full cycle of water and are key in the collection, distribution and use of water. Well-known and respected product brands such as Bell and Gossett, Flojet, Flygt, Godwin, Goulds Water Technologies, WTW and YSI, among others, will continue their place in the water industry as a part of the Xylem portfolio.

Xylem's senior management team has significant water industry expertise and a demonstrated track record of growth and strategic execution. The company's leadership team includes:

- Gretchen McClain, president and CEO
- Mike Speetzen, chief financial officer
- Mike Kuchenbrod, president, Water Solutions
- Chris McIntire, president, Analytics
- Ken Napolitano, president, Residential & Commercial Water
- Bob Wolpert, president, Flow Control and China & India
- Angela Buonocore, chief communications officer
- Frank Jimenez, general counsel/corporate secretary
- Robyn Mingle, chief human resources officer
- Colin Sabol, chief strategy & growth officer.

K/BIS to move 2012 Chicago show dates

CHICAGO — As part of Chicago's city-wide schedule adjustments to accommodate the G-8 and NATO summits in May 2012, the Kitchen & Bath Industry Show (KBIS) has moved up its annual tradeshow and conference to April 24 to 26, 2012, at McCormick Place, with the conference beginning on April 23.

Owned by the National Kitchen & Bath Association (NKBA) and produced by Nielsen Expositions, KBIS brings together nearly 20,000 of the industry's top dealers, designers, builders, remodelers, retailers and other professionals directly involved in the design and remodel of residential kitchens and bathrooms.

Owens Corning invests in new pipe innovation

TOLEDO, OHIO — Owens Corning announced improvements to its FIBERGLAS™ pipe insulation as a result of investments in its Newark, Ohio, facility. The enhancements touch the entire FIBERGLAS™ product line through an investment in new capital equipment, as well as process improvements on existing equipment.

These advancements, along with Owens Corning's proven SSL II® Positive Closure System, deliver consistent pipe insulation sections that are easier to install and have a smooth appearance. The company has also upgraded its pipe insulation cartons to make them sturdier to withstand the rigors of rugged job sites.

The new FIBERGLAS™ pipe insulation is now available. To learn more about how these refinements can help your business visit www.owenscorningpipe.com.

SolarLogic launches heating system controller

SANTA FE, N.M. — SolarLogic LLC, a New Mexico solar heating technology company, announced that the next generation SLIC controller is installed and operating in the company's Santa Fe R&D Center.

"Our first generation solar home heating controller, the SLIC (SolarLogic Integrated Controller), was a "proof-of-principle" design. With the development of the Gen II SLIC, SolarLogic is ready for the broad market. Validation of this Gen II product in a controlled number of homes around the country will be happening this fall, and a product launch to the full U.S. market will happen in early 2012. This is an exciting time for the company, bringing revolutionary products to market. They are going to have a major impact on the solar heating industry," said SolarLogic CEO, Dr. Fred Milder.

The SLIC includes switching and interfacing for every heating system component (thermostats, zone valves, pumps and sensors), all home-run wired to pre-labeled terminals for easy installation. It comes "plug-and-play" pre-programmed, including detailed knowledge about the specific heating system in which it is to be installed.

More Industry News on page 10

Cast Iron
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Stainless Steel Floor
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System adjustments can be made with any computer over the Internet to further optimize energy efficiency.

Chief technical officer Bristol Stickney has a different perspective. "The real beauty of this controller is that, even if you just turn it on and walk away, it still runs the system flawlessly."

Taco introduces iPhone app

CRANSTON, R.I. — Residential and commercial HVAC professionals on job sites and on the road can now quickly and easily find the Taco centrifugal pump to meet their

specific system requirements with a new, free iPhone app.

The TacoHVAC Pumps app is available free from the Apple iTunes store. It can be found within the store by searching for "Tacohvac." With this app users can view the performance characteristics of each pump, based on specified flow and head conditions, and can email the results from within the application.

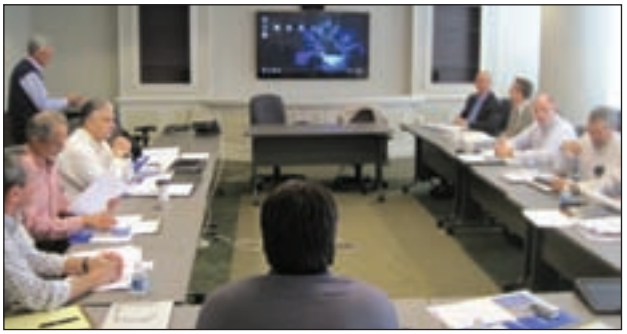
The TacoHVAC Pumps app also gives mobile access to the entire document library on the Taco website, www.taco-hvac.com. The app accesses product catalogs, instruction sheets and wiring diagrams, will find the nearest sales representative or will call Taco tech support.

Radiant Council moving forward

WASHINGTON — The ACCA Radiant & Hydronics Council, a newly-forming group of hydronics-focused contractors who are members of the Air Conditioning Contractors of America (ACCA), is moving ahead with an aggressive agenda to provide targeted support for this important segment of the indoor environment industry.

On November 9, the council's advisory committee, a group of volunteer contractor leaders who are guiding the new group, met at ACCA national headquarters near Washington, DC. Chaired by Dan Foley, of Foley Mechanical in Virginia, the advisory committee laid out a strategic vision for the group's launch. The group will begin accepting new members online at ACCA's website shortly after the Thanksgiving holiday.

Among the new initiatives that will be undertaken by the RHC is the formation of MIX Groups specifically for



RHC in action: Dan Foley, back to camera. Clockwise: John Siegenthaler, John Abularrage, Greg Jannone, Paul Stalknecht, Donald Prather (technical services specialist), Glenn Hourahan (VP research and technology) Brian Stack and Dave Yates. Also present Hilary Atkins (Sr VP & general counsel), Kevin Holland (Sr VP Business operations & communication division). Picture by Bob Rohr.

hydronics and radiant contractors. MIX Groups are one of ACCA's most popular programs, being small groups of non-competing contractors who act as informal "boards of directors" for each other, providing in-depth peer review and guidance on business operations.

"Having once worked for a contractor who was in a MIX Group, to this day I rely on wisdom gained from that program in running my own business," Foley says. "I would love to participate in a MIX Group with similar, non-competing radiant/hydronics professionals, because I know just how incredibly valuable these groups can be. This will be a tremendous benefit for radiant/hydronics contractors."

Manufacturers are optimistic about HVAC/R industry outlook

WESTPORT, CONN. — Despite widespread concern about the global economy, manufacturers appear to be very optimistic about the economic outlook for the HVAC/R industry.

According to a recent survey of more than 1,000 AHR Expo exhibitors worldwide, nearly three fourths (72%) of the total respondents expect a "better year" (59%) or a "much better year" (13%) in 2012, compared to 2011. Twenty four percent replied that sales would be the "same," while only four percent are expecting a "worse year."

Don't miss the AHR Expo, January 23-25, 2012 in Chicago. For more information, www.ahrexpo.com.

IAPMO, ASPE sign MoU

ONTARIO, CALIF. AND CHICAGO — The International Association of Plumbing and Mechanical Officials (IAPMO) and the American Society of Plumbing Engineers (ASPE) have entered into a Memorandum of Understanding (MoU) to train, test, and certify qualified plumbing engineers and designers in the United States to perform green plumbing design work, to design systems that conserve and protect water supplies and to reduce energy consumption in the delivery and use of water.

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ASPE partners with Knovel

CHICAGO — The American Society of Plumbing Engineers (ASPE) has partnered with Knovel, a web-based application integrating technical information with analytical and search tools, to broaden the exposure of its technical resources to the engineering community. With this licensing agreement, engineers around the world will have access to ASPE's technical content on plumbing system design and installation techniques.

D.S. O'Brien Award of Excellence presented to Russ Borst

ROCKVILLE, MD. — Russell J. Borst, LEED AP, vice president of service at Hurst Industry, Belmont, Mich., was presented the D.S. O'Brien Award of Excellence at the Mechanical Service Contractors of America's (MSCA) 26th annual educational conference in Colorado Springs, Colo. This award was established by MSCA in 2000 to recognize those individuals who exhibit extraordinary dedication and outstanding commitment to the mechanical service contracting industry and to MSCA.

Borst has been involved in the mechanical service contracting field for more than 20 years. He serves on the MSCA Labor Relations Committee and was previously the chairman of the association's board of managers in 2008. Borst has a bachelor's degree in engineering technology as well as an applied science degree from Ferris State University in Big Rapids, Mich.

ASSE's RP/DC backflow standards available

WESTLAKE, OHIO — On Aug. 17, 2011, the American National Standard Institute (ANSI) recognized the American Society of Sanitary Engineering's (ASSE) four RP/DC backflow standards as American National Standards. These standards were approved by ASSE's board of directors on Aug. 9, 2011.

ASSE's RP/DC backflow standards include: ASSE Standard #1013-2011, *Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers*; ASSE Standard #1015-2011, *Performance Requirements for Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies*; ASSE Standard #1047-2011, *Performance Requirements for Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies* and ASSE Standard #1048-2011, *Performance Requirements for Double Check Detector Fire Protection Backflow Prevention Assemblies*.

Harvel Plastics president earns prestigious award

EASTON, PA. — Harvel® Plastics Inc. president Patrick Foose has received the highest honor given by the International Association of Plastics Distribution (IAPD) for his contributions to the industry and to the association.

Foose was presented with the 2011 Paul Davis Award of Merit at the IAPD's Annual Convention and Expo in Baltimore. He was selected based on his work as a former IAPD board of director's president, where he served as the first plastics manufacturer representative to hold the position.

More Americans cleaning up in public restrooms

MILWAUKEE — According to a national survey conducted by Bradley Corporation, a leading manufacturer of bathroom and locker room furnishings, including sinks, faucets, hand dryers, showers and lockers, Americans are becoming more diligent about washing their hands after using a public restroom.

In Bradley's third annual Healthy Hand Washing Survey, Americans said they wash up 90 percent of the time after using a public restroom;

that's up from 87 percent when the survey was first conducted in 2009.

While more Americans are taking the time to wash, the vast majority (91%) of respondents described the impact of an unclean public restroom as having a negative effect on their perception of the establishment or business. A restroom's overall unappealing appearance is the most commonly mentioned complaint, followed by empty or jammed toilet paper dispensers and partition doors that don't latch closed.

This year, the proportion of Americans who claim they will never return to a business or establishment in which they had an unpleasant experience increased to 37% (up from 24% in 2010) along with 34% (up from 28% in 2010) who will "think twice" before returning.

As revealed last year, gas stations top the list when respondents were asked the type of establishment in which they had the most unpleasant experience.

For info, www.bradleycorp.com.

Large scale solar thermal systems installed in North Carolina YMCAs

LINUO RITTER USA AND VANIR ENERGY engineered and installed evacuated tube solar thermal systems at six YMCA facilities in the vicinity of Winston-Salem, North Carolina.

Vanir financed and built these systems through a Power Purchase Agreement. The Ys received new state-of-the-art solar thermal systems with a fixed energy cost for the next 20 years.

The systems were engineered using the design principles of Ritter XL Solar Germany, utilizing CPC evacuated tube collectors and the "Aqua Principle," which uses water as the heat transfer medium instead of glycol. The solar energy will be dispersed at five different temperature levels for showers, laundries, space heating, dehumidification and pool water heating.

The combined annual output from the 12,600 sq. ft. of CPC 45 collectors is 38,638 therms, which will offset 2.6 million lbs. of CO_2. System monitoring and data collection is available in real time via the Internet.

Chicago Faucets offers special promotion

DES PLAINES, ILL. — The 420 Series of lavatory faucets from Chicago Faucets is part of a special promotion lasting from October 11, 2011, to January 31, 2012. During this time, distributors have an opportunity to enjoy special pricing, 48-hour shipping, no hassle returns and more. The faucets combine the durability of solid brass body construction with the dependability of a time-tested ceramic mixing valve.

Designer's Guide

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

To pump or not to pump?

