

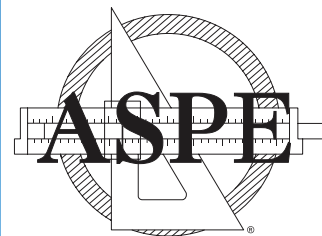
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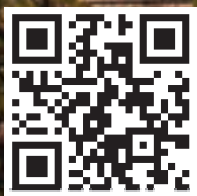
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- Where Will the Next Generation of Mechanical and Plumbing Engineers Come From?



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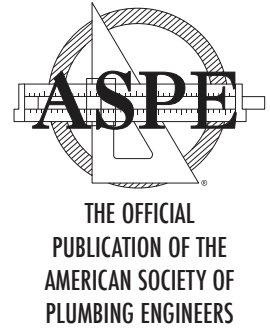
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The views and opinions expressed in this issue's articles are those of the contributors and do not necessarily reflect a position of Plumbing Engineer, TMB Publishing Inc., or ASPE.

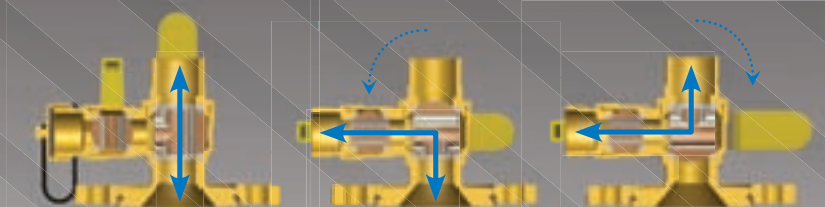
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Editor's Letter

Jim Schneider, LEED AP, editorial director
editor@plumbingengineer.com



After the storm

In October, the East Coast of the United States was ravaged by Superstorm Sandy. The nation watched for more than a week as the hurricane picked up strength and moved toward the U.S. Meteorologists told us how Sandy would merge with a powerful oncoming winter storm to create a rare and devastating weather event. Even after talking about it for days, when the storm made landfall, those of us watching on television could scarcely believe the images we were seeing. I can only imagine what it must have been like to experience it firsthand. The magnitude of the wind and storm surge was shocking. For all of our technology and power, we are still very much at the mercy of nature and this storm was a powerful reminder of that fact.

In its wake, Sandy left more than 125 people dead in the United States alone. An additional 125 were killed in Haiti and the Caribbean. Parts of New York and New Jersey look like they have been through a war. Entire communities were leveled,

leaving an estimated \$62 billion in damages. This makes Sandy the second-costliest storm in U.S. history, second only to Hurricane Katrina. Governor Chris Christie of New Jersey estimated that more than 72,000 homes and businesses were destroyed in his state alone.

Destruction of this magnitude will take time to recover from. There is much to rebuild and repair and those affected continue to suffer long after the news cameras have shifted their attention elsewhere. It is important to remember those in need and continue

to support the reconstruction and relief efforts in the areas impacted by the storm.

Starting with this issue of *Plumbing Engineer*, we will dedicate a portion of our news department to covering our industry's ongoing efforts to help rebuild and lend a hand to those in need. So for those who are involved in the cleanup and reconstruction efforts, send us your stories and your pictures so we can continue to recognize the good work those in our industry are doing.

Without a doubt, there is a great deal of work to be done, and the plumbing and hydronics industry has a big role to play. People repairing and building new homes and communities will rely on the expertise of our people in the field and solutions our industry has to offer. In the face of a tragedy like this is the opportunity to rebuild even stronger.

And for readers who want to help the relief efforts in other ways, we encourage you to remember those in need of basic supplies, food and shelter. There are many ways to help, and a simple one is to visit www.redcross.org/charitable-donations to lend a hand to the families who continue to need our help. ■



A flooded street in an oceanside community shows the power of Hurricane Sandy, a powerful storm which crashed into the Eastern U.S.

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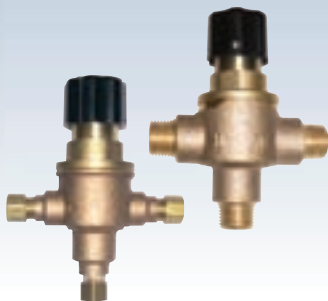
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Sandy Response News

Liberty Pumps sends items for Hurricane Sandy relief

BERGEN, N. Y. — Liberty Pumps employees contributed to the purchase of items to be shipped to help with Hurricane Sandy relief efforts. Items sent by Liberty



employees included cleaning supplies, first aid supplies, toiletries, food items, paper products, baby items, batteries, winter clothing, pet items and much more. Also contributing to this shipment was C&M Forwarding, a local trucking company, who shipped this huge pallet at no charge.

Weil-McLain & MEP donate to Red Cross Hurricane Sandy Relief Effort

BURR RIDGE, ILL. — In response to the massive devastation on the East Coast caused by Superstorm Sandy, Weil-McLain and Marley Engineered Products (MEP) have donated \$10,000 to the Red Cross Superstorm Sandy Relief Effort.

At a presentation ceremony on December 6, 2012, LaPorte County, Indiana, Red Cross executive director Bobbi Petru acknowledged a \$10,000 donation on behalf of both companies and presented President Tom Blashill with a plaque of recognition from the Red Cross for the generous donation.

In his remarks, Blashill said "On behalf of our employees, we thank the Red Cross for all of the work that you are doing to support the people of the East Coast. Both Weil-McLain and MEP are producing and shipping every boiler we can and have ramped up production to a 24/7 schedule in order to meet the demands of our friends and neighbors in the Northeast."



Petru thanked both companies for their donation and commented that this donation "would make a major difference in the lives of individuals who have lost everything." She thanked the employees of both companies for spending so much time away from their families to meet the product needs of the people of the East Coast.

Petru also stated that, since Superstorm Sandy hit, the Red Cross has:

- Served over eight million meals to people on the East Coast
- Donated 6.1 million relief items (blankets, goods, etc.)
- Provided 8,000 shelter nights to victims

To make a donation to the Red Cross Superstorm Sandy Relief Effort, visit www.redcross.org.

Taco and industry allies assist hurricane victims

CRANSTON, R.I. — When Hurricane Sandy trudged ashore in October, she left a broad, \$70 billion path of destruction in her wake. Just missed by the worst of Sandy's wrath, Cranston-based Taco Inc., stepped in to respond. Among those joining forces with Taco to help with recovery and supply efforts was Greg Talbot, VP of sales for Wales-Darby Inc., an Islandia, N.Y.-based manufacturer's rep firm. Taco's Steven Pearson, VP, OEM sales, and Ken Anderson, VP of sales, Northeast region, joined a group of industry representatives and contractors at Wales-Darby's location in Islandia for a meeting hosted by Kevin Rooney, CEO, Oil Heating Institute of Long Island. Attendees included representatives from several oil heating companies and Hunter Botto, New York state PHCC president. "We learned, among other things, that recovery efforts are now just the tip of the iceberg, and that more than 40,000 homes will require new heating systems, most of them hydronic," said Talbot.

"Our focus at Taco is to eliminate any bottlenecks in the pipeline," said Anderson. "The focus is on filling orders as quickly as we possibly can and coordinating assistance wherever possible. The replacement work in Sandy's wake has become a giant need, especially considering that winter is right around the corner." At Taco, employees are working overtime and with overlapping shifts to meet the need for replacement products. Vendors were asked to expedite material and component shipments to meet the need.

Taco has also set a group on their FloPro Team Neighborhood to connect contractors affected by Sandy with other contractors around the country that are willing to provide assistance. "The FloPro Neighborhood is all about one hydronic professional helping another hydronic 'neighbor' — with education, practical answers or, in the case of the Sandy aftermath, with equipment, or offering to lend a hand," said Facey. If you are one of the contractors still affected by disruption from the storm, are having challenges meeting customer's hydronic needs, or if you're able to help others with needs like these, please visit the Taco FloPro Neighborhood at www.flopro.taco-hvac.com.

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IT ALL BOILS DOWN TO THIS:

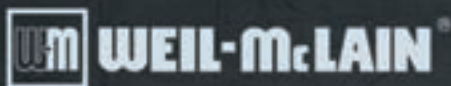


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Industry News

Continued from page 8

Williams Joins TMB Editorial Staff



NORTHBROOK, Ill. – Ashlei Williams has joined the staff at TMB Publishing, taking on the newly created role of Associate Editor/Social Media Coordinator for *Plumbing Engineer*, *Phc News*, and *The Wholesaler*. Williams will bring additional content support to the publications, coordinating news, product, and feature coverage both in the print publications and online.

Williams will also spearhead the publications' social media presence, continuing to build each brand's networks and further engage with readers and professionals in the field. She comes to TMB from the Robert R. McCormick Foundation, a philanthropic organization committed to fostering communities of educated, engaged, informed citizens. There, she served in a communications role, developing and implementing strategy for streamlining the foundation's brand on social media platforms, which resulted in measurable organic audience growth. She also produced and edited content for a Foundation newsletter.

With editorial experience spanning print and online brands including *Today's Chicago Woman* magazine and *Young Mogul Nation*, Williams brings a wealth of experience and expertise to TMB. She has a B.A. in English from Spellman College and an M.S. in Journalism from Northwestern University's Medill School of Journalism.

"Ashlei has an impressive background and her accomplishments speak for themselves," said Jim Schneider, Editorial Director of *Plumbing Engineer* and *Phc News*. "We are excited to have her join the TMB team. Her skills and perspective will be a great asset to our publications and will help us continue to deliver high quality content to our readers. In addition, her knowledge of social media strategy will help us connect with our audience in new and exciting ways."

Acorn and Morris Group International Restructured

CITY OF INDUSTRY, Calif. – Morris Group International (MGI) is pleased to announce Tom Duddy as the President/COO of Acorn Engineering Company. Duddy will assume the President/COO position on March 1, 2013. Tom has worked with Acorn and Morris Group International for over 20 years. His skill set, integrity and value system reflect the leadership needed at Acorn.

Tom's presence allows Morris Group to continue to grow, while ensuring that the Acorn Engineering Company division is well-managed and will continue to prosper. Tom will also maintain his current role as the President/COO of Elmco/Duddy.

Continued on page 12

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As the 60th anniversary of Acorn Engineering Company approaches, Tom will be the third President. Don Morris will remain Chief Executive Officer of all divisions and partnerships. Additionally, Ron Stewart will relocate to Southern California and assume responsibility for the

day-to-day operations of Elmco/Duddy as Vice President of Operations, reporting directly to Tom Duddy.

On the sales and marketing side of Elmco/Duddy, Randall Morris, Senior Vice President and Richard Root, Vice President of Sales &

Marketing, will continue to report directly to Tom. Effective January 1st, Steve Miller, Vice President and General Manager at Elmco/Stewart, will take over complete management, sales, and marketing responsibilities for the Arizona market, reporting directly to Don Morris. The current name of the Arizona branch will change to Elmco Sales Phoenix. Ron Stewart will also have dual responsibilities, as he will retain his role as President of Elmco/Stewart Las Vegas. The reorganization of Morris Group International is expected to provide greater opportunities for long-term future growth.

M&G Group acquires Security Chimneys

VACAVILLE, CALIF. — M&G Group, owners of M&G DuraVent Inc., recently signed an agreement to purchase Security Chimneys International Limited from Comvest Investment Partners IV, L.P. and Innovative Hearth Products. Security, located in Laval, Quebec, Canada, is a manufacturer of venting products and accessories for residential and commercial applications in both the U.S. and Canada.

Brooks Sherman, president and CEO of DuraVent, said, "We are very excited about the addition of Security, which will serve to expand DuraVent's line of innovative products for the venting of residential and commercial appliances of all kinds. In particular, Security has recently made significant investments to further develop their commercial venting systems, which has excellent potential for future growth.

"This acquisition further demonstrates DuraVent's commitment to provide customers with technologically advanced chimneys and complete venting solutions. Security will continue to serve all the venting needs of its customers under their well-established brand names, including Security Chimneys and Oliver MacLeod."

Continued on page 14

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Camco acquires rights to Wall Saver tankless water heater pan

GREENSBORO, N.C. – Camco Manufacturing, Inc., is pleased to announce a licensing agreement

with Applied Design Concepts, Inc., of Mechanicsville, Va., regarding the Wall Saver™ Tankless Water Heater Drain Pan. The patented Wall Saver is designed to protect property from water damage in the event of a tankless system leak or failure and is the only drain pan on the market

specifically engineered for tankless water heaters.

This agreement with ADC grants Camco exclusive rights to manufacture and market the Wall Saver Tankless Drain Pans in both the U.S. and Canada. The Wall Saver is made of injection-molded polypropylene for superior strength and durability; it will not rust, corrode or crack. Easily installed underneath the tankless heater, the Wall Saver™ may be used for both electric and gas applications. Pans come with either a PVC or CPVC fitting attached and are manufactured in Greensboro, N.C.

Taco receives award from Sid Harvey's

CRANSTON, R.I. —Taco Inc. recently received a Vendor of the Year award from national HVAC/R wholesale giant, Sid Harvey's.

Sid Harvey's CEO John Rynecki, senior vice president of sales and marketing and Rich Carbonaro, VP of purchasing, presented the award to Taco CEO and president Johnny White during a recent visit to Taco.

"We give these awards on rare occasions, based purely on merit,"



said Rynecki. "We routinely deal with more than 300 manufacturers, and it's quite special when one company exceeds our expectations based on many variables. It's not like a cookie cutter evaluation process. Rather, the award is the sum of many experiences, including Taco's consistent innovation, product design and quality, attention to details; even the rep firms they choose. This recognition resembles a lifetime achievement award more than it does a typical Vendor of the Year award."

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Rainwater Catchment System design standard opens for public review

CHICAGO — A new American National Standard to provide design and installation requirements for rainwater catchment systems is being jointly developed by the American Rainwater Catchment Systems Association (ARCSA) and the American Society of Plumbing Engineers (ASPE), with sponsorship support from the International Association of Plumbing and Mechanical Officials (IAPMO).

ARCSA/ASPE 63: Rainwater Catchment Systems, an existing standard published in July 2009, has gone through extensive revision using the ASPE standards development process accredited by the American National Standards Institute. The draft revisions are now open for public comment until 11:59 CST on January 18, 2013. To view the draft standard and submit a comment, visit <http://aspe.org/PublicReview>.

ARCSA/ASPE 63 has already achieved broad recognition by being adopted into the IAPMO Green Plumbing and Mechanical Code Supplement and the 2012 National Standard Plumbing Code published by NAPHCC, as well as providing the foundation for rainwater catchment system criteria that have been recently

added to model plumbing codes.

Rainwater catchment systems provide an important alternate source of water; quality design standards are critical for protecting the health of those who use water from these installations in potable and nonpotable applications. ARCSA/ASPE 63 is designed to assist engineers, designers, plumbers, builders/developers, local governments and end users in safely implementing a rainwater catchment system using precipitation from a rooftop and other hard, impervious surfaces. It applies to new installations as well as alterations, additions, maintenance and repairs to existing rainwater catchment installations. It does not apply to the collection of rainwater from vehicular parking or other similar surfaces.

ARCSA/ASPE 63 will provide guidance in how to design, install and maintain a healthy alternative to municipal water and to optimize rainwater utilization, while preventing risk to consumers from poor design, installation and maintenance or illegal work, reducing risk to the public from injury or loss of amenity due to a failure of the supply, installation, maintenance or operation of the rainwater catchment system and ensuring that the rainwater catchment system will assist in maintaining and enhancing the quality of the environment, while helping to ensure compliance with the intent of relevant regulations and local government officials. ■



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AHR EXPO

Dallas to Host 2013 AHR Expo

Coming off the largest show in its 83-year history, the AHR Expo returns to the Dallas Convention Center on January 28-30. This was the site of the AHR Expo's largest Southwest event, held in 2007. That year, AHR occupied the entire convention center and attracted more than 47,000 attendees from around the world to see the latest products and innovations on display from nearly 1,800 exhibitors.

