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Plumbing Engineer®

A TMB Publication

January 2012

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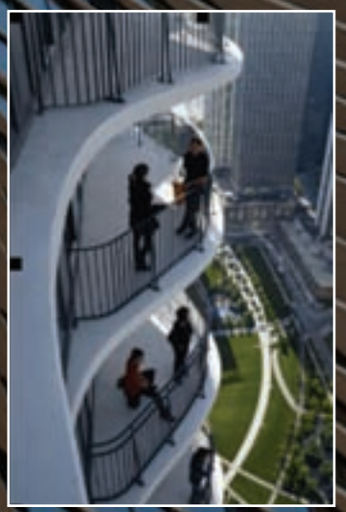
'Aqua' changes Chicago Skyline



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ALSO INSIDE:

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A TWB Publication

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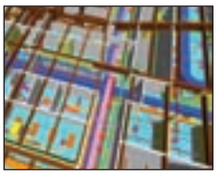

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With Revit, design professionals can more efficiently manage their design and produce more accurately detailed project plans.

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Editor's Letter

John Mesenbrink, editorial director
editor@plumbingengineer.com

2012 Industry Forecast – Nebulous to partly cloudy

Nebulous. That's really the best word that came to mind to describe the overall 2012 industry forecast and economic climate. Just ask the experts. Some will give a rosier 2012 forecast while others remain cautious. Some indicators look positive and favorable while others, not so much. With the residential market still struggling to regain respectability, the commercial market seems to be faring better, with healthcare, education and government industries remaining pretty solid. And speaking of government, don't underplay the importance of the upcoming presidential election. A wait-and-see attitude might play out here.

Moreover, unemployment numbers seem to be decreasing ever so slightly to indicate a trend in the right direction. And, consumer confidence is on the rise, although most are cautiously optimistic. According to a December 27 report by the Associated Press, "An improving job outlook helped the Consumer Confidence Index soar to the highest level since April and near a post-recession peak, according to a monthly survey by The Conference Board.

"It marked the second straight monthly surge and coincided with what's wrapping up to be decent spending for the holiday shopping season.

"The rise in confidence jibes with a better outlook for the overall economy... But confidence is still far below where it is in a healthy economy. And Americans' mood could sour again if the debt crisis in Europe deepens and spreads to the U.S. Shoppers still face big obstacles — higher costs on household basics and a still-slumping housing market."

Our experts share their views on the Industry Forecast on page 73. There you'll find information on the hydronics/radiant, plumbing and PVF markets.

Mark Hudoba, senior product manager for heating and cooling, Uponor North America, predicts that the radiant market in 2012 will start to make headway. "I predict that radiant will start to gain ground, not by replacing alternative heating and cooling systems, but by integrating with them. In the commercial market, radiant will be considered in more applications that are also using traditional HVAC systems but can benefit from the energy efficiency of adding radiant as a complementary system," says Hudoba.

Washington, D.C.-based hydronic contractor, Dan Foley, conveys a positive outlook, "The federal government stokes the economic engine, but it's actually the companies doing business with the federal government and the military that really give the economy a boost. In particular, defense and other government contractors have done well for the last several years, helping to cover the dip in the residential housing market. The commercial market remained steady throughout."

PHCC president Keith Bienvenu says, "The U.S. economy is gaining momentum, with some indicators anticipating a 6 percent rise in construction in 2012. New housing permits began to creep up this past fall, with multi-family housing showing particular gains. Initial claims for unemployment recently fell to the lowest number since last April. And, while service and repair contractors are faring better than new construction contractors overall, our PHCC members are reporting signs that conditions are slightly improving."

PVF expert Morris R. Beschloss states, "Since I interface with a substantial

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Bank on total gang shower protection

When it comes to multiple showers, Leonard rules: the new XL-690 mixing valve can take on any gang shower configuration.

With a 20 GPM flow at 15 psi and a minimum flow rate of 1.0 GPM (3.8 lpm), the XL-690 reliably **meets the ASSE 1069 standard** for advanced automatic temperature control of multiple (gang) showers.

The XL-690 high/low thermostatic water mixing valve provides accurately mixed water from extremely low flows of 0.5 GPM (1.9 lpm) to high flows — maintaining desired output temperatures. This valve is certified to the stringent performance requirements of both the ASSE 1069 and 1017 standards.

Leonard valves can help you stay ahead of water tempering requirements. Call our free technical support hotline at **888-797-4456** or visit our website, **www.leonardvalve.com,** for more information.

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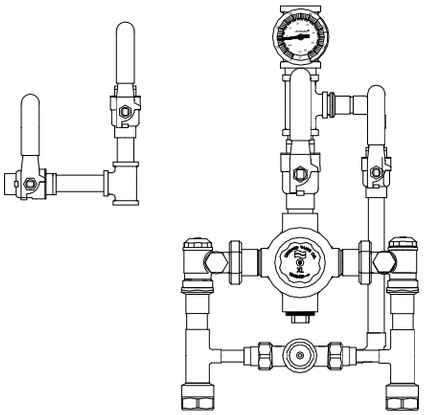
HIGH LOW THERMOSTATIC MIXING VALVES

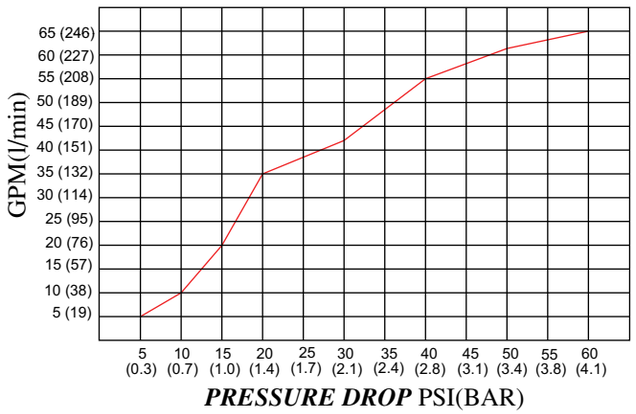
Submittal Data Sheet S-690
January 2011



PRESSURE DROP													
MIN FLOW	5	10	15	20	25	30	35	40	45	50	55	60	PSI
	0.3	0.7	1	1.4	1.7	2.1	2.4	2.8	3.1	3.4	3.8	4.1	BAR
1	5	10	20	35	39	41	48	55	59	62	64	65	GPM
3.8	19	38	76	132	148	155	182	208	223	235	242	246	l/min

NOTE: Flowrates will vary depending on existing field conditions. Leonard Valve Company always recommends using CASPAK® sizing software for proper valve sizing and model number applications.

FLOW RATE



***NOTE:** A locking temperature regulator set for 120°F (49°C), is simply a mechanical setting to prevent unauthorized temperature set point changes. If incoming water is hotter than 150°F (65.5°C), the temperature of the factory test, the valve may deliver in excess of 120°F. MUST BE RESET BY THE INSTALLER

XL-690-_____

1-65 GPM (3.8-246 l/min)

- High Low Thermostatic Water Mixing Valve with 0.5 GPM (1.9 l/min) minimum flow capacity, 1 GPM (3.8 l/min) to ASSE 1069
- 1" inlets, 1-1/4" outlet (25mm x 32 mm)
- Dial Thermometer on outlet
- Test Connection (ship loose)
- Integral combination checkstops with strainers and wall support
- **125 PSI (8.6 BAR) maximum operating** pressure with temperature control down to 0.5 GPM (1.9 l/min)
- Copper encapsulated thermostatic element assemblies with Teflon coated shuttle
- Locking temperature regulating handle set for 120°F(49°C)*
- Internal parts of bronze, brass, and stainless steel
- Rough bronze finish

ASSE 1017 Certified
ASSE 1069 Certified

OPTIONS

_____ **SUFFIX CP** Chrome Plated Finish

_____ **SUFFIX IT** Inlet thermometers

NOTE: Leonard Valve Company reserves the right of product or design modification without notice or obligation

Engineer's Approval

NOTE: The model shown represents Leonard Products which are believed to be equivalent in type and function to items specified. Leonard Valve Company is not responsible for errors or omissions due to differences in interpretations of information provided.

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The New Green Solution for Domestic and Hydronic Heating!

In Today's Market, Cost Savings are Important!

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

- *SCH 40 3" PVC Venting*
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- *Eco-Friendly Technology*
- *Space Saving Design*
- *Ultra-Condensing Efficiency*
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Remote Control
NR-10DPU
(Included)

(ASME Models are Energy Star Qualified)

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KD NAVIEN®

Condensing Combi Gas Boiler/Water Heater

Models: **CH-180/180 ASME, CH-210/210 ASME, CH-240/240 ASME**

Specifications	
Heat Input (Btu/h)	199,000
Modulation Range	20,000 to 199,000
Energy Factor	0.90 - 0.92 DOE
Primary Heat Exchanger	Stainless Steel-ASME "H"
Secondary Heat Exchanger	Stainless Steel-ASME "H"
DHW temperature	86 – 140 deg F
Operating Pressure (PSI)	15 – 150 PSI
Minimum DHW Flow Rate (GPM)	0.5 GPM (W/O DHW Preheat)
DHW Plate Heat Exchanger	Stainless Steel
Hydronic Side Water Pressure (min – max)	7 – 30 PSI
Venting Type	Direct Vent
Ignition Type	Electronic
General Data	
Fuel Type	Natural Gas
Inlet Gas Pressure - N/G	3 75" – 10 5" w c
Power Supply	120VAC, 60Hz, 200W
Freeze Protection	Circulation/Burner
Max Vent Length	100 feet
Max number of Elbows	6
Self Diagnostics	Error codes displayed
Installation Type	Indoor/Outdoor Wall Hung
Connections	
Gas Connection	¾" NPT
Cold Water Inlet	¾" NPT
Hot Water Outlet	¾" NPT
Heating Return Inlet	1" NPT
Heating Supply Outlet	1" NPT
Hydronic Fill Connection	1/2" NPT
Exhaust Venting Outlet	SCH 40 3" PVC
Fresh Air Intake	SCH 40 3" PVC
Dimensions	
Height (in)	28"
Width (in)	17"
Depth (in)	12"
Weight (lbs)	84 lbs
Approvals	
Safety	CSA, ASME, Energy Star
Commercial Warranty	10 yrs HX, 5 yrs Parts

(ASME Models are Energy Star Qualified)

Ultra Condensing Technology

• Qualifies for Federal Tax Credit

One of the industry's highest energy ratings of 0.96 DOE energy factor means the lowest annual operating costs and the best payback compared with conventional tankless and tank-type water heaters.

• Heat Exchangers

Navien's state of the art stainless steel heat exchanger condensing heat exchanger traps the condensation and uses it, making the whole process incredibly efficient and economical.

• Venting

The higher efficiency and lower exhaust temperatures allow the use of SCH 40 3" PVC. Maximum vent length is 100ft with a maximum of 6 elbows.

• Weather Compensation Heating

An outdoor sensor can be connected to automatically regulate the heating temperature according to changes in the temperature outdoors, allowing for precise indoor heat regardless of what the weather is doing outside.

• Remote Control

Advanced water heater diagnosis and error feedback. Keypad lock prevents inadvertent temperature changes. Temperature adjusts in 1 degree increments. Built-In re-circulation timer for water and energy savings.

Additional Accessories

Navien PH Condensing Neutralizer Cartridge	Navien Cascade Cable (links 2 units)	Navien Model CH Outdoor Sensor
		

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SHOWER VALVE


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- Science Lab
- Locker Room
- Janitorial Closet
- Boiler Room

HEALTHCARE

- Public Restroom
- Chemistry Laboratory
- Patient Room
- Nurses Station
- Janitorial Closet
- Boiler Room

HOSPITALITY

- Public Restroom
- Guest Bathroom
- Kitchen
- Janitorial Closet
- Boiler Room

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SPEAKMAN™

Eyesaver® Faucet SEF-1800

SPECIFICATION

EYEWASH FEATURES:

- Pull handle activator
- Aerated yellow plastic spray outlets with flip-top dust caps
- 2.6 gpm @30 psi performance

COMPLIANCE:

- ANSI Z358.1

FAUCET FEATURES:

- Gooseneck faucet with independently operated eyewash
- Lead-free brass construction
- ¼ turn ceramic cartridge
- ½" male connections for hot & cold inlets
- Adjustable center of 6" to 12"
- Vandal resistant 4" wrist blades handles with color-coded indexes or single handle l
- 2.2 gpm flow rate

COMPLIANCE:

- ASME A112.18.1, CSA B125 and CA AB1953

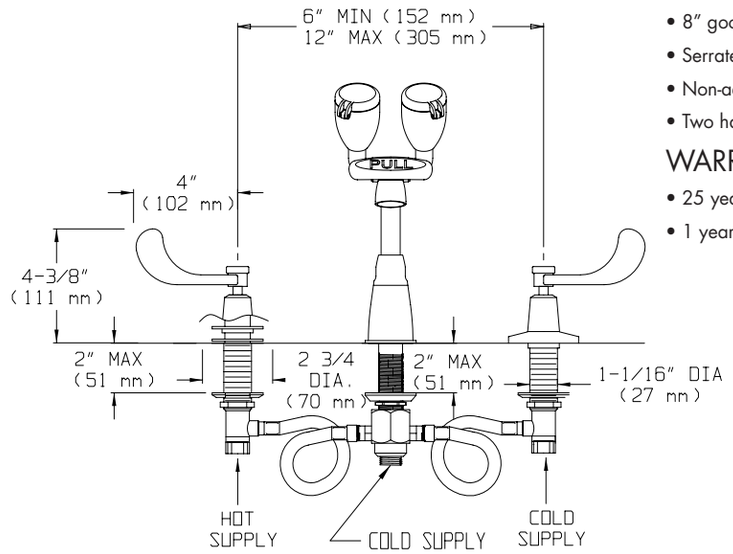
OPTIONS:

ADD SUFFIX TO MODEL #

- Vandal resistan 0.5 gpm flow control ❑ **-BO**
- 6" wrist handles ❑ **-6WH**
- Laminar flow outlet 2.2 gpm ❑ **-LF**
- 8" gooseneck spout ❑ **-8**
- Serrated tip with vacuum breaker ❑ **-ST** (not available in lead free option)
- Non-aerated eyewash ❑ **-NA**
- Two handle valves replaced with single lever valve ❑ **-SL**

WARRANTY:

- 25 year for ceramic cartridges
- 1 year limited



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Industry News

RPA to join IAPMO group

ONTARIO, CALIF. — The Radiant Panel Association (RPA) has reached agreement with the International Association of Plumbing and Mechanical Officials (IAPMO) to work together to expand a burgeoning market, furthering the goals and objectives of an important facet of the heating and cooling industry.

RPA and IAPMO have contracted for IAPMO to acquire key RPA assets, pending ratification of the agreement by the RPA membership. The RPA board has voted to enthusiastically recommend that membership support the agreement for the expanded benefits it will promulgate on behalf of the industry. Aided by the assets acquired, IAPMO will be able to service the industry needs of the RPA membership as IAPMO does for the plumbing, mechanical, swimming pool, spa, hot tub and solar industries.

The manufacturers, distributors, designers, dealers and installers of radiant panel heating and cooling systems and components that are presently members of the RPA will have the opportunity to join IAPMO. With IAPMO, radiant panel industry members will take part in an expanded scope of activity symbolized by an updated logo created by IAPMO. The RPA seeks to facilitate communication and cooperation among those interested in the advancement of the radiant panel heating and cooling industry, primarily in North America. These efforts will now be led by IAPMO.

As the sponsor of the American National Standard-designated Uniform Plumbing Code® (UPC), Uniform Mechanical Code® (UMC), Uniform Solar Energy Code® (USEC) and Uniform Swimming Pool, Spa and Hot Tub Code® (USPC), IAPMO members are dedicated to working in concert with government and industry for safe, sanitary plumbing and mechanical systems. In addition to product testing and listing services, IAPMO also develops standards, delivers technical education in support of its codes and standards and certifies journeymen and inspectors.

Incoming members will immediately have the tenure of their RPA membership recognized in good standing by IAPMO, as well as receiving the added new advantage of becoming IAPMO members, with accompanying benefits including:

- A role in shaping the codes that govern the design, installation, methods and materials employed by the plumbing, mechanical and solar systems in our homes and businesses
- Access to a team of technical experts to provide answers and analysis
- Professional publications delivering timely news and critical technical information
- Expanded networking opportunities
- Enhanced visibility for the Radiant Professionals Alliance worldwide

IAPMO's desire to advance the mission of the RPA members after the RPA ceases to exist and to maintain the services to which they have been accustomed is perceived as a win-win for the membership of both associations.

Study on drainline blockages just short of funding needed to move forward

Here is the issue: Water-efficient fixtures lead to reduced water consumption and can result in lower drainline and sewer line water flows. This provokes some important questions: Do these reduced flows lead, in turn, to stoppages of waste in building drains? What is the "tipping point" at which flows can be reduced no further without causing solids to clog the drainline? Does the installation of certain high-efficiency plumbing fixtures contribute to stoppages? If so, are remedies available that can mitigate or prevent drainline stoppages?

So far, much of the information on this subject is largely anecdotal. However, field failures recently reported in Australia indicate that the emphasis upon aggressive water efficiency practices, fixtures and equipment may have contributed to systemic waste transport-related failures in building drains and sewer lines, costing millions of dollars to repair.

Will the Australian experiences be repeated in North America? Let's hope not. Yet, while the drain systems and drought conditions in North America are not necessarily the same as Australia, it is important that the Aussie experiences be considered as a wake-up call to North America.

What is the solution? The Plumbing Efficiency Research Coalition (PERC) is undertaking a study that will begin to address the questions noted above by scientifically analyzing the issue of blockages and further evaluating the use of higher volume toilet discharges at intermittent intervals as a way to effectively clear drainlines.

This is a critical issue that must be resolved, the sooner the better. Lack of answers is currently discouraging many water utilities from running commercial water efficiency programs. It is further stalling the U.S. EPA's plans to develop a WaterSense Label specification for commercial high-efficiency toilets (HETs).

The good news is that this study will be underway by January 2012. Due to a generous offer by American Standard Brands to allow the use of its test apparatus, and also due to the generous contributions of others, the study now requires only an additional $50,000 in funding to get this important research started. Please consider supporting this effort in whatever way you can. All contributors will be recognized in the study's final report. No amount is too small.

Contact Mary Ann Dickinson (maryann@a4we.org) at the Alliance for Water Efficiency for further information on contributing funding. Contributions will be tax deductible.

More Industry News on page 14

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Continued from page 13

ASPE announces ICC committee appointments

CHICAGO — The American Society of Plumbing Engineers (ASPE) announced the appointment of a number of its members to serve on critical code committees for the International Code Council (ICC).

"ASPE is committed to providing the plumbing engineering and design expertise of its members by volunteering to serve on model code body committees to ensure that the model codes meet good engineering practices and, ultimately, protect the public health and safety," says ASPE president William F. Hughes Jr., CPD, LEED AP, FASPE. "One of ASPE's strategic objectives is to work toward a consistent and uniform set of national, state and local codes related to plumbing engineering and design, and one way of accomplishing this objective is to ask our members to serve on code and standard development committees."

The ASPE members selected by ICC and the committees on which they will serve are as follows:

Code development committees

• David E. DeBord, CPD, LEED AP, ARCSA AP (Chicago chapter) – Plumbing

• James Paschal, PE, CPD, LEED AP (Eastern Michigan chapter) – Mechanical

• Ronald E. Holmes (Alabama chapter) – Residential

• Terrence R. LeBeau, CPD (Chicago chapter) – Swimming Pool

• Winston L. Huff, CPD, LEED AP (Nashville chapter) – Green Construction,

Energy and Water

• Phillip F. Parisi (New York City chapter) – Green Construction, General

Code interpretation committee — Plumbing, Mechanical, Fuel Gas and Swimming Pool

• Gary M. Chiurazzi, CPD (Capital Region New York chapter)

• Jim Kendzel, MPH, CAE

Code action committee – Plumbing, Mechanical, Fuel Gas and Residential

• David W. Burke, CPD (Western Michigan chapter)

In addition, ASPE is represented on the ICC membership council and industry advisory council by its executive director/CEO Jim Kendzel, MPH, CAE.

ACCA, AHRI, HARDI to collaborate on hydronics, radiant initiatives

WASHINGTON —The three leading trade associations in the indoor environmental industry have announced that they will collaborate closely on educational initiatives to benefit the industry's hydronics and radiant panel sectors.

The three associations are Air Conditioning Contractors of America (ACCA), which represents contracting businesses; the Air-Conditioning, Heating & Refrigeration Institute (AHRI), which represents manufacturers and the Heating, Air-conditioning and Refrigeration Distributors International (HARDI), which represents wholesalers and distributors. These three organizations have a longstanding history of collaboration and partnering for the betterment of the air conditioning and heating industry.

The hydronics partnership was developed in a series of meetings at ACCA, which recently launched a radiant & hydronics council (RHC) to provide specific support to member companies who work in the hydronics field.

Through the collaboration, AHRI will continue to update basic hydronics training and curricula. This material will be used by HARDI to encourage its distributor members to provide hydronics training in their local areas. ACCA will use the material to develop online education for contractors and their employees and to encourage members to take advantage of HARDI member training where available. The ACCA RHC will develop advanced online training modules for contractors that need to go "beyond the basics" in hydronics design and installation.

The ACCA RHC and HARDI will be represented on the AHRI committees responsible for developing or revising hydronics training materials. The ACCA RHC will join AHRI, HARDI and many others in the North American Council on Hydronics, a U.S.A.-Canadian alliance group.

86 new product technology presentations to be featured at 2012 AHR Expo

WESTPORT, CONN. — Visitors to the 2012 AHR Expo in Chicago January 23 – 25 can get a sneak preview of the latest new products and technologies that will be impacting the HVAC/R industry by attending some of the 86 presentations taking place in three New Product Technology Theaters.

Ranging from the latest in micro thermo technologies to the future of air purification, manufacturers from around the world will be showcasing their newest products and solutions during 15-minute presentations all three days of the show. The presentations are complimentary to all attendees, and seating is available on a first-come, first-served basis.

Despite the uncertain economy, the HVAC/R industry seems to be moving confidently ahead. He cites a recent exhibitors' survey in which nearly three-fourths of the respondents said they expect a better year in 2012. The same survey found that 82 percent expect sales to increase in 2012, with 29 percent expecting increases of more than 10 percent. Another strong indication of a positive economic outlook is that exhibitors have reserved more than 415,000 square feet of space, making 2012 the largest AHR Expo in its 82-year history.

The 2012 AHR Expo will feature more than 1,900 exhibitors from around the world, showcasing hundreds and hundreds of innovative new products to over 50,000 attendees and exhibitor personnel. The 2012 AHR Expo is endorsed by 35 leading HVAC/R industry associations and is co-sponsored by ASHRAE and 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.

More Industry News on page 16

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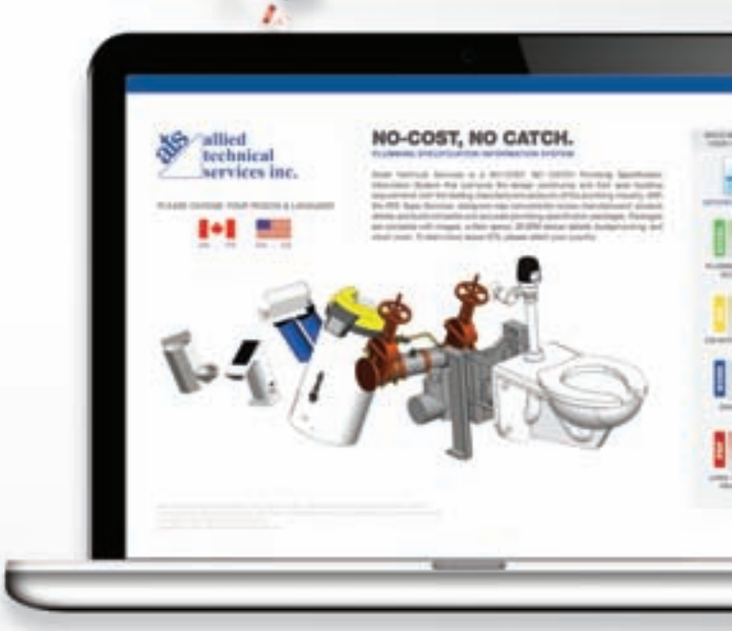

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Industry News

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A. O. Smith Johnson City plant earns LEED certification

JOHNSON CITY, TENN. — A long-term, comprehensive approach to efficiency and sustainability culminated with A. O. Smith's manufacturing facility in Johnson City, Tenn., earning Leadership in Energy and Environmental Design (LEED) silver certification. This is the first A. O. Smith facility awarded LEED certification.

To achieve LEED certification, given by the U. S. Green Building Council, a facility's operation and maintenance must meet specific standards in energy efficiency, environmentally responsible business practices and maintaining a healthy work environment.

Pictured from l to r: Chuck Thornton, manufacturing engineer; Andy Demski, director of operations; Rebecca Grizzle, manufacturing engineer; John Dreher, manager-manufacturing engineering; Mike Wilson, supervisor-maintenance; and Nathan Timbs, manufacturing engineer.

Among the short-term and long-term initiatives that enabled Johnson City to earn the LEED certification were:

- Reducing water usage for compressed air cooling by $80,000 per year;
- Reducing the annual water usage in restrooms by 25 percent per year;
- Efficient lighting and ventilation systems that resulted in annual electricity savings of more than $40,000;
- A "green" cleaning program that reduced chemical costs by $5,000; and
- A long-term recycling program that has achieved cost savings of more than $30,000 per year.

Delany adds sales reps

CHARLOTTESVILLE,VA. — Delany Products, a manufacturer of flush valves, has selected Pro Marketing Inc. of Spartanburg, S.C. to represent the company in both North and South Carolina as well as in parts of eastern Tennessee. Pro Marketing Inc. was formed in 1982 by partners Danny L. Cash and Robert A. Stokley and currently has six experienced outside salesmen as well as an experienced inside sales staff handling customer service.

In Ohio, Delany has selected BWA Co. of Cleveland to represent the company for the entire state. BWA Co. was formed in 1982 by its partners and currently has four experienced outside salesmen and an experienced inside sales staff for customer service.

Shadco Inc. of LaGrange, Ky. has been selected to represent the company for all of the state of Kentucky. Shadco Inc. was founded in 1989 and specializes in commercial plumbing products. It has been family owned and operated, with more than 50 years of combined sales experience and is known for its sales and customer service.

In other news, Delany Products has upgraded its website, www.delanyproducts.com, to reflect a modern clean design that enhances the user experience, while making it effectively easier and faster to navigate.

Eemax launches BIM product models

OXFORD, CONN. — Eemax Inc. has launched its building information modeling (BIM) product models that are built in native Autodesk® Revit® format to leverage the software's intelligent functionality. Based on information-rich, model-based designs, BIM has become quite popular for designers, architects and contractors, because it helps work out any issues during the design phase so they do not occur during the actual construction phase.

Eemax product models can be downloaded from the newly created BIM product library at www.eemax.com/BIM-Revit, where building professionals can simply choose the model they want to specify for their project. Eemax product models can also be directly accessed from within the Revit program by visiting the Autodesk Seek Site at http://seek.autodesk.com/manufacturer/Eemax?resetft=true&source=mfrbrws.

ICC-ES PMG recognized under new City of L.A. guidelines

WASHINGTON —The City of Los Angeles approved the ICC Evaluation Service (ICC-ES) plumbing, mechanical and fuel gas (PMG) listing program as the first certification agency recognized under its new guidelines (Reference number LAMC 98.502).

With the addition of this important recognition, ICC-ES PMG is now the leader in nationwide acceptance of its certification marks. When it comes to approving products for installation, ICC-ES PMG has obtained all the necessary accreditations, approvals and recognitions to cover all of North America to better serve the specific requirements of the code officials.

High-rise fires cause billions of dollars in property damage a year

QUINCY, MASS. — According to a new report released by the National Fire Protection Association (NFPA), in 2005

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Continued from page 16

– 2009 there were an average of 15,700 reported structure fires in high-rise buildings per year, with an associated $235 million in direct property damage.

The report, "High-Rise Building Fires," cites apartments, hotels, offices and facilities that care for the sick as accounting for roughly half of all high-rise fires. Structure fires in these four property classes resulted in $99 million in direct property damage per year.

There is a downward trend in high-rise fires. In the last few decades, a range of special provisions have migrated into the codes and standards for tall buildings. At NFPA's upcoming Fire & Life Safety Conference, division manager of building fire protection Robert Solomon will explore code changes related to high-rise building construction, configuration, systems, planning and evacuation procedures.

Other findings from the report:

• In 2005 – 2009, high-rise fires claimed the lives of 53 civilians and injured 546 others per year.

• The risks of fire, fire death and direct property damage due to fire tend to be lower in high-rise buildings than in shorter buildings of the same property use.

• An estimated three percent of all 2005 – 2009 reported structure fires were in high-rise buildings.

• Usage of wet pipe sprinklers and fire detection equipment is higher in high-rise buildings than in other buildings of the same property use.

• Most high-rise building fires begin on floors no higher than the sixth story. The risk of a fire is greater on the lower floors for apartments, hotels and motels and facilities that care for the sick but greater on the upper floors for office buildings.

More information on Solomon's session and the conference can be found at www.nfpa.org/FLSCONF.

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Precision Plumbing Products goes all in with Revit

Precision Plumbing Products (PPP) has implemented a program incorporating the REVIT 3D design software now utilized on a growing number of construction projects. The company has partnered with SmartBIM in compiling a complete library of its products. The library includes accurate, three dimensional drawings, complete submittal date, all applicable product certifications and much more.

For info on the SmartBIM/REVIT file, contact Chuck Lott at 503/256-4010 or chuckl@pppinc.net.

More news on page 20

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ONE STROKE TO CUT A PIPE EQUALS MORE TIME FOR MORE JOBS.