Recently, my firm bid on a design-build project, a medical office building on a fairly large medical campus. The bridging documents (the drawings and other materials used for bidding the project) did not indicate domestic water pumps nor did they indicate a backflow preventer on the water service.

The building will be four stories in height, but the absence of a backflow preventer (BFP) was not surprising, since the entire campus has central backflow preventers on the main water services. The absence of domestic water pumps was also not surprising, since the water pressure was indicated to be 90 – 92 psi. In bidding the job, my estimating department figured a central pressure regulating station to protect the lower floor fixtures from exceeding the code maximum of 80 psi.

After a lengthy proposal process, we were finally awarded the job. As the details began to unfold and we started communicating with the utility providers, we learned that the street water pressure had a range of 80 – 90 psi, which, on the low end, is quite a bit less than the 90 – 92 psi indicated on the bridging documents. We checked the water pressure with a gauge downstream of the central backflow preventer; it read 75 psi, which would be consistent with the water utility's figures after a 10 –12 psi drop through the BFP.

Further investigations into the details of the job revealed that there was an RFI issued during the bid by one of our competitors, questioning the need for a BFP serving the building; the response indicated that a BFP should be provided. Now, I'm sensing a water pressure problem.

If the city water pressure ranges from 80 to 90 psi, we have to design around the worst case scenario. We have to assume low pressure for design purposes but also safeguard the building against the higher static pressure.

With 80 psi in the street, if the central BFP loses 12 psi, and the building BFP loses another 12 psi, the dynamic low pressure to the building will be 56 psi or less, once you account for friction, water meter loss and the like. The building is only 45' to the top floor slab, which is just under 20 psi, so the dynamic pressure at the top floor would be 36 psi or lower. This is not even accounting for friction within the building.

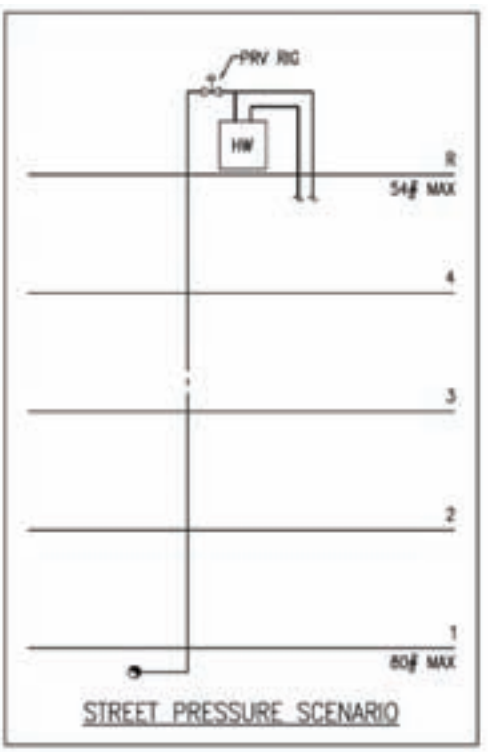
Since most flush valve fixtures today require 35 psi — which closely approximates our available pressure — there is no pressure left over to account for friction, and there is no basis for sizing piping without a friction factor. Further, since the static pressure condition to the building is in excess of 80 psi, a pressure-regulating station will be required to avoid static over-pressurization, which will add even more pressure loss to the system.

One can make the argument that, since there are central backflow preventers, the utility main is already protected, so no BFP should be required for the building. If the building BFP were deleted, that would allow an additional 12 psi for friction, which is a manageable scenario.

If the building BFP cannot be deleted, then pumps will have to be added. Since the pumps will be low pressure and commensurately small horsepower (5HP duplex in this case), a VFD pump set can be provided at a reasonable cost. VFD control is desirable for this scenario, since the pump pressure demand will be marginal and variable in nature.

If the booster pumps are utilized, the building still requires protection against static over-pressurization; the most economical means of achieving this is to fit the pumps with pressure-regulating style discharge check valves set to 80 psi. This is unconventional for a VFD controlled pumps set, since pressure is controlled with pump speed and not PRVs. When the pumps aren't running and the static pressure rises to 90 psi, this pressure would travel through the pumps and to the fixtures if PRVs are not provided.

So, right now we are grappling with two scenarios. The first is a street pressure system with no BFP on the water service and a regulating station to prevent over-pressurization. My preferred method of piping a building with this pressure sensitive condition is to run express to the top to a PRV set and water heaters in the roof mechanical room and then have a down-fed supply to take advantage of static gain in pipe sizing. Refer to the schematic diagram (below).



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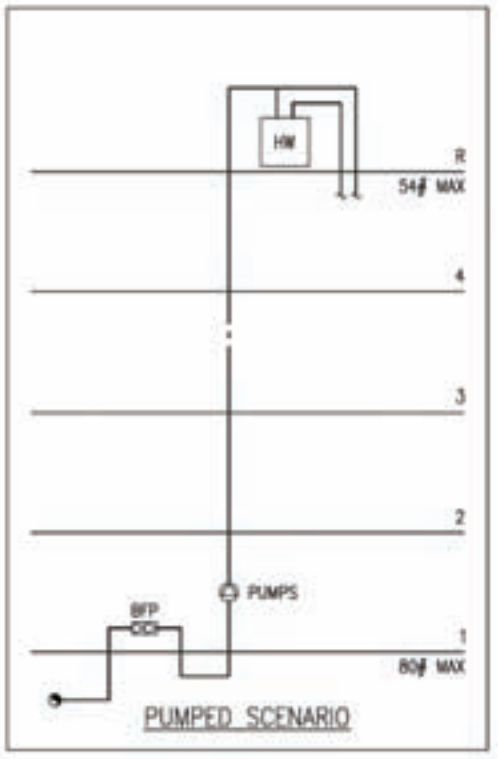
The second scenario, if the BFP is required, is a pumped system with VFD control and PRV check valves on the pumps. In this scheme I also prefer an express riser to the roof with a down-fed system, since we don't have a great deal of pressure for friction due to the 80 psi limit at the first floor. Refer to the associated schematic diagram (right).

The two scenarios are not dramatically different, but it is essential to determine early in the program which arrangement the project requires. The architect is not pleased about having to sacrifice program space on the 1st floor for the pumped scenario, but the required pump room is not large, so it is not that big of a deal. The key is to catch potential problems such as this early in the design, as, the sooner you catch them the easier they are to deal with. ■



Timothy Allinson *is a senior professional engineer with Murray Co. mechanical contractors in Long Beach, Calif. He is licensed in both mechanical and fire protection engineering in various states and is LEED accredited. He can be reached at laguna_tim@yahoo.com.*

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Code Classroom

Ron George, CPD
President, Plumb-Tech Design & Consulting Services, LLC

Code and standard update

This time of year is a busy time of year for the codes and standards industry. Each late summer and fall, I spend a significant amount of time attending the code organization meetings and standards writing organization meetings. The following is a summary of some of the happenings at the various code and standard writing organizations.

ASME news

ASME A112 Plumbing Material and Equipment Committee Update: The ASME Main Committee, (A112 Plumbing Material and Equipment committee) is in the process of issuing revisions to several standards.

The revised ASME standards are: ASME A112.18.1 / CSA B125.1 Plumbing Supply Fittings; ASME A112.18.7 Deck Mounted Bath/Shower Transfer Valves With Internal Backflow Protection.

The first proposed change to the A112.18. 1 / CSA B125.1 Plumbing Supply Fittings standard was a proposal to address language dealing with the rounding off of decimal equivalents to the translation between metric and English units. The proposed change included the following note: *For purposes of determining compliance with these specifications, an observed or calculated value shall be rounded "to the nearest unit" in the last right-hand digit used in expressing the specification limit in accordance with the Rounding Method of ASTM E29 "Using Significant Digits in Test data to Determine Conformance with Specifications."*

There was a concern that rounding may allow a product to pass the standard that exceeds the Energy policy act maximum flow volumes because of rounding.

There are two flow rate specifications in the Flow Rate table, which have values smaller than 0.1. One is a 1.25 gallons per minute and the other is a 0.25 gallons per cycle, hence just rounding to the nearest 0.1 gpm could have allowed flow rates of 1.3 or 0.3 respectively and there was concern that the language in the standard would allow a maximum allowable flow rate to exceed the flow rates in the federal energy policy act.

Another proposed change to the A112.18. 1 / CSA B125.1 Plumbing Supply Fittings standard language was added to address low-lead fittings in the ASME A112.18.1 / CSA B125.1 Plumbing Supply Fittings. The proposed change is as follows:

4.9 Toxicity and Lead Content

4.9.1: *Fittings covered by this standard shall comply with the applicable requirements of NSF/ANSI 61.*

4.9.2: Solders and Fluxes in contact with potable water shall not exceed, by mass, 0.2% lead content. Metal alloys in contact with potable water shall not exceed 8% lead content.

4.9.3: Fittings intended to convey or dispense water for human consumption through drinking or cooking shall not contain a weighted average lead content in excess of 0.25% when evaluated in accordance with NSF/ANSI 372.

The task force agreed to propose the change to 4.9.1. This change would avoid a situation whereby the scope of the ASME/CSA standard included a fitting that doesn't fall under Section 9 of NSF 61. It would ensure that any fitting in contact with drinking water needs to meet the toxicity requirement, even if it didn't fall under the scope of Section 9, as has occurred in the past. The requirement is also consistent with CSA standard B125.3.

A separate and new clause (4.9.3) was needed to address this requirement. This proposed language is consistent with the new U.S. legislation S.3874 dealing with "lead-free" content.

Another proposed change to the A112.18. 1 / CSA B125.1 Plumbing Supply Fittings standard language was in section 4.1.3 dealing with seating members of the faucet valves. The seating members section was modified as follows:

4.1.3 Seating members

4.1.3.1: *The following fittings shall have replaceable seats:*

(a) supply valves for bath and shower fittings, except concealed stops;

(b) combination lavatory fittings;

(c) combination kitchen sink fittings;

(d) bidet fittings;

(e) single lavatory faucets; and

(f) exposed valve-type bath and shower fittings.

4.1.3.2: Seat disc arrangements shall be replaceable.

4.1.3.3: *Seat disc arrangements shall not vibrate in service. When a threaded device is used to secure the disc, it shall remain secure after the disc has been removed and replaced five times.*

4.1.3.4: *In lieu of a replaceable seat as required in 4.1.3.1 and 4.1.3.2, a replaceable cartridge that includes both seat and seal shall be acceptable.*

4.1.3.5: *Solenoid valve used to open and close the flow of water shall be replaceable.*

The underlined language above was proposed to be added because in recent years new valve and cartridge designs have provided several other methods to close a valve other than just a rubber seal on a cartridge stem that is screwed down on a seat enclosed in the valve body. The proposed language adds language addressing other methodologies so that the seating requirement is not limited to the older technology.

Another proposed change to the A112.18. 1 / CSA B125.1 Plumbing Supply Fittings standard language was to update the definitions of terms "flowing pressure" and "supply pressure."

This item is in regard to the use of the terms "flowing pressure," which is also referred to as residual pressure and "supply pressure," which is also referred to as static pressure instead of undefined terms such as simply "water pressure."

The following definitions apply to uses of the term pressure:

Pressure — Flowing pressure — the pressure in the piping upstream of an open fitting or accessory.

Supply pressure — the static water pressure in the fitting supply piping.

The ASME A112 Plumbing Material and Equipment committee will hold their Winter 2012 meetings January 30 – February 2, 2012 at the Hampton Inn Downtown, 226 Carondelet St., New Orleans. The ASME meetings will be held in conjunction with the Canadian Standards Association meetings to facilitate the Joint Harmonization Task Group (JHTG) meetings for the standards being harmonized between the two organizations.