"The last three shows have all established new records for their regions of the country," said Clay Stevens, president of International Exposition Company, which produces and manages the AHR Expo. Stevens pointed out that the 2011 Las Vegas AHR Expo and 2010 Orlando event both set new records for number of registered visitors for Western and Southeastern shows, respectively. The 2012 Chicago Show set all-time records for visitor registration and square footage. Indications that the 2013 AHR Expo Dallas Show will be a strong event include:

- There are thousands of HVACR engineers and contractors within a 300-mile radius of Dallas.
- The Dallas ASHRAE chapter is one of the largest in the country.
- Dallas/Ft. Worth is home to two dozen Fortune 500 companies.
- The projected economic growth rate for Dallas continues to outpace the overall U.S. rate.

The 2013 AHR Expo is endorsed by the leading HVACR industry associations and is cosponsored by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the Air-Conditioning, Heating and Refrigeration Institute (AHRI). The Heating, Refrigeration and Air-Conditioning Institute of Canada (HRAI) is an honorary sponsor. ASHRAE's Winter Conference is held concurrently with the AHR Expo each year. For more information visit www.ahrexpo.com.



AHR Expo showcases special product sections

WESTPORT, CONN. — Two special sections featuring the latest products and technologies driving the HVAC/R industry's software and building automation segments will be showcased on the show floor at the 2013 AHR Expo in Dallas, January 28 – 30.



The Building Automation and Control Showcase, now in its 18th year, will feature more than 160 companies from 10 countries displaying state-of-the-art building integration and automation products and solutions. The showcase will highlight the latest innovations that include:

- Facility management systems
- Network integration products
- Building automation systems

- Web-based monitoring systems
- Energy management systems
- Climate controls

The Software Center will feature over 50 companies from four countries showcasing everything from design and CAD systems to equipment selection, estimating, pricing and contracts.

In addition to the hundreds of new products being showcased by nearly 2,000 exhibiting companies, three New Product and Technology theaters will feature more than 40 presentations. These special sessions presented by exhibitors will highlight the latest innovations and solutions from all segments of the HVAC industry. The theaters will include presentations on topics ranging from heating and cooling technology, thermal energy management and hydrocarbon applications to indoor air quality and more. For more information

about the presentations, visit www.ahrexpo.com/forvisitors/nptsched.php.

"These special features are always very popular with attendees at AHR Expo because they present the latest in cutting-edge technology," said Clay Stevens, president of the International Exposition Company that produces and manages the AHR Expo.

For more information, visit the Show's website at www.ahrexpo.com.

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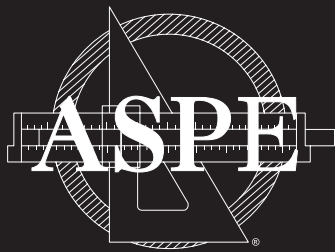


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From the President's Pen



William F. Hughes Jr., CPD, LEED AP, FASPE
2010-2012 ASPE PRESIDENT
aspepres@aspe.org

I hope everyone was able to relax and enjoy the holidays with your family and friends. Now that the holidays are over, it is time to get back to work. ASPE is no exception.

Last month the ASPE staff moved into our new office space in Rosemont, Illinois. I had the opportunity to visit the new office shortly after the staff moved in. It is impressive, and if you are ever in the Chicago area, I hope that you consider stopping by the new ASPE office. I know the staff will be more than happy to give you a tour.

During the last two years, ASPE made many changes and implemented several new programs. All of these initiatives have benefited and strengthened the position of ASPE and increased our visibility within the plumbing industry, the construction industry, and beyond. In the upcoming months we will be continuing to review and update ASPE's Strategic Blueprint that was established in 2011. Last year we put in place several programs to help execute the goals and objectives, but we still have much more work to do.

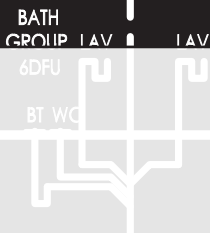
Education and membership are two of the key areas on which we will be concentrating. These areas are critical to help the Society grow. Working to get younger members is an important step in the process. We have some programs currently in place, and we have others to consider. Technical publications are another focus. We will be working to develop up-to-date technical publications that can be used as part of your daily design activities.

Another key item in the Strategic Blueprint is signing memorandums of understanding with other organizations within the plumbing industry. This is something we will continue to do this year. We have reached out to several organizations and are in the process of completing the final paperwork, so stay tuned for additional developments.

Congratulations go to the American Society of Sanitary Engineering (ASSE) for becoming an International Chapter of the International Association of Plumbing and Mechanical Officials (IAPMO). Prior to ASSE becoming part of IAPMO, we had been discussing an MOU with the ASSE leadership. It is our goal to continue these conversations and hopefully complete the MOU sometime early this year. We have strong relationships with both IAPMO and ASSE, and we are looking forward to even greater opportunities in the future.

Another avenue ASPE will be continuing to explore is partnering with other organizations on certain projects. We are currently discussing several projects with other organizations, and I hope to make announcements about these opportunities in the upcoming months.

As you probably know by now, ASPE applied for and was approved as an ANSI-accredited standards writing organization. Having the ability to provide ANSI-accredited standards is yet another avenue that has given ASPE the opportunity to partner with other organizations. For example, ASPE and the American Rainwater Catchment Systems Association (ARCSA) partnered once again to revise the existing ARCSA/ASPE rainwater catchment systems standard and submit it for ANSI approval. Many developments recently have occurred regarding this standard. As of this writing, the draft ARCSA/ASPE 63: *Rainwater Catchment Systems* standard is under ASPE's public review process, and we anticipate that it will be submitted to ANSI for the ANSI public review process sometime later this month. I also am pleased to let you know that IAPMO has stepped forward to be a sponsor of ARCSA/ASPE 63. The International Code Council (ICC) was



also approached by ASPE and ARCSA in hopes that they would be a co-sponsor of the standard as well, but ICC has chosen to continue developing their own rainwater catchment system standard. This is unfortunate since the ARCSA/ASPE standard already exists and has been adopted in other model codes. It was our hope that both IAPMO and ICC would work with us to develop a consistent American National Standard of which we all could be proud, so we have left the door open to ICC. Having all four groups working on the standard would send a strong message to the industry that we all can work together and put aside our differences for the betterment

of the industry. It is my sincerest hope that ICC will reconsider their decision and become a co-sponsor of ARCSA/ASPE 63.

Based on the new programs, activities, and all that went on last year, the ASPE Board of Directors cannot help but sense a renewed enthusiasm within the Society. We want this to continue and plan to build on these developments and keep spreading this enthusiasm throughout the membership.

As you can see, plenty of new things are happening with ASPE, and they will continue throughout the year. The ASPE Board of Directors encourages and challenges you, the membership, to help and participate and be a part of the future of ASPE. **ASPE**

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Julie Lynn Hadfield, GE
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Wossen Assefa Tsigie

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Eric William Erbeling, GE, EIT

Boston Chapter

William Haridman, PE
Darrin Healey
Robert William Martin
Kelly Quinn
Meghan Ratnam

British Columbia Chapter

Richard L. Granger
James Hicks
Zhou Lu

Capital Region NY Chapter

Nicholas Bello
Eric Cushing

Central Florida Chapter

Jessica Fernandez
Caleb Freeman, PE
Steve Horton

Central Indiana Chapter

Brian William Butkus
Shawn Mowery, PE
Kyle F. Trick
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Central Ohio Chapter

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Christopher Charles Forry
Dawne Jillian Herrick, PE, LEED AP, HFDP

Southwestern Ohio Chapter

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Peter Skelly, GE

Virginia Blue Ridge Chapter

Mark Kipps, PE
Zachary Zwart

Washington, D.C. Chapter

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Sarah Kirwin
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ASPE REPORT

Monthly News for ASPE Members



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From the Executive's Desk



Jim Kendzel, CAE, MPH
ASPE EXECUTIVE DIRECTOR
jkendzel@aspe.org

I hope everyone enjoyed a happy and safe holiday season. I am pleased to report that ASPE is starting off the New Year well positioned to offer new and exciting opportunities to help our members excel professionally. If you have not done so already, mark your calendar for the ASPE Technical Symposium being held in Orlando, Florida on September 19–22, 2013. Our last Symposium received high praise from attendees, so you will not want to miss this event!

ASPE has never been more financially healthy than we are as we enter the New Year. Through the sale of our building and moving into more efficient and less costly office space, we have been able to grow our financial reserves significantly. In addition, we ended 2012 by holding the most successful ASPE Convention & Exposition in our history. Attendance at the event grew by almost 10 percent from 2010, and the number of exhibitors participating in the Exposition increased by 5 percent! Thanks go to all of the member volunteers and sponsors who helped make the event so successful. Don't forget another date to put on your calendar: the 2014 ASPE Convention & Exposition being held in Chicago on September 19–24. We will be celebrating our 50th Anniversary, so you definitely will not want to miss out on the fun.

I want to take this opportunity to personally say thank you to the ASPE staff for all they accomplished in 2012. It is still hard for me to fathom what they were able to accomplish in the midst of planning and carrying out the move to our new location while also planning and executing a highly successful Convention & Exposition. To those who experience the value provided by ASPE throughout the year, it may come as a surprise to you that it is all done with the dedication of only 10 employees. I am so lucky and thankful that we have them all on the team!

To Our Friends at ICC

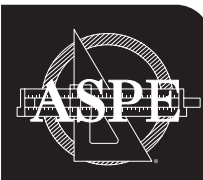
By now, most of you are probably aware of the two projects underway to publish an American National Standard for rainwater catchment systems. One is the ARCSA/ASPE project, which is nearing completion, and the other is an initiative recently announced by the International Code Council (ICC).

Ever since coming to the ASPE family, I have tried to instill a culture that encourages collaboration and partnership

throughout the plumbing industry because we can accomplish so much more together than separately. It is in the spirit of collaboration that ASPE and ARCSA reached out to both the International Association of Plumbing and Mechanical Officials (IAPMO) and ICC to work together on the development of one rainwater catchment system standard.

I am taking this opportunity to reach out one more time to the leadership at ICC to join ASPE, ARCSA, and IAPMO in the development of one American National Standard for rainwater catchment systems. Competition, in my opinion, does not have a place in standards development. Duplicative efforts lead to inconsistent standards and confusion in the marketplace. Together, we can do so much more in serving the plumbing industry and also accomplishing our combined missions of protecting the public health and safety. Please join us. **ASPE**

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SEPTEMBER 19–22, 2013

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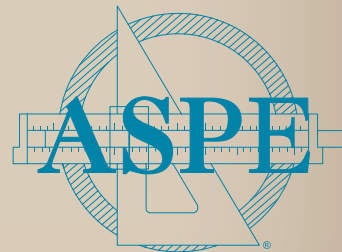
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**AMERICAN SOCIETY OF
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Thousands of plumbing industry professionals from across North America raced to Charlotte, North Carolina in October to take advantage of the nonstop networking and educational opportunities offered during the 2012 ASPE Convention & Exposition. From the instructional and thought-provoking technical education sessions to the exciting hands-on product displays and the New Product Innovation Showcase, attendees learned everything they need to know about the industry's latest advances to help their companies succeed in the coming year.

If you missed the event or want to relive some memories, the following pages include the top highlights from the 2012 Business Meeting and Convention & Exposition.

DIRECTOR'S AWARD

For each biennial ASPE Convention & Exposition, the Society's region directors choose an outstanding chapter achievement to be recognized with the Director's Award. This year, two chapters received the award.



Boston Chapter President Richard Dean, CPD (right), receives the Director's Award on behalf of the Boston Chapter from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for the chapter's critical role in helping develop ASPE's first official student chapter at the Wentworth Institute of



Central Florida Chapter President Christopher Farr, CET (right), receives the Director's Award on behalf of the Central Florida Chapter from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for the chapter's outstanding performance and continued support of the Society for organizing and hosting the 2011 Technical Symposium.

SPECIAL AWARD OF ACHIEVEMENT

The Special Award of Achievement is given for commitment to the Society and the advancement of the profession. This year, the ASPE board chose the following recipients, as well as Haig Demergian, PE, CPD, FASPE, for the dedication he demonstrated in working with UCLA Extension to help develop its online plumbing systems design course; Mark Allen, for his advancement of the profession by providing educational opportunities for ASPE members; and Bryan Hutton, for his endless efforts to advance and promote the plumbing engineering profession.



Stephen Ziga, CPD, SET, CFPS (right), receives the Special Award of Achievement from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for his commitment, service, and stewardship as chair of the Technical & Research Committee.



Frederick Neth (right), receives the Special Award of Achievement from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for being instrumental in the development of ASPE's first student chapter at the Wentworth Institute of Technology.

ASPE AWARD OF MERIT

The ASPE Award of Merit is presented to those individuals who have performed outstanding and meritorious service to the Society and the profession. This year, it was presented to three members.



David Anelli (right) receives the ASPE Award of Merit from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for his commitment and service on the ASPE board of directors and his leadership as Region 3 Director for the last 12 years.



Curtis A. Ray Jr., CPD (right), receives the ASPE Award of Merit from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for excellence and stewardship as a member of the ASPE Research Foundation and his promotion of ASPE and the plumbing engineering profession.



Michael Olson, CPD, FASPE (right), receives the ASPE Award of Merit from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for dedication, commitment, and service to the Society as chair of the Long-Range Planning Committee for many years.

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2012 CONVENTION AND EXPOSITION HIGHLIGHTS



SPECIAL AWARD OF APPRECIATION

An ASPE Special Award of Appreciation was presented to the following individuals, as well as Dan Murphy, PE, CPD, for his service, commitment, and dedication to ASPE's certification program.



James Rodgers, CPD (right), receives the Special Award of Appreciation from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for spearheading the development of the Evansville Satellite Chapter.



Vivian Enriquez, CPD (right), receives the Special Award of Appreciation from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE, for her commitment, dedication, and longstanding chapter contributions, which have benefitted the Society and advanced the profession.

CERTIFICATE OF APPRECIATION

ASPE Certificates of Appreciation were presented to the following individuals, as well as Ferroz Bhamani, CPD, for their commitment and dedication to the Society and the advancement of the profession.



Brian Henry (right) receives the Certification of Appreciation from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE.



James F. Spinelli, CPD (right), receives the Certification of Appreciation from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE.

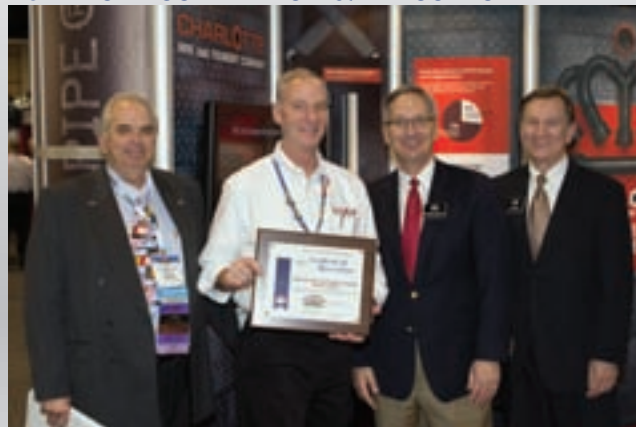


Steve Kormanik, CPD (right), receives the Certification of Appreciation from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE.



Thomas Ford Jr., CPD (right), receives the Certification of Appreciation from ASPE President William F. Hughes Jr., CPD, LEED AP, FASPE.

