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Net-Zero Planned Community Relies on Advanced Geothermal

BY STEVE SPAULDING OF CONTRACTOR'S STAFF

AUSTIN, TX — Last year Austin, Texas was named second fastest-growing city in the US (according to a ranking from the American Growth Project). Warm weather, cultural offerings, an influx of tech companies and a concentration of venture capital has drawn residents from around the state and around the country,

► Turn to Net-Zero, page 6



An aerial view of Whisper Valley homes.

Foremen Get Unexpected Lesson on Artificial Intelligence

SPECIAL TO CONTRACTOR

FALLS CHURCH, VA — “How many of you have heard of ChatGPT?” was the question asked to the foremen attending the Plumbing-Heating-Cooling Contractors—National Association (PHCC) Educational Foundation’s popular *Super Foremen Workshop* last week. Purdue University Professor Emeritus **Kirk Alter** posed the question to the 26 attendees in the two-day class conducted May 5

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Kirk Alter provides instruction for the PHCC Educational Foundation’s Super Foremen Workshop, May 5-6, 2023 at the Viega Seminar Center in Broomfield, Colorado.

ABC Construction Backlog Indicator Rebounds in April

SPECIAL TO CONTRACTOR

WASHINGTON, DC — Associated Builders and Contractors reported today that its Construction Backlog Indicator increased to 8.9 months in April from 8.7 in March, according to an ABC member survey conducted April 20 to May 3. The reading is 0.1 months higher than in April 2022.

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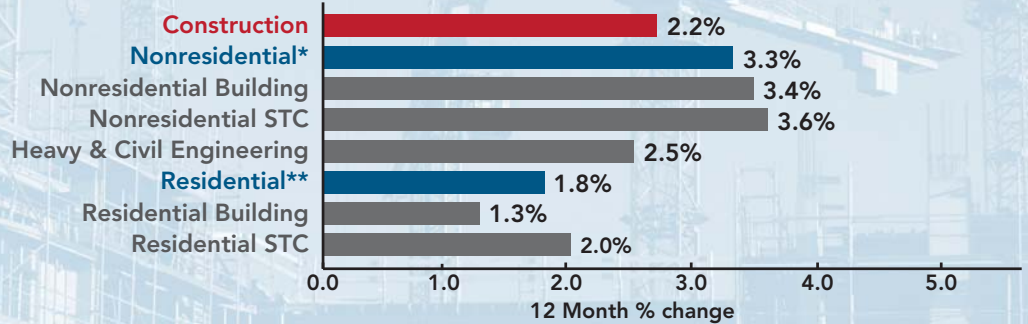


Photo 10618326 © Marco Richter | Dreamstime.com

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Construction Employment Growth:

April 2022 vs. April 2023



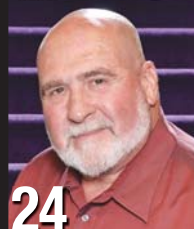
*Includes nonresidential building, nonresidential STC, and heavy and civil engineering

**Includes residential building and residential STC

Source: Bureau of Labor Statistics

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IWSH Works With County's Local High School Students

■ SPECIAL TO CONTRACTOR

LOWNDES COUNTY, AL — The International Water, Sanitation, and Hygiene Foundation (IWSH) returned to Lowndes County, Alabama, recently to teach local high school students how to conduct household plumbing surveys that assess the quality and function of homes' plumbing systems.

IWSH has been working in Lowndes County for the past few
➤ Turn to IWSH, page 18



High school students from Lowndes County and members of the IWSH and LIXIL Americas training team.

Manhattan Mechanical Becomes First Merit Shop to Receive TRMA Platinum Award

■ SPECIAL TO CONTRACTOR

MANHATTAN, IL — Manhattan Mechanical Services set a new standard as the first merit shop contractor to receive the Three Rivers Manufacturers' Association (TRMA) Platinum Award, solidifying its place as a premier mechanical services contractor.

As a leading manufacturing
➤ Turn to Story, page 8



Manhattan Mechanical's Nate Hassett, Rick Coleman, Glen Moody, Mike Uremovich, Joe Harkness, Tim Boreman, and Tim Cvitanovich holding the Platinum and Gold awards at the TRMA Annual Awards Gala.

Rheem Family of Brands Wins Silver and Bronze at the 2023 Edison Awards

■ SPECIAL TO CONTRACTOR



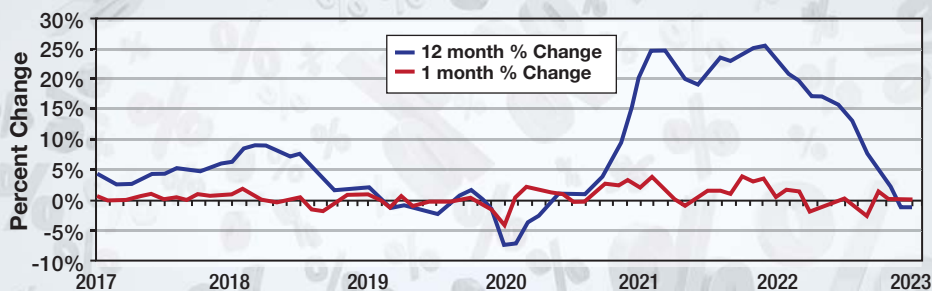
The Rheem team accepting the Silver and Bronze awards.

ATLANTA, GA – Rheem®, a leading global manufacturer of water heating and HVAC products, is celebrating its achievement of winning two awards at the internationally recognized 2023 Edison Awards ceremony, in Ft. Myers, Fla., on April 20. The Edison Awards, named after the American inventor Thomas Alva Edison, recognizes
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CONTRACTOR INFOCUS

Producer Price Index Percent Change Inputs to Construction Industries

April 2017 through April 2023



Source: U.S. Bureau of Labor Statistics

Peshkova / iStock / Getty Images Plus

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In Brief

Mullen Automotive, Inc. has announced **Amerit Fleet Solutions** as the provider for national service and warranty work, supporting Mullen's commercial vehicle lineup. To date, Mullen has received \$279 million in purchase orders for Mullen Class 1 and Class 3 EV Vans and Trucks from **Randy Marion Automotive**.

Isuzu Commercial Truck of America, Inc., announced that Matthew A. Mesick has been appointed as the company's first Director, EV Strategies. The creation of the position comes just two months after the company announced that its first all-electric truck for the U.S. and Canadian markets will begin production late in Q1 of 2024.

MrSteam has expanded MrSteam University, an on-demand training program, to offer courses that cover the latest trends in residential homes and high-end commercial spaces. MrSteam University also provides showroom consultants, architects, builders, designers, installers and wholesalers with the knowledge and skills to help clients the benefits of a steam shower systems.

Marcone, North America's largest distributor of appliance repair, HVAC, plumbing, commercial kitchen and pool/spa parts and equipment has debuted an all-new website to make it easier for customers, partners and those exploring career opportunities to learn about Marcone's value-add solutions. Visit www.marcone.com.

Sponsored by **Birkey's**, the **Illinois Land Improvement Contractors Association** is hosting a Backhoe Rodeo & Annual Picnic at Lake Land College in Mattoon, IL on Saturday, June 17th. Held annually throughout the state, Illinois LICA's picnics bring members and local contractors together for the opportunity to network and socialize. This year's event kicks off at 8:00 AM at Lake Land College.

A new **HammerHead** Trenchless Order Fulfillment Center (OFC) located in Fresno, California, is now fully operational. "The Fresno OFC covers Montana directly south to New Mexico, and all states west, including Hawaii," said Paul Waskow, HammerHead Inventory Control Manager. The new OFC has the potential to cut transit time in half for customers in this territory.

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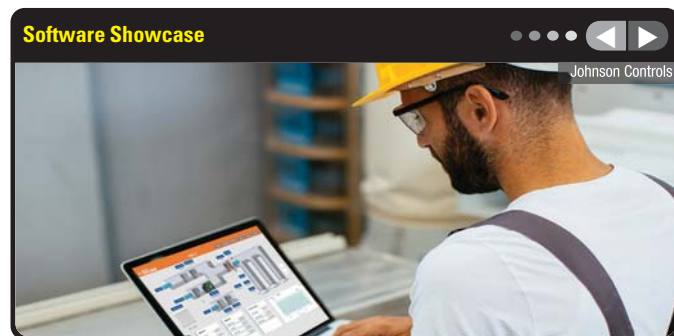
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- ABC Releases 2023 Guide to Construction Safety Best Practices
- SFPE Announces Sponsorship of Building Safety Month
- Beaumont, Texas, Adopts 2021 Uniform Plumbing Code

Videos & Media Galleries



For the latest news on the federal and local response, code and regulation developments, opinions and best practices from industry experts and more, bookmark **CONTRACTOR'S Coronavirus News Page**: www.contractormag.com/covid-19.

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- ▶ 8 Simple ways to boost your monthly cash flow

INDUSTRY PERSPECTIVES

- ▶ Want to know what is on the mind of Ed O'Connell, business coach and consultant?
- ▶ Want to know about how to get the flow rates right in hydronics from master trainer Steve Swanson?
- ▶ Want to know what the 14 characteristics are of a professional plumbing company? Matt Michel will tell you.

If so, our Industry Perspectives page is the place for you! Visit Industry Perspectives today at contractormag.com/industry-perspectives-0

Want to converse with experts in the plumbing and hydronics industries? Then check out **CONTRACTOR'S Industry Perspectives**, serving up thoughtful, conversational content from the industry experts you have gotten to know so well at www.Contractormag.com.

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Net-Zero Planned Community Relies on Advanced Geothermal

► **Continued from page 1**

pushing the population past the one million mark.

GFO Homes

And all those people need homes. Over the last decade, sustainable building and real estate development have become a top priority for builders, homeowners, and investors across the country. At the same time geothermal exchange technology become increasingly sought-after, especially after the Inflation Reduction Act (IRA) introduced a Federal Investment Tax Credit (ITC) of up to 30% for geothermal systems.

GFO Home, a Texas home builder doing business in Austin, Dallas and Houston, has been providing the Whisper Valley community with homes that focus on innovative design and versatile floor plans since 2019. Whisper Valley currently houses the largest geothermal infrastructure in the United States and is the first zero-energy capable master planned community in Austin.

All GFO homes built in Whisper Valley feature comprehensive geothermal infrastructure from EcoSmart Solution. Since 2014, EcoSmart has been involved in the design and scaling of GeoGrid™ infrastructure. “We are actively expanding to new states, such as Florida and Massachusetts, with the aim of bringing zero-energy capable communities to different regions,” **Greg Wolfson**, Chief Technology Officer for EcoSmart said.

Vital Air and Energy

The geothermal installer for Whisper Valley is Vital Air and Energy, a company created just for the project that has its origins in the business and personal relationship between **Steve Smith**, CEO of Enertech Global (a manufacturer of geothermal heat pumps among other products) and **Brian Houchin**, Owner/Operator of Bratcher Htg & A/C.

“Brian and I started Vital Air and Energy (VAE) to provide professional installations for the development,” Steve Smith said. “Enertech has 148 employees, Bratcher Heating & A/C has 65 employees, and VAE is in growth mode as it has had a great start. Brian has 25 years



These are the auxiliary cooling towers connected to the GeoGrid to mitigate peak demand should they be needed.

Whisper Valley houses the largest geothermal infrastructure in the US.

experience in geothermal systems and I will be at 40 years at the end of this year.”

Smith and Houchin have had to rely on their years of experience to make the project the success it has become. Considering the technology it is employing, Whisper Valley has demanded more in planning, scheduling and execution than a typical residential project. “When six builders are converging in one development, the pace keeps companies on their toes!” Smith said.

With 7,500 homes planned for the development, VAE sees plenty of work in its future.

How it Works

All the homes at Whisper Valley interconnect to EcoSmart Solution’s geothermal infrastructure. The GeoGrid© uses geothermal exchange to provide Ambient Temperature Geothermal water to Ground Source Heat Pumps (GSHP) for heating, cooling, and domestic hot water. The vertical ground loops, which are housed in boreholes, are installed well in advance of construction. These boreholes are drilled to depths exceeding 300 feet.

The GeoGrid™ district infrastructure is installed prior to other wet and dry utilities during early stages of a phase’s

construction. Once a lot is prepared and a home is constructed, an approved vendor then interconnects the home’s ground source heat pump to the GeoGrid™ and commissions the unit.

At Whisper Valley, there are 867 lots served and connected by four GeoGrid™ infrastructure districts. This includes over 400 homes equipped with EcoSmart’s system, which incorporates solar PV, energy storage, ground source heat pumps, smart thermostats, and prewired EV charging.

The geothermal heat pumps at Whisper Valley transfer heat to and from the ground through ground loops. These loops are installed approximately 10 to 100+ feet below the frost line. The ambient loop water temperature ranges from a low of about 60 degrees in the winter to a high of about 90 degrees in the summer.

The GeoGrid district connects each home’s local loop (LotGrid) to the system energy center. The Energy Center at Whisper Valley performs pumping and auxiliary cooling during peak cooling periods, ensuring overall system control and optimization. The LotGrid provides each home with a base load borehole capacity and a heat exchanger to access GeoGrid™ thermal capacity for

handling peak loads. The interconnection of all homes through the GeoGrid™ captures the diversity of thermal loading, enhancing system resiliency and reliability.

How it’s Working Out

All homes in Whisper Valley receive a third-party certified Home Energy Ratings Index (HERS) score. While EcoSmart Solution guides all builders at Whisper Valley to a target developer-agreed HERS rating of 25 or lower, GFO Home at Whisper Valley feature HERS ratings in the teens or lower, saving homeowners thousands in utility bills.

Over the course of 30 years, an EcoSmart home contributes to saving the environment by reducing greenhouse gas emissions equivalent to those produced by 45.8 vehicles driven for one year, saving 23,868 gallons of gasoline, and powering over 27 million smartphones. Whisper Valley homes achieve a minimum 50% reduction in energy consumption, resulting in lower monthly utility bills.

During major storms in Texas, the GeoGrid™ has demonstrated its resilience against environmental damage and power outages.

“While many Texas homeowners experienced days without power following these storms, Whisper Valley homes were restored power within hours or maintained uninterrupted power throughout the entire event,” Greg Wolfson said. “A 3-ton Enertech ground source heat pump had only about 3kW power demand throughout the week. In contrast, a 4-ton conventional electric HVAC unit (such as an air source heat pump) would have shown more than 15kW power demand throughout the week because of the conventional HVAC system’s need for backup resistive heating in cold weather events.”

As consumers demand more sustainable homes, GFO Homes, EcoSmart and Vital Air and Energy are showing how their technology can protect homeowners from volatile energy prices, as well as extreme weather events. And demonstrating the ability to scale geothermal systems across climates will hopefully drive greener housing throughout the United States. **G**



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Manhattan Mechanical to Receive TRMA Award

► **Continued from page 3**

association, TRMA focuses on promoting manufacturing excellence and improving the general manufacturing climate. The association recognizes and awards industrial contractor companies that exhibit high-level safety practices at TRMA manufacturing plants. These companies achieve OSHA (Occupational Safety and Health Administration) recordable rates below the national average.

To qualify for the Platinum Award, a contractor must hold a three-year average OSHA recordable rate of 0.6 or less and a three-year Lost Workday rate of 0.2 or less in 2022.

In addition, the contractor must

have held an OSHA recordable rate of 0 in 2022 for work completed at TRMA facilities, with a minimum of 250,000 total man-hours worked in the past three years.

Ownership and Engagement

According to Manhattan Mechanical safety manager **Nate Hassett**, the company's ever-evolving and improving safety program involves more than just rules and regulations.

"This award is truly a tribute to our team," says Hassett. "Anyone can update the safety manual and implement new safety strategies. Our team shows ownership of our safety program, engagement from all the employees and management, open communication,

and training that has built our leading safety culture."

Manhattan Mechanical Services' total recordable incident rate (TRIR) is 0.00, with over 2.5 million man-hours. The premier merit shop company is heading into its fourth consecutive

Proactive Approach

The merit shop contractor's impressive safety record can also be attributed to its proactive approach to safety. Manhattan Mechanical uses leading indicators, loss-prevention observation cards, and job safety

Mechanical contractor also received the Gold and Meritorious awards for its proactive safety approach and deep-rooted safety culture.

year with zero OSHA-recordable incidents. Its experience modification rate (EMR) is at 0.63.

assessments (JSAs) to assess and mitigate risks and hazards on the job site before work begins. This also identifies the key components of safety on the site, such as safety showers, alarm systems, etc.

Through weekly safety meetings, toolbox talks, and frequent job-site visits, the Manhattan Mechanical safety team relays safety protocols effectively and efficiently to ensure the team recognizes on-site risks and hazards.

New-Hire Safety Training

Recently, the merit shop contractor updated its new-hire process, involving a safety orientation during the onboarding process for new employees at the company's Manhattan, IL, or East Chicago, IN, facilities. The safety department then conducts an internal meeting with new employees to address safety policies and procedures before diving into Manhattan Mechanical's safety culture.

The next step takes place on-site where the new hire meets with one of the safety managers for another site-specific safety orientation. The new hire is then partnered with a seasoned employee having five or more years of experience until the hire meets the high level of criteria needed to work independently on site.


Manhattan Mechanical Services is an Accredited Training Sponsor and an Accredited Assessment Center through the National Center for Construction Education and Research (NCCER). The merit shop contractor utilizes the NCCER curriculum in standardized training programs and provides extensive, ongoing in-house training in all safety standards and protocols, including working from heights, hole watch, fire watch, lock-out tag out (LOTO), confined space entry, dropped objects, safe driving, use of ground-fault circuit interrupters (GFCI), and much more.

Multiple Awards

In addition to the TRMA Platinum Award, Manhattan Mechanical Services received the Gold Award, which acknowledges companies that decreased their OSHA recordable incident rate by at least 25% in 2022. This reduction applies not only to work done at TRMA plants, but it also encompasses the overall company recordable incidence rate.

The Meritorious Award for high-risk work (fabrication, installation, construction, etc.) acknowledges contractors that achieve a total OSHA recordable incidence rate of 0.6 or less working at TRMA facilities, and achieve an overall recordable incidence rate of 2.0 or less in 2022.

Manhattan Mechanical's outstanding safety efforts have also been recognized and awarded by the Associated Builders and Contractors, ExxonMobil, and the Four Corners Construction Group.

For more information, visit meritshopworks.com, call 815/478-9940 or follow Manhattan Mechanical on Facebook, Twitter, or LinkedIn. 

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T H E L E A D E R I N C O N D E N S I N G T E C H N O L O G Y

The Future of Water Heating Technology

CONTRACTOR talks with engineer, inventor, entrepreneur and founder/CEO of Intellihot Sridhar (Sri) Deivasigamani about electrification, regulation and more.

■ SPECIAL TO CONTRACTOR

It's a story common enough to any plumber who fields emergency calls. One night, returning home from a 30-hour flight, Sri Deivasigamani found his basement flooded from the tank failing on his home's water heater. After mopping up, the robotics engineer began troubleshooting the problem and by morning had developed the seed of an idea that would grow to become the world's first, on-demand, commercial tankless water heater.