IAPMO news

The IAPMO standards Council Meets and approves the 2012 UPC and UMC

The International Association of Plumbing & Mechanical Officials met in California in Early November to hear final

Continued on page 20

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Code Classroom

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appeals to the 2012 Code changes and approve the 2012 edition of the Uniform codes for Printing. The 2011 Standards council consists of the following members: Terry Swisher, chairman; Phil Ribbs; Tim Brink; Kurt Steenhoek; Bob Courtnier; Kevin Tindall; Ron George; Linden Raimer; Rex Crawford; Gabriella Davis, secretary; Lynne Simnick, recording secretary. Staff members present were: Neil Bogatz, general counsel; Matt Sigler, UPC staff liaison; Monte Bogatz, associate general counsel; Hugo Aguilar, UMC staff liaison; Leticia Gallegos-Wilson, executive assistant.

2012 Uniform Plumbing Code.

Phil Ribbs is retiring from the IAPMO Standards council and as his last official duty as a member of the IAPMO Standards council, Phil Ribbs made a motion and it was seconded to issue the 2012 edition of the Uniform Plumbing Code as adopted at the Association Technical Meeting Convention and as amended by the appeals decisions. The motion carried unanimously.

2012 Uniform Mechanical Code.

A motion was made and seconded to issue the 2012 edition of the Uniform Mechanical Code as adopted at the Association Technical Meeting Convention and as amended by the appeals decisions. The motion carried unanimously. The Uniform codes will soon be forwarded to the printer for publication.

UPC Technical Committee appointments

A motion was made to accept Len Swatkoski's application to serve as the Principal member representing the Plumbing Manufacturers International (PMI) on the Plumbing Technical Committee. The motion was seconded and passed unanimously. The council reviewed several other applicants and placed them on hold.

IAPMO Standards Council appointments

IAPMO Standards council chairman Terry Swisher, other Council members and staff thanked Phil Ribbs for his six years of service on the Standards Council. Jed Scheuermann will join the Council in January 2012 to replace Phil Ribbs. Council members reappointed to serve another term include chairman Swisher, Tim Brink and Linden Raimer.

ICC news

The International Code Council completed the 2012 International Code cycle with Green Code Hearings and the International Pool & Spa Code Final Action hearings.

The International Code Council recently held their Final Action code hearings for the 2012 Family of codes with Green Code Hearings and the International Pool & Spa Code hearings in Phoenix. The final editions of the Green Code and the pool and spa code are ready to go to the printer and should be available in the spring of 2012. Most of the 2012 editions of the 2012 ICC codes are available for purchase at the International Code website. www.iccsafe.org. ■

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, FSFPE
President, S.S. Dannaway Associates, Inc., Honolulu

Factory Mutual data sheet 2-0 (the other 13?)

FM Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*, the current edition of which is dated April 2011, was first published in March 2010. This data sheet is dramatically different from the three Data Sheets it replaced, those being:

• *Data Sheet 2-2, Installation Rules for Suppression Mode Automatic Sprinklers*

• *Data Sheet 2-7, Installation Rules for Sprinkler Systems Using Control Mode Ceiling Sprinklers for Storage Applications*

• *Data Sheet 2-8N, NFPA 13, Standard for the Installation of Sprinkler Systems 1996 Edition*

Previously FM sprinkler system installation guidelines used NFPA 13 as a basis for sprinkler installation and modified or added requirements. DS 2-0, which was first issued in March 2010, only refers to NFPA 13 once as noted above. No other references are contained in the document, though NFPA 13 is referenced in companion data sheets.

So, is DS 2-0 a stand-alone sprinkler installation standard? Almost, but not quite. DS 2-0 refers to significant requirements contained in several other companion data sheets, two of the most significant ones are:

• *Data Sheet 2-8, Earthquake Protection for Water-Based Fire Protection Systems*

• *Data Sheet 3-10, Installation/Maintenance of Private Service Mains and Their Appurtenances*

DS 2-0 does not provide occupancy hazard specific design requirements, but rather refers one to the appropriate occupancy-specific data sheets for this information. For those occupancies not covered by a specific data sheet one should refer to DS 3-26 *Fire Protection Water Demand for Nonstorage Sprinklered Properties*. This document classifies occupancies into three Hazard Categories, HC-1, HC-2 and HC-3, which are roughly equivalent to NFPA 13 occupancies hazard classifications light, ordinary and extra hazard, respectively.

There are several things I find interesting in DS 2-0. The requirements are presented in a straightforward manner and the intent of requirements is provided in many cases. In that sense it is a performance based document. In *Section 3.0 Support for Recommendations* the goals of this document are clearly stated:

The recommendations in this data sheet are aimed at ensuring the following:

(1) Sprinklers will operate in a timely fashion.

(2) Sprinklers will have an unobstructed water discharge pattern.

(3) Sprinkler system components will function in a reliable manner.

The requirements (or more correctly recommendations) for sprinklers in DS 2-0 are based on one of the three basic sprinkler types recognized by FM, nonstorage sprinklers, storage sprinklers, and special sprinklers.

Now just as we were getting comfortable with the various storage sprinklers FM had provided approvals for, "Control Mode Density Area (CMDA) sprinkler," "Control Mode Specific Application (CMSA) sprinkler," and "Suppression Mode (ESFR) sprinkler," they went on in March of 2010 and eliminated all of these terms, replacing them with the single term of "Storage Sprinkler."

Special Sprinklers are those sprinklers used in "non-room" applications such as combustible concealed spaces, within ducts, cooling towers, transformers, and exposure protection.

For nonstorage occupancies sprinkler linear spacing and coverage area per sprinkler are a function of the hazard classification (HC-1, 2 or 3), ceiling height, ceiling type, k-factor, sprinkler orientation, and sprinkler response.

For storage occupancies the storage sprinkler spacing and areas for unobstructed ceilings is a function of ceiling height, ceiling type, k-factor, sprinkler orientation, and sprinkler response. There are special provisions for obstructed ceiling construction.

DS 2-0 addresses obstructions to sprinkler discharge with separate requirements for storage and nonstorage sprinklers for 1) avoiding disruption of the development of the sprinkler umbrella spray pattern and 2) avoiding obstruction to the inner core discharge area.

Requirements to avoid disruption of the spray patter are intended to insure that nothing interferes with development of the umbrella spray pattern to a distance of 36 inches below the sprinkler. Requirements to avoid obstruction to the inner core of the sprinkler discharge pattern are intended to deal with large obstructions below and near the sprinkler. There are also obstruction rules for storage sprinklers used in racks.

The approach to categorizing obstruction rules is similar to that of NFPA 13, but the figures and tables in DS 2-0 are far more user friendly, especially the diagrams showing the umbrella patterns.

A few of the notable differences between DS 2-0 and NFPA 13 are as follows

• Ceiling Construction. The definitions of obstructed and unobstructed ceilings are different. In DS 2-0 obstructed ceilings are simply those that do not meet the definition of an unobstructed ceiling.

• Clearance Below Sprinklers. DS 2-0 requires a minimum clearance below sprinklers of 36 inches for both storage and nonstorage applications. In NFPA 13 the general minimum requirement is 18 inches with several conditions requiring at least 36 inches.

• Though not contained in DS 2-0, sprinkler design densities and design areas tend to be greater than those required by NFPA 13.

• Ceiling Slope. Chapter 12 of NFPA 13 indicates that storage design criteria is limited to facilities with ceiling slopes that are 2 in 12 or less. For other than storage appli-

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FPE Corner

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cations there are no general limitations on slopes though there are several limits on application for slopes exceeding 2 in 12 for specific sprinklers. In DS 2-0 for nonstorage sprinklers there are limitations on ceiling slope with several exceptions allowing slopes to exceed 4 in 12. For storage sprinklers ceiling slopes are limited to 2 in 12 except that is one uses standard response sprinklers in conjunction with in rack sprinklers a maximum 4 in 12 slope is permitted. The document also notes that occupancy specific data sheets may permit varying slope conditions also.

The limitations in both NFPA 13 and DS 2-0 on ceiling slopes is an issue that needs more research as the slope limitations are driving building design. DS 2-0 comes right out and recommends a flat ceiling be installed to solve the problem (The architects will just love that).

Now the most interesting difference between 13 and DS 2-0 (to me anyway) is that in the most recent edition of DS 2-0 the maximum area of coverage for a sprinkler system is no longer limited by a firm floor area. The area covered by a single sprinkler system is limited only by the hydraulic requirements of the system and/or the maximum time permitted for activation of water flow alarm when a sprinkler activates (which is 60 seconds). Again, this is a performance based approach. Now, one can argue that this increases risk because a closure of a single valve will shut off protection to a very large area. I believe the approach that FM uses here is one of providing proper valve supervision combined with a philosophy of "the fewer control valves the better" the chances that protection will remain in place. It is noted that NFPA 13 has a requirement for an audible alarm be sounded with 5 minutes of start of sprinkler flow.

So is FM Data Sheet 2-0 better than NFPA 13? In my opinion, it depends. I would use an analogy comparing private secondary schools to public secondary schools. DS 2-0 would be the private school and NFPA 13 would be public school. FM can take this relatively simplified and direct approach to sprinkler installation because of the controls they have in place for "FM Approved" systems. Namely that one must use FM approved components, comply with the installation quality control requirements, acceptance testing provisions, and operations and maintenance requirements. In other words FM to a certain extent and depending on the market, FM can pick whom they protect, similar to a private school attracting the better students, while NFPA 13, like a public school, has to serve the needs of the entire range of students. ■

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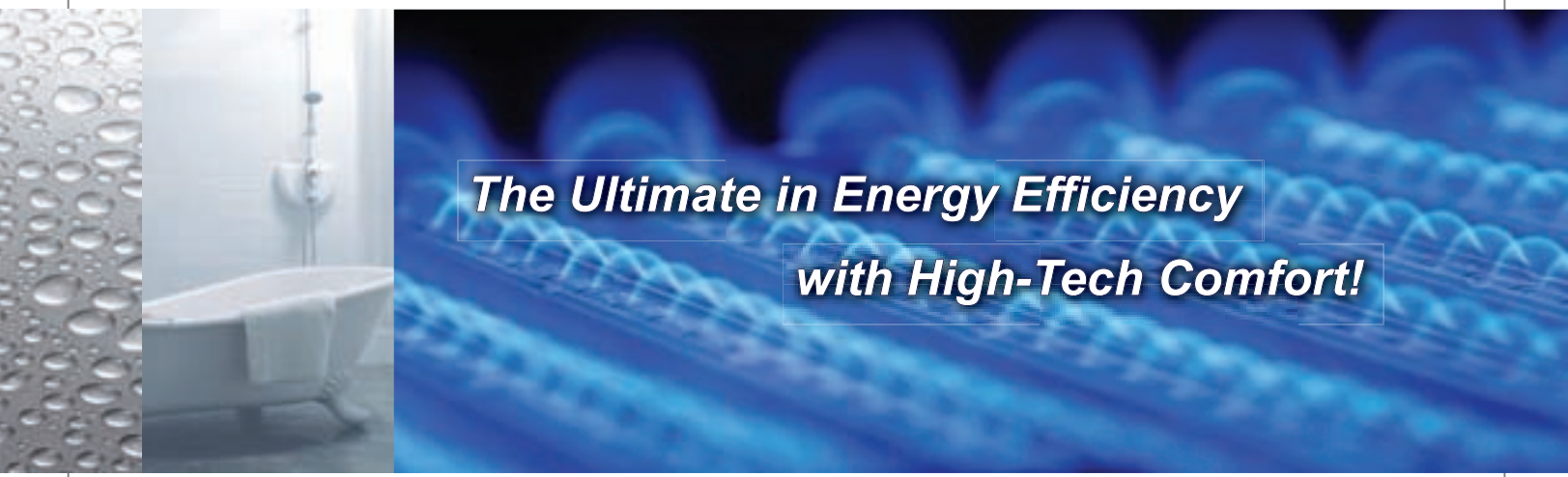

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Solar Solutions

Bristol Stickney, chief technical director, SolarLogic LLC, Santa Fe, N.M.