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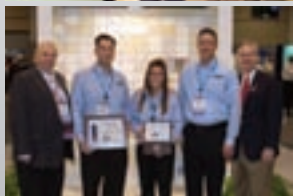
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2012 CONVENTION AND EXPOSITION HIGHLIGHTS



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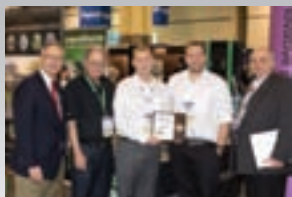
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Circle 17 on Reader Reply Form on page 73



SANICUBIC 1 Grinder System Offers Clog-Resistant, Overall Lower-Cost Alternative to Sewage Ejector Packages

Offering a simpler, more reliable option than a conventional sewage ejector, the new SANICUBIC 1 is a pre-assembled simplex grinder designed to handle wastewater from multiple plumbing fixtures. Featuring a one-horsepower motor, the unit is capable of pumping up to 50 gallons per minute from toilets, sinks, tubs and showers, dishwashers, washing machines and much more.

The high-performance grinding system can easily handle the accidental flushing of sanitary articles, such as feminine products, baby wipes, dental floss, condoms, etc. Its fast-rotating, stainless steel cutting blade minimizes the incidence of clogs by quickly reducing solids in the wastewater to a slurry that can be pumped up to 36 feet vertically or 328 feet horizontally through a 1.5-inch, rigid pipe.

The SANICUBIC 1 is ideal for applications in which the septic tank or sewer line is located either above or at some distance from the structure, or where gravity flow is insufficient to move the waste. That's because the SANICUBIC 1 pumps the effluent up — not below the floor — so there is no need to install conventional, below-floor plumbing drainage — a potentially expensive option in applications where no such drainage exists.

"In these types of applications, the SANICUBIC 1 offers a simpler, more reliable option than a conventional sewage ejector package," says Saniflo CEO Regis Saragosti. "With the SANICUBIC 1, there's no breaking through concrete to bury a storage basin for the waste, with all the hazards that entails.



Featuring a 1-hp motor, the SANICUBIC 1 can pump up to 50 gpm from plumbing fixtures located throughout a residential or commercial building.

SUPERIOR OPTION: Besides eliminating the need for expensive excavation, the SANICUBIC 1 offers a number of other clear-cut advantages over conventional sewage ejection packages.

No waste storage: The SANICUBIC 1 discharges most of its contents immediately with every activation. As a result, in contrast to a sewage ejection system, there is no need to dig a pit to house a large-diameter vessel capable of storing up to 50 gallons of waste.

Greater installation flexibility: With sewage ejection, piping that runs throughout the structure must come together at a single connection at the pump. With its four inlets, the SANICUBIC 1 offers greater piping-layout flexibility, making it easier to handle multiple fixtures. Not only is installation labor less, but because the SANICUBIC 1 can typically accommodate smaller-diameter piping, materials costs are reduced as well.

Lower operational costs: By reducing solids to a slurry, the stainless steel grinder in the SANICUBIC 1 dramatically lessens the possibility of plumbing-line clogs — plus the heavy cost of clearing them — thus minimizing any callbacks. Sewage ejection systems typically do not include a grinder and are therefore more susceptible to blockages as well as to disruptions of their float mechanisms, preventing their storage tanks from ejecting waste in a timely manner.

Easier servicing: In a sewage ejector system, the pump is typically located in the storage tank and therefore covered in waste. Removing it for servicing is a physical ordeal for the plumber. Because the SANICUBIC 1 evacuates with each activation, removing the pump for servicing is much easier. "The service tech won't need to wear a hazmat suit and a mask to work on the SANICUBIC 1," says Regis Saragosti. "In fact, he likely will be able to lift the pump out of the unit wearing only gloves, and he won't be tracking that waste through his customer's home or business."

With all these advantages, the new SANICUBIC 1 offers a lower overall lifetime cost than a conventional sewage ejection system, once the extra expense of floor excavation, the higher cost of plumbing materials and labor, and the increased incidence of maintenance are all factored in. For more information, contact Saniflo at 1-800-571-8191 or www.saniflo.com.

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Designer's Guide

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



Hot water dead-ends and ASHRAE 191P

I want to start by wishing everyone a very Happy New Year! 2012 was a tough year for most of us, but I hope we all have a wonderful and surprisingly prosperous 2013.

I want to say that Gretchen Pienta rocks with her *ASPE Pipeline* e-newsletter. I never fail to learn something interesting from the material she researches, consolidates and circulates every two weeks. Most recently, it was the ASHRAE/USGBC/ASPE/AWWA Standard 191P, *Standard for the Efficient Use of Water in Building, Site and Mechanical Systems*, which was released for public comment on Oct. 26. The comment period closed on Dec. 10. Thanks to Gretchen, I was able to submit my comments before the deadline, but I question if they will affect any change.

As recently as last month I wrote in this column that the plumbing codes are woefully inadequate in regulating maximum hot water dead-ends. Both the UPC and IPC are silent on the subject. When I started in this industry in 1984, the NYC Plumbing Code had a hot water dead-leg limit of 50 feet. If dead-legs exceeded this limit, temperature maintenance was required to within 25 feet of the point of use. In contrast, the Chicago Code had a dead-leg limit of 100 feet, presumably because water was more plentiful there than in NYC. Since then, the NYC Code has been replaced by an amended version of the IPC. With these memorable exceptions, hot water dead-legs seem to know no bounds.

Given the lack of code limits on hot water dead-ends, I applaud the fact that the new ASHRAE Standard 191P addresses this issue. It is a standard, not a code, but will surely be adopted by the USGBC as the LEED template for water conservation in buildings. So it is bound to become prolific.

What concerns me about the content in Standard 191P is that it is excessively restrictive. The pendulum has swung far to the opposite end. Clearly, the standard was not written by plumbing engineers. In its efforts to be proactive about water conservation, ASHRAE and company have gone so far overboard that the criteria is nearly impossible to satisfy. With regard to hot water distribution, it stipulates that, "*The volume of water in the piping between water heaters or boilers and fixture fittings they serve shall not exceed 32 ounces.*" Using 3/4 inch Type L copper as a typical example, the length of pipe associated with 32 ounces is just under 10 feet. As written, the pipe length between heater and faucet cannot exceed this length (otherwise circulation or heat trace is required).

Don't get me wrong, I strongly believe there are many dead-end hot water distribution systems that should have temperature maintenance. My house is one of them. However, 10 feet of pipe includes 5 feet for the wall drop, so the water heater has to be within 5 feet of the furthest fixture to satisfy this criterion. In my opinion, that is excessively restrictive.

Granted, small structures such as my home are not likely to pursue the ASHRAE Standard 191P. The projects that will endeavor to conform to this standard are sure to be larger buildings that would have hot water temperature maintenance, be it circulation or heat trace, as a matter of course.

When a system is supplied with temperature maintenance,

the standard requires that hot water dead-ends be limited to 16 ounces, just five feet of 3/4 inch Type L copper pipe. That's right, 16 ounces, one pint, two cups of water. Then bam! Hot water delivery. The only sizable systems I have ever designed that could achieve this are high-rise residential systems with vertical water distribution and a circulated hot water riser directly behind every hot water consuming fixture.

The only way of achieving this criterion in a large, sprawling, low-rise building with horizontal hot water distribution is to circulate or heat trace right up to the valve in the ceiling outside the pipe chase. The criterion is, quite simply, ridiculous.

Don't get me wrong; I would love if every fixture in my home had hot water delivery after a mere pint of water flow. But it scares me to no end to think that this might become the design standard for water efficient buildings, because the complexity of the hot water circulation system would make the plumbing piping look like spaghetti. A great deal of money would have to be spent on additional copper pipe, and balancing large circulated systems, already a daunting challenge in many cases, would become even more difficult. In all likelihood, a hybrid approach of water circulation coupled with heat trace cable would be required to meet such a criterion.

My comment proposed that the criteria are too restrictive and that the distinction between systems that have temperature maintenance and those that do not is essentially unnecessary. "Water waste is water waste, regardless of this distinction." I proposed that the volume of the dead-end be increased to allow for reasonable pipe runs to fixtures. I started with one gallon, since that would allow nearly 40 feet of 3/4 inch pipe to the fixtures, or about 35 feet in the ceiling plus a 5-foot drop.

Thinking that this might be too much of a leap from the 32 ounce/16 ounce criteria in the standard, I proposed, as a second alternative, a volume of 96 ounces, which would allow 30 feet of pipe or 25 feet plus a five-foot drop. But, since it is triple their proposed maximum and six times their circulated maximum, my guess is that it will still be too much of a reach, although it might get them to loosen up their criteria to something more manageable. We'll see.

In the interim, proposed changes to the UPC Code are due by Jan. 3, 2013, so, by the time you read this, I will have submitted a proposed code change on this subject. I do not yet know exactly how that will be structured, but you can be sure it will not be as restrictive as ASHRAE 191P. However it is written, hopefully it will be accepted. Our codes have been silent on this issue for far too long, and it is time to put mandates in place to save both water and time while users wait patiently for the arrival of hot water. ■

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Prevention of Legionellosis Associated with Building Water Systems, Part 2

The purpose of the ASHRAE 188 standard is to present practices for the prevention of Legionellosis associated with building water systems and to provide risk management methods to prevent Legionellosis associated with centralized industrial and commercial building water systems. The standard applies to human-occupied buildings, excluding single-family residential buildings.

The scope of the standard states, *"While not specifically intended for non-centralized or single-family residential building water systems, some of the information presented in non-mandatory Appendix B may be useful for these systems."* In layman's terms, this means that, although the standard is not intended for standalone or residential buildings, information in the appendices could be useful for those types of buildings.

With the adoption of ASHRAE 188P and, soon after that, ASHRAE Guideline 12, new and existing buildings will be held accountable for safeguarding potable and

utility water systems from contributing to Legionella bacteria growth. Legionella bacteria do not know what size building it is in, nor does it care. If the right temperature and stagnant conditions are in place, and when lack of water treatment is coupled with nutrients present in the piping system, the bacteria will grow and multiply.

Legionella is commonly found in domestic drinking water systems, cooling towers, evaporative condensers and decorative fountains, but it can only be transmitted to humans through airborne particles. If building water systems are not properly maintained, Legionella can grow to very high concentrations. The dispersal of Legionella bacteria through aerosol or misting of contaminated water leads to individual and, sometimes, widespread illness.

More than 20,000 cases of Legionnaires' disease occur in the United States each year. Individuals with weak immune systems are most susceptible. According to the

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Legionella Facts

- Legionella bacterium got its name from the American Legion convention where it was first discovered in 1976. Its official name is Legionella Pneumophila: Pnuemo means "lung," philia means "loving." The bacterium is found primarily in warm water environments. Legionella causes Legionnaires' disease, a multisystem illness that includes a deadly type of pneumonia.

- Many, if not most, cases of nosocomial (hospital acquired) Legionnaires' disease go undetected, and most detected cases are not reported. Therefore, many health care professionals have the false impression that Legionnaires' disease is rare, although it is actually widespread.

- Legionnaires' disease is contracted by inhaling water droplets containing Legionella. Some investigators believe that the disease may also be acquired by drinking Legionella contaminated water, particularly if Legionella aspirated from the water are inhaled before the water enters the stomach.

- Underlying disease and advanced age not only increase the risk of contracting Legionnaires' disease but also the risk of dying from it. Thus the death rate for nosocomial (hospital acquired) cases is higher than the death rate for community acquired cases because of the higher concentration of immunosuppressed persons in hospitals.

- Outbreaks have been linked to domestic water systems, cooling towers and evaporative condensers, respiratory care equipment, showers, faucets,

whirlpool baths, hot tubs, humidifiers, decorative fountains and a grocery store mist machine. The hot water system and cooling towers are the primary sources to be addressed by health care facility managers.

- The hot water system can be a perfect breeding habitat for Legionella, which grow best in water at 95 – 115 F (35 – 46 C). Scale and biofilm within tanks, pipes and fixtures add to the problem by providing food and protection for Legionella.

- In most cases, healthy human beings have a low risk of contracting Legionnaires' disease. However, there is a general estimate of Legionella per ml ratio that can help you know what procedures need to be taken

- At very low concentration levels, Legionella bacteria are not a concern. The concentration will increase as the bacteria are incubated in warm or hot water piping systems.

- Water pressure shock, major excavation work and the opening of new or renovated buildings have dislodged biofilm full of Legionella and caused Legionella outbreaks. Dust and dirt can potentially provide a nutrient-rich food source for existing Legionella in cooling towers or domestic water systems.

- Plumbing systems in new buildings that are not flushed to remove dirt prior to opening can present Legionella problems. Idle buildings with stagnant water or hospitals that have sitting water due to renovation can increase the amounts of Legionella in the water systems.



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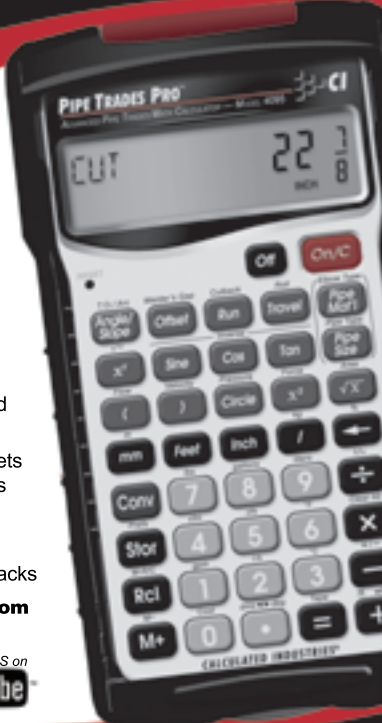
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CDC, this serious illness results in fatality rates ranging from five to 30 percent,

Disinfection methods

Growth of Legionella bacterial colonies is often supported by so-called “dead legs” in plumbing systems, which allow scale and biofilms to grow in ideal temperature conditions. Water temperatures can also play a role, with systems that mix hot and cold creating ideal Legionella growth environments. There are several common techniques to disinfect water systems for Legionella organism control, but proven effectiveness varies.

When determining disinfection methods, individual water system managers are encouraged to weigh effectiveness, implementation cost, potential for plumbing corrosion and environmental impact. The most common disinfection methods are as follows:

High temperature heat and flush (emergency disinfection)

The heat and flush method involves heating water to temperatures as high as 160 F for up to 30 minutes to sterilize the piping systems. This chemical-free method requires no additional equipment and is commonly used, particularly in hospital outbreak scenarios. It is, however, labor intensive, and in many piping scenarios there are dead legs where the hot water does not flush thoroughly.

Some types of instantaneous water heaters are sized to

When determining disinfection methods, individual water system managers are encouraged to weigh effectiveness, implementation cost, potential for plumbing corrosion and environmental impact.

raise the water temperature only to the usage temperature and not to disinfection temperatures at flow rates high enough to flush hot water to all fixtures simultaneously. Even many storage-type water heaters can have problems meeting a 30-minute draw at 160 F.

Emergency disinfection can prove ineffective for long-term Legionella infestation management. It can also damage older pipes and create a significant potential for scalding during the emergency disinfection.

Hyper chlorination (shock)

The shock, or hyper chlorination, disinfection method, involves injecting chlorine into the water distribution system. Initial shock chlorination levels approach 50 parts per million (ppm) and taper off to create a 2 ppm to 5 ppm chlorine cycle. A concern with this method is that chlorine decomposes rapidly at elevated water temperatures and Legionella re-colonization can occur in as little as one to two weeks during continuous chlorination following the shock.

The method has also proven highly corrosive to

plumbing, which can be offset in part with sodium silicate corrosion control, although silicate build-up can be problematic. Chlorination can also create maintenance challenges, including chemical storage considerations. In addition, exposure to the chlorine byproduct Trihalomethane (THM) is linked to several types of cancer, creating risk for facility employees.