'Natural gas will remain the key fuel for water heating until around 2045, at which point electric will overtake gas systems.'

Deivasigamani is today the founder and CEO of Intellihot, a manufacturer of gas- and electric-powered water heaters employing more than 100 workers in Galesburg and Chicago, IL. The company has made a name for itself for its innovative designs and currently holds more than 60 patents.

CONTRACTOR spoke with Deivasigamani about the state of the hydronics industry, and what regulation, technology and the market might mean for the future.

CONTRACTOR: Government regulations—both state and federal—continue to push for ever-higher levels of efficiency in water heating products. What are some of the challenges Intellihot faces as a manufacturer in meeting those efficiency levels?

Deivasigamani: At Intellihot, all of our water heaters are tankless,



Sri Deivasigamani.



Intellihot has units that can be installed in series to deliver the high capacities commercial customers require.

providing tremendous efficiencies over tanked systems. We also just introduced the industry's first tankless heat pump water heater, combining tankless

technology with the efficiency of heat pumps for healthy hot water production. We are well positioned for the trends of efficiency, decarbonization

and safety. If anything, we would ask the Biden administration's condensing commercial water heating standard to be in effect today rather than 2026. We are already there!

As we introduce new technology to an industry that is often slow to change, we've needed to educate and motivate engineers and contractors to go beyond the status quo for their customers. The advantages of our high efficiency units can be shocking to some long-term users of legacy water heaters.

We recently had a customer in disbelief that our three million BTU tankless water heater was small enough to fit in a service elevator. This unit replaced a huge boiler and a thousand-plus gallon water storage tank. Our customers save about 35% of their utility costs, while meeting the hot water needs of their facility with a reliable modular solution in a fraction of the space needed previously.

C: Hand-in-hand with efficiency is the push towards electrification. While Intellihot offers both gas- and electric-fired products, do you think electric will come to dominate the market? And if so, how quickly do you think things will change?

Deivasigamani: We believe natural gas will remain the key fuel for water heating until around 2045, at which point electric will overtake gas systems. We expect our new Electron series to play a significant role in the growth of electric units, but we also expect gas heaters to be powered by hydrogen or a blend in many markets.

Thus, even Hydrogen-powered water heaters can become zero emission devices. Electric water heaters and more specifically, heat pump water heaters will continue to improve and become perfect replacements for most traditional gas heaters.

As far as an exact timeline goes, the phasing out of gas also depends

➤ **Turn to The Future, page 50**

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LG Launches Training Academy

ENGLEWOOD CLIFFS, NJ — LG Electronics USA has opened its newest US HVAC Training Academy. Located in the company's LEED Platinum® North American headquarters campus in Englewood Cliffs, NJ, the new facility features an array of the latest LG air

conditioning and heating technologies, including the most recent generation of LG's market-leading Variable Refrigerant Flow (VRF) systems.

"This exciting hub will provide designers, engineers, and contractors with access to advanced LG

technologies that are paving the way towards electrification," said **Steve Scarbrough**, Senior Vice President and General Manager for LG Air Conditioning Technologies USA. "Being in the tri-state area, which is renowned for its commitment to decarbonization,

this new learning center promises an enriching experience like never before."

The new facility will include classroom lectures, a hands-on laboratory and more.

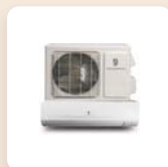
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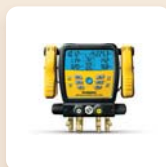
Mini Splits



Fans



Capacitors



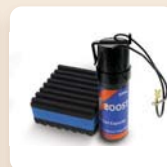
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Comprehensive Program

The company's comprehensive training program offers practical instruction for LG's inventive, all-electric, energy-efficient comfort solutions for residential and commercial applications. Academy courses include classroom lectures and a hands-on laboratory designed to educate HVAC professionals about LG's HVAC products, including technical training on installation and service.

Expert LG instructors, with extensive experience installing and troubleshooting an array of air-conditioning products, teach classes across a variety of subject areas, including duct-free, VRF, and controls solutions, with topics covering everything from installation to service best practices for the full range of LG air solutions products.

The new academy will help educate experienced third-party contractors about the environmental and economic benefits of heat pump technology, including LG's popular cold-climate heat-pump home comfort systems. Furthermore, the academy will provide training to assist contractors in specifying, installing, and servicing LG's complete line of commercial and residential Heat pump and Heat Recovery products as well as the new Inverter Heat Pump Water Heater.

Onsite Laboratory

The academy's onsite lab has LG VRF Multi V commercial air- and water-cooled outdoor units, a variety of indoor units, including the latest roof top indoor unit, high-, low-, and mid-static ducted units, and a hydro kit. [G](#)

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IAPMO Publishes 2024 Editions of UPC, UMC

ONTARIO, CA — The International Association of Plumbing and Mechanical Officials (IAPMO®) has published the 2024 editions of the *Uniform Plumbing Code® (UPC)* and *Uniform Mechanical Code® (UMC)* in both hardcopy and electronic versions, completing a three-year consensus development cycle accredited by the American National Standards Institute (ANSI).

Significant changes to the *UPC* include:

- New provisions for tileable shower receptors and kits
- Provision for temperature-actuated, flow reduction devices for individual fittings
- New provisions for all-gender facilities, including fixture count, privacy compartments, and partitions
- New requirements for water supply and distribution manifolds
- Updated provisions for hot-water recirculating systems
- New provisions for private well water tanks
- Updated provisions for appliance condensate drains when serving

more than one appliance and connecting to a common indirect waste pipe

- Updated minimum water quality provisions for onsite treated nonpotable water systems, nonpotable water devices and systems, for harvested rainwater systems

indoor horticultural facilities

- New Appendix R providing minimum plumbing system requirements for tiny houses
- New Appendix S with provisions pertaining to onsite stormwater treatment systems

Significant changes to the *UMC* include:

Group A2L refrigerants for human comfort applications

- New refrigerant safety group classifications based on flammability and toxicity
- New requirements for refrigeration machinery rooms where A2L and B2L refrigerants are used
- New materials standards for refrigerant piping, tubing, and fittings
- New design requirements for geothermal district ambient temperature loop (ATL) systems
- New Appendix H providing minimum qualifications for installers, inspectors, or employers for systems covered by the UMC
- New Appendix I addressing mechanical system requirements for indoor horticultural facilities
- New Appendix J addressing CO₂ monitoring and clean air delivery for adequate ventilation in occupied spaces

The 2024 Uniform Codes will once again be available electronically, meaning that if someone is working from home or in the field and left the code book at the office, it is accessible from a computer or mobile device.

The Uniform Codes are developed using IAPMO's ANSI-accredited consensus development procedures.

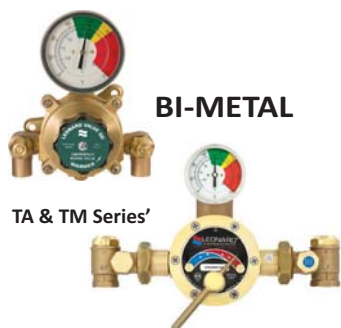
- Update water supply fixture unit (WSFU) and drainage fixture unit (DFU) values for bathroom groups in Appendix C;
- New Appendix O providing minimum non-sewered sanitation systems
- New Appendix P providing minimum qualifications for inspectors, examiners, service technicians, installers, and administrators
- New Appendix Q addressing plumbing requirements for
- New minimum air filtration requirements for occupied spaces of mechanically ventilated buildings
- Revised outdoor air intake requirements for transient occupancies
- New air balancing requirements for ventilation systems
- New exceptions for materials exposed with ducts or plenums
- New provisions for high-probability systems using

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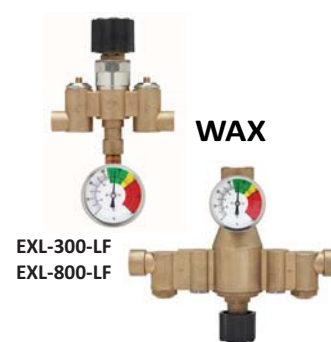


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Introduced in Los Angeles in 1928 and formally published as the *Uniform Plumbing Code* in 1945, the *UPC* is developed to govern the installation and inspection of plumbing systems as a means of promoting the public's health, safety and welfare. Later published by IAPMO in 1967, the *UMC* provides the same governance for mechanical (HVAC, combustion, exhaust, refrigeration) systems.

The public at large is encouraged and invited to participate in IAPMO's open consensus code development process. A code development timeline and other relevant information are available at IAPMO's website:

<https://www.iapmo.org/code-development/>

The 2024 UPC and 2024 UMC may be purchased through the IAPMO bookstore at: <https://iapmomembership.org/store/>.

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ABC Construction Backlog Indicator Rebounds in April

► **Continued from page 1**

After declining to a seven-month low in March, backlog rebounded in April due to strength in the infrastructure category. Regionally, backlog increased in the Northeast and West but fell in the South and middle states.

ABC's Construction Confidence Index reading for sales and staffing moved higher in April, while the readings for profit margins inched lower. All three readings remain above the threshold of 50, indicating expectations of growth over the next six months.

"Based on ABC member sentiment, one would not be able to discern that interest rates are high, the nation's banking sector is in tumult, politicians are arguing over the nation's debt limit and recession fears remain pervasive,"

said ABC Chief Economist **Anirban Basu**. "Despite many headwinds and an active news cycle, contractors continue to express confidence in the near term.

After declining to a seven-month low in March, backlog rebounded in April due to strength in the infrastructure category.

"Still, there is some evidence of a shift," said Basu. "With credit conditions tightening, expectations are that private construction is poised for weaker times ahead. Nonetheless, backlog expanded in April, as


infrastructure contractors began to take on more public works projects. Moreover, despite rapidly rising compensation costs, more ABC contractors expect profit margins to expand

as opposed to recede over the next six months, evidence of sufficiently strong demand for construction services to support pricing power."

Note: The reference months for the Construction Backlog Indicator and

Construction Confidence Index data series were revised on May 12, 2020, to better reflect the survey period. CBI quantifies the previous month's work under contract based on the latest financials available, while CCI measures contractors' outlook for the next six months.

Visit abc.org/economics for the Construction Backlog Indicator and Construction Confidence Index, plus analysis of spending, employment, job openings and the Producer Price Index.

This national assessment of construction backlog is based upon a confidential monthly survey sent to ABC member companies active in various nonresidential construction segments throughout the US. 



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IWSH Works With Local High School Students

► Continued from page 3



years with LIXIL Americas, FujiClean USA, and the Black Belt Unincorporated Wastewater Program (BBUWP) as part of a larger initiative to improve homes' water efficiency and sanitation system functions. IWSH led a training with 12 high school students from Central High School and Calhoun High School in Lowndes County. Apprentices from Plumbers & Steamfitters Local Union 91 constructed product demonstration boards that included faucets, pipes and other fixtures so the students could get hands-on experience and learn about home plumbing systems. The high schoolers were also taught how to use the IWSH Household Plumbing Survey, a tool that assesses the efficacy of indoor plumbing systems.

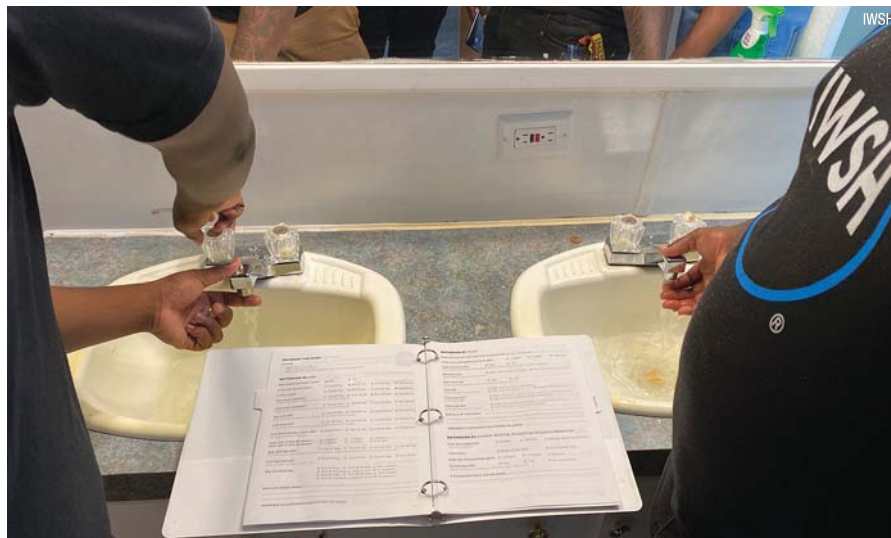
Educating for Service

"IWSH's survey provides the necessary information to guide home plumbing repairs, helping us to create a more sustainable wastewater program," BBUWP Executive Director Sherry Bradley said. "The training IWSH led for the local high school students will equip teenagers with the education and tools to conduct these surveys and perform a much-needed service in their own community. We see these kids learning the correct words about plumbing systems and understanding what's not working within homes, and why. The students are now an integral part of improving people's quality of life in Lowndes County."

Based on the IWSH Household Plumbing Surveys, IWSH and LIXIL Americas staff were able to analyze the repairs needed in each home



High school students attend a training session.



Training included getting hands-on, both with plumbing fixtures and the survey tools.

surveyed. IWSH then created job sheets that provided guidance for volunteer plumbers from the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada Locals 52, 91, 760, and South Central Pipe Trades—who are licensed in Alabama—to upgrade fittings, fixtures and appliances in selected homes using water-efficient products donated by LIXIL Americas.

Upgrading 100 Homes


"We know there are a lot of homes that need support; people deserve access to adequate sanitation and

functioning plumbing systems with water-efficient technologies," said Mike Webster, leader, project management for LIXIL Americas. "In October 2022, IWSH came to Lowndes County to pilot their Household Plumbing Survey with four high school students. The information they gathered allowed BBUWP, IWSH and LIXIL to better understand which repairs were needed and which materials LIXIL needed to provide. This visit, IWSH trained more students and surveyed more homes, which will eventually help LIXIL achieve our goal of upgrading indoor plumbing systems of 100 homes throughout Lowndes County."



Survey results were used to create job sheets that provided guidance for volunteer plumbers licensed in Alabama.

The US Environmental Protection Agency (EPA) and the Department of Agriculture Rural Development (USDA-RD) have prioritized this type of work in their Closing America's Wastewater Access Gap Community Initiative. More recently the Department of Justice has directed the Alabama Department of Public Health to conduct a variety of actions to address public health in Lowndes County.

"IWSH will continue to work in this area to help improve household plumbing systems and advance septic needs," said Robyn Fischer, senior director of IWSH North America. "As part of this program, IWSH is training young people to use the Household Plumbing Survey, which will inform job sheets for licensed plumbers so they can perform the necessary repairs in homes throughout the county. It's incredible to watch the students learn about the importance of water efficiency, understand how inadequate septic systems pose threats to people's health, and see them develop an interest in plumbing. By supporting community involvement and local leadership, along with the vital work spearheaded by BBUWP and other partners, we can help improve access to more sustainable sanitation solutions and address public health issues." 

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BrassCraft Announces 10th Annual Zell Scholarship Program

NOVI, MI — BrassCraft Manufacturing Company, a leading designer, manufacturer, and distributor of rough plumbing products, is now accepting 2023 applications for its BrassCraft® Zell Scholarship Program. This scholarship program provides financial support to plumbing apprentices who are the next generation of the plumbing trade. This year marks the 10th anniversary of the program, which has awarded more than \$600,000 to plumbing apprentices across the United States and Canada since its inception.


“At BrassCraft, we believe in investing in the future of the plumbing industry. Our Zell Scholarship Program

BrassCraft®

is one of the ways we support these apprentices, providing them with financial assistance and resources as

Product Development. “As we celebrate the 10th anniversary of the Zell Scholarship, we’re proud of the impact we’ve had on the industry and the lives of those we’ve supported. We look forward to continuing to help young

professionals build their future for decades to come,” Wierengo said. The BrassCraft Zell Scholarship program was named in honor of the company’s founder, **Robert M. Zell**, who founded the company in Michigan more than 75 years ago. Since then, BrassCraft has been committed to meeting the needs of the professional plumber by providing quality products they can trust.

Full program requirements can be found on the company’s website. If you’re an interested apprentice, apply at this link: <https://www.brasscraft.com/about-us/scholarships/> —or share with someone you know working on their apprenticeship. Applications close mid-July and all scholarship funds are sent directly to the apprentice’s training center. 

The program has awarded more than \$600,000 to plumbing apprentices across the United States and Canada since its inception.

they become established professionals in the field,” said **Jonathan Wierengo**, Vice President of Marketing and

professionals build their future for decades to come,” Wierengo said. The BrassCraft Zell Scholarship

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Bell Brothers Heating and Air Conditioning Expands Business

DES MOINES, IA — Bell Brothers Heating and Air Conditioning, which has been providing HVAC services in Des Moines for 68 years, now offers residential plumbing services for the Des Moines metro area. The new service division will be led by **John Helmers**, who has more than 20 years of experience in the skilled trades and currently leads the residential service department at Bell Brothers.

“Since becoming the president of Bell Brothers in 2017, I’ve been focused on growing our service offerings and providing added value to our customers,” said **Jason Gassmann**, president of Bell Brothers Heating and Air Conditioning. “In 2017 we added commercial plumbing services, in 2020 we launched Virtual Tech Connect, and in 2021 we brought our duct cleaning services in-house. The time is right to further expand our services to include residential plumbing.”

The new residential plumbing division offers repair, replacement and installation services. Homeowners around the Des Moines metro can



Two company technicians in front of a Bell Brothers service van.

call Bell Brothers for help with:

- Water heater repair, replacement and installation
- Emergency plumbing
- Leak detection and repair
- Garbage disposal and dishwasher service
- Faucet repair and replacement
- Sump pump installation and repair
- Toilet repair and replacement
- Bath and shower installation
- Plumbing inspections
- Repiping and remodeling
- Plumbing for outdoor spigots

Homeowners can expect the same quality service for plumbing that they receive when a Bell Brothers technician comes into their home to provide home heating and cooling service and installation.

The company will now offer residential plumbing services for metro Des Moines Homeowners.

“Our customers have trusted Bell Brothers with their home comfort for nearly 70 years, and with the continued expansion of the services we provide, they can now also trust us with their home plumbing needs,” said Gassmann.

Des Moines metro residents can learn more about Bell Brothers plumbing services and can schedule an appointment by calling 515/244-8911.

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by Al Schwartz
PLUMBING CONTRACTOR



Perception – Right or Wrong

Let me take you through two separate service scenarios, from the customer perspective.

Scenario #1

ABC plumbing & Heating gets a service call about a commode that keeps on running. The dispatcher assigns the call to “Ramblin’ Rick,” one of his best service plumbers. Rick rolls on the call and arrives at the appointed time to the “Mr. & Mrs. Customer” residence. So far, so good.