Freeze danger from thermosyphon reverse flow

During extreme weather conditions, strange and unexpected things can happen to a solar heating system. A good example occurred last winter during a record cold snap, when the temperature outdoors dropped suddenly into the negative double digits (F). This was followed by an epidemic of frozen and broken water pipes throughout our region, which can be expected during record-breaking cold weather. There were also a few instances of frozen and broken solar heat exchangers, which could not be so easily explained. They were mounted indoors, in the mechanical rooms, next to the other heating equipment and were properly filled with the correct mixture of antifreeze. One of these is shown in Figure 41-1, cut in half to reveal the freeze damage inside.

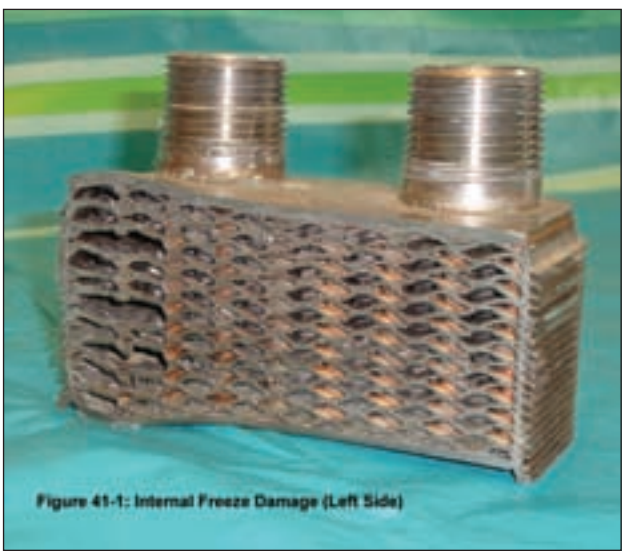

Figure 41-1: Internal Freeze Damage (Left Side)

While this only happened to a few systems in different locations, they all had some piping details in common. All of the offending heat exchangers (HTX) were located in residential solar combisystems with heat exchangers mounted at the bottom of a closed glycol loop. A typical solar heat exchanger installed like this is shown in Figure 41-2. They all used hydraulic separators (rather than a primary loop) as the "flow center" that connects all the secondary loops together. They all had roof-mounted, flat-plate solar heat collectors connected to the boiler room with a relatively short and straight pair of glycol supply pipes (1" copper, well-insulated). None of the other plumbing indoors or outdoors was damaged.

Figure 41-3 (page 28) shows the typical piping configuration used in all of the troubled installations. All of these systems worked normally for years before the unexpected freeze damage occurred. It turns out that the sub-zero liquid antifreeze itself caused the water side of the heat exchanger to freeze overnight. How does this happen and how can we prevent it? Let's take a closer look at the details.

Thermosyphon reverse flow — two pipes

The phenomenon of thermosyphon reverse flow is well known in the solar heating world. It is common knowledge that liquid in a closed loop will circulate when driven by a temperature difference. The warmer fluid, with lighter density, tends to rise, and the colder fluid tends to drain "downhill" if the piping allows. At night, if unchecked, cold fluid from outdoors "sinks" down one solar supply pipe, while warmer fluid, heated by the warmth of the boiler room, rises up the other supply pipe, causing continuous circulation through the two pipes. The cool fluid usually flows in the reverse direction from the daytime pumped flow. To prevent this, a spring check valve is virtually always included in the solar loop, labeled as spring check 2 in Figure 41-3.

If spring check 2 is missing or fails to shut properly, cold glycol can pass backwards through the pump and reach the heat exchanger. A pair of red and blue arrows shows the direction of the thermosyphon flow at night around the solar glycol loop. When this happens, freezing cold glycol can enter the heat exchanger backwards through the pump, causing the water side of the heat exchanger to freeze. In our perplexing example, the check valve was doing its job, and that side of the heat exchanger was not damaged.

Figure 41-2: Brazed Plate Solar Heat Exchanger

Thermosyphon reverse flow — single pipe

Thermosyphon flow is also possible inside a single pipe. Under moderate temperature conditions and in smaller pipes, the effect is hardly noticeable. But under extreme temperature conditions, with larger diameter pipes, especially in straight vertical pipes, the resulting flow can be substantial. The enlarged pipe diagram in Figure 42-3 shows the flow pattern inside a single pipe with two pairs of red and blue arrows. This is what happened during our record cold snap. The evidence can be seen in Figure 41-1, where all the freeze damage has occurred on the left side, at the solar glycol "hot pipe" connected to the top of the solar collector. In all of these examples, this was the pipe without a spring check valve. Single pipe reverse flow can be

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Solar Solutions

Continued from page 26

blocked by installing another spring check valve on the solar hot pipe, shown as Spring Check 3 (in green) in Figure 42-3. This will prevent cold fluid from "falling" directly into the HTX down the vertical pipe.

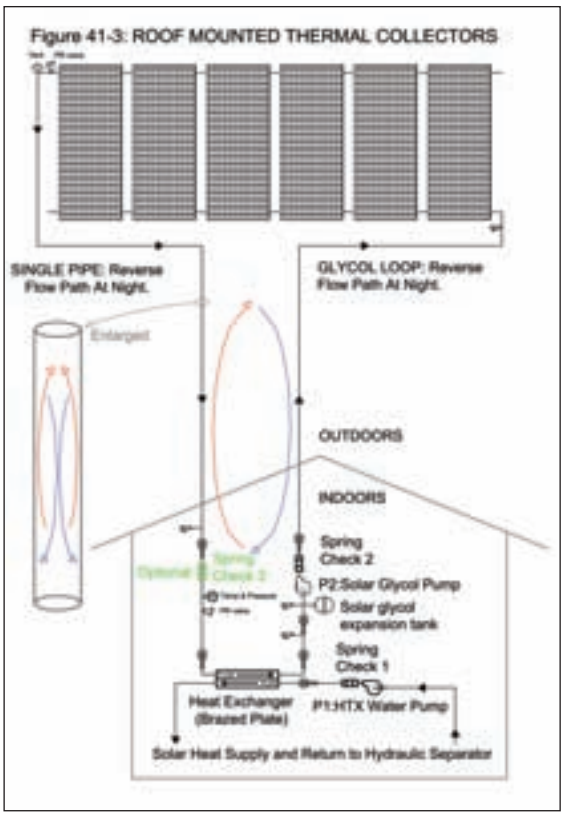
Preventive measures — summary and discussion

This experience pointed out a certain vulnerability that exists in this piping detail that does not exist when using a primary loop HTX system, such as the Combi 101 mentioned in previous columns. When the water side of the HTX is placed in the flow path of the primary loop, it is freeze-protected by the constant flow around the loop, due to the persistent operation of the heating system. It would take a major power outage or shut-off of the backup fuel for freeze danger to occur. In our example, when pump P1 shuts off at night, there is no flow in the water side of the HTX.

The installation of Spring Check 2 is mandatory, and it is probably a good idea to install Spring Check 3 any time the HTX is located at the lowest point in the glycol loop or is connected with direct vertical supply pipes. Single pipe thermosyphon flow can also be blocked by terminating the bottom of a vertical pipe with a horizontal run followed by an uphill run, creating a "U-trap" for the migrating cold fluid. (Remember to allow for air vents when adding bends that can trap air in the solar supply pipes.)

A freeze protection controller can always be added to any boiler room for a little extra peace of mind. This can be as simple as mounting a snap disk or capillary tube low limit switch on the heat exchanger pipe to run the circulator pumps to provide freeze protection by forced circulation. An electronic temperature control could also do this job.

It is interesting to note that, when the solar collectors are wall-mounted or ground-mounted at the same level or below the level of the boiler room, the problem of reverse thermosyphoning tends to just go away.



Final notes

These articles are targeted toward residential and small commercial buildings smaller than 10,000 square feet. The focus is on pressurized glycol/hydronic systems, since these systems can be applied in a wide variety of building geometries and orientations with few limitations. Brand names, organizations, suppliers and manufacturers are mentioned only to provide examples for illustration and discussion and do not constitute recommendation or endorsement. ■

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., where he is involved in development of solar heating control systems and design tools for solar heating professionals. Visit www.solarlogicllc.com for more information.*

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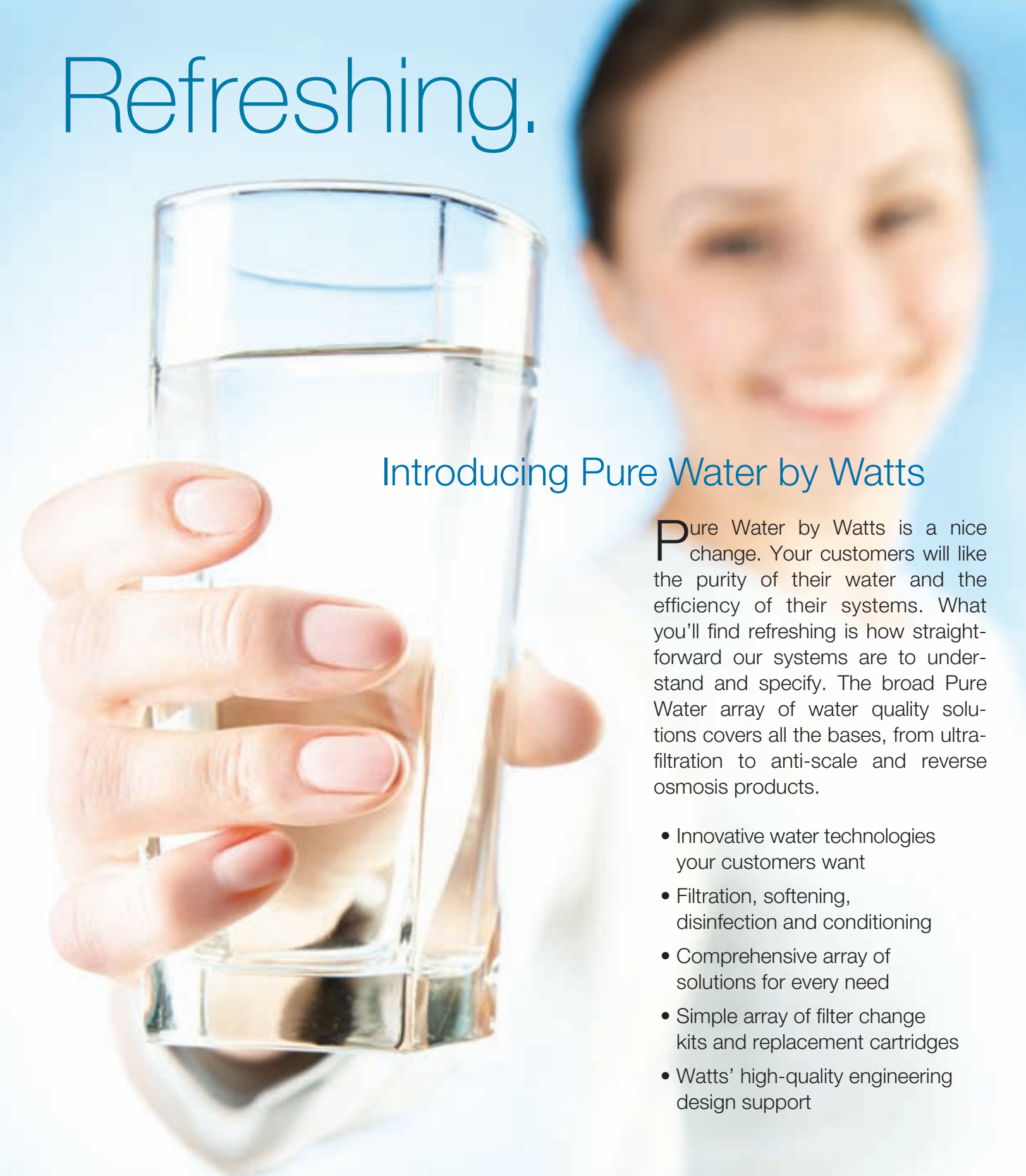

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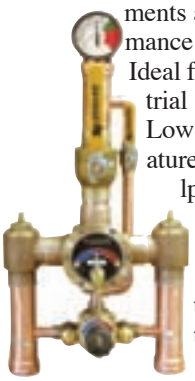
Leonard Valve adds new generation mixing valve

CRANSTON, R.I. — Leonard Valve Company has added its first New Generation Thermostatic water mixing valve to its line of ECO-MIX™ valves. The TM-2020B-LF ECO-MIX thermostatic mixing valve meets California's AB1953 and Vermont's S.0152 lead-free plumbing laws. It's also certified by ASSE as compliant with the lead-free requirements and is listed to the stringent ASSE 1017 performance standard.