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Industry News

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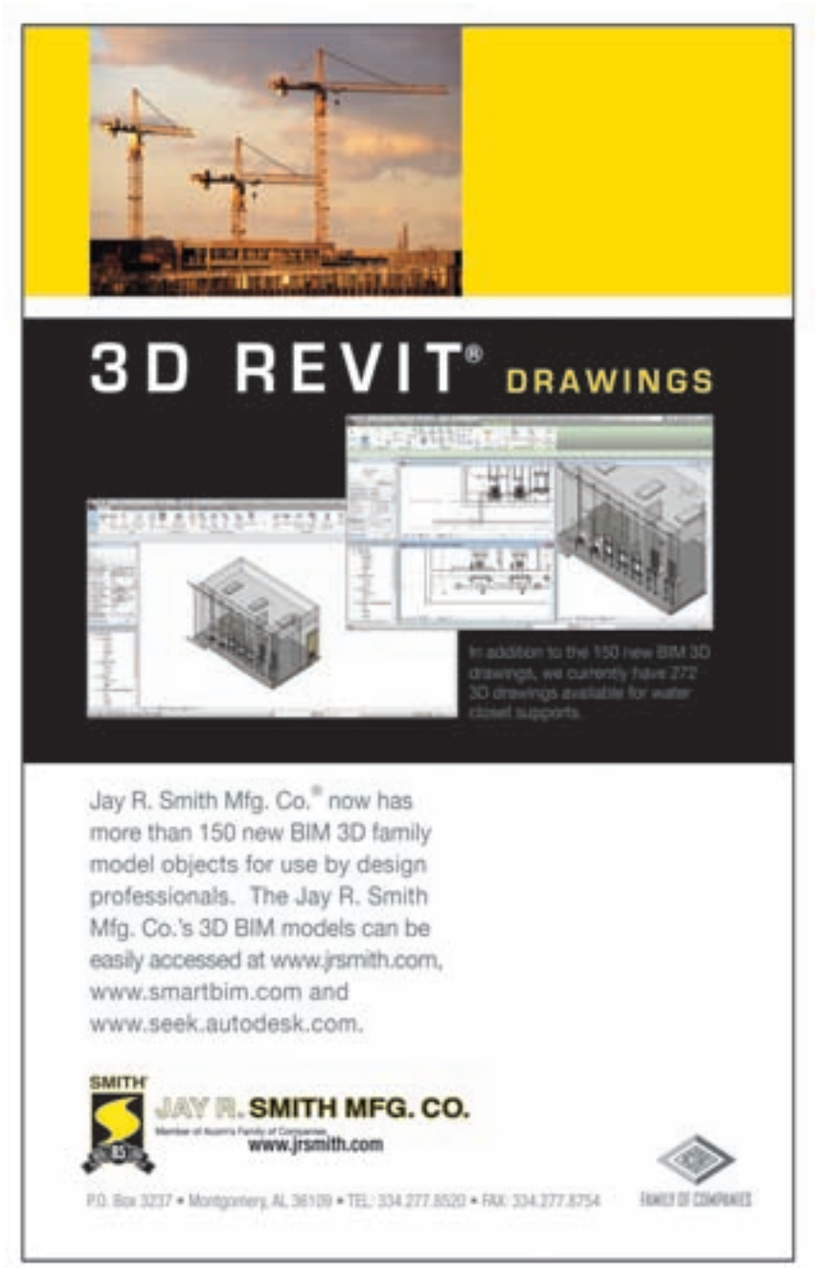
ASPE CEO Kendzel appointed to IAS advisory council

JAMES G. KENDZEL, executive director and CEO of the American Society of Plumbing Engineers (ASPE) has been appointed to the International Accreditation Service (IAS) technical advisory council (TAC) for the newly approved IAS Personnel Certification Body Accreditation program.

The program (AC474), approved in October, will recognize companies and organizations that provide the highest quality personnel certification services. It is also an expansion of the IAS Work Force Accreditation program that includes accreditation for training agencies (AC371) and curriculum developers (AC372).

TAC members are senior managers selected from personnel certification bodies and from private and public-sector agencies that use these services. The IAS board of directors authorizes committee members. TAC activities relate to IAS accreditation criteria and IAS rules of procedure. The councils also advise on international standards related to accreditation and conformity assessment and other subjects, as requested by the IAS management.



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Viega MegaPress system brings press technology to black steel pipe

WICHITA, KAN. — Viega has introduced the new MegaPress® system for installing schedule 5 – schedule 40 black steel pipe and the MegaPressG system for installing schedule 40 black steel pipe in sizes from 1/2" to 2", using a unique press technology to secure pipe connections in under seven seconds. The systems use modern cold press connections for pipe installation and make watertight and airtight connections.

The MegaPress system is ideal for hydronic heat, chilled water, compressed air, non-medical gases, fire sprinkler systems, low pressure steam and vacuums. The MegaPressG system is designed for use in fuel oil and natural gas applications.

More than 200 fittings are available for both systems, ranging in sizes from 1/2" to 2" that include elbows, couplings, reducers, tees, reducing tees, threaded adapters and unions. The systems use a stainless steel grip ring with an EPDM sealing element for the MegaPress system or HNBR for the MegaPressG system, along with a carbon steel separator ring that ensures the sealing element and grip ring perform at maximum capacity.

Ideal for industrial, commercial and residential applications, the Viega MegaPress and MegaPressG systems are easy to use, flameless and environmentally friendly.

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cispi.org/News.aspx

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Industry Movers

Symmons announces appointments

BRAINTREE, MASS. — Symmons Industries announced the recent appointments of Christopher Ehlers as director of hospitality and Angela Coffman as vice president of marketing.

Rajendra elected to A. O. Smith Board of Directors

MILWAUKEE — A. O. Smith Corporation announced that President and Chief Operating Officer Ajita G. Rajendra has been elected to the company's Board of Directors. Rajendra was named president of the Milwaukee-based water technology company in August. He is responsible for A. O. Smith's water heater operations in North America, China, Europe, and India as well as the company's water purification business in China and the recently acquired Lochinvar business.

Rajendra joined A. O. Smith as president of its Water Products Company in January 2005. He was named an executive vice president of the corporation in 2006.

BrassCraft appoints VP of retail sales

NOVI, MICH. — George Werner has been promoted to the position of vice president of retail sales for BrassCraft Manufacturing Company. Werner will direct retail sales strategies and initiatives in support of BrassCraft Manufacturing's business goals and sales targets.

Webstone names director of engineering

WORCESTER, MASS. — Webstone announced that Josh Netz has joined its management team as the director of engineering.

SJE-Rhombus® appoints new president

DETROIT LAKES, MINN. — SJE-Rhombus®, an industry leading control solutions provider for over 35 years, announced the appointment of David Thomas as president/director of standard products. Thomas will direct SJE's sump effluent and sewage standard products Controls Group focusing on operations, continuous improvement and growth.

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Efficiency Perfected.

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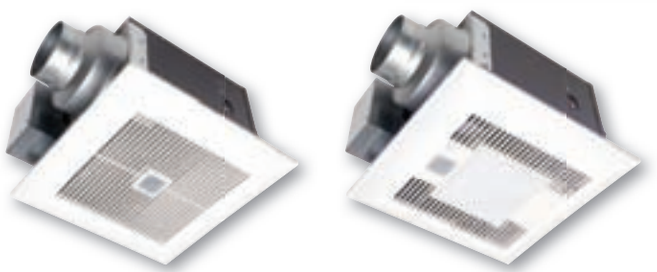

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Panasonic ideas for life

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WhisperSense™ VENTILATION FAN

FV-08VQC5

Specification Submittal Data / Panasonic Ventilation Fan

Description
Ventilating fan shall be low noise ceiling mount type rated for continuous operation. Fan shall be ENERGY STAR® rated and certified by the Home Ventilating Institute (HVI). Evaluated by the Underwriters Laboratories and conform to both UL and cUL standards.

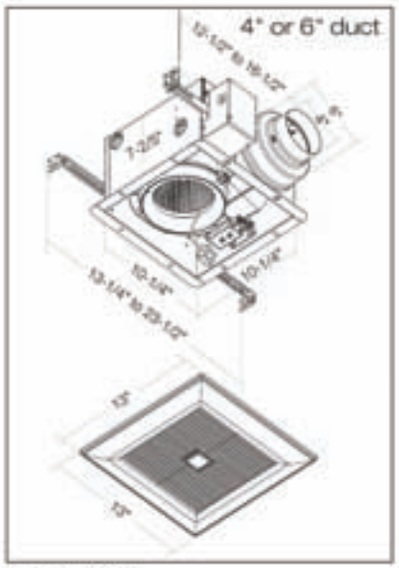
Motor/Blower:
- Four–pole totally enclosed condenser motor rated for continuous use.
- Power rating shall be 120 volts and 60 Hz.
- Fan shall be UL and cUL listed for tub/shower enclosure when used with a GFCI branch circuit wiring.
- Motor equipped with thermal–cutoff fuse.
- Permanently lubricated plug-in motor.

Housing:
- Rust proof paint, galvanized steel body.
- Detachable dual 4" or 6" diameter duct adaptor.
- Built in backdraft damper.
- Expandable extension bracket up to 24".
- Double hanger bar system allowing for ideal positioning.

Grille:
- Attractive design using PP material.
- Attaches directly to housing with torsion springs.

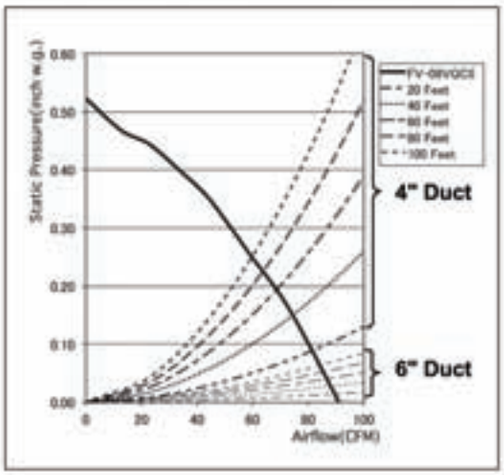
Warranty:
- 3-Year limited warranty.

Architectural Specifications:
Ventilation fan shall be ceiling mount, ENERGY STAR rated, with no less than 80 CFM and no more than 0.3 sone at 0.1 static pressure in inches water gauge (w.g.) and with no less than 59 CFM with no more than 0.3 sone as certified by HVI at .25" w.g. Power consumption shall be no greater than 15.8 Watts at 0.1" w.g. and 15.6 Watts at .25" w.g. with energy efficiency of no less than 5.1 CFM/Watt at 0.1" w.g. and 3.9 CFM/Watt at .25" w.g. The motor shall be totally enclosed, four pole condenser type engineered to run continuously. Power rating shall be 120v/60Hz. Included is a detachable dual 4" or 6" diameter duct adaptor. Dual motion and humidity sensors with adjustable delay off timer that can be set from 30 seconds to 60 minutes. Humidity sensor is the rapid rise in relative humidity (RH) type with user-adjusted set points between ~30% to ~80% RH. Fan shall be UL and cUL listed for tub/shower enclosure when used with GFCI branch circuit wiring. Fan shall be ASHRAE 62.2, LEED, ENERGY STAR IAP, EarthCraft, California Title-24, WA Ventilation Code and **CALGreen compliant.**



FV-08VQC5

Specifications: **WhisperSense** FV-08VQC5		4" or 6" Duct (Standard)	
Ventilation Fan Characteristics (HVI tested data)	Static Pressure in inches w.g.	0.1	0.25
	Air Volume (CFM)	80	59
	Noise (sones)	<0.3	<0.3
	Power Consumption (watts)	15.8	15.6
	Energy Efficiency (CFM/Watt)	5.1	3.9
	Speed (RPM)	825	1110
	Current (amps)	0.14	0.14
	Power Rating (V/Hz)	120/60	
	ENERGY STAR Qualified	YES	



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			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
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CALGreen

Panasonic ideas for life

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Boiler manufacturer takes high-tech training to the masses

As mechanical systems continue grow in efficiency — and inevitably in sophistication — some manufacturers are upping the ante when it comes to customized training for contractors, wholesalers and engineers. Laars, in Rochester, New Hampshire, is one such firm.

With the market pushing for advanced, more energy efficient heating systems, Laars managers felt that a new customer outreach and training facility was in order.

Just completed in November 2011, Laars' state-of-the-art, 12,800-square-foot Customer Center is designed to help educate installers about radiant system design, Laars products, and the next generation of heating technology. Contractors, wholesalers and engineers can all benefit from the courses offered.

"Flexibility in training content and techniques was kept at the forefront during the design phase of the facility and curriculum," said Bill Root, VP and general manager of Laars.

To maximize the value of each training experience, the staff at Laars tailors classes to the needs of contractor, wholesaler, or engineering group attendees. According to Chuck O'Donnell, Laars marketing manager, either pre-structured training courses can be selected or an à la carte approach of training topics can be chosen based on the attendees' level of experience and educational goals.

Crown jewels: high tech, hands on and fully integrated

The Customer Center is a two-story expansion of the Laars headquarters. The first floor consists of a new main lobby to the Laars facility, a 60-seat tiered classroom used as one large room or two individual 30-seat classrooms, a café that can seat up to 70 and a large outdoor patio next to the café. In-floor radiant heat runs through the lobby and café and an expansive snowmelt system melts winter precipitation from sidewalks and the patio, all sourcing heat form Laars NeoTherm boilers.

Front and center in each 30-seat classroom are the crown jewels. Two bays are capable of displaying any Laars boiler and/or water heater; each display unit can be live-fired during training sessions. The boilers tie into the facility's existing large cooling loop allowing for continuous operation of up to two million Btus — one million Btus per 30-seat classroom, or two million in one bay.

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Corporate report

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The state-of-the-art, 12,800-square-foot Customer Center is designed to help educate installers about radiant system design, Laars products, and the next generation of heating technology.

"We felt it was critical to include live-fire equipment right in the classroom to create a meaningful experience by allowing the attendees to work with our equipment as they learn," said O'Donnell.

Seamlessly connecting the classroom experience with the live-fired equipment is a state-of-the-art audio/video system. Each 30-seat section has a high-definition projection system with large display screens used for standard presentations and also to tie into ceiling mounted HD cameras to pan and zoom into Laars trainers or equipment. This allows for up close views of system components to enhance the learning experience.

Laars also invested in the latest in video conference hub technology, permitting live, web-streaming of training sessions to the web or to record for later viewing. The live streaming system will offer even further flexibility for training those that cannot travel or for follow up training sessions after attending a live session at the Laars facility.

In-house experience

"It was a great experience for the Laars staff as many departments were involved in the design and installation of the hydronic and radiant heat systems," explained Root. "The indoor radiant and snow melt systems were designed by the Laars application team. Also, over a two-day period, just prior to the concrete pour, many of our employees were involved with the installation of PEX tubing for the addition. It turned into an enjoyable, team-building exercise. Who said Outward Bound has the corner on that market?"

"It was a thrill for so many of us to take interest in and to be closely involved with our work on the heating system," added Chuck O'Donnell. ■

Sign up for courses will be done through area sales managers and also online at www.laars.com. Courses will begin in early 2012. For more information about courses and scheduling, e-mail Laars at sales@laars.com.

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Designer's Guide

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

Highway robbery

Last October I wrote a column titled "Confessions of a water waster" in which I described my local water utility's new tiered water billing program. The program, I originally thought, was intended to penalize water wasters financially and generate conservational behavior as a result. I have since learned that the billing structure is a lot more ominous than I was first led to believe; it is starting to feel like Chinatown all over again.

By way of history, the city in which I live was nothing but orange groves until the 1990s. Then a housing boom hit Southern Orange County (Calif.) and housing tracts went up at an enormous rate. These tracts all have home owners associations (HOAs) that are responsible for the common area landscaping, among other things.

When I wrote about the Moulton Niguel Water District's (MNWD's) new tiered billing structure, I wrote about it from a personal "single family residence" perspective. I found it interesting and intelligent, but I was yet to discover the fly in the ointment. To rehash, the new tiered billing structure assigns a billing unit (BU) budget to each customer, based on population, landscaped area and weather data. One BU is 100 cubic feet.

If a customer exceeds their budget, there are penalties, as follows:

- Efficient (within budget) $1.54
- Inefficient (+10% of budget) $2.75
- Excessive (+20% of budget) $5.51
- Wasteful (>120% of budget) $11.02

As you can see, the penalty is significant if you exceed 120% of your water budget. For a single family residence, where behavior and irrigation are fairly easy to control, this is not unreasonable. But when it comes to HOAs that have large amounts of landscaping, this billing structure takes on a whole new meaning.

I happen to be the president of my HOA, so I am intimately familiar with all of the goings on in the Community, including the utility bills. When the MNWD's new billing program came into effect July 1, I saw our water bill skyrocket from $2,838 to $7,332 every two months. I was certain this had to be a correctable mistake.

Our Community has five water meters, which I find strange, as it has always been my experience that one customer gets one water meter, or maybe two at the most for redundant services. I don't know why there are five meters. It probably has something to do with the fact that the Community was built in three phases.

A review of our bills revealed that three of our meters were dramatically over their water budget and two were dramatically under budget. One of the five serves the pool house; this, of course, was one of the two that were under budget. The other meter that was under budget serves an undeveloped slope that represents 60% of the landscaped area. This area, due to its size and rugged landscaping, is easy to water efficiently.

The remaining three water meters serve the landscaping for all of the small, fragmented sections of grass and hedges that weave in between the various residences. They include hundreds of areas that have only nine square feet of landscaping between driveways, walkways and curbs. These areas are impossible to water efficiently, since there is always overspray from the surface irrigation. If all of these areas were changed to drip irrigation, the efficiency would improve, but this would be a massive undertaking.

Here's where the subject "highway robbery" comes into play. If all five meters were combined as one, totaling their water budgets and usage, our water bill would reduce to $4,089. This is still a dramatic increase from $2,838 with the old non-tiered billing system, but it represents a reasonable penalty for the inherent inefficiency of the irrigation system. However, the MNWD refuses to total the meters this way. "One meter, one bill" is their mantra, whereas I believe "one customer one bill" would be fairer. But they wouldn't make as much money that way.

So here's what I hope to do. Since two of our five meters (meters 1 and 4) are the prime culprits of inefficiency, and one meter (meter 5) has a great deal of spare water budget, the goal is to backfeed meters 1 and 4 from meter 5, thereby taking advantage of the spare water budget and shedding the penalties we are receiving. Accomplishing this will be no small task, since we have no drawings of the irrigation system, but I believe it can be done without too much effort. If achieved, it will reduce our water bills by nearly 50%.

The saddest part of this whole saga is that not a drop of water will be saved in this process; we will merely be getting around the penalties connected with the billing system. True, it would be better to change the irrigation to a drip system, but this would cost well in excess of $100,000 to achieve, and we don't have the budget for that.

I've heard the rumor that voluntary conservation measures were reducing the revenues of the MNWD and putting the pensions of its staff in jeopardy. This new billing system has simultaneously promoted conservation and secured pensions for many years to come.

While this tale is very personal to my home district, my experience is that trends in the water industry tend to start in California, due to our desert environment, and move eastward. So don't be surprised when this new water billing program shows up in your mailbox and that of your clients. ■

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

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

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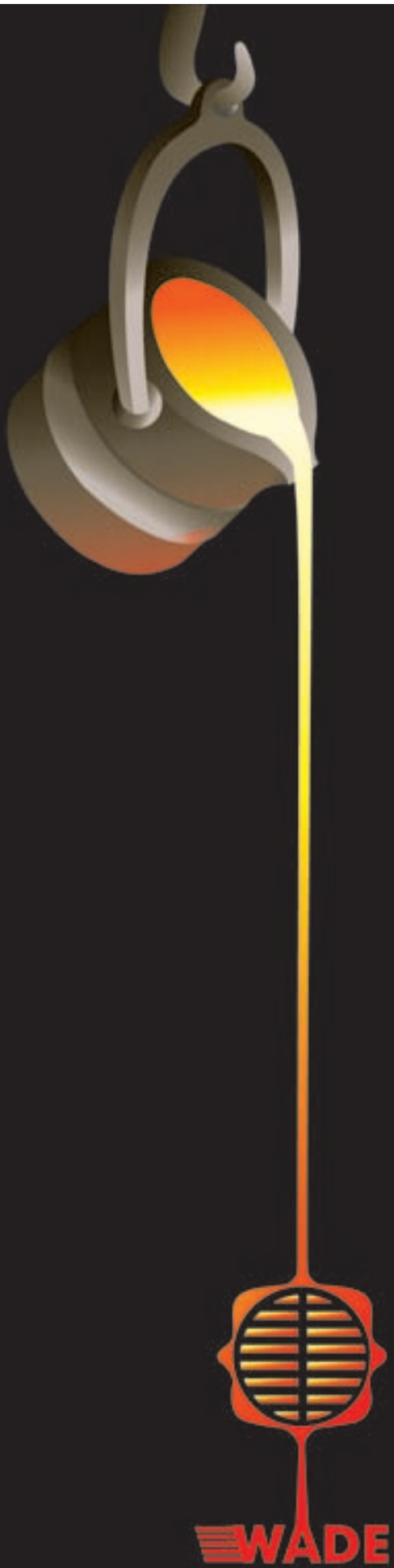

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CASE STUDY
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FACILITY:
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APPLICATIONS:
Main Building — (1) prep kitchen; (2) culinary arts kitchen; (3) locker rooms as well as restrooms and locker areas.

Indoor practice facility — (1) locker rooms for varsity; (2) hydrotherapy room; (3) laundry facilities.

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Main building/kitchens — Six N0841MC gas-fired condensing tankless water heaters, with inputs from 12,000 to 199,900 BTUH, capacity range of 0.5 to 11.1 gallons per minute (gpm), and an efficiency rating of 93%. Venting method: 4-inch PVC.

Main building/gym facilities — Nine N1321M-ASME gas-fired tankless water heaters, with inputs from 22,500 to 380,000 BTUH, capacity range of 0.7 to 13.2 gpm and an efficiency rating of 80%. Venting method: 5-inch stainless steel.

Indoor practice facility — Ten N1321M-ASME units. Venting method: 5-inch stainless steel.






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NC380-SV

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Code Classroom

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

Green codes and water conservation

International Green Construction Code is finalized

The International Code Council (ICC) has finalized its International Green Construction Code and is readying it for publication by the spring of 2012. The code is being coordinated with other international codes already in place and includes many water and energy saving features that will be familiar to anyone who has followed other green codes, standards and programs. It also has provisions intended to make the code simple to follow without performing a lot of calculations.

The ICC green code will cover water conservation issues such as:

- Fixtures, fittings and appliances, including faucets, toilets, urinals, dishwashers, washing machines, pre-rinse spray valves, showers and drinking fountains.
- Hot water delivery system design, including pipe sizing and insulation.
- Reclaimed water use and systems, including municipally reclaimed water, onsite water recycling systems, rainwater catchment systems, condensate capture systems, foundation drain-water reclamation systems and dual plumbing considerations and requirements.
- Landscape and site water use, including xeriscaping, turf, landscaping and storm water management.
- Recreational water such as pools, spas, ornamental water features and water parks.

The proliferation of codes, specifications, standards, guidelines, regulatory mandates and similar initiatives throughout North America is largely unnecessary. Multiple editions of green codes and standards are being simultaneously developed in a flurry that reminds me of the space race. Everyone is trying to have the first green code, standard or supplement available on the market so it will be adopted by the various authorities having jurisdiction. The number of green codes and standards that are being developed can be confusing. ICC and IAPMO, LEED and Green Globes, ASHRAE 189 Standard for the Design of High-Performance Green Buildings and several others are all green codes, standards and guidelines, and they do not all agree. In some rare cases, these actually encourage wasteful designs and practices.

This is not a condemnation of the green codes, which are very important contributions to improving the built environment. Because multiple competing documents are being developed simultaneously, it is nearly impossible for someone to attend all of the hearings, review the drafts and provide comments to nearly a dozen different green codes and standards. This renews the debate for one code. The plumbing industry has been dealing with multiple plumbing codes and politics for years, but the electrical industry has one code.

Recently, numerous proposals and changes were made to the initial draft of the International Green Construction Code. With a few exceptions, there was not much testimony on code change proposals from plumbing industry people. Most of the input seemed to be from individuals or groups interested in conservation. Many of them did not seem to be aware of the language in the current plumbing codes and standards, the laws of physics, plumbing installation practices or engineered plumbing systems.

Compared to other codes and standards, such as ASHRAE's *Standard 90.1, Requirements for Pipe Insulation*, which requires calculations, Section 607.5 of the International Green Construction Code tried to keep it simple. Insulation thickness is equal to the pipe diameter, up to two inches; ½-inch pipe, for example, requires ½-inch insulation and so on up to 2-inch pipe diameter. Pipe $2^1/_2$ inches in diameter and larger would also get a minimum of two inches of insulation. If larger pipe is installed in a commercial building, it is usually specified as part of an engineered system; the engineer understands the resistance value (R-value) of various insulation materials and, typically. specifies the insulation material, R-value, jacket type and insulation thickness, based on the system temperatures and the design requirements.

Another simplification involves the length of pipe from the source to the fixture for hot water systems. A lot of water is wasted waiting for hot water to flow from the water heater to the fixture. To reduce this waste of water and energy, most green codes, including the International Green Construction Code, require either an on-demand hot water recirculation loop or heat tracing on the pipe. Some design professionals have expressed the concern that the use of heat tracing cables on domestic hot water pipes could allow hot stagnant water to sit in the pipes at a temperature that is ideal for amplification of any bacteria and pathogens that may be in the water supply. Provisions should be made to periodically raise the hot water temperature to a disinfecting temperature of about 160 F or higher. Precautions should be taken to prevent scalding by scheduling down time for the hot water system. During this disinfection, which should be done during an off-peak period, the hot water main valve should be closed to prevent usage that could scald someone.

Previous attempts to limit the amount of wasted ambient temperature water in the hot water pipe mandated how far the fixture could be from the hot water source using the developed length of the pipe. The plumbing code called for the hot water to be within 100 feet of the fixtures served or within 100 feet of a circulated hot water line; otherwise a temperature maintenance system would be required. Previous attempts to limit wasted water also addressed lowering the distance and limiting the volume of water in the pipe between the source of hot water and the fixture. The problem with calculating the volume of

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water was that each type of pipe material — copper, PEX, or CPVC — has a different interior volume.

The International Green Construction Code abandoned that approach and now considers all pipes to be the same. Table 702.8 gives the maximum number of linear feet of pipe allowed for 11 sizes of pipe from ¼-inch to 2-inch. The table says, for example, that for ½-inch pipe, you can run 43 feet of pipe on systems that do not have a hot water return circulating loop or heat tracing. For systems that have a hot water circulating loop or heat tracing line, the maximum length of ½-inch pipe from the loop to the fitting is 16 ft.

The maximum distance for public lavatory faucets is two feet. This will require most systems to circulate domestic hot water through the plumbing chase behind public restroom lavatories. In a public restroom, the flow rate for metering faucets is mandated as ½ gpm per minute, in accordance with the Energy Policy Act of 1992. People using public washrooms tend not to wait for hot water and to wash their hands in cold or ambient temperature water

The International Green Construction Code prohibits continuous running of circulating pumps on domestic hot water systems, timer operation or water temperature-initiated or aqua-stat operation of a circulating pump. Gravity or thermo-siphon circulation loops are also prohibited. Many of these are viable options for larger institutional, commercial or industrial facilities with continuous or 24-hour demands.

Domestic hot water circulating systems must now be controlled with either hard-wired or wireless controls activated by one of the following:

- A normally open, momentary contact switch.
- Motion sensors that make momentary contact when motion is sensed. After the signal is sent, the sensor must lock out for at least five minutes to prevent restarting the pump while the circulation loop is still hot.
- A flow switch. This will not be practical in large buildings, where it could take in excess of 10 minutes to get hot water to the farthest fixture from the hot water source. This option can also contribute to hot water temperature fluctuations and sudden temperature changes during showering in larger buildings.
- A door switch. This has the same drawbacks as the flow switch.

The controls have to keep the pump off if the temperature is above 105 F, in case the device that senses temperature rise fails. Controls must also have a lockout that prevents extended operation of the pump if the sensor fails or is damaged.

Plumbing fixture flow rates were simplified to single numbers on a table. The International Green Construction Code originally had two numbers built around a base case and a better case. California's CalGreen code has three possible flow rates. Again, water conservation was the main focus during the hearings, and there was no supporting data addressing scalding with low flow showers, thermal shock or drainline carry at these lower flows.

Showerheads would be limited to a maximum of 2.0 gpm, private lavatory and bar sink faucets to 1.5 gpm, kitchen faucets to 2.2 gpm, urinals to 0.5 gallons per flush (gpf) or non-water and toilets to 1.28 gpf. No comprehensive drainline flow studies were done to support drainline transport of solids at these rates. Because of the proliferation of drain blockages in large horizontal buildings with 1.6 gpf fixtures, an amendment was accepted to allow higher flowing fixtures for these buildings. More research is needed in this area. The table also has flow rates for public lavatory faucets, pre-rinse spray valves and drinking fountains.

Because of the possibility of drainline blockages with current 1.6 gpf fixtures, there was one proposal for remote water closets on the end of drainlines in large industrial or commercial buildings. These can be 1.6 gpf water closets if they are located not less than 30 feet upstream of other drainline connections or fixtures and where less than 1.5 drainage fixture units are upstream of the drainline connection. This still will not solve the problem if current 1.6 fixtures are not getting the job done.

Green legislation: California law requires water conserving fixture disclosure

A new California real estate transfer law will likely drive the demand for more water efficient fixtures in 2012 and beyond. The new law, effective January 1, 2012, revises the California real estate transfer disclosure statement (TDS) to include a checkbox for the seller to disclose whether a property has water-conserving plumbing fixtures.

By January 1, 2017, a single-family residence built on or before January 1, 1994 must be equipped with water-conserving plumbing fixtures, which include low-flow toilets, showerheads and faucets under section 1101.3 of the California Civil Code. There is a danger associated with mandating low flow fixtures on older homes without verifying the existing plumbing systems that the fixtures will be connected to. For example: if an older home has a two-handle shower valve of the non-temperature compensating type or non-pressure compensating type, installing a low flow shower valve can significantly increase the potential for scalding incidents because of the potential for crossover flow. No amount of water savings is worth having hundreds of people scalded and severely burned.

The public and the plumbing industry must be warned of the dangers of mandating ultra-low-flow (ULF) showerheads on older non-code compliant shower valves. I worked on a scald awareness task group with the American Society of Sanitary Engineering (ASSE) to develop a white paper warning of the dangers of scald hazards associated with low-flow showerheads. The paper can be can be downloaded at www.asse-plumbing.org/ScaldHazards.pdf.

Some types of code compliant shower control valves will not perform well with ULF showerheads. Any legislation calling for installation of low-flow or water conserving fixtures should require that the shower valve and showerhead be purchased as a matched set from the manufacturer, in order to assure that scalding will not occur in ULF showers.