Rick’s truck looks like it has been the lead vehicle in a convoy to Kandahar. The company logo is visible, but the truck itself is dirty, battered, dented, with what looks like a ream of multi-colored paper spread across the dash, and it has a cracked windshield. Then there is Rick. He knocks on the door and Mrs. Customer opens it to find herself face to face with what looks like a homeless man sporting torn jeans, tennis shoes, an AC/DC tee shirt, full beard, a gap-toothed grin and a “Death before Disco” tattoo clearly visible on his arm. Even after he introduces himself, Mrs. “C” is not completely sure she wants him in her home.

Rick goes right to work repairing the offending toilet tank, taking ten minutes or so to locate that flapper and overflow tube that is somewhere in the back of his truck. Despite the delay, Rick does a good job. He is polite, personable and competent. He works quickly, prepares the bill, gets paid and leaves. Upon his exit, Mr. C breathes a sigh of relief, checks to make sure her valuables are still there, and goes back to whatever it is she does all day with, at best, a mixed impression of ABC Plumbing & Heating.

Scenario #2

XYZ Plumbing & Heating gets a service call about a leaking faucet. Same story as our first scenario, but the dispatcher gives the call to “Smooth Steve.” Steve is a decent mechanic, but not in the same league as our friend Rick from the previous episode. Steve arrives at the home of Mr. & Mrs. Customer at the appointed time. His truck

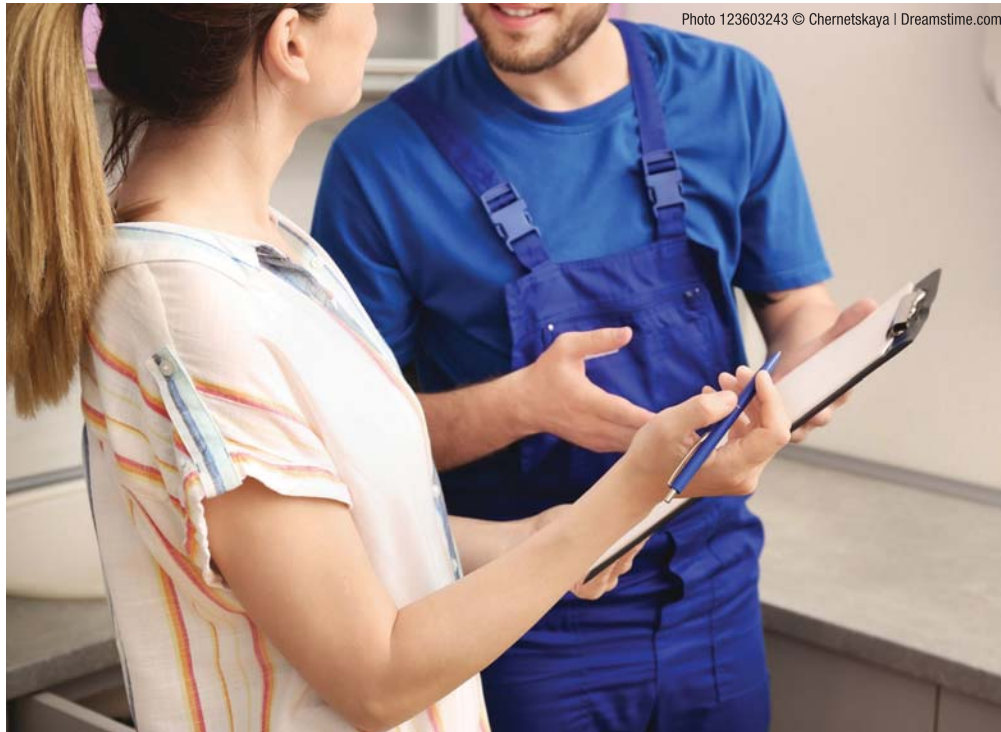


Photo 123603243 © Chernetskaya | Dreamstime.com

We all make value judgments every day based upon nothing more than first impressions.

has been recently washed, displays the company logo and phone number prominently and has no discernible defects. Mrs. C opens the door to find a clean-cut, smiling man wearing a clean uniform with his name and the company logo above the breast pockets. Steve introduces himself, and when invited inside, stops to don a pair of surgical booties before crossing the threshold.

Steve puts down a drop cloth in the immediate area where he will work, repairs the faucet, but advises Mrs. Customer that it is an older model which will, most likely, leak again in the near future. “Oh, Steve,” Mrs. C asks, “What do you recommend?” Of course, Steve replies, “I can replace that faucet for you while I’m here. I have a couple of new ----- model ----- in my truck.” Steve goes out to his neatly stocked van and selects two faucets for her to choose from. Soon Steve is back on the road and Mrs. Customer is happy with her new

faucet and a favorable impression of XYZ Plumbing & Heating.

Perception Becomes Reality

These examples are obvious in their opposition, but not fictitious. Not by a long shot. Most especially in today’s digital climate. In our daily lives perception is reality and your customers have a sharpened sense of it. Regardless of the skill level of our imaginary (?) plumbers, the fact of the matter is that the customer will make a judgment based upon the impression that they form on that first meeting. As the saying goes “you never get a second chance to make a first impression.”

We can pretend that, in our politically correct society, judging people by their looks is not a good thing, but we know that in reality we all make value judgments every day based upon nothing more than first impressions. You are in business to make money... period. In the two scenarios presented here, which company is more likely

to get referrals and repeat calls? Why? The answer is as obvious as it is politically incorrect.

There are many things you can do to “dress up” your company’s image and presentation without incurring great expense. Things like washing your truck(s) regularly, reviewing your stock and inventory with the eye toward modernizing and standardizing it, having your personnel dress uniformly and making sure that they represent your company in a professional manner, are a few low- to no-cost ideas that will pay off handsomely right now. Holding training sessions to make your employees aware of how they need to interact with the clients is a good idea as well. It also gives you the opportunity to get feedback from your field people, which is always help-

ful in maintaining your relationship with your crew(s) and gives you a better understanding of any problems that they might have.

It’s Your Business

You might feel uncomfortable about telling your best guy to clean up and make a better impression on your customers, but frankly, it’s your business. You have every right to demand that it be presented to the public, and your prospective clientele, in a good light. I’ve said it before, and will again; in these perilous business times, you must make every effort to hone your business to a razor edge if you expect to survive, let alone prosper. Keeping in mind that the customer is the one to whom you must tailor your services cannot be overstated. **C**

The Brooklyn, N.Y.-born author is a retired third generation master plumber. He founded Sunflower Plumbing & Heating in Shirley, N.Y., in 1975 and A Professional Commercial Plumbing Inc. in Phoenix in 1980. He holds residential, commercial, industrial and solar plumbing licenses and is certified in welding, clean rooms, polypropylene gas fusion and medical gas piping. He can be reached at allen@proquilldriver.com.

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The Push Toward Sustainable Heat Pump Technology

CONTRACTOR magazine took the opportunity to speak to two manufacturing leaders in the sustainable space—A.O. Smith and Lochinvar—about electrification and heat pump water heater technology.

BY JOHN MESENBRINK OF CONTRACTOR'S STAFF

ASHLAND CITY & LEBANON, TN — In recent years, there has been a tremendous push in both the residential and commercial water heating industries for more sustainable and efficient solutions that will save homeowners and facility managers money and energy. This push comes as government efforts to decarbonize continue to grow across the country, putting a spotlight on sustainable heat pump technology. But are we moving too quickly? Are federal and state policies and mandates coming too soon? Will heat pumps perform adequately in colder climates? And, is there adequate infrastructure in place to accommodate this the transition, say, from natural gas to electrification?

“Decarbonizing the nation’s economy can’t happen overnight. This is especially true for buildings. It’s going to take time to upgrade local electric grids to support a full transition to support building electrification, but there are things we can do now—like implementing heat pumps and demand-response technology—that can help make it a smoother transition,” says **Josh Greene**, A. O. Smith Corporate Vice President, Government and Industry Affairs.

“We’ve seen a shift in government mandates and environmental, social and governance (ESG) goals for a while, so we anticipated this push for electrification. At Lochinvar, we’ve always dedicated time and resources to understand how we can best support our customers and the industry during this transition,” says **Jennifer Russell**, Lochinvar Segment Development Manager, Decarbonization.

But having aggressive goals isn’t necessarily a bad, or in this case, an irresponsible thing. “Setting goals that promote a more sustainable future is critical to the success of our industry.



Gerry Winset of A.O. Smith (right) shakes hands with Carl (left), a tech working with W. L. Staton Plumbing, Cooling & Heating, in front of a Voltex hybrid electric heat pump water heater.



Lochinvar's Veritus air source, commercial heat pump water heaters can be banked together to achieve large commercial hot water demands, provide built-in redundancy, and match the capacity to the demand.

Having aggressive goals gives everyone in the industry a driving force to propel the development of innovative technology,” says Russell.

The Economics of Sustainability

Let’s delve deeper into this. We all realize that electrification/heat pumps are the way of the future, yet some

argue that limiting energy choices could be detrimental to the economy. According to Greene, the transition to a decarbonized economy has already begun and it’s imperative that manufacturers develop the technology accordingly. “Though there are certainly challenges ahead, we’re confident that through recent technological advancements which help decarbonize the environment, we’re creating a better future for the world around us. While heat pump water heaters typically require a higher investment upfront, they are more efficient in the long run, decreasing utility costs and keeping money in the pockets of customers,” says Greene.

Speaking of money, according to Russell, the Inflation Reduction Act significantly increases tax credits for homeowners who purchase heat pump water heaters, plus tax credits for home builders who implement heat pump water heater (HPWH) technology. In addition, the legislation provides discounts for low-income families

to encourage them to purchase heat pump water heaters.

Although the initial cost, including installation, of heat pump water heaters is higher than that of conventional water heaters, says Greene, there are many financing mechanisms, including rebates and incentives to offset those higher upfront costs. That includes not just federal rebates and incentives, but many state and local utility ones as well.

“The Inflation Reduction Act, for example, incorporates broad climate mitigation strategies that will incentive economy-wide decarbonization, including building electrification. The legislation included multiple funding pathways that will support the adoption of heat pump technology. Typically, more efficient technologies tend to come with a higher price tag, so this bill will help provide financial relief to homeowners,” continues Greene.

Greene stresses that in order to support A. O. Smith’s ongoing commitment to support its customers and inform its internal greenhouse gas emission reduction goals, the company’s regulatory team constantly monitors and works with regulators and policymakers on the latest standards, regulations, codes and rebate/incentive opportunities.

(Rebate finders on both the Lochinvar and A.O. Smith websites help ensure that contractors and customers get all the tax credits and incentives they’re eligible for in their communities. To access these benefits, customers can visit both the A. O. Smith and Lochinvar websites and use the ZIP code-enabled rebate finders. Contractors and customers can find available rebates and tax credits for their high-efficiency heat pump water heater.)

Yet, with all of the hoopla surrounding electrification, are heat pumps

➔ **Turn to The Push, page 54**



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Tools and Tiaras: Empowering Plumbing's Next Female Generation

Founder Judaline Cassidy builds a fierce group of Princess Warriors to break down barriers to mechanical, industrial and technical trade careers.

by Kelly L. Faloon

Growing up in the Caribbean's Trinidad and Tobago, Judaline Cassidy wanted to be a lawyer—and Wonder Woman. However, law school was not in her future—and Wonder Woman's job was taken. Raised by her great-grandmother, Cassidy had free schooling on the dual-island nation until secondary school. By the time she was ready to go to college and study law, her grandmother had died.

"I didn't have the means to attend university and pursue law, so I tried to figure out the next best free education I could get," she explains. "It was a school in Trinidad and Tobago called the John Donaldson Technical Institute. And at that school, they offered careers in secretarial, tailoring, culinary arts, electrical and plumbing.

"I figured a lot of women would be applying for the secretarial and culinary arts. I wanted to make the odds in my favor, so I figured I'd try for plumbing and electrical. And then I further reduced it to: electrical, you get shocked; plumbing, you get wet. And that's how my love of affair with plumbing began."

Cassidy was one of the first three women to learn plumbing at John Donaldson. Her marriage brought her to the United States, where she worked as a nanny and housekeeper before eventually finding her way back to plumbing. She has practiced her plumbing trade for more than two decades in metro New York City.

Her plumbing career was challenging in the beginning. "Back then, many African Americans couldn't get on jobsites," Cassidy recalls. "So, they formed coalitions to help get construction jobs within their neighborhoods."

Her first US plumbing job came from a neighbor's tip. However, the foreman didn't want her on the jobsite.

"I love to negotiate; like I said, I wanted to be a lawyer," Cassidy notes. "I told him if he lets me work for the day, he gets a day laborer and doesn't have to pay me anything. And if I'm good at plumbing, we could take it from there. He wanted to prove that I didn't know anything about plumbing; he didn't know that I went to school for it."

The company took her on, and a mentor paved the way for her to join the Staten Island Plumbers Local Union No. 1—the first woman to do so. Thus began her 25-year (and still counting!) plumbing career.

Creating Princess Warriors

Today, Cassidy not only works in her beloved plumbing field, but pays it forward by inspiring and mentoring women and young girls to pursue careers in the trades. She founded Tools

Judaline Cassidy is a New York City union plumber and founder of Tools & Tiaras.



Tools & Tiaras is for young girls ages six to 14 and provides hands-on learning in carpentry, electrical, plumbing and automotive (mechanical, industrial and technical trades).

and Tiaras—“Where Strong Girls are Forged”—in 2017 to demonstrate to them that trade careers are lucrative and rewarding.

“If you do any kind of research on women who have left the trade, they have never left because the work is too hard or the equipment too heavy,” Cassidy explains. “The job itself is not a deterrent for women; it’s all the barriers people put in our way.”

In her research, she found that since 1970, only 3% of women in construction work with tools. “I wanted to see a change in our industry; I wanted to see that needle move from 3%, and it has,” Cassidy explains.

“I believe the collective work that women like myself and in other organizations are doing is starting to make the needle move. About four, five years ago, it started moving: 3.9%. I’ll take that. I wish it were more, but I’m grateful it’s moving now.”

Tools and Tiaras is an avenue for young girls and women to learn confidence in themselves to work in “nontraditional” fields, which our society does not encourage women to pursue. Its mission is to demonstrate to girls that “Jobs Don’t Have Genders.”

It accomplishes this by exposing girls ages 6 to 14 to hands-on projects in carpentry, electrical, plumbing and automotive (mechanical, industrial and technical trades) at summer camps, conferences and career workshops.

“You give me a challenge and I want to figure out how to solve it,” Cassidy says. “Girls are driven by their dreams and passion when they are young. And then, around 10 and 11, society starts to tell them they can’t do something because it’s for boys; this over here is for girls.

“I said to myself, what if I created a group of warriors? A group of young female warriors who believe they are awesome, fearless and strong— and



Two Princess Warriors learn how to install a faucet.

nobody can take that away from them. I call them my Princess Warriors. What change would we see in the world as they grow up?”

Not all Princess Warriors will end up in construction, but as they grow older, they will always remember the roots that gave them their start: Tools and Tiaras.

“They could grow up to be senators, lawyers and others who look favorably on the trades, right?” Cassidy remarks. “Right now, they’re starting to go to high school and junior high school. They keep coming back to camp and bringing in friends. Give us four or five more years and see these girls begin and grow in their professions.”

Leadership, Confidence and Pride

An important concept that Tools and Tiaras teaches young women is leadership.

“I tell them they’re boss ladies,” Cassidy notes. “They need to know from a young age that nothing is wrong with being a boss, being a leader. I teach them to be leaders like I am. However, I let them know I’m not perfect; I make mistakes. Be empathetic, but don’t be afraid to be a leader.”

The Princess Warriors not only learn technical trade skills, they learn life skills.

“We have total ownership of life skills,” Cassidy explains. “So our girls learn finances, self-defense, debates, public speaking, meditation, yoga, cooking, etc. We create warriors and want to see them go out there and change the world. We see the difference.”

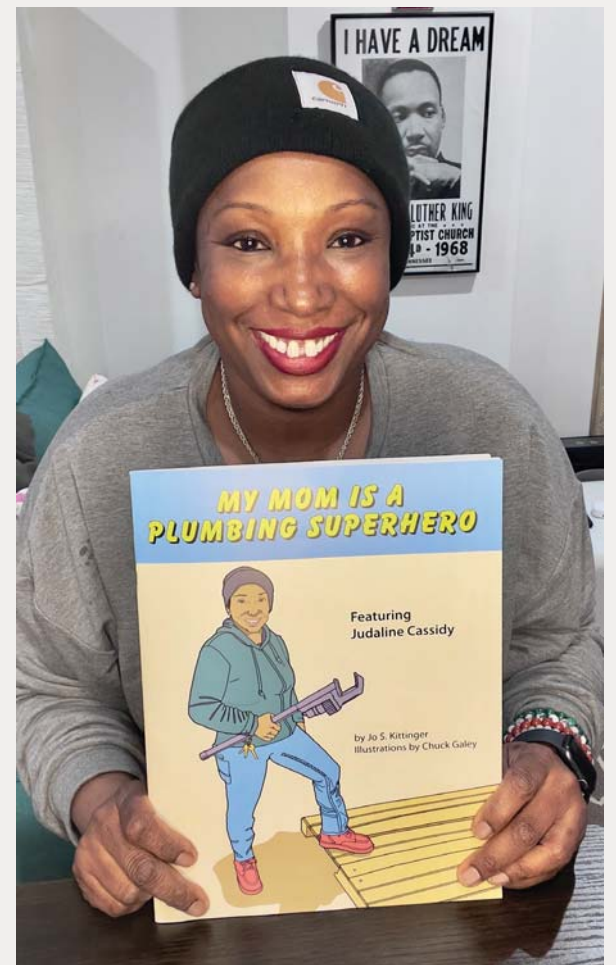
She would like to add an entrepreneurship course as creating a business requires different skill sets than plumbing: “I wish I’d learned that younger, sooner. I had finance classes in Trinidad and Tobago, but they weren’t the same. You need to know how to grow your money, how to invest it. I want to empower our girls with tools they can use with their hands and those they can use in business.”

Cassidy proudly talks about the success stories Tools and Tiaras has had in the roughly six years since it was established: **Penelope**, the first and only girl on her robotics team; **Samantha**, who is studying engineering at an aviation high school; **Izzy**, the girl who fixes everything in her parents’ house; **Tanzira**, who is starting college; **Autumn**, who wants to be an architect; and so many more.

“The girls, I love them, I really do,” she says. “I don’t like to do anything with emails and grant writing and all that; just put me in front of the workshop with the girls.”

What do their parents think? “Oh, they love it!” she says. “They see the changes in their daughters; they see their daughters light up with confidence.”

➤ **Turn to Tools, page 55**



Working in collaboration with the International Association of Plumbing and Mechanical Officials, Judaline Cassidy is the subject of “My Mom is a Plumbing Superhero.”

Under 30 All Stars of 2023

We talk to two young men about their careers in the trades, their hopes for the future, and their advice to the next generation of skilled workers.

Good help remains hard to find.

According to the most recent jobs report, the US economy added 339,000 jobs in May. Even while unemployment ticked up to 3.7%, it remains at a historic low, even in the face of rising interest rates and a cooling housing market.