Chlorine dioxide

CLO₂ is a gas generated by either chemical or electrolytic means. While the methods of production vary, most involve the use of an acid and chlorite donor. CLO₂ is a powerful oxidant that is distributed as a gas throughout the water distribution system and kills Legionella and other bacteria through the oxidative disruption of cellular processes.

It readily decomposes in drinking water, and residuals decrease as water system temperatures rise, making this treatment approach difficult in hot water systems. It is corrosive to plumbing infrastructure and creates byproducts, including chlorate and chlorite

Onsite sodium hypochlorite generation

Onsite sodium hypochlorite generation (OSHG) is a safe, clean and green disinfection option, and the system reduces operator hazardous material exposure. Sodium hypochlorite is produced on demand by combining salt, water and electricity.

The only chemical required for the process is common salt, which allows for the instantaneous passive removal of all hydrogen produced.

Copper-silver ionization

The most recent advance in the fight against Legionella is copper-silver ionization. This method dissolves and distributes small amounts of copper and silver ions throughout water systems to eradicate bacteria. Installation of a continuous eradication metallic ion unit is required. It is particularly effective in eliminating Legionella in recirculation hot water systems.

What ASHRAE 188P means to building owners and managers

You will be held accountable for safeguarding potable and utility water systems. This applies to both existing and new buildings. There are no blanket remedies for Legionella eradication programs and there are a number of issues to take

into account when evaluating the best technology for disinfection. The decision is best left up to the facility team evaluating the effectiveness and ultimate costs of various available technologies. Experts recommend testing for Legionella to provide uniform practices to prevent the

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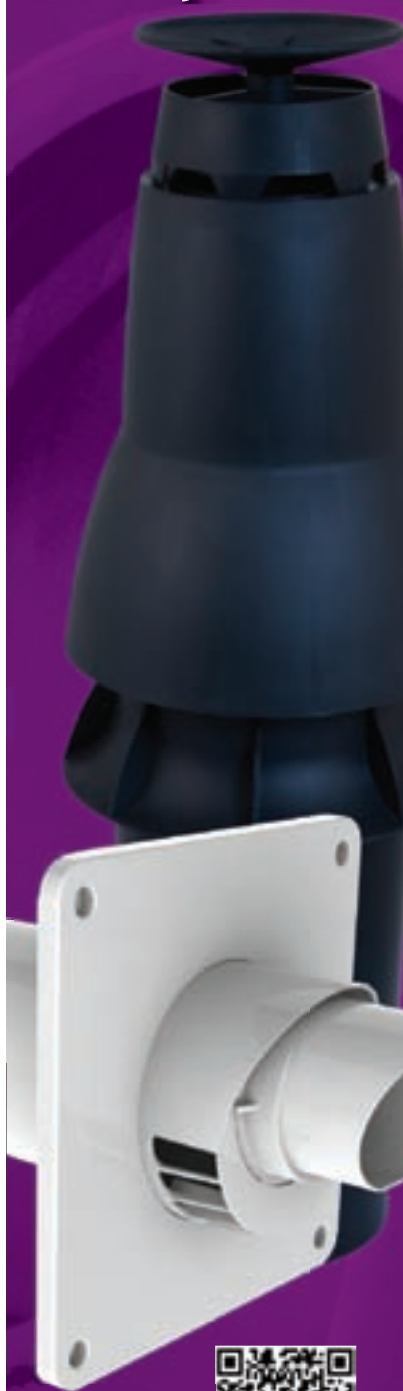
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disease. In order to be proactive, an HACCP plan should be implemented.

What is HACCP?

HACCP stands for Hazard Analysis and Critical Control Points. It is a systematic preventive approach to food safety and pharmaceutical safety that identifies physical, allergenic, chemical and biological hazards in production processes that can cause the finished product to be unsafe and designs measurements to reduce these risks to a safe level.

In the case of Legionella prevention, HACCP is for the identification and prevention of hazards in a piping system. The use of HACCP is currently voluntary in industries other than food and pharmaceutical.

water use is constant, and temperatures may not vary. If temperatures do vary, consider relocating the supply and return taps, installing a top-to-bottom circulating pump or insulating the underside of the vessel.

This is not an accurate or feasible statement. Temperatures do vary in larger facilities, and the proper way to control Legionella growth in a water heater or hot water storage tank is to store the hot water at or above 140 F, to use a master thermostatic mixing valve to reduce the temperature to about 135 F for distribution and to use a circulation pump with recirculation piping sized for a 10-degree temperature differential on the hot water return pipe (per the ASPE/ASHRAE method). This should result in a hot water return temperature of about 125 F.

A complete mechanical and system evaluation of plant operations, from sampling to data analysis, should be conducted to determine the best fit for system design to minimize risks, technology, products and services.

An HACCP plan requires facility managers and/or owners to assess possible risk points:

1. Identify uses of potable and utility water with potential hazards.
2. Create diagrams of the water systems
3. Identify control points.
4. Monitor procedures and corrective actions to verify that the Legionella hazard is controlled.

A complete mechanical and system evaluation of plant operations, from sampling to data analysis, should be conducted to determine the best fit for system design to minimize risks, technology, products and services. When a chemical approach is decided upon, specialists should work closely with chemical manufacturers and clients to determine the custom blend that best meets clients' water treatment needs.

This is in line with a new ASHRAE Guideline 12 recommendation for a minimum water heater storage temperature of 140 F and a minimum hot water return temperature of 124 F to minimize Legionella bacteria growth.

For more information about Legionella and how to prevent the growth of the bacteria in building water systems, visit my website, www.legionellaprevention.org. ■

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.

The ASHRAE standard erroneously suggests:

... In most larger facilities where HACCP plans are required, hot

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The engineer and the technician revisited

A few years ago this column examined the role of the fire protection engineer and the engineering technician with respect to the design of fire protection systems. A recent discussion with one of the engineers in our office made me think it may be a good idea to deal with the topic again.

The engineer was telling me about the meeting he had just attended. The meeting was for a design-build project in which our firm is involved. Our firm was part of the A-E design team assembled by the prime contractor. This was the initial meeting between all the team players; the prime contractor, the major subcontractors, lead architect and all the engineering subconsultants. During the course of a project there will be several such meetings, sometimes general in nature and sometimes dealing with specific topics. This particular meeting's purpose was to introduce the team and to inform one another of the general scope of responsibility for each of the players.

The meeting eventually got around to the roles of the fire protection engineer and fire protection contractor/technician. The fire protection contractor, who will be referred to as Joe's Fire Protection of Frostbite Falls (names changed to protect the innocent), could be described as, how shall I say it, "brimming with attitude." We, as engineering consultants, always get a little concerned when our subcontractor partner is "not from around these parts" (and Frostbite Falls is not from around any parts), when he is not familiar with working in the area or with the jurisdiction and when he comes to the table with a clear understanding that his way is only way.

Now this particular design-build project requires the A-E team to prepare full design documents, plans and specifications, which are based on the client's RFP documents. After the client has approved the design, the contractor can start building. While the FPE from our office was

starting to describe the fire protection design process, Joe, the owner of Joe's Fire Protection of Frostbite Falls, jumped in and said, "We don't need no stinkin' design drawings. (Please grant me a small bit of literary license.) I am a fully certified technician. I'll just prepare shop drawings and that FPE over there can stamp 'em good to go."

This is the point where the engineer begins to think, "Sheesh, I gotta work with this guy for the entire project. Man-oh-man, my fee was way too low!"

The FPE's calmly stated response was, "We, as the Designer of Record, prepare our own design drawings, which will spell out the performance requirements of the fire protection system in detail, and we will seal them. The fire protection contractor will prepare fire protection submittals including shop drawings, calculation, and manufacturers' data, and we will review the package and provide approval when the submittal meets the requirements of the RFP and our approved design." Wow! Perfectly stated (Of course, I have no bias.)

The prime contractor wisely tabled the discussion at that point and took the matter offline. To our satisfaction, the prime contractor told old Joe from Frostbite Falls that he had to do it our way. This was simply because it was a requirement of the RFP.

It is a good model for design-build projects and takes advantage of the real value the engineer and technician can bring to the project. It also aligns with the June 2008 document, *SFPE/NSPE/NICET Joint Position on the Engineer and the Engineering Technician Designing Fire Protection Systems*, which describes the roles played by the engineer and the engineering technician in the design for fire protection systems. (The statement can be found at www.nspe.org/IssuesandAdvocacy/TakeAction/PositionStatements/ps_sfpe_nspe.html?printerFriendly=true.)

The position statement describes the engineer's responsibilities for the designs, which include, but are not limited to, the following:

A. Evaluate the broad range of hazards and protection schemes required to develop a workable, integrated solution to a fire safety problem.

B. Prepare design documents for fire protection systems. This includes:

- Conceptual and detailed engineering documents
- Hazard and risk analyses
- Performance-based design analyses
- Integrated building systems analyses
- Layout fire protection systems
- Performing necessary calculations for all fire protection systems
- Affixing a professional stamp or seal with signature and date to documents prepared under the engineer's direct supervision and control

SFPE News

The Fourth Edition of the *Guide for Careers in Fire Protection Engineering* is now available: The guide offers information for students on college degree programs, benefits and resources to help them enter and succeed in the industry as a fire protection engineer. To obtain free copies contact Chris Jelenewicz at chris@sfpe.org.

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FPE Corner

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- Reviewing all work by engineering technicians to ensure conformance with the engineer's design
 - Reviewing fire protection installation shop drawings and submittals for compliance with the engineer's design
 - Developing commissioning and acceptance requirements
 - Monitoring the installation of fire protection systems
- C. (and most importantly) The engineer must maintain competency through continued education.

Regarding the technician, the position statement states: Based on engineering design documents, which include the system(s) design drawings, specifications and nationally recognized codes and standards, the technician is qualified to:

A. Perform the system layout in accordance with the engineer's design.

B. Prepare shop drawings and material submittals in accordance with the engineer's design for review and approval by the engineer.

C. Perform supplemental calculations and other functions based on the engineer's design for review and approval by the engineer.

D. Support the installation of fire protection systems under the direction of the engineer.

E. Technicians are responsible for their work and must

maintain competency through continued education

I believe the vast majority of engineers and technicians involved with fire protection system design understand and follow the principles outlined in the position statement. My friend Joe from Frostbite Falls was only doing what he had done in the past, enabled by "engineers" willing to shirk their responsibility.

My message to that very small portion of engineers that go along with Joe from Frostbite Falls is to take back ownership of your fire protection system design. If you do not feel comfortable designing fire protection systems, find a professional engineer that does.

Have a happy and good, busy New Year! ■

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

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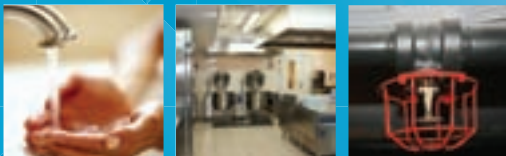
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Venting systems and their uses

You probably hear these terms often: vent stack, vent branch, vent terminal, relief vent, circuit vent, loop vent, wet vent, suds relief vent, and vent header. Do you ever wonder what these components are and where and when they should be used? If so, this column will shed some light on these plumbing system components and their uses.

Why vent sanitary systems?

Sanitary system ventilation is required by all plumbing codes, because the proper venting of a sanitary system prevents traps from being siphoned, reduces back pressure and vacuum surges and promotes the smooth flow of waste. When water is siphoned from traps, insanitary and sometimes hazardous conditions can result. Pressure and vacuum surges can cause the movement of water in water closets and affect other fixture traps as well. If the pressure is excessive, bubbles of sewer gas can flow through the sealed traps, and if the system is not vented properly, gurgling noises and a slow waste flow that can clog the piping system might occur.

Vent terminals

The vent terminal is the part of the venting system that extends through the roof to keep the drainage system open to atmospheric pressure. Even though it may be smaller

than the overall sanitary drainage piping system, the vent terminal is the most important part of the system, because it allows air at atmospheric pressure to flow through the piping, which holds the balance of water contained in each fixture trap for a proper seal. Following are a few good engineering practices for designing a vent terminal.

- In climates where freezing weather and/or snow might occur, increase the terminal by two pipe sizes 18 inches below the roof line. The interior building space that is warmer will provide enough heat to keep the vent terminal from freezing over. Also, extend the piping approximately 12 to 18 inches above the roof to keep snow from covering the vent opening.

- Locate the vent terminal a minimum of 10 feet from any intake louvers, windows, doors and roof openings. Review the local code, because this distance differs from jurisdiction to jurisdiction.

- Provide a 4-inch-diameter minimum vent terminal to allow an adequate volume of air to enter the piping system. A 4-inch opening is not as easily constricted by debris, ice, snow, bird droppings, or nests as smaller sizes are. However, if you are designing a system in a coastal area, keep in mind that large birds have been known to nest on vent terminals.

- High winds can force air into the venting system, which will cause an unbalanced air pressure within the system. You can use protective devices, but they may be susceptible to frost, which can prevent the system from breathing.

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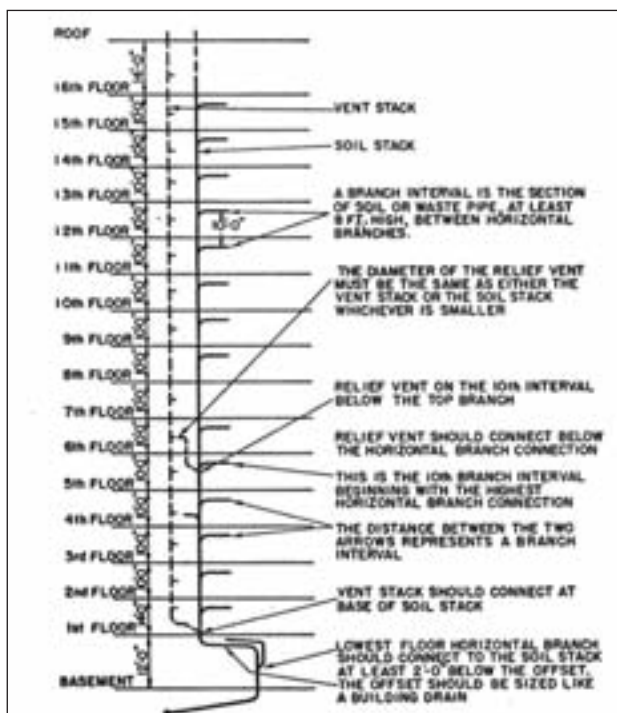


Figure 1. Relief vent

Source: National Plumbing Code Handbook

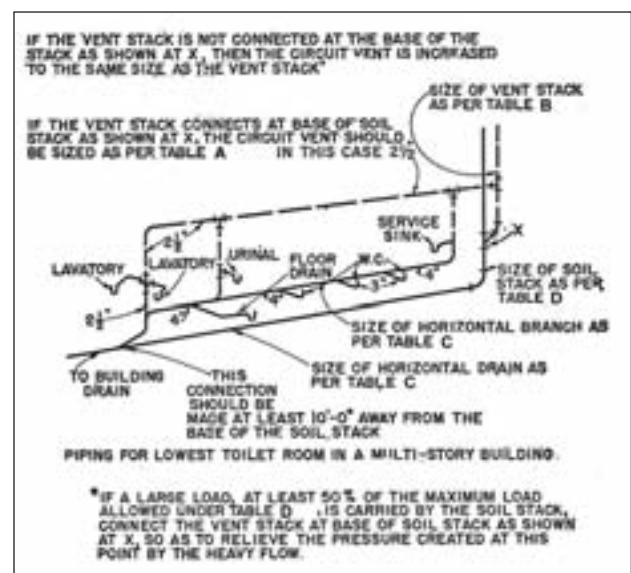


Figure 2. Circuit and loop venting

Source: National Plumbing Code Handbook

A large, industrial-grade roof hydrant is shown vertically on the left side of the advertisement. It has a long, dark metal shaft with a mounting bracket at the top and a threaded nozzle at the bottom. The background is a clear blue sky with a city skyline featuring several tall skyscrapers.