Ideal for use in any commercial, institutional or industrial applications, Leonard's New Generation High Low System delivers precisely mixed water temperature from extremely low flows of 1.0 GPM (3.7 lpm) to high flow requirements. The dual valve arrangement also helps eliminate maintenance downtime required with single valve systems. The TM-2020B-LF ASSE 1017-compliant thermostatic valve features an adjustable high temperature limit stop, inlet checkstops, wall support and an outlet ball valve.

Its bronze body features locking temperature regulators that have a limit stop, set at 120°F (49°C), which can be reset by the installer, to prevent excessive handle rotation.

In addition to this product, Leonard has a line-up of ECO-MIX products that are either ASSE 1017 or 1070-listed.

Leonard's valve models give plumbing engineers "integrated control" for water tempering design and installation needs, and offer efficient response time to temperature and pressure fluctuations, ensuring optimal temperature control and performance. These valves provide accurately mixed water from extremely low flows of 0.5 GPM (1.9 lpm) to high flow requirements.

T&S Brass lead-free ready

TRAVELERS REST, S.C. — T&S Brass switched to a new array of alloys like Eco Brass, a low-lead alternative to the standard brass alloys on the market. Not only does this type of brass comply with new state and federal regulations, it's also much more affordable than stainless steel, which can be at least double in price than a low-lead solution. The company's new material selections allow our customers to comply with emerging lead-free standards without sacrificing the durability and economy of brass.

In the end, by the time the legislation came into effect in 2010, T&S was 98% successful in meeting its original goal with only a marginal price increase. T&S quickly converted the remaining products, and by mid-2010 the entire line of T&S and equip products were in compliance with the new regulations.

T&S Brass has taken a leading role in innovating and developing AB1953-compliant fixture fittings. "Reliability Built In" is more than a slogan; it's how the company approach every situation. In the end, we were brave enough to make a tough call and nimble enough to implement quickly, and our customers are now reaping the rewards.

For more info on T&S Brass and its lead-free products, visit www.tsbrass.com. Other useful content can be found at http://www.youtube.com/user/TSBrassVideos.

* The Reduction in Lead Drinking Water Act, also known as Senate Bill 3874, which carries the same standard of 0.25% maximum lead content to a national level, was signed into law by President Obama on January 4, 2011. All pipes, fixtures and fittings being sold in the U.S. for installations delivering water for human consumption must comply with the federal requirement by January 4, 2014.

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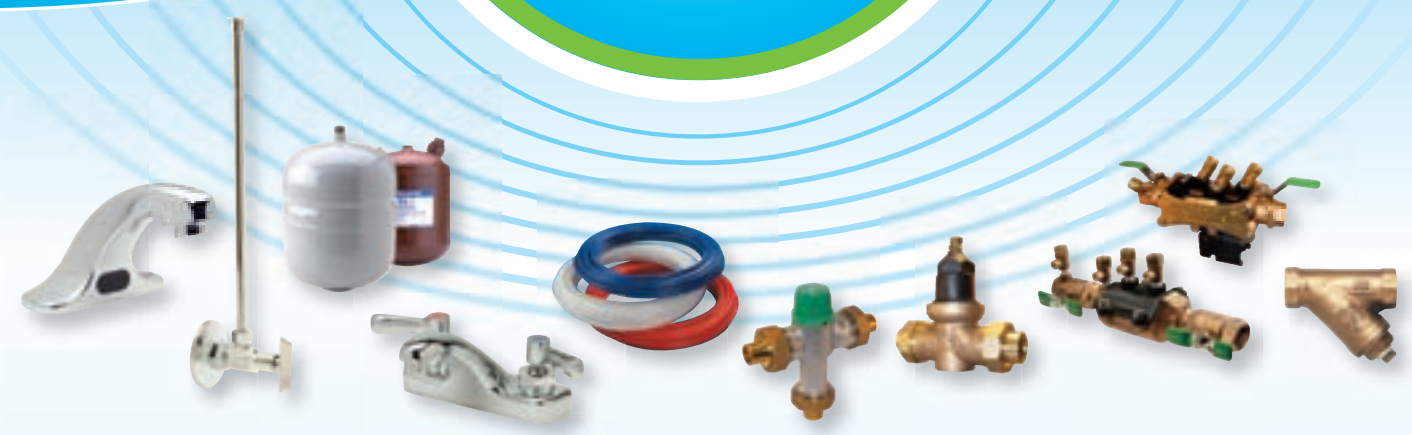

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The Hydronic Balancing Act

By Bob "Hot Rod" Rohr

Certainly we need balance in our daily lives. Finding balance between work and play can be a quest, especially for small shop, self-employed owners. Of course, a positive balance in our bank accounts is a good thing to strive for, too.

Let's talk a bit about balance in a hydronic system. Balancing is often overlooked in hydronic systems. Many residential hydronic systems are installed without a means to balance or even confirm flow rates. Balancing is important if you want to get the highest performance, best efficiency and ultimate heat transfer.

In larger commercial system design, you will always find balancing devices in the spec sheet and mechanical drawings. A specialty contractor is often employed specifically to balance and adjust the system at startup to assure optimum performance.

But what about the smaller, installer-designed hydronic systems? Without a doubt, all systems would benefit from proper and complete balancing. The good news is that there are more and more components on the market to assist even small shops in balancing. Many radiant and hydronic manifolds offer loop balance options. In addition to an adjustable valve, these manifolds are also available with flow indicators. With some brands of manifolds, you can turn the small flow indicator to adjust the attached balancing valve below it. So now you can "dial in" every loop connected to the manifold to the design flow rate. If you add a couple of snap-on temperature gauges, you now have the ability to determine the Btu output of every loop. This can be a handy troubleshooting procedure. The formula is fairly simple: Supply temperature - return temperature × flow rate × 500 (factor for water.) An example of a radiant loop with a 10-degree temperature drop would be (110 - 100 F) × 2 gpm × 500 = 10,000 Btu/hr.

Some other applications that may require balancing components are solar and GEO installations. If a large solar thermal array is installed with multiple banks of collectors, a flow balance valve should be installed to assure that every group of collectors is receiving adequate flow. Only with a balancing device will you be assured of peak performance. You will notice all of the pre-plumbed, packaged solar pump stations come equipped with flow setters. These are typically a spinning plastic flow indicator with a basic ball valve for adjustments.

The same balancing principles apply to the loop field installed with a ground source system. Without flow balancing and flow indication, how will you know what each loop is contributing to the load? Balancing the loops could be accomplished with a quick-setter installed on every loop at the manifold. With a pump and dump type of geo installation, a balance valve would be installed to set the appropriate flow rate through the heat exchanger.

Balancing devices are offered in a large array of types and sizes. There are a few types of ball or disc valve balancers that have a quick-set feature. With these components, you pull a ring to view the flow and use a small wrench to adjust the flow. The quicksetter type of valves do not require an additional differential meter to check and adjust. The well known Bell & Gossett Thermoflow and Caleffi QuickSetter are a couple of examples of this type of setter/ indicator.

A more refined type of flow adjusting valve uses a tapered cone or plug to provide finer and more accurate adjustment across the range. These are referred to as equal percentage valves. A step up in accuracy would be a valve with an equal proportion valve mechanism. This type would have a cone-shaped valve mechanism to provide better adjustability.

A PIBV (pressure independent balance valve) is a type of automatic balance valve that will maintain a set flow even as the system pressure changes. This type of valve is commonly installed at air handlers in multi-unit building applications. So, as the various air handlers come online and go offline, the PIBV will assure the exact flow is being supplied. In some cases, a manual balance valve could be installed on a riser feeding one floor of a multiple story building. In conjunction with the riser balancer, the PIBV would be installed at the heat emitter.

If a large solar thermal array is installed with multiple banks of collectors, a flow balance valve should be installed to assure every group of collectors is receiving adequate flow.

Most balance valves will have a means to test and adjust the flow rate. Often a couple of PT (pressure/ temperature) ports are provided. A differential pressure gauge will be connected to the two ports to read the flow rate.

Use a delta P circulator in the system with a balance valve, and you will get the best performance and efficiency. The flow valve "nails" the desired flow rate and the pump modulates it's output to match the system load. The delta P circulator will consume less energy as it reduces its output as zones close down.

That's a lot of technical talk. Let's balance that with the benefits of balancing; more efficient, more comfortable and less problematic hydronic systems. ■

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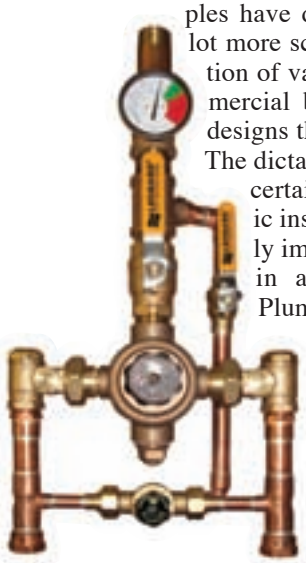
The Science of Mixing Valves

By Peter Gobis III

In 1961, Alan Shepard became the first American in space, JFK was inaugurated as president and Barbie got a new boyfriend named Ken. (Don't worry, I only know this cute fact courtesy of Google.) In the land of mixing valves, things were pretty simple 50 years ago; if there was a two- inch domestic hot water line in the building, a two-inch valve was installed. Design principles have drastically changed since then, and a lot more science is incorporated into the utilization of various types of mixing valves in commercial buildings and into the mixing valve designs themselves.



The dictation by state and national codes to use certain types of mixing valves with specific installations is a trend that is significantly impacting the market. For those residing in a state that uses the International Plumbing Code (IPC), code compliance is paramount. A clear example of this is the mandate to use ASSE 1069 listed valves for gang shower applications. The American Society of Sanitation Engineers (ASSE) refers to 1069 valves as "automatic temperature control mixing valves that are intended to control the water temperature to individual or multiple fixtures to reduce the risk of scalding and thermal shock."

These devices are intended to be installed in applications where the bather has no access to the temperature adjust means. With this in mind, the IPC has mandated their use in Section 424.4, which states, *"Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an approved automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE 1069 or CSA B125 and is installed at the point of use."* Very few manufacturers offer products that are listed to ASSE 1069; actually, only eight, so building designers have limited products to draw from for compliance to this requirement.

In addition to this requirement for gang showers, several other sections of the IPC dictate the use of certain types of mixing valves for specific applications. One such application is noted in Section 416.5, which states, *"Tempered water shall be delivered from public handwashing facilities. Tempered water shall be delivered through an approved water-temperature limited device that conforms to ASSE 1070 or CSA B125.3."* Designers and inspectors should research and reference the IPC for the specific requirements to ensure code compliance in their respective municipalities.

Beyond this example of how codes are driving design, technology advancements are certainly impacting market trends. All buildings have forms of mechanical and electrical services necessary for maintaining a comfortable working environment. Basic controls of these services used to take the form of manual switching, time clocks or temperature switches that provided the on and off signals for enabling pumps, fans and other devices.

Now, building managers are looking for more sophis-

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Mixing valves

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ticated applications to help in analyzing and managing these systems, and the arena has changed, with building management system (BMS) software.

The purpose of BMS software is to monitor and automate these systems' operations in an efficient manner. The software also allows for support tools that enable facility managers to monitor, analyze and help in the decision making process for predictive maintenance and long-term building planning. In regards to mixing valves, this has lead to the development of interfaces that can collect water temperature and communicate this information in a language that the BMS can receive. This is accomplished by using protocols such as MODBUS® and BACnet®. Presently, there are only a couple of manufacturers that offer a product to interface with a building management system, but further integration will surely be developed as market demands create the need.