As for drainline carry, many older homes have 4-inch or

Continued on page 39

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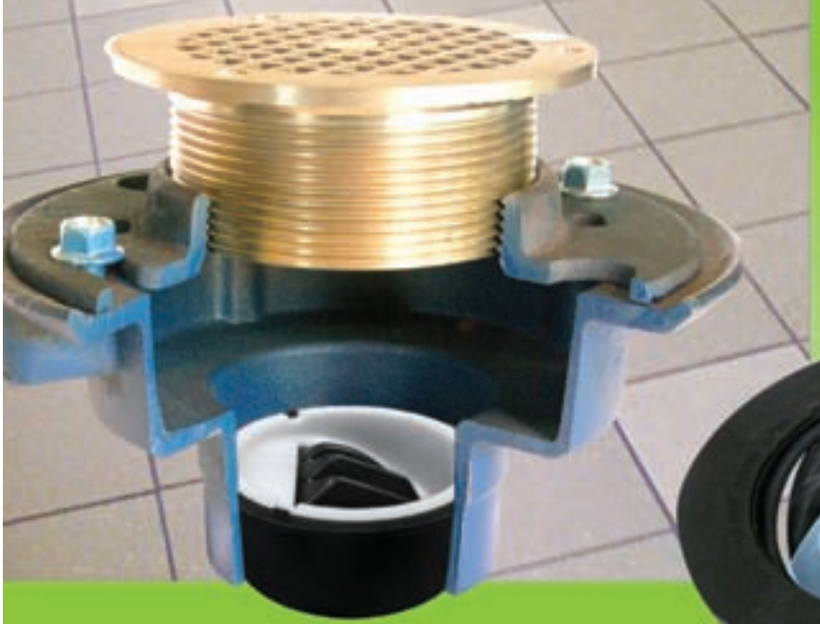

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Waterless Trap Seal Protection - An ECO-nomic Alternative to Trap Primers

Today in nearly every building across North America - whether commercial (offices, warehouses, stores, etc.) or residential (homes, apartments, & condos) - there are floor drains. Because drains connect to the sewer system, some method of sealing must be used to protect against the backflow of dangerous and noxious sewer gases into work or living areas. In North America the standard is a water based seal in a p-trap.

Water seals in p-traps work so long as there is water in the traps. In situations where there are infrequent uses of the drain; the water can evaporate (an effect exacerbated by the recent adoption of dry mop techniques), venting problems may cause the seal to be siphoned off when toilets or other fixtures are used, and old traps may leak or one may never have been installed. No seal = no protection from the known public health threat of noxious sewer gas.

SureSeal Manufacturing has developed an alternative to the traditional water based trap primer methods – the SureSeal Inline Floor Drain Trap Sealer. The SureSeal is a one way valve that fits watertight inside the drain - not in the plumbing system. Its elegant and functional design utilizes a custom elastomeric material with permanent memory for its valve system. The SureSeal opens when fluids are flowing but closes when they stop with zero impact on normal drain flow. When closed, the valve remains sealed protecting the water from evaporating in the trap while preventing the emission of sewer gas, even if that gas is under nominal pressure. Additionally, SureSeal's physical barrier also blocks insects from entering work and living areas through protected drains.

SureSeal MFG has worked to gain awareness and approvals for the application of its concepts and methods - culminating with the development of the ASSE 1072-2007 standard for Barrier Type Floor Drain Trap Seal Protection Devices. ASSE 1072 approved products must meet the following performance tests:

- Physical Membrane Material
- Dirt and Debris
- Evaporation
- Trap Seal Interference
- Opening
- Flow
- Floor Wax
- Grease
- Life Cycle

These rigorous requirements establish the threshold which products must meet in order to be considered as an alternative to the traditional trap priming solutions. SureSeal is the only product that has been designed to meet – and successfully tested to pass - all tests in this Standard, earning the ASSE Seal Approval. ASSE, ICC-ES, & IAMPO listings that are available for download at www.TheSureSeal.com/design .

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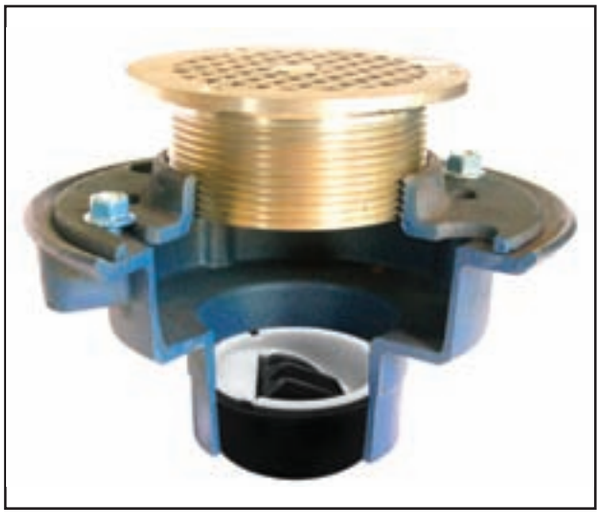

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6-inch building drains and building sewers leading to the public sewer. If low-flow fixtures are mandated for these older buildings, there will likely be an exponential increase in drainline blockages, because the hydraulic depth of flow will not be sufficient in large drainlines with ULF water closets. California and Texas have legislation requiring 1.28 gpf ULF water on all new construction in 2014.

In new construction, drain sizes can be reduced to accommodate the lower flow rates and maintain a hydraulic depth of flow in the drains.

> Multiple editions of green codes and standards are being simultaneously developed in a flurry that reminds me of the space race.

If this ULF fixture requirement is applied to existing construction, it could be devastating for drainline carry of solids. It will be great news for drainline cleaning businesses. The larger pipe sizes, coupled with lower flows from ULF fixtures, will likely result in insufficient flows for drainline transport. I have always said, "There has to be enough water in the river to float the boats." If this legislation goes through, I would advise you to consider buying stock in a sewer cleaning business.

Drainline carry study needs funding to proceed

Water-efficient fixtures lead to reduced water consumption and result in lower drainline and sewer line wastewater flows. Lower mandated flow rates for fixtures provoke important drainage questions: Do these reduced flow rates lead to stoppages of waste in building drains? How low can flows be reduced without causing solids to clog the drainline? What is the minimum drainline flow rate for each pipe size? Does the installation of certain high-efficiency plumbing fixtures or systems contribute to drainline stoppages? If so, are remedies available that can mitigate or prevent drainline stoppages?

The Plumbing Efficiency Research Coalition (PERC) is undertaking an important study on the potential for building drainline blockages with low-flow plumbing fixtures. Work on this important research can begin in early 2012, thanks to generous contributions from water utilities and others and a kind offer from American Standard Brands to allow the use of its test apparatus. However, an additional $50,000.00 of funding is necessary to get this study started. If you

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would like to support this research, please contact Mary Ann Dickinson at the Alliance for Water Efficiency. Contributions are tax deductible. You can send a tax deductible check in any amount to:

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More green legislation: Mortgage underwriting could take energy efficiency into consideration

An energy efficient home could mean a better mortgage for the borrower. Legislation titled "The Sensible Accounting to Value Energy" (SAVE) Act of 2011 (S.1737), introduced on October 19 by Senator Michael Bennet, (D-Colo.) and Senator Johnny Isakson, (R-Ga.) would require that home energy costs be factored into the formula for determining a home's overall value and the prospective homebuyer's eligibility for a loan.

The SAVE Act seeks to incorporate energy efficiency into appraisal and mortgage guidelines so as to ensure appropriate valuation of energy costs and energy efficiency improvements in the mortgage process. This legislation deals directly with federal agencies involved in mortgages (e.g., Fannie Mae and Freddie Mac). Because these agencies guarantee around 90% of the home mortgages in the United States, changes to their standards would likely affect the vast majority of new home mortgages in the United States, including home re-financings.

These guidelines would require that an energy efficiency report provided to the mortgagee be used to determine energy savings. The present value of the estimated energy savings would be added to the appraised value of the property when determining loan-to-value ratios of the property if the value of the energy efficiency is not included in the appraisal. Energy savings would be calculated relative to an average comparable house, according to rules set by HUD. They would account for the estimated life of the applicable equipment, and they would be discounted annually, using the average interest rate for 30-year mortgages.

Several adjustments would be made to the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 to better enable appraisers to consider the energy efficiency of a home. Appraisals that use an energy efficiency report would need to be done by state certified appraisers, who meet higher qualification requirements. Lenders would be required to grant state certified appraisers timely access to information about a property's energy and water conservation features, including ratings.

Regulations would include any necessary limitations to

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protect against double counting and under- or over-valuation of efficiency improvements. After seven years, HUD could alter regulations or add additional exceptions to better reflect actual market values for properties' energy efficiency.

Within 18 months of enactment, HUD would establish an advisory group to report and comment on implementation of these underwriting criteria. They could suggest revisions or additions, which can include the addition of location-based transportation costs and water costs as factors in the underwriting.

Although the law would allow other suitable third-party methods to be used, the preferred tool for estimating energy costs is The Home Energy Rating System (HERS) index, which was established in 2006 by the Residential Energy Services Network (RESNET), a California-based national association of home energy raters and energy-efficiency mortgage lenders. The lower a home's HERS Index, the more efficient the home.

To calculate a home's HERS index, a rater uses a computer program — most commonly, REM/Rate. (RESNET has also approved three other software programs.) REM/Rate compares the home being rated to a "reference home," which is an imaginary home of the same size and shape as the home being rated. The reference home is assumed to barely meet the 2006 International Energy Conservation Code. If the home being rated has thicker insulation or better window glazing than the reference home, those improved specifications will result in a lower (better) HERS Index.

The HERS Index is a useful metric; it doesn't indicate, however, how much energy a home will use. Although it's a good sign if a home has a low HERS Index, that doesn't mean that energy bills will be low. For example, if you have a large house with a low HERS Index, all you know is that your house will use less energy than a typical large house. But a large HERS 70 house can still use more energy than a small HERS 100 house.

The HERS Index doesn't take occupant behavior into account. Researchers who study residential energy use have long known that occupant behavior explains much of the variation from one house to another. When all other things are equal, occupants who use higher thermostat settings and take longer showers can affect the overall energy usage.

Green legislation: California rainwater capture bill vetoed

California Gov. Jerry Brown recently vetoed California Assembly Bill AB 275, the proposed Rainwater Capture Act of 2011, which would have authorized a landowner to install and operate a rainwater capture system for two purposes: (1) outdoor non-potable use or infiltration into groundwater or (2) subsequent indoor non-potable use.

In his veto message, Gov. Brown stated his preference for adopting a rainwater capture standard through the state's Building Standards Commission process. This bill would apparently have created a conflict with the commission's existing process for adopting codes.

Although rainwater catchment systems are growing in demand and popularity, this is the second year in a row that a California governor has vetoed a rainwater capture bill. Governor Arnold Schwarzenegger vetoed a similar bill last year but for different reasons. ■

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.*

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FPE Corner

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

NFPA 101, 2012 edition changes affecting fire suppression systems

In October, the 2012 edition of NFPA 101, The Life Safety Code® was published. Let's look at a few of the changes in this document that involve fire suppression systems.

7.13 Normally Unoccupied Building Service Equipment Support Areas. This is a new section addressing means of egress requirements for large unoccupied areas such as utilidors and interstitial spaces. Much of it is intended to recognize and legalize existing conditions that are commonplace. These spaces will be exempted from certain NFPA 101 means of egress requirements in nonsprinklered spaces not exceeding 45,000 square feet and sprinklered spaces not exceeding 90,000 square feet. In an otherwise fully sprinklered building, the fact that the space is nonsprinklered shall not affect the classification of the building as fully sprinklered under NFPA 101. Look for this new section to be challenged in future editions as its passage has tweaked significant noses. I give two thumbs up to NFPA 101 for this one.

Convenience Stairways, Paragraph 8.6.9.2. Here's another one that will likely be revisited in the next code change cycle for 101. In prior editions, unenclosed convenience openings were limited to connecting two stories, had to be separated from corridors and could not be concealed in building construction. If the NFPA 101 occupancy chapters choose to permit these provisions (currently only New and Existing Assembly Occupancies have opted to do so), then unenclosed convenience stairways may connect an unlimited number of floors provided that 1) the stairs do not serve as a required means of egress, 2) the building is fully sprinklered and 3) the openings are protected as required by NFPA 13 for vertical openings, such as escalators using curtain boards or soffits and closely spaced sprinklers around the opening. NFPA 101 has permitted unenclosed convenience openings for escalators for years. Now, convenience stairs can take advantage of this. Another two thumbs up.

7.14 Elevators for Occupant-Controlled Evacuation Prior to Phase I Emergency Recall Operations. This is a new section moving us a little closer towards provisions recognizing elevators as a normal component in the means of egress. These limited provisions require a fully sprinklered building with the following requirements related to those sprinklers:

7.14.4.2 Sprinklers shall not be installed in elevator machine rooms serving the elevators, and such prohibition shall not cause an otherwise fully sprinklered building to be classified as nonsprinklered.

7.14.4.3 Hoistways serving occupant evacuation elevators may not have sprinklers installed at the top of the elevator hoistway or at other points in the hoistway more than 24 in. (610 mm) above the pit floor, and such prohibition shall not cause the building to be classified as nonsprinklered.

7.14.8.6* An approved method to prevent water from infiltrating into the hoistway enclosure from the operation of the automatic sprinkler system outside the enclosed occupant evacuation elevator lobby shall be provided.

Paragraphs 7.14.4.2 and 7.14.4.3 make this a two-thumbs-up for me, as removing requirements for sprinklers in elevator machine rooms and hoistways is another item on my "code wish list."

11.3.4 Additional Requirements for Air Traffic Control Towers.

11.3.4.5.3 Standpipe Requirements. A requirement for a Class I standpipe system has been added to the requirements for new air traffic control towers "where the floor of the cab is greater than 30 feet above the lowest level of fire department vehicle access." This provision appears to be correcting an oversight from previous editions.

New Educational Occupancies 14.3.5 Extinguishment Requirements.

14.3.5.1. The threshold building floor area for sprinkler protection was decreased from 20,000 square feet to 12,000 square feet. This brings NFPA 101 a little ahead of the International Building Code in terms of sprinklers in schools, as the 12,000-sq.-ft. threshold in the IBC applies to fire areas in school buildings, not to the entire building. Two thumbs up. It has taken far too long for the code industry to recognize the need to sprinkler schools to protect our children in the place they spend more time than any other place aside from home. (We already sprinkler the malls.)

New and Existing Health Care Occupancies.

18.2.5.7.2.3(B) and 19.2.5.7.2.3(B) An increase in the size of sleeping suites to 10,000 square feet is allowed where the space is provided with direct visual supervision, complete smoke detection and the building is fully sprinklered for new healthcare occupancies and the affected smoke compartment is sprinklered for existing occupancies.

19.4.2 The schedule for complying with sprinkler retrofit requirements for existing high-rise buildings containing healthcare occupancies was modified to accommodate various adoptive requirements. This schedule adjustment essentially rewards jurisdictions that wait to adopt new editions of NFPA 101. Two thumbs down.

18.3.5.10 and 19.3.5.10. This provision allows small closets in hospital patient sleeping rooms in sprinklered buildings to be unsprinklered. In order to take advantage of this provision, sprinklers in the room must be arranged so that protection of the closet area is within the protected

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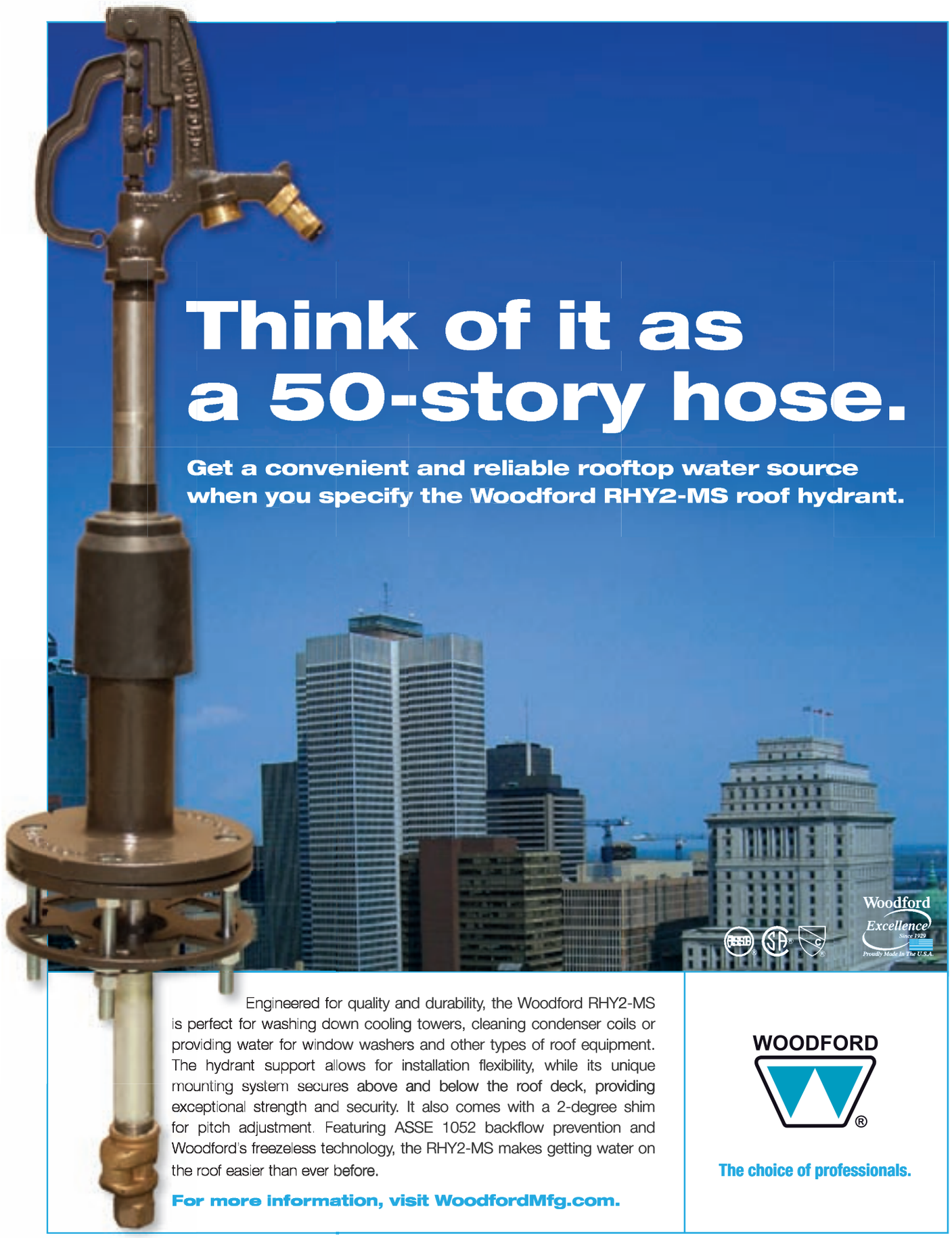

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FPE Corner

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area of one of the sprinklers. The annex note to this provision tells us that at the time of publication this does not comply with NFPA 13, though a proposal to change NFPA 13 was submitted. This is a reasonable sprinkler omission, since closets in patient sleeping rooms in hospitals tend to be sparsely used.

NFPA 101 has included several new provisions to accommodate an industry trend towards making the healthcare environment more homelike. These new provisions are quite significant, allowing previous prohibited items if certain additional protections are provided. In every case, sprinkler protection is one of these additional protections. In the case of new healthcare occupancies, the entire building must be sprinklered, which is already a requirement. In the case of existing healthcare occupancies, the sprinkler provisions need only apply to the affected smoke compartment. The "homelike improvements" provisions include:

18.2.3.4(5), 19.2.3.4(5) permits fixed furnishings which encroach into the required eight feet corridor width.

18.3.2.5.3 &19.3.2.5.3 Residential or commercial cooking equipment used to prepare meals for 30 or fewer persons will be permitted in patient sleeping smoke compartments.

18.5.2.3 (2) & 19.5.2.3 (2) Direct-vent gas fireplaces will now be permitted in patient sleeping smoke compartments.

18.7.5.1(4) 19.7.5.1(4) Draperies and curtains in patient sleeping smoke compartments.

18.7.5.6 and 19.7.5.6 Decorations. Relaxed provisions for use of combustible decorations.

Existing Ambulatory Care Occupancies, 21.3.7.6. Allows the omission of smoke dampers in smoke barriers in fully ducted systems where adjacent smoke compartments are sprinklered. This provision provides the same benefit to existing occupancies as is already provided for new ambulatory care occupancies. Two thumbs up; any time the amount of required smoke dampers is reduced is a good thing in my view.

New Residential Board and Care Facilities, 32.2.3.5.3.1 and 32.2.3.5.3.2. Facilities sprinklered in accordance with NFPA 13R or 13D must also include sprinkler protection in "all habitable areas, closets, roofed porches, roofed decks and roofed balconies." This addresses recent fire fatalities that have occurred in sprinklered facilities in which fires that started in unprotected porch areas extended into the building.

Existing Residential Board and Care Occupancies Chapter 33. There are numerous new provisions involving requirements related to sprinkler systems.

Existing Business Occupancies 39.2.4.7. A new section permitting a single exit for a single-tenant building, three or fewer stories in height and not exceeding an occupant load of 15 people per story if sprinklers are provided among other restrictions. ■

***Sam Dannaway**, PE., is a registered fire protection engineer and mechanical engineer. He is president of S.S. Dannaway Associated, Inc.*

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SFPE Notes

2012 annual meeting: Professional development conference and exposition

Mark your calendars to attend the SFPE annual meeting at the Hyatt Regency Savannah in Savannah, Ga., October 14 – 19, 2012. SFPE is now accepting abstracts for the engineering technology conference. For more information, visit www.sfpe.org/SharpenYourExpertise/Education/2012SFPEAnnualMeeting.aspx.

University of St. Thomas announces collaboration with University of Maryland on fire protection engineering

The University of St. Thomas in Minnesota and the University of Maryland have announced a joint agreement to promote a master's in fire protection engineering program in the Twin Cities region. The program will be the first program in the Midwest United States in 25 years. The SFPE Minnesota chapter played an instrumental role in getting this program started. To find out more, go to http://blog.sfpe.org/2011/11/university-of-st-thomas-announces.html

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Solar Solutions

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

Bristol's Six Principles for Good Solar Hydronic Design

Example project: Combi 101 retrofit in Canoncito, N.M.

Existing hydronic (hot water) home heating systems represent a largely untapped market for solar heating installation. Solar retrofits are especially attractive for the following reasons:

• The hot liquid temperatures required by hot water boiler heating systems are directly compatible with the temperatures easily provided by solar thermal collectors.

• Existing hot water radiant masonry warm floors can be used directly for solar heat storage.

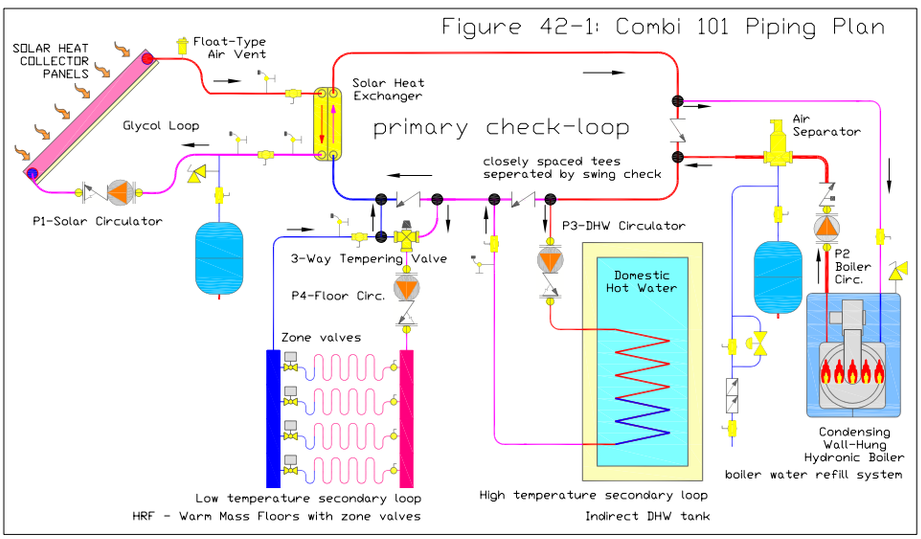
• Other important heating system components can be reused, often without modification.

• The whole retrofit operation can sometimes be accomplished in a matter of days (rather than months or years with new construction projects).

Finding somewhere to put the collectors without spoiling the look and feel of the building and surrounding landscape and fitting the new solar-compatible equipment into the old mechanical room are among the biggest challenges with retrofit projects

The example project presented here is a good illustration of how the art and science of solar heating can be applied to a retrofit. The owners of this house already had radiant heated masonry floors heated by propane. Solar heat has become a reasonable alternative to the steadily increasing cost of propane. The new system was designed to provide a substantial reduction in propane consumption and to fit on the house with as small an impact on the existing home design as possible, both outdoors and indoors.

This project makes good use of a typical solar combisystem that I call Combi 101. As I have mentioned in previous articles, a Combi 101 system is the most basic solar home heating system; it includes solar collectors, a backup boiler, domestic hot water tank (DHW) and hydronic radiant heated floor zones, all connected together. This example project fits the Combi 101 profile nicely. The conceptual piping plan used on this job can be seen in Figure 42-1.



The existing house

The house has just over 2,000 square feet of heated space, is single-story, well-constructed, but with high ceilings in the center. (See Figure 42-2) The original hydronic heating system included four heating zones with separate room thermostats and zone valves feeding a total of 1,250 square feet of masonry radiant warm floors.

The only heating fuel available is propane, and the original gas burner was a Lochinvar DDL075 that provided both potable DHW and boiler fluid for the floors (seen on the right in Fig.42-2). This resembles a conventional 75-gallon gas water heater tank, but has a heat exchanger coil built into it, so that boiler fluid can be heated indirectly by the hot potable water in the tank. This was an atmospheric burner with an AFUE burner efficiency rating of only 82 percent, operating at high altitude, with a de-rating for 7,000 feet elevation. The burner required a large flue pipe and large fresh air vents feeding the boiler room.

Roof-mounted solar heat collectors

The house was built with passive solar features (large south windows), so a large portion of the roof had a good south-

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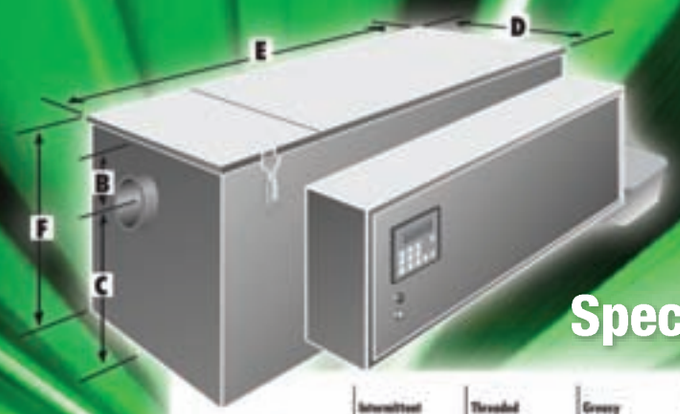

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RAGRU.25	25	3"	50lb.	4.0"	10.5"	18"	30"	14.5"
RAGRU.35	35	4"	70lb.	4.5"	12.5"	18"	36"	17"
RAGRU.50	50	4"	100lb.	4.5"	17"	18"	36"	17"
RAGRU.75	75	4"	150lb.	4.5"	17"	24"	42"	21.5"
RAGRU.100	100	4"	200lb.	4.5"	17"	24"	52"	21.5"

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ern exposure. The roof was built with a shallow pitch and covered with corrugated metal. Ground mounted collectors were considered, but rejected because of the added difficulty posed by the trees, landscaping and underground piping required.

Figure 42-3 shows the collectors installed in this project. The small modular collectors were chosen for several reasons. The shape of the collectors tends to mimic the existing windows resulting in a softer appearance that is less monolithic than with larger panels. The panels have a low profile that fits below the highest peak of the existing roof, which also helps to moderate the dominating appearance of the panels on the building.

The panels plug together easily side by side to allow a simple flow path using horizontal headers and vertical risers, all hidden inside the collector frames. This allows the easy installation of thermosyphon cooling fins on the back of the collectors, which were used here to prevent overheating during the summer and fall. The panels are the SS16 model made by SolarSkies and have the added benefit for the installers of being easier to lift up a ladder than larger panels.

Existing equipment to keep or replace

When burning propane at high altitude in this home, we determined that a sealed-combustion condensing boiler would provide better fuel economy. We found that a wall-hung condensing boiler would fit in the limited space provided in the mechanical closet; the installer, Jeff Stampfer, chose the Knight WBN106 with an AFUE rating of 95.5%. To control the heat loss from the DHW tank, a Triangle Tube indirect water heater tank was chosen that can be heated by solar or boiler using its tank-in-a-tank heat exchanger, and has no heat loss from a central flue pipe as the original tank did.

The use of a sealed-combustion boiler eliminated the need for the existing large metal flue pipe and fresh air vents that were originally installed from the boiler room up through penetrations in the roof. Since these vent pipes were installed with metal flashing as a permanent weatherproof part of the finished metal roof, it made sense to use them as conduits for our new boiler flue pipes and solar glycol supply and returns. As a result, we did not need to cut any new penetrations in the roof to make these connections.

A number of heating system components were kept and reconnected with little or no modification. This includes the gas supply pipes, the boiler refill and air eliminator parts, the heat distribution tubing and manifolds, including the zone valves, and the existing four conductor thermostat wires.

Results in the mechanical room

Figure 42-4 shows how the final components fit into the existing boiler room. This was a very small closet in the center of the house, so remodeling it and even photographing it were something of a challenge. Our installers from Eldorado Solar did a good job of placing the tank, the boiler, the solar heat exchanger and the new circulator pumps in positions where they could be reached for installation and service. Because the primary loop is mounted horizontally near the ceiling, all the components can be connected with reasonable accessibility in this tiny utility closet. While still a crowded space, this installation would have been much more difficult and much less serviceable without the ceiling mounted primary loop.

The control system for this installation is the SolarLogic Integrated Control, known as the SLIC. It provides comprehensive control over every heating component in the house, including heat storage in the masonry floors and remote access over the Internet. I will describe the control system in more detail in an upcoming column.