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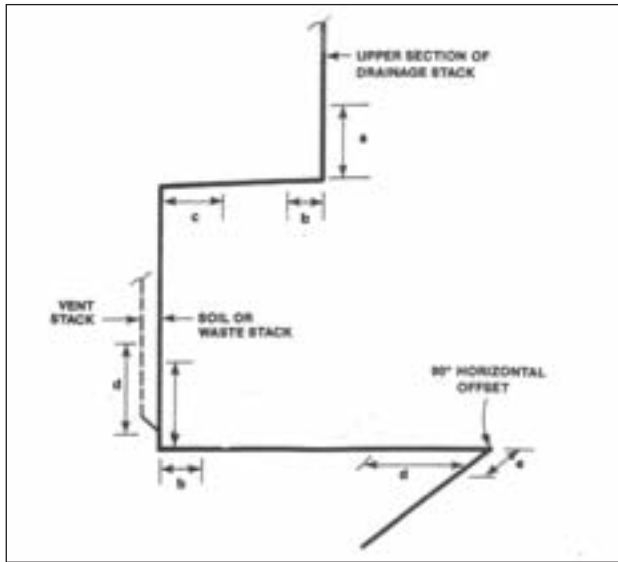


Figure 3. Suds pressure zones

Source: Facility Piping Systems Handbook

Relief vents

Relief vents (see Figure 1) are typically installed in high-rise buildings with more than 10 floors to balance the pressures that are constantly changing throughout the system. The relief vent shall be installed at every tenth interval, beginning with the top floor. The size of the relief vent shall be the same as the waste stack to which it connects. The proper fitting for this type of connection is a wye fitting installed below the horizontal branch that serves that floor, and the upper connection to the vent stack shall be made through a wye that is not less than 3 feet above the floor level.

You should always refer to the local code prior to designing the system, because requirements for relief vents differ depending on the jurisdiction.

Circuit and loop venting

Circuit and loop venting are very similar, except that a circuit vent connects to the vent stack and a loop vent connects to the stack vent (see Figure 2). What is the difference between a vent stack and a stack vent? A vent stack is a standalone vent line that is routed up through a building, and a stack vent is a vent line that connects to the top of a soil or waste stack and continues through the roof. (See Table 1 for vent stack and stack vent sizing guidelines.)

Circuit and loop venting can be used only on branch soil or waste pipes with two to eight water closets, urinals, mop sinks, shower stalls or floor drains connected in a battery, and it must take off in front of the last fixture. The size of a circuit or loop vent is equal to or greater than the vent stack diameter or one-half the size of the horizontal soil or waste branch diameter, whichever is smaller. (See Table 2 for sizing guidelines.)

Wet venting

Wet venting is a system that combines a vent and a drainline that receives drainage from the fixtures, while

Size of soil or waste stack (in.)	Fixtures units connected	Diameter of vent (in.)							
		1½	2	2½	3	4	5	6	8
		Maximum horizontal length (ft)							
1½	2	30	—	—	—	—	—	—	—
1½	4	30	150	—	—	—	—	—	—
2	10	30	100	—	—	—	—	—	—
2	12	30	75	200	—	—	—	—	—
2½	20	30	50	150	—	—	—	—	—
2½	42	—	30	100	200	—	—	—	—
3	10	—	—	—	—	400	—	—	—
3	30	—	—	30	200	500	—	—	—
3	60	—	—	30	30	400	—	—	—
4	100	—	—	30	100	200	1,000	—	—
4	200	—	—	30	30	250	900	—	—
4	500	—	—	20	70	150	700	—	—
5	200	—	—	—	25	30	250	1,000	—
5	500	—	—	—	30	70	300	900	—
5	1,100	—	—	—	25	50	200	700	—
6	250	—	—	—	25	30	200	400	1,300
6	620	—	—	—	15	30	125	500	1,100
6	900	—	—	—	—	24	100	250	1,000
6	1,900	—	—	—	—	20	70	200	500
8	400	—	—	—	—	—	30	150	500
8	1,400	—	—	—	—	—	40	100	400
8	2,200	—	—	—	—	—	30	30	250
8	5,600	—	—	—	—	—	25	40	250
10	1,000	—	—	—	—	—	—	75	125
10	2,500	—	—	—	—	—	—	50	100
10	5,000	—	—	—	—	—	—	30	30
10	9,000	—	—	—	—	—	—	25	30

Line	Soil or waste pipe diameter (in.)	Maximum number of fixture units	Diameter of loop vent circuit (in.)						
			1½	2	2½	3	4	5	
			Maximum horizontal length (ft)						
1	1½	10	20						
2	2	12	15	40					
3	2	20	10	30					
4	3	10	—	20	40	100			
5	3	30	—	—	40	100			
6	3	60	—	—	18	30			
7	4	100	—	7	20	52	200		
8	4	200	—	6	18	30	180		
9	4	500	—	—	14	26	140		
10	5	200	—	—	—	16	70	200	
11	5	1,100	—	—	—	10	40	140	

Source: National Plumbing Code Handbook

Pipe size (in.)	40 Diameters (ft)	10 Diameters (ft)
1	5	1½
2	7	1½
2	8	2
3	10	2½
4	13	3½
5	17	4
6	20	5

also serving as the vent pipe. Only one fixture unit can be drained into a 1½-inch diameter wet vent, and only four fixture units can drain into a 2-inch diameter wet vent.

Wet venting is similar to a combination waste and vent system, with a few different requirements, so when considering wet venting versus a combination waste and vent, you should check with the local code authority to verify which system is allowed, what fixtures may be connected and how many fixture units the vent can handle. If code allows, wet venting is a great system to use when you have a group of floor drains up through a building.

End venting

End venting is used with a system of floor drains if the branch arms do not exceed 15 feet and slope at 1/8 inch per foot to a main drainline that is sized two pipe diame-

Continued on page 46



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ters larger, allowing the main drain-line to be vented at the end of the run. This type of venting is also very similar to combination waste and vent systems. The theory behind end vent-

fixtures hung side by side, located on the same level and connected to the same waste pipe. This type of venting is commonly used with a battery of fixtures. Both P traps must conform

An end venting system is commonly used in mechanical rooms, central plants and commercial kitchens, where a number of floor drains are located.

ing is that the sewage will flow half-full through the piping, allowing air to circulate in the upper portion of the piping. An end venting system is commonly used in mechanical rooms, central plants and commercial kitchens, where a number of floor drains are located. Before designing this type of venting, check with the local code authorities to verify that it is approved.

Common vents

A common vent vents two fixtures that are back to back, as well as two

to the required distance from the trap to the vent for the various drain sizes.

Suds relief

In a high-rise building that contains numerous kitchen sinks, dishwashers, bathtubs, showers and clothes-washing machines that discharge a large amount of detergents, the flow velocity may create turbulence and generate suds, which collect in the lower portions of the drainage system. When other liquid is introduced into the system, the suds get displaced and will flow to the

path of least resistance, often being forced through fixture traps.

As illustrated in Figure 3, suds pressure areas exist in the following parts of the system.

1. Two suds areas are in the upper-level stack offset serving fixtures on two or more floors above the offset. The first, zone a, extends 40 pipe diameters of the stack upward from the base of the offset. The second area, zone b, extends 10 pipe diameters horizontally downstream from the change in direction.

2. In the upper-level stack offset turning from horizontal back to vertical is zone c, extending 40 pipe diameters of the stack upstream from the fitting changing direction from horizontal to vertical.

3. There are two suds pressure areas in the horizontal runout from a stack where the pipe changes direction horizontally with a fitting greater than 45 degrees. Area d extends 40 pipe diameters of the horizontal pipe upstream from the change in direction, and area e is 10 pipe diameters downstream.

If suds pressure exists, no pipe shall connect to any of the areas indicated in Figure 3. Refer to Table 3 for the actual distances based on the pipe size. ■

Joseph V. Messina, CPD, is the section manager of plumbing engineering for HDR Architects Inc. in Atlanta. He has more than 30 years of experience specializing in plumbing and fire protection system design for instructional, research and medical facilities.

Resources

1. *Plumbing Engineering Design Handbook, Volume 2: Plumbing Systems*, Chapter 3: "Vents and Venting Systems," American Society of Plumbing Engineers.
2. Michael Frankel, *Facility Piping System Handbook, Second Edition*, Chapter 9: "Plumbing Systems."
3. Vincent T. Manas, PE, *National Plumbing Code Handbook, Standards and Design Information*.

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Bristol's Six Principles for Good Solar Hydronic Design

#54: The cost of DHW recirculation

In buildings where the Domestic Hot Water (DHW) heat source is a long way from the hot water fixtures, a circulator pump is often used to force hot water from the water heater through the hot supply pipes to the base of the fixtures and then back to the water heater through a "recirc return" pipe. In a previous article (fall of 2010) I wrote about this in some detail. A well-controlled solar heated DHW tank will lose only a fraction of a degree (F) per hour overnight, providing "shower temperature" water the next morning. When the DHW recirculator is left running all night, all the solar heat stored in the tank may easily be lost overnight, requiring backup heat to kick in every morning to provide shower temperature.

Recently, with the advent of continuous data-logging and remote control provided by our SolarLogic Integrated Controllers (SLIC), we have been able to observe and record the performance of various recirculator control methods in greater detail. Now, using remote monitoring, we can measure the heat loss and calculate the cost of the recirculator based on the results from actual field installations.

TABLE 54-1: Annual Cost of Various DHW Recirculator Control Schemes in Santa Fe, NM (using propane).

	24/7	Timer off midnight - 6AM	Timed- temp	Demand- temp	No recirc
added cooling AC, KWH	\$ 133.34	\$ 108.46	\$ 133.41	\$ 59.98	\$ -
propane to maintain DHW temp	\$ 948.29	\$ 746.46	\$ 993.46	\$ 309.18	\$ 141.00
boiler and DHW pump cost	\$ 56.63	\$ 42.49	\$ 31.74	\$ 27.44	\$ 8.36
recirc pump cost KWH	\$ 77.48	\$ 54.36	\$ 27.38	\$ 7.55	\$ -
total cost of convenience	\$1,235.95	\$ 952.17	\$ 785.78	\$ 404.16	\$ 149.36

TABLE 54-2: Cost of Various DHW Recirculator Control Schemes Averaged over the U.S. based on the Santa Fe heat loss data.

Heating Fuel	24/7	timer	timed-temperature	demand-temperature	no recirc
Propane	\$ 1,233	\$ 952	\$ 786	\$ 404	\$ 149
Electricity	\$ 1,507	\$ 932	\$ 770	\$ 396	\$ 148
Fuel Oil	\$ 1,195	\$ 891	\$ 737	\$ 375	\$ 138
Natural Gas	\$ 568	\$ 429	\$ 370	\$ 187	\$ 87

Control option review

Here is a list of typical controls often installed to control the energy usage of the DHW recirculator.

1. Temperature setpoint switch. The easiest and cheapest way to limit the run-time of the recirc pump is to put a sensor on the recirc return pipe that turns the pump off when hot water comes back from the building. This can be a snap-disc, a cap-tube or an electronic setpoint controller. When the return pipe cools off, the pump runs only until hot water arrives back in the mechanical room and then pauses until the pipe cools again. For proper control, it is important that the circulation loops be balanced.

2. Timer switch. It is very common for a clock timer switch to be used to allow the recirculation pump to run only during critical occupancy hours. The timer switch is often used along with the setpoint control mentioned in No. 1. The biggest drawback of the common timer switch is that the clock must be reset after a power failure.

3. Manual demand switch. A momentary contact switch that resembles a doorbell button can be placed at each hot water fixture. This is for users who are energy conscious and don't mind "asking for instant hot water" by pressing the button. Both wired and wireless button systems are available these days.

4. Automatic demand switch. An automatic switch such as an Infrared Red (IR) motion detector or IR beam switch can be installed near each hot water fixture. This type of sensor uses a relay to "press the demand button" whenever it senses that somebody is nearby.

A timer or setpoint switch is used to turn off the demand circulation after a reasonable amount of time in both manual and automatic systems.

The manufacturers of hot water recirculation pumps and hydronic controls offer many of these controls and features either built onto their pumps or as add-on control packages. Some are fairly sophisticated, with sensors and timers built into the pumps and electrical connections for a demand switch. If you haven't seen this equipment at your local supplier, ask them about it. Good recirc control is just as important for non-solar as it is for solar water heater systems for peak energy performance.

Control scenarios for comparison

For comparison purposes, we have identified five different control schemes that can be implemented using control settings that are built into the SLIC control system. They are defined as follows:

1. 24/7. No recirculator control; the recirc pump runs continuously day and night.

2. Timer. Time clock switch turns on recirc pump only during occupancy hours.

3. Timed temperature. Time clock switch is installed with a return water temperature sensor switch to pause the recirc pump whenever the return pipe is hot.

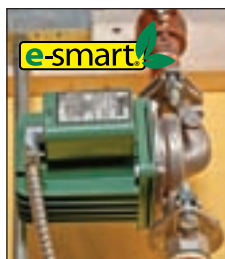
4. Demand temperature. A demand switch (either manual or automatic) is installed along with a timer switch or temperature switch that shuts off the recirc pump after the necessary run-time required to deliver hot water to the fixture.

5. No recirc. No DHW recirc pump is installed at all. When these control schemes are implemented, the results are calculated for comparison below. In summer, the heat that is released into the building from the DHW recirculation piping must be removed by the air conditioning

Continued on page 50

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system, if one is used. This is in addition to the more obvious energy costs of running the circulator pump(s) and replacing the heat that has been removed from the DHW storage tank. All of these costs are included in this comparison.

Recent cost comparisons

Table 54-1 shows the cost of the five different control strategies for DHW recirculators described above. The cost is modeled on actual heat-loss rates that are taken from data provided by a residential DHW system in Santa Fe, N.M., which uses propane as the heating fuel. This is a common fuel in areas outside the population center of Santa Fe. The scenario is strictly about energy efficiency; i.e., it does not assume that there is a renewable energy system providing free heat or electricity.

The bottom line results above will vary in other locations according to the local cost of heating fuel. Table 54-2 below looks at that variation. The energy prices used in the model are an average of prices across Los Angeles, Chicago, New York, Seattle, Atlanta, Washington, D.C. and Miami from September 2012, Bureau of Labor Statistics.

Of course, the calculations in these two tables are based not only on DHW heat loss data, but also on some assumptions such as air conditioner efficiency, backup

boiler efficiency and pump run times. Reasonable assumptions were chosen, based on the equipment used in the Santa Fe residence, so that the comparative costs (and savings) are realistic.

Final Notes

Special thanks to Dr. Fred Milder for the data-analysis, calculations and the results provided in the two tables included in this article. Dr. Milder is CEO of SolarLogic LLC and is largely responsible for the development of the SLIC control system and its data-logging and remote control functions. ■

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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The graphic features a red background with yellow stars, a clapperboard, and a film strip showing various people.

"Change is the law of life.
And those who look only to the
past or present are certain to
miss the future"

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EST. 1961



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I had an eye-opening visit to New York recently. While in town I had the opportunity to visit some jobsites. I always jump at the chance to get out in the field. It is fun for me to see how the products we manufacture are applied.

I've known Moses Fishman and Kal Rotenberg for many years. I believe I met Moses on an ISH trip a few decades ago. We cross paths at various association meetings from time to time. Both Moses and Kal are somewhat shy about sharing job photos. Not!

After meeting and gabbing at the RHC Conference in



The engineering and detail that was going into the construction of this "mega" mikvah was amazing.