Trends towards energy management may also play a role in this market. With commercial buildings gobbling up nearly 20% of all energy used in the United States, some designers are looking to identify means to reduce energy cost. One such method being explored is to turn off the tempered water recirculation pump during long periods of no demand. With water heating accounting for around 7% of commercial energy cost, this philosophy may have its applications. One such building design that has seen some usage of this method is the elementary school, which experiences long periods of no demand.

Although this method may seem desirable for cost savings, facility managers and designers need to remain aware of Legionella concerns. Legionnaire's Disease is a form of pneumonia bacteria that is present in many water systems. To help combat this deadly disease, it is important to keep water moving and also to store hot water at 140 F, because, after 32 minutes of exposure to this temperature, the bacteria will die off.

As these trends evolve, plumbing designers are being pushed and pulled to find a balance in their designs. You are being challenged to meet codes, to specify robust yet sustainable products and to meet aggressive budgets for building completion. Before your head starts to spin, don't forget about that lead-free law that will be going national in 2014.

This is a very delicate and taxing situation that needs to result in the correct mix of products and design approach. Fortunately, a number of manufacturers employ best engineering practices and can offer solutions for these market demands for water temperature control devices. ■

Peter Gobis III *is the national sales manager for the Leonard Valve Company.*

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Healthcare Facility **Plumbing Design**
Part 2

By Ron George, CPD
President, Plumb-Tech Design & Consulting Services LLC

Plumbing commissioning

Plumbing systems should be integrated into the commissioning plan. The plumbing commissioning plan should include commissioning procedures for the following systems and equipment:

1. Pressure test procedures for all pipe systems
2. Shower or bathroom basin leakage tests
3. Plumbing fixture carrier installation
4. Plumbing fixture flow rate adjustment
5. System chlorination and flush.
6. Booster pump package start-up procedures and pressure settings. Verify the installation is installed in accordance with the manufacturer's instructions.
7. Domestic hot water systems temperature requirements verify HW temperature in water heater is at a temperature above 135 F and HWR balancing valves are set for a 10 degree temperature difference.
8. Domestic hot water heater temperature settings. Verify the installation is installed in accordance with the manufacturer's instructions and the outlet temperature is in accordance with the system design.
9. Domestic hot water circulating pumps and balance valve settings to maintain HW temperature at design conditions.
10. Verify that the maximum temperature limit-stop on the shower valves is set to the temperature specified to prevent scalding.
11. Thermostatic mixing valve temperature settings under flow. Verify the installation is installed in accordance with the manufacturer's instructions and verify that the outlet temperature is in accordance with the system design.
12. Vacuum system, test of alternation of pumps and test of all alarms, set vacuum switch settings. Verify the installation is in accordance with the manufacturer's instructions.
13. Medical air system, test of alternation of compressors and test of all alarms, set pressure switch settings. Verify the installation is in accordance with the manufacturer's instructions.
14. Laboratory air system, test of alternation of compressors if duplex units and test of all alarms, set pressure switch settings. Verify the installation is in accordance with the manufacturer's instructions.
15. Compressed gas manifold systems, test the changeover valve for each system and test all alarms on the gas system. Verify the installation is in accordance with the manufacturer's instructions.
16. Oral evacuation system, test of alternation of pumps if duplex units and test of all alarms, set vacuum switch settings. Verify the installation is in accordance with the manufacturer's instructions.
17. Dental compressed air system, test of alternation of compressors if duplex units and test of all alarms, set

pressure switch settings. Verify the installation is in accordance with the manufacturer's instructions.

18. Natural gas and fuel system, verify gas pressures at static and under load conditions to assure proper gas pressure for proper flame at the burner.

19. Pure water systems, verify system flushing and test the water quality to determine if the water quality is within specifications. Verify the installation is in accordance with the manufacturer's instructions.

20. Perchloric acid hood automatic wash down system, Verify the hood exhaust fan is performing per the specifications, verify water and drain connections allow proper washdown per the manufacturers instructions.

21. Kitchen hood automatic wash down system, Verify the hood exhaust fan is performing per the specifications, verify water and drain connections allow proper washdown per the manufacturers instructions. Verify drain is routed to the grease waste system.

Water distribution systems

Size the piping for the hot and cold water systems not to exceed the maximum velocity allowed by the Copper development association for copper piping. For cold water piping the maximum velocity should be 8 feet per second and for hot water piping systems the maximum velocity should be five feet per second.

Minimum pressure

Maintain a minimum pressure of 35 psi at the highest plumbing fixtures. In minimum pressure calculations, use residual pressure at design flow. Monitor for diurnal pressure fluctuations experienced by the building water supply and modify starting pressures accordingly. Provide a pressure gauge on the top floor branch adjacent to the riser.

Water hammer arrestors

Provide necessary water hammer arrestors that are certified to meet the requirements of the American Society of Sanitary Engineers Standard 1010, Water Hammer Arrestors. The sizing and location of the water hammer arrestors should be per the Plumbing and Drainage Institute (PDI) Standard PDI-WH 201, Water Hammer Arrestors, latest edition, requirements. Show quantity and type of water hammer arrestors on plans and riser diagrams. Water hammer arrestors should be located near any quick closing valve and installed with inlet isolation valves to allow for removal and servicing.

Trap primers

All floor drains and floor sinks should have a single or manifold electronic trap primer supply. The trap primer

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control box should be recessed. Traps located 50 ft from the control box should be piped to that control box unless shown otherwise on the construction documents.

Wall hydrants

Provide wall hydrants a maximum of 200 ft apart at loading docks and at building entrances, with a minimum of one wall hydrant on each exterior wall.

Backflow preventers

All lab sinks with hose connections should have vacuum breakers. All hose valve connections should have hose type vacuum breakers. All laboratory and process water systems should have a reduced pressure backflow prevention device installed on the branch serving those systems. There should be a reduced pressure backflow prevention device on the water supply to all pure water systems, reverse osmosis, hemodialysis, and reagent water distribution systems.

Minimize the use of pressure-reducing valves – pressure zones

Minimize the use of pressure-reducing valves by providing separate pressure zone with separate pumps for each pressure zone and separate domestic hot water heating systems for each pressure zone.

Hot water branch lines

Provide a means to "heat and flush" the domestic hot water branch lines by providing a 1/2-inch drain and shut off valve extended to a floor sink.

Domestic water booster pumping system

Designers should consider at least a three-pump booster system for a hospital and they should use a four-pump booster system to allow for smaller pump sizes and greater energy savings.

Three-pump systems can be sized with one pump at approximately one-third or 34 percent of the total water demand the other two pumps at two-thirds or 66 percent of the demand. With this sizing, any one of the pumps can be out of service and the system can still meet 100 percent of the demand. Another option for a three-pump system is for each pump to be equally sized at 50 percent of the load. Again any one pump can be out of service and the system can still meet the demand.

Four-pump systems can be sized with two pumps at approximately one-quarter or 25 percent of the total water demand the other two pumps at one-half or 50 percent of the demand. With this sizing, any one of the pumps can be out of service and the system can still meet 100 percent of the demand. Another option for a four-pump system is for each pump to be equally sized at 34 percent of the load. Again any one pump can be out of service and the system can still meet the demand. The four-pump system allows a smaller pump to run for the majority of time when there is little demand. This equates to less horsepower consumption and energy savings.

For pump sequencing of the multiple pump systems, each of the smaller pumps should alternate and operate until water demand exceeds the smaller or lead pump's capacity, at which point that pump should stop and one of the other larger pumps should start.

When the demand exceeds the capacity of the larger pump, the smaller pump should restart and both pumps should operate together. When the demand exceeds both the large and small pumps' capacities, both of the larger pumps should come on. The other large pump should be a standby and alternate with the first large pump. The system should be capable of operating at full capacity with one pump out of operation.

The plumbing designer should provide a hydro-pneumatic tank connected to the cold water system downstream of the booster pump to allow the booster pump to shut down during periods of low or no flow for energy savings. The designer should coordinate with the electrical engineer to make sure the booster pump is connected to the emergency power supply system. The discharge pressure can be controlled by a pressure reducing valve or it can be controlled using variable frequency drives through the packaged booster pump controller. The booster pump package should be specified with spring-loaded swing check valves to reduce water hammer when the pumps shut down.

Domestic hot water systems

Patients in healthcare buildings often have suppressed or weakened immune systems. A healthy adult exposed to a moderate amount of Legionella bacteria might experience a few slight flu symptoms while the body's immune system fights off the invading Legionella bacteria. The problem comes when the immune system is weakened and cannot put up a good fight against Legionella bacteria. Legionella bacteria is transmitted to people when they breathe in water vapor or ingest water with Legionella and choke or inhale water with a the bacteria. Shower heads, indoor fountains, cooling towers and any source of water mist provides a path for the bacteria to ride a microscopic water droplet into someone's lungs. Once the Legionella bacteria makes it to the warm moist lungs, the lungs provide a perfect breeding ground at an ideal temperature for incubating the bacteria. This is why designing plumbing systems and specifically domestic hot water systems to minimize Legionella bacteria growth is so important.

Hot water system temperature controls

No building, especially a hospital, should rely of the thermostat on a water heater for controlling the hot water temperature delivered from the fixtures in a building. The model plumbing codes specifically prohibit the water heater thermostat from being the final temperature control for hot water delivered from the fixtures. This is because the thermostat on most water heaters is located near the bottom or inlet connection of the water heater and the water heater thermostat is designed to anticipate cold water coming into the heater in order to turn "on" or "off" the heating element. The water heater thermostat is generally not designed to accurately control the outlet temperature of the water heater. It is common for most water

heaters to experience temperature swings of variations. Some temperature swings can be as much as 30 degrees Fahrenheit at the outlet of a water heater. A master thermostatic mixing valve conforming to ASSE 1017 should be used near the outlet of a water heater to mix hot water with cold water and deliver a relatively constant temperature of hot water to the hot water distribution system. Other hot water system temperature controls can be used to control the hot water distribution temperatures to the maximum recommended temperature for the application or at the fixture by using local mixing valves or temperature limiting valves conforming to ASSE 1070, and/or Point-of-use mixing valves conforming to ASSE 1016. These devices should be used to reduce the hot water distribution temperatures to the maximum recommended temperature for the application. The maximum delivery temperature for showering, bathing and hand washing fixtures should be 120 degrees Fahrenheit or the temperature required by the local codes. Sitz baths, bidets, hydrotherapy baths and whirlpool baths typically require maximum temperatures less than 110 degrees Fahrenheit. Check the local health department and the local code for the maximum temperature for these fixtures.

Water heaters

Generally, water heaters in a hospital are storage type or semi instantaneous type water heaters with storage temperatures kept above 135 to 145 degrees Fahrenheit to minimize Legionella bacteria growth. When storage temperatures are high enough to kill Legionella bacteria, a mixing valve should be used to reduce the hot water to a safe temperature.

Water heaters can be storage type, instantaneous type or a combination of a small storage tank with an instantaneous heater, generally referred to a semi-instantaneous type. Fuel sources for water heaters can be steam, heating hot water, electric, fuel gas, fuel oil or a combination of fuels in duel fuel burners.

Instantaneous type heaters are sometimes used but generally do not perform as well as semi-instantaneous or storage type heaters when there are large variations in flows. Instantaneous water heaters generally are not designed to raise the system temperature high enough for disinfection temperatures. Instantaneous heaters generally only raise the hot water temperature to the usage temperature and not disinfection temperatures. Many instantaneous heater designs are also prone to temperature swings due to the location of the temperature sensor in relationship to the steam or heating hot water control valve and the inherent delay associated with the thermostatic element and the valve actuation process reaction times. Many instantaneous heaters also have significant pressure drops and can experience high velocity erosion and temperature drops during peak flow rates.

Water heaters are generally centrally located in one or more equipment rooms at or below grade. In high rise buildings the water heater should be in the same pressure zone as the cold water piping so as not to cause recirculation pressure problems or pressure relief valve problems. Pressure reducing valves and re-pressurization pumps should be avoided in domestic hot water systems. Pressure reducing valves and re-pressurization pumps generally are a sign of a poor system design and they increase the energy costs and maintenance costs of the building because they do not to last very long in hot water environments. This usually leads to pressure and circulation problems that in some cases have led to scald incidents.