Final notes

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

Bristol Stickney *has been designing, manufacturing, repairing and installing solar hydronic heating systems for more than 30 years. He holds a Bachelor of Science in Mechanical Engineering and is a licensed mechanical contractor in New Mexico. He is the chief technical officer for SolarLogic LLC in Santa Fe, N.M., where he is involved in development of solar heating control systems and design tools for solar heating professionals. Visit www.solarlogicllc.com for more information.*

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ANSI Z21.10.3/ CSA 4.3	**Gas water heaters Volume III, storage water heaters with input ratings above 75,000 btu per hour, circulating and instantaneous**
ANSI Z21.13/ CSA 4.9	**Gas-fired low pressure steam and hot water boilers**
ANSI Z21.47	**Gas-fired central furnaces**

National Fuel Gas Code, NFPA 54.

Venting systems covered by these requirements are intended to be used with Category II, III, and IV appliances that have been installed in accordance with NFPA 54, and with codes such as the BOCA National Mechanical Code, the Standard Mechanical Code, the Uniform Mechanical Code, and local codes. Components coming in direct contact with products of combustion shall carry the appropriate UL/cUL labels.

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B. Maximum continuous flue gas temperature shall not exceed 230 degrees F (110 degrees C).
C. The vent system shall be routed for zero clearance to combustibles as specified by the manufacturer.
D. Vent shall be listed for a maximum positive pressure rating of 20" w.c.
E. The vent shall be constructed from Flame Resistant Polypropylene, with a min. wall thickness of:

Diameter		Wall thickness extruded pipes			
Diameter (mm)	**Diameter (inch)**	**min (mm)**	**max (mm)**	**min (inch)**	**max (inch)**
DN 60	2"	1.7	2.2	0.0669	0.0866
DN 80	3"	1.8	2.4	0.0709	0.0945
DN 110	4"	2.4	3.2	0.0945	0.1260
DN 125	5"	2.7	3.7	0.1063	0.1457
DN 160	6"	2.9	4.5	0.1142	0.1772
DN 200	8"	3.5	4.5	0.1378	0.1772
DN 250	10"	3.3	4.7	0.1299	0.1850
DN 315	12"	4.2	5.8	0.1654	0.2283

F. All systems components such as vent supports, roof or wall penetrations, terminations, appliance connectors and drain fittings required to install the vent system shall be UL/cUL listed and provided or approved by the vent manufacturer.
G. All systems components shall include a factory-installed gasket in their female-end to render the vent air and water tight when the male/female ends are pushed together as per manufacturer's instructions.

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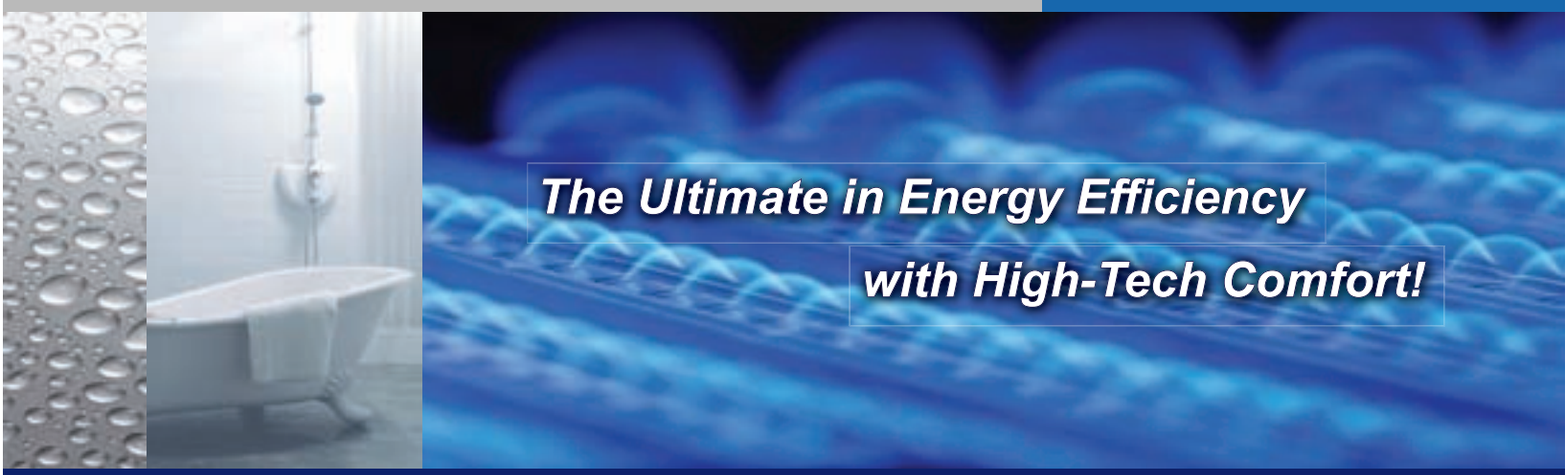
KD NAVIEN®

Condensing **Tankless** Gas Water Heater



With NAVIEN Condensing Technology, You Get the Best of Both Worlds: The Best Value and "Ultra Condensing Efficiency"!

- *Energy Factor = 0.96 (DOE)*
- *Industry Leading Ultra-Condensing Technology*
- *SCH 40 3" PVC Venting*
- *Re-Circulation Pump and Buffer Tank*
- *Endless Supply of Hot Water*
- *Eco-Friendly Technology*
- *Space Saving Design*
- *2 Stainless Steel Heat Exchangers*

Remote Control
NR-10DU
(Included)

Come Visit Us at the
AHR EXPO Booth **#2247**

Circle 32 on Reader Reply Form on page 113

www.NavienAmerica.com **1-800-519-8794**

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KD Navien®

Condensing Tankless Gas Water Heater

Models: NR-180/180A, NR-210/210A, NR-240/240A, NP-240/240A

Specifications	
Heat Input (Btu/h)	199,000
Modulation Range	15,000 to 199,000
Energy Factor	0.95 - 0.97 DOE
Primary Heat Exchanger	Stainless Steel
Secondary Heat Exchanger	Stainless Steel
DHW temperature	98 – 185 deg F
Operating Pressure (PSI)	15 – 150 PSI
Minimum Flow Rate (GPM)	0.01 GPM
Venting Type	Direct Vent
Ignition Type	Electronic
Performance / Temperature Rise	
35° F Rise	8.0 GPM - 10.6 GPM
45° F Rise	6.2 GPM - 8.2 GPM
70° F Rise	4.0 GPM - 5.3 GPM
General Data	
Fuel Type	Natural Gas or LP
Inlet Gas Pressure - N/G	5.0" – 10.5" W.C.
Inlet Gas Pressure - LP	8.0" – 13.5" W.C.
Power Supply	120VAC, 60Hz, 200W
Freeze Protection	Circulation/Gas Burner
Max Vent Length	100 feet
Max number of Elbows	6
Self Diagnostics	Error codes displayed
Installation Type	Indoor/Outdoor Wall Hung
Connections	
Gas Connection	¾" NPT
Cold Water Inlet	¾" NPT
Hot Water Outlet	¾" NPT
Exhaust Venting Outlet	SCH 40 3" PVC
Fresh Air Intake	SCH 40 3" PVC
Dimensions	
Height (in)	28"
Width (in)	17"
Depth (in)	15"
Weight (lbs)	86 lbs
Approvals	
Safety	CSA, NSF, Energy Star
Commercial Warranty	10 yrs,HX 5 yrs Parts

Ultra Condensing Technology

• Qualifies for Federal Tax Credit

One of the industry's highest energy ratings of 0.96 DOE energy factor means the lowest annual operating costs and the best payback compared with conventional tankless and tank-type water heaters.

• Heat Exchangers

Navien's dual stainless steel heat exchanges are up to 20 times more resistant than copper heat exchangers to erosion and condensate damage.

• Venting

The higher efficiency and lower exhaust temperatures allow the use of SCH 40 3" PVC. Maximum vent length is 100ft with a maximum of 6 elbows.

• Remote Control

Advanced water heater diagnosis and error feedback. Keypad lock prevents inadvertent temperature changes. Temperature adjusts in 1 degree increments. Built-In re-circulation timer for water and energy savings.

• Built-In Re-Circulation Pump

Delivers hot water to fixtures quickly resulting in water conservation. No minimum flow rate: get hot water even at very low flow rates of 0.1 or 0.2 GPM. Minimizes hot/cold/stacking, the so called "cold water sandwich".

Additional Accessories

Navien PH Condensing Neutralizer Cartridge	Navien NR/NP Pipe Cover	Navien Cascade Cable	Navien Easy Plumb Valve Kit - 3/4" & 1"
			

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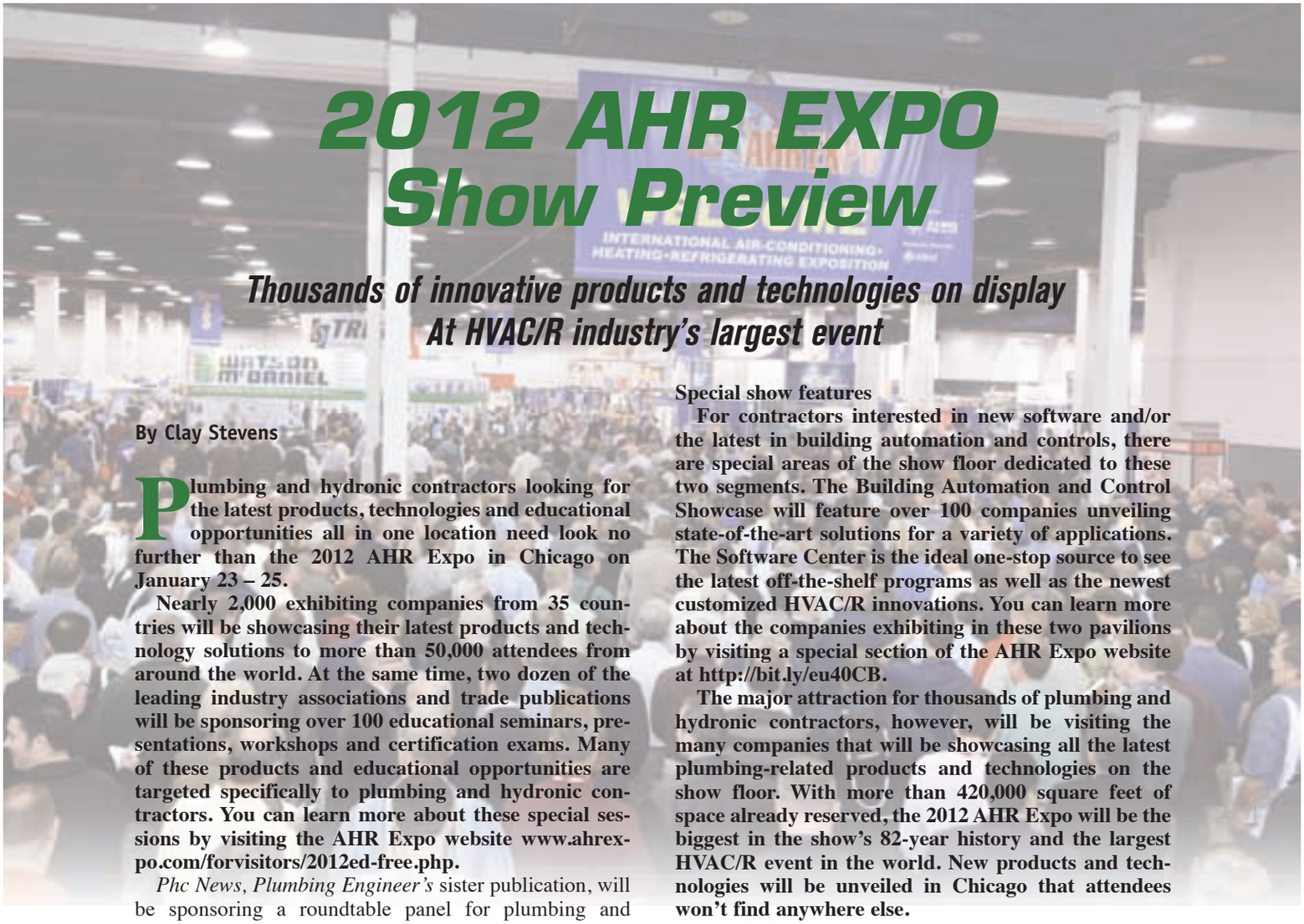

2012 AHR EXPO Show Preview

Thousands of innovative products and technologies on display At HVAC/R industry's largest event

By Clay Stevens

Plumbing and hydronic contractors looking for the latest products, technologies and educational opportunities all in one location need look no further than the 2012 AHR Expo in Chicago on January 23 – 25.

Nearly 2,000 exhibiting companies from 35 countries will be showcasing their latest products and technology solutions to more than 50,000 attendees from around the world. At the same time, two dozen of the leading industry associations and trade publications will be sponsoring over 100 educational seminars, presentations, workshops and certification exams. Many of these products and educational opportunities are targeted specifically to plumbing and hydronic contractors. You can learn more about these special sessions by visiting the AHR Expo website www.ahrexpo.com/forvisitors/2012ed-free.php.

Phc News, Plumbing Engineer's sister publication, will be sponsoring a roundtable panel for plumbing and hydronic professionals on the topic of "Selling Energy Efficiency in Today's Marketplace" on Tuesday, January 24 (http://tinyurl.com/789x6qo). A panel of industry experts, including Bob "Hot Rod" Rohr, will examine why embracing energy efficiency can be a good investment for your business.

A variety of other educational sessions will also be taking place during the 2012 ASHRAE Winter Conference in the Palmer House Hilton hotel. These half-day courses cover a variety of topics of interest to plumbing and hydronic engineers and contractors. You can learn more about these offerings at ASHRAE's website, www.ashrae.org/education/2012-chicago-courses.

I have spoken with many of the thousands of plumbing and hydronic contractors who have attended the event over the years; they all come away amazed at the many new products they discovered and new things they learned.

In addition to the AHR Expo and ASHRAE educational sessions, dozens of new product innovations and technology solutions will be previewed in the New Product Technology Theaters all three days of the show. You can learn more about these 15-minute free presentations by visiting the online schedule at http://bit.ly/u0dCA4.

Special show features

For contractors interested in new software and/or the latest in building automation and controls, there are special areas of the show floor dedicated to these two segments. The Building Automation and Control Showcase will feature over 100 companies unveiling state-of-the-art solutions for a variety of applications. The Software Center is the ideal one-stop source to see the latest off-the-shelf programs as well as the newest customized HVAC/R innovations. You can learn more about the companies exhibiting in these two pavilions by visiting a special section of the AHR Expo website at http://bit.ly/eu40CB.

The major attraction for thousands of plumbing and hydronic contractors, however, will be visiting the many companies that will be showcasing all the latest plumbing-related products and technologies on the show floor. With more than 420,000 square feet of space already reserved, the 2012 AHR Expo will be the biggest in the show's 82-year history and the largest HVAC/R event in the world. New products and technologies will be unveiled in Chicago that attendees won't find anywhere else.

If AHR Expo sounds a bit overwhelming with so many things to see and do, it need not be. There is a special AHR Expo online tool called My Show Planner that allows visitors to:

- Search for specific products, product categories and/or exhibitors they wish to see.
- Virtually "walk" the exhibit halls and scroll over a booth to get more information.
- Automatically request a meeting with the companies they are interested in seeing.
- Plan events and meetings and automatically update them in Outlook Calendar.
- Automatically add booths to their planner, based on pre-selected criteria.
- Map the best course through the exhibit halls based on products/criteria selected.
- Enhance existing relationships and create new ones.

By spending a few minutes planning your visit in advance, you can save a good deal of time and unnecessary walking. You can learn more about My Show Planner at http://bit.ly/sIrt81.

I have spoken with many of the thousands of plumbing and hydronic contractors who have attended the event over the years; they all come away amazed at the many new products they discovered and new things they learned. One contractor summed it up best by saying, "I can spend countless hours on the Internet looking for products and information or meeting with manufacturers

Continued on page 60

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to discuss their specific solutions. Or, I can go to AHR Expo and see everything I need and meet with all the key people in just a few hours' time."

You can register to attend AHR Expo and visit the show floor at no cost on the show's website, http://registration3.experient-inc.com/showAHR121/Default.aspx.

We'll see you soon in Chicago. ■

Clay Stevens *is president of the International Exposition Company.*

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About AHR Expo

As the world's largest and most comprehensive, exclusively HVAC/R, exposition, the AHR Expo attracts tens of thousands of attendees from all facets of the industry, including contractors, engineers, dealers, distributors, wholesalers, OEMs, architects, builders, industrial plant operators, facility owners and managers, agents and reps.

In addition, more than 130 educational sessions and workshops addressing all facets of the HVAC/R industry are offered by leading industry associations and organizations during the three days of the show, many free of charge.

Since 1930, the AHR Expo has been the HVAC/R professional's best resource for new products, new ideas and new services. It's a hands-on, interactive event that showcases a wide spectrum of equipment, systems and components. This unique industry forum creates a dynamic marketing environment unequaled in size and scope by any other industry event. For information, www.ahrexpo.com.

Trade shows' ROI?

With everyone pressed for time these days, you or your boss may ask the question "Is it worth my time to attend a trade show?" Depending on the show, it can be a very valuable investment of your time. Here are five ways you can benefit from attending major industry events.

1. Discover new products and solutions you can't find anywhere else. With several hundred suppliers from dozens of countries exhibiting at major trade shows, you will certainly discover new products and technologies you didn't even know existed, because many will be unveiled for the first time at the show.

2. Compare competitive products and technologies. In just a few hours' time you can meet with the key global suppliers of the specific equipment you are interested in and compare their various features and benefits side-by-side.

3. Discover innovative solutions to your specific challenges. With so many leading suppliers and industry experts gathered in one location, you can usually find solutions to all your needs and challenges. Many events offer an online "match-making" service, where you can reach out to exhibitors and conference speakers in advance and explain what your specific needs and challenges are so they can be prepared to discuss them with you at the show.

4. Expand your knowledge. Conference programs at major trade shows can be a great place to gain valuable insights into new trends and technologies as well as detailed information on technical topics. These sessions are usually produced by leading industry associations and feature the top experts in their field. Many also offer CEUs or other types of accreditation.

5. Take advantage of special "Show Deals." Many exhibitors offer special pricing or other incentives that are only available at the show. ■

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Do your **best work.**

From concept
Our job is to help you do your job better. Start with Green Building system design and Taco Hydronic System Solutions® software. You'll be surprised at how easy it is. In fact, you can design a LoadMatch® single pipe system or a LOFlo® radiant cooling/chilled beam system in a fraction of the time you used to spend.

To comfort
Every job has its own challenges, so we give you lots of options like our e-Smart® sustainable components, our Advantage® Series variable speed drives, and geothermal, solar, and high efficiency packages to help meet the demands of sustainability and LEED.

To control
Once you turn the building over, the facility engineer can monitor, manage, and control both the hydronic and air systems from the comfort of his own PC with iWorx® from Taco Electronic Solutions. iWorx is self-configuring, expandable, Niagra® compatible, and economical. And it requires no proprietary software or knowledge of code.

All under one roof
Taco is a family-owned business that understands the value of integrity and customer support. When you choose Taco, you're choosing a whole-business approach to system creation; we're here from the start to the finish.

See it all at our AHR Expo booth #5400.
Come see a sampling of OUR best work at the AHR Expo 2012 in Chicago. Stop by and talk shop with a Taco engineer, catch a presentation in our classroom, test drive our design software and see iWorx in action, hands on. Or find us online at www.taco-hvac.com.

e-smart®

Taco®
ADVANCED HYDRONIC SYSTEMS
www.taco-hvac.com

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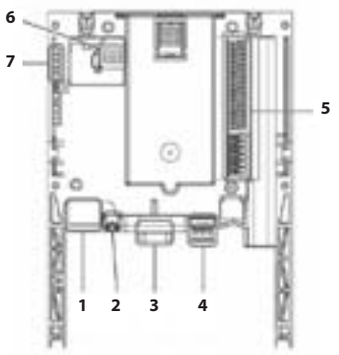
Advantage
VARIABLE SPEED DRIVES

Pump Controller Card
For use with Advantage 61 Drives

- **Multiple System Monitoring Options** – Controls variable speed pumps based on three different user selected metrics for variables including building pressure, three independent zones of differential pressure (Delta P) or central plant supply and return temperature (Delta T).
- **Pump Staging and Duty Sharing for Four Pumps** – Monitors system demands and stages pumps on and off to satisfy demand and optimize energy efficiency. Duty shares to provide either equal run time or skewed run time, delivering preferential loading to owner designated equipment.
- **Differential Pressure Control** – Monitors up to a three zone differential pressure system. The Advantage VFD Pump Controller Card determines the zone with the highest demand based on a pre-determined setpoint for each zone. It then regulates speed and staging/destaging based on the requirements of the most critical zone.
- **Flow Reject Function** – Enhances system efficiency with the usage of flow meters. By configuring the flow value for a single pump system in the Delta-P menu, the system will de-stage all other pumps in operation if the flow value drops below the flow capabilities of a single pump. This de-staging provision operates in addition to the standard de-stage function which may be based on feedback error.
- **Fault Tolerant Control** – Ensures that the system can still be satisfied if signal loss occurs from any sensor. The pumps immediately go to a user defined default speed mode (factory preset 45 Hz) and the controller notifies the BMS that a fault has occurred.
- **Life Cycle Optimization** – Improves the pump life cycle by hydraulically stable control, end of curve protection, as well as energy optimization.
- **Drive Parameterization** – (Auto-Commissioning) – Reduces drive setup time by transferring master drive/motor parameters to other VFDs in the system.

Parts Description



1. Ethernet port used for programming with SoMachine and for Modbus TCP communication.
2. Mini-USB B port used for programming with SoMachine.
3. 9-pin male SUB-D connector for connection to the CANopen® bus.
4. Connector with removable screw terminals, 3 contacts intervals of 3.81 mm (0.15 in.) for the 24 Vdc power supply.
5. 10 logic inputs, 6 logic outputs, 2 analog inputs, 2 analog outputs and 5 commons.
6. Block of 4 configuration switches.
7. 5 LEDs, comprising:
   - 1 LED G/Y ETH (EtherNet activity)
   - 1 LED G/R NS (Network Status)
   - 1 LED G/R MS (Module Status)
   - 1 LED G/R CAN (CANopen®)
   - 1 LED G/R USER programmable from the customer

Part Number	Description
VW3A3521S0M	ADVANTAGE 61 VFD PUMP CONTROLLER CARD
VW3M3805R010	Cable #1: DB-9 to RJ45 for CAN tap w term in DB-9
VW3CANCARR1	Cable #2: CANopen cable 1 m
TCSCTN023F13M03	Splitter: RJ45 DAISYCHAIN TAP W 0.3M DROP CABLE
TCSCAR013M120	Termination Resistor RJ45
TDG1026KS-C5E	Category 5E Shielded RJ45 (8x8) Keystone Feed-Thru Coupler

Terminal	Function
24 V	Power supply for the Advantage VFD Pump Controller Card, logic outputs and analog outputs.
COM	Common ground and electrical 0V of the Advantage VFD Pump Controller Card power supply, logic inputs, (LI••), outputs (LO••), analog inputs (AI••) and analog outputs (AO••). This ground and electrical 0 V are common with the drive ground and electrical
LI51 to LI60	24 VDC logic inputs
LO51 to LO56	24 VDC logic outputs
AI51 and AI52	0 ... 20 mA analog inputs
AO51 and AO52	0 ... 20 mA analog outputs

Power	Voltage		
Current Consumption	Maximum	**V**	24 VDC (min. 19, max. 30)
	No-Load	**A**	2
	Using logic output	**mA**	80
Analog inputs (1)	AI51, AI52	**mA**	200 maximum (1)
			2 current analog inputs 0…20 mA, impedance 250Ω Resolution: 10 bits Accuracy: ± 1 % for a temperature variation of 60 °C Linearity: ± 0.2 % of the maximum value Common point for all the card I/O (2)
Analog outputs	AO51, AO52		2 current analog outputs 0…20 mA, impedance 500Ω Resolution: 10 bits Accuracy: ± 1 % for a temperature variation of 60 °C Linearity: ± 0.2 % of the maximum value Common point for all the card I/O (2)
Logic inputs (2)	LI51…LI60		10 logic inputs, 2 of which can be used for 2 counters or 4 of which can be used for 2 incremental encoders Impedance 4.4 kΩ Maximum voltage: 30 VDC Switching thresholds: State 0 if Ω 5 V or logic input not wired State 1 if Ω 11 V Common point for all the card I/O (2)
Logic outputs	LO51…LO56		Six 24 VDC logic outputs, positive logic open collector type (source),compatible with level 1 PLC, standard IEC 65A-68 Maximum switching voltage: 30 V Maximum current: 200 mA Common point for all the card I/O (2)
I/O connection	Type of contact		Screw, at intervals of 3.81 mm2
	Maximum wire	**mm2**	1.5 (AWG 16)
	Tightening torque	**Nm**	0.25
Lithium battery	Life		8 years approx.

(1) If the power consumption table does not exceed 200 mA, this card can be powered by the drive. Otherwise, an external 24 VDC power supply must be used.

(2) This common point is also the drive 0 V (COM).
Note: When the VW3A3503M Advantage VFD Pump Controller Card is installed, the analogue inputs may be configured for 4-20 mA in screens.

Taco® systems made easy®

Taco Inc., 1160 Cranston Street. Cranston, RI 02920 / (401) 942-8000 / Fax (401) 942-2360
Taco (Canada) Ltd., 8450 Lawson Road, Unit #3, Milton, Ontario L9T 0J8 / (905) 564-9422 / Fax (905) 564-9436
www.taco-hvac.com

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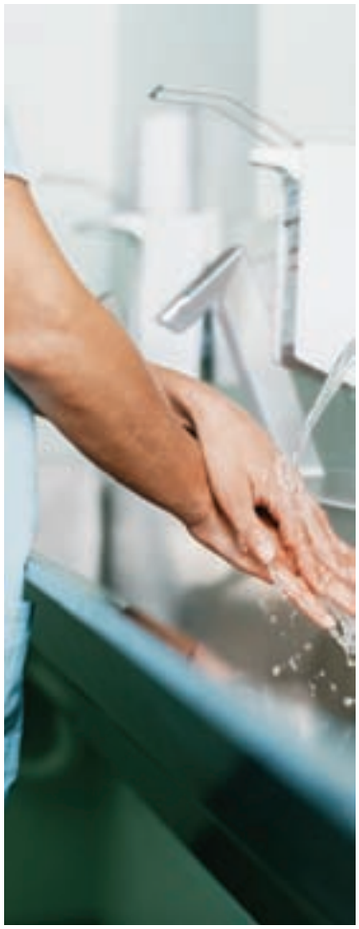
INTRODUCING

BASYS™



Any Application. Any Environment.™

Basys™ offers a truly innovative platform of modular electronic sensor faucets for a broad range of commercial applications. Backed by a century of experience and grounded in proven Sloan technologies, the platform delivers revolutionary efficiencies in service and maintenance. With five body types, multiple power harvesting options, and advanced programmability and user controls, Basys provides the ultimate experience for users and plumbers alike.

Crowns:

Power Options:

Battery *Solar*

Hard-wired *Turbine*

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Build a Basys online:
sloanvalve.com/basys

U.S. GREEN BUILDING COUNCIL MEMBER

SLOAN®

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BASYS™

Any Application. Any Environment.™

Informed by in-depth research and backed by Sloan's century of experience and proven technologies, Basys offers a modular platform of body types, features and components to meet the needs of any application or environment.

Low

The modest profile minimizes the potential for vandalism, making this body type ideal for high-use, low-security environments. For extra assurance against damage, opt for the capacitance model.*

EFX-3

Active Infrared

Capacitance

Low Integrated Base

Ideal for the most demanding high-use environments. The integrated base offers added durability via two attachment points. The capacitance model is especially robust.*

EFX-6

Active Infrared

Capacitance

Mid

This model provides optimal height and proportions for effective hand washing, making it well suited for most restroom environments.

EFX-2

Active Infrared

High

The tall profile offers a distinct aesthetic as well as an optimized delivery angle that permits a greater wash area. Users can scrub up to their forearms if desired.

EFX-1

Active Infrared

Wall

Elimination of the deck translates into uninterrupted clearance and a striking appearance. The spout attaches directly to a valve box in the wall, making this body type easy to install and secure.

EFX-8

Active Infrared

***Sensing Options:** Active Infrared sensing is the standard on all models and is designed to provide above-deck access to key components, and offer additional user enhancements. Capacitance sensing does not utilize a vulnerable sensor window and critical components are protected in a watertight, below-deck box. Electronics on all models protected to IP-67.

UNIVERSAL FEATURES

One tool service
A single allen wrench provides access to all key components. No additional tools required.

Shared parts
Interchangeability of components simplifies orders, upgrades, repairs and maintenance.

Visible diagnostics
Individual external diagnostic LEDs indicate the health and status of key components.

Automatic shut-off
One twist of the solenoid caddy shuts off water supply to facilitate cleaning or replacing the filter.

Power options
Multiple power harvesting options are available to suit the unique needs of each environment.

Sleep mode
With a touch, staff can temporarily turn off the water in order to clean a sink.

Line purge
All models include a line purge function to eliminate the stagnant water that can lead to bacterial growth.

Flow rates
Three spray inserts – multi-laminar spray, full stream aerated and full stream laminar – offer options to adjust feel and flow rate.

Warranty
All products have a standard three-year limited warranty.

For more in-depth specifications, or to build a Basys™ faucet online, visit:
sloanvalve.com/basys

World Headquarters:
10500 Seymour Ave. Franklin Park, IL 60131
T: 847.671.4300 / 800.9.VALVE.9
F: 847.671.6944 / 800.447.8329

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Legend: Hardwired Battery Operated Solar Turbine

SLOAN®

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‘Aqua’ changes Chicago skyline

Chicago’s high-rise skyline is forever changed. Under construction for four years, the 82-story, 1.9 million-square-foot Aqua building in Chicago’s downtown area is now one of the city’s most prominent jewels.

Aqua building

The Aqua — built by developer James Loewenberg of the Magellan Development Group, with design by Jeanne Gang, FAIA, of Studio Gang — is now a 28-acre Lakeshore East complex on the old Illinois Central Railroad yards along Lake Michigan. At its center, the Aqua Tower surges high above the surrounding area.

Gang’s alluring design includes a residential tower, which rises from a mixed-use podium at its base. All told the entire project, from land to furnishings, required an investment of $4 billion.