Providence, R.I., I renewed my desire to visit some of their unique jobs. As luck would have it, I was doing some training for the team at Rathe and Associates on Long Island. Don Rathe arranged to visit several of their jobs in the city.

Moses and Kal have positioned themselves as the go-to team for mikvah piping and controls. Moses and his crew handle the piping and Kal specializes in the controls portion of the installations. A mikvah is a ritual purification bath taken by Jewish people on certain occasions.

Rivkah Slonim describes a mikvah best: "The world's natural bodies of water — its oceans, rivers, wells and spring-fed lakes — are mikvahs in their most primal form. They contain waters of divine source and thus, tradition teaches, the power to purify. Created even before the Earth took shape, these bodies of water offer a quintessential route to consecration. But they pose difficulties as well; they may be inaccessible or dangerous, not to mention the problems of inclement weather and lack of privacy. Jewish life therefore necessitates the construction of mikvahs (pools); this has been done by Jews in every age and circumstance.

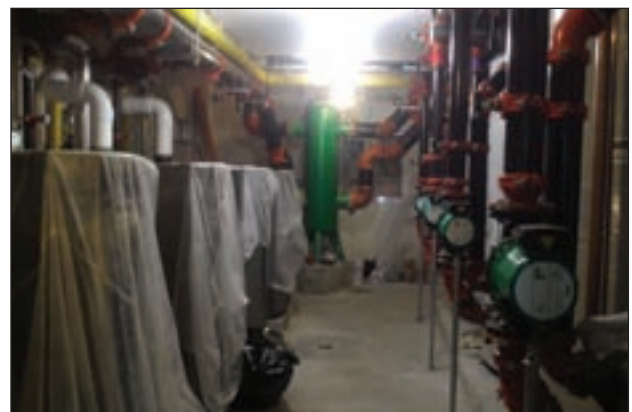
"Briefly: A mikvah must be built into the ground or built as an essential part of a building. Portable receptacles, such as bathtubs, whirlpools or Jacuzzis can, therefore, never function as mikvahs. The mikvah must contain a minimum of 200 gallons of rainwater that was gathered and siphoned

into the mikvah pool in accordance with a specific set of regulations. In extreme cases, when the acquisition of rainwater is impossible, ice or snow originating from a natural source may be used to fill the mikvah. As with the rainwater, an intricate set of laws surrounds its transport and handling.

"The casual observer will often see only one pool, the one used for immersion. In reality, most mikvahs are comprised of two, sometimes three, adjoining pools. While the accumulated rainwater is kept in one pool, the adjacent immersion pool is drained and refilled regularly with tap water. The pools share a common wall that has a hole at least two inches in diameter. The free flow, or 'kissing,' of waters between the two pools makes the waters of the immersion pool an extension of the natural rainwater, thus conferring upon the immersion pool the legal status of a mikvah. Modern-day mikvah pools are equipped with filtration and water purification systems. The mikvah waters are commonly chest high and kept at a comfortable temperature. Access to the pool is achieved via stairs."

The engineering and detail that was going into the construction of this "mega" mikvah was amazing. From the gravity feed rainwater to the deep well water that was "burped up" from the ground with compressed air, it was a fascinating look at traditional engineering.

To a plumber, the biggest challenge is how to supply almost endless DHW to the baths with a continuous, fast fill of 100-degree water. At the first mikvah we visited, Moses and Kal provided the heated water with large TurboMax reverse indirect tanks. A bank of Lochinvar boilers provided the horsepower. The equipment was shoehorned into a small basement space, yet, with the careful planning and installa-



The equipment was shoehorned into a small basement space, yet, with the careful planning and installation, every component was serviceable.

tion, every component was serviceable. In addition to the large DHW dump load required by the mikvahs, a shower stall was provided for each tub, requiring yet more DHW.

Continued on page 54



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Modern Hydronics

Continued from page 52

As with most projects, mechanical space was at a premium. The projects we visited were assembled like a giant jigsaw puzzle by the team. Hydro separators and some of the pumps and piping needed to be installed in a specific order, or in layers, so to speak. Access to service and replace components was also provided, with thoughtfully

placed valves and unions.

Working in the downtown areas of Brooklyn, the project involves logistics for product delivery and placement into the building. In some instances, the equipment needed to be lifted into place with a truck crane before the windows were installed.

Most impressive was the “mega”

mikvah project that was still under construction. Located on Walworth Street in downtown Brooklyn, this was the second stop on our visit. This project included 85 baths with about a 1,700-gallon capacity each. The design required the ability to fill a tub every 30 minutes. Redundancy was built in to allow this load to be covered even with one boiler (20 percent of the system) down. The DHW production system is comprised of Lochinvar boilers and Laars storage tanks with B&G copper tube bundles. Wilo pumps move the energy at a 211gpm flow rate to generate 2,060 gallons per hour.

The team also designed and built plated copper tube heat exchangers to place in the tub. The exchangers could be used to quickly raise the tub temperature from 80 to 98 F in a 20-minute period. Kal's unique control strategy provided redundancy and alarms to ensure the system is always online. The control will notify the technician in the event of a malfunction or loss of performance.

The thought that went into installing the equipment was amazing. Careful consideration was paid to service and repair access too. The ability to have redundancy and easily remove and replace components was critical. Adding to the challenge were the tight working conditions and the small mechanical space allocated.

Please remember to help and support the folks struggling from hurricane Sandy. Just a week after I visited these jobsites, Sandy changed the lives and landscapes of many in this area. Moses and Kal are first responders and EMTs in the Brooklyn area and selfishly leave their homes and loved ones to aid and assist. The Red Cross and groups like www.121212concert.org are a few to consider supporting. ■

Bob “Hot Rod” Rohr has been a plumbing, radiant heat and solar contractor and installer for 30 years. Rohr is a longtime RPA member and Plumbing Engineer and Phc News columnist. Bob joined Caleffi North America as manager of training and education.

The views and opinions expressed in this column are those of the author and do not reflect those of Plumbing Engineer, TMB Publishing, or ASPE.

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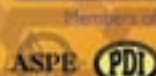


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Alternative Energy

By Max Rohr, contributing writer



Climate middle ground

This election season was a disappointing one for those concerned about climate change. For the first time since 1988, no questions about global warming were asked of a candidate in the presidential debates. In an election cycle where over one billion dollars were spent on ads, you would have thought climate change would have come up more. I find it cowardly that both candidates and the media ducked this issue. It seems that there is an underlying stalemate between Republicans and Democrats. This election cycle, climate change was either deemed too much of a hot button topic or unimportant. The result of this deadlock is no conversation and no action.

You would think that the only two options
for dealing with climate change are denying
that it is a problem or regulating industry
into oblivion to cut carbon emissions.
These are not our only choices.

The United States electorate has deemed climate change worth talking about: 68 percent of Americans now believe that climate change is a serious issue, this is up from 46 percent in 2009. Of these respondents, 41 percent believe the globe is warming because of human activity, while 38 percent believe the causes are planetary trends. The political attention on this issue seems to focus on the split between why the respondents think the planet is warming instead of building upon the fact that so many are in agreement that we should be doing more.

Landscape-changing storms are happening more often. Ten of the top 15 years with the most named tropical storms have occurred since 2000. Nine of the top 10 warmest years in modern meteorological record have happened since 2000. 2012 is shaping up to be the warmest ever recorded by the National Climatic Data Center. The world is getting warmer at an alarmingly fast rate. These numbers are not based on esoteric climate models but on measured temperatures and numbers of storms.

For the last four years, our elected federal officials have passed a dismal amount of climate change legislation. You would think that the only two options for dealing with climate change are denying that it is a problem or regulating industry into oblivion to cut carbon emissions. These are not our only choices. I will not accept that the issue of climate change continues to be deadlocked. The most damaging storm is the storm of inaction in our houses of legislature.

There is a group of Americans who think that this whole climate change business is either a hoax or nothing for

humans to concern themselves with. I would humbly presume that the majority of Americans don't think the earth is a disposable napkin. Needless waste is not glorified in any holy book I am aware of. The EPA has been painted as a radical left wing group that is trying to destroy industry; what they actually strive to do is keep poison out of the air we breathe and the water we drink. Sensible regulation of pollution and economic growth are not opposing forces, nor do they stand in defiance of religion.

My criticism of the scientific community is their lack of respect for the religious point of view. Some hardline scientists say religion is the problem, because it excuses destructive environmental behavior. The scientific community gets less done by demeaning anyone who doesn't have the exact same worldview. Having faith in a higher power doesn't make someone an inferior thinker. To some extent, climate change policy has stalled because of the scientific community's inflexibility.

President Obama has had four years to spearhead a comprehensive policy to address climate change without crippling our economy. He did not make this happen; a few mentions of a warming planet are not a viable policy. Investing in research and development is good, but it is not enough. After Solyndra went out of business, Obama failed to find a balanced alternative that could engage the other side of the aisle.

On the other side, Governor Romney mentioned a warming planet in his convention speech this year. Romney said, "President Obama promised to begin to slow the rise of the oceans and to heal the planet. My promise is to help you and your family." This line was



The United States electorate has deemed climate change worth talking about: 68 percent of Americans now believe that climate change is a serious issue, this is up from 46 percent in 2009.

used as a zinger and drew a laugh from the crowd, as if both tasks can't be accomplished. Romney supporters in

the wake of Hurricane Sandy may not find that line as funny now. It was in poor taste at the convention in Florida, as that too was disrupted by a hurricane.

Climate change is not a joke; 97–98 percent of the most actively publishing climatologists believe that humans are causing our climate to change. While some climate change projections can be labeled as overly dramatic, recorded surface temperatures in the last few decades show an alarming trend. As a planet, we are getting hotter and dryer, and storms are becoming more frequent. All of the other long-term planetary-trend warming periods in our history have occurred over hundreds of years, not thirty. As the Rasmussen poll shows, the level of concern is rising among Americans.

The image of President Obama and Governor Christie sharing a solemn moment in the shared concern for citizens in the path of Sandy was inspiring. Two of the biggest political foes of this election cycle came together to set aside politics and help the voters they had been courting. It sheds a light on how our politics should be. In the wake of a hurricane there was no finger pointing or point scoring by these two leaders. I thought it was a very sobering moment, especially after such a long and divisive election season. Political foes may disagree on specific ideas or policies, but the smart ones know that digging in their heels and avoiding any compromise isn't helping us

stay relevant as a nation of leaders.

As I have said before and will say many more times, renewable energy is the answer to so many problems. What do we have to lose by slowing down our nation's use of fossil fuels? Worst-case scenario, we commit to renewables, and it doesn't have a drastic effect on the amount of storms or warming. Best-case scenario, we do the same thing, and the trend of climate change starts to level off. In both the best and worst case scenarios we would be moving towards energy independence by utilizing renewables.

Energy independence has bipartisan benefits. We can create jobs here that are currently held overseas, and we can do our part to protect the environment that we live in. It is beneath us as Americans to avoid the subject of climate change. Compromise is always better than stalemate.

Max Rohr is a graduate of the University of Utah. He is currently an outside salesperson at Shamrock Sales in Denver. He has worked in the hydronics and solar industry for the last 10 years in the installation, sales and marketing sectors. Max is a LEED Green Associate and a BPI Building Analyst and is passionate about green technology. He can be reached at max.rohr@mac.com.

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Plumbing Engineer's

LEAD FREE REPORT

Get The Lead Out Plumbing Consortium Highlights the Impact of the Lead Free Law

ROLLING MEADOWS, ILL. – On Nov. 9, members of the newly formed Get The Lead Out Plumbing Consortium met with the media to highlight how the group is working together to explain the impact of the national “Reduction of Lead in Drinking Water Act” on the plumbing industry. The meeting was held at the Plumbing Manufacturers International offices in Rolling Meadows, Ill., at the invitation of the Plumbing-Heating-Cooling Contractors—National Association (PHCC) Educational Foundation.

Roger Peugeot, vice chair of the PHCC Educational Foundation and owner of Roger the Plumber in Kansas City, Mo., spoke on behalf of the consortium. He explained how industry-wide compliance with the amended Safe Drinking Water Act that takes effect on January 4, 2014, will reduce the permissible levels of lead in pipe, fittings and fixtures to a weighted average less than or equal to 0.25 percent from the current national standard of an 8.0 percent maximum.

The mission of the Get The Lead Out Plumbing Consortium is to provide education about the manufacture, distribution and installation of lead free plumbing products. Lead free refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average ≤ 0.25 percent per the Safe Drinking Water Act (Sec. 1417) amended 1-4-2011 and other equivalent state regulations. To this end, the consortium has developed a training program about lead free plumbing products that will be offered at industry meetings in 2013. Online training options will also be available, as well as a website that will include a calendar of events, FAQs and other resources.

Members of the consortium include: American Society of Plumbing Engineers (ASPE), American Supply Association (ASA), International Association of Plumbing and Mechanical Officials (IAPMO), International Code Council (ICC), Legend Valve, Milwaukee Valve, NIBCO Inc., Plumbing Heating Cooling Contractors—National Association (PHCC), PHCC Educational Foundation, Plumbing Manufacturers International (PMI), Reliance Worldwide, Viega, LLC, and Watts Water Technologies.

Watts lends its expertise to Get the Lead Out Plumbing Consortium

NORTH ANDOVER, MASS. – Watts Water Technologies has joined a new coalition formed by PHCC and other industry leaders. The Get the Lead Out Plumbing Consortium is charged with providing education about the manufacture, distribution, and installation of lead free plumbing products to contractors/apprentices, distributors, plumbing engineers and code officials.

Watts Water also continues adding resources and tools to its educational website, WeAreLeadFree.net. Originally launched in 2009, this comprehensive (and growing) collection of resources includes: product look-up guide for lead free equivalent products; an educational white paper on preparing for national lead free compliance; in-depth information on the upcoming lead free transition in Louisiana, which takes effect January 1, 2013; an informational video on how Watts Water is preparing for the change and video testimonials from customers in Vermont who have already made the lead free transition. ■

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WATTS
WATER TECHNOLOGIES

What You Need to Know About Pressure Booster Design Under Standard 90.1

By Chris Edmondson

By October 18 of this year, states must certify that they have updated the provisions of their commercial building code regarding energy efficiency to meet or exceed ANSI/ASHRAE/IES Standard 90.1-2010: Energy Standard for Buildings Except Low-Rise Residential Buildings.

Design professionals who are aware of this rather pivotal change will surely wonder what this means in terms of HVAC design, lighting, building envelope, etc. However, few plumbing engineers realize the significant impact that this requirement will have on pressure booster design. You may be surprised to learn that these new requirements, imposed per ruling by the U.S. Department of Energy (DOE), effectively put an end to constant-speed pressure boosting. You may also be surprised to learn that the way we are currently designing variable-speed pressure boosters will not meet the new requirements.

These changes are literally months away, and in some states they are already in effect under current state energy codes. Other states will be forced to adopt these changes by October 18 or else formally request an extension. To determine the precise requirements for any given state, you can go to the International Code Council website (icc-

safe.org). This article focuses on the specific changes outlined in ASHRAE 90.1-2010 that impact pressure booster design.

Death to Constant Speed

The specific changes to service water pressure booster systems, as outlined in ASHRAE 90.1-2010 Chapter 10, Section 10.4 are as follows:

- One or more pressure sensors shall be used to vary the pump speed and/or start and stop the pumps. The sensors shall be located near the critical fixtures that determine the pressure required, or logic shall be employed that adjusts the set point to simulate the operation of a remote sensor.
- No device shall be installed for the purpose of reducing the pressure of all of the water supplied by any booster system pump or booster system, except for safety devices.
- No booster system pumps shall operate when there is no service water flow.