Demand for skilled labor is even higher. According to the Bureau of Labor Statistics there will be about 48,600 openings for plumbers, pipefitters, and steamfitters each year over the coming decade. Demand for plumbers is expected to grow by 14% from 2018 to 2028—much faster than the average for all occupations—and supply is not keeping pace with demand. The shortage could cost the US economy billions.

With the Baby Boomers reaching retirement, all eyes turn to the next generation to pick up the wrenches. Meet two young men making careers for themselves to learn what drew them to the skilled trades, what they like about the work, and their hopes for the future.

★ **Tristan Wright** 25 Years Old

Tristan Wright's father works as a Senior Superintendent for TDIndustries, a premier facilities service and mechanical construction company headquartered in Dallas, TX. When Wright graduated high school, his father wanted him to come work for the company that summer.

Wright worked out a deal to take the summer job after his first year of college, and discovered he had a real liking for the work. "I really enjoyed it," Wright says, "and I changed my degree over to construction management. And then after my second year of college, I was

just like, you know, I think I'd rather just stick with working."

Just this past year, Wright was promoted to Journeyman. He's already done work on some big jobs, including a hotel/convention center. "It's the 15 floors of hotel rooms and I've been jumping all around on this job, so I've gotten to taste a little bit of everything," Wright says.

His other recent accomplishment was winning a Gold Medal in Pipefitting at ABC's 2023 National Craft Championships. Qualifying was incredibly challenging. During his fourth year of trade school Wright took a written test and scored in the top of his class. The top four students with the highest score in the class went on to compete in the regional John Hogan Craft Championship Competition. The top two from that competition participated in the national competition.

"To prepare for the national competition, the silver medal winner for Pipefitting, **Bryon Alford**, our mentor, **Levi Terry** and I went to TDEXchange (TDIndustries' training facility and meeting space) every Monday to practice," Wright says. "We used mockups to emulate the skills tests that would be present at the national competition. During the local competition, I was nervous. By the time we reached the national competition, I was prepared enough to feel relaxed."

And all the hard work certainly paid off.

Wright hopes to take the next steps in his career at TDI, leading crews and eventually becoming a foreman. "Then just keep on and take it as far as I can," Wright says.

He also hopes that more members of his generation consider the trades when searching for a career. "It's always preached college, college, college," Wright says, "but I definitely think that people should consider doing trades, especially if you're on the fence about going... I think that the trades are a great option for people. You get to do very fulfilling work, you get to learn skills, and you get to see physically see changes that you've made to our environment."



Tristan Wright on the job.

★ **Gregory Baladez** 28 Years Old

Gregory Baladez is a second-generation millwright about to enter his 10th year working for Colorado-based Industrial Constructors/Managers. ICM is a 35-year-old mechanical contracting firm that offers a wide array of services to its clients, including design-build, plumbing and process piping, machining, steel fabrication and more.

Baladez owes a lot of his career to his father's influence. While the elder Baladez never brought his son to work, he would do some welding and fabrication at home, and was often visiting with co-workers.

"I was 18 years old and [my father] pushed me at the beginning to get into it, but I just really liked it. I enjoy it a lot," Baladez says. "It's really fun to see behind the scenes of everything going on in the world. How everything



Gregory Baladez on the job.

works, the different kind of machinery, how intricate some of the stuff can be, how big some of the stuff can be. Most of the things we work on, most people don't ever see. It's really exciting to be behind the scenes."

Baladez explored other career options. He has a college degree in AutoCAD. But, at the end

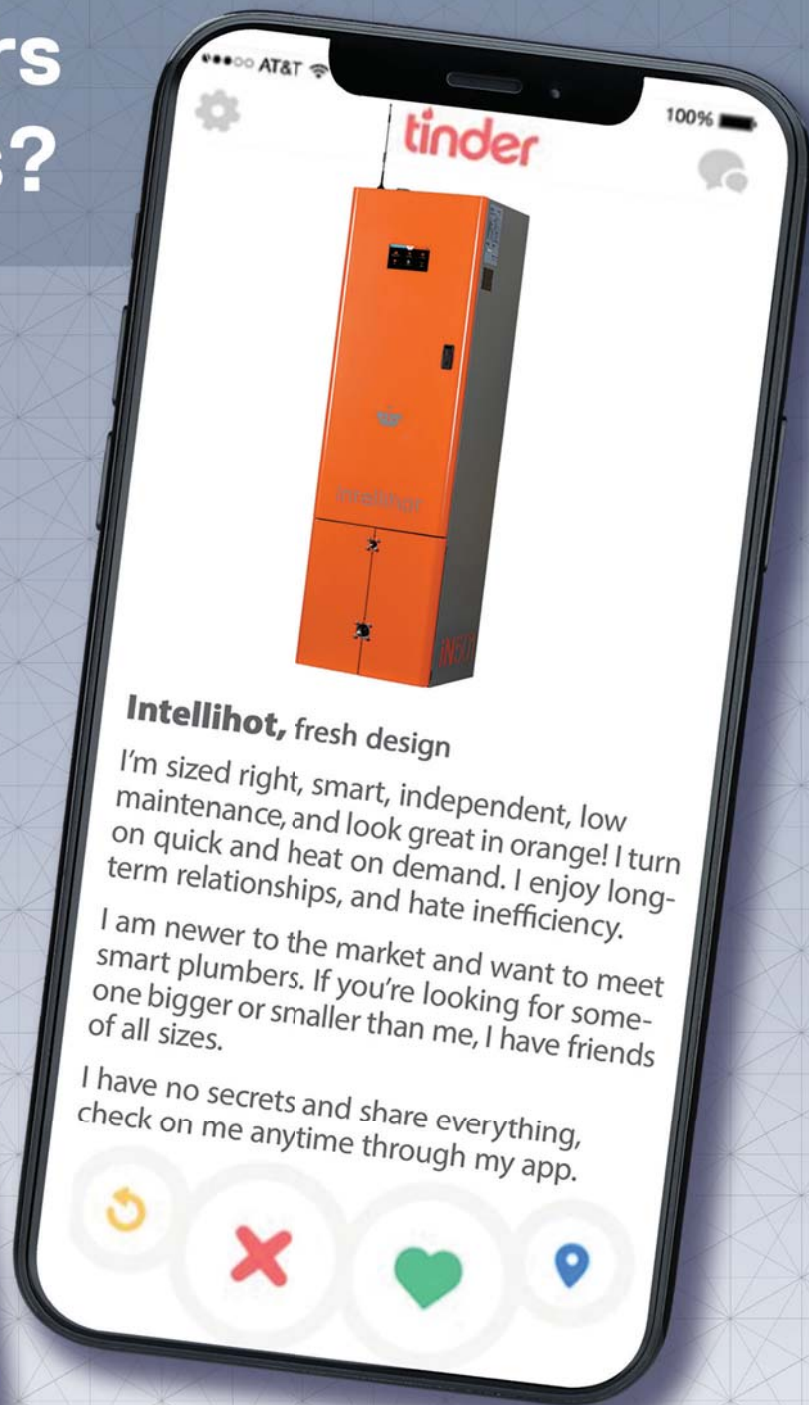
of the day, he decided he would rather be on the job site than in an office. He has recently completed a stint as a foreman and is currently a general foreman.

"I'd like to become a superintendent," Baladez says. "I'd like to see what that's all about. I'd like to try to run some big jobs. And I think it would be really interesting to oversee multiple projects at the same time."

Like so many who enter the trades, Baladez gets a sense of satisfaction from seeing how the work he does helps to shape the world around him. Part of a recent job was working at a popular food manufacturer. "I was right there with a crew installing the equipment that feeds people all over the country," Baladez says. Now, whenever he sees those products in a store or brings some home for his family, he feels a sense of pride and accomplishment.

That feeling, he thinks, is a good reason for anyone to pursue a career in the trades. "You get to work with your hands, you get to see behind the scenes," Baladez says. "There's nothing else much like it."

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by **Patrick Linhardt**
HYDRONICS MANAGER AT CORKEN STEEL PRODUCTS CO.



Make Snow to Melt Snow

We don't get much snow where I live, except for a ski slope nearby in mountainous Southeastern Indiana, because they make it themselves. They've been doing it with their own snow making technology for a long time and can keep a pretty good size north-facing hillside covered in fake snow for most of the winter.

The problem has always been what to do with the snow that the skiers deposit in and near the lodge on their journey from the slopes to warm up in the lodge. Also, depending on the wind, snow builds up near the entrances to the lodge while they're making snow. To originally solve the problem, they installed steel grating around the snowy side of the lodge. In theory, the snow falls off the boots/pants/etc. as the skier walks over the grating. Then the snow falls through the open spaces of the grating, keeping the walkway somewhat snow free.

This system worked semi-adequately for years, until the rust bug got into the support structure underneath. This spring they tore the whole 7600 square feet of steel sidewalk off and called me. I had helped them in the past with radiant floors in the snow-cat maintenance shop, the first-aid clinic, and most recently the snow-tube warming hut. Now they wanted to put tubing in the new concrete sidewalk being installed this summer.

The Snow Melt Quote

I met them at the job site to verify what they wanted to do and where they wanted to install equipment, because when you heat that much concrete in the great outdoors to the temperature to melt snow, a lot of equipment is required. I needed to put together a quote for the tubing, manifolds, boilers, pumps, air control, etc., so they could get idea of the scope.

Every snow melt quote starts with a design that is based on the maximum conditions the customer wants to be able to melt snow or ice. The two most important are outdoor temperature and wind speed. If you are designing for a



Every snow melt quote starts with a design that is based on the maximum conditions the customer wants to be able to melt snow or ice.

critical application like the ramp to an emergency room, you use the worst-case conditions for your area.

If you are doing a residential driveway, you might use the almost worst-case conditions. My default numbers are zero degrees outside temperature and 10 mile per hour wind, which works out to 147 BTUS per square feet on the chart I grew up with. Today it's all on a computer program, which the Kid gently reminds me of.

BTUS to Boiler Size

Once you know the BTUS, you have the boiler size. With this being a non-typical application, I consulted with my tubing manufacturer. I told him about the balcony above the whole area that protects it from naturally falling snow. He recommended using the factor of 125 BTUS per square feet. For this job, that works out to 953,250 BTUS, which is real close to the output of a million btu input high efficiency hot water boiler.

Nowadays, I split that into two 500,000 BTU boilers for ease of installation and redundancy. The boiler room piping is like most other jobs, making those selections routine. The system circulator is the critical item to size for snow melt. It needs to overcome the friction loss of a cold glycol/water mix as it circulates through the

distribution piping to the manifolds, and then through all that tubing.

Sq. Ft. to Tubing to Pump Size

How much tubing do you ask? The lineal feet of tubing is based on the square footage of the area to be conditioned. Most snow melt applications use tubing spaced on 10" on center distance. The factor for that is 1.2 lineal feet per square feet, so 1.2 times 7626 equals 9150 or so. Now the questions are what size tube and what loop length.

Both determine the friction loss which effects the system pump sizing. Again, I go to my trusted charts from 30-plus years ago, while the Kid goes to his trusted computer program. In the long run, they both produce estimates that we use for design, while the real world determines exact values during operation.


To stay safe, use large diameter tubing and add some safety factor to the pump selection. In this case, I selected 3/4" tubing and 287 feet average loop length. The 3/4" tubing we sell comes in either 300 or 500 foot rolls. Using the 500 foot rolls, the friction loss was making the pump too expensive. Using the 300 foot rolls, the friction loss was manageable for a stock pump. But with the extra loops, the manifold pricing was going up.

That what's design is all about, comparing one cost to another. The manifolds are a fixed cost, while the pump has an operating cost. Bigger pumps to overcome higher friction losses on longer loop lengths cost more money to operate, and this application was going to run all winter. I went with the 300 foot rolls.

Flow Rate to Head Loss

To calculate head loss in 3/4" tubing, you need to know the flow rate. To get the flow rate, you need to know BTUS per loop. To get that you need to know how many loops. Take the 9150 total lineal feet and divide by the average loop length of 287 to get 32 loops. Divide the 953,250 BTUS by 32 loops to get 29,789 BTUS per loop. To calculate flow rate, pick a water temperature drop, typically with snow melt we use a 25-degree drop.

Time to break out my ever-present System Syzer, line up 25 over 29,789 BTUS and read 2.4 gallons per minute. Now go to friction loss table for 3/4" tubing with 30% glycol. The loss is about .05 feet of head per foot of tubing. At 287 ft average loop length, the head loss per loop is just short of 15 ft. Add in the loss for the distribution piping and manifolds—but not the boilers because they are decoupled by the primary secondary connection—and we have a nice pump ratio of 77 gallons per minute (2.4 GPM per loop x 32 loops) at 22 ft of head.

I applied a safety factor of 25% to the head loss while selecting the pump. A stock three speed in-line circulator does 77 GPM at 29 ft of head on medium speed and 77 GPM at 35 ft of head at high speed. Looks like we got the design covered. I'll double check with the Kid to see what his computer says. 

Patrick Linhardt is a thirty-seven-year veteran of the wholesale side of the hydronic industry who has been designing and troubleshooting steam and hot water heating systems, pumps and controls on an almost daily basis. An educator and author, he is currently Hydronic Manager at the Corken Steel Products Co.

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Training Icon Herbert Harvey, Jr. Recognized for Decades of Service

ASTON, PA — Rich-Tomkins Company, an industry-leading plumbing and heating manufacturers' representative, honored industry icon and Bradford White Water Heaters trainer **Herbert Harvey, Jr.** by renaming their training room after Harvey following an in-person training he led for more than a dozen plumbing contractors and Bradford White representatives at their facility in Aston, PA.

Bill Bradshaw, President, Rich-Tomkins, surprised Harvey at the end of the training session and shared a few words with the group. "Harvey travels miles across the US teaching and educating the plumbing trade. In honor of Harvey and the sweat equity he puts into his home base at Rich-Tomkins, we have renamed our training center the Herbert Harvey, Jr. Training Center and are proud to display his name in our facility."

Committed to His Craft

Harvey has been a Field Trainer with Bradford White Corporation for seven




Honoree Herbert Harvey Jr. posing with proud Bradford White and Rich-Tomkins Company leaders celebrating his hard work.

years and previously served as President for the PHCC DE chapter from 2016 to 2018 and was a member of the PHCC Board of Directors from 2012

to 2019. As a master HVACR contractor and having taught PHCC Plumbing as a certified plumbing instructor for ten years, Harvey has decades of

experience and a wealth of knowledge to share with plumbing professionals to ensure they are up to date on installation of water heating products as well as new technologies. "Harvey is committed to his craft and ensuring the next generation of plumbing professionals have the tools they need to be successful and support their customers' needs," said **Dustin Bowerman**, Senior Director, Field Services. "As Harvey says, tools don't lie."

Harvey was in tears during the dedication and was appreciative of the recognition. "Thank you, Rich-Tomkins. This is such a blessing and an honor." Harvey has built strong relationships over the years and knows that his work ethic and commitment to the industry has helped him attain his success. Harvey always shares with his students, "If you see a turtle sitting on the fence post, it didn't get there by itself. I feel the same way about my accomplishments, I didn't get here by myself." 

Essency Wins 2023 Edison Award for Innovation in Consumer Solutions-Sustainable Design

FORT MYERS, FL — Essency, maker of the world's first on-demand tank water heater, won a Gold Edison Award at the Edison Awards ceremony held on April 19 in Fort Myers, Fla.

The company's water heater, the EXR, earned top honors as the most innovative product of the year in the Consumer Solutions - Sustainable Design category. The prestigious Edison Awards are a symbol of innovation and ingenuity in new products designed to succeed in the marketplace by solving societal needs and improving people's lives.

Designed for maximum longevity, comfort, and reliability, the Essency EXR is an electric water heater that Americans can count on to meet all their home water heating needs. The EXR uses its 55-gallon polymer storage tank's storehouse of water as a thermal battery source to heat incoming




The EXR on display at the awards.

tap water on demand to household users. It combines the convenience and on-demand capabilities of a tankless water heater in a traditional, practical, easy-to-install and maintain tank water heater form, delivering unprecedented performance, reliability, and durability.

The Essency EXR is available exclusively to plumbing professionals at local Ferguson branch locations; see it on the Ferguson website at <https://tinyurl.com/EXRwaterHeateratFerguson>.

"We are thrilled to have been selected as the gold award winner by the elite panel of international judges who

make those decisions," said **Nathalie Barendrecht**, CEO of Essency. "It was a great honor to be a part of the Edison awards, and to take home a top prize in recognition of the EXR as one of the most innovative, effective and useful new consumer products in the world!" 



Nathalie Barendrecht and Scott Isaksen at the awards gala.

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Discover more about the Laars® LT Series Tankless Water Heater at laars.com



Tankless Install Pairs Perfectly with Acid-Neutralizing Condensate Pump

■ SPECIAL TO CONTRACTOR

STANHOPE, NJ — **George DeJesus** is a licensed plumber, a seasoned craftsman who has worked with the tools for nearly three decades. In 2018, he started his own company, George's Drains, doing service work for residents in Morris (NJ) County and the surrounding areas.

When George isn't doing service calls, he also runs his Instagram account @georgetheplumber, which has acquired over 30,000 followers. George educates his followers on projects and recommends quality products for specific jobs.

For a recent job, the homeowner was doing various upgrades and looking to improve the hot-water circulation throughout the home. According to George, the homeowner had a 30-gallon gas water heater in the corner of the basement, which was not in a great location for proper ventilation.

George talked through the options, and the homeowner decided on purchasing a new high-efficiency, condensing tankless water heater. George immediately recommended condensate neutralization to protect the home's plumbing drainage infrastructure from the acidic by-products of the water heater's condensation process.

Effective, Affordable Solution

George installed a Navien tankless water heater with a 95% efficiency rating and provided internal, hot-water recirculation in the home. The higher the water heater efficiency rating, the higher the acid level in the water runoff. This makes finding an effective, affordable way to neutralize the condensate before drainage absolutely critical. As George points out, neutralization of condensate discharge is required by New Jersey plumbing codes. Most states throughout the US are adopting this requirement for neutralization as well. As a matter of fact, International Plumbing Codes (IPC) and National Standard Plumbing Codes (NSPC) require neutralization for corrosive waste.



The finished tankless installation. The Sanicondens Best Flat unit can be seen underneath the Navien unit, just above the expansion tank.

NJ plumber opts for Saniflo's 2-in-1 Sanicondens Best Flat for handling acidic condensate before it can damage the drain line.

Since he had confidence in the quality and reliability of Saniflo products, George opted for the 2-in-1 Sanicondens Best Flat condensate pump for this application. What is meant by "2-in-1"? The product is not simply a pump to drain the condensate. Its durable polypropylene encasement also contains a built-in acid neutralizer that raises the condensate's pH level *before* it can be discharged, preventing the corrosive runoff from damaging household plumbing and sewer lines. Protecting

the plumbing minimizes service calls, delivering long-term cost savings to the customer.

Condensate entering the Sanicondens Best Flat system automatically activates a float mechanism that, in turn, starts the motor whose spindle/shaft drives the impeller. The acidic condensate is neutralized as it comes into contact with the neutralizer pellets in the unit's tray before being pumped safely away.