The designer should determine whether the domestic hot water heat source will be steam, fuel oil, electric or natural gas. The designer should also determine if there will be any solar or heat recovery, heat exchangers used for pre-heating domestic hot water. This information will aid in selecting the appropriate water heating equipment.

Hospitals generally have a requirement for steam for building heating, humidification, kitchen equipment or for sterilizers. When steam is available, consider providing duplex, double wall steam to hot water shell and tube water heaters with a moderate storage capacity to serve as a buffer tank for temperature fluctuations. The heaters should have the capacity to generate the peak flow demand at 160 degrees Fahrenheit for sanitation temperatures with each water heater sized to supply 100% of the demand. The heater storage temperature should be set at about 135 to 145 degrees Fahrenheit. A high temperature alarm should be installed on the hot water main leaving the Master Thermostatic mixing valve and the alarm should be wired to the building management system.

Shower valves

Shower valves should meet the requirements of: ASSE 1016 Performance Requirements for Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations. These valves have a maximum temperature limit stops that must be field adjusted when the hot water system is operational to limit the supply of hot water to a maximum of 105 degrees Fahrenheit at the shower head. The shower valves should be of the combination temperature and pressure (TP) compensating type shower valves. The domestic hot water system should have a re-circulating system to maintain hot water at remote areas of the building. Flow balancing valves, check valves and isolation valves should be at the end of every hot water main with the balancing valve adjusted to provide a temperature drop in accordance with the sizing guidelines in the domestic hot water systems chapter of the American Society of Plumbing Engineers, "Plumbing Engineering Design Handbook" or as described in the "Service Water Heating Systems" chapter of the "2011 ASHRAE Applications Handbook." ■

Ron George *is president of Plumb-Tech Design and Consulting Services LLC. He has served as chairman of the International Residential Plumbing & Mechanical Code Committee. Visit www.Plumb-TechLLC.com, email Ron@Plumb-TechLLC.com or phone 734/755-1908.*

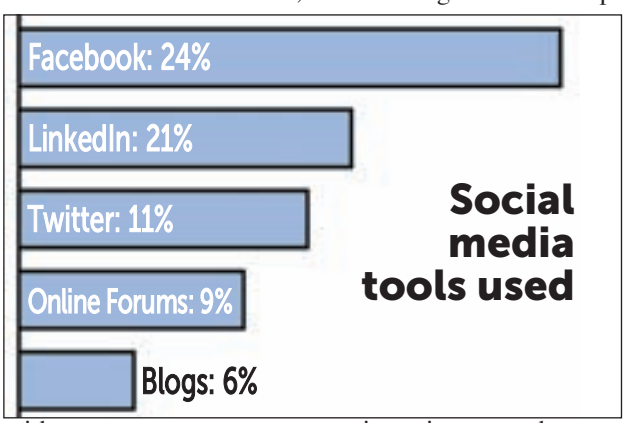
This report in its entirety can be found online at www.plumbingengineer.com.

2011 Internet Usage Survey

Welcome to *Plumbing Engineer's* 2011 Internet Usage Survey. *Plumbing Engineer* would like to thank those who took the time to participate in this year's survey. The response was overwhelming! The survey gives us a unique view of the Internet habits of today's engineer, and overall online trends. The questions range from work hours spent on the Internet to social networking to RFIs.

Nearly 35 percent of the respondents work at a company which has 50 or more employees; nearly 34 percent work at a firm that employs 1-5 people.

There is no debating that social media has changed how Internet users conduct business and spend time online. An large contingent of those rebonding claim that social media helps them network with their peers. *Plumbing Engineer* asked about social media use: **Are you currently using social media?** Thirty-five percent of those asked currently employ social media. Of the thirty-five percent, 24 percent use Facebook, 21 percent use LinkedIn, 9 percent use online forums and 11 percent use Twitter. The reasons for getting into social media? Increase brand awareness, build stronger relationships



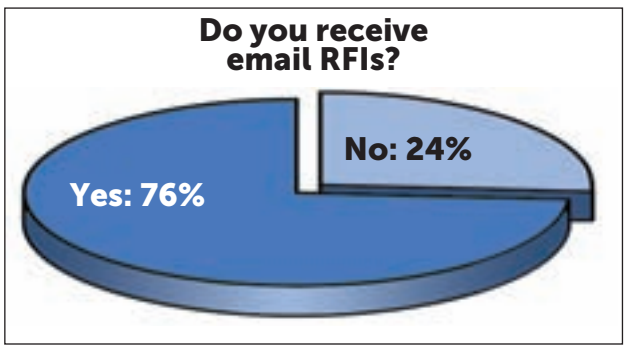
with customers, announce services, improve the customer service experience, network and maintain industry connections, Web meetings, education and all other forms of basic information.

1. How much time do you spend on the Internet as it relates to work? Eighty-five percent said everyday, of which 35 percent spend an average of 30-60 minutes. Twenty percent spend 1-2 hours online and 16 percent claimed 2+ hours.

2. Where do you go for product/technical information? Manufacturer websites garnered a 90 percent response rate. Trade publications and trade publication websites received 62 percent and catalogs garnered 55 percent of the tally.

3. Interested in the engineer's purchasing habits over the Web, we asked: **do you make online purchases and do you feel secure making those purchases over the Internet?** Forty-six percent of the engineers surveyed do make purchases via the Web. Of those 46 percent, 71 percent claim that they feel secure making online purchases.

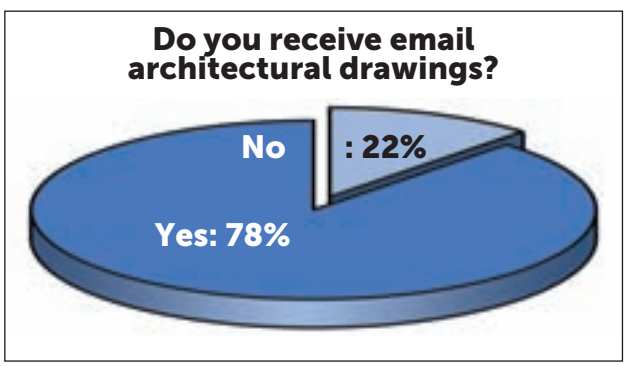
4. Do you use the Internet for project management purposes? A surprising 67 percent do not use the Web



for any project management duties.

5. Do you use the Internet for Building Information Modeling purposes? Again, a surprising answer in that 63 percent of those polled claim that they do not use the Internet for BIM purposes.

6. Do you use the Web for education and training?



The plumbing engineers in the survey responded that 84 percent of them use the Web for education and training.

7. 8. Do you receive Requests for Information (RFIs)? Seventy-six percent said they receive RFIs.

9. Do you receive email architectural drawings? Increasing efficiency in their jobs, seventy-eight percent of the engineers tallied receive drawings.

10. Do you use the Internet from a mobile device? More than half (55%) claimed they went mobile. ■

Product Application

Water Conservation: Small Changes, Large Impact

According to the Nature Conservancy[1], more than two-thirds of the world's population could face water shortages by 2025. Some of the biggest water usage offenders are restaurants that use an average of 5,800 gallons per day of water[2]. With statistics this large, it is important for restaurant operators to tap into solutions that can decrease their daily water usage in any way possible. Often, small changes can make the largest impact. Replacing leaky faucets with water-conserving options, for example, can help decrease water consumption and maintenance costs.

Many restaurant workers don't think about the harmful effects just one leaky faucet can have on the environment. However, a faucet leaking a mere one drop per second can waste up to 2,700 gallons of water each year[3].

Recognizing that water is our most precious resource, Component Hardware Group constantly strives to reduce the water consumption of products, without sacrificing performance, with its Encore® plumbing fixtures. Partnering with the EPA's WaterSense® program and the U.S. Green Building Council (USGBC) helps Component Hardware ensure that their products meet the latest water efficiency and health safety standards. Americans now use more than 100 percent more water than we did in 19503. While consumers are made aware of shortages through water restrictions, much can be done within the restaurant industry to protect this resource.

Component Hardware's Encore faucets offer reliable performance.

Component Hardware's Encore brand offers aerators, low-flow spray valves, electronic faucets and metering faucets, all aimed at reducing water consumption. Their electronic sensor faucets have long offered reliable performance and reduced water consumption. Many of their water-efficient faucets, fittings and pre-rinse units have been on the market for more than a decade.

Using aerators is one of the easiest and most cost-effective ways to reduce water consumption. With the Encore ONE-TAP™ Metering Aerator, water flow starts with a single touch. The adjustable metering activator automatically stops the flow in two to 20 seconds. This action reduces the risk of cross-contamination and provides up to 87% water savings over conventional faucets. By installing low flow aerators on all hand sink and lavatory faucets and spouts, restaurateurs can dramatically reduce daily water use. A water-conserving, pre-rinse spray valve can provide superior cleaning performance, while saving as much as 100,000 gallons of water per year.

While they may seem a bit more antiquated, (You may have seen these at rest stop areas) metering faucets allow you to control both the water's flow and duration, which will significantly reduce water consumption.

Electronic faucets offer a more advanced approach, using reliable motion sensor technology and saving up to 70 percent of water consumption, as compared to standard lavatory and hand sink faucets. Encore's cost effective and water-saving electronic faucets can also help reduce waste, enabling the industrial sector to become more environmentally friendly.

Ideal for hand sink applications in the kitchen, the Encore Hands-Free Electronic Faucet Adapter is an economical hands-free and drip-free alternative to other expensive electronic faucets. It features a reliable infrared sensor that instantly stops water flow when not in use, thereby helping to reduce water consumption by up to 70 percent. Providing an additional measure of performance and security, a three-minute automatic time-out feature minimizes the chance of overflow, while a manual on/off over-ride button provides instant flow to fill any container.

Existing fixtures can also be upgraded with this adapter. Converting any existing faucet into an automatic hands-free faucet takes less than five minutes; it fits on most standard faucets with aerators, using a simple screw-on installation.

In addition to fixing leaky faucets, preventing sink overflow can help decrease wasteful water consumption. The Encore SideKick™ Electronic Faucet features energy-saving wave on-wave off technology with an automatic time-out feature to prevent accidental sink overflow.

With the industrial sector representing the third largest user of water, the restaurant industry has a responsibility to streamline water consumption. Replacing leaky faucets with water-saving solutions can make a significant difference. Given that 50 percent of the water used in restaurants is used in kitchen areas3, simple upgrades like these can yield a significant decrease in energy bills, maintenance costs and, most of all, unnecessary water consumption.

Operators, owners and managers can help staff understand the importance of conservation though training or through simple dialogue with employees. To help keep conservation top-of-mind, some may consider posting helpful reminders to encourage workers to properly shut off faucets and informing managers of leaking situations or recommended processes that help conserve water. ■

1 "Water in a Changing World" (UN World Water Development Report, 2007)

2 "Water Conservation at Work" (Southwest Florida Water Management District, 2011)

3 "Water, Use Less—Save More: 100 Water-Saving Tips for the Home" (Clift, Jon and Amanda Cuthbert, 2007)

Moen Canada helps Humber College create more reliable washrooms on campus

With more than 17,000 full-time students enrolled at Humber College, one of the largest in Canada, out-of-service washrooms can cause a problem. Its facilities are in constant use, especially in high-traffic areas like cafeterias and main hallways. And when existing fixtures continued to malfunction and his team had difficulty finding replacement parts, plumber Martin Kondrat knew he needed to install products that were reliable and easy-to-service.

There was also a need to convert the campus washrooms to hands-free facilities, especially with the recent spread of the H1N1 virus. "With the issues surrounding H1N1, moving to an automated system made sense," said David Griffin, manager of maintenance and operation, Humber College. "Such a high volume of people use the facilities each day; therefore, we knew we needed products that offered a hygienic solution, as well as provided water savings." In order to keep its washrooms maintenance- and disease-free, Humber College turned to Moen Canada and its line of commercial products to provide the perfect solution for its facilities.