The design team devised ways to make Aqua energy efficient through sustainable strategies that enabled the developer to apply for LEED Silver status. Loewenberg admits that green wasn’t the first thing on his mind at the beginning of the process, but, because of Chicago’s strong environmental laws, he soon thought, “We could make this building green. We were already heading in that direction, and I wasn’t even aware of it.”

Gang, who has incorporated energy-saving features into a number of her previous projects, was delighted.

Concrete and glass

In a city known for its rectilinear skyscrapers, Gang introduced dramatic curves by wrapping the tower with sinuous concrete balconies. The building’s plan reserves floors four to 18 for The Radisson Blu Aqua Hotel, which opened in late 2011, with 334 rooms and suites. Floors 19 to 52 will have 474 rental apartments. The remaining upper floors provide space for 264 high-end condos, with penthouses on floors 80 and 81.

Gang designed the balconies for sun-shading, making them deeper on the south than on the north. As many balconies as possible were placed next to living rooms, thus forming visual extensions of the living spaces.

While the concrete decks cut solar load on the glass facades, the architects left certain glazed areas exposed — organically shaped expanses of wall they call “pools” — for interiors where balconies aren’t needed but direct sunlight is welcome. To reduce solar load on the exposed glass, Studio Gang conducted sun pattern studies that in turn led to its specifying six different types of glazing. In addition to low-E coatings, the firm selected reflective glass for the exposed parts of the east and south facades.

Studio Gang acknowledges that the concrete balconies, which are extensions of the floor slabs, shed Btu in the winter, much like fins on an air cooled engine. The idea of adding thermal breaks between the indoor and outdoor portions of the slabs was considered, but it proved too difficult. In terms of overall energy use, the heat loss in the winter is more than offset by summer savings from shade provided by the balconies and the use of reflective glass in the “pool” areas.

Inside the dwelling units, the architects selected materials and equipment with sustainable features, such as bamboo for the floors. Low-flow plumbing fixtures were selected to cut down on water use, and Energy Star-rated appliances were installed.

Mechanical bliss

Heat for the 870-foot tall building comes from four, 12,800 mbh gas-fired boilers that feed a 10-inch riser. Two 1,030 gpm pumps are used to circulate the water, while another pump is on standby. The boilers are also used to fire indirect water heaters to supply nearly the entire building with domestic hot water. The upper condominium floors have individual gas-fired water heaters.

“That 10-inch main supplies three risers for the whole building,” said Dan Krebsbach, VP of Advance Mechanical, which is based in Arlington Heights and kept between 30 and 40 union workers on the Aqua job for

Continued on page 66

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Chicago's Aqua

Continued from page 65

Advance Mechanical's Jim Paulsen, service foreman, and Dan Krebsbach, check fan coil wiring inside a condo unit.

nearly four years. Engineers at Advance designed the mechanical system.

"The biggest challenge we had to overcome was the height of the building," said Krebsbach. "It necessitated breaking the hydronic systems apart vertically to keep the hydrostatic pressure within reasonable limits." The tower was broken into three sections, with the use of two large plate-and-frame heat exchangers and powerful base-mounted pumps.

Hot water is delivered to 1,600 International Environmental Corporation (IEC) fan coil units, most of which are either 300 (9,000 Btu) or 600 CFM (1,800 Btu)

Tim Mayer (foreground) and Building Engineer Jerry Kemperman, check the operation of one of four 10,500 MBH boilers.

This Taco vertical in-line pump resides on Aqua's 57th floor. It circulates hot water for fan coil units to condo fan coil units at that level, and to living spaces in the floors above it.

units. The concealed vertical stack units cut installation time and material costs. "The units are generally located one on top of the other, making hot water, chilled water and condensate drain line installations very simple and cost effective," said Ron Porter, senior product manager at IEC. The risers, which were installed at IEC's Oklahoma City manufacturing facility, essentially became extensions of the cooling and heating water mains.

"Each fan coil unit has separate heating and cooling coils with water valves that respond to the local room thermostat," said Porter. "With this system, individual apartments or hotel rooms can enjoy heating or cooling as desired, creating an optimum luxury environment." The four pipe, stacked fan-coil units are often situated against an exterior wall, where maximum heat gain and loss is noticed.

On the lower level of the skyscraper, two 1,200-ton heat exchangers tap Thermal Chicago's underground chilled water lines. In operation since 1995, Thermal Chicago Corporation is the world's largest interconnected district cooling system, serving about 100 buildings in the downtown Chicago area, for a contracted capacity of 100,000 tons. The Aqua building fulfills its name; it calls for 12-inch water mains to cool the entire structure.

Lush greenery

At the base of the tower, a three-story podium contains the hotel and apartment lobbies. Most notable is the 80,000-square-foot garden on the podium roof. The garden includes an outdoor swimming pool and a running track, while the tower rises from the center, high above the greenery.

On this park-like roof, meandering paths weave between low evergreens and deciduous plantings. A continuous drainage layer allows water to flow under soil, gravel, and concrete walls to drains and pipes. The roof's vegetation is not only aesthetic but also combats the heat-island effect during the hot summer months by lowering ambient temperatures around the building.

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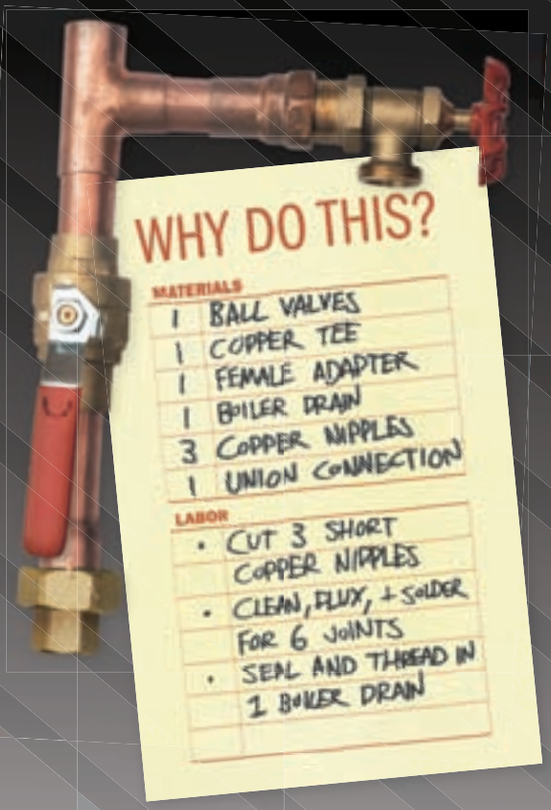

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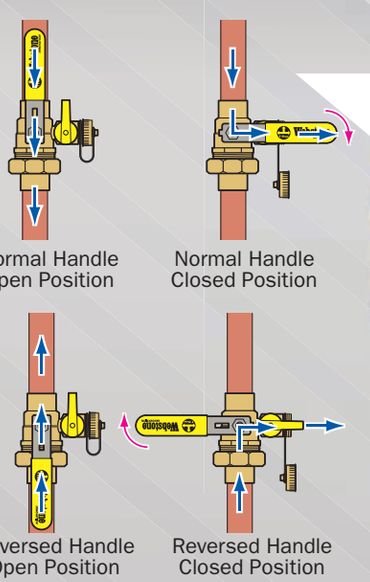

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Chicago's Aqua

Continued from page 66

Tim Mayer, Advance Mechanical job superintendent, check pressure across a Taco vertical inline pump.

The Aqua is also host to Chicago's first electric-vehicle charging station open to the public, in the tower's underground parking garage. The station can accommodate 24 electric and hybrid vehicles. Other sustainable features include rainwater harvesting systems and energy-efficient lighting.

For those with a soft spot for wild animals, the tower has a design concept unlike any other skyscraper in the city. The balconies, railing and etched glass minimize bird casualties by making the building easily seen, minimizing aerial impacts.

All this comes at a price, however. The tower's condominium models include a 1,251 square-foot, two-bedroom, two-bath plan with a southeast view on the 58th floor priced at $755,000. A two-bedroom, 2.5-bath with den design with 1,577 square feet of living space on the 71st floor with a south view, costs $759,000.

On Magellan Development Group's Aqua Tower sales website, high-speed zoned elevators are listed as a selling feature. So are breathtaking views from all apartments, floor to ceiling windows, hardwood floors and granite countertops. Among the selection of top-tier appliances and creature comforts, the list includes "year-round, individually-controlled heating and air condition." It omits, however, "courtesy of Advance Mechanical and IEC." ■

Tim Mayer checks the amount of pressure drop through a plate and frame heat exchanger.

Aqua's Mechanical System

Hidden inside the Aqua building's wondrously aesthetic outer shell is a sophisticated, world class mechanical system.

Dan Krebsbach, VP of Advance Mechanical, the firm tapped for all HVAC installations at the Aqua building, says that the only key challenge posed by the 86-story Aqua building (5 underground levels and 81 above) was the need to contend with all of the hydrostatic pressure.

"With that many floors, we knew we'd need to break the system into sections to avoid hydrostatic pressures greater than 250-300 pounds. On the heating side, we split the system up into three sections - each with its own 5 million BTU heat exchanger," said Krebsbach.

The building's mechanical system includes 17 Taco pumps, the largest of which are three 2,000 gpm chilled water end-suction pumps. There are also nine 1,000 gpm end-suction pumps. The remaining pumps include two vertical inline pumps and three fill-system pumps.

"We've been very pleased with the performance of Taco pumps through the years," added Krebsbach who began work in the field in 1972. "I learned very early in my hydronics career about Taco pumps. They're certainly pulling their weight at Aqua." ■

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*Based on 3 hours of daily usage and industry average utility costs, industry standard 1.42 gpm.

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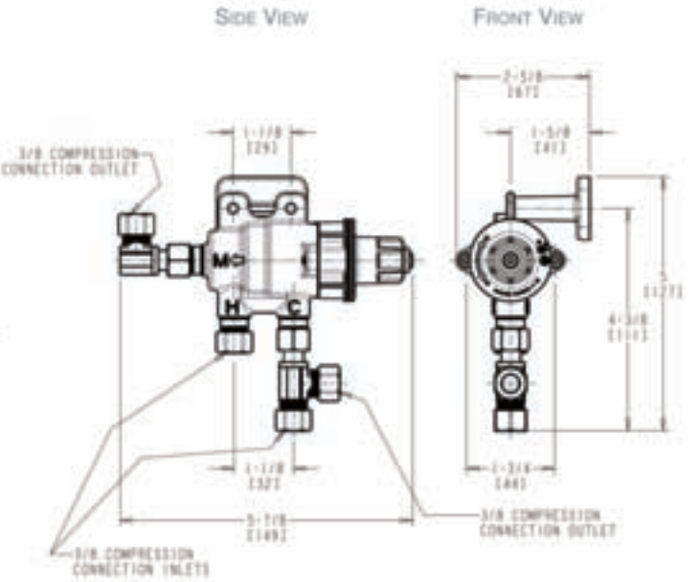

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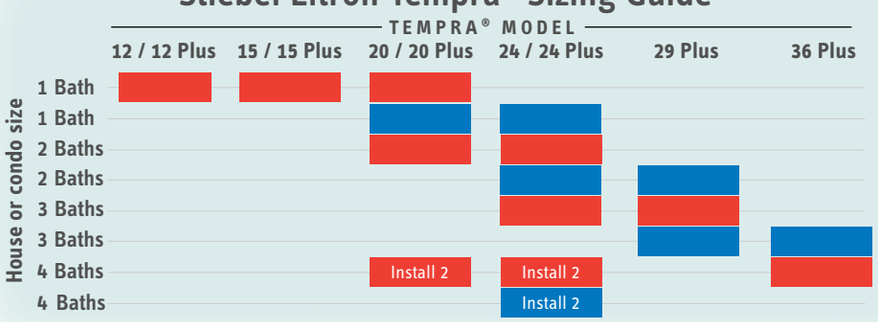
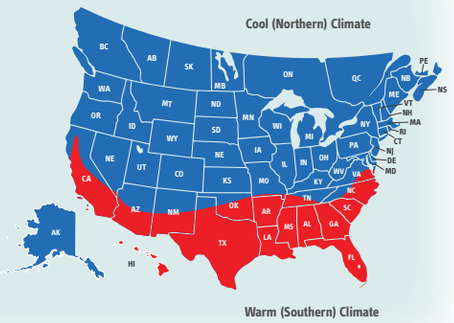
Item Number		223420 / 224196		223421 / 224197		223422 / 224198		223424 / 224199		223425		223426	
Phase		single		single		single		single		single [4]		single [4]	
Voltage	V	208	240	208	240	208	240	208	240	208	240	208	240
Wattage	kW	9	12	10.8	14.4	14.4	19.2	18	24	21.6	28.8	27	36
Amperage Draw (see below for recommended breaker size)	A	44	50	2 x 26	2 x 30	2 x 35	2 x 40	2 x 44	2 x 50	3 x 35	3 x 40	3 x 44	3 x 50
Recommended circuit breaker size [1]	A	60	60	2 x 40	2 x 40	2 x 50	2 x 50	2 x 60	2 x 60	3 x 50	3 x 50	3 x 60	3 x 60
Recommended wire size [2]	AWG	6	6	2 x 8	2 x 8	2 x 8	2 x 8	2 x 6	2 x 6	3 x 8	3 x 8	3 x 6	3 x 6
Maximum temperature increase above	@ 1.50 GPM	41	54	49	65	66	88	82	92	92	92	92	92
ambient water temp.	@ 2.25 GPM	27	36	37	43	44	58	54	73	66	87	82	92
	@ 3.00 GPM	20	27	25	33	33	44	41	54	49	66	61	82
	@ 4.50 GPM	-	-	-	-	22	29	27	37	33	44	41	55
Min. water flow to activate unit	GPM / l/min	0.37 / 1.4		0.58 / 2.2		0.58 / 2.2		0.58 / 2.2		0.87 / 3.3		0.87 / 3.3	
Weight	lb / kg	13.2 / 6.1		15.4 / 7.3		15.4 / 7.3		15.4 / 7.3		17.6 / 8.6		17.6 / 8.6	
Nominal water volume	Gal	0.13 / 0.5		0.26 / 1.0		0.26 / 1.0		0.26 / 1.0		0.39 / 1.5		0.39 / 1.5	
Max. inlet water temperature		131°F / 55°C											
Dimensions		16⅝″ / 42.0 cm width x 14½″ / 36.9 cm height x 4⅝″ / 11.7 cm depth											
Working pressure		150 PSI / 10 BAR											
Tested to pressure		300 PSI / 20 BAR											
Water connections		¾″ NPT											

[1] This is our recommendation as the manufacturer. Check local codes for compliance if necessary. Tankless water heaters are considered a non-continuous load.
[2] Copper must be used. Conductors should be sized to maintain a voltage drop of less than 3% under load. [3] Requires a 300A main service. [4] 29 Plus & 36 Plus may be wired for 3-phase 208V.

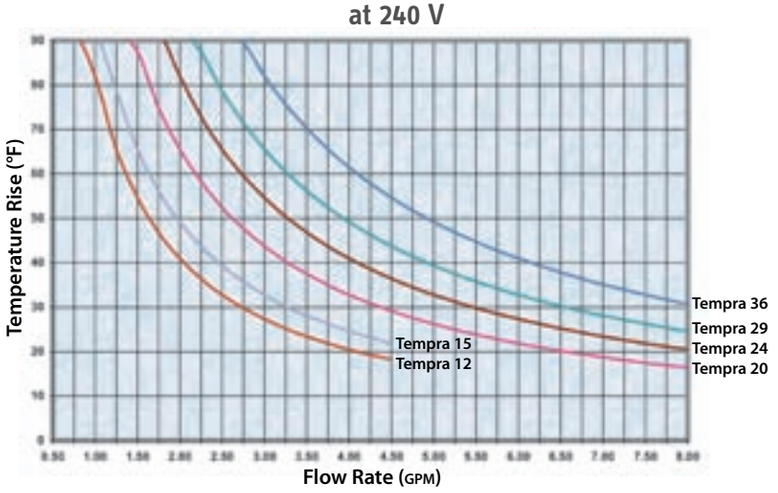
Stiebel Eltron Tempra® Sizing Guide





Temperature Rise vs Flow Rate

at 240 V



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Radiant forecast for 2012: affordability, integration and controls

By Mark Hudoba

Although hydronic radiant systems have been around since Roman times, radiant has remained in a small, niche market, a "luxury" item reserved mainly for the upper classes. However, with the onset of sustainable building requirements for commercial structures, demand for energy-efficient homes and new technologies making radiant easier and more affordable for the masses, radiant is making a new name for itself in the building sector.

In 2012, I predict that radiant will start to gain ground, not by replacing alternative heating and cooling systems, but by integrating with them. In the commercial market, radiant will be considered in more applications that are also using traditional HVAC systems but can benefit from the energy efficiency of adding radiant as a complementary system. Residentially, radiant will also become more accessible to the masses with the availability of new products that make it faster, easier and more affordable to install in a home. In both markets, system controls will provide the "brains" that integrate the different components to operate as a single, optimized, energy-efficient, radiant-based HVAC system.

Accessibility and affordability

With the introduction of new radiant packages that offer a complete radiant mechanical room in one preassembled, easy-to-install appliance, manufacturers are seeing the gap in the market and answering with a product that can make radiant more accessible and affordable for the masses.

As the housing crunch continues to challenge the building market, many installers have seen an increase in remodel and retrofit projects. These radiant appliances make it very easy to install radiant in a basement or addition. The process is simple: Hang the panel on a wall and hook up the electrical and the radiant tubing. It removes the guesswork and increases the system success rate.

In addition, manufacturers have also created products to address the other key part of the system installation — the tubing installation. New knobbed mat products dramatically simplify the tubing installation. The installer simply places the network of mats on the slab or subfloor and then "walks" the tubing in between the knobs. The combination of the mechanical room appliance coupled with the knobbed mat tubing products allows contractors to install a basement remodel that may have previously taken a week in less than one day.

On the commercial side, prefabricated radiant tubing mats are another innovative product, making it faster and easier to install radiant systems in large-scale applications. By simply rolling out the prefabricated mats at the job site, many commercial installers are seeing their install times decrease by nearly 80 percent. That significant time savings, coupled with the energy efficiency of radiant heating and cooling systems, makes it easier for commercial engineers to justify radiant as part of a value-engineered project.

Systems integration

Renewable energy, such as geothermal and solar, will

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Industry Forecast

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continue to be strong in 2012. This is particularly true as energy costs continue to climb and a mix of federal and local tax incentives and rebates on renewable systems make them more affordable to a greater number of consumers.

Radiant can play a big part in enabling a geothermal or solar system to run more efficiently and maximize energy savings. For example, high-efficiency geothermal heat pumps operate more efficiently at lower water temperatures. Because radiant floor heating systems require lower water temperatures than radiators or forced-air systems, the radiant floor heating system enables the heat pump to operate more efficiently.

Radiant systems can also use a passive design in commercial applications, which enables them to store unused heat or cooling during off-peak hours and then use it at peak hours to maximize energy efficiency. While traditional HVAC systems will continue to play an important role in commercial building projects, radiant will definitely see an increase as a valuable system to integrate energy efficiency and indoor environmental quality.

In both residential and commercial applications, radiant and air heating and cooling, ventilation, humidification, dehumidification and renewable-energy products will be integrated into a single, synergistic system.

Integrated controls

Integrating radiant with renewable and traditional HVAC systems also brings the necessity of integrated control systems. The new wave of integrated radiant controls will continue to see a strong presence in the marketplace. These control packages make it easier to increase system efficiency and optimize comfort by integrating heating, cooling, ventilation and humidification into a single system.

For example, one problem integrated controls solve is simultaneous heating and cooling that can occur when one control system is used for heating and another is used for cooling. An integrated control package is a "smart" system that will routinely perform two-way communication throughout the network to send as well as to receive information so that systems are not working against each other.

Some of these integrated control systems also allow remote access to the system via the Internet. This option gives incredible control for greater energy efficiency and monitoring. There are even electronic notification options that permit a service contractor to monitor and manage the system online and troubleshoot remotely.

While radiant will be a relatively small share of the total HVAC market in 2012, with new technologies making it faster and simpler to install, it will start to become a more popular option. And as more and more people have the opportunity to experience the incredible comfort and efficiency of radiant — two of its most valuable selling points — its presence will expand in the market.

Mark Hudoba *is the senior product manager for heating and cooling at Uponor North America. Hudoba is listed as an inventor on 10 patents. He is a LEED®-accredited Green Associate and a professional member of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the Radiant Professionals Alliance (RPA)/ International Association of Plumbing and Mechanical Officials (IAPMO), the U.S. Green Building Council (USGBC), the National Association of the Remodeling Industry (NARI) and the Product Development and Management Association (PDMA).*

Looking ahead to 2012

By Dan Foley

As we're in the process of closing out 2011 here at Foley Mechanical, I took some time to reflect on 2011. We're ending the fourth quarter on an upswing and had a positive year. Gross revenues stayed about the same as 2010, but our margins improved from 6% net to 11% net. And there is still room for improvement.

I have the good fortune to work in a thriving local economy. The Washington, D.C., metro area seems to weather economic downturns better than most. Our economy is diverse with no single dominant sector. The federal government stokes the economic engine, but it's actually the companies doing business with the federal government and the military that really give the economy a boost. In particular, defense and other government contractors have done well for the last several years, helping to cover the dip in the residential housing market. The commercial market remained steady throughout.

My outlook for 2012 is positive. If 2010 was about holding ground and not slipping backwards, and 2011 was about improving the bottom line, then 2012 will be about growth and ever-higher margins.

I've made changes so that my company will be in a good position to respond when the recession loosens its grip. This past fall, I closed three significant deals totaling more than $2M that allowed me to invest in the new employees and infrastructure.

"Luck is what happens when preparation meets opportunity," said the first-century Roman philosopher Seneca. I plan on being "lucky" in 2012.

I asked old friend and super rep Skipper Joyce how he envisions the coming year. Skipper is owner of The Joyce Agency (www.thejoyceagency.com) located in Springfield, Virginia. Skipper reps many of the lines we use, such as Viessmann, Grundfos, Mitsubishi, and Watts Radiant. He also carries a full plumbing line.

"2011 was a good year for The Joyce Agency," said Joyce, "especially on the commercial side. 2012 is going to be a mixed bag with commercial business expected drop a little. We're planning on residential to be up slightly. Repair and remodel work will hold steady. Moving forward into 2012, we're looking to react to the market and be able to change direction quickly," he said.

For a broader insight into the state of the hydronics industry, I contacted Lino Santoro, director of radiant sales at Viega North America. Lino has a pulse on the national market.

"Viega is forecasting a double-digit increase in sales in

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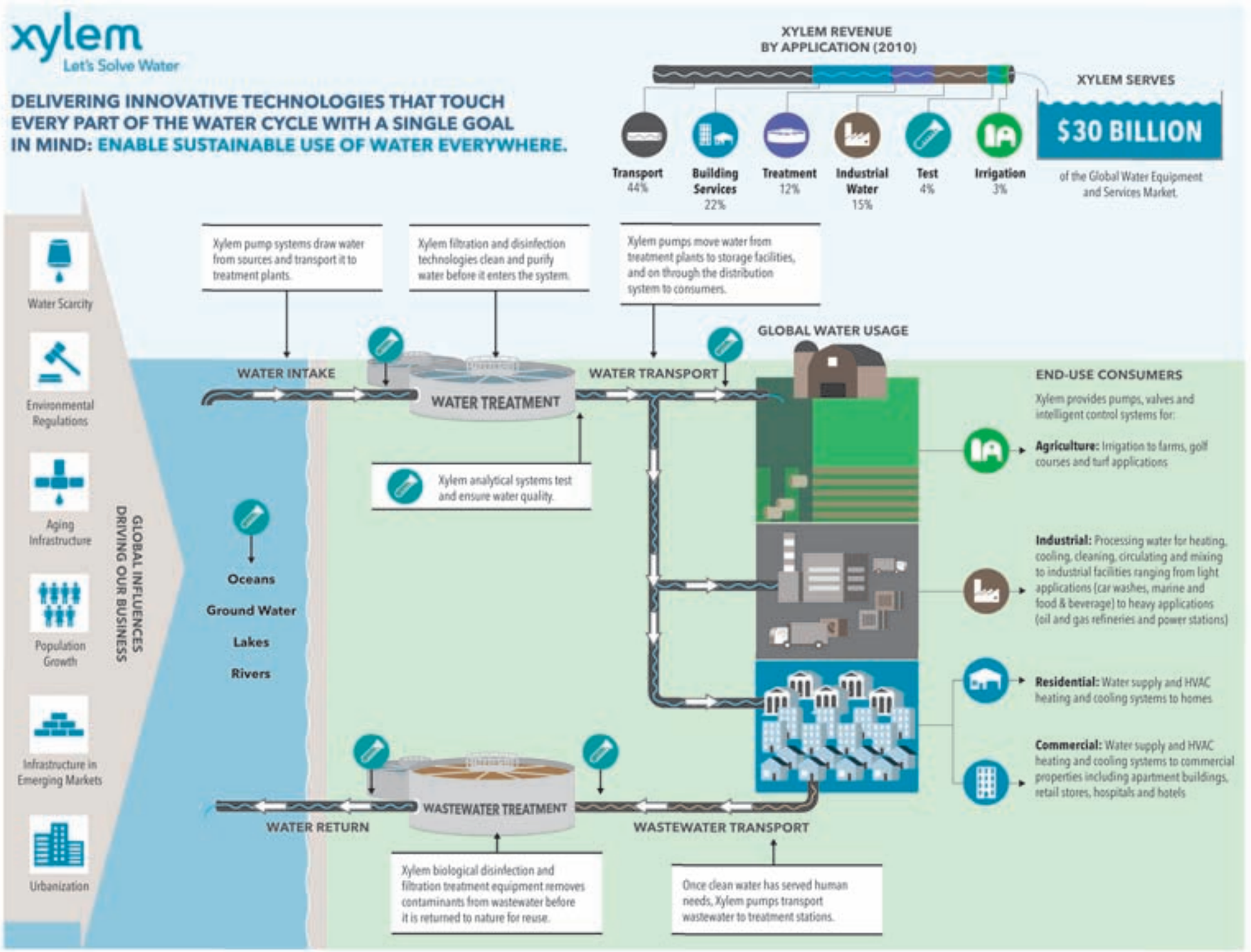

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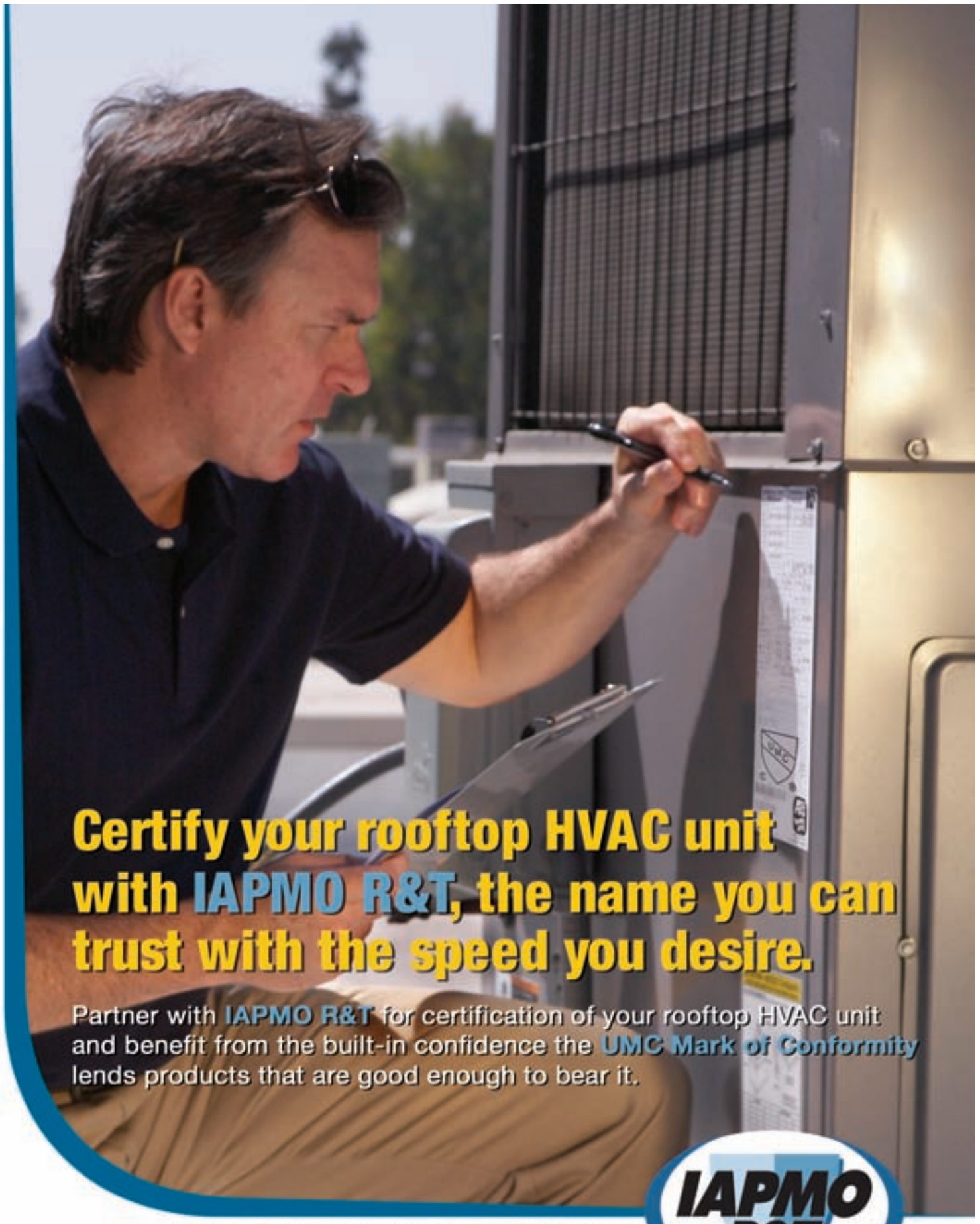

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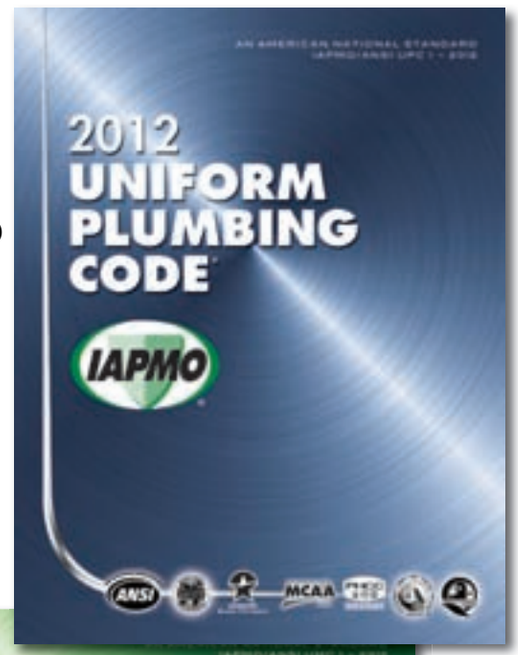

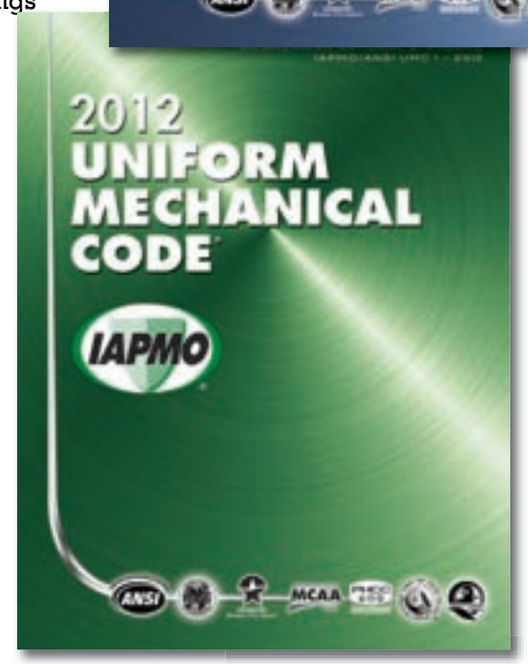

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Industry Forecast

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2012 for our residential radiant product line," said Santoro. "We expect this trend to hold true for our commercial snowmelt, heating and cooling line as well. We're also forecasting an increase in our Pro-Press line."