The Sanicondens Best Flat removes condensate through a flexible vinyl

hose, measuring 1/2 inches in diameter, to a PVC discharge pipe. The discharge run may extend up to 15-foot vertically and/or 150-foot horizontally into the sanitary sewer or a septic tank.

The product is capable of neutralizing runoff from multiple condensing appliances with combined inputs up to 500,000 BTU/hour—say, a boiler as well as a water heater. Floor- or wall-mounted, the Sanicondens Best Flat comes ready-to-install with connections to an external overflow, shut-off switch or alarm system.

Quick, Confident Installation


George had to install the tankless water heater in a different location, on the other side of the house, since the old tank unit was so poorly vented. He then ran a new condensing line from the new water heater to the Sanicondens Best Flat and then to a drain line to provide proper discharging.

The entire installation took about four hours, largely because of the water heater relocation. But the Sanicondens Best Flat itself required only 45 minutes: from hanging the unit on the wall to running the condensate line through the ceiling.

"There is definite time savings when you install this product, because it's all right there," says George. "You don't have to buy and install two separate systems"—the pump and the neutralizer. "It's a one-step system."

George also liked the three-year warranty on the Sanicondens Best Flat—"compared with other systems on the market which offer only one year," he says.

George is confident that Sanicondens Best Flat was the right choice for his customer. "Honestly, when it comes to using a neutralizer, I don't offer any other brand."

He adds that the unit has been working fine since its installation in August 2021, and the homeowner is very happy with having enough hot water to supply the four-person household. 



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by Patti Feldman
COMPUTER AUTHORITY



Software Solutions to Help Make Your Day a Little Easier

Rhvac v.10 Desktop (www.elitesoft.com) for Windows calculates peak heating and cooling loads (block and room by room) for residential buildings and some light commercial buildings in accordance with ACCA Manual J 8th edition V2 and duct sizes, system losses, and fan static pressure requirements in accordance with ACCA Manual D. Users can enter an entire duct system or individual ducts.

The software, which includes weather data for over 2,000 cities in the USA also has the ability to facilitate equipment selection and create sales proposals. Data can be entered manually or taken automatically from a floor plan drawn with Elite's optional Drawing Board program (V2 only).

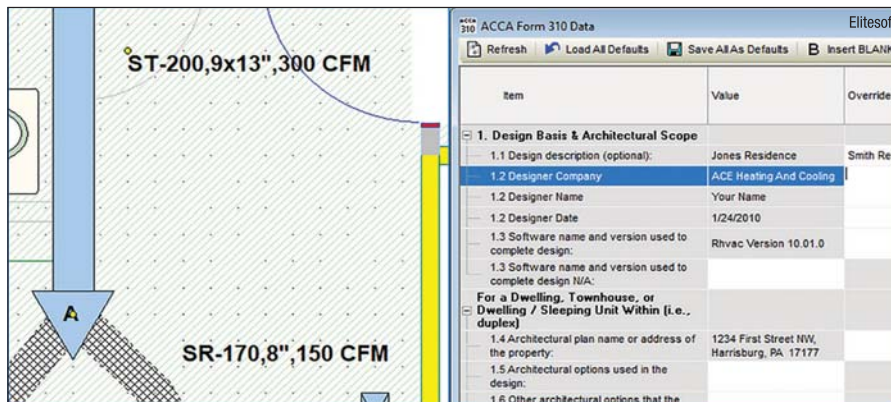
Features added to this latest version include consideration of three new rating values (SEER 2, EER2, and HSPF2 HVAC equipment inputs) to use when selecting equipment; the ability to allow overhang offset as a negative value when selecting windows with awnings; and the ability to export data to EnergyPro v.9, Elite's energy analysis software (to which Rhvac v.9 can no longer export).

The new version includes metal wall selections to accommodate the light gauge steel framing with R-panel metal sheathing that barndominiums (a new trend in custom homes) now use.

The software also includes a "Show-Flow" property for MDD trunks that shows the CFM flow rate on every duct in a duct system, which some jurisdictions now require.

Rhvac Online is a web application formatted to run on all Internet devices like computers, tablets, and smart phones. It uses the same "fill-in-the-blank" data entry system as Rhvac v.10 and it gives users the ability to review, edit, and create projects from scratch.

It can perform all three code calculations as required for ACCA including Manual J (loads), D (duct sizing), and S (equipment selection). Heat Transfer Multipliers (HTM values) for all walls, windows, doors, and roofs listed



Left side: Rhvac 10 can now display the CFM flow rate on every duct in a duct system. Right side: Rhvac 10 can save many hours in generating the Form 310 report.

Reviews of Rhvac v.10 Desktop for Windows, Newforma software, and the GoSite Pro digital platform.

in Manual J are looked up automatically and used as needed. The online and the desktop versions of Rhvac v.10 can import and export project files between them.

Pricing for each: Rhvac Desktop—one-time purchase or update fee; Rhvac Online—subscription.

Newforma Project Center Enterprise

Newforma Project Center Enterprise (www.newforma.com) is a construction Project Information Management software solution for architects, engineers, and construction companies that is designed to aid informed real-time collaboration from one central location. Taking advantage of Newforma's Connectors, Project Center unifies project data, workflow processes, and email across multiple sources, from project start to completion. Connectors are available for Microsoft SharePoint, Outlook, Procore, Bluebeam, several Autodesk applications including BIM 360 and Autodesk Construction Cloud.

Newforma Project Center facilitates efficient locating and organizing of emails, RFIs, drawings, submittals, mark-ups, and other action and reporting

items, affording a participant the ability to view all project emails regardless of who sent or received it; respond to submittals and RFIs from any contractor or subcontractor; and relate all project data no matter where it resides.

For example, Autodesk BIM 360 and the Autodesk Construction Cloud Connectors enable users to access, view, and share BIM 360 and ACC documents directly from Newforma and includes the ability to find items or keywords embedded within any file attachment.

The BIM 360 Connector automates the transfer or submittal and RFI information between Autodesk BIM 360 and Project Center.

The Autodesk Revit Connector allows teams to integrate workflows directly within the project's models and bi-directionally sync sheets, specs, and elements.

The Bluebeam Connector enables efficient collaborative mark-up sessions, capturing all RFI and Submittal review comments in one document.

Newforma Search takes advantage of Project Center's scanning, indexing, and Optical Character Recognition (OCR) function to find any item embedded in a file attachment. It finds

items across all project folders, files, and project documents for a single project or across multiple projects at the same time. Newforma Search also locates information across multiple applications and platforms including Autodesk BIM 360™, Bentley Project Wise™, Microsoft SharePoint Online™, Panzura™, Nasuni™, and more.

Pricing: annual subscription per user.

GoSite Pro/Plus/Complete

GoSite Pro/Plus/Complete (www.gosite.com, 858/295-7995) is an all in one cloud-based digital platform and mobile app solution for small businesses, including HVAC and plumbing contractors, to convert website visitors into customers and, if they become customers, have the ability to generate and send invoices and receive payments from SMS and email.

Companies can also set up automatic scheduling online, enabling customers, at any time, to book their services for a specific date and time. The software can send automatic booking updates, confirmations, and reminders.

In addition, the solution allows a company, through a single dashboard, to manage reviews posted on Facebook and Google and, with Plus and Complete, to also manage reviews on a the main business listing sites.

Complete adds power widgets (booking, online payments, web chat that syncs with all the other instant messaging tools, including Google, Facebook, SMS, and Thumbtack). Complete users can also create automatic responses for standard customer messages to deploy on Facebook, Google or other messaging platforms and set up scheduled and recurring invoices. .

Pricing: scaled per month subscriptions with options for discounted annual payments and customized number of users.

Patti Feldman writes articles and web content for trade magazines and manufacturers of building products. She can be reached at productpad@yahoo.com.

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by Matt Michel
MARKETING AUTHORITY



7 Deadly Sins of Plumbing Contractors

There is a lot of virtue in plumbing. After all, plumbers really do protect the health of the nation. Yet many plumbing business owners are less than virtuous. Here are their seven deadly sins.

Sin #1: Pricing Low

This is the most common problem in the trade. It's also the easiest to fix. If there has ever been a time to raise prices, it is now. Look at fuel prices. Look at food. Look at the price of everything. It is all going up. Plumbing prices should rise as well, and not just material prices, but labor. Charge more to provide better service and more profit to reward the investor and to reinvest in the business for the future.

Remember, if you are not charging enough to pay well, reward investors, and build for the future you are subsidizing your customers. Do your customers need your subsidy? If not, raise your prices. Do you intend to run a not-for-profit plumbing business? If not, raise your prices.

Sin #2: Charging Time & Materials

Flat rate pricing made its debut in the 1980s. It has been around for FOUR DECADES. Yet, there are still plumbing companies that charge time & material. If you are one of these, stop! Reach out to one of the flat rate publishers and change. Do it now.

Flat rate removes your hourly rate from sight, which is right. Your barber doesn't promote his hourly rate. The quick oil change company doesn't promote their hourly rate. These and a host of other businesses, including most of the nation's profitable plumbing companies present customers with a fixed price for work. This is actually preferred by homeowners since it removes uncertainty.

Sin #3: Staying Small

It can be painful to grow. You must buy trucks and stock, hire people, train them on the way you want things done, and put up with all of their human failings. Many plumbers punt. They remain small. They remain



Photo 23333336 © Ryan Deberardinis | Dreamstime.com

From not pricing correctly to talking politics on the job, here are seven Deadly Sins that every plumbing contractor should avoid.

one-truck operations. If you run a single truck plumbing company and intend to keep it that way, you are one of the most selfish people in the industry.

Single-truck plumbers better have good insurance. What happens to your family if you get into a bad accident on the job or on the road? You leave them without an income. What happens to your customers? You leave them without a service provider, sending them to a competitor.

Yes, growth can be a challenge, but so are most good things in life. Hire great people and develop them. Build a true business, a business that you run without you. Then, you can take extended vacations. You can spend time with your family. You can enjoy a prosperous lifestyle. As the protector of the health of the nation, as a contributor to your local community, as a job creator, and as a risk taker, **you deserve prosperity.**

Sin #4: Knowing It All

An unfortunately large number of plumbers reach a point where they stop learning and growing. They come to think they know it all. If you stop growing, you start dying. There is no plateau. Coasting is heading downhill.

In truth, plumbers who act like they know it all, know they do not. They put on airs of omnipotence to cover for their insecurities. It is okay if you do not know everything. You can

learn. You can read the trade magazines. You can attend the trade shows. You can join your local, state, and national plumbing association. You can join a plumbing business alliance. You can attend seminars. You can listen to podcasts and audio books.

The area where plumbers need to learn more than any other is the ever-evolving craft of business. Decades ago, a big yellow pages ad near the front of the phone book was enough to drive your business forward. Today you need a website, social media presence, digital marketing (as well as old-fashioned direct mail), reviews, field service management software, and more. If you are not learning, you are falling behind.

Sin #5: Failing to Groom

This is such a simple problem. It is continually the most frequent complaint about home service providers in the Service Nation Alliance's bi-annual survey of thousands of their members' customers. Too many plumbers seem to try to live down to the Billy Butcrack image.

No matter how early you start your day, start with a shave and a shower. Get your hair trimmed regularly. Dress neat in clean company uniforms. Use deodorant and breath spray. It is not hard. By looking professional, you will be treated like a professional, and compensated accordingly (assuming you charge enough—see Sin #1).

Sin #6: Driving White Beater Trucks

Your truck is how you project your brand to most people. What are you projecting? For starters, white trucks look pretty much like other white trucks. They fail to stand out in a sea of white trucks. Moreover, many women think of them as "abduction vans." In fact, many women will not park next to one in a busy parking lot in broad daylight. If you drive one, you are scaring your customers. Add a little body filler, some primer, and then do not wash it and you will have the perfect effect.

Invest the money to wrap your truck. Your wrap gets 30,000, or more exposures a day. What does it say about your company? Does it communicate that your company is professional, safe to invite to the home, and worthy of the prices you need to charge to prosper?

Sin #7: Sharing Your Politics

Plumbers have strong opinions. Many do not hesitate to share them. In today's polarized, politicized society, you have a 50% chance of irritating someone with your opinions regardless of whether they are to the left or right. Why do it? It's like walking into a home adorned with Philadelphia Eagles swag and proclaiming your love of the Dallas Cowboys. It is not the way to make friends.

Plumb for profit, not politics. If a customer says something you disagree with, bite your tongue and think about the Benjamins. Let the beer companies self-destruct by incorporating politics into their businesses. If it bothers you to the point where you have to do something, donate part of your profit from a given, mouthy customer to a political organization diametrically opposed to the customer's views. Or, just move on down the road to the next customer. **G**

Want to become a virtuous plumbing company? The Service Nation Alliance can help. Attend one of their free Success Day seminars. Get the schedule for upcoming seminars by visiting www.ServiceRoundtable.com or call 877/262-3341

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by Ozzie Cejas
TECHNICAL SALES SPECIALIST AT HARRIS PRODUCTS GROUP

Common Brazing Mistakes and How Best to Avoid Them

Strong brazed joints in high-pressure pipes are critical to lasting, leak-free performance. However, brazing is not always given the attention it deserves when training new technicians, resulting in missteps that may seem minor but can have serious consequences.



Skipping any of the basic brazing steps can lead to pipe joint failure.

While soldering is the most common technique used to join pipes in plumbing applications, brazing is the best choice for high-pressure piping because a brazed joint has typically up to five times the mechanical strength of a soldered joint. Brazing is also preferred for joining dissimilar metals such as ferrous and non-ferrous base materials.

Brazing is a straightforward, six-step process for joining pipes. Each step is relatively simple, but skipping any one of the steps can undermine the entire project. Here are some of the most common mistakes observed in plumbing and HVACR applications, and how to prevent them so that every brazed joint will be strong.

Mistake #1: Wrong amount of clearance

Clearance is the amount of space between two base metals prior to brazing; it determines the flow of the alloy and strength of the joint. The recommended clearance for a brazed joint is .002 - .005".

Too small of a clearance reduces the ability of a filler metal to flow properly. A wide clearance does not permit a filler metal to accumulate and fill the

unoccupied space, causing filler metals to crack under stress or vibration.

The highest strength is created between the .002 - .005" range. Once you

breaks the surface tension of the metal being brazed. Clean both parts one fourth inch past the area of the metals to be joined.

Here are some of the most common mistakes observed in plumbing and HVACR applications, and how to prevent them.



Too wide of a clearance between the two parts during brazing results in a gap that will cause joint failure.

surpass the .005" clearance, strength drops off drastically. Although the joint may hold initially, the longevity of the joint will be significantly reduced.

Note: Technicians typically do not carry micrometers to measure the gap clearance. A rule of thumb is if it takes significant pressure such as using a mallet to fit the tubes together, the clearance is too small. And if the male tube feels too loose, the clearance is too large.

Mistake #2: Dirty pipe surface

Cleaning the piping to be brazed is very important. A dirty surface prevents the alloy from melting across the entire surface. The alloy is more likely to ball up and bond to itself than flow across the base material.

First, remove oil and grease by wiping the parts with a suitable degreasing solvent. Then etch the surface using a mesh cloth, sand cloth or wire brush on all areas to be joined, including inside the fitting. This removes oxidation and



The joint surface areas must be clean and free from oil, grease, or oxide contamination prior to brazing.

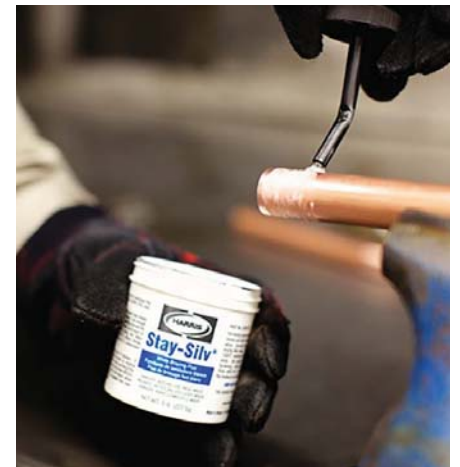
Finally, remove small foreign particles such as emery dust by wiping with a clean, dry cloth.

Mistake #3: Forgetting to apply flux

Flux removes surface oxides that the cleaning step itself cannot do. Proper fluxing is important because the flux absorbs oxygen formed during heating and promotes the flow of the filler metal. Flux does not clean oil, grease, or rust inhibitors, which is a common misconception.

Only after cleaning should flux be applied to the part. During flux application, to prevent excess residue, apply a thin layer to only the male tubing. Insert the tube into the fitting and, if possible, rotate the fitting once or twice on the tube to ensure uniform coverage.

Flux should be placed about 1/4" from the bottom of the tube; this



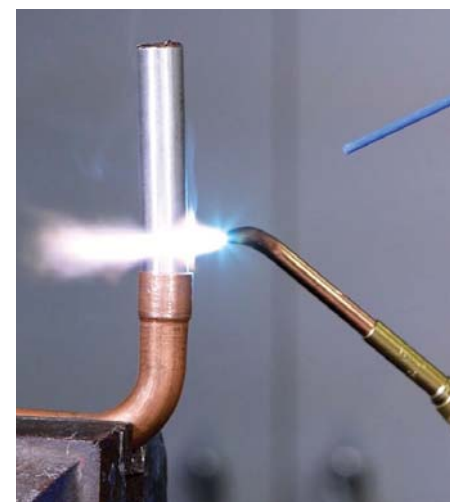
Proper fluxing is important for alloys that do not contain flux; flux absorbs oxides formed during heating and promotes the flow of filler material.

allows capillary action to move the flux into the joint.

Note: Flux is required for all brazing jobs. However, in some brazing alloys, the flux is contained within the alloy. Refer to the alloy manufacturer's specifications to determine if adding flux is needed.

Mistake #4: Uneven heating

Improper heating of the joint leads to inadequate or incomplete penetration by the filler metal. Three things to consider before beginning the heating



Proper heating of the tube includes making sure the base metals have been heated to brazing temperatures before adding filler material.

➤ Turn to Brazing, page 52

by Mike Disney
CO-OWNER AND THE CHIEF OPERATIONS OFFICER FOR CEO WARRIOR



Top 3 Mistakes Technicians Make That Can Hinder Sales

No matter what official roles you have within your home service company—from customer service representatives (CSR) to the sales team to the technicians—they all have to interact with customers and represent the organization. This makes everyone, regardless of their job title, a “salesperson,” in a way.

And, since the person who generally deals with the customer for the longest period of time is the service technician, they often have to sell, even though it may not be their most important role.

As a leader, owner or critical manager, you’ve probably often considered that given their time spent in the client’s home and understanding of the client’s comfort systems, your techs are integral to your company’s success.

But, if they’re not trained in how best to handle their interactions with the client, there are mistakes they can make that could ultimately doom the sales process.

Three crucial mistakes that techs make that can hinder your sales include:

1. Entering the workday with a poor mindset.
2. Not following the processes you’ve developed.
3. Not understanding their importance to the homeowner.