David Griffin (l), manager of maintenance and operations, Humber College, discusses water savings with Martin Kondrat, plumber at Humber College.

The solution

Once the decision was made to install new products, Kondrat said identifying Moen Canada as the right manufacturer was an easy one. "Because of my knowledge of Moen and the reliability of its products, it was my first and only choice," he said. So as things at Humber needed to be converted, I installed Moen; I wanted to choose something that could withstand the wear and tear."

The maintenance team at Humber College decided to install the new M•Power line of commercial faucets and flush valves from Moen Canada. Not only are they easy-to-use, but the M•Power line is a safe and reliable replacement option for manual products as they feature unique motion sensors that provide hands-free activation. "Disease control is an issue in any commercial facility, especially one that sees roughly 20,000 individuals in it on a daily basis," Griffin said. Without handles to touch before and after use, preventing the spread of germs and bacteria from user to user with M•Power faucets and flush valves is simple, helping Humber College to keep its community healthier.

Increased hygiene was only one reason for the change. Like all Moen Canada commercial products, M•Power faucets and flush valves are backed by a five-year warranty against material or manufacturing defects. Additionally, if a need for replacement parts should arise, the products are distributed nationwide for easy accessibility, another part of Kondrat and Griffin's rationale for switching to Moen.

"Moen products are readily available, and there are no issues with parts," Griffin said. "The great warranty and distributors across the country definitely helped solidify our decision."

According to Griffin, water saving was also a factor in selecting the products for Humber College's facilities. The M•Power faucets feature a 1.9 liters per minute (L/min) flow rate, which allows Humber College to decrease the number of daily liters used. This means reduced sewage bills, lesser hot water consumption and energy savings. The M•Power high-efficiency flush valves also feature a reduced flow rate of 4.85 L/min, increasing water savings by 20 percent, helping Humber College to meet its goal of reduced water consumption in its washrooms.

"We also installed Moen showering products in our athletic facility," Kondrat said. "The showers there are running a minimum of 12-14 hours a day — so they're under constant use, as well. We've seen additional water-savings there, too, since switching to a Moen showerhead with an eco-performance setting."

The result

Nearly 150 new Moen faucets and flush valves have been installed on the Humber College campus since mid-2009. According to Kondrat, the fixtures have been the

answer to his problems. "Before installing Moen, we had one particular washroom on campus where we were called to fix something at least once a week," he said. "We replaced the flush valve three times and we were still getting calls. So, we took it out, put Moen in, and we have not had one call since.

"I knew from working with Moen products in the past that we would be satisfied," Kondrat said. "More importantly, I knew that once the products were installed, they were going to work. It's been great for our department, as there are no more constant calls to the manufacturers or relentless searching for replacement parts."

> "I knew that once the products were installed, they were going to work."

And best of all, there have no longer been any out-of-service washrooms negatively affecting the Humber College community. "We know Moen is going to work day-in-and-day-out. The other products we've tried just haven't matched up with the usage we have here, but Moen has been very successful to meet the demands of our facilities, and they've been just excellent products."

There were three main reasons why Kondrat recommended Humber College make the switch to Moen, saying:

1) The faucets and flush valves provide water savings and reliability — there are no worries with Moen as to whether or not they will work and we know we're saving water at the same time

2) The products are simple to install and service — I no longer spend the majority of my time figuring out how to solve the problem

3) The faucets are virtually maintenance-free

"Moen met all of our criteria and has surpassed all of our expectations," Kondrat explained. "The sun is always shining with Moen – the difference is like night and day."

For more information on the Commercial line of faucets from Moen Canada, visit www.moen.ca or call 1-800-465-6130. ■

Moen Canada offers a diverse selection of thoughtfully designed, on-trend kitchen faucets, bathroom faucets and showerheads for residential and commercial applications. As the #1 faucet brand in Canada, customers have come to rely on Moen to deliver dependable products and service. Moen is part of Fortune Brands, Inc. (NYSE: FO, www.fortunebrands.com), a leading consumer brands company.

Circle 25 on Reader Reply Form on page 49

Product News

Tub/shower replacement

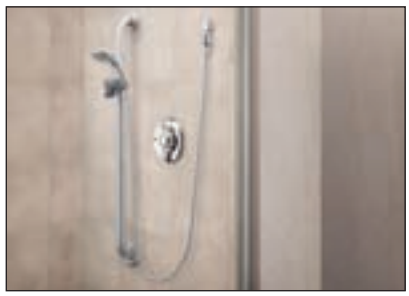
A simple and low cost tub/shower replacement solution is now available for hotels and multi-family applications. The Ciencia™ solid surface shower wall and base system from American Standard can be easily installed with a simple glue-up installation over existing tile, concrete, or sheetrock. Surface color runs through the thickness of the material, so stains and scratches can simply be sanded away. Shower walls are available in a wide array of sizes, colors and tile patterns to easily coordinate with any bathroom style. Matching bases with low and zero thresholds can be installed directly over subfloors. **American Standard.**

Circle 101 on Reader Reply Form on page 49

'Wags' valve prevents leakage

Late night, leaking water heater emergency calls can be avoided with the addition of this new device. The "Wags" (Water and Gas Shut-off) valve is a simple, inexpensive and reliable to way to guard against disastrous water problems that can arise when water heaters develop a leak. The Wags valve, ideal for new or existing water heaters, is totally mechanical and can be installed with or without an electric harness. **Taco.**

Circle 102 on Reader Reply Form on page 49



Slide Bar Grab Bar System

Adds increased safety in the shower. It includes a chrome hand shower in one of three flow rates — 1.5 or 1.75 gpm Eco-Performance models, certified to meet WaterSense® criteria and a 2.5 gpm model — and an ADA-compliant stainless steel grab bar. It can be mounted using SecureMount™ Anchors, which can hold up to 500 pounds and allow for secure installation at any angle, without a stud. **Moen Commercial.**

Circle 103 on Reader Reply Form on page 49

Versatile contemporary showerheads

The Anystream® Caspian is just one of the many new showerheads introduced by Speakman during the February launch of the renewed shower product line. The Anystream® Caspian product family features contemporary design aesthetic, coupled with powerful Speakman spray technology. The family includes a fixed, hand-held shower, and three unique combination showers available in both polished chrome and brushed nickel. The fixed and hand-held showerheads are also available as WaterSense® certified 2.0 GPM fixtures. **Speakman Company.**

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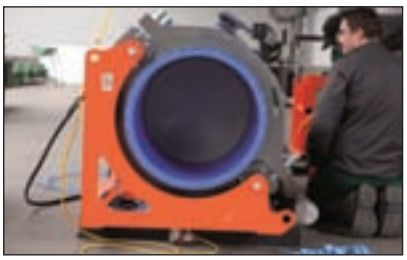

Greenpipe® & Climatherm® extended

Company has extended its Greenpipe® line up to 18-in.-dia., and the Climatherm® line up to 24-in.-dia. These new pipe sizes are ideal for water mains, high rise buildings, district energy systems and large chilled water systems. Climatherm® SDR 17.6 is now available in sizes ranging from 6-in.-dia. to 24-in.dia., and Greenpipe, which is specifically engineered for potable water, is available in SDR 11 from ½-in.-dia. to 18-in.-dia. **Aquatherm Inc.**

Circle 105 on Reader Reply Form on page 49

Stainless steel RETROFIT liners

Liner provides a simple and cost effective solution to the ongoing issue of corrosion on installed floor sinks and drains. Installs into the existing floor sink and eliminates the costly solution of disrupting the surrounding floor area and removal of the existing unit. The universal design of the RETROFIT liner fits most commercially available floor sinks and is available with a variety of options and stainless steel grates. **Josam.**

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Classifieds

Advertiser Index

Plumbing Engineer
A TME Publication

1 I wish to receive (continue receiving) **Plumbing Engineer** for **FREE**
☐ Yes ☐ No

2 I am engaged in plumbing engineering: ☐ Yes ☐ No

3 I am also engaged in the following kinds of engineering work:
☐ Piping (a) ☐ HVAC (b) ☐ Hydronics (c)
☐ Sprinkler/Fire Protection (d) ☐ Plumbing (e)

4 I am employed by one of the following:
☐ Architectural/Engineer (a) ☐ Mechanical Engineer (b) ☐ Building Owner/Engineer (c) ☐ Consulting Engineer (d) ☐ Contractor (e) ☐ Design–Construct Engineer (f) ☐ Architect (g) ☐ Manufacturer (h) ☐ Manufacturers Rep (i) ☐ Government (j)
☐ Mechanical Contracting (k) ☐ Other (x) _____

5 My title is: ☐ Construction Manager (c) ☐ Engineer (e) ☐ Owner (o) ☐ President (p) ☐ Specifier/Design (s) ☐ Vice President (v)
☐ Other _____

6 Do you design and specify products? ☐ Yes ☐ No

7 I belong to the following professional organizations:
☐ ASPE (a) ☐ ASSE (b) ☐ ASHRAE (c) ☐ NSPE (d) ☐ Other (e)

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December 2011

Please fill out this Reader Reply form and fax it to us at 630.739.9700 to receive the information you have requested.

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Industry News

2012 IPC® includes certification changes

WASHINGTON — The International Code Council's® IPC previously required certification only for select plumbing components and fixtures. A significant change relative to certification reflected in the newly published *2012 International Plumbing Code*® (IPC) requires certification of all plumbing products. Certification has always been important to ensure safety and better construction overall, which is the key reason behind this major code change.

The significant change referenced in section 303.4 of the 2012 IPC, which focuses on Material Identification and Third-Party Certification now states, "*All plumbing products and materials shall be listed by a third-party certification agency as complying with the referenced standards. Products and materials shall be identified in accordance with Section 303.1.*" *The section goes on to note, "…products and materials shall bear the identification of the manufacturer, as well as the identification requirements that are referenced by the applicable standard.*"

"The previous editions of the IPC included several options, among which was mere compliance with an applicable standard. The 2012 IPC mandates listing by a third-party certification agency," said Dawn LaFleur-Qualley, manager of certification programs at ICC-ES PMG. "Therefore, looking for a mark of conformity on a product is mandated by this code section."

Earlier in 2011, the Code Council instituted official membership councils, including one for PMG. The PMG Council consists of respected members from across the PMG industry whose goals are to provide members with more valuable benefits with which to advance their trade and help in their efforts to further public safety.

The ICC-ES PMG program offers a full range of certification activities, including PMG listings and evaluations of sustainable product attributes. The ICC-ES PMG program, which was recently recognized by the City of Los Angeles as the first certification agency recognized under its new guidelines (reference number LAMC 98.502), also certifies plumbing products to AB1953, Annex G of NSF/ANSI 61, S.3874 (Federal Law for Reduction of Lead in Drinking Water) and the requirements of WaterSense for toilets, urinals, lavatory faucets, showerheads and weather-based irrigation controllers.

ICC-ES' experienced and knowledgeable technical staff offers listings that are respected and trusted by jurisdictions nationwide. The ICC-ES PMG program is also accredited by the Standards Council of Canada (SCC), which helps manufacturers distribute their products in both the U.S. and Canada."

ICC-ES PMG has been evaluating plumbing products to the requirements of the International Plumbing Code® (IPC), the International Residential Code® (IRC), the UPC, and the product standards referenced in these codes for years.

MIRO Industries and Rooftop Anchor open manufacturing facility

HEBER CITY, UTAH — MIRO Industries, Inc. and Rooftop Anchor Inc. moved their corporate headquarters to a new 30,000-square-foot manufacturing facility in Heber City, Utah. The facility will house engineering, sales, service, factory and administrative staff, and includes custom metal fabrication, product manufacturing, testing and shipping.

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KEEPING UP THE FLOW

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Zurn "paired performance" fixture systems combine the strength of commercial brass fittings with an innovative offering of sanitary fixtures. These systems reduce water usage and maintenance costs, saving your company a lot of green, and make the world a lot greener, too. Contact us for new construction or building upgrade needs. Call 1-800-997-3876 or visit www.zurn.com.

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