What recession? It appears that Viega has chosen to ignore the economists and create its own market. I like Lino's optimism and make-it-happen attitude.

Larry Drake, president of Teal International Corporation and former executive director of the Radiant Panel Association, is well connected within the hydronics industry. He is presently working on an innovative graphical hydronics design software program. He shared his thoughts on the future of the hydronics market:

"2012 will be a year of "if" this, "then" that. As with most election years, the mood of the country's economic outlook will depend on who stays in office and who goes. "If" the current administration continues, "then" we can expect to see things remain pretty much the same. The world market will continue to struggle and any recovery is years away.

On the other hand, "if" there is a new administration, regardless of one's political bent, "then" it will bring a spurt of optimism. This will fuel a temporary uptick in the economy. There is a lot of pent up energy. Industry has been winding its spring. "If" a new administration offers any kind of regulatory relief for industry, "then" the spring will begin to unwind once again.

Politicians like to say jobs fuel the economy, but it is optimism that makes our system work. Give industry a reason to believe in the future and it will create jobs. Jobs create wealth and wealth builds homes."

To benefit from a West Coast perspective, I talked with Bill Shady, P.E., owner of Sustainable Design and Product Management, a Santa Cruz-based consulting engineering, and product development firm (www.sustainabledesignpm.com). Bill's primary market covers the entire state of California, but he has projects all over North America as well as international commissions.

"2011 was a recovery year for everybody," said Shady. "The economy and construction industry contracted so quickly, it took people by surprise. We look for 2012 to be a year of positive growth," he said.

Bill certainly has a positive outlook. He's rolling out a brand new, innovative product called the Climate Right System, a packaged mechanical and control system that I plan to cover in greater detail in a future column. The product is in growth mode with nine systems on order.

"My market is full of young, wealthy, stock-laden internet and software entrepreneurs," says Shady. "I foresee the high-end custom estate home market picking up."

Bill also forecasts growth in the hydronics market for the multi-family high-rise commercial market. The owners of these projects are looking for mechanical systems with a small footprint that are economical to operate and allow for sub-metering, according to Bill. So it sounds like this is a good time to be in the hydronics business in California as well.

Here in the DC market, I've observed a number of trends. In my daily contact with architects, builders, engineers and clients, I've observed the following:

• A continuing focus on sustainable technologies such as solar thermal, ground-source heat pumps, air-to-water heat pumps, and bio-fuel systems. The one thing these systems have in common is hydronics.

• Passive house and related building envelope technologies will become mainstream. We completed our first passive house mechanical system this year (see my June and July 2011 columns) and have two more in the design phase.

• A larger percentage of hot water boiler installations will be 95%+ condensing gas boilers. We will probably install eight low-mass condensing gas boilers for every one cast iron atmospheric boiler we install.

• New control systems allow mechanical contractors to achieve what used to be subbed out to specialty contractors. Uponor CCN, tekmar and Taco iWorx are three I have used, but many more are available.

• Radiant cooling will be a growth area. Our first system is going in now. The affordable control systems mentioned above now make radiant cooling systems possible for residential projects.

I'm optimistic about the opportunities for growth and higher margins in 2012. I hope you'll write to us and share your thoughts for the year ahead, and I wish you all a healthy and prosperous new year.

***Dan Foley** is president and owner of Foley Mechanical, Inc., based in Lorton, Virginia. FMI specializes in radiant, hydronics, and steam systems as well as mechanical systems for large custom homes. He can be reached at 703-339-8030 or at dfoley50@verizon.net.*

Are you FIT for 2012?

By Keith Bienvenu

We always enter a new year full of promise and resolutions. This year is no different. There are many positive trends occurring, and indications are that 2012 will be a better year for the construction industry overall.

Based on conversations I am having with other p-h-c contractors, along with reports that are in the news, I'm feeling cautiously optimistic about 2012. The U.S. economy is gaining momentum, with some indicators anticipating a 6 percent rise in construction in 2012. New housing permits began to creep up this past fall, with multi-family housing showing particular gains. Initial claims for unemployment recently fell to the lowest number since last April. And, while service and repair contractors are faring better than new construction contractors overall, our PHCC members are reporting signs that conditions are slightly improving.

Sure, there is still a lot of competition for work, especially on the new construction side. But many of the less-qualified bidders are going away. And many of our members are learning that saying "no" when asked to go lower on bid prices can help them steer clear of non-profitable jobs. Adoption of new technologies and software is also helping them improve efficiencies and profits.

There are several positive signs for the residential service market. Homeowners are spending more money on home improvements. "Aging-in-place" improvements and

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Industry Forecast

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energy/water efficiency features are two particular areas that offer business opportunities for service contractors.

Still, there is a lot of economic uncertainty out there. Businesses continue to cut staff, reduce benefits and look at all options to cut costs. The confidence is just not there to launch new initiatives and take some risks.

To build a stronger level of confidence, PHCC encourages its members to approach 2012 with goals to keep refining operations, training staff and preparing for a gradual turnaround. With the positive trends occurring, now is the time to build on that momentum and make sure their business is physically fit. You can't just grasp at short-term gains. With more contractors vying for fewer jobs these days, a business needs be solid and steady to surface on top. Here are some ideas for your "game plan" moving forward:

Keep training

Stay ahead of the competition with a highly skilled, well-educated workforce, and keep profitable with proven business management training.

Tackle the technology

There's no doubt that technology is driving our businesses. Plans are posted online. Builders want bids faster. Homeowners want more technology, and manufacturers are answering the call by producing more of it. Frankly, the contractors surviving and succeeding in this economy are the ones finding ways to work more efficiently through the use of technology. To stay up to date on technology, research educational opportunities in your area, keep up on the news and talk with vendors and contractors about what new technologies are recommended.

Make legislative and regulatory issues part of diet

Legislative and regulatory decisions made at national, state and even local levels have a direct impact on our industry. Just this past year, PHCC's grassroots efforts led to two significant victories: the November repeal of the 3 percent withholding tax affecting government contractors and the April repeal of the controversial Form 1099 provision of the healthcare law. Several state-focused efforts also are making progress.

Looking ahead, make your voice heard on important issues impacting your own business.

Members and non-members alike can attend PHCC's Legislative Conference, May 2-3, 2012, on Capitol Hill. PHCC also conducts regular letter-writing campaign on important industry issues. To get an idea of the latest efforts underway to protect your business, visit www.phccweb.org.

So as you tackle business challenges in 2012, be sure to remember to stay fit in the process. Don't hesitate to contact PHCC for any assistance at (800)533-7694.

***Keith Bienvenu** is PHCC – National Association president.*

2012 PVF sector poised for record performance

By Morris Beschloss

The 2012 PVF sector's performance potential is poised for the best record ever generated by this energy, power and expansion-anticipated flow control infrastructure.

Never before has such a perfect storm of opportunity faced pipe-valve-fitting manufacturers, distributors, end-users and installers, as facility development, maintenance and repair, as well as expansion-in-place combine to simultaneously move forward. The following major factors are the key to such unusually lofty expectations:

• **Energy Development.** All aspects of oil and its derivatives, natural gas and renewables are set to move aggressively forward, as the private sector's investments trump the obstacles put in its way by the Environmental Protection Agency, bent on inhibiting dynamic energy development opportunities. This puts significant additional pressure on extraction, refining, and transmission.

• **Power Generation.** The nation's electric utilities are in a woeful state of disrepair, anticipating a rash of brownouts and blackouts as the years wear on. These shocking shortages in upkeep and expansion have gotten worse in the wake of the Enron scandal, which subsequently cancelled new projects and relegated existing initiatives to mothballs. This critical restoration was further delayed by the jarring recession, which downplayed growth due to reduced demand. As the industrial sector leads the current economic comeback, America's utility network is hard-put to keep up with sharp demand growth.

• **Renewables.** Solar, geo-thermal, wind, ethanol. Although expectations for these "green" peripherals are exaggerated by an environmentally-involved Administration, they have added to the overall impact on the wide range of pipe, valves and fittings needed to activate these added procedures. With the federal government committed to a 'green' strategy, the need to implement its growth will put additional demand on the PVF sector's capability.

• **Derivatives.** Such consumer-oriented sectors as chemicals and plastics, as well as food, depend on PVF products to service their facilities ongoing. Already on the upswing in 2011, they are headed for accelerated expansion in 2012.

What makes domestic and export opportunities for the widening expanse of PVF products feasible is the greatest monetary liquidity ever enjoyed by America's corporations and banks. Where previous post-recessionary rebounds have been restrained by money shortages, plentiful balance sheet cash makes simultaneous growth on all fronts readily available.

The wild card in this potential breakout to the upside is the rapid evolution of technology. This is particularly relevant to the hydraulic-fracturing (fracking) process of extracting natural gas and oil from shale. Although this process was first engendered more than 50 years ago, the high price of oil, especially, has made this constantly improving technique profitable. It has already fulfilled all

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domestic natural gas requirements, anticipating export possibilities in the future. As the following column points out, it's now a real possibility in oil as well.

Total oil energy independence lurks under America's top soil

Outside of the Middle East, only the Russian Federation has the potential oil reserves that could challenge the estimated 90 billion oil barrels trapped in the handful of U.S. regions where shale rock content has already been identified.

It's likely that this potential could be multiplied many times over if a "full-court press" could be undertaken with enthusiastic government support.

Therein lies the problem. It's no exaggeration to claim that the current Administration is an unwilling party to a massive drive for exploiting this unanticipated oil glut. These production capabilities, not even dreamed about a short few years ago, have been made available through the hydraulic-fracturing process.

Further enhancing an astounding reserve potential and profit-ample domestic U.S.-based oil prices are the revolutionary fracking process. This has already turned a relatively recent shortage of natural gas and sky-high costs of up to $15 per million British thermal units only three years ago, into downward cascading price levels in the $3.75 per comparable Btu into a virtual glut. This previous anticipation of liquid natural gas (LNG) to meet U.S. growing needs has, in the veritable blink of an eye, elicited a major export opportunity.

Fracking opportunities have provided a stunning turnaround in natural gas. This has already been proven in the Bakken Belt in North Dakota, and the Marcellus Range in Pennsylvania and upstate New York. In addition, new discoveries have already been found in West Texas, and there are endless acres awaiting development on federal lands.

But standing as an irrevocable barrier to a fossil fuels (natural gas and oil) breakthrough is the anti-fracking Environmental Protection Agency, and its activist head Lisa Jackson. She believes that accelerating prices of oil, her number one target, will make an evolutionary leapfrog into renewables, such as solar, wind, geothermal, hydroelectric and electric cars totally viable, sooner rather than later. She is committed to a total renewable energy replacement at any cost.

Whether this rejectionism will stop the energy revolution dead in its tracks, will depend on the outcome of the November 2012 general election.

(Editor's note: The controversy over fracking revolves around the many proprietary mixtures of substances injected into the fuel-bearing substrates during the fracking process. Environmental groups contend these mixtures contain toxic chemicals that can find their way into water tables and waterways, depending upon the depth and location of the fracking process.)

'Buy America' is gathering support

The most recent attempt by both the U.S. government and the independent businesses sector to shift industry back to America's shores seems to be increasingly resonating.

Although wrapped around the "Stars and Stripes," Buy America's initial objective is primarily employment-wise motivated. To put this concept into full context, this call to "Americanization" encompasses manufacturers, distributors, contractors, retailers and specifiers, who control the overwhelming employment potential in the American nation.

Even though a reversal of rampant unemployment is a major target of "Buy America," it should not be exclusively protectionist. But it should restore a realistic global balance within the world's largest economic giant, the U.S.A.

While the huge shift to imports has had a salutary effect on both producer and consumer costs, with a moderating impact on a potentially inflationary spiral, it may have swung the pendulum too far toward offshore dependence. Energy usage is the best example. With America's massive business/industry community enmeshed in import/export activities, it would be foolhardy to embrace the [Republican-sponsored] Depression-era Smoot-Hawley protectionist legislation, which some economists claim exacerbated that disaster's downward plunge.

What I have gleaned from several hundred respondents regarding a restoration of a more balanced foreign/domestic role in America's economic future brought out the following:

- An overwhelming majority of business decision-makers believe that it should be mandatory that American business owners and managers all be totally responsible for the products of their domestic or import manufacture; whether industrial or consumer-oriented. Their point is that the highest standards of safety and performance must be assured by the progenitor to their markets, no matter where their origins.
- An attitudinal shift indicates that the runaway importation of foreign finished goods and components, in the hands of importers buying strictly on price, should be reversed.
- Higher overseas labor costs, galloping transportation outlays, questionable and untraceable foreign quality standards, and "just in time distributor inventories" have added to bringing some manufacturing back to the U.S.

In the final analysis, the legal consequences to the company responsible for installing or dispensing such products made overseas, if not controlled by a reputable owner/manager in the U.S., will provide the ultimate answer to how well the foreign/domestic balance continues to resonate.

In my continuous national survey of America's manufacturing comeback, now in its multi-month consecutive rebound, I tend to dwell on the consummate amount of orders emanating from the actual product users for new projects, maintenance and repair, and internal expansion.

Since I interface with a substantial number of distributors of industrial and flow control products, I noted an October disparity between the brisk pace of new orders emanating from the field, in comparison with the inventory downturn at the distribution level, which seemed to be lagging from the brisk pace I noted from field reports in general.

The answer lies in the schism between increasingly skittish distributors, concerned about a sputtering economy and overall fears of increasing recessionary trends, and the actual usage. This has caused distributors in general to tighten their "just-in-time" inventory level, while customer orders were expanding during the month of October.

Since the bulk of distribution's investment revenues are expended on inventory buildup, this critical segment of the business channel is heavily influenced by anticipation of future economic growth, pricing levels, and maintenance of adequate immediate service to its customers. ■

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Just the word makes you wonder.

Does it conform to the specifications? Do the producers follow the necessary quality control requirements? Do they run the required tests during the manufacturing process? It's vital for buyers to have correct answers to these questions. But these days, just the word on a piece of pipe kind of makes you wonder.

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Now That is One Smart Pump

New pump designs improve efficiency and reduce total life-cycle costs.

By John Mesenbrink

Now more than ever energy efficient products are critical when trying to lower a building's carbon footprint. And when it comes to water efficiency, pumps are the backbone of the building's infrastructure. Today's intelligent pumps carry the answers for water distribution.

As we delve into the world of smart pumps, *Plumbing Engineer* recently spoke with the major players in the pump manufacturing industry to get their perspective on today's smart pumps and the benefits their pumps offer to the overall HVAC system. The players are Mark D'Agostino, vice president of sales and marketing, WILO; Eugene Fina, product manager — commercial pumps, Taco; Joe Rice, product manager for Grundfos; and Mark Handzel, director of Xylem building services marketing.

PE: In today's energy efficient HVAC market we hear a lot about "smart pumps." What exactly does the term mean?

Mark D'Agostino/WILO: The term "smart pump" is derived by the pump's ability to "learn" what the system is doing and react accordingly. For example, with a typical asynchronous pump, it runs at full speed regardless of system demand. Think of it like a car that we push the accelerator to the floor continuously and regulate our speed with the brake pedal. In essence that is the current logic in hydronic pumping. We utilize pressure compensated bypass valves, throttle valves on the discharge side of the pump or 3-way valves to act as the "brake" to deal with this unwanted, excess system velocity. The WILO Stratos pump "senses" the changes within the system (ie; zones opening and closing as demand varies) and automatically slows down or speeds up to react to this change much like cruise control.

The UL listed WILO Stratos is North America's first commercial wet rotor circulator with an EC motor. With this revolutionary "smart pump" technology, the Stratos can achieve energy savings of up to 80% compared to a standard wet rotor circulator. The Stratos also offers flows from 10-285 USGPM, and 2-40' of head delivery. This "all-in-one" pump can offer constant pressure curves, inclining pressure curves, temperature controlled set points, an infrared communication module to any Windows mobile-based PDA, and is fully compatible with building management systems.

The term "smart pump" is derived by the pump's ability to "learn" what the system is doing and react accordingly. For example, with a typical asynchronous pump, it runs at full speed regardless of system demand. Think of it like a car that we push the accelerator to the floor continuously and regulate our speed with the brake pedal.

– Mark D'Agostino, WILO

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Models OF744-10, OF844-12, OF948-16, OF1054-20 and OF1252-30

OneFlow® Anti-Scale System

Connection Sizes: ¾", 1" and 1¼" (20, 25, 32mm)

Flow Rates: 5 gpm to 30 gpm (38 lpm to 144 lpm)

The OneFlow® Anti-Scale System provides protection from scale formation on internal and external plumbing surfaces. The OneFlow® system may be installed at the point-of-entry to a building to treat both hot* and cold water, or it can be located directly before a water heater, boiler, or other hot water-using device that requires protection from the ill effects of hard water.

OneFlow® prevents scale by transforming dissolved hardness minerals into harmless, inactive microscopic crystal particles. These crystals stay suspended in the water and are passed to drain, thereby having a greatly reduced ability to react negatively like dissolved hardness does. The system requires very little maintenance, no backwashing, no salt, and no electricity. Typical hardness problems, especially build-up of scale in pipes, water heaters, boilers and on fixtures are no longer a concern.

OneFlow® is not a water softener or a chemical additive (like anti-scalants or sequestrants). It is a scale prevention device with proven third party laboratory test data and years of successful residential and commercial applications. OneFlow® is the one water treatment device that effectively provides scale protection and is a great alternative to water softening (ion exchange) or scale sequestering chemicals.

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Features

- Chemical free scale prevention and protection – converts hardness minerals to harmless, inactive microscopic crystals making OneFlow® effective alternative technology to a water softener for the prevention of scale due to water hardness
- Virtually maintenance free – No salt bags or other chemicals to constantly add
- No control valve, no electricity and no wastewater
- Uses environmentally friendly "green" technology
- Improves efficiency of all water using appliances – both hot* and cold
- Simple sizing & installation – all you need to know is pipe size and the peak flow rate
- Perfect system for towns or communities where water softeners are banned or restricted
- OneFlow® does not remove minerals or add sodium to the water supply
- OneFlow® can be installed as a pre-treatment to reverse osmosis (OneFlow® should be the last stage in treatment unless a point-of-use system is being used downstream.)

* For hot water applications where water temperature is 110°F – 150°F (43°C – 66°C), please consult ES-OneFlow-HotWater

***The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight.**

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

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Pump efficiency

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A smart pump automatically responds to change in system demands and, most importantly, reduces its speed automatically when the demand is reduced.

– Eugene Fina, Taco

Fina/Taco: "Pump Affinity Laws" help us to evaluate what the savings are for most jobs. The laws say that the change in horsepower consumed is proportional to the cube of the change in speed. It's all based on a mathematical formula. A smart pump, or a constant speed pump set up and balanced with a drive, consumes only 73 percent of design horsepower if it's running at 90% of its top speed; a pump running at 50% of its speed consumes only 12.5% of its full energy draw. These are significant energy savings. Other benefits are that these pumps run at reduced speed, which extends their life, and they're also soft-started. This puts less wear on pump and system components. These become an advantage for the equipment and the building owner.

With the focus on first cost, green construction and energy optimization, our industry needs advantages like these. The decisions we make about design Delta T and flow balancing can have a significant positive impact on system performance. A smart pump automatically responds to change in system demands and, most importantly, reduces its speed automatically when the demand is reduced. The Viridian is capable of doing this without the use of sensors. Taco's 1900 VFD is used with differential pressure sensors for a Delta P system, or temperature probes for a Delta T system.

Rice/Grundfos: While variable speed motors are a huge efficiency over fixed-speed pumps, intelligent or smart pumps such as the Grundfos MAGNA™ represent an ability to automatically modulate circulator performance to match ever-changing system demand.

Exclusive to Grundfos, the variable speed wet rotor MAGNA circulator uses an integrated logic algorithm to 'learn' a system's usage patterns to automatically determine the lowest possible operating efficiency point to maintain the desired temperature. By continuously finetuning power consumption and flow rates to meet the dynamic needs of the system, this AUTOADAPT function saves both energy and money. In live field tests of the product, independent contractors have experienced power savings up to 80 percent over conventional pumps. From experience and several market studies, we know that the majority of installers never identify the specific details of the heating systems in which they install circulator pumps. Consequently, they find it hard to select the most efficient pump for the system and then to program it with the correct settings. For installers, the intelligent or smart AUTOADAPT function means that for approximately eight of every 10 installations, the pump will automatically select the optimal setting with no additional intervention needed — just set it and go. Said differently, the AUTOADAPT learning algorithm is the most efficient and effective pump system setting where the majority of head-loss is a result of piping friction versus zone valves.

Grundfos MAGNA pump

While there is a price premium for smart pumps and motors integrated with variable speed technology, contractors should remember that power consumption represents 85 percent of a pump's lifetime costs. Therefore, even the smallest improvement in energy efficiency can translate into sizeable cost savings over the 15-year average pump lifespan. In fact, some of today's leading integrated, variable speed circulators offer payback in as little as two years.

Handzel/Xylem: Although contractors and building owners know that pumps play an important role in all HVAC systems, they sometimes overlook what a critical factor pumps can play in reducing operating costs and significantly increasing a building's energy efficiency. However, new industry regulation initiatives now make it more important than ever that building owners look at the entire HVAC system to achieve more sustainable energy efficiency. To help building owners achieve this, smart pump design is a growing trend in the pump industry and more astute manufacturers are creating new designs to improve efficiency and reduce the total life-cycle cost.

Bell & Gossett VSX Series pump

As a global water technology company with 95 years of innovation, Bell & Gossett, a Xylem brand, created a double-suction, split-case, base-mounted centrifugal pump series with features never before offered in the HVAC industry. Aptly named the VSX Series (vertical split-case), the pumps are designed to provide unparalleled smart performance and reliability over a wide range of applications.

The industry experts told us they wanted smarter pumping solutions and we delivered a unique series of

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Pump efficiency

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pumps designed to their specifications. The VSX pumps provide the ultimate in high efficiency hydraulic design, reliability, and installation versatility.

The VSX series can help building owners achieve these type of savings due to special product features such as multiple configurations for piping design flexibility and a 40% smaller footprint than a vertical in-line pump and static vertical load on flanges allowed.

PE: How does your company's particular pump offer savings as it relates to water/energy efficiency?

Mark D'Agostino/WILO: The Stratos pump dramatically reduces energy consumption (by as much as 90% in some applications) by matching pump speed with system demand. A typical hydronic system is sized to the heaviest demand day. Circulators are then sized based on logic. In reality the system operates in this "heaviest demand area" less than 10% of the heating year. Therefore the circulator is bigger than it needs to be for greater than 90% of its actual operating life. By varying its speed, the Stratos products are only as "big" as the system requires it to be at any given point in its operating range.

The Stratos ECO is ideal for residential hydronic heating applications. The Stratos product line addresses heavy residential and light commercial hydronic heating & cooling applications. The Stratos D (dual Head / single volute model) is applied in heavier commercial hydronic heating and cooling applications. In Q1 2012 we will introduce Stratos Z, which is the same ECM Smart Pump Technology applied to a stainless Steel volute (NSF61/Annex G rated) for domestic water applications (ie Hot Water Recirc) and Stratos Giga (due Q3 2012) will address hydronic heating and cooling applications in much larger commercial systems.

Wilo Stratos pump

Fina/Taco: The Taco Viridian is a web-enabled, high efficiency, wet rotor, variable speed commercial pump product line for chilled and hot water applications. All settings and pump access can be done over an Internet connection making installation, setup and service easy. The ECM motor saves up to 80% of the electrical energy compared with conventional pumps and its multiple operating modes fit most applications. The ECM based design combines a brushless electronically commutated synchronous motor with a strong permanent magnet rotor. An ECM motor does not consume any energy in order to magnetize the rotor and the position of the magnetic poles of the rotor and stator generate continuous thrust in the rotating direction of the rotor. The integral electronics precisely drive the rotor as fast as the rotating flux, significantly reducing motor efficiency losses while greatly increasing starting torque.

Taco 1900 VFD pump

Taco's new 1900 VFD close-coupled, in-line pumps with integrated variable frequency drives are designed to enhance pump and building efficiency. The single- or three-phase 1900 VFD line greatly increases energy efficiency and building comfort.

Taco 1900 VFD pumps are available in five basic models ranging in size from $1^1/2" \times 1^1/2"$ to $2" \times 2"$ with a flow range of 10 to 250 GPM, and head capability to 160 feet. Rear, pull-out design allows servicing of the pump without disturbing the piping.

The 1900 VFDs can be installed anywhere in the piping layout. They are self-supported by system piping, requiring no additional strapping or external support. Each can be mounted horizontally or vertically. The motor's permanently sealed, grease- lubricated ball bearings make the 1900 Series pump virtually maintenance free.

Typically, the payback period for installing VFD pumps in place of single-speed pumps is less than 12 months. Because HVAC systems are rarely required to operate at full capacity, VFD pumps gently ramp-up and ramp-down operation to match system flow to actual heating and cooling demands, enhancing overall system efficiency.

Rice/Grundfos: Designed for hydronic heating applications in large residences, multifamily, institutional and light-commercial applications, the Grundfos MAGNA

> The Grundfos MAGNA ECM (Electronically Commutated Motor) circulator features a permanent magnet motor that will cut power consumption by a minimum of 50 percent, as compared with other circulators in its class.
>
> – *Joe Rice, Grundfos*

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ECM (Electronically Commutated Motor) circulator features a permanent magnet motor that will cut power consumption by a minimum of 50 percent, as compared with other circulators in its class. The result is a dramatically more efficient motor that generates less heat and energy waste, while delivering a starting torque four times higher than a standard induction motor — a key feature should the circulator experience long periods of idleness.

By their very nature, heating systems fluctuate, so why use circulator pumps that cannot automatically optimize output to meet changing demand? Rather than running at a fixed speed all the time, the MAGNA pumps operate on a proportional pressure curve, which means you get only the pressure you need. Another way to think about proportional pressure is a means to compensate for head or friction loss in a heating system.

An energy-efficient, intelligent heating circulator with an ECM motor — such as the Grundfos MAGNA — uses up to 80 percent less energy than a conventional pump. This level of savings would cut around 10 percent off an average household's annual electricity bill.

Ten years ago, when energy costs were not paramount, the conventional thinking held that it didn't make sense to use variable speed drive technology on motors smaller than 50 horsepower (HP). Since that time, the industry discovered that energy and operational efficiencies should not be reserved only for large applications. After all, there are many more fractional HP pumps and motors in operation than there are large 100 HP applications.

Handzel/Xylem: Based on extensive Voice of the Customer outreach feedback, the pumps were designed to provide HVAC professionals with enhanced energy-efficiency, easier maintenance and a significantly smaller footprint. Some of the other unique 'industry-first' features include:

Bell & Gossett, a Xylem brand, created a double-suction, split-case, base-mounted centrifugal pump series with features never before offered in the HVAC industry.

– Mark Handzel, Xylem

• Multiple suction and discharge flange configurations that maximize piping possibilities. The VSX connection options include the VSC model (Top Suction — Top Discharge flanges), VSCS model (Side Suction — Top Discharge flanges) and the VSH (Side Suction, Side-Discharge flanges).

• The hydraulic matching of the pump impeller and casing was achieved by utilizing Computational Fluid Dynamics (CFD). The result is a product offering superior performance in chillers, cooling towers, distributive pumping and a wide range of additional applications.

• Unique 'Plug-n-Play' capability that allows simple field modifications for mechanical seals and external seal flushing. ■

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Reaching the Energy-efficiency Conscious Consumer: the ENERGY STAR choice for water heaters

Residential water heating represents the second largest consumption of energy in the home, just behind heating and cooling. In January 2009, the ENERGY STAR® program for residential water heaters was established. The U.S. EPA's ENERGY STAR program provides residential water heater manufacturers, contractors and plumbers with resources and tools to help them promote high-efficiency products that save money and deliver the same or better performance as comparable products.

Contractors and plumbers offering their customers more energy-efficient products are tapping into the growing base of energy-aware homeowners. Contractors can distinguish themselves from their competitors by tapping into resources provided by EPA ENERGY STAR programs to help consumers assess the benefits of these products and to select the most appropriate options.

How can plumbers and contractors market their involvement with ENERGY STAR?

EPA's ENERGY STAR label is one of the highest-influencing labels in the marketplace. ENERGY STAR provides free marketing resources for those working with qualified products. The "We sell ENERGY STAR" logo is valuable branding that can be used in advertisements and brochures. A range of free resources are available at www.ENERGYSTAR.gov, including a list of qualified product models. In fall 2011, EPA rolled out an MS Excel-based savings calculator to help contractors and consumers calculate the benefits of ENERGY STAR qualified water heaters, as well as the payback period.