We’ll explore each of these unforced errors and how you can help your service technicians become some of your company’s best representatives.

Poor Mindset

What we need to understand as owners and critical managers is that today’s world is filled with complexities. Our service techs come with their own personalities, past beliefs and experiences that sometimes lead to their creating a judgment when they enter a client’s home.

Whether they’re considering the home, the client’s car or the neighborhood, they begin judging how clients will react to their consultation and estimates. Their judgment can cause them to assess their presentation of

solutions as though they are dealing with their own wallets and not those of the clients.

But, they should be trained to realize that just because they grew up with a father who fixed everything with duct tape and Crazy Glue doesn’t mean that

dealing with customers in their defined roles.

You may hold practice sessions with your CSRs and sales team on how to deal with clients and how to overcome their objections. And, you probably regularly hold training sessions for your

a tire for the 50th time, you know what you’re doing.

Do what you need to do to sharpen the axe and create a culture of improvement.

Understanding Their Importance

Finally, if your service team believes their job is to “fix it and get out,” then they don’t understand their value. They are not at the client’s home to perform a meaningless task.

Most homeowners are busy—they have lives to lead and they don’t understand or want to know what is wrong with their comfort systems. They just want them to be fixed.

But think of it this way: a sick patient doesn’t get asked what kind of treatment they want. Instead, doctors present the processes necessary to provide solutions with the desired outcomes. The same is true for your tech team: they are the experts charged with providing the right solutions to fix your client’s pain points.

Let your tech team know they are valuable and help them build their confidence when working with the client. The client needs to know what a great opportunity it is to have this service expert in their home prepared to help them solve their problems.

Your home service techs have a profound opportunity to change the lives of your clients for the better. and It’s important that critical managers and other leaders impress upon their service techs that they recognize their value. Being knowledgeable about how to improve their clients’ living conditions should inspire the confidence in them to continue your company’s sales experience through the servicing phase. **G**

Michael Disney is a co-owner and the chief operations officer for CEO Warrior, where he leads the large and growing company as a trainer and subject matter expert. Early in his career, Disney was an automotive electrical specialist before joining Gold Medal Service in 2013 as a lead generator.

We’ll explore each of these unforced errors and how you can help your service technicians become some of your company’s best representatives.

their experiences are the same as their clients. This takes some transformative thinking, but it can be overcome.

They have to be trained to deal with objections and present solutions as something of value. You need to show your technical staff that they must serve the client and have a consultative approach. While it is “sales,” so to speak, they should always treat it as service at the highest level.

The greatest day of your clients’ lives should be the day your service tech comes to their home because that’s

techs so they can stay up to date on the latest innovations and solutions.

But, do you practice the art of handling customer objections with your techs? Do you teach them how to avoid meandering on about solutions so that they don’t overwhelm the client?

If you don’t, you should.

You can probably look at your leaderboard and know who is following the process and who isn’t. And, you probably know who is overwhelming the client instead of listening to them.

The reason you have a process is so that there is a systematic approach that won’t put the client into a state of confusion. A confused client leads to hesitation—“I need to talk with my spouse,” or “I need to think about it.”

Your techs have a right and a privilege to ask for the sale, and they need

to know this. Teach them how to learn the system without becoming robotic. They certainly need to interject their own personality or their solutions will appear forced.

That is why you need to practice with them every bit as much as you do with your CSRs and sales team. Remember, the first time you changed a tire, you were probably slow and robotic in the methodology but, once you’ve changed



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the day they’re going to learn about their home’s comfort system, what the solution is to that system’s problems and what the value is in repairing it the right way.

Follow the Process

As an owner, you’ve probably spent many hours defining, developing and improving the crucial processes your teams should follow when

by Chris Gardner
CURRENTLY LEADS THE FRANCHISE PARTNERSHIPS TEAM AT JOBBER



3 Ways Contracting Businesses Can Strategically Set Prices

Over the past few years, contractors have been faced with a variety of challenges from labor shortages and rising materials costs, to economic uncertainty and delays. While there's no immediate end in sight to these ongoing issues, one fundamental takeaway has emerged: it's more important than ever for business owners to price their work correctly in order to maximize profits while keeping customers happy.

While pricing projects may appear straightforward, choosing the right pricing strategy involves a number of factors including market conditions, variable costs, margins, and a customer's ability and willingness to pay for your services. The right pricing isn't just important for profits, but often influences a potential customer's view of the quality of your service—simply offering the lowest price may be perceived as a signal for poor quality. While there's no one-size-fits-all approach to pricing, the right strategy can help businesses grow their market share, outperform competitors, and ultimately build a loyal customer base.

1) Pricing that Scales with Your Business

It's crucial for you to select a pricing strategy at the start that sets your company up for success. Pricing strategies can also change over time to support your business as it grows. Market Penetration Strategy and Price Skimming are two approaches that evolve over time to reflect changes in your business.

Market Penetration Strategy is where you initially set pricing low to grow market share, then increase your rates over time as your customer base grows. While this isn't a common pricing strategy for service businesses, it can help you scale your customer base quickly. With this strategy, you will book more jobs at a lower fee, so you will have to work harder to cover your overhead costs.

Meanwhile, Price Skimming is where you set a high price and lower it over

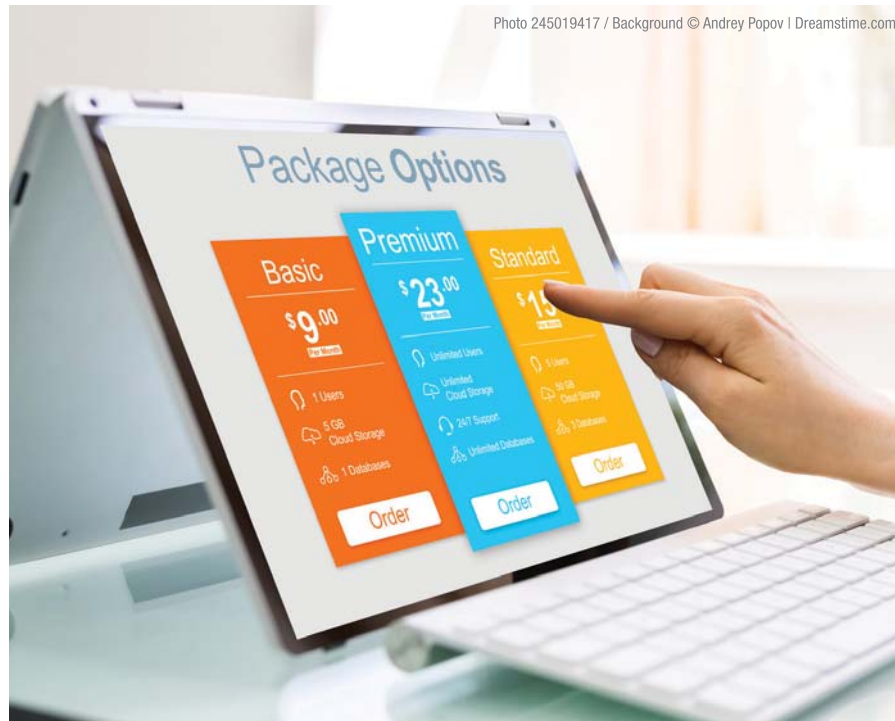


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The right pricing isn't just important for profits, but often influences a potential customer's view of the quality of your service.

time. Using this strategy will maximize your profits upfront and help you grow a more sustainable business. However, if you can't justify the price, you'll struggle to get your business off the ground.

2) Pricing that Helps to Differentiate

While pricing reflects the status of your business, it can also be used to attract new customers and differentiate your business. Premium Pricing allows you to charge higher prices if you provide a unique offering. For example, if you provide a warranty or service guarantee that your competitors do not, or if you use exclusive tools or technology that make your business easier to work with or improve your results.

Economy Pricing allows you to set pricing low because overheads are

low. Your costs may be low for several reasons, such as using software to organize and manage your business instead of hiring back office support.

Psychological Pricing is the practice of setting prices lower than a whole number—for example \$19.97 as opposed to \$20—for example \$19.97 as opposed to \$20—as it's believed that odd numbers are more attractive than round numbers. Meanwhile, some contractors use Competitive Pricing where they charge what their competition charges. The key is to remember that your business is unique and just because someone is charging a specific price doesn't always mean you should price-match.


3) Pricing that Empowers Customers

In addition to attracting customers, certain pricing strategies can help you

offer the highest quality customer service. Bundled Pricing involves bundling various services together and charging one price, which is a great technique for creating customer loyalty and upselling more services to boost profits. Good, Better, Best Pricing or tiered pricing offers clients the option of choosing between different levels of service or packages. This strategy allows customers to compare your packages against each other instead of comparing them to the competition.

How to choose the right strategy

While there are many options when it comes to pricing, there's no silver bullet solution when choosing a pricing strategy. Multiple strategies can even work together to meet customer needs. For instance, value and bundled pricing compliment one another because you're illustrating to clients that you understand their needs. By offering different pricing solutions, business owners can show that they understand their customers and set prices that are aligned with the value that's provided.

There's no doubt that pricing services is often harder than pricing products, and the process can be known for instilling fear into many business owners. The bottom line is, while pricing can be difficult to master, it'll only be a matter of time before you find out what works best for your business. After all, you've already mastered one craft and the more jobs you bid for, the more comfortable you will become with pricing, too. 

Chris Gardner currently leads the franchise partnerships team at Jobber, an operations management platform for home service businesses. Prior to joining Jobber four years ago, Chris owned a lawn care business with his friend that he ran entirely on pen and paper prior to discovering Jobber. Once he started using the software to help him run a smoother business, he loved it so much that he decided to join the company.

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CINTAS
READY FOR THE WORKDAY™

by Oscar Collins
EDITOR-IN-CHIEF AT MODDED



5 Fleet Optimization Strategies for Tech-Forward Contractors

Managing a vehicle fleet is an indispensable part of running a larger contracting business. However, it can also be a challenging one, with many factors to track and high expenses to deal with. Adopting a tech-centric management strategy can help businesses overcome these challenges.

New technologies like artificial intelligence (AI) and the Internet of Things (IoT) hold significant promise for fleet optimization. Here are five strategies contractors can adopt to capitalize on that potential.

1. Reduce Repair Costs with Predictive Maintenance

Keeping vehicles in good condition is one of the best-practices-for-fleet-management but can be difficult with conventional approaches. Running vans to failure leads to costly breakdowns, but schedule-based preventive repairs can lead to a lot of downtime. Predictive maintenance provides a better path forward.

Predictive maintenance uses IoT sensors to track vehicle health factors like engine heat, vibrations or repair codes. When these systems detect an issue, they alert relevant employees so they can schedule timely maintenance. As a result, contractors can fix vehicle problems while they're still small and avoid time-consuming repair inspections simultaneously.

This tech-centric approach to maintenance reduces unscheduled vehicle downtime by 25% and cuts annual repair costs by \$2,000 per vehicle on average. While any preventive care is better than run-to-failure models, only predictive maintenance can achieve this level of savings.

2. Optimize Routes with AI

Inefficient routes are another common obstacle for fleets. Many contracting businesses understand the importance of planning routes in advance, but even then, changing factors like traffic and road closures can disrupt operations. The



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New technologies like artificial intelligence (AI) and the Internet of Things (IoT) hold significant promise for fleet optimization.

solution is to automate this planning through AI.

AI is often better than humans at finding trends and gaining insight from data. As a result, it's the ideal technology to analyze road conditions, route lengths and other relevant information to find the most efficient way forward. Contractors don't need to have extensive AI programming skills to take advantage of this, either, as off-the-shelf AI route planning systems are available today.

AI route planners can find faster paths humans may miss and account for real-time updates. As a result, some companies have saved as much as 20% on route time, distance and fuel consumption.

3. Use Telematics to Enforce Safe Driving Policies

Optimizing fleet operations is also a matter of addressing unsafe or inefficient driver behavior. If contractors

don't drive safely on their way to a job, it can have serious consequences. Aggressive driving can increase fuel consumption and vehicle wear, and distracted driving caused more than 400,000 injuries and 2,841 deaths in 2018 alone.

Contracting businesses must hold their employees to a higher standard to avoid these consequences, and telematics provides a way to do so. Telematics systems can track vehicle locations, speeds, braking, turning and more to highlight driving patterns. With this data, companies can recognize and reward their best drivers and learn which employees need additional training.

Telematics' transparency holds employees to a higher standard, with both rewards and penalties encouraging compliance with safe driving policies. As workers drive more efficiently and safely, fleets may be able to reduce their insurance premiums, too.

4. Consolidate Fleet Data on Cloud Platforms

Another helpful tech-centric fleet optimization strategy is to pull all a fleet's data into a single point of access. Running a fleet means managing a lot of information, from repair logs to vehicle runtime to tax and registration fees. If contractors keep each of these records in separate places, it'll be easy to miss important deadlines or possible savings opportunities.

The solution is to use cloud-based fleet management platforms. These systems let contractors keep all their relevant information in one place, making it easier to get the full picture of their operations. They can then see where and how to lower costs or improve efficiency.

For example, looking at all fleet data in context can reveal if contractors often go through toll roads and how much those tolls cost. The fleet could save money with toll transponders, but only if these fees recur frequently enough. Viewing all cost and operational information together will help make those decisions, ensuring contractors are as informed as possible.

5. Automate Repetitive Tasks

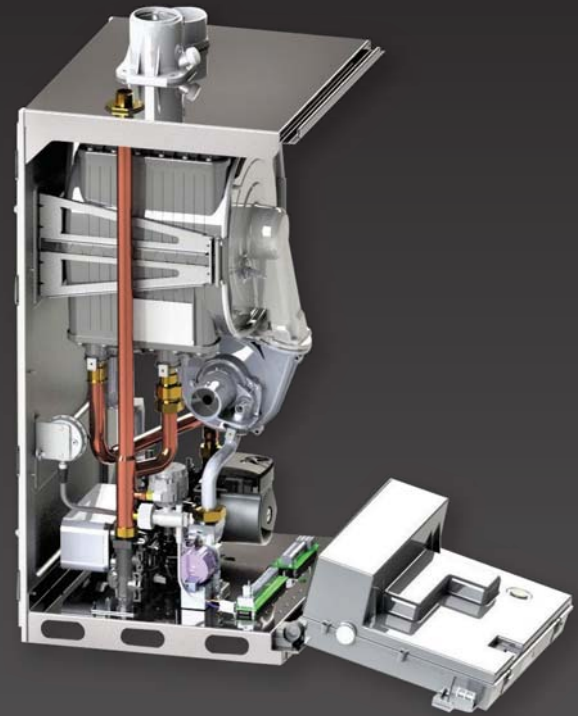
Technology can also help optimize the back-office tasks involved in running a fleet. Processes like billing and scheduling may not seem that time-consuming initially, but they add up to considerable time sinks over time. Using cloud software and robotic process automation (RPA) to manage them will give contractors more time to focus on other, more critical tasks.

Fleet management software can automatically categorize repair order data to automate approvals, scheduling and data entry related to ongoing maintenance. Similarly, some programs can automatically plan routes for upcoming jobs or assign vehicles to employees. Others can automate tax and fee management concerns like bookkeeping and alerts.

➤ **Turn to Fleet, page 53**

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Foremen Get Unexpected Lesson on Artificial Intelligence

► **Continued from page 1**

and 6 at the Viega Seminar Center in Broomfield, Colorado. A few attendees had heard of ChatGPT, but none had used it.

“Foremen in our industry are comfortable with the tools that they keep in the jobsite box,” said Alter in the class. “But as the first line of company management, please realize that your best tools now are going to be technology and software. Artificial intelligence, A.I., is one of those software tools that foremen should be using. You just haven’t seen why yet.” Alter then led the class through entering prompts into the platform, generating helpful output.

Not Just for Office Workers

Alter introduced a scenario where a foreman needs a standard operating procedure to guide a new apprentice through the steps required for installing underground piping. The attendees worked for about 15 minutes to



Attendees at the Super Foremen Workshop working on a group activity.

create a step-by-step list. “Okay, now let’s ask the A.I. for the same thing!” Alter described what was needed using just two sentences typed into the ChatGPT platform. Within a few seconds, the

software had used its resources to generate a detailed installation instruction sheet that included important steps that the human audience had missed.

Alter then put the A.I. to work generating a list of construction finance books to read, calculating duct installation productivity rates and generating a construction delay notification letter to a general contractor. “This is not just a tool for office workers,” said Alter. “You can put this to work for you as well. Like any tool, if you know how to use it properly, it will save you time and give you an advantage over others who are not using it.”

Purdue University Professor Emeritus Kirk Alter shows some of the practical uses of ChatGPT during the PHCC’s Super Foremen Workshop.

The Future of Water Heating Technology

► **Continued from page 10**

on the pace of regulations and policy changes. Moreover, the building trades industry also needs to adapt quickly to standardizing heat pump water heaters so that they can be adopted with higher ease by engineers and contractors.

C: What kind of opportunities do you see for water heating professionals doing specification and installation work in this evolving environment?

Deivasigamani: We can’t solve the CO2 emissions problems without addressing our built environment. At 26%, they are the largest consumer of energy. I see a world of rapid and exciting change that will be an opportunity for every engineer and contractor to grow their careers and businesses much like the Internet revolution. In this case, they will also be contributing to the greater good. The early adopters and pioneers of heat pumps are going to be the winners and leaders in their businesses.

There are huge opportunities for forward-thinking engineers and contractors to specify systems that are well positioned for the future. Leaning into the federal government’s Inflation Reduction Act, seeking out local government and utility rebates and incentives will also help secure lots of new jobs for contractors and other specifiers.

C: Do you see greater growth on the residential or the commercial side in the coming 5-10 years?

Deivasigamani: That’s a great question and a tough one to answer. Certainly, commercial and industrial facilities use more energy than residential buildings on a per unit/building basis, making them better targets for larger efficiency gains. But the sheer number of residential water heaters versus commercial heaters tips the scale in the favor of residential growth. Currently, Intellihot is focused solely on commercial/industrial water heaters, but we may have news soon on other fronts.

C: During the pandemic, supply chain issues were a pain point for many manufacturers. Have those problems resolved themselves? Have manufacturers been forced to expand/diversify their supplier networks?

Deivasigamani: Through a mixture of good fortune and strong planning, Intellihot has not had the supply chain problems of other companies, making this a particular strength of our company. As an example, we worked with a restaurant in the Northeast that had a tanked water heater fail at 4:00 PM on a Friday. Our rep received the call Friday evening, and by 7:30 on Saturday, they had installed a 1.0M BTU Intellihot tankless water heater, and the restaurant was back up and running.

Our supply chain has delivered for us, and our distributors stock the units that are needed. It’s a win-win for everyone and this restaurant has already documented significant energy savings with their new tankless water heater. **G**

Hosted by Viega

Viega hosted the workshop at their Broomfield, Colorado Seminar Center, and generously provided A/V, meals for the attendees and more. “We appreciate the work Viega has done to host our classes this year,” said **John Zink**, VP of Development and Communications at the PHCC Educational Foundation. “The purpose-built classroom space is a perfect fit for our training, and the interactive displays onsite help attendees learn about new installation possibilities with Viega’s various product lines. Plus, the Viega team is always a pleasure to work with.”