Collectively, these three requirements will transition nearly every booster system to variable speed. First, by using the most critical fixture as the sensing point, pressure boosters will be required to vary pump speed over a much wider range. This is a critical departure from most pressure-boosting systems in use today, where the pressure sensor is installed locally in the discharge header of the pumps. The pumps are controlled based on a set point that equals the minimum suction pressure and the required boost. In the example shown in Figure 1, the pumps would have to maintain a discharge pressure of 74 pounds per square inch gauge (psig) in a conventionally controlled system using local sensors at the discharge. However, if the sensors are located at the most critical fixture (or otherwise based on demand) the pumps could vary downward to as low as 54 psig. This represents a dramatic reduction

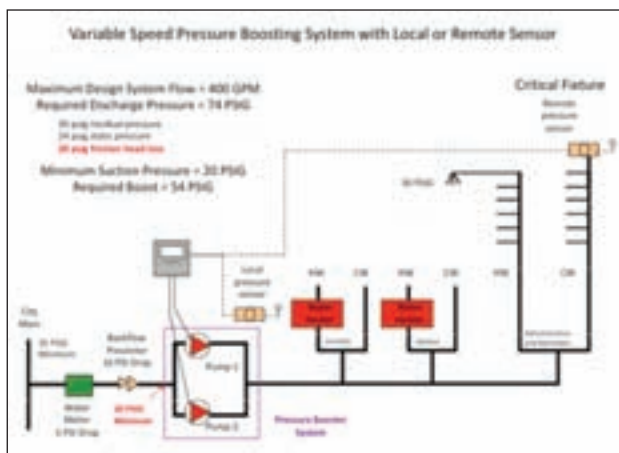


Figure 2 Variable-Speed Pressure Boosting System with Local or Remote Sensor

in overall pump speed—in this case a 26 percent reduction as opposed to a 10 percent reduction when sensing at the discharge header.

Secondly, the very common practice of installing pressure-reducing valves (PRVs) on the pumps shall be prohibited, with the exception of safety valves installed for the purpose of keeping discharge pressures below 80 psig. In other words, you cannot constrict pump flow to keep downstream pressure at a predetermined limit.

Finally, the pumps shall not operate when there is no demand for water. This presents certain challenges with respect to short-cycling when there are minor, intermittent demands. This will be addressed later in the article.

Change Is Good; Saving Energy Is Better

These are major changes, which many in the industry may view as being thrust upon them with little warning or resources for how to make it all work without major increases in installed cost, especially when it comes to demand-based pressure sensing. The idea of wiring remote sensors is not likely to be embraced by many owners, engineers, or contractors, simply due to the labor and expense involved. However, when you closely examine the potential savings for a new demand-based control path

cate, meaning that the vast majority of pressure boosters are already oversized.

- Variable head loss: As flow decreases, friction loss also decreases. Constant-speed pressure boosters do not adjust for these consistently recurrent variable head losses, using far more energy than actually required.

- Pressure-reducing valve losses: Pressure-reducing valves typically have a pressure drop of up to 5–8 psi, which must be taken into account when sizing the pump/motor. Thus, PRVs create a permanent energy burden on pressure-boosting systems. Eliminating PRVs would have a significant impact on the overall energy consumption of pressure booster systems.

- Varying system loads: Booster systems experience widely varying system loads over the course of 24 hours, yet pumps are selected for the peak flow rate—a condition that may occur for only a short period of the day. Thus, for most of the day, pressure boosters are over-pumping.

- Changing suction pressure: Booster systems typically experience a wide variance in suction pressures throughout the day unless the pumps are drawing from a tank. However, systems are designed based on the minimum available suction pressure. Constant-speed systems do not capitalize on intermittent increases in suction pressure, whereas variable-speed pressure boosters will slow down under these conditions.

Applying variable-speed pressure boosting with demand-based control eliminates the waste associated with all of the above scenarios, but how much energy (and money) will it really save? As an example, consider again the system in Figure 1. Changing the sensor location from the discharge header to the

Table 1 Pressure Booster System Control Strategy Comparison*

Strategy	Operating Costs
Two constant-speed pumps, 50/50 percent split	\$4,331/year
Two variable-speed pumps, with local sensor located at discharge header with 50/50 percent split	\$4,873/year
Two variable-speed pumps, with remote sensor located at most critical fixture with 50/50 percent split	\$3,205/year

*Based on 10-psf variable-suction pressure and 20-psf friction head loss at 80.10 per kWh

when compared to constant-speed systems (and their inherent waste), it becomes apparent that this is a change for the better. It may also be encouraging to learn that hardwiring sensors is not the only available option for demand-based control.

The DOE was not without motive when it made the decision in late 2011 to make Standard 90.1–2010 the commercial building reference standard for state building energy codes. The DOE determined through quantitative analysis that the standard will have a significant impact on building energy consumption—to the tune of approximately 18.2 percent over Standard 90.1-2007. In other words, it just makes sense.

In terms of pressure boosting, you need only to look at the current widespread waste associated with constant-speed pumping to come to terms with why these particular changes belong in the energy codes. Consider the following common characteristics of virtually every constant-speed booster system in service today.

- Oversized pumps: It is a well-accepted fact that engineers tend to err on the side of oversizing pumps. This problem is magnified by the fact that many new buildings have high-efficiency plumbing fixtures, and many state codes are now requiring their use. This decreases the demand for water below what Hunter's curve would indi-

cate. This speed reduction translates into some pretty significant monetary savings for owners. If you factor in changing the sensor location along with eliminating PRVs, compensating for varying suction pressure conditions and system loads, then the energy savings can be more dramatic. The following comparison reflects these savings.

This level of operational efficiency delivers an attractive payback, but there are other financial incentives to consider. Utility companies in most if not all states offer attractive rebates, sweetening the pot for the application of variable-speed drives alone. These rebates vary from state to state, but typically deliver a return of approximately \$100/horsepower. (More detailed information about state-by-state rebates for VFD applications can be found at dsireusa.org.) Unfortunately, these rebates are frequently underutilized simply because owners and many engineers are unaware they exist. However, the payback is compelling, and it could be argued that engineers have a fiduciary responsibility to present owners with these options and benefits, regardless of impending building codes.

Given these financial incentives, there is little if any justification on the part of the well-informed plumbing

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Pressure booster

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engineer not to recommend a system that meets the pressure booster criteria of Standard 90.1-2010 sooner rather than later.

Making It Work

The most energy-efficient pump is the pump that isn't on, which is why Standard 90.1-2010 prohibits the operation of booster system pumps when there is no service water flow. Ascertaining that booster pumps only operate when there is a call for domestic water without short-cycling means two things: (1) an effective demand-based sensing control must be in place and (2) the system must be adequately pressurized during low demand periods to meet minor, intermittent demands, such as the occasional 3 a.m. toilet flush or glass of water.

Addressing the latter prerequisite first, a properly sized hydropneumatic tank is required to prevent short-cycling of the booster system. Hydropneumatic tanks are ASME and non-ASME vessels that hold water and air under pressure. The compressed air creates a cushion that can absorb or apply pressure as needed to provide efficient water supply under low demand conditions without the operation of the pumps. These tanks should be sized based on the length of time the designer theorizes that the booster pumps should remain inoperable in a no-flow condition, the type of building and application, and the tank location

in relation to the pressure booster pumps. It is important to remember that if the tank is too small, the booster system will short-cycle, which wastes energy and shortens equipment life. It is a misnomer that variable-speed booster systems can operate effectively without a hydropneumatic tank. Invariably, short-cycling will occur without this low-cost pressurization strategy in place.

Of course, control is key when it comes to efficient variable-speed pressure booster control, which is why Standard 90.1-2010 specifies that the pressure sensor must be located near the critical fixtures or some other logic be applied to simulate operation of a remote sensor. Clearly, many will balk at the idea of hardwiring a remote sensor because of the expense and complexity. Wireless sensors are a possibility, but many, with good reason, will hesitate to use this type of technology because of the reliability and also the expense. What alternatives exist?

Surprisingly, the answer comes down to a basic law of fluid dynamics that every engineer knows well: flow varies as the square root of differential pressure changes. If you know the flow, then the differential pressure changes can also be determined. By sensing the demand (flow) of the pressure booster, the discharge set point can be reset continuously based on demand. This reset is based on the amount of variable head lost in the distribution piping between the booster discharge and the critical fixture. By knowing the demand and variable head loss it is possible to create a virtual remote sensor. This allows the owner to achieve the energy savings of a remote sensor without the added installation cost of mounting and hardwiring a remote sensor.

These control measures can be accomplished in the field or custom designed and special ordered, although design and installation costs, and sometimes reliability, may be a deterrent. However, at least one manufacturer of prepackaged variable-speed booster system includes this built-in logic on their units, already programmed for the given application. In this case, the added cost is all but negligible, and the owner has the peace of mind of single-source accountability.

This is valuable information to have on the eve of the adoption of Standard 90.1-2010 into commercial building codes. But given the potential for savings, the obvious question for engineers and building owners is "Why wait?" ■

Chris Edmondson is the CEO of James M. Pleasants Company (JMP), a manufacturers' representative specializing in the sales and application of equipment for hydronic, steam, and condensate systems. In addition to his employment with JMP since 1971, he has served ASHRAE in a multitude of capacities from Chapter President to Chapter Program Chairman. He is a Distinguished Lecturer for ASHRAE and currently serves on the organization's nominating committee. He frequently lectures to engineers on topics relating to energy savings, primary/secondary variable-volume systems, heat transfer, hydronic systems, plumbing piping systems, and central chilled water plant design.

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Heavenly Heat

Integrated team approach pays off for a church boiler upgrade

By Jim Schneider

St. Mary's Episcopal Church in Park Ridge, Ill., has been serving the community since the 1890s. The parish began as a mission in 1895. Over the years, the property expanded, with additions built in 1913 and 1923.

Today's church complex spreads across the property and offers worship space, as well as meeting rooms, offices and other facilities.

Properly heating a space like that is no small task. For many years the burden was shouldered by two 900,000-Btu Weil-McLain cast iron boilers, which were installed back in 1964. The old boilers did their job well for decades, but the time finally came for an upgrade.

"A parishioner we had been servicing for about 15 years served on the St. Mary's board and asked us to give a presentation to the church about replacing the old boilers," explains Dan Schacke, president of Home Comfort, the contractor and installer on the St. Mary's boiler replacement project. "I spoke to Jay Needleman, who is in charge of maintenance at the church. There were two [Weil-McLain] J Series boilers there, so we gave a quote to replace them with two new LGB 7s. We also gave a preliminary quote with two Weil-McLain high efficiency condensing boilers."

The parish had three other bids, but ultimately they liked what Home Comfort was offering, as well as its proximity. "We had a good relationship with the client; one of the things they love about us is that we're only a mile away," Schacke adds. "We take care of five or six churches; that helped us get the job as well."

When the job was set, the first step was to determine the heat loads for the building and to see what size boilers were needed. "We went out to the church for a few hours, digging in every nook and cranny of the complex, trying to find any radiator buried anywhere in an effort to come up with an accurate load," explains Bill Gorgius, installer and boiler specialist with Home Comfort. Piotr Zelasko from Able Distributors also joined in to help with the design and preliminary groundwork. With the loads determined, work began on getting the right components and planning the installation. "When I put together the materials I needed, there were some

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Boiler upgrade

continued from page 63

oddball things that needed to be ordered, but once we got the OK to go ahead and determined the schedule, things picked up steam quickly," says Gorgius. "I sent Able Distributors a list of materials; within a couple of hours they had answers for me: 'It's coming here, here's the price ... it'll be there when you want.' That's what made the project go smoothly. We didn't have to wait for anything. On day one we had the boilers down here, we had our large fitting delivery. Jay [Aponte] and I were able to lay it all out and go to work."

The ultimate success of the boiler replacement project was in large part due to a truly integrated team approach. It meant the contractor, distributor and manufacturer worked together as a single unit. "This is the culmination of generations of understanding and passion about boilers, hot water, comfort and teamwork," says Michael Bleier, vice president of Able Distributors. "It's an example of how a manufacturer works with a wholesaler and how a wholesaler can hopefully add some value in today's world, where value is hard



The church received a utility rebate of \$2,500 for each of the two high-efficiency boilers it installed.

to find or is sometimes overlooked because price is so important."

Swapping in the new boilers basically meant melding new technology with an old delivery system. That required lots of planning and forethought on the part of the project team. Getting the flue pipe through the small existing chimney presented a challenge. "The existing chimney and flue also had a water heater going into it; we had to take everything out of the flue so we could use that as a chase for our new PVC exhaust system," Schake says. "We wound up pulling out their old gas water heater and replacing it with an electric water heater."

The sheer weight of the equipment also presented some issues with suspending it from the ceiling. "With the rafter design, there were steel trusses, so we had to break into the ceiling and tie to the girder system to support the weight of all the heavy piping," explains Jay Aponte, installer with Home Comfort.

"The old boiler is long gone, but the original piping system still exists," Gorgius says. "The challenge was trying to figure out how to make this work with that in an efficient manner."

Settings and savings

All parts of the team were involved in the process, and once the design was laid out and the components assembled, the actual installation went pretty smoothly. This was largely due to the fact that a great deal of pre-planning went into the install. "It went pretty much according to plan," Gorgius recalls. "The biggest hiccup was getting the boilers down the

stairs; other than that everything went without a hitch. We had great support. Piotr [Zelasko from Able Distributors] and I designed it, and we followed it to a tee."

"It's a nice, clean install," says Mike Gambill, commercial specialist with Weil-McLain. "I looked at the primary and secondary piping and the multiple boilers they had clipped into the sequence and how they had to zone out for the two separate zones, one feed."

Part of what makes the installation work as well as it does is the way the controls have been set. "The way the two boilers are staged up, one that is operating off the built-in Weil-McLain controls," Gambill continues. "I noticed that one of them has been set up as the lead boiler with a 60 F outdoor ambient. That boiler has a time delay. Before time and temperature, it'll bring the second boiler on and parallel those together. Since it sets time over temperature, they put a different setpoint on the second boiler, which I think is really unique, creative and smart. The second boiler has an outdoor ambient of 55 F to kick in. So it has to be cold enough in order for, not only the second stage to come on, but also the outdoor ambient. That also affects the heat loss of the building."

The old boilers had been made for decades and had an IBR rating in the 70s or low 80s. "The boilers the church has now have an IBR rating of 94, but if you lower the ambient temperature, they'll run up to IBR ratings of 96 or 97 easily," Gambill says. "That's the operating efficiency range where you'll really save energy."

According to Gambill, the efficiency rating is just part of the equation. There are seasonal efficiencies to be gained by varying the target temperature according to the outdoor ambient temperature. "The building loses more energy when it's colder outside. By reducing the target temperature when it's warmer outside, we burn less fuel because of the duration time it takes to get from cold start to that lower setpoint."

The boilers also have a five-to-one modulating turndown. "As they come up toward their target temperature, they can modulate down and only burn 20 percent of the energy that a normal on/off boiler would," Gambill continues. "By adding indoor and outdoor resets and high turndowns, you really curb the spikes off the top and bottom and tighten your energy savings. I've seen bills cut by anywhere from 20 to 60 percent, depending on the building's operation."

Adjustments to the system are being made as it enters its first winter, but the system is running smoothly, and the parish is pleased with the results of the replacement project. In addition to the long-term energy savings the update should bring, there was a pleasant surprise on the financial side. "When we were finishing up, I asked Jay [Needleman] for his signature on a form. I told him he would get a \$2,500 Nicor utility rebate for each boiler," Schake recalls. "They already got the check for \$5,000. They didn't expect it, and I didn't even expect it when I bid the job. We didn't think about it until we were doing the installation and one of the guys brought it up. We looked into it and got the church the rebate."