What tax credits and rebates are available for ENERGY STAR qualified residential water heaters?

Contractors can help their customers assess the full value of choosing ENERGY STAR qualified water heaters by introducing them to available incentives. Detailed information on available incentives and rebates is available at energystar.gov/rebatefinder and energystar.gov/taxcredits. Homeowners can benefit from a $300 federal tax rebate for gas tankless and heat pump water heaters, as well as a tax credit for 30% of the installed cost of solar thermal. Many states offer additional incentives for these technologies. (See also www.DSIREUSA.org.)

What other incentives are available to offset the costs of an ENERGY STAR qualified residential water heater?

Utilities also offer incentives. More than 700 utility and state energy efficiency programs are promoting ENERGY STAR to households nationwide and offering rebates and incentives to their customers. Many gas and electric utilities educate homeowners on the benefits of these units. Center Point Energy in Minnesota, for example, has over 250 contractors in their network and offers a rebate of $100 on high efficiency ENERGY STAR qualified residential natural gas water heaters. This year to date, they have rebated over 900 qualified water heaters. In a recent survey of rebate participants, two-thirds of respondents were aware that ENERGY STAR natural gas water heaters were available and one-third were made aware of the rebate offer through their plumbers.

For more information on incentive programs available from your utility, visit the Consortium for Energy Efficiency (CEE). CEE tracks utility incentive programs for gas water heaters and rebates can be found on the Residential Gas Water Heating Program Summary 2011 page at www.1cee.org.

Are trainings available to learn more about ENERGY STAR qualified residential water heaters?

Many manufacturers provide contractors with training opportunities specific to the sales and installation of their ENERGY STAR qualified products. Increasingly, plumbing contractors are taking advantage of energy and water efficiency training programs such as the Accredited GreenPlumbers Training Program (www.greenplumbertraining.org) to better serve energy aware customers. GreenPlumbers residential audit calculates energy and water savings for new high efficient product installations. Plumbing contractors can then work with homeowners to deliver the best ENERGY STAR qualified product and to maximize the consumer's return on investment. ■

ENERGY STAR was introduced by EPA in 1992 as a voluntary, market-based partnership to reduce greenhouse gas emissions through energy efficiency. Today, the ENERGY STAR label can be found on more than 60 different kinds of products, including lighting, appliances, TVs, computers and other office equipment, and on consumer electronics for homes, schools and commercial buildings. Products that have earned the ENERGY STAR prevent greenhouse gas emissions by meeting strict energy-efficiency specifications set by the government. In 2010 alone, Americans, with the help of ENERGY STAR, saved nearly $18 billion on their utility bills, while reducing greenhouse gas emissions equivalent to the annual emissions from 33 million vehicles.

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Advanced Boiler Control

By David A. George

In a few short years, boiler control technology has made dramatic advancements. Boiler controls have become smarter, leaping out of the dark ages and into an era of complex boiler operation. In fact, smart boiler controls have advanced beyond boiler operation and into related operations, such as the management of multiple boilers, boiler pump and system pump control, domestic hot water production and more. System control functions once only available via a remote control or Building Automation System (BAS) are now "on board" the boiler.

First and foremost, advances in boiler control were made due to advances in combustion systems. One such combustion system, Negative/Regulation (Neg/Reg), operates using blower speed and matching gas flow to modulate the main burner across a broad input range. Neg/Reg is unique, because changing negative air pressure informs the gas valve on the amount of gas to supply. In other words, the blower and the gas valves are smart now too.

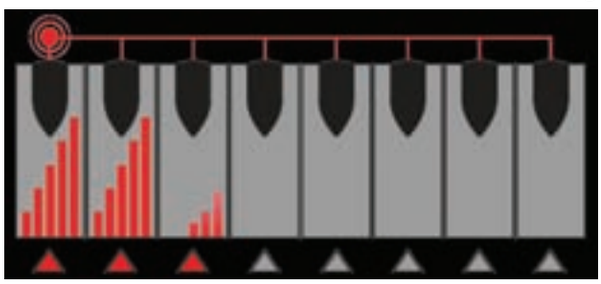
Soon, PID logic was employed to control the modulation of new combustion systems. PID combines proportional, integral and derivative logic into a set of directions for the boiler to operate. Proportional is the difference between the actual water temperature and the target temperature or setpoint. Integral is the difference between the actual water temperature and the setpoint over time. Derivative is the rate at which change is occurring in the difference between the actual water temperature and the setpoint. These three ways of calculating the boiler's modulation rate work together to achieve control that is more accurate than any single calculation.

Add to this the idea of outdoor reset, which changes the setpoint temperature based on outside air temperature. As the outside temperature drops, a reset curve in the control logic will increase the setpoint temperature. This puts higher water temperature in the heating system to offset the greater heat loss created by the lower outside air temperature.

Multiple boiler operation was the next logical step in onboard boiler control. In most commercial applications, multiple boilers or banks of boilers are installed. This provides boiler redundancy to deliver a level of safety against total system shutdown if only one large boiler were installed. Previously, multiple boiler control was provided by a separate modulating or stage controller. By building this into the boiler's operating control, an important function is offered at no extra cost. Plus, onboard multiple boiler control is specially configured to match the particular design and operating characteristics of the boilers.

Often referred to as "cascade," the boilers will be wired together or "daisy chained." One boiler will be assigned the task of group leader. If there is a building automation system, it will communicate with the lead boiler. Appropriate sensors required for boiler operation or group operation will be connected to the leader. The actions of the group will be decided by the leader.

The follower boilers will fire upon a call for heat directly from the leader. Depending on the programming, the follower boiler will fire at a given input rate chosen by the leader or by its own onboard logic. Typically, the leader and the follower boilers will "take turns" being the first one to come on each day. This operation gives equal cycle time to all the boilers over a long period of time.



On-board cascade connects up to eight boilers for coordinated operation. Built-in multiple boiler control improves system efficiency, reducing operating costs.

Another new feature is domestic hot water prioritization (DHW). For DHW, a boiler would be piped to an indirect water heater as well as to the space heating system. An indirect water heater is a storage tank for potable water. Inside the tank is a coil of copper or stainless steel tube. Heated water from the space heating system passes through the coil, transferring its heat into the potable water. With this design, a low cost indirect fired tank is connected to an existing space heating system to provide

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domestic water. This reduces system cost by eliminating a separate domestic water heater and storage tank.

The control logic will monitor the space heating system and the DHW system. If the DHW system needs heat, the control will shut off flow to the space heating system, direct flow over to the indirect tank and fire the boiler for appropriate heating. Typically, the boiler will fire at a high input rate with a high setpoint temperature. The idea is to quickly satisfy the domestic water needs and get back to the job of space heating.

Smart controls can now manage more operations beyond the boiler's internal operations. Night setback is a popular cost saving function built into many boiler controls. As the name implies, this allows the control to alter the setpoint during hours and days when the building is unoccupied. The boiler will fire at a lesser rate or shut off entirely, which saves fuel costs.

In addition to operating the boiler, a smart control program can reach out beyond the boiler to control the operation of other related devices in the system. The most obvious is pump control, such as pumps that flow water through the boiler and pumps that flow water throughout the space heating and DHW systems. The smart control can coordinate the firing of the boiler and the flowing of water with the pump, turning the pump on or off in time with the call for heat. More advanced controls can modulate variable speed pumps in synchronization with the modulation rate of the boiler.

In addition to improved boiler control, these new smarter control programs can collect and transmit a large amount of operational information. Status of the boiler is primary. Is there a call for heat? Is the main burner on to answer the call for heat? Is the boiler shut down on a fault? What is the fault?

Control programming can collect other operational data, such as Hours of Main Burner operation. Hours of Main Burner operation can be captured at low or high input rates, such as less than 25%, 25% to 50%, 50% to 75% and 75% to 100%. The controls can record the number of attempted ignitions and the number of successful ignitions. The control can count the firing time, the firing cycles and inform the customer that the boiler is due for service.

Smart boiler control is a natural progression, and it's not over yet. There is a future out there for even smarter boiler control — wireless communications, Internet access, email reports of faults. Super smart boiler control is a lot closer than you think. ■

David A. George *is a product manager for Lochinvar Corp.*

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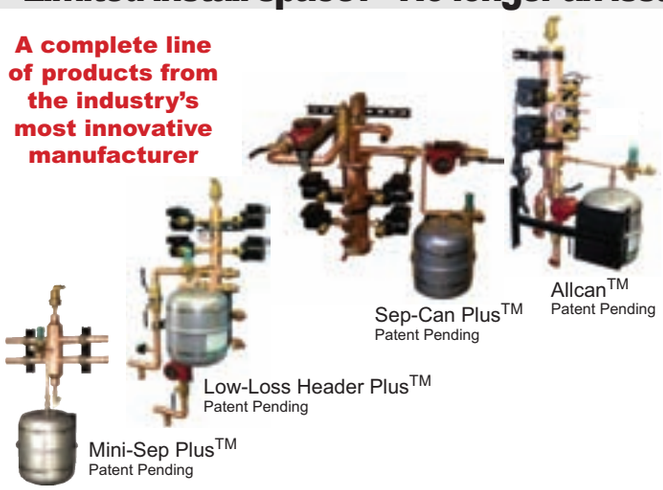

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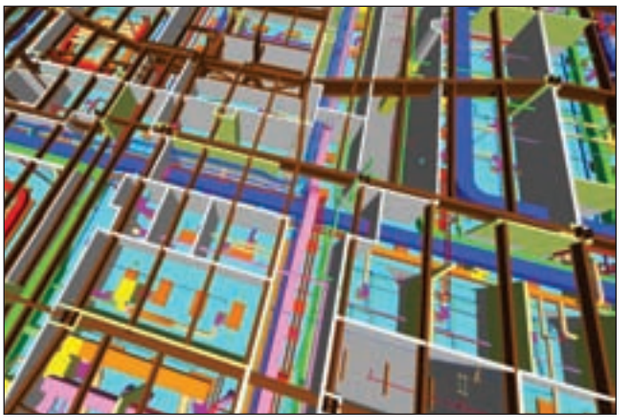
The REVIT Revolution

By Chuck Lott

The mechanical, electrical and plumbing community has seen a significant evolution in how project design and planning has evolved from the more traditional design tools such as hard copy versions of blueprints to more computer aided design (CAD)-based programs. Perhaps the biggest shift has been the recent adoption of the Autodesk software Revit. With Revit, design professionals can more efficiently manage their design and produce more accurately detailed project plans. As opposed to the architect and the mechanical, electrical and structural engineers working from their own sets of plans, Revit allows for a single, three dimensional view of the project to be created and communicated across the entire project user base.



BIM allows design professionals the ability to quickly perform specification and design functions that have traditionally required a much greater time frame. ***Photo credit: Ron George***

Extending the power and functionality of the Revit program, building product manufacturers are taking advantage of this technology to create branded, visually compelling, information-rich 3D virtual models of their products. Known as building information modeling (BIM), the transformation taking place means that a building and its component parts now have imbedded data directly in the models, allowing design professionals the ability to quickly perform specification and design functions that have traditionally required a much greater time frame.

The building industry is seeing a growing number of manufacturers create a library of information rich, three dimensional real-world products that are making the entire design, bid and build process more fluid, while reducing commonly seen mistakes made either in the design phase or as a result of miscommunication and value engineering.

In addition to the Revit revolution, technology is now taking building design to a new, more interactive level. Using years of experience taken from the video-gaming industry, companies like VIMtrek are bringing the immersive world of gaming to building design. Projects built in Revit can be rendered in minutes instead of hours, and the technology allows designers the ability to literally walk through the virtual building. Once inside the project, participants can make notes, access the latest price information and even calculate building materials down to the nail. A brave new world, indeed. ■

***Chuck Lott** is vice president sales and marketing for Precision Plumbing Products.*

Precision Plumbing Products has partnered with SmartBIM, an Atlanta-based company responsible for developing both the software for managing object models in Revit, as well as the environmental documentation process for the PPP library. Design professionals utilizing Revit may now go to one place where the entire PPP product line may be accessed for insertion into their Revit models. (Visit www.pppinc.net and click SmartBIM).

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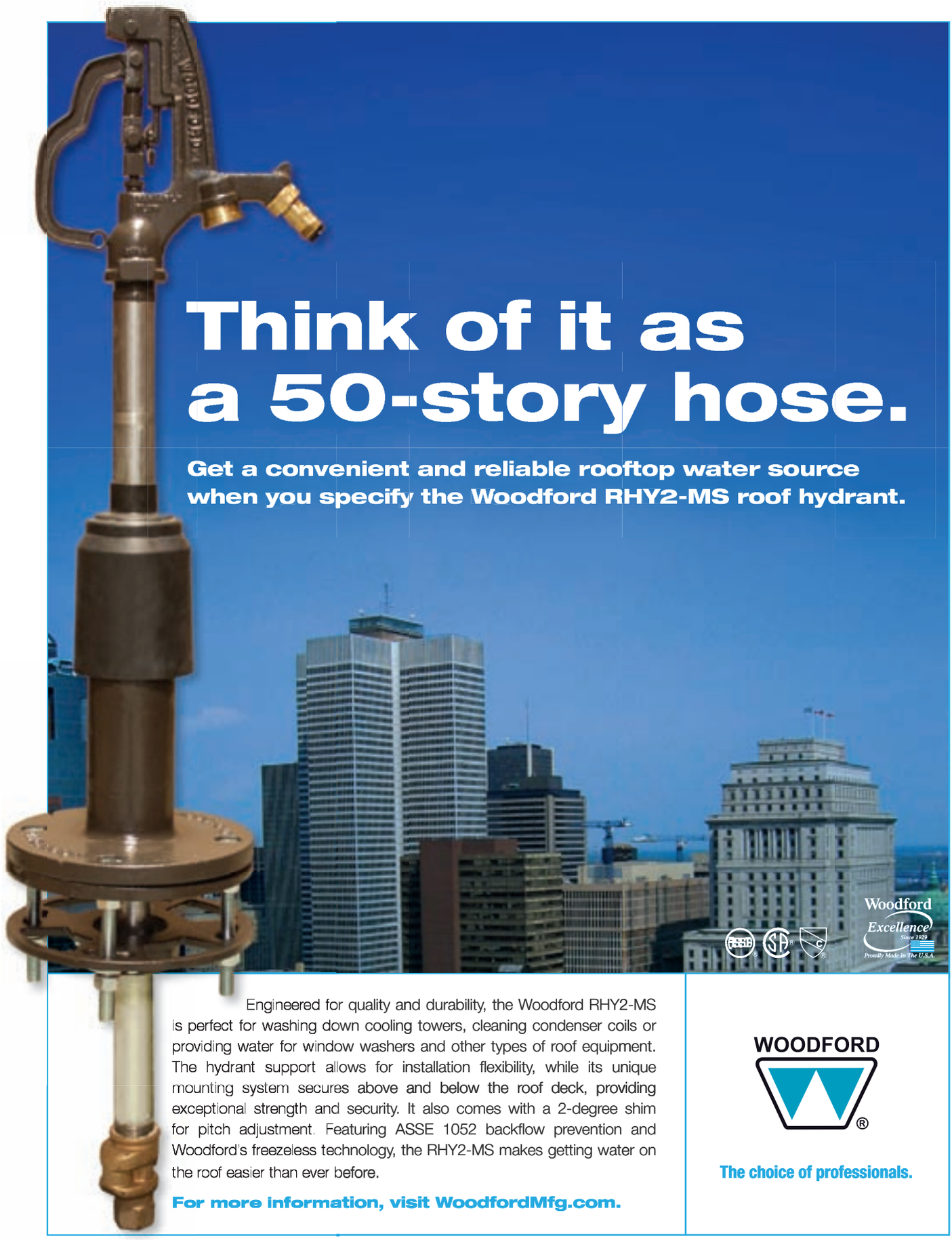

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New Technology Solves Age-old Problems at Fort Sill, Oklahoma

OneFlow tanks appear to be standing at attention, shoulder to shoulder, waiting for instructions from their drill sergeant, when, in fact, these tanks are protecting the domestic water system in the army training barracks at Fort Sill, Okla.

Built during the Indian Wars, Fort Sill served as the base of operations against Cheyenne, Comanche and Kiowa Indians. After decades of warring with "native hostiles," it was there, on February 17, 1909, that Geronimo, the great Apache chief, died of pneumonia. Today, Fort Sill is not only a National Historic Landmark but also one of the U.S. Army's largest bases.

In the 1970s, initial entry training (IET) "starship barracks" were constructed on Army bases nationwide, including Fort Sill. The facilities acquired the nickname because they're completely self-contained, with living quarters, classrooms, mess halls and latrines all under one, star-shaped roof.

Many of the starship barracks — designed to house up to 500 troops — are being renovated, chiefly to reduce energy consumption. Ft. Sill has already renovated one starship and is now preparing to modernize four more.

Hard water has plagued maintenance crews at Ft. Sill since the addition of indoor plumbing, and the problem remains today. Unfortunately, southern Oklahoma has some of the most challenging water quality nationwide. With all new mechanical and plumbing systems being installed during renovations, the Army Corps of Engineers has moved to eliminate domestic water scale problems before they begin.

Impressive demand

With 500 troops mobilizing, high-quantity water use is inevitable. At Fort Sill, dealing with persistent scale is a costly problem to solve compounded by the inevitable spikes in water use. At the start of each new day, soldiers have a set routine. Wake up (still a cheerfully, piped-in, high-decibel reveille at "O-dark-hundred") leads to a quick shuffle to the showers, where a combined 632 gpm surge through the spacious gang showers.

A daunting challenge for the mechanical contractor is how to provide scale protection for domestic water systems at a rate of 632 gallons per minute with a water quality defined as "very hard." At 10 grains of hardness per gallon, water is considered hard and, over time, calcium and bicarbonate scale become a problem for system components. The water at Ft. Sill measures a whopping 27 grains per gallon.

"One plan was to use a commercial, salt-based water softener," said O.G. Mills, VP of Tulsa-based, Okla., sales. "But the four tanks needed wouldn't fit through the mechanical room door and, once inside, would've taken up far too much space. On top of that, the sheer amount of salt used to regenerate the water softeners would have required additional storage, constant attention from a service tech and an expense to treat all the water that would have made it nearly cost prohibitive."

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Fort Sill

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Four and eight-inch Watts model 957 RPZ backflow preventers protect the domestic water system. Strainers installed upstream of the RPZs help keep debris from getting into the OneFlow system and backflow preventers.

Physical water treatment

Mills continued, "The Army Corps of Engineers started doing their homework, researching different means of scale removal." What they already knew was that the system must handle a huge volume while being cost effective. Mills added, "There was the need for tolerance to huge pressure drops as well. And, according to the Buy American Act, the equipment would need to be American-made."

With those mission parameters, and after a careful study of their options, the Army Corps of Engineers chose Watts' OneFlow® anti-scale central treatment system. This uses TAC (template-assisted crystallization) technology. TAC falls into a category of water treatment often referred to as physical water treatment (PWT). The primary goals of PWT are to eliminate the use of chemical additives, reduce or eliminate discharge and wastewater and create zero pollution, while minimizing installation and maintenance costs.

The environmentally friendly technology behind leading TAC treatment systems was developed in Germany about 15 years ago. It was used throughout Europe for several years before coming to the U.S. and continues to be the dominant form of commercial water treatment there. TAC media starts out as polymeric beads (resin) in the 20- to 40- mesh size range. Catalytically active sites or templates are "imprinted" or coated on the bead surface through a batch-coating process.

The system changes the physical characteristics of the water with little or no change to the solution's chemical composition. PWT is chiefly used to reduce the negative effects of water hardness (calcium carbonate) in plumbing systems, appliances and equipment, valves and other components. The template influences the water solution at localized sites (on the media surface), such that hardness ions and their counter-ions (bicarbonate) combine to form inert nanometer-size "seed crystals." Called nucleation, this occurs when dissolved molecules or ions dispersed throughout a solution start to gather to create clusters in the sub-micron size range.

The seeds provide an enormous area for preferential growth of remaining hardness ions still in solution. "Low energy heterogeneous transfer" then begins. The remaining dissolved ions reach their solubility shift, attach to the seed crystals and continue harmlessly downstream.

Out with the old…

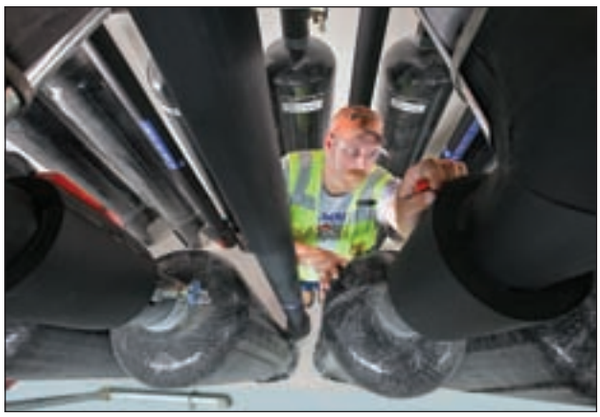
"The Army Corps of Engineers in Lawton wasn't impressed with the old traditional water softening system or with the service contract attached to it," said Allen Jones at C.H. Guernsey, lead mechanical engineer on the project. The mechanical room had been built around the existing system. Two tanks, one 10 feet tall and the other five feet in height, were situated on either side of the mixing unit. The tanks were disassembled and removed.

"The Corps did their own research, looking for a better alternative financially, logistically and environmentally," said Jones. "Mills was a bulldog when it came to explaining how TAC technology is the winner in all three categories and also uses less than half the floor space of any of the alternatives."

TAC: Unaffected by fluctuating water demand

Another huge advantage the TAC system has over a traditional water softener is the ability to operate effectively at trickle flow rates," said Steve Callahan, national sales manager of water treatment products at Watts Water

Continued on page 103



Technician Rob Myers opens the outlet connection to one of 12 tanks installed at Fort Sill Army Base.

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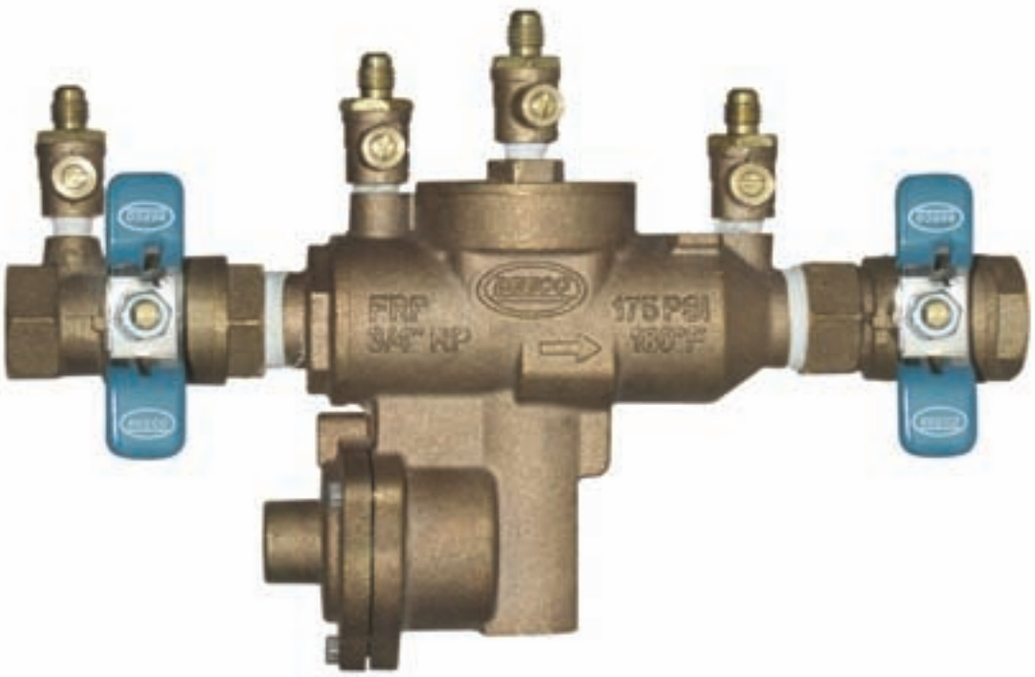

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FRP

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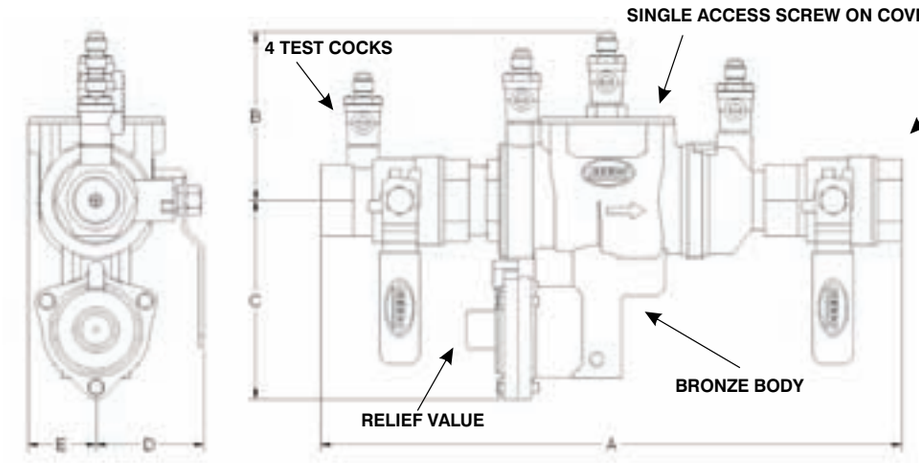
Specification: The BEECO Friendly Reduced Pressure Zone Backflow Preventer is designed to stop the reverse of flow of a liquid into a potable water system. The proper installation of a backflow preventer must be done by a certified expert under local codes and guidelines to assure the protection of the drinking water system. The Valve shall be certified to ASSE 1013, CSA B64.4 and IAPMO listed.

Function: The assembly shall consist of two repairable positive seating check modules with captured springs and rubber seat discs. Service of all internal check components shall be through a single screwed in cover and designed for ease of access. The valve shall be equipped with a serviceable and replaceable relief valve with easy access repair and replacement while in line.

Features: The checks are designed with a unique thumb screw holding in the disc to allow for easy removal of the check with a simple pair of pliers dramatically reducing part breakage during repair. The single threaded cover makes for the quickest access inside the valve in the industry. Repair parts are so modular it only takes two relief valve kits and three check repair kits to cover all sizes 1/2" through 2".

Ratings: Maximum Working Pressure 175 psi, Hydrostatic Test Pressure 350 psi ,Temperature Range 33° F – 180° F. Tested and approved to ASSE® 1013 and CSA® B64.4, and is IAPMO listed.



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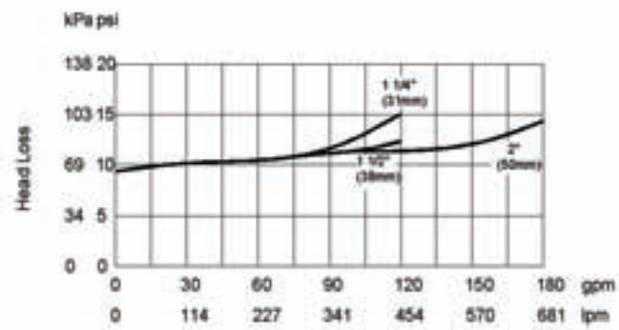
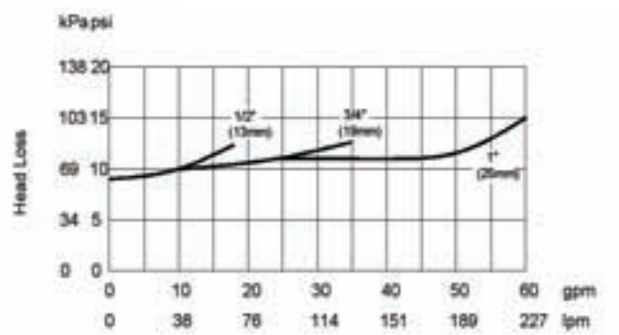
☐ Locking Handles	-LH
☐ Strainer Attached	-S
☐ Less Ball Valves	-LF





Model Number	Size	A	B	C	D	E	Weight
FRP.50-QT	1/2" (13)	10 1/2" (260)	3 3/8" (86)	4" (100)	2" (50)	1 1/4" (32)	5.5 (2.5)
FRP.75-QT	3/4" (19)	11 1/8" (280)	3 3/8" (86)	4" (100)	2 1/2" (64)	1 1/4" (32)	6 (2.7)
FRP1.00-QT	1" (25)	12 3/4" (320)	3 1/2" (89)	4 1/8" (105)	2 1/2" (64)	1 1/2" (38)	9 (4.1)
FRP1.25-QT	1 1/4" (32)	16 1/4" (610)	4 3/8" (111)	6 5/8" (168)	2 3/4" (70)	1 3/4" (44)	13 (5.9)
FRP1.50-QT	1 1/2" (38)	16 3/4" (425)	4 3/8" (111)	6 5/8" (168)	3 3/8" (86)	1 3/4" (44)	17 (7.7)
FRP2.00-QT	2" (50)	17 1/2" (445)	4 7/8" (124)	6 5/8" (168)	3 1/2" (89)	2 1/4" (57)	26 (11.8)

Job Name: _____ Page No: _____
Section No: _____ Contractor: _____
Schedule No: _____ Purchase Order No: _____

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Fort Sill

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Rob Myers, Technician for Archer Western Contractors, adjusts pipe hanger at Fort Sill Army Base.

Technologies. "TAC media is always used in an up-flow design, so it's not subject to low flow channeling or high flow pressure drops. With traditional [salt-based] systems, if flow is below peak rate, you can get hard-water bypass. That's when water finds the path of least resistance through the media and comes in contact with minimal amounts of resin."

According to Callahan, TAC media isn't sacrificial; it doesn't dissolve. Media lifecycle is not influenced by the amount of water being treated or by the hardness of the water. However, impurities in the water, such as chlorine, over time can degrade the template on the beads, which affects media longevity. The typical suggested media change-out is three years.

"Selecting the appropriate size system is simple. All you need to know is peak flow rate," said Callahan.

The first phase of the Ft. Sill restoration project called for 12 OneFlow tanks, each capable of handling 75 gpm. Linked in parallel, the tanks treat up to 900 gpm. This system also affords the base the flexibility to isolate tanks if the barracks aren't at full capacity and to perform media change-outs one tank at a time.