Project managers and foremen who wish to register for future offerings of the Foundation’s *Essentials of Project Management* class or the *Super Foremen Workshop* can add their names to the notification lists for these sessions at: phccfoundation.org/essentials. Kirk Alter will also be presenting two sessions during PHCC CONNECT 2023 in Cleveland, Ohio this October. **G**

Oatey Generates Critical Skill Awareness with Book Readings



Oatey Women's Resource Network Educates on Careers in Construction with Book Reading at Douglas MacArthur Girls Leadership Academy held on International Women's Day (March 8, 2023).

CLEVELAND, OH — Oatey Co. has partnered with The House That She Built, an organization with a mission to help generate awareness of the skilled trades.

A new children's book, *The House That She Built*, educates young readers about the people and skills that go into building a home. The book tells the true story of a home built by all female tradespeople. One by one, the reader learns about the architect, framer, roofer, plumber, HVAC technician, and many more.

Readings for Awareness

As part of the partnership, Oatey is spearheading book readings throughout the Cleveland, Ohio, area. Oatey's Women's Resource Network (WRN), has organized readings at multiple Cleveland Metro Schools, including the Douglas MacArthur Girls Leadership Academy and Goldwood Primary School in Rocky River, Ohio.

The book reading at Douglas MacArthur Girls Leadership Academy was held on International Women's Day (March 8, 2023) and included a hands-on STEM activity for Pre-K through 3rd-grade students.

The Goldwood Primary School reading was held on April 3, 2023, in partnership with the school's PTA. Oatey donated a copy of *The House That She Built* for each classroom in the school. Parents and teachers, in addition to reading the book, led the students in a hands-on STEM activity.

"The House That She Built is an ideal partner for Oatey, especially as the


construction industry faces one of its biggest challenges: the shortage of skilled trade workers," says Oatey's Senior Vice President of Brand & Digital Marketing, **Katherine Lehtinen**, who also sits on The House That She Built Executive Leadership Council.

A Sense of Urgency

The House That She Built movement helps create a sense of urgency to overcome the international labor shortage in construction by elevating the skilled trades within underrepresented communities.

Oatey first connected with The House That She Built through the company's podcast, *The Fix*, after hosting author and founder **Mollie Elkman** as a guest.

Oatey continues to host book readings throughout surrounding northeastern Ohio communities. An upcoming initiative involves Providence House, a crisis nursery committed to child abuse prevention and family preservation in the Cleveland area. Oatey associates will conduct a book reading at Providence House and donate copies of *The House That She Built* to all current Providence House residents.

Oatey is looking to expand the book-reading program in the Cleveland area. If you are interested in partnering with Oatey to host a reading, please contact **Amanda Keiber**, Director, Corporate Communications, at akeiber@oatey.com; or call 216/339-0120. To learn more about The House That She Built's mission, visit www.thehousethatshebuilt.com. 



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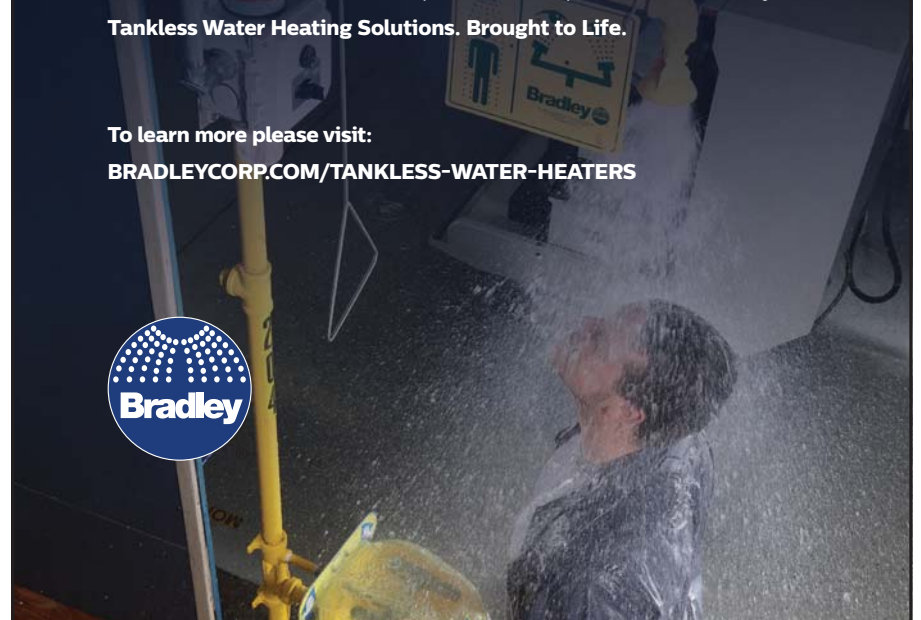
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Common Brazing Mistakes

► Continued from page 44

process: setting the proper flame, observing the flux behavior, and heating the joint evenly.

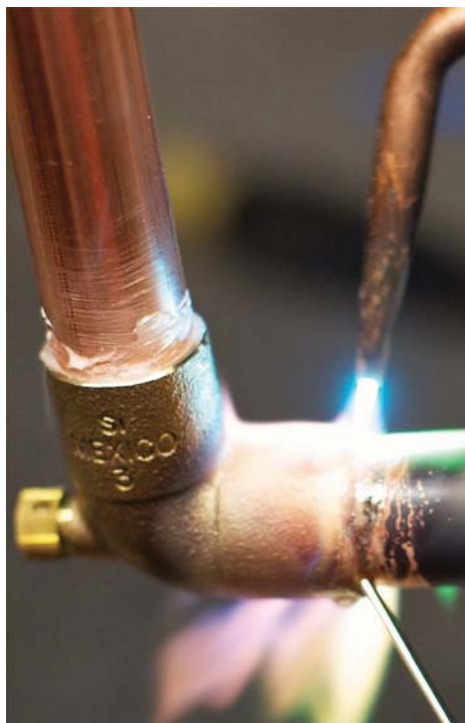
For most brazing jobs using oxygen-acetylene gases, a neutral flame should be used. It is important to avoid an oxidizing flame, as excess acetylene removes surface oxides from the copper. When this happens, the copper appears bright rather than having a dull or blackened surface. Review the manufacturer's instruction manual to set the flame based upon the equipment you are using.

For filler metal alloys that contain flux, use the alloy to touch the joint area to determine if the metals are up to temperature. Apply the alloy when the metal reaches proper temperature.

If you are using alloys that require adding the flux, observing the flux as it goes through physical changes will provide a good visual guide to determine when the metal is up to brazing temperature. While heating the tube, flux starts to bubble and becomes completely fluid and transparent, indicating the parts are at brazing temperature. The brazing alloy melts very shortly after the flux stops bubbling. The transition to fluid and clear is the time to add the brazing alloy to your joint.

Proper heating steps:

- Begin heating the tube by applying the flame perpendicular to a point just adjacent to the fitting, moving the flame and heating completely around the tube.



The alloy can be touched to the tube to ensure the joint is up to brazing temperature.

- Move to the fitting, still holding the flame at a 90-degree angle and work around the fitting.
- Watch the flux changes to indicate when it is time to apply the alloy. The alloy can be touched to the tube to see if the joint is up to brazing temperature. Remember that the heat of the base metals—not the heat of the flame—should melt the alloy.
- After the base metals have been heated to brazing temperatures, move the flame to the joint between tube and fitting and apply filler metal. Move the flame over both parts as the braze alloy is drawn into the joint via capillary action.
- Sweep the flame back and forth along the axis of the assembled joint. The heat draws the alloy into the joint and completely fills the unoccupied joint space.

The key to successful brazing is having all parts of the joint evenly heated and up to brazing temperature before applying the alloy.

Mistake #5: Flux residue is left on the pipe

Cleaning parts after brazing is a quick but critical step because flux is a corrosive alkaline and could corrode the base material. All flux residue must be removed for inspection and pressure testing.

Immediately after the brazing alloy has set, quench with water, or apply a wet cloth to crack and remove the flux residue. Use an emery cloth or a wire brush, if necessary.




Once the brazing is completed, it's important to remove all flux residue because flux is alkaline and could corrode the base material.

Getting brazing help

Both new and experienced plumbers will benefit from reminders on the steps to brazing. More information on brazing is available at www.harrisproductsgroup.com. In-person training is also available for customers working with Harris distributors and wholesalers.



A quality brazing job results in strong, long lasting pipe joints.

The art of brazing is relatively simple but requires practice and attention to detail. When every step is taken, the results will be successful, and customers will be satisfied. 

Ozzie Cejas is Technical Sales Specialist at Harris Products Group. Harris is the only company that manufactures not only alloys and solders but also a complete line of equipment including oxyfuel torches and torch kits, air fuel torches, and accessories. www.harrisproductsgroup.com.

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5 Fleet Optimization Strategies

► **Continued from page 48**

Automating these tasks will also minimize the risk of human error. As a result, contractors will experience fewer losses from mistakes and reduce the time they'd spend going back to fix errors.

Key Considerations

These strategies hold significant potential for any contracting business, but it's important to approach them carefully. Implementing technologies like AI, IoT and telematics can quickly become expensive and complex if contractors aren't careful, but a thoughtful approach will make the process manageable.

Before investing in anything, contractors should review their fleet

operations to see where their biggest inefficiencies lie. For some, maintenance may incur the most downtime and expenses, but others may struggle more with route planning. Identifying these inefficiencies will show which

includes comparing multiple sources and looking into vendors' experience with companies in similar industries and situations.

Finally, contractors should ensure they have appropriate cybersecurity

cybersecurity best practices to use new technology safely.

Optimize Your Fleet

These five technology-driven strategies can help any contracting fleet reduce its operating costs, improve safety and become more efficient. When that happens, contractors can enjoy higher profit margins, less downtime and higher customer satisfaction.

It all starts with understanding what technology is available today and how it applies to your specific business. **C**

Oscar Collins is the Editor-in-Chief at Modded. Follow him on Twitter @TModded for frequent updates on his work.

Contractors should work closely with technology vendors to find a solution that fits their needs.

technology strategies will be the most effective. Starting with a single upgrade in these areas of most improvement will help manage technology costs.

Contractors should also work closely with technology vendors to find a solution that fits their needs. That

measures in place. Many of these technologies involve collecting valuable data, making businesses a target for cybercrime. Considering cyber-crime is the fastest-growing type of crime in the US, contractors must use up-to-date security software and learn

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The Push Toward Sustainable Heat Pump Technology

► **Continued from page 26**

alone adequate for colder climates such as the Upper Midwest or the Northeast? Lochinvar's Russell says that while in the past there has been hesitancy when specifying heat pumps in colder climates, that concern is slowly but surely dissipating.

Hybrid systems are a great approach to both lower carbon emissions and up-front system costs.

"Heat pump technology has made remarkable strides over the last couple of years and is now able to perform well in a variety of climate zones, including parts of the US that have colder winters. Today, it's a viable option for consumers in the Midwest and Northeast," says Greene.

For example, Lochinvar's recently launched Veritus Air Source Heat Pump Water Heater is an excellent example of how new technology is developing to operate at a higher efficiency in below-freezing temperatures. Additionally, hybrid systems are a great approach to both lower carbon emissions and up-front system costs.

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High Efficiency DNA

It's important to note that federal legislation and local mandates aren't the only driving factors for change. Many businesses are establishing their own sustainability goals. "We're finding that our commercial customers are showing great interest in heat pump water heater (HPWH) technology, especially products like the Veritus HPWH, which has a high coefficient of performance (COP) that raises the bar on efficiency and maximizes energy savings. At Lochinvar, high efficiency is in our DNA, so it's a natural next step for us to introduce Veritus as another high efficiency option for our customers," says Russell.

Multiple Veritus heat pumps can be banked together to meet the most challenging commercial hot water demands and more precisely match capacity to demand. With its SmartTouch control, the Veritus HPWH takes installation ease to a new level. With new built-in diagnostic tools being incorporated into units like the Veritus, troubleshooting and maintenance are a breeze for facility managers. "Maintaining HPWHs is no more difficult than with traditional water heaters, but it's important that contractors have the resources and training that will help them be successful when working on a heat pump water heater," says Russell.

While developing heat pump technology to support the direct need for electrification options, "we also have what we believe to be the most highly efficient gas-fueled products on the market today to indirectly support these initiatives," says Greene.

For example, A. O. Smith's Voltex AL HPWH is a game-changer for residential heat pump technology thanks to its integrated leak detection, smart connectivity and updated water connections. The Voltex AL heat pump family features one of the highest Uniform Energy Factors (UEFs) on the market at up to 4.02. The Voltex AL HPWH is also one of the quietest HPWHs on the market, operating at just 45 dBA.

Training U

With any new technology and/or products, training becomes paramount. And with the push toward electrification, both A. O. Smith and Lochinvar are poised to take on advanced education, both in-house and online.

A. O. Smith University is constantly evolving its class offerings to ensure that it provides contractors with the resources they need to succeed in the field. "We recently reintroduced in-person classes at our state-of-the-art broadcast studio in Ashland City, Tenn., allowing contractors to receive real-time, full-scope demonstrations on a range of A. O. Smith products. We also offer virtual classes which are taught on a two-way meeting platform to ensure participants have a high level of engagement with instructors and the opportunity to ask questions," says Greene.

Lochinvar offers a wide range of educational resources for contractors, engineers and technicians. Lochinvar University courses cover not just

an overview of the company's technology's features and benefits but also instruction in practical areas like correct unit size specifications. "We are presently developing several new modules to break down the technology for those that might be just making the transition themselves. For on-demand resources, contractors can check out LochinvarU, which features digital simulators, video tutorials and more," says Russell.

It's clear that electrification and the subsequent development of heat pump water heaters are going to play a huge part in the future of the HVAC industry and the economy, but it's also important to recognize that there are other technologies that will support the future of the industry and the push for sustainability. "Both A. O. Smith and Lochinvar are continually working to improve efficiencies on our products to ensure every customer has a sustainable option that best suits their installation needs," says Russell. **C**



Tools & Tiaras founder Judaline Cassidy with a Princess Warrior at a summer camp event.

► **Continued from page 29**

Cassidy acknowledges that she struggled with confidence early in life, partly because she has dyslexia.

"I didn't know that I was until later in life, but I struggled with the math portion of plumbing, not so much theory and the actual hands-on," she explains. "It wasn't an impediment because people who have dyslexia always find ways to compensate and make whatever it is work. Many entrepreneurs have dyslexia, so now I consider it my superpower.

"I have no struggle with my confidence in being a plumber. I walk around with the most pride and an I-know-it-all kind of attitude—in a good way!—about plumbing."


A Game-Changer

Cassidy wants more parents to realize that the construction trades can give their daughters a good living and a rewarding job: "Be open-minded; college is not the only path to success. It's recession-proof, COVID-proof—even zombie apocalypse-proof! Plumbing and other trades can lead your daughters down the entrepreneurial path and into the owner's chair, having their own businesses."

She also would like to see more visibility and a rebranding of the trade. "Not so much focused on the

blue color aspect, but to show that we are equal in earning a good salary as other people, which comes along with pride," Cassidy says. "Technology also plays a large role in construction today; we must get that message across, too."

Growing up, Cassidy was extremely poor; being a plumber has been a game-changer for her. And she wants young women to have that same experience in a career that truly helps people.

"I think nothing can be more satisfying than building something with your hands, even if it's something you got in the mail and you had to put it together," Cassidy notes. "When you accomplish it, how do you feel? That feeling is what the girls get. Building a table or soldering something; if I can do this, I can do anything. That's what we want to instill in them, that they can do anything." 

Kelly Faloon is a contributing writer to CONTRACTOR magazine and principal of Faloon Editorial Services. The former editor of Plumbing & Mechanical magazine, she has nearly 35 years of experience in B2B publishing, with 25 of those years writing about the plumbing, heating, cooling and piping industry. Faloon is a journalism graduate of Michigan State University. You can reach her at kelly@falooneditorialservices.com.

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Bradford White and Podium Partner to Help Contractors Streamline Customer Communication

AMBLER, PA — Bradford White Water Heaters, an industry-leading manufacturer of water heaters, boilers and storage tanks, announces a new partnership with the powerful messaging platform Podium that helps contractors grow their business through better communication with their customers.

With premium access to Podium's suite of messaging tools, Bradford White contractors can text customers to gather online reviews, connect with leads and send promotional campaigns, all from a single easily accessible inbox.

"At Bradford White, we do everything we can to help our contractors be more successful," said **Carl Pinto, Jr.**, Senior Director of Marketing Communications for Bradford White. "Podium makes connecting with existing and prospective customers as easy as sending a text. With their customizable, intuitive tools, contractors can streamline communications and distinguish themselves from competitors who continue to rely on clunky and outdated options."



Leading US-based manufacturer of water heaters and boilers offers contractors specially discounted access to the powerful messaging platform.

Texting is the only marketing channel with a 98% open rate and offers customers a convenient, personal 1:1 connection that is more effective than advertising. On average, Podium users see monthly online reviews double and build lasting relationships with customers five times faster.

Podium allows contractors to send custom review requests that link customers directly to Google reviews or industry-specific websites. The Podium platform also routes leads from all channels into a single easy to use inbox, increasing efficiency and conversion rates.

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For more information about Podium for Bradford White contractors, visit <https://www.podium.com/bradford-white/>.

For more information about Bradford White Water Heaters, visit <https://www.bradfordwhite.com>.

Rheem Family of Brands Wins Silver and Bronze at the 2023 Edison Awards

► **Continued from page 3**

world-changing innovations and the brilliant minds behind them.

The Rheem Renaissance™ 15-25 ton Commercial HVAC line earned silver in the Engineering & Robotics, Commercial Technology category and the Rheem ProTerra® Plug-in Heat Pump Water Heater earned bronze in the Consumer Solutions, Sustainable Design category.

"To receive recognition for two of our Rheem products from the Edison Awards is a true testament to our company's determination to provide next-level comfort solutions for all of our customers' needs," said **Chris Day**, Vice President, Global Water Product Strategy and Marketing, at Rheem. "It

is an important acknowledgment for our Rheem team members who work meticulously to ensure we continue to

lead the industry by bringing the most innovative, sustainable and smart products to market."

Creativity and Innovation

Rheem Renaissance 15-25 ton is a culmination of years of research and development, creative engineering and

innovation. Crafted with smart features, the Renaissance line includes exclusive PlusOne® advantages for easy

replacement, installation and service. Renaissance products incorporate features contributing to Rheem's goal of building a more sustainable future.

The Rheem ProTerra Plug-in Heat Pump Water Heater is ENERGY STAR® certified and ideal for drop-in gas replacement. It plugs into any standard

120V outlet and features high-efficiency upgrades without the need to install a 240V electric service. Its built-in EcoNet Wi-Fi technology provides control of the household water heater so homeowners can adjust water temperature and track energy usage from a smartphone.