Every dollar counts and, for a parish that plans to be around for at least another 100 years, the kind of efficient long-term performance this boiler upgrade delivers will pay off many times over. ■

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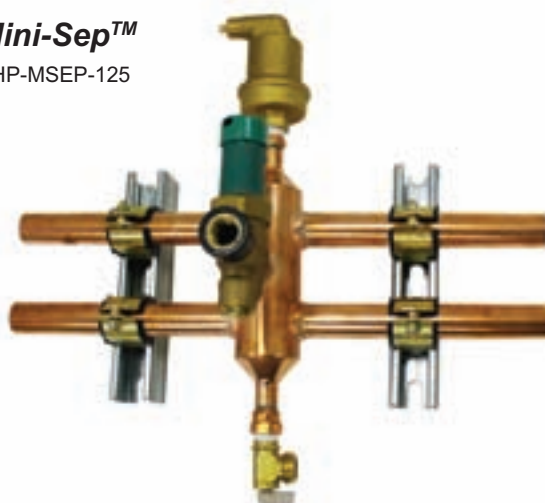
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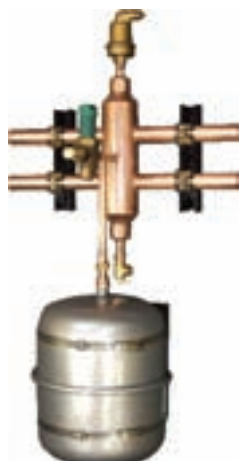
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Mini-Sep Plus™
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Where Will the Next Generation of Mechanical and Plumbing Engineers Come From?

By John R. Nussbaum,
IPP-FASSE-FASPE

The plumbing and mechanical engineering portion of the construction industry is in dire need of attracting young talented people to prepare for shortages due to attrition and lack of students applying to become design professionals in the field. Other engineering fields, such as automotive, electrical, computer science, chemical and civil, as well as health care prosthetic rehabilitation engineering are all drawing students.

It is up to those of us who want to continue having an educated and talented construction industry to find, recruit and encourage young people to take courses and further their education.

Community colleges and universities should be notifying potential engineering students that organizations like the American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE), American Society of Plumbing Engineers (ASPE), American Society of Sanitary Engineering (ASSE) and American Backflow Prevention Association (ABPA) have student memberships at affordable, low student member rates. These national associations and some of their local affiliates also have scholarship money for students who apply and qualify.

Some of these associations are reaching out to gain membership, but is it enough? Association literature needs to entice potential students into looking for careers in mechanical and plumbing engineering.

Chapter level officials should meet with junior and senior high school student counselors and encourage students to consider classes that will prepare them for college courses leading to these professional engineering careers. Association members could also volunteer to go into schools and address the students at assemblies.

The United Association of Plumbers, Pipe Fitters and Sprinkler Fitters Apprenticeship programs promote associate, bachelor, master and doctoral degrees. Apprentices can take college courses online or at night in local community colleges and universities. After completing their apprentice-

ship, students will have earned between 32 and 38 recognized credits toward an Associate degree in Applied Science.

Scholarship money is available for ASSE members' sons, daughters and grandchildren. The Michigan chapter's scholarship program, the John E. Matthews Scholarship Program, is for mechanical and plumbing engineering students who have declared their major in their third year and carry a 3.0 GPA or better; they are eligible to receive scholarship money all the way through school if they maintain that GPA.

Contact John Nussbaum at the ASPE Eastern Michigan chapter for the scholarship information and forms. E-mail jnussbaum@mcadetroit.org or call (313) 341-7661.

ASPE's program, the Alfred Steele Scholarship Program for qualified applicants seeking an engineering degree, is limited to ASPE members and their immediate families who have a GPA of 3.0 or higher and who are enrolled in or plan to enroll full time in an engineering program at a college, university or technical school. Contact skid@aspe.org for more information.

Undergraduate engineering, university-specific, regional, engineering technology and high school scholarships are available from ASHRAE. Information on these national scholarship funds can be found at www.ashrae.org/membership--conferences/student-zone/scholarships-and-grants/ashrae-scholarship-program.

Information about the ASHRAE Detroit scholarship, the Joseph B. Olivieri Scholarship, can be found at <http://gaelicweb.com/detroitashrae/scholarships/scholarships.html>.

We in Southeastern Michigan have money but are lacking applicants, in spite of advertising for them and sending letters to educational institutions that have ongoing engineering courses.

We are obligated to secure an educated, well-trained construction industry to meet the ever-changing technology in our mechanical and plumbing systems design and installations. Our codes and standards demand it. ■



Q&A with Kevin Ruppelt, President and CEO of Eemax



Recently, Plumbing Engineer had the opportunity to chat with Kevin Ruppelt, president and CEO of Waterbury, Conn.-based Eemax. We discussed the company's upcoming 25th anniversary, its operating philosophy, and the state of the tankless business in the U.S.

Can you give a quick overview of the history of Eemax? When, where and how did it start?

Eemax started 25 years ago with one engineers' idea: how do we heat water electrically and do it at the point of use? He started in his garage in Connecticut and, as the technology was accepted and customers discovered the value, it grew into what Eemax is today.

Eemax is celebrating its 25th anniversary in 2013. How has the company evolved over the years?

We are excited about celebrating our 25th anniversary. Eemax has evolved from being a product company to a solutions company. We provide solutions to meet plumbing and safety codes. We provide solutions to save space, water, energy, and money by rethinking the deployment of the water heater from central to a distributed design. We can also help reduce the growth of Legionella by not storing water at elevated temperatures typically found in standard water heaters. We also provide solutions for heating highly corrosive de-ionized water. One can see if you need to heat hot water, Eemax has the solution.

Can you talk about the company's overall philosophy? How does this philosophy guide your approach to manufacturing, as well as relationships with employees and customers?

Eemax's philosophy is to be innovative and customer centric. We listen to customers' issues and develop solutions to solve such issues. As an example, we've integrated a mixing valve into our heater we call AccuMix® to meet the public handwashing code and provide an all-in-one simple solution. Instead of installing the heater and a mixing valve, we combined them into a single device saving labor and calibration time.

We not only provide innovative products, but innova-

tions that make it easier to do business with Eemax. We recently launched a full complement of BIM/Revit drawings. This allows engineers to simply download our product drawings for a quick and easy way of specifying our products in their new buildings.

Can you tell us about the new facility Eemax is about to open?

Eemax has grown over 80 percent during the past 6 years, but that's just the beginning. Our goal is to double our business over the next 5 years. That's why we needed to expand our factory.

Our primary goal was to move to a location convenient for our employees so we retain our excellent workforce. We relocated to Waterbury, Conn., and doubled our facility. We have a world-class team of engineers, accountants, sales, marketing, customer service technicians and a productive/dedicated manufacturing team. We are investing in new plant equipment, IT technology, engineering test labs, a training center and new products.

Eemax is committed to manufacturing in the U.S. It allows us to be responsive to our customers and to provide customized solutions to meet their unique needs. For Eemax to compete with low-cost imports we must continue to invest in technology, equipment, and in our people and that's what we are doing. Eemax does not import electric tankless heaters into the U.S., but we export them to 30 countries around the world.

We are proud to manufacture in the U.S., as many larger companies are finally realizing that outsourcing is no longer the right strategy. Eemax has been in-sourcing for the past 25 years and it's not new to us.

Where do you see the tankless business going in the coming years? Are there technology or technique innovations that will change things?

When we meet with engineers and communicate the value proposition of electric tankless, they begin to see the advantages and begin to specify them into new and unique commercial applications. As the home building market

Continued on page 68

Product News



Pipe rollers

MegaMc® rollers are designed to boost productivity on 12-inch IPS through 54-inch OD polyethylene piping jobsites. Fused joints and pipe roll through the device easily, while keeping the pipe off the ground and protected from the damage of pulling pipe on the ground. Designed to be tip resistant, MegaMc Rollers have a capacity of 9,000 pounds per unit and can be paired with MegaMc PolyHorse™ and MegaMc pipe stands. **McElroy.**

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PICV actuators

AME 435QM and AMV 435 actuators offer improved operation with lower power consumption. Standard features include two selectable operation speeds, external LED for visual confirmation of actuator operation, end travel LED signaling and easy calibration via an external reset button. When a Logarithmic or equal percentage setting is selected, an optional adjustment can be made to the equal percentage characteristic. **Danfoss.**

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Grinder pump retrofit kit

Goulds Water Technology grinder pump retrofit kit for residential grinder pump stations provides an economical option to replacing entire pump system, allows for continuous operation and is retrofitable with other grinder pumps and progressive cavity pumps. Includes a single-phase, 2 HP motor with 60 Hz, 3450 rpm, 230 V and a capacitor start with winding thermal protector. A silicon bronze impeller is balanced for smooth operation, provides trouble-free, non-overloading two-vane design with pump-out vanes for mechanical seal protection. **Xylem.**



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Q&A

continued from page 67

comes back from the recession, we see an opportunity to grow the residential business as well. As I stated earlier, we are investing in new technology. In 2013 Eemax will introduce more new products than in anytime during our 25-year history.

What advantages do tankless heaters have in terms of overall energy efficiency?

Electric tankless heaters have a unique advantage because they are the only type of water heater that can be practically located at the point of use. By locating the water heater at the point of use, customers get their hot water faster, thus reducing the amount of wasted water and ultimately saving the energy that would have been used to heat the wasted water. Electric tankless is the most efficient way of heating water without robbing heat from the surroundings. Space saving is another often-hidden advantage, since these units simply install on the wall and thus take up no floor space.

What training programs do you have in place?

Eemax is committed to education, as demonstrated by the ASPE continuing education classes we currently offer and our investment in our new training facility. In the last three years, more than 3,000 engineers have earned CEUs by participating in Eemax certified training. We plan to bring customers in from all over the world into our new facility to train and demonstrate the advantages of electric

tankless.

Can you tell us about your work on Yankee Stadium?

Here's the question: When a facility is used maybe one to three times per week, why would you continue to heat the water 24 hours per day, every day? Our electric tankless units use zero energy until the hot water is needed. This is why Yankee Stadium installed Eemax electric tankless – it's a smart choice to save energy. Not only did Yankee stadium choose Eemax, but so did other stadiums, including Citi Field, Gillette Stadium, Lincoln Financial Park, and Miller Park.

Has Superstorm Sandy impacted your business? Are you getting involved in the reconstruction efforts?

Given that we live in the Northeast and hurricane Sandy impacted areas just miles from our facility, we are committed to helping those impacted by the storm. We are launching a program that will allow those impacted by Sandy to save money on purchasing Eemax products.

How does business look for 2013? Any particular challenges or opportunities?

We are bullish on 2013; not because we'll experience tailwind from the economy, but because of increased awareness of electric tankless technology and, specifically, Eemax's solutions to solving water-heating needs. ■

Plumbing Engineer's Product of the Month



Sensor faucet

The Z6930 is the latest in sensor faucet innovation. A sleek, uninterrupted modern design is showcased, while the high quality sensor lens is concealed. The Z6930 delivers superior performance and features a unique sensor lens that is more durable, chemically resistant to harsh cleaning agents and easy to replace, extending the life of the faucet. Experience one of the most versatile, premium sensor faucets in the commercial market today. **Zurn Industries.**

Circle 103 on Reader Reply on page 73

Gas condensing tankless water heater

The NPE Series premium gas condensing tankless water heater reduces time and labor for tankless retrofit by using existing gas lines and flue chases. New technology reduces installation time by half. Features include: 2-inch PVC venting up to 60-foot or a System 636 (ULCS636) option for Canada; 1/2 inch gas lines up to 24 feet; ComfortFlow and Intelligent



Preheating technology; field convertability from natural gas to liquid propane gas; cascading capable; dual stainless heat exchangers; ultra-condensing efficiency; ultra-low NOx emissions; outdoor vent cap option and high altitude operation, up to 10,000 feet. **Navien.**

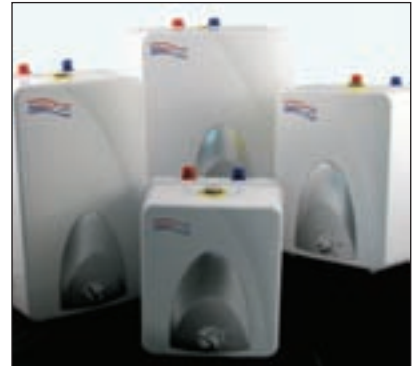
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Solar expansion tanks

BackStop solar expansion tanks are an integral safety device designed to meet even the most demanding solar thermal system requirements. These tanks capture the expansion and condensation of the solar heat transfer fluid. They also feature a specialized EPDM diaphragm that is resistant to high temperatures and deterioration from solar glycol fluid. A six-year limited warranty is included. **DuraTrac Products.**

Circle 106 on Reader Reply
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Point of use water heaters

WaiWela mini tank 110VAC electric point of use water heaters conserve fresh water by instantly satisfying hot water needs at any lav sink without recirculation. Avoid fresh water waste down the drain while the user stands by waiting for hot water to arrive. Four sizes small enough to fit under the counter or in a cabinet. UL and WQA certified. Ready to plug into 110v outlet. **Efficient Technology Sales Inc.**

Circle 104 on Reader Reply
on page 73



Hydraulic separator

The Mini-Sep™ is an economical small hydraulic separator that allows a fast and easy primary/secondary piping arrangement for many different boilers. It has an air vent and convenient fill valve. The 2 ports on one side go to the primary loop and the opposite 2 ports go to the secondary side. **Precision Plumbing Products.**

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Product News

Preassembled grinder system

Utilizing the unique Tri-Slice™ cutter, this energy efficient, yet extremely powerful, 7 amp, 115 V grinder system provides over 250,000 cuts per minute and significantly reduces the maintenance and clogging worries associated with other grinder and sewage ejector systems. Engineered for the life of the system, the unique Basin Scouring System automatically agitates standing liquid to prevent grease and sludge buildup. System arrives fully assembled, installation time is minimal. **Zoeller Pumps.**



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Foodservice gas connectors

This foodservice gas connector kit for use in commercial kitchens improves cleanliness and safety by increasing the mobility of appliances. Quick disconnect fittings are designed to rapidly disconnect and reconnect connectors. Made with stainless steel 304, along with braided jacket and PVC coating jacket. Come in 1/2, 3/4 and 1 inch sizes and lengths of 24 to 72 inches. **Easyflex.**

Circle 110 on Reader Reply
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Plumbing Engineer's Product of the Month

Low-lead push connectors

AB1953 low lead compliant John Guest push-to-connect configurations and new sweat x nut in 3/4 and 1 inch are now available. Easy installation;



lifetime warranty. Provides increased flow, flexibility and strength; resist kinking, crimping, cracking, corroding, pin holing, while meeting ASME A112.18.6 and NSF requirements. Water flex in various configurations and sizes (3/8 to 2 inches ID) available for all water flowing needs including

water heaters, water treatment, faucets, toilets and boilers. **Falcon Stainless.**

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Corrosion-resistant sprinkler coating

Sprinklers with the new Electroless Nickel PTFE (ENT) coating were rigorously tested and listed by UL as corrosion-resistant. ENT coating provides an enhanced level of protection in any environment where sprinkler corrosion is a concern. The new ENT coating is applied using a non-electric, auto-catalytic process that maximizes the coating's durability and anti-adhesion properties. Sprinklers are thoroughly coated, including the waterway, screw and pip cap.

Viking Corporation.


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on page 73



Expanded unit heater line

The Effinity93 is now available with input ratings of 55,000 and 65,000 Btu/hr, extending the original line from eight to ten models, ranging from 55,000 to 310,000 Btu/hr. Features Conservicore® technology, a high-grade stainless steel secondary heat exchanger specifically designed to withstand the acidic condensate that is a byproduct of the combustion process. The two new sizes are certified for installation in residential, commercial and industrial applications. Residentially-certified units require a 40-degree ambient temperature at all times and access to a drain for condensate. **Modine Mfg. Co.**

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