Four and eight-inch Watts model 957 RPZ backflow preventers protect the domestic water system. Strainers installed upstream of the RPZs help keep debris from getting into the OneFlow system and backflow preventers.

"For the Army Corps of Engineers to review and ultimately select TAC technology over a traditional softener, it meant that we had to meet a very strict performance standard to protect their plumbing systems. We have thousands of installations, some in areas where water is even harder than at Ft. Sill, so I was certain our technology was best suited for water use at Fort Sill," he added. "They'll reap the benefits of zero water discharge and no salt expense for years to come." ■

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Product Application

Product Quality & Customer Support Key to Bradford White's Success

Bradford White Water Heaters is the tank type water heater brand most purchased by contractors according to an independent water heater study. Not only that, but Bradford White is also the brand most recommended by contractors to consumers. Bradford White has held this top position for five consecutive years in both categories; brand most purchased and brand most recommended, since the categories became part of the study.

So what is it that Bradford White is doing right? In this Internet era where companies are constantly "reinventing" themselves online in the race to win the favor of friends and followers on Facebook or Twitter, Bradford White is engaging customers, staying relevant and "friending" people the old fashioned way — by making great products, supporting its customers with accessible, efficient service, and staying true to a business philosophy that helped the company become the industry leader it is today.

Bradford White is engaging customers, staying relevant and "friending" people the old fashioned way — by making great products.

"When you look at the reasons contractors prefer Bradford White, you realize that our philosophy to provide a premium product and to back that product with unequaled service and support is right on target," said Bradford White's Bruce Carnevale, senior vice president — sales and marketing. "We make a great product, there's no denying that. Manufacturing those products for wholesale distribution only is a critical reason we enjoy strong brand loyalty from plumbing and heating contractors."

24/7 Call Center

It was this focus on the customer support that led Bradford White to open the water heater industry's first ever 24 hour a day, seven day a week warranty and technical service support center at its Middleville, Mich. manufacturing facility. The new center is fully staffed with both warranty specialists and technical service experts. The entire staff has completed a rigorous and extensive training program.

"This is an exciting move for Bradford White and we are proud to have very knowledgeable people ready with the solutions our customers need whenever they need them," said Dustin Bowerman, Bradford White's director of technical services.

"Bradford White has always been a company that put a premium on customer service. Our continued volume growth in recent years increased our call volume at a similar rate. This new state-of-the-art facility puts our customers first and will provide them with the best service and support in the business."

BRADFORD WHITE

OnGuard RMT™ — Water Heater Management System

In the coming months, Bradford White will introduce its OnGuard RMT™ System, a remote monitoring technology and service available for commercial gas powered water heaters. OnGuard RMT™ combines proprietary hardware, alert status notification, 24/7 factory-based technical support, and fast service dispatch to give customers the ultimate level of awareness, protection, and peace of mind.

When connected to the OnGuard RMT™ communication gateway, the status of the water heater is communicated directly to Bradford White technicians.

When connected to the OnGuard RMT™ communication gateway, the status of the water heater is communicated directly to Bradford White technicians. This assisted monitoring protocol frees customers from monitoring their water heater's operational status. Bradford White technicians do the status monitoring and contact the customer in the event the water heater indicates a fault or requires service. These same technicians then contact an authorized service contractor to perform any required repair or maintenance. And just as important, Bradford White covers the cost of the service calls and repair.

In addition to the monitoring, live technical support and service dispatching, customers also get fault alert notification via email or phone call, and the tracking, reporting and data collection of unit performance. This data provides a record of burner cycles, burner run hours, and approximate fuel usage. The OnGuard RMT™ System also has the ability to monitor up to four water heaters with one communication gateway and provide statistical data on each unit. ■

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For the fifth straight year, Bradford White is the tank water heater brand most purchased by professional contractors. And again, we are the most recommended brand.

"We made the switch to Bradford White almost 15 years ago when we started having problems with another brand. Our reputation depends on the products we recommend so quality and reliability are critical. We couldn't be happier. Bradford White is loyal to the plumbing profession. Their products and people are top notch." ***Kevin and Ryan Carney - Carney Plumbing – Heating – Cooling, Line Lexington, PA***

The results of the 2010 CLEAReport*, an independent water heater study by Clear Seas Research, revealed that product quality, service, technical support, and the fact that Bradford White is not sold in retail stores were the most important factors to contractors when selecting a brand of tank type water heater.

And now our support for you gets even better. Bradford White has just opened a 24/7, factory-based call center.

This fully staffed technical service team is there when you need it, anytime day or night.

We're making it easy for you to be a Bradford White contractor.

BRADFORD WHITE®
WATER HEATERS

www.bradfordwhite.com | Built to be the Best™ | To Find A Wholesaler Call 800.523.2931

*Ranking is based on the 2006, 2007, 2008, 2009 and 2010 CLEAReports by Clear Seas Research. Please visit www.clearseasresearch.com for additional information. © 2011, Bradford White Corporation. All rights reserved.

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Product News

Plumbing Engineer's Product of the Month

ASME certified combination condensing boilers and tankless water heaters

Complete line of Combi Boilers — model numbers CH 240 ASME with 199,000 Btus, CH 210 ASME with 180,000 Btus, and CH 180 ASME with 150,000 Btus — are offered in both natural gas and propane fuel applications. All of the units are condensing and can be vented using 3" Schedule 40 PVC pipe in most application. **Navien America.**

Circle 100 on Reader Reply Form on page 113

Megatron® control stations

New Megatron® models 270 and 370 provide a reliable solution to comply with ASSE 1070 for advanced lavatory output water temperature control. They specifically address the maximum temperature of tempered water provided to lavatory use in commercial, institutional and industrial applications to 110ºF as called out in the IPC. With a water-saving, minimum 0.5 GPM flow rate, Megatron models 270 and 370 share the same features as their counterparts in the Megatron line, a complete prepackaged control station designed to regulate and maintain water temperature for hot water systems. **Leonard Valve.**

Circle 101 on Reader Reply Form on page 113

Wall-mount boiler

Loaded with a winning combination of features, the WM97+ is a wall-mount boiler that comes in 70,000 and 110,000 Btu input models, both at a AFUE rating of 97%. The WM97+ offers a unique condensing stainless steel heat exchanger, built in boiler circulator and a built in primary secondary option. **Weil-McLain.**

Circle 102 on Reader Reply Form on page 113

Geothermal heat pump

Bosch TA Series Geothermal Heat Pump has been awarded ENERGY STAR® Most Efficient Designation for 2011. Utilizing the natural energy found beneath the Earth's surface, geothermal technology is a super efficient and environmentally responsible method for heating and cooling homes and businesses. The Environmental Protection Agency (EPA) states that geothermal heat pump systems are 45 percent more efficient than standard options. The Bosch TA series, by comparison, will provide almost 60 percent savings over geothermal systems that meet the federal minimum efficiency standards. **Bosch Thermotechnology North America.**

Circle 103 on Reader Reply Form on page 113

Press System® ball valve redesigned

The NIBCO® Press System® has taken press technology to a new level in leak detection. The new PC585-70 cast bronze ball valve by NIBCO features a new design that allows a leak to occur during testing, if the press connection is not properly crimped. Other NIBCO® Press System® fittings and valves will feature this new leak detection technology using a phased-in approach. **NIBCO.**

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Integrated boiler control

VERSA IC™ fully integrated boiler control is a giant leap forward from currently availability control platforms. Modulating, or selectable stage fire, the VERSA IC™ , fully integrates temperature control, ignition, safety and individual fault monitoring. Cold Water Protection software included. Field upgradable. Modbus communications port standard for continuous monitoring, trending, and trouble shooting. This cutting edge VERSA IC™ control platform will initially be incorporated into the XFyre modulating condensing boilers by December, and phased in to all products during 2012. **Raypak.**

Circle 105 on Reader Reply Form on page 113

AirTap hybrid water heater

The ATI-S is a heat pump solar hybrid water heater that can also harness solar energy to heat water. Allowing solar and heat pump technologies to work in tandem is expected to boost the unit's efficiency. The ATI-IO is a double vent unit that allows users to vent intake air into the unit AND vent exhaust air away. AirgGenerate's current products are pre-configured with a vent outlet but the addition of an intake option will be of significant benefit to many. **Air Generate.**

Circle 106 on Reader Reply Form on page 113

Plumbing Engineer's Product of the Month

Hybrid boiler system

Now you can add one or more high efficiency boilers to a traditional cast iron modular system or large Slant/Fin boiler and achieve virtually the same energy savings with this hybrid system as you would with an all high efficiency system but at a much lower installed cost. During the colder heating months, when systems need water temperatures above 140 F high efficiency boilers run at about 88% efficiency. During the warmer months of the winter where system water temperatures can be 140 F or less to fulfill the reduced heating load, high efficiency boilers can take over with efficiencies as high as 96.7%. **Slant/Fin.**

Circle 107 on Reader Reply Form on page 113

Mighty Stack volume water heater

Mighty Stack volume water heater combines the Mighty Therm 2 boiler with an 80-gallon storage tank resulting in 199, 300 and 399 MBH sizes fueled by natural or propane gas. With less than 10 ppm NOx emissions, the sealed-combustion Mighty Stack offers 83% thermal efficiency and meets low lead requirements.

This light commercial product is designed for apartments, restaurants, hotels, laundries, schools, businesses and large homes. Key assets include its small footprint, a removable upper boiler section for easy handling, common venting and up to 50 feet of Category I or III venting. Thanks to the rugged steel cabinet, the new Mighty Stack can be installed inside or outside. The Mighty Stack meets ASHRAE 90.1 requirements. Laars offers a five-year tank and 10-year heat exchanger warranty. **Laars.**

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Product Application

Pumps Don't Add Head: Valves do

By Greg Cunniff, Taco Inc.

Net-zero green buildings are in vogue today and for a very good reason: They are meant to operate at no net energy consumption, drawing no net energy from the electrical grid. This sustainable capability is accomplished through a combination of energy efficiency and onsite energy generation, often through co-generation.

We were asked recently whether there is data to support a claim that electrical consumption in a system employing Taco's LOFlo® injection mixing system, which is a single-pipe controlled system instead of a two-pipe valve system, would be less than a traditional design with control valves. To be more precise, what the question is getting at is whether there would be less energy used in a system configuration using a single pipe with two seats of pumps in a primary-secondary configuration vs. a system using one larger pump set along with control valves in the building's zones.

To answer the question, we need to examine how we calculate pump energy consumption, which is a simple first law problem. And we should take into account today's variable speed drives, which are specifically designed to reduce energy consumption.

First off, it doesn't make any difference how the pump horsepower is split up. What counts are the total flow and the total head in a system; e.g., placing 40% of the pump head on one set of pumps and 60% with the other. If the efficiencies of the pumps are the same, the total pump horsepower will be the same.

In Taco's case, using our single-pipe LoadMatch® and LOFlo systems, we can achieve savings in pump horsepower by splitting the pump horsepower between primary and terminal secondary pumps. This allows for a pump-controlled system without control valves and a self-balancing system without balancing valves. This will save between 15 and 20 ft. of pump head on the total system, depending on how the valves are sized.

For our LOFlo injection mixing system — a three-pump system with primary, secondary injection and secondary terminal unit pumps — it doesn't make any difference if we have two secondary pumps instead of one. Adding pumps does not add head; it eliminates head. Graph #1 is an example of how one can calculate the head in a system with and without using LOFlo.

Graph 1

	Head Loss 2-Pipe System	Head Loss LOFlo® System
Primary Chiller Loop		
Chiller	15	15
Pipe	3	3
Multipurpose Valve	5	5
Air Separator	3	3
Suction Diffuser	3	3
Misc. fittings	2	2
Secondary House Loop		
Pipe	15	15
Terminal Unit		
Pipe (runouts form main)	1	1
Terminal unit coil	3	3
Control valve (5 psi)	12	0
Balance valve (2 psi)	5	0
Misc. fittings	1	1
Total Head (Ft.)	68	51

To calculate pump horsepower, multiply head x flow x a conversion factor, divided by the pump efficiency in both loops. The calculation of total pump horsepower would therefore be as follows:

Conventional system: Horsepower = 200 gpm x 68 ft./3960/.70 (pump efficiency) = 4.9 hp

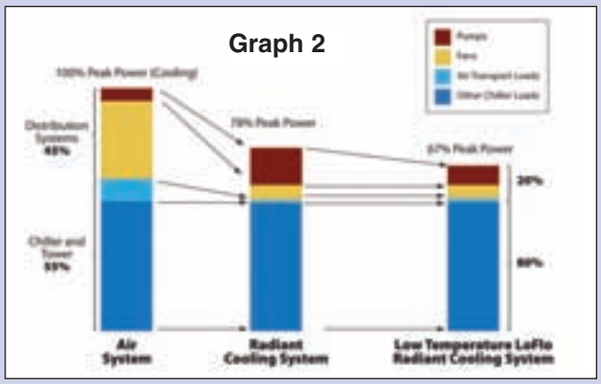
LOFlo system: Horsepower = 200 gpm x 46 ft. (head of primary and secondary house loop)/3960/.70 (primary pump efficiency + 200 gpm x 5 ft. (head of terminal unit loop)/ 3960/.25 (efficiency of LoadMatch circulators) = 3.2 + 1.0 = 4.2 hp

This represents a savings in pump horsepower of 14%, which is not trivial. In the real world, achieving net zero is difficult from a cost standpoint as well as from a first law standpoint. However, it is our contention that hydronic systems are more efficient than air systems and that single pipe systems are more efficient than two-pipe systems, making net zero buildings more achievable.

Let's graphically compare total system horsepower or electrical demand in the case of energy efficiency for an all-air VAV system, a conventional chilled beam system and Taco's LOFlo chilled beam system.

Then there's the use of variable speed drives to further reduce pump horsepower and energy consumption. In a single-pipe system such as LoadMatch, the VFDs are controlled from Delta T (differential temperature) and not Delta P (differential pressure). Pump-mounted VFDs with an integral controller, which Taco now offers, sequence both Delta T and Delta P. In fact, Taco is the only pump manufacturer presently offering both control sequences in one on-board controller.

Graph 2



Single-pipe systems such as LoadMatch and LOFlo achieve savings in pump horsepower by splitting the horsepower between the primary and terminal secondary pumps. Using a single-pipe system eliminates the need for all control and most balancing valves, which in a conventional two-pipe system add head. Pumps, regardless of how many are used, do not impose head on a system. Control and balancing valves do. Therefore, hydronic systems such as LoadMatch and LOFlo, which use pumps instead of valves, will have lower overall pump horsepower. ■

***Greg Cunniff** is applications engineering manager for Taco Inc.*

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Industry News

Lochinvar opens new distribution center

LEBANON, TENN. — Lochinvar® has opened a new distribution center in the Chicago area. With the continued growth of Lochinvar's business and the ongoing expansion of its industry-leading product lines, the strategic addition of this new distribution center is intended to meet increasing customer demand. The facility, located in Elk Grove Village, Illinois, opened its doors on December 5, 2011.

Like Lochinvar's other warehouse facilities, which are located in Detroit, Orlando, Tampa, Phoenix, Pompano

Beach, Dallas and at company headquarters in Lebanon, Tenn., the new warehouse stocks the company's complete line of water heaters, boilers, pool heaters and storage tanks. Most products are available for immediate pickup or delivery.

In other news, Lochinvar LLC®'s CREST® condensing boiler and Strato-Therm+ solar thermal storage tank are among the products recognized in the 2012 AHR Expo Innovation Awards. CREST was awarded honorable mention in the Heating category, while Strato-Therm+ received honorable mention in the Green Building Products category. A panel of judges made up of ASHRAE members evaluated all of the entries received in this year's competition, which represented a broad cross-section of the HVAC/R marketplace.

Honored for innovation in the Heating category, the CREST condensing boiler brings leading-edge technology and exceptional energy efficiency to the largest commercial applications, making it the ideal choice for both new construction and energy retrofit applications. Available in five models that range from 1.5 to 3.5 million Btu/hr, CREST offers thermal efficiencies as high as 99 percent. Designed with innovative fire-tube technology integrated with the exclusive SMART TOUCH™ operating control, CREST offers greater design flexibility and distinctive performance characteristics to meet today's building standards.

NSF International publishes standard for water reuse

ANN ARBOR, MICH. — NSF International, a global public health and environmental organization, has published the first American national standard for commercial and residential onsite water reuse treatment systems, NSF/ANSI 350. The new standard complements NSF's expanding scope of environmental standards and sustainable product standards, which help establish criteria for and clear methods of evaluating environmental and sustainable product claims.

NSF/ANSI 350: *Onsite Residential and Commercial Reuse Treatment Systems* establishes criteria to improve awareness and acceptance of water reuse technologies that reduce impacts on the environment, municipal water and wastewater treatment facilities and energy costs. According to the American Water Works Association, 84 percent of residential water is used in non-drinking (non-potable) water applications such as lawn irrigation, laundry and toilet flushing. Residential and commercial builders, architects and regulators are turning to onsite wastewater reuse systems as a solution to increasing water scarcity and energy costs associated with the treatment and distribution of municipal water and wastewater.

Certifying a water reuse system to NSF/ANSI 350 also satisfies requirements for leading green building programs. The U.S. Green Building Council has included reference to NSF/ANSI 350 in their LEED Building Design & Construction 2012 draft standard. Products certified to NSF/ANSI 350 also could satisfy graywater use strategies under the National Association of Home Builders (NAHB) National Green Building Certification program as an innovative practice.

Rinnai announces results of water heating survey

PEACHTREE CITY, GA. — Rinnai Corporation has announced the results of its recent survey on consumer water heating trends. The survey, which posed a series of water heating-related questions to homeowners from across the country, confirmed the importance of hot water to a home and revealed that, after learning about the benefits it offered, 92 percent of survey respondents would be interested in purchasing a tankless water heater.

The survey determined that the most compelling reason to buy a tankless water heater is the energy savings associated with the unit; however, the longer lifespan of tankless models compared to tank water heaters and a tankless unit's ability to provide endless hot water only when needed are also top purchase drivers.

Additional takeaways from the survey include the following:

- Almost three-quarters of respondents stated they would view a broken water heater as very problematic, and more than 90 percent would make repairing or replacing a broken water heater their highest priority.
- More than one-third of respondents stated they are most likely to run out of hot water due to increased demand (i.e., showers used more than normal or multiple hot water appliances used at the same time).
- The misconception that tankless water heaters provide instant hot water at the tap continues to persist; 71 percent of respondents believed it to be true.
- Many homeowners are unaware of the major benefits

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that tankless water heaters offer.

• Although 83 percent of respondents stated that the energy savings provided by a tankless water heater would be one of their top reasons for purchasing a unit, prior to the survey almost half did not realize that the units could offer up to 40 percent energy savings.

• Approximately 60 percent of participants did not know that tankless water heaters have a lifespan of 20 years or more.

• 42 percent of respondents did not know that tankless water heaters supply ample hot water for garden tubs and high-flow showers.

Speakman Cooling sells evaporative cooling business

NEW CASTLE, DEL. — Speakman Company has sold its Speakman Cooling business, which consists of two individual product lines, the OASys™ and the Air2O™, to two separate interested parties.

The Speakman Cooling business is part of Speakman Company, a 143-year-old plumbing company. Speakman Cooling started its business in 2005 with the introduction of OASys, an advanced indirect/direct evaporative cooling technology. The OASys IDEC product line was purchased by Practical Renewable Energy Corp. of Las Vegas.

In 2010, Speakman Cooling moved beyond the OASys line and launched the Air2O, a unique and sustainable line of indirect/direct evaporative coolers. This product line was purchased by Green Air Company. AirMax Industries LLC of Fresno, Calif., is the U.S. distribution arm of Green Air.

Forbes names Aquatherm one of America's Most Promising Companies

LINDON, UTAH — Aquatherm Inc. was selected as one of America's Most Promising Companies on *Forbes* magazine's exclusive list of only 100 companies nationwide. Making this distinction more impressive is that, while Forbes used financial data 2008 to 2010, the polypropylene pipe company's annual revenue has more than doubled during the 2011 fiscal year.

Aquatherm Inc., the North American partner of Aquatherm GmbH, markets and supports the German-manufactured polypropylene-random (PP-R) pipe systems that are rapidly being integrated into a huge variety of plumbing, HVAC and industrial pipe applications throughout the U.S. and Canada. Aquatherm is ranked 76th on the list.

ASSE elects 2011 – 2012 board of directors

WESTLAKE, OHIO — On Friday, Nov. 11, 2011, the American Society of Sanitary Engineering's (ASSE) new board of directors was sworn into their elected positions. The nominations, elections and installation of ASSE's officers and directors took place as part of the Society's 2011 annual meeting. Donald R. Summers Jr. (Missouri) of Plumbers and Pipefitters Local Union 562 was elected as the 2011 – 2012 international president of ASSE.

To fill the vacancies left by expired terms, four new members were elected to the ASSE board of directors. These board members are: third vice president Douglas Marian (California) of UA Plumbers Local 78; region two director Matthew Marciniak (Wisconsin) of IAPMO; region six director Richard J. Prospal (Ohio) of Prospal Consulting Services Inc. and region eight director Laurence Coleman (Illinois) of Pipe Fitters Local Union 597.

The 2011 – 2012 board of directors are: president, Donald R. Summers Jr. (Missouri) first vice president, Steve Silber (California); second vice president, Scott Hamilton (Wisconsin); third vice president, Douglas Marian (California); immediate past president, James Bickford (Florida); treasurer, John F. Flader (Illinois); region one director, representing the West, Donald Kool (Oregon); region two director, representing the Northwest, Matthew Marciniak (Wisconsin); region three director, representing the south-central, Dana Colombo (Louisiana); region four director, representing the Midwest, Steve Stahnke (Missouri); region five director, representing the Southeast, Joseph Kajak (Florida); region six director, representing the East, Richard J. Prospal (Ohio); region seven director, representing the Northeast, Sean Cleary(Pennsylvania) and region eight director, representing members at-large, Laurence Coleman (Illinois).

BrassCraft Manufacturing redesigns logo

NOVI, MICH. — One of BrassCraft Manufacturing's logos is being redesigned. The new logo incorporates the American flag encircled with text that reads, *DESIGNED, MACHINED AND ASSEMBLED IN THE USA*.

Some manufacturers today make misleading "Made in the USA" claims. BrassCraft Manufacturing is diligently ensuring that the products that carry this new flag logo on their packaging meet all of the applicable Federal Trade Commission rules that prohibit deceptive advertising. Brasscraft water connectors, water stops, gas connectors and appliance connectors are designed in the USA, machined at plants in Lancaster, Texas, Corona, Calif. and Thomasville, N.C. and assembled by their American work force.

"The redesigned logo sets these BrassCraft® products apart from our competitors," said Jeff Jollay, vice president of marketing and product development. "The flag says it all, and the text reinforces the message that BrassCraft Manufacturing is an American manufacturer, employing American workers. It is a powerful message that resonates very strongly with our customer, the professional plumber."

For more information, visit www.brasscraft.com.

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Industry News

ICC names chapter of the year, presents merit awards

WASHINGTON — The Virginia Plumbing & Mechanical Inspectors Association chapter of the International Code Council was presented with the 2011 Chapter of the Year award during the ICC annual conference in November in Phoenix. The Code Administrators Association of Kentucky (CAAK) and the Northwest Building Officials and Code Administrators of Illinois were presented with Chapter Merit awards.

To be recognized as the Chapter of the Year, a chapter must demonstrate a high degree of professionalism in promoting the vision, mission and goals of the code council. Founded in 1962, the VPMIA boasts a growing membership in most every jurisdiction in Virginia. Members are extremely active in code development and related activities. VPMIA members participate in the state code academy training and lobby for or against proposed code changes in state law, as necessary. Last year alone, the VPMIA proposed more than 120 code changes before the ICC code committees and membership, 85 percent of which were adopted into the model codes.

Merit awards honor chapters that distinguish themselves through activities that demonstrate the goals and objectives of the code council. CAAK was honored for its passion about education and its work with regional chapters to accomplish its goals and objectives and those of ICC. To support the education of its members and their families, CAAK, which is an umbrella chapter for three local ICC chapters, underwrites scholarships, including a scholarship that allows one of its members to be a first-time ICC annual conference attendee.

2012 Industry Forecast – Nebulous to partly cloudy

Continued from page 6

number of distributors of industrial and flow control products, I noted an October disparity between the brisk pace of new orders emanating from the field, in comparison with the inventory downturn at the distribution level, which seemed to be lagging from the brisk pace I noted from field reports in general.

The answer lies in the schism between increasingly skittish distributors, concerned about a sputtering economy and overall fears of increasing recessionary trends, and the actual usage. This has caused distributors in general to tighten their "just-in-time" inventory level, while customer orders were expanding during the month of October. ■

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3 I am also engaged in the following kinds of engineering work:
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☐ Sprinkler/Fire Protection (d) ☐ Plumbing (e)

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

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

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

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

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Industry News

AHRI announces 2012 leadership

ARLINGTON, VA. — The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) announced new leadership, including new chairman Ajita Rajendra, president and COO of A.O. Smith, during its 2011 annual meeting, held November 12 – 15, 2011, in Bonita Springs, Fla.

In his address to the membership, Rajendra emphasized the need for AHRI to work with industry partners to pass key legislation on Capitol Hill, including two consensus agreements establishing new federal minimum efficiency standards for small duct, high velocity air conditioners and heat pump pool heaters and requiring DOE to develop a new test procedure for water heaters.

He also called on members to work together to make AHRI's certification program even more credible in the United States and across the globe.

Morrison Carter, president and CEO of Beckett Gas Inc., will serve as immediate past chairman. Harry Holmes, president of Morrison Products, was named vice chairman and Chris Drew, vice president, Burnham Holdings Inc., was named treasurer.

Noritz boosts tankless water heater service quality

FOUNTAIN VALLEY, CALIF. — Noritz America recently unveiled two customer-service initiatives, a technical support website and an in-house call center, with the goal of delivering information more quickly and efficiently to customers, whether their preferred method is the telephone or online. Targeting tradespeople and consumers, the website went live on Nov. 1, while the new call center began operations inside the company's Orange County headquarters on Nov. 28.

The origins of both initiatives can be found in the product application and installation questions that contractors and homeowners routinely ask Noritz sales and service personnel on a daily basis, according to Scott Isaksen, manager of application engineering, who led the multi-department team that developed the initiatives.

Elkay EZH20™ wins 2011 Chicago Innovation Award

OAK BROOK, ILL. — Elkay Manufacturing was named one of 10 winners of the 2011 Chicago Innovation Awards. The winners were announced at an event held at Chicago's Harris Theater on Tuesday, November 8, with more than 1,400 people attending. The Chicago Innovation Awards, celebrating its 10th year, is the Chicago region's foremost recognition of the most innovative new products or services brought to market or to public service each year.

Elkay Manufacturing was recognized for its EZH2O™ bottle filling station, which offers an alternative solution to the environmental and economic waste of plastic disposable bottled water. The EZH2O provides end users with a rapid fill of clean, cold drinking water for their existing bottles and cups, eliminating the need to purchase single serving plastic bottles.

Oasis International launches new website

COLUMBUS, OHIO — Over the last few months, OASIS International has been busy redesigning its website to provide up-to-date, user-friendly information on water delivery and filtering solutions for home and business.

The new Oasis International website, oasiscoolers.com, provides product information on water filtration, bottle/bottleless water coolers, drinking fountains, water chillers, dehumidifiers, stainless steel sinks and more. The site also features ecommerce functionality for quick and simple purchase of various products.

Alliance praises $4 billion in energy-saving building upgrades

WASHINGTON — The Alliance to Save Energy applauded the White House announcement that the federal government and private sector are moving forward with energy efficiency upgrades to a broad swath of public- and private-sector buildings. Together, residential and commercial buildings account for 40% of all U.S. energy consumed. The president's announcement will make a large dent in energy use in non-residential buildings, helping them become at least 20% more efficient by 2020.

Energy efficiency is the cheapest, quickest and cleanest way to achieve savings and help the environment, according to the Alliance. The federal government is leading by example, and taxpayers are the beneficiaries. By using energy savings performance contracts, private companies will carry out $2 billion of improvements to federal facilities and will be paid back over time with the money saved due to lower energy use in those buildings.

Chicago Faucets mixing valves available at a special price

DES PLAINES, ILL. — Chicago Faucets' promotion on its new 131 series thermostatic mixing valves is good until January 31, 2012. During this time, distributors have an opportunity to enjoy special pricing, 48-hour shipping, no hassle returns and more. Intended for use with either electronic or manual faucets, these valves are designed to mix hot and cold water in under-sink installations to protect against accidental scalding.

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BAXI LUNA

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If a high efficiency, gas-fired boiler can heat a home reliably even in the harshest of Alaskan winters, it can heat a home anywhere.

Substantial savings and proven performance, year after year, make the modulating, condensing Baxi Luna the preferred sustainable heating solution. No bigger than a kitchen cabinet, this whisper-quiet wallhung appliance saves valuable living space. It also reduces fuel consumption by up to 50% and greenhouse gas emissions by up to 90% over conventional boilers.

- **Range:** Up to 98% thermal efficient, Baxi Luna is ideal for new construction or retrofit applications – from in-floor radiant, heated towel racks and snow melt systems to forced air with a hydronic air handler. In addition to heating-only models, Baxi offers a combination heating and domestic hot water boiler, the first of its kind in North America. The modulating, condensing Baxi Luna HT 380 satisfies a heat load up to 113 BTU/hr, fully modulating to 32 MBTU/hr. The unit prioritizes to domestic hot water demand, producing endless hot water at a rate 3.9 gallons per minute (ΔT80 F) – enough for two concurrent showers.

- **Quality and Safety:** Baxi Luna is CSA and Energy Star approved. The boiler's nickel chrome stainless steel pre-mix burner (AISI 316L) bears the ASME H-Stamp.

Other Baxi residential boiler built-in safety features include: electronic, gradual ignition (no open flame); flue high limit, central heating high limit, fan pressure and differential pressure switches; flame sensing electrode; back flow prevention; circulator pump with integrated air vent; expansion tank; automatic self-diagnostics; frost protection and a Legionella prevention function.

Baxi Luna wallhung boilers are only available through Baxi-Certified Plumbing and Heating Contractors who are supplied by authorized regional Baxi Distributors. The manufacturer is committed to quality and safety and, therefore, does not authorize the sale of Baxi units directly to consumers or over the Internet.

www.wallhungboilers.com

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