All nominations were reviewed by the Edison Awards Steering Committee, with the final ballot determined by an independent judging panel. The panel comprises more than 3,000 senior business executives and academics from the product development, design, engineering, science, marketing and education fields and past winners.

For more information about Rheem, please visit www.rheem.com.

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Mitsubishi Electric Trane Predicts Green Trends in Commercial Building

The Center on Global Energy Policy recently reported the buildings sector worldwide consumes approximately 30% of global energy—natural gas, electricity and solid and liquid fuels for heating, cooling, lighting, equipment and cooking. The commentary also pointed out the importance of decarbonization in the buildings sector.

Interest in eco-friendly commercial buildings is on the rise, especially with increasing reports of global warming and the impact of companies using vast amounts of the planet's resources. Couple this with rising scrutiny of organizations' environmental, social and governance (ESG) initiatives, building owners' and other stakeholders' reputations and revenue depend upon taking steps to become more sustainable.

Here are five trends Mitsubishi Electric Trane HVAC US (METUS) believes will become more prevalent in 2023 and in the coming years in the United States.

Inflation Reduction Act Upgrades Will Save Money and Reduce Emissions

The Inflation Reduction Act (IRA), signed into law in August 2022, is the United States' largest climate investment initiative in the country's history. With the IRA set to funnel hundreds of millions of dollars in rebates and tax credits for greener and more energy-efficient building upgrades, commercial builders, architects, engineers and building owners will increasingly search for ways to take advantage of these lucrative incentives and the long-term energy savings accompanying them.

For example, the 179D commercial buildings energy efficiency tax deduction now offers base tax deductions to commercial building owners and designers of buildings that meet certain energy efficiency standards. Deductions work on a sliding scale of \$.50 per square foot for energy savings of 25% and up to \$1 per square foot for energy savings of 50% or greater.



MITSUBISHI ELECTRIC TRANE HVAC US

Bonus deductions are on a sliding scale of \$2.50 per square foot for energy savings of 25% and up to \$5 per square foot of energy savings of 50% or greater. Depending on the size of a commercial project and if it meets certain prevailing wage requirements, savings can be considerable.

Some industries are receiving specific incentives. For example, the 45L ITC benefits multifamily building contractors that build and sell homes that meet specified energy efficiency

requirements, as well as zoning and smarter system controls.

VRF technology allows a building to be divided up into zones for heating and air conditioning, ensuring that energy is being used more efficiently only in the spaces where air is needed. For example, a hotel would be able to set back or turn off systems in unoccupied rooms, or an office building manager would be able to better control specific tenants' heating and air conditioning. Additionally, if builders and building

Interest in eco-friendly commercial buildings is on the rise.

owners choose electric versions of VRF technology, they will also make their buildings greener by reducing dependence on fossil fuels. Zoning is made possible through systems controls becoming smarter and easier for building owners and managers to navigate.

To improve their equipment's energy efficiency, savvy commercial builders, architects, engineers and building owners are also taking a close look at their water heating needs. More on water heater trends is in the water conservation and water heating section below.

Installation of Energy-Efficient Equipment Set to Increase

As operators look closer at their buildings' power usage, they are increasingly wanting to install more environmentally friendly and energy-efficient equipment. Some of this more energy-efficient equipment includes buildings switching to use all-electric variable refrigerant flow (VRF) technology, the fastest-growing segment of the commercial HVAC in-

dustry, as well as zoning and smarter system controls.

To improve their equipment's energy efficiency, savvy commercial builders, architects, engineers and building owners are also taking a close look at their water heating needs. More on water heater trends is in the water conservation and water heating section below.

Renewable Energy Generation on the Rise

Commercial buildings will use more of their free outdoor space, such as roofs, for photovoltaic systems, or solar panels. They will pair this renewable energy generation with energy storage. Generating, storing and tapping into their own renewable energy will help reduce a building's carbon footprint and utility bills—of particular importance since energy bills are becoming more expensive.

For the commercial sector, the price of energy went up nearly 13% between January 2022 and January 2023.

By storing electricity through ultra-large batteries, for instance, buildings can use their reserves when needed. According to the Environmental Protection Agency (EPA), "electricity storage could help the utility grid operate more efficiently, reduce the likelihood of brownouts during peak demand and allow for more renewable resources to be built and used."

When builders combine solar panels with advanced, energy-efficient heat pumps, the savings can be sizeable since the sun is the source often powering the heat pumps instead of electricity. It is easy to see why this carbon emissions-reducing duo paired with energy storage are increasingly being used: when the sun is not shining, buildings can tap into their own electricity reserves, reducing energy bills.

Tenants of the Distillery North Apartments, a 28-unit multifamily complex in South Boston, benefit from sizeable utilities savings. Between the complex's solar panels, positioning of the complex and an energy-efficient HVAC system, heating and air-conditioning bills hover close to \$65 per unit annually in one of the country's priciest cities to live.

Building Materials Getting a Closer Look

Section 60503 of the IRA appropriates funding to the General Services Administration (GSA) for construction materials and products with substantially reduced levels of embodied greenhouse gas emissions, also known as low-embodied carbon rates, to be used on federal construction projects. These actions are expected to grow the market for even lower-carbon construction materials and prompt more industry innovation. As such, the buildings industry will increasingly use materials with low-embodied carbon rates.

➤ Turn to Mitsubishi, page 65

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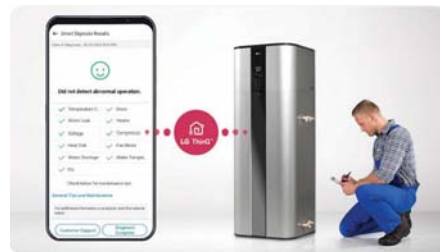
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Mitsubishi Electric Trane HVAC US
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▶ I200 COMMERCIAL TANKLESS WATER HEATERS

features a commercial-grade, expandable 316L stainless-steel heat exchanger and masterless cascading technology. If one cascaded unit is offline, all other units regroup and continue to operate. Multiple venting configurations are available.

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Easyflex

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▶ VH-199 CONDENSING HYBRID WATER HEATER

features a UEF of 0.91 and a thermal efficiency of 98%. Options includes wall-mounted, floor-standing and top water connections. It is designed for 2" venting up to 60". Easily field-convertible from natural gas to propane. It features a stainless steel heat exchanger.

Vesta

WWW.VESTAHWS.COM



▶ PROLINE XE VOLTEX AL HYBRID WATER HEATER

is a smart hybrid electric heat pump water heater. The residential Energy Star-certified water heater, Model HPTS-80, is built to commercial-grade standard. The unit offers premium features including a user-friendly display, vacation mode and a heavy duty anode that protects the tank for 10 years. It includes leak detection and alerts, with optional automatic shut-off valve. Two heating elements provide quick recovery during periods of high demand.

A. O. Smith

WWW.HOTWATER.COM



▶ CENTURION 1,600 MBH DOMESTIC WATER HEATER

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▶ HYBRID HOT SERIES WATER HEATERS

mounts the Noritz NC-C199CDV commercial condensing tankless water heater onto a 119-gal. storage tank; the tankless unit draws cold water from the side port of the attached tank. The hybrid unit has a 317 gal. per hour delivery rate. It offers a maximum input of 199,900 Btu per hour with a capacity range of 0.29 to 11.1 GPM.

Noritz America

WWW.NORITZ.COM



▶ RCB-SERIES COMMERCIAL BOILER

is a high-efficiency, wall-hung condensing boiler that delivers reliable, energy-saving performance. A stainless-steel water tube heat exchanger and 97% thermal efficiency maximize productivity within a compact design. Premix burner performance reduces greenhouse gas emissions and increases turndown ratio—set at 10:1 for precise load tracking and energy savings. Multiple boiler configurations can be accommodated with the Integrated Cascade Logic, which distributes runtimes equally for optimal application diversity.

Rinnai America Corp.

WWW.RINNAI.US/COMMERCIAL

▼ VERITUS AIR-SOURCE COMMERCIAL HEAT PUMP WATER HEATER

features a modular design that allows multiple units to be banked together to achieve large commercial hot water demands, provide built-in redundancy and match capacity to demand. Units can be installed outdoors while the SmartTouch control's touch screen can be located indoors. Also features a high coefficient of performance and uses low-global-warming potential refrigerant (R513A).

Lochinvar

WWW.LOCHINVAR.COM



editor's choice

MODEL 406 1/6 HP COMPACT DRAIN PUMP from Liberty Pumps features quiet, automatic operation; a short profile design for compact areas, only 10" tall (base to top inlet flange); float switch and pump serviceability via access cover; and wet-end serviceability via removable pump "cartridge" with a simple, ¼-turn removal. Factory pre-assembled, ready to install. Includes rubber gasket for a gas-tight seal. Floor-level side inlets, with integral check valve and couplings, are included for convenient plumbing. Also includes a stepped discharge adapter: 1 inch, 1¼" and 1½" inch with integral check valve.



Liberty Pumps
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CLEARFIRE-LC CONDENSING FIRE-TUBE BOILER is a high-mass, fully condensing hydronic boiler capable of variable-flow pumping. The larger-capacity, 98% efficiency design allows the most effective installation by using fewer units as opposed to banks of smaller boilers. The boiler features dual temperature returns for system design flexibility.

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TANKLESS ELECTRIC WATER HEATER from GE is a whole-home solution offering unlimited hot water on demand. Model GE18SNHPDG uses standard ½" NPT water connections and does not require venting for simple, wall-mounted water heater installation. Performance of up to 3.8 GPM is enough to run one enough to run one faucet and two showers simultaneously in warm climates.



GE Appliances
GEAPPLIANCESAIRANDWATER.COM

FTHE BLAZE 100-FT. LASER MEASURE (GLM100-23) features two-button operation: one to measure and one to round. The rounding button allows user to easily round the measurement result from ½" up to 1/32". It is easy to read in no/low light conditions.

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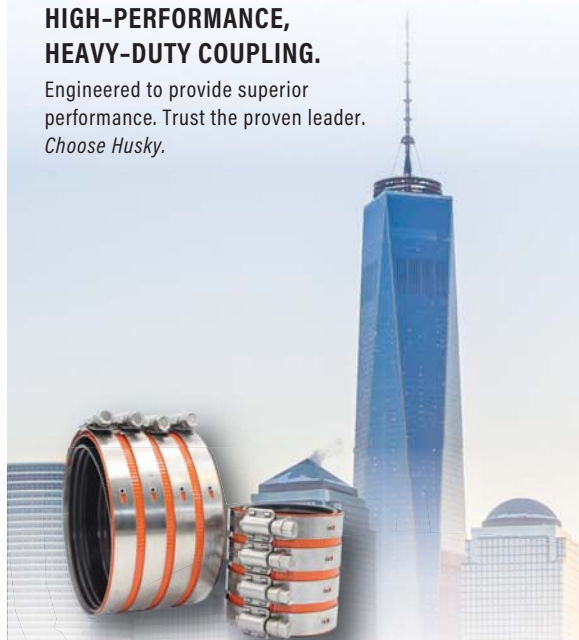


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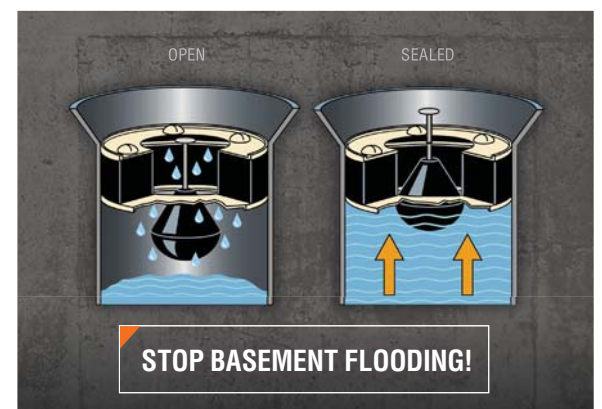
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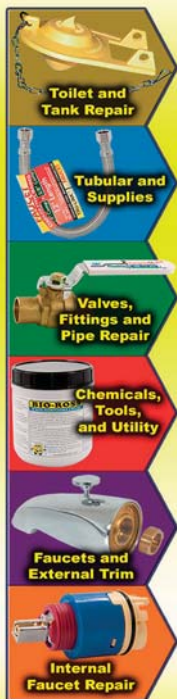


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NEW EBOOK FROM CONTRACTOR

Download the Best of Pat Linhardt

Patrick Linhardt is a thirty-seven-year veteran of the hydronics industry who has been designing and troubleshooting steam and hot water heating systems, pumps and controls on an almost daily basis.

Pat has been a regular monthly columnist for CONTRACTOR Magazine since 2019, where his column has become the cornerstone of our Hydronics & Radiant section. We are proud to publish this selection of his recent work, and hope these columns serve to educate and inspire a new generation in the industry.

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Class With the Kid
The System Syter is a slide rule turned into a circle by an icon of the industry named Gil Carlson
By Patrick Linhardt

Mitsubishi Electric Trane Predicts Green Trends

► **Continued from page 58**

The industry will also be looking at ways to improve window designs to decrease energy usage and even generate electricity. With many commercial buildings today having large and sometimes floor-to-ceiling windows on every floor, cooling costs and energy consumption can skyrocket on sunny and hot days. Some may also explore photovoltaic windows, which transform solar energy into power for the building and reduce energy use and associated carbon emissions by 40%.

Solid exterior walls may also become more prevalent, as well as solutions like fluid-applied membrane air barriers—material designed to control air movement of air throughout a building, waterproof and conserve energy.

Further, builders and other stakeholders will increasingly move away from developing ducted systems and instead install ductless HVAC systems since they are cost-effective, easy to maintain, ultra-quiet and can save on energy expenses.

Water Conservation & Water Heating Continue Being Key


Builders will continue to look at rain-water capture and other water-conservation methods to decrease their burden on city and county water supplies, especially in the Western US where water resources are stretched thin. Successive, compounding years of drought have led to reclamation facilities realizing below-normal inflows and water storage. As a result, onsite water reuse systems are gaining traction nationwide. These systems collect and treat water from onsite sources like stormwater, wastewater and rainwater. The systems then reuse non-potable water for things like outdoor irrigation and flushing toilets.

Additionally, the industry will install more smart water monitoring systems to provide owners and property managers with data surrounding water consumption. Benefits include the system alerting these stakeholders when leaks, malfunctions or other upticks in water usage are detected so challenges can be swiftly addressed.

Other technologies being adopted to make water usage more sustainable include electric hot water heating systems, replacing gas-powered hot water heaters. Conventional methods for heating water can be expensive and use a lot of fossil fuel power. For

example, in multifamily buildings, domestic hot water accounts for roughly 25% of annual energy usage, according to the US Energy Information Administration. More builders and building owners are considering installing electric heat pump water

heaters to limit their dependence on fossil fuels, and to provide greater energy savings than other electric water heating systems.

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by Steve Spaulding
EDITOR-IN-CHIEF



What do Younger People Want?

We live in accelerated times. Advances in technology doesn't just mean that people have more access to information, it means that digital content of every conceivable type is proliferating exponentially.

2,500 new videos are uploaded to YouTube *every minute*—about 183 hours worth. There are over a billion monthly active TikTok users, and 83% of them have posted a video. Users currently spend 17.6 million hours per day on Instagram Reels.

All this content is being tracked for how many eyeballs it can hold for how long. The most popular gets amplified by algorithms and then rocketed around the infosphere at the speed of social networking. We are all of us—but most especially younger people—awash in the new. New trends, new fashions, new language, new celebrities, concepts, perspectives.

No wonder the gap between how the older generations and the younger perceive the world seems to grow wider with every passing day. Maybe I'm wrong. Maybe this is just the way generations

have always worked—think of the gulf between teenagers in the 1930s and teenagers in the 1960s!—but it certainly feels that way.

In 2023 the oldest Millennials are in their 40s, and the oldest Gen Z-ers are

I think if we started to sell the plumbing profession as a force for good it might do a lot to attract younger workers.

in their early 20s. Those digital natives are now the backbone of the US workforce. At this same time, every plumbing business survey lists finding new workers a top concern. Consequently I, like so many others in the trade press, have been asking for years: just what do younger people want?

(To hear from some of these young people themselves, check out our Under 30 All-Stars feature on pg. 30.)

I think young people want that sense of community, of belonging, that comes from working for a good company. But

they've lived through two historic economic downturns (the Great Recession and the pandemic recession) and they know that the days of a company keeping its employees on, through good times and bad, are long gone. A boss might say,

"we're all family here," but they know a company is only as loyal to them as the numbers allow them to be, so they are slow to show loyalty in return.

I think they want to develop skills and expertise they can take pride in. At the same time, they're wary of being exploited. There was a time when "paying your dues" and "putting in the hours" had a payoff: job security, home ownership, the kind of benefits (healthcare, vacation, pension) you could build a life around. Now, even generous employers are hard-pressed to compete

with the rising cost of living. Why put in those long hours for so many years just to still be stuck in an apartment you can barely afford?

I think the skilled trades can offer a sense of belonging. I think the trades can offer independence, security and prosperity. But more than that, I think it can offer young people the opportunity to make a difference for the better in the world.

In our May issue Matt Michel wrote a column that has attracted a lot of attention, *6 Reasons Why Plumbing is a Noble Profession*—and it is! Plumbers protect communities against waterborne disease. They solve people's problems when there's a leaky pipe or a toilet that won't flush. They help people live happier, more comfortable lives. They can make homes and businesses more resilient and more sustainable.

I think if we started to sell the plumbing profession as a force for good it might do a lot to attract younger workers; and I think once they discover for themselves all the profession offers, they'll stick around. **C**

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DCC-115

Type	Wall Mounted [W x H x D]	Floor Standing [W x H x D]	CH Mode Input	DHW Mode Max.	DHW Flow Rate
COMBI	DCC-115 [17 3/4" x 30" x 13 9/16"]	DCCF-115 [24 3/4" x 43 3/4" x 17 1/2"]	16.6 - 93.5 MBH	115.5 MBH	2.5 GPM
	DCC-150 [17 3/4" x 30" x 13 9/16"]	DCCF-150 [24 3/4" x 43 3/4" x 17 1/2"]	22.0 - 125 MBH	153.0 MBH	3.5 GPM
	DCC-205 [17 3/4" x 30" x 21 1/2"]	DCCF-205 [24 3/4" x 43 3/4" x 23 1/2"]	29.5 - 164 MBH	205.0 MBH	5.0 GPM
HEAT ONLY	DCB-75 [17 3/4" x 30" x 13 9/16"]	DCBF-75 [24 3/4" x 43 3/4" x 17 1/2"]	16.6 - 75 MBH		
	DCB-100 [17 3/4" x 30" x 13 9/16"]	DCBF-100 [24 3/4" x 43 3/4" x 17 1/2"]	16.6 - 93.5 MBH		
	DCB-125 [17 3/4" x 30" x 13 9/16"]	DCBF-125 [24 3/4" x 43 3/4" x 17 1/2"]	22.0 - 125 MBH		
	DCB-165 [17 3/4" x 30" x 21 1/2"]	DCBF-165 [24 3/4" x 43 3/4" x 23 1/2"]	29.5 - 164 MBH